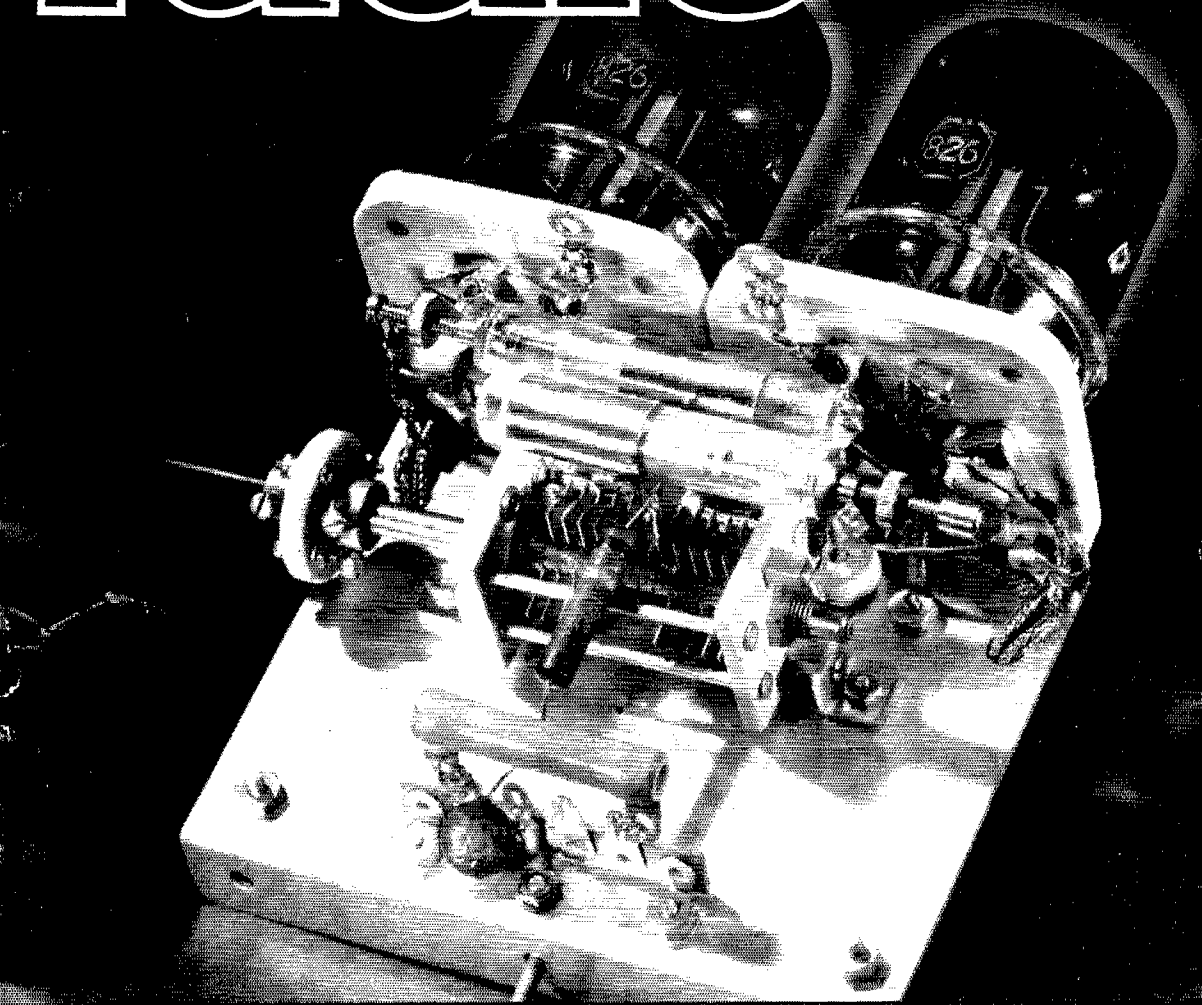
May, 1950
40 Cents
45c in Canada

QST

devoted entirely to

amateur radio



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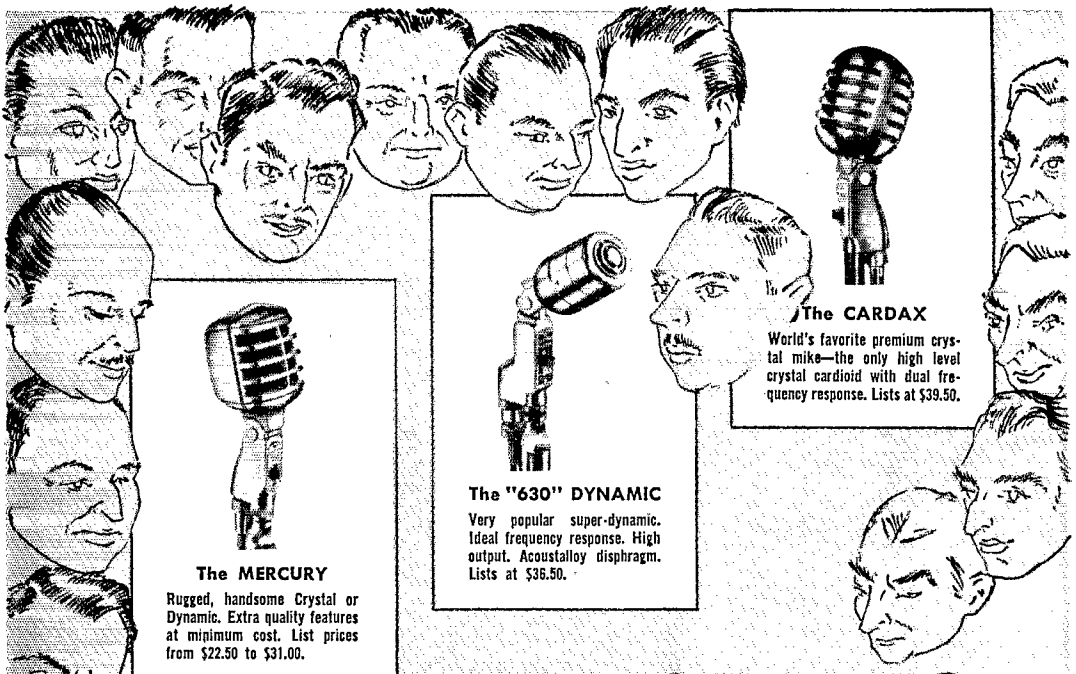


The CARDAX

World's favorite premium crystal mike—the only high level crystal cardioid with dual frequency response. Lists at $39.50.

The "630" DYNAMIC

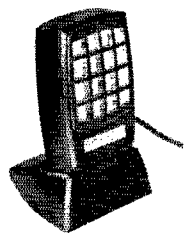
Very popular super-dynamic. Ideal frequency response. High output. Acoustalloy disphragm. Lists at $36.50.

The MERCURY

Rugged, handsome Crystal or Dynamic. Extra quality features at minimum cost. List prices from $22.50 to $31.00.

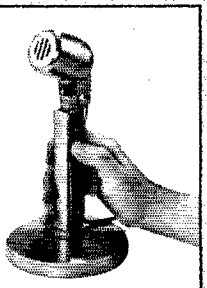
FAVORITES for Clear QSO's

A roll call of Hams proves the popularity of E-V mikes. That's because E-V engineered response assures *clear, exact* voice reproduction... E-V high output provides more power! There's a model made for you in the complete E-V line—with all the *extra* quality, *extra* features, *extra* value you want! *Ask your E-V Distributor or write for Bulletin No. 104.*



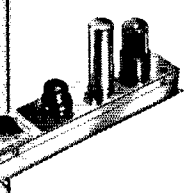
The CENTURY

Low-cost all-purpose crystal and dynamic models. Rugged, dependable. Satin chromium finish. Lists at $10.00 and up.



TOUCH-TO-TALK

First to fit any mike with 5/8"-27 stand coupler. Finger-tip relay operation or microphone "On-Off." With or without mike.



SPEECH CLIPPER

Clips the peaks from speech frequencies which exceed a pre-set amplitude. Adds greatly to articulation and intelligibility in speech transmission, especially in the presence of high QRM or QRN. Holds modulation at 100%. With tubes. Lists at $24.50.

NO FINER CHOICE THAN

Electro-Voice

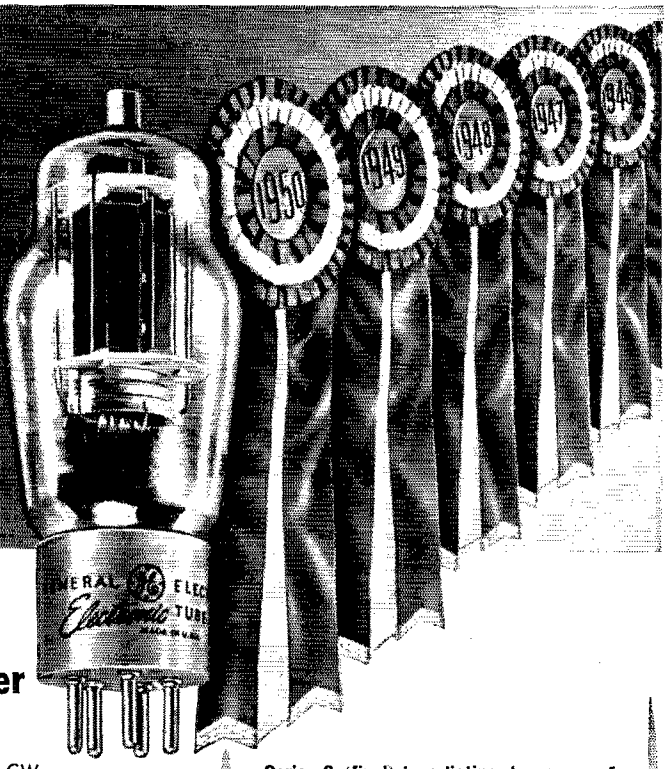
ELECTRO-VOICE, INC., BUCHANAN, MICH.

Export: 13 East 40th St., New York 16, N. Y.

Cables: Arlab

STILL CHAMPION

in its power class!



GL-807
Beam Power Amplifier

Filament voltage	6.3 v	
current	0.9 amp	
Max ratings, ICAS:	Phone	CW
voltage	600 v	750 v
current	100 ma	100 ma
input	60 w	75 w
dissipation	25 w	30 w
Freq. at max ratings	60 mc	

YESTERDAY or today, they don't come any better than the GL-807. As an active ham, you're already familiar with many of the tube's good features.

You know that the GL-807 is a jack-of-all-trades circuitwise, serving as oscillator—buffer—doubler, tripler, quadrupler—or final tube. In audio, you're aware of the tube's suitability for modulator work. A pair in Class AB_2 will put out 120 w, ample to modulate a ¼-kw rig.

General Electric design know-how and precision manufacturing stand behind this most useful of ham transmitting types. A beam power tube, special care in production is needed to assure top efficiency. Here G-E close-tolerance methods pay off directly in superior service by the GL-807 which *you* buy and install!

It will pay you to study afresh the advantages to your rig—the *economy*—that come from use of this fine and respected G-E tube. See your G-E tube distributor! The low price of the GL-807, in case you've forgotten, is less than that of a pair of average receiving types! *Electronics Department, General Electric Company, Schenectady 5, N. Y.*

Series 9 (final) in a listing, by areas, of tube distributors who can supply you with Ham News, G.E.'s bi-monthly magazine:

Alhambra, Cal.: Coast Electronics Supply Co.
Bellingham, Wash.: Waitkus Supply Co.
Everett, Wash.: Pringle Radio Wholesale Co.
Fresno, Cal.: General Electric Supply Corp.; Jack C. Arbuckle Wholesale Parts and Supplies
Glendale, Cal.: Hagerty Radio Supply
Hollywood, Cal.: Yale Radio and Electric Co.
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Los Angeles, Cal.: General Electric Supply Corp.; Kierulff and Co.; Papel Brothers; Radio Products Sales Co.
Oakland, Cal.: W. D. Brill Co.; Electric Supply Co.
Pasadena, Cal.: Dow Radio Supply Co.; Empire Electronic Distributing, Inc.
Portland, Oregon: General Electric Supply Corp.; Pacific Stationery
Sacramento, Cal.: E. M. Kemp Co.; Sacramento Electric Supply Co.
San Diego, Cal.: Shanks and Wright; Western Radio and Television Supply, Inc.
San Francisco, Cal.: Associated Radio Distributors; General Electric Supply Corp.
San Jose, Cal.: Frank Quement, Inc.
Santa Ana, Cal.: Radio and Television Equipment Co.
Santa Barbara, Cal.: Channel Radio Supply Co.
Seattle, Wash.: General Electric Supply Corp.; Seattle Radio Supply
Spokane, Wash.: General Electric Supply Corp.; Northwest Electronics
Tacoma, Wash.: C. and G. Radio Supply; A. T. Stewart Co.

(*List as of February 25, 1950*)

ELECTRONIC TUBES OF ALL TYPES FOR THE RADIO AMATEUR

GENERAL ELECTRIC

160-JA3

PEACE . . . it's wonderful!

HERE'S the TVI experience of Stanley H. Rosenberg, W2GSC, as he told it to us in a recent letter:

"Having recently purchased a Collins 32V-2 transmitter, I felt that you might be interested in the results obtained here at my station W2GSC.

"At the outset may I tell you that this is the first commercially built transmitter ever to grace my operating room. The home built job runs 500 watts into a push-pull amplifier and even with moderate attempts to clean up the severe TVI situation it has been necessary to stay off the air during TV hours.

"After much deliberation it was decided to purchase the 32V-2 and see just what happens. The rig was set up with a 35C-1 low pass filter inserted in the line feeding a three element rotary beam. Faint cross-hatching was visible on channels 2, 5 and 9 on the TV receiver in my home. At no time was the quality or contrast of the picture changed as a result of the 32V-2 being on the air. The receiver here employs in its front end the type of continuously variable tuner that is notorious for its poor rejection. A check at a neighboring TV set fifty feet removed from both transmitter and beam indicated nothing but fundamental. Fifty feet to the other side of my house, the results were the same as experienced on my own TV receiver (incidentally the tuner was the same as mine). I soon discovered that tuning the VFO in the transmitter could eliminate the harmonics on any one channel. Of course while interesting from the standpoint of receiver design, it was a condition that was hardly tolerable.

"A quick check with a wave-meter indicated that while the electrical suppression of the 32V-2 was high it was not sufficient to permit operation with receivers as close as they were in my own particular neighborhood. The transmitter was removed from the cabinet and the cabinet was lined with ordinary window screening. To prevent leakage around the lid at the point it contacts the felt cushion, a 'flange' was built extending from under the top of the cabinet and extending just beyond the point at which the lid closes down on the top of the cabinet. I further bonded the lid to the cabinet itself. In addition, I inserted two Ohmite Z50 chokes in the Final meter leads and by-passed them with a 100-mmf condenser. Results? Well, the results were beyond my wildest imagination. Not a trace of harmonics on any channel. A test with a dummy load further indicated no harmonics even tuning through the 21 MC. band. The rig normally operates on phone on the 14 MC. band. Three high-pass filters, one on my TV set and the other two for neighbors, and the story here is now complete. Sunday night, Tuesday night—any night, no phone calls from irate neighbors. It's simply wonderful.

"As to the operation of the transmitter, well, that too is beyond words. In a few weeks of operation on 20 phone I have worked all continents but Asia. The DX to date is Australia 'long way' around (over 15,000 miles from NY) with a report of 30 db over S9. This is conclusive as my good friend W8BM and myself were both working VK3HW. Dan (8BM) has 1 KW and I had 500 watts. We were both 40 db over 9 that day and I had told Dan that VK3HW and myself had been in QSO a week previously and I was then using my 32V-2. Well, he didn't believe it so I made the switch again. The result was the same as it always seems to be. 'Can hardly tell which is which.' Well, Dan pinned the VK down until he confessed that my Collins was registering over 30 db.

"Congratulations to Collins on a really wonderful transmitter. Without the 32V-2 I would still be observing 'quiet hours'."

NOTE: *The new Collins 49S-1 shielded cabinet for the 32V-2 is briefly described in our ad in the 1950 Radio Amateur's Handbook. Designed for reducing TVI from sources other than the antenna, it is available at extra cost.*

QST

MAY 1950

VOLUME XXXIV • NUMBER 5

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

OFFICES

38 La Salle Road
West Hartford 7, Connecticut

Subscription rate in United States and Possessions, $4.00 per year, postpaid $4.50 in the Dominion of Canada, $5.00 in all other countries. Single copies, 40 cents. Foreign remittances should be by international postal or express money order or bank draft negotiable in the U. S. and for an equivalent amount in U. S. funds.

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INDEXED BY
INDUSTRIAL ARTS INDEX

— CONTENTS —

no other set gives you so much

HAM PERFORMANCE

so economically as the new... SX-71

$179.50

Check These Features Before You Buy!

DOUBLE CONVERSION — images practically eliminated. First i-f 2075 kc.

SELECTIVITY — plenty of it. 11 tuned circuits, one r-f, two conversion, and 3 i-f stages. 2½ kc "nose" selectivity.

BUILT-IN NBFM — controllable from front panel. Increasingly important as more hams switch to NBFM to avoid TVI and BCI. Sensitivity approximately 1 microvolt at 28 Mc for 500 milliwatts output.

AVC — essentially flat—far surpassing comparable sets now on the market.

TEMPERATURE COMPENSATION — it's good! Ceramic coil forms—wound in Hallicrafters own coil plant. Special band switch insulation, special trimmers.

SIGNAL TO NOISE RATIO — Amazingly high, almost twice as good as the SX-28.

TUNING — Calibrated Bandspread—Parallel drive dial pointers. Logging scales on both dials.

OTHER FEATURES — 11 tubes plus Regulator and Rectifier. Range 538 kc to 35 Mc and 46-56 Mc. Crystal filter. "S" meter.

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See it at your Parts Distributor or write direct to us for a spec sheet

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"The Radio Man's Radio"

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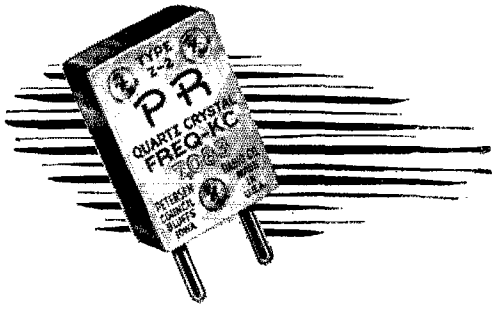
ONLY THE BEST IS GOOD ENOUGH!



In many respects, Crystals are like "diamonds." You can buy them from six-bits up. It may be difficult to tell quality from a distance, but measured under close-up of performance, accuracy and stability . . . quality stands out. After all, your frequency control is the heart of your transmitter. When you trust your frequency to PR you know where you are . . . today, tomorrow and years from now. This is worth a great deal. In the long run the money you put in a crystal is not important . . . because even quality PRs cost little. When you buy a PR from your jobber you can get the exact frequency you want (within the amateur bands) at no extra cost. You can be where you want to be . . . not within 5, 10 or 15 KC. but JUST WHERE YOU WANT TO BE! That means a lot.

• 20 METERS, Type Z-3, $3.75 • 40, 80 AND 160 METERS, Type Z-2, $2.75

PR Crystals

Since 1934

USE PR AND KNOW WHERE YOU ARE

PETERSEN RADIO COMPANY, INC.
2800 W. BROADWAY • COUNCIL BLUFFS, IOWA

Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio Club reports are also desired by SCMs for inclusion in *QST*. **All ARRL Field Organization appointments** are now available to 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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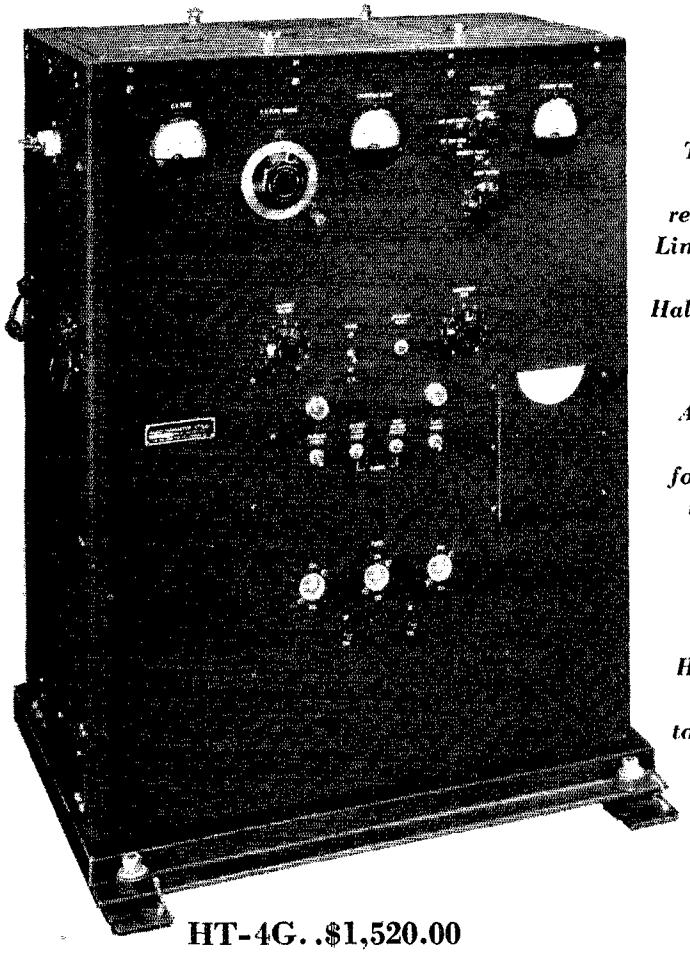
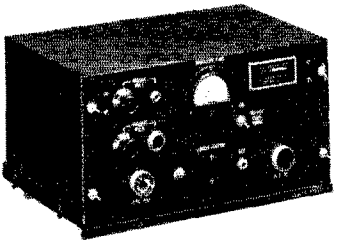
1950 Version of the famous World War II (and pre-war) Transmitter!



The communications "work-horse" of World War II has returned to its peacetime role! Limited quantities of this most respected member of Hallicrafters transmitter family are now being built for the civilian market.

All transformers hermetically sealed. Shock mounted for mobile use. Complete with tuning units and output coil sets for 2 to 18 Mc (coils for 28-30 Mc available separately). 450 Watts CW, 300 AM phone. Ask wherever Hallicrafters communications equipment is sold or write to the factory for a spec sheet.

HT-4G..$1,520.00



Speech Amplifier HT-5G...$217.00

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See and examine the latest Hallicrafters equipment at the Radio Parts Show, Chicago, May 22 to 25

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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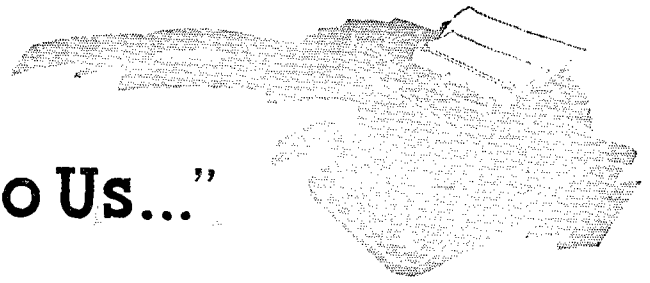
Alternate:

Rocky Mountain Division
FRANKLIN K. MATEJKA . . . . . WØDD
P. O. Box 212, Estes Park, Colo.
Alternate: William R. White . . . . . WØPDA
1263 Pearl St., Denver 3, Colo.

Southeastern Division
LAMAR HILL W4BOL
104 Myrtle, Cochran, Ga.
Alternate: William P. Sides W4AUP
Fleming Road, Montgomery, Ala.

Southwestern Division
JOHN R. GRIGGS W6KW
3212 Grape St., San Diego 2, Calif.
Alternate: John E. Bickel W6NY
14820 E. Whittier Blvd., Whittier, Calif.

West Gulf Division
WAYLAND M. GROVES W5NW
P. O. Box 586, Odessa, Texas
(W5NW at Humble Pipe Line Camp, Odessa)
Alternate: David H. Calk W5BHO
7730 Joplin St., Houston 17, Texas



"It Seems to Us..."

• It's a rare occurrence when *QST* uses a "guest" editorial, but then this is a rare piece of writing. From the pen of Frank Fisher, W5AIIT/AST, in the January issue of his Oklahoma traffic bulletin "OLZ," it is as concise and as powerful an argument in support of organized amateur radio as we have ever read. All we can say is, "We wish we had written it!"

THIRTY-SIX YEARS

The arrival of a new year can hardly be celebrated without some sort of review of those gone by. In retrospect the years past are rich in memories for many of us. Memories of other days and of friends, some of them now gone, who have helped to build the structure we now know as amateur radio. Memories of those who laid the cornerstone of our structure and who labored with ceaseless effort to build onward and upward from the sound foundation they have established for us.

Chiseled in the cornerstone of our structure is the name, "The American Radio Relay League" — a name which our founders would not have believed would ever become recognized throughout the world as typifying, and representative of, the radio amateur — his aims, his problems and his accomplishments. But so it has; and in recognizing that fact there are those of us who are conscious of the fact that we have long enjoyed occupying this wonderful structure without full appreciation of the many facilities incorporated therein for our well being, health and happiness and without contributing to our fullest extent to its upkeep and improvements. The rapid increase in the tempo of technologic progress has been felt keenly in the radio art, and many additions and alterations have been necessary to meet these changing conditions and to keep our structure among the foremost in the community of radio services. It is a wonderful feeling to point to our structure and be able to say with just pride, "This is our building, built solidly from materials gathered by radio amateurs and constructed, maintained and operated by the amateurs." Somewhat like a club, it provides its amateur members with a common meeting place with special facilities for enjoyment of their interest in the art of radio communication. Here is a pleasant place where congenial persons gather together to spend many hours in mutual enjoyment of the amateur radio service. The greatness of the structure is difficult to visualize because it stretches over the width of the land and reaches into the very homes of the members. Provisions have been made for the diverse interests of many of its members. New wings have been built to provide housing for new activities as they were born. A gigantic research service is maintained for our benefit and the new developments made available to all members and to the world at large. A liberal education is possible for any member attending the excellent lectures or browsing in the library in *QST* hall. Various sports are sponsored to test the skill of those participating. We own a well-equipped radio station which keeps us informed of late events affecting our interests. We retain legal counsel to protect our interests and publish a journal devoted entirely to the amateur radio service. Because of income derived from advertising in this journal, coupled with the fact that the affairs of the League are administered by a group of members selected by and from our membership and serving without pay, the cost of membership is about that of a couple of cartons of cigarettes for full privileges for a year — and — including subscription to the journal I have mentioned. Only a few salaried assistants are required to provide this wonderful service and insure efficient operation of our vast structure.

Yes, my friend, we have indeed built a marvelous structure, one of which we are justly proud. I regret that I personally contributed but little to its building and realize that I owe a lot to those that have cheerfully done my share in addition to their own. Perhaps I can make up for some of my thoughtlessness in the days to come. There is a lot to be done in a big structure like this and I don't

know a better time than now to get in with the boys and go to work. I'd be glad to have you come along, my friend. I can see you are interested and would like to help too.

— *W5AHT*

"HOW TO BECOME"

There's been a particularly high-pitched buzz of activity in certain of the Hq. departments these past few months, perhaps not prophetic to the casual visitor but to those of us in the "nine to five" category a certain indication that something was cooking in the publications field. The subject of all this commotion turns out to be the beginner, the neophyte or, as the British have it, the "nipper." It seems our gang is producing a new and revised version of *How to Become a Radio Amateur*, and there have ensued endless arguments on what makes the average beginner tick, how he gets interested in amateur radio, what his technical background is, if any (and therefore at what level the booklet should be written), what kind of gear he wants to start with, whether his initial interest is in DX or rag chewing or tinkering or what have you. Yes, endless arguments; we didn't find all the answers. Oh, we did find some; for example, one of us bet his shirt that there was still a considerable interest among beginners in simple "breadboard" construction, lost it when a survey showed 92 per cent of our associate members preferred metal chassis. And all this discussion many times took us back to our own beginnings, but while it was fun to reminisce it wasn't much direct help, because things have changed so radically since those days. After all the wrangling, we had to admit we didn't know *exactly* what the average amateur beginner is looking for and that we didn't know where to find out.

So we compromised; we decided to cover, as simply as possible, as many basic fields of interest as we could. The result is a booklet nearly double the size of the older edition. Besides elementary theory, basic license data, etc., there are three complete beginner's stations. It has some extremely simple gear to enable anyone clipped for cash to get on the air successfully (and even the fellows with adequate mazuma are urged to take a crack at building one of the simpler units, primarily to give them the "feel" of a soldering iron and a little practical experience in construction). It has a modest beginner's station adequate to hold its own on the air with a minimum of outlay of funds for the performance obtained. It has a special section on beginner's two-meter gear, so that the fellow who is primarily interested in the higher frequencies can start right out there.

Why is all this a subject for the editorial page? Well, mostly because we think it is a good time to point out that because of space considerations *QST* cannot do fully for the neophyte the kind of job we would like to do. We are so completely loaded with material for the active communicating amateur — technical articles, operating data, regulatory announcements, station activities, and numerous regular departments of special interest to amateurs — that there just isn't adequate space available for these other things. And so, it is in this "How to Become" booklet that we've endeavored to do the specific job of providing all the material the beginner needs to get a good start in ham radio.

OUR COVER

The rather unusual looking assembly shown on our cover this month illustrates the "leadless" construction possible with the Type 826 triode. A good bet at almost any ham frequency, a practical amplifier putting these inexpensive war-surplus tubes to work in the 10-, 6-, and 2-meter bands is described on page 25 of this issue.

FEED-BACK

In our review of *Reference Data for Radio Engineers*, page 38, March *QST*, we inadvertently announced the price as $3.00 per single copy. We hasten to inform our readers that this price applies only to purchases of a dozen or more copies — orders for less than this quantity will be filled at the single-copy price of $3.75.

Beverly Dudley, author of the article, "Calibrating a BC-221 Frequency Meter," March *QST*, has notified us of errors in the tables therein. At the bottom of page 41, frequency column, "153.875" should read "153.846." In the frequency column of Table II, page 43, "3546.154" should read "3545.769," "3578.362" should be "3578.942," "3789.421" should be "3789.473," and "3923.769" should be "3923.077." Dud has extended the data to the 20th harmonic of the interpolation oscillator on the l.f. scale and to the 20th harmonic of the crystal oscillator on the h.f. scale. These additional check points fill 8 sheets, which Dud will gladly arrange to duplicate for interested parties at cost (about ten cents per sheet).

A Variable-Selectivity Sharp I.F. Amplifier

An Outrigger "Q10-er" for the C.W. Man

BY BYRON GOODMAN,* W1DX

A FEW YEARS AGO W9AEH described a "super-selective" c.w. receiver,[1] and the idea prompted a number of amateurs throughout the country to build similar jobs or at least give the matter some serious thought. After visiting both W9AEH and W9LM last fall and listening to their selectivity-plus receivers, the writer came away with the firm resolve that such a receiver had to show up at W1DX. The first job used six 85-kc. i.f. transformers from two BC-453 receivers, and it was an immediate revelation and tremendous operating aid. However, the i.f. transformers are not too readily available so the thing wasn't described in *QST*.

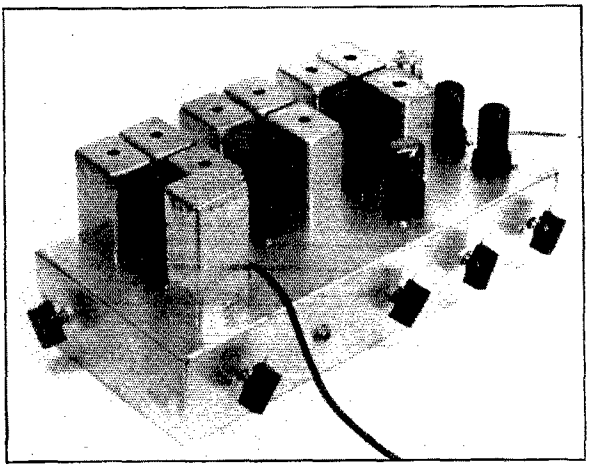
In fact, it is this bugaboo of availability that has kept many operators from enjoying the advantages of good "skirt" selectivity in their c.w. receivers. W9AEH used some 72-kc. transformers that he built for himself, and W9LM used Hammarlund and Millen transformers that were designed primarily for good 'phone selectivity, and so required some modification for c.w. work.

Jumping back to fundamentals for a minute, let's consider what we want in one of these super-selective jobs. A crystal filter gives good selectivity at the peak and perhaps for 20 or 30 db. down, but the super-selective principle requires an i.f. characteristic that isn't too sharp at the peak, since this would introduce "ringing" and considerable tuning difficulties, but which does have very steep skirts. For example, the W9AEH amplifier was 310 cycles wide at 6 db. down and 1330 cycles wide at 80 db. down. A characteristic like this makes tuning across a band an unusual experience. Instead of hearing a number of signals of different intensities at any one dial setting, you usually hear either nothing or just one signal. The signals pop in and pop out as though they were all in their own separate niches, as is indeed the average case. A receiver with excellent skirt selectivity like this will enable you to listen to a weak signal within a kilocycle of an extremely strong one, but of course you're licked if the strong one has key clicks. But by putting a number of "holes" in any band, it gives you a better chance to enjoy a QRM-free QSO or to find a weak DX signal in among the strong locals. Skirt selectivity is also useful in backing up a crystal filter when separating two signals of about the same strength within 100 cycles or so of each other, although by itself it will not do the job except by careful positioning of the two signals on the edge of the i.f. passband. Since most c.w. operators use or have available a crystal filter, the addition of a sharp c.w. i.f. amplifier will result in a versatile combination that will meet any practical receiving problem.

You don't get this extreme skirt selectivity with a few tuned circuits, regardless of their in-

* Assistant Technical Editor, *QST*.

[1] Githens, "A Super-Selective C.W. Receiver," *QST*, August, 1948.



A 50-kc. outrigger i.f. amplifier for additional c.w. selectivity. The signal is picked up at the tail end of the i.f. amplifier in the regular receiver.

dividual Qs. If you have a few extremely high-Q circuits in a bandpass circuit you can approach the performance but the adjustment is critical and may change with temperature and humidity. The same or better performance is obtained fairly easily if you use a large number of tuned circuits. The Q doesn't have to be out of proportion. The adjustment isn't critical, and temperature and humidity do not bother the alignment. All of which led us to thinking that a single tuned circuit for some low frequency might be a useful device to have around. It could be combined with similar circuits in any kind of configuration we could devise, and the coupling would be under exact control. The Millen Manufacturing Company agreed to make a few 50-kc. tuned circuits as a starter, and the amplifier described in this article shows one way they can be used. The Q of the circuits runs around 60, and they tune to 50 kc. with about 550 $\mu\mu$fd., in case you want to design your own amplifier.

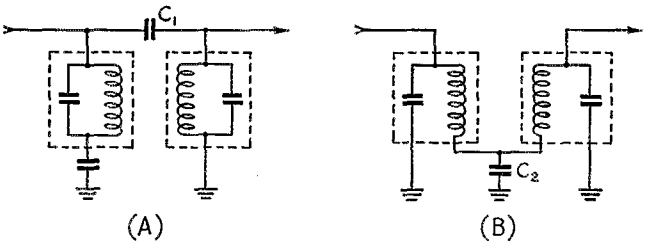


Fig. 1 — Two methods of coupling tuned circuits. At A, the coupling increases with the value of C_1. In B, the coupling decreases as C_2 is made larger.

Variable Selectivity

Some operators object to extreme receiver selectivity because they like to be able to hear several stations at once and keep a check on "what's going on." W9AEH said that he was getting a reputation for being "high hat" because he didn't always answer stations calling him after he finished a QSO, when the real trouble was that the calling station was slightly off the frequency and just wasn't heard. This consideration, plus the fact that some few highly desirable bits of choice DX are not exactly T9x, prompted us to include variable selectivity in the amplifier to be described. The method of obtaining it is simple, and a natural with separate tuned circuits.

Two conventional methods for coupling tuned circuits are shown in Fig. 1. The method shown at A uses a small coupling capacity, C_1, between the two "hot" ends of the circuits. It might be called a high-impedance coupling method, and the coupling is made looser by decreasing the value of C_1. The method shown at B uses a large condenser at C_2 — the larger it is the looser the coupling becomes. It might be called a low-impedance coupling method.

The coupling method of Fig. 1B looked like a good one for switching, since the switch points would be at a low-impedance point in the circuit and we wouldn't have to worry too much about stray couplings. Thus it is easy to arrive at the circuit of Fig. 2, which shows how tuned circuits can be cut in and out of an amplifier to give variable selectivity. With S_1 in the position shown, the signal is coupled from V_1 to V_3 through six tuned circuits, each set of three combining the coupling methods of Fig. 1. With S_1 in the next position, two circuits in the plate of V_1 and one in the grid of V_3 do the coupling, with a consequent loss in selectivity. The bias on V_2 can be set originally so that the over-all gain remains the same in either switch position. To reduce the selectivity still more, a smaller coupling condenser, C_3, can be cut in at the third switch position. This latter method of changing selectivity cannot be carried very far, however, because the loose coupling afforded by C_1 will allow the tuned circuit in the plate of V_1 to determine the selectivity, and changing C_2 radically detunes the associated circuits. Changing selectivity by changing the total number of tuned circuits seems to be the most straightforward approach.

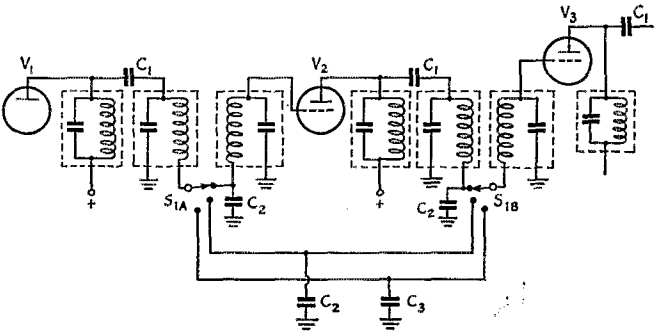


Fig. 2 — A simplified diagram showing how the coupling methods of Fig. 1 can be combined to make a variable-bandwidth amplifier. With S_1 in the position shown in the diagram, there are six tuned circuits between the plate of V_1 and the grid of V_3, coupled by C_1's and C_2's. With S_1 in the next position, there are only three tuned circuits between V_1 and V_3, coupled by C_1 and C_2. With S_1 in the third position, there are three tuned circuits, coupled by C_1 and C_3.

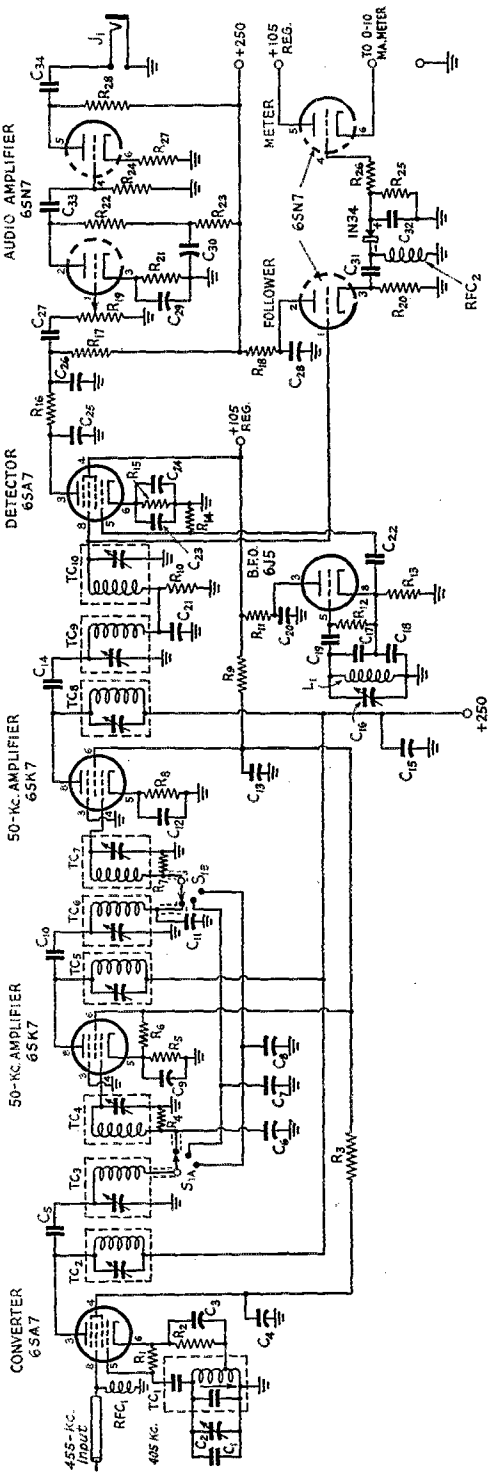
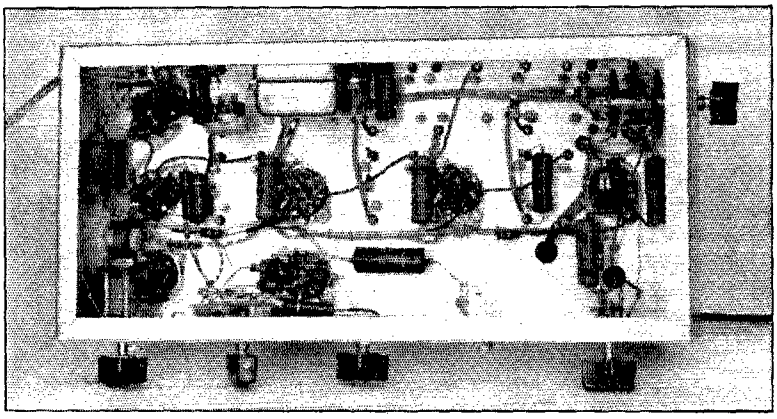


Fig. 3 — Wiring diagram of the 50-kc. variable-bandwidth amplifier.
C_1 — 22-$\mu\mu$fd. mica.
C_2 — 15-$\mu\mu$fd. midget variable (Millen 20015).
C_3, C_4, C_9, C_{12}, C_{20}, C_{28} — 0.1-μfd. paper, 200 volts.
C_5, C_{10}, C_{14} — 4.7-$\mu\mu$fd. mica.
C_6, C_7, C_{11}, C_{21} — 0.05-μfd. paper, 400 volts.
C_8, C_{25}, C_{26}, C_{27}, C_{28}, C_{32} — 0.01-μfd. paper, 400 volts.
C_{13}, C_{15} — 1.0-μfd. paper, 400 volts.
C_{16} — 100-$\mu\mu$fd. midget variable (Millen 20100).
C_{17}, C_{18} — 470-$\mu\mu$fd. mica.
C_{19}, C_{22}, C_{33} — 0.001-μfd. mica.
C_{24}, C_{29} — 10-μfd. 25-volt electrolytic.
C_{30} — 10-μfd. 450-volt electrolytic.
C_{31} — 0.03-μfd. paper, 400 volts.
C_{34} — 0.1-μfd. paper, 400 volts.
R_1, R_{14}, R_{23} — 22,000 ohms.
R_2 — 270 ohms.
R_3, R_9 — 2400 ohms, 1 watt.
R_4, R_7, R_{10}, R_{25}, R_{26} — 1.0 megohm.
R_5 — 15,000 ohms.
R_6 — 68,000 ohms.
R_8 — 470 ohms.
R_{11}, R_{18} — 1500 ohms.
R_{12}, R_{16} — 33,000 ohms.
R_{13} — 56,000 ohms.
R_{15} — 330 ohms.
R_{17} — 38,000 ohms.
R_{19} — 0.5-megohm volume control.
R_{20} — 4700 ohms, 1 watt.
R_{21}, R_{27} — 2700 ohms.
R_{22}, R_{28} — 0.1 megohm.
R_{24} — 0.47 megohm.
All resistors ½-watt unless specified otherwise.
L_1 — 80-mh. r.f. choke. See text. (Millen 34280.)
TC_1 — 455-kc. b.f.o. assembly with grid leak removed (Millen 65456).
TC_2–TC_{10} — 50-kc. tuned circuit (Millen 63650).
RFC_1 — 1-mh. r.f. choke (Millen 34300).
RFC_2 — 10-mh. r.f. choke (Millen 34210).
S_1 — 2-pole 3-position wafer switch.

The Amplifier Circuit

There are one or two other considerations in an amplifier of this type. Certainly over-all gain is not very important, because the amplifier is designed to pick up the signals at the tail end of your present 455-kc. i.f. amplifier, and the level is fairly high there. Consequently, the amplifier gain need be only sufficient to give decent signals with a 500- or 1000-μv. signal at the input. In fact, the gain must be held down to prevent overloading at the tail end. If the output volume is adequate for comfortable headphone reception, and the noise in the output is noise from the front end of the receiver and not from the 455-kc./50-kc. converter, the design can be considered satisfactory. In the strip to be described, some noise is generated in the converter, but it is always masked by the noise from the receiver itself.

Applying the principles discussed so far, and a few that showed up during testing, we ended up with the circuit shown in Fig. 3. The 6SA7 converter picks up a signal from the receiver i.f. amplifier and converts it to 50 kc. The oscillator portion of the 6SA7 is on 405 kc. instead of the alternative 505 kc. simply because it was easier to pad a b.f.o. assembly, TC_1, to 405 kc. than to remove turns to bring it to the higher frequency. A maximum of nine 50-kc. tuned circuits is



Underneath the chassis of the 50-kc. i.f. amplifier.

available, and three degrees of selectivity are obtained at the various settings of S_1.

The second detector is a 6SA7 "mixer" to avoid any loading on the last tuned circuit and to permit the use of a beat oscillator that isn't in the kilowatt class. The advantages were described in an earlier article[2] in *QST*. The beat oscillator uses the grounded-plate Colpitts circuit because an r.f. choke can be used for the coil without requiring that a feed-back tap be taken off the winding.

A 6SN7 provides a two-stage audio amplifier and all the gain necessary for good headphone operation. Another 6SN7 was used for a tuning-meter circuit and, while not absolutely necessary, it is extremely useful. One section of the 6SN7 is used as a cathode follower at the grid of the 6SA7 detector, to decouple this circuit from a 1N34 crystal diode. The d.c. appearing in the output of the diode is used to bias back the other half of the 6SN7, and a 0–10 milliammeter reads the current in this tube. The larger the signal, the lower the current reading. You can use a 6J5 cathode follower and read the voltage at the 1N34 with a high-resistance voltmeter if you like, or you can use a 6SN7 in a follower/rectifier combination. This is c.w., and we aren't looking for the ultimate in S-meters.

If some of the values in the circuit look out of proportion, remember that most of this is at 50 kc., a sort of never-never land where i.f. components are too small and audio components aren't too hot. Decoupling resistors, such as R_3, R_9 and R_{11}, were found necessary in reducing regeneration and b.f.o. feed-through, and both subjects will be discussed later.

Construction

The construction of the amplifier may look a bit queer at first glance, since control knobs appear on two sides. There was good reason for this. It was felt that most operators would add the unit to an existing receiver, and this type of construction gives two choices of installation. If the unit is located on the operating table alongside the receiver, it can be placed on the right-hand side of the receiver with the one-knob end facing the operator. Thus it takes up a minimum of table frontage. The knob facing you is the selectivity-selector switch, the one you are most likely to use, but you can reach around and get at the others if necessary. If you mount the amplifier above the receiver or on a panel above the receiver, mount it with the long side facing you and bring the selectivity-selector switch out with a right-angle drive or flexible shaft. But all this is hypothetical — most amateurs modify designs to suit their own particular needs and requirements.

The unit is built on a 7 × 15 × 3-inch aluminum chassis. No unusual construction is involved, and the components are mounted in the most convenient places. The 405-kc. oscillator assembly TC_1 is a standard b.f.o. unit with the grid leak removed and an extra lead (to C_1C_2) added. The pick-up lead to the receiver is a 40-inch length of RG-58/U — its capacity and the inductance of RFC_1 resonate close to 455 kc., but no great harm will result if they don't. The leads from the tuned circuits to S_1 are run in ordinary shielded wire. The b.f.o. coil L_1 was mounted by soldering one of its terminals to one of the terminals on C_{16} because we noticed that using a brass mounting screw in the coil reduced the Q, but that isn't to imply that it wouldn't work otherwise. And RFC_2 was mounted by soldering one of its terminals to a ground lug on the chassis simply because it was convenient.

The rotary switch next to the volume control was originally incorporated because we had hoped to be able to make the amplifier broad enough for selective 'phone reception, and this switch would have selected one of several modes of operation. In its broadest condition the amplifier is a little too sharp for 'phone, and so the switch now serves as a convenient mounting

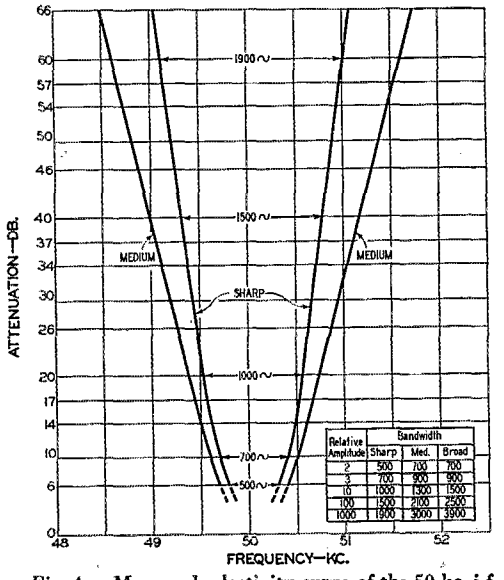
[2] Villard & Thompson, "A Detector for Single-Sideband Reception," *QST*, June, 1948.

strip. Some day we may use it to vary the time constants in the S-meter circuit.

Alignment and Adjustment

There isn't much to aligning the amplifier. If you have a source of 50-kc. r.f. from a frequency standard or test oscillator, you can start at the grid of the second 6SK7 and work backwards in the usual manner. However, if you don't have the source, just wrap one turn of insulated wire around the diode plate pin in your regular receiver, to give you a little coupling, and connect this wire to the RG-58/U input lead of the 50-kc. amplifier. Turn on the b.f.o. in your receiver — you are using it for the test oscillator — set S_1 in the 50-kc. amplifier for the "broad" condition, and twist the iron slug in TC_1 in or out until you get an indication on your S-meter in the output of the 50-kc. amplifier. Do this with C_2 set at midcapacity. If you can't find any indication and want to check the oscillator portion of the 6SA7 converter, lift C_1 and listen in your receiver for this oscillator as you tune it around.

When you have some signal getting through the 50-kc. i.f. in its broad condition, peak up TC_2, TC_3, TC_7, TC_8, TC_9 and TC_{10}. By the time they are all peaked you may be overloading the 50-kc. amplifier, so as soon as you are getting a reasonable signal through you can switch off the receiver b.f.o. and tune in a steady b.c. carrier or a signal from your frequency standard. Use this as the signal to align the 50-kc. amplifier, always keeping the gain in the receiver down to the point where nothing is overloading. After



Relative Amplitude	Bandwidth		
	Sharp	Med.	Broad
2	500	700	700
3	700	900	900
10	1000	1300	1500
100	1500	2100	2500
1000	1900	3000	3900

Fig. 4 — **Measured selectivity curve of the 50-kc. i.f amplifier in the "sharp" and "medium" positions, and a tabulation of the bandwidths measured at various amplitudes.**

aligning in the "broad" position, switch S_1 to "sharp" and realign all of the circuits, starting with TC_{10} and working back. Look at the position of each trimmer, to be sure that you have peaked each circuit and not merely set some at one end of their tuning ranges.

The amplifier should be checked for regeneration in the three positions of S_1. With a signal coming through the 50-kc. i.f., watch the S-meter as you add a 0.25-μfd. paper condenser from screen to ground on the 6SA7 converter and either of the 6SK7s. Any decrease in S-meter reading indicates regeneration, and some additional filtering or by-passing may be required. Make the same test on the 250-volt line.

If the gain of the amplifier is not substantially constant in the three positions of S_1, increase or decrease the gain of the first 6SK7 stage by increasing or decreasing the value of R_6.

When the amplifier is aligned and the gain equalized, the next step is to adjust L_1 so that the b.f.o. will tune to 50 kc. (or whatever frequency your i.f. ended up on). With C_{16} at half capacity remove turns from L_1 or juggle the values of C_{17} and C_{18} until the oscillator is zero beat with the incoming test signal. A milliammeter inserted between R_{14} and ground should show about 0.4 ma.

With no signal coming through the amplifier, watch the S-meter as you tune C_{16} through its range. Some of the b.f.o. voltage gets into the S-meter circuit, but the S-meter reading due to the b.f.o. shouldn't change when you short the grid of the first 6SK7 to ground, and it shouldn't change much when you short the grid of the second 6SK7 to ground. If it does, it indicates that b.f.o. voltage is leaking around to the front end of the amplifier, and more isolation is required. Making C_{20} and R_9 larger will help.

That's about all there is to aligning the amplifier. As with any single-signal reception, the b.f.o. will be tuned off to one side of the i.f. frequency, and the choice of beat note depends on the operator. When used with a receiver, the crystal in the receiver will add some selectivity, of course, and the best way to be sure everything is in proper relationship is to tune in a signal on your receiver with the crystal in its sharpest position. Peak the signal by watching the receiver S-meter, and then peak the 50-kc. amplifier by adjusting C_2 and watching the amplifier S-meter.

Keep the coupling between your receiver i.f. and the input of the 50-kc. amplifier as loose as possible consistent with proper masking of the converter noise. In other words, when you turn off your receiver you should be able to hear a little noise coming through the 50-kc. i.f. amplifier, but when you turn on the receiver the noise should come up enough to mask this other noise completely. No i.f. gain control is included in the 50-kc. unit, and all of your gain juggling can be

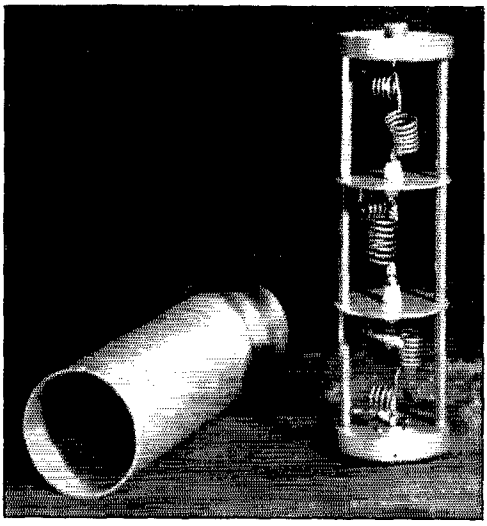
(Continued on page 106)

A Low-Cost TVI Filter

Tubular Construction for the Harmonic Filter

BY CHARLES A. DENE,* W3CPC

As the number of TV receivers in this locality grew by leaps and bounds, the trials and tribulations at W3CPC became worse — so much so that operation on 28 Mc. had to be confined to the early morning or the late hours of the night. Obviously something had to be done if the good-neighbor policy was to be maintained. Although the transmitter was well shielded and r.f. filters had been installed in the power line, plus lowered L in the final tank circuit, there still remained sufficient third harmonic to make the neighbors unhappy.



This view of the filter removed from the tubular case shows how the components are assembled. Baffle plates provide shielding between individual filter sections.

It was the necessity for getting rid of the harmonic that led to the construction of the low-pass filter described here. The total cost amounted to $5.07. The filter was built for use with 72-ohm coax, the general construction being along the same lines as that used in the Collins 35C-1 but using inexpensive components. It has performed entirely satisfactorily with an input of 300 watts, amplitude modulated.

The condensers are the zero-temperature-coefficient ceramic type having a nominal d.c. rating of 500 volts. It was considered that this type of condenser would be adequate for the job because we had succeeded in getting a low standing-wave ratio on the transmission line. So long as the line standing-wave ratio actually is low there should be no trouble from condenser breakdowns at power levels of the same order as that used by the writer.

The filter construction is shown by the photograph, with details and dimensions given in Fig. 1. The outer shield is a 10-inch length of aluminum tubing, 1/16-inch wall, having an inside diameter of 3 inches. Circular baffle plates provide shielding between sections and also serve for mounting coils and condensers. These can be cut from 1/16-inch sheet aluminum and should be carefully filed to size so that they will fit snugly inside the tube, making good contact. The end pieces, in the writer's case, were made from 1/2-inch aluminum stock routed out as shown on the drawing. If a lathe is not accessible for this purpose, there is an alternative method of construction that does not require special tools. Cut a ring a half-inch in width from 3-inch thin-walled brass tubing, file one edge flat and then tin the edge with solder. Make a hack-saw cut through the ring and file the edges down until they just touch when the ring is squeezed into the end of the aluminum tube. Cut a 3-inch disk from sheet brass or copper, filing the edge so it will fit snugly inside the aluminum tube. Then insert the ring part way inside the tube with the tinned edge out, and solder the disk to the ring. After soldering is completed, the piece can be cleaned up with a file and emery cloth to make a close fit in the end of the tube. The drilling and assembly is the same as shown in Fig. 1 for the aluminum end pieces. If brass tubing is used instead of aluminum for the shield, the rings can be sawed from the same piece providing a little extra length is obtained in the first place.

Assembly of the unit should be quite clear from the photograph and Fig. 1. The inductances are soldered to the screws that go through the small feed-through insulators, the nuts being tightened just enough to hold the insulators firmly against the baffle plates. The whole unit is of course completely assembled before being slid into the tube. The tube and end plates are held together by 6-32 machine screws through holes drilled at 90-degree intervals through the tube and the end-piece flanges.

The circuit diagram of the filter built by the writer is given in Fig. 2, with constants for either

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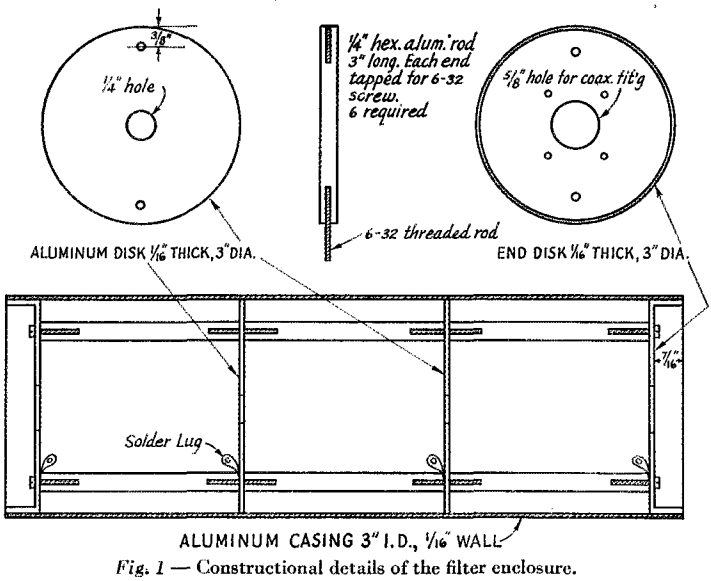


Fig. 1 — Constructional details of the filter enclosure.

when the junction between L_3, L_4 and L_5 is shorted to the baffle plate with the shortest possible connection to L_5. With no short on the filter, the grid-dip meter should show resonance at 44 Mc. when coupled to either L_2 or L_4. The theoretical attenuation of this circuit is over 60 db., and its performance has more than justified the time and money spent on its construction.

The same type of construction can readily be applied to other filter circuits, either more or less elaborate. Where the power does not exceed three or four hundred watts and the line s.w.r. is low, the condensers would appear to be entirely adequate.

52- or 75-ohm lines. The filter cuts off at 44 Mc. and the *m*-derived sections have maximum-attenuation points at approximately 55 and 70 Mc. The condenser capacitances shown are the nearest standard values to those theoretically required, and in all cases are within 10 per cent of the theoretical values. The coils are best adjusted by using a grid-dip meter as described in December *QST*.[1] L_1 and C_1 should resonate at 55 Mc. when J_1 is shorted, as should also L_6 and C_4 with J_2 shorted. L_5 and C_3 should resonate at 70 Mc.

[1] Seybold, "The Design of Low-Pass Filters," *QST*, December, 1949.

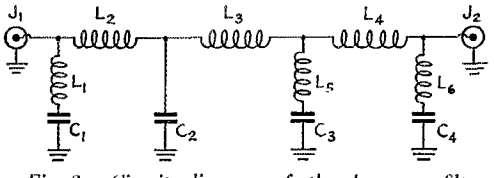


Fig. 2 — Circuit diagram of the low-pass filter. J_1, J_2 — Coax receptacle.

	52-Ohm Line				*72-Ohm Line*			
	μμfd.	*Turns*	*Dia.*	*Length*	*μμfd.*	*Turns*	*Dia.*	*Length*
C_1, C_4	40				25			
C_2	150				100			
C_3	100				75			
L_1, L_6		4	1/2	1/2		6	1/2	3/4
L_2		6	1/2	3/4		6	3/4	3/4
L_3		7	1/2	7/8		6	3/4	3/4
L_4		6	1/2	3/4		8	1/2	1
L_5		3	3/8	1/2		4	3/8	1/2

Condensers are zero-temperature-coefficient ceramic, 500-volt rating (Centralab type CC). Coils are wound with No. 12 tinned wire; dimensions above are in inches, diameter measured inside.

A.R.R.L. GREAT LAKES DIVISION CONVENTION

Detroit, Mich., May 27th, 28th & 29th

The first convention to be held by the Great Lakes Division will be a three-day affair, sponsored by the Detroit Area Amateur Radio Council. Headquarters and the center of most activities will be the Hotel Statler in downtown Detroit.

The program will start with a mammoth swap-and-shop session which is expected to clean out attics for miles around. Technical talks covering a wide range of interests, including TVI, single sideband, portable-mobile design, and tower construction will highlight a program including an ARRL forum, DX and traffic meetings, contests, and other ham fare. Among the speakers will be A. L. Budlong, W1BUD, Mack Seybold, W2RYI, Don Norgaard, W2KUJ, and George "Lighthouse Larry" Floyd, W2RYT. A full program for XYLs has also been arranged. The convention banquet will be held Sunday evening.

Registration fee for the three-day affair is $3.50; banquet tickets are $4.25 per plate. Purchased together, the price is $7.50. Tickets and information are available through clubs, wholesalers, or by mail at: ARRL Convention, P.O. Box 903, Detroit 31, Mich.

"In the Spring a Young Ham's Fancy . . ."

BY CARL H. NELSON,* W6EPH

"AH, SPRING — this is the time of year to make decisions," I am muttering to myself. And I am deciding to buckle down and learn 13 w.p.m. of dit-dahs. I am going to become dit-happy so I can walk into the local FCC office, chin up, chest out — confident.

Every night, faithfully, I am turning on my S-40 and am taking code practice from W1AW. I am sitting down and waiting for code practice to begin. I am taking 8 w.p.m., then 10 w.p.m., solid. Now, if I can take 15 w.p.m. solid I am ready to take the exam.

At last the day is arriving. I am marching up to the FCC office and am proudly announcing my intention of becoming a ham. It all is seeming so easy, only for some reason I am kind of nervous. Must be the pickle sandwich I am eating for breakfast, I am figuring.

After filling out some forms, a gentleman is calling my name and I am stepping up to a table, putting on some headphones, and waiting. I am copying a message which says practically nothing and am perspiring profusely by the time the machine stops.

Then I am waiting for what seems like about five hours, while the examiner is grading my paper. He is calling my name and I am rising from my seat like a prisoner awaiting a sentence.

"You pass," he says as he hands me the written exam. I am grinning from ear to ear.

After the exam I am going back to the office with a song in my heart. Yessir, I believe I have made it. Seven weeks and I am on the air.

I am going home that night to start plans for my rig.

In six weeks I am ready to go on the band and am 'phoning the XYL from the office each morning, long distance, to find out if the postman is bringing that valuable hunk of paper. The answer is "No." The answer is always "No."

So finally I am 'phoning another hopeful who has taken the exam the same day as I. He greets me happily, informing me that he is on the air for ten days.

I am nonplused. I am mortified. I am downright unhappy. I now am 'phoning the XYL twice a day. I am nervous, irritable. I am suffer-from *hamus melancholia*. The neighbors are asking me if I am losing weight and I am just mumbling something unintelligible and turning my back on them. Finally, I am taking the bull by the horns and writing to FCC.

At the end of the tenth week I am getting a terse answer to my letter, to wit: "Your application is not found. To avoid further delay, please fill in Questions 1 to 14 on the enclosed Form 610, have the jurat completed, and return."

I reach for the aspirin, drag myself to the bookcase, and grab Webster's little book of words. With glazed eyes I am turning to the "Js." The XYL is coming into the room and saying, "What's wrong, dear?"

I am grunting and licking my burning, swollen lips.

"*Jurat* — A memorandum as to before whom, when, and where an affidavit was made."

That's it — that's it — they are wanting the darn thing notarized. Well, why aren't they saying so?

The next day the letter is on the way to our Capitol in an airmail, special-delivery envelope with "RUSH" written all over it.

I am now twenty pounds lighter, twenty years older, and have 1387 more gray hairs on my head by actual count.

In about a week she arrives. Eyes gleaming, mouth drooling, I am rushing into the spare room where the rig is sitting and am snapping on the receiver. I am hearing a character across town on ten meters who is calling CQ. I am giving him a buzz. He is coming back to me and I am sailing on a fleecy cloud.

We are discussing all sorts of topics, pro and con, and are generally having a perfect QSO when I am hearing an angry knock at the front door. I am asking the W6 to QRX while I am answering the door.

When I open the door I am finding my next door neighbor giving me the cold eye and saying something nasty about seeing me all over the screen on Channel 6.

And that's the way it is going from then on. I am making no friends among the neighbors. But who cares? I am a ham. The birds are singing, the bees are buzzing. All is right with the world. Besides, I am getting used to my wheel chair.

* 200 Hill Ave., Whittier, Calif.

"Tailor Made" Antenna Couplers

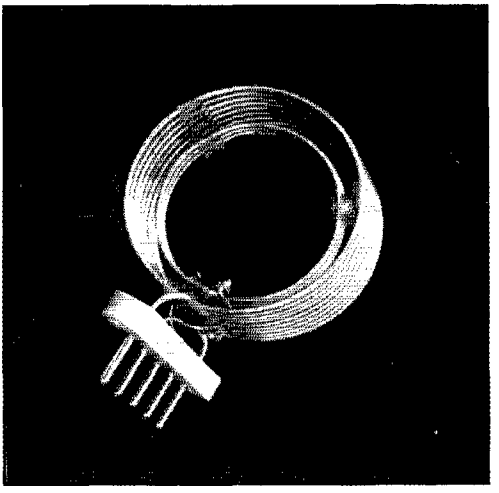
Optimum Design with New Coil Material

BY GEORGE GRAMMER,* W1DF

COMMERCIALLY-MADE COILS are not, as a rule, too well adapted to use in the antenna coupler. One difficulty is with the link winding; at the lower frequencies it is usually too small — except possibly in the plug-in variable-link type — to give optimum coupling. Mechanically, the tank coils vary in conductor size and spacing over the range from 3.5 to 30 Mc., so that the clips used for tapping the line on the coil will fit on one band and not on another. In the medium-power coils the turn spacing is frequently so small that it is either impossible to get a clip on the coil or else it can't be done without shorting to the adjacent turns. With fixed-link coils the link gets in the way of the taps when the latter must be close to the center of the coil. While this is not so bad with variable-link coils, variable coupling is not needed and in any event cannot usually be made as tight as the coupling between fixed coils — and tight coupling is a very desirable feature in an antenna coupler.

What all this adds up to is this: For electrical reasons, we ought to be able to select a link-coil size that will meet the particular requirements at hand. For mechanical reasons, we need coils that all have the same conductor size and have sufficient turn spacing so that a single type of clip can be used on all bands. Furthermore, the coils should be arranged so that the link is *inside* the tank coil, thus making all the tank-coil turns accessible for tapping.

Coil material by the foot has been on the market for some time, but did not quite meet the requirements outlined above. Through the cooperation of Barker & Williamson we now have some coils that we believe fill the bill very nicely. The tank-coil material is similar to the Type 3905 coil (2½-inch diameter, No. 12 wire, 6 turns per inch) but with tinned instead of enameled wire so tap connections can be made. The link-coil material is a new type using No. 14 wire, 8 turns per inch, of such diameter that the insulating spacers just fit snugly inside the tank-coil spacers. It is therefore possible to cut off as many link turns as are needed, slide the link inside the tank coil to whatever position is selected, and then fasten it in place with a touch of Duco cement on each end. Johnson type 235-860 clips are excellent for tapping on the tank coil, as the jaws can be locked securely on the wire to make good low-resistance connections.



Construction of coils used in the antenna coupler shown in the other photographs. These coils are made from new coil material which permits "tailor made" links fitting snugly inside the tank coil. Connections to the link coil are made with short lengths of wire soldered to the ends of the link winding. The tank-coil turns should be spread slightly where the connecting wires to the link pass through the coil, to prevent short circuits. Keep the link connections at right angles to the tank coil turns, insofar as possible, to reduce capacitive coupling.

Coils constructed in this way can easily be mounted on ordinary straight-line plugs. The accompanying photograph shows one of a set made by the writer, mounted on a Millen 40305 plug. Unlike the ordinary commercial coil, this coil is supported only by the wire itself soldered in the connection pins. We had some doubt about the strength of such an assembly before building one, but were pleasantly surprised to find that it is at least as rigid and strong as the customary type using a supporting strip for the coil. In fact, we suspect that it will stand everyday handling better than the bar arrangement; No. 12 wire is pretty stiff in the short length necessary to reach from the end of the coil to the pin.

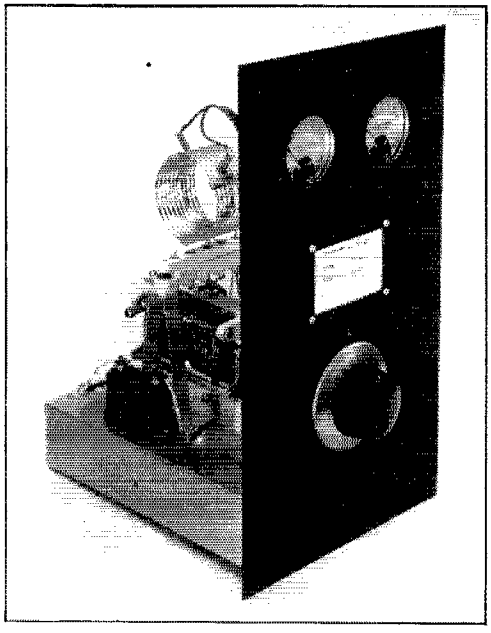
When used in a properly-designed antenna coupler these coils should easily be capable of handling 500 watts of r.f. The *Q* of the circuit does not need to be very high, so the circulating current is not excessive. The cost of a complete set of assembled coils, with plugs and clips, is

* Technical Editor, *QST*.

about half the cost of a ready-made fixed-link set of comparable conductor size and power rating.

A Medium-Power Antenna Coupler

The remaining photographs show an antenna coupler, designed for handling a few hundred watts, and for coupling a transmitter to a reasonably-flat 300-ohm line, built around the new coil material. The coupler uses the regular parallel-tuned circuit and includes an antenna changeover relay. It also includes a pair of r.f. ammeters for reading feeder current; these are not an essential part of an antenna coupler but are very useful for indicating when maximum output is being obtained. (Plate current of the final amplifier is not always a reliable power-output indicator, particularly with tetrodes.) Since we got the meters at bargain prices in surplus, we used them. We used the fixed mica padding condenser on the 80-meter range for the same reason; new, this type of condenser costs more than a transmitting variable of the same rating, but this one came out of a BC-375 tuning box.



A coax-coupled antenna coupler using the new coil material. As shown, the coupler will handle a few hundred watts, the limitation being primarily the plate spacing in the tank condenser rather than the current-carrying capacity of the coils. The fixed padding condenser (for the 3.5-Mc. range only) is used principally to avoid the necessity for having a tank coil longer than the plug bar on which it is mounted. Any available capacitance between 50 and 100 $\mu\mu$fd. will suffice as a padder, providing it has the required voltage rating and providing the number of turns on the tank coil is adjusted to permit covering the 3.5–4 Mc. band.

The coupler is built on a 7 by 9 by 2 aluminum chassis, and most of the construction can be seen in the photographs. The coil socket is mounted on brackets made from 1/16-inch aluminum cut in strips a half inch wide; here again we expected the assembly might be flimsy but it turned out to be just the opposite. The brackets are made high enough so that the coil socket clears the tuning condenser comfortably. The condenser is a split-stator type because the circuit is balanced, and it is insulated from the chassis because at the time of building the coupler we did not know whether we wanted to ground it or not. Subsequent developments showed that it was desirable to have it ungrounded, because on some bands we found it necessary to ground the center of the coil. A vernier-type friction-drive dial (National AM) was used because past experience with antenna couplers had convinced us of the necessity for being able to reset with fair accuracy, and because such a dial does not turn when it is accidentally bumped. The r.f. meters are mounted on a piece of bakelite set behind a rectangular cut-out in the 8 by 12 metal panel; the bakelite was used to reduce the capacitance between the meters and the panel, especially since these were metal-cased meters.

Each coil is provided with its own pair of clips soldered to a short length of 300-ohm line, in turn terminated in a Millen 37412 plug. The line plug is inserted in a 33102 crystal socket mounted on top of the tuning condenser. This scheme makes coil changing quite rapid and avoids the necessity for changing clip connections when changing coils. A crystal socket also is used for the output terminals, the same type of plug being used on the regular transmission line. A third crystal socket is mounted on the rear edge of the chassis for the line to the receiver.

The socket for the coax link is mounted centrally on the rear chassis edge. A length of coax runs from this coax receptacle to the coil socket, and is grounded where it goes through the chassis (between the stator sections of the tuning condenser) to reach the coil socket. The a.c. plug on the rear edge connects to the relay coil.

The fixed condenser, C_2, is connected in parallel with C_1 by flexible leads and banana plugs. The sockets (actually the tops of jack-top binding posts) are simply soldered to the lugs furnished on the variable condenser. Mechanically, this method is not too good; a switch would be better but we did not have a suitable one.

The L/C ratio in the coupler tank circuit is not especially critical, so the dimensions given in Fig. 1 can be varied within reason. The chief point is that each coil must resonate, on the band for which it is made, with the tuning condenser. Fairly low C is preferable to high C, but the limitation on L/C ratio at 3.5 Mc. is the size of the coil required. The plug bar will mount a 4-

inch-long coil comfortably, but it is doubtful if much greater length could be used without devising some method of supporting the coil on the bar. With the 3.5-Mc. coil dimensions given in Fig. 1 the coil is just slightly longer than the bar and is easily mounted. Additional support was given this coil by running a No. 4 screw through the end holes in the bar and fastening a soldering lug under the nut; the coil ends are soldered to this lug as well as to the pins in the plug.

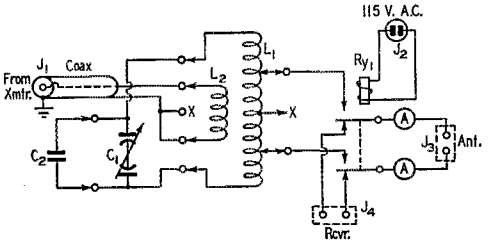


Fig. 1 — Circuit diagram of the antenna coupler. The antenna changeover relay and r.f. ammeters are convenient but not essential to the operation of the coupler. The ground (X in the diagram) on the center of the tank coil may be used or not as required to break up undesirable resonances of the type described in the text.

C_1 — 100-$\mu\mu$fd.-per-section, 1500-volt plate spacing per section (National TMK-100D).

C_2 — 90 $\mu\mu$fd., 3000 volts, 2 amp. at 3 Mc.

A — R.f. ammeter, scale range according to power and antenna feeder system. For a reasonably-flat 300-ohm line, 0–1 amp. is satisfactory for 100 watts r.f. output; 0–2 will suffice for outputs up to 400 watts.

J_1 — Coax receptacle.

J_2 — 115-volt receptacle, male (Amphenol).

J_3, J_4 — Crystal socket, for FT-243-type pin spacing (Millen 33102).

Ry_1 — Antenna relay, d.p.d.t. (Ward Leonard 507–531).

Coil Data

Band	L_1, *turns*	L_2, *turns*
3.5–4 Mc.	24	8
7 Mc.	18	5
14 Mc.	10	3
28 Mc.	6	2

L_1 — No. 12 tinned wire, 2½ inches dia., 6 turns per inch (B & W 3905-1).

L_2 — No. 14 tinned wire, 2 inches dia., 8 turns per inch (B & W 3900).

The link coils specified in Fig. 1 are chosen so that the reactance at the operating frequency is approximately equal to the coax link impedance, 75 ohms in this case (the link cable is RG-59/U). This size of link is optimum for tightest coupling, for any given coupling coefficient. The coils can be somewhat smaller for a 52-ohm link.

Tuning the Coupler

The proper way to tune an antenna coupler was described in considerable detail in February *QST* beginning on page 22, so we will not take space here to repeat it. Using a resistance-bridge s.w.r. indicator to check the s.w.r. in the coax link, the data below were secured from the antenna coupler shown. The load, substituting in this case for an actual transmission line, was a 300-ohm ½-watt composition resistor. The frequency marked with an asterisk in each group was the frequency at which the coupler was adjusted for minimum s.w.r.

Frequency	*S.W.R.*
3500	1.4
3550	1.15
3600*	1.0
3700	1.15
3750	1.5
3750	1.5
3900*	1.0
4000	1.15
7000	1.15
7150*	1.0
7300	1.2
14,000	1.1
14,200*	1.05
14,400	1.15
28,000	1.3
28,500	1.05
29,000*	1.0
29,700	1.5

Since an s.w.r. of ⅓ does not represent a significant change in tuning conditions and is entirely inconsequential so far as loss is concerned, the figures above give a good idea of the frequency range that can be covered on each band without readjustment of the antenna-coupler tuning — providing the load is a pure resistance. In other words, the necessity for readjusting the antenna coupler when changing frequency within a band depends principally on the s.w.r. on the transmission line to the antenna. Over a given frequency range the transmission line is not likely to be as broad as the coupler.

V.H.F. Resonances

Those who have the TVI question on their hands will do well to pay some attention to the possibility of resonances in the TV region. It is an unfortunate fact that coils of any size have self-resonances, roughly in harmonic relation, that begin to appear at frequencies several times that for which the coil is designed. These resemble the resonances that occur on a straight length of wire — that is, the phenomenon is one of standing waves. Two typical cases of practical importance are shown in Fig. 2. The tank coil is always connected to a condenser which, at v.h.f., is almost a short circuit. Under these conditions the standing waves of current and voltage are about as shown in the drawings for the "fundamental" and "second harmonic" resonances. The resonance can be destroyed, in the drawing at the left, by grounding the center of the coil, since this is a high-voltage point for that frequency. Grounding the coil center will have no particular

effect on the resonance shown in the drawing at the right, because the center is at a point of voltage minimum. Since it is impossible to ground any point other than the center if the circuit is to be balanced at the operating frequency, there is no remedy for these "even harmonic" resonances except to shift them to a frequency where they will do the least harm, by changing the number of turns in the coil.

It has been our experience that resonances of this nature will show up at at least one frequency in the 54–88 Mc. TV band with tank coils designed for 14 Mc. and all lower frequencies. In the set of coils made for the antenna coupler described here the 14-Mc. coil, with the tank condenser set for normal operation in the 14-Mc. band, had a resonance point at 86 Mc., right in the middle of Channel 6. Grounding the center of the coil killed the resonance and left the coil clean throughout the low TV channels. Resonances in the 7- and 3.5-Mc. coils showed up at various spots in the low TV range; some could be destroyed by grounding and some not. The 28-Mc. coil did not show any resonances in the critical region.

Link-Circuit Resonances

In addition to self-resonances in the tank coils, the link circuit will resonate at v.h.f. Transmission-line type resonances are to be expected, of course, but are complicated by the fact that the coax link is terminated in reactances at both ends — at the transmitter end, in the coupling circuit, and at the antenna coupler end, in the link coil. Since the constants of these circuits will vary from one installation to the next, there is no one "best" length for the coax link. The only safe way to determine the right length is to check with a grid-dip meter. Fig. 3 is a chart showing the resonances for various link-line lengths with the antenna coupler described above at one end and a transmitter at the other. These measurements were made with the transmitter and antenna coupler set up for 14-Mc. operation. The "fundamental" resonance is shown by the curve marked A_1 and the "second harmonic" by curve A_2. The curves marked B_1 and B_2 are similar, but were obtained with a low-pass filter inserted between the transmitter and the link line. They are included to show how the resonance point is affected by changing the constants of the circuit connected to the line.

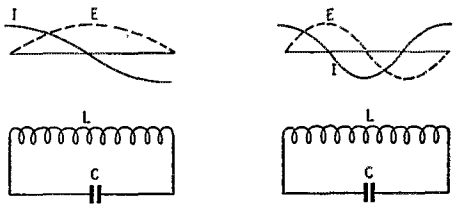
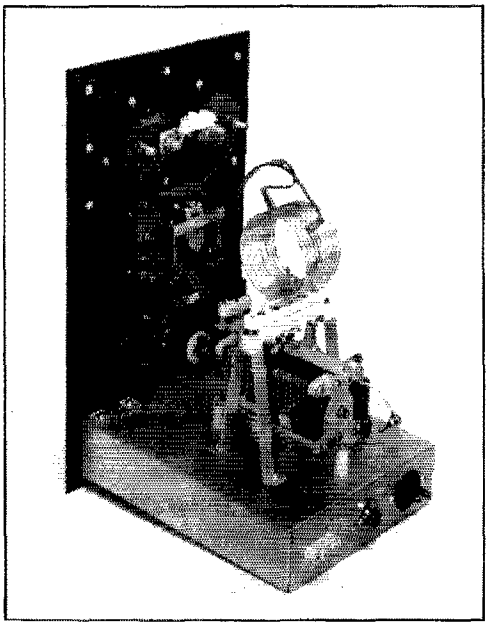


Fig. 2 — **Simple types of self-resonance occurring with coils as used in ordinary circuits tuned by a condenser. For identification, the type of resonance at the left is termed "fundamental" and that at the right "second harmonic."**



Rear view of the antenna coupler. Connections to the coax link, to the receiver antenna posts, and to the 115-volt supply for the relay are through sockets on the rear edge of the chassis.

It will be observed that there is no way to avoid at least one resonance in the 54–88 Mc. region (except by building the antenna coupler as part of the transmitter and using no connecting line at all) for the simple reason that if the line is made long enough to tune it past 54 Mc. the second harmonic starts to come in at 88 Mc. However, the TVI problem is always most acute in one or at the most two channels, and those are the ones in which resonances need to be avoided. Where only one channel is concerned the best possible line length is the one that keeps all the resonance points as far as possible from that channel. Using the A curves in Fig. 3 as an example, the shortest possible line is obviously best if Channel 2 is to be avoided, and in any event the line should be less than 30 inches long. If it has to be longer, then it should be not less than 60 inches long, but not long enough to bring the second-harmonic resonance into Channel 2. On the other hand, if Channel 6 is the important one a length of 36 inches would be about optimum under the conditions shown by the A curves, and about 30 inches under the conditions represented by the B curves.

The resonance frequencies for a given line length will vary with the band on which the transmitter is operating, because the terminal conditions will vary on different bands. The higher-frequency bands should be favored in choosing a line length, since the harmonics from those bands are the most potent in causing TVI.

Just what these resonances may mean is perhaps best illustrated by the writer's experience with the antenna coupler described here. In its first trial on 14 Mc. the tank coil was not grounded at the center, and purely as a matter of convenience a 13-inch link line was used. Both the tank coil and the link were resonant in Channel 6, the only one on which there is anything resembling TV service in Hartford. The picture on that channel disappeared when the transmitter went on, leaving nothing but a jumble of bright and dark lines. Grounding the tank-coil center and changing to a 36-inch line reduced the interference to the point where, while there was still some cross-hatching in the picture, it was not strong enough to cause any particular annoyance at normal viewing distance. The probable difference in harmonic intensity between the two conditions is estimated to be of the order of at least 60 db. Subsequent tests, after making the measurements shown graphically in Fig. 3, showed that (with the tank-coil center-tap grounded) a line length of either 13 or 52 inches caused about the same amount of interference — in neither case intense enough to wipe out the picture entirely, but taking away all the entertainment value because the picture was just visible through cross-hatching. Changing to a 45-inch line brought the cross-hatching down to a tolerable level, but the interference was least with the 36-inch length. These tests were made without filters or traps of any kind in the transmitter.[1]

It is probably an unusual coincidence for both the tank coil and link circuit to be resonant in the same TV channel. Nevertheless, resonance in only one of the two can do a great deal of damage to TV reception. Such resonances can be avoided by using a grid-dip meter for checking, and then making the necessary changes should a resonance show up where it is not wanted. In making such checks disconnect the transmission-line clips from the tank coil, because innumerable resonances occur in the antenna system itself and can cause a lot of confusion. In checking the tank coil, disconnect the link at the antenna coupler so the link-circuit resonances will not be present. After cleaning up the tank coil, reconnect the link line and check the link circuit by coupling the grid-dip meter to the link coil. The link resonances can be identified by disconnecting the line; they will disappear when that is done.

This checking process may represent a bit of bother, and there are those who might be inclined to question whether it's worth while to use an antenna coupler at all if it can't be trusted without investigation. The point is this: Regardless of what you hook on to the output link of your transmitter proper, the same amount of harmonic voltage is induced in that output link. If resonances occur in a link-coupled antenna coupler, they will cause the harmonic energy to be transmitted on to the antenna with fair efficiency.

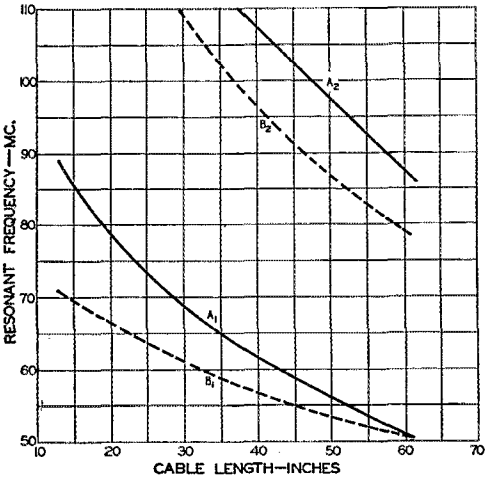


Fig. 3 — **Measured link-circuit resonances, as a function of the length of the coax link, in a typical set-up using the antenna coupler described in the text.**

But if the resonances are avoided the harmonic is greatly attenuated. On the other hand, if the output link is simply connected to the transmission line that goes to the antenna the full harmonic voltage is applied directly to the line. Those "innumerable resonances" that we mentioned above as occurring in the antenna system actually appear every few megacycles in the average system, so the chances are excellent that the harmonic will travel along in great style. Properly deresonated, the antenna coupler offers quite a few decibels of discouragement. Besides, it offers an excellent means for impedance matching with balanced lines and — probably most important of all — offers the man who uses a parallel-conductor line a way to install a low-pass filter under the conditions most favorable for its proper functioning. It's a good investment.

[1] For those who want more statistics, the measured r.f. output of the transmitter used for these tests was 100 watts and the transmitting antenna was within 8 feet of the TV antenna at the nearest point. The latter was a dipole-reflector affair aimed at the transmitting antenna. The TV signal strength is not known accurately but has been measured in the vicinity of 100–200 microvolts per meter at 30 feet in better locations in the Hartford area. The small amount of interference remaining after making the changes described above was easily taken out by a two-section low-pass filter of the type described in the 1950 *Handbook*. The transmitter is of course adequately shielded and the supply leads are thoroughly filtered, using the methods described in past issues of *QST*.

May, 1925

. . . The ARRL Traffic Department is setting up local vigilance committees to iron out BCI problems.

. . . Successful experiments on waves as low as 1.2 meters, using parabolic reflectors, are reported by Frank C. Jones, 6AJF-6XM.

. . . C. Francis Jenkins, visual-radio pioneer, announces plans to make available to amateurs low-cost models of his automatic facsimile machine.

. . . A. L. Budlong of the ARRL Experimenters Section debunks the theory that 54.7 degrees is the correct angle for "no coupling" between inductances.

. . . French amateurs are being heard on 40 meters in this country in midafternoon.

. . . Design features of the new nonradiating Isofarad regenerative broadcast receiver are reviewed by Byron B. Minnium.

. . . Build your own transmitter parts and invest the savings in meters, advises Department Editor L. W. Hatry. Home-brewed pie-plate condensers, water grid leaks, and inexpensive square inductors are recommended.

. . . Acting upon the request of the ARRL Board of Directors, the Department of Commerce has authorized a new amateur band at ¾ meter.

. . . Approximately 100 amateurs have had their transmitting licenses canceled for infractions of the new Department of Commerce regulations.

. . . President Coolidge has publicly thanked amateurs for their participation in the successful Governors-President Message Relay.

. . . A Third National Convention is announced for August under the sponsorship of the Chicago Radio Traffic Assn.

. . . H. E. Ogden, 9BRK, and D. B. Rauth, 9CHG, have won new laurels for amateurs by providing communication for the press during rescue operations to free Floyd Collins, entombed in Sand Cave, Ky.

. . . Don Wallace, 9ZT, is experimenting on 5 meters with a 204A running at one-kilowatt input.

. . . ARRL Traffic Manager Schnell has sailed from San Francisco with the United States Fleet. He will carry on communications tests on amateur frequencies.

. . . Experiments in top loading antennas and loops are described by Capt. William H. Murphy, USA.

. . . Bartholomew Molinari, 6AWT, has been awarded the Hoover Cup for 1924. Described as the "Best All-around Amateur Station," 6AWT boasts an inductively-coupled Hartley transmitter, a semi-vertical cone cage antenna, and a detector-and-one-stage receiver.

HAMFEST CALENDAR

ILLINOIS — Sunday, June 4th, at Ki-Shau-Wau Boy Scout Camp, staged by the Starved Rock Radio Club. Picnicking, contests, displays, and mobile operating activities are planned. Refreshments and lunch will be available for those who do not bring a picnic dinner. Tickets $1.00 if purchased before May 25th, $1.50 at the gate. For further details see the Ham-Ads in April and May *QST* or write W9MKS, Utica, Ill.

KANSAS — Sunday, May 21st, at Kenwood Park, Salina, arranged by the Central Kansas Radio Club. Starts at 9 A.M. No advance registration required. Licensed amateurs attending will be charged 50 cents. Coffee and soft drinks will be free. YLs, XYLs, and harmonics are welcome. Make it a family affair if you wish, but bring your own service.

MISSOURI — Sunday, June 11th, at Tweedies Resort, located between Eldon and Bagnall Dam on Highway 54. Sponsored by the Missouri Emergency Net. Boating, fishing, swimming, sodas, lunch, and contests will be part of the day's activities. For information about cabins contact Paul M. Cooper, WØTGG, 415 South Maple, Eldon, Mo.

NEBRASKA — Sunday, June 4th, at the Youth Cabin, Cody Park, North Platte, sponsored by the North Platte Amateur Radio Club. Program starts promptly at 10 A.M. and features entertainment for the XYLs and kiddies. Bring your own picnic lunch — everything else free.

NEBRASKA — Plans are now being formulated for the Nebraska 160 Emergency 'Phone Net Hamfest, to be held in late May or early June at a site in central Nebraska. The exact date and location will be announced when questionnaires have been tabulated. Hams, hams to be, and SWLs are invited. Get last-minute dope from Net members or from Hamfest Chairman William C. Gettman, WØYSK, Norfolk, Nebr.

NEW YORK — Saturday, May 13th, at the Liederkranz Club, 660 Main Street West, Rochester, sponsored by the Rochester Amateur Radio Association. Registration starts at 2 P.M. Afternoon activities will include discussions on emergency operation, traffic handling, DX, and v.h.f. development. V.h.f. gear will be in operation and there will be an interesting display of ancient apparatus for the old timers. Special events for the ladies. Dinner will be served at 7:00 P.M., followed by entertainment. Tickets $3.75 per person.

SOUTH CAROLINA — Sunday, May 7th, at W4BPD's "antenna farm," in Orangeburg. Hams from neighboring states are invited. Bring the wife, kids, lunch and refreshments; also gear for the swapfest. Early arrivals are invited to an all-night 20-meter DX Party at W4BPD's shack.

SOUTH DAKOTA — Saturday and Sunday, May 20th-21st, at Watertown, South Dakota State Hamfest, sponsored by the Howlin' Wind Amateur Radio Club. Everybody invited! A full program has been arranged by the Committee. Plan to attend!

TEXAS — Saturday and Sunday, May 27th-28th, at Cuero, Annual Convention of the South Texas Emergency Net. All amateurs are invited. Program includes business meeting, speakers on emergency work, the usual fun and good fellowship. Further details available from STEN Secy L. F. Megaw, W5PY, 202 Bedell Bldg., San Antonio, Texas.

SASKATCHEWAN — Saturday and Sunday, July 1st-2nd, at Saskatoon, sponsored by the Saskatoon Amateur Radio Club. Registration starts at 10 A.M. at Hamfest headquarters, H.M.C.S. Unicorn, 4th Avenue North at 24th St. Saturday: ARRL meeting and discussion presided over by SCM J. H. Goodridge, VE5DW, banquet and program at Bessborough Hotel. Sunday: field day, picnic, and general get-together. A ham station will be in operation at Hamfest headquarters. Special programs for XYLs and youngsters. Fee: $5 per couple, $3 single. The Committee will endeavor to arrange hotel accommodations when requested in advance. Contact F. Foster, 201 Avenue Bldg., Saskatoon, Sask.

Utilizing the 826

A 250-Watt Amplifier for Ten, Six, and Two Meters

BY RICHARD M. SMITH,* W1FTX

• The 826, an efficient tube at frequencies well above 144 Mc., now presents an inexpensive means to increase power in the v.h.f. range. Heretofore ignored because of its unusual shape and high price, current surplus prices make it a real bargain.

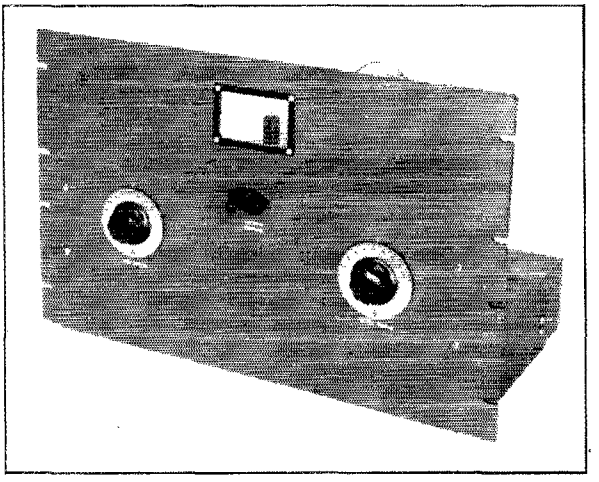
THE amateur fraternity is missing a good bargain by continuing to ignore the 826. This 55-watt triode at present seems to be a drug on the surplus market, yet its price is only about 50 cents. It is a tube designed especially for v.h.f. work, which means that it should be a good bet at almost any ham frequency. About the only reason we can see for its continued neglect by hams is that it presents a few layout problems that cannot be solved by the usual style of ham construction. We decided to see what could be done with this bargain bottle, and came up with the amplifier shown here. The unit is designed to cover the 10-, 6-, and 2-meter bands, but the same layout with larger tank circuits could undoubtedly be used with success at much lower frequencies.

The circuit is shown in Fig. 1. Aside from the use of a linear tank circuit for 2 meters, the arrangement is unusual only in physical layout and that is dictated largely by the shape and size of the tubes themselves. To one who is accustomed to building gear using double-ended tubes such as the 812, 35T, 24G, 829, and others, the arrangement pictured here may be a mild shock. We hasten to assure you, however, that we did not purposely try to build something "different" in this case. Study of the physical arrangement of the 826 will bring you to the same conclusion we reached. If you want short leads (and who doesn't), the layout shown is about the only possible arrangement unless you want to go in for some fancy sheet-metal bending. What we wanted was something that could be duplicated with a minimum of "special" parts. The results may not be the prettiest thing in the world, but we can assure you that the basic aim of efficiency in performance *is* achieved here, and when you can get a $12 tube for one-twentieth of its usual price, appearance becomes secondary.

Circuitwise, the amplifier uses the customary push-pull cross-neutralized arrangement with plug-in coils in grid and plate tank circuits. To obtain maximum efficiency at 144 Mc. a system devised by W1JEQ permitting a linear tank to be used was selected.[1] The 2-meter plate lines visible in the rear view of the unit remain in place regardless of what band is being used. Conventional plug-in coils are used for 6- and 10-meter operation, with a standard B & W BVL base mounted above the plate-tuning condenser. When either

* Technical Assistant, *QST*.

[1] Chambers, "450 Watts on V.H.F.," *QST*, Sept., 1949, p. 22.



Front view of the amplifier. A symmetrical panel arrangement is obtained through the use of pulleys and dial cord to drive the two condenser shafts. The antenna coupling adjustment is centered in the panel, with the grid tuning control at the left, plate tuning control at the right. The over-all appearance is enhanced by a window cut through the front panel at about the same height as the tubes.

plate coil is in place, the 2-meter lines are open-circuited by the removal of the shorting bar. They then serve merely as plate leads joining the tank circuit to the tubes. For 2-meter operation, the shorting bar is placed across the end of the lines, and a "hairpin" coupling loop is plugged into the position formerly occupied by the coils.

Construction

This amplifier consists of three separate subassemblies. The first, which comprises the tube mount, grid circuit, and neutralizing circuits, is shown in the detail photograph. The second is made up of the plate tuning condenser, the 2-meter plate lines, and the BVL assembly for the plug-in coils. The third is the chassis and panel which merely serves to tie the two major assemblies into a unit, and as a means of mounting the completed amplifier in a standard rack or cabinet. Departures from the arrangement shown can be made in the chassis-and-panel assembly to suit individual requirements, but the plate and grid assemblies should be duplicated as closely as possible.

The tube sockets are mounted 3¾ inches above the chassis on an aluminum bracket measuring 5¼ inches wide. If a different plate condenser from that specified in the parts list is used, the height above the chassis should be changed to suit, because the plate lines, which are supported by the condenser, must end directly at the plate terminals of the tubes. The socket for the grid coils is mounted on the bracket in such position that its terminals project through the bracket immediately beneath the tube sockets. Just below the holes for the coil socket (National XB-16), make a ⅝ × ¼-inch grommet-lined slot to pass a length of 300-ohm Twin-Lead through to the link terminals on the coil socket.

Mount the tube sockets and the coil socket first. Then do all the filament wiring, including by-pass condensers C_3 through C_6. Next mount grid resistor R_1, followed by the grid condenser C_1. This condenser is made from a single-section 35-$\mu\mu$fd. condenser (Millen 21935). Remove 3 rotor plates and 2 stators from the center of the unit, sawing through the two stator bars, but *not* through the rotor shaft. Use ¼-inch copper strip to make the r.f. leads joining C_1, L_1, and the grid terminals of the tubes. An additional length of copper strip should be soldered directly between the two grid terminals, Pins 3 and 5, to reduce grid lead inductance. Next place a similar strip between Pins 1 and 7 of each socket. By crimping and soldering, attach lugs that are later to be used to join these to the plate lines.

Once these parts are in place, mount the neutralizing condensers, with the tabs of the "stator" plates soldered directly to the stator bars of the

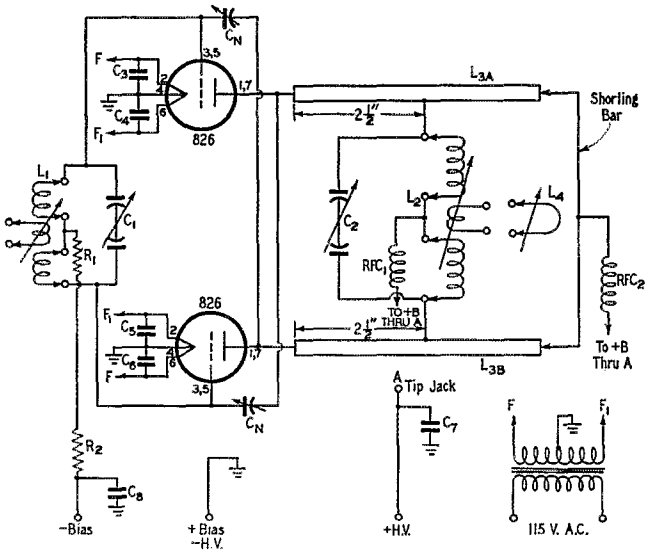


Fig. 1. — Schematic diagram of a 250-watt amplifier using push-pull 826s for operation in the 10-, 6-, and 2-meter bands.

C_1 — Millen 21935, modified (see text).

C_2 — National TMH-35D with 2 rotor plates and 2 stator plates removed from each side.

C_3, C_4, C_5, C_6, C_8 — 0.005 μfd., 600 volts (Sprague disc ceramic).

C_7 — 470 $\mu\mu$fd., 5000 volts test.

C_N — Neutralizing condenser, 1.5–8.5 $\mu\mu$fd., 1200 v. d.c. wkg. (Millen 15003, mounting ring removed).

R_1 — 100-ohm 1-watt carbon.

R_2 — 2000 ohms, 10 watts.

L_1 — 28 Mc. — 10 turns No. 18, space-wound, 1¼-in. diam., each half of coil spaced to occupy ½ in. 4-turn variable link. (National AR-16 20-S with 1 turn removed from each side.)

— 50 Mc. — 8 turns No. 14 enam., ¾-inch diam., c.t., each half spaced to occupy ⅝ inch. 3-turn variable link.

— 144 Mc. — Hairpin loop, No. 16 wire, ½ in. wide, 1¼ in. long, c.t. A similar loop spaced ⅛ inch below it is used as link.

L_2 — 28 Mc. — 8 turns of ⅛-inch tubing, 2 inches o.d., each half spaced to occupy 1 inch (B & W 10 BVL).

— 50 Mc. — 4 turns of ⅛-inch tubing, 1¾ inches o.d., each half spaced to occupy 1 inch (B & W 5 BVL).

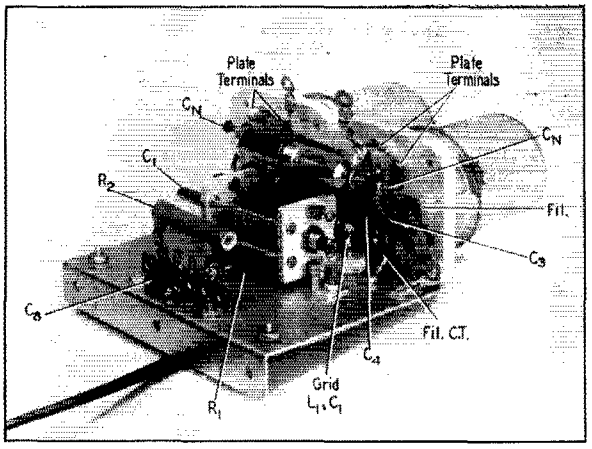
$L_{3A, B}$ — 5⅛-inch lengths of ½-inch o.d. copper tubing, spaced 1½ inches center-to-center. One end of each drilled and tapped for 6-32 screw ½ inch from end.

L_4 — Pick-up loop, 2 in. long, 1 in. wide, mounted on jack bar.

RFC_1 — 20–60 Mc. r.f. choke, 500-ma. rating (Ohmite Z-28).

RFC_2 — 144-Mc. r.f. choke, 500-ma. rating (Ohmite Z-144).

Filament transformer — 7.5 volts, 8 amperes.

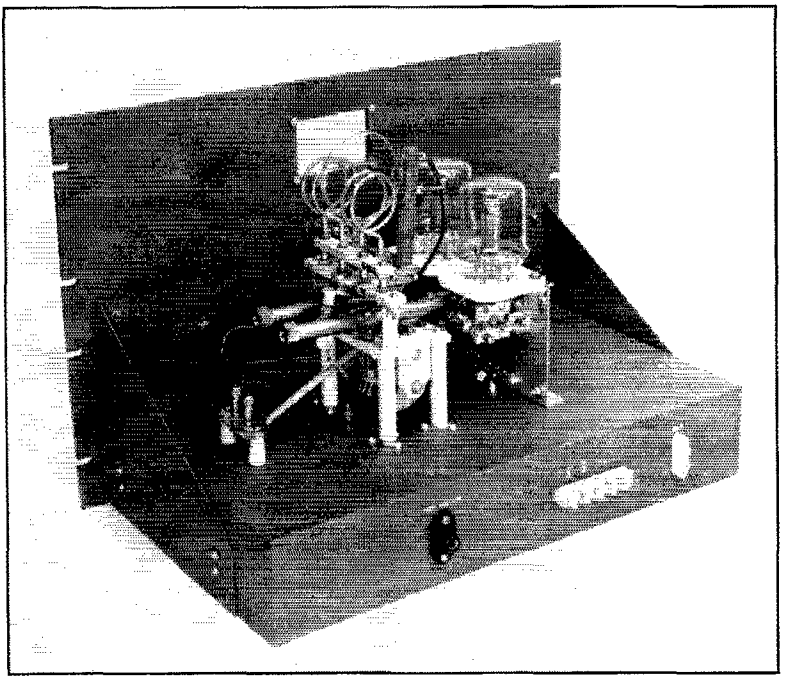


Detail view of the grid assembly, showing placement of parts for minimum lead length. The Twin-Lead extending toward the lower left corner of the picture is part of the input link line.

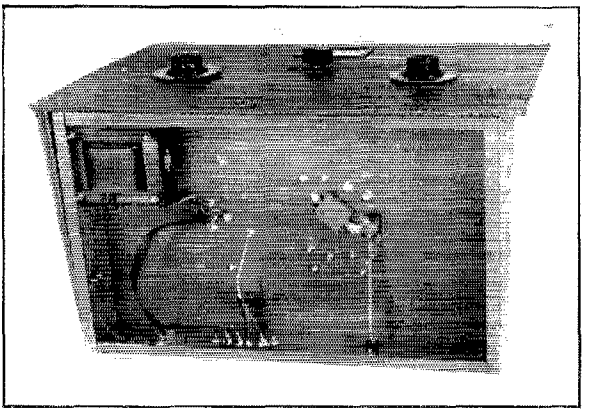
grid condenser C_1, and the tabs of the movable slugs connected to the copper strips at the plate terminals of the tube. The arrangement is shown in the detail photograph.

The plate assembly is made by inverting the tuning condenser and mounting it on four ceramic pillars 2⅝ inches high (National GS-2) as shown in the rear view. The socket for the plate coils is supported on aluminum brackets 1⅜ inches above the plate condenser. It is connected to the plate lines by ¼-inch copper strips soldered to metal plate grips through which the plate lines pass. The plate grips (National type 12) are bolted to the stator terminals of the plate condenser, and connection to the lines is made by springing the grips to the proper diameter. The plate end of each line is drilled and tapped for 6-32 screws used to make connection between the line and the lugs on the plate terminals of the tube sockets. The distance from the plate grips to the plate terminals is shown in the circuit diagram, Fig. 1.

The construction of the chassis-and-panel assembly is evident from the photographs. To accommodate the plug-in r.f. chokes used, a standard tip jack is mounted on a polystyrene plate which is then placed beneath the chassis so that the tip jack will be centered in a 1⅛-inch



Rear view of the amplifier. The arrangement of the plate assembly is shown. The coils shown are those used for 50-Mc. operation, with the grid coil just visible behind the tube bracket.



Bottom view of the amplifier. All input terminals are arranged along the rear of the chassis. The polystyrene plate near the plate by-pass condenser is used to mount the pin jack for the plug-in r.f. chokes, as described in the text.

hole in the chassis immediately below the forward edge of the plate condenser. Thus, when 6- or 10-meter operation is desired, RFC_1 is plugged into the tip jack. For 2-meter work, RFC_2, which is mounted on the shorting bar, is inserted. The plate by-pass condenser C_7 is connected between the pin jack and chassis as shown in the bottom view. Also visible in this view are the filament transformer, and a portion of the input link line. This line passes through a grommet-lined hole in the chassis between two ceramic bushings used to pass the filament leads. The line runs to a standard crystal socket mounted on the rear of the chassis, and is twisted one or two turns to achieve better balance to ground.

Operation

Ratings for the 826 permit its operation in a.m. 'phone service at 1000 volts, 125 ma. per tube, thus permitting this amplifier to be operated at 250 watts input. Under c.w. conditions (or n.f.m.) plate current may be increased to 140 ma. per tube, or an input of 280 watts. These are the ICAS ratings for natural cooling at frequencies up to 250 Mc. With forced-air cooling, the ratings permit the plate voltage to be increased to 1250 volts in c.w. operation, but a similar increase is not recommended by the manufacturer for 'phone use. Grid-bias requirements are as follows: for a.m. 'phone, −160 volts (80 ma. through 2000 ohms); for c.w., −70 volts (70 ma. through 1000 ohms). If break-in c.w. operation is desired, or if some form of protective fixed bias is to be used, −22.5 volts is suggested as a value suitable to hold plate current within reasonable limits.

Tests have shown the amplifier to be fairly easy to neutralize by the usual methods. If unbalanced operation is obtained (as evidenced by heating of the plate of one tube), balance can be restored by readjustment of both neutralizing condensers. Adequate drive at 50 Mc. can be obtained for the amplifier from an 829 driver stage operated at about 40 watts input. Somewhat more input to the driver is required for 2-meter operation, but it is still well within the capabilities of any efficient 829 driver. It might even be possible to obtain enough 6-meter excitation from an 832. Thus, the amplifier described is a good bet for anyone who wants to get a bit more power at relatively small cost. The parts used are inexpensive, and the tubes are cheaper than their sockets!

Calling CQ

When I call CQ while using the key,
  At least one station will come back to me.
For on c.w. a guy makes a choice
  By the strength of the signal and not by a voice.

I call CQ on the ten-meter 'phone,
  I twist the dials — wear my thumb to the bone.
I try it again, I yell and I yell,
  Do they answer me? No! They call a YL.

At last I got mad and said to my wife,
  Come here, sweetie pie, and help save my life.
Put out a CQ on this old pile of junk,
  Let's prove this YL biz is true or the bunk.

She calls a CQ in her sweet-mannered style,
  Ye Gads! Hear the answers — I didn't touch the dial.
They gave her reports of R5 . . . S9 . . . plus.
  Not in all my experience have I heard such a fuss.

She kept it agoing for quite a long time.
  Oh! Boy! Am I happy, someone's on the line.
I said, sweetie pie thanks a lot for the help,
  Now give me the mike, let me give him a yelp.

Now I know band conditions can change mighty fast,
  But I can't understand how her contact can last;
For soon as she's finished and I take the mike,
  QRM blanks me out and the guy has to hike.

I'm going back to c.w. where all CQs hit,
  Where I get many answers and don't have to sit
And holler and shout and call to beat hell
  Then hear the guys answer a sweet-voiced YL.

But on second thought, I think I will stay
  On ten-meter 'phone and enjoy every day.
Now why should I crawl up on a shelf?
  I'm going to answer some YLs myself!

— *G. E. Hoffstetter, W9JC*

The Ground Wave at 1.8 Mc.

Probable Consistent Range on 160 Meters

BY C. F. ROCKEY, JR.,* W9SCH

THE reopening of the 1.8-Mc. band to amateur operation elicits a new interest in ground-wave propagation. Because communication on the higher frequencies is almost entirely in the sky-wave mode, the behavior of earth-guided radiation has remained rather unfamiliar to the average ham. It is our purpose here to present a few useful facts and figures on this interesting subject.

By definition, a "ground wave" is a radio wave that is guided over the surface of the earth by virtue of the conductive properties of the ground. The wave itself exists in the space above the surface, but "drags its feet" on the ground. As the wave passes over the ground, currents are induced in the earth that assist in propagation and guide the energy flow very much as do the wires of the ordinary transmission line.

True ground waves are always vertically, or very nearly vertically, polarized. If the electric field of the wave were parallel to the earth, as in the case of a horizontally-polarized wave, it would soon be short-circuited by such a conductive surface. The vertically-polarized wave meets with no such difficulty, since its electric field is perpendicular to the conductor.

Because the ground-wave mode of transmission is a continuous, rather than a "skip" phenomenon, it is much more reliable and amenable to prediction than is the sky wave. For this reason it is extensively used for broadcasting, police, marine, and other forms of communication where reliability is important. However, because the earth is usually far from being a perfect wave guide, it is not the best mode of transmission for long-range work, but this is more than compensated for by its consistency at medium distances.

If the earth were a solid metallic ball of infinite radius and practically perfect conductivity, ground-wave transmission would be ideal, for in this case the only energy decrease with distance would be caused by the spreading of the wave. As the wave front expands, it is natural that the energy contained in any small section of it will diminish. However, the amount of signal that actually appears at any given receiving antenna is always appreciably less than would be expected if only spreading effects occurred. These "ground losses," which are the primary limiting factor in ground-wave DX, are the result of the resistance of the ground over which the wave passes.[1]

Generally speaking, the ground losses in any given locality increase rapidly with frequency, which is why the low-frequency channels in the broadcast band are more effective than those at the 1600-kc. end. As the transmitting frequency is raised much above 3 Mc., the losses render the ground wave practically inaudible beyond a few miles. The intermediate and low frequencies give excellent results, while the amateur 1.8-Mc. band is something of a compromise. It does, nevertheless, show a useful and reliable ground-wave range of about fifty miles, which is its greatest virtue. Within limits, it is possible to calculate the field strength at any given distance from a particular 2-Mc. antenna, and expect the signal to be and remain at that order of magnitude day after day.

The ground-wave field strength, in microvolts per meter, at any given distance along the earth from a 1.8-Mc. amateur station may be calculated from the following general formula:

$$E = \frac{k\sqrt{PA}}{D^n}$$

where: E = field strength in microvolts/meter,
P = radiated power, watts,
D = distance to point of measurement in miles,
k = numerical constant, depending upon antenna and frequency,
n = exponent of distance, depending upon frequency and ground resistance, and
A = horizontal directivity factor of antenna, assumed to be unity for the usual amateur antenna.

There are other expressions for the variation of signal strength with distance, some perhaps more exact, but it is the writer's opinion that the formula given interprets short-distance transmission as well as any, and possesses the additional advantage of simplicity.

To evaluate experimentally the various constants in this formula, a series of daylight field measurements was made at Elmhurst, Illinois, in November, 1941. A small amateur radiophone transmitter, running 20 watts input, was set up

* R.R. No. 2, Box 363, Palatine, Ill.

[1] Ground resistance is measured in terms of the resistance between two opposite faces of a 1-cm. cube of the soil, under normal conditions. In practice it is found to vary between the limits of 1000 ohms to 0.1 megohm per cc. For northeastern Illinois soil it averages around 12,000 ohms.

on the Elmhurst College campus and connected to a bent quarter-wave Marconi antenna. This antenna, rather typical of many used at other amateur stations, consisted of a horizontal single-wire "flat top" 70 feet long and a vertical "lead-in" 50 feet in length connected to one end. The steam-heating system of the college was used as ground. Under operating conditions (20 watts carrier input to final amplifier) the current at the base was 0.7 ampere. During the course of the test, the station maintained contact with other amateur stations using the author's call, W9SCH/9. A rebuilt battery-operated portable receiver with loop antenna and an S-meter was used for the measurements, having previously been standardized against a signal generator. Measurements were made at distances of one, three and five miles from the antenna; others at ten miles were contemplated but could not be made during the available time. The results are shown in Fig. 1.

Because of the modifying effect of local obstacles, the results naturally show great variation, but the average values at each distance may be plotted into a smooth curve. When arranged as in Fig. 1, it is seen that the field intensity falls off, within the limits of measurement, inversely as the 1.25 power of the distance, in miles, when the wave travels over northeastern Illinois soil. The average field strength at one mile was 7.3 millivolts or 7300 microvolts per meter.

The actual power output of the transmitter was not measured, but since the efficiency of any Class C amplifier worthy of mention at this frequency is at least 60 per cent, we may estimate the power output at 12 watts. Thus our ground-wave transmission formula, for the conditions stated, should be:

$$E = \frac{2100\sqrt{P}}{D^{1.25}}$$

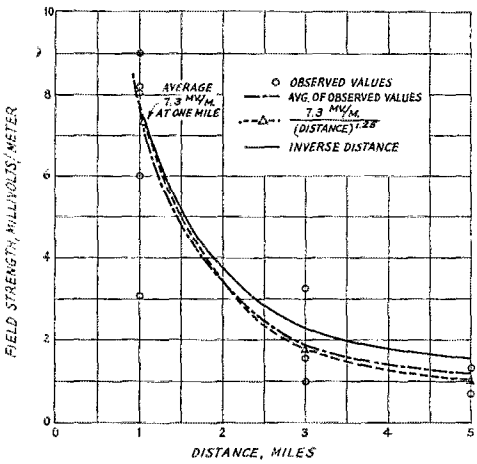


Fig. 1 — The results of a field-strength survey made at Elmhurst, Ill., November, 1941. The frequency was 1987 kc. See text for other details.

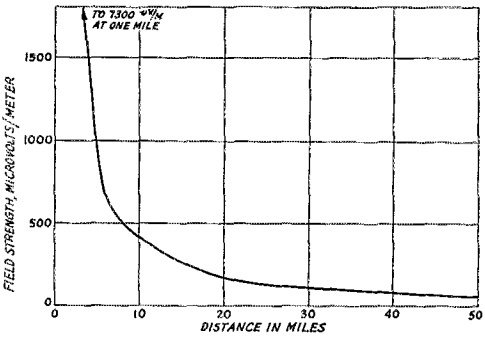


Fig. 2 — Predicted ground-wave field strength, under same conditions as Fig. 1, based on $E = 7300/d^{1.25}$

where: E = field strength in microvolts per meter,
P = power supplied to antenna in watts (given by 60 per cent of input power), and
D = distance from transmitting antenna to point of measurement in miles

Fig. 2 shows the predicted field strength at various distances from the station described. The predicted distances to the 50-, 100- and 500-microvolt contours, based on measured one-mile values, are plotted in Fig. 3. The many signal reports received during the operation of the station frequently demonstrated the reasonable nature of the prediction. In many cases we could give ourselves a report and have it actually confirmed by the receiving operator — much to his amazement.

Because the average amateur is not able to raise his "flat top" as high as we were, we have tabulated data based upon a more common antenna system, one with a 100-foot "flat top" raised only thirty feet above the ground. From measurements of the characteristics of a number of such antennas in the Chicago area, we find that such a radiator will have an average resistance of 30 ohms and an effective height of five meters, when operated in the 1.8-Mc. band. Accordingly, our ground-wave propagation formula becomes:

$$D = \frac{1420\sqrt{P}}{D^{1.25}}$$

with other units the same as before.[2]

To simplify the estimation of field-strength values at various distances, we have provided the curve of Fig. 4. This is the field strength produced by one watt in an "average" antenna as described above. To determine the field strength when more power is used, multiply the

[2] This is calculated from the fundamental antenna transmission formula found in *Robison's Manual of Radiotelegraphy and Radiotelephony, 8th Revised Edition, p. 350* (United States Naval Institute, 1928).

value taken from the curve by the *square root* of the transmitter power output, which will then give the field strength at that distance under the new conditions.

When using this information it must be remembered, however, that it applies strictly only to propagation over open, flat, or slightly rolling country such as is found in northeastern Illinois. Where an appreciable portion of the wave path is through a congested city, or if the surrounding country is hilly or covered with dense woods, these figures will not hold. But since amateur measurements of field intensity cannot be too accurate at best, the data presented will be at least approximately useful in most residential areas.

Those who are familiar with field-intensity data for the broadcast service will note the wide divergence between it and the material presented here. For example, while one watt in a perfect quarter-wave vertical antenna will provide over six thousand microvolts at one mile, the same power in the typical amateur antenna provides only about one-sixth of this. The explanation lies in the inefficiency of the simple bent-wire radiator as compared with the vertical tower over an extensive radial ground system as used by broadcasters. Also, broadcast engineers are accustomed to employing a more complex procedure in calculating signal attenuation, a procedure requiring information and mathematics not at the disposal of the amateur. For this reason, data from the two sources cannot be compared.

It is hoped that, in the future, further investigations can be made to determine more nearly the effect of high-building densities, such as found in the large cities, upon the wave attenuation at this frequency; and that more measurements at greater distances may be carried out. Meanwhile, if the information provided here is helpful in planning the better utilization of our 1.8-Mc. band, its purpose will be well served.

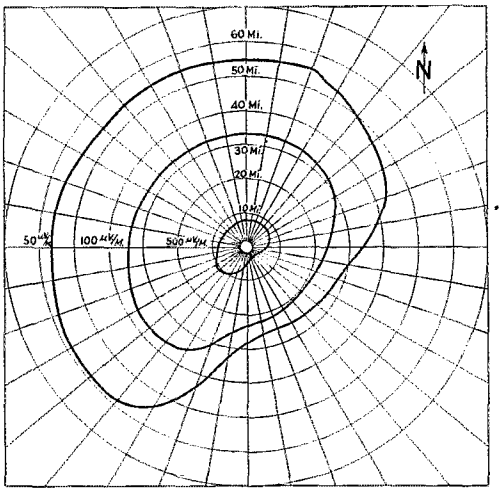


Fig. 3 — Predicted field-strength distribution, based on values measured at 1 mile.

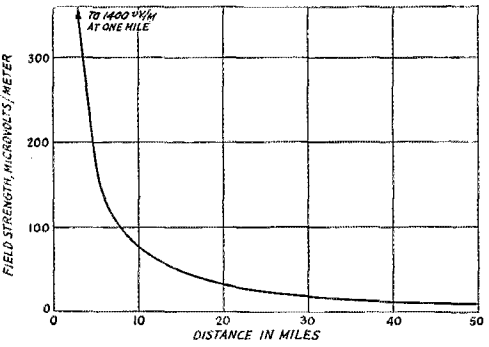


Fig. 4 — Predicted ground-wave field strength for 1 watt in average amateur antenna (30 feet high) over northeastern Illinois soil.

Strays

There's been quite a pick-up in ham activity in the shadows of the oil derricks of the Humble Pipe Line Camp, Odessa, Texas, now that Bertron (age 10) and Grantland (age 13) Groves have won their operator licenses and the calls W5QNA and W5QMZ respectively. Our newest young hams are the sons of ARRL West Gulf Division Director and Mrs. Wayland M. "Soupy" Groves, well known on the air as W5NW and W5DUR.

Four hams in one family created quite a shack problem, admits "Soupy," but he finally solved it by relinquishing his old shack to the boys and setting up in a new structure alongside. To date the young squirts have confined their operation to 40-meter c.w. and concentrating on WAS, using a BC-348 receiver, BC-459 VFO, and p.p. 807 final. They are very active in Boy Scout work, and plan on taking a rig with them on future camping trips. The photo shows the Groves's gathered in the new W5NW shack, with Bert seated in the foreground and Grant standing in the rear.

Happenings of the Month

DOCKET 9295

On March 21st FCC issued an order dealing with the various requests which had been filed n January in response to its notice of proposed rule making of last November. The Commission denied a request, submitted by "National Amateur Radio Council," and conditionally supported by "Society of Amateur Radio Amateurs," for a formal hearing, saying, "such a proceeding would not be warranted since, insofar as the requests show, the evidence which would be adduced at a hearing would not have any substantial value in aiding the Commission to resolve the issues raised by Docket No. 9295 relating to the merits of the rules proposed therein." The Commission denied a request, submitted by "NARC," that it poll amateur licensees to determine their opinion on the proposed Amateur Extra Class license, saying that "the burden involved in such an undertaking would not be commensurate with the benefits to be derived therefrom." The Commission confirmed its earlier tentative grant of a request for oral argument, submitted by the American Radio Relay League, and set May 19th, in Washington, as the date and place. Any interested party wishing to participate in such general oral argument should notify FCC in writing, with three copies, not later than May 10th, setting forth specific sections of the proposed rules to which argument will be directed and estimating the amount of time required. ARRL has already filed its notice of intention to appear to present the views of its membership, through the Board of Directors, on that portion of the Docket discussed in its January comment.[1]

ROANOKE ALTERNATE ELECTION

Gus M. Browning, W4BPD, became the new alternate director of the Roanoke Division on March 20th, to fill the remainder of a term expiring the end of this year, when a tally of the ballots cast in the special election showed that he received 340 votes to 258 for Victor C. Clark, W4KFC, and 112 for Walter G. Walker, W4AKN. An OPS, Gus has been an active ham since 1926, is chief engineer of WRNO and part-time in the radio repair business. The signal of W4BPD is particularly well known to DXers.

BOARD MEETING

The annual meeting of the ARRL Board of Directors is scheduled to be held on May 5th (probably extending through the 6th) in West Hartford. If you haven't already written to your director in response to our note in this column last month, and you or your club have some ideas you'd like considered, there's still time to go on record with your views. See page 8 for the representative from your division, and the next page for last-minute agenda.

F.C.C. CHIEF ENGINEER

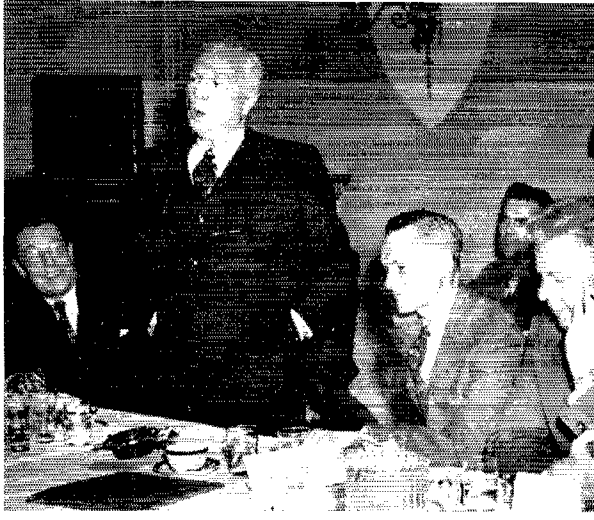
When the Commission recently filled the long-vacant post of chief engineer, it chose a man not only thoroughly schooled in engineering and experienced in the communications industry, but a man with that intense, personal interest in the field which comes only with experience as an amateur. Curtis B. Plummer, W3KRK, was appointed to the chief engineer's job at the same time it was elevated to the status of direct advisor to the Commission itself rather than solely the head of the engineering division.

As so many of us do today, Mr. Plummer got his first ticket (W1IUA) while attending school — in this case the University of Maine. After receiving his B.S.E.E. in 1935, he worked at several jobs in industry but it was not until he

CURTIS B. PLUMMER, W3KRK

received a Civil Service appointment as an FCC inspector that he found a job to his particular liking — supervisory field-monitoring duties in the old Radio Intelligence Division. Soon after, he transferred to Washington in the broadcast division of FCC, later becoming assistant chief of his section and, in 1945, chief of the new TV division with additional duties in connection with the Voice of America service. He's kept so busy these days his hamming is limited to occasional 6-meter activity, but every summer he gets up to Maine on vacation and gives W3KRK/1 a real workout.

[1] P. 9, *QST*, March, 1950.



Alex Reid, VE2BE, recounts some of the highlights of his twenty years as ARRL Canadian General Manager to 70 amateurs who gathered in Montreal for a surprise testimonial dinner in his honor. *L. to r.*, T. H. Letts, VE2BG; CGM Reid; Lin Morris, VE2CO; and ARRL Secretary Budlong, W1BUD. Continuously the CGM since January 1, 1930, VE2BE is the "dean" of the ARRL Board of Directors. He expressed his sincere thanks to the Montreal and District amateurs, and to the SCMs, clubs, and individuals who sent congratulatory letters and telegrams on the occasion.

♦

NOTIFY F.C.C. WHEN MOVING

When you pack up the furniture and the ham rig and move to a new location, you can operate at the new location provided you do two things: apply for modification of license to change the permanent address of your station, and notify the engineer in charge of the district in which the new address of the station is located. A lot of fellows forget this notification to the engineer in charge, and FCC has asked us to remind you about it. Providing notice is sent the engineer every thirty days, you can continue operating at your new location up to four months; of course well within that time action will have been taken on your application for modification.

I.A.R.U. CONGRESS

On May 17th through 20th the halls of the Aero Club in Paris will echo with discussions about amateur radio in several languages, when delegates from numerous national societies meet for an IARU Congress to commemorate the 25th anniversary of the founding of the Union. Proposed jointly by Lucien Aubry, F8TM, and Marcel F. Dupuis, ON4EY, and agreed to quickly by IARU societies, the Congress will form special committees to take up various aspects of international amateur matters such as band planning, propagation, interference, regulations, etc. Evenings will, of course, be kept free — for sightseeing and attendance at the Paris Fair. At this writing it appears impossible for the League to send a representative, primarily because of the May 19th session on Docket 9295.

R.I.D. ASSOCIATION

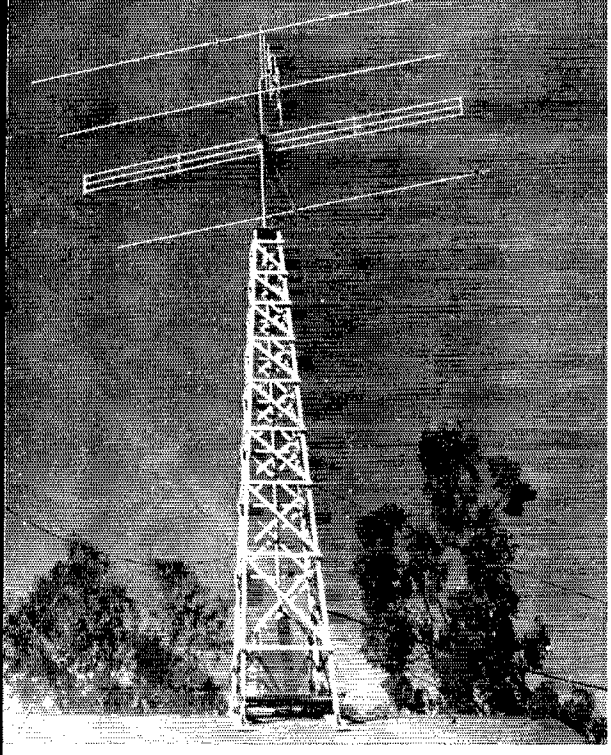
On February 21, 1950, a number of former employees of the FCC's wartime Radio Intelligence Division met in Washington, D. C., for the purpose of forming an association of persons who assisted in the Commission's radio intelligence activities during World War II. The purposes of the RID Association are to perpetuate the fellowship existing between the men and to maintain a roster of persons who, as members of the FCC's NDO, FBIS, Field Division, and RID, participated in radio intelligence activities. The group will hold its annual meeting and dinner in Washington, D. C., on May 5, 1950. Any former employee of the aforementioned groups who desires to affiliate with the association is invited to submit his name to Merle Glunt, 10003 Gardiner Avenue, Silver Spring, Maryland.

A.F.C.A. CONVENTION

A Signal Corps demonstration of practical military communications, including wire laying by helicopter and bazooka, combat communications problems, parachute drops and elaborate equipment displays will highlight the national convention of Armed Forces Communications Association, May 12th and 13th. In addition, the program includes elaborate displays from the Signal Corps Engineering Laboratories, the Armed Services Electro-Standards Agency and the Signal School of Ft. Monmouth. The above events, scheduled for the 13th, follow the May 12th meeting sessions in New York City, at the Hotel Commodore, which include business meetings and the annual banquet.

BOARD AGENDA

As *QST* goes to press, the items (other than routine) scheduled to appear on the agenda are: consideration of the report of the Committee studying the Communications Department; Director Dosland's proposal to amend the Constitution to "define more clearly the duties of the Communications Manager, his position in the Headquarters organization, and to provide for over-all Headquarters coordination so as to assure the carrying out of the Board-recommended activities and services"; Director Canfield's proposal to amend the Constitution to deny voting rights to the President and Vice-President (except that the presiding officer may vote to break a tie), and to deny voting rights to the Canadian General Manager on questions of U. S. regulations; the Secretary's recommendation to close out the Building Fund, to appropriate funds for possible ARRL participation in the Extraordinary Administrative Conference, and (jointly with the CGM and CM) to add Newfoundland and Labrador to the administrative territory of the League; the Communications Manager's recommendation to consider setting aside a portion of the 21-Mc. band for maritime mobile.



Tower and Rotator Techniques

Part I — Building a Rugged Tower

BY LOUIS H. HIPPE,* W6APQ

WHEN a fellow takes up operating with a simple antenna on any of our bands from 14 Mc. up, it is not long before he begins to hanker for a more efficient beam type of antenna, complete with rotating mechanism. The prime requisite now becomes some method by which his new beam can be supported in the best possible manner and at the same time have a supporting structure sturdy and safe enough so the neighbors aren't going to view it with apprehension each time a slight breeze occurs.

"A" frames or trees may do for long-wire antennas, but they are not much good for beams. Masts are great, if you can get a telephone pole, but the cost may be prohibitive. The most versatile and efficient support for an amateur rotatable array is a tower. With proper construction it is possible to go up a hundred feet and support a compression weight of several hundred pounds. A tower is comparatively light and can be handled and placed in position without too much difficulty. Best of all it can be easily climbed with safety if you find it necessary to do so. At either the top or the bottom of the tower there will be ample room to install a rotator.

The tower and construction about to be described answer all of the above qualifications. The tower was designed to be placed atop a garage roof where the combined height of the roof and the tower would equal at least one full wave above ground for ten meters and a half wave for twenty. Since the tower is placed on the garage roof it can very conveniently be guyed to the garage itself, thus eliminating the chance of accidental stumbling over or running into the guys by some unwary bystander.

*10636 Victory Blvd., North Hollywood, Calif.

Constructing the Tower

Proper construction of the tower is of paramount importance. Sway and horizontal braces must be placed properly for the greatest stress bracing. The materials should be carefully selected as insurance for sturdiness and lasting quality in weather. The wood used in its construction consists of four 20-foot 2 by 2s and eight 20-foot 1- by 2-inch pieces of *unfinished* pine or Douglas fir. The fuzzy surface of unfinished lumber will hold paint and weather better than the finished variety. All joints are glued with Weldwood glue or a good waterproof cement such as casein. In addition, all of the joints are firmly secured with *galvanized* nails. The tower at W6APQ has been up for over two years and shows no signs of weather whatsoever. It is impossible to pound any one of the sway braces or horizontal members off without shattering the wood.

The four 2 by 2s should be knot-free and straight. Square off the ends and be sure each piece is exactly the same length before starting construction. Next take two of the 2 by 2s and lay them out on flat ground as in Fig. 1A, nailing on temporary holding strips as shown. This and each succeeding step should be done carefully to insure a finished tower that will be accurate. Start at the top (narrow portion) and measure and mark off the place on both 2 by 2s where the first horizontal brace is to be secured. Be sure it is square with the top and bottom of the tower; if it is not, the error will be magnified all down the tower.

Place a piece of 1 by 2 across the measured points and mark it *accurately* for sawing. Use plenty of glue and place the horizontal brace you have just cut on the 2 by 2s where marked. Fasten each end of the brace with five galvanized nails, drilling the brace to take the nails. Use a drill slightly smaller than the shank of the nail. Contrary to general belief, this will actually make the nailed joint sturdier since the glue will squash up through the drilled hole and more firmly unite the galvanized nail to the wood.

After the first horizontal brace has been located and nailed in position, the next one below should be located and spaced in such a manner as to allow the sway braces to cross at *exactly* 45 degrees. The same procedure of crossing the sway braces at this 45-degree angle should be followed all the way to the bottom of the tower. The 45-degree crossing is the secret of getting the greatest stress bracing built into the tower.

If you wish to give your structure a graceful Eiffel Tower look the central portion may be pulled in after the first horizontal brace has been fastened in place, and a holding strip nailed on at center to hold the 2 by 2s in position while the rest of the horizontal and sway braces are nailed on.

After the horizontal and sway members are glued and nailed on one side (Fig. 1B), the side structure of the tower should be turned over and the cross sway braces cut, glued and nailed on. When this is done the remaining 2 by 2s should be placed on top of the section just completed and aligned to match. It will be easy to locate the positions of the horizontal and sway braces by this method. To strengthen and waterproof the joints, glue the cut ends of the sway braces that fit against the horizontal braces as well as the part that fits against the 2 by 2.

When the two sides are completed, place them on edge opposite each other and align them exactly as was done with the first 2 by 2s. Nail on temporary holding strips, then turn the entire structure completely over and align the opposite side in the same manner. At this point the tower is taking on its final shape and before going any further check carefully to see that the sections are exactly square with each other. Measurements of the 2 by 2 spacing on the four sides should be made at center, top and bottom.

The first horizontal brace on the third side should be cut to overlap the ends of the first two braces. Glue these ends and drive the first two nails on each end of the new horizontal member into the ends of the previous girders. The next piece to be cut, glued and nailed into position should be the horizontal tie on the *bottom* of this same side. The center brace can now be fastened into position followed by the rest of the horizontal braces on that side. Do not add any of the sway braces on the third side at this time. Turn the tower over so the fourth side is uppermost. Repeat the same procedure as for the previous side.

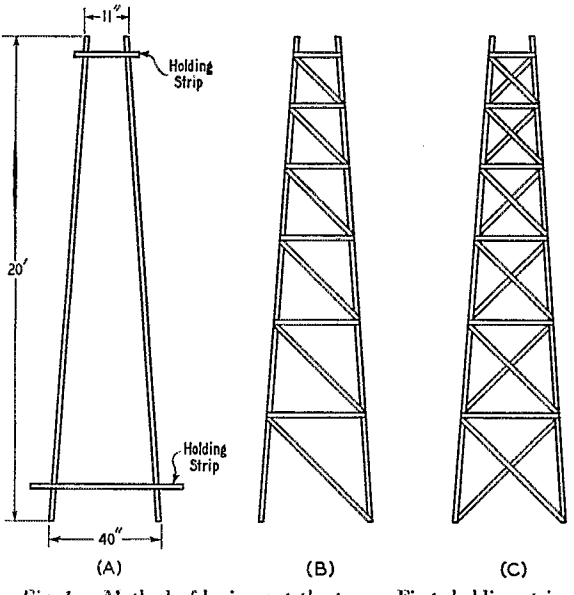


Fig. 1 — Method of laying out the tower. First, holding strips are nailed to the tower sides (A) to give the proper dimensions. This should be done carefully, as the error will be magnified many times in the completed structure. The second phase (B) shows horizontal braces and one set of sway braces in place. The completed side (C) is done by turning the assembly over and adding the second set of cross braces. The braces may be carried to the bottom of the tower, or the bottom section may be left open for easy access to the rotating mechanism.

Once the horizontal pieces are all in position the sway braces can be cut and fastened as were the first braces. Before nailing the crossing sway braces on, turn the tower over once more and install the sway braces on the side now uppermost. It will also be found easier to measure, cut and install the crossing sway braces on the *inside* of the side now resting on the ground. When this step has been completed the tower can again be turned over and the same operation finished on the side now downmost.

When all of the sway and horizontal braces have been secured in position the tower should be bridged across two sawhorses to facilitate the work that is to follow. Out of a piece of 3/16-inch-thick 24ST aluminum flat stock cut a plate 14 inches square. This will fasten to and overlap the top of the tower. This plate is important for it can support a rotating motor, house a rotary bearing, or act as a surface for a homemade rotary thrust bearing to run on.

The top of the tower should now be resquared so the plate will fit flat and snug against the ends of the 2 by 2s.

Fasten four angle-iron braces to the 2 by 2s with 1¾-inch brass flat-head wood screws. The aluminum plate should be marked and drilled to take 10-32 brass flat-head machine bolts to enable the plate to be bolted to the iron angle pieces. The bolt holes in the aluminum plate should be reamed so the screw heads can be countersunk flush with the surface. The top assembly is shown in Fig. 2.

Procedure from here depends upon whether you wish to mount the rotator at the top or base of the tower. At W6APQ the rotating motor is situated in the base of the tower and the beam antenna rotated with a two-inch drive-shaft pipe which also acts as the mast support for the beam at the top 41½ feet. This has proven to be an efficient as well as easy method of engineering the problem.

The aluminum plate accordingly was prepared to accept the pipe mast by cutting a 3-inch round hole in the exact center. On the bottom of the plate is fastened a sturdy radial bearing to prevent friction and hold the mast steady at the top.

The tower, with its broad base, can be self-supporting or it can be guyed with one set of guys at the top. To be extra safe, we added another set of guys slightly above center. These were not necessary, but since we are located next door to a 5-unit apartment house we considered the neighbors and added the extra safety factor. Quarter-inch holes were drilled diagonally through the 2 by 2s at the top of the tower and at points above center. These accommodate eye bolts with quarter-inch shanks three inches long. Be sure to use washers on the eye end as well as the end where the nut threads on. The antenna and tower have easily withstood 75-mile-an-hour gusts during heavy windstorms without sway or noticeable vibration.

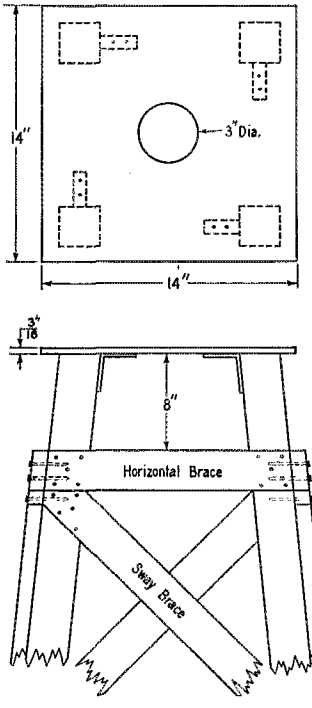


Fig. 2 — Detail drawings of the top of the W6APQ beam tower.

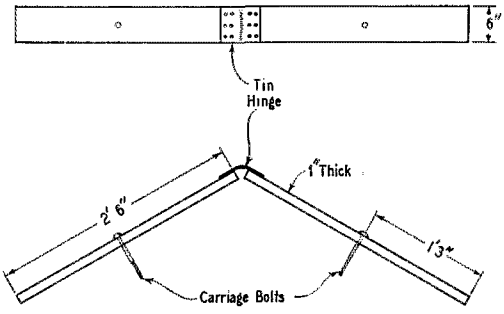


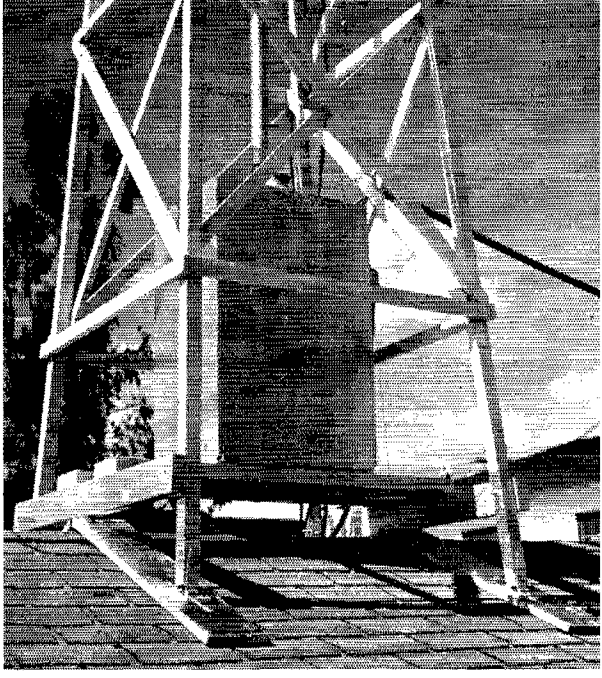
Fig. 3 — Details of one side of the saddle used between the tower and the roof. Two are required.

The tower itself is now completed. Before installing, however, it is a good idea to give the tower several coats of outside white paint. This is best applied with an air brush as it affords greater facility in and around the crevices formed by the various joints. Two coats of aluminum paint sprayed on first will seal the wood against moisture before the white paint is sprayed on. Use only the best grade of outside white that you can buy. Thin it only with pure linseed oil if necessary. Linseed oil is slow drying, but it will add a tough hard coat to the paint as an added protection against weather. Be sure each coat of paint is thoroughly dry before spraying on the next one.

The Roof-Top Mounting

The time between paint coats can be spent in preparing the spot on the roof where the tower will eventually rest. The simplest way of handling the roof-top problem and providing a solid base is to build a saddle, as shown in the second photograph and Fig. 3.

To fasten the saddle to the roof center it on the roof, taking care that it is measured off so the feet of the tower will rest in the center of each of the 1 by 6s of which the saddle is made. Drill quarter-inch holes completely through the 1 by 6s and the roof, to accommodate ¼ × 7-inch carriage bolts which are used to secure the saddle to the roof. On the under side of the roof two 2 by 6s 4½ feet long are used as anchors against the rafters for the base of the tower, as shown in Fig. 4.



Looking at the base of the W6APQ tower.

To prevent the garage roof from leaking I cut four large washers out of an old inner tube, cementing these with a liberal quantity of asphalt cement, over the four holes drilled in the roof. Another coat of cement was applied over the washers before the saddle was mounted in place. When the bolts were passed through the saddle and the whole drawn up tight the entire unit became cemented firmly together, making it completely watertight. The saddle should be painted before installation to protect the under side against moisture.

The anchors for the guys at the corners of the garage were made by drilling holes through the garage walls, wrapping the guy anchors around the studding inside. Two lengths of No. 8 galvanized wire together were used for each of the anchors and they were threaded through three-foot lengths of garden hose to prevent cutting into the edge of the roof. A large turnbuckle on the anchor wires about a foot or so above the surface of the roof edge serves as a master turnbuckle to which the top guys are fastened, since they are the longer. The lower guys have a smaller separate turnbuckle. The guy wires are broken into unequal lengths with strain insulators.

Up She Goes!

Now comes the excitement — the mounting of the tower on the roof. With the aid of two or three helpers the whole thing can be set in position in about ten minutes, because of the light weight of the structure. Walk the tower to an upright position next to the garage roof where two helpers on the roof can lift as the two on the ground boost the base of the tower while climbing two ladders. Keep the tower in an upright position throughout the operation and when the base is resting on the roof it can easily be steadied while the ground crew mounts the roof.

With one man on each base leg of the tower the whole thing can be picked up bodily and carried to its final spot on the roof saddle. Measure carefully to see that the tower is centered properly, assuring it to be perfectly perpendicular. Use four large strap hinges and husky screws to fasten the base of the tower to the saddle. This makes it easy to tilt the tower over should it ever become necessary to do so.

When the base of the tower is secure the guys can be installed. Fasten the guys by working on opposite corners. It is important that the guys are not pulled up tight; keep a little slack in them for now. When all guys are fastened in place they can be balanced off for even tension in all directions. A very important thing to remember in relation to guy wires is that they are designed to hold the structure up, not to pull it down. If the guys are too tight there will be excessive compression on the tower and it will not be as stable as when the guys are balanced off properly.

The tower is rugged enough for any antenna purpose. It should be inspected occasionally to see that the paint is holding up and that the guys have not loosened to the point of sagging. The turnbuckles should be kept greased so they will adjust easily. Built with care, and properly maintained, this tower will give many years of service.

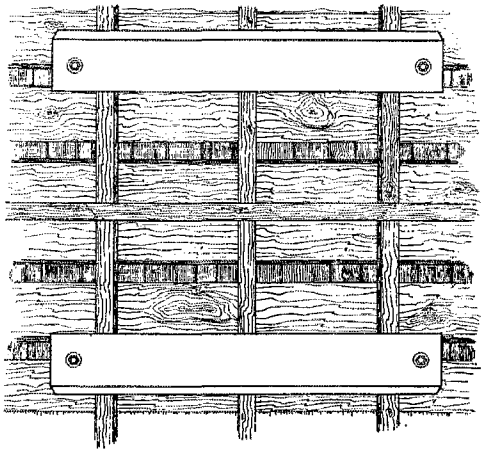


Fig. 4 — Anchor for the base of the tower, as seen from under the roof.

(Part II of this article will appear in a subsequent issue. — Ed.)

16th Sweepstakes Contest

Part II: Final Results — 'Phone Section

PART I of the 1949 ARRL Sweepstakes results, published in April *QST*, recounted the accomplishments of participants in the c.w. section. This month we are pleased to report the final scores in the 'phone portion, the aggregate scores in the club competition, and to publish photographs of leading brass-pounders and 'phone contestants in the fray.

'Phone SS entries were submitted by 274 contestants. Individual certificate awards are being presented to the leader in each of the 66 sections from which logs were received. The winners are those first-listed in each section tabulation under the accompanying score listings. All contestants will certainly join us in extending sincerest congratulations to the award winners on their well-deserved victories!

Highlights

The 'phone section followed the pattern of the c.w. competition in producing new score and sections-worked records at which contestants in future Sweepstakes may aim. For the first time in any SS, the 'phones topped the 100,000 mark. The distinction of having broken into the six-digit category goes to three West Coast operators, W6ITH, W6OGZ and W6QEU. It is interesting to note that whereas the greater share of top scores in the c.w. section was made by eastern stations, the western contingent walked away with top 'phone score honors. The general level of 'phone scores was considerably higher in this SS than in the previous affair. In the 15th Sweepstakes, 12 'phone scored over 50,000 points. The '49 SS produced 28 such scores, a definite indication that competition is becoming much keener for those who would set their sights on section awards!

A clean sweep of all 72 League sections was made by six contestants, W4LXE, W6CHV, W6ITH, W6OGZ, W6QEU, and WØPRZ. Again, note the prominence of the West Coast in the list! The following each missed but one section: W1ATE, W1PGZ, W4CYC, W6AM, W6TT, W8TRX. Seven contestants submitted logs showing contacts with 70 sections.

The following tabulation lists the high scorer in each licensing area:

W1ATE	65,959	WØJYW	58,030
W2NSD	54,400	VE2ID	7,544
W3LTU	64,260	VE3RM	19,096
W4LXE	47,232	VE4YO	8,685
W5SMA	45,713	VE5MS	4,290
W6OGZ	122,400	VE6NA	40,969
W7PUM	75,641	VE7LP	18,815
W8TRX	40,044	KH6WD	19,386
W9QIX	33,132		

Club Participation

An attractive gavel with engraved silver band is offered in each Sweepstakes to the radio club whose members submit the highest aggregate score. In this SS, entries were received from 47 club groups. Until 1949, the Frankford Radio Club of Philadelphia had won each of the eight gavels offered. In the 15th SS, the Potomac Valley Radio Club took the award by a handsome point margin. Frankford countered this year with a grand effort that won, by an equally handsome margin, the '49 gavel, thus placing itself once again on the road to its avowed ambition: to win a gavel for each FRC member! We doff our hats to you once more, Frankford, on a unified effort that certainly deserves the hearty congratulations of all concerned!

The Potomac Valley Radio Club took the runner-up position easily. The Ohio Valley Amateur Radio Association deserves special mention for a third-place score that was well above others submitted. A tabulation of the 44 other clubs that entered the competition accompanies this report. Special certificate awards are being made to the leading 'phone and c.w. operators in each club that submitted the minimum number of entries required by the contest rules.

—···—

Another ARRL Sweepstakes is scheduled for two week ends in November. Watch the *ARRL Calendar of Activities in QST* for the exact dates.

♦

Georgia section 'phone winner, C. L. "Stubby" Wilder, W4LXE, worked all sections, led his call area.

An old time SS-er, Jack Matthews, W3DPA, made a clean sweep of all sections, won the c.w. award for Maryland-Delaware-D. C.

♦

Meanwhile, if you plan to get into this annual operating spree make your preparations now. It isn't too early to get your station in readiness by building and installing gear or antennas that you've always threatened to have ready for that *next* contest. If TVI is your big problem, start licking it *now*. Get set for the 1950 SS. CU in November! — *J. M.*

'PHONE SCORES

Sixteenth Sweepstakes Contest

Scores are grouped by Divisions and Sections. . . . The operator of the station first-listed in each Section is award winner for that Section unless otherwise indicated. . . . Likewise the "power factor" used in computing points in each score is indicated by the letter A or B. . . . A indicates power up to and including 100 watts (multiplier of 1.25), B indicates over 100 watts (multiplier of 1). . . . The total operating time to the nearest hour is given for each station and is the last figure following the score. . . . Example of listings: W3LTU 64,260–459–70–B–37, or, final score 64,260, number of stations 459, number of sections 70, power factor of 1, total operating time 37 hours. . . . Stations manned by more than one operator are grouped in order of score following single operator station listings in each section tabulation; calls of participants at multi-operator stations are listed in parentheses.

ATLANTIC DIVISION

E. Pennsylvania

W3LTU	64,260–459–70–B–37
W3HFD	27,962–226–62–B
W3DHM	18,212–157–58–B–14
W3BET	17,955–158–57–B–22
W3MQC	13,920–116–48–A–28
W3HRA	1283– 27–19–A–12
W3KZ	208– 14– 8–B– 3
W3RPB (W3KAC OIG)	7920– 99–40–B– 7

Md.-Del.-D.C.

W3LEU	32,480–203–64–A–35
W3DKT	28,152–210–68–B–36

Southern New Jersey

W2YOS	25,152–197–64–B–39
W2QKE	11,500–100–46–A– 8
W2PQJ	8280– 93–45–B–10
W2QKJ	7733–105–37–B–22
W2SAI	1628– 37–23–B

Western New York

W2PVG	36,584–269–68–B–34
W2PDB	12,000– 96–50–A–19
W2ICE	1386– 33–21–B– 4

Western Pennsylvania

W3KQU	37,660–271–70–B–36
W3LQX	27,870–200–65–B–39
W3AER	15,104–128–59–B–13
W3OIW	12,210–111–44–A–20
W3NCL	5293– 73–29–A–24

CENTRAL DIVISION

Illinois

W9DWQ	11,781–117–51–B–12
W9KLV	11,310– 87–52–A
W9IFA	10,120– 92–44–A–19
W9AJI	2898– 63–23–B
W9ABA	1800– 36–25–C– 1
W9BWM	1360– 32–17–A–10
W9PFD	418– 19–11–B– 4
W9SJY	200– 10–10–B– 8
W9DJG	60– 6– 5–B– 1

Indiana

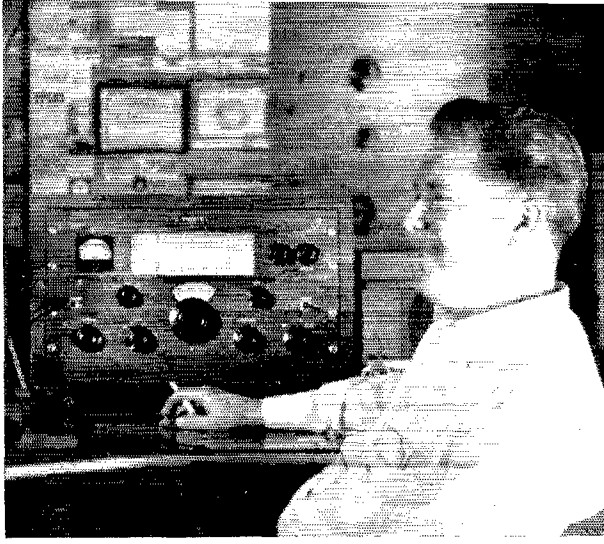
W9ZCI	26,334–209–63–B–21
W9NUB	11,500–100–46–A–37
W9BKJ	2068– 47–22–B

Wisconsin

W9QIX	33,132–251–66–B–22
W9ZTO	31,552–232–68–B–23
W9JBF	30,195–200–61–A–26
W9NVJ	7688– 75–41–A– 7
W9EWM	5850– 75–39–B
W9OVO	4720– 60–40–B– 5
W9CJO/9	2325– 48–20–A–17
W9HEE	1349– 36–19–B
W9ESJ	1344– 32–21–B
W9VHA	1105– 26–17–A– 6

♦

"Rog" Corey, W1JYH, won handily over his c.w. competitors in Western Mass., made the top W1 score.



W9FTY	598– 23–13–B– 6
W9AOW	364– 14–13–B– 6
W9QJW	176– 11– 8–B– 1

DAKOTA DIVISION

North Dakota

WØIPC	34,100–256–55–A–28
WØWFO	22,479–193–59–B–24
WØJWL	11,655–115–42–A–17
WØHAI	5528– 67–33–A–15

South Dakota

WØPRZ	53,100–295–72–A–35
WØIWE	27,200–210–52–A–31
WØGFG	25,438–187–55–A–35
WØQHX	18,448–157–47–A–13
WØGWH	14,094–139–41–A–17
WØEZE	9450– 98–40–A–12
WØBLK	3420– 57–30–B– 4
WØJLS	1125– 31–15–A–11

Minnesota

WØPXB	10,040–126–40–B–23
WØHPJ	8603– 96–37–A–20
WØHAM	7440– 95–32–A–10
WØSZC	6336– 97–33–B–14
WØOBM	5184– 72–36–B– 7
WØMLT	224– 16– 7–B–10

DELTA DIVISION

Louisiana

W5EVZ	32,472–246–66–B–34
W5GHF	17,856–144–62–B
W5PXW	15,000–150–40–A–28
W5LDH	660– 22–15–B– 4
W5ISF	615– 21–15–B– 2

Mississippi

W5IHP	23,490–203–58–B–30

Tennessee

W4AQR	43,960–314–70–B–39
W4FLS	17,884–132–68–B–18

GREAT LAKES DIVISION

Kentucky

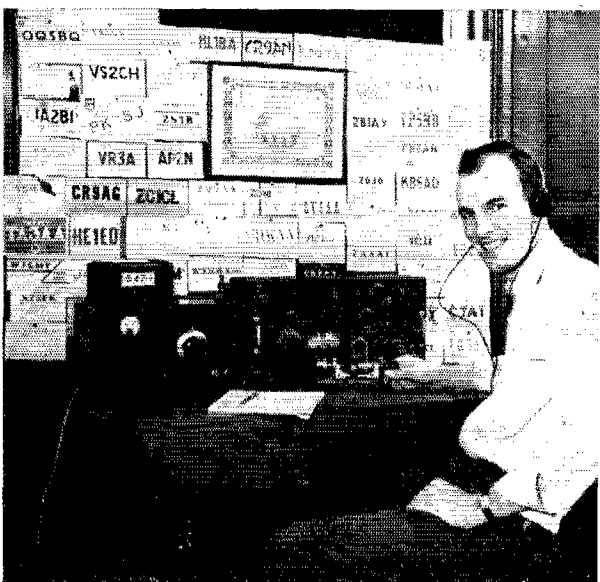
W4KAE	31,488–252–64–B–23
W4OMW	4425– 59–30–A– 9
W4IYH	1334– 30–23–B– 8

Michigan

W8NML	19,200–150–64–B–20
W8QBR	14,716–126–58–B–17
W8BGY	2013– 35–23–A– 2
W8BET	1778– 40–18–A–10

Ohio

W8TRX	40,044–284–71–B–37
W8ALG	35,700–255–70–B–38
W8VDJ	34,816–256–68–B–39
W8PXP	34,204–252–68–B–33
W8LAX	26,796–205–66–B–28
W8VZ	22,120–158–56–A–18
W8NCV	16,377–156–53–B–19
W8NYP	10,244–107–48–B–13
W8BSR	6930– 77–45–B–27



CLUB SCORES

Club	*Score*	*C.W. Winner*	*'Phone Winner*
Frankford Radio Club (Penna.)	3,446,824	W3BES	W3LTU
Potomac Valley Radio Club	2,616,335	W4KFC	——
Ohio Valley Amateur Radio Assn	629,339	W4KVX	——
Monmouth County Amateur Radio Assn. (N. J.)	552,657	W2YLS	——
Detroit Amateur Radio Assn.	495,354	W8SCW	——
Northern California DX Club	465,196	W6MVQ	——
Milwaukee Radio Amateur Club (Wis.)	461,769	W9VSO	——
Hampden County Radio Club (Mass.)	454,930	W1JYH	W1CJK
El-Ray Radio Club (Mass.)	440,226	W1IAF	W1OTH
Mid-South Amateur Radio Assn.	384,373	W4ILY	——
Buckeye Shortwave Radio Assn. (Ohio)	359,934	W8OYI	W8NYP
Nassau Radio Club (N. Y.)	331,935	W2IOP	——
Case Institute of Technology Radio Club	324,153	W8YPT	——
Cincinnati Amateur Radio Club	317,455	W4ZWR	W8TRX
Wisconsin Valley Radio Club	288,334	W9RQM	W9ZTO
Queens Radio Amateurs (N. Y.)	285,604	W2KPA	——
York Road Radio Club (Penna.)	277,825	W3ALB	——
Dayton Amateur Radio Assn.	258,326	W8ZJM	W8LAX
Associated Radio Amateurs of Long Beach	254,579	W6CUF	W6AM
Sioux City Amateur Radio Club	247,812	WØFZO	WØAXE
Conn. Wireless Assn.	244,778	W1FTX	——
Bridgeport Radio Amateur Club (Conn.)	234,089	W1RY	——
Ridgewood Radio Club (N. J.)	232,325	W2EQS	——
Narragansett Assn. of Amateur Radio Operators	193,005	W1CJH	W1BFB
Baton Rouge Radio Club	192,428	W5KC	——
Egyptian Radio Club (Ill.)	190,079	——	WØMCX
South Lyme Beer, Chowder and Propagation Society	179,485	W1LVQ	——
Horseshoe Radio Club (Penna.)	162,919	W3TXQ	——
Northeast Radio Club (Penna.)	149,519	——	——
Wesco Amateur Radio Society (Penna.)	135,082	W3LEJ	——
Rebel Radio Club (Fla.)	132,942	W4BRB	——
Calgary Amateur Radio Assn.	109,757	VE8UB	——
Point Radio Amateurs (Wis.)	109,331	W9KXK	——
Canton Amateur Radio Club (Ohio)	108,173	W8ZWX	——
Columbus Amateur Radio Assn. (Ohio)	105,239	W8DWP	——
Red River Radio Amateurs Club (N. Dak.)	94,077	WØBJG	——
Philadelphia Wireless Assn.	93,290	W3HHK	——
The Black Hills Amateur Radio Club (S. Dak.)	75,691	——	WØIWE
Northern New Jersey Radio Assn.	75,018	W2NIY	——
Lancaster Radio Transmitting Society (Penna.)	72,033	W3NOK	——
Sandia Base Radio Club (N. Mex.)	66,907	W5CA	——
Manchester Radio Club (Conn.)	63,877	W1QIS	——
Central Illinois Radio Club	58,561	W9AJJ	——
Rogue Valley Radio Club (Oregon)	30,726	W7LNG	——
Bucknell University Amateur Radio Club (Penna.)	27,239	——	——
Westlake Amateur Radio Assn. (Ohio)	21,308	——	——
Stratford Amateur Radio Club (Conn.)	6087	W1RFJ	——

W8MQG	5040– 64–40–B–12
W8NSS	2906– 47–25–A– 3
W8BFH	1675– 34–20–A
W8VKK	1121– 30–19–B
W8NOQ	828– 23–18–B
W8CGG	585– 20–12–A– 8
W8RM	330– 15–11–B– 2
W8ENH	88– 7– 5–A– 1
W8WZH	13– 3– 2–A– 1
W8VEL	10– 2– 2–A– 1

HUDSON DIVISION

N.Y.C.-L.I.

W2NSD	54,400–401–68–B–39
W2SKE	39,402–301–66–B–28
W2BWC	27,537–206–67–B–24
W2LHQ	22,330–204–55–B–29
W2NNB	1575– 30–21–A–13
W2UGZ	1026– 27–19
W2UYX	770– 22–14–A– 3
W2LNP	560– 20–14–B
W2IHE	432– 19–12–B– 6
W2CB	8– 2– 2–A– 1

Northern New Jersey

W2JJI	22,035–172–65–B–33
W2GKF	14,500–123–50–A–26
W2JQJ	11,985–102–47–A–20
W2CCS	7182– 87–42–B–14
W2ORX	5400– 75–36–B–10
W2ESC	4140– 58–36–B–13
W2SOX	418– 19–11–B
W2LTP	50– 5– 5–B– 1

MIDWEST DIVISION

Iowa

WØAXE	30,353–215–57–A–34
WØMCU	10,800–108–40–A–12
WØSQN	9350–110–34–A–19
WØHUH	1650– 34–20–A– 6
WØAHQ	1265– 28–23–B– 6

Kansas

WØQQT	22,800–190–60–B–15
WØMOX	11,400–150–38–B–12
WØIFR	7636– 83–46–B– 9
WØAAO	553– 17–13–A– 2

Missouri

WØOMG	42,746–319–67–B–37
WØMCX	26,664–202–66–B–33
WØPGI	24,318–194–63–B–25
WØYHD	10,065–122–33–A–28
WØZVM	6364– 86–37–A–10
WØWCM	1540– 39–20–B– 4

Nebraska

WØMGV	23,423–200–59–B–16
WØGYM	20,300–178–58–B–20
WØVRU	1211– 30–17–A– 3

NEW ENGLAND DIVISION

Connecticut

W1ATE	65,959–465–71–B–39
W1DEP	17,653–156–46–A–28
W1MRP	14,016–146–48–B–24
W1ON	1218– 29–21–B– 7
W1LVQ	1102– 29–19–B– 2
W1BDI	128– 9– 6–A– 1

Maine

W1PGZ	47,925–339–71–B–38
W1ROM	19,525–179–55–B–31
W1RAC	138– 11– 5–A– 3

E. Massachusetts

W1OTH	20,273–153–53–A–31
W1PKV	16,250–125–52–A–24
W1OHS	7650– 88–36–A–25
W1QJU	4455– 68–33–B–21
W1PWK	2828– 45–26–A– 9
W1JNX	600– 20–15–B– 3

W. Massachusetts

W1CJK	20,592–198–52–B–22
W1RDR	17,292–200–44–B–35
W1NLE	10,915–119–37–A–29
W1MQK	10,890– 99–55–B–19
W1MNG	9430–117–41–B–24
W1RRX	6200– 80–31–A–30
W1QFB	5760– 80–36–B–11
W1JWV	30– 6– 2–A– 1
W1RED	20– 8– 1–A– 1
W1QDE (W1SCF W8DIW W9JCD)	18,256–168–56–B–26

New Hampshire

W1CVK	75– 6– 5–A– 1

Rhode Island

W1BFB	37,329–275–69–B–37
W1NCX	7752–102–38–B–22
W1LZD	7566– 97–39–B
W1LFE	4983– 78–33–B–13

♦

Peter K. Onnigian, W6QEU, Santa Clara Valley 'phone winner, worked all sections and was one of the three West Coast 'phone operators who topped the 100,000 mark.

QST for

Ken Langenbeck, W5PKF, Louisiana c.w. winner, top W5 scorer.

♦

W1RVQ 4960- 64-31-A-14
W1PXI 4752- 67-36-B-14
W1KHZ 1817- 40-23-B-11

Vermont

W1AXN 6732- 77-44-B-22
W1AVP 782- 23-17-B
W1FH/1 (W1HX) 1080- 24-18-A-10

NORTHWESTERN DIVISION

Alaska

KL7SQ 23- 3- 3-A- 1

PACIFIC DIVISION

Hawaii

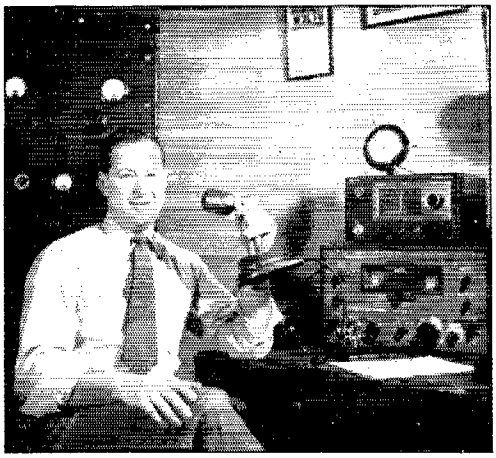
KH6WD 19,386-183-54-B-14
KH6IJ 348- 15-12-B- 1

Nevada

W7JUO 28,578-217-66-B-26
W7LAT 7678- 83-37-A-14

Santa Clara Valley

W6CBE 41,976-318-66-B-36
W6ZIO 27,342-217-63-B-32
W6YX (W5LWW W6s TOT VUW VXL WZD ZBB) 57,188-433-68-B-34



Leading 'phone scorer in W3 and winner of the Eastern Pa. section award was Don Phillips, W3LTU. Don says the 'phone section of this Sweepstakes "was the best since the war, with plenty of activity on all bands."

Montana

W7MHQ 25,531-240-43-A-26
W7FIN 14,025-110-51-A-21

Oregon

W7MLJ 44,336-326-68-B-33
W7QP 42,140-301-70-B-40
W7EJS 3983- 59-27-A- 9

Washington

W7EYD 46,320-292-64-A-33
W7KUX 20,451-202-51-B-28
W7QGN 13,050-148-45-B-27
W7MCU 1650- 33-25-B-13

W6CHR (W6s ALN GHA GTF GZV) 1163- 31-15-A-10

East Bay

W6ITH 112,320-780-72-B-40
W6TT 86,336-608-71-B-40
W6UZX 37,812-276-69-B-25
W6VUW 1259- 28-19-A- 3

San Francisco

W6CXO 782- 34-23-B

Sacramento Valley

W6WTL 10,208-116-44-B- 8
W6GDO 4379- 57-31-A-18

♦

Larry Walsh, W5SMA, New Mexico 'phone winner, made the highest score in W5 from this neat operating position. (*Photo by W5UFA*)

W6JDN 532- 19-14-B- 2

San Joaquin Valley

W6QEU 115,776-805-72-B-38
W6VPV 35,535-261-69-B
W6ILH 16,706-150-45-A-23
W6WJF 4423- 62-29-A-11
W6RLG 3990- 57-28-A-12
W6BHI 350- 14-10-A- 1

ROANOKE DIVISION

North Carolina

W4MRH 27,648-216-6?-B-21
W4IZR 9430- 92-41-A-22

South Carolina

W4PXZ 22,693-157-58-A-38
W4BSS 11,990-109-55-B-16
W4IW 1368- 36-19-B- 3

Virginia

W4IWO 32,844-238-69-B-33
W4LIM 31,212-232-68-B-35
W4FV 24,120-201-60-B-29
W4KMS 11,978-115-53-B-25
W4CVO 11,348- 89-51-A-23

West Virginia

W8TAP 31,815-253-63-B-36
W8CKW 3432- 53-33-C- 5

ROCKY MOUNTAIN DIVISION

Colorado

WØJYW 58,030-416-70-B-39
WØAZT 15,820-113-56-A-11
WØCBU 7938- 81-49-B- 8
WØIC 2- 1- 1-B- 1

Utah

W7DTB 70,840-506-70-B-35
W7SSY 34,365-240-58-A-26
W7KOP 20,520-192-54-B-26
W7UIB 135- 9- 6-A- 5

Wyoming

W7IRX 38,740-248-65-B-31
W7ILL 23,800-215-56-B-34
W7NHC 5994-115-27-B

SOUTHEASTERN DIVISION

Alabama

W4CYC 46,505-328-71-B-27
W4KCQ 27,264-213-64-B-14
W4HA 8131-173-47-B- 6

(*Continued on page 108*)

A Compact 2-Meter Station for Mobile Use

BY HENRY J. HAYES, JR.,* W3JUM

THE MOBILE STATION described and pictured herewith is designed for fixed-frequency operation in the 2-meter band. It was built exclusively for mobile use, and the layout work was done with convenient installation in a car or light plane in mind. It departs completely from the customary chassis-panel-cabinet technique, in order to arrive at a form factor that would best serve its intended purpose.

In general, such small composite equipment is difficult to build and service unless the component parts are arranged in preoperating subassemblies before the final assembling operation. This design endeavors to use such a technique, with a minimum of additional construction work. It involves some special chassis work that can best be done in a well-equipped shop, but similar techniques are not beyond the average amateur's workshop facilities. In this rig the power supply, modulator, transmitter r.f. unit, and receiver are all separate subassemblies, arranged to fit on a 7 × 15-inch base plate. A 3-inch-high chassis serves as a dust cover. The only additional equipment needed is a control box, 2 by 4 by 4 inches in size.

From experience with other mobile installations it has been found that the most convenient mounting location in a car is near the control position, up front. This eliminates long cabling to the trunk, does not expose the unit to possible damage in loading and unloading operations, and facilitates testing and manipulation of the controls by one person. Additional accessories in the author's car left little room on the fire wall, so the unit was mounted on the side wall in front of the right door. The 3-inch depth gave a good space factor in this position, and the unit is readily accessible.

It was desired to have the operation of the rig free of critical adjustments, once it was bench-aligned, so operation of the transmitter and receiver was limited to single preset frequencies. Such single-frequency operation makes the establishment of communication more certain than is possible when provision is made for operation over the entire band, and this approach might well be used in amateur emergency operation, where reliable and instant communication may be of utmost importance.

The general mechanical arrangement leaves important points readily accessible after the cover is removed. All tuning, voltage checking, and rough signal tracing can be done with the unit mounted in the car if necessary, and if trouble develops in any part of the rig the unit involved may be removed easily for bench testing.

• Perhaps not many readers will care to duplicate this rig in its entirety, but anyone who is interested in improving his layout technique will do well to study this complete station — transmitter, receiver, modulator, and power supply — all inside a 7 × 15 × 3-inch chassis.

The Transmitter R.F. Unit

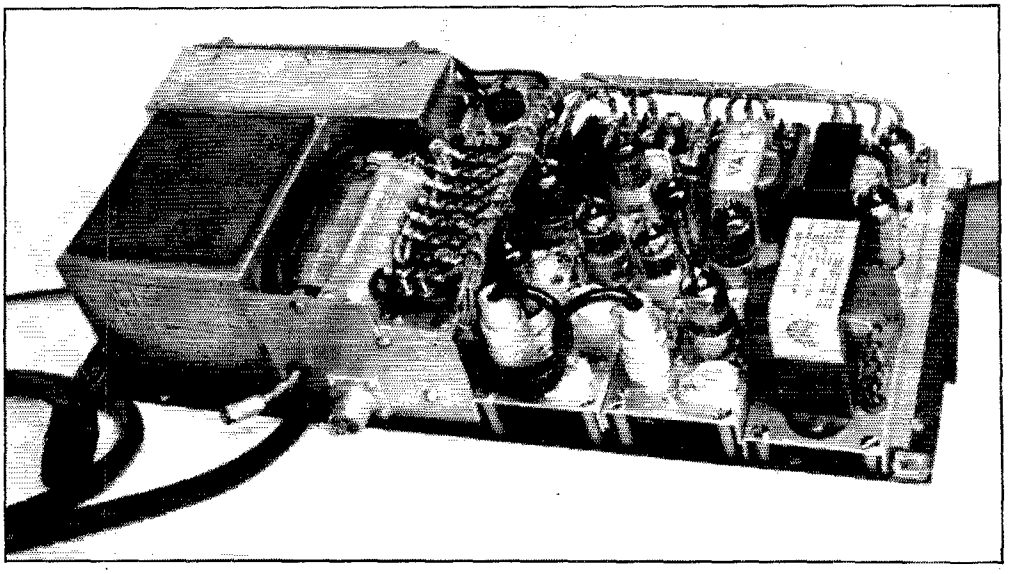
It is always difficult to generate high-frequency r.f. power efficiently, and several multiplying schemes were tried before the one shown was finally evolved. The rated power from the vibrator supply is only 100 ma. at 250 to 300 volts, so this total power was made available to the transmitter by disabling the receiver during transmission periods. The current distribution is approximately 40 ma. to the exciter, 35 ma. to the final, and 25 ma. to the modulator.

The exciter uses a 6AH6 oscillator with 12- or 18-Mc. crystals, doubling or tripling to 36 Mc., followed by two 6C4 doublers to 72 and 144 Mc., respectively. The final stage is a 2E30 amplifier, delivering approximately 3 watts output on 144 Mc. A somewhat more compact arrangement might be made by using a 12AT7 dual triode in place of the two 6C4s. The 2E30 requires 2.3 ma. through a 20,000-ohm grid resistor to develop full power at the rated plate voltage. This is developed readily by the exciter portion, and both it and the final stage are run somewhat below their maximum ratings. The socket for the 2E30 is recessed below the chassis to provide clearance for the envelope of this tube, which is somewhat longer than the others.

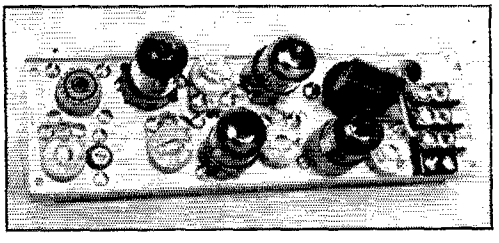
The Modulator

The bottoms of the transmitter and receiver chassis clear the base plate by one inch, but because most of the modulator components are as tall as the 6AQ5 nothing is recessed on the chassis, and the clearance is reduced to one-half inch. The 10-watt modulation transformer has a higher rating than necessary, but nothing physically smaller was available. The universal taps on the transformer are connected to a tie-point strip on the bottom of the chassis. The over-all gain was adjusted by varying the microphone

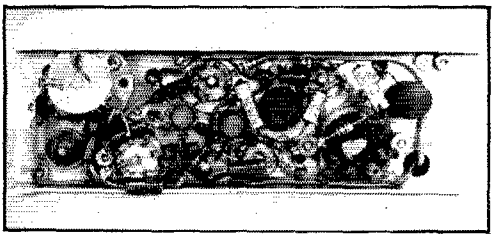
*c/o Dept. of Electrical Engineering, Princeton University, Princeton, N. J.



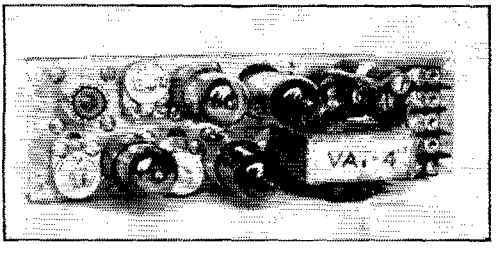
Complete station, with dust cover removed.



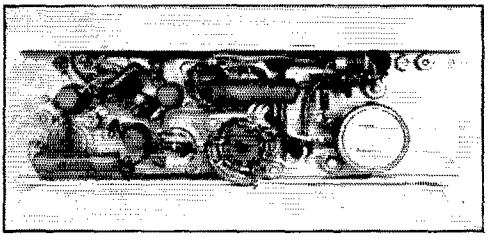
Transmitter r.f. section.



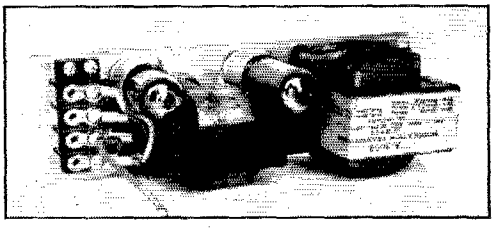
Bottom of transmitter.



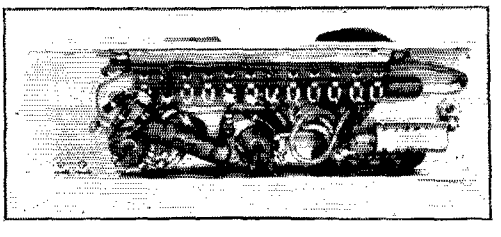
Receiver subassembly.



Bottom of receiver.



Modulation unit.



Bottom of modulator.

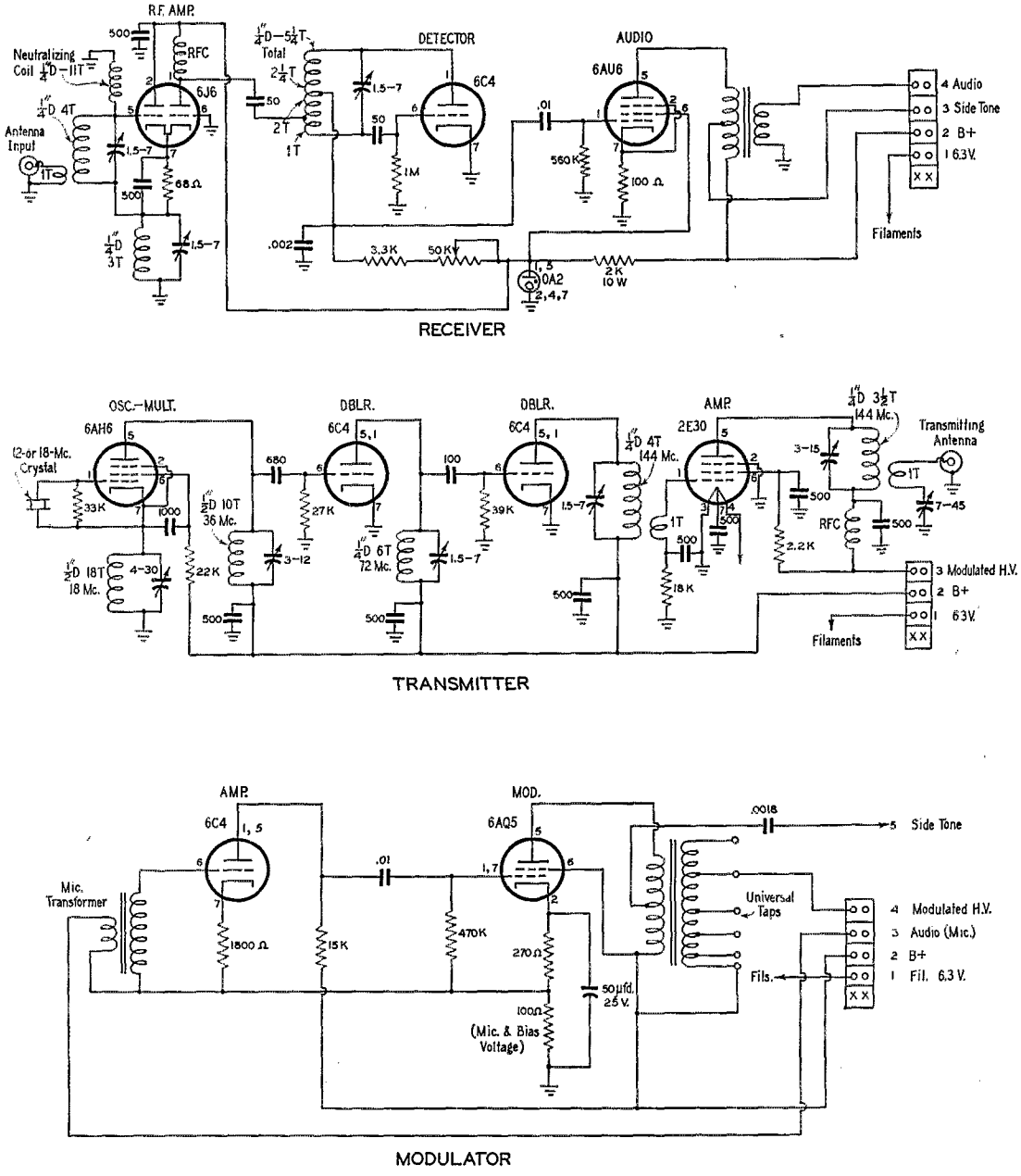
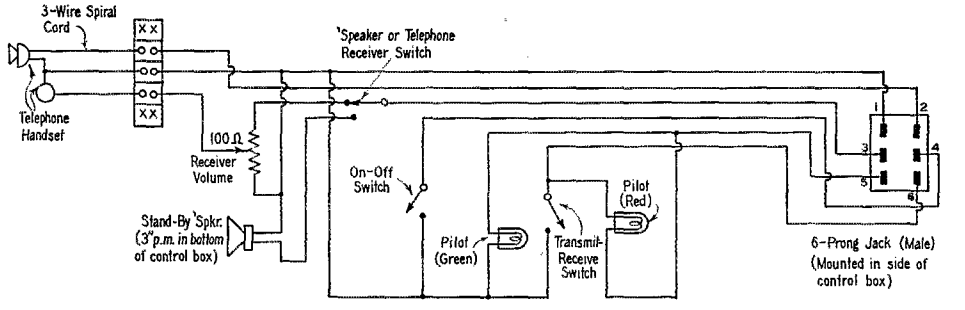


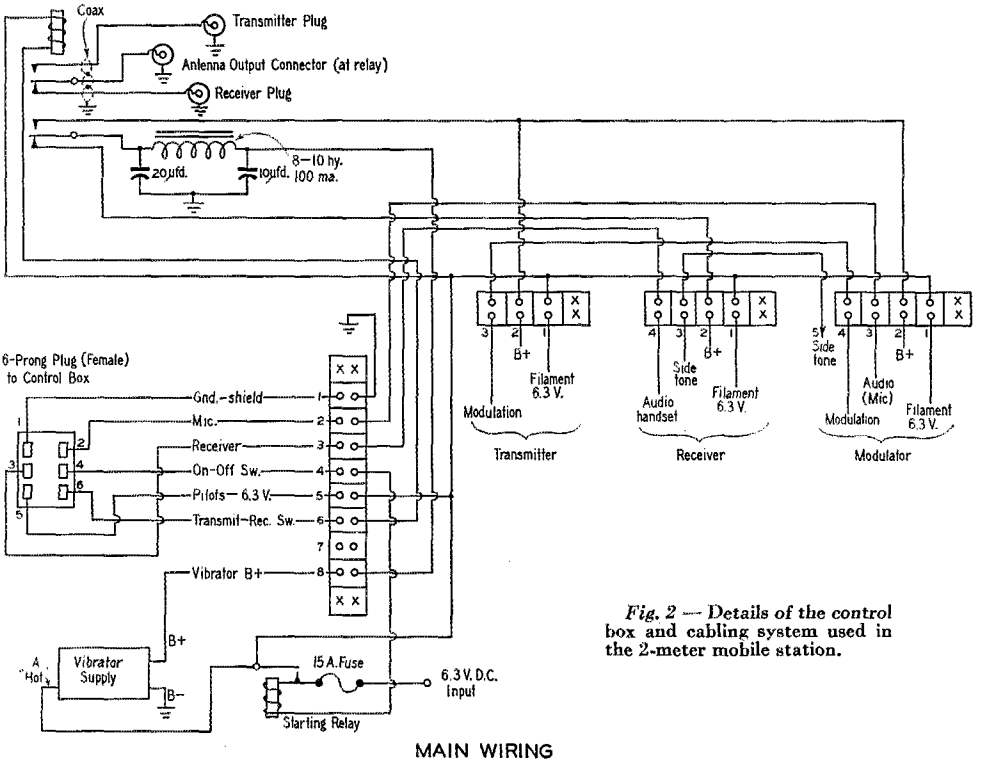
Fig. 1 — Circuit diagrams of the component subassemblies in the 2-meter mobile station.

bias resistor to obtain 100 per cent modulation with average talking level. Any variation in modulation level required after this is provided by a change in the operator's voice level.

Sidetone, for a continuous check on the transmitter operation, is obtained from a tap on the primary of the modulation transformer. When the transmitter is loaded the signal on this tap will give the correct volume in the handset, if it is fed to the output transformer through a 0.002-μfd. blocking condenser. The condenser prevents the 6AU6 from drawing plate current. An *RC*



CONTROL BOX



MAIN WIRING

Fig. 2 — **Details of the control box and cabling system used in the 2-meter mobile station.**

attenuator may give better frequency response, but the variable reactance obtained with various-sized coupling condensers serves as a good attenuator and eliminates extra parts. If the side-tone level is too high feed-back across the handset will cause the system to oscillate.

The Receiver

The complete receiver, on a 2 × 6-inch chassis, has a sensitivity comparable with a more complicated superheterodyne. It has lower selectivity, but this ordinarily is not a disadvantage in the type of service for which the rig is intended. Electrically it consists of a 6J6 in a modified version of the cascode circuit, a 6C4 superregenerative detector, and a 6AU6 audio stage.

The r.f. stage serves three very useful purposes. The primary one is isolation of the antenna from the detector circuit. A superregenerative detector cannot be operated at peak performance under mobile conditions without this isolation, as the change in loading resulting from whipping of the antenna will cause the detector to go in and out of oscillation if it is loaded near the optimum point. The r.f. amplifier also increases

(*Continued on page 108*)

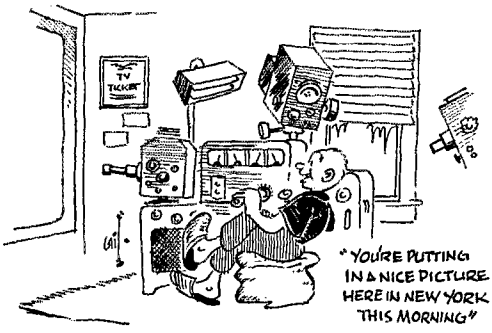
Future-hamic

(With Television Taking the Country by Storm, This Is the Type of QSO Which Might Be Heard in the Year 1980)

BY KERMIT A. SLOBB,* W9YMZ

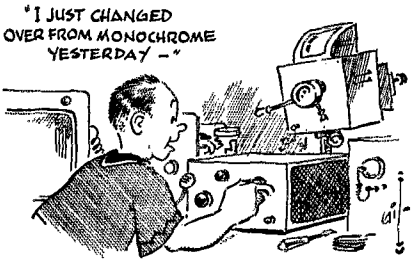
K9XOX: "Hello K2YOY. K2YOY . . . K2YOY. This is K9XOX, Chicago, calling and by."

K2YOY: "K9XOX, Chicago; this is K2YOY, New York City, returning. Thanks very much for answering my CQ slide, old man. Oops, there we go again using that ancient expression, when we can see from the screen that you are about, oh, twenty-five years old. Anyway, handle here is Jim. You're putting in a nice picture here in



New York this morning. That superimposition of your test pattern and your operating position is swell. We'll give you your report now. *Audio* . . . Readability 5, Signal Strength 7. *Video* . . . Signal Strength 4, Contrast Scale 8, Resolution 425 lines, Color Register 6. With that nice picture, must be a new orth you have out there in Chi. Well, weather here is snowy and cold. Just a minute, we'll take off the test chart and shove the camera out the window. That focus knob sticks a little. There! Push that monitor around so I can see it, will you? You can see the snow on the ground, about four inches now. See the doorway at the bottom left of the raster? That's the entrance to our building. We'll see if we can get the camera on the thermometer in the window sill. Yeah, there it is. Twenty-two degrees. Well, back we come into the shack, and we'll show you the rig. This is the audio rack, ending in a pair of 90002s. If you have a projection screen out there in Chicago you can probably read the meters without a tight shot. Five hundred watts input there. Then this is the video rack, running . . . ah . . . 820 watts input. Receiver here is a new theater-type projection job, with a screen eight feet by ten. Here, we'll put on a slide with a box diagram of the rig. As you can see from the diagram, the orth is the new 58020. We happen to know a guy who knows a guy who managed to get it for us wholesale. Incidentally, we also have made up a slide with a schematic of the whole rig if you're interested. This long enough? Fine. Here's a slide showing my antenna. Four eight-element beams stacked. Not bad, eh? Well, we've held it here long enough. Back to you. K9XOX, Chicago; this is K2YOY, New York City, now standing by. Over."

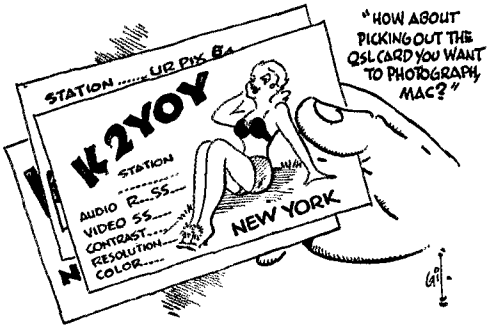
K9XOX: "K2YOY, New York; here is K9XOX, Chicago, returning. All OK, Jim, solid all the way, no TVI at all. You sure have a nice rig there. Looks like it's custom-built. I wish I could afford something like that, but will have to wait till I get the payments finished on my jet helicopter. I'll give you your report now, based on your test chart. *Audio* . . . Readability 5, Signal Strength 9. *Video* . . . Signal Strength 5, Contrast Scale 10, Resolution 600 lines, Color Register 10. Really swell, Jim. That new orth of yours is terrific. Mine is an old 2P223, and I know the dynode spots make me look like I have measles, but I can't afford a new one yet. Before I forget, the name here is Mac, M-A-C. As you can see with that big screen of yours, the rig here is low-powered. Right now audio is running 100 watts, video 200. I wasn't able to read your meters, Jim, as my kine here is only 19 inches.



Hope to build one of those projection jobs soon, and also set up an orth for slides. That's for the future. Say, Jim, I haven't much time, but I would like to have you comment on my color register. Hope it isn't streaking, as I just changed over from monochrome yesterday. So how about a real critical report on that, huh? K2YOY, New York; this is K9XOX by for you."

* 3344 Ainslie, Chicago 25, Ill.

K2YOY: "K9XOX, Chicago; this is K2YOY of New York City, calling and returning. Fine, Mac, all the way. You forgot to show me the weather out Chicago way. How about that on your next transmission? In regard to your color register, that report we gave you is about right. Wonder what you're using for light out there? We're using 3479-degree Kelvin fluorescents,

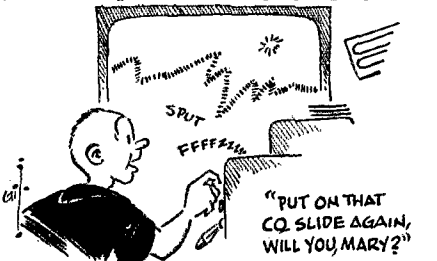


with a Wratten 2B386 filter. Works out real well inside. Then we're using a special make-up that just came out, Virile Manhood No. 31. That with a little mascara on my light-colored eyebrows does a real fine job, we think. We wouldn't worry about the dynode spots on that old orth too much. You might readjust your focus-coil current, though. Say, wonder if you took part in Field Day out there in Chicago? We've got some real fancy shots taken of our club's Field Day work, plus some video recordings we made of on-the-air checks. Just a second and we'll put them on. Mary, take out that reel numbered 24583 and thread it on the projector, will you? The XYL, Mary, is here with me. You probably saw her in the background before. She's my cameraman. Just got her FCC license and joined the union a week ago Tuesday. Oh, there it is! This is Mary and I driving over the George Washington Bridge. My son Jeff took these pictures. Nice color, huh? And here we are as we . . .

". . . well, that's the end of that four hundred foot reel. Say, Jim, we meant to ask you; how do you manage to keep your mike out of the picture? This lapel mike we've got sticks out like a sore thumb. We've been thinking about having Jeff take the mike-boom operator's exam, but he isn't much interested. Well, back to you. K9XOX, Chicago; this is K2YOY in New York City standing by. Over."

K9XOX: "K2YOY, New York City; this is K9XOX, Chicago, returning. Swell, Jim. Enjoyed the pictures very much, although I was called to the telephone while they were on. Well, I made a few notes which I'll answer rather quickly, as I have to go to work in just a few minutes. About the weather, I'll have to tell you about that, as the camera here is in a fixed position with a single lens from an old press camera. Maybe some day I can afford one of those turret jobs on a dolly, like yours. Weather here is clear and cold, with the temperature eight below right now. About the color register, thanks very much for the report. I'm using regular 3400-degree Kelvin photofloods, plus a Wratten 2X56 filter. The make-up here is Florida Suntan No. 28. About the mike. Because of the fixed camera I have an old broadcast polydirectional ribbon suspended about three feet over my head. Works pretty well with pulsed a.g.c. Thanks for the report on my old orth here. While you were talking I dropped the beam current slightly and adjusted the transient suppressor. Hope it looks better now. Well, Jim, it's been nice talking to you and seeing your swell rig, but I do have to run before I'm late for work again. See you again. K2YOY, this is K9XOX, Chicago, Illinois, signing off and clear and pulling the big switch."

K2YOY: "Hello K9XOX. This is K2YOY of New York City returning. All OK, Mac, and real boff all the way. Say, in regard to that color register of yours, we think maybe a Wratten KN43A might be better for you. And that make-up is old stuff. Didn't you read that article in the November issue of *QST* by Algernon Kronk on make-up? According to him Florida Suntan is lousy. We think for those lights of yours he recommends Blushing Youth No. 40. Look up your old *QST*s for that article. Say, before you run along, how about picking out the QSL card you want to photograph? We have three to choose from. Mary, hand me those cards, will you? And change over to an 8½-inch lens. Thanks. This is number one, Mac. Pretty nice, huh? And here is number two. Jeff took this color shot of me sitting at the rig. And here is number three. We figured the cheesecake shot of Mary added some class to the card. OK, the fifty millimeter. Mac, you just tell me which card you like, and we'll put it in the opaque projector so



you can photograph it. How about breaking in and making your selection, huh? Break . . .

"K9XOX, K9XOX, Chicago. This is K2YOY, New York City, calling. Come in. . . .

"Guess the band conditions have changed. I don't see him in there. Put on that CQ slide again, will you, Mary?"

[THE END]

United States Naval Reserve

PLANS for amateur radio participation in the celebration of the first Armed Forces Day, May 20, 1950, were announced in April *QST*. The double-header program includes a receiving competition, patterned after the popular activities conducted for many years on Navy Day, and a QSO party, containing certain unique features. All hands should get in on the Armed Forces Day fun.

—•••—

The title "Chief of Naval Communications" has been redesignated "Director, Naval Communications." Thus, Rear Admiral John R. Redman, USN, becomes the first "DNC" since 1945, when the title "CNC" was adopted. Old-time communicators need no introduction to the abbreviation "DNC," which is traditional in the Naval Communications Service.

—•••—

Here and there: Electronic Warfare Company 5-3 (K4NBH) is located at the Technical Institute of the William and Mary–V.P.I. extension in Norfolk, Va. The unit has a completed shipboard installation. . . . The Training Center at Muncie, Ind. (K9NAM), was high scorer in the Ninth Naval District communication competition for the quarter ended 31 December 1949. . . . K6NRA, Training Center, Santa Barbara, works in an emergency radio net in coöperation with the Santa Barbara Amateur Radio Club. . . . In a recent search for a missing flier the Santa Barbara Training Center furnished a transmitter-receiver unit which was used as contact between local CAP and the ground searching party. . . . First area to report a YL ham in the Electronic Warfare Program is the Potomac River Naval Command. Miss Ethel Smith, W3MSU (ex-W7FWB), has received her Naval Reserve call sign. Drills should have a new appeal in PRNC! . . . Father-daughter acts account for two additional YL reservists! Lieut. Cmdr. M. M. Hasse, WØDKJ, accepted his daughter Gertrude into the Wave Reserve program at Aberdeen, S. D. WØDKJ is commanding officer of EW Company 9-116 (KØNAI) and ARRL emergency coördinator. In Sonoma, Calif., Nancy Simpson was enlisted by her father, Lieut. R. L. Simpson, W6FCX (ex-K6FCX), commanding officer of EWC 12-39 (K6NAA). . . . Among the many old timers active in the Reserve Program are these commanding officers of Electronic Warfare companies in the First Naval District: Cmdr. Fred Best, W1BIG; Cmdr. W. S. Rogers, W1DFS; Cmdr. C. C. Chis-

(*Continued on page 112*)

A Message from the Director, Naval Communications

The mission of the Naval Reserve is "To provide a force of qualified officers and enlisted personnel who are available for mobilization in the event of a national emergency."

Since July 9, 1946, radio amateurs who are members of the Naval Reserve have been receiving regularly-scheduled training in military communications procedures and techniques. On that date the Naval Reserve Electronics Warfare Program was inaugurated. Wider in scope than the prewar Communication Reserve, the postwar program embraces all phases of electronics, both operational and technical. The Naval Reserve Communication System, which is a part of the over-all program, is comprised of radio stations operated at each Naval Reserve training center and by each Electronic Warfare company and platoon, as well as the individual stations of those radio amateur reservists who drill from their homes. There are at present some 1700 stations in the system, approximately 850 of which are the stations of radio amateurs. In addition to these 850, many amateurs receive training as members of established units of training centers and at other Naval Reserve facilities.

In addition, the Military Amateur Radio System, which was instituted in 1948, provides further support for training of radio amateurs. While the Naval Reserve Electronic Warfare Program is not affiliated with MARS, the programs are similar in some respects.

The Naval Reserve Electronic Warfare Program, together with the MARS program, provides a nucleus of radio amateurs from which the armed forces may draw support in the event of a national emergency.

It has long been the policy of the armed forces to encourage and support amateur radio. The Navy will continue to carry out this policy. The participation of radio amateurs in the Naval Reserve program is both welcomed and appreciated.

JOHN R. REDMAN
Rear Admiral, U. S. Navy
Director, Naval Communications

The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,* W1HDQ

DID you ever trace the history of v.h.f. work back through *QST*s for the early '20s? If so, chances are you were amused to find that, not knowing any better, hams were trying to work across the Atlantic on 5 meters back in those days — almost before they were able to work across town! But before we laugh too hard at the idea, let's recall that most of the accomplishments we have made have come about because someone didn't know any better — and went ahead and did the impossible. Almost all the advances in the radio art that are credited to amateurs came about in this way; because hams jumped in and tried to do things that more-learned individuals might have written off as futile.

No better example is apt to be found than the DX now currently being worked on 50 Mc. by amateurs of the Western Hemisphere. A look at the prediction charts for the paths between northern U. S. and South America would convince anyone that there was little use in trying to work such a path on 50 Mc. There also would be little to indicate the desirability of attempting work over 2000 to 3000 miles, and more, on a nightly basis in the regions near and below the Equator. But because some hams, not knowing any better, went ahead and tried, hundreds of South American DX contacts have been made on 50 Mc. by Ws and VEs in the past year, and our friends in Latin America have demonstrated that 50-Mc. DX of major proportions is an almost nightly phenomenon over much of their continent.

How consistent this 50-Mc. DX is may be seen clearly from the adjoining table showing the openings observed by LU9EV, near Buenos Aires, Argentina, for February and March of this year. Note that, beginning with early February, the

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

50-Mc. Openings at LU9EV

February, 1950 (Ionosphere Storm: 19–24)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Caracas, Venezuela (3100 Mi)						●				●	●	●	●	●	●	●	●	●	●					●	●	●		
Barranquilla, Colombia (3400 Mi.)								●		●															●	●		
Lima, Peru (2000 Mi.)								●																●	●	●		
Santos, Brazil (1100 Mi.)															●	●	●	●	●						●			
San José, Costa Rica (3700 Mi.)														●	●	●		●	●					●	●			
Mexico City (4500 Mi.)																								●				
Guayaquil, Ecuador (2700 Mi)																			●					●		●		
W1, W8, WØ (5300 to 5600 Mi.)																								○				

March, 1950 (Ionosphere Storm: 19–23)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Venezuela	●	●	●	●		●	●	●	●	●	●	●	●	●	●		●	●		●	●		●					●
Colombia	●			●	●	●	●	●	●	●	●	●	●	●		●	●	●		●			●		●			
Peru		●	●		●		●	●	●					●		●	●			●			●					
Brazil	●	●	●	●	●	●	●			●													●			●		
Costa Rica			●			●	●	●	●		●	●	●		●	●	●						●		●			
Mexico City							●	●		●	●					●	●	●				○	●		●			
Ecuador	●			●							●			●	●													
Paramaribo, Surinam (2800 Mi.)														●												●		
Mendoza, Argentina (600 Mi.)																						○						

● = Evening Opening ○ = Daylight Opening

50-Mc. openings observed by LU9EV, near Buenos Aires, Argentina, in February and March, 1950. Note that the principal blank periods are times when ionospheric disturbances were in progress in this hemisphere.

band was open almost every night, the only exceptions being in the periods when ionospheric disturbances were in progress. The openings shown as solid dots were evening affairs, usually beginning between 7 and 7:30 EST, and lasting for as much as four hours. The open circles are daylight openings, a less-frequent phenomenon in Latin America. The consistent nature of much of the work, and the character of the signals reported, seem to point to F_2-layer propagation, but there is also evidence indicating sporadic-E effects, too. Note that some of the hops, such as Buenos Aires to Santos, Brazil, are typical E-layer distances.

There were only a few instances of long-distance work in March that jibe with available information on F_2-layer propagation, and even one of these is a considerable stretch of the F_2 predictions for the month. The first contact between North and South America (it won the Milwaukee Cup for W4IUJ) on 50 Mc. was made on March 23, 1947, when OA4AE and W4IUJ got together at 2:50 P.M. EST. This was straight F_2, right in line with the CRPL charts, and the path has been open each March since. March, 1950, was no exception. The charts show the path good for 46 Mc. for several hours, so we know, from past experience, that it should be open to well above 50 Mc. on the better days. March 26th was such a date this year. Around midday, OA4AE started running automatic transmission on 50 Mc., and at 1:45 P.M. EST the signal was heard by W4IUJ. Between then and about 3 P.M. OA4AE and OA4BG had several contacts with W4IUJ, W4FNR, and W4OGC. At 3:07 P.M. W5VY broke through and was heard intermittently until 3:15.

On March 22nd LU9EV heard weak signals from an easterly direction during the morning, and worked LU9MA (who is 600 miles to the *west*) by the rebound method, both beams *east*, at 1:57 P.M. EST. At 2:27 EST, XE1GE came through, for the first daylight work LU9EV has done over this 4500-mile path. This one also checks with the predictions, as to time, though 42 Mc. is indicated on the charts as the approximate m.u.f. for this path.

In most of this country March was a disappointment to 50-Mc. men. The fine openings in February led us to believe that we might have a repeat in March, but except for Florida, Texas, and California the Ws were left pretty much out of it. HC2OT caught a good one to W6 on the 11th, working W6s AMD, FFF, and OB between 8:43 and 9:55 P.M. EST. W5VY was heard in Argentina on the 26th, around the time of his break-through to Peru. Your conductor sweated out several mornings between March 19th and 27th, with little to show for it. There was an early-morning aurora on the 19th, breaking up the 'Phone DX Contest activity, as predicted, and providing a poorly-attended 50-Mc. aurora opening in the hours before about 9 A.M. VE1TR, Chester, N. S., W1PWW, Bangor, Maine, and W1KEX, Somersworth, N. H., were buzzing into W1 and 2, but not many customers were on hand that early on a Sunday morning. No South American DX followed this one, but an aurora developing late in the evening of the 21st did a bit better. HC2OT was heard intermittently between 9:38 and 10:27 A.M. EST on the 22nd, but signals were too weak and erratic for any sort of exchange of information, though we heard each other several times.

Over in South Africa, ZS1P noted evidence of high m.u.f. to Europe several days. On the 21st commercial harmonics were heard up to 50.5 Mc., beginning at about 1500 GCT, and ZS1P began looking for possible European contacts. He raised G5BY on 28 Mc. at 1630, and changing to 50 Mc., continued contact, crossband, at 1637. Conditions had started to sag, however, and the signal was only RST 339 on 50.07 Mc.

On 144 Mc. the feeling of spring was in the air. No unusual DX has been reported, other than an unconfirmed report of the reception of W1IS in Labrador, but many paths that were covered infrequently during the winter months were being broken down again. There were more good nights, and antenna weather was coming along. Plenty of 144-Mc. beams were being built on paper, and there was every prospect that the spring inversion season would be producing some real DX any day. The month closed with a couple of nights when attenuation seemed almost zero, on paths of 100 miles or more along the Atlantic Seaboard, giving promise of better DX to come.

RECORDS

Two-Way Work

50 Mc.: CE1AH — J9AAO
10,500 Miles — October 17, 1947

144 Mc.: W4JFV — WØEMS
830 Miles — September 16, 1949

220 Mc.: W1CTW — VE1QY
275 Miles — June 29, 1949

420 Mc.: W6VIX/6 — W6ZRN/6
262 Miles — July 4, 1949

1215 Mc.: W1OFG/1 — W1MZC/1
37 Miles — July 30, 1949

2300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1947

3300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1947

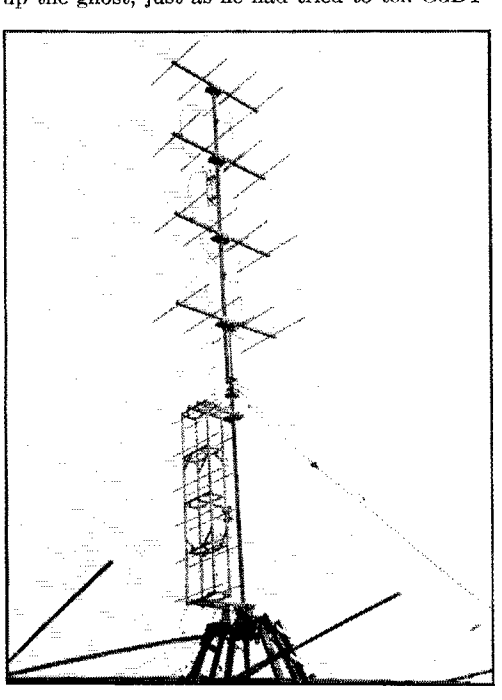
5250 Mc.: W2LGF/2 — W7FQF/2
31 Miles — December 2, 1945

10,000 Mc.: W4HPJ/3 — W6IFE/3
7.65 Miles — July 11, 1947

21,000 Mc.: W1NVL/2 — W9SAD/2
800 Feet — May 18, 1946

On 420 Mc. we find interest growing in many quarters. The trend is toward better gear, particularly in the receiver line, and it is hoped that the operating range of home stations will be stepped up considerably in the next few months. Taking equipment (soon to be described in *QST*) around to a few radio club meetings, your conductor found increasing evidence that 420 Mc. is in the back of many minds. If all the fellows who say they are going to do so actually get started on 420, things are bound to happen there this summer.

The best news we have regarding 420-Mc. work this month comes from that tireless v.h.f. enthusiast, G5BY. On March 5th at 1600 GCT, Hilton was in contact with G3EJL, Southampton, on 145 Mc. G3EJL changed over to 436.3 Mc. and was heard at once, S5 to 7, over the 119-mile path. For three minutes there was no appreciable change in signal level, and then the signal faded to S3-4, though readable on both voice and c.w. (Note — that's *c.w.* on 420 Mc.!) Crossband contact was maintained for 20 minutes and then G5BY changed over to 435.4 Mc. When he stood by G3EJL came back but promptly disappeared. Contact was resumed on 145 Mc., and G3EJL explained that his 832 tripler had given up the ghost, just as he had tried to tell G5BY that his 435-Mc. c.w. was being copied S6 to 7.



The arrays for 145 and 420 Mc. used by G5BY in working 119 miles to G3EJL on 420 Mc. The top array is a 16-element 145-Mc. job. Below is the 24-element array for 420 Mc. The supporting tower is on the roof of the station. This installation withstood gales up to 102 m.p.h. during the past winter.

G5BY runs a pair of 8012s tripling, driven by an 80-watt amplifier on 144 Mc. The antenna he uses is shown in the accompanying photograph. It's a 24-element job patterned after the 144-Mc. array described by W2NLY in *QST* for September, 1947. His receiver is a converter, using cavities from an R89A/APN5A, working into a BC-455 used as an i.f. amplifier. This job produces T9 c.w. signals from crystal-controlled stations on 420 Mc. G3EJL uses an 832 tripler, feeding a 13-element yagi array. His converter was made from a radar receiver, and employs a crystal mixer. The two stations are 119 miles apart, G5BY at 430 feet elevation, G3EJL at 200, with higher land in between. This is undoubtedly the best DX yet worked between two fixed stations on 420 Mc. and higher. A 2-way c.w. contact on 435 Mc. was made over this path on March 28th at 1914 GCT. Conditions on 145 Mc. at the time were good but not outstanding.

Around the World on the V.H.F. Bands

Melbourne, Australia — Australian amateurs are using 50, 144, 288, 580, and 2300 Mc., according to word from VK3NW. Most v.h.f. operation is done in and around the capital cities, and these being 500 miles or more apart is a limiting factor in interstate work, except on 50 Mc. In recent months (the sporadic-*E* season is December and January in Australia) there has been considerable 50-Mc. DX work from VK3 to VK2, 4, 5, 6 and ZL. VK7 is an intermediate haul that is occasionally negotiated by tropospheric bending. Equipment used on 6 is of good quality, mostly 829 amplifiers, with a few 834s and 24Gs in use. Antennas are usually beams of 3 or 4 elements, with horizontal polarization.

On 144 Mc. there is good activity, and the gear is almost completely of the stabilized variety, with 832s, 829s and 7193s used in the final stages. Low-noise r.f. amplifiers are widely used in receiver work. Most beams are from 4 to 16 elements, but lack of good-quality lumber at reasonable prices makes it difficult to build high towers capable of supporting large arrays. Though nice contacts are made in open country, there has been no two-way work over high intervening hills, and the record for VK3 is 190 miles. Some Melbourne stations have been heard in Tasmania, across the Bass Strait, some 230 miles, but no two-way contacts have yet been made.

Approximately ten stations are active on 288 Mc. in the Melbourne area, mostly with the simplest sort of gear and low power. The greatest distance yet covered is about 40 miles. As in the case of the 220-Mc. band in this country, many of the experimenter-type amateurs have skipped 288 Mc. for the next-higher assignment.

Getting equipment to work on the VK assignment at 580 Mc. has been something of a problem, and our 420-Mc. techniques haven't been much help. That extra 150 Mc. or so rules out practically everything we use on 420, and even 955s and superregen detectors barely make the grade. The best bet so far is an interesting little English tube known as the RL18. This has acorn-size elements, with the grid and plate leads coming out the top of the envelope. It takes 5 watts input on 580 Mc. and will work as a superregen detector there. The best DX worked so far is 90 miles, with VK3AKE and VK3NW both on elevated locations, working portable. The most popular antenna system is 8 driven elements with a screen reflector.

Lighthouse-cavity jobs (similar to those described by W2RMA in *QST* for February, 1948) are used by VK3s XA, AKZ, QO, and NW, covering distances up to 8 miles or so. Parabolic reflectors are being built, in anticipation of tries for some real DX, though it means a lot of traveling to reach

(Continued on page 112)

Graphical Solution of Superhet Tuning Design

Determining H.F. Oscillator Values for Simple Tracking

BY P. V. PROOIJEN,* PAØPVP

In the "Correspondence" section of *QST* for November, 1949, I read a request by a reader for a simplified method of determining the principal factors involved in tracking a superheterodyne receiver. Some time ago I built my own receiver and was upset by the same problem. For my own use, I hit on the idea of making a set of graphs for determining the values of inductance and capacitance in the h.f. oscillator stage in terms of corresponding values used in the r.f. and mixer stages, since the latter are quite easily determined.

In an r.f. or mixer stage, the capacitance change required to cover a desired frequency range is the square of the frequency change expressed as a ratio:

$$\frac{C_{max}}{C_{min}} = \frac{f_{max}^2}{f_{min}}$$

Thus a 2-to-1 frequency change requires a 4-to-1 capacitance change, a 3-to-1 frequency change needs a change in capacitance of 9 to 1, a 2.25-to-1 range in frequency requires a $2.25^2 = 5.06$-to-1 capacitance variation, etc. If the minimum circuit capacitance, C_{min}, is set at 60 $\mu\mu$fd., the capacitance when the tuning condenser is turned to maximum must be $4 \times 60 = 240$ $\mu\mu$fd., $9 \times 60 = 540$ $\mu\mu$fd., and $5.06 \times 60 = 303.6$ $\mu\mu$fd., respectively, in the above three cases.

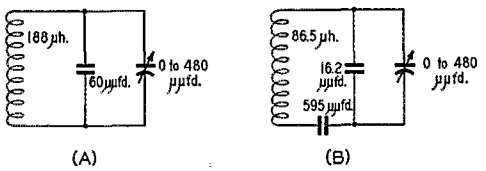


Fig. 1 — A — Typical r.f. circuit values for a range of 500 to 1500 kc. B — Corresponding values for the h.f. oscillator circuit to track.

The inductance required may then be determined from the *ARRL Lightning Calculator*, or from the relationship

$$L_1 = \frac{10^{12}}{(2\pi f)^2 C_1}$$

where L_1 is the inductance in microhenrys, f is the maximum frequency desired in kilocycles and C_1 is the minimum circuit capacitance, C_{min}, in micromicrofarads, with the tuning condenser set at zero.

Thus, if we wish to cover the range of 500 to 1500 kc., this is a frequency ratio of 1500/500 = 3 to 1. The capacitance range must be $3^2 = 9$ to 1. If C_{min} is to be adjusted to 60 $\mu\mu$fd., then C_{max} must be $60 \times 9 = 540$ $\mu\mu$fd. A condenser with a *variation* of $540 - 60 = 480$ $\mu\mu$fd. will be required.

At 60 $\mu\mu$fd., the frequency we have selected is 1500 kc. Therefore the required inductance, determined by the means mentioned above, is 188 μh. The r.f. and mixer tuning circuits will look like Fig. 1A. The 60 $\mu\mu$fd. includes all stray capacitances as well as the minimum capacitance of the tuning condenser.

Perhaps you will want to attack the design from a slightly different angle. You may have a gang of 350-$\mu\mu$fd. condensers and you want to know what tuning range to expect. You find that the minimum capacitance of each section is 20 $\mu\mu$fd. and estimate that tube and wiring capacitance and the capacitance of a trimmer to set the high-frequency end of the band accurately may take another 30 $\mu\mu$fd. The total minimum is then 50 $\mu\mu$fd. and your gang condensers have a *variation* of $350 - 20 = 330$ $\mu\mu$fd. Therefore the capacitance in the circuit may be varied from 50 $\mu\mu$fd. to $50 + 330 = 380$ $\mu\mu$fd. This is a ratio of $380/50 = 7.6$ to 1. The frequency range will then be the square root of this figure or about 2.76 to 1. If you design the coil, as previously described, to tune to 1000 kc. with the tuning condenser in full (380 $\mu\mu$fd. total), the circuit will tune to $1000 \times 2.76 = 2760$ kc. when the tuning condenser is at minimum (50 $\mu\mu$fd. total).

Oscillator-Circuit Design

The values of inductance and capacitance that must be used in the h.f. oscillator circuit so that it will track with the r.f. and mixer stages are not ordinarily determined so easily. Here is where the curves of Fig. 2 come in.

The factors that must be known before starting to use the curves are the inductance of the r.f. coil (L_1) as determined above, the frequency range covered by the r.f. or mixer stage (previously selected) and the frequency of the i.f. amplifier. In the preceding example, the frequency range of

* 58 Corn. van der Linjstraat, The Hague, Holland.

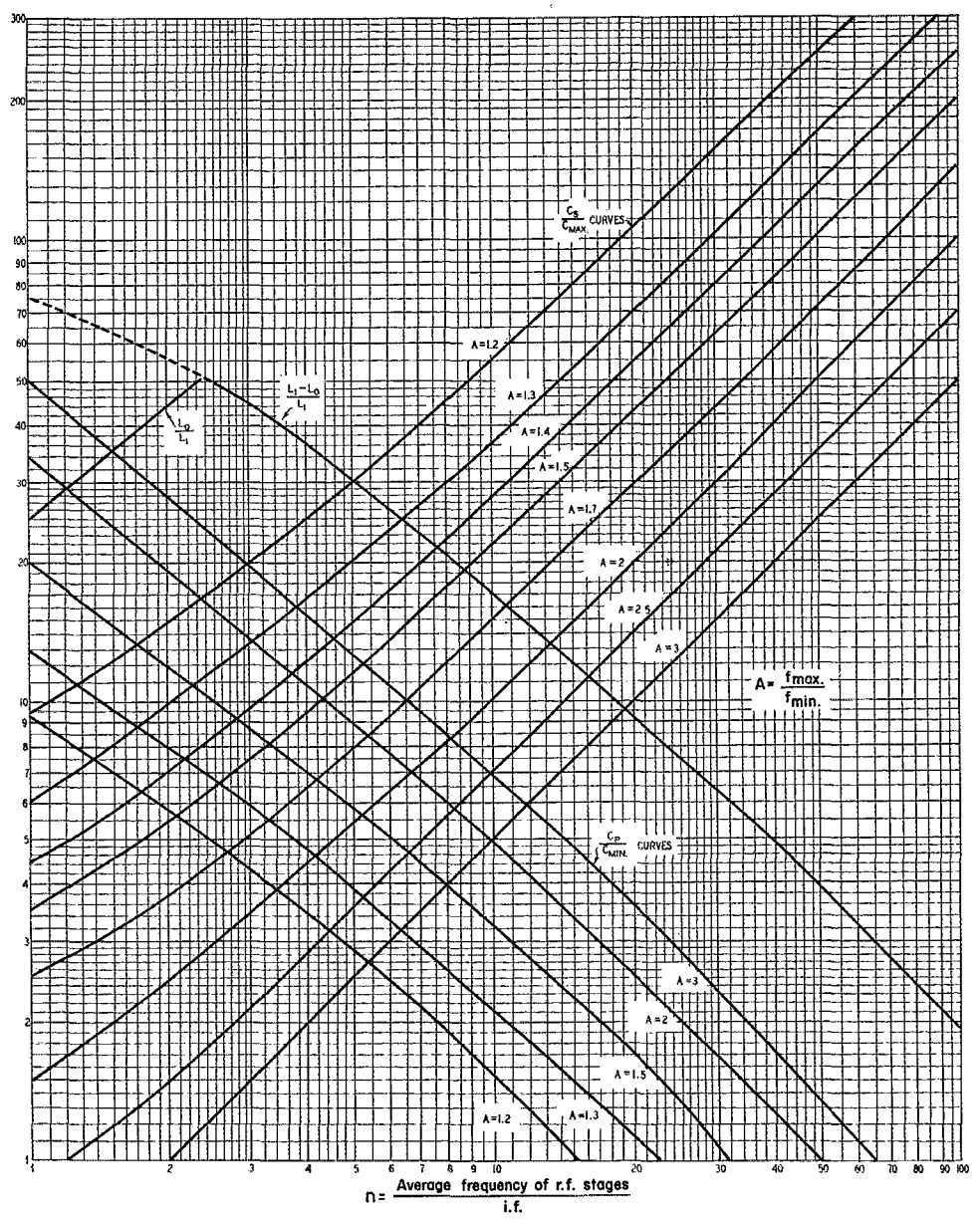


Fig. 2 — Chart for determining oscillator-circuit values from values of similar units in the r.f. and mixer circuits. The values given on the vertical scale are in terms of percentage for $\frac{L_o}{L_1}$, $\frac{L_1-L_o}{L_1}$ and $\frac{C_p}{C_{max}}$. For $\frac{C_s}{C_{min}}$, the values are in terms of direct proportion. $n = \frac{0.5\,(f_{max}-f_{min})}{\text{i.f.}}$ and $A\,\frac{f_{max}}{f_{min}}$.

the r.f. stages is given as 500 to 1500 kc., the inductance, L_1, was calculated to be 188 μh., and let us say that the i.f. is 460 kc.

To use the graphs, we need to work out a couple of simple ratios:

$$A = \frac{f_{max}}{f_{min}},$$

$$n = \frac{\text{Average frequency of r.f. stages}}{\text{i.f.}}.$$

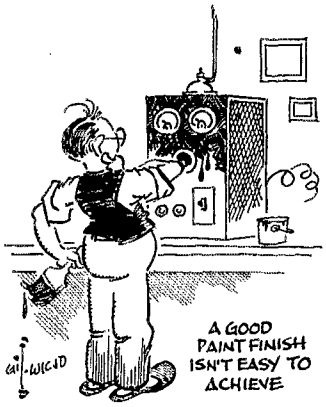
(*Continued on page 114*)

It's a Pretty Pickle

Home Anodizing Your Panels in Color

BY J. W. PADDON,* VE1OU, EX-VP2GJ

In the years since the end of the war there has been a marked improvement in the quality of amateur-built equipment. An inspection of a file of old *QSTs* shows the advance from the sort of thing we used to put together in the mid-Thirties to the almost professional use of aluminum and steel in the 1950 efforts. However, one refinement generally is missed. We have the choice of an untreated panel on that new converter or else a painted one. A good paint finish — especially on aluminum — is not easy to achieve.



If the panel is left as raw untreated aluminum, it soon gets that tired look and frequently becomes abraded around controls which are subject to much handling.

It is perfectly possible for any amateur to produce panels with a jewel-hard surface, in any color he (or his XYL) may desire — beige or canary yellow, black, blue or what have you. The method is not in the least critical. The materials cost a few cents, and in most communities can be obtained from the corner grocery, the drug store or the local garage. The excellence of the result will depend entirely on the care exercised in the process. Some of the materials used should be treated with a degree of respect but they are by no means really dangerous.

Let us examine the procedure step by step.

Preparing the Metal

The first step has nothing to do with the chemical treatment of the aluminum. It is a question of the handling of the panel or chassis before we begin treatment. The fact is that no surface treatment will remove a gouge, drill mark or scratch from the surface of the metal. In laying out the panel and doing whatever work is necessary, take it easy! Don't hurry! Lay out the holes on a paper fastened over the panel, rather than making scriber marks on the metal itself. Aluminum is a soft material. A dropped file or an awkward twist of the drill will make a blemish that can't be removed.

The second step is that of cleaning the metal. A thumb print or smear of grease or oil will persist and ruin the finished product. When the work is ready to start the finishing process, give it a good scrubbing with soap and hot water and let it dry thoroughly. Holding it by the edges, so as not to put thumb prints on the surface, wash it down with a cloth dipped in thinners, lacquer remover or almost any good solvent except carbon tetrachloride. Set it on a paper towel or clean newspaper to dry. From here on it is better not to touch the surface of the metal with the bare hands. Pick it up with a bit of rag or a paper towel.

The third step is the old faithful so commonly used to such good effect. Get a pound tin of household lye from the grocery. Dissolve it in warm

water. An ordinary tin bucket is a satisfactory container. A better one is a large *enamel* dishpan which can be used in later steps of the process. Submerge the work, tied on the end of a piece of string, in the lye solution. It will immediately begin to bubble and, as time goes on, the shiny

* % Cossor (Canada), Ltd., Halifax, N. S.

surface will change to a velvety matte. Remove the work from the solution from time to time and choose the degree of matte most pleasing to yourself. The work should then be taken out and thoroughly washed in hot water and put to dry over a hot stove or in a low oven. There are two important precautions to observe. *Don't* put the lye solution in an aluminum pan because later on

there won't be any pan. A lye solution should be handled with respect. If you get splashed rinse it off at once. It won't do much damage if a little gets on your hands but it should be kept away from the face and, above all, the eyes. It's a good idea to wear a pair of large sun glasses or cheap plastic goggles as a precaution. Also, a few drops can put holes in your clothes.

Anodizing

During the war aluminum was almost invariably specified as "anodized." This sounds very impressive but, like so many things, a little analysis shows that there is nothing very tough about it. The term simply means that the outer surface of the aluminum panel is changed to aluminum oxide. The oxide is the identical stuff of which many precious stones are made. It is literally "hard as rubies" and, incidentally, is an excellent insulator. A test you can apply to see if you have achieved an anodized finish is to lay the two leads from an ohmmeter on the surface of the panel. It will read open circuit even on the "megohms" position — a demonstration which the uninitiated visiting fireman will find somewhat puzzling.

To make an anodized film, you place the piece of metal to be treated on the end of a positive lead from a d.c. supply and another piece of *aluminum* on the end of the negative lead and hang them both in a sulphuric-acid solution. As the current passes, the positive electrode — the piece we want to treat — generates nascent oxygen. This highly-potent gas immediately turns on the electrode that generated it and changes the surface to aluminum oxide. The nascent oxygen has a very brief life and what little gas is given off is ordinary oxygen. The negative electrode bubbles merrily away releasing hydrogen but in such small quantities from the kind of work we are doing as to present no hazard at all.

There is nothing in the least critical about the anodizing operation. The procedure given below is the standard commercial method chosen for speed and economy of operation. In amateur practice the widest excursions will still produce good results.

First we will want some d.c. It can be awful d.c. The totally unfiltered output from a half-wave rectifier is perfectly satisfactory. The book calls for from 12 to 18 volts at a current density of from 8 to 20 amperes per square foot. Thus if the panel being anodized is a foot square we will have two square feet of work — for the panel has two sides. According to the book we need from 16 to 40 amperes. That's what the book says. But remember that this refers to commercial operation where speed and efficiency are at a premium. In amateur practice 12 volts is plenty and quite a good job can be done with 6 volts from a storage battery. If the current density is low, it simply means that the work must remain in the solution longer for a given amount of anodizing.

Acid Solution

Now we must provide a sulphuric-acid solution. The standard solution is given as 15-25 per cent sulphuric acid by weight in water. As mentioned above, even the commercial boys set up a very wide tolerance. The battery department of the local garage should be able to supply the acid. If you want to make an exact mix, find out the specific gravity of the acid. The standard commercial figure is 1.84, which means that it weighs 1.84 times as much as a similar amount of water. Weigh the acid and work out what an equivalent amount of water will weigh. Thus, 10 ounces of acid will represent 18.4 ounces of water. Now, let's take a 20 per cent solution. We will need 10 ounces of 1.84 s.g. acid and 73.6 ounces of water — but it will take a determined purist to go to such lengths. In practice any commercial sulphuric acid plus about 8 times as much water by volume will be fine.

Put the water in the enamel dishpan or some other nonmetallic container. Alternatively, use a large aluminum dishpan and let the container itself serve as the *negative* electrode. Now be *carefull* Pour the *acid* slowly into the *water*. Do *not* on any account pour the *water* into the *acid*. Better wear an old pair of pants, for sulphuric acid ruins some kinds of cloth. Suspend the work in the solution but do not connect it with a copper wire. The wire (or strip) supporting the work and carrying current to it *must* be of aluminum wherever it is submerged in the solution. Connect the work to the *positive* terminal of the d.c. supply. The *negative* electrode may be any old piece

(Continued on page 116)

An Automatic Transmitter Turner-Onner

BY M. E. HIEHLE,* W2SO

As MANY operators know, the need for sleep during the latter parts of SS and DX contests cuts down on a fellow's efficiency. My decreased effectiveness shows up in a particularly serious way — sometimes after finishing a call I find that I have forgotten to turn on the power switch. Too much of that can really cut down one's score, since I am not an accomplished telepathist. Down through the years the condition has been getting worse instead of better, but I now have a solution and I pass it along for anyone else who might find it useful.

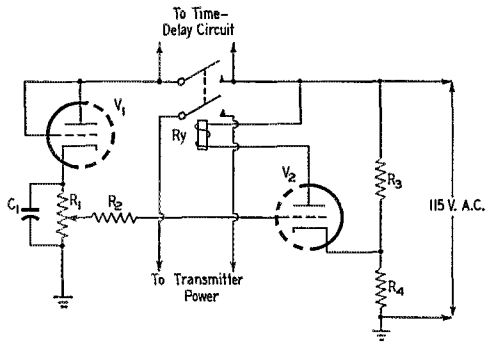


Fig. 1 — A commercial circuit for protecting transmitter tubes from line-voltage failures, that serves as the basis for the "automatic transmitter turner-onner." The a.c. relay, R_y, will close immediately after a short power failure, jumping the time-delay circuit and turning on plate power, only if C_1 has not discharged below a certain level. If the voltage at the arm of R_1 is too low when the power resumes, it is necessary for the time-delay relay to recycle.

Fundamentally, the circuit was designed for commercial equipment as a power-failure control.[1] In high-power transmitters, filament power must be applied some little time before the plate power, to provide tube protection. In case of a power failure, it is desirable to return to the air as soon as possible. Provided the power outage does not exceed a certain time, it is permissible to throw on both plate and filament voltages simultaneously. However, if there is too long a power failure, it is then necessary to recycle and use the standard filament time delay. In its original form, Fig. 1, the circuit was used across the power line. In normal operation, C_1 is charged through V_1. This puts a positive voltage on V_2, and V_2 draws plate current, closing the relay. One set of relay contacts shorts out the time-delay relay contacts. If a power failure occurs, the relay opens up and the charge on C_1 starts to leak off through R_1. If power returns before the voltage on C_1 drops too much, the relay will close, shorting out the time relay. If, however, the off time is too long, there will not be enough charge left in C_1, V_2 cannot conduct, and the filament time-delay relay will have taken over. Resistors R_3 and R_4 make up a voltage divider to furnish bias voltage for V_2. R_2 is a high resistance that limits the grid current to V_2 and also lengthens the discharge time. The potentiometer, R_1, actually sets the outage time that the circuit will handle, a maximum of two or three seconds in this case.

Automatic Turn-On

The circuit of Fig. 1 can be used in any ham rig using filament time delay. However, a very slight modification provides automatic transmitter turn-on. A.t.t.o. works like this: When the rig is first keyed, the transmitter power is turned on and stays on for about two seconds. This is long enough to hold the power on continuously during any transmission. If there is a keying pause of more than two seconds, the power turns off, but it comes right back on with the next dot. Fig. 2 shows the modified circuit. The potentiometer, R_1, controls the length of time the power stays on after the key is up. The switch, S_1, was added when it was found that there was some rectifier hash present, and the switch is shifted off C_1 for manual turn-on of the transmitter. Thus the power can be removed immediately after a trans-

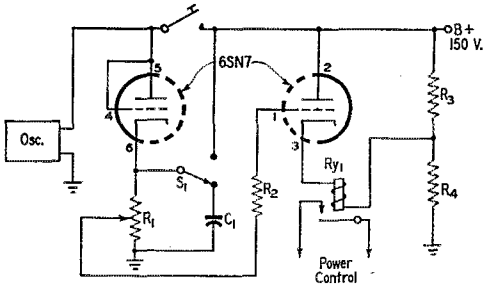


Fig. 2 — The a.t.t.o. circuit. The setting of R_1 determines the "hold-in" time of R_{y1}.
C_1 — 1-μfd. paper, 200 volts.
R_1 — 1-megohm potentiometer.
R_2 — 1 megohm, ½ watt.
R_3 — 10,000 ohms, 2 watts.
R_4 — 1000 ohms, ½ watt.
R_{y1} — Low-current (6 or 7 ma.) relay. See text.
S_1 — S.p.d.t. toggle.

* 457 South Beech St., Syracuse 10, N. Y.

[1] U. S. Patent 2448371.

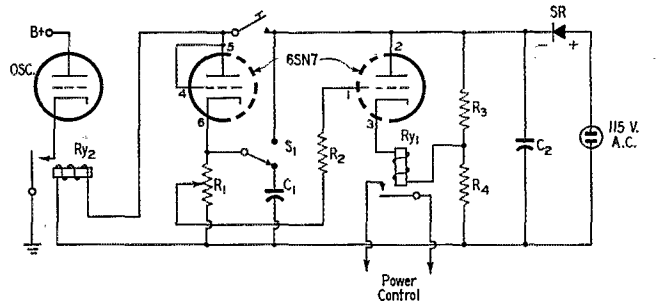


Fig. 3 — The circuit modified for relay keying of the oscillator. Constants are the same as Fig. 2, except as below.
C_2 — 8 μfd., 250 volts.
R_{y2} — D.c. keying relay. Use series dropping resistor if necessary.

mission, using S_1 for the control, and there is then no 2 or 3 seconds of rectifier hash to listen through. The relay, Ry_1, can be any high-impedance low-current relay that will operate on 6 or 7 ma. A Clare telephone-type relay, with a 34,600-turn 4000-ohm coil, performs very satisfactorily.

The circuit can be modified very easily for use with a keying relay that will work from rectified 60-cycle a.c. The wiring diagram is shown in Fig. 3. If Ry_1 and the keying relay, Ry_2, are a.c. affairs, the selenium rectifier and filter condenser, C_2, can be omitted. In any event, the impedance of Ry_2 must be low enough so that the diode-connected tube section will not cause the relay to tend to hold in.

There are no tricks in these circuits, and their operation certainly saves wear and tear on the operator, either during general operating or those rugged hours near the end of a contest. To adjust the circuit, just step once on the key and then release it. If the length of time Ry_1 stays closed is too long or too short, adjust R_1. Repeat the check until you have what you want. Using this system with good break-in, you can just forget everything except the QSO. Incidentally, a.t.t.o. provides a degree of filament time control, because power cannot be applied to the transmitter until the 6SN7 heater warms up. This usually takes about 20 seconds or so, after which you are ready to enjoy the pleasures of operating with an "automatic transmitter turner-onner."

Military Amateur Radio System

A Reminder — First Annual Armed Forces Day Contest Coming Up

GET ON the air May 20th and join in the Armed Forces Day double-header celebration arranged by the Department of Defense. Featured are a QSO-message relay contest and a receiving competition along the lines of the former Navy Day copying contest. All amateurs are invited to compete. See page 31 of April *QST* for complete rules, times, particulars, and sample log sheets.

There is no previous similar activity with which to compare the 1950 Armed Forces Day. The day will be observed throughout the entire U. S. military system on an integrated teamwork basis. Army Day, Navy Day and Air Force Day are all rolled into one big gala observance, and the close and special relationship between the armed forces and the amateur radio fraternity calls for an extra-special celebration.

So, be sure to participate in both events. Send logs and receiving competition copy to Armed Forces Day Contest, Room 5 B 519, The Pentagon, Washington 25, D. C.

Brig. General Wesley T. Guest (ex-W8KM), chief of Army Communications Service Division, personally supervised the preparation and layout of the certificate to be awarded those making perfect copy in the Armed Forces Day receiving competition. Here he checks a "model copy" prepared by the Bureau of Engraving and Printing.

A Simple Vertical for Forty

BY H. E. THORNHILL, JR.,* W6DDT

WHEN faced with the problem of where to put a 40-meter antenna, I finally decided that the only place it could go was UP. And after having decided that a vertical was the only solution which would be practicable in my particular location, I had to consider such factors as what kind of pole or support to use, where to put the guy wires, and how to climb up to the top to shorten or lengthen the antenna when I found out that it would not load quite right.

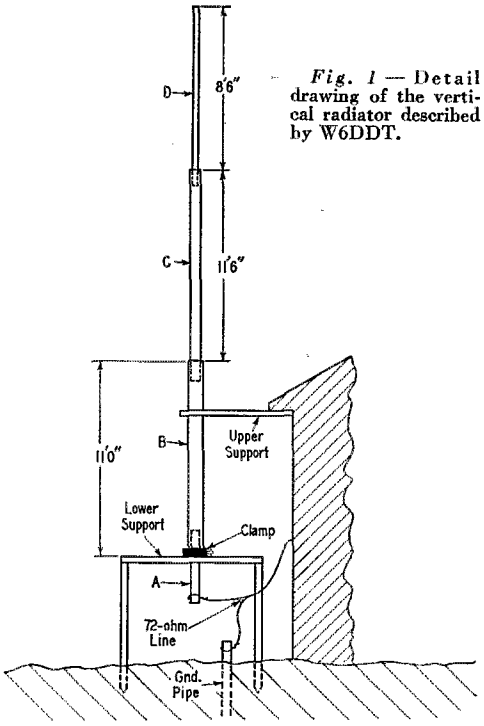


Fig. 1 — Detail drawing of the vertical radiator described by W6DDT.

The antenna sketched in Fig. 1 solved all the problems at W6DDT. Made of dural tubing, it requires no pole or tower for support, and no guy wires are used. Tuning is accomplished by exposing more or less of the bottom section. Although in a high wind the vertical will bend until the top section is almost horizontal, it has never blown down, and always goes back to a vertical position when the wind abates.

The sections of tubing are telescoped together as shown in Fig. 1. Sections *B*, *C*, and *D* are bolted together, since no adjustment of these sections is required for tuning. When assembled the total length of sections *B*, *C*, and *D* is 31 feet. Sections *A* and *B* were also bolted together after the proper position of section *A* was determined by trial and error. Over-all length of the antenna is about 33 feet. The diameters and lengths of the four pieces of tubing used are as follows:

Section	*Diameter*	*Length*
A	¾ in.	4 ft.
B	⅞	11
C	¾	12
D	½	9

With the antenna located right beside the house, only two supports are required. The bottom one is simply a board nailed to two stakes driven into the ground. The support is about two feet above the ground and has a hole in it through which section *A* of the antenna passes. A clamp around the antenna rests against the board and supports the weight of the antenna. The upper support is a single board nailed to the house. The antenna fits snugly in the holes in both supports so that it will not rattle in the wind. The supports are illustrated in Fig. 1. A cork in the top end of the antenna prevents water from collecting inside the tubing.

Feeding the antenna is a simple matter. One conductor of a 52- or 72-ohm line is connected to the bottom of the antenna and the other conductor is connected to an adjacent ground pipe. The feed line can be connected to the link of either a balanced or an unbalanced final tank circuit. No antenna tuner is necessary on 40 meters when the antenna length is properly adjusted.

The same antenna performs well on 80 meters when a simple tuner is employed. The arrangement at W6DDT employs a variable loading coil (35 turns of No. 12 wire, 2 inches in diameter and 5 inches long) and a 50-$\mu\mu$fd. (1500 w.v.) series condenser. Details of the tuner are shown in Fig. 2. Setting of the loading coil for different frequencies in the 80-meter band is fairly critical.

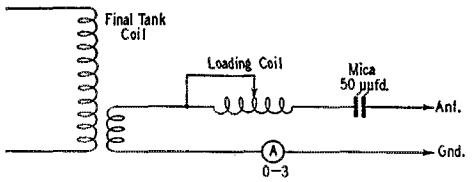


Fig. 2 — Loading-coil arrangement used in operating on 3.5 Mc.

(*Continued on page 120*)

* Lieut., USN; 2662 Bayside Walk, San Diego 8, Calif.

A.R.R.L. QSL BUREAU

The ARRL maintains a QSL bureau system to make it easy for you to receive your DX QSL cards, but in order for it to function it is necessary that we receive your coöperation. All you have to do is send the QSL manager for your call area a stamped self-addressed envelope of the No. 10 stationer's size (No. 8 post-office size), with your name and address in the customary place and your call letters printed prominently in the upper left-hand corner. When he has an envelope full of cards for you, he'll return the envelope to you. Upon receipt of that envelope, be sure to send him another.

If you've previously held a different call, send an envelope to the manager for that call area. All QSLs for portable operation are routed via the *home district.*

Do not send cards for other W or VE stations for distribution via the QSL bureau; they cannot be accepted. Likewise, do not send cards for distribution to foreign stations via this domestic QSL bureau system. For the addresses of the proper bureaus to which foreign cards may be sent, see page 61 of December, 1949, *QST*.

The bureau handles only incoming DX QSLs.

W1, K1 — Frederick W. Reynolds, W1JNX, 83 Needham St., Dedham, Mass.
W2, K2 — Henry W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia, Penna.
W4, K4 — Johnny Dortch, W4DDF, 1611 East Cahal Ave., Nashville, Tenn.
W5, K5 — L. W. May, jr., W5AJG, 9428 Hobart St., Dallas 18, Texas
W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.
W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.
W8, K8 — William B. Davis, W8JNF, 4228 W. 217th St., Cleveland 16, Ohio
W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wisc.
WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.
VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.
VE2 — Austin A. W. Smith, VE2UW, 6164 Jeanne Mance, Montreal 8, Que.
VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.
VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.
VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.
VE7 — H. R. Hough, VE7HR, 1785 Emerson St., Victoria, B. C.
VE8 — Jack Spall, VE8AS, P. O. Box 268, Whitehorse, Y. T.
KP4 — E. W. Mayer, KP4KD, P. O. Box 1061, San Juan, P. R.
KZ5 — C.Z.A.R.A., Box 407, Balboa, Canal Zone
KH6 — Andy H. Fuchikami, KH6BA, 2543 Namauu Dr., Honolulu, T. H.
KL7 — Box 73, Douglas, Alaska

VE/W CONTEST

May 13th–14th

ARE you ready for the 1950 VE/W contest? Have you got all those QSLs for WAS or WAVE? If not, you had better get started and fire up that tired old 807 with the loose plate cap. Perhaps after last year's battle you decided that a 304TH would stand the gaff better and have made the necessary substitution. It would be only fair, however, to warn you that the 100-watt multiplier applies to plate power input, not filament power input!

This year's contest will be very similar to last year's with the exception that, in an endeavor to get more stations on the air at the same time, the contest period will be confined to a total of 30 hours, out of which each station may operate 20 hours or less. A point which should be stressed: You must send your QTH as well as the ARRL section in which you are located.

Certificates of Merit will be awarded to the leader in each ARRL section. The complete rules are printed below. Be sure you understand them and don't hesitate to read them over twice.

1) Any station located in any ARRL section as listed in *QST* is eligible to enter.

2) All contacts must be made during the contest period 6:00 P.M. EST May 13th to 11:59 P.M. EST May 14th, with a total of no more than 20 hours operating time for each entry. Times on and off the air must be clearly shown in the contest log.

3) Message preambles such as the following must be exchanged and be fully reported in the log entered: (1) number of contact; (2) your call; (3) RST report given; (4) location; (5) ARRL section; (6) time sent; (7) date sent. *Example:* NR 1 W3KMN 569 Silver Spring Md Del DC 6R02P May 13.

4) One point may be counted for each preamble sent and acknowledged. One point may be counted for each preamble received. No more than two contest points may be counted for contacts with any one station, regardless of frequency bands in use. VE stations will multiply the total points by the number of W ARRL sections worked. W stations will multiply the total points by the number of VE ARRL sections worked and also by 8, there being eight times as many W sections as VE. Stations using a power input of less than 30 watts will receive an additional multiplier of 2, and stations using a power of less than 100 watts will receive one of 1.5. The final score consists of "total points" multiplied by "sections" (times 8 in case of W stations) multiplied by the "power multiplier."

5) Each entry must be accompanied by the following certification: "I hereby state that in this contest I have not operated my transmitter outside the frequency bands as specified by governmental regulation, and also that the log submitted is correct and true."

6) All entries shall be sent to the Canadian Amateur Radio Operators' Association, 46 St. George Street, Toronto, Ontario, Canada, and must be postmarked not later than midnight June 3, 1950.

Preview—DX Contest C.W. Scores

As we bundle copy off to *QST*'s printer for this issue, 1950 ARRL DX Contest logs are still arriving at Headquarters in huge batches. Examination of the c.w. logs on hand indicates that it was a DX fracas in the old tradition: shattered records, tough competition, DX galore. Since time is short we'll dispense with the usual editorializing on what a terrific contest it was and pass along a few of the cold figures and let you draw your own conclusions!

Here's a list of the highest claimed scores reported as of late March from each of the W and VE call areas: W1JYH 207,675, W2BXA 298,102, W3LOE 434,073, W4KFC 365,454, W5ENE 202,584, W6MVQ 215,922, W7VY 227,174, W8DX 234,780, W9LM 229,308, WØDAE 232,638, VE1EK 23,628, VE2WW 153,709, VE3IJ 52,462, VE4MF 180, VE5QZ 28,392, VE6MC 1350, VE7ZM 122,310, VE8AY 12,015, VO6EP 2184. Of the W/VE logs thus far received, those from the following show contact totals above 400: W3LOE 563, W4KFC 514, W2BXA 465, W4BRB 421, WØDAE 406, W8DX 402. Highest multipliers were reported by W3LOE 257, W4KFC 237, W2BXA 214, W4BRB 198, W8DX 195, W7VY 194, W9LM 194, W2WZ 192, WØDAE 191.

Outside W/VE, many high scores have already been reported from all continents except Asia. The following have submitted the highest claimed scores from their respective countries: CE3AX 107,016, EK1AO 240,000, G2MI 100,450, GW3ZV 377,187, HC1PK 267,732, KL7PB 187,364, KP4JE 103,071, KS4AG 174,464, KV4AA 691,782, KZ5PA 247,401, LA7Y 200,872, ON4QF 277,480, ZL1MB 280,620, ZS6CT 129,774. Top reported contact totals: KV4AA 2544, GW3ZV 2131, ON4QF 1674, ZL1MB 1559, HC1PK 1206, KZ5PA 1071, KL7PB 1013, ZS6CT 1006. High multipliers: KV4AA 91, KZ5PA 77, HC1PK 74, LA7Y 68, KS4AC 64, KL7PB 62, ZL1MB 60.

It should be emphasized that all figures quoted above are *claimed* and subject to intensive checking before final results can be announced.

See June *QST* for the highest claimed scores in the 'phone section.

WWV-WWVH SCHEDULES

The technical radio broadcast services over WWV, Beltsville, Md., and WWVH, Maui, T. of H., were revised effective Jan. 1, 1950. Except in certain details, these services of the National Bureau of Standards do not differ greatly from those given in the past.

The revised services from WWV include (1) standard radio frequencies of 2.5, 5, 10, 15, 20, 25, 30 and 35 Mc., (2) time announcements at 5-minute intervals by voice and International Morse code, (3) standard time intervals of 1 second, and 1, 4 and 5 minutes, (4) standard audio frequencies of 440 cycles (the standard musical pitch A above middle C) and 600 cycles, (5) radio propagation disturbance warnings by International Morse code consisting of the letters W, U or N, indicating warning, unstable conditions, or normal, respectively.

The audio frequencies are interrupted at precisely one minute before the hour and are resumed precisely on the hour and each five minutes thereafter. Code announcements are in GCT using the 24-hour system beginning with 0000 at midnight; voice announcements are in EST. The audio frequencies are transmitted alternately: The 600-cycle tone starts precisely on the hour and every 10 minutes thereafter, continuing for 4 minutes; the 440-cycle tone starts precisely five minutes after the hour and every 10 minutes thereafter, continuing for 4 minutes. Each carrier frequency is modulated by a seconds pulse which is heard as a faint tick; the pulse at the beginning of the last second of each minute is omitted.

Station WWVH, recently established in Hawaii by the National Bureau of Standards, broadcasts on an experimental basis on 5, 10 and 15 Mc. The program of broadcasts on the three frequencies is essentially the same as that of WWV. Reception reports indicate that WWVH is received at many locations not served by WWV, thus extending the area served by standard frequencies and time signals. Time announcements in GCT are given from WWVH every five minutes by International Morse code only.

Strays

To date we've heard of no challenges to W5OLU's claim (March *QST*) of having the highest permanent QTH in the United States. However, W6HMF comes through with a response that may set some sort of record for having the *lowest* QTH in the country. Chris's station is located on the floor of Imperial Valley, Calif., elevation 250 feet *below* sea level!

Silent Keys

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

W1GRV, Richard E. Jenkins, Salem, Mass.
W1HUA, Frank W. Evans, sr., Fairfield, Conn.
W2ZA, George O. Milne, Wood Ridge, N. J.
Ex-3MM, Albert King, Burlington, N. J.
W5WN, Henry A. Keys, Kinder, La.
W6CVT, Clarence Sutherland, Fresno, Calif.
W6ZM, Sam C. Houston, Veterans Home, Calif.
W8FLZ, Fred W. Salisbury, Jackson, Mich.
W8NIJ, Daniel B. Kinly, Williamson, W. Va.
W8SRS, Glenn L. Dallas, Alliance, Ohio
W9BXH, Emmett J. Rourke, Decatur, Ill.
W9DRZ, Wilbur E. Shadwick, jr., Tell City, Ind.
WØTGZ, Frederick V. Lammey, Des Moines, Iowa
G4HV, Eric Spencer, Ruislip, Middlesex

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

Darting thither and yon, yet tripping over no one, he succeeded in maintaining a foamy cap on every glass in the room. Of which, to be sure, there were many.

Yes, Jeeves was at his very best.

With the ionosphere rent into sorry shape by an uncalled-for solar burp and a brisk spring chill hanging on the air, it was a perfect night for yattada-yattadayap with little worry about the possibility of missing a good crack at FB8XX or CR5UP.

The topics of discussion varied from the sad lack of originality, if not vitality, of the modern species of *Hoggus DXus* to the lamentable demise of that former trademark of first-water DX men, the DX Swing, and then lagged reflectively until one of our deeper thinkers posed a query.

"Tell me, O tin-eared colleagues, why we still persist in the use of 'CQ' as a general call, on c.w."

"Why do some guys ask such stupid questions?" rejoined a second, being the first to gain control of his gaping jaw. "What's wrong with the traditional 'CQ'?"

"Oh, nothing. Except that on DX bands and where DX is concerned, if nowhere else, it's about as informative and intelligence-conveying as a simple long dash of AØ — and the latter, bless it, disturbs no one with click sidebands."

"And how would one separate 'testers' from CQers?" queried a third.

"How naïve can you get?" continued The Brain. "'T was merely an illustration. But it does seem to me that international amateur radio could very advantageously adopt another system."

"Like what?" we harmonized.

"It's no suggestion you probably haven't heard before. Very simple. When G6ZO wants a contact he sends 'G G G DE G6ZO.' When ZD9AA wants a QSO he goes 'ZD9 ZD9 ZD9 DE ZD9AA.' When W1EZ wants same he says 'VT VT VT DE W1EZ.' Since nobody gives a fig where we are, I guess we'd just holler 'W9 W9' and so forth. The signal CQ would be reserved for the distinction of directional calls. For instance, 'CQ ZS3' would be the reciprocal of 'ZS3 ZS3.' Shucks, one DX contest would prove the merit of the idea."

Well, we tried to tear the deal apart but it remained a formidable nut to crack. But we all agreed that as long as so many reputable operators continued to exude tripe like "UR SIGS RST 559 BUT TERRIFIC QRM OM" such a scheme, whether good or bad, would have about as fat a chance to get anywhere as an 807 in California.

What:

One-Sixty may be back in the QRN rut so far as DX is concerned but *eighty* hasn't quite thrown in the towel. W2NSD was chinning on 2-meter teletype when he discovered 75 was hot. Despite the use of an antenna which he says is "scraping the ground," Wayne is now up to 22 'phone countries on the band with contacts like JA2AZ, LX1JW, HB9J, DL4LN, F9BO, OK1MB, SM5UM, GW3CYB, XE1A, G2PU and G8VB. TG9AD and CN8MI were heard but not raised . _ . _ . _ Now up to 77 3.5-Mc. countries, W4BRB reports MD7WE (VFO t8), **VK5KO** (3505) and **VP5AR** (3517) on c.w. plus 'phone work with PAØUN, VP5AR and VP7NN . _ . _ . _ ZL1BY, EK1AO and HC1PK wound up in W2ESO's log while W9AND cornered **SVØWH** (3530), **FM8AD** (3505), KL7OK, VK2RA, ZL3NE and HC1JB . _ . _ . _ SVØWH and **EA4CN** (3539) made it 69 80-meter countries at W2QHH, while W1QMJ nabbed PY7WS, VP5BF and CT3AB. OY3IGO was heard but, alas, not hooked.

Forty-meter stock quotations took a drop as 14-Mc. conditions resumed the swing shift. Kangaroo Island's **VK5XK** (7030) was worked by W3DLI. The VK, using some No. 40 enameled for a skywire, needs just Delaware and Maryland for his WAS. Walter thereafter added OE5CA and **KG6GM** (7050) . _ . _ . _ According to W1RWS, **ZE2JN** is seeking several states for a 7-Mc. WAS, operating between 7020 and 7040 kc. almost daily, evenings our time . _ . _ . _ W2QHH collared **SP5ZPZ** (7062) and W2TZU is faintly hopeful of a card from **LX1GGL** (7040) although the chance is a long one. QSL to "G. Berger, 20 Louvigny St., Luxembourg."

* DX Editor, *QST*. Please mail reports of DX activity to W9BRD's home QTH: 1517 Fargo Ave., Chicago 26, Ill.

the fellow said . . . . . EK1TY and TA3FAS were captured by W1QMJ and UQ2AK made it 89 7-Mc. countries on Joe's tally sheet. SVØWJ, ZS6VV and PY2BBO were also worked . . . . . W8YGR came back from 20 long enough to bag **FM8AD** (7012) and **ZS1M** (7010) while W2LCB's indoor radiator called him to the attention of people like CE3BM, FA8RJ, GC3FMS, GD3UB, HA5FA, HC2IH, HK5HN, OH3NY, UB5DA, UB5DE, VP9RR, YU3FME and several ZS-men.

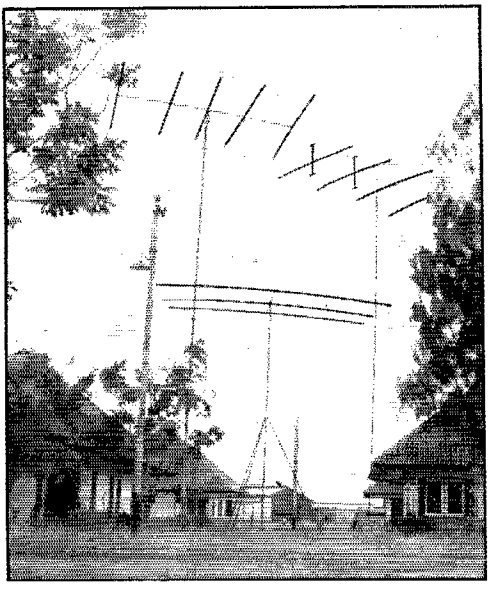
The spice market is cornered by *twenty*, as usual. Tarawa's **VR1A** (14,040 t7) is recommended by W5FXN and W6VFR finds **FK8AD** holding interviews on 14,111 kc. The latter sports 25 watts of 'phone and c.w. . . . . **CR1ØAB** (14,001 t8) is of interest at W1EWF, as well as **EL5B** (14,035), **VS6AC** (14,105), **VS1CW** (14,010), **SVØUN** (14,040 t7), VQ8CB, KJ6AH, KM6AP, IS1AHK and UP2KBC. Dick's new v.t. keyer proved of value in taking the local click-complainers off his neck . . . . . W2QHH's 35 watts is still potent: **YU3FMI** (14,077), **ZS6DO/ZS7** (14,000), **SP5ZPZ** (14,006), **SP1SJ** (14,001), **MD7WE** (14,041) and **VS6BC** (14,012) were contacted but Howy still stalks FN8AD and the AC4 boys . . . . . **GCs 2AWT** (14,060), **4LI** (14,120), **VPs 5AK, 6PV** (14,105), **FE8AB** (14,100) and the 7-watter of VP3FJ were collected by W8YGR while W6GPB made off with EL3A, TA3GVU, OQ5DF, **CR1ØAA** (14,100), MI3ZZ, LX1AS and VR2BF. PKs 1LR and 3LC, by the way, tell Joe to QRX on QSLs until theirs are received . . . . . PJ5RE, LX1VV (14,008) and **MI3DX** (14,127) were welcomed by VO6X. Jack observes that the Sardinia boys are rolling up their sleeves, IS1AHK upping soup to 100 watts and IS1FIC returning his 30-watter to the fray . . . . . "First half of DX Test was okay. I got on with the sole purpose of looking for new ones. Wasn't going to work any of the simple stuff or anything like that. The first sig I heard was a KZ5 and off I went!" So writes W8WWU and he wasn't the only one who entered that brawl with the moderate intentions of finding a new one or two only to wind up calling everything in sight. CT3AV, PK4DA, HR2HZ, and SP1CM make it 143 for Bill . . . . . W4MR ran down VP8AR in South Georgia, LX1JW, ZS3Q, ST2RD, UL7BS, AP5B, MD7XP, FF8JC, UA9CI and UAØKFD with FK8AC a much-sought-for new country. CR1ØAA continues to elude Al, mainly because of the superfluous verbosity of some Ws evidently seeking to popularize the RCC with the rarest of rare DX . . . . . KP4KD knocked off ZS9D, **EA9BB** (14,000) and OY3IGO from the new QTH and VK3ARV tells us of confabs with VQ2s GW, HC, VQ3SS, CR7BN, MD4KW, FA8DA and OA4AP. Ron has edited Aussie DX news and now is engaged in WIA Observer work, commercial signals in the amateur spectrum having become quite a headache in VK. Between DX sessions, VK3ARV is whipping a p.p.-807 c.w./a.m./n.f.m./s.s.b. rig into shape . . . . . **ZB2I** (14,068), **YU3FMG** (14,005), **TI2PZ** (14,000) and **PJ5FN** (14,088) were flagged down by W3QLW's Zepp and W9FDX tagged ZD2S, ZC6UNJ, IS1AYN, MF2AA and VQ4RF with the new 813s . . . . . W9KOK finds the polar routes in good shape with **AC3SQ** (14,104), **AC4s NC** (14,123), **RF** (14,145) and **HS1SS** (14,140). Mitch has, at least temporarily, an insidious form of TVI interfering with his DX operations — he can't keep from watching the squint-box himself. W2CSO also grabbed AC4NC after a long shadowing job . . . . . For the info of possible awaitees, EA6AF, UI8KBA, UJ8AF and MD4GC came through with cards to W8SYC . . . . . Making us feel even lower than usual, as Jeeves will agree, W9SHG made a 3-hour Chicago WAC without effort on KX6BA, JA2FE, VE8OD, FA8RJ and PY2QW. **VR5PL** (14,050), VP1AA and **YS1O** (14,045) were also snagged . . . . . W1JYH has a cutie in **ZZ9XY**, "Sierre Leone," who shined forth on 14,005 kc. **ZS7B** (14,000), **SPs 1KM** (14,080), **5AC** (14,010), **MS4FM** (14,035), **PKs 1LR** (14,040) and 2ZZ (14,065) are safer bets in Roger's log . . . . . Fearing that he has more r.f. in the shack than in the antenna, W5ONL nevertheless cranked his BC-459 up on 20 for YS1ZG, VP5JB and CX4CZ while G6RH was bumping into **FB8XX** of the Kergueiens on 14,030 kc., T9x . . . . . W3DPA was one of those fortunates to work **VQ9ON** (14,125) — unfortunates, perhaps, if he doesn't pan out to be proper . . . . . CR7IZ is another WAS-seeker, pursuing N. H., Nev., Mont., Idaho and N. Dak. near the low edge of 20, according to W4NUI.

Among the audio gang, XE1AC has a collection of quality: **VP8AI** (14,199), **VR5GA** (14,360), **MP4BAD** of Oman (14,317), **FS8PR** of Clipperton Island (14,170), **FF8DA** (14,345), **FK8AC** (14,168), **EA6AM** of the Balearics (14,194), **CR6AJ** (14,301), **CT3AC** (14,325), **MD7HV** (14,320), **UA3AM** (14,188), **UB5BV** (14,327), **VK1AJT** (14,312), **VU2ARCI** (14,340), **YO7WL** (14,311), **YK1AC** (14,307), **HZ1KE** (14,161), **XZ2KN** (14,307) and **LU3ZB** (14,115) of Melchoir Island, Graham Land, in Antarctica . . . . . W9JCD reports that W1QDE of the Williams College club now has an elaborate set-up in operation and tried same out on FM7WE, EK1AD, ZD1KO, and **CR5UP** (14,130) . . . . . W3QLW scored with **LX1DC** (14,305). **MD2AF** (14,320) and **I1RC** Trieste (14,168) . . . . . Successes at HC2JR feature FK8AC, **CE7ZG** in Antarctica (14,100), **SV5UN** (14,184), **CR7AH** (14,194), **VK1RD** (14,371), **VR5PL** (14,123), **PK1AF** (14,297), **VU2CQ** (14,342) and **AP2N** (14,297).

No foolin', about the quickest way to make DXCC these days is to glom onto a night shift at work and spend your daylight hours camped on *ten* 'phone. Of course, it isn't as easy as it sounds, but the stuff is there. For instance, here's W1EKU with PKs 1UA, 3LC, 3PH, 4DA, 5HL, XZs 2EM, 2PM, 2SY, VQs 2WP, 4RF, 5ALT, MP4s BAB, BAO, GD6IA, CP5FB, KR6DL, ZD4AU, KX6BH, VU2SD, UB5BV, 4X4CC, HZ1KE, YK1AC, VS9AH, CT2AE, 3V8AP, MF2AA and enough JAs to fill a call book. Vern joins in noting unusual Asiatic openings in the mornings, a la 14 Mc., and also wonders why XYLs are termed "SWs" in ZS6, translation unknown . . . . . W2AEB was in there swinging, too, for MD7HV, PK4KS, AP2G, CR7s AD, AH, CR5UP, MS4A, XZ2KN, ZD2JHP and last, but not least, VQ8AE . . . . . A fast WAC was reeled off at W9MUD and W2ZVS encountered VQ4NSH, YO7WL, MD2AC, MT2BFC, ZP3AW, VP1WS and the two hopeso's (see "Tidbits"), M1D and KV4AAT . . . . . Just to show you how good this band can be, W2ZJ netted a neat WAC on six consecutive calls; no CQs or "misses" in between. Ed adds ZS8A, FF7FB and OQ5CC to our synopsis and W1GOU now has 151 'phone countries on this band. His latest: VS7PS, MP4BAE, CR4AC, YO7WM, ZS6OS/ZS7, TF3MB, KM6AO, ZS9F and untold others . . . . . Before taking off for a month's engineering assignment at Wright Field, W2VRE managed **ZB1AJX** (28,356), **SVØAJ** (28,143), **SVØWY** (28,326), **ZC6JM** (28,475), **MD2MD** (28,316) and **FF8AH** (28,386) . . . . . W2KDS recorded a fast 'phone WAC with his indoor folded dipole and the

♦

Despite the necessity of dependence upon indoor antenna, ZS1DU is able to drive through an effective signal on 14-Mc. 'phone and c.w. The elaborate installation features an 80-watt transmitter with p.p.-807 final. Bruce was active from Rhodesia as early as 1928 under the call VP7SRB and was a previous licensee of ZE1JI.



With a set-up rivaling many of our Stateside antenna farms, PK4DA pours a relentless signal into all portions of the world. The beams shown are a 5-element close-spaced 10-meter, a 4-element wide-spaced 10-meter, and a 3-element close-spaced 20-meter job.

boys at W1QDE worked many of those already mentioned as well as MI3SZ and OE5YL.

If the neighbors know your voice too well, you might still find a few snappies on c.w. W9AND discovered ZC6UNJ, ZS3B, GC3EBU and YR2CC . . . . . And how about TF3EA, EK1AO, LX1JW, FA8s BG and IH at W1EWF? . . . . . W2QHH concludes this section with PK4DA on eleven (27,053) and YO3GY (28,117).

Where:

In a pinch, all MD7 stations may be QSLed to Box 451, Nicosia, Cyprus, says W8GER. And, if you're looking for some code practice, ask any SP fellow what the "PZK" in their bureau address (PZK, Post Box 320, Warsaw, Poland) stands for. We have it as *Polski Zwiazek Krotkofalowcow* . . . . TA3GVU would appreciate incoming QSLs be accompanied by stamped, self-addressed envelopes to ease the load on W2SN . . . . . At this writing the PJ gang is still somewhat undercover although a brighter near future is anticipated. Meanwhile, if they do give you their full QTHs, use no "radio" terminology on the envelopes. . . . . A new QSL bureau has been announced for Ethiopia: Robert Newbert, ET3AE, Box 145, Addis Ababa, Ethiopia.

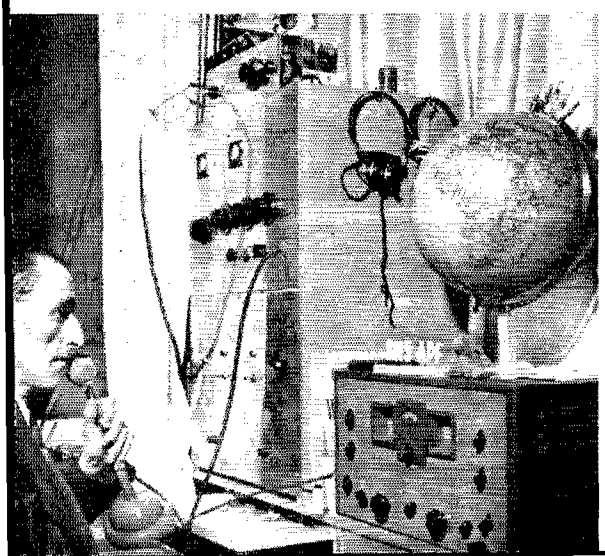
C3MY	(ex-C1MY) M. T. Yang, P. O. Box 34, Taichung, Formosa
CR4AE	Flavio A. da Cunha, P. O. Box 17, St. Vincente, Cape Verde Islands, P. W. A.
DL4ND	M/Sgt. Ford Robirtson, Transmitter Station, 7774 Sig Bn., APO 403, % PM, N. Y. C.
EQ8SAM	S. G. Morrison, 509 Weldon Ave., Oakland, Calif.
F9JD	Ajaccio, Corsica
F9OD	(in Corsica, QSL via REF)
FA8RJ	Henri Grossin, 16 Rue de la Paix, La Redoute, Algiers, Algeria
HC8GRC	Guayaquil Radio Club, Casilla 784, Guayaquil, Ecuador
KC6WC	Robt. Mawby, CiVad Unit, Navy No. 3054, FPO, San Francisco, Calif.
KV4AO	(via KP4KD)
KX6BA	(via W6PZ)
MD7DC	Box 451, Nicosia, Cyprus
MD7XP	Box 451, Nicosia, Cyprus
MP4BAO	(via RSGB)
PK1SM	(via W7AM)
PK3WH	W. F. Hartman, Embong Tjermee 25, Soerabaja, Java, Indonesia
PK4OO	Bert Modderman, Radio Department, Sungeigerong, Sumatra
PY5RT	Carlito Wielewski, Itaiopolis-Sta., Catariva, Brazil
SP2TH	(via PZK)
ST2RD	(via RSGB)
SV1SP	George Zarifis, 10, St. Famourion St., Pangrati, Athens, Greece
SV5UN	United Nations Radio Station, Island of Rhodes, Greece
TA3GVU	(via W2SN, see earlier)
VE8SM	QSL to Mrs. Don Chisholm, RN, Red Cross Hospital, Guysboro, Nova Scotia, Canada
VK9JC	Momote, Los Negros Island, Admiralty Islands
VP3FJ	Kindon Field, British Guiana
VP6PZ	Paul Carrington, Cheapside, Barbados, B. W. I.
VQ5ALT	P. O. Box 27, Entebbe, Uganda
WØMCF/C3	Capt. Howard J. Olson, Box 25, Navy No. 3923, FPO, San Francisco, Calif.
ZC6JM	QSL to John Marden, 2726 Ballentine Blvd., Norfolk 9, Va.

If any of these produce results for you, W1s EKU, FPS, IKE, JNV, RWS, RF; W2s CJX, CWK, MLW; W4s CYY, LZM, MR; W5FXN; W6s GPB, JKH/2, NTR; W8s GER, WWU, YGR; W9s CFT, JNB; VO6X — will not have labored in vain through contribution.

Tidbits:

The Guayaquil Radio Club and HC2JR have been having a deuce of a time getting under way on the aforementioned HC8GRC Galapagos jaunt. There was a cancellation of the April 3rd sailing which meant a postponement until the 14th. Mark says this same unpredictable transportation could leave them stranded on the spot for more than the planned duration! Lovers of turtle soup and birds' eggs among the expedition might not quake at such a horrific development, yet it must be admitted that the GRC has indeed rigged up a rigorous project for itself. The islands definitely are not a tourist's haven! . . . . . With eleven channels from which to choose, W4LZM was not surprised to see local WJAX-TV select Channel Two. That's just Bob's luck . . . . . GG2BMU is hot after his last half-dozen states on 20 c.w. and VO6X hopes his ears hold out long enough to let him find Montana, same band . . . . . W4CYY, keeping an ear to the ground, hears that AC3SQ cards are being disseminated in VK and that the ZLs have VQ9ON pegged as a ne'er-do-well, first class. W6VFR is not averse to sharing this opinion and has VQ8AD's VQ9 cable-operator friend giving the situation the look-see. Then, too, KV4AA told Marv that the British Virgin Island claimed as QTH by KV4AAT features on its topside naught but a bedraggled species of grass. [Say, Boss, who's the biggest phoney of them all? — *Jeeves.*] (Of that I wouldn't be sure, Jeeves, but I think I know who would look the funniest being choked with a headset cord.) . . . . . Squeezings from the W6 grapevine indicate that EA8AO worked only 'phone while in Rio de Oro and that MD4KW was the BERU Test call of HZ1KE. Also, that FB8XX may be a shipboard deal and there is a new FG8 entry in the making . . . . . Any stamp connoisseur who might be interested in exchanging a *QST* subscript for some Spanish mints drop us a line and we'll connect you with EA8CO and party . . . . . An MD7XP card to W8GER stated that contemporary Cyprus actives are MD7s HV on 'phone and c.w., WE, XP, DC, PE and JW. VQ8AD spends his mornings and evenings seeking the Dakotas, Wyoming and Utah for guess-what; uses a T8c VFO on 20 and 10 . . . . . DL4ND was much grieved by his inability to sign a promised portable-CZ during the

DX Test but the misfortune occurred through no fault of his own. "After writing a letter to the Director of Communication for Monaco and receiving a reply to the effect that I could operate from there I bundled up a portable rig and made the run of 750 miles thru the mountains down to Monte Carlo from Mannheim. . . . Upon arrival I went to see the man in charge of radio . . . was in the process of assigning me the call 3AAIA when they found out the Prince of Monaco had never got around to signing the Atlantic City Conference agreement and that amateur radio was as yet unauthorized in Monaco." Well, if that wouldn't be enough to make a preacher cuss! But Ford hasn't given up; as soon as the Prince slaps his X on the necessary documents back he goes with the rig, even with gas at 70 cents the gallon . . . . HB9JJ, who toils for the "HB-land FCC," dubs HE1SW a Blackbeard and W1RF hears that Fred of TA3GVU will remain in the Near East through September or October . . . . . The Greensboro (N. C.) Radio Club, with several crack DX men in the fold, recently expanded headquarters, doubling the size of their building. W4s MR and GG collected housemaid's knees in flooring the attic. The clubhouse has a pair of 304TLs on 75, the membership evidently preferring to work their DX at home where it counts . . . . . The military nets operating just outside the ham bands are causing a bit of confusion to neophyte DXers and some old-timers as well through the use of some juicy-sounding prefixes in the "A" series. Distinguish them from AC3, AC4, AC5, AG2, AP and AR8 and you'll have no troubles. Anyway, amateur "A" prefixes should only be found inside the bands . . . . . W2GVZ has just won a harrowing battle with TVI and W5FXN was told that ZS6DO is toying with the idea of operating from Madagascar if the red tape involved can be surmounted. Should be a tough go as even licensed FB8s seem to be having their troubles . . . . . W8ELL and W1JNV join in raising the roof regarding many diathermy-like r.a.c. carriers currently jamming 20 meters. We are particularly interested in hearing from others similarly troubled. For sure, if our best DX frequencies are being used intentionally or otherwise as a convenient spot for the setting of industrial gear or the like it's high time some commotion was raised. Gosh-all-heck, QRM is entirely sufficient as it is without coaching from the audience . . . . . Ex-KP4BJ-W4OLC was W4OLC/KV4 for a few weeks and is now dispensing KV4AO QSLs, being quite active on 14 and 3.5 Mc., 'phone and c.w. You'll hear him engaged quite often in schedules with his OM, KP4KD. Ev, by the way, just swapped a sticks QTH for one back in town but is still adding to his 178-country total. KP4KD's 9-watter, KP4KB, needs just one more continent for a WAC. (Who will bet that it isn't Asia?) . . . . . W9FWW is at work designing a "retractable" rotary beam after painfully watching some 90-m.p.h. breezes shred up his 60-foot-high 2-element job. This particular monsoon reaped about $150,000 worth of damage in Lincoln and undeniably cramped many W9 DX styles. The advent of spring saw icing conditions on many other midwestern skywires with many a slick beam being converted into a semblance of a third-hand trombone, jumbo size. Only goes to show that the lad with the old 40-meter Zepp does get a break once in a while.



W9ALI declares his new "A" mast didn't just break under the ice; it fairly exploded . . . . . ZS5BW received a bad break when the 8-month-old jr. op contracted polio. Fortunately, the chipper is improving. George is at the threshold of the Magic Circle, needing just four more veries to make the century . . . . . Making his portable-1 DXCC in good time, we note that W3EVT uses a double-conversion superhet employing, among other valves, *15* 6AK5s . . . . . PJ5RE joins in expressing the gratitude of the Curacao gang for the congeniality shown by U. S. amateurs, excerpting from a letter to W1BDI. They anticipate a more official status down there in the near future . . . . . Get out the crying towel if you expect San Marino confirmations from M1D or M1C. Marino, I1SN, asserts emphatically that M1B has remained the sole native licensee since the passing of M1A. All other M1 operation has been due to visiting I1 amateurs, namely, I1s AHV, ALU, HR, LT, PL and SN, at least through February of this year. Ah, such is life . . . . . VP7NM tipped off W8SYC that VP7NU uncorked 600 QSLs recently, mostly Statesward. 7NM, himself, is busy at work filling out some 1000 pasteboards as provided by Clint . . . . . W1HDQ's friend, PK4DA, sends good tidings from Indonesia. Representatives of the newly-formed Persatuan Amateur Radio Indonesia (persatuan for society) were officially informed that the lid was off and amateur band operation permitted. "Dozens of PKs, particularly in Java, are appearing on the air and undoubtedly more will come, most using low power," writes PK4DA. Every development of this nature is not only a boon to the DX angle but a forward step for amateur radio as a whole. [Gnats, stow the histrionics, Boss. Just because you think we stand a chance to raise one, now. . . . — *Jeeves*] . . . . . Quoting MT2E's Tripolitanian statistics, we find as active military-personnel amateurs MD2s AC, AF, AM, HN, KP, MD and PJ; civilian ticket-holders MT2s A, AB, BA, BFC, DZ, E, JT and PW. Identifying with former calls, MD2AC (W4LQQ), MD2MD (W6CSF), MT2A (ZS6LM), MT2BFC (G3BFC), MT2DZ (G3AXU, ZC6DZ, ZC6JZ, MD5DZ) and MT2AB, of course, is the XYL of MD2AF. Obsolete calls (owners having left Tripolitania) are MD2s B, BU, DH, G, H and I, MT2s C, D, F and FU. T1NS is also in this latter category. W9TRD loaned us this rundown . . . . . Medals should be struck for XYLs of the KX6BA (W6PZ) type. As W4HVQ attests, the young lady is handling the KX6BA confirmation department from the home location and doing a snappy job of it. If we recollect correctly, KB6AJ's better half shared a similar fate. DX Clubs looking to bolster slim agendas might well rig up a flourished testimonial or two to the honor of such gals . . . . . W2MLW, W1RXL of W1AW and others teamed up to donate VP7NN info. W2s COK and ZK, plus an unknown (to us) W8 ran up 800 QSOs early in the DX Test and assure a fast QSL policy, bless 'em. They are civilian engineers on a three-month assignment for the Signal Corps, these W2s, and their midwestern helper an army man. As mentioned previously, QSLs should have been sent to W2ZK's home address . . . . . Chet Davis, W4MUE, and now ZS6XT, will soon be signing VQ3MUE, VQ4MUE, and VQ5MUE. QSL through the ZS bureau.

— . . . —

Sharply reprimanded by W9AND for misreading his hand, we are behooved to move KL7ACI from the Valley of Ten Thousand Snakes to that of the Ten Thousand Smokes. Jeeves says he knows the place well. It was named, he declares, after the DX man who heard the world's longest and weakest CQ.

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SM5APF, the compact station of Gustav Gajner at Trancberg. Gus is brother to W1AKY who probably holds the SM-working championship of the U.S.A. SM5APF specializes in 10- and 20-meter 'phone.

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Correspondence From Members-

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

OVERSEAS MEMBERSHIP GIFTS

If you will refer to page 10 of the December, 1949, issue of *QST*, you will understand the reason for the letters below, which are only a few of the many similar responses. This arrangement still exists, should you wish to help out some overseas ham.

British Guiana, S. A.

Editor, *QST*:

The renewal membership/subscription certificate was definitely a surprise and a very happy and pleasant one! It is something I never expected. This is a very great gesture on the part of American amateurs and I am sure that all amateurs and members like myself who have been honored by such a gift will never be able to show enough of our gratitude to our patrons.

I have just finished writing my patron, to thank him for such a treasured gift, and want to express my thanks to the League also for nominating me to receive it.

— — — —, *VP3* —

London, England

Editor, *QST*:

Many thanks indeed for your letter containing the surprising and extremely pleasing news that W2 —— had entered my subscription for 1950. This generosity to an unknown foreign amateur exemplifies the bond which exists throughout the amateur fraternity, irrespective of international boundaries and policies. I am writing to thank him personally for his great kindness, which to anyone like myself who had envisaged a year without *QST*, is something akin to a blood donation. I should also like to take this opportunity of thanking you for effecting the introduction and also to wish success to all members of the staff of the ARRL in their continuous efforts to further the cause of amateur radio.

— — — —, *G3* —

Essex, England

Editor, *QST*:

It was quite a wrench deciding that I just couldn't keep up my sub to ARRL, and now to know that I am still in the ranks is a very comforting thought. Thanks a lot.

— — — —, *G4* —

TVI FILM

Chicago Suburban Radio Assn.
2000 South 2nd Ave., Maywood, Ill.

Editor, *QST*:

The membership was greatly impressed with the possibilities of cleaning up TVI and was very pleased with the picture. We want to express our appreciation to ARRL.

— *D. P. Zochert, W9ZSQ*

Hallicrafters Co.
5th and Kostner Avenues, Chicago 24, Ill.

Editor, *QST*:

The TVI film was shown to approximately 600 hams. All of us were extremely enthusiastic about the film . . . and how well it showed the solution of TVI.

— *F. A. Franke*

821 University Block, Syracuse, N. Y.

Editor, *QST*:

Fifty amateurs were present from the area. Everyone was grateful for the chance to see it, and they realize that you are doing a fine work.

— *Richard M. Walker, W2ZOL*

American Overseas Airlines
LaGuardia Field, New York, N. Y.

Editor, *QST*:

We had two showings of the film in our Flight Department classroom, attended by about 75 interested electrical specialists, radio mechanics, and hams. They found the film most interesting and constructive, and I am sure it will be of great assistance in helping us eliminate TVI.

— *James G. Flynn, jr., W2ZO*

710 Williamson Building, Cleveland, Ohio

Editor, *QST*:

Your film on TVI was exceptionally good and well received by the servicemen who attended our factory service school. We thought this was an excellent approach to a problem which is getting more serious every day.

— *R. L. Merwin, jr.*
Field Service Engineer, General Electric Co.

DOORKNOB POLISHERS

3938 East Elmwood, Tucson, Arizona

Editor, *QST*:

I have noticed within about the last year a condition on our c.w. bands which I think it is time someone called notice to. During a contact there is not much waste of words and everything is put across easily. Then comes the end of the QSO. The average station takes almost as much time to say good-by as he takes during all the rest of the contact. It seems we are afraid that the other station will be offended if we just say 73 ES CUL. They want to make a ritual of it and send all sorts of greetings and good-bys when just a few words or even letters would express their regards just as fully. Some of them go about it as though they were lovesick farm boys saying good-by to their best girl for the next ten years.

— *William J. English, W7LHI*

QSL

6000 Outlook Ave., Mission, Kans.

Editor, *QST*:

Never thought too much about this QSL problem before so long as I sat nightly at the controls of SU1US. As a matter of fact, I nearly wore my fingers to the bone answering them all, and felt rather righteous about it.

So then I returned to the States about a year or so ago. Thoughts of DX didn't bother me a bit; I'd had all of that I wanted. But it sure seemed like a lot of fun to garner in a WAS with my 0.06 gallon, optimistically computed as my output. All I needed was the QSL cards from 48 states. But I never started to compute how many cards to how many states I would have to send out to get those 48 back. If I had, perhaps I never would have started trying! It took 16 to different W6s before I could cross that one off my list. So, 250 contacts and 150 cards later, I find that I only need confirmations from 18 states more.

Probably I wouldn't feel quite so wrought up if a ham would come right out and say, "Sri, OM, never care about

(*Continued on page 120*)

Hints and Kinks For the Experimenter

NULL INDICATOR FOR THE BC-221

THE UTILITY of the BC-221 frequency meter can be increased considerably by the addition of a null indicator that gives positive indication of exact zero beat between the crystal and the heterodyne oscillator or the signal from a near-by transmitter. A 6E5 "magic eye" tube can be added without circuit complications, as shown in Fig. 1.

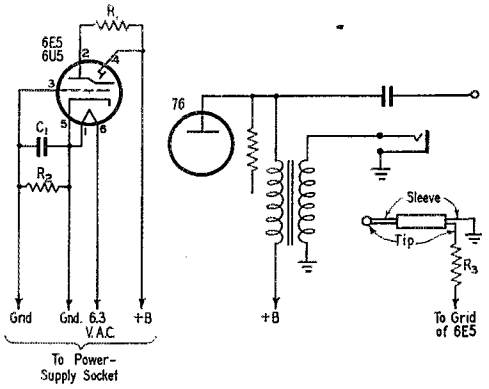


Fig. 1 — Circuit for using a 6E5 electron-eye tube as a null indicator with the BC-221 frequency meter. The connections at the base of the 6E5 are shown at the left, with the method of connection to the output transformer in the BC-221 at the right.
C_1 — 0.001-μfd. mica.
R_1, R_2 — 1 megohm, ½ watt.
R_3 — 47,000 ohms, ½ watt.

In operation, the wavemeter is tuned until the eye shows the greatest opening. This method is much more reliable than merely listening for zero beat in the headphones, and is especially useful when the incoming signal is weak. In such case, when the beat approaches zero, the last few cycles become inaudible, but they are clearly visible on the eye tube.

The 6E5 could be mounted inside the wavemeter cabinet, but in the interest of keeping heat to a minimum for added accuracy, I mounted it externally with provision for connecting it to the wavemeter circuit through the headphones jack, as shown. The 6E5 itself is mounted on the top of the wavemeter cabinet. The small parts used in the circuit can be mounted inside the tube-socket cover. Power is obtained from a separate output socket on the power supply used to operate the wavemeter, with the +B lead being tapped into the circuit ahead of the VR tubes to obtain the full 250 volts for the plate of the 6E5. The connection from the 'phone plug to the grid of the 6E5 passes through an extra terminal on the power plug, with R_1 mounted on the power socket.

The addition of this gadget has made a big improvement in my BC-221, and it is hoped that others will be able to derive the same benefit from it. — *W. A. M. Wood, VE4MW*

IMPROVEMENT FOR SOLDERING IRONS

IN MANY soldering irons, especially the cheaper ones, the tip does not fit snugly in its socket after a few weeks of use. A layer of oxide forms on the base of the tip inside the socket, and heat conduction is greatly impaired. Scrape the tip until the oxide is removed and the bare, bright copper shows. Also scrape the inside of the socket to remove the oxide scale. Then wrap the base of the tip with aluminum foil (available in hardware stores for food-storage purposes). Use only enough foil to shim the tip to a snug fit within the socket.

This little kink will usually restore the iron to its original efficiency. — *Charles Erwin Cohn*

DIRECTION-INDICATOR HINT

MOST of the synchro motors available in surplus for use as direction indicators have one serious shortcoming. They lack the finished appearance that comes only after the addition of a neat compass rose to show what direction the beam is headed. This need can be filled simply by almost any ex-GI who still has the little compass supplied by Uncle Sam.

Fig. 2 — A neat direction-indicator scale made by photographing a compass rose.

Remove the compass rose from the compass, and have it photographed by your local studio. If you know the size you want the finished article to be, enlarge it to the exact dimensions needed. A reverse print, as shown in Fig. 2, cemented to the indicator makes a very attractive and useful addition to any set-up. The cost is low, and extra prints for "deserving friends" can be obtained whenever needed. — *William W. Orr, W2OWQ*

SOLDERING TO POLYSTYRENE COIL FORMS

TO ELIMINATE the need for gripping the pins of a polystyrene coil form with pliers when connections are being soldered, use of the gadget shown in Fig. 3 is highly recommended. It is a short length of brass with a hole the size of the terminal drilled in it, plus a slot to permit a nice sliding fit to be obtained.

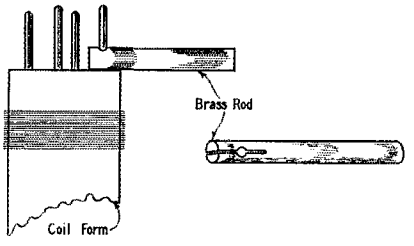


Fig. 3 — Handy "third hand" for preventing polystyrene coil forms from melting during soldering operations.

Just slip the brass over the terminal, and apply solder as you would with a bakelite form without fear of melting the pin out of the form. Furthermore, when it becomes necessary to remove the winding for change or for use in another rig, you can remove the winding with ease and safety so long as the brass rod is in place. — *J. E. Dussault, VE2EV*

MEASURING CENTER IMPEDANCE OF ANTENNAS WITH THE "TWIN-LAMP"

THE CENTER IMPEDANCE of the driven element in a beam antenna can be measured quite simply with nothing more than a few carbon resistors, a source of r.f. at the operating frequency of the antenna, and the well-known "twin-lamp." [1] It is best to use a low-power source of r.f. so that the size of the resistors used may be kept small.

The first step is to check the impedance of a length of Twin-Lead that can be used as a feed line to the antenna. In most cases the actual surge impedance of the so-called 300-ohm Twin-Lead is closer to 250 ohms. To check this, couple one end of the feed line to the source of r.f., inserting the "twin-lamp" at a convenient point in the line. Then connect *noninductive* resistors totaling about 300 ohms across the other end of the line. Add or subtract resistance until the lowest standing-wave ratio is indicated by the "twin-lamp." If you change the resistance in steps of 25 or 50 ohms, you can obtain a close approximation of the actual line impedance.

Now connect the antenna in place of the resistors, noting the indication obtained from the "twin-lamp." Next place resistors of equal resistance in each leg of the feed line where it joins the antenna. Start with 25-ohm resistors, then change to 50 ohms, then 75 ohms, and so forth, each time noting the change in s.w.r. indicated by the "twin-lamp." If the s.w.r. drops as the series resistance is increased, continue the process until a minimum is indicated. The impedance of the antenna is then obtained by subtracting the sum of the series resistors that produced the lowest s.w.r. from the line impedance obtained in the first measurements.

If the series resistors increase the s.w.r., it is an indication that the line impedance is lower than the center impedance of the antenna. In such case, connect resistance across the line where it joins the antenna, changing the resistance until the minimum s.w.r. is indicated. Considerably larger resistance values will ordinarily be required than for the series-resistance case described above. The impedance of the antenna is calculated from the line resistance and the resistance value that produced the lowest s.w.r. using the formula for resistors in parallel.

$$x = \frac{ab}{a - b}$$

where x is the unknown impedance, a the value of the resistor, and b is the impedance of the line.

A few words of caution are needed here, because accurate results can be obtained only when noninductive resistors of known r.f. resistance at the operating frequency are used. In most cases any good carbon resistor should be suitable. Using several carbon resistors in parallel and short leads will help to eliminate the inductance problem. In addition, error can be caused if the antenna impedance is not purely resistive, which will be the case if the antenna length is incorrect for the frequency used. — *Reuben E. Gross, W2OXR; Nafta, 4X4AM*

INDUCTIVE COUPLING SYSTEM

A SIMPLE inductive coupling unit for use between stages in a transmitter can be made from one of the "swinging link" coils manufactured for use in low-power transmitters. In most cases, coils with the variable link feature consist of two separate coils joined together to provide a center tap, and the link coil is inserted at the center between the two coils.

(Continued on page 122)

[1] *The Radio Amateur's Handbook*, 1950 edition, p. 498.

Operating News

F. E. HANDY, WIBDI, Communications Mgr.
JOHN E. CANN, WIRWS, Asst. Comm. Mgr., C.W.
GEORGE HART, WINJM, Natl. Emerg. Coördinator

J. A. MOSKEY, WIJMY, Deputy Comm. Mgr.
L. G. McCOY, WIICP, Asst. Comm. Mgr., 'Phone
LILLIAN M. SALTER, Administrative Aide

Use Amateur Service, Start a Message. Are you as an individual getting the most from your amateur radio that it has to offer? Rag chewing? DXing or experimenting? Trafficking? It is the right of every amateur to send and receive messages at any time in the domestic pursuit of our hobby. Let's not limit our starting traffic just to the holiday season.

The framework or plan of the National Traffic System permits a message to go from state or section level to regional and national (area) levels and back to the same section systematically. All amateurs are invited to report into section nets, either one night a week or all nights, as the spirit moves. There is nothing "exclusive" about working in one's section net. Just drop a card to ARRL for the latest Net Directory and you will have the necessary information on frequency and time. You will be welcomed with open arms if you call in on your net frequency and present a message for some point to be handled through channels by the group that specializes in this work. *Originations* are heartily welcomed. Messages for *any* point in the nation can be sent. To members of nets who declaim that they never receive any deliveries we offer this bit of advice: *Start a message* requiring reply to you. For many years clubs and aggressive traffic-minded amateurs have used message boxes, placards in convenient spots, and solicitation through friends to enjoy the opportunity to secure *more* good traffic to handle. There is equally excellent traffic to handle where using one's own list of acquaintances, including the radio amateurs met at conventions, clubs or over the air! Don't expect that just by QNI (report) into a net night after night a lot of traffic will come your way. Shake it up a bit. *Start some messages yourself* and see what gives!

Received OK? *Receipting* is a first essential in constructive communications work, whether conversation or record communications are involved. Accuracy is of top importance in conveying intelligible thoughts from one place to another. Misinterpretation of a single word can result not only in changed emphasis but in incorporation of entirely new and different meanings in a transmission. The expression "Roger" on 'phone or a concise "R" on c.w. should *not* be used in extending acknowledgment of receipt until all has been received accurately and correctly. On this subject W8YFJ of Fremont, Ohio, writes: "For some time, I have noticed a vast increase in such as the following: WØXYZ DE W1PDQ $\overline{BT}$ RR OK OM SRI DIDNT GET ANY OF THAT QRM BLAH BLAH. . . . The trouble seems to be mostly with beginners. Some, however, picked it up from old hands that never learned the meaning of 'R.' 'R' is not ever to be used to show that one *heard* the other fellow's signal but that the material transmitted was copied *solid*."

Pride in technique will not permit the skilled communicator to "Roger" (R) for a transmission unless wholly received. An amateur can demonstrate his experience and adequacy by doing things the right way or on the other hand his ineptness just by his lack of acceptance of responsibility and pride in a decent standard of performance. The little matter of receipting correctly, or frankly going at the request for a repeat or fill as it may be required, can make the difference and show you as a responsible and experienced operator.

On Listening First. W4PSB confirms the remarks above from Ohio, stating that such things as RST 5- - QRS QRM CAN'T GET YOU are too often heard in spite of the definition of "5" as *perfectly readable*. He reports other difficulties due to thoughtlessness. It is not uncommon on 7 Mc., he says, to hear as many as three amateurs madly calling CQ on the same frequency. Why not a little *listening first* to keep the QRM down, and to help find a spot which will yield a better possibility of bringing a reply with chance for satisfactory QSO!

Armed Forces Day. Remember the annual Navy Day receiving competitions? With unification of services, that October activity by one service was discontinued. In its place we have the opportunity (May 20th) to participate in an activity established by all departments of the military, the Armed Forces Day Receiving Competition. There will be certificates . . . and a separate QSO activity too. Please see the full announcement in April *QST*.

June V.H.F. QSO Party. OESs and all v.h.f.-interested amateurs are invited to get set for another ARRL V.H.F. Party, coming up the first week end in June. There's just about time to get

up some new antenna arrays and to have any newly-built v.h.f. gear ready for a tryout June 3rd–4th.

— *F. E. H.*

FEBRUARY FMT RESULTS

The first 1950 Frequency Measuring Test, open to both ARRL official observers and other amateurs, was held on February 6th. It was one of the most successful tests yet, from the standpoint of participation; 206 entries were received, 99 from observers and 107 from non-observers. A total of 660 measurements was made by those taking part. A report comparing the accuracy of his measurements of the W1AW FMT transmissions with those of a commercial laboratory has been sent to each participant.

The leading entrant in the OO group was Robert S. Palmer, W9CIH, with a calculated accuracy of 0.1 part per million. OM Palmer was also top observer in the second 1948 FMT, and has been consistently accurate in succeeding tests. Top honors in the non-OO category go to Edward J. Panner, W3LOX, whose accuracy of measurement also figured to 0.1 part per million. The standings of other leaders in the test are listed below. Since the official readings can only be accredited to 0.4 part per million, the decimal is shown only to permit establishment of listing order. In accordance with FMT rules, no entry consisting of one measurement was considered eligible in the competition.

LEADERS

Observers	*Parts/ Million*	*Non-Observers*	*Parts/ Million*
W9CIH	0.1	W3LOX	0.1
W2OUT	0.2	W8HB	0.4
WØOTR	0.6	VE3CBG	1.4
W1EFQ	0.9	W4QN	1.7
W1MUN	1.1	W9NZH	2.2
W2RYT	2.6	W8WXY/8	3.9
W3ASW	2.6	W4LNT	6.4
W2ZT	3.4	W6KJG	7.0
W1BKG	3.4	W5BDX	7.1
W1BGW	3.8	W5PIN	7.9
W3ADE	4.0	W1PXI	8.2
KH6BA	4.2	W2SKM	8.5
W7GP	8.7	W9JNU	9.1
W2BEI	9.3	W5EVZ	10.4
W1QVF	10.0	W1AOS	10.4
W8VZ	11.3	W6AFH	10.8
VE6HM	12.5	W9PHV	11.4
W9UKT	12.8	W9BNO	13.1
WØEG	13.3	W6YNM	13.7
W5BKH	14.1	W4JUI	15.2
W8HUD	15.9	W9ATY	15.3
WØIWE	17.3	W3BYB	15.7
W8JRG	18.4	W4KJS	16.6
W1LQQ	19.0	W1PNA	16.8
W4WO	19.2	W1IHI	18.1

The following ratings are based on a single measurement: OOs — W1VW 0.0, W1PXH 0.6, W2WI 11.7, W1ON 13.1, W7KL 18.9, W6YSK 19.0; non-OOs — W8ZCJ 0.0, W2SQB 0.9, W2PIU 5.1, W1JSY 16.5.

♦

Traffic handlers and DX men are familiar with Capt. Walter Laing, KG6USA, ex-KG6FI, one of the well-known amateurs on Guam who handles a goodly amount of GI traffic. Active on the 10- and 20-meter bands, 'phone and c.w., Capt. Laing has provided many amateurs with KG6 contacts. He has on numerous occasions arranged for the military and civilian personnel on Guam to talk to their friends and relatives in the States via his station.

May 1950

A.R.R.L. ACTIVITIES CALENDAR

May 5th: CP Qualifying Run — W6OWP
May 16th: CP Qualifying Run — W1AW, WØTQD
June 3rd–4th: V.H.F. Contest
June 4th: CP Qualifying Run — W6OWP
June 15th: CP Qualifying Run — W1AW, WØTQD
June 24–25th: ARRL Field Day
July 1st: CP Qualifying Run — W6OWP
July 17th: CP Qualifying Run — W1AW, WØTQD
July 22nd–23rd: CD QSO Party (c.w.)
July 29–30th: CD QSO Party ('phone)
Aug. 4th: CP Qualifying Run — W6OWP
Aug. 18th: CP Qualifying Run — W1AW, WØTQD
Sept. 9th: CP Qualifying Run — W6OWP
Sept. 20th: CP Qualifying Run — W1AW, WØTQD
Sept. 23rd–24th: V.H.F. Contest
Oct. 6th: CP Qualifying Run — W6OWP
Oct. 14th: Simulated Emergency Test
Oct. 17th: CP Qualifying Run — W1AW, WØTQD
Oct. 21st: CD QSO Party (c.w.)
Oct. 28th: CD QSO Party ('phone)

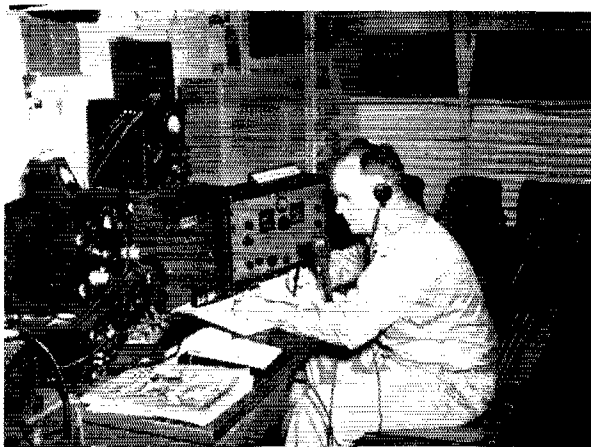
CODE-PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW/WØTQD will be made on May 16th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters. Frequencies of transmission from W1AW will be 1887, 3555, 7215, 14,100, 28,060, 52,000 and 146,000 kc. WØTQD will transmit on 3534 kc. The next qualifying run *from W6OWP only* will be transmitted on May 5th at 2100 PST on 3590 and 7248 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of *all* qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the five speeds transmitted, 15 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening, Monday through Friday, at 2130 EST. References to texts used on several of the transmissions are given below. These make it possible to check your copy. To get sending practice hook up your own key and buzzer and attempt to send in step with W1AW.

Date	Subject of Practice Text from March *QST*
May 1st:	*A Beginner's Four-Tube Superhet Receiver*, p. 11
May 3rd:	*Incandescent Light Flicker*, p. 18
May 5th:	Qualifying Run, 2100 PST, from W6OWP only
May 9th:	*Eliminating TVI with Low-Pass Filters*, p. 20
May 11th:	*Crystal-Controlled Oscillators*, p. 28
May 16th:	Qualifying Run, 2130 EST, W1AW, WØTQD
May 17th:	*A 2-Meter Station for the Novice*, p. 34
May 19th:	*Calibrating a BC-221 Frequency Meter*, p. 40
May 22nd:	*On the Air with Single Sideband* p. 44
May 25th:	*Technical Topics*, p. 46
May 30th:	*The Difficult Takes a Long Time*, p. 48



A.E.C. TIP-OF-THE-MONTH

In case you think the rig installed in your car is the last word in versatility, ask yourself this: How quickly can you take it *out* of your car to operate elsewhere? There are lots of places where cars cannot go. Design equipment with this in mind. Put handles on it for portability. Construct it to operate either from batteries or commercial power. If remote-controlled in back compartment of car, put duplicate controls on the equipment itself so it can be operated anywhere. — *W6ESR*

AEC organizers have many crosses to bear. We hear about them every day. Everyone has his particular problems, of course, but there are many common ones: the eternal fight for local recognition and for participation by local amateurs, equipment worries, strife between intra-community groups, QRM on your emergency net frequency, etc. If we got paid for all this, it might make it easier to bear, but sometimes we think we should see our psychiatrist for going to all this trouble for, monetarily speaking, nothing.

Why do we do it? What is the driving power which makes us take our emergency organization work so seriously, which makes us insist on the best of everything? Well, the answer varies with different people, but the principal reason is self-satisfaction — satisfaction of doing a good job and doing it well, the satisfaction of knowing that you are doing somebody a service, the feeling of pride that you stand high in the eyes of your fellow amateurs and your townspeople. In other words, we do what we do because for some reason we enjoy it, notwithstanding the fact that we gripe and complain and think the other fellow is all wet.

There are many problems to deal with in AEC organization, to be sure. Many of them appear to be insurmountable, many differences of opinion irreconcilable. Some organizers throw up their hands in despair, resign their positions, and devote their amateur radio to rag chewing or DX-ing. But amateur radio in general and the AEC in particular are the better, not the worse, for having to deal with all these problems peculiar to amateur radio. Where else can one get such a combination of training in communications techniques, personnel management, sociology, and political science? An EC who gets a local emergency organization in top shape has received the benefit of this diversified training, has "been through the mill," and we take our hats off to him. And it behooves *you* to remember, OM, when you are giving him a "hard time," that he did not accept the appointment of EC for his health or for the money he gets out of it.

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The South Texas Emergency Net received a tribute recently from none other than the Hon. Allen Shivers, governor of Texas. This was in the form of a recorded message from the Governor transmitted by W5NXD. It said, in part: "Whenever disaster strikes and however grave the circumstances and inconvenient the assignment, the amateur radio operator has always been a significant and well-nigh indispensable part of the relief organization. No one knows or can realize how much suffering has been averted, how much property has been saved through the public-spirited activity of the amateur radio operator. In the days ahead, the significance and the value of this contribution to public well-being will be vastly increased." A very nice tribute, STEN!

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The United States Weather Bureau is preparing to supplement its extensive forecasting communications set-up with amateur radio facilities. W2ZDE has been appointed as regional coördinator for Region 1 and is busy lining up amateur facilities along the various river valleys in the northeastern states. Several river-valley nets are already in existence and maintain regular drills. Operators who feel they might be interested in this work should contact W2ZDE for information. Meanwhile, the various Weather Bureau stations are being informed by their headquarters of the desirability of maintaining liaison with the amateur groups so established.

— • • • —

During the tornado and flood threat in the Wood River-Wanda (Illinois) in January, members of the Egyptian Radio Club's Mobile Emergency Corps rendered material assistance to the U. S. Coast Guard in maintaining communication between Alton, Wood River and Wanda. As a result, they have received a letter of commendation from the Chief of the Communications Section, 2nd Coast Guard District. Amateurs who took part in this operation were W9s DJG, EKP, ILM, JPT, RVF, RVT, TCB, THB, TSS, UZU, YZE, and WØs PGI, QDF and RCE. Members of the Corps were called out by W9YZE from his mobile station immediately after the tornado. The club station, W9AIU, was also active on all amateur bands.

The Egyptian Radio Club has offered to supply emergency mobile stickers free of charge to any group interested in forming a mobile emergency corps. Contact W9DJG if interested.

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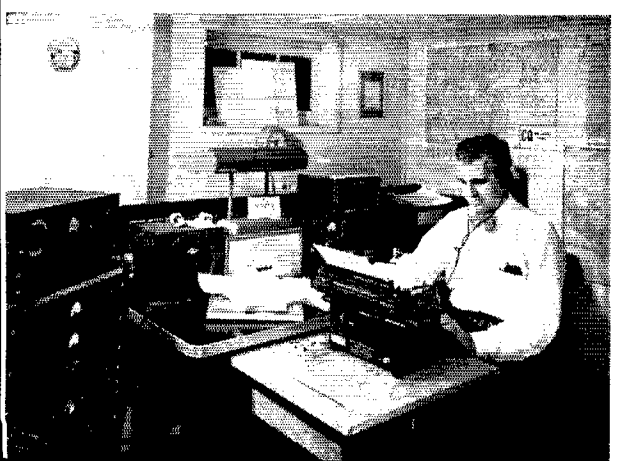
It should be a matter of some interest to emergency coördinators that the United States Naval Reserve is implementing plans to effect liaison with local amateurs of the ARRL Emergency Corps, for the purpose of planned interchange of facilities in the event of emergency. Local USNR units have received instructions to offer their facilities locally wherever a need can be served. In some cases liaison has already been effected and has resulted in successful carrying-out of emergency communication missions. Your emergency plans are not complete if you have not effected liaison with all agencies whom you can serve and who can serve you. Your local USNR unit, if any, may be interested in being included in your plans, and may be able to assist you at the local level.

♦



This neat basement layout is the source of that booming signal from W2CLL, the energetic SEC of Eastern New York. The transmitter uses a pair of 35Ts running 500 watts input into separate antennas for 80, 40 and 20, all fed with underground RG-8/U coax. The possession of appointments as RM, ORS, OO, managership of the ARRL National Traffic System's Eastern Area Net, and membership in the A-1 Operator's and Rag Chewer's Clubs makes W2CLL one of the busiest and best-known hams in the east.

On March 7th a blizzard struck the north Midwest with such force that all means of normal communication were down and amateur radio took over. Accordingly, FCC declared North Dakota, South Dakota and Minnesota and the area 500 miles surrounding as an emergency area and ordered 3925, 3940 and 3955 kc. cleared for emergency operation. National Emergency Net and other stations surrounding this area were alerted by ARRL and put on the job monitoring the cleared frequencies and handling communications for places outside the emergency area. The FCC emergency declaration was terminated March 12th. Reports of operations are starting to trickle into headquarters and will appear in the June issue of *QST*.

NATIONAL CALLING AND EMERGENCY FREQUENCIES

C.W.	*'PHONE*
7100 kc. (day)	3875 kc.
3550 kc. (night)	14,225 kc.
14,050 kc.	

During periods of communications emergency these channels will be monitored by stations of the National Emergency Net for personal-inquiry traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

BRIEF

All you fellows with wire and tape recorders might be interested in the work that is being carried on in the ten-meter band. Amos Kanaga, W6BAA, and several other amateurs around the country have been making recordings of the band with the view of studying propagation and band conditions during the year. The procedure is that a station with a recorder gives a general call to any stations willing to make a test and then proceeds to record each station calling and wishing to be included. The recording is then played back and the amateurs that participated have a chance of hearing and studying all stations on the record which will give some clue to conditions in all the various call areas including DX points. Sunspots, aurora, and other phenomena can be correlated to give information as to what conditions give the optimum band conditions. Any amateurs interested in taking part can contact W6BAA, 623 Capuchino Drive, Millbrae, California.

DENVER DAY

Amateurs in the Greater Denver area are coöperating to make May 7th "Denver Day." Denver hams will be on the air that day for rag-chews, filling in that WAS and for handling traffic to or from neighboring points. Denver stations will be identified by their call WØ- - -/DEN; they will be listening for CQ DEN from other amateurs and will be grouped on the following frequencies to facilitate contacts: C.w. — 3550–3575, 7100–7125, 14,100–14,125, 28,050–28,100; 'phone — 3850–3875, 14,200–14,225, 28,950–29,000 kc. During "Denver Day" messages will be especially welcome for patients at Fitzsimons and Ft. Logan hospitals, and other military hospitals in the vicinity. Traffic to other points in Colorado can be swiftly handled.

W1AW OPERATING SCHEDULE

(All Times Given Are Eastern Standard Time)

Operating-Visiting Hours:
Monday through Friday: 1130–0600 (following day)
Saturday: 1900–0230 (Sunday)
Sunday: 1600–2200

General Operation: Use the chart below for determining times during which W1AW engages in general operation on various frequencies, 'phone and c.w. Note that since the schedule is organized in EST, certain morning operating periods may fall in the evening of the previous day in Western time zones.

W1AW will not be open from midnight May 29th to midnight May 30th, in observance of the Memorial Day holiday. On Saturdays and Sundays during which official ARRL activities are being conducted, W1AW will forego general-contact schedules in favor of participation in the activity concerned.

Official ARRL Bulletin Schedule: Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules:

Frequencies:
C.W. — 1887, 3555, 7215, 14,100, 28,060, 52,000, 146,000 kc.
'Phone — 1887, 3950, 14,280, 29,000, 52,000, 146,000 kc.

Times:
Sunday through Friday, 2000 by c.w., 2100 by 'phone.
Monday through Saturday, 2330 by 'phone, 2400 by c.w.

Code-Proficiency Program: Practice transmissions are made on the above-listed c.w. frequencies, starting at 2130, Monday through Friday. Speeds are 9, 13, 18, 25 and 35 w.p.m. on Monday, Wednesday and Friday, and 15, 20, 25, 30 and 35 w.p.m. on Tuesday and Thursday. Approximately ten minutes of practice is given at each speed. Next certificate qualifying run from W1AW and WØTQD is scheduled for May 16th; from W6OWP, May 5th.

W1AW GENERAL-CONTACT SCHEDULE

W1AW welcomes calls from *any* amateur station in accordance with the following time-frequency chart:

EST	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0015–0200 *	7215	.....	3555	7215	3555	7215	3555
0200–0300	.....	.....	← 3950- or 14,280-kc. 'phone ** (Tues. thru Sat.) →				
0300–0400	.....	.....	← 3555-, 7215- or 14,100-kc. c.w. ** (Tues. thru Sat.) →				
1130–1230	.....	← 29,000-kc. 'phone (Mon. thru Fri.) →					.....
1230–1300	.....	← 28,060-kc. c.w. (Mon. thru Fri.) →					.....
1500–1530	.....	.....	14,100	14,100	14,100	14,100	.....
1530–1600	.....	14,280	14,100	14,100	14,100	14,100	.....
1600–1700	.....	14,280	← 29,000-kc. 'phone (Tues. thru Fri.) →				.....
1800–1900	14,100	3950	7215	14,280	7215	14,280	.....
2015–2100 *	14,100	146 Mc.	52 Mc.	7215	14,100	7215	.....
2110–2130 *	3950	14,280	3950	14,280	3950	14,280	.....
2230–2330	.....	3950	1887	3950	1887	14,100	.....

* Starting time is approximate. General-contact period on stated frequency begins immediately following transmission of Official Bulletin which begins on the hour.

** Operation will be on one of frequencies stated, depending on propagation conditions, expediency and general activity.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....231	W3BES.....220	W6MEK.....211
W6VFR.....225	W8HGW....218	G6RH.....211
G2PL.....221	W2BXA.....217	WØYXO.....211
W6EBG.....220		W3GHD.....211

RADIOTELEPHONE

W1FH.....187	VQ4ERR....169	W9RBI.....159
W6DI.....177	W8HGW....165	W4CYU.....158
XE1AC.....172	W2BXA.....162	G2PL.....158
	W1JCX.....160	

From February 15 to March 15, 1950, DXCC certificates and endorsements based on postwar contacts with 100 or more countries have been issued to the amateurs listed below.

NEW MEMBERS

ON4TA.....151	ZL3HC.....104	W2PJM.....102
W6LS.....117	W6LMV.....103	WØCWW.....101
ZC1CL.....116	KH6VP.....103	OK1GT.....101
W4AZK.....115	WØFET.....102	W1MLT.....101
W5LHP.....110	G4JB.....102	W8CJ.....101
W8NJC.....109	W3EVT/1....102	WØBFY.....100
G2DHR.....109	ZE2JN.....102	W5LXY.....100
ZS6KK.... 109	HB9FI.....102	I1VS.....100
OH6NZ.....105	KZ5WZ.....102	W4OG.....100

RADIOTELEPHONE

PK4DA.....117	W2JY.....104	W2ZKG.....101
W5JJA.....112	VE7MS.....102	W9JJF.....100
HC2OT.....110	W2UTH.....101	W8AJW.....100
	I1RB.....101	

ENDORSEMENTS

WØNUC....210	PAØGN.....150	W8HFE.....130
W6GRL.....210	I1IR.....150	W2BJ.....129
W1ME.....200	W9YNB.....147	W1BFT.....128
W2NSZ.....191	ZL1BY.....144	EI5F.....125
W9RBI. ...191	KP4CC.....143	W6OBD.....124
W1ENE.....190	W7BE.....142	ZL3CC.....124
W3OCU.....181	W1CLX.....141	G3YF.....124
W2AGW....181	W1FTX.....140	PAØMZ.....123
W2HMJ....174	CE3DZ.....140	VQ8AD.....123
W9TJ.....171	W5IGJ.....140	ZS6GI.....123
VK5JS.....165	W4DHZ.....140	W3LPF.....122
HB9J.....162	W2QCP.....140	W4IYT.....120
HB9DO....161	W2RWE.....140	W2OST.....120
W8UDR ...160	W7PGS.....134	W6ATO.....120
W3JKO.....160	W4CYC.....134	SM5WI.....116
W5JC.....160	W1LZE.....133	W1JMT.....114
W4OM.....160	W6EYR.....132	VE3ACS.....113
G2FSR.....160	HK3CK.....131	W2MYY.....112
W8UAS.....160	PAØIF.....130	W6EAY.....111
W8SYC.....160	W1MUN....130	W3KQU.....111
W1LOP.....153	W6LDD.....130	W8AJW.....111
WØEYR.....151		G3CBN.....110

RADIOTELEPHONE

W8REU.....155	W9TJ.....122	W1MMV.....112
W7MBX.....142	W6CHV.....122	HB9J.....110
W1GOU.....130	I1ASM.....120	G8KP.....110
W4GMA....130	W2PBI.....113	W9HP.....110
ZS6Q.....122	WØEYR.....112	W9IOD.....110

BRIEF

From the "South Carolina Amateur Net Bulletin":

"It is courteous for a speaker in a group of people to confine his remarks to that which is of interest to the entire group." In round-table operation in amateur radio, this should hold true at all times. There is no one thing so boring as to listen to one station give a long talk on something that is of no interest to the group as a whole. Save your directed remarks until such a time as they can be addressed to the interested party alone.

TRAFFIC TOPICS

Tradition is a wonderful thing and it dies hard — if at all. CD appointees, in the recent CD Bulletin poll, turned "thumbs down" on the proposal to change the name *Brass Pounders League* to *Message Pushers League*, by a vote of 186 in favor of the change to 262 opposed. So we are going to string along with the tradition, fellows. Thanks for letting us know your wishes. Some of those who voted opposed indicated that they favored a change but didn't like the proposed name — but even adding those to the "in favor" column and subtracting them from the "opposed" column would not overcome the heavy negative vote. The term BPL is a tradition dear to the hearts of traffic handlers, and they do not want a change. So be it.

But just in case there is any doubt about it, let it be understood that traffic handled on 'phone is eligible for listing in the BPL, and always has been, provided it is record traffic handled in standard form.

On the other two traffic questions in the CD Bulletin poll, the proposed changes received a hearty okay. On giving additional BPL credit for originations, 313 of the 447 who registered an opinion were in favor of it. On simplifying the message check count, 340 of 452 were in favor. We'll have to study the numerous suggestions before we make these changes definite. Hardly any two of them agree with each other, and there are going to have to be some compromises. Meanwhile, no changes are effective.

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Using BPL listings as a guide, it would appear that February, March and December are the three biggest traffic months of the year. During the last three years (1947–49 inclusive) 98 BPL-ers were listed in February, 96 in March and 127 in December. Looks like January falls behind because everyone is resting up from the Christmas and New Year's rush, when the going is *really* rough. We thought you might be interested in this table of BPL listings for each month of the years 1947, 1948 and 1949 respectively.

Jan. — 6–12–22	*July* — 3– 5–18
Feb. — 19–27–52	*Aug.* — 4–11–39
Mar. — 10–21–65	*Sept.* — 13–16–34
Apr. — 9–17–57	*Oct.* — 14–24–35
May — 12– 8–18	*Nov.* — 11–19–43
June — 7– 9–18	*Dec.* — 29–30–68

In addition to the general increase, which is nothing short of phenomenal, note particularly the big increase in summer traffic handled — more than doubled in June and September, and more than tripled in July and August. In 1949, August was a bigger traffic month (BPL-wise) than January, September or October, and hang the hot weather, vacations and static. This is not too illogical when you consider that August is the principal month for vacations, when a lot of people are away from home and like to send "wish you were here" messages to friends back home. Then too, August is getting to be a big month for exhibit traffic — probably an even more significant factor in the increase than vacation traffic.

Regardless of what we may think of this kind of traffic, the fact remains that it is there and we must handle it, and if we don't handle it properly we are not living up to our reputation. Many traffic nets will remain active all summer this year. The National Traffic System will continue to operate in accordance with personnel available. Trunk lines will operate or discontinue at the discretion of their managers and members. If you expect to be active all summer, make the proper contact with your net manager so that he can include you in summer plans.

Above all, if your net intends to discontinue or modify operation during the summer please let us know so that our Net Directory card file will continue to show correct information.

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Interest in traffic handling is beginning to spring up in Alaska. The Alaska C.W. Net has been formed by KL7OK, meeting at 2300 PST daily on 3695 kc., and has connections with the Seventh Regional Net of the National Traffic

System for quick interchange of traffic between Alaska and the States. Put your Alaska traffic on any NTS net for quick relay.

NET DIRECTORY SUPPLEMENT

This is the last supplement to the Net Directory before a complete list of nets will be published in the fall, and will correct your net list to March 15, 1950. An asterisk indicates a change from a previous listing in Mar., Jan. or Nov. *QST;* otherwise, the net has not previously been listed.

Name of Net	*Freq.*	*Time*	*Days*
Alaska C.W. Net	3695	2300 PST	Daily
Alaska Emergency Net	3892	0900 PST	Mon.–Sat.
		1000 PST	Mon.–Sat.
Crossroads Net (C.Z.)	7150	2200 EST	Mon., Wed., Fri.
E. Mass. Slow-Speed Net	3745	1815 EST	Mon.–Fri.
Eastern Shuttle Net *	7120	1030 EST	Mon.–Sat.
	7280	1030 EST	Sun.
	7280	1900 EST	Sat., Sun.
Eighth Regional Net *	3530	1945 EST	Mon.–Fri.
		2130 EST	Mon.–Fri.
Fifth Regional Net *	3645	1945 EST	Mon.–Fri.
		2130 EST	Mon.–Fri.
First Regional Net *	3610	1945 EST	Mon.–Fri.
		2130 EST	Mon.–Fri.
Five O'Clock Net (B.C.)	3850	1700 PST	Mon.–Sat.
Fourth Regional Net *	3617	1945 EST	Mon.–Fri.
		2130 EST	Mon.–Fri.
Gloucester Co. Emergency Net (N. J.)	144,160	1900 EST	Mon.
Illinois C.W. Net *	3515	1845 CST	Mon.–Fri.
Mercer Emergency Net (N. J.)	145,920	2000 EST	Mon.
New England 'Phone Net	3865	0900 EST	Sun.
Ninth Regional Net *	3565	1945 CST	Mon.–Fri.
		2130 CST	Mon.–Fri.
Northern Net (B.C. & Alaska)	3780	1930 PST	Mon.–Sat.
Oregon Emergency Net	29,200	1900 PST	Daily
QPO Net	3715	2100 EST	Fri.
	7260	2200 EST	Mon.
Saskatchewan 'Phone Net *	3870	1930 MST	Daily
Second Regional Net *	3690	1945 EST	Mon.–Fri.
		2130 EST	Mon.–Fri.
Seventh Regional Net *	3575	1945 PST	Mon.–Fri.
		2130 PST	Mon.–Fri.
Sixth Regional Net *	3725	1945 PST	Mon.–Fri.
		2130 PST	Mon.–Fri.
South Carolina Amateur Net	3940	1930 EST	Mon.–Fri.
		0900 EST	Sun.
		1530 EST	Sun.
Southern Calif. Net *	3650	1900 PST	Mon.–Fri.
		2200 PST	Mon.–Fri.
So. New Jersey Net *	3700	1900 EST	Mon., Wed., Fri.
Swing-Shift Net *	7280	1230 EST	Mon.–Sat.
		1830 EST	Mon.–Fri.
Tenn. Slow-Speed Net	3750	2000 CST	Mon.–Fri.
		0800 CST	Sun.
Tenth Regional Net *	3735	1945 CST	Mon.–Fri.
		2130 CST	Mon.–Fri.
Third Regional Net *	3590	1945 EST	Mon.–Fri.
		2130 EST	Mon.–Fri.
Thirteenth Regional Net *	3675	1945 EST	Mon.–Fri.
		2130 EST	Mon.–Fri.
Upper Peninsula Net (Mich.)	3625	1900 EST	Mon.
Upper Peninsula 'Phone Net (Mich.)	3930	1000 EST	Sun.
Wisconsin Net *	3625	1900 CST	Mon.–Fri.
		2200 CST	Mon.–Fri.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for February traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W7CZY	63	1082	1036	21	2202
W6CE	46	988	961	40	2035
W8ACW	900	900	0	0	1800
W4DUG	1610	0	0	0	1610
W5LSN	7	530	405	125	1067
W5MN	19	456	335	119	929
W4ANK	3	459	406	47	915
W4MNT	2	446	446	0	894
W8NOH	18	389	268	114	789
W3CUL	216	274	232	35	757
W2TYU	18	384	333	14	749
W8GBF	20	365	289	22	696
W2RUF	41	361	256	21	679
WØZJO	20	326	299	25	670
W2CDQ	26	323	286	24	659
W5IGW	9	316	309	2	636
W8SJF	7	313	225	88	633
W3NRE	7	305	296	8	616
W9QLW**	142	233	225	8	608
W4PYV	15	20	268	288	591
W4IQV	15	285	264	20	584
KG6FAA	418	83	30	49	580
W9CBE	6	279	259	12	556
W3GEG	15	253	243	11	522
W9DGA**	123	198	174	13	508
W8BTV	4	252	235	14	505

The following made the BPL for deliveries:

W1NJM**	105	W8SJF**	66	W1AW**	56
W8DAE	98	W3KMN	66	W4JEP	55
W8SCW	91	W6QAE*	63	W6DDE	52
W7FIX	86	W1NJM	62	W6YVJ	51
W9TT**	82	W5ARK	61	W1BDI**	50
W6CMN	71	W3LFG	58		

A message total of 500 or more or 50 or more deliveries will put *you* in line for a place in the BPL. The Brass Pounders League is open to all operators who qualify for this monthly listing.

* December Traffic.
** January Traffic.

♦

Ever handle a "Martygram"? They're a lot like regular radiograms, except that they are signed "Marty, W7KCU," and there are a lot of them floating around. For example, during 1949 Marty originated 3373 messages, and that takes a lot of friends! The rig is a pair of 813s driven by a VFO to 450 watts input. Next to ham radio, Marty's favorite hobby is collecting clocks, and she has about 25 of them around the house. We hear that she has something to do with everything in Colfax (Wash.) except the Fire Department, which is run by W7ERH. The chief engineer and OM at W7KCU is W7EQN.

Station Activities

• 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 — BXE is planning a 14-Mc. rig for Field Day and for use on FP8 if possible this year. His country total is now 156. The Abington Township Amateur Radio Assn. now is affiliated with the ARRL. AXA has his TVI cured although the TV antenna is within 25 ft. of his transmitting antenna. EU was elected president of the Wilkes-Barre radio technicians. The Harrisburg Radio Club keeps the Penn-Harris emergency net active on 144-Mc. 'phone and 3.5-Mc. c.w. The Abington Club is running successful code classes and is planning to demonstrate ham radio before one of the local men's clubs. AQN has had some glamourous stickers made up for radio cars to expedite travel in emergencies or drills. It is an FB idea. KIR worked his first DX on 28-Mc. 'phone, namely G3DT; only 99 more now for DXCC. KMH has his TV transmitter going on 425 Mc. What some hams won't do! CPC and KIW worked long and tirelessly on their rig to no avail until they discovered that a 6X5 will not readily replace a VR150. EDO is chairman of the York Emergency Committee. Its net operates on 147.19 Mc. the 2nd and 4th Mondays at 10 P.M. The average attendance is 12 stations. The York ARC operates its station, EDU, on 7 and 144 Mc. IPE is active on both the SEN and the York Net. New officers of the West Philadelphia Radio Assn. are OWK, pres.; MYR, vice-pres.; and Janet Smith, secy.-treas. Meetings now are held on the 1st and 3rd Tuesdays at OWK's, 1534 Edgewood St., West Philadelphia. The WPRA's WAS Contest ended in January. PVY advises that at present there is no radio club serving the Hazelton area and that there are at least twenty active hams there. He and DUI are starting to organize a club to fill the gap. Will the hams in this area contact PVY or DUI and help them to get going? Traffic: W3CUL 757, PMG 366, OML 111, ADE 101, NHI 88, EAN 43, WTS 41, PDJ 40, AXA 36, ELI 23, BXE 18, AQN 4.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Eppa W. Darne, W3BWT — The Baltimore Amateur Radio Communications Society held its annual Social at Eickenkranz Hall Feb. 17th. A raffle and plenty of door prizes were among the many features of the evening; also lots of eats, drinks, and dancing to music by the Ray Strickroth Orchestra made up a very complete evening, thoroughly enjoyed by all present. The Potomac-Rappahannock Valley Emergency Net handled 23 weather observer reports on its 3.85-Mc. drill of Feb. 5th. The Chesapeake Amateur Radio Club featured LXK at its Feb. 7th meeting, his topic being "Introduction to the Transistor." At this meeting the Club also held its annual election of officers for 1950. At the second February meeting, AFM spoke on "C.W. Operating Procedures" and demonstrated same. Subject on the agenda of the Washington Radio Club's first February meeting was an extremely interesting talk and demonstration by NTS, his subject being "Radio Remote Control of Model Airplanes." At the second February meeting, the Club assembled at the Bureau of Standards Station, WWV, Beltsville, Md., inspected the equipment there and enjoyed an excellent talk on the station and its functions by Mr. Lester. The Frederick Amateur Radio Assn. has been reorganized with PKF, pres.; and AKX, secy.-treas., and holds monthly meetings. Plans for Field Day are already in progress. The Club has a nice Emergency Corps group with WN as Emergency Coördinator. The Washington Mobile Radio Club's new officers for 1950 are NL, pres.; NPW, traffic mgr.; CDL, secy.-treas. KMN is on 7 Mc. VES has worked 21 countries with 90 watts, his first six days on the air. QCW, transferred from Idaho, has been appointed ORS. BKK and AS, of the Baltimore area, are operating mobile. ATQ's work keeps him out of town and off the air a great deal. KUM is busy keeping TV sets working. AKX is trying Radio T.T. with 4JCV and is on 'phone most evenings. PKF puts out a nice signal on 144 Mc. WN still is plugging away on 144 Mc. UF is off temporarily because of an operation. JZY has been chasing DX. GZH is back on regularly and recently received WAC certificate. JNN is back on the air with n.f.m. EQK has eliminated TVI on next-door neighbor's set. NNL tried his hand in recent Frequency Measuring Test. DQB, on 7 Mc., has worked 34 states and 19 countries using an indoor antenna. EYX attended I.R.E. Convention in New York and schedules 6WAI, ex-3GQM. DVW is new ORS, puts out a nice signal on 3.5 Mc., and is a regular in the MDD Net. AKR is on 14 Mc. FQZ has a new four-element beam on 28 Mc. PZ is on 14-Mc. c.w. and 'phone, and has been using circular polarized antenna on 144, 435, and 465 Mc. LFG is on 420 Mc. OEU, the Veteran's Radio Club station, is on 7-Mc. c.w. and 14-Mc. 'phone. QCB is on 7- and 14-Mc. c.w. AKX puts out a nice signal on 144 Mc. with 45 watts input, and using a five-element beam. LMC is on 144 Mc. AQV is busy house-building. KMN and LFG make BPL on deliveries this month. Traffic: W3ECP 237, UF 215, KMN 159, LFG 158, GZH 125, AKB 56, MCG 30, DVW 28, NNX 20, QL 18, BWT 12, FWP 11, JHW 10, AKR 3.

SOUTHERN NEW JERSEY — SCM, Dr. Luther M. Mkitarian, W2ASG — The Atlantic Radio Club is commended for installation and maintenance of a station, K2BR, with all necessary emergency supplies and power in coöperation with the local Red Cross Chapter. Officers of this club for 1950 are SOC, pres.; ZLD, vice-pres.; CTI, secy.; PXZ, treas.; VIC, RCD, and RRG, trustees. YSP is active on 3.5 and 7 Mc. with a VFO. He is a brand-new ORS. SDO and GQO are using beam antennas on 144 Mc. WVN is on the lookout for mobile activities. BAY is on 50.020 kc. ASG had an FB visit with the Atlantic Radio Club and was glad to walk away with the prize. Traffic: W2ZI 83, ZVW 38, ORS 36, RG 24, QUH 23, ASG 14, ZYX 13, PFT 4, HAZ 3, YSP 2, BEI 1.

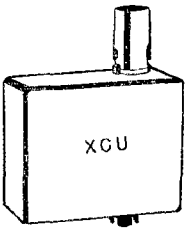
WESTERN NEW YORK — SCM, Harding A. Clark, W2PGT — SEC: SJV. Net manager: RUF. Since the crystal ball is not working there is no column because of lack of news. If you want a column, send me the dope on what is going on in your neck of the woods. If everybody who complained about the lack of a column would send in one news item we could fill this column easily. Don't let George do it — do it yourself! Traffic: W2RUF 679, CDQ 659, RUT 124, YGW 98, NAI 68, PGT 63, SJV 56, FE 50, BLO 26, EMW 21, FCG 17, WOE 8.

WESTERN PENNSYLVANIA — SCM, Ernest J. Hlinsky, W3KWL — GEG and NRE again made the BPL. The W. Pa. traffic net total was 1525 messages handled. The Fort Necessity Radio Club is sporting 5 new antenna poles furnished by the Bell Telephone Co. LAC and WVE lost their 28-Mc. beams in a recent storm. The Boys Club of St. Marys reports that club activities are picking up, with old Doc in charge of club station KYR. The Radio Association of Erie, PKJ, gave a swell report on what goes on at Gannon College regarding ham radio. PIY is doing a swell job of sending code practice lessons. TFX not only puts real interest in his weekly radio articles concerning ham radio, but includes pictures of various ham rigs and throws in a good story or two. PIY has written a very interesting article concerning ham radio. Heard in the 10-meter WAS Contest were NMP, QN, KNQ, and MMH. NLU is knocking off the DX on 7 Mc. KKS is proud of his QSO with HA5C on 7 Mc. PLX and MS are working 28 Mc. QKI and WNM are heard and worked frequently on 144 Mc. In the Smoky City, the ATA heard MLK give an interesting talk on the trials and tribulations of getting WWSW on the air. The QSL Contest sponsored by the Club is meeting with success. POS is a new club member. KSR has taken up radio-controlled airplanes. OMA got 15 confirmations from Canal Zone contacts. OOP says there's nothing like a good converter for 28 Mc. UHN, club secretary, says too much Zoop got into his receiver. The Steel City Radio Club makes the news again with its v.h.f. activities. OKU has relinquished his job as treasurer and RIK has taken over. NKM, OMY, NRQ, and LKM are members of the transmitter committee. Up Altoona way, *Hamateur News* reports the club still is going strong. TXQ is leading the DX gang. The 160-meter boys are PRO, RFM, KQD, QCH, and POZ. LQH gets home week ends to make the local nets. The Mercer County Radio Assn. has purchased an 8mm. sound projector. GEG and QCN, along with your SCM, journeyed to 3MPO to talk over a new emergency net set-up. Traffic: W3NRE 616, GEG 522, NCD 100, NUG 97, GJY 80, NCJ 65, PAB 24, UHN 22, KWL 12, AER 10, LSS 8.

CENTRAL DIVISION

ILLINOIS — SCM, Lloyd E. Hopkins, W9EVJ — Section nets: IEN 3940 kc.; ILN 3765 kc. NN is in new home and reports good DX with 14-Mc. indoor doublet. BRX

(Continued on page 76)



WITH the increasing popularity of accessories such as the S-O-J, the NBFM adapter, and now the crystal calibrator, it is only natural that this question arises frequently: "How much additional load will my receiver power supply stand before it breaks down?"

Most receiver power supplies are conservatively rated to handle the load that the receiver places on them in normal operation and the addition of a single low drain tube places no unusual burden upon them. However, as a general rule, two additional low drain tubes are about the maximum a receiver power supply should be expected to handle efficiently, and although a greater number may cause no damage to the unit, lowering of B+ and filament voltages may cause the receiver to become insensitive, or may otherwise affect its performance.

The later model National receivers are designed with an accessory plug and these receivers were tested to handle the additional drain the normal accessories in use at that time would demand. Thus, the NC-173 and NC-183 will handle the NBFM adapter or the S-O-J, while the new HRO-50 will handle the NFM adapter, the S-O-J, and the crystal calibrator simultaneously without overloading the power supply. Only the HRO-50 has a socket to accept the crystal calibrator.

Incidentally, the NC-57 can be used with the S-O-J, but considerable rewiring is necessary to use on NFM adapter such as the NFM-73 with the NC-57 and it, therefore, appears impractical to make such changes at this time.

There is another plug at the rear of most communications receivers that usually receives little or no attention from the average user, except when he is going to set his receiver up for portable operation for the next field day. This is the so-called "battery plug." This plug is an excellent source of B+, B−, and filament voltages, as well as blank pins which can be used to bring out other leads in many instances. It could come in very handy for adding accessories when the receiver has no accessory socket, or when the only available accessory socket is in use full time. Of course, care should be taken not to overload the receiver, but any number of accessories can be hooked up and provided with suitable switches so that only one is in use at any one time.

We might add that the "hot hand" test is not always a true test for an overloaded power supply, since most power transformers are rated to operate efficiently up to 95° Centigrade maximum temperature. This is over 200° Fahrenheit, a little too hot for comfort. A better way is simply to measure the B+ current being drawn and the filament voltage drop when the accessory is added to determine if the load is too great for efficient operation.

BILL BARTELL
W1PIJ

is putting the finishing touches to new frequency standard. EBX is taking it easy after a recent illness. The Amateur Radio Emergency Assn. new officers are EBZ, pres.; KCW, vice-pres. and treas.; ZQS, secy.; FFR, communications mgr. NIU listens to our c.w. net when time permits. BPU took an extensive trip through the South and West, reporting 110 contacts with 22 states plus VE and KL7 from mobile rig. BUK has new 400-watter perking. FRP is breaking in a new car for trips to hamfests this summer. HPG is tied down with radio club work. ULO is building new VFO and high-power amplifier. UBP upped power to 300 watts. North Suburban Radio Club new officers are GRV, pres.; FKC, vice-pres.; JNC, secy.; RBD, treas. CMU is back at regular work after seven weeks of rest for a heart condition. Chicago Suburban Radio Assn. new officers are HON, pres.; CIA, vice-pres.; PGW, treas.; ZSQ, secy. The Peoria Amateur Radio Assn. newly-elected officers are NAG, pres.; MXD, vice-pres.; PSO, treas.; FM, secy.; HEQ, activities mgr. The fourth annual Weldon Springs picnic will be held July 16th near Clinton, Ill. BIN keeps busy on MARS. LIG, DGY, QLZ, and DKW are planning another SRRC hamfest. CXT is expected home from Japan in June. IDA is making plans to move to Kewanee. NOO rebuilt main power supply. New officers of the Cenois Amateur Radio Club are CJV, pres.; JZP, vice-pres.; MUD, secy.-treas.; CKW, activities mgr. AHC organized a radio club at the school where he is teaching. CJV runs a kw. on 3.85-Mc. 'phone. DBD moved to new QTH. EAD is active on 7-Mc. c.w. EQT operates on 3.85-, 14-, and 28-Mc. 'phone. FLF may be found on 7 Mc. but is making plans for other bands. GOZ and brother NET are struggling with new rig. HOK is back home and active on 28 Mc. HTR and IBN are new hams in the Decatur area. IPD is ex-7NLU. JNW is running 20 watts on 3.5 and 28 Mc. JZP is active on 3.85-Mc. 'phone. KDP and KPS get away from their TV sets on occasion to do some hamming. LAQ is working with AHC in local school club. OFI is sporting new antenna tower for proposed beam. LUV is heard from Decatur Signal Depot club station. PLY keeps in touch with his son in New York via radio. TCL is building a new house with a special room for radio shack. MUD is chasing DX on 28 Mc. EVJ lost antenna in recent ice storm and is QRL with other activities. Traffic: (Feb.) W9FLQ 274, SXL 126, UBP 106, SYZ 78, DUA 39, MRQ 36, BUK 32, FRP 27, LIN 26, ASN 25, EVJ 19, JNC 17, CMU 8, ULO 4, ZMU 4. (Jan.) W9BUK 44.

INDIANA — SCM, W. E. Monigan W9RE — DOK has sixteen-element turnstile on 144 Mc. BKJ says the weather is too cold and he will wait until it's warmer to repair beam and get back on 14 Mc. Evansville monitors 29,600 kc. AQO is on 144 Mc. with an SCR-522. DGA plans a new exciter. HUV works three new countries and hopes the QSLs will roll in for DXCC. DGA and QLW are trying for 3.5-, 7-, and 14-Mc. WAS. HQF is new *TARS* editor. AZU is *TARS* EC. CVN and QLW visited Indianapolis hams during the Basketball Tourney. NQB now is on all bands, including 144 Mc. Russ Jenkins presented the Michiana Amateur Radio Club with a well-designed and well-built bulletin board. Traffic: W9RCB 278, JTX 263, BKJ 224, TT 215, QLW 164, DGA 147, DHJ 46, DOK 18, KTX 12, HUV 11, RE 9, DKV 5.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SUF is in the midst of rebuilding. FXA submits a nice traffic total. ANM now is State Coördinator for Milwaukee Road Emergency Radio Net. SFL is new ORS. HDZ operated portable at YMCA hobby show. DND's present OBS schedule is 3625 kc., 6:15 P.M., Mon., Wed., and Fri. UIT has five continents worked on 3.85-Mc. 'phone using n.f.m. IQM has ARC-5s on 3.5 and 7 Mc. with an NC-57 receiver. The M. & M. Radio Club February meeting had a talk on r.f. amplification problems by KPK. AFT has 125 watts on 3.85-, 14-, and 28-Mc. 'phone, as well as 50 watts on 144 Mc. SYT again is active on 144 Mc. GPU replaces OGT as EC for LaCrosse. KXK picked up ZS8A for a new one in the 'phone section of the DX Contest. Business took YYY to California for about three weeks. YCV renewed ORS appointment. The Wausau Club presented a half-hour program over local b.c. station WSAU on ham radio, including a simulated emergency drill by the AEC under the direction of VHA, the EC. Participating were HFV, CTD, CGO, FZC, RQM, LED, EWM, and FYP, with ESV as b.c. engineer. WEN is trying to figure out how to spend more time with ham radio and still make a living and keep peace with the rest of the family. MUM renewed EC and ORS appointments. CPB, the station of the Stout Radio Club, was built entirely from surplus gear obtained through W.A.A. RBI and LNM both pounded away in the DX Contest. Traffic: W9CBE 556, ESJ 442, SUF 294, FXA 178, IQW 78, LFK 75, SZL 63, CWZ 37, ANM 34, SFL 34, YCV 29, HDZ 16, DND 12, UIT 10, RKT 6, AFT 5.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Rev. Lawrence C. Strandenaes, W0JWY — GWU reports that JPW is NCS for the State MARS Net. AAU lays down an FB signal from Portland on 160 and 75 meters. Heard on 3.5 Mc. from the western part of the State were new calls AAM, at Skaar, and VDK, at Beach. GJJ must be gold-plating that new 500-watt 'phone rig. DOW and AJH keep Minot on the 160-meter 'phone net. From Jamestown, AZV burns the midnight oil on 3.85 Mc. with his new 150-watt bandswitching job, while EOZ on 14-Mc. c.w. and NBS on 28-Mc. n.f.m. have been smoking out some juicy DX. UGM is again putting out a good signal on 3.85 Mc. from Fargo. OCI is showing off his new Viking I on 160 and 75 meters. Sporting a new Class A is BSL. WFO and MEK keep the megacycles warm on 6. Watch for dope in next month's issue on our annual state-wide hamboree. Traffic: W0KZL 13, JWY 7, ZCM 7, EFJ 5, GWU 5, KOY 3, FNZ 1, JJP 1, KRC 1.

SOUTH DAKOTA — SCM, J. S. Foasberg, W0NGM — On March 7th we suffered what has been described as the worst blizzard in the history of the State. An emergency net was set up and going at 7:30 A.M. At 9:00 A.M. the Huron Club station, QDN, took over control from VQC, who had power failure. Stations active were YDT and DKJ, Aberdeen; BJV, VT, and DYM, Watertown; ORE, Gary; 5MKD/0, Mobridge; YYU, Groton; MMQ, Yankton; GQH, Selby; UVL, Pierre; ZXW, Brookings; GCP and HDO, Mitchell; HWS, ZRA, and PHR, Sioux Falls; HAT, Centerville; and AGL, Lead; with the help of outside-the-State stations AZR, Sioux City; QIQ, Marshall; HFS, Minneapolis; and 9DUA, Evanston. All the above were on 'phone. A c.w. net also functioned, headed by GCP, the RM and NCS. The nets handled traffic for transportation means, telephone companies, and power and light companies, as well as handling many personal messages. Traffic: W0GFG 40, FJS 4.

MINNESOTA — SCM, John B. Morgan, W0RA — Only two reports were received this month. The Red River Radio Club ran its portable gear at the Moorhead Kiwanis Hobby Show. RXL's new antenna withstood the wintry gales nicely, and his kw. is one of loudest on the Minnesota State Net. The high state of preparedness for emergencies certainly paid off in the recent blizzard which put out of commission all the phone and telegraph lines throughout parts of North Dakota, South Dakota, and Minnesota. Director Dosland did a beautiful job as NCS for the whole show, and those of you who heard him certainly must have appreciated the high degree of efficiency that he and the many stations working with him displayed in fulfilling their duties, even though many of them were without sleep for 30 and 40 hours at a time. Let us not say that it can't happen here. Here is a case when it did, and when those who were prepared stepped in to do a job that had to be done. Are you ready to do some practical work when and if disaster strikes your community? If you are not yet a member of the AEC, write to BOL, who is our State Emergency Coördinator, and who will direct you to the Emergency Coordinator in your county. Then, get that emergency rig built up and ready to go on a moment's notice. Traffic: W0GHN 121, MXC 74, RA 64, EHO 40, FID 14, RXL 14.

DELTA DIVISION

LOUISIANA — SCM, W. J. Wilkinson, jr., W5VT — CEW has been having a spell of trouble hearing the DX others have been working. HR sends in a nice report from NOLA saying n.f.m. is on the increase there. FMO dropped in for a nice chat one rainy evening recently. CGC still is working all he hears. MJT has been bitten by the bug again. KTE has been QRL of late but manages to get in a few QSOs. BSR also is QRL with income tax returns. LQV is back in town after a little exploring for oil pools. LQO has his rig on 28 Mc. now. GHF still is making the nets around these parts. DU (ex-RI) now is doing commercial engineering. Good luck to you, and I know all the hams as well as the b.c. engineers hate to see you leave the FCC. Well, that just about takes care of things for the present. Let's have more reports next time, as you can see it is very hard to write something with nothing to start from. Good luck to all.

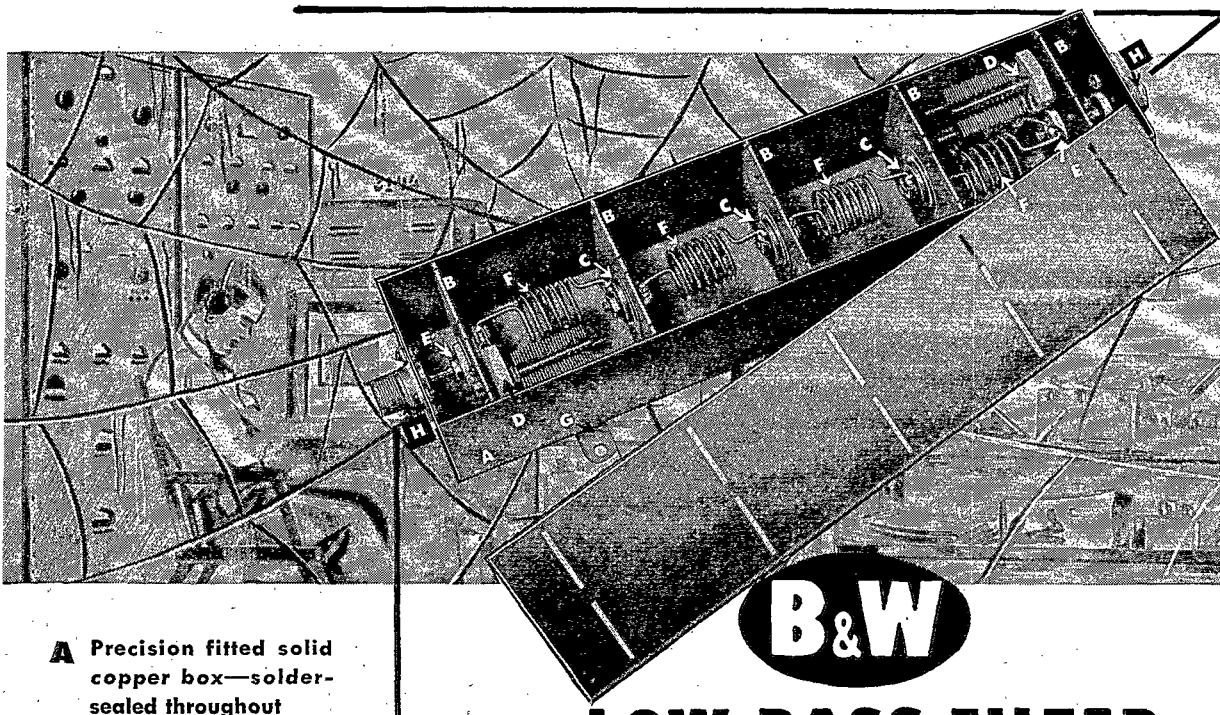
MISSISSIPPI — SCM, J. C. Wallis, W5DLA — The Hattiesburg Club sponsored a Bill in the recent session of the State Legislature to provide for the issuance by the State Motor Vehicle Comptroller of special license tags to motor vehicle owners who operate amateur radio stations. The Bill passed and was signed by the Governor. RDA is new in Jackson. CQJ has new 28-Mc. final. OSX has new 32V-2. PFC and PRB are building new rigs. ITL is back on 28 Mc. PFC is handling 'phone patch and direct contacts between 4MXU, on Guam, and his XYL, in Jackson. OTD is active on 28-Mc. 'phone, 3.5- and 7-Mc. c.w. Thanks to PNA for the reports. OSA and OGN, formerly Class C, now are Class B. PJQ is new EC at Brookhaven. QMQ has new skywire on 3.85 Mc. and Select-O-Ject. Keesler Club membership is approaching one hundred. RY reports activity on 144 Mc. Traffic: W5IGW 636, JHS 271, WZ 168, QYX 56, DEJ 46, QMQ 19.

TENNESSEE — SCM, Ward Bulrman, W4QT — Asst. SCM: John Oliver, 4FDF. The SCM, being down and out with an FB case of flu asked yours truly, FDF, to be "Guest Columnist." LRE and KAF have a new ham shack and are partners on the deal. KUW is in the wholesale business, having bought out a distributor in Knoxville. LMO has about finished a kilowatt. IKG has his crusher on and sure sounds good. HBZ has reworked his speech department in order to be better heard. BAQ and the boys in Memphis did

(*Continued on page 78*)

LET'S LICK TVI

and brush the cobwebs off the rig



A Precision fitted solid copper box—solder-sealed throughout

B Heavy copper ground plate shields

C Precision-Silvered Mica Low Inductance Condensers

D "M" derived end sections peaked on Channel 2 (Coil not visible)

E Alsimag 196 Insulation

F Heavy, distortion-free, precision coils

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LOW PASS FILTER

- *Provides extreme attenuation to all harmonics above 30 mc*
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Three years of intensive study of TVI problems first introduced the B&W Faraday Shielded Link. Now we proudly present a natural companion—*the B&W Low Pass Filter*. Properly installed in the antenna feed system, in accordance with our recommendations, the Low Pass Filter provides virtually complete harmonic suppression above 30 mc.

The B&W Low Pass Filter consists of two "m" derived end sections and three midsections of constant K type. Each section is contained in a completely sealed copper compartment to prevent inductive transfer of unwanted frequencies from section to section. RF bypass condensers in the K sections are of special low inductance design having resonant frequencies higher than 500 mc thus eliminating resonances within the TV bands, a fault common to conventional types of condensers.

Complete details on how you can banish TVI are available in *Filter Facts*—packed with each Low Pass Filter. See your dealer today!

BARKER & WILLIAMSON, Inc.

237 Fairfield Ave., Upper Darby, Pa.

a swell job on their ice storm. Several of the boys ought to go in the railroad business; they had plenty of practice handling to and from the railroad offices. NNJ announces a slow-speed net has been formed, starting at 2000 CST Mar. 6th on 3750 kc. He says the speed does not exceed 15 w.p.m. All interested should contact NNJ. A booklet on operating in nets is free from Headquarters. FQI finally quit crystal-control and built himself a Clapp VFO. Listen in on the Tennessee 'Phone Net. It has been reworked and has the snap of a real net with business first and gab later. A new directory is out and the roll is called promptly and messages handled with form. I can still hear the clunk of the relays at CZL ringing in my ears. Art Weston, ETN, contemplates a slow-speed net for the local EC on 40. Traffic: W4BAQ 265 ATC 257, CZL 192, ETN 156, NNJ 83, AEE 18.

GREAT LAKES DIVISION

KENTUCKY — SCM, Dr. Asa W. Adkins, W4KWO — Again, let me request you to get your traffic reports to me on or before the fifth day of each month. Hams, why don't you join a net? Kentucky Net, c.w.: YPR has a BC-457 VFO, OET rebuilt to eliminate TVI, CDA is making improvements to that end, BXU took NCS on KYN on Saturdays, Lexington is becoming very active on KYN with IVY, JSH, JTL, KFA, MGT, and occasionally BPN. Paducah now has NBS, NZH, and WWT on KYN. NIX now is NCS, 7200 kc. MMY, NCS of 10:00-P.M. KYN sessions, is off temporarily because of the coal strike. VD now is NCS Thursdays, replacing LMN. Blue Grass Net: JQY, PAM, Net Control Station, Wednesday; NBY, Alternate; JTB, Monday; KWO, Friday; 8:00 P.M. CST 3890 kc. The Blue Grass Net needs Ashland. Can't you arrange it, BEW? BGN members include AHL, CMP, JEI, JQY, JTB, JPV, JUI, JVD, KKE, KOX, KWO, KZF, LLB, MMY, MVU, NBY, NYJ, ODK, ODL, PKR, and YCC. 1NBP for Connecticut and 3LNW for Pennsylvania call in regularly to handle traffic. ODL is working nights now. They cut down the old pine tree March 4th and KWO's antenna came down with it. He had it back up March 5th, 6:00 P.M. How about the clubs sending news items? I am not getting reports from all net members. Please report separately for c.w. and 'phone. Traffic: W4BAZ 226, JQY 128, MWX 83, FQQ 73, CDA 42, BXU 37, NBY 36, UPB 36, WWT 36, MMY 28, ODL 24, JTB 19, KWO 13, VD 8, FKM 7.

MICHIGAN — SCM, Robert B. Cooper, W8AQA — Asst. SCM c.w., J. R. Beljan, 8SCW. Asst. SCM U.P., A. P. Kohn, 8TTY. SEC: GJH. RMs: UKV, TRN, and NOH. PAM: YNG. New appointments: ORS to YAO, and OPS to PGJ and QIT. BGY is the new EC in the St. Clair Shores area. FOV, as part of the Flint Emergency Corps, worked through the fixed station at the Red Cross Headquarters along with other mobile units to assist the Coal Rationing Board in providing some very necessary aid during the critical period brought on by the coal strike. DLZ, of the Grand Rapids area, assisted the Kent County Red Cross Disaster Committee through a very critical period brought on by a series of gas explosions when communications were at a premium. NML reports DAW as a new DXCC on c.w. while he joins the rank via A3. Another candidate for the OT Club is EEW, who was DGC in '23. The Straits Area Radio Club officers are DQQ, pres.; RHD, vice-pres.; CPY, activities; CRB, secy.; and DWB, treas. EYK has joined Silent Keys as the result of a heart attack. OJT reports the U.P. c.w. net under way on 3625 kc. at 1900. The Twin Saults have started a bulletin with some fine reading under the heading of the personalized visit by the Canadian Government to some of the Canadian amateurs. DSE is handling traffic from KG6FAA direct. Thumb Area Club officers are VWY, pres.; VE3DZ, vice-pres.; EHT, secy.-treas.; and VE3BMF, secy. for VE affairs. BEG is in charge of publicity. Congratulations to the Central Michigan Amateur Radio Club on its affiliation with the ARRL as reported by its secretary, GSP. BHL reports the Adrian Amateur Radio Club is now on the air from the Blissfield Club Rooms. RER did some fine work during the ice storm as his antenna went down and required some work under unpleasant conditions to be ready for emergency traffic. BHL also lost his antenna of two days service during the ice storm. QIT is back with a pair of 813s. WXO reports a stiff working schedule prevents his active QMN participation. FX has converted a 696 for a VFO to drive a p.p. T55 final. UES is having antenna troubles. ENT is using his new Vibroplex. ZBT reports 9EOX/8 is the new ham in the Niles area. Traffic: W8ACW 1800, NOH 789, SCW 369, RJC 308, TRN 205, AYV 181, DSE 175, MQU 74, FOV 66, AQA 57, WXO 56, ZWM 43, QBO 42, YMO 42, GJX 28, LR 19, FX 17, TTY 15, DAP 14, UES 14, CRH 12, WVL 12, OJT 10, WOV 8, ENT 6, DWB 5, ZBT 4, OAF 3.

OHIO — SCM, Dr. Harold E. Stricker, W8WZ — Asst. SCMs, C. D. Hall, 8PUN, and Charles Lohner, 8RN. SEC: UPB. PAM: PUN. RM: PMJ. SJF made BPL for the third month in a row. DAE also made BPL. The following are OOs in this section: ATK, BFB, BIF, BMC, EDX, EQ, GJU, 7GP/8, GXI, ICC, JFC, JRG, NCO, UDR, VZ, WAV, BHE. Three of these are temporarily inactive and only five reported. The following are ORS: AQ, AYS, BEW, BLI, BUM, CBI, DAE, EBJ, EIU, FFK, HOX, IVC, LCY, LJH, LOT, OUR, PIH, PMJ, PNY, QIE, RN, ROX, SJF, TAQ, TKS, UPB, UW, UZJ, VTF, VWX, WAB, WDQ, WE, WYH, YCP, YFJ, ZAU, ZJM. Fifteen of these reported. The following are OPS: AQ, ATK, BCJ, BFB, BZX, CBI, DXO, DZO, EQN, FNX, JFC, PBX, PNJ, PUN, TRX, ZOF. Eleven reported; one is temporarily inactive. The following are OBS: BBK, BFH, DXO, DZO, EFW, EQ, LBH, PR, PUN, SRF, STQ, TIH, TZO, WAV, WDQ, YGH. Six reported. There are 2 OES and one of them, WRN, has never failed to report and the other, RJD, does so when he is able. I do the best that I can with this column, but if I don't have much material to work with I can't give you much information. Let's get back on the ball and get those reports in. From the *Mike and Key* of the GCARA: New officers are RJD, pres.; 4UXH, vice-pres.; BDA, secy.; NCV, treas.; MGP, editor. From the Minutes of the Cleveland Area Council of Amateur Radio Clubs: The ground wave contest was held Mar. 13th. The hamfest was held April 8th, from 3 until 11 at the Central Armory at East 6th and Lakeside Avenue. We received our first issue of *The Canton Amateur Radio Club Bulletin*. Club officers are AL, pres.; DNU, vice-pres.; EKL, secy.-treas.; TND, editor. Meetings are held the 1st and 3rd Wednesdays at 132 3rd St., S.W. EKL is an XYL and works 7 Mc. and also 28-Mc. 'phone. At a special meeting held Mar. 11th UPB spoke on emergency work and the need for ARRL appointees in the Canton area. Your SCM regrets that he could not attend the meeting because of a flu epidemic in his town. From the *R-F Carrier* of the DARA: 9UN (ex-KA1AF, DU1AF, JU2CF) spoke to the club on "Amateur Radio in the Far East." The boys in the Dayton area seem to have TVI pretty well under control. From the *Q-5* of the Springfield Amateur Radio Club: AUP suggests that all DX cards containing foreign stamps be sent to some veterans' hospital for stamp collectors there. YAC is a new ham in Springfield. EHW worked YV with 20 watts on 7 Mc. From the CORC *News:* The Club has been offered rooms at the local O.N.G. Armory. From the *Voice-Coil* of hams in Eastern Ohio: EKX is a new ham in Niles. ETV gave a demonstration of amateur radio to the science class at Boardman High. He put up a temporary rig and antenna and worked several stations on 7 Mc. The boys fixed up the beam of DXO. WEN fired in another fine DX report. A lot of the boys up there are working mobile. We hate to lose the *Voice-Coil* from our list because of the retirement of the editor, FRY. We want to thank him for all the news and hope that someone will take over. From the *Carascope* of the CARA: WXM gave a talk and demonstrated his teletype equipment. YBF gave a report on the interference committee. How about giving your EC, WAB, some help on EC work? Columbus is one of the main points for the River Forecast Center. The Intercity Radio Club of Mansfield held its meeting Mar. 10th with our Director, SPF, as the principal speaker. We are sorry to learn of the passing of SRS. *Please, let's get those station activity reports in.* Traffic: W8SJF 633, DAE 432, UPB 84, DZX 67, CBI 59, RN 50, ZJM 49, ZAU 39, DXO 27, OUR 27, WE 25, EQN 19, PUN 19, SFI 17, TAQ 11, WAB 8, YFJ 6, QIE 5, DZO 4, BUM 2.

HUDSON DIVISION

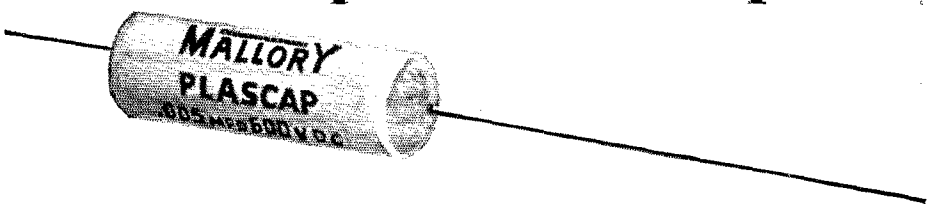
EASTERN NEW YORK — SCM, Fred Skinner, W2EQD — SEC: CLL. Appointments made this month: ILI as OO, Classes III and IV; HUM as RM; EFU and FZW as Assistant ECs. Appointments renewed: LRW as RM; CLL as SEC; IXK as OES. RYT had an average error of only 2.6 parts per million in the recent Frequency Measuring Test. The Eastern New York Emergency 'Phone Net meets each Saturday at noon on 3950 kc. All stations are urged to report in so the entire section can be covered. Arrangements have been made to relay regular traffic. NVB has been operating K7NRU in Nevada and scheduling EQD on 14 Mc. Traffic: W2CLL 258, PHO 107, RH 96, TYC 84, EFU 51, LRW 36, GTC 33, LDS 20, EQD 16, CJP 15, FZW 13, AQF 11.

NEW YORK CITY AND LONG ISLAND — SCM, George V. Cooke, W2OBU — SEC: BYF. RM: TYU. AEC activity is increasing by leaps and bounds with numerous amateurs in all parts of the section joining up. WHB added a half dozen new stations on the 3.5-Mc. c.w. AEC group, comprising Manhattan, Bronx, and Queens. The western section group operates on 3710 kc. at 2000 Fridays. WHB is NCS, with ZDE as alternate. Brooklyn still is lacking an EC. SYW resigned as EC for Northern Queens but secured PQG to replace him. NZJ is working hard in Southern Queens with a good increase in those reporting in to drills on Thursdays at 2100 on 144 Mc. KTF advises of several Nassau AEC members getting together on 3600 kc. Mondays at 2000. Liaison is being established with other c.w. groups in the section. Nassau AEC, all bands, is coördinating plans for a bang-up Field Day lined up with the Nassau Radio Club. A meeting with the Suffolk County Radio Club and your SCM and SEC resulted in all-out efforts to revive the County's AEC on all bands. A 3.85-Mc. net has been in operation for some time and a 144-Mc. AEC net is in formation. A full report will

(Continued on page 80)

MALLORY HAM BULLETIN

Major New Capacitor Development



For many months, top-level Mallory capacitor and chemical engineers have been quietly investigating every aspect of the common paper tubular capacitor to determine just how the electrical and mechanical features of currently available capacitors could be improved.

In addition to testing paper capacitors made by manufacturers in this country and abroad, hundreds of sample capacitors were actually fabricated in the laboratory using almost every conceivable commercially available plastic compound, wax and impregnating oil. Of these, not one measured up to desired high levels of electrical and mechanical excellence.

Sample capacitors produced with wax compound case seals exhibited the best electrical characteristics and resistance to moisture, but had poor mechanical strength and temperature characteristics.

Sample capacitors made with available plastic molding compounds exhibited good mechanical strength and temperature operating characteristics, but were inferior electrically because it was impossible to prevent damage to the fragile capacitor cartridge during the high pressure molding operation. In addition, the conventional molded plastic capacitors exhibited considerable moisture leakage because of poor bonding to the metal leads.

As a result, Mallory engineers were convinced that an entirely new technique, using entirely new raw materials, would have to be devised before the ideal paper tubular capacitor could be made.

And that was exactly what was done in designing the new *Mallory PLASCAP** paper tubular capacitor (now available at your Mallory Distributor).

Chemistry and electronics have combined to give you a totally new and superior paper capacitor in the *Mallory PLASCAP.*

The new *Mallory PLASCAP* capacitor is not a conventional molded plastic capacitor where the cartridge is subjected to molding pressures. *Its tough outer plastic shell is pre-molded before insertion of the cartridge.* This eliminates any possible distortion of the cartridge during the molding operation.

The cartridge itself is wound in a conventional manner, but the impregnate—MALLOTROL* —gives greatly improved electrical properties.

After drying and impregnation, the cartridge is inserted into the pre-formed plastic shell, and a special fluid plastic compound, called Mallocene*, is poured around the outer plastic shell. Note:—Mallocene is an exclusive Mallory plastic compound with excellent moisture resistance properties.

After a short "curing" operation the *Mallory PLASCAP* is then ready for shipment to your Mallory Distributor and subsequent use in your equipment.

The logical step by step method of building the *Mallory PLASCAP* is your assurance that when you buy a Mallory plastic tubular, you are getting a capacitor which is moisture sealed, is mechanically strong, and has the kind of electrical qualities you can depend on. See your Mallory Distributor.

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be made when the group gets drills lined up. IAG is talking up a 28-Mc. AEC group to cover Queens for future tie-in with other AEC nets. Mobile operation is the outstanding mode for this group, composed of many members of the Tu-Boro Club. SJC is the recipient of a Section Net certificate for work in NLI traffic net, with TYU as RM on 3710 kc., 1900 and 2200 Mondays through Fridays. OUT received a Section Net certificate for attendance in New York State Slow-Speed Net, on 3720 kc. at 2000 Mondays through Fridays, with PHO as RM. LR has been appointed communications director for New York Chapter of Red Cross and is endeavoring to line up AEC for liaison with National Net. DJC, after many tries, got his new ticket. WDT maintains schedules with Boy Scout groups in Kansas and would like to make it on a national scale. ZPG is building 420-Mc. gear and will be on with it, working others in the UHF Club in Jamaica. PPH just moved to the section from New Jersey. DDT is a new ticket-holder in Manhattan and joined the NLI traffic net. RWQ has been appointed OO, Class IV. Officers of the newly-formed Eastern Amateur Radio Club in Brooklyn are BJM, pres.; YSY, secy.; YMH, treas. Meeting place is P.S. 214, Pitken Ave. and Forbel St., Brooklyn, at 7:30 P.M. the 3rd Friday of each month. Anyone desiring aid in securing his ticket should write YSY. AFC is on 3.5 Mc. with a new BC-457. DL4BS, stateside W2BHP, is on 7010 kc. week-end afternoons and early evenings with 10-watt HT-17. OAF joined up with NLI Net and earned ORS and net appointments. Arnie put on a Viking I rig and eliminated TVI. LGK got on 28 Mc. with n.f.m. gear. TUK added Collins 310C-1, and says QNZ is no worry with fine calibration on NLI Net. EC keeps up schedules with TLAP, NLI, and NYS nightly. RQJ now totals 55 countries worked, with 49 confirmed. BO, ill for two weeks, put BC-696 at bedside with a BC-454 and a whip antenna and continued schedules. BQP built a new beam for 28 Mc. JSV was elected communications manager and LLR official photographer of the Tu-Boro Club. JYR renewed OBS appointment. ZRR is running 100 watts to 829B, is working 7 Mc., built that W6OWP keyer, and has received his ORS appointment. For those extra Field Day message points look for OBU at Amityville operating with the call 1AA/2. Traffic: W2TYU 749, EC 159, BO 141, OBU 118, ZDE 100, OAF 91, SJC 85, YIR 50, LGK 28, TUK 24, RQJ 23, WHB 22, YDG 17, BQP 3.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — On Feb. 8th the boys at Marshalltown had an organization meeting. A board of six directors was elected, namely, SCV, YNP, WXH, TIU, SRQ, and DCK. The board then appointed SCV chairman, WXH secretary, YNP treasurer. TIU, ZFO, and SQN are new ECs. TIU, UOT, and ZFO now report into Iowa 75 Net. OHO, of Burlington, is sporting new Class A license. NYX and FDL renewed ORS appointments. AEH renewed OBS appointment. New officers of Sioux City Club are MCU, pres.; UNJ, vice-pres.; YMH, secy.; HFT, treas.; KUX, master at arms. DYL is planning new low-power rig for 28 Mc. WFP is high-power on 14 Mc. VJF is back on 28 Mc. ALH is a new ham. FNF is building a new house. The Club is holding a code class before each meeting. RTI is with TLCN. UHC is experimenting with TV. MCU is on c.w. with 813. The new YL at MHC's has shoved the ham rig into a corner. WOC-TV cut in on FDL operating time in DX Contest. 6GAI stopped to visit SEE and talked to her daughter in California via ham radio. IKG has a new Globe King. APF is a new ham at Clinton. ZLC now is Class A. Bob Flynn, 15 years old, now has his ticket, 9FOZ, as a result of the club effort. JAD puts Bob up as the youngest Class A ham in the State. SCA reports TEN is going good. SCA now is RM. QVA reports that FTF and YNP are new members of TLCN. NTA now is chief operator at Des Moines Police radio. Traffic: WØSCA 127, QVA 119, NYX 61, QAO 32, SRR 5.

KANSAS — SCM, Earl N. Johnston, WØICV — The Central Kansas Radio Club at Salina will hold a hamfest and picnic in Oakdale Park, Sunday, May 21st. JFE, PKD, QDH, and MVG sign into the Wagon Wheel Net on 144 Mc. every Mon. and Thurs. night in Salina. ISC has new 28-Mc. beam. New officers of CKRC are YBC, pres.; 1NW, vice-pres.; PKD, secy.; YZX, act. mgr.; ISC, publicity. At a recent banquet the Wichita Amateur Radio Club awarded UUS for his all-around activities, GAV for his 'phone activities, and YOS for his c.w. activities. The Kansas State Amateur Radio Club new officers are YGP, pres.; DEL, secy.-treas.; ABV, chief 'phone op.; LTG, chief c.w. op. KSARC was presented its Charter by your SCM personally Feb. 23rd. WGM, our RM, gave a talk on traffic-handling. AHM is holding code classes on 1915 kc., 1930 to 2030, Mon. and Thurs., power 15 watts. QQQ was on exhibit at Engineers' Open House Mar. 17th and 18th. The Eldorado Amateur Club membership is 100 per cent AEC and 60 per cent have emergency power supplies. LIX, HEC, 1FR, and NXJ are building for 144-Mc. work. LIP is putting up new 28-Mc. beam. AOD is new licensee in Lawrence. From Chanute we learn LYF had to put up new antenna for 3.85 Mc. and WPL is active on 7-Mc. c.w. IZJ reports MARS station getting on in Emporia. IPI has a pair of 3C24s with 200 watts input and three-element rotary beam up 70 ft. Traffic: WØOOT 201, FER 119, HBL 12, LIX 11 UKH 11, ICV 5, SKF 5, TVU 3, TDW 2.

MISSOURI — SCM, Ben H. Wendt, WØICD — The section has been very fortunate this past winter in that only a few emergencies existed because of ice and snow storms. A mild winter and alert amateurs eased those parts where emergencies did exist. Sunday, June 11th, is the date set for the Missouri Emergency Net picnic. This annual event will be held at Tweedies Resort, located between Eldon and Bagnall Dam on Highway 54. Enjoy boating, fishing, swimming, beverages, lunch, etc. For full particulars contact TGG. The Tri-State Amateur Society is interested in getting new hams started by offering training aids and code practice sessions. The HARC was host to DEA, the Midwest Division Director, at its last meeting. Docket 9295, the Club Federation plan and League matters were discussed. The Club is sponsoring an extensive membership drive. The latest figures available indicate that there are 725 amateurs in the Greater Kansas City area. QMF is beginning to wonder whether or not his 144-Mc. gear is working. Endless calling and listening result in only a few QSOs. An added beam brings high hopes for more frequent QSOs. A modulator is the new equipment for the 160-meter band. UAB now is the operator of a radio station on Okinawa. QXO is slowly recuperating from a heart attack. His absence in traffic-handling and net activities has been keenly felt. WAP is completing his first 'phone rig. WIS is using a new Collins receiver. WAP has a new Monitone and is constructing a Select-O-Ject for 7 Mc. OZS can be heard on 160, 80, and 40 meters with 125 watts to an HT-9. Traffic: WØPME 173, CGZ 123, KIK 86, WAP 75, QMF 11, NNH 8, GBJ 6, ICD 6. SOM 6, TLY 2, OZS 1.

NEBRASKA — SCM, Scott E. Davison, WØOED — AY reports activity on all bands. FMW has broken records as EC for 160-meter emergency net; he has recruited every available ham and all available gear on the band with daily drills at 10:15 P.M. SENRC voted to have calls on license plates. The RUJ club station has inaugurated a memorial QSL card. APH is a new call at Falls City. AHJ, JHT, VTQ, IAY, ZJF, RUJ, and GJM can be found on 160 meters now. KJP is busy with activity in both 'phone and c.w. nets. JDJ reports for the Lincoln gang. IXL patrols c.w. net frequency. DW, IILX, and PZU were guests at QRM Club recently. JPI now is Class A. DMY is using electronic keyer with fine results. BXJ checked into the 'phone net with two watts recently. EDI, Assistant EC for Lincoln, has 3.5-7-Mc. mobile, 'phone-c.w. JDJ found out it pays to fuse primary of power supply. OHP's new QTH is Lincoln. KJP reports that there are 71 stations in the 'phone net. RCD is EC for the Fremont area. FHA has been experimenting with antennas on 400 acres of ground! Your SCM enjoyed his visit to the Ak-Sar-Ben Radio Club. The following have earned Section Net certificates in the Nebraska 'Phone Net: BDE, BXJ, CBH, CXT, DLX, DMY, ERW, EUT, EXJ, EXP, FOW, FYP, GBH, GJM, IDO, LEF, LRF, LWK, MJY, AYM, NVE, OZC, QOU, VAA, VMP, ZNI, ZUT, and WKP. RGK, CXT, and VQR are new members of the Emergency Corps. We need more reports, fellows. Traffic: WØFQB 245, KJP 172, FAM 107, AY 76, JDJ 39, DMY 27, FMW 16, IXL 16.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Walter L. Glover, W1VB — The Connecticut Wireless Assn. reports two new members, TX and BIH. Its membership list includes the following well-known hams: JMY, NJM, AFB, DXT, FTX, CEG, JTD, MPB, and RWS, in addition to the newcomers. Plans for Field Day include the use of the call TX/1. ODW now has 67 countries using an 807. BVB works into ESN and EPN as well as the Connecticut nets. VW, our PAM, has issued a CPN bulletin listing the Net Controls and Alternates, and also the stations which tie into the CN Net. CPN is the section's official 'phone net, meeting on 3880 kc. at 8:30 P.M. Mon. through Fri. and Sun. at 10 A.M. All Connecticut 'phone stations are invited to join in and make it the best 'phone net in the country. LKF, SEC, has issued a six-page CAREC bulletin, which includes an up-to-date list of all ECs, a complete alerting plan for the State in conjunction with the State Police, other tentative plans, and news from the different areas. All in all it makes interesting reading, and it is suggested that everyone get hold of a copy if possible. Pete also reports progress with a Naval Reserve set-up, and the probability that there will be another "Operation Lookout" in the near future. QAK has left for the South to recuperate after his stay in the hospital. YU has been appointed OPS. Traffic: W1BVB 424, NJM 400, KUO 267, HYF 171, BDI 129, CTI 73, KV 71, LKF 67, DAV 63, VB 62, FTX 58, ORP 45, QIS 45, ADW 32, CJD 28, NBP 28, JTD 20, FOB 19, LV 19, RWS 18, GVK 15, VW 14, ODW 6.

MAINE — SCM, Manley W. Haskell, W1VV — Pine Tree Net, 3550 kc., 1900, Mon. through Fri., RM NXX, 1RN EAN. Sea Gull Net, 3061 kc., 1700, Mon. through Fri., PAM FBJ. IGW is new OPS as well as SEC. HUT now is EC for the Auburn-Lewiston area and QDO for the Bar Harbor section of the State. NGV, of Richmond, tried for BPL during February, making a total of 491. Had it been

(Continued on page 82)

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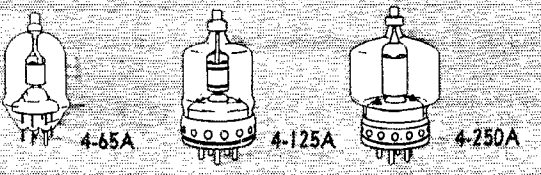

a month of 31 days he would have made the grade. A new high of 29 stations reported traffic to the SCM with a grand total of 1407 points. GMD has moved to New York. QQY lost his 144-Mc. bazooka in the recent high winds. ICN, of NAB fame and the old four-pipers, has joined the gang on 3961 kc. Members of the Deep Sea Drag Net are anxiously awaiting the certificates. Under QUI, head man for the PAWA, every meeting of the Club sees a full house and major and minor programs. Other members are working for the exams to be held soon. KLH and GVS have made grid-dip adapters using a signal generator, and they work FB! HYH reports that the memorial station for Charlie Garcelon, AWQ, is well under way. BF has his 522 hot most of the time and is looking for a rig for 3.85, 14, and 28 Mc. Traffic: W1NGV 491, LKP 217, YA 161, LBJ 105, KLH 74, QUA 72, NXX 61, VV 40, AFT 20, FBJ 18, IGW 17, COV 16, EFR 16, JAS 14, PTL 10, KEZ 9, GE 8, KDE 8, GMD 7, AWN 6, FV 6, NHT 6, JJF 4, LGR 4, LRQ 4, QDO 4, AMR 3, IXC 3, GJY 2.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — The following have had their appointments endorsed for another year: OPS — DJ, GDY, JCX, and HUP. OBS — LMB and LMU. ORS — MDU and PLQ. SEC — BL. ECs — RCJ, QMJ, PMC, HUP, AWA, and LVN. OOs — PLQ and MIT. CTR is a new OBS on 144 Mc. BGH is new OO, Class III–IV. The Eastern Mass. Net held a meeting and supper in Boston with the following present: JJY, BL, JCK, TY, NBS, PLQ, PYM, QJB, BDU, CCF, QZS, QMJ, QKM, QGL, FGT, EMG, ALP, and ZR. It was decided to move our slow section of the Net back to 6:15 P.M. How about some of the new hams coming in on this? Top speed limit is 15 w.p.m. Also any of the 'phone men are welcome, new or old. New calls on 144 Mc.: DFE, SOJ, MHC, SNO, RLA, LYL, AWX, KVF, and QJT. LYL, DW, and QOS are on 28 Mc. PH is on 7 Mc. BZQ has sixteen-element beam on 144 Mc. SW and K1NAR are on 3.85-Mc. 'phone. CTR is on 7 Mc. The Eastern Mass. Club visited the Squantum Naval Station. The Martha's Vineyard Amateur Radio Club now is affiliated with ARRL. The Quannapowitt Radio Assn. had a talk by ELP. The Brockton Radio Club is having lectures on theory of circuits. The Eastern Mass. Club had By Goodman give a talk on single side-band. The South Shore Club held its annual auction with AKY doing his stuff. The T-9 Radio Club held a meeting at MVQ's. GGV is working hard to win the Club's contest. IPK is firing up his 210s. MGP writes from Shaw A.F. Base, S.C. QJB reports that the ESN has discontinued all night schedules, except Sat. and Sun. at 7 P.M. on 7280 kc. The CQ Chess Club is on 7240 kc. at 1400 and 1930 Sundays. WU keeps schedule with KP4DU. NBS is back on the air. OBN and SMO had a QSO for 4 hours. BB has three-element beam. The Merrimack Valley Amateur Radio Club had movies by QNC and lectures on theory by Norman Given. The Club has PFA's four-element beam. NZX has code class going well. PFA has new three-element beam and Collins receiver and transmitter. RLF has 12-watt rig on the air. NNG is the Club's QSL Manager. BLO has almost TVI-proofed his BC-810. The Newton Emergency Net had a drill with the following on: BL, EK, HLX, LMU, KVF, OMU, RM, and NPA. OMU is on 3.85-Mc. 'phone. The officers are RM, pres.; NSZ, vice-pres.; OMU, treas.; PK, secy.; BL, EK, and LMU, directors. LMU is working for Workshop Associates. EH has a C.A.P. call. The Fall River Amateur Radio Club meets the 2nd and 4th Thurs. nights of the month. IIC, the president, reports that they have a rig on 3.5-Mc. c.w. IO has a rig in his car using 6J6s and a coaxial pipe receiver on 144 Mc. SFV has a rig in his car on 144 Mc. JTF and MMY are discussing converters vs. receivers. HXY is back on 144 Mc.; also KIM gets on some. BGW is on 14-Mc. mobile 'phone. The Quannapowitt Radio Assn. had a talk by Matthew Abbott on "Wire and Tape Recording." Traffic: (Feb.) W1EMG 210, LM 152, RXT 61, TY 44, PU 36, QJB 31, DMS 18, PYM 16, WU 11, NBS 8, OBN 2. (Jan.) W1QZS 85, BB 22, MDU 12, MGP 12.

WESTERN MASSACHUSETTS — SCM, Prentiss M. Bailey, W1AZW — RM: BVR. Net frequency: 3725 kc., Mon. through Fri., 7 and 10 P.M. Net call: WMN. RDB writes a nice letter from school. Dick keeps busy with school work and wrestling and gets home quite often to build a new 100-watt rig. GVJ is new Superintendent of Schools in Agawam. RZG sorrowfully reports his lowest traffic report since reporting because of rig trouble. SSO is new YL operator in Spencer. QQO/RLQ visited 3OJA in Pennsylvania. AQM is enjoying a vacation in Florida. MUN renewed OO appointment and worked plenty of DX in the contest. RHU went to town on traffic this month. JE reports no time for activity. GZ has had many interesting 28-Mc. 'phone contacts and made his first KL7 contact. BDV is building a small portable job, 616–807, in a small cabinet. The Pittsfield Radio Club enjoyed a swell talk and demonstration on high-fidelity recording by "Lighthouse Larry," George Floyd. EFN is a proud papa again. The PRC will take part in a hobby show May 3rd, 4th, 5th, and 6th. A transmitter will be in operation on 3.85 and 28 Mc. New members of the Hampden County Radio Club are EGN, ETY, SFU, and SOZ, along with several ham-minded SWLs. JYH, KFV, CJK, EOB, PDF, APA, and MVF went in heavy in the DX Contest. The 50- and 144-Mc. nets again are going strong in Springfield. The Hill-Top Radio Club of Worcester has a snappy club bulletin. PYR and his XYL are the proud parents of a baby boy. JLT participated in the DX Contest. AZW has been traveling on business for G.E. Traffic: W1BVR 106, RHU 101, GZ 65, GVJ 22, BDV 11, AZW 7, IHI 6, RZG 3.

NEW HAMPSHIRE — Acting SCM, Clifton R. Wilkinson, W1CRW — RM: CRW. A new member in the New Hampshire Net is JGI, C. E. Sargent, North Conway. IJB has new jr. operator. BFT celebrated his twenty-fifth year in amateur radio and was presented a bronze plaque by the Concord Brasspounders. In this time he has logged 41,000 contacts. EWF reports that in the first two weeks of February he worked 51 countries on 14- and 28-Mc. c.w. POK reports conditions on 7 Mc. in the early morning hours not so good. QWR, working 28-Mc. 'phone, is building a new rig with VFO for 3.5 and 7 Mc. QWP made WAS with 25 watts power, using three-element beam and eight-wave 28-Mc. beam, and is waiting for cards for WAC. CRW is busy with new business. SAL has all bugs out of VFO. It now sounds like crystal. RFP now is running higher power and sounds swell, too. GMM is back operating in NHN. Traffic: W1CRW 339, PFU 66, SAL 46, QJX 20, RFP 9, EWF 3, POK 1.

RHODE ISLAND — SCM, Roy B. Fuller, W1CJH — RM: BTV. PAM: BFB. The PRA will hold its annual dinner dance on May 13th at Johnson's Sea Grill. This is one of Rhode Island's activity highlights so let's see you up there. NAARO station, SKT, is now set up for complete emergency work with a gas-powered generator installed in the basement of the Club. The Newport County Radio Club has some new appointees for its club activities, such as JBB and Commander Modaves in charge of visual education. QLD found that a low-power amplifier inserted in the keying jack of his Clapp oscillator does a swell job on n.f.m. KNE found out too late that his three-element rotary installation was in a proposed roadway so three months of hard work had to be undone. New appointments are QLD as EC and OHR as OO. It's time to make plans for the coming Field Day. Would like to see every club in this section active in this. What say? You miss lots of fun if you don't participate and it's a good way to find out what you can get together in case of a real disaster. Traffic: W1BBN 110, BTV 81, CJH 45, QR 23, ODJ 15, QLD 13.

VERMONT — SCM, Burtis W. Dean, W1NLO — SCE has a VHF-152A. Orrin has his 29-Mc. beam back up. MEP is using small reversible motor driving the VHF-152A tuning dial, with sweep of the dial in one minute. Chet reports into the Schenectady and Glens Falls emergency nets every Thursday night on 144 Mc. NDL has three-element wide-spaced 28-Mc. beam. RPR has NC-173 receiver. OHD is converting SCR-522 for 144 Mc. JBP, ETE, IDM, and RWX recently visited KJG. QVS is using TVI filter on TBS-50D with FB results. JEN, our hustling SEC, is getting the AEC off to a flying start in the Green Mountain State. Harold operates K1NAG with 900 watts on the c.w. net now and then. OKH has a 14-Mc. home-built converter. MMV is converting BC-406 for 144-Mc. receiver and building final with VT-127As. Between DX contacts EKU runs the school bus. Traffic: W1KRV 109, RNZ 38, JEN 21, OAK 21, AXN 19, AVP 17, IT 13, RNA 12, ELJ 10.

NORTHWESTERN DIVISION

ALASKA — SCM, Charles M. Gray, KL7IG — Well, gang, things are looking up once again. JE has taken over the duties of SEC since BE has left the Territory for the States. There also are two emergency nets operating on 3892 kc. The S.E. Alaska Net at 9:00 PST and the Northern Net at 10:00 PST. Net controls are IG and PE. OK sends word of the c.w. net on 3695 kc. with OW as Net Control, time 10:00 PST. New appointments are ABF as EC, AAQ as EC, ZM as OPS and OBS. FM reports the new QSL Manager's address is Box 73, Douglas, Alaska. ABF reports four hams in one CAA station, ABM, ABF, ABS, and ADH. The QRM is terrific.

IDAHO — SCM, Alan K. Ross, W7IWU — News from outside Boise is very scarce this month. Don't forget to send some news with your traffic reports. Hayden Lake: FIS writes some good letters and has extensive plans for going jeep mobile. Boise: GTN gave a fine demonstration on s.s.s.c. at the recent Gem State Radio Club meeting. Anyone interested, contact Leonard for all the "dope." The Boise gang is "mobile crazy," with ALY, KJO, SHN, and IWU in caravan for an 85-mile round trip ending up with campfire and lunch. The May meeting of the Club will feature mobile rigs, antennas, etc. Anyone is welcome to attend — the second Friday of each month. All ECs should get their gangs out for the June Field Day. We will monitor and work on 3935, 3745, and 7155 kc. Here's hoping to work all ECs out in the field. Traffic: W7EMT 80, BAA 22, NH 19, BDL 12, IWU 11.

MONTANA — SCM, Fred B. Tintinger, W7EGN — New officers of the Butte Amateur Radio Club are FLB, pres.; MNI, vice-pres.; JFR, secy.-treas.; EMF, sgt. at arms. The Butte Club paper, *T1'R*, is good for plenty of chuckles. MHQ and ED were in QSO with KUX in Manhattan when a terrific explosion shook the shack at KUX.

(*Continued on page 84*)

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Erv (KUX) ran outside in time to see a fast freight train piling up. Thirty-four cars were derailed and emergency procedures for amateur traffic were immediately set up but none was necessary. However, the net did supply rapid on-the-spot news reports of the wreck to the local b.c. station. ED is the EC for that area and an emergency drill had been run just a few weeks prior to the wreck. The Gallatin Valley Amateur Radio Club is conducting a novice class in radio. MYF, LHZ, LSC, and ED (jr. operator) are leaving Bozeman. Montana State College Naval Reserve Unit is licensed with the call K7NAV. CAL has abandoned n.f.m. and is back on a.m. BYX has a new receiver. LVJ is in charge of National Guard Communications. CT is working hard toward building up the AEC. Traffic: (Feb.) W7KGJ 71, EGN 61, CT 59, FTO 23, LIT 6, COH 3. (Jan.) W7KGJ 113.

OREGON — SCM, J. E. Roden, W7MQ — Albany: SO is asking for more check-ins on OEN, 3600 kc. MNS has become NC on OEN 'phone net. Baker: HAZ reports a local net on 160 meters using battery power is in the process of formation for use in the local AEC program. Bend: GNJ has 100-watt mobile on 3.85 Mc. JOP is regular NC on OSN. SY works 3.85-Mc. mobile. Eugene: KL has deserted 3.85 Mc. to catch up on his DX. Forest Grove: NQB is new EC. Medford: LNG reports the Rogue Valley Radio Club has received the call OEK, with RE as trustee. MNF is a new club member. Milton-Freewater: GYH is new EC. Pendleton: BDN is new Net Manager for OEN 'phone net. FSP has moved to Montana. Philomath: APF is considering State Net Control for CARS. Portland: WJ is new OBS. LT is new ORS and is doing a grand job as jump station between OSN and OEN 'phone net. COB is new EC for Portland area. LK is new Net Manager of 29.2-Mc. mobile net. MTW helps move intrastate traffic by acting as jump station between OSN and RN7. Sweet Home: GWE is new ORS and reports that the Oregon Emergency Net has opened up another net frequency on 7200 kc. for Sundays and holidays at 1430 PST. Check-ins are invited. Traffic: W7GWE 441, ESJ 315, APF 247, AJN 165, HV 141, LT 141, DIS 137, MQ 119, HDN 103, JRU 89, GNJ 79, FY 61, NMH 60, MYI 50, ACZ 44, MTW 44, MNS 42, NOJ 42, FRT 33, BDN 32, MBI 27, EBQ 25, NOB 25, JVO 19, GZW 17, BSY 14, JOP 14, JKU 12, NGG 12, KIN 8, NQD 8, EHW 6, JLU 4, WEN 2.

WASHINGTON — SCM, Clifford Cavanaugh, W7ACF — SEC: KAA. RM: CZY. PAM: CKT. DRA is having a tough time keeping WSN schedules because of his health. CWN wants an invitation to the shack of someone who is near good fishing. FRU is sure glad he isn't in TV country. EAU has built a Select-O-Ject and says it's FB. The new officers for the Valley Radio Club at Puyallup are HMQ, pres.; MTX, vice-pres.; LEC, secy.; EHJ, treas. The new trustee is Bud Lundrigan, who should receive his ticket any day now. The *HI-MU Journal* of the Walla Walla Valley Radio Club reports that the Club has an opening on its service committee — a man is wanted who can serve hot dogs, not take 'em off in a corner and wolf the works. KBA, who was the last man on the job, gained more than fifty pounds. APS is doing a fine job taking Seattle traffic off WSN. CZY, the section's top traffic-handler, says that the transpacific traffic outlets are in top shape and doing a land-office business. JC can fix any radio but his electric stove has him stumped. KTL reports that the Vancouver Amateur Radio Club has finally put its rig on the air. The call is AIA. LVB is having a tough time eliminating TVI in fringe area. ZU is getting his big schooner ready for the yachting season. ETO says TV is coming to Wenatchee soon. FWD is kept quite busy handling his YF's QSL Bureau traffic. KCU was active as CZY's campaign manager. FIX has a new car so guess we will see him at the WSN picnic at Stevens Pass this summer; his old one never would have made it. LFA is having too much school and too little radio. ACF is having TVI troubles. IOQ thinks he is slipping as he handled only 323 messages this month. Gang, this is my last report. I want to thank all hands for the fine cooperation given me during my turn in office as your SCM. It has been a pleasure to have served you and I wish you all the best of luck. Traffic: W7CZY 2202, FIX 327, IOQ 324, JJK 305, KCU 139, FWD 122, LFA 122, LK 85, BX 46, APS 40, FRU 33, ZU 32, ACF 31, ETO 25, LVB 19, DRA 16, LJM 16, EPW 14, EAU 8, CWN 6, KTL 6, JC 4.

PACIFIC DIVISION

HAWAII — SCM, Dr. Robert Katsuki, KH6HJ — The HPN (Pineapple Net) has been maintaining its scheduled operations on 3725 kc., Mon., Wed., and Fri. nights at 2000 HST. BW, UL, PX, and HJ have been the most consistent. W6CE appeared on several occasions taking mainland traffic direct. PL has had to confine his activities to unloading last year's sugar as well as moving his rig into another shack. First operator at UL (Gilmore, W7FUL) is returning to W7 on leave, then on to Washington, D. C. AAR is taking over. The 75-meter 'phone net presumably still is in existence, but no word has been received from MN (PAM). Ditto as regards EC activities. VE is rebuilding to p.p 812s with p.p. 807 modulators. VE worked UA1KFA on 14-Mc. c.w. and finally made WAC. Fellows, please make

(Continued on page 86)

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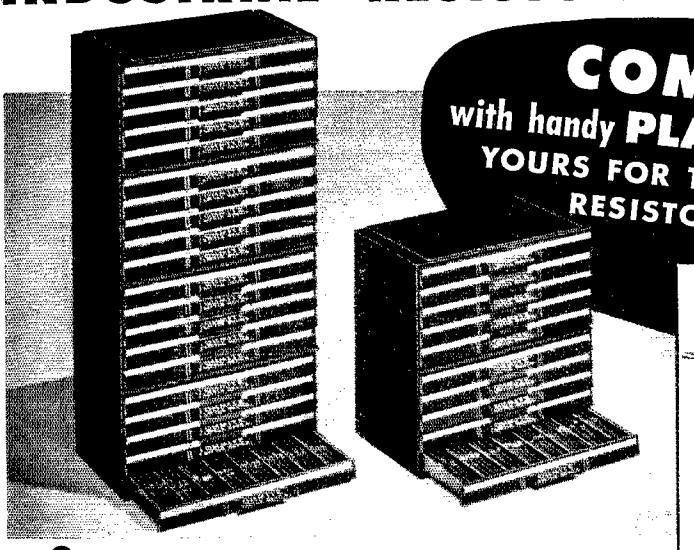

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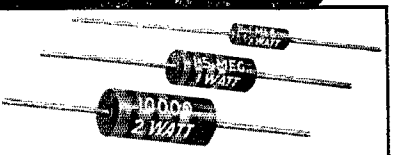

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INDUSTRIAL ±5% tolerance (153 resistance values)	CAB-41	2025	Assorted ½, 1, and 2 watt	397.50
	CAB-42	1650	½ watt	247.50
	CAB-43	1240	1 watt	279.50
	CAB-44	1000	2 watt	299.50
RADIO SERVICE ±10% tolerance (40 resistance values)	CAB-1	125	½ watt	12.50
	CAB-2	125	1 watt	18.75
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use of those station activity report blanks I've been handing out and send me a report. Traffic: KH6UL 115, HJ 26, BW 16, PL 12, PX 3.

SANTA CLARA VALLEY — SCM, Roy E. Pinkham, W6BPT — During the Red Cross drive SCCRA had a display in the window of a San Jose department store stressing emergency communication. OMC gave a talk on TVI and its elimination at the San Jose club meeting in March. At his Lockhart Gulch QTH AYL is using Lazy-H on 14 Mc. beamed on Rome. HC has been attending meetings of the Palo Alto Radio Club. The Palo Alto's club exhibit at the hobby show gained some very nice publicity. LZL seems to be QRL watching TV. VE7JT was a visitor in the Bay area during March. HYH is a new call at Mountain View. CAA is working in MTN handling traffic when time permits. NYS now is using 200 watts on 3.85-Mc. 'phone after playing with very low power for the last few months. CFK is sporting a new Hudson, made necessary by the arrival of his YL harmonic. TBK is busy working in 144-Mc. net covering Monterey Bay to San Francisco. NOE is using Clamper tube modulation on 3.85-Mc. 'phone with good results. NW is QRL with his service and Chick reports he will rebuild the rig before getting back into traffic-handling. PARRA has made plans to participate in Field Day from the top of Mt. Hamilton. SYW is working on 160 meters. Traffic: W6EGH/6 86, BPT 80, SYW 17, MMG 11.

EAST BAY — SCM, Horace R. Greer, W6TI — Asst. SCM, Charles P. Henry, 6EJA. SEC: OBJ. RM: FDR. ECs: CX, AKB, EHS, NNS, IT, IDY, QDE, MLZ. CX is new EC for Mission Trail Net. On Feb. 18th ZM passed away after a long illness. Sam had a great love for ham radio in the many years he played it, and always seemed to have the interest and time to do what he could to better our great hobby. Sam was just like an old landmark around these parts and it is with great and sincere sorrow that he now has joined the ranks of Silent Keys. JZ is confined to low-power TVI trouble. OJW is getting back on the beam again. DQL had his rig on a recent snow trip and was the life of the party. KV4AF/6 expects new orders soon. QXN is getting back to big traffic-handling. YDI keeps 'em rolling. The University of California Amateur Radio Club now is affiliated with ARRL. We hope this FB gang will give us a call if we can be of any help. IXH is plugging along. WII is on the QRL side. *Say, gang, please send in your reports right after the first of the month so I will receive 'em by the 4th or 5th. My report should be mailed on the 7th, and not later than the 8th, and I must have time to get things organized. This is a must.* The Mt. Diablo Radio Club meets the third Friday each month. Officers of the Mission Trail Net are NTU, pres.; CML, vice-pres.; BF, treas.; KZF, secy.; CX, EC; NLQ, c.w. section coördinator; 7TJY, traffic mgr. The DX boys are getting rested after the DX Contest. Although conditions were not too good there was lots of effort on both c.w. and 'phone by many of the local brass hats. Yes, the ARRL DX Contests are always looked forward to here in the East Bay section. What do you think is going to happen? — Yes, ELW finally is going to clean up the room and put everything in a rack and panel job. Guess Temp has thought it over at last — "Switch to Safety and Live." EY is putting signals out on all bands and has no TVI trouble yet. TI finally cleaned up the TVI trouble with his BC-610 with the use of a Harmonica and a condenser coil set up. Yes, all channels are clear. MEK has 213 DX countries confirmed postwar out of 223 worked. PB is chasing power leaks. IKQ is on the air at last for a change. MVQ had plenty of problems with antenna vs rain in the Contest. DYP is building new tower. Traffic: W6JZ 335, WII 247, QXN 227, IXH 165, KV4AF/6 115, W6DQL 47, YDI 8, TI 3.

SACRAMENTO VALLEY — SCM, Ronald G. Martin, W6ZF — Asst. SCMs: *Northern Area,* 6YNM; *Central Area,* 6CKV; *Southern Area,* 6SUP. SEC: KME. ECs: Met. Sac., BVK; Walnut Grove, AYZ; Dunsmuir, JDN. Chico Area, HBM; Roseville, GHP. RM: PIV. OBS: AF, BTY. OES: PIV, GHE. OOs: ZYV, BTY, GDO, YV. OPS: JDN. Sac. Emer. Net (City) NCS AUO. SVS Traffic Net, 29.4 Mc., NCS ZYV, Asst. NCS BTY. Mother Lode Net, NCS WSI. *Please mail your reports to reach the SCM by the 2nd of each month! Northern Area:* JDN and CFU are teaching code to Dunsmuir Radio Club members. IEO is a newcomer in Dunsmuir on 7 Mc. REB is on 7 Mc. *Central Area:* GERC held its February meeting at Naval Reserve quarters, Chico. HNL works all bands, 10 to 160, with 100 watts. NGG is active on American Legion 75-meter 'phone net. WCC has high power f.m. on 28 Mc. DGK erected six-element 144-Mc. beam. OEX, VQJ, SLS, VZE, DPG, and SLV have been heard on 160. VZE is newcomer at Oroville from Bay area. BHM is kilowatting on 14 Mc. with new three-element beam. AF has new eighty-footer! CKV is mobiling on 3.85 Mc. *Southern Area:* HTS schedules YLRL 29 Mc. Tuesdays. ZYV is editing Helpful Hints for 'Phone Traffic Procedure. SYN has new SX-42 for working Gypo Loggers Net on 1995 kc. KKL is DXing with new 10-20 beam. MUN returned to 28-Mc. 'phone after 10-year absence from the air. FFM worked his first JA on 7 Mc. ASE has new five-element 144-Mc. beam. OXG worked TI2ZZ for his first 28-Mc. 'phone DX, and has 50 watts on 160. CTH lectured before Placer Radio Club on TVI. SUP is setting 50-ft. pole for 14-Mc. beam. HOP has new 32V-2 and three-element beam.

(*Continued on page 88*)

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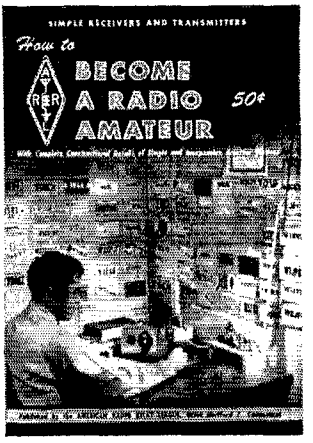

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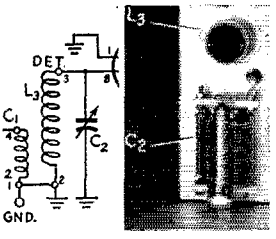

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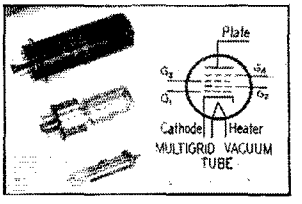

33 photographs of components with their schematic symbols.

V	• • • ▬	dit-dit-dit-dahh
W	• ▬ ▬	dit-dahh-dahh
X	▬ • • ▬	dahh-dit-dit-dahh

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ROANOKE DIVISION

NORTH CAROLINA — SCM, W. J. Wortman, W4CYB — Spring fever must have set in much earlier in North Carolina than elsewhere — again the reports that came in this month were one verbal and one postal card. We have seen a few of the fellows in a couple of trips over the State and find that the Greensboro gang is all fixed up with a brand-new remodeled club house and interest is quite high there. Congrats, fellows! The Catawba Valley Club, up Hickory way, is doing a grand job with its publication of news of local interest, and is planning lots of activity for club-owned gear and mobile equipment. The grapevine says that OQQ, NHV, and perhaps several others recently passed Class A exams. This source also tells us that there is some interest in 160 meters in this section. Known to be on this band are RER, PZ, US, DSO, and LOA. Thanks to DSO for the card. KJS is trying to stir up a bit of interest in traffic on 3605 kc. Some of you fellows get in touch with Charlie and help him out. In last month's report the president of the Engineer's Radio Assn. of Duke University, AHV, was incorrectly shown as KFC. This call should have appeared as KCF. Our apologies to Vic Clark, KFC, Virginia SCM, for incorrectly listing him as the president of the Duke club. That is it, gang.

SOUTH CAROLINA — SCM, Wade H. Holland, W4AZT — ANK did it again this month. His traffic total is 915, placing him in the BPL. In Rock Hill NTD is operating CAP rigs, CXO is dividing time between police bands and amateur bands, and PHS and NDH are rebuilding. We welcome NQP back to Aiken and announce his OPS appointment. BAT, in Charleston, renewed his EC appointment. ANK renewed his ORS appointment. DX, our PAM, advises that GTW, in Sumter, is on 7 Mc. and GWT on 28 Mc. and that both are planning 160-meter operation. LLH and LSM, in Florence, are operating 160 to 10 meters, and ETF, in Manning, is on 160 meters. PVQ and KTI, in Georgetown, confine activity to 28 Mc. We would like to see more 160-meter operation in the State with the possibility of a 'phone net on that band to cover all sections of South Carolina. *Break-In*, our new section news magazine, has had a good reception over several states and subscriptions are coming in regularly. Items for *Break-In* can be

(*Continued on page 90*)

FIRST ANNUAL VIRGINIA QSO PARTY . . . MAY 7TH

A QSO party, open to all Virginia hams, will be held between the hours of 1:00 P.M. and 9:00 P.M. EST, Sunday, May 7, 1950. *Every licensed amateur in Virginia is urged to participate, if only for a few QSOs, in this affair!*

No power limit, band or mode restrictions in this get-together. Objective will be to contact as many fellow Virginians in as many *different* Virginia counties as possible during the eight-hour period, exchanging certain information with each station worked. Stations may be worked only once on each band (regardless of mode used) but they may be worked again on a different amateur band.

Contest call is "CQ Virginia" on 'phone, "CQ Va" on c.w.

Information to be exchanged in each QSO is to consist of the following items: 1. Number of QSO (in the party). 2. Your call. 3. Your RS or RST report to station worked. 4. Your county. 5. Your name or nickname. For example . . . W4FF might send the following message on his third QSO in the party: "Nr 3 W4FF 589X FAIRFAX LINDY."

SCORING: Each message sent counts 1 point and each one received, 1 point. Two points, therefore, are possible from each QSO. Multiply total number of QSO points by number of *different* Virginia counties contacted in course of party for final score.

The following frequencies are suggested as rallying points during this affair: 3550–3600 kc.; Vicinity 3680 kc. (VN frequency); Vicinity 3880 kc. (VFN frequency); 3900–3950 kc.; 7050–7100 kc.; 14,100 to 14,125 kc.; 14,250 to 14,275 kc.; 28,800 to 29,000 kc. (c.w. and 'phone).

Use the VHF's, too!!!

There will be prizes for winners. Get on and meet your neighbors, neighbor! All Virginia hams, except SCM, are eligible for awards. All logs should be mailed to SCM before June 1. Send in your log whether you have one QSO or a dozen! Scores will be announced in the Virginia Net bulletin (a copy to each participant submitting a log) and the winners in *QST*.

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sent to the SCM along with *QST* news. Traffic: W4ANK 915, AZT 22.

VIRGINIA — SCM, Victor C. Clark, W4KFC — Asst. SCM: Elias Etheridge, jr., 4KYD. PVRC officers are NNN, pres.; 3AEL, vice-pres.; FF, treas.; KPK, corr. secy.; 3EIS, act. mgr., KVM, rec. secy. NQV and RAI are new PVRC members. SN reports the Falls Church Club meets at the Fire Hall on Lee Highway near E. Falls Church at 8 P.M. the 2nd and 4th Wed. of each month. Visitors are welcome. DWF is carrying on as prexy in place of IOV. The Wm. & Mary Club reports RDL a new operator at PYN. ØWJG now is 4RDL. The V.P.I. Club now is affiliated with ARRL. New appointees: KRX as EC for Appalachia, NBA as OBS, and MLE as ORS. AIV earned VFN certificate. VE, assisted by EMJ and NNN, raised new two-element 14-Mc. beam. Heard in the 'phone DX tests were FV, IWO, JUY, KDG, KWY, LIM, LUE, NQV, and OM. New AEC members reported by IWA are KYD, BCI, and PGD. ATA is CRM on a "tin can" based in the Norfolk area. REX is a new Falls Church ham, reports LAP. CQW has 23 states on 160 meters! PVA has 6-volt dynamotor and 20-watt portable for emergency work. CVO reports that JCC is on 14-Mc. 'phone, OVK is a navigator on the USS *Missouri*, USN is back on the air, and CVO had a QSO with 2CKD/4 ("Tex" Beneke, the band leader) during the latter's visit to Norfolk. JDL is erecting 15-element Yagi for 420 Mc. DTV is raising five-element 144-Mc. job. MLE paid a visit to FF, IPC, NNN, and KFC are de-TVIing. LRI and ITA are busy with AEC organization work. KBB is back on VN. OO CVO spotted an S.C. b/c station harmonic in the 80-meter band. Fellows, be sure to give some thought to the selection of a new SCM and get your petitions in to Headquarters promptly. Traffic: (Feb.) W4PYV 591, LAP 411, PYN 259, FF 192, MLE 100, FV 94, IWA 58, KFC 56, NRO 50, IA 36, II 31, MLH 28, DTV 26, PWX 24, NBA 22, NV 19, BCI 18, CVO 15, LPP 15, JHI 14, JAR 10, CQW 5, IPC 5, NQV 2, BZE 1. (Jan.) W4DTV 24, PWX 8.

WEST VIRGINIA — SCM, Donald B. Morris, W8JM — FMU, the SEC, has been named on a committee of the ARC in Morgantown. Assisting FMU are KWL, ZOW, TDJ, and SPY. DYJ has new 90-watt rig on 160-meter 'phone. JM visited OXO and worked KV4AA on 160-meter c.w. WSL keeps OX and PA schedules three times a week. YPR plans mobile operation through West Virginia for WACWV contacts. GBF, OXO, DFC, and AUJ keep traffic humming in West Virginia with OXO quite active on 8RN. With nets closing May 1st for the summer, your suggestions for improving nets for next season will be welcomed. Drop me a card and I will pass it on to the NCS. The following stations have been heard from Fairmont on 28-Mc. groundwave: EP, QG, KWL, FMU, YGI, WSL, DHT, YBQ, AEN, WVF, ESQ, JRL, EXC, KWI, and MIT. Plans are progressing for a State net on 28 Mc. with relays to cover the State. If active on 28 Mc., drop a card to WSL for your ideas. PQQ's new location gives him space for more antennas and improved DX conditions. EZR is quite active on 3.5-Mc. c.w. YLE worked his first DX station, a G, on 7 Mc. Traffic: W8GBF 696, BTV 505, AUJ 104, BWK 68, YPR 60, DFC 35, CSF 22, QG 14, WSL 13, JM 10.

ROCKY MOUNTAIN DIVISION

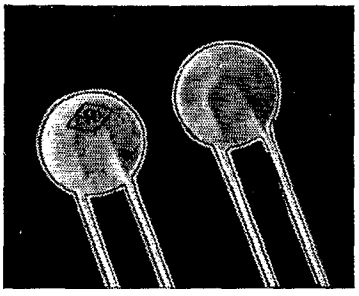
COLORADO — SCM, M. W. Mitchell, W0IQZ — SEC: KHQ. RMs: ZJO and LZY. The news will be sweet and short this month because only three cards had been received at the time this was written. KHQ is gradually getting the "big" rig together. PNK got his mobile on the air, made two contacts, and now is rebuilding it! EKQ, IC, ZJO, and FUO visited IQZ. ZJO had to travel over 250 miles of ice on his way back home. He made BPL again this month. Our sympathies go to DD, whose mother passed away recently. Our loyal SWL, Edna, spent some time in the hospital for some transfusions and at this writing is rapidly becoming her cheerful self again. Check your appointments and if expired or near expiration, be sure to send them in for endorsement. If no word is received 30 days after expiration, they will be cancelled. If you need report cards, just drop me a line and you will receive enough to last you a year. IC is building an electronic bug. That's it, gang. How about some more reports in the future? Traffic: W0ZJO 670, PNK 62, KHQ 35.

UTAH — SCM, Leonard F. Zimmerman, W7SP — The emergency test held for Salt Lake City and vicinity on February 21st went off nicely, thanks to the efforts of NWM and CEI. UTM and his ECs have a start on a good emergency set-up for Utah. Mayor Glade, of Salt Lake City, and Red Cross officials participated in the test and commended the boys very highly for their efforts. JPN reports about 20 stations active on the UARC 28-Mc. net. DTB and NAY report considerable activity in Ogden and Salt Lake City on 144 Mc. DTB is running 800 watts input to a sixteen-element beam on 144 Mc. SSY reports that the Ogden Amateur Operators Club is active and probably will give

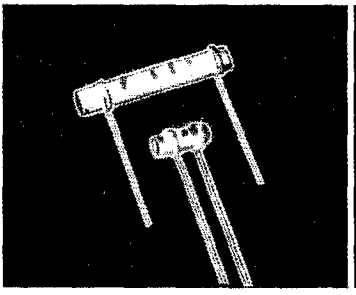
(Continued on page 94)

You Say Goodbye to Guesswork When You Use Centralab Parts

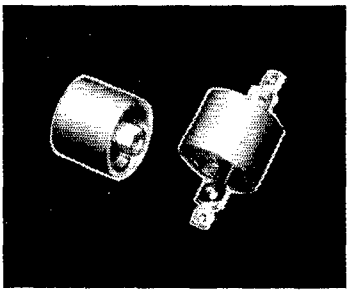
You Can Rely on CRL Components for Top Quality Performance



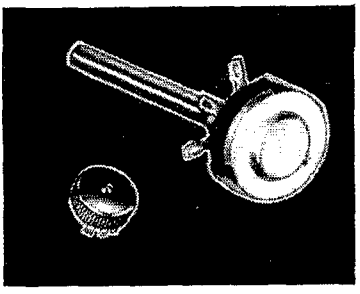
1 **KOLORDISK HI-KAPS** replace old-type by-pass or coupling capacitors in TV, AM, FM, HF, VHF, UHF, AF circuits. Smaller than a dime!



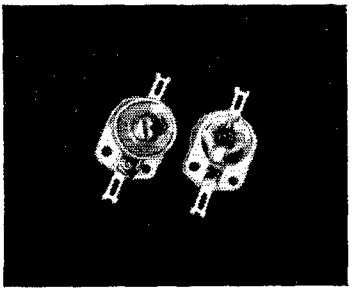
2 **TC, BC TUBULAR HI-KAPS;** Use TC for greater stability in temperature compensation. Use BC for non-resonant, by-pass and coupling circuits.



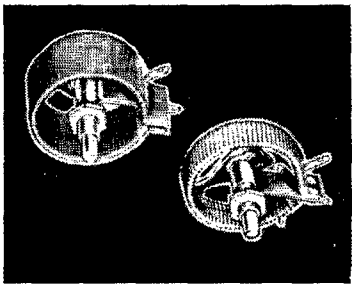
3 **HIGH VOLTAGE CAPACITORS.** These capacitors for transmitter and industrial use afford low power factor, stable retrace characteristics.



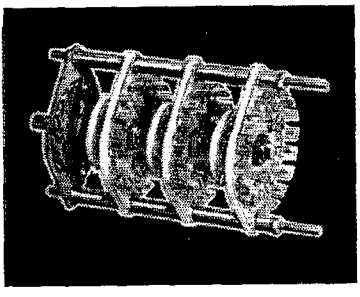
4 **MODEL "1" RADIOHM,** left, for miniature uses such as hearing aid controls. *Model "M"*, right, most popular and versatile of all controls.



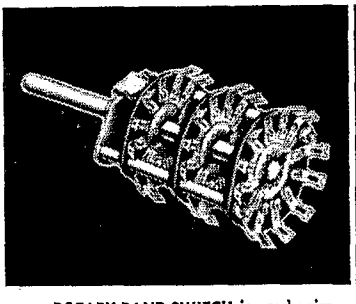
5 **TRIMMERS** for RF, HF circuits. Made with steatite base, burnished silver electrodes for electrical and mechanical dependability.



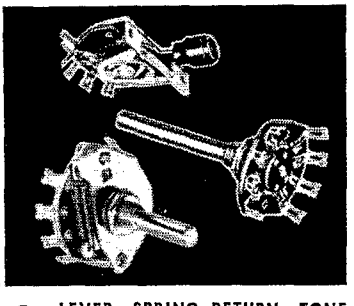
6 **POWER RHEOSTATS** for filament control on transmitters, small motor speed controls, other industrial applications. 25 and 50 watt sizes.



7 **POWER SWITCHES** are designed for transmitters, power supply converters and other applications. Efficient performance to 20 megacycles.



8 **ROTARY BAND SWITCH** is used primarily for band change and general tap switch applications. Made with steatite or phenolic insulation.



9 **LEVER, SPRING RETURN, TONE SWITCHES.** See your Centralab distributor for complete details on these switches—and all quality CRL parts.

WRITE FOR LITERATURE AND NAME OF NEAREST CRL DISTRIBUTOR

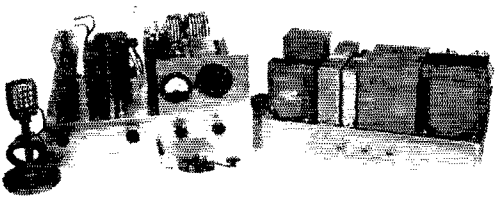
Centralab

Division of GLOBE-UNION INC., Milwaukee

YES! IT'S ALLIED FOR ELDICO

SUPER-QUALITY X-MITTER KITS
EASY TO BUILD

Absolutely "tops" for design excellence and quality components. Complete to the last piece of wire—simple to build. Quality and performance are incomparable at these amazing low prices!

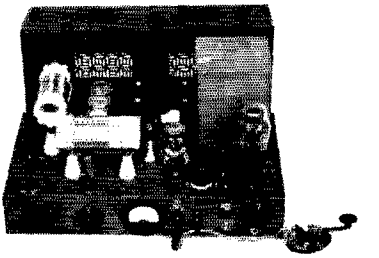


TR-1 TRANSMITTER KIT

A conservative 300-Watt phone and c.w. rig 6V6-6V6-6L6-813, Class B 811 modulators. All bands, 80, 40, 20, 15, 11 and 10. Exciter broad band, single control PA tuning. Three power supplies delivering 1500 v.d.c. at 350 ma, 500 v.d.c. at 200 ma, and bias supply. Aluminum chassis, tubes, transformers, capacitors, resistors, antenna changeover relay, meter, wire, hardware and coils included. Electro-Voice 915 high level crystal microphone part of the package. Plug in the crystal and line cord and you're on the air.

97-794. TR-1 Transmitter Kit. *Only* **$179.50**

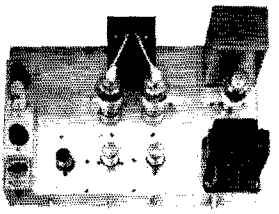
$17.95 down, **$14.27** monthly, for 12 months



TR-75 TRANSMITTER KIT

Loafing along at 75 watts this is the c.w. man's buy of the year. Simple enough for the beginner to assemble. Uses the time proven 6L6 oscillator-807 amplifier combination. Pi-network output. Husky power supply delivers 600 volts to the 807. Complete . . . not another bolt or wire to buy, including a smartly styled shielded cabinet to minimize television interference. Unbelievably low priced.

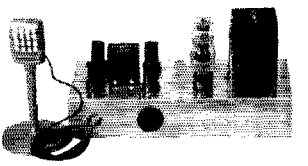
97-795. TR-75 Transmitter Kit. *Only* **$34.95**



MD-100 Medium Power Modulator

100 watts of audio, this AM modulator is designed to be assembled once and put into action for keeps . . . with no maintenance problems. Lineup consists of 1 6SJ7, 6SN7 audio amplifier/phase inverter driving a 6SN7 which drives two 807s. It is an ideal modulator for the quarter kw c.w. rig and is another Eldico complete package. There isn't another thing to buy; it even includes an Electro-Voice 915 crystal microphone. Ready for easy assembly. This is the kind of value the ham world's been waiting for.

97-796. MD-100 Modulator. *Only* **$44.95**

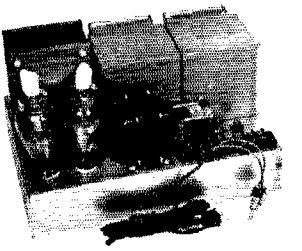


MD-40 Low Power Modulator

40 watts of audio, the MD-40 is a kit of the same superior parts that go into its bigger counterpart, the MD-100. In place of the 807s, two 6L6s are used. Complete, including the same standard communications Electro-Voice 915 high-level crystal microphone (less stand). Absolutely everything you need for quick easy assembly—nothing extra to buy. An amazing ham "buy."

97-797. MD-40 Modulator. *Only* **$29.95**

NOTE: All prices shown on both of these pages are F. O. B. Chicago.



High Voltage Power Supply Kits

Here are power supplies that are designed to take it. Ultra-conservatively rated. Kit includes plate and filament transformers, two filter capacitors and filter chokes, bleeder, safety plate caps, and all additional hardware, less two 866 rectifiers and chassis. The total cost is what you would expect to pay for the transformer alone.

97-798. HV-1500 Power Supply. Delivers 1500 volts d.c. at 350 ma. *Only* **$29.50**

97-799. HV-2000 Power Supply Delivers 2000 volts d.c. at 500 ma. *Only* **$69.50**

ALLIED HAS IT IN STOCK FOR IMMEDIATE DELIVERY...

Transmitter Kits and TVI Cures!

LICK TVI

IT'S EASY THE ELDICO WAY!

You can lick TVI these *four ways*, and ELDICO and ALLIED have what it takes to do the job:

1. By complete shielding to prevent direct radiation from the transmitter. 2. By using line bypasses and brute force line filters to prevent kickback through the AC lines. 3. By using W2GX's M derived Low-Pass Filter to prevent radiation of harmonics through the antenna. 4. By using W2GX's M derived High-Pass Filters to prevent the over-loading of the front end of the TV receiver by amateur fundamental signals.

FREE

"TVI Can Be Cured" booklet —all of the best dope on TVI —is available without charge from ALLIED. Ask for it now!

ALLIED *HAS THE TOOLS FOR YOU!*

HERE ARE THE TVI FILTERS

TRANSMITTER DUAL LOW-PASS FILTERS

First line of defense in the transmitter. One should go into antenna; another between driver and highpower final is recommended. 40 Mc cutoff—over 75 db harmonic attenuation. 52 or 72 ohm input and output. For other impedances, use an antenna tuning network. Good for 1 KW input; negligible fundamental attenuation; no effect on antenna performance.

77-605. TVD-62 for 52 or 72-ohm coax. In kit form, *only* **$7.99**

77-559. As above, but wired and tested, *only* **$10.99**

TVD-104 *Diaxal for use with paired RG-8/U or RG-58/U* or approximately 100-ohm coax.

77-607. In kit form, *only* **$14.95**

77-606. Wired and tested, *only* **$17.95**

RECEIVER HIGH-PASS FILTERS

Essential filters to install directly at antenna coil of the TV receiver. 40 Mc cutoff; no attenuation to signals above 40 Mc. Efficient on any TV set; insertion loss negligible; will not affect signal quality or strength. Available for coaxial or 300-ohm ribbon feed lines.

77-604. TVR-62 for coax. In kit form, *only* **$1.98**

77-560. As above, wired and tested, *only* **$3.98**

TVR-300 High-Pass Filter for 300-ohm line.

77-603. In kit form, *only* **$1.98**

77-561. Wired and tested, *only* **$3.98**

BRUTE FORCE LINE FILTER

R.F. that feeds back through the A.C. line is a potent source of TVI. These line filters will completely eliminate this cause of interference. Minimum installation. Patterned after model recommended page 508, ARRL 1949 Handbook.

77-610. TVL-1KW for total maximum power from AC supply line of 1 kw. In kit form, *only* **$5.98**

77-562. As above, but wired and tested, *only* **$8.98**

TVL-2.5 KW for total maximum power from AC line of 2.5 *kw 110* or 220.

77-609. In kit form, *only* **$11.98**

77-608. Wired and tested, *only* **$17.98**

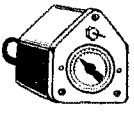
HERE ARE THE "SNOOPERS"

GDO GRID DIP OSCILLATOR

Here's the most valuable piece of test and measuring equipment in the ham's shack. Amateurs using it have saved countless hours in building, improving and de-bugging rigs. Locates resonant circuits without applying power to rig; measures harmonics, permits accurate neutralization, helps eliminate parasitics, etc. The improved GDO kit builds an exact duplicate of the famous Grid Dipper, and incorporates regeneration; includes everything from special handy case permitting one-hand operation, down to instruction book. Complete with tube and internal power supply, range 3 mc to 250 mc in six steps; size 5½"x2⅝"x3".

84-964. GDO Kit. *Only* **$24.50**

HARMONIC CHASER



Modified absorption type wavemeter designed to eliminate swamping by the fundamental when unit is tuned to harmonic. Identifies and records strength of your harmonics falling into all 13 TV channels. For use with external sensitive indicating meter.

77-600. TVH, complete kit, with instructions **$4.98**

77-601. TVH, wired and tested **$9.98**

77-602. TVH 500 microamp. meter in matching case. **$6.50**

ALLIED RADIO

ALLIED RADIO CORP., Dept. 15-E-O
833 W. Jackson Blvd., Chicago 7, Ill.

☐ Send FREE "TVI Can Be Cured" Booklet No. 37-039.

Send following ELDICO Equipment:.....

.....

$.....enclosed. ☐ Full payment.

☐ Part Payment, bal. C.O.D.

Name.....

Address.....

City.....Zone....State.....

...ORDER TODAY.....

(Continued from page 90)

other Utah clubs a run for their money on Field Day. The following appointments have been made or endorsed: PAM — DTB. OBS — JPN, FST. OO — JPN. ECs — PTO, CEI. Traffic: W7UTM 283, MFQ 148, EWX 32, SYD 24, LUP 3.

WYOMING — SCM, Marion R. Neary, W7KFV — LLP works the High Plains Emergency Net on Mon., Wed., and Fri. at 1730 on 1995 kc. and the Inter-Mountain Net on Tues. through Fri. at 2115 on 1902.5 kc. The Sheridan Club has NMB for pres.; NJI, vice-pres.; and JMM, secy.-treas. NJI, NJF, JMM, GUX, and NMB work almost exclusively on 7 Mc. IAP works all bands. JRG, CRP, and IAP are on 50 Mc. NWZ is working on 7 Mc. ØAHL moved to Warren Air Base. NDV is DX hunting on 28, 14, and 7 Mc. with 300 watts. MWS works the Inter-Mountain Net. HRM hunts DX on c.w. when CAA work permits. OWZ is active on 144 Mc. with weekly schedules into Colorado. MVK worked Denver on 144 Mc. from the Summit east of Laramie. KFV is trying airborne/mobile on 144 Mc. IRX enthused over 3.85-Mc. mobile. MGZ is on 3.5-Mc. c.w. with 813 final. NFW is trying 144 Mc. Traffic: W7IQQ 26, OWZ 18, HDS 12, IRX 7, KFV 7, HFV 6, JDB 4, GSQ 3, MWS 2, SQT 2.

SOUTHEASTERN DIVISION

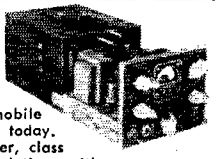
ALABAMA — SCM, Leland W. Smith, W4YE — MFA is new president of Auburn Club. The Club call is NQH. OHV has finished his kw. with VT-127As on 4 and 28 Mc. GCQ has ARC-5 on 3.5 Mc. NYC is active on 7 Mc. NKE is call of High School Club at Talladega. JYB has converted 274-N into 28-Mc. supermodulated rig. DAQ is working 3.5- and 28-Mc. c.w. FEY has new QTH in Jackson. YET operates K4FAG at Craig Field from quarters by remote control. BMM still is working on his p.p. 810 final. MVM has turned in his best report as OO. LYE, MEP, PGO, and PJB have nightly ragfests on 28-Mc. groundwave. HA has metal cabinet to combat TVI. GJW, MBA, MKS, and GBP became new papas in February. ASM has returned to the air after years of absence. JKU reports his 28-Mc. n.f.m. is working like a charm. KE still pounds 7 Mc. MEM is sporting new backyard shack and new p.p. 813 final. EJZ and EAB are active in Opp. OHR, ELX, and HXX are active on 28 Mc. FGT, SLJ, and CYT visited the SCM. Birmingham papers report FSW runs 2000 watts to five rigs! IMK has taken his Class A exam and is awaiting results. KCQ still is fighting TVI. LRU is QRT because of studies at U. of A. KUX has gone v.h.f. KDP is heard temporarily as 6YX in California. HFL has new QTH and new sky hooks. PXO, our "Sunshine Girl," worked her first G. PXN and RAP are new calls in Birmingham. JAM is teaching code class. CHJ has been on the same frequency, 3690 kc., for 15 years. BTU is strictly a DX hound. OLG has new wrinkle for feeding ART-13 into HRO receiver! DID is said to have the nicest shack in the section. PGW, EBD, MVA, OKG, GXC, and DFE are active on 28 Mc. IQN is working 3.5-Mc. DX on his mobile rig. The Dothan Club has cancelled plans for a hamfest. ATF finally made it on 56 Mc. PEP has new 28-Mc. beam. PYU is active on 28-Mc. mobile. NOF specializes in foreign Service traffic. ELV has new Collins 75-A and 310-B. AUP has new portable VFO. Traffic: W4EWN 105, KIX 28, JYB 21, MVM 21, MAB 14, BMM 12, YE 11, K4FAG 7.

EASTERN FLORIDA — SCM, John W. Hollister, W4FWZ — Congrats to the gang for a good job in handling traffic at the Tampa Fair. It's time for the Gator Net to open on 7290 kc. and you fellows that like fun on 7 Mc. should pitch in. A word of praise to the following regulars on the 3675-kc. Palmetto Net: AXP, AYV, DEP, LCF, OGI, NFD, OAV, IQV, MNT, ZC, IYP, DES, NMO, OKD, HWA, RP. And let's give a cheer for the 3945-kc. 'phone traffic net: BZN, EEZ, GZV, HWA, IEZ, IQV, JEP, KEU, KHI, LCF, LMG, LTE, MJU, MNT, NAK, NMO, OAV, OKH, OMV. It's BPL for DUG, IQV, MNT, and JEP. With summer just about on us it behooves all ECs to cogitate on the local situation. Need Emergency Manuals? Drop me a card. How about a check-up on the emergency gear? The AEC program should be put on the club program. Don't overlook the MARS circuit into Atlanta and Washington. Contact KJ about it. Clearwater: AYX reports the Clearwater Amateur Radio Society has been organized. Daytona: PYB reports the officers of the Halifax Radio Club are LZT, QAG, PYB, and HCS. LZT is on 3.85 Mc. with 300 watts. Lakeland: NAK made 7 QSOs on 3.85 Mc. on the last LO-Nite. Lake City: IQV is revising AEC set-up. He also is communications chairman of the ARC disaster committee. New Port Richey: KJ has been burning up gear faster than it can be made. Sarasota: It's a jr. operator for LMT. St. Petersburg: PT reports club officers are OJH, PT, FPC, HUY, KQR, and T. A. Larson. Jacksonville: WJAX-TV has gone on channel 2 and is causing some local consternation. FS is looking into it, in hopes. In the DX Contest IZ got about 60 countries and 100 c.w. contacts in the first half and LZM hooted up 40 countries and 83 'phone contacts. Traffic: W4DUG 1610, MNT 894, IQV 584, JEP 119, RP 117, LMT 52, KJ 35, NAK 14, FWZ 12, AYX 4, PYB 3, BT 2.

(Continued on page 96)

HARVEY *for variety —for bargains*

THE NEW SUBRACO MT 15X



The finest in mobile rigs available today. 30 watts power, class B 100% modulation, with push-to-talk and built-in coaxial type antenna relay. Xmttr complete with tubes, coaxial antenna connector, mounting brackets, etc. *Shipping weight 15 lbs.* **$87.50**

BRAND NEW—MT15X for 20 meters $87.50

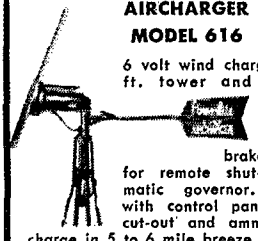
(Same features for 20 as for 10-11.)

Speech input. Any of the MT15X can be ordered with high-gain speech input for either xtal or dynamic mikes at an *additional cost of*.....**$9.95**

SUBRACO DS400

Dynamotor supply. 6 V. DC input, 400 V. at 175 ma. output. Complete with built-in control relays, filter, etc. *Shpg. Wt. 10 lbs.*.....**$59.95**

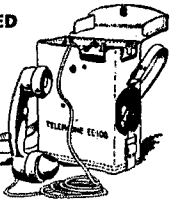
AC Supply for operation of any of above Subraco xmttrs indoors. Complete with rectifier and built-in control relay..**$39.50**



AIRCHARGER MODEL 616

6 volt wind charger, with 5 ft. tower and universal mounting brackets. Built-in brake assembly for remote shut-off. Automatic governor. Complete with control panel, battery cut-out and ammeter. Will charge in 5 to 6 mile breeze. Max. Chg. rate 15 amps. at 1100 RPM. Brand New, with full installation instructions. *Shpg. Wt. 85 lbs.* Very specially priced at.....**$34.95**

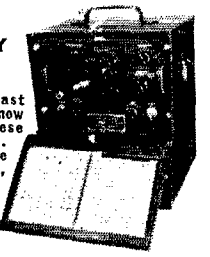
SOUND-POWERED FIELD PHONES



Army type EE-108. Any number can be hooked together on any 2-wire or grounded line. Max. range 12-15 miles. No batteries needed, simple, few parts. Complete instruction manual. Genuine leather case with strap. *Shipping Weight 10 lbs.* Each.....**$24.50**

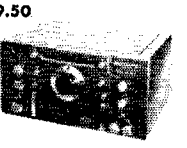
NOTE: All prices are Net, F.O.B. N.Y.C. and are subject to change without notice.

BC-221 FREQUENCY METER



These won't last long so order now for one of these famous freq. meters. They are just like new, with original calibration charts. Range 125-20,000 kc. with crystal check points in all ranges. Complete with crystal and tubes. **Special Price $79.50**

HRO-50



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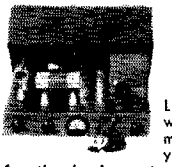
Kit No.	Output	Price	Transformer only
HV-1500	1500 v. 350 ma.	$29.50	$19.50
HV-2000	2000 v. 500 ma.	69.50	39.50
HV-2000SP	2000 v. 700 ma.	89.95	49.95
HV-2500	2500 v. 500 ma.	99.95	69.95

TR-1 TRANSMITTER KIT

A conservative 300-Watt phone and c.w. rig 6V6-6V6-6L6-813, Class B 811 modulators. All bands, 80, 40, 20, 15, 11, and 10. Exciter broad band, single control PA tuning. Three power supplies delivering 1500 v.d.c. at 350 ma, 500 v.d.c. at 200 ma, and bias supply. Punched aluminum chassis, tubes, transformers, capacitors, resistors, antenna changeover relay, meter, wire, hardware and coils included, but final tank coil for one band only. Electro-Voice 915 high level crystal microphone part of the package. Plug in the crystal and line cord and you're on the air. Shpg. Wt. 180 Lbs.....Only **$179.50**



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WESTERN FLORIDA — SCM, S. M. Douglas, jr., W4ACB — The SCM has application blanks for ARRL appointments and would like more of the gang to get in on these activities. Drop me a card, fellows, stating what you are interested in. Pensacola boasts the following Class B ticket holders: OKA, PTK, PQW, OCX. Making Class A were ODO, OKB, RDC. Welcome to RCH, an ex-W5. PQW and MS have their mobile rigs going. KIK has moved to Georgia, and has also taken unto himself an XYL. JV and EQR, in Pensacola, and GAA, in Tallahassee, have taken up TV. OCL has been having HOI (Hammond organ interference). OYR keeps Tallahassee represented on 7- and 14-Mc. c.w. OCL has a new Buick and QB has a new Lincoln. We're still interested in getting a Western Florida net going on the high frequencies. Let us know your views. Traffic: (Feb.) W4AXP 92. (Jan.) W4AXP 97.

GEORGIA — SCM, James P. Born, jr. W4ZD — The new officers of the Amateur Radio Club of Augusta are OKL, pres.; BZH, vice-pres.; OGS, secy.-treas.; JEF, act. mgr. EFS has moved to Augusta. OGS reports three new hams in Augusta, QDF, QDM, and PTE. DXI is on 144 Mc. TO is building separate finals for 28 and 14 Mc. He already has separate finals on 7 and 3.5 Mc. HZG has moved to Atlanta from Miami. NNM, MTS, and HZG have new 28-Mc. beams. NQO is the new secretary of the Atlanta Radio Club. OFT has resigned. He will be in the hospital for several months and at home for five months. If you cannot visit him, send him a card. FBH now has 45 states on 50 Mc. RZ is on 14-Mc. c.w. KFL is on 28 Mc. with a new rig. Please mail your activity reports so I will receive them no later than the fifth of each month. Traffic: W4DXI 4, IRL 2.

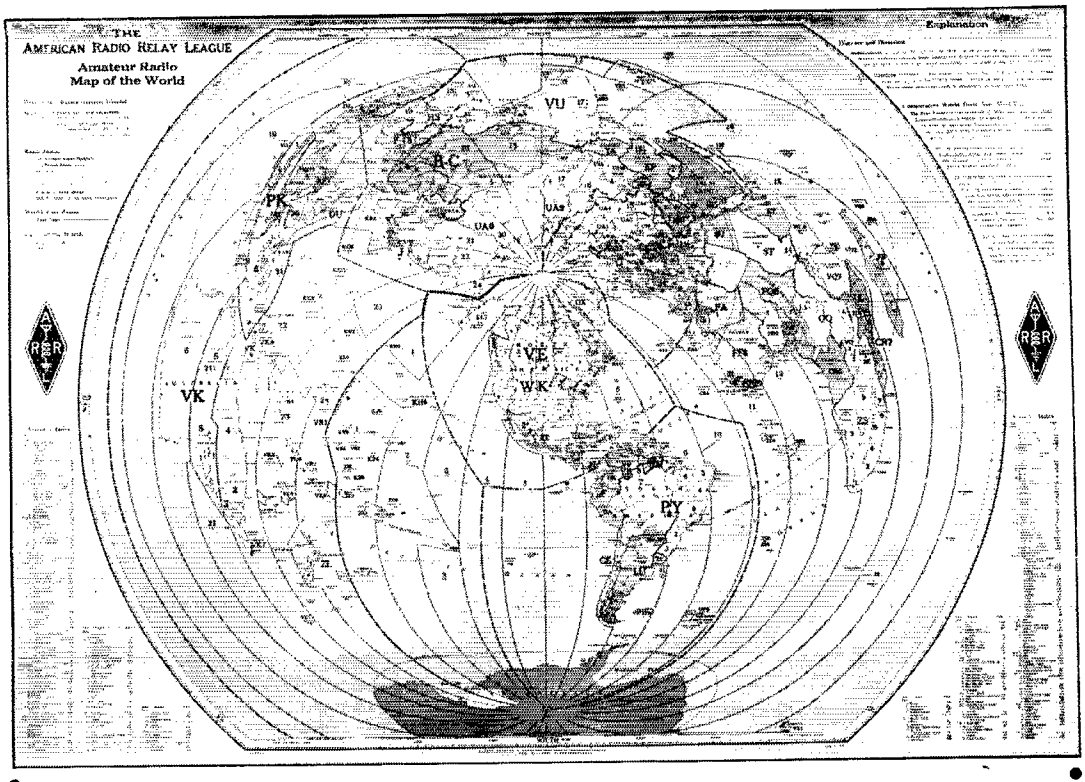
WEST INDIES — SCM, Everett Mayer, KP4KD — DJ keeps AEC net and stateside schedules. KV4AO is active on 3.5 Mc. scheduling OM KD and on 14 Mc. working stuff like FE8, FF8, 4X4, and UD6. DV is 100 per cent mobile on 3.85- and 14-Mc. 'phone. IN, FN, and JI are transferring to Miami. KQ is back in Ramey and her OM, IQ is due back soon. KM and his XYL, LG, are active. AJ is changing antennas with IT handling the job and reworking gear. KP is racking up gear in wooden rack. JO is increasing power. KY had one QSO, received one QSL, then tore down for a rebuild job. LH and KL are using converted 522s. KP has 27-Mc. beam in addition to 28-Mc. array. KP4FU now is KV4AP and is active on 28-Mc. 'phone and 3.5-Mc. c.w. with Viking rig. KD picked up one new country, so the XYL can live with him again. 3.85-Mc. 'phone AEC net attendance is down but the 3.5-Mc. c.w. AEC net is going strong. Traffic: KP4KD 12, KP 12, HU 10, KO 9, AJ 7.

CANAL ZONE — SCM, Everett R. Kimmel, KZ5AW — Often to CZARA instructors FJ would say, "Gosh, if I ever get through this ham exam stuff, I'll throw a whizzbang fish fry for the gang." He did, and he did. On the cool roof terrace of the Balboa Elk's Club recently, an HK, an HP, and nearly 30 KZ5s sat down to a free fish fry. CRN takes traffic Mon., Wed., and Fri. at 2200, with RM PA passing it Stateside later at 2300. WJ is accepting "serious" traffic for the Marine Corps Net. LR has outlets to Tennessee and Texas. AC and FL, with FL doubling in brass as Red Cross chairman, arranged a shipment from the Zone of 135 lbs. of watermelons needed up in Itasca, Texas, to treat a small boy with a kidney ailment. Right in with the gang operating UT, signing Uncle Tom, is Colonel Thomas Hahn, Coördinator, Amateur Activities, Headquarters, Caribbean Command. Traffic: KZ5PA 32, WJ 24, LR 14, RM 6.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Virge A. Gentry, jr., W6VIM — We are pleased to announce that ESR is going to stay on the job as SEC. Sam's change of mind about resigning came after a deluge of requests for him to stay on the job. KSX got off the night shift and is back on the traffic nets and AEC drills. VIM appreciates that IOX now has time to make changes at his station. TFC is on 50 Mc. with an MBF. DLR is busy with CAA work. APQ has an MBF on 28 Mc. and an ART-13 on 3.5, 7, and 14 Mc. HOV recently welcomed a jr. operator. The Hawthorne Show on KLAC-TV is giving the radio amateurs good publicity. There is a special amateur radio show once a month on this same program. COZ's Mt. Baldy Area AEC is active in its own simulated emergencies. Two new amateurs in Pomona are HYS and HYO. The Tri-County Amateur Radio Assn. meets every second Wednesday and all are invited to attend. AAE is active on 3.5 Mc. after being busy with a Civil Service exam. POD now is president of the Paso Robles Radio Club. FYW visited DYQ in Santa Maria and IXH in San Leandro. CTJ and YCZ compared 1.9 Mc. with 144 Mc. between Atascadero and Paso Robles. 144 Mc. was the choice. YVJ is attending Los Angeles City College. QAE made BPL last December. CMN is teaching code at the San Fernando Veterans Hospital. Results of the Two Meters and Down Club contest are as follows: 1st place NGN, 2nd place BHG, 3rd place WKO. GZZ is on 28 Mc. using supermodulation running 800 watts to a four-element beam. The Inglewood Radio Club is incorporating and will furnish other clubs information in that regard. KEY is nearing completion of his own dual conversion receiver, including

(*Continued on page 98*)



ZD1, VR2, AC3, KS4, SV5, EA6, CR7, UG8, C9 and 258 others.

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the new Select-O-Ject circuit. EBR is available for supermodulation demonstrations to any radio club furnishing transportation. KSX staged an over-all simulated disaster drill for members of the Santa Monica City Council, Civic and Red Cross officials. DLQ has mapped the western area for dead spots by holding AEC mobile drills. EC AOT has organized the largest mobile net in the section. LY is knocking a hole in the 14-Mc. 'phone band. QQM has completed his Clapp oscillator. Visitors are welcome at the Telco Amateur Radio Club which meets at 740 S. Olive, Los Angeles, on the 3rd Wednesday of each month at 7:30. EC DLQ insists upon precision AEC drills in his area, and EC HKD promotes attention to details in planning for an actual disaster. CND has had trouble with his 4E27 transmitter. EC DQO is in charge of the section's Daylite Emergency Net. All night workers are eligible for membership. The net operates on 146.8 Mc. on Thursdays at 12:00 noon. Your SCM will endeavor to visit every radio club in the section if notified of the place and dates of the meetings. In order to get station activity reports in this column, your reports must be legible, complete, and must reach the SCM by the 5th of the month. Station appointees, including ECs, are urged to make regular reports in order to retain their appointments. Traffic: (Feb.) W6CE 2035, CMN 341, DDE 223, YVJ 154, QAE 115, ANT 66, IOX 49, FYW 35, BHG 30, TFC 13, COZ 12, KSX 9. (Dec.) W6QAE 400.

ARIZONA — SCM, Gladden C. Elliott, W7MLL — Arizona hams regret the passing of NFS, of Prescott. New calls are OEO, Joan Horwitz; OFD, Nichols; NYH, Paulson. NYT has a new four-element 28-Mc. beam. MOB reports the first 100 Tucson QSLs. NMD is on 160 meters at Prescott. 6AMB now is 7OFA. LUK has a new electronic key. KUJ was first in the Arizona C.W. Party in February, with MNU second and SQN third. Phoenix hams again did a bang-up job of supplying communication on the Don's Trek into the Superstitions. Those making the Trek were JFX, OBZ, KUZ, 6EAI/7, JZS, RIJ, and OIF. The home end was handled by KMQ, LUK, MAE, OAS, and NGJ. NDJ is handling Arizona traffic from Wickenberg on 3.5 and 7 Mc. 1AEM/7 is on 7-Mc. c.w. in Williams, making 7 hams there and a claim for the greatest per capita ham population in Arizona. All interested in forming a 7-Mc. c.w. Arizona net, please contact MAE. NBZ, at Amphitheater, and LXY, at Scottsdale, are looking for other high school contacts on 7 Mc.

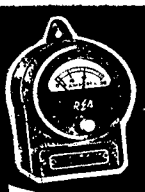
SAN DIEGO — SCM, Dale S. Bose, W6BWO — BYX has moved to the Los Angeles section and is working for North American Aviation, Inc. YYN is too busy with school work to get in much ham activity. YYM is on the YL net every Friday night and PFJ is Net Control of same. The YLRL is making its plans for Field Day. They did a fine job last year. WXJ's XYL went up for her ticket and hopes to be on the air soon. AD is on 3.85 Mc. with 50 watts and on 28 Mc. with 700. CNQ is about done with his rebuilding; he will have 100 watts going very soon. CHV got in the DX Contest with 70 contacts. ITY had 80. ELQ has his hands full with net schedules. ICN, one of the local smoke eaters, is a new call in Santa Ana. FCT and BAM have been handling the northern end of the section for the Southern Border Net. YXE and VJQ are doing a swell job for the AEC. BWO finally got an emergency and stand-by rig going after working on it for about a year. Traffic: W6ELQ 207, YYN 169, BAM 4, CHV 4, FCT 4, BWO 1.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, Joe G. Buch, W5CDU — IWO, ETSTC Amateur Radio Club station, is back on the air with OBS as trustee. IWO is working 3.85 and 7 Mc. and wishes to contact all former members. The Fort Worth Radio Club is reorganizing after a period of inactivity. Regular reports from AW indicate the Big Spring amateurs have a most active club. The Dallas Club now has a permanent location. Considerable equipment has been donated for the permanent set-up, including a kw. transmitter. COK has renewed his OBS appointment. If you have an appointment which has expired, please send your certificate to your SCM if you wish renewal. AKM, NCS for Central EC Net, is recovering after a rough tussle with double pneumonia. ASA, a faithful member of NTX, also has been off the air because of illness. We all wish Pop and Mickey a speedy comeback. PEF, Borger, now is Class A. BCK is determined to see television — he has a 32-element stacked array on a 70-foot stick. If you are lonesome, move to Abilene where BKH, AT, JOJ, LFN, GGS, JSP, LWZ, KVD, and MNG work 3.85-Mc. 'phone. DN is keying his 813s in the final of his 'phone rig and loosening up that good old fist. We welcome AGE back into active circles. LSN makes it four in a row in the BPL column. GZU finished a run of twelve consecutive months and is vacationing for a strong comeback. Traffic: W5LSN 1067, ARK 268, BKH 32, LGY 17.

OKLAHOMA — SCM, Frank E. Fisher, W5AHT/AST — SEC: AGM. RM: OWV. PAM: ATJ. OWV received RM appointment and took on the additional work of NCS of OLZ net. Keith is working hard to make OLZ the best section net in the U.S.A. The coöperation he is receiving from net members, old and new, is commendable. As alternate

(*Continued on page 100*)



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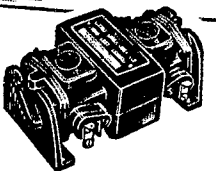

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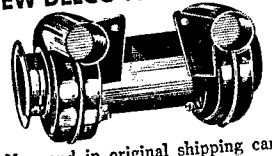

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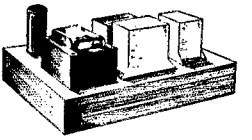

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T-321	8	Phone jacks, open circ, PL-55 standard, reg 28c ea.	8/$1
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NCS and relay. AAJ brings an essence of prewar to OLZ operation. Activity in the slow-speed section of OLZ is picking up. We're glad to see the newcomers to traffic getting started. Oklahoma A.&M. ARC elected new officers as follows: OLZ, pres.; NEN, vice-pres.; NDD, secy.-treas.; PGX, chief operator; NDO, publicity manager. The Club is installing a new switching system at YJ to simplify operation. Led by OLZ, JFY and LHP conducted a "Short Course For Hams" April 15 and 16, a hamfest combined with a worthwhile lecture course. Holdenville has organized a club with ADC, pres.; NVD, vice-pres.; BXO, secy.-treas.; and PGN, trustee of the club station, RFY, which runs 200 watts all bands. They have a 2½-kw. emergency generator and all gear ready for what may come. ADC is recovering from a major operation and hopes to be back on OLZ soon. RDI, REN, and RFH are new members of ACARC at Oklahoma City. AGM reports increased interest in AEC. Are you doing your part in preparedness? Only four Oklahoma counties are fully organized for AEC. Spring floods and tornadoes are brewing, fellows. Let's get going. Traffic: W5OWV 202, PA 149, AHT 110, OYP 71, OQD 52, MEZ 45, FOG 42, ADB 4, EHC 1.

SOUTHERN TEXAS — SCM, Ammon O. Young, W5BDI — MN is handling traffic on 7 Mc. Zone 4 of STEN enjoyed a big picnic at Port Isabel Feb. 12th. MN had his boat tied up there and everyone went for a visit. Orange hams put on an emergency drill in which a message was sent to Governor Shivers and an answer received during the drill. PCO has things in good shape in emergency work in El Paso. FNY is doing a nice job along the same lines in San Antonio. NOT has an HRO-7 and three-element beam on 14 Mc. ADZ has Federal rig on with 600 watts. NXX has 45 watts on 7-Mc. c.w. while TVI-proofing the big rig. IX is celebrating after having had a contact with PK4DA. NNY is working 28-Mc. 'phone and 14-Mc. c.w. MOS is on with flea power on 28-Mc. 'phone. LXY changed back to a four-element beam after missing VU2GB on 28-Mc. 'phone. NMA worked VU2CQ for 130 on 28-Mc. 'phone. NMG has a ten-over-twenty on a 75-ft. telephone pole. Traffic: W5MN 929.

NEW MEXICO — SCM, Lawrence R. Walsh, W5SMA — SEC: BYX. PAM: BIW. RM: ZU. PAM v.h.f.: FAG. Your SCM visited Socorro, Hot Springs, Las Cruces, and El Paso. Discussions were held with the SEC, PAM, and PAM v.h.f. and many other amateurs were contacted personally. PLK operates on 28-Mc. 'phone, 3.5- and 7-Mc. c.w. running 150 watts to a pair of 55Ts. FAG is back on 144 Mc. with a twelve-element beam. Hub has a tower for 50- and 144-Mc. beams and one for 14- and 28-Mc. beams; he has *seven* BC-610s! JXH is getting ready for 144 Mc. with an ARR-2 and a ten-element beam. Carl is instructing a radio hobby class at the Hot Springs High School. The Las Cruces gang is organizing a club. BIW is on 3885 kc. every night between 7 and 8 P.M. BUY, of Clovis, has his old ticket and call back and is active on 144 Mc. with CXP. NVR has a new all-band exciter running 100 watts input. LNG is back on 3.85 Mc. with 45 watts input. MTG/5, at Hillsboro, is enjoying a mountain-top vacation with a TBS-50. Another new call at Los Alamos is RBX. JXO reports the Albuquerque 28-Mc. 'phone net is perking right along. MJI has been appointed OPS. Traffic: W5ZU 158, IGO 71, A5ZU 50, W5JXO 26, NJR 21, QNQ 16.

MARITIME DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — EC: FQ. PAM: KS. The Maritime 'Phone Net, with IE as Net Control, continues to show marked improvement in good snappy operating procedure. Net Certificates still are being issued in addition to the 45 already on the walls of their owners. Please use your station activity cards each month or report activity via HCARC net station. ES reports his new converter going on 28 Mc. In addition to some OO and OBS work, KS is on Maritime and AFARS Nets regularly. VY has new 60-watt rig on 3.5-Mc. c.w. and 28-Mc. 'phone. DB handles a few on 14-Mc. c.w. New rigs being put in use on 3.8-Mc. 'phone in the Halifax area are worked by NO, LZ, and DQ. AAX is new three-letter call man on 3.5-Mc. c.w. from Bedford using an ART-5. "Tex" covers the entire band and does lots of daytime operating. MK is high traffic man this month, with ZR second. We hear DD made the first transharbour contact on 235 Mc. VO, of 8NB fame, is on 3.8-Mc. 'phone quite regularly from Cross Island. BC operates the low power 3.8-Mc. 'phone rig quite consistently. LR now has a nice-sounding 3.8-Mc. n.f.m. signal. Traffic: VE1MK 28, FQ 16, ZR 16, KS 12, DB 3.

ONTARIO DIVISION

ONTARIO — SCM, Thomas Hunter, jr., VE3CP — Asst. SCM c.w., W. Guillot, 3BUR. Asst. SCM 'phone, E. Kimble, 3FQ. SEC: KM. RMs: ATR, AWE, BMG, BUR, DU, TM, and WK. PAMs: BSA, DF, and FQ. PA delivered 64 messages by mail. WY is mobile on all bands. ATR is VFO. AHA is on 7105 kc. from Toronto. PH has speech clipper with 807s. BXB has Hammond three-element on 28 Mc. JU has new VFO. ABP has two-element beam,

(*Continued on page 102*)

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W6ARA

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on 14 Mc. The executive committee of CAROA meets on 3815 kc. each Friday at 8:00 P.M. IA needs Idaho for WAS. AMI is newest among WAS holders. BFF has new bandswitching rig. BXL reports for the Brantford gang. DBN, DDH, and DDI are newcomers to 3.5-Mc. c.w. BSF has WAC. HX has gone TV. DBN lost the roof of his house in a recent wind storm while his sky-wire stood pat. ADB, EI, and AAL are on with s.s.s.c. LH is on 3.8 Mc. from North Bay. AZN has 350 watts on 3.8 Mc. BNI has special 'phone endorsement. BBZ has new 100-watt rig on 28 Mc. BGK uses a Mon-Key. AYW is new OPS. BUR is new Asst. SCM (c.w.), replacing AWJ. PA relayed medical advice from a doctor in his shack to a nurse in Baffin Land, who saved the patient. BCP now is located in Wiarton. AHO and AZZ are active on the Ontario 7-Mc. net. DBJ is on 7 Mc. BXS has left us for VE5-Land. ATR reports 7-Mc. net going FB. ADN is on the Early Bird Net. LA and BUG give code practice to the newcomers of the Frontier Radio Club. YJ has the London gang organized for emergency work. ZE is QRL editing *XTAL*. API visited the Kirkland Lake gang. DAD has new homemade receiver. Traffic: VE3IA 157, BUR 147, PA 128, ANO 108, ATR 90 AZZ 66, NI 60, WK 58, WY 51, GI 49, BL 45, BBM 44, BTQ 35, IL 32, KM 30, BER 28, ADN 24, BMG 22, YJ 21, PH 20, CP 18, BVR 16, AG 12, AZH 10, AHA 9, DBG 9, YS 9, BUG 8, DCW 8, HK 6, VD 6, APS 5.

QUEBEC DIVISION

QUEBEC — SCM, Gordon A. Lynn, VE2GL — On Feb. 7th approximately 40 hams from the Lakeshore district met at the Dorval Hotel for a gabfest, which proved highly successful with an excellent interchange of ideas, etc. concerning amateur radio. TH has changed his QTH to Toronto for business reasons and we have lost an ardent ham from this district. Good luck to him in his new venture and we hope to be hearing him soon from VE3-Land. KG reports weekly schedules with VE8MJ and VE4NR. He had the misfortune to lose his beam because of the mast breaking during a wind storm. AHL, in St. Lambert, has a pair of 807s modulated with 6L6s on 28 Mc. and has had good results, operating on conjunction with AKC. EC reports daily schedules with AKJ, AHN, RM, AEM, EV, GU, and AKF, plus 10 stations on 144 Mc. KY is a new voice on 3.8 Mc. ABJ is mobile on 144 Mc. PQN continues to handle traffic with CD, GM, XR, AIE, AKJ, and LO, with 3BOZ and 3GI taking part. WX is new in Dorval with 150 watts to 8001 final on 3.5-, 7-, and 14-Mc. c.w. XA has acquired National 1-10 receiver and is building rig for 50 and 144 Mc. AFV, 12 years old, has been reporting into SSN regularly for the past 6 months and is a prospective ORS. Traffic: VE2EC 94, CD 92, GM 82, XR 71, AKJ 42, GL 34, AIE 25.

VANALTA DIVISION

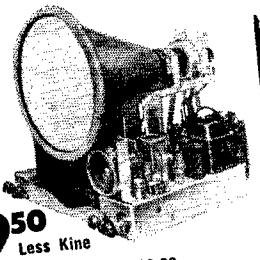
ALBERTA — SCM, Sydney T. Jones, VE6MJ — SEC: MJ. Congratulations to WS and his XYL on the arrival of a new baby girl. The Coronation Emergency Net had its first workout under the able direction of E. C. Butterfield. Weekly tests are planned for Sunday mornings at 1000 hours. February LO-Nite was quite successful, with the SCMs of Saskatchewan, Alberta, and North Dakota making contact. OW and FJ staged a successful NARC meeting February 17th with films of interest to the new amateur and the old-timer. OD checks Saskatchewan Net and handles a fair volume of traffic. JP visited Edmonton and now sports a new VFO complete with n.f.m. YM reports in on the Alberta 'phone net regularly. IW's peanut whistle is heard quite often. RA, TH, IX, SV, OA, HI and MB comprise the EC net in the Coronation area. CJ is interested in an RM appointment. DF is secretary of CARA. EO was heard exchanging yarns with two other savages. How about some news items for this column, gang? Report each month to your SCM; he is always pleased to hear from you. OW has left Edmonton for greener pastures in Eastern Canada. EY and MJ snagged some DX in the contest. Traffic: VE6OD 95, MJ 30.

BRITISH COLUMBIA — SCM, Ernest Savage, VE7FB — ZL and CX are both honored with new jr. operators. AFN was heard on 28 Mc. recently. WM is building a 'scope. ALJ is leaving Ashcroft for Abbotsford DOT. DZ has been buying elements. The Delta ARC is 100 per cent ARRL members. The Collingwood ARC report has gone with the wind and it was newsy. OK's new electronic bug is working smoothly. KM's new receiver seems to be quite a headache. AX's receiver probably will be so selective he won't even hear his neighbor. KC. LZ now is a 'phone man complete with series cathode modulator and "V" beam. EO couldn't work VE2BV so he flew down to QSO. SK has some fiendish ideas about 14- and 28-Mc. 'phone brewing with controlled carrier. TR finds it's easier to visit VKs, JAs, KRs, etc., than working them, the way he gets around. ABP is on 144 Mc. AOQ is rebuilding the rig. TF, our big traffic-handler, is rebuilding to end all rebuilding. AKG is building a tape recorder. US has worked JA2AZ six times on 3850-kc. phone. XA, our RM, reports VEs 4, 5, and 7 are active but not much is heard from VE6s. CB's new

(*Continued on page 104*)

Smashing Reduction!

NEWARK 16-19" 630-TYPE DELUXE TV RECEIVER



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Deluxe 16" 630 Type TV Chassis, complete as described, with tubes, knobs, etc. and 16" mtg. brackets. Less Picture Tube. **$159.50**
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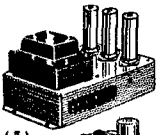
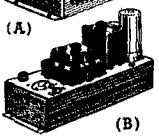


(A)



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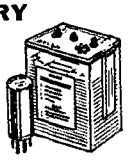

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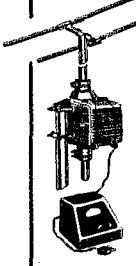

New Model! Meter indicates position of antenna at any time. Turns 360°. Takes mast up to 1⅜" dia. — supports up to 20 lbs. Operates from 110 v, 60 cps AC. Rotor: 7¾ x 5¼ x 8". Control Box: 5 x 5". Incl. instructions. Less 4-wire cable. 12 lbs. **No. A16182, Complete**..... **$26.43**

Alliance "Tenna-Rotor" without Direction Indicator.
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4-Conductor Cable.
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Thrust Bearing Bracket. Permits weight up to 200 lbs. on Alliance Rotator by supporting end of shaft. 4 lbs. **No. A16181**.....Net $2.92

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4.2 Hy at 300 Ma. DC Resistance 78 ohms. 2500 Volt breakdown. Conservatively rated — built by RCA for continuous operation. Big Value! 3½" dia. x 4½" H. 4" sq. base.
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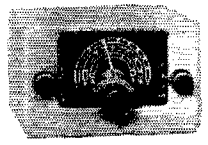

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project is the grid dipper. Between putting parts into Mode A, XW is building all-band turret rig. AOW and his XYL, AOV, are looking into 28-Mc. 'phone building. We never hear from EH, SW, and AEU. The Nanaimo ARC is going great guns and is heard reporting into the 5 O'clock Net. Traffic: VE7XA 100, AOQ 21, ID 3, FB 2.

PRAIRIE DIVISION

MANITOBA — SCM, A. W. Morley, VE4AM — The Assiniboine Valley Radio Club will stage its Second Annual Hamfest at Wildwood Country Club just out of Russell, Manitoba, May 24th. Contact HR or JB for full details. CS is new call at Brandon and is active on 7Mc. JU is using a Sky Champion to pull them in. OS completed his WAS by snagging Vermont with his new pp. 811 final. He pulled it in with a BC-312. JB is modulating a BC-457A on 3.75 Mc. KN has new crystal and a new rig coming up. MP is heard on 14-Mc. 'phone after cleaning up some BCI. DP is using 814 to an end-fed Zepp and a homemade super on 7 Mc. EA is back on 3.8 Mc. with 807s and an SX-25 with an R-9er. The WARC held its yearly election and new officers are VK, pres.; EI, vice-pres.; TX, secy.; and LC, treas. Meetings are held the 4th Friday of each month in the Free Press club rooms. All out-of-town visitors are welcome to attend. Ex-BG, our former SCM, is back in Winnipeg after a couple of years in Sunny California. LC, the QSL Mgr., tells me there are thousands of QSL cards in the Bureau waiting to be claimed. Traffic: VE4AM 88, FA 40, CE 24, DN 12, CI 7, FE 7, QD 7, HS 6, DJ 5, LF 4, DQ 3, JM 2, DT 1.

SASKATCHEWAN — SCM, J. H. Goodridge, VE5DW — MQ is moving east and sold his SX-25 receiver to CJ. IC is busy building equipment for himself and some of the boys. JK has completed a mobile unit for 420 Mc. HR has received 35-w.p.m. Code Proficiency certificate. 5EY, radio engineer for Dept. of Natural Resources, was guest speaker at February meeting of Saskatoon Club. New appointees are DN, EE, and HR as OBS; IC and MA as OO; JK as OES. WG is heard on 3.8-Mc. 'phone from Watrous after an absence of several months. MA's radar system, self-designed for keeping storks away, has ceased to operate. EE got tied up in a coast-to-coast round table working all VE districts, including a VO, on 3.8-Mc. 'phone. NE is active on 14-Mc. c.w. and n.f.m. WK finds it easy to work DX on 14-Mc. c.w. with hoar frost on folded dipole antenna and seeks a technical explanation. The Saskatoon gang, led by GR, is working hard arranging for the hamfest to be held July 1 and 2. YF is a member of YLRL. MA and HL play checkers on "75." AS and his XYL took a trip to Saskatoon and Winnipeg. FY worked about 250 miles on 3.8-Mc. 'phone with ¾ of a watt input to final of newly-designed portable. Traffic: VE5YF 72, HR 60, BH 19.

Strays

The Pennsylvania State College will be host on July 24th, 25th, and 26th to a conference for scientists in the field of physics relative to the upper atmosphere. Foremost authorities will participate in the presentation of approximately a dozen papers on the latest theoretical and experimental developments. Several symposia are planned to allow free exchange of ideas. The meetings are being sponsored jointly by The Pennsylvania State College and the Geophysical Directorate of the U. S. Air Force. Further details may be obtained from Dr. A. H. Waynick, Radio Propagation Laboratory, The Pennsylvania State College, State College, Penna.

—•••—

If you haven't already seen it, get yourself a copy of the May *Reader's Digest* for the article, "Hobby-Happy-Hams." The author, Jack Cluett, radio editor of *Woman's Day*, spent several days at ARRL Hq. doing research for his piece and we think he's done a mighty fine job of telling the public something about us hams.

—•••—

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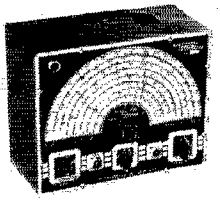

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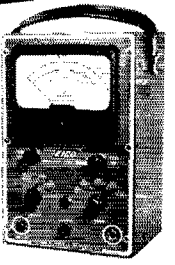

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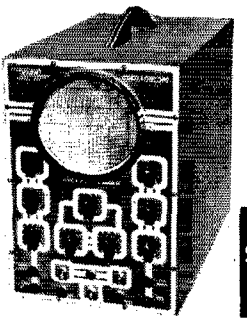

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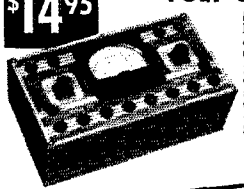

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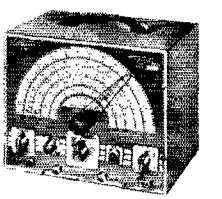

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WE STOCK ALL EICO EQUIPMENT

Model 145-K Multi-Signal Tracer. **83-158.** Only	$18.95
Model P-75K High-Frequency Probe Kit. **83-156.** Only ..	3.75
Model P-76K H-F Probe Kit. **83-157.** Only	3.75
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Name .....

Address .....

City ..... *Zone* ..... *State* .....

I.F. Amplifier

(Continued from page 15)

done in the regular receiver. Don't let your receiver or the amplifier overload, or you won't have the selectivity you're shooting for.

One more thing. While this amplifier is not as sharp as the W9AEH affair, it is still sharp enough to require a fairly slow tuning rate for maximum ease of tuning. We have talked to operators who dislike slow tuning rates in a receiver because they say they like to be able to jump around in a band. We won't try to argue with them, but personally we have found a slow tuning rate to be very desirable in our own operating. If the receiver you now use tunes too fast, perhaps you can do as we did and add a 5-to-1 planetary reduction drive on the bandspread knob. This gave a rate of 12 kc. per knob rotation at 14 Mc. on an HQ-129X. It isn't necessary, of course, but it is mighty convenient. The planetary reduction drives can be found in many of the mail-order catalogs.

More Selectivity

The selectivity of this amplifier, shown in Fig. 4, is not as great as that of the W9AEH receiver. One reason is that it uses fewer tuned circuits and the other is that the circuit *Q*s run lower. However, quite a bit of selectivity is gained by the mere fact that it operates at 50 instead of 72 kc. We believe that once an operator becomes used to using the kind of selectivity represented by this amplifier that he will want more. You can get it by using more tuned circuits, and perhaps using four of them between tubes instead of three. For example, a total of 12 tuned circuits would give an amplifier approximately 1500 cycles wide at 60 db. down and about 350 cycles cycles wide at 6 db. down.

As is, these circuits don't do much for you on 'phone. The technique there is to use a number of circuits, to get a rapid cut-off characteristic, but to adjust the coupling and *Q*s so that a relatively flat-topped selectivity curve results.

Regeneration is out in this particular approach to c.w. selectivity, in case you are already thinking about a simplified version. It has the effect of adding a single high-*Q* circuit, instead of the multiplicity of medium-*Q* circuits.

LEEDS
"The Home of RADIO"

Our 28th Year

QUALITY—PRICE DEPENDABILITY

TUBES

3C24 Triode 100 Watts output: 6.3 Volts 3 amp. Filaments 2000 Volts plate @ 75 Ma. Each 39¢. 10 for.... **$3.50**

3 BP1 Cathode Ray Tube .....$ 1.45

TERRIFIC BUY

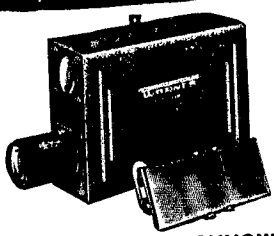
6.3 Volt @ 10 amp. filament transformer, upright mounting. Cased. Can also be used as a 12 volt, 5 amp. transformer. **$1.69**

WIRE SPECIALS

300 ohm. Twin-Lead clear Polyethylene.	Per 100 ft..$ 1.95 Per 1000 ft. $12.50
300 ohm. SHIELDED Twin-Lead.	Per foot ..$ .11 Per 100 ft. $10.25
RG 59U. 72 ohm. Coax Cable.	Per foot ..$ .05 Per 100 ft. $ 4.75
2 conductor tinsel cloth overall in 1000 ft. hanks..$ 3.25	

Ideal for speaker extensions, etc.

Write us for your Wire needs.



WORNER FOTOELECTRIC ANNOUNCER

MODEL 61A. Unit is designed to project a beam of light across any entrance to any room, building or premise. The breaking of this light beam will activate a chime or other sound device to automatically announce the "Entrant." Comes equipped with an optical system to arrest unwanted light. This allows installation in the direct rays of natural or artificial light. Complete with light source, sensitive photo-cell unit, mirror, chime for 115V. A.C., 60 cycle. Size 10¾"x7½"x2¾". Weight 3¾ lbs. **$18.05**

UNIVERSAL MODULATION TRANSFORMERS

Tapped series — Parallel coils provide a wide range of Modulation Ratios. Made by Merit.

TYPE	WATTS	PRI IMP	PRI MA	SEC IMP	MAX SEC MA	EACH
A-3104	15	2000-20000	50	2000-20000	50/100	$ 5.14
A-3105	60	2000-20000	150	2000-20000	150/300	$ 7.64
A-3106	125	2000-20000	220	2000-20000	220/440	$10.97
A-4007	300	2000-20000	250	2000-20000	250/500	$30.57

PLATE TRANSFORMERS

For Small Transmitters. DC Voltage Ratings are Approx. Values Obtained at Output of a 2 section Choke input Filter. Using Mercury Vapor Rectifier Tubes Pri. is for 115 V. 60 cy.

Type No.	Sec. Rms. Volts	Sec. DC Volts	DC Sec. MA.	Dimensions H.	W.	D.	Price Each
P 57	660–660†	500	250	4⅝	3⅛	4⅜	$ 6.76
	550–550	400					
P 58	1080–1080	1000*	125	4⅝	3⅛	5	8.23
	500–500	400	150				
P 59	900–900	750	225	4⅝	3⅛	5⅛	7.94
	800–800	600					
P 67	1450–1450	1200	300	5¾	6⅛	4	19.84
	1175–1175	1000					
P 68	2100–2100	1750	300	5¾	6⅛	4¼	24.99
	1800–1800	1500					

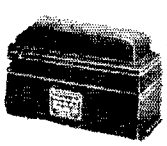
* For dual operation with simultaneous use of both sec. ratings.

† Has 40-volt bias tap.

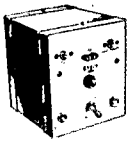
RAYTHEON VOLTAGE STABILIZERS

Positive Stabilization ±½%

Input 95-130 volts, 60 cycles single phase; output 115 volts stabilized to ±½%. *Output 6.0 or 7.5 volts stabilized ±½%.



Catalog No.	Output Net Cap. Watts	wgt. lbs.	Net Price
VR-6110	15	4	$15.00
VR-6101*	30	5	$17.00
VR-6111	30	5	$17.00
VR-6112	60	8	$24.00
VR-6113	120	14	$31.00
VR-6114	250	25	$48.00
VR-6115	500	45	$75.00
VR-6116	1000	92	$125.00



LYSCO TRANSMITTERS

Model 129-10 Meter Model 175-75 Meter

Designed for mobile or fixed operation in the 10 or 75 meter phone band. Dimensions 5"x 4"x5½". Tube compliment 6AG7—oscillator, 6AG7—power amplifier, 6AG7—modulator. Power output 8 watts. An exceptional buy (less tubes) at **$23.95**

SUPERIOR POWERSTATS

Smooth, efficient voltage control. 0 to 135V. output from 115V. AC line.

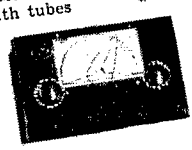
Type 20 (illustrated 3 amps	$12.50
116 for table mtg 7.5 amps	23.00
116U for panel mtg 7.5 amps	18.00
1126 15 amps	46.00
1156 45 amps	118.00

Also available for 230 volt input. Write for descriptive literature.

LYSCO MOBILE VFO

Model 381

3-6AK5's Doubler, Oscillator & Buffer. Doubler supplies plenty of drive to replace 3.5Mc. or 7Mc. X-tal. Direct reading illuminated clock dial. Ideal size 3"x4½"x5". Operates on 200 to 400V D.C. @ 25Ma. Complete with tubes **$21.95**



MODEL 381R

Calibrated for 40, 20 and 10 meters. OUTPUT: 40 meters. 15 foot co-axial cable with tuned circuit to plug into X-tal socket. Complete with tubes ready to go **$27.95**

ALUMINUM CHASSIS

7x5x2....18 gauge....	$0.82
7x7x2....18 gauge..	$0.92
9x7x2....18 gauge....	$1.03
5x10x3...18 gauge....	$1.12
7x11x2...18 gauge....	$1.06
12x10x3..18 gauge....	$1.62
10x14x3..16 gauge....	$2.26
15x' x3...16 gauge....	$1.76
17x10x3..16 gauge....	$2.20
17x13x3..14 gauge....	$2.82
17x13x5..14 gauge....	$3.67

We carry a complete stock of steel & Aluminum Chassis & Panels.

STANDARD STEEL CHASSIS

Black Crackle

4 x 4 x 2	59¢
6 x 14 x 3	$1.06
10 x 14 x 3	$1.44
10 x 17 x 3	$1.44

METERS

100 amp.—6 volt D.C., 3 inch scale, 4½" square, Grey finish, supplied with 100 amp. shunt. Brand New. Each as illustrated $1.45

CHOKES

SMOOTHING TYPE	Hy	SWINGING TYPE	Hy	MA	PRICE EACH Price
C-80	10	C-87	4–16	150	$3.09
C-81	10	C-88	4–16	200	$3.82
C-82	10	C-89	4–16	250	$5.29
C-83	8	C-90	3–14	300	$5.59

All above 3000 Volts Insulation

If not rated 25% with order, balance C.O.D. All prices F.O.B. our warehouse New York. No order under $2.00

We ship to any part of the globe.

LEEDS RADIO CO.

75 Vesey Street
COrtlandt 7-2612

Dept. QS 5
New York City 7

Sweepstakes Scores

(*Continued from page 41*)

Eastern Florida

W4CPG [1]	34,706-263-67-B
W4POF	24,684-203-49-A-26
W4PJU	21,803-171-51-A-18
W4AKV	15,369-165-47-B-23
W4LEN	11,480-112-41-A-13
W4AYX	11,468-122-47-B-40
W4MVJ	10- 2- 2-A- 1

Western Florida

W4AGB	32,368-246-68-B-36

Georgia

W4LXE	47,232-333-72-B-36
W4FGL	21,180-179-60-B-19
W4IZM	11,136-118-48-B-12

SOUTHWESTERN DIVISION

Los Angeles

W6OGZ [2]	122,400-853-72-B-38
W6AM	76,964-543-71-B-40
W6RDR	72,845-440-68-A-37
W6UQQ	24,720-207-60-B-25
W6ELB	21,431-192-45-A-29
W6FFH	13,018-130-41-A-24
W6LSO	12,936-136-49-B-12
W6ZVD	9231-108-35-A-19
W6HS	1276- 29-22-B- 4
W6CUC	1044- 29-18-B- 5
W6VVT	203- 9- 9-B- 3

Arizona

W7PUM	75,641-444-69-A-37
W7ENA	41,333-252-66-A-32
W7MOW	13,493-129-42-A-27
W7JUT	2933- 52-23-A- 5

San Diego

W6CHV	61,020-344-72-A-37
W6IV	10,498-112-38-A-17

WEST GULF DIVISION

Northern Texas

K5FAX [3]	4182- 63-34-B-11
W5AWT	468- 18-13-B- 2

Oklahoma

W5FAB	32,128-254-64-B-27

Southern Texas

W5BDI	40,296-293-69-B-38
W5JWM	26,264-199-67-B-24
W5NLH	(W5LDH NJB PQI QKP QIU) 9118- 99-47-B-21

New Mexico

W5SMA	45,713-266-69-A-34
W5OGL	19,600-182-56-B-25
W5KAO	3300- 55-30-B-12

CANADA

Maritime

VE1OM	3- 1- 1-A- 1

Ontario

VE3RM	19,096-155-62-B-22

Quebec

VE2ID	7544- 83-46-B-20

Alberta

VE6NA	40,960-240-60-A-31

British Columbia

VE7LP	18,815-143-53-A-32
VE7VT	17,188-125-55-A-25

Manitoba

VE4YO	8685- 98-45-B-14

Saskatchewan

VE5MS	4290- 53-33-A-20

[1] Not eligible for award. Entry submitted after deadline specified by rules.
[2] Operated by W6UBT.
[3] Operated by W5OXL.

2-Meter Station

(*Continued from page 45*)

the receiver sensitivity somewhat, and reduces radiation from the oscillating detector.

Regulation of the plate voltage on the detector is also necessary to prevent variations in sensitivity resulting from voltage variation. The 0A2 regulator maintains constant voltage on the r.f. amplifier, the detector, and the audio screen. Receiver output is controlled by a 100-ohm potentiometer inserted between the audio output line and the telephone handset. The regeneration control is a slotted 50,000-ohm potentiometer mounted on the receiver chassis. With voltage stabilization and detector isolation, the setting of the regeneration control need not be changed after the receiver is once adjusted for optimum performance. It may be noticed that the photograph of the receiver was made before the neutralizing coil was inserted. This fits between the input coil

(*Continued on page 110*)

$AVE $ ON $UN $URPLUS AND $TANDARD $PECIAL$!

CRYSTALS Low Freq.

FT-241A holder ½" pin spacing, for ham and general use. Xtal controlled Signal Generators, marked in *army Mc harmonic frequencies—Directions* for deriving fundamental frequencies enclosed. Listed below by fundamental frequency, fractions omitted.

412	426	442	475	493	504	515	372	381		390	401
413	427	443	477	494	506	516	374	383		391	402
414	429	444	479	495	507	518	375	384		392	403
415	431	445	481	496	508	519	376	386		393	404
416	433	446	483	497	509	522	377	387		394	405
418	434	447	484	498	511	523	379	388		395	408
419	435	448	485	503	512		380			396	409
420	436	462	487	**49¢**						397	411
422	437	468	488				each			400	each
423	438	472	490	each							
424	440	473	491				**39¢**			**79¢**	
425	441	474	492	*10 for $4.50*							

450	531.944	**Frequency Standard 98.356 kc 3-pr.holder** **$3.98**
452.777	533.333	
461.111	536.111	
464.815	537.500	
465.277	538.888	
526.388	**99¢**	
529.166	each	
530.555		

SPECIAL 200 kc Xtals without holders. 21–32" x 23–32". **69c each 3 for $2.00**

HAM CRYSTALS

FT-243 holders, ½" pin spacing, for ham and experimental use. Fractions omitted.

4190	6173	7806	7973	3735	5825	6373	6706	7506
5030	6206	7840	7975	5305	5840	6406	6740	7540
5485	6208	7873	8240	5675	5850	6425	6806	7573
6006	6773	7906	8273	5677	5873	6440	7306	7640
6040	6840	7925	8306	5700	5875	6450	7340	7673
6073	6873			5706	5900	6473	7373	7706
6075	6906	each		5725	5906	6475	7406	7806
6100	6940			5740	5925	6506	7440	8173
6106	6973	**49¢**		5750	5940	6540	7473	8340
6140	7740			5760	5973	6573	each	
6150	7773	10 for $4.50		5773	5975	6606	**99¢**	
				5775	6273	6640		
				5806	6340	6673	10 for $9.00	

SCR-522 XTALS

5910	6610	7580	
6370	7350	7810	
6450	7480	7930	
6470	*each*		
6407.9	**$1.29**		
6522.9			
6547.9			

BC-610 XTALS

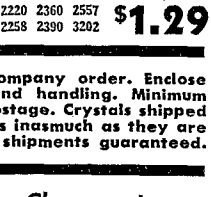
2 banana plugs ¾" spc.

2045	2260	2415	3215	3510	3580
2105	2282	2435	3237	3520	3945
2125	2300	2442	3250	3550	3955
2145	2305	2532	3322	3570	3995
2155	2320	2545	*each*		
2220	2360	2557	**$1.29**		
2258	2390	3202			

Payments must accompany order. Enclose 20¢ for postage and handling. Minimum order $2.00 plus postage. Crystals shipped packed in cloth bags inasmuch as they are shock mounted. All shipments guaranteed.

Reduced for Clearance!

Bendix TA-12 Transmitter, 100 watt.



4 separate ECO's with tubes, 3–807, 4–12SK7. Complete instructions for converting to 10, 20, 40, and 80 meters supplied. Only a few left at this low price!

Used **$19.95** LIKE NEW **$29.95**

Replacement Filter Condensers

Famous make, new, boxed, upright can, twist prong mounting, at 60% off List in lots of 10.

Capacity	DCWV	List Price	Your Cost
20x20	150	$1.55	$ .62
20x20	150		
20	25	2.20	.88
20x20	150		
200	25	2.65	1.06
20x20x20	150		
20	25	2.85	1.14
30x20	150		
20	25	2.20	.88
40x20	150		
20	25	2.30	1.02
40x30	150		
20	25	2.35	.94
40x40	150		
20	25	2.40	.96

In lots of 50 ass't additional 10% discount

TELEVISION CHASSIS

for custom installation, famous make—*reduced for clearance 30 tubes plus* 16" Cathode Ray Tube. Improved RCA 630 circuit, voltage doubler completely wired, *and aligned using famous make* good quality components, complete with all tubes, insulators and mounting brackets for 16" *tube. Less Cathode Ray Tube* **$160**

With 16AP4 Metal Tube **$210**

With 16AP4 & Table Model Heavy Duty Mahogany Cabinet **$265**

SPECIAL BARGAINS IN HAM GEAR

Reduced for clearance—Display models

GONSET—6 meter converter. Reg. $39.95..... **$27.95**

GONSET—20 meter converter. Reg. $39.95..... **$27.95**

SONAR—XE-10 NFM Exciter. Built in power supply, for xtal or VFO with tubes, less crystal. Reg. $39.45. **$27.50**

SONAR—CFC, calibrated frequency control VFO exciter, all band, with built-in power supply, tubes and 1000 kc calibration crystal. Reg. $59.75. **$39.95**

Famous Make Butterfly Transmitting Condensers SPLIT STATOR

All new, boxed, below cost, new shipment just arrived.

.500 sp. Cap.	MMF	.375 sp. Cap.	MMF	.250 sp. Cap.	MMF
11	$ 8.35	11	$ 8.15	13	$ 7.95
20	10.25	22	9.95	46	11.20
30	11.85	34	11.30	62	12.55
40	13.20	45	12.90	78	13.95
49	14.75	58	14.35	95	15.40
59	16.20	70	15.90	111	16.80
77	19.20	82	17.20	127	18.25
87	20.65	94	18.75	143	19.85
96	22.15	106	20.15	159	21.00
105	23.80	118	21.60	175	22.50
115	25.20	141	24.50	192	23.95
124	26.65	153	25.95	208	25.25

Grid Mod. Trans.—Kenyon....**$.99**

ARMY HEADPHONES. High Impedance..... **$2.49**

TUNING UNITS, from BC-375 transmitter, TU-9B, TU-10B. Each....**$1.89**

INTERPHONE AMPLIFIER, AM26, with 4 tubes, 2–12J5, 2–12A6, and dynamotor, new with instructions for conversion to HI-FI mike and phono amplifier..... **$4.95**

SPERRY ELEVATOR SERVO AMPLIFIER, Brand new, with tubes and diagram..... **$3.95**

TUBES;

MAGNETRONS, 2J38. New... **$ 18.95**

CATHODE RAY 5BP4. New..... **$3.89**

CATHODE RAY 5BP1. New..... **$3.89**

BC-746 Tuning Units, contains antenna, oscillator coils, 140 mmf midget tuning condenser, double crystal socket, less xtals..... **$.39**

With 2 crystals..... **$.99**

With 2 crystals, one in 80 meter band. **$1.29**

PHONO ARMS, for replacements.

ASTATIC—D-9, with L-26A cartridge. New in original boxes. Original list price $4.95, reduced to..... **$1.65**

PHONO ARMS, less *cartridge, with all* necessary hardware. Five (5) for **$1.95**

2-SPEED RECORD PLAYER, in portable carrying case, *including* 3-tube amplifier, speaker and 33⅓ & 78 rpm Green Flyer motor. 115 volt AC or DC *operated. Used, reconditioned.* Only..... **$12.50**

VARIABLE CONDENSERS, as used in SCR-522, brand new, 2-gang, 220 mmf per section, **$1.29;** 3-gang, 220 mmf per section, **$1.59;** Variable condenser, 1-gang capacity 14–600 mmf. **$.59**

RECORD CHANGERS, single speed automatic, removed from new console combinations, single post, **$9.95;** double post, **$14.95;** Special Capehart record changers, value $85.00, reduced to..... **$17.95**

FILTER CHOKES, *Jefferson Electric* 2.2 HY—65 MA, 70 ohms 1500 V. ins. Hermetically sealed..... **$.69**

BC-728A. Pushbutton Receiver 2–6 mc with tubes and speaker, less batteries, includes conversion instructions for broadcast band..... **$9.95**

BC-728A, as above, slightly damaged less one tube, less speaker, as is **$4.95**

RCA AVR-20, AIRCRAFT RECEIVER, *2300–6500 kc with tubes,* 2 crystal controlled channels plus variable tuning..... **$14.95**

TRANSFORMERS

Ham Transformers, Peerless (Altec Lansing) new, not surplus, priced below cost.

Modulation Trans.—20 w. Universal Model No. M-4081Q. List $9.25—Only..... **$3.70**

Modulation Trans.—300 w. Universal No. M-2107T. List $70.00—only..... **$28.00**

Plate Trans.—2428 V. CT—300 MA. No. P-5196A. List $45.00—only **$18.00**

Fil. Trans.—2.5 v. CT-20 Amp. 4500 v. ins. No. F-8513J. List $8.00—only **$3.20**

Driver Trans.—Universal 70 MA for 15 w. Audio No. A4237Q. List $10.75—only..... **$4.30**

CALLING "CQ" to all HAMS from W3PPQ-Pick and W3MQD—Johnny, we are always ready to help you in obtaining any kind of gear you may need for your rigs. We carry a full line of ham parts of all popular makes and can ship from stock as soon as we receive your order.

SUN RADIO

OF WASHINGTON, D. C.

938 F STREET, N. W. WASH. 4, D. C.

TERMS All items F.O.B., Washington, D. C. All orders $30.00 or less, cash with order. Above $30.00, 25 per cent with order, balance C.O.D. Foreign orders cash with orders, plus exchange rate.

and the edge of the chassis, and is supported on its own leads.

Mechanical Features

The mechanical layout is shown in the large photograph. The dust cover, a standard chassis with slight modifications, slides down over the unit and is held in place by six ¼-20 screws. The screws tighten into nuts which are sweated to the base plate. The power supply and the control circuits, which are more or less trouble-free, are mounted in a relatively fixed fashion to the base. The radio section's three readily removable units — the modulator, receiver, and transmitter — are seen in that order, looking from the right edge toward the center. Individual top and bottom views of each of these sections also appear in the composite view. Circuits to each of these chassis, to the control box, and to the vibrator supply terminate on Jones barrier strips. Installing and dressing the wires connecting these strips constitutes the major assembly wiring. The coaxial cables from the antenna relay connect to the chassis and the incoming antenna cable with coaxial fittings. Smaller connectors, Type BNC, will fit the RG-58/U, and they may be used if available. The dust cover has two slots cut out of one edge, one providing clearance for the control cable and the A-battery wire directly above it, the other for the antenna connector. The top Jones strip, which is used mainly to provide termination for the control cable, covers the B-supply filter choke and the starting and change-over relays.

The vibrator supply is a standard Mallory 6.3-volt 100-ma. 250-300-volt Vibrapack, No. VP-552, with sponge rubber cemented to the top and bottom faces of the vibrator transformer to insure a snug fit when the dust cover is in place. An aluminum "L" plate supports the main weight of the Vibrapack.

Test Results

With the transmitter delivering approximately three watts to a quarter-wave vertical roof-top antenna, reliable communication is possible from a car over a ten-mile radius in rolling country. By operating from picked locations, communication is possible over twenty miles or so. The other end of this circuit consists of a crystal-controlled transmitter radiating the same power and a crystal-controlled superheterodyne receiver.

A night airborne flight was made with the unit in a Cub Super Cruiser. Though the installation was far from adequate in many respects, good contacts were made, and reception was reported at nearly three hundred miles when the plane was at an altitude of 6000 feet over eastern Pennsylvania. The rig was then installed in the author's car, where it has been in service for several thousand miles of driving.

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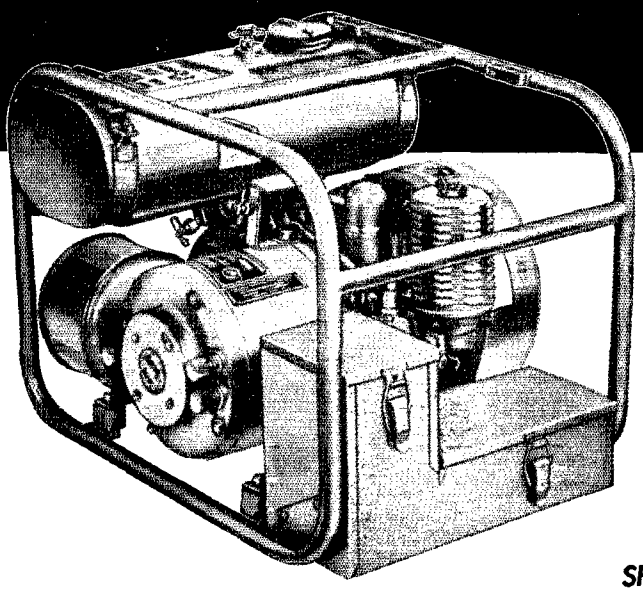
GAS-DRIVEN 120/240 VOLT AC 60 CYCLE GENERATORS

Cash in Advance, or 20% with Order, Bal. C.O.D.



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NET WEIGHT 56 LBS.
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This Power Unit is a compact, light weight electric generator set consisting of a 1 HP Jacobson gasoline engine and an alternating current generator. It is designed to supply 60 cycle, single phase, alternating current at 120 or 240 volts and to deliver 300 watts. The engine is a single-cylinder, two cycle, air-cooled unit with two inch bore, 1 ¼ inch stroke and a piston displacement of 4.72 cubic inches. The ignition system is completely shielded to prevent radio interference. The fuel tank capacity is one gallon and the Unit will run 7 ½ hours at full load, on one tankful of gas. Complete set of tools and spare parts are included free with each unit.

The complete Power Unit is contained in an open frame of tubular construction. It is mounted on four rubber shock mountings which hold the Unit securely in place when transported and absorb vibrations when the Unit is in operation.

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U.S.N.R.

(*Continued from page 48*)

holm, W1FI; Capt. R. B. Meader, W1KG; and Cmdr. R. W. Hart, W1RH. . . . K1NRM, assigned to EW Company 1-16 at Augusta, Me., is working some good DX on 7 and 3.5 Mc. Output of the BC-610F feeds an antenna 792 feet long over the Kennebec River. . . . Company 9-127, Mount Pleasant, Mich. (K8NAG), under the command of Lieut. F. A. Robinson, is one of the Ninth District's outstanding Electronic Warfare organizations. Housed in two Quonset huts outside the city utility-service limits, the unit supplies its own power by means of a gas-driven generator. Members drive in from a 50-mile radius to attend weekly meetings. . . . K5NR, Training Center, San Antonio, Texas, supplied a mobile unit and served as NCS at South Texas Emergency Net gathering in January. . . . EW Company 1-2 at Malden, Mass., held open house. Operation of a communication van (K1USN) adjacent to unit headquarters was supervised by W1PH and W1IAE. . . . George Croft, SR, USNR, is transmitting code practice four nights a week from his home station, W9GTA. His efforts are aimed at assisting fellow reservists in Muncie, Ind., to qualify for amateur licenses. . . . The Training Center at Beaumont, Texas (K5NBW), provided communications at a local air show, using its mobile communication unit. . . . Open house at EWC 8-6, Eureka Springs, Ark. (K5NBT), featured a simulated emergency test; portable equipment was used on the 1.8- and 3.5-Mc. bands.

50 Mc.

(*Continued from page 51*)

mountain locations that will permit anything like the line-of-sight distances that have been covered by W6s working in this frequency range.

V.h.f. work in general is impeded by lack of suitable components. Very little of the surplus available there is adaptable to v.h.f. work, and importing of gear is almost out of the question from the standpoint of cost. No, don't rush to the nearest post office to send some of your gear to your VK friends — it's the duty that slays them, so W generosity is not much help.

Wiesbaden, Germany — DL4CK (W6YHI) would like to have it known that there are DL4s who do something in ham radio besides solicit 'phone-patch contacts with their BC-610s on 10-meter 'phone. The enthusiastic 2-meter gang mentioned last month in these pages have even converted some of the 10-meter ops to 144 Mc. A 10-meter beam contains enough tubing to make quite a respectable 2-meter job, they find. Jack says that his February *QST* has been the rounds, as many of the fellows are building 2-meter converters along the lines of the one described in that issue. They even have 522s over there (on German surplus markets) and a number of the DL1s and DL3s (German nationals) are now on with them. Some low-noise front ends are in use and being built, and bigger and better beams are going up this spring. It appears that there should be some real DX worked throughout Europe on 144 Mc. this summer. In addition to those reported previously, DL4s ZV, YT, AY, ET, and DL3KE are operating in Wiesbaden, DL3CZ in Hanau, 3OD in Frankfurt, 3NQ, Weinheim, 4DD, Freising, 1LS, Heidelberg, and 1HC, Viernheim, are all on with crystal control. Polarization is horizontal.

Moose Jaw, Sask. — Those f.m. tone signals, received last fall in the East when the m.u.f. to the northwest was up around 50 Mc., are heard on sporadic-*E* skip by VE5NC. They seem to come in when the band is open to Washington and northern Oregon, and they have been heard on some occasions when no 6-meter signals have come through. They are scattered all through the region from 40 to 50 Mc. Does anyone know from where and what they come?

Los Angeles, Calif. — Increases in attendance at meetings of the Two Meters and Down Club, reports of expeditions in the planning stages, the organization of a c.w. net on 147.5 Mc. (8 P.M. Sundays) by W6ZL, and a prize of $50.00 offered by W6MVK for the first out-of-state contact by a Los Angeles area 2-meter station — these are signs of spring that are significant to the 2-meter enthusiast. That prize will be administered by the Two Meters and Down Club. Mexico is excluded, and the contact must be with a

(*Continued on page 114*)

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QUIT WORRYING ABOUT TVI—
GET A WRL TRANSMITTER . . .

Tests with amateurs living in congested and fringe areas using WRL transmitters have proven to us that we have a XMTR with **minimum television interference.** Write today for detailed information!

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GLOBE KING
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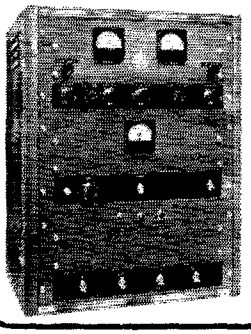
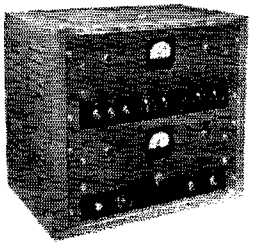


A versatile, advance design transmitter that gives efficient performance on all bands—10 to 160 on phone and CW. 350 watt phone—400 watt CW. Provisions for ECO. Complete with one set of coils.

KIT FORM $379.45 **WIRED-TESTED** $399.45

Low Down Payment

WRL 175 WATT GLOBE CHAMPION



R.F. Section a complete 175 watt XMTR. Provisions for ECO. Automatic fixed bias on Final and Buffer. Class B Speech Modulator 175 watt input — 10 thru 160 meter bands. Complete with tubes, meters, and 1 set of coils.

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land-based station. This has got to be DX, and no ships or planes allowed.

Downers Grove, Ill. — 'TVI had W9PK off 6 and 2, but not for long. The cure in his case was use of high-frequency crystals (in a Bliley CCO) and 100 watts to an 829, in place of the 400- and 200-watt jobs formerly used on 6 and 2. All is now clear, even on his own receiver.

The World Above 420 Mc.

Springfield, Mass. — For some months W1AEP has been trying to put a signal into the Hartford area on 420 Mc. Using a pair of 8012s at up to 100 watts input, and a 16-element array, W1AEP had been heard once by W1PNB, Bristol, Conn., 37 miles, in many tries. Now Chellis is using 16 driven elements backed by a screen reflector, with the 8012 oscillator mounted right in the antenna assembly. This eliminated a 75-foot feed line and multiplied the power in the antenna many times. With this array his signal has been copied nicely by W1PNB and W1HDQ, the latter at only 26 miles, but with obstructions in the direction of Springfield at less than a mile.

W1PNB uses a lighthouse mixer working into an f.m. tuner on 90 Mc. At W1HDQ we have a converter using 6J6s as mixer and oscillator and a 6AC5 30-Mc. i.f. stage, working into an SX-62. This receiver provides either a.m. or f.m. detection and several different bandwidths. Surprisingly enough, we have found that some oscillator rigs can be copied on the 455-kc. i.f. (broad position, for high-fidelity b.c. reception) with fair readability. On f.m. detection and the 10.7-Mc. i.f. they sound fine in most cases, when the audio is backed down far enough.

Syosset, Long Island — In order to help develop 420-Mc. activity W2JND is now running automatic transmission each evening between 8 and 9 P.M. on 436 Mc. A 16-element array is used. Tone modulation is employed for the automatic work, and voice breaks are made every five minutes. Polarization is vertical.

Superhet Design

(Continued from page 53)

Then, $$A = \frac{1500}{500} = 3.$$

The average frequency of the range 500 to 1500 kc. is

$$\frac{500 + 1500}{2} = \frac{2000}{2} = 1000.$$

So, $$n = \frac{1000}{460} = 2.17.$$

Now, in Fig. 2 find the intersection of the $n = 2.17$ line and the $\frac{L_o}{L_1}$ line. Opposite this intersection, on the vertical scale to the left, read 46. L_o is the required h.f. oscillator inductance and the figure 46 means that L_o should be 46 per cent of the r.f. inductance. Since L_1 above was found to be 188 μh.,

$$L_o = 0.46 \times 188 = 86.5\ \mu\text{h}.$$

Next, find the intersection of the $n = 2.17$ line and the $A = 3$ line in the $\frac{C_s}{C_{max}}$ group of curves. To the left on the vertical scale we read 1.1. This figure is the ratio of $\frac{C_s}{C_{max}}$, where C_s is the required series condenser and C_{max} is the value previously determined above for the r.f. stages. Therefore,

(Continued on page 116)

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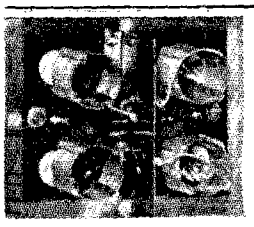
All Harmoniker kits now come with special boxes – all holes punched, shield welded in place, then copper plated – ready to assemble! Makes building a cinch! All you need is a screwdriver, pliers and soldering iron–less than 20 minutes to finish.



Here's the latest, and most sensational TVI filter – as described in GE Ham News and December QST, page 36. Unlike 40 MC low pass filters, this half-wave filter attenuates ALL harmonics (as much as 110 DB for the TV band harmonics of an 80 meter xmitter!) Negligible insertion loss. For flat, untuned line with low SWR. Simple to construct! Nothing to tune or adjust, when using our factory guaranteed 2% accurate condensers!

Harrison Kits contain the metal box, brass for inter-section shield, B and W Miniductors, (no coils to wind!), ground posts, the indicated condensers, connectors, and complete instructions.

For 50 to 100-ohm coaxial cable (Includes coaxial fittings): With 1000 Volt (2000V Test) SILVER MICA condensers for stabilized tuned circuits. Will handle 1 KW CW or 250 W AM Fone RF output.

80 Meters – FI-85 $5.99	40 Meters – FI-45 $4.99
20 Meters – FI-25 $4.29	10 Meters – FI-15 $3.79

Same with 2500 Volt (5KV Test), 2% Transmitting Mica Condensers to handle a full KW Fone!

80 Meters – FI-86 $9.95	40 Meters – FI-46 $8.41
20 Meters – FI-26 $7.21	10 Meters – FI-16 $6.65

For 200 to 600-ohm twin lead or spaced open wire. (Includes feed-thru insulators): With 1000 Volt (2000 V Test) SILVER MICA condensers. Will handle 1 KW CW or 250 Watts AM Fone.

80 Meters – FI-83 $6.71	20 Meters – FI-23 $5.87
40 Meters – FI-43 $5.47	10 Meters – FI-13 $5.35

Same with 2500 Volt (5KV Test) 2% Transmitting Mica Condensers to handle a full KW Fone.

80 Meters – FI-84 $13.25	20 Meters – FI-24 $12.27
40 Meters – FI-44 $12.51	10 Meters – FI-14 $11.75

Special copper plated utility box provided with all kits

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LYSCO'S TVI-LESS BAND SWITCHING VFO TRANSMITTER

Send for illustrated descriptive bulletin.

- TVI SUPPRESSED! – Xmtr designed with 3-section, low-pass filter incorporated in output – all leads by-passed for RF – most effective shielding – etc., etc.
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- VFO CONTROL! – Calibrated output on 10, 11, 15, 20, 40, 80, and 160 meters. Provision for crystal control, too!
- CW BREAK-IN! – Oscillator keying for clean, chirpless, full break-in operation. Built-in key click filter.
- MODULATION PROVISION! – Terminals provided for external modulator. Add 15-watt amplifier and enjoy phone operation. (Special 18 Watt Modulator – $39.95 complete!)
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Excellent as a compact portable or home station transmitter. Coaxial connector output to 50 to 75 ohm cable to feed antenna or high power amplifier. Attractive metal cabinet finished in black crackle with chromium trim – 15" x 9" x 8" deep. Weighs 35 lbs. Supplied complete with all tubes. Nothing more to buy! Simply plug into 115V AC line! Complete installation and operation instructions including antenna data furnished. Operate all bands – QSY at will – eliminate TVI!

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73, Bill Harrison, W2AVA

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$\frac{C_s}{540} = 1.1$, and $C_s = 1.1 \times 540 = 595$ $\mu\mu$fd.

To find the required minimum capacitance in the oscillator stage, C_p, we find the intersection of $n = 2$ and $A = 3$ in the $\frac{C_p}{C_{min}}$ group of curves. Here C_p is the oscillator-circuit minimum capacitance and C_{min} is the r.f. circuit minimum capacitance determined previously. Opposite this intersection we read 27. This means that C_p is 27 per cent of C_{min}. Therefore,

$$C_p = 0.27C_{min} + 0.27 \times 60 = 16.2 \ \mu\mu\text{fd.}$$

The oscillator circuit then looks like B in Fig. 1.

A more accurate determination of the oscillator inductance, particularly when the difference is small, may be obtained by using the ratio $\frac{L_1 - L_o}{L_1}$ instead of $\frac{L_o}{L_1}$. For example,

If $n = 5$, the $n = 5$ line intersects the $\frac{L_o - L_1}{L_1}$ line at 30. Then $L_1 - L_o = 30$ per cent of $L_1 = 0.3L_1$ and $L_o = L_1 - 0.3L_1 = 0.7L_1$.

It is hoped that this will help some of those hams who like to build their own receivers as I do.

Pretty Pickle

(Continued from page 55)

of scrap aluminum suspended in the solution at any convenient spacing from the work and connected with an aluminum wire or strip. As mentioned above, the solution can be put in an aluminum container and the *negative* lead connected to the container itself.

D.C. Supply

Let's see what happens. We set up our connections and switch on. The negative electrode bubbles good and hearty, giving off hydrogen. The positive electrode (the panel for that new converter, perhaps) bubbles slightly. After the thing has cooked for say half an hour take out the work and have a look at it. Don't handle it, for we don't want finger marks at this stage and sulphuric is no skin lotion. A pair of wooden tongs, such as are used in photographic dark rooms, comes in handy here, or just fish it out with a pair of long-nosed pliers (washing them off afterwards). Give the work a good rinse in hot water and then dry it over a hot stove or in a slow oven. When it is dry it probably won't look much different except for a slight varnishy sheen. Put the ohmmeter on "megohms" and touch the two prods lightly to the panel. If it reads open circuit as you move the prods gently about, then you've done your job. If it reads some resistance here and there put the work back in the bath and cook it some more. If it reads dead short, either you've been impatient or something is sour in the process. Better check back. As a matter of procedure

(Continued on page 118)

it is a good idea to start off with the work and another control piece of aluminum connected together as the positive anode. You can fish out the control piece for tests. It will be smaller and easier to handle and if you smear it up, it doesn't matter.

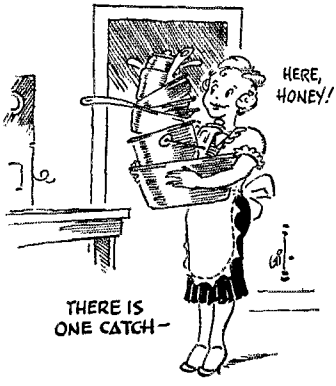
When you have a good anodize film on the work, dry it off as earlier and set it on a clean paper towel or newspaper ready for the next and last step.

If you want peace around the home, be careful with that sulphuric acid. It's death on carpets and woodwork. Better do it in the cellar or in the back yard. Apartment dwellers are advised to stand the bath on a good thick, wide pile of newspapers.

Coloring

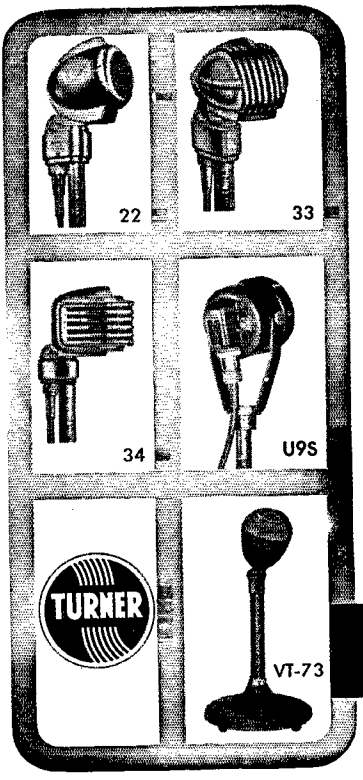
This is the durndest thing! You can take your anodized panel and dye it any doggone color you want. It seems a completely insane idea, but it works perfectly. For want of anything better you can use ordinary household dye (Tintex, etc.) from the drug store. There are too many commercial dyes useful for this process to do any more than to advise a visit to the nearest chemical supply house. Tell the man what you want to do and what color you want and leave it to him. He will be happy to give you the dope and, incidentally, you will acquire valuable professional advice on the particular dye he has available.

Let's consider ordinary Tintex, Diamond or other standard brands. Make a dye bath of twice the strength called for on the package. Some improvement comes from dissolving the dye in methyl alcohol. Add a dash of acetic acid (ordinary white vinegar is OK) to the tune of a tablespoonful or so. Sink the freshly-anodized panel in the dye bath. Fish it out half an hour



later — and there you are. All that remains to be done is to give it a steam treatment. An inch of water in the bottom of a bucket placed on the stove will generate all the steam you need. Put the work in the bucket, suspended just clear of the water. Throw a towel over the top of the bucket and let her steam for fifteen minutes. After the steaming, let the work dry and the job is done.

(Continued on page 130)



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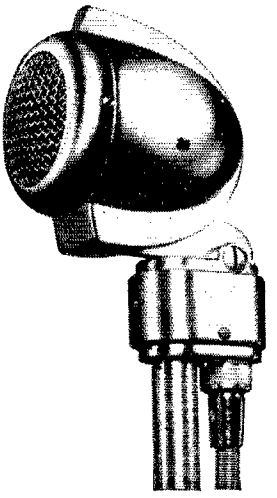

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Our purist friends can have their fling by setting the dye. This is not essential but worth doing. It is not complicated. Dissolve nickel acetate in boiling water at a concentration of 5 grams per liter. Submerge the dyed work for fifteen minutes. Remove the work, wash and dry.

There is one catch. The YL or XYL is apt to take one look at the lovely smooth color on your panel and demand that her saucepans get the same treatment — and you can do it!

Vertical for Forty

(Continued from page 58)

The antenna-current meter (0–3 r.f. amp.) should be used when loading the antenna on 80.

After using the antenna for over a year, I am satisfied that it performs well on 3.5 and 7 Mc. To check on the performance I put up a temporary folded dipole for 40 and made checks with stations located in the maximum signal-strength direction of the folded dipole. These tests indicated that there was essentially no difference in signal strength when my 100-watt transmitter was switched from the folded dipole to the vertical antenna. Thus having satisfied my curiosity, I took the folded dipole down from my neighbor's roof, and have confidently used the vertical ever since.

Correspondence

(Continued from page 65)

swapping QSLs with a W." But no, comes the usual, "Sure gld to QSL, OM, send crd first thing in the AM." So I hasten to make out mine and take it directly in my hot little hand to the P.O., not trusting our rural carrier. Luckily, I don't hold my breath any more until the return comes in.

"T ain't the same as it was back in '28 when I first got the bug as our high school physics class formed that radio club and started to build one tube regeneratives and breadboard bloopers.

— *Walt Bennett, W9WMH*

NO TVI!

426 E. 67th St., New York 21, N. Y.

Editor, *QST:*

I have a suggestion that might appeal to readers of *QST*. Despite the numerous articles about TVI elimination, the 10-meter band in the evening is almost completely dead.

I have been on the air evenings with 3 watts a.m. for 5 months and have been able to work every ground-wave station that I could hear. Just the other day I worked out 35 miles with a report of Readability 5. The antenna is only a dipole, nonrotatable.

Quite a number of fellows have been very interested in my rig as a solution for their TVI problems for nighttime rag chewing. Taking the ordinary simple harmonic-reducing measures (low-pass filter, shielding, etc.), I'm sure almost every case of TVI can be cured. I built the QRP a.c.-d.c. 50L6 rig described in September, 1949, *QST*.

To give you an idea how well low power gets out (with no TVI) I've worked, in a few months, about 80 new stations on ground wave and they all gave me Readability 5.

— *Ernest Palinkas, W2ZVT*

CQ MARATHONS

3804 Rexmere Rd., Baltimore 18, Md.

Editor, *QST:*

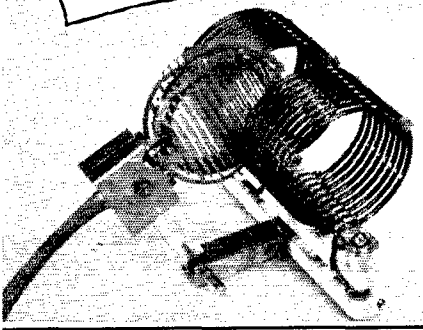
I have been in ham radio since 1933 on 160-, 75-, 20- and 10-meter 'phone. In the past several months I have noticed a certain malpractice on the part of quite a few 'phone men

(Continued on page 122)

HELP! FOR TVI

WITH THE NEW

JOHNSON FARADAY SHIELD



For reduction of TVI caused by capacitively coupled harmonic radiation, you can now equip your links with the new JOHNSON Faraday shield. This shield is designed to be installed on the full line of JOHNSON plug-in links and other makes as well. The screen of conductors is plated on low loss polystyrene sheets. With a hood over the link terminals and copper braid covering the link leads, shielding is complete. Low link to shield capacity leaves link impedance relatively unchanged. With JOHNSON Faraday shields the flexibility of plug-in links is unimpaired.

Cat. No.	Description	Ham Net
238-303	150/500 watt swinging link shield assembly including hood and shielded leads.	$ 2.25
238-304	1000 watt swinging link shield assembly including hood and shielded leads.	2.55
238-301	150/500 watt link shield only.	.99
238-302	1000 watt link shield only.	1.26

Solve Your Loading Problems With JOHNSON Ham Inductors

Pick from three sizes, 1000 watt, 500 watt and 150 watt the model with the right conductor size and L/C ratio for maximum coupling efficiency. These inductors, together with the plug-in links originated by JOHNSON will meet your needs whether you're using an 807 or push-pull 250THs.

Ask to see them at your dealers or write:

E. F. JOHNSON COMPANY
WASECA, MINNESOTA

LOOK! IT'S MOBILE RADIO TIME AT B-A!

6 VOLT DYNAMOTOR

USUAL LIST PRICE $82!

Only $9.88

Output 425 V. At 375 MA

EVEN BETTER, MORE COMPACT THAN THE FAMOUS PE103!

Weighs only 9 lbs., overall length 7 inches, height 4 inches. Has standard 4-hole mtg. base and black wrinkle finish case. Input current 46 amps. when loaded to maximum output of 425 V. at 375 MA. On actual test, other ratings are 30 A. input with 285 MA load, 25 A. input at 160 MA load, 20 A. input with 100 MA load. Both windings completely isolated from frame.

Top make, beautifully engineered. Originally manufactured for use with Western Electric equipment. Brand spanking new in original factory cartons. Shipping weight, 11 lbs. No. 32B235—Available only at B-A!.....$9.88 For Parcel Post Shipment add 91c (over remittance promptly refunded.)

WATCH FOR THE LATEST B-A BARGAIN CATALOG LISTING OTHER ITEMS FOR MOBILE OPERATION

WRITE US IF NOT ALREADY ON OUR LIST

B-A BURSTEIN-APPLEBEE CO. 1012-14 McGEE ST. KANSAS CITY 6, MO.

which should be corrected not only for their own benefit but also for the benefit of other users of the frequencies. A station will come on the air and call CQ and instead of identifying himself frequently he will call CQ for about three or four minutes. Over and over again, incessantly and monotonously, he will yap his CQ all over the place but does he give his call letters once in a while — oh no! I have often picked up a good strong signal, one I would like to work, and have sat for as much as three minutes by the clock waiting for an identifying call, but none comes. He just takes a long breath and starts that blasted CQ all over again. I suppose there are lots of other hams like me who get tired of waiting for him to sign his call and stand by who eventually tune away from his frequency. I venture to say many of these fellows lose out on good QSOs on account of this practice and I daresay they don't realize what they're doing.

— *Arthur W. Plummer, W3EQK*

OM

486 City Rd., Edgbaston, Birmingham, England

Editor, *QST:*

I have received the March copy of *QST* and notice on page 120 "Old Man Roth," W2DKH, is moaning about his old age at 40. I would say he is just in his prime.

If he wants to feel young, he should act young especially when the fair sex are around. Hi.

I advise him to try it as I know it will work wonders and believe me I know, as I am 70 and still hold a call sign in this "God's Own Country" and am doing my darndest to fill the ether.

Cheer up, OB, and get going.

— *R. Kirlew, G6KW*

THANKS, OM

73 Beverley Crescent, Bedford, England

Editor, *QST:*

May I take this opportunity of saying how much *QST* is appreciated, and offer sincere congratulations on the amazing way you maintain such a phenomenal standard of interesting material not occasionally, but every month.

— *C. W. Clarabut, G2VS*

Hints & Kinks

(*Continued from page 67*)

A driver plate coil and final-amplifier grid coil can be made from one of these coils by removing the link winding and bringing the remaining connections to separate pins. Because of the close coupling, it is only necessary to tune one of the two coils, thus saving the cost of a tuning condenser as well as a coil.

In most applications it will be necessary to adjust the number of turns on the coil to resonate in the desired band with the proper L/C ratio, but this presents no serious difficulty. — *Jerry Horn, W4AFR*

Strays

In answer to a number of inquiries, Nevada SCM N. Arthur Sowle announces that those who attended the late-October ARRL Pacific Division Convention at Reno can obtain pictures of same by sending a dollar and their name and address to Everett B. Cobb, W7LXF, 1260 Ridgeway Court, Reno, Nevada.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contact 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 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League takes the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

Please note the 7¢ rate on hamads is available to ARRL members only.

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.

QSLs. 100, $1.25 up. Stamp for samples. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore 29, Md.

AMATEUR radio licenses. Complete theory preparation for passing amateur radio examinations. Home study and resident courses. American Radio Institute, 101 West 63rd Street, New York City.

QSL's, SWL's. Finest stock. Fairest prices. Faster service. Dossett, W9BHV QSL Factory, 857 Burlington, Frankfort, Ind.

QSLS! Kromkote cards at a fair price. Dauphince, W1KMP, Box 219, Cambridge 39, Mass.

SUBSCRIPTIONS. Radio publications a specialty. Earl Mead, Huntley, Montana, W7LCM.

DON's QSL's "The finest". Samples. 2106 South Sixteenth Avenue, Maywood, Illinois.

QSL's high quality, fair prices. Samples? W7GPP R. D. Dawson, 1308 F Street, The Dalles, Oregon.

10-METER Beams, $19.50. Send Card for free information, Riverside Tool Co., Box 87, Riverside, Illinois.

CRYSTALS: Bassett Type 100A precision low-drift units made to your exact specified frequency within the 80 or 40 or 20 amateur bands, at $1.50 each, plus postage. Rex Bassett, Inc., Bassett Building, Ft. Lauderdale, Fla.

MOBILE antenna mounts: spring type, whip detachable for garaging, mountable without visible body holes, price, $3.75, postpaid. Wayne, W1PFB, 130 Mount Vernon St., Middletown, Conn.

WANTED: QST for February, March, July 1916. I have 500 other copies QST and Radio for trade or sale. WØMCX, 1022 N. Rockhill Rd., Rock Hill 19, Mo.

WANTED: Marconi magnetic detector, multiple tuner; DeForest responder and audion control panels; other wireless gear prior to 1925. Franklin Wingard, Rock Island, Illinois.

FOR Sale: First class equipment, like new; 32V1 Collins, $400.00; 75A1 Collins, $300.00; Model 59 megacycle meter, $135.00; 120-watt modulator, $36.00; dual 600V power supply, $46.00 and a few items left as advertised in Feb. QST. Orval Hanson, WØHBA, Watertown, South Dakota.

QSLS, Stationery, "etc.", Taprint, Sumrall, Miss.

ZIPPO lighter, ARRL insignia and call sign, inlaid enamel, $5.00. Ideal birthday gift. McCarron, W2BNO, 3050 Decatur Avenue, New York 67, N. Y.

300 watt station, complete, $250.00. Includes SX-25 receiver, speech amplifier, 2 mikes, rack-mounted xmitter with P.P. 35Ts, P.P. 805s, P.P. 809s in Class B, high and low voltage power supplies, antenna network and relay, 40 ft. portable tower, beam rotator, spare tubes, etc. R. Bennett, W2URV, 12 Lawrence, Waterford, N. Y.

SUPER PRO SP-400X, excellent condition, $250.00. Consider in trade: Collins 70-E-8 or 310-C-1 or Panadaptor. W6TOT, Donald Rolph, Los Gatos, Calif.

QSLS: Kromkote cards priced right! Samples. Imsande, W6YLU, 6106 Acacia, Los Angeles 56, California.

SELL: General Electric 15-tube transceiver, 20 watts output on pre-adjusted frequencies from 435 to 500 Mc. New. $22.00. Bob Franzke, 4306 N.E. 8 Mason St., Portland 13, Ore.

QSLS? SWLS? Modernistic? Cartoons? Deluxe? Photographic? QSL specialists! Samples 3¢. Sakkers, W8DED, Holland, Michigan. QSLS made-to-order!

420 Mc. Antenna arrays. Also circularly polarized 250 power gain beams. Matching transformers. High powered transmitters. Special receivers. Equipment approved field tested, W3PZ, Smith, 218 Newcomb S.E., Washington 20, D. C.

FOR Sale: Meissner Signal Shifter $60.00; Millen 500 watt R.F. amplifier, $60.00; 1500 volt-350 Ma. power supply, $25.00; Meck 150-B xmitter, $60.00; Lysco 75-meter mobile xmitter, $12.00; Meissner phono-recorder, radio, P.A., $60.00; Electro-Voice velocity mike, $12.00; Don Kadish, 9 Peters St., Cambridge 39, Mass.

WANTED: A good 10-meter on all bands mobile xmitter and converter. Donald R. Clark, W7OHG, Blackfoot, Idaho.

SELL: Hammarlund Super-Pro (Army model BC-779) complete with power supply, $98.00; radio receiver BC-348 (not converted), $50.00. W7MCK, Capt. Morgan Z. Evans, Fort Worden, Washington.

WANTED: 20 and 40-meter bandspread coils for Meissner 9-1080 shifter. Molyneux, 53 Gulf, Chickasaw, Ala.

CLEAN BC-522 transmitter (BC-625A) with four spare 832's and two xtals. $27.50. WØJV.

SELL: 300 watt phone xmitter. 8005 P.P. final, 811 mods. Deluxe 5 ft. Par-Metal cabinet. Bandswitching exciter, $195.00. W7JLJ, 647 E. 3065 S. Salt Lake City, Utah.

MUST sell out excess equipment including HQ-129-X, 152A, BC-522, 3EL 10 beam, RF osc, 810s, 813s, 4E27s, hundreds of parts, tubes, meters, no junk. Just spring house-cleaning. Card for list. C. C. Richelieu, W1JR, 23 Bennett Road, Gardner, Mass.

SELL: QSTS, complete 1938 through 1942, 1946, others. Abbott TR4B, Stancor 30W mobile, Weston photocell, micro-relay (cell's current actuates relay), 780 volt supply. George Kravitz, 7919 20th Ave., Brooklyn 14, N. Y.

UNCLE Fred's QSLS. 3 colors and up. Rainbow map QSLS. Special DX QSLS. Samples? Uncle Fred, Box 86, Lynn, Penna.

FOR Sale: SCR-522, transmitter and receiver with 400 Mil. power supply in Deluxe cabinet, on 2-meter band now, $55.00. W2NKH, 64 Chestnut St., Huntington, L. I., N. Y.

HAMFEST: June 4, 1950. Come to Camp Ki-Shau-Wau where the Starved Rock Radio Club will again hold their annual hamfest. Follow Hamfest signs South from Junction of Illinois Routes 178 and 71 near Starved Rock State Park or east on Blacktop Road from Route 51 at Tonica, Illinois. One dollar advance registration, or one fifty at gate. For additional information, write W9MKS, Utica, Illinois.

JOHNSON Viking I kits assembled, with tubes, as a complete transmitter carrying a 90-day guarantee for $275.00 at Evans Radio, Concord, N. H.

10 and 20 meter beams $19.25 up. Aluminum tubing, etc. Willard Radcliff, Fostoria, Ohio.

BC-348-Q purchased new, AC supply, base, instruction book. $85.00. Rotary converter 110 VDC-110 VAC, 60 cycle. 250 W. filtered, practically new, $25.00. R. Endres, Pleasant Valley Ave., Moorestown, N. J.

HRO-5A1 with revised circuits. $100.00. Also 2000 volt generator and test equipment. Richard Houghton, Littleton, Mass.

HAM'S HAVEN, where amateurs fish and holiday. On Big Eagle Lake in Northwest Ontario. Family cabins. Write Connor VE3AFH, Box 238, Dryden, Ont., Canada.

NEW in crate $150. WRL Globe Champion modulator for $95.00. Very neat, complete, Stancor ST-202-A 125 watt xmitter, $75. Hammarlund HQ-129-X (not even scratched), $125.00. A money-back guarantee to local buyers on this excellent equipment. Swanson, 107 Colrain S.W., Grand Rapids, Mich.

FOR Sale: Super Pro 100 Kc-20 Mc., complete with power supply, dust cover, etc. A-1 shape: $125.00; RCA Model TMV-122B, 3" 'scope, A-1 shape, $50.00; RCA Model 151, 1" 'scope, $25.00; Will consider 1-10 recvr or similar high frequency receiver as part. W3DPA, Box 1067, Wilmington, Del.

SUPER SKVRider, SX-16, 550 Kc. to 61 Mc. S-meter, xtal filter, B.F.O. P.M. Spkr. Good condition. $40.00. T. D. Childs, Box 62, Anderson, S. C.

RECEIVER SX-25 complete with matching speaker, in excellent condition, $75.00. W3ARR, Robert Dunham, RD #2, Morrisville, Penna.

MASONITE panels, 3/16 blk wrinke, ½ cent sq. inch. Cut to size. 19 x 8, 76¢; 19 x 10, 95¢, etc. Palmer, W2JQG, 964 E. Hamilton, Allentown, Penna.

WANTED: GE VRS-1 SSB selector. State condx and price. Paul Kretschmer, 726 N. Grammercy Place, Hollywood, Calif.

HALLICRAFTERS S-20R, $40.00. Randolph Herman, Excelsior, Minnesota.

SELL: Collins 32V-1, $400.00; VHF-152, $55.00; Simpson test meter, model 260, $35.00. Equipment in excellent condition. Arthur C. Jacobs, W2OEO/4, 5628 Merrick, Apt. A, Univ. of Miami, Coral Gables, Fla.

HUNTER Cyclemaster, $125.00; Super Pro SP200K, $150.00; VHF 152A, $65.00; Sonar FM exciter, $20.00; All in perfect condition. WØOSX, 3212 Georgia Ave., Minneapolis 16, Minn.

SELL: VHF152A, excellent condx, $55.00; Millen R9er, 6-meter coil, 6AK5, excellent condx, $15.00; F.o.b. Richford, Vt. W1QQ, John Boocock, Richford, Vt.

SELL: TBL-13 Navy battleship transmitter, $249.00; TCS-12, new PT Boat transmitter; receiver, AC and DC, power supplies, cables, etc. $199.00. 522 transmitter receiver, new, instruction book, $35.00. BC-654 transmitter receiver, $29.00. PE-104A power pack, $5.95; RA-34 rectifier adjustable DC/AC voltages, $49.00; HRO power supply, $10.00. T. Howard, 46 Mt. Vernon St., Boston, Mass.

FOR Sale: All band xmitter, 400 w. fone/c.w., Thordarson built. P.P. 808's, Mod. 811's. Simpson meters. 15A. Variac, totally enclosed rack. Dolly. Weight 400#. $250.00. cash only. W9MWN, George Gaul, 1311 North Lake St., Aurora, Ill.

RME-69-DB20 combination receiver with filter, silencer, and built-in monitor. Best reasonable offer. Randolph Neal, 713 Spring St., Atlanta, Ga.

HALLICRAFTERS SX-43 with Model R-44 speaker, for sale. In good working order. First money-order for $100.00 takes all. Will ship express collect. Elmer Krute, W5OWL, 2349 Glenwood Drive, Port Arthur, Texas.

LABORATORY quality test equipment wanted for cash! Send details to Weston Laboratories, Weston 93, Mass.

NEW crystals for all commercial services at economical prices; also commercial regrinding. Over fourteen years of satisfaction and fast service! Eidson Electronic Co., Phone 3901, 1802 No. Third, Temple, Texas.

QSLS. Have you seen them yet? Samples today. Your best bet. Larry's QSLs. Opportunity, Wash.

1000 VA transformer 1100-2200-4400 each side CT. Guaranteed. Dawson, 5740 Woodrow, Detroit 10, Mich. $15.00.

BARGAINS: New and used transmitters, receivers, parts: Globe King, $299.00; HT-9, $249.00; Temco, 75GA or Supreme AF100, $275.00; Sonar SRT-75, $149.00; ART-13, $149.00; new 150-watt phone $199.00; HT-6, $99.00; 60-watt phone, $99.00; Globe Trotter, $57.50; HT-17 $29.50; New Meissner signal calibrators $29.95; MB611, $29.50; NC240D, $165.00; HRO complete, $129.00; SX-43 $129.00; NC173, HQ-129X, $139.00; RME-45, SX-25, $99.00; S-38, $29.95; S-41, $22.50; VHF-152A, $69.00; BC610's and many others. Large stock trade-ins. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deal to World Radio Laboratories, 740-44 West B'way, Council Bluffs, Iowa.

10 meter converter available at $16.00 postpaid anywhere in the United States. Our 3-tube type RF24 broad band converters are winning hosts of friends with their splendid performance. Requiring no alterations and guaranteed to work, these units are furnished with 3 spare tubes. Measures only 5" x 7" x 10" and requiring 250 v plus 6.3 they are suitable for BC-348, 342, etc. Output frequency 5 Mc. Write for yours today. Overbrook Company, Overbrook 81, Mass.

SWAP SCR-522 for power supply for 810 final. W5KYO.

WANTED: Telegraph ink recorder with puller. H. Grossman, 1320 Manor Ave., New York 59, N. Y.

FOR Sale: Telvar T-60-2 xmitter, BC-459A converted with power supply, Drake low-pass filter, Astatic N-30 mike, $150.00 takes all. W2ZRY, 141-A 22nd St, Brooklyn, N. Y.

FOR Sale: Used, unconverted ART/13, $100. Prefer to sell but will consider trade. W7JFR.

SELL at bargain: Want to hear elusive DX? HRO-W plus DB-22A Gon-Set Clipper power supply and speaker, completely lined on the nose, $150.00. shipped prepaid in USA. This line-up heard and worked 175 countries with apartment dipole. Write, wire, phone W2YW, RE 9-4253, R. O. Strock, 84–49 168th St., Jamaica 3, L. I., N. Y.

WANTED: Code practice machines and tapes. New, used. A. Blau, 627 W. 164th St., New York 32, N. Y.

SELL: Cool KW P. P. 250TH final best components. Collins 32RA-8 in A-1 shape. 2 ARC5 transmitters, 3–4 and 7–9 Mc, with AC power supply, modulator and speech equipment. Mark 11 tank set with AC supply. Consider all offers. Charles S. Greene, M.D., W2CPI, 107 W. Center, Clayton, N. J.

MEASURE that R.F. 0–1½ thermocouples, $1.50 each; 0–8 amp. thermocouples, $1.75; Millen 50 watt exciter, with all coils 80 through 10, at $37.50. Sonar XE10 exciter, $25.00. All in good condition. R. L. Kalmbach, W4IW, Lykesland, S. C.

"TAB" bargains! 1N34 crystals, 78¢. 2/$1.49, 10/$6.75. New FL-5 filter, 98¢. Selsyns GE/2J1G1 Tested, used, pair $1.49. BC-456 modulator, less tubes, dynamotor, as is, 98¢. Free "Tabogram". "TAB," 109 Liberty St., New York, N. Y.

SELL: BC-453A, new, original carton, best offer answered. Few copies of schematic, sell 30¢ copy. Also few new and original Army Technical Manuals on "Repair and Calibration of Electrical Measuring Instruments"; "Signal Generators 1-72-G, H, J, K"; "Test Set 1-56-E"; "TG-10-Keyers (code machines)"; any one, $1.25. Navy Radar Electronic Fundamentals, $2.25. Want manual on SCR-522, name price. Frank Dunan, W3NB, 1717 Lang Place, NE, Washington 2, D. C.

QSLS, SWLS. High quality, reasonable price. Samples. Write Bob Teachout, W1FSV, 40 Elm Street, Rutland, Vt.

G.E. pole xmfrmr 1.5 KVA. 2400-0-2400 with 110 input. Oilfilled cast iron case. $35.00 takes it. Inquiries answered. W2ZEQ, Yorktown Heights, New York.

BARGAINS: New and reconditioned Collins, National, Hallicrafters, Hammarlund, RME, Millen, Meissner, Gon-Set, etc. Reconditioned S-38, $29.00; S-40A, $59.00; SX-42, $179.00; HQ-129-X, $129.00; NC-173, $139.00; NC-183, $199.00; DB22A, $49.00; HF-10-20, $59.00; VHF152A, $69.00; RME-84, RME-45, $89.00; NC240D, HRO, SP400X, SX-43, HT18, $69.00; HT9, Temco 75GA, $249.00; BC-610, 32V, 75A1, Meissner bandswitching VFO, $49.00, etc. Shipped on trial. Terms. List free. Henry Radio, Butler, Mo.

SELL: HRO-7 complete with broadcast coils and NBFM adapter; slightly scratched on top cover but otherwise in perfect condition; $150.00 F.o.b. A. G. Woolfries, East High School, Sioux City, Iowa.

FOR sale: QST 1935 to date, complete. $25.00. Herbert L. Gilman, W2RKR, 414 Triphammer Rd., Ithaca, N. Y.

QSLS-SWLS! Free samples. Cushing, W1HJI, Box 32A, Manchester, N. H.

FOR Sale: Army Super Pro, 1300 Kc to 40Mc BC-794 B with power supply, in good condition, $125.00; BC-654A, $20.00, with PE 103, new, $35.00; BC-645, new, $20.00; 5v 60 amp Kenyon Fil xformr. for 304 TLS, $9.00; Zeiss Ikonta 120 size 4.5 lens case, new $50.00; Zeiss Ikonta 2¼ x 2¼ 4.5 lens case, new, $54.00; Eastman 2-in. enlarging lens, $20.00; other items. Need: RCA voltomyst, rack panel cabinet, high power, 6 and 2 meter rig. F.o.b. R. M. Reavis, W5OWG, 125 West Main, Ardmore, Okla.

MUST sell: National HFS and 5886 power supply. Used one month. In perfect shape. Express prepaid, $140.00 (money order). Reason: need the money. W6TGO, 6040 Beeman Ave., North Hollywood, Calif.

FOR Sale: $300.00 cash, Hallicrafters HT-9 transmitter, complete with coils and xtals. Hammarlund HQ-129-X receiver and speaker, complete; DB-20 preselector; D-104 microphone, automatic bug. Apply Mrs. D. B. Kenly, 533 Maple St., Williamson, W. Va.

SELL or trade for TV Eq A.1.T.G.-10 auto-keyer. R. S. Cole, Box 326, Owingsville, Ky.

3 SIX volt mobile police stations, 10-watt 35 Mc xmitters, 2.49 Mc revrs, and Main station 25-watt 2.49 Mc xmittr, 35 Mc. revr. All AM, Used, but serviceable. Easy shift to ham band. Best offer takes. W6ADH, 334 Main St, Port Washington, N. Y.

BC-610E bought from factory, 614E preamp with Electro-Voice clipper, converted for 10. Complete extra set of tubes and coils for 10–20–40–80. Home built antenna tuner with 2 R.F. meters. Dozen xtals, all manuals. The whole works for $600.00 or best offer. W7DTB, Route 1, Box 1, Clearfield, Utah.

WANTED: Hammarlund HFBD-100-E or Caldwell MT-100-GD. W8DGG, 216 Weaver, Xenia, Ohio.

NC-33, in factory unopened carton. D. S. Overton, RFD # 1, Paterson, N. J.

FOR Sale: AVT 112a and companion power supply, AVA 126A 6V, $23.00. For sale or swap; National 1" 'scope, complete with tubes; works FB — $15.00. Large Southwind auto-heater, like new, $20.00; SCR-522 and accessories, $50.00. Desire Gon-Set converter, BC-348 or what have you in receivers? L. W. Berg, WØKAI, 403 E. Wyoming, Redwood Falls, Minn.

BEST offer takes back issues of QST, 1923 through 1947 (August 1931 missing). W1ALP, Baker, 91 Atlantic, No. Quincy, Mass.

FOR sale: HRO-M with ABCD coils, power supply, speaker, $125.00, or best offer by May 10th. Webb, W1HOD, Bullard Avenue, Holyoke, Mass.

VHF-152A, like new, $74.00; BC-348-N AC power supply, speaker in metal cabinet, noise limiter, 4" square external R meter, PP audio tubes, $85.00; 684 FM transmitter, with two dynamotors (12V), 28 xtals, 27 to 29.7 Mc. in 100 Kc steps, $30.00; Gordon rectifier 220V input, 27V at 40 amps output, $45.00; BC-348 power supply, AC, $5.50; Amertran Transtat 110V, 13 amps, $15.00. Bill Ferguson, W4NVI, Morehead, Ky.

10-METER mobile rig, 20 watts to 807, complete with dynamotor, shielded cable; crystals, dynamic mike, $22.50. NC-100X receiver with S-meter, crystal filter and 10" speaker, $40.00. BC-696 and BC-459 on rack, all $9.00. QST July 1947 to April, 1950; $5.00. Radio News, June 1947 to March 1950, $5.00. CQ for May 1948 to April 1950, a few older, $3.00. Don Fleischhauer, W9DIP, Mulberry, Ind.

1-KW DELUXE bandswitching transmitter complete for xtal-signal shifter control for cw, 'phone, AM or FM on 10–20–40–80 meter bands. Will furnish photo and complete description. Parts alone cost over $1000. Will sell for $350.00 F.o.b. W3BTV, P. O. Box # 994, Lancaster, Penna.

MAKE offer for Paragon type two detector and one-step receiver. W3LML, R. Dennis, 7 Robert St., Claymont, Del.

RME DM36 conv., 10 and 20, (6 meter changed to 20). $25.00 Western Electric 10-meter mobile rig, complete with mike and genemotor, manual, $25.00. Address: L. G. McCoy, W1ICP, 38 LaSalle Rd., West Hartford 7, Conn.

FOR Sale: by estate of WØTGZ: 100-watt cw transmitter in floor rack, BC-348-Q converted, Hallicrafters SX-24, Hallicrafters S-72, BC-696, etc. All equipment in excellent condition. Send stamp for complete list. Hazel T. Lammey, Extrx, 3019-54th St., Des Moines 10, Iowa.

BC-610 speech amplifier, factory converted, 10 meters. All coils and tuning units. $400.00 F.o.b. Windsor, Missouri. WØJUR, Glenn Irick.

PLATE transformer, 120/240 V. Primary 2400–0–2400 V. secondary rated 500 mils, $20.00; 1200–0–1200 V. secondary rated 600 mils, $15.00; 2500–0–2500 V. secondary rated 500 mils — $25.00; with 3000–0–3000 V. secondary rated 500 mils, $27.00. Send us your requirements on special filament transformers and chokes. Northern Engineering Co., Baraboo, Wis.

QSLS: Rainbo, regular, fotographic, new cartoons! Which samples would you like? C. Fritz, 1213 Briargate, Joliet, Ill.

SELL: PE-75-B gas driven 110 V. generator, 2500 watt, 60 cycle, A.C. shielded and filtered for radio. K. C. Rhody, W3OKI, Patton, Penna.

FOR Sale: ARC-5-BC696, $10.00; LM-10 with original calibration, AC power supply, cable and operating manual, $85.00; new ARB receiver 200–9050 kc, $20.00; NC-173 receiver, speaker NBFM adaptor, $165.00 F.O.B. F. MaDan, W2CUD, Cedar Ridge, Ivington, N. Y.

FOR Sale: 30-watt speech amplifier, crystal mike input to 4-2A3, multimatch transformer for Class B grids, rack-mounted, bias and power supply on same chassis. Also: 500-watt Thordarson modulation transformer, 4 ratios. 2000 Volt D.C. at 750 Ma. plate xformer, cased. Cardwell TZ4ORD condenser 40–40, ½ inch. Also several turret coils, Gon-Set 10–11 BC-375, 522. Want: ART-13 Handbook, dynamotor. Want also 'scope, Gon-Set 3–30, R. F. Meters, ARC-5 recvr and xmitter. C. Ham, W2KDC, 200 Harvard St., Westbury, N. Y.

PHONE Patch Schematics Discussion, $1.00. W1MRK.

FOR Sale: Complete station consisting of: BC-610-E transmitter, excellent condition, with speech amplifier, power cables, tuning units and coils for 10 thru 80 meters, all tubes, antenna relay and negative speech clipper, installed; modified for all bands; 700 watts input on fone easy. $495.00. Super Pro receiver (BC-779) in cabinet; looks and performs like new, with all tubes, power cable, power supply. $125.00. Frequency meter, (BC-221-AH) with AC power supply, only slightly used. $35.00. Instruction book for each. Will sell separately. All three for $600.00. Shipped F.o.b. from W5LFI, Apt. 4, Building 539, Fort Monmouth, New Jersey.

LOS ANGELES Hams: Complete station. Rack KW phone CW, all bands, $375.00. Receivers, $75.00. Beam and tower, $45.00. Inspect. Write for inventory. Reason: getting married. W6ZDU, 1275 Wesley Ave., Pasadena 7, Calif.

FOR Sale: HQ-129-X with speaker, in perfect condition. Used very little. Also 20-watt phone cw transmitter; 2E26 final, three xtals, coils for 40 and 80 meter bands, mike and key. All for $150.00. Will deliver up to 100 miles. W8EAC, Box 16, Brown City, Michigan.

SELL or trade deluxe kilowatt phone cw bandswitching except final plate. Cost $1150 two years ago. TVI reduction devices. No TVI present location. All reasonable offers considered. W5DA, 4424 Bordeaux, Dallas, Texas.

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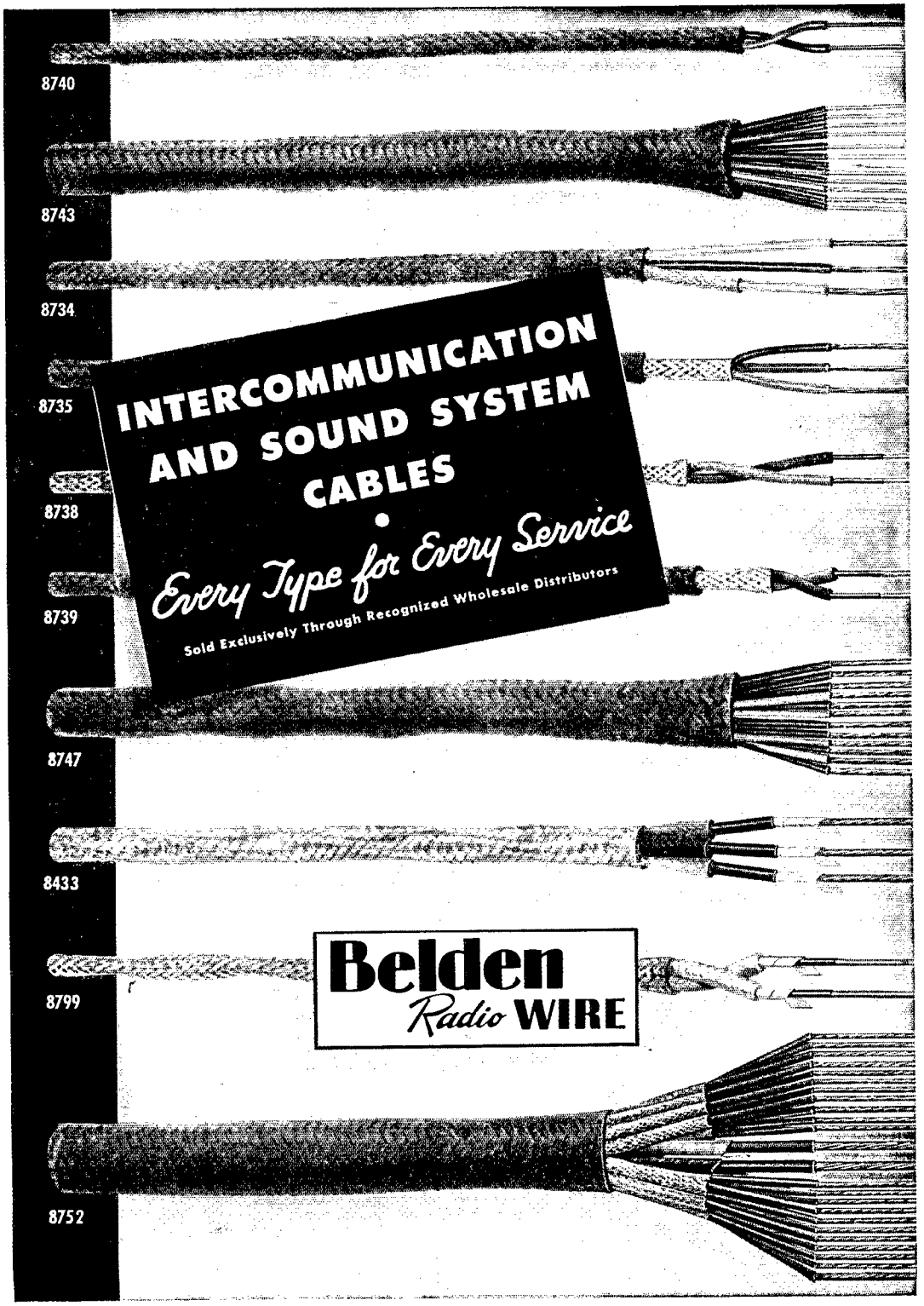
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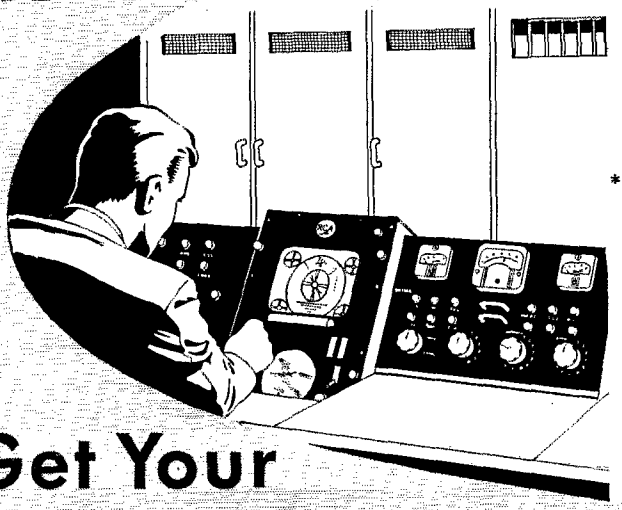

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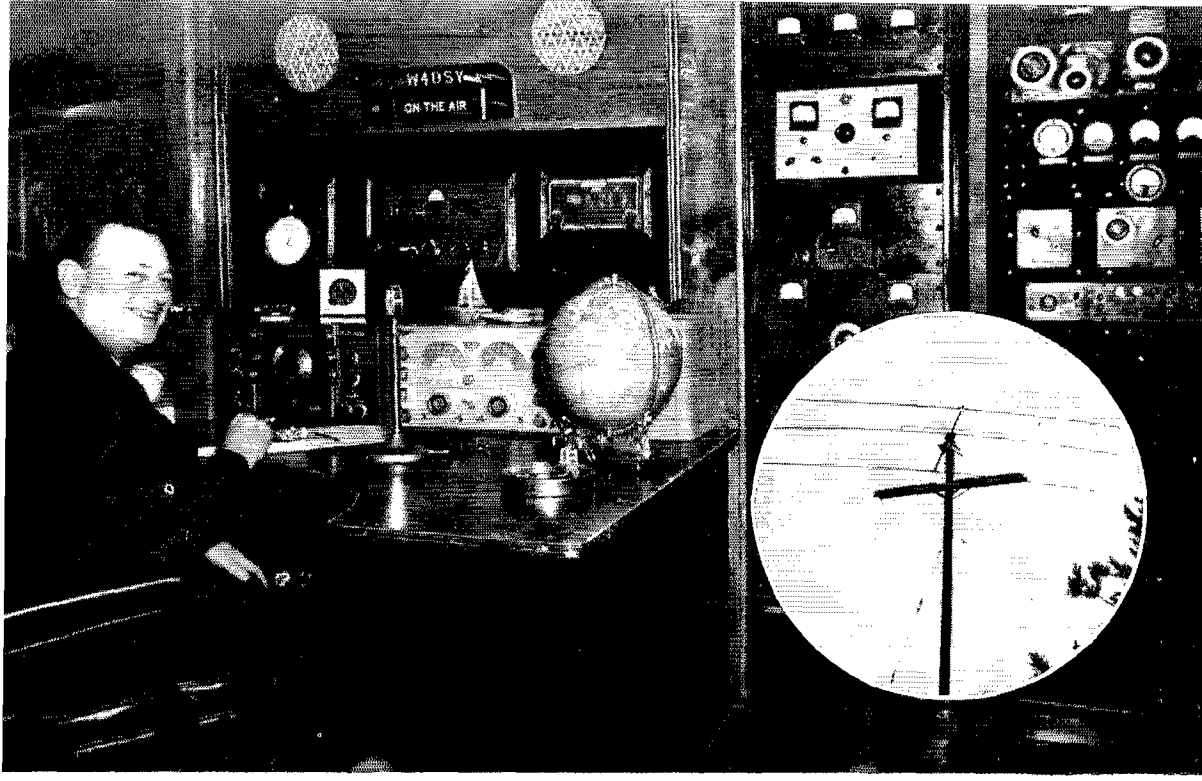

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