CQ

JULY, 1951

The Radio Amateurs' Journal

35¢

NOVICES

WELCOME TO THE RANKS OF AMERICAN AMATEURS!

July marks the entry of a new class of licensee into the amateur fold . . . the Novice. We welcome the Novice as one who takes the first uncertain step into the fascinating world of amateur radio . . . with its rich background of comradeship, loyalty, public service and searching experimentation. The transmitter of the Novice operator must have accurate frequency control . . . crystal control with its complete dependability. May we suggest that—from the start—you depend on PR's for frequency. They will never let you down . . . as old-timers have found out since 1934.

ONLY THE BEST IS GOOD ENOUGH

The frequency stability of your signal is only as good as the crystal that controls it . . . an impelling reason why you can place your faith in PR . . . the standard of excellence in crystal control. Get PRs at your Jobber.

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Since PR 1934

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Q-5 ALL THE WAY!

...for critical civil-defense transmission

Here's help toward that clear, understandable message you must send when lives are at stake. General Electric's 6W6-GT, so sensitive it can be "driven with a whisper," lends itself to a simple r-f circuit with few stages—one you can count on for dependably good transmission.

Feed the 6W6-GT low plate voltage, and it delivers high output—evidenced by the tube's ability to dissipate up to 10 w. Add, as an extra asset, the heavy-duty heater . . . giving you plenty of reserve emission, to draw on when you need it.

Any r-f job, from oscillator to final, will be capably handled when you plug in a G-E 6W6-GT. Study the ratings, to prove to yourself that this tube belongs in your low-power emergency rig . . . which must send a clear signal unfailingly; must be simple, fool-proof, easy to service.

Extra-reliable, the 6W6-GT! And a premium value at its low receiving-tube price! Get the full story from your G-E tube distributor! *Electronics Department, General Electric Co., Schenectady 5, New York.*

6W6-GT

High-mu Beam Power Amplifier

Heater voltage	6.3 v
Heater current	1.2 amp
Max plate voltage	300 v
Max screen supply voltage	300 v
Max plate dissipation	10 w

● *Great manufacturing resources, mean tubes great in dependability and value. Typical of the advanced equipment behind G-E tubes is General Electric's automatic filament-handling machinery which "processes a hair ⅔-mile long." Gossamer-fine wire, only .00135 inch in diameter, is unwound from spools carrying 1,000-meter lengths . . . gets 16 coats of insulation while passing through a special coating machine . . . finally is shaped with precision to form the tiny, efficient heaters within tube cathodes. Result: exact filament uniformity, reflected in greater G-E tube reliability!*

ELECTRONIC TUBES OF ALL TYPES FOR THE RADIO AMATEUR

GENERAL ELECTRIC

184-KAB

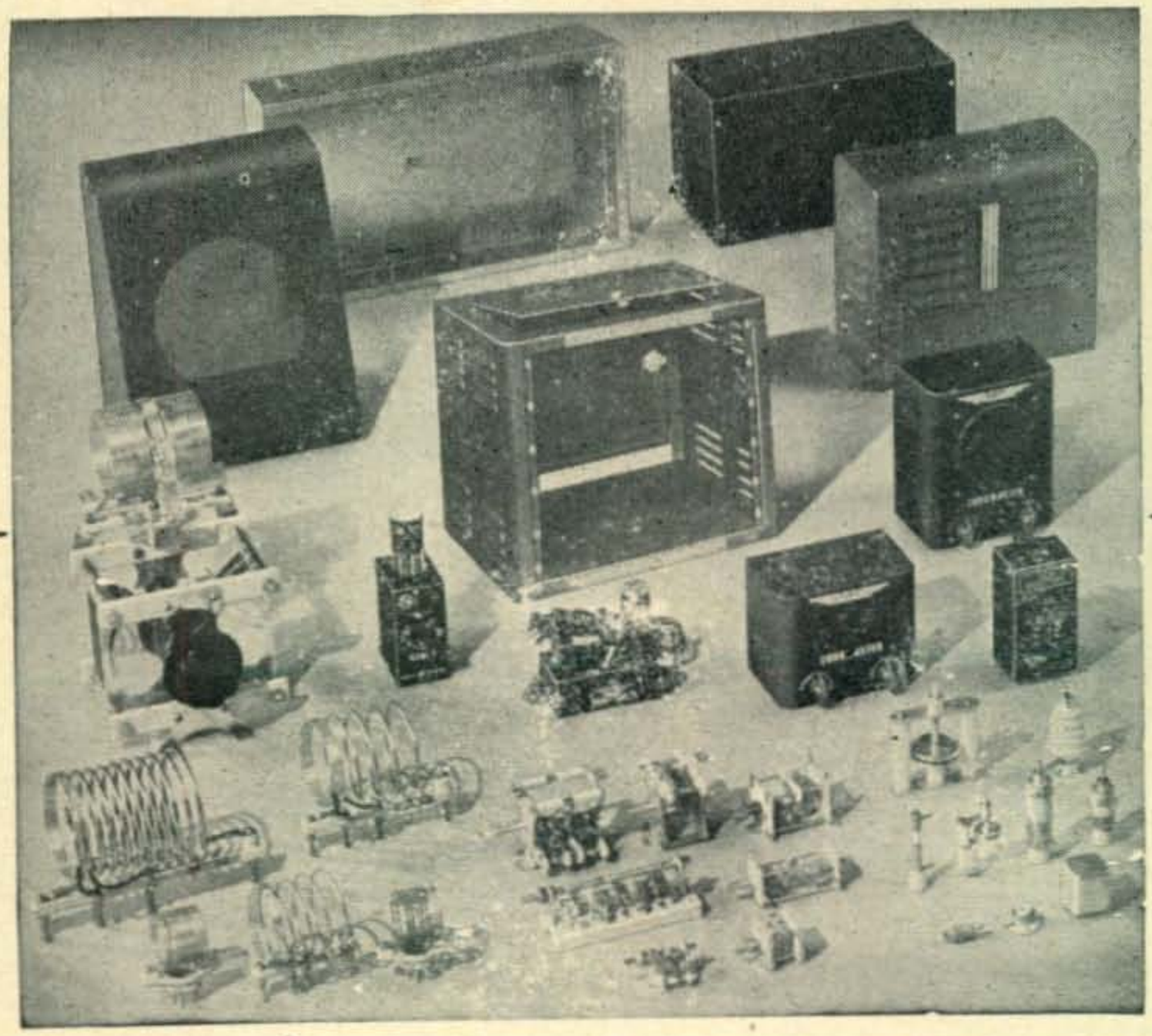
There is ~~no~~ *one* substitute for experience — BUD

You don't have to be an expert to select electronic components or sheet metal products. Buy Bud products and you know that you're getting the best — because they are the result of over 23 years experience in manufacturing electronic components. For "top-flight" performance buy Bud products for all your needs. Made to the same high standard . . . they work better together.

NEWLY LICENSED TECHNICIANS AND NOVICES

You, who have recently passed your examinations, or are planning to take them soon, will find radio and electronics a thrilling and profitable field. You'll get a lot of enjoyment out of building your own equipment rather than buying it and you'll save money, too. Consult the Bud catalog and you'll find the widest assortment of products for your needs. GET ACQUAINTED WITH YOUR BUD DISTRIBUTOR, his advice will be valuable and he will help you get the greatest advantage out of your work.

Write us for the name of your nearest Bud Distributor.



BUD RADIO, Inc.

2120 East 55th Street • Cleveland 3, Ohio

CQ

VOL. 7, NO. 7

JULY, 1951

CONTENTS

OUR COVER

Dr. J. Gaetane, W2PAG, operates W2PAG/2 from the Medical Director's office in Flushing Hospital as a unit of the Queens County 144 mc Civil Defense Net. This appears to be the country's first CD hospital installation, and is staffed by a regular crew of outside operators in addition to Dr. Gaetane.

(Photo by Bob Cobaugh, W2DTE)

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Feenix, Ariz.

Deer Hon. Ed:

Well, it looking like Scratchi might be rolling in the bux again. I are just discovering great boon to mankinds by accident (I freely admitting it all an accident, because you knowing how modest I am.) Of course I may be needing help to get this project underway, which is one reason I writing you. You see, I ... but I getting ahead of my story.

Several weeks ago I idly thumbing through old copies of radio magazines while waiting for my latest batch of caktus juice to age, when I coming across place what are advertising slitely used Geiger counters for sale. Now, normally Scratchi not having any use for a Geiger counter, new or used, but the price are so low that I just can't passing it up. So, writing order and sending it out.

Two days later it showing up in mail. Luckily Brother Itchi are home so can paying postman. (Scratchi fresh broke as have been having big time recently with my XYL-to-be, Lil Watanabe.) I unpacking the box and there it is, the Little Gem Geiger counter, complete with earphones. I taking it apart and noticing that several wires are loose I solder them to nearest connection. Then turn it on, and Hot Diggedity!! can hearing clicks.

Following day, not having much else to do, I saddling up old Paint (we calling him that on acct. one day he walking under ladder on which Scratchi are painting and the inevitable are happening) and going for a ride on the ranch. I taking the Geiger counter along, but for first hour or so not finding any uranium. Hon. Ed., have you ever listened to a Geiger counter for an hour? Sacramento! but it's monotonous.

After while I getting so I can't tell whether counter is clicking or Scratchi's brain is making funny noises, and I just about to shutting it off when clicks start to get closer together. I pay attention, keep listening, and start searching around, and by gollies the first thing I know the Geiger counter is sounding like high-speed see-w station sending out a teletype transmission. I get down, take up sample of earth, and get back on Paint and urge him into a fast walk. When back at ranch house, I call Brother Itchi, and tell him what happening. He looking at sample I have, and asks me to test it with the counter. Holy smoke, no clicks.

(Continued on page 61)

Veterans- LEARN THE VALUE OF YOUR RADIO SKILLS

Radio Maintenance is just one of the fields in which the Air Force offers opportunities to veterans with special skills.

Here's why so many veterans with training in Radio and Electronics have been moving into the Air Force

Today's fast-growing Air Force offers better pay and more chances for rapid advancement than ever before. If you're a qualified technician, you can enlist now with your old grade or better, according to your present ability. And, the Air Force will tell you before you enlist what your rating will be. Initial duty assignment for veterans will be to a nearby Air Force Base, and you'll skip basic training, of course. If you're experienced in radio or electronics, find out *now* what the Air Force has to offer you by mailing this coupon.

HEADQUARTERS, U. S. Air Force
Washington 25, D. C.
Attn: AFPTR-Department 4

Please tell me how I, as a veteran, can get an Air Force rating in keeping with my skill and experience in radio and/or electronics.

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FCC ANNOUNCEMENTS & ORDERS

Novice Calls

The issuance of these call signs will be in accordance with the normal procedure of the Commission in the assignment of amateur station call signs, except for a change in the prefix of the call sign. In the continental United States, where the call-sign prefix would normally be a single letter "W" or "K" (such as W3ABC or K4DEF), the prefix for the Novice's station call sign will become "WN" or "KN" and the call signs of the example will become WN3ABC and KN4DEF. In the territories and possessions of the United States, where the call sign prefix would normally be two letters beginning with the letters "K" (such as KH6LMN or KL7OPQ), the letter "W" will be substituted for the letter "K" in the prefix for the Novice's station and the call signs of the example will become WH6LMN and WL7OPQ.

This procedure is designed to permit the holder of a Novice class amateur license to retain the same amateur call sign; with the exception of a change in the call sign prefix, if he qualifies for and obtains a higher grade of amateur operator license and obtains new station license during the normal one-year period of his license as a Novice. In the examples given, the holder of the Novice station license WN3ABC will be assigned the call sign W3ABC for his station if he qualifies for a higher class of amateur operating privileges, and the holder of the Novice station license WH6LMN will likewise be assigned the call sign KH6LMN for his station if he obtains some other class of amateur operator license. It should be noted, however, that after the expiration of a Novice class license, the previous holder of such license cannot be considered eligible to be assigned the counterpart call sign in accordance with the above.

Restriction of 220-225 mc in Southwest

Following an Army request for daytime protection of frequencies in the 220-225 mc band in the area surrounding White Sands, New Mexico, Proving Ground, the FCC has ordered the following text appended to our Regulations:

In those portions of the States of Texas and New Mexico in the area bounded on the south by parallel 31°53′N., on the east by longitude 105°-40′W., on the north by parallel 33°24′N., and on the west by longitude 106°40′W., the frequency band 220-225 mc is not available for use by amateur stations engaged in normal amateur operation between the hours of 0500 and 1800 local time Monday through Friday inclusive of each week. However, the entire frequency band 220-225 mc shall be available in all areas to those amateur stations authorized to operate in an organized civil defense network during all periods when civil defense emergencies exist and, in addition, special arrangements for civil defense drills between the hours and within the area set forth above may be made upon mutual agreement between the Federal Communications Commission Engineer in Charge at Dallas, Texas, and the Area Frequency Coordinator at White Sands, New Mexico, if it appears necessary to conduct such drills. Such arrangements shall specify dates and times, and will depend upon the degree of use of the frequency band at White Sands at any particular time.

"Sylvania tubes in daily operation since 1934...still working fine,"

writes J. Jessop Nott, VE6JJ

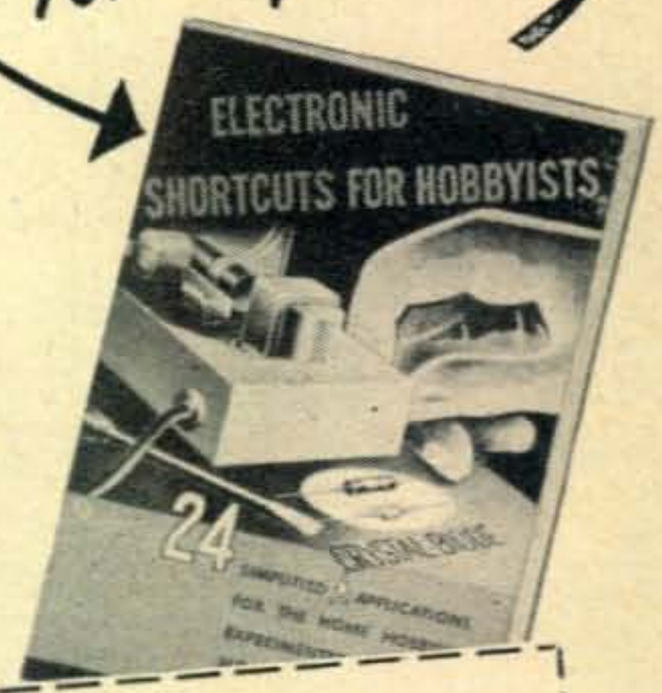
"J-J" first burned his fingers with "wireless" in 1912, got his first ticket in 1928, made WAC early. Pictured are his 10-11-20 rig with 808's and 75 fone rig. He also operates a 10-through-160 mobile rig with push button control and gas generator in the trunk. Fixed antenna is beam with 3 corrugated copper tubing elements, good (so far) for 80 mph gusts.

"I have never been disappointed with even one Sylvania tube during the 17 years I have been using them," says J. J. Nott, of Medicine Hat, Alberta, Canada. "My Patterson 16 receiver, purchased in 1934 and equipped with Sylvania tubes, has been in daily use ever since. Most of the original Sylvania tubes are still working fine.

"These include two type 6D6, one 6C6, and two 42's. Two Sylvania 53's in my 10-11-20 transmitter, built in 1937, are also still 100% useful whenever I go on xtal."

Thank you, Mr. Nott! Letters such as yours speak volumes for the long life, trouble-free performance, and economy of Sylvania receiving and transmitting tubes.

Make Electronics save you time and trouble... this book tells how... Yours for a quarter



Of great practical help to hams is Sylvania's new book, "Electronic Short-cuts for Hobbyists." Filled with ideas and working diagrams to save time, labor, and dollars. Mail the coupon with 25¢ for your copy NOW!

SYLVANIA ELECTRIC

RADIO TUBES; TELEVISION PICTURE TUBES; ELECTRONIC PRODUCTS; ELECTRONIC TEST EQUIPMENT; FLUORESCENT TUBES, FIXTURES, SIGN TUBING, WIRING DEVICES; LIGHT BULBS; PHOTOLAMPS; TELEVISION SETS

Sylvania Electric Products Inc.
Dept. R-4007, Emporium, Pa.

Enclosed please find 25¢ for my copy of "Electronic Short-cuts for Hobbyists."

*Name*_____

*Street*_____

*City*_____ *Zone*___ *State*_____

Dramatic Proof from

ACTUAL EXCERPTS OF UNSOLICITED LETTERS FROM SOLDIERS IN KOREA

c/o Fleet Post Office, San Francisco, California, 14 April, 195

I have recently received delivery of a model S-72 Hallicrafters portable It really is a fine radio. Right now we are in central Korea, and it operates well regardless of location

KOREA—38th Parallel—3 April, 1951:

I received my S-72 and it is performing very well. Because of the mountains here in Korea it is almost unposible to receive standard broadcast from Japan during the daylight hours. However, I receive the same programs at that time during the day and get standard broadcast very good at night. I have been able to pick up London and San Francisco direct on that wave.

AMIDONG, KOREA—22 March, 1951:

Hallicrafter S-72 radio has performed even better than I expected, and the addition of music makes the primitive life here a bit more bearable. We don't feel quite so isolated now that we can hear the news each day instead of waiting for the tardy newspapers several days later. The radio will pick up Japan easily on either the standard broadcast band or on shortwave; and on the latter you can get Australia (even in the daytime), Manila, Honolulu, and at night with an outside supplementary aerial, San Francisco.

To help you . . .
A New Service for the Amateur

John L. Reinartz, K6BJ . . . one of the best known of the real old-timers in amateur radio. Formerly W1QP . . . he started his activities in 1908 and has since that time gained prominence not only for his accomplishments on the air but also for his frequent magazine articles and lectures to ham groups. John, still an active amateur, now heads the new Eimac personalized engineering-assistance service for amateurs.

Now, under the able wing of John L. Reinartz K6BJ . . . a new, personalized engineering-assistance service specifically for the amateur. This new service will carry one step further Eimac's continued fight for advancement of the "electron art" as applied to vacuum tubes in amateur radio. Through Mr. Reinartz' capable efforts, the vast fund of knowledge and know-how of the Eimac research and field engineering facilities will be drawn on to provide the best answers to your vacuum tube problems. Of course, this service is rendered without obligation or cost. Remember, if you have a vacuum tube application problem . . . it's our problem, too. Write John today.

Eimac TUBES

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ZERO BIAS

EDITORIAL

LAST YEAR THE FCC issued a list of countries with which amateur communication was forbidden. These included certain French and Dutch colonies, in addition to such politically troubled areas as Iran and Lebanon.

Judging from the howling mob of W's who ganged up on F8EX/AR on 20 the other night, this order is not receiving much respect or attention. Since the FCC has stated that it will issue citations to all W's intercepted by an FCC monitoring station while in QSO with any of these verboten prefixes, a reminder is in order. The complete list includes AR, EP, EQ, FI, HS, J, OE, PJ, PK. Occupation forces using prefixes JA, OE13 and MB9 are of course excepted.

This is a messy situation, no matter how you look at it. Following international agreement, the FCC is forced to issue an order of this type. If it enforces it by issuing citations, the FCC unfortunately assists the undemocratic suppression of amateur radio abroad. If the notice is issued but not enforced, the result is loss of respect for FCC authority, which then leads to violations of more meaningful rules and regulations. Why challenge the FCC to see how much you can get away with?

Novices and Technicians

Despite the use of small type, the results of CQ's 1950 DX Contest occupy nearly half again as many pages as any of the previous contests. This unexpected demand for space made it necessary for us to drop out the write-up on the Novice examination originally scheduled for this issue. For those prospective Novices who have not already discovered it for themselves, may we point out that the Novice question and answers are contained in the June issue of QST.

We stated last month that anyone qualfying for the Technician license would also be issued a Novice license upon request, since he had presumably demonstrated more than the requisite- technical knowledge plus the necessary code speed. We now understand that the Commission has decided to require passing the Novice question element in every case before issuing a Novice license.

The FCC has also released information on its procedure for issuing Novice and Technician call letters. The Technician calls will be assigned in regular order, and will be indistinguishable from other amateur calls. Novice calls will also be issued in order from the pool of available calls, but will carry the prefix "WN" in the United States and will replace the "K" with a "W" in places like KP4, KH6 and KL7. More details are given on another page in this issue.

Late Flash—New VHF DX Records

Too late for inclusion in W2PAU's column is news of two new records on the 144 mc band. On June 10, 1951, the 2-meter band was open between North Texas and California, from 7:15 to 8:15 pm, CST. W5QNL, near Texarkana, Texas, worked W6ZL of Glendale, a distance of around 1390 miles. Other stations worked by W5QNL and W5AJG were W6WSQ and W2PJA/6.

A new European record for the 144 mc band was made on June 1, when G5YV worked SM7BE. The distance is just over 600 miles.

W2GX

Amateurs everywhere lost more than a friend with the death, after a long illness, of Russell D. Valentine, W2GX, on May 15, 1951.

W2GX possessed the rare talent of combining high theoretical knowledge with sound practical engineering savvy. He unstintingly gave of his time to assist hams everywhere, particularly in the postwar period when TVI threatened the existence of the hobby he loved so well.

To W2GX goes credit for the development of the first practical filters for ham TVI reduction. It was his successful application of audio filter designs to r-f work that paved the way for most of the low-pass and high-pass r-f filters now in use.

Professionally, W2GX was chief engineer for the New York Times broadcast station WQXR, since 1936. He had much to do with the experiments in high-fidelity which distinguished WQXR among U. S. broadcast stations. He designed almost the entire station from power supply to the just recently completed new studios. And, as might be expected, he supervised most of the construction himself.

Russ Valentine was a fully rounded amateur, commencing from the day he received his first license in 1914. A postwar DXCC holder on 'phone, a pioneer 11-meter low-power enthusiast, expert on difficult war surplus conversions, past President of the North Shore Radio Club, his interests covered every phase of amateur radio.

We join the host of friends and admirers on literally every continent who mourn his passing.

Unrivaled on both c-w and phone

The Collins 75A-2 amateur receiver is not a phone man's dream and a c-w man's compromise. Nor vice-versa. It is specifically, separately engineered to give surpassing service to each.

As shipped from the factory, for instance, the selectivity of the 75A-2 is adjusted to 4 kc at 6 db down and about 12 kc at 60 db down (selectivity knob at zero — crystal filter out). With the selectivity knob set at 4, the bandwidth is approximately 200 cycles at 6 db down and 6.5 kc at 60 db down. An excellent balance for intelligibility on phone and sharpness on c-w.

But if a dyed-in-the-wool c-w operator wants still more selectivity, it is a simple matter (explained in the instruction book) to adjust to 2.5 kc at 6 db down and 10.5 kc at 60 db down, with the crystal filter out.

The 75A-2 has a separate front panel controlled c-w noise limiter, designed to accomplish this one purpose in the best way it can be done. It consists of a shunt type circuit, following the first audio amplifier, which acts on both positive and negative portions of the audio cycle and positively cuts off all interfering noises at any level desired. This limiter noticeably decreases nerve fatigue and enables the operator to copy c-w signals which would not be readable without it.

The 75A-2's highly stable BFO injection is designed for optimum reduction of heterodynes between incoming signals.

For the best in amateur radio, it's . . . COLLINS

COLLINS RADIO COMPANY, Cedar Rapids, Iowa

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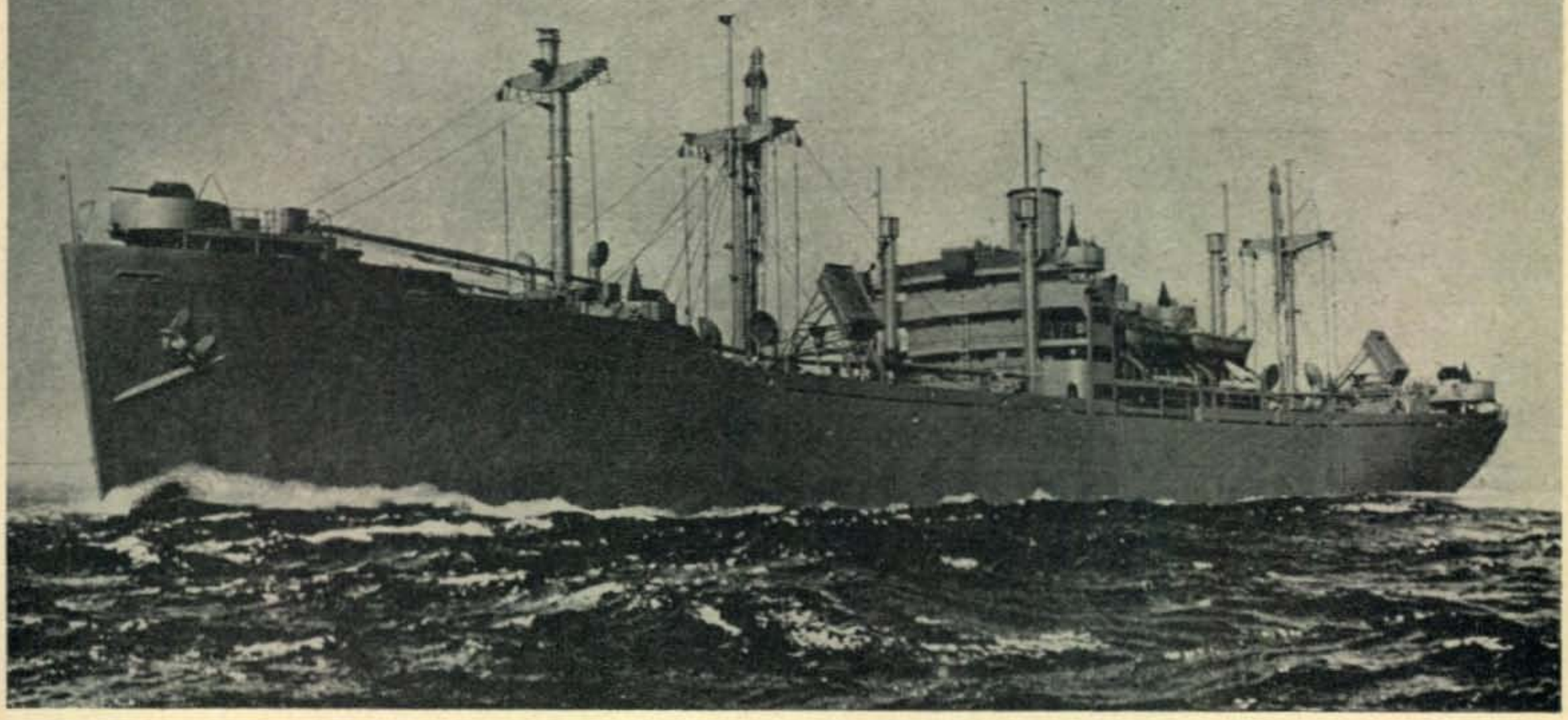


FRANCIS M. CRANE*

Maritime brass-pounding, once the largest part of radio and in later years one of the most overcrowded and lowest-paying, now suffers an acute shortage of qualified men. Many American ships are unable to sail for lack of a Radio Officer. Mr. Crane, an experienced "Sparks" of many years sitting, describes the steps necessary to break into this field today.

Did you ever want to visit those places you raise on the air? Calcutta may not be as colorful as the name sounds, nor Persia as romantic; the Mediteranean isn't always sunny, nor the Caribbean blue; but they're worth a whirl —at least one. And you needn't spend your little hoard to get there.

As a matter of fact, the average amateur can get to all of the faraway places—and be well paid for it too—as a ship Radio Officer aboard the vessels of the U.S. Merchant Marine. Can you obtain a berth, though?

Stop right here if the YL won't let you leave home for shorter or longer periods, because the answer to that question is yes.

Newcomers normally find the doors to this profession effectively shut to them. But now, as America takes up the task of helping the free nations rearm, aiding in their recovery, supplying drought and famine relief to sustain their strength, the while we provide most of the men and the vast quantities of materials needed in Korea, the door is wide open to hams. More, they are being urged to qualify, for there is an important job to be done in sailing the ships. A serious shortage of ship Radio Officers has developed as a result of the reactivation of hundreds of merchant ships from the "mothball fleet" of over two thousand vessels that were hauled up the rivers and anchored to rust after World War II ended.

Admiral Edward L. Cochrane, Federal Maritime Board chairman, sees no let-up in the present rate at which ships are being brought out of the reserve fleet. In short, for the remainder of the year, upward of fifty ships a month will need Radio Officers. The slack has long since been taken up in the available supply of experienced Radio Officers, or R. O.'s, as they call themselves, and new men will have to be brought into this field to keep the ships sailing.

What, you probably would like to know, is the cost of preparing to enter this line. For the average ham, very little, nothing, or almost nothing. Here is how you can start.

License Requirements

First of all, you need two licenses. Prime requisite is a commercial FCC Radiotelegraph Operator License, either First or Second Class. You'll have to start with a Second Class ticket, since one

*U. S. Merchant Marine, Mail c/o CQ Magazine, 67 W. 44th St., New York 18, N. Y.

(Courtesy Radiomarine Corp. of America)

Aboard an older tanker we find a radio station of the type that is fast disappearing.

year's radio operating experience aboard ship or at a coast station is required for the First Class license.

If you are eighteen years old and an American citizen, you can apply for a license examination at any FCC field office. In the larger seaports, like New York, examinations may be taken without prior arrangement on any business day. In other cities they may be taken within a matter of days. Check with your nearest FCC office for details. Proof of birth and/or citizenship papers are required when filing applications.

As with the Amateur exam., the first part is the code test, requiring the ability to send, on a hand key, and copy in longhand, at least 16 International Morse Code groups a minute. (Five characters are counted as one code group, with numerals and punctuation marks computed as two characters.) You need send without error for only *one minute* out of several, and copy *any sixteen consecutive groups,* out of about eighty, to pass.

If your code speed is below the FCC requirement, special code speed courses are available at schools, or by mail. Practice records or machines may be rented; or simply copy press circuits faster than your own normal speed. You can raise your code speed ceiling by practicing a few words a minute faster than you can copy fairly solid.

Written sections, or Elements, of the FCC examination are by far the most difficult. Yet, here again the average intelligent ham should be able, with proper preparation, to qualify. Element One, which is on Radio Law, consists of ten essay type questions. The other element questions are on schematic diagrams or are of the multiple choice type. Seventy five percent must be scored in each element to pass the examination.

For 25 cents the FCC (address: Washington 25, D.C.) will send you its "Study Guide & Reference Material for Commercial Radio License Examinations", with supplements bringing them up to date. This "Study Guide" contains the material from which the actual examination questions are chosen.

The subject matter breaks down into four main headings: Radio Law, Maritime radio operating procedure, radio theory, and specific maritime radio equipment.

Basic Law, Element One, is the simplest section of the examination. It may be passed by studying the quoted sections of the Communications Act of 1934 and other material found in the Appendix to the above-mentioned "Study Guide". Any ham failing to pass Element One has simply not tried to prepare.

Basic Operating Procedure, Element Two, is also quite simple. "Study Guide" material, and later supplements issued by the FCC make these fifty questions virtually impossible to fail.

Radiotelegraph Procedure, Element Five, must next be passed. Its fifty questions on commercial radio operating procedures, signals and practices require some careful preparation, since this is new material to the ham. Commercial procedures should be learned for the actual shipboard radio operating you expect to do[1].

We come now to the really difficult part of the test, Element Six, with its one hundred questions on radio theory and shipboard equipment. These radio theory and technical questions were, until recently, scattered through *three* of the examination elements (2, 5, and 6). It is the heart of the examination. And a hard heart it is, too. For Element Six you must seriously and carefully prepare. How?

To begin with, you need a solid grounding in radio theory: basic d.c. and a.c. electricity; batteries; motors; generators; vacuum tube characteristics; amplifiers; detectors; modulation; antennas and wave propagation; receiver and transmitter circuits. Though this embraces a high level understanding of radio theory, it is only the beginning. Graduate engineers, well grounded in radio fundamentals, have failed to pass Element Six for

Most war-built ships—the bulk of our present merchant marine—are equipped with the marine unit, or "coke machine." In its single chassis are housed three transmitters, three receivers, an auto alarm, antenna switches, charging panels and all power connections—a one-piece ship radio station built for complete installation in eight hours.

(Courtesy Radiomarine Corp. of America)

lack of specific knowledge on equipment encountered on shipboard, and its characteristics.

Among these, for example, are questions on the radio direction finder, loran, radar, the automatic alarm, and charging and keying methods employed in ship radio stations. Don't be frightened, however, as this data is readily comprehensible to any good ham who is given the details on it.[1],[2],[3]

You do not have to sit for all the written examination elements on one day. It is customary to take Element Six, the toughest one, on a subsequent day; the FCC at present requires a repetition of the code test when this is done. It is also possible to take Elements One and Two prior to the code test, as these constitute the requirements for a Radiotelephone Third Class ticket. Adding the code test and passing Element Five complete the requirements for a Radiotelegraph Third Class license, and the necessary Element Six taken at still a later date.

After the FCC Exam

Upon completion of the examination, the FCC license will be issued. The next step is to apply for your Merchant Marine Radio Officer License and the accompanying Mariners Document at the nearest office of the Merchant Marine Inspection Service of the U.S. Coast Guard. Two copies of the application you must file may be obtained by writing to the Commandant, U.S. Coast Guard, Washington 25, D.C., if you do not reside in a Coastal or Great Lakes seaport city where the Coast Guard maintains offices. Your Radio Officer License applications must be signed by three persons who will attest to your good character. The Coast Guard will not permit you to file unless you have a "letter of committment" from the Hiring Hall of a union of maritime Radio Officers (see below) or the Military Sea Transportation Service, asserting that you will be granted employment upon issuance of your Radio Officer License. These days, with Radio Officers hard to get, you should be able to obtain such a letter with relative ease. Bring along your FCC license, when you apply, as well as your proof of birth, and/or citizenship, and three passport-type, dull-finish photographs (at least one inch by one and a quarter inches), which show your head uncovered.

After your license application is accepted by the Coast Guard, you will have to wait until issuance is authorized by U.S. Coast Guard headquarters in Washington. There may be a delay of some days, or even weeks, while your character and background is carefully subjected to security screening procedures. You might best spend this period making your acquaintance with the two unions of marine Radio Officers. If you indicate to them that

(Courtesy Radiomarine Corp. of America)

A one-piece radio station aboard the SS INDEPENDENCE, America's newest luxury liner, is this deluxe console, developed from the earlier marine units.

you would be available for immediate "shipping out" upon issuance of your license, they may be able to have the processing of your application speeded up somewhat. Both maritime radio unions maintain national offices in New York City, to which further inquiries may be directed, as well as branch offices in Baltimore, New Orleans, Houston, Wilmington (Calif.), San Francisco, and Seattle. The CIO Union is the American Radio Association, 5 Beekman Street, New York City. The AFL Union is the Radio Officers Union, 1440 Broadway, New York City.

Since almost all of the steamship companies are under contract to obtain the Radio Officers they hire through the hiring halls of the unions, it is useless to apply directly to the Steamship companies. The Military Sea Transportation Service is hiring civilian Radio Officers through its Port of Embarkation employment offices in the principal seaports. However, the choicest positions, the widest selection of ship types and "runs" is obtainable only through the union hiring halls.

It is generally acknowledged that the income of Radio Officers on union contract ships are from fifty to one hundred dollars more a week than on the government MSTS ships. Union organization is credited with having raised the earnings of marine Radio Officers from $90 monthly for an 84 hour week to the present level, averaging over $100 weekly, for a 48 hour week at sea, with practically all time off in port.

Amateurs who want to ship out will do well to remember that the professional status of ship radio operating is jealously guarded by the men who make their living in this field. When you enter it, bring the enthusiasm of the amateur, but try to acquire the calm competence of the professional.

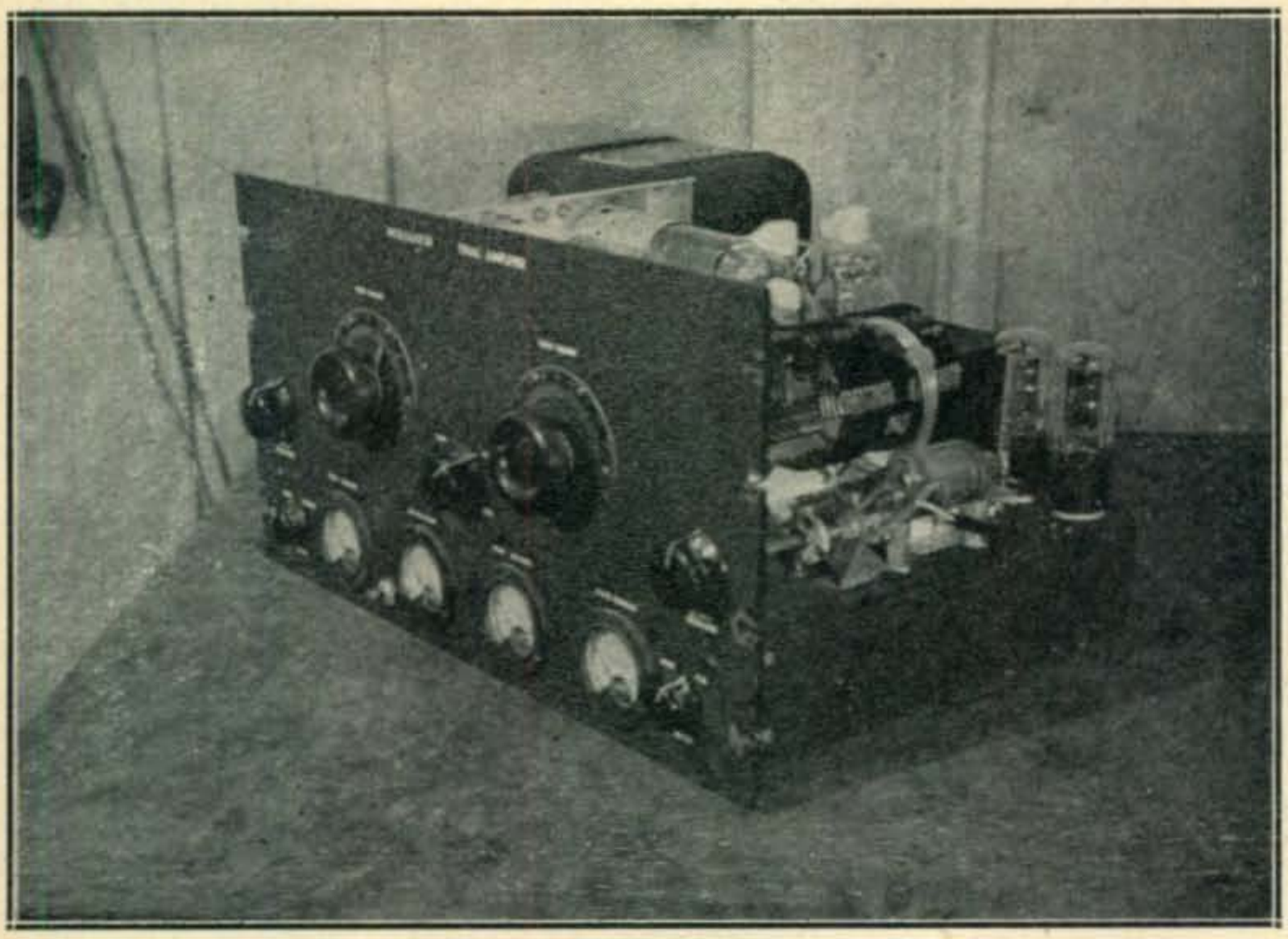
While we are on the subject of earnings, what about them? Well, you can expect to earn, before taxes, upwards of $90 a week, and as high as $200 a week, depending on the ship, run, cargo,

(Continued on page 56)

1 Standard text on this subject is "The Marine Radio Manual," edited by M. H. Strichartz (Cornell Maritime Press, N. Y., 1944, 518 pp, $4.00). With this book, the average ham should be able to grasp this subject matter in about twelve hours of self-study.

2 "Radio Operator's Q and A Manual," by Milton Kaufman (John F. Rider Publisher, Inc., N. Y., 1950)

3 "Radio Operating Questions and Answers," by Nilson and Hornung (McGraw Hill, N. Y., 1950)



The power amplifier, modulator, and bias supply all fit on a standard chassis.

HARRY D. HELFRICH, JR.
W4DWF

A COMPACT HALF KILOWATT

This is the concluding installment of the description of W4DWF's all-band phone-CW transmitter.

THE LAST ISSUE of CQ described the exciter section of a band switched AM-FM-CW all band transmitter. This transmitter was designed particularly for compactness, ease and variety of operation, and elimination of TVI. It is not presented as a rig to be copied exactly but rather one having many features worthy of inclusion in any amateur's equipment. The power stages and power supply are described below.

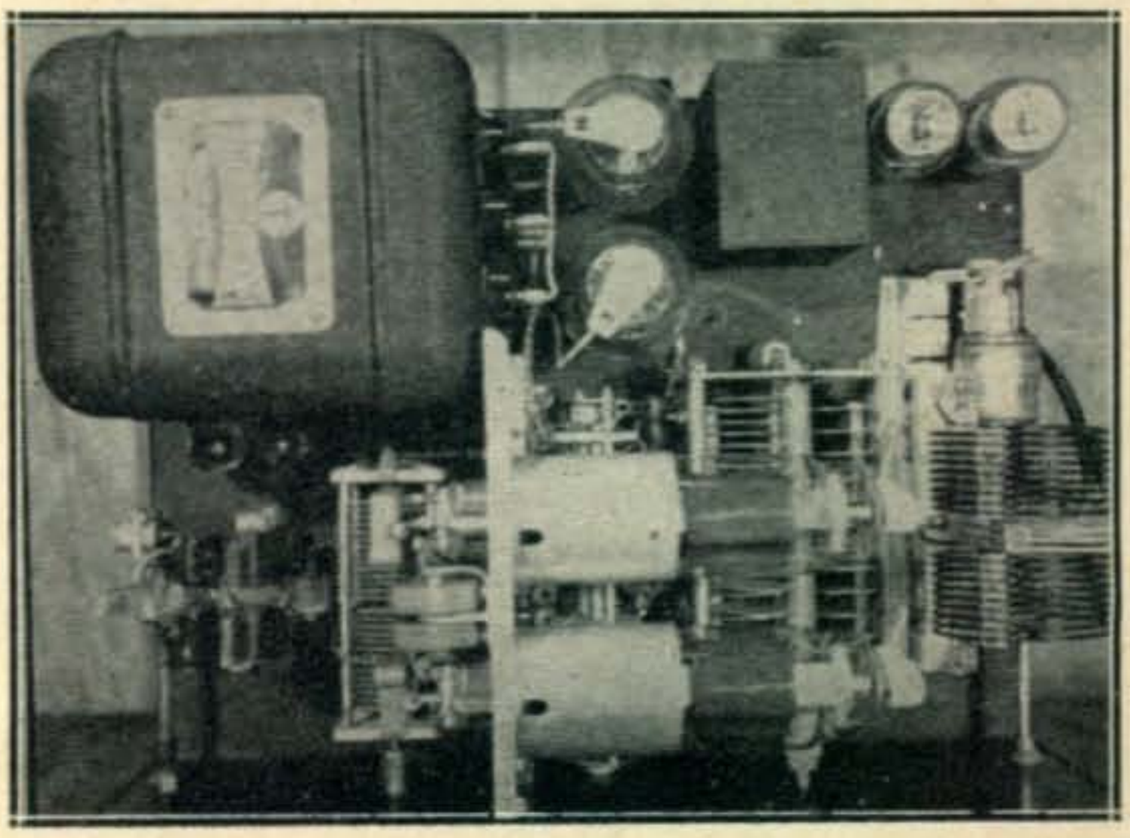
Modulator-Power Amplifier

The modulator and power amplifier unit was planned to provide the shortest possible r.f. leads while maintaining panel symmetry. To do this the r.f. tubes were placed in a horizontal position and raised to clear the final tank condenser. The modulator and speech driver occupy the rear half of the chassis. A shield is mounted between the front panel and modulation transformer, giving good isolation between plate and grid circuits. Filament transformers, meters, etc. are mounted below the chassis.

The modulator consists of two 811's class B, with 6L6 drivers. Input to the 6L6's is via a low impedance line from the exciter chassis. A 500 ohm potentiometer provides adjustment of level if desired, and the input transformer has a split secondary, required to provide inverse feedback for the 6L6s. The inverse feedback is used to reduce the driver source impedance and thus improve regulation of the driver stage. Although not required for 1250 volt operation, a 4.5 volt bias battery is used on the 811's, to give lower idling current and reduce tube dissipation. This battery is necessary if the power supply is shifted to the high voltage tap, as is done occasionally.

M_4 is a peak reading a.c. voltmeter (0-25 volts) which gives continuous speech level indication. This meter, a surplus one, is calibrated in % modulation. As described later, R_{72} is adjusted to give full scale reading with 100% modulation as determined by using an oscilloscope. S_{10}, momentary switch, must be depressed to give full scale reading. When S_{10} is released, R_{73} is put in the circuit to reduce meter reading by approximately one-half and thus prevent pegging

Top view of the modulator-power amplifier unit.

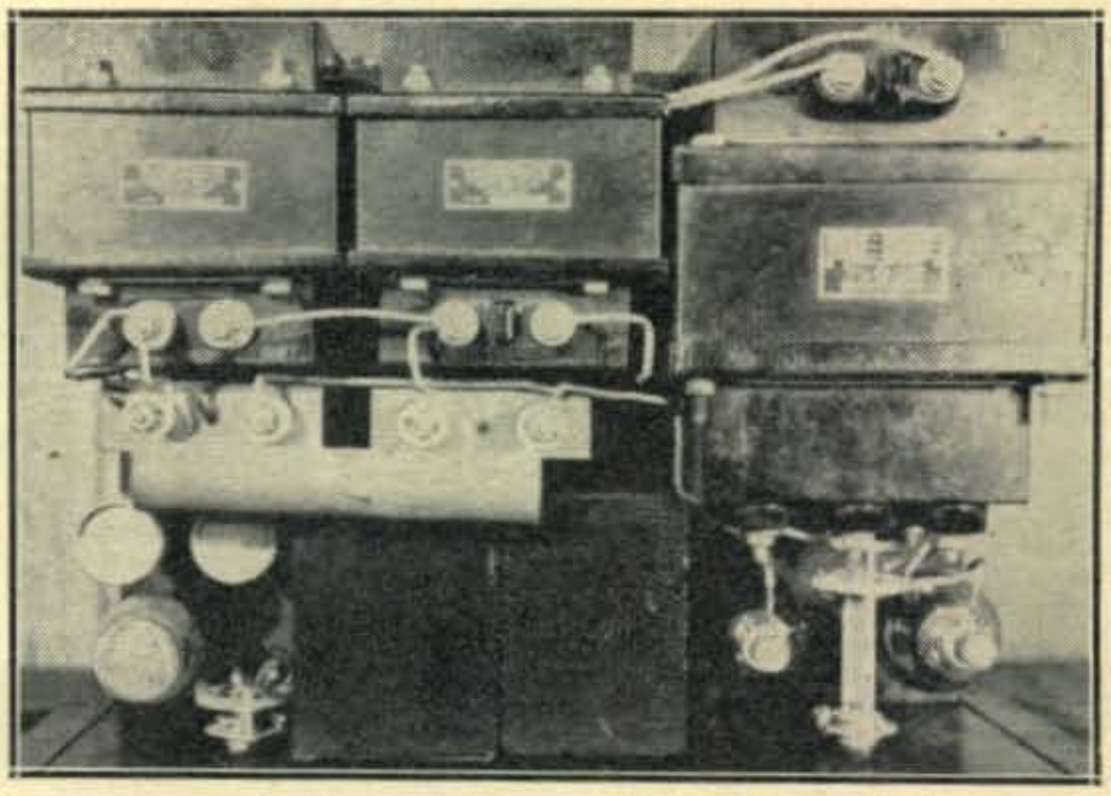


*911 26th Pl. S., Arlington, Va.

the meter on modulation peaks. M_3 can also be switched to read modulator plate current to check modulator operation.

R_{59} is switched across modulation transformer secondary in all but the AM position of S_7. Its dissipation is not sufficient to take care of modulator output but it will prevent voltage breakdown of the transformer secondary and give warning of incorrect positioning of S_7 with modulation input. Plate voltage is kept on the modulator and audio driver tubes in the c.w. and test positions of S_7 so these tubes will provide a slight drain on their respective power supplies, improving power supply regulation.

In addition to shifting the modulator output, S_7 transfers the screen supply from the dropping resistor to the low voltage supply, and increases the bias on the 6L6s in other than the AM position. This switch has four positions; in order they are: C.W., Tune, AM, and FM. For C.W. and Tune positions the screens of the 814s are fed from the low voltage supply through the keying relay K_2. The plate also is supplied 30 volts in the tune position. This permits initial tune up of the final with no danger of overload when detuned.

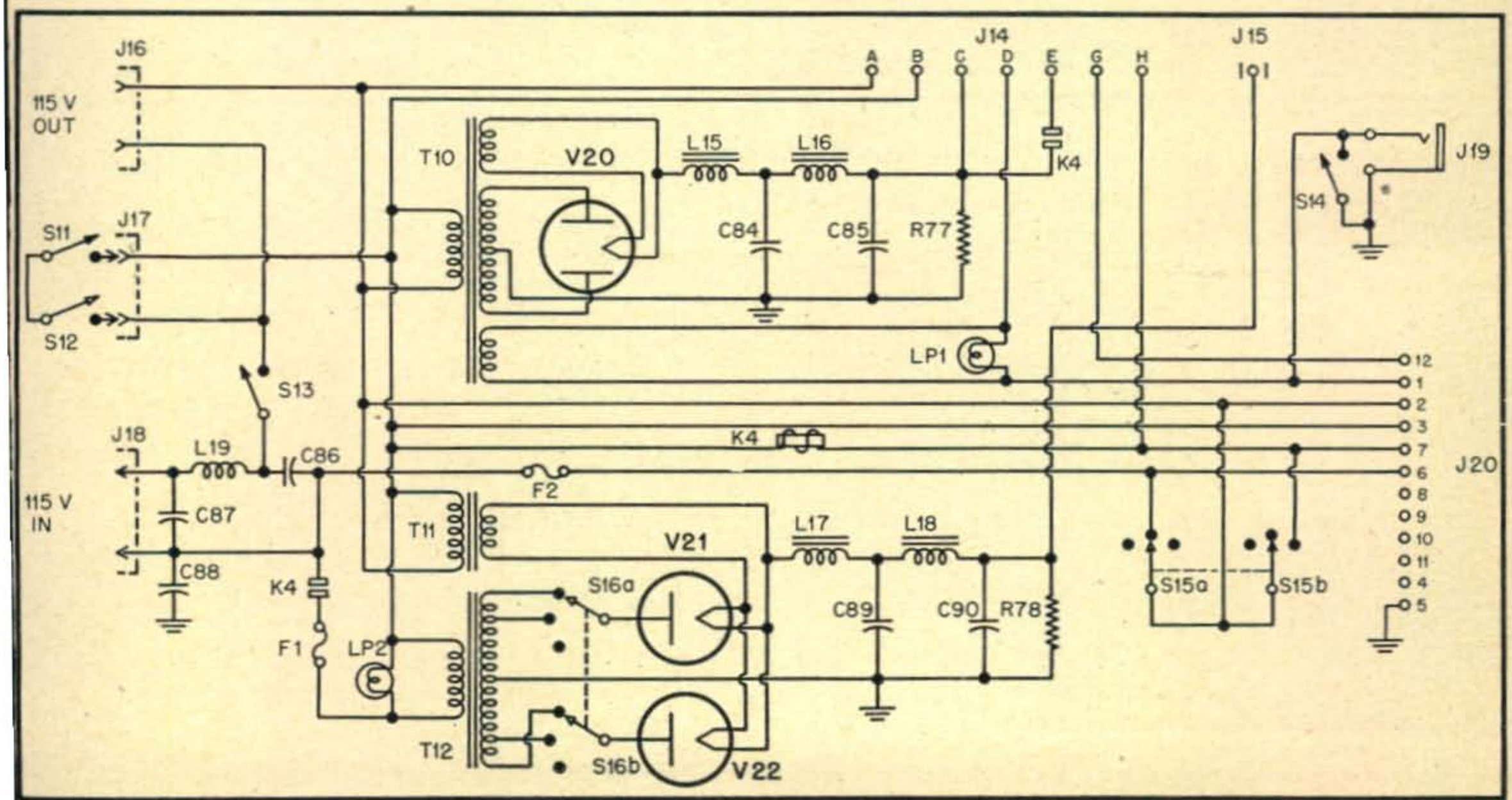


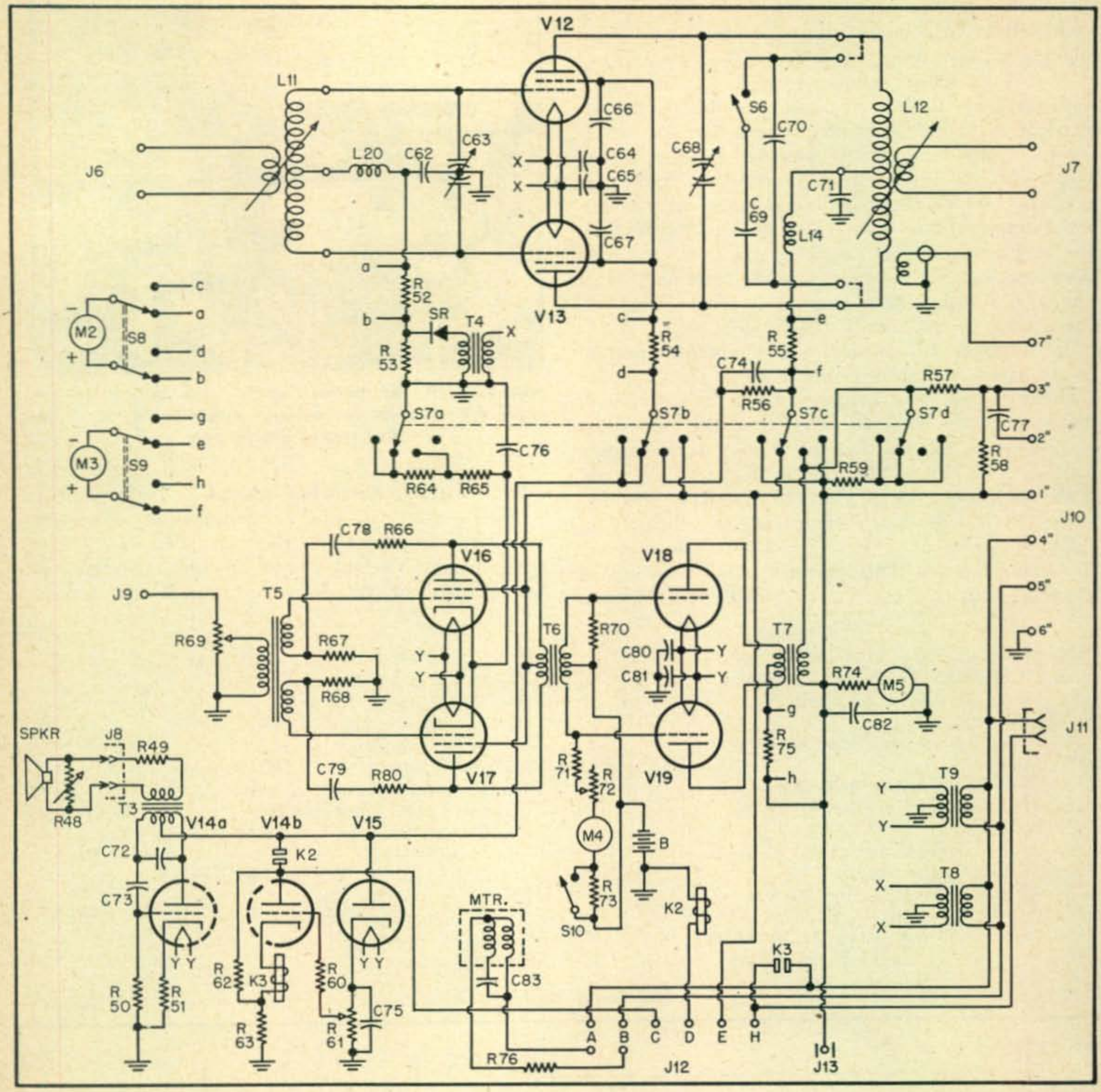
Top view of the power supply. The switch on the right with the insulated shaft extension is the high-low power changeover.

The final amplifier has several features worthy of note: variable input coupling, the protective bias arrangement, and the unconventional plate tank circuit. Variable input coupling permits exact adjustment of drive to obtain the recom-

C84, 85—4 μf 600 v oil filled
C86, 87, 88—.002 μf silver mica button
C89, 90—3 μf 2000 v oil filled
F1, 2—10 amp fuse
J14—Jones barrier strip connector
J15—Millen h.v. connector
J16, 17—115 a.c. receptacle female
J18—115 a.c. receptacle male
J19—key jack
J20—Jones connector 12 pin
K4—115 v a.c., dpst relay
L15—4/20 h 160 ma choke UTC R21
L16—7 h 160 ma choke UTC R20
L17—5/20 h 500 ma choke Thord 19C38
L18—12 h 500 ma choke Thord 19C45
L19—50 T #14 enam. ½" x 3" long
R77—25,000 ohms, 25 w
R78—50,000 ohms, 100 w
S11, S12—s.p.s.t. micro switch
S13—s.p.s.t. toggle switch
S14—s.p.s.t. spring return NO toggle
S15a, b—2 pole 3 position ceramic rotary
S16a, b—2 pole 3 position heavy duty rotary ceramic
T10—700 c.t. 120 ma, 5 v 3 amp, 6.3 v 5 amp
T11—2.5 v 10 amp
T12—3750-3120 c.t. 500 ma Thord 19P64
V20—83 rectifier
V21, 22—866/866A rectifier
LP1—6.3 v lamp
LP2—115 v lamp

The Power Supply Unit





The Modulator-Power Amplifier

C62—.002 μf 1000 v mica
C63a, b—Dual 150 μμf variable
C64, 65—.005 μf 1000 v mica
C66, 67—.003 μf 1000 v mica
C68—Dual 50 μμf .171" spacing Cardwell XG-50-XD
C69—Three 50 μμf h.v. ceramic in series
C70—50 μμf 7500 v vacuum
C71, 74—.002 μf 2500 v mica
C72, 73—.01 μf 600 v paper
C75—.5 μf 600 v paper
C76, 80, 81—.1 μf 600 v paper
C77—.25 μf 2000 v oil filled
C78, 79—.05 μf 600 v paper
C82—50 μμf 7500 v ceramic
C83—2 μf 600 v oil filled
J6—Co-ax connector
J7—300 ohm line connector
J8—Miniature 3 prong socket
J9—Shielded cable connector
J10—Octal socket
J11—Miniature 115 v a.c. conn.
J13—Millen h.v. connector
J12—Jones barrier strip conn.
K2—Keying relay s.p.s.t. 6 v coil
K3—Sensitive d.c. relay s.p.s.t. Approx. 2500 ohm coil
L11—B&W 50 w xmtr coils swinging center link removed
L12—Bud 500 w xmtr coils
L13—8 T ½" x 1" long
L14—1 mh 500 ma r.f. choke
L20—2.5 mh 125 ma r.f. choke
M2—100 ma 2" panel meter
M3—500 ma 2" panel meter
M4—Modulation meter (see text)
M5—2000 v 2" panel meter
S6—s.p.s.t. switch (see text)
S7a, b, c, d—4P4P h.v. rotary ceramic switch
S8, 9—dpdt rotary h.v. switch
S10—s.p.s.t. momentary NO
T3—Midget PP plate to voice coil
T4—6.3 v 1 amp fil. trans.

T5—500 ohm to PP grid—split secondary Kenyon T3
T6—PP plates to PP grids Prim. to Sec. turns—3/1
T7—300 w modulation trans. Thord T11M77
T8—10 v 8 amp fil. trans. Thord T19F96
T9—6.3 v 10 amp fil. trans. Stancor P-6308
V12, 13—814 PP final amplifier
V14a—½ 12AU7 side tone osc.
V14b—½ 12AU7 relay tube
V15—9006 charging rectifier
V16, 17—6L6GA audio driver
V18, 19—811 modulators
R48—10 ohm rheostat
R49—10 ohms, ½ w
R50—33,000 ohms, ½ w
R51—820 ohms, ½ w
R52, 54—22 ohms, 1 w
R53—7500 ohms, 10 w
R55, 75—10 ohms, 2 w
R56—25,000 ohms, 100 w
R57—1 meg., 2 w
R58, 66, 73, 80—100,000 ohms, ½ w
R59—5,000 ohms, 10 w
R60—1 meg., ½ w
R61—2 meg. potentiometer
R62—33,000 ohms, 5 w
R63—3,000 ohms, 1 w
R64—100 ohms, 2 w
R65—150 ohms, 5 w
R67, 68—20,000 ohms, ½ w
R69—500 ohm potentiometer
R70—150,000 ohms, 1 w
R71—70,000 ohms, 2 w
R72—150,000 ohm potentiometer
R74—Four 500,000 ohm, 2 w in series
R76—3,000 ohms, 10 w
B—4.5 v bias battery
Spkr—4" PM speaker
SR—50 ma selenium rectifier
Mtr—115 v fan motor

mended 20 ma grid current. This is important as too little drive will give poor efficiency and too much will result in excessive harmonic generation (something to be avoided at all costs at this power level). The variable coupling is provided by removing the link coils from the B&W variable center link coils and mounting one link on a section of polystyrene rod; the rod is drilled and slipped over a ¼" shaft which may be turned from front of panel. Adjustment is smooth and makes a very desirable feature.

The protective bias is provided by a small 6 volt filament transformer (wired in backwards) and a selenium rectifier connected across the grid bias resistor. No filtering is necessary. The protective supply merely floats during operation, drawing essentially no current due to the high back resistance of the rectifier. With loss of excitation, however, the transformer and rectifier provide sufficient bias to prevent damage to the final amplifier tubes.

The final plate tank is designed to reduce capacitive coupling to the output link. The coil center tap is grounded for r.f., assuring a balance between the two halves of the coil and the output link. When this is done the condenser rotor must be left floating to prevent setting up spurious resonances and possibility of parasitic oscillations.[1] C_{70} is connected in parallel with C_{68} by a spare set of contracts on the 80 meter tank coil only. This was done to give a proper "Q" in the tank circuit - again to reduce harmonics. When C_{70} was added it was found that C_{68} was too small to tune the entire 3.5 - 4.0 mc band, so C_{69} and S_6 were improvised to cover the low end of that band. C_{69} is made up from three high-voltage ceramics in series, giving a total effective capacity of 17 μf. and S_6 is a "gimmick" switch consisting of a banana plug and shorting tap. A length of poly rod as an extension shaft permits placing S_6 close to the r.f. section. The use of C_{69} and C_{70} has proven satisfactory in practice and these capacitors are necessary to maintain tank Q at a proper value.

L_{13} is a small r.f. pick up coil mounted under the coil jack bar. It and R_{57}, R_{58}, C_{77} provide r.f. and a.f. outputs to J_{10}, which is an octal socket for the oscilloscope used to check modulation.

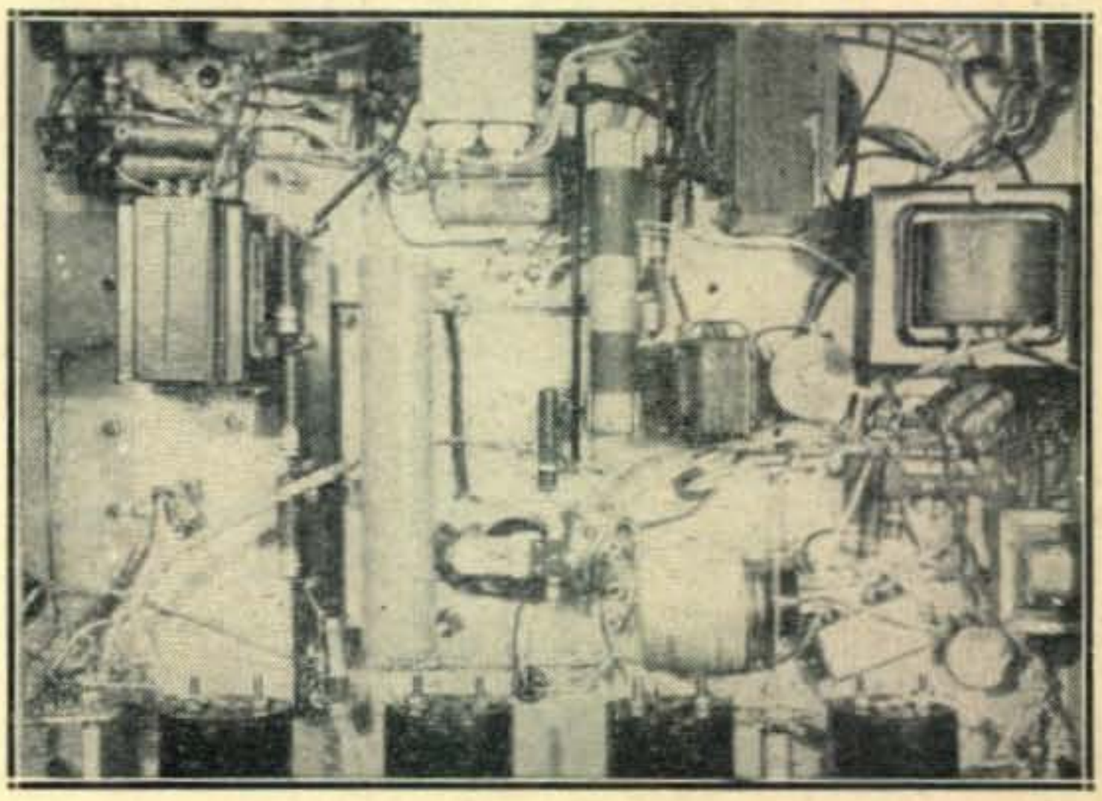
V_{14b} and V_{15} constitute an automatic transmitter turn-on for c.w. operation. Pin "C" of J_{12} is continually energized and V_{14b} is normally cut off by the drop across R_{63}. When the key is closed, closing keying relay contacts K_2, C_{75} is charged thru V_{15} and V_{14b} conducts. K_3 closes, turning on the high voltage supply. C_{75} must discharge through R_{61}, so K_3 will hold closed for a time delay determined by the setting of R_{61}. This time is normally set for several seconds - more than the average delay between keying characters or words - but fast enough to catch all but the first letter or two of a transmission coming back to you. It's the next best thing to full break-in, and it comes far more easily.

The other section of V_{14} is used as a side-tone oscillator with output to a small speaker mounted in the side of the cabinet. C_{72} is chosen to give tone pleasing to the ear. This oscillator can be built from a very few parts and it gives an accurate repeat of the outgoing signal since it follows the keying relay itself.

J_{11} is an output socket for operating a 115 volt a.c. antenna relay. A small split phase a.c. fan is mounted inside the cabinet to cool the modulator and final tubes. Space has been so restricted that

(Continued on page 50)

Bottom view of the modulator-power amplifier. A cover plate is used to assist in reducing TVI.



[1]George Grammer, "Keeping Your Harmonics at Home," QST, Nov. 1946.

The Nursery JUKE-BOX

Constructional details of the "console." WØLQS estimates the lumber cost to be approximately $5.50, with some reduction possible by substituting Kimsul Board or Masonite for the plywood panels.

An aid to DX and the Happy Home.

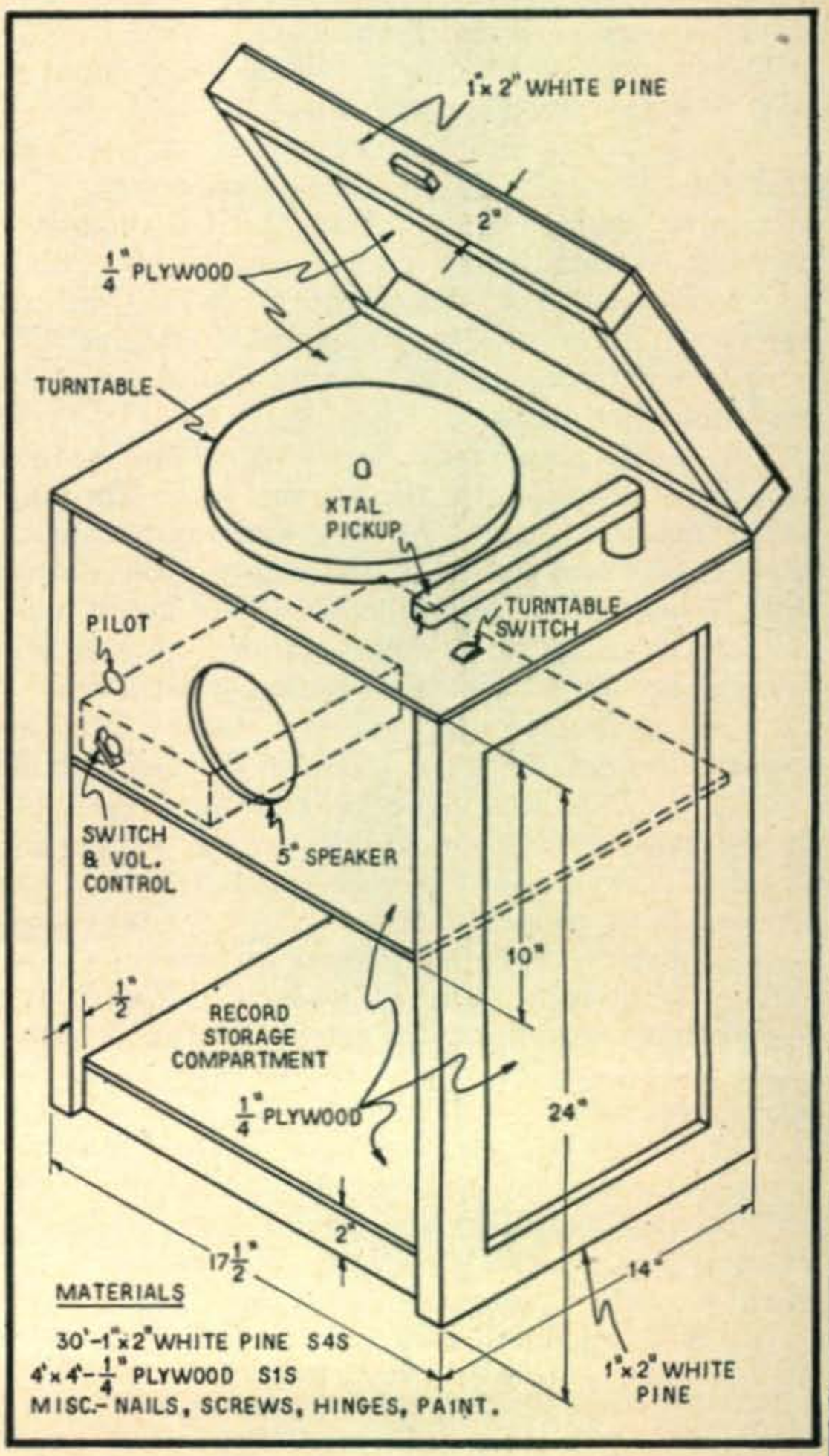
DON V. R. DRENNER, WØLQS*

THE SMALL FRY around most shacks begin to radiate spurious harmonics *excessively* about the age of three. When you're trying to concentrate on an elusive S1 signal, or tell Joe down in the next block how you licked TVI, then this stage in the growing-up process tempts you to drastic action, maybe even wiring the HV supply across the bed springs, or conking the little darling with that surplus 5BPI.

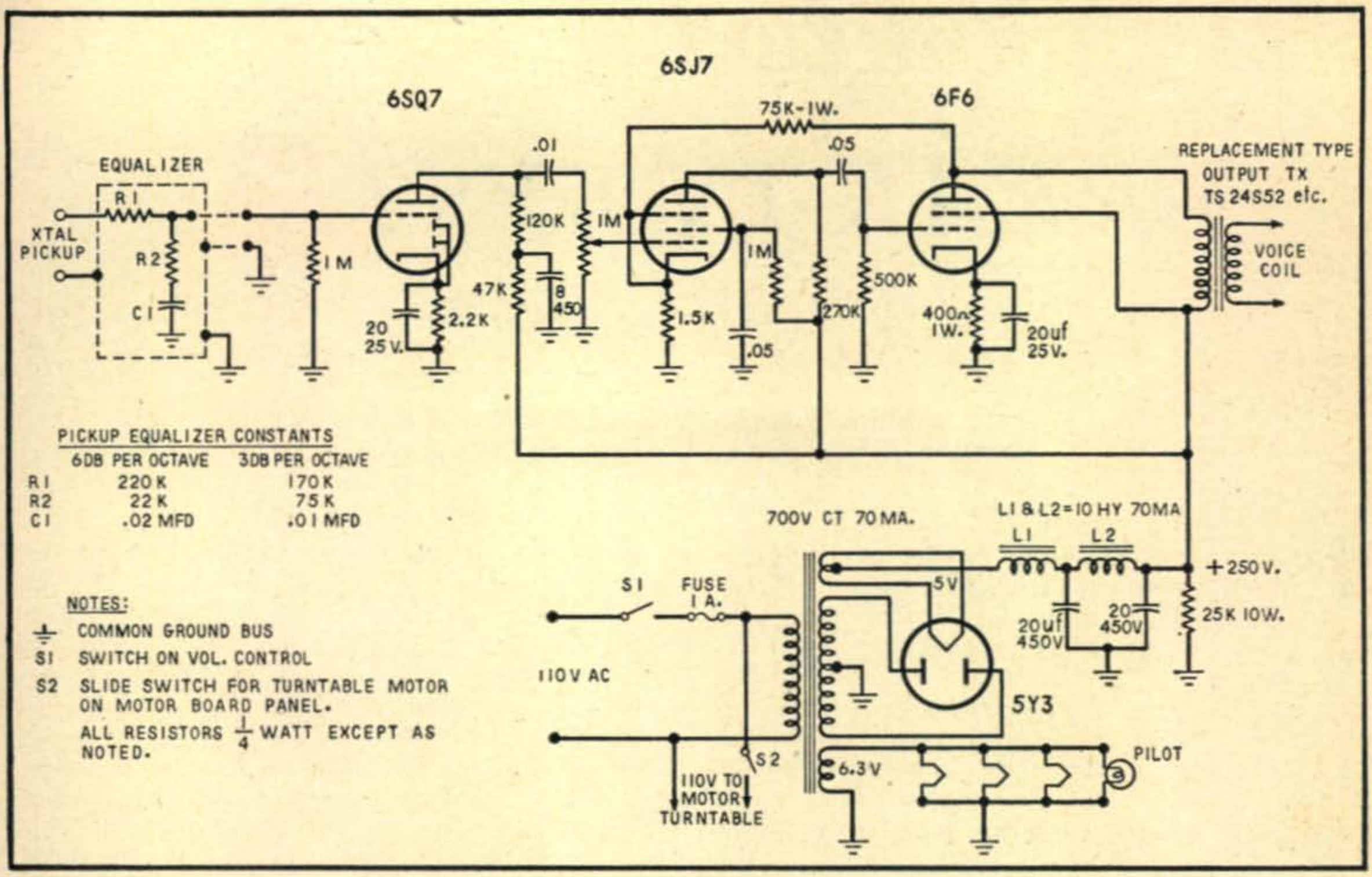
Don't do it—just reach in the junk box and build yourself this little gadget. It's guaranteed to keep all Jr. Ops occupied, relieve the strain on the ice cream money, and keep your XYL glowing with pride at your ingenuity and thoughtfulness.

A look at the schematic will show that a few beat-up parts you didn't know what to do with have been wired in a relatively simple manner. The circuit is conventional, and yet will give surprising "quality" to a 5" speaker. The feedback loop and some equalization—if you use a crystal pick up—account for a great deal of this. No aim at super fidelity was made, yet some allowance must be had for the fact your own ears will hear some of what goes on. And you don't want that super-flexible high frequency distortion which most a.c.-d.c. phono amps supply.

Before you start moaning about the carpentry work ahead, let's take a look at the chassis. An



*513 Highland Road, Coffeyville, Kansas



old 16" aluminum disc from the BC station, suitably cut and formed, saved the worry and time waiting for one to arrive from the factory. An old dishpan or chassis, or even a piece of guttering will work just as well. The layout shown in the photo won't strain your ingenuity to the breaking point in figuring out where to put the stuff. Just follow the usual precautions to be safe from hum, oscillation, standing waves and other professional problems. The small chassis used gets pretty well filled and you don't want some of the parts hanging overboard, you know. Your wife might want to sweep the floor.

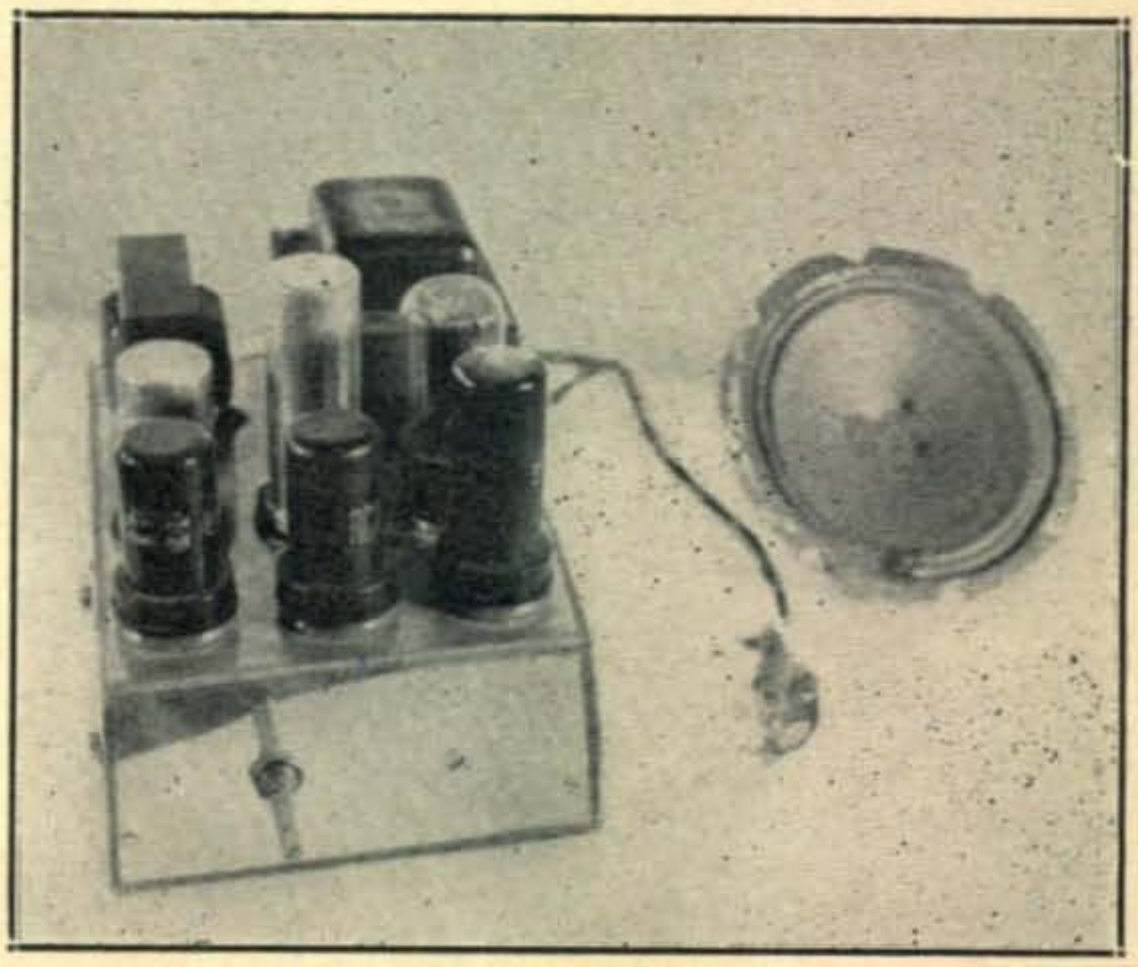
The 6SQ7 input stage was used because we happened to have one around salvaged from a friend's BC set. If you substitute, use a hi-mu triode of some sort. The feedback across the last two stages requires a little more gain than you might realize from a low- or medium-mu tube.

The Volume Control at the input of the 6SJ7 has a novel feature not shown in the schematic. This is, in effect, a volume limiting device, and a better one than most BC stations use. It's an absolute essential unless you wear wool head phones or have creeping deafness. One small wood screw is inserted on the front panel so that the volume control bar-knob can't be turned past it. This limits the excursion of the resistance element, eliminates continuous shouting to "turn the ---- thing down" and will win friends and more approval from your wife and neighbors.

The feedback loop from the 6F6 plate to the cathode of the 6SJ7 is the ever-popular negative one, and gives some linearity, reduces hum, increases stability and improves the bass response The feed back resistor and the cathode resistor of the 6F6 output stage are the only 1 watt units in the whole thing. So, some of those ½ watt carbons of questionable value salvaged from surplus gear, or that you've had around for years can be put to good use. If you want to be real finnicky about it, use the values given, but it's not too important.

The power supply utilizes some more junk box parts, and is definitely not a.c.-d.c. Despite the urge to make use of the lethal characteristics of such power, supplies, play it verry, very safe and DON'T use a selenium rectifier and high voltage heater tubes. This is not only common sense with children around, but good insurance for yourself as well. The input choke shown will or will not be needed depending upon the output voltage of the transformer. In our case it was needed,

(Continued on page 50)



A Simplified BREAK-IN SYSTEM

M. A. HAIRSTON, KP41Y*

An economical approach to the problem of combining break-in operation with clickless keying.

THREE MAJOR REQUIREMENTS for an up-to-date c.w. transmitter are: (1) clean keying—no sign of clicks, chirps or other transients, (2) provision for break-in operation, and (3) v.f.o. control.

It is fairly easy to meet any two of these requirements, for example v.f.o. control and clean keying, by keying a buffer or amplifier stage and letting the v.f.o. run continuously during transmissions. Of course, this makes break-in impossible with ordinary mechanical construction. To key the v.f.o. will provide for break-in, but makes it impossible to produce a really good clean signal on the air.

One answer to the problem is to key an amplifier stage is such a way that the v.f.o. also turns on at the start of the first character sent and holds on during the transmission of letters or words but turns off during the short pause between letters or words.

There have been several systems described in CQ and QST in recent months that do just that.[1,2] However, all of them require additional power supplies, several tubes, and sometimes an expensive relay. Left with a rather thin pocketbook after building my last transmitter, I came to the conclusion that a less expensive method must be found.

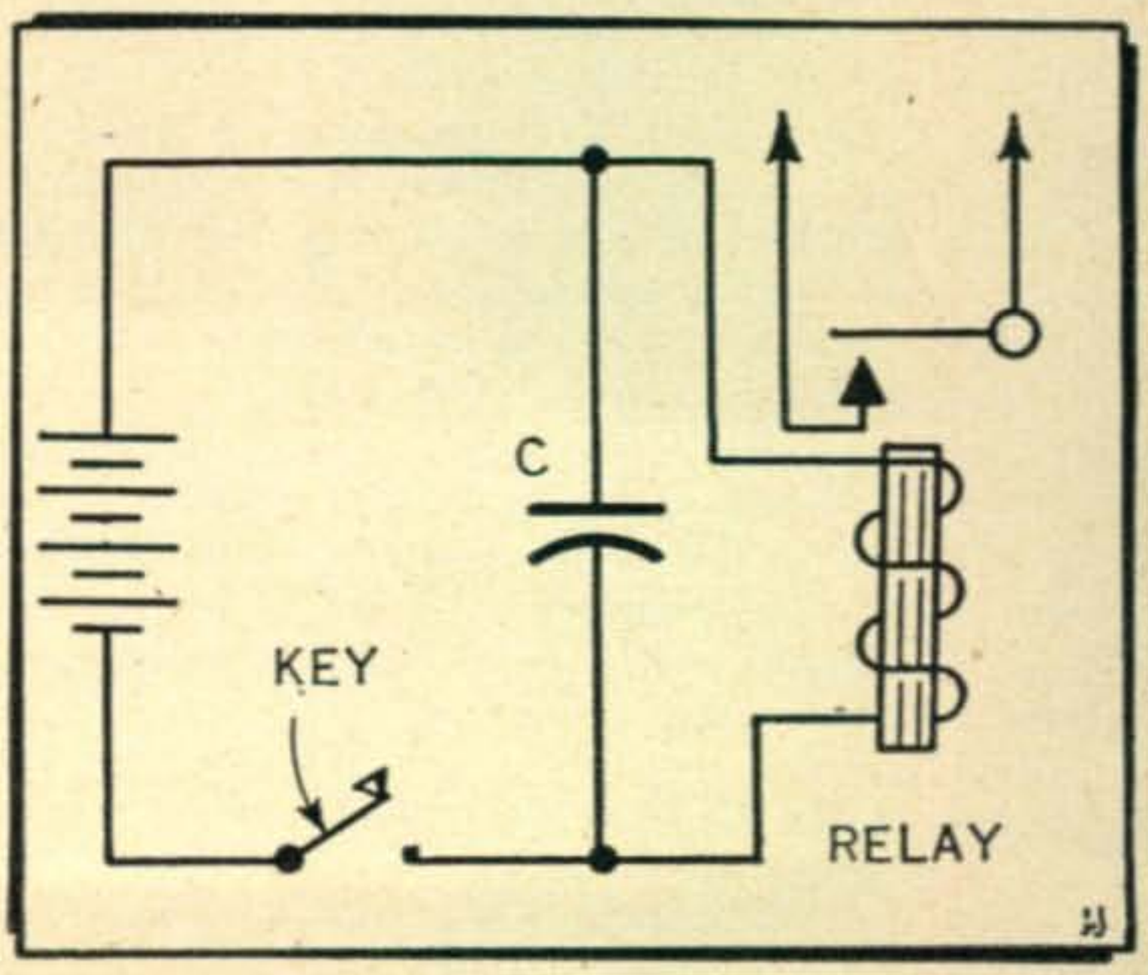
After several sessions of head scratching, I came up with an idea, the basis being the circuit shown in Fig. 1. When the key is closed, current flows through the relay causing the contacts to close, and at the same time the voltage drop across the relay winding charges condenser C. When the key is released, the relay remains closed until the condenser discharges through it, the decay time being determined by the characteristics of the relay winding and the capacity of the condenser. Thus, if a series of dots are keyed the relay closes with the first dot and remains closed until the key is released for a pause. If this circuit were now adapted to a transmitter, with the key inserted in an amplifier circuit and the relay contacts operating the oscillator circuit, a simplified form of "differential keying" would be realized. The oscillator would turn on with the first character of a letter or word, and remain on for a period while the amplifier was keyed.

A look through the junk box disclosed a s.p.d.t. relay of the surplus variety that looked promising. The coil resistance was 12,000 ohms and the contacts closed on approximately 1 ma. As I remember it, the relay was removed from a marker beacon receiver that was purchased for about a buck and a half, a couple of years ago. A quick try in a test set-up similar to Fig. 1 gave rather positive results, so it was decided to see if it could be worked into the transmitter.

As can be seen in Fig. 2, the transmitter is a run of the mill job consisting of a 6AG7 v.f.o., 6L6 buffer/doubler, and a pair of 807's in the final. The buffer stage seemed well suited since it was normally keyed, and the screen circuit was made to order for our gimmick.

The screen dropping resistor in this stage was removed, and replaced by the relay, with R3 added to reduce the screen voltage to its normal level. The fixed contact of the relay was connected to a

Figure 1



1 "Improved Break-In Keying," Goodman, QST, March 1948

2 "A New System for Perfect Keying," Leibholz, CQ, Jan. 1951

*267 Isabel la Catolica, Hyde Park, Rio Piedras, P. R.

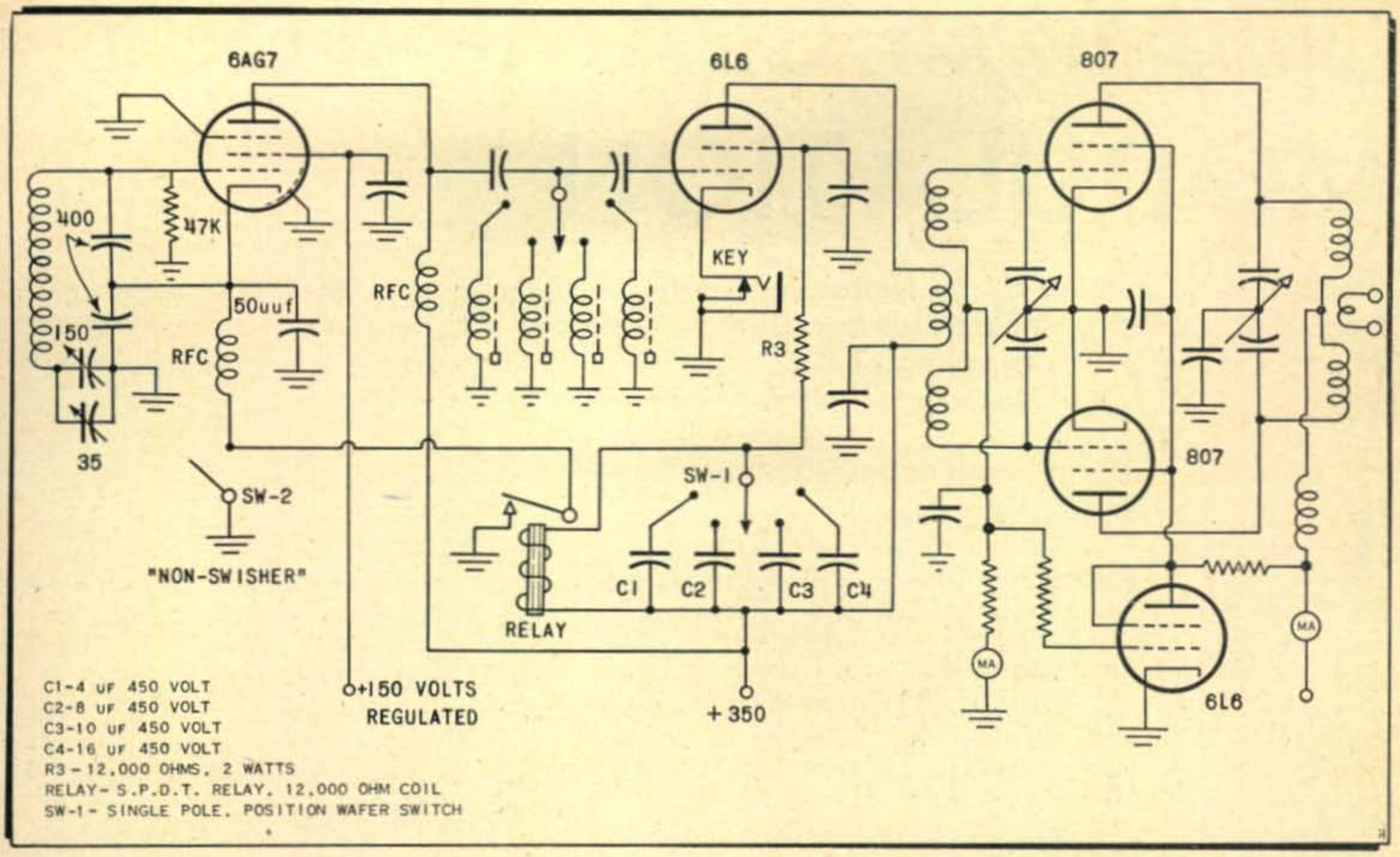


Fig. 2. As the author points out in the text, the key-click filter is omitted from this "skeleton" schematic, but some sort of shaping should be included in the keyed circuit. The keyed cathode must also be by-passed for r.f. at the tube socket.

good ground point and the cathode of the v.f.o. connected to the "normally open" contact. (See Fig. 2). The v.f.o. and buffer power supply was then turned on, and several different size condensers (from 1 μf to 150 μf) were tried in parallel with the relay. It was found that about 50 μf would do for the very slowest sending speed, and from 1 to 5 μf worked well when keying with a bug at speeds over 30 w.p.m. These values were not at all critical; however, for maximum flexibility is was decided to add a switch to select the capacity best suited to the keying speed in use.

The operation of the system is simplicity itself. With the key open and no screen current flowing, the relay remains open, thus keeping the v.f.o. cathode open. When the key is pressed screen current starts to flow and the relay closes as soon as the screen current reaches 1 ma, which means practically instantaneously. When the key is released, the relay remains closed and the v.f.o. remains on for the interval selected. Our own preference is for the v.f.o. to remain on during the transmission of words and turn off only during short pauses, between words. By merely changing the capacity the characteristics can be made to meet your own needs.

If the best results are to be obtained, it is important that the v.f.o. cathode circuit should have a minimum of series resistance and shunt capacity. A key-click (shaping) filter should be used in the keyed buffer stage, as in normal operation.

We had some misgivings at first about passing the total 6L6 screen current through the relay, since it is probably several times the rated current of the relay. However, the relay has shown no signs of heating, even after long periods of keydown conditions.

It should be pointed out here that this system is somewhat of a compromise. It is doubtful if it can be made as fast acting as some of the previously described systems.[3] However, it is believed that the advantages outweigh any disadvantage in this respect. It might be well to list some of the advantages that we have noted.

1. Ease of construction.
2. Simplicity: the average beginner should have no trouble adjusting and installing it.
3. Economy: the relay need not be expensive, with plenty of good surplus relays still on the market.
4. Flexibility: it can be used with almost any transmitter, with just about any type or combination of types of keying.

On-the-air results have been very gratifying. A report of T9 has become a rule, even from DX stations. The biggest satisfaction is in the ease and smoothness of operating; there are no switches to throw - just grab the key and send.

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3 At the start of each series there will probably be a click, since the amplifier and oscillator are keyed on practically simultaneously. This is in contrast to the more elaborate systems referred to, in which the oscillator is always turned on before the amplifier. While falling short of perfection, the effect is probably not serious, and certainly can't be anywhere as annoying as the gunfire of clicks sprayed out by the average keyed v.f.o.-Ed.

Improved CLAMP-TUBE MODULATION

G. K. HICKIN, W2OUT*

Clamp-tube modulation is fundamentally Heising modulation applied to the screen of a tube. Past articles by W2CVV and W1DBM have pointed out that overall linearity should be checked on an experimental basis, and W2OUT illustrates the procedure with a medium power rig.

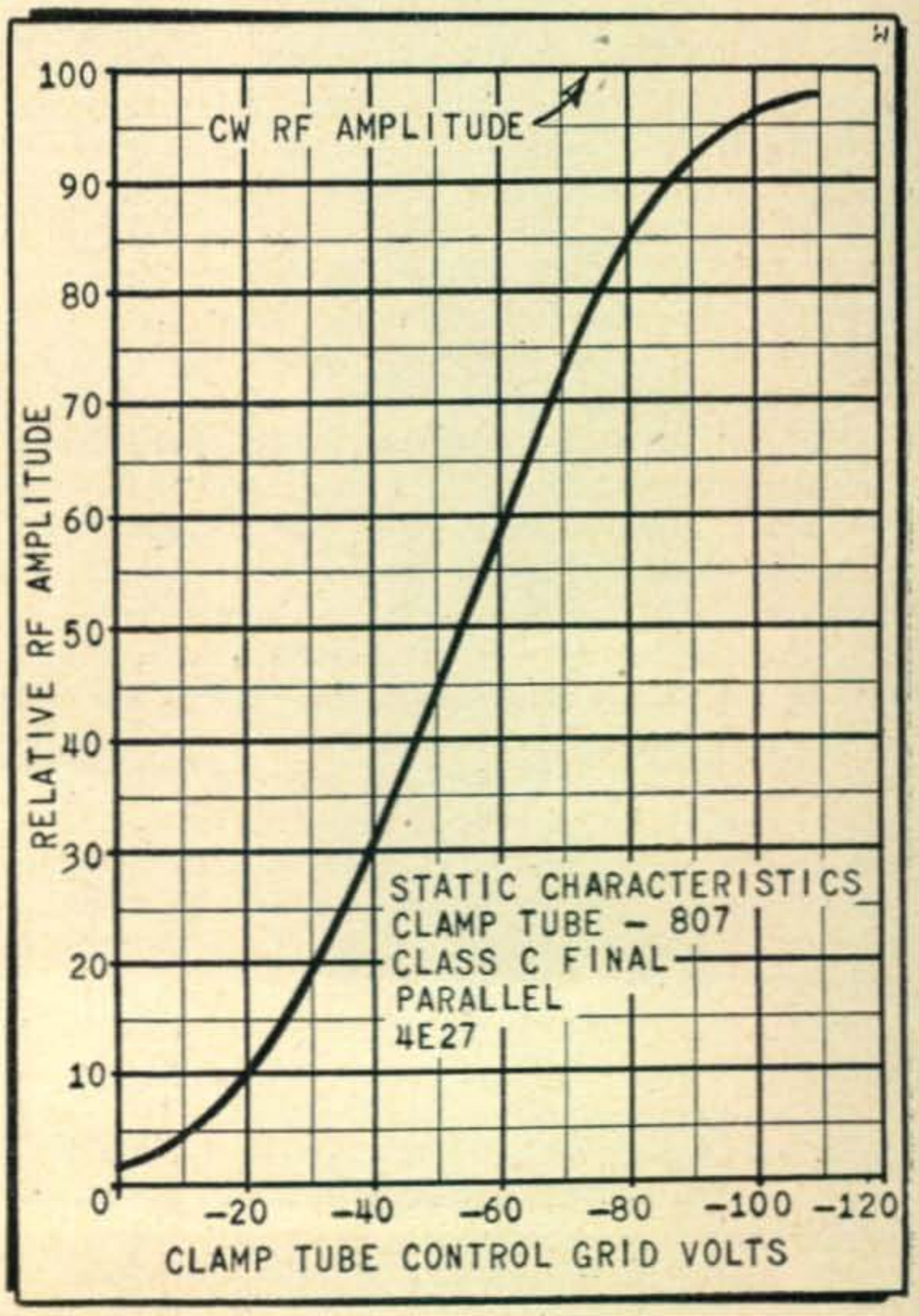
THE USE OF clamp-tube modulation is increasing rapidly, especially among c.w. operators who are already using a tetrode or pentode final with a protective screen ballast tube. The reason for its popularity is easy to understand, since little more than speech voltage is needed to convert any high powered c.w. rig into a fairly satisfactory AM transmitter.

The author's preferred method of clamp-tube modulation is to cathode bias the clamp tube to give about 50% of maximum r.f. output before modulation is applied. Full wave audio voltage will now swing the r.f. amplitude up *and down* with the average carrier power remaining at the pre-set level. Operation is now along the more linear portion of the curve and is confined to only that portion by means of audio gain control (or by speech clipping). The net result is a better quality signal of somewhat greater average strength. Examination of Figure 1 shows that the linearity between audio wave form and r.f. amplitude is fairly good, at least in the author's circuit to be described later. Judging by recent literature on the subject there are many other tube combinations that exhibit sufficient linearity.

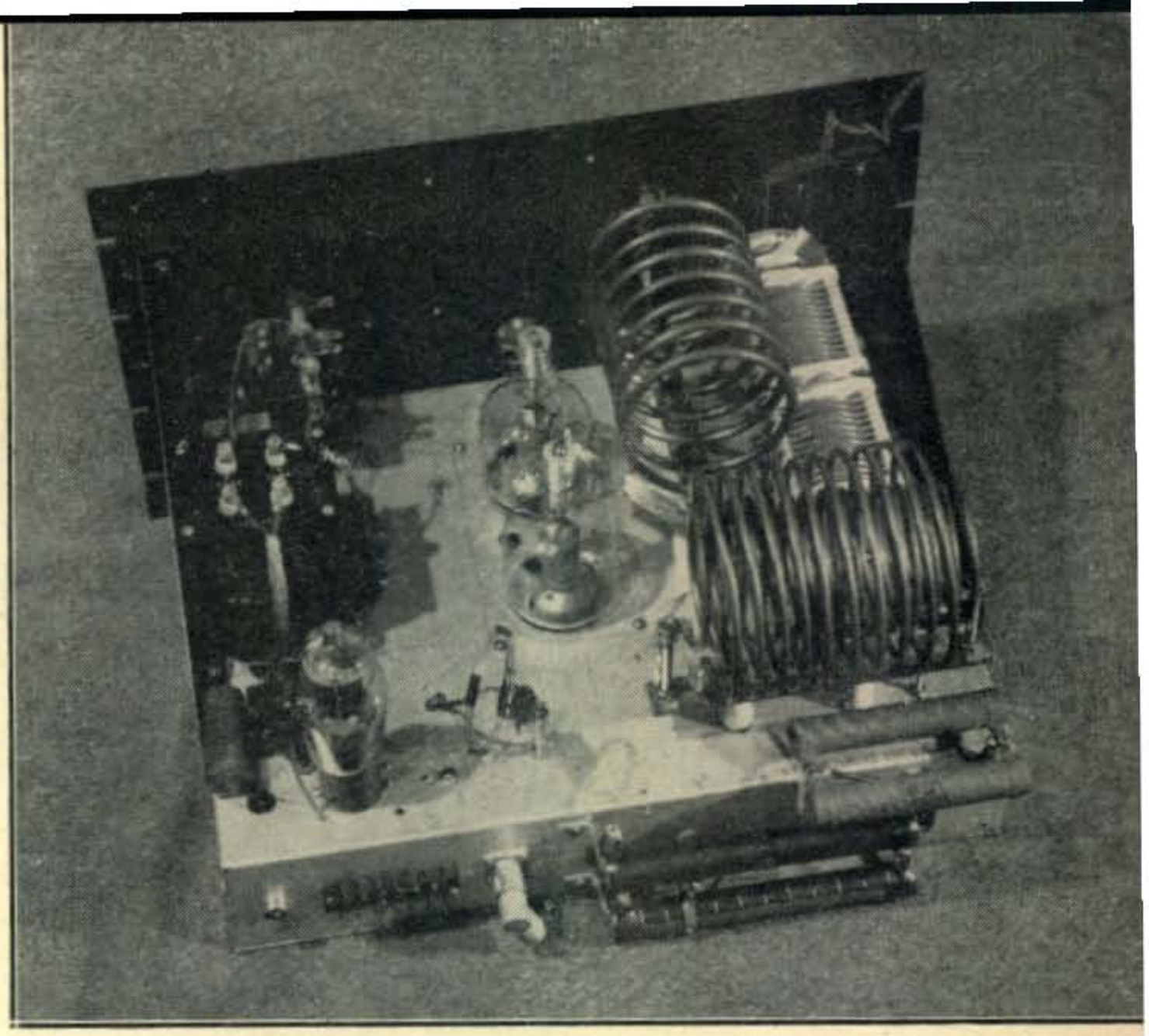
Circuit

Figure 2 shows the circuit used to accomplish the above results. It is so arranged that throwing one switch will change operation from c.w. to fone. Since the v.f.o. stage of the layout already has break-in keying, it is then only necessary to work a straight key to turn the transmitter on and receiver off during a fone QSO. R4 provides an impedance for the audio voltage and the ground return for the 807 clamp tube control grid. R5 and C2 form an r.f. bypass filter without attenuating the higher audio frequencies. In addition, R5 also prevents the 807 control grid from excessive current peaks should overmodulating values of audio voltage accidentally occur. R6 is adjusted to about 1000 ohms to set the no-modulation r.f. output level at the desired point. It is mounted on the front panel because occasional adjustments are required when various c.w. tune loadings are in effect. C3 prevents audio degeneration and distortion in the clamp tube operating characteristics. RY-1 is a d.c. relay so chosen that it will operate at the current level that will exist in the Class C grid circuit. It can have any d.c. resistance less than the totals required in the grid circuit. R2 is made equal to the relay resistance while R1 is chosen to make up the required total grid circuit resistance in conjunction with either RY-1 or R2. Switch S1 and the relay serve to protect the final and to change operating conditions from c.w. to A.M. With the switch on c.w., the clamp tube grid is connected to the Class C grid voltage point, protecting the final in the usual manner. When the switch is turned to fone, RY-1 is placed in the grid circuit while the clamp tube grid is still grounded but now through contact RY-1A (nor-

Fig. 1. The overall modulation characteristic of the final amplifier and 807 modulator.



*50-13 Oceania St., Bayside, N. Y.



The clamp tube modulated final stage at W2-OUT has some interesting features in addition to the modulation system. The plate tank for the paralleled 4E27's is a high-power home-grown version of the multi-band tank described in CQ several years ago, and requires no coil changing or switching for coverage from 80 through 10 meters. The small link to the right of the 807 modulator is used for inductive neutralization of the 4E27's.

mally closed) instead of through the final grid string. Now, if r.f. is applied to the final grid tank, RY-1 operates, grounding the clamp tube grid through R4 and removing the short across the clamp tube cathode resistor by the action of the normally closed contact RY-1B. Due to the self-biasing action of R6, the r.f. output rises to the desired median value. Application of a.f. will now modulate the r.f. carrier. The depth of modulation is dependent not only on the a.f. amplitude but is finally limited by the minimum r.f. level that can be obtained. This minimum level occurs whenever the clamp tube control grid reaches the potential of the cathode due to the positive audio peaks (or by adjusting R6 to zero under static conditions). The value of the minimum output can be decreased by using two or more clamp tubes in parallel or by using a clamp tube having a lower plate resistance. To some extent, this can be done with a screen grid tube by operating its screen at a higher potential that the plate. The process is limited by the allowable screen dissipation, which is a good reason for choosing the 807 as the clamp tube. In the circuit shown, the screen is tapped up some 5K ohms higher than the plate on the 25K dropping resistor. With this arrangement the final idles at 60 plate mils, zero screen mils and 125 screen volts. With the screen tied to the plate, however, the idling plate current is 127 mils, the screen current is 3 mils and the screen voltage is 280. This represents a change from 100 watts to 220 watts plate dissipation and has a comparable effect on the minimum r.f. level when modulating. Without this arrangement is would be impossible to attain the high level modulation now exhibited by the system.

The combination of resistors shown in the circuit diagram does not represent the optimum design, as they merely happened to be those available when the rig was built. A proper design procedure might be as follows, assuming a 1500 volt plate supply, with 55 ma at 600 volts required for the screens at full c.w. rating. The required voltage drop is 900 which calls for 16,400 ohms resistance. A safe power rating is calculated by assuming the dropping resistor will short the plate supply directly to ground. Thus, 16,400 ohms will dissipate approximately 137 watts. A conservative choice for the job would be a 20,000 ohm, 200 watt adjustable wire-bound resistor. C4 is the total value of the r.f. bypass condensers at the screen grid terminals of the final. If the total capacity is too great, the higher audio frequencies will be attenuated. If the value is such that the impedance at 3000 cps is 5 to 10 times that of the input screen resistance, no difficulty will be encountered. From 500 to 1500 $\mu\mu$fd will usually be correct for this application.

Adjustment

Figure 1 shows the attainable modulation linearity and a similar curve should be determined for any clamp tube modulation rig before putting it on the air. This is easily done by using a source of negative d.c. voltage and an r.f. amplitude indicator, such as an absorption wave meter or 'scope. The rig is first fully loaded at c.w. rating, feeding power to a dummy antenna, with the r.f. indicator coupled to give full scale reading. Then with R6 set at zero, the switch is turned to fone and the d.c. voltage is connected to the audio input terminal. This voltage source can be the center tap of a 1 meg potentiometer connected from —150 volts d.c., VR-regulated, to ground. The voltage is then increased from zero in 10 volt steps, reading the r.f. amplitude each time. The results, when plotted will show the linearity, minimum r.f. level, proper mid-point for fone operation and the audio voltage required for full modulation.

Subsequent adjustments of the rig for fone operation are easily performed as follows:

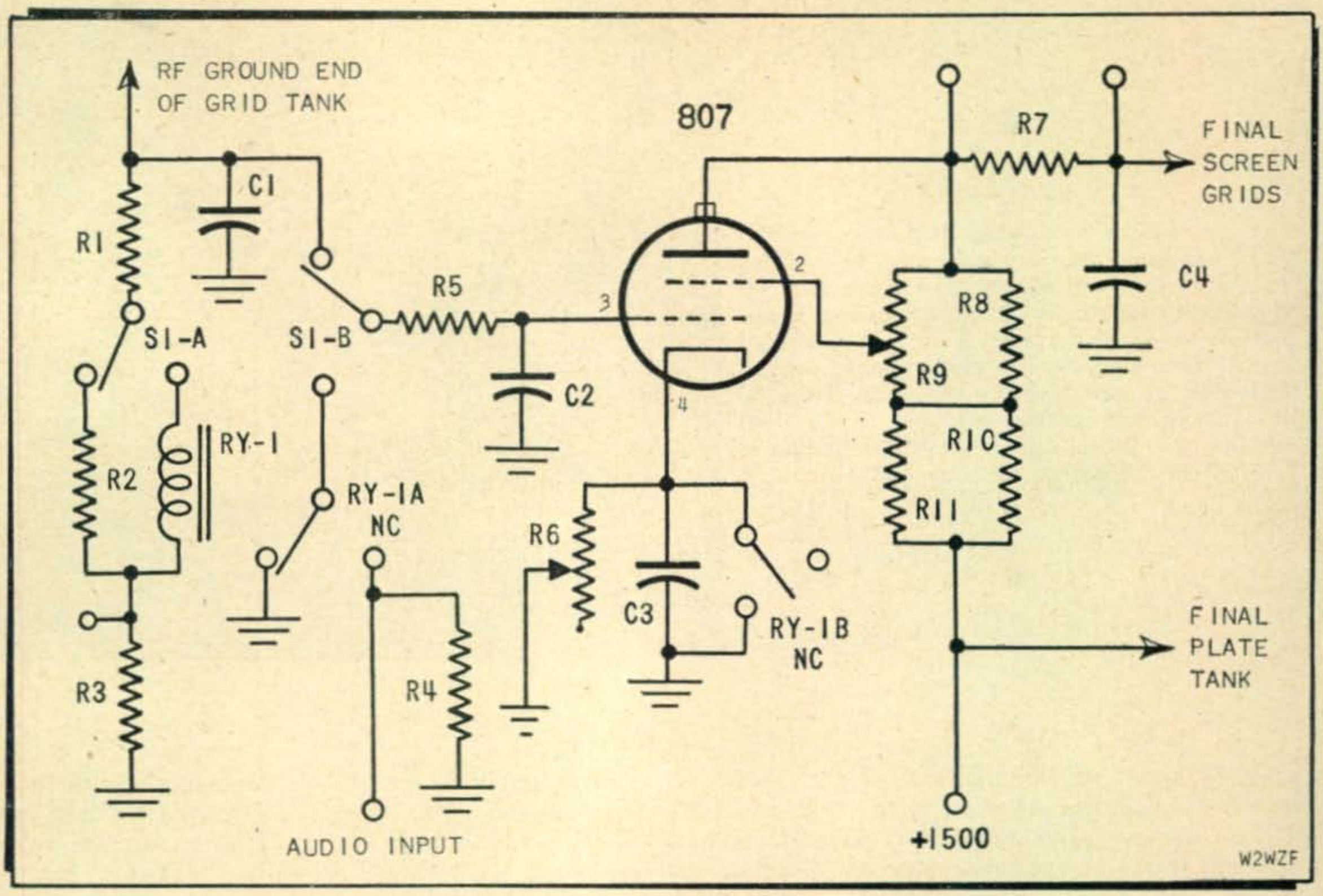


Fig. 2. Circuit of the 807 modulator and relay switching system.

C1—.01 μf mica
C2—330 μμf ceramic
C3—10 μf, 150 v electrolytic
C4—1000 μμf ceramic, see text
R1—8,000 ohms, 2 w
R2—12,000 ohms, 2 w
R3—meter shunt
R4—680,000 ohms, 1 w
R5—68,000 ohms, 1 w
R6—2,000 ohms, 10 w wire wound
R7—meter shunt
R8—25,000 oms, 100 w wire wound fixed
R9—25,000 ohms, 100 w wire wound adjustable
R10, R11—7,500 ohms, 50 w wire wound fixed
S1—dpdt switch
RY1—DPDT d.c. relay. Operates with 3 to 5 ma. See text.

1. Tune rig up on the air in c.w. position and fully load the final. Couple an r.f. indicator to show any reading between half scale and full scale.
2. Throw the switch to fone and set R6 to a lower value than the previously determined midpoint for fone operation.
3. With the speech amplifier on, talk into the mike with constant volume while slowly advancing the audio gain control until the r.f. meter kicks slightly. It should flick upwards if R6 has been properly set on the low side.
4. Now, at the same audio level, raise R6 until the r.f. meter begins to kick downwards.
5. Then set R6 midway between the positions noted for the downward and upward kicks.
6. Finally raise the audio gain slowly until the r.f. meter again flickers and then decrease the audio slightly below this point.

The rig has now been adjusted for the greatest possible AM modulation with linearity. The adequacy of this method of adjustment has been shown to be sufficient and quite accurate by observation of trapezoid and wave form patterns on a scope. Overmodulation will increase the average output and cause the meter to kick upwards even after the no-modulation output has been properly adjusted. This is of course the reason for finding the midpoint by interpolation, using low audio levels. After the adjustments for operating level are made, the r.f. meter can serve as an overmodulation indicator.

The rig now operates in a manner similar to a plate modulated transmitter of lower power and less than 100% modulation. Examination of Figure 1 indicates that about 90% modulation can be obtained without noticeable distortion. Overmodulation is to be avoided in this system just as in plate modulated circuits. Since the carrier will not cut off completely on negative peaks, the spurious sidebands are less apparent but they are there nevertheless, Any clipping should take place in the speech amplifier and be followed by the usual clipper filter.

Readers familiar with the subject of clamp-tube modulation will have already observed that the author's goal was not to operate a given tube combination at maximum allowable dissipation ratings. The object of the design was rather to determine the simplest way to switch a c.w. clamp-tube final to acceptable fone operation. On-the-air reports have shown that the quality and signal strength are entirely adequate for enjoyable fone QSOs.

Conducted by RALPH V. ANDERSON, W3NL*

ONE TOPIC of discussion which recurs at frequent intervals is operation of the mobile rig while driving. Some states have laws which require the driver to stop while he is operating a radio transmitter. It is understood that other states are considering similar legislation. The basic fault, it would seem, is that the usual mobile installation requires the use of one hand to operate the rig while driving. If this is eliminated there is no more danger in driving while operating than there is in talking to a fellow passenger. Most properly, the law should not require the driver to stop if the installation leaves both hands free for driving. There are a good many traveling salesmen and executives who use a mobile wire recorder to dictate letters while they are driving. They are not included in these laws, yet if amateurs are at fault, so are they.

Why installations are made which require one hand to hold the mike is somewhat of a mystery, when it is so easy to provide for the use of both hands for driving. For getting the transmitter on and off the air a foot switch may be employed, although there's nothing wrong with a toggle switch on the dash since it is operated rather infrequently. There are three general answers for the microphone; first, the telephone operator type which is fastened to a head band and held always in front of the lips; second, the chest mike, and third, the lapel mike. The first type works excellently, has good quality with high output but may be a little difficult to obtain. There are many varieties of the second type available. Some of the older ones do not have good quality but the later models are very acceptable. All of the foregoing units will normally work directly into the transmitter without extra amplification. The third type, the lapel mike, is perhaps best of the three but will likely require extra speech amplification. Normally a simple triode, such as a 6C4, will provide sufficient gain but, if not, the pentode 6SS7 is excellent. For commercial ham transmitters where space is unavoidable, a simple "rumble seat" can be added. Of a great many units tested the telephone type F-8 carbon unit was far superior in quality and gain. This unit requires that a case be provided. It will be found that the mounting ring of one of the small bargain Selsyns is easily adapted for this purpose. The only remaining factor that requires a hand is tuning. Little time is required for this, however, and the exact time that tuning will be required is normally under control of the operator. He doesn't need to stand-by on a CQ just when he approaches a busy intersection.

If hams will devise mobile installations which obviously do not compromise their driving, we quite likely would not have restrictive laws. In any event, the mobile operator is a nuisance to the fellow he is working if he has to pause every time he turns a corner.

Use of 29.640 mc as a Calling Frequency

About two years have elapsed since 29.640 mc was suggested as a National Calling Frequency and it has since been adapted by a great many cities throughout the nation. The mid-west in particular is almost solid in the use of this frequency for calling purposes. Many mobile organizations maintain squelch operated receivers on this frequency constantly and a number of others are using an Auto-Call (Feb.-May CQ). The receivers in many cases are located at police stations or similar locations when an operator has to "sit and listen" anyway. The frequency has been adopted so widely that a new problem now exists, originating from the fact that many mobiles use this frequency for ordinary contacts, and in some cases,

(Continued on page 60)

Now that Georgia is issuing calls on license plates, the Kennehoochee A.R.C. has gone in for them as a group. Left to right: W4IDY, HNJ, FHW, MCM, NT, LOR, PBW, NEJ, KXT and HAJ.

Send contributions to R. V. Anderson, 2509 32nd St., S. E., Washington 20, D. C.

Conducted by HERB BECKER, W6QD*

The Honor Roll and DX News for this month give way for the 1950 World Wide DX Contest results.

1951 "CQ" World Wide DX Contest
The dates for this year's contest will be: Phone, October 27-29 — C.W., November 2-4. Keep these weekends open. Rules in next issue.

Our hard-working DX Committee has just finished tabulating the results of the 1950 "CQ" World Wide DX Contest. Here are the scores for the c.w. section only. Next month we will run the phone section results.

Participation in this contest exceeded that of the 1949 affair by a good margin, but unfortunately, conditions were anything but the best. In fact, they weren't even average. This is one point on which there was unanimous agreement by the DX men the world over. However, the comments as noted on the various logs indicated the genuine interest in this type of a contest.

Now, let us take a look at some of the highest scores. These are of the All Band group. 4X4RE scored 369,075 points, and made 673 contacts. This makes him the highest in the world. Close on his heels is that reliable CE3AG, making 625 contacts and a total score of 338,180. Next in the single operator section is 4X4BX, with 552 contacts and 293,296 points.

Out Oceania way, KH6IJ had 439 QSO's and a total of 162,625 points. ZL1MB made 464 contacts and 144,884 points. VK2EO had a score of 60,738, and VK5BO had 61,692 points.

It was interesting to see a fair number of multiple operator stations reporting, and it looks as though CN8EG, with CN8ET as second op, scored highest with 316,257 points. W6GAL with his pal W6GHU ganged up for 135,222 points and made 293 contacts. DL1AT assisted by DL1FK wound up with 112,970, and I1AIV with the help of I1PL scorded 131,215 points.

Getting back to the single section operator section, ON4QF made 130,453 with 326 contacts. OK1HI scored 90,471 with his 14 mc score at 27,072. OK3AL took first spot on 7 mc with 8,736 while OK3IT led off on 28 mc with 2,592 points. By the way, take a quick look at the huge contingent of OK participating stations.

G3DCU had an all band score of 66,340, while G2LB concentrated on 14 mc and came up with 71,174. High man on 7 mc was G5MP with 5,396. DCU was in there again on 28 mc with 3,375. Before going anv further, I would like to say the participation in Europe was especially good, as the columns of participants will indicate.

F9BO had a score 93,019 on all bands and took first place on 7 mc with 2,960 and 14 mc with 34,974. On 28 mc F3WT was in there with 6,278. A few more I would like to call to your attention are HZ1KE, 133,200; HB9EU, 144,007; GW3ZV, 121,948; EA1AB, 64,880; and EA6AF, 56,133.

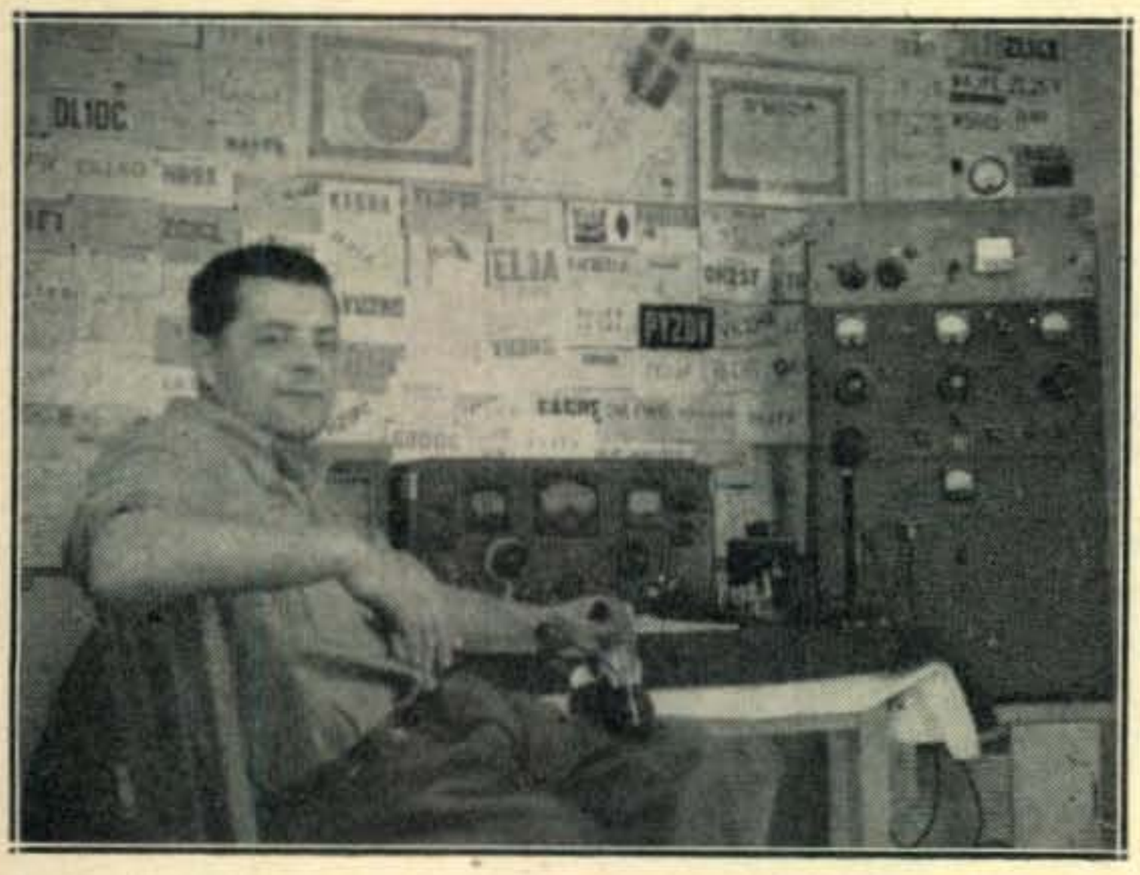
Vic Clark, W4KFC, did a noble job and ran up 153,901 points. This was his all band score, while W9LM did 82,950. W8JIN, working alone, made 137,902.

To indicate what happens when a man decides to concentrate on one band look what W3JTC did by working only 14 mc. He wound up with 66,675 points for first spot on this band, and W6PQT with 45,105 points also concentrated on 20 for another top spot.

4X4RE 369,075 points and 673 QSO's. This score puts Egon as the highest scoring station in the World for this contest. He was running 50 watts into a pair of 807's in parallel, and the receiver was an SX-28. During the contest he used a 20 meter Windom antenna about 25 feet high.

**Send all contributions to Herb Becker, 1406 South Grand Ave., Los Angeles 15, Calif.*

In checking over the various logs the DX Committee was gratified, amazed, amused, intrigued, and sometimes disappointed at the various comments made regarding the contest. You, too, may like to read some of them and fall into any one of the above named conditions. For example, from G2LB: Many thanks once again, for Contest of year. . . OY3IGO: It is funny to think if I only worked a single contact then I would still be winner in my country. . . PK1TM: Band overworked. Hi! But had wonderful time. . . KH6PM: Understanding XYL is the only "operating aid" I had. It was my first try—sure was fun. . . KH6CD suggested low power boys be given extra multiplier. . . ZL3AB: Everything was fine except conditions and tactics of a few DX hogs. . . ZL3OA: Many thanks, chaps, for fine Contest. . . ZL4GA: Noticed operating this year much more sporting. . . OA4J: Best of luck in future Contests and there is no doubt the next one will be even bigger. . . CP1AQ: Glad I was in Contest, but didn't find out about it until it was half over. . . ZS6DO: Suggest real prizes like receivers for 1st, 2nd, and 3rd places. . . (This shows what happens when a man is on the air for years and years). VQ4HK: Faulty refrigerator motor made



4X4BX with 293,296 points and 551 contacts. With but one xtal frequency plus a power failure, Sam really did a job. The rig winds up with 125 watts to an 813. Receiver an SX28. Dipoles on each band, only 24 feet about ground due to the airport QTH, complete the layout.

terrific QRN. . . ZE3JP: Thanks for an enjoyable weekend. . . G3ATU: A really excellent and fair contest. . . OH2OP: I think best of all Contests. Why can't we count USA and Canadian call areas as separate countries? . . . OH3NY: Very pleased if you can send me free "CQ" magazine. . . DL4FS: Sure a lot of snappy operating seen during this one. . . GM3CSM: Limit power to 200 w. and one antenna. GW3ZV: Excellent Contest. Repeat the dose next year, please. . . W6PQT: Too many W's calling CQ DX . . . W6MVQ: Best rules, best length of time, and fairest scoring. . . W5ZD: Have 80 to help fill in the dead spots. . . W4BRB: Operating aid—One understanding wife. . . (It appears to be an important factor).

W4KFC: Participation was much better than in '49, but condx—oooh! . . . K4WAR: Our operators gained valuable experience in Contest

CE3AG 338,180 points and 625 contacts. Luis uses a 75A1 with DB22A and the rig is a revamped BC610E with a 304TL in the p.a. with 1 kw. Antennas . . . and old Mims dual three element and a half wave center fed for 7 mc.

and looking forward to next one. . . W4VE: Was it my receiver, or were condx really bad? . . . W3PDX: Lost time going to a wedding. Please have one next year—a Contest, that is. . . . W3JTC: Why no 3.5 mc? . . . *(Will have this year—W6QD) (Shucks, too early for 160-W2ESO)* W2EVK: Beginners like myself should enter Contest and get invaluable experience. . . . VE3API: I am a minister, and during Contest I had a funeral service, six baptisms, two Church services, and a group meeting. Also repaired receiver power supply. Had fun. . . .VE7WH: Tons of fun, but oh, my aching back. . . W6LER: Wish foreign stations would give call of station they are working. after giving their number, instead of merely sending BK. Would help in dog fights. . . W6IBD: Had a divine time. . (Whatever that is). . . W7AHX: Had to rotate beam with pipe wrench. . . W9ABA: Suggest a better time of year. . (We agree, but these weekends are only vacant spots. Rest of year filled with various activities throughout the world.) W9LM: How about a couple of extra sun spots before the next one?

KH6IJ, 162,625 points. Rotaries are 4 element, receivers are SP400X, HRO, HQ129. Kay says the DX men the world over are good operators . . . and he's one of them.

In looking over the entire summary of the contest scores, notice how the three top place men in the All Band section do not necessarily line up in the same sequence in their single band scores.

Countries in which there has been only one participant will show the score under the All Band section only.

Certificates will be awarded in accordance with the rules and those stations receiving certificates are shown in bold face type.

CW SCORES

Multiple Operator Stations*

UNITED STATES

	STATION	COUNTRIES	ZONES	SCORE
All bands	K4WAR	66	40	36,146
All bands	W6GAL (W6GHU)	125	60	133,940
	W6VDG (W6EAE)	76	49	52,500
	W6YX (W6VUW, W6VXL, W6WZD, W6TOT)	45	32	16,016
7 mc.	W6GAL	26	17	6,106
	W6VDG	15	13	2,380
	W6YX	9	9	720
14 mc.	W6GAL	84	31	61,525
	W6VDG	55	28	26,560
	W6YX	35	22	9,519
28 mc.	W6GAL	15	12	1,269
	W6VDG	6	8	210
	W6YX	1	1	2

W6GAL with W6GHU (left) as 2nd operator, 133,940 points and 293 contacts. George and Ray used one rig winding up with a pair of 250TH's, and in the Receiver Department it was an HRO and a 75A-1. For antennas they used a wide spaced, 3-element rotary 60' high, on 14 mc. while another one 50' high was on 28 mc. A single section 8JK did very well on 7 mc. plus a dipole.

ALASKA

	STATION	COUNTRIES	ZONES	SCORE
All bands	KL7CM (KL7AES)	15	14	2,204

CHANNEL ISLANDS

All bands	GC2CNC/P (GC2FMV, GC3FMS, GC3FSN)	64	21	21,995

ENGLAND

14 mc.	G2BOZ (G3HCT, G3HDA)	70	27	58,297

FINLAND

All bands	OH3OX (OH3QB, OH3QK, OH3QL, OH3QP)	22	5	1,512

FRENCH MOROCCO

All bands	CN8EG (CN8ET)	84	43	316,257

GERMANY

All bands	DL1AT (DL1FK)	108	50	112,970
	DL4FS (DL4WK)	69	33	76,704
	DL1CS (DL1DC, DL1CX)	104	47	73,537

ITALY

All bands	I1AIV (I1PL)	113	50	131,215
	I1AKL (I1ALU)	74	30	33,592
7 mc.	I1AIV	43	13	17,080
	I1AKL	24	7	2,263
14 mc.	I1AIV	55	25	33,840
	I1AKL	30	9	4,914
28 mc.	I1AKL	20	14	4,216
	I1AIV	15	12	2,079

NEW ZEALAND

14 mc.	ZL4KB (ZL4KL, ZL4DU)	31	19	24,850

VIRGIN ISLANDS

All bands	KV4AA (KP4KD)	23	17	14,840

YUGOSLAVIA

All bands	YU1CAB (YU1CAG)	76	20	48,288

* Calls in parentheses are additional operators.

North America—Single Operator Stations

UNITED STATES

	STATION	COUNTRIES	ZONES	SCORE
All bands	W1BIL	41	83	38,645
	W1AQT	28	16	4,004
	W1ODW	21	22	2,279
	W1RY	19	19	1,976
	W1DHO	21	17	1,520
7 mc.	W1BIL	15	28	6,364
	W1ZL	24	12	2,555
	W1RWP	12	9	777
	W1DHO	8	9	289
	W1ODW	3	4	42
14 mc.	W1AZY	44	21	14,560
	W1BIL	17	42	8,201
	W1AQT	15	7	1,364
	W1ODW	10	10	540
	W1RY	10	10	520
	W1DHO	10	6	256
28 mc.	W1BIL	9	13	588
	W1RY	9	9	468
	W1NLM	9	8	374
	W1ODW	8	8	320
	W1DHO	3	2	35
All bands	W2CJM	42	23	8,840
	W2DJT	37	26	6,552
	W2EQS	39	25	5,952
7 mc.	W2HZY	45	21	14,388
	W2OTC	33	15	6,096
	W2WC	28	15	4,300
	W2EQS	18	10	1,176
	W2DJT	12	7	551
	W2CJM	7	4	99

	STATION	COUNTRIES	ZONES	SCORE
	W3PDX	7	6	247
	W3LOE	5	5	120
	W3AOO	2	2	24
	W3YMR	3	3	12
	W3ALB	2	2	8
All bands	**W4KFC**	**127**	**60**	**153,901**
	W4TO	**89**	**47**	**43,520**
	W4CKB	**77**	**47**	**34,348**
	W4QED	12	11	713
7 mc.	**W4BRB**	**50**	**21**	**26,412**
	W4KFC	**36**	**17**	**8,162**
	W4VE	**28**	**18**	**4,140**
	W4TO	22	15	2,664
14 mc.	**W4KFC**	**70**	**28**	**58,898**
	W4AH	**53**	**28**	**37,827**
	W4TO	**61**	**27**	**19,976**
	W4CKB	36	20	8,232
	W4IZR	30	20	7,300
	W4OM	35	15	6,650
28 mc.	**W4CKB**	**21**	**13**	**2,448***
	W4KFC	**21**	**15**	**2,448***
	W4EEO	**8**	**8**	**528**
	W4TO	**21**	**5**	**231**

* Tie for first place.

All bands	**W5ZD**	**78**	**32**	**38,610**
	W5DFT	**42**	**33**	**14,325**
	W5OLG	**9**	**6**	**390**
7 mc.	**W5GEL**	**39**	**21**	**8,760**
	W5ZD	**19**	**11**	**2,460**
	W5DFT	**11**	**10**	**1,050**
14 mc.	**W5ZD**	**59**	**21**	**21,520**
	W5DFT	**24**	**17**	**4,633**
	W5OLG	**3**	**2**	**25**
28 mc.	**W5DFT**	**7**	**6**	**364**
	W5OLG	**6**	**4**	**210**
All bands	**W6MVQ**	**101**	**56**	**90,746**
	W6IBD	**88**	**44**	**74,932**
	W6AM	**83**	**51**	**66,330**
	W6ATO	55	39	29,422
	W6BPD	61	42	23,690
	W6DFY	45	35	22,560
	W6QD	49	35	17,724
	W6LER	48	30	15,444
	W6QDE	39	24	14,364
	W6BJU	39	29	9,044
	W6BYH	22	21	4,816

W4KFC 153,901 and 317 contacts, 29 different zones, 73 different countries. Vic, who has the highest total in N. A., hastens to add that the photo was taken before he learned ZA2AA and CZ2AC were NG. Rig is a pair of 4-125As with 700 watts input and the receiver is a BC-348 plus a Selectoject. Beam is a two element rotary for 10 and 20 and is about 35 feet off the ground. For 7 mc its an end-fed full wave.

IIAIV 131,215 points and 373 contacts. This Multiple operator station with IIPL as second op. did a very good job. One rig was used having an 814 in the final with a little over 100 watts input. As "Pep" puts it they used a veteran and bombed BC-312 surplus receiver with a homemade converter for 28 mc. The antenna for 14 mc. is a quarter wave vertical and a 66 foot dipole with tuned center feeders is used for the other bands.

	STATION	COUNTRIES	ZONES	SCORE
14 mc.	**W2EMW**	**42**	**22**	**13,312**
	W2TXB	**34**	**14**	**6,820**
	W2CJM	**26**	**11**	**3,663**
	W2PZM	25	12	3,034
	W2EQS	13	8	672
	W2DJT	10	9	456
	W2PXR	9	7	432
	W2QKJ	11	5	432
	W2JB	9	6	315
28 mc.	**W2DJT**	**15**	**10**	**1,275**
	W2CJM	**9**	**8**	**476**
	W2EHQ	**8**	**6**	**364**
	W2EQS	7	8	285
	W2NHH	3	3	42
All bands	**W3LOE**	**115**	**52**	**94,021**
	W3GRF	**93**	**46**	**72,558**
	W3JKO	**89**	**51**	**46,900**
	W3PDX	78	42	37,920
	W3AOO	76	37	31,075
	W3ALB	58	30	14,872
	W3FQB	39	26	7,475
	W3YMR	29	17	5,060
	W3SEI	17	9	1,378
	W3OOU	19	13	1,088
	W3ADZ	11	7	612
7 mc.	**W3LOE**	**40**	**19**	**10,325**
	W3NKI	**36**	**23**	**9,086**
	W3BXE	**37**	**18**	**7,645**
	W3ORU	34	18	6,864
	W3GRF	28	16	4,180
	W3PDX	26	16	3,864
	W3AOO	26	13	2,652
	W3JKO	21	13	1,870
	W3YMR	29	17	5,060
	W3ALB	6	5	132
	W3FQB	6	4	100
	W3ADZ	1	1	6
14 mc.	**W3JTC**	**76**	**29**	**66,675**
	W3LOE	**70**	**28**	**36,848**
	W3GRF	**48**	**22**	**25,460**
	W3AOO	48	22	14,070
	W3PDX	45	20	13,325
	W3ALB	50	23	11,315
	W3JKO	44	22	12,012
	W3IBT	29	12	6,314
	W3NCF	29	18	5,358
	W3YMR	18	8	2,366
	W3FQB	20	12	1,824
	W3SI	17	9	893
	W3ADZ	10	6	496
	W3LVJ	5	5	110
	W3KQD	4	5	81
28 mc.	**W3JKO**	**24**	**16**	**3,920**
	W3GRF	**17**	**8**	**1,225**
	W3FQB	**13**	**10**	**1,104**

W8JIN 137,902 points and 273 QSOs. Jim's rig starts out with a 310-B into an 813 driving a pair of 250THs. Receiver is an HRO and the antenna layout consists of a 4 element wide spaced on a 32 foot tower for 28 mc, a 3 element wide-spaced on a 65 foot tower for 14 mc, and for 7 mc he has a ground plane, slanting doublets and a two-wire fixed beam on Europe. However, Jim says the ground plane works as well as the beam. It must, as he was second high in N. A.

	STATION	COUNTRIES	ZONES	SCORE
	W6NKR	20	21	3,280
	W6BIL	23	16	2,769
	W6YC	15	13	1,904
7 mc.	**W6DFY**	**26**	**19**	**6,300**
	W6IBD	**18**	**16**	**6,086**
	W6AM	**18**	**16**	**3,196**
	W6MVQ	16	14	3,180
	W6YAW	19	16	3,115
	W6BPD	15	12	1,215
	W6ATO	10	10	920
	W6QD	8	11	665
	W6QDE	5	5	460
	W6NKR	8	8	448
	W6BJU	7	7	336
	W6BYH	8	6	196
	W6BIL	5	4	90
	W6EPZ	3	4	77
	W6GTC	3	3	24
	W6YC	1	1	12
14 mc.	**W6PQT**	**67**	**30**	**45,105**
	W6MVQ	**71**	**30**	**43,935**
	W6EPZ	**69**	**30**	**41,382**
	W6IBD	71	28	39,204
	W6AM	53	23	27,284
	W6ATO	34	20	12,096
	W6QDE	34	19	12,084
	W6QD	41	24	11,245
	W6LER	34	20	8,415
	W6AUT	34	24	8,280
	W6BPD	34	20	7,560
	W6ALQ	21	17	5.434
	W6DFY	19	16	4,970
	W6BYH	16	13	2,842
	W6BJU	22	13	2,765
	W6BIL	18	12	1,830
	W6YC	13	11	1,344
	W6NKR	12	13	1,300
	W6DLR	4	4	80
28 mc.	**W6LER**	**13**	**10**	**1,035**
	W6AM	**12**	**12**	**1,008**
	W6MVQ	**14**	**12**	**962**
	W6BPD	12	10	946
	W6ATO	11	9	860
	W6BJU	10	9	570
	W6YC	1	1	12
All bands	**W7NLI**	**30**	**29**	**5,782**
	W7KIO	**19**	**17**	**2,448**
	W7LNG	**18**	**17**	**1,645**
7 mc.	**W7LNG**	**7**	**7**	**266**
	W7NLI	**6**	**7**	**234**
	W7KIO	**3**	**3**	**36**
14 mc.	**W7AHX**	**26**	**15**	**3,116**
	W7NLI	**21**	**19**	**3,040**
	W7AC	**26**	**18**	**3,036**
	W7KIO	15	13	1,652
28 mc.	**W7NLI**	**3**	**3**	**24**
	W7KIO	**1**	**1**	**6**
All bands	**W8JIN**	**131**	**60**	**137,902**
	W8PQQ	**115**	**47**	**87,642**
	W8JRG	**48**	**24**	**18,936**
	W8PM	31	20	4,131
	W8ICC	26	21	3,760
7 mc.	**W8JIN**	**38**	**20**	**8,236**
	W8PQQ	**33**	**20**	**5,936**
14 mc.	**W8JIN**	**78**	**28**	**56,498**
	W8PQQ	**82**	**27**	**46,761**
	W8HFE	**71**	**28**	**44,946**
	W8JRG	42	18	14,820
	W8AVW	18	12	1,920
	W8OBS	18	8	1,664
	W8ICC	16	12	1,316
	W8PM	18	11	1,247
28 mc.	**W8JIN**	**15**	**12**	**1,269**
	W8ICC	**10**	**9**	**627**
	W8PM	**11**	**7**	**612**
	W8JRG	6	6	192
All Bands	**W9LM**	**93**	**57**	**82,950**
	W9HUZ	**68**	**34**	**29,580**
	W9NII	**67**	**42**	**25,833**
	W9ABA	27	19	2,944
	W9FAU	20	17	2,220
	W9NH	15	16	930
7 mc.	**W9LM**	**22**	**17**	**4,719**
	W9NII	**15**	**12**	**1,404**
	W9HUZ	**9**	**7**	**368**
	W9ABA	10	7	357
	W9FAU	5	7	168
	W9NH	6	6	84
14 mc.	**W9LM**	**58**	**26**	**33,096**
	W9FID	**56**	**26**	**24,272**
	W9HUZ	**59**	**27**	**22,962**
	W9EXY	42	22	14,400
	W9NII	45	23	11,560
	W9ABA	17	12	1,247
	W9FAU	15	10	1,150
	W9NH	9	10	437
28 mc.	**W9LM**	**14**	**14**	**1,120**
	W9NII	**7**	**7**	**210**
All bands	**WØDAE**	**94**	**50**	**85,248**
	WØFGW	**35**	**25**	**8,820**
	WØGUV	**25**	**18**	**3,397**
	WØFID	11	12	805
	WØBRA	8	8	208
7 mc.	**WØDAE**	**23**	**15**	**3,458**
	WØGUV	**22**	**15**	**2,775**
	WØFGW	**2**	**4**	**60**
14 mc.	**WØDAE**	**63**	**26**	**42,987**
	WØERI	**46**	**23**	**14,421**
	WØFGW	**33**	**21**	**7,398**
	WØRSZ	11	8	779
28 mc.	**WØDAE**	**8**	**9**	**289**
	WØJZX	**4**	**4**	**80**
	WØGUV	**3**	**3**	**24**

CANADA

All bands	**VE1IM**	**24**	**17**	**5,125**
	VE1EK	**23**	**16**	**3,003**
	VE1CU	**11**	**11**	**836**
7 mc.	**VE1IM**	**7**	**5**	**348**
	VE1EK	**5**	**6**	**220**
	VE1CU	**2**	**3**	**80**
14 mc.	**VE1RP**	**20**	**10**	**2,400**
	VE1IM	**15**	**10**	**2,325**
	VE1EK	**15**	**8**	**1,104**
	VE1CU	2	2	24
28 mc.	**VE1CU**	**7**	**6**	**208**
	VE1EK	**3**	**2**	**45**
	VE1IM	**2**	**2**	**12**
All bands	**VE2NI**	**64**	**31**	**20,330**
7 mc.	**VE2NI**	**7**	**7**	**1,248**

	STATION	COUNTRIES	ZONES	SCORE
14 mc.	VE2BV	31	17	7,584
	VE2NI	31	14	5,310
	VE2WA	25	13	3,876
28 mc.	VE2NI	16	10	1,144
All bands	VE3IJ	34	20	6,210
	VE3AGX	29	17	3,956
	VE3API	18	13	1,829
	VE3DT	19	12	1,798
	VE3BBR	11	10	588
7 mc.	VE3AGX	10	9	551
	VE3DT	8	5	247
	VE3IJ	3	4	42
	VE3BBR	3	4	35
	VE3API	3	3	18
14 mc.	VE3IJ	31	16	5,123
	VE3AGX	19	8	1,539
	VE3API	15	10	1,400
	VE3DT	10	6	608
	VE3BBR	7	5	252
28 mc.	VE3BBR	1	1	4
	VE3DT	1	1	2
14 mc.	VE5QZ	28	14	4,452
All bands	VE7VO	39	28	21,909
	VE7WH	24	21	11,070
	VE7EH	21	22	10,836
	VE7KC	30	18	5,376
7 mc.	VE7EH	7	8	1,920
	VE7VO	8	9	1,462
	VE7WH	7	8	1,410
	VE7KC	4	4	64
14 mc.	VE7VO	30	18	11,563
	VE7WH	17	13	4,560
	VE7KC	23	11	3,298
	VE7EH	13	13	3,224
28 mc.	VE7KC	3	3	42
	VE7YR	2	2	12
14 mc.	VO6A	24	9	8,745

ALASKA

	STATION	COUNTRIES	ZONES	SCORE
All bands	KL7UM	26	14	7,920
7 mc.	KL7RZ	3	2	40
	KL7UM	3	2	40

W9LM 82,950 points. Hal uses for different amplifiers, those for 28, 7 and 3.5 mc. each use a pair of VT-127As while the 14 mc. unit has a pair of 250TLs. His common driver is a 32V1 and the receiver in use is a HQ-129X. The antennas used at W9LM are rotaries for each of the 10, 20 and 40 meter bands while a ground plane does a nice job on 80. The 40 meter rotary is fed by three resonant lengths of RG8U in parallel; giving a feedline of about 17 ohms.

	STATION	COUNTRIES	ZONES	SCORE
14 mc.	KL7UM	23	12	6,650
	KL7CZ	9	7	1,600
	KL7AGM	11	10	1,365
	KL7KQ	7	8	1,035

BAHAMAS

14 mc.	VP7NU	13	12	7,625

BERMUDA

14 mc.	VP9OO	12	11	4,669

CANAL ZONE

All bands	KZ5ES	28	25	19,557
	KZ5CW	12	10	1,694

COSTA RICA

All bands	TI2DL	15	14	2,146
	TI2PZ	9	9	2,142
7 mc.	TI2PZ	6	5	1,111
14 mc.	TI2DL	4	5	225
	TI2PZ	3	4	126
28 mc.	TI2DL	11	9	980

CUBA

7 mc.	CO2LN	4	5	450

GUANTANAMO BAY

All bands	KG4AD	25	20	7,290

HONDURAS

14 mc.	HR1AT	10	9	3,534

MEXICO

All Bands	XE1SA	9	12	966
28 mc.	XE1PO	29	21	10,700

PUERTO RICO

All bands	KP4JE	31	24	9,075

SWAN ISLAND

All bands	KS4AI	52	36	57,024
	KS4AC	44	33	39,655

TURKS & CAICOS ISLANDS

All bands	VP5BF	18	15	5,610

South America

ANTARCTICA

	STATION	COUNTRIES	ZONES	SCORE
All bands	VP8AJ	.8	11	3,078

ARGENTINA

All bands	LU6AX	15	15	1,740

BOLIVIA

All bands	CP1AQ	19	20	6,045

B AZIL

All bands	PY6DU	15	10	2,300
	PY2AFS	9	11	1,040
	PY1ANR	5	4	333
7 mc.	PY2AFS	3	4	161
	PY6DU	1	2	27
14 mc.	PY4IE	52	27	50,244
	PY6AJ	21	16	8,288
	PY1ARZ	8	9	2,771
	PY6DU	12	6	1,458
	PY1ANR	3	3	198
28 mc.	PY1AJ	47	20	12,395
	PY2AFS	2	4	108
	PY1ANR	2	1	18
	PY6DU	2	2	8

CHILE

All bands	CE3AG	123	62	338,180

ECUADOR

All bands	HC2OT	24	16	5,320

FALKLAND ISLANDS

All bands	VP8AI	45	33	49,686

PERU

All bands	OA4BR	43	40	89,274
14 mc.	OA4BR	22	17	23,244
	OA4J	13	15	6,760

URUGUAY

14 mc.	CX6AD	7	7	868
	CX1FY	5	5	420

VENEZUELA

	STATION	COUNTRIES	ZONES	SCORE
All bands	YV5BZ	20	14	4,250
14 mc.	YV5AE	19	13	12,864
	YV5BZ	19	13	3,904
	YV5EH	7	6	3,544
28 mc.	YV5BZ	1	1	6

Europe—Single Operator Stations

AUSTRIA

	STATION	COUNTRIES	ZONES	SCORE
All bands	OE13EG	61	22	20,252
	OE1KF	18	6	1,008
7 mc.	OE13EG	32	10	5,796
14 mc.	OE5CA	55	19	26,492
	OE1ZZ	41	17	15,776
	OE7PK	31	14	5,625
	OE1FF	36	11	5,405
	OE13EG	29	12	4,346
	OE5PP	26	10	3,876
	OE1KF	17	5	828

BALEARIC ISLANDS

	STATION	COUNTRIES	ZONES	SCORE
All bands	EA6AF	61	20	56,133

BELGIUM

	STATION	COUNTRIES	ZONES	SCORE
All bands	ON4QF	137	54	130,453
	ON4DB	70	39	35,970
	ON4SF	34	16	5,650
7 mc.	ON4QF	37	9	8,096
	ON4SF	11	5	640
14 mc.	ON4QF	63	27	33,030
	ON4WZ	31	14	4,500
	ON4SF	23	11	2,412
28 mc.	ON4QF	37	18	7,700

ON4QF 130,453 points and 326 contacts. Mick, who always seems to be infected with the DX bug has, done it again. He uses two receivers, an HRO-7R with a BC-453 and a Telefunken E52. Rig winds up with an LS50 pentode with about 65 watts input. Main antenna is a center fed Hertz cut for 3.5 mc. and has tuned feeders 66 feet long making it possible for use from 3.5 to 28 mc.

CZECHOSLOVAKIA

	STATION	COUNTRIES	ZONES	SCORE
All bands	OK1HI	113	46	90,471
	OK2SO	87	38	53,375
	OK3AL	84	31	36,815
	OK3SP	75	30	32,235
	OK3IT	66	32	22,246
	OK3DG	57	22	21,833
	OK1NS	57	18	13,200
	OK1RW	54	15	13,110
	OK2BDV	49	19	6,596
	OK1CX	45	14	5,015
	OK1VB	34	13	4,935
	OK1ZM	35	14	4,459
	OK2QK	32	11	3,182
7 mc.	OK3AL	41	11	8,736
	OK1HI	41	11	7,280
	OK2SO	33	9	3,948
	OK1SK	33	7	4,080
	OK1AW	24	6	1,890
	OK3SP	25	6	1,860
	OK1RW	24	5	1,764
	OK3DG	22	6	1,624
	OK1NS	20	5	1,025
	OK1AHA	15	5	880
	OK1CX	20	5	850
	OK2BDV	19	5	714
	OK1VB	13	3	560
	OK1ZM	11	5	368
	OK3IT	11	4	270
	OK1US	10	3	260
	OK1AHN	10	3	208
	OK1AEH	7	2	99
	OK2QK	5	2	42
14 mc.	OK1HI	52	20	27,072
	OK2SO	43	19	18,290
	OK3SP	47	21	15,980
	OK3DG	32	13	9,450
	OK1NS	37	13	6,750
	OK3IT	34	13	6,439
	OK1XQ	40	12	5,564
	OK1RW	30	10	5,080
	OK3AL	30	10	4,160
	OK2QK	27	9	2,448
	OK1ZM	22	7	1,885
	OK1VB	17	7	1,344
	OK1CX	22	6	1,176
	OK2BDV	20	6	1,040
	OK1UY	16	7	782
	OK1NA	12	8	400
28 mc.	OK3IT	21	15	2,592
	OK1HI	20	15	1,855
	OK3AL	13	10	1,127
	OK2SO	11	10	798
	OK2BDV	10	8	414
	OK1VB	4	3	98
	OK3SP	3	3	72
	OK1CX	3	3	54
	OK3DG	3	3	54
	OK1ZM	2	2	12

DENMARK

	STATION	COUNTRIES	ZONES	SCORE
All bands	OZ7BG	94	38	53,460
	OZ2E	14	11	5,814
7 mc.	OZ7BG	31	8	2,652
	OZ2E	14	4	666
14 mc.	OZ7BG	52	23	23,325
	OZ2E	26	7	2,541
	OZ8BN	15	5	640
28 mc.	OZ7BG	11	7	468

ENGLAND

	STATION	COUNTRIES	ZONES	SCORE
All bands	G3DCU	110	45	66,340
	G8KP	82	26	40,068
	G2VD	91	34	32,500
	G8IP	61	31	21,344
	G2QB	49	19	14,212
	G2AJB	61	25	13,674
	G3DES	51	20	12,922
	G3ATU	37	11	4,080
7 mc.	G5MP	32	6	5,396
	G2VD	29	6	2,450
	G8KP	27	7	2,244
	G2AJB	26	6	1,856
	G2QB	23	8	1,333
	G3DES	9	4	195
14 mc.	G2LB	74	29	71,174
	G3EYN	45	20	17,745
	G3DCU	42	19	17,263
	G8KP	44	11	15,125
	G8IP	32	19	8,670
	G8DA	31	14	7,740
	G2BW	39	16	7,315
	G3DES	35	11	7,084
	G2VD	40	14	6,858
	G2QB	26	11	6,142
	G2HFC	30	12	6,048
	G6NK	22	9	3,255
	G2AJB	24	11	2,765
	G3ATU	3	3	42
28 mc.	G3DCU	28	17	3,375
	G2VD	22	14	2,268
	G8KP	11	8	570
	G2AJB	11	8	418
	G3DES	7	5	156

FAROES

	STATION	COUNTRIES	ZONES	SCORE
14 mc.	OY3IGO	15	4	1,071

FINLAND

All bands	**OH2OP**	**75**	**37**	**31,808**
	OH5OE	**30**	**9**	**5,382**
	OH2TC	**28**	**14**	**1,974**
	OH6PT	32	10	1,722
	OH6NR	17	8	1,080
	OH6PK	12	5	374
7 mc.	**OH3NY**	**25**	**4**	**2,088**
	OH2OP	**21**	**7**	**1,764**
	OH5OE	**10**	**3**	**546**
	OH6PT	10	3	130
	OH6PK	7	3	100
	OH6NR	5	2	95
	OH2TC	4	2	24
14 mc.	**OH2OP**	**37**	**18**	**9,515**
	OH6OE	**32**	**12**	**4,092**
	OH2WI	**30**	**5**	**3,220**
	OH5OE	20	6	2,496
	OH6PT	22	7	899
	OH2UM	16	4	740
	OH2TC	16	5	525
	OH3NU	12	3	330
	OH6PK	5	2	48
28 mc	**OH2OP**	**17**	**12**	**1,392**
	OH2TC	**8**	**7**	**270**
	OH6NR	**2**	**1**	**6**

FRANCE

All bands	**F9BO**	**116**	**51**	**93.019**
	G3WT	**69**	**32**	**37,007**
	F8TM	**52**	**17**	**13,386**
	F8LD	40	17	10,260
	F9BB	47	19	7,194
	F9ND	42	17	6,903
	F8JD	16	16	3,680
	F8NV	13	7	1,540
	F9QP	8	6	224
7 mc.	**F9BO**	**33**	**7**	**2,960**
	F8TM	**26**	**7**	**2,904**
	F9BB	**15**	**4**	**722**
	F8LD	10	3	364
	F9ND	9	3	132
	F3WT	6	4	120
	F8NV	2	1	9
14 mc.	**F9BO**	**60**	**27**	**34,974**
	F9RO	**40**	**16**	**9,968**
	F3WT	**35**	**13**	**7,152**
	F8LD	30	14	6,688
	F3QF	47	9	4,872
	F8TM	26	10	3,816
	F9ND	26	9	3,150
	F8NV	11	6	1,258
	F8JD	9	9	1,170
	F3AG	13	8	798
	F9BB	15	4	437
	F9QP	5	3	56
28 mc.	**F3WT**	**28**	**15**	**6,278**
	F9BO	**23**	**17**	**3,240**
	F9BB	**17**	**11**	**1,392**
	F8JD	7	7	700
	F9ND	7	5	192
	F9QP	3	3	54

GERMANY

All bands	**DL1FF**	**132**	**54**	**126,666**
	DL1FI	**112**	**50**	**77,760**
	DL1AU	**78**	**44**	**39,162**
	DL7DF	95	33	37,248
	DL1AV	76	33	36,079
	DL3DU	72	22	32,994
	DL1KB	52	34	16,942
	DL7BA	38	20	7,308
	DL3AB	32	15	5,217
	DL1YA	35	9	1,628
	DL7EK	9	3	144
7 mc.	**DL1FF**	**42**	**13**	**6.875**
	DL7DF	**32**	**7**	**2,808**
	DL1AV	**26**	**7**	**2,739**
	DL1FI	31	8	2.730
	DL1KB	23	10	2,046
	DL3DU	26	5	1,612
	DL1AU	17	8	1,275
	DL1YA	25	6	713
	DL6CL	9	2	242
	DL3AB	5	5	120
	DL7EK	8	2	110

	STATION	COUNTRIES	ZONES	SCORE
14 mc.	**DL1FF**	**67**	**29**	**46,848**
	DL1FI	**56**	**24**	**25,520**
	DL3DU	**46**	**17**	**18,837**
	DL7DF	**54**	**21**	**14,250**
	DL1AU	41	20	12,200
	DL6GC	40	17	8,664
	DL1AV	32	14	7,728
	DL3AB	27	10	3,663
	DL1KB	14	13	1,404
	DL1YA	10	3	182
	DL7EK	1	1	2
28 mc	**DL1FI**	**25**	**18**	**3,913**
	DL1AU	**20**	**16**	**2.820**
	DL1FF	**22**	**12**	**2,312**
	DL1KB	15	11	2,123
	DL1AV	18	12	1,600
	DL7DF	9	5	406

DL1FF, 126,666 points. Receiver is larger than rig, having 13 tubes plus 4 in the converter. Final p.a. input about 150 watts. Best antenna is a "60 mtr" long wire, but his 14 mc vertical is better for Africa.

GIBRALTAR

14 mc.	**ZB2I**	**17**	**9**	**4,966**

HUNGARY

All bands	**HA4SA**	**89**	**32**	**50,336**

ICELAND

14 mc.	**TF3SF**	**35**	**12**	**17,954**
	TF3AB	**26**	**11**	**6,105**
	TF3MB	**19**	**7**	**4,264**

IRELAND, NORTH

All bands	**GI4NU**	**70**	**22**	**28,980**
	GI2FHN	**34**	**16**	**6,000**
7 mc.	**GI4NU**	**29**	**7**	**2,808**
	GI3GQB	**12**	**3**	**645**
	GI2FHN	**8**	**2**	**160**
14 mc.	**GI4NU**	**40**	**14**	**12,636**
	GI2FHN	**23**	**11**	**3,230**
28 mc.	**GI2FHN**	**3**	**3**	**54**
	GI4NU	**1**	**1**	**6**

ITALY

All bands	**I1IT**	**70**	**36**	**19,186**
	I1AHV	**62**	**19**	**16,200**
	I1ER	**13**	**10**	**713**
7 mc.	**I1AHV**	**26**	**6**	**2,336**
	I1IT	**18**	**6**	**888**
	I1BJG	**8**	**2**	**160**
	I1ER	**1**	**1**	**2**
14 mc.	**I1KN**	**57**	**25**	**27,798**
	I1AHV	**36**	**13**	**6,223**
	I1IT	**33**	**16**	**3,871**
	I1KE	20	11	2,511
	I1ER	1	1	6
28 mc.	**I1IT**	**19**	**14**	**2,145**
	I1ER	**11**	**8**	**513**

LUXEMBOURG

All bands	**LX1JW**	**28**	**14**	**2,268**

NETHERLANDS

	STATION	COUNTRIES	ZONES	SCORE
All bands	PAØVB	62	29	24,297
	PAØWAC	27	10	1,073
7 mc.	PAØYJ	28	6	2,754
	PAØVB	22	7	1,218
	PAØTA	11	3	574
	PAØUL	14	4	324
	PAØPLM	10	3	280
	PAØWAC	2	1	6
14 mc.	PAØKW	36	17	13,515
	PAØVB	33	16	9,996
	PAØPZW	35	17	7,956
	PAØWAC	25	9	918
28 mc.	PAØVB	7	6	273

NORWAY

	STATION	COUNTRIES	ZONES	SCORE
All bands	LA6U	89	35	35,384
7 mc.	LA6U	37	11	5,288
14 mc.	LA6U	45	20	14,040
	LA6PB	32	9	6,396
	LA9T	11	5	672
28 mc.	LA6U	7	4	209

POLAND

All bands	SP1JF	84	28	48,720
	SP1SJ	34	13	3,525
7 mc.	SP1JF	34	7	4,387
	SP1SJ	11	3	266
14 mc.	SP1JF	47	18	20,930
	SP1SJ	16	5	735
28 mc.	SP1SJ	7	5	162
	SP1JF	3	3	36

PORTUGAL

All bands	CT1SQ	45	25	25,480
	CT1AL	39	11	6,480
	CT1PM	31	11	6,258
	CT1HT	16	5	1,680
7 mc.	CT1SQ	14	7	2,184
	CT1HT	14	4	1,224
	CT1PM	13	5	954
14 mc.	CT1SQ	20	11	4,743
	CT1PM	18	6	2,304
	CT1HT	2	1	36

HB9EU 144,007 points. Rig uses a 304TL in final, so arranged that Rudy can switch in either half or both. Receiver is an S-40 with home built improvements. Antennas are a small Vee for PY and a 40 meter zepp for W.

ROUMANIA

All bands	YO3RF	81	26	31,137
	YO3GH	44	16	13,680
7 mc.	YO3RF	32	7	4,218
	YO3GH	9	4	260
14 mc.	YO3GH	35	12	9,776
	YO3RF	41	15	9,240
28 mc.	YO3RF	8	4	216

SAAR

	STATION	COUNTRIES	ZONES	SCORE
All bands	9S4AX	43	19	10,478

SARDINIA

All bands	IS1AHK	62	29	34,853
	IS1FIC	48	14	7,874
7 mc.	IS1AHK	22	7	3,219
	IS1FIC	26	7	1,947
14 mc.	IS1AHK	40	22	16,864
	IS1FIC	22	7	1,972

SCOTLAND

All bands	GM6RV	64	26	27,857
	GM3EST	50	16	13,992
	GM3CSM	35	19	9,720
7 mc.	GM3EST	20	4	1,944
	GM6RV	24	6	1,380
14 mc.	GM6RV	35	15	12,700
	GM3CSM	26	12	5,776
	GM3EST	30	12	5,502
28 mc.	GM3CSM	9	7	448
	GM6RV	5	4	114

SPAIN

All bands	EA1AB	56	24	64,880
	EA3HE	77	30	35,417
	EA4CR	37	15	6,292
	EA1BZ	23	10	5,610
7 mc.	EA1AB	19	9	7,280
	EA3HE	22	6	2,212
	EA4CR	18	4	902
14 mc.	EA1AB	37	15	28,652
	EA3HE	34	15	9,408
	EA1BZ	17	7	2,928
	EA4CR	2	2	40
28 mc.	EA4CR	17	9	1,820
	EA3HE	21	9	1,770

SWEDEN

All bands	SM5IZ	76	26	30,702
	SM7QY	81	28	23,871
	SM3ARE	61	20	18,144
	SM7ACO	49	14	9,450
	SM5AYC	16	4	760
	SM5AFU	12	6	396
7 mc.	SM5IZ	28	7	2,275
	SM7QY	26	5	1,519
	SM3ARE	19	4	943
	SM7ACO	17	3	660
	SM5AYC	14	3	612
	SM5AFU	3	2	45
14 mc.	SM5IZ	43	19	15,812
	SM5DZ	40	15	12,045
	SM5AQV	36	14	9,100
	SM7QY	45	16	8,479
	SM3ARE	33	10	6,966
	SM5AQW	34	14	6,528
	SM7ACO	32	11	5,031
	SM5ARL	21	8	2,233
	SM5AFU	12	6	396
	SM5ANY	11	4	360
	SM5HT	8	4	240
	SM5LL	4	4	96
	SM5AYC	2	1	6
28 mc.	SM7QY	10	7	527
	SM3ARE	9	6	315
	SM5UH	2	2	16

SWITZERLAND

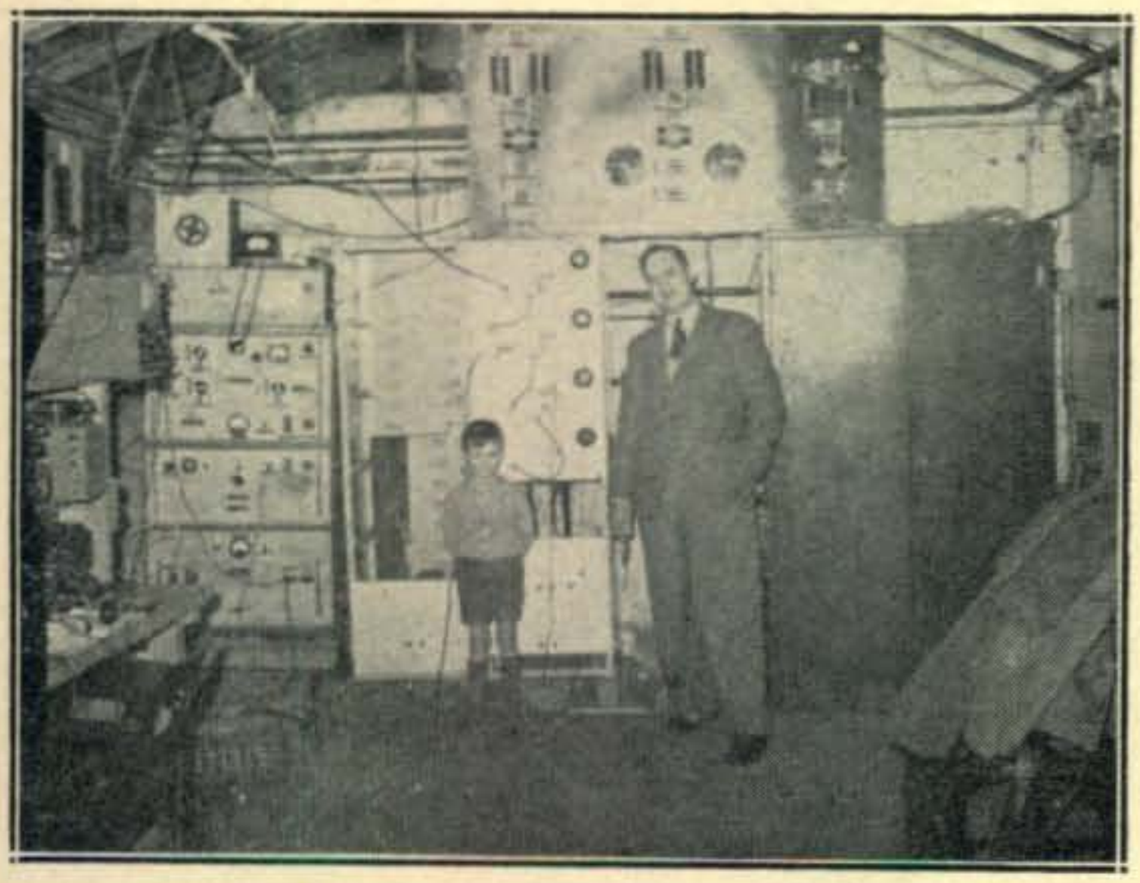
All bands	HB9EU	137	60	144,007
	HB9BJ	51	27	31,980
	HB9CI	28	11	6,708
	HB9JK	31	11	3,486
7 mc.	HB9EU	49	14	14,994
	HB9BJ	12	5	425
	HB9CI	13	2	240
	HB9JK	9	4	221
14 mc.	HB9EU	59	28	33,060
	HB9BJ	31	13	9,900
	HB9CI	15	9	3,744
	HB9JK	21	6	1,701
28 mc.	HB9EU	29	18	5,311
	HB9BJ	8	9	340
	HB9JK	1	1	6

TRIESTE

	STATION	COUNTRIES	ZONES	SCORE
All bands	I1BCB	79	32	40,626
	I1AXG	48	13	8,174
7 mc.	I1BCB	21	7	2,352
	I1AXG	18	5	1,035
14 mc.	I1BCB	46	14	13,980
	I1AXG	30	8	3,382
28 mc.	I1BCB	12	11	1,568

WALES

All bands	GW3ZV	121	51	121,948
	GW5SL	78	37	34,075
	GW3JI	65	22	30,102
7 mc.	GW3ZV	37	13	6,750
	GW5SL	28	8	3,348
	GW3JI	27	7	2,176
14 mc.	GW3ZV	79	34	63,393
	GW3JI	38	15	14,946
	GW5SL	35	18	8,639
28 mc.	GW5SL	15	11	1,274
	GW3ZV	5	4	117



GW3ZV 121,948 points and 329 contacts. Receiver is a single selectable side-band job which gives better than 120 db at 1.2 kc. This plus a band pass audio filter with three position switch for 1.2 kc, 800 and 150 cycles pretty much keeps John on cw. Rigs consist of separate p.a.'s for each band also two vfo's. Antennas: Vee beam for 3.5 and 7 mc. 4 element rotary for 14 mc. and a Sterba curtain for 28 mc. A 1250 foot long wire completes this dept.

Africa—Single Operator

ALGERIA

	STATION	COUNTRIES	ZONES	SCORE
All bands	FA8DA	94	37	14,625
	FA9RZ	67	25	41,032
	FA3VV	42	14	15,624
7 mc.	FA8DA	28	8	13,824
	FA9RZ	27	7	5,712
14 mc.	FA8DA	34	12	13,064
	FA3VV	30	8	8,398
	FA9RZ	24	11	6,125
28 mc.	FA8DA	32	17	10,143
	FA9RZ	16	7	2,369
	FA3VV	12	6	1,044

FRENCH EQUATORIAL AFRICA

14 mc.	FQ8AE	18	11	2,291

FRENCH MOROCCO

All bands	CN8EX	42	21	56,070
	CN8AG	10	6	3,504

FRENCH WEST AFRICA

All bands	FF8JC	41	26	27,805

GOLD COAST

All bands	ZD4AB	65	36	49,288

KENYA COLONY

	STATION	COUNTRIES	ZONES	SCORE
14 mc.	VQ4SGC	49	22	54,244
	VQ4HK	24	15	5,760

MADEIRA

14 mc.	CT3AA	18	10	10,332

MOZAMBIQUE

14 mc.	CR7AQ	16	11	2,349
	CR7CI	13	9	946

NORTHERN RHODESIA

All bands	VQ2GW	64	40	48,568

PORTUGUESE GUINEA

14 mc.	CR5AC	7	9	5,312

SOUTHERN RHODESIA

All bands	ZE3JP	52	23	46,575
14 mc.	ZE3JP	23	11	8,296
	ZE2JH	9	12	3,087
	ZE3JO	15	10	2,025
28 mc.	ZE3JP	29	12	14,457

TANGANYIKA

	STATION	COUNTRIES	ZONES	SCORE
All bands	VQ3SS	44	25	35,880

TANGIERS

All bands	EK1AO	117	50	263,025

UNION OF SOUTH AFRICA

All bands	ZS6DO	78	37	59,110
	ZS1BK	11	9	860

Asia-Single Operator Stations

ARABIA

All bands	HZ1KE	99	49	133,200

CEYLON

All bands	VS7NG	9	8	544

HONG KONG

All bands	VS6AE	32	20	8,528

INDIA

All bands	VU2JP	61	26	59,769
	VU2LJ	34	19	5,77
7 mc.	VU2JP	1	1	4

EK1AO 263,025 points and 547 QSOs. This old timer who many of us will remember as EAR96, EA4AO and EK4AO still punches a wicked key. Receiver, since photo was taken, is now a Super Pro with FL8-A audio filter. Rig covers from 28 to 1.7 mc. and uses a single 805 in the p.a.

	STATION	COUNTRIES	ZONES	SCORE
14 mc.	VU2JP	60	26	58,824
	VU2LJ	23	14	2,664
28 mc.	VU2LJ	11	5	592
	VU2JP	1	1	2

ISRAEL

All bands	4X4RE	138	47	369,075
	4X4BX	137	47	293,296
	4X4DF	45	17	27,032
7 mc.	4X4BX	41	13	38,070
	4X4RE	41	9	26,800
	4X4DF	18	4	3,894
14 mc.	4X4RE	66	25	101,738
	4X4BX	63	19	53,054
	4X4BM	39	15	19,278
	4X4DF	27	13	10,360
28 mc.	4X4RE	31	13	15,006
	4X4BX	33	15	11,616

Cal Graf, JA2FM, was somewhat handicapped since JA's were restricted to 20 and 10, but he made out OK. 90 watts input to a Stancor ST-202A, feeding an "all-band" 80 meter half-wave antenna through 300 ohm line.

JAPAN

All bands	JA2FM	32	21	16,377

MALAYA

All bands	VS1DZ	27	43	33,320

TURKEY

All bands	TA1AT	56	13	31,671

Oceania—Single Operator Stations

AUSTRALIA

All bands	VK2EO	66	40	60,738
7 mc.	VK2EO	3	5	176
14 mc.	VK2EO	54	27	41,958
	VK2DI	50	28	11,700
	VK2PV	35	20	10,285
	VK2GW	28	17	4,860
	VK2AND	10	11	966
28 mc.	VK2EO	9	8	561
All bands	VK3XK	45	29	36,704
	VK3XB	10	10	1,040
7 mc.	VK3XK	8	7	1,612
	VK3XB	1	2	18
14 mc.	VK3XK	36	19	20,020
	VK3XB	9	8	782
	VK3KS	3	3	30
28 mc.	VK3XK	3	3	48
All bands	VK5BO	59	32	61,692
All bands	VK6RU	55	35	36,630
14 mc.	VK6RU	37	20	14,022
	VK6AS	8	7	315

GILBERT ISLANDS

	STATION	COUNTRIES	ZONES	SCORE
14 mc.	VR1C	24	21	22,905

HAWAII

All bands	KH6IJ	74	51	162,625
	KH6BA	27	37	14,400
	KH6AEH	33	36	14,145
7 mc.	KH6IJ	12	11	12,259
	KH6ZG	14	13	7,452
	KH6WW	3	5	1,064
	KH6BA	3	4	525
	KH6AEH	2	3	150
14 mc.	KH6IJ	50	28	50,700
	KH6PM	40	24	44,224
	KH6CD	36	23	22,420
	KH6LG	32	19	13,923
	KH6AAQ	29	21	13,000
	KH6BA	34	19	8,745
	KH6AEX	41	23	8,192
	KH6AEH	17	17	2,448
	KH6WW	3	3	318
28 mc.	KH6AEH	14	16	3,090
	KH6IJ	12	12	2,832

JAVA

14 mc.	PK1TM	31	19	10,700

MARSHALL ISLANDS

14 mc.	KX6AA	41	25	25,014

NEW GUINEA, NETHERLANDS

14 mc.	PK7NL	24	17	9,348

NEW ZEALAND

All bands	ZL1MB	72	44	144,884
	ZL1MQ	38	34	42,336
	ZL1HY	28	26	9,612
7 mc.	ZL1MB	13	11	7,920
	ZL1MQ	6	7	3,445
	ZL1HY	2	4	522
14 mc.	ZL1MB	54	28	74,210
	ZL3OA	53	25	56,940
	ZL4GA	50	26	40,660
	ZL1MQ	23	18	12,054
	ZL3AB	31	18	10,927
	ZL1HY	23	18	3,321
	ZL3CP	20	15	2,940
28 mc.	ZL1MQ	9	9	522
	ZL1MB	5	5	140
	ZL1HY	3	4	91

SAMOA, WESTERN

14 mc.	ZM6AK	23	17	14,560

SUMATRA

All bands	PK4DA	34	28	8,680

Thanks to the following for sending in logs for checking purposes: W2EVK, W2AIY, W2FF, W3JO, W3HH,

(Continued on page 59)

ZL1MB 144,884 points and 464 QSOs. Slim uses an English Eddystone receiver, while the antennas consist of a 132 foot zepp and a 555 foot Vee beam and Sterba curtain on USA. This, of course, accounts for some of the signal reports he receives out of us.

The Monitoring Post

gleaned by THE BRASSPOUNDER

PLANNING IN CIVIL DEFENSE took a long stride on May 18 when representatives of ten northeastern states met at the request of Col. Lawrence Wilkinson, Director of the New York State Civil Defense Commission. The conference was called for the purpose of reaching an agreement by the ten states with a view to minimizing interference in using the frequencies earmarked by the FCC for civil defense amateur radio operations. Where local CD communications nets are operating in different states, yet geographically close, QRM could cause failure to accomplish necessary communications if arbitrarily chosen frequencies were the same, or even close to one another. After permanent sub-committees had been appointed to study frequencies from the Disaster Communications Service band to, and including 225-mc, reports of the committee were adopted unanimously. Other subjects discussed were mutual assistance, standard operating procedure, intra-state and inter-state communications, and manner of conducting drills.

Such planning will bring about successful civil defense amateur operation at all levels and should be adopted by all state civil defense organizations, for radio transmissions know no bounds. At the New York conference it was agreed that should any one of the participating states be affected by enemy action, all the other states in the area would refrain from transmissions, monitor frequencies of control stations, and transmit only when called by the affected state or area. This, once again, brings to the fore the importance of listening during emergencies, rather than transmitting. Until there is something to transmit, unnecessary signals will do nohing but cause confusion. Another decision reached was that the net control station in the state affected would designate which station would be the net control for all operations pertaining to the particular emergency.

Other such regional conferences are suggested. They will go a long way toward unification and understanding in civil defense amateur radio operation, and bring about the most economical use of the limited frequencies available for this work. Among those present, other than non-amateur official representatives, were: *W1NZR, W1NJM, W1LKF, W2QGH, W2BQR, W2OUT, W2BGO,* and *W3DB*. LKF, VQR, and OUT were appointed permanent chairmen of their respective sub-committees.

W3CUL was seen on the Laraine Day TV Show after being selected as the most deserving person in her neighborhood. CUL, Mary (Mae) Burke, of Folsom, Pa., is credited with handling thousands of holiday messages for GIs, sacrificing her own Christmas holiday to bring cheer to the families of the boys away from home. The show was seen in 28 cities across the country. . . . Civilian Defense Controller Tom Lawrence had great praise for the ten-meter gang after an emergency test held in Toronto recently . . . . The Atlanta RC monthly, "The Atlanta Ham," describes the CD operation in that city—four civil defense control centers with a fleet of mobiles in operation throughout the city will give good coverage. . . . One-cent postage stamps on QSLs for Canada will not reach their destination—the rates have gone up.

Don't forget the dates of the Army and Air Force maneuvers—Aug. 6 to Sept. 7. During this period the hams in the east have been asked to voluntarily keep the freqs between 3700 and 3900 kc clear of ham signals to permit uninterrupted communications by the troops concentrated in North and South Carolina.

"AFARS Affairs," an extremely interesting quarterly periodical of the Air Force Amateur Radio System of Canada, made its debut recently with a sincere message to all AFARS members from Chief Controller E. A. D. Hutton, A description of AFARS is given, a complete listing of member stations, news from all five areas, and photos of squadron controllers, which include Steve Jones, a retired flying officer, formerly VE3CT, SJ, and AUU; *VE3BMG,* whose son, *VE3DEN* is an AFARS member; *VE3QB, VE1OU,* and Don Leitch. The function of AFARS is to provide aid to aircraft in distress, and aid in any necessary circumstance, particularly in regard to shipping in distress in Canadian coastal waters.

Well worth copying from SARA News, monthly organ of the Schenectady ARA, is the following: "Lost, Strayed or Stolen . . . The two-meter enthusiasts have been dealt a mortal blow by WRGB, the local TV station. As two-meter men well know, the one reliable signal on two has been the second harmonic of WRGB, which came exactly at 143.5 mc. NO MORE . . . NO MORE . . . WOE, OH, WOE. WRGB has seen fit to eliminate their second harmonic. Bob Zecher, *W2YIK,* spent over an hour trying to find out what was wrong with his two-meter receiver, because he could not get WRGB's harmonic. He finally decided WRGB was no longer transmitting a second harmonic, and he called the station to confirm this. Evidently, they had been interfering with some government channel, so—presto—no second harmonic."

W3OHI, who got his first ticket only three years ago, has spent many more years than that pounding brass. He was an op in the Signal Corps back in 1912. . . . *VE1JD* has taken to DX lately and has a good start with 32 countries, 28 of which

(Continued on page 59)

Conducted by LOUISA B. SANDO, W5RZJ*

JULY—and that means the National ARRL Convention at Seattle, Washington. Scheduled for the 27-29th, you still have time to make arrangements to attend if you haven't already done so. Added enticement is the Seattle Centennial which opens the following week. The Convention Committee is planning a bang-up affair so don't miss it if you possibly can get there.

One of the novel features is the Convention train being run from Chicago to Seattle, leaving Chicago on July 23rd. Equipped with 115 v a.c. and special antennas, it will really be a "ham special" and the itinerary includes some extra sightseeing side trips in the Rocky Mountains in Montana.

But to get down to details of special interest to the YLs. If you get there on Friday, the 27th, registration is at the Olympic Hotel. There will be a golf tournament in the a.m. and tours to radio stations and around the city.

On Saturday registration is at the Civic Auditorium. Then for YLs especially there will be a boat cruise from Lake Union through the government locks to Puget Sound and down to Tacoma and back. Luncheon will be served during the cruise, points of interest described, and there will be prizes and entertainment, including a fashion show if all details can be worked out. For the landlubbers who don't wish to cruise, there will be a tea and fashion show, card games and other activities at the Auditorium.

At 6 p.m. Saturday station KOMO will conduct a half hour broadcast from the stage of the Auditorium. During the evening there will be code contests (using both stick and mill) for both the YLs and OMs, with separate prizes for the YLs. At 9 p.m. there will be a dance with a fifteen piece orchestra. Sandwiched in at intervals will be prize drawings. We hear these will be numerous and will include 50 airplane tickets for flights over the area. The night's activities will wind up with an initiation into the Royal Order of the Woof-Hong.

On Sunday there will be a special YLRL breakfast (dutch) with prizes for the oldest and youngest YL, for the one coming the greatest distance, etc. A trophy, donated by the West Seattle Amateur Radio Club, will be top prize for a radio quiz contest.

Following the breakfast there will be the mobile contest and judging, tours, view of the world's fastest speed boat on Lake Washington, technical meetings and movies. The banquet and awarding of trophies is set for 6 p.m.

For those with jr. ops, there will be a nursery available. There may be a small charge for this service, but they hope to include it as part of the registration fee. This is $7.50 for pre-registration, and $8.50 after July 1st, and is all-inclusive.

W7LCS, Toddy Nye, has been selected as chairman for the YL activities. "We expect this to be the best convention ever held," says Toddy. "The farthest away YL we've heard from is

F3YL, Michelle Herbet.

W3CDQ, with several other gals from there to come via Chicago on the special train. We expect all the Oregon gals and lots from Washington, Montana, Idaho and California." W7JFB, KEU, NWT, GSR and FWR will all lend a helping hand. W7IHJ will have charge of the boat cruise and point out places of interest, while W7JWC will have open house for YLs from 1 to 3 p.m. each day.

First District YLRL Meeting

A get-together that drew so many YLs it was practically a convention was held in Brookline (Mass.) on April 7th. Meeting for dinner and much rag-chewing were W1FTJ, Dot; W1RTB, Nell; W1BCU, Peg; W1HIH, Ronnie; W1RYJ,

Address all correspondence to 216 North Pine Street, Albuquerque, New Mexico.

Esther; W1KTG, Beatrice; W1MVX, Ruth; W1MCW, Lou; W1SLQ, Sylvia; W1SYL, Mary; W1NUO, Tisha; W1PIG, Edith; W1SAJ, Marguerite; W1MDV, Lou; W1SCS, Ruthe, and W1QON, Eleanor.

"We had simply a wonderful time," reports W1QON. "The girls were delighted to meet for face-to-face rag-chews and there was such an enthusiastic spirit about the whole affair that they have requested a repeat performance in six months."

Two Boston papers sent reporters and photographers. Each YL told who she was, gave her call, QTH, amateur interests, hobbies, etc. The *Boston Sunday Herald* the following day carried a write-up and FB photos of some of the gals.

W1QON, W1SCS and W1NUO are members of the Deep Sea Dragnet. Meeting at noon daily Monday through Friday the Dragnet handles messages regarding sickness, death and other news from people behind the Iron Curtain.

We're sorry to hear that under doctor's orders W1SCS has had to give up the editorship of *YL Harmonics*. Thanks from all of us for your work on it, Ruthe, and take care of yourself.

W1RTB, Nell Waterman, is taking over the Editor's job for the remainder of the year. Since Nell had been D/C for the first district she has had to give up this work, but W1MCW, Lou Littlefield, is taking over the job for the remainder of the term.

At the same time we hear YLRL Secretary-Treasurer W4HWR is on her way overseas. Her OM is an Army chaplain so no telling where Hilda will end up. Let's hope it's where she can get a rig on the air. Finishing out the year as Secretary will be W1BCU, Peg Wells. For YLRL membership or other matters, address W1BCU at 343 Fisher Street, Walpole, Massachusetts.

F3YL

Among the newer DX members to join YLRL is F3YL, Michelle Herbet, who was introduced to the club by PAØZC. Her QTH is Authie (Somme), 150 km. north of Paris, where her OM directs a textile mill. Michelle got her license in May a year ago and since then has been operating phone on 40 and 80 using her OM's rig. She has been waiting for her own rig to be completed and then will be on 20 meters, for which they have a rotary. She uses an SX28A receiver.

"My OM, F8BO, introduced me to ham radio," writes Michelle. "He has been licensed since 1937 and was one of the youngest to get his ticket. But I cannot give too much time to my hobby as I have three children—Paul-Joel 6 years old, Alain-Patrick 3 years, and Marie-Chantal 2 years. These little ones create a world of QRM!"

YL of the Month

Our YL this month is from the "land down under"—Clarice Adams, VK3VB. Clarice has been on the air since 1948 and when we asked her "how and why" she replied, "Frankly, I was just sick to death of hearing the OM's receiver blaring forth and thought that if I did not take an interest in his hobby I would blow up and commence a little dismantling while he was out!"

VK3VB, Clarice Adams, YL of the Month.

Hi! Of course, once she began to really listen and become interested she caught the fever, too, and dug deeper into the handbooks. Since then VK3VB has been operating on 6, 10, 20, 40 and 80 meters running 50 watts to a pair of 807's, cathode modulated with 6V6s.

Clarice is another of these "wonder women" who find time to accomplish so much. Besides her hamming and keeping house for her OM and caring for their three children, two boys and a girl, she says: "By profession I am an accountant and during the day run my husband's office; also help a little in the production of educational films, shorts, etc. (her OM runs the Adams Film Service), mainly for government departments. I also am treasurer of one of our political party branches and president of an adult community group which works in conjunction with the grammar school which the kiddies attend." All this, and she adds, "I enjoy the work but enjoy even more the free Saturdays which my OM, the kiddies and I always spend out of doors. (How can one do all that and still have *free* weekends?!) Main activities are country hikes with barbecue meals, sailing on the bay, and in winter frequent weekends up in the snow areas."

That all sounds grand to us. We've always wondered what it would be like living "down under" and Clarice's description of life in VK-land is as interesting as hamming activities. She writes: "Our home is in Box Hill in the shire of Nunawading. (An aboriginal name meaning ceremonial ground. This area was one of the tribal meeting places and ceremonial grounds.) Box Hill is a suburb ten miles east of Melbourne. Nearby are orchard areas and we are fairly close to the ranges which surround Melbourne. It is high and we have a very good view. A few miles further on and one reaches the mountains of which we

(Continued on page 63)

Conducted by E. M. BROWN, W2PAU*

Late News Flash

The Gulf of Mexico has been spanned on two meters! On May 30, 1951, at about 9:45 p.m. EST W4HAD and W4LAW shared honors for the first real 144 mc DX work from the state of Florida. Both stations worked W5ONS, of Victoria, Texas, W5EM of Metairie, La. and W5MXJ of New Orleans. The distance from Tampa, Florida, to Victoria, Texas is 887 miles!

THE MONTH OF MAY, 1951, brought better-than-normal conditions to all of the v.h.f. bands. Top honors in the "Number of Openings" category should go to the six-meter band, which provided almost daily opportunities for working DX. "Short skip"—sporadic E—openings caused most of the excitement. We have overheard a few newcomers to the band expressing amazement at the tremendous signal strengths encountered during these openings, and at the ease with which DX can be hooked with low-powered transmitters. That's what the 50-mc gang have been trying to explain right along! When conditions are right even the simplest equipment will net many enjoyable QSOs. And conditions have been "right"—and will continue to be so—for a remarkably large percentage of the time during the spring and summer months. "Double hop" openings have produced transcontinental QSOs, literally thousands of sporadic E contacts in the thousand-mile class have taken place, and aurora skip has provided the "in between" stuff at 200 to 700 miles distance. Yes, six meters has much to offer. More details on those May openings later....

The Northern Lights also got into the act. Though they brought considerable action to the six-meter band, the headlines were made on two meters, where ionosphere transmission is a much rarer phenomena! On May first, during the late afternoon and early evening, auroral effects were prevalent over the whole northeast section of the country. The best 144-mc DX reported for this session was between W9UCH of Fort Wayne, Indiana, and W1IZY of Middleboro, Massachusetts. This contact covered about 740 miles, and represents a new state for each of the principals! (#19 for W9UCH, #15 for W1IZY. Speaking of new states, Ye Ed got #16 during this same opening, likewise thanks to W9UCH!) VE3RM of Ottawa was active and his QSO with W1IZY was, we think, one of the most northerly two-meter aurora contacts on record. Again, more details later.....

Tropospheric DX has been noted frequently during the past month—none of the record-breaking variety, but conditions were good enough to permit many QSOs out beyond the usual ground-wave working limit. This is the season for such openings—watch the weather maps, gaze into your crystal ball and don't miss the next big one!

Reports of 420 mc achievements continue to come in. W2QED, the 420 mc spark plug in the eastern Pa.-Southern New Jersey area, reports QSOs with W3OWW, 80 miles away in Stewartstown, Pa., on three occasions during the month.

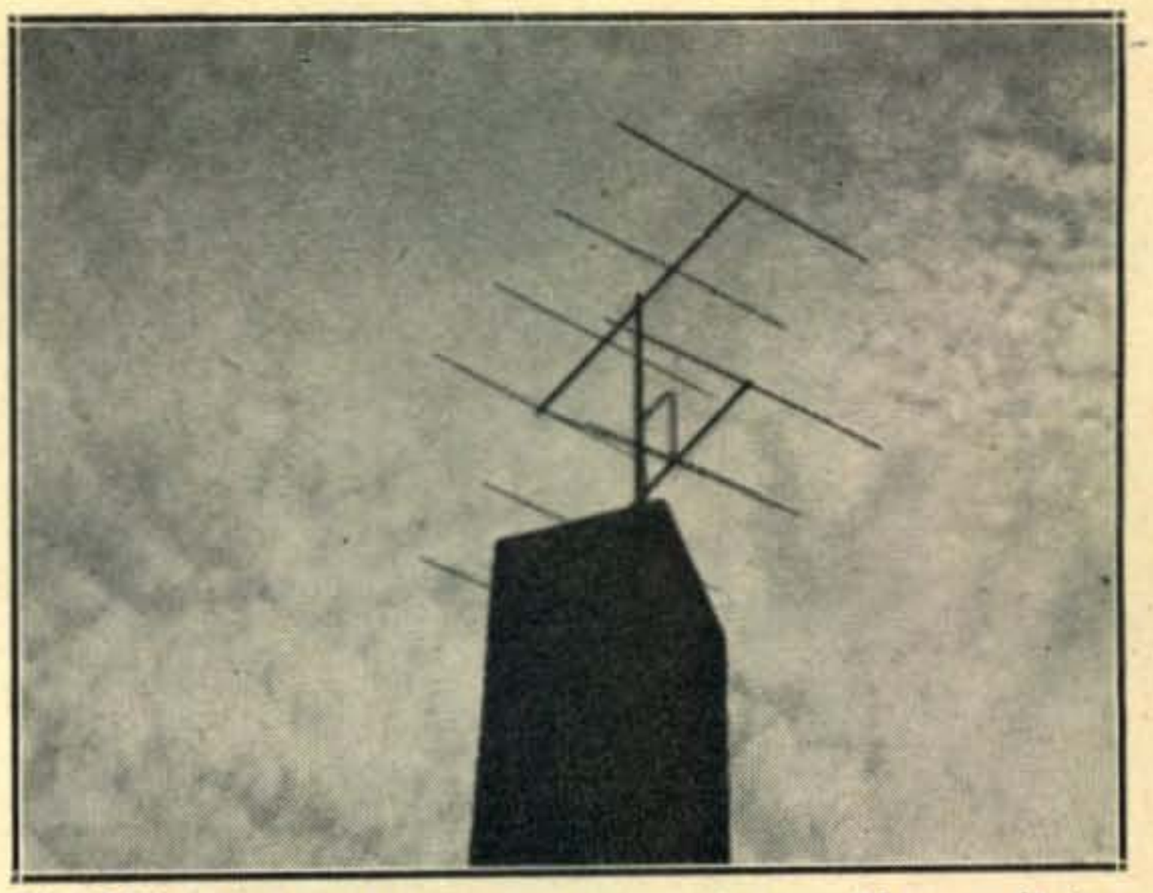
The operating position at DL4CK, Wiesbaden, Germany. Note the weather-warning instruments on the wall! All these DX QSLs are from two-meter operation. The present receiving set-up uses a Wallman Cascode converter into a BC-342.

W3BSV, at Salisbury, Md., approximately 90 miles distant, was worked four times. W3AIR, of Washington, D.C., was worked for the best DX of the month—close to 100 miles. K2AH and W2QED have been running tests on Saturday mornings at 8:00 a.m. EDST. To date, K2AH reports hearing Ken on three out of five tests. Not bad for a distance of over 100 miles! W2QED has not been able to copy George's signals as yet during this series of tests, but a continuing program of receiver improvement is under way, and Ken expects to have much more to report soon.

DL4CK claims the first "DL" QSO on the 420

**Associate Editor, CQ. Send all contributions to E. M. Brown, W2PAU, 88 Emerald Avenue, Westmont, Collingswood 7, New Jersey.*

mc band. Using a BC-625 tripling in the final, and 40 feet of twin lead to a 4-element Yagi aimed at DL3NQ at Weinheim (about 40 miles away), Jack hopefully fired up and was surprised to get a report of 5 and 7 on the first try. The QSO had to be cross band, as the German nationals are forbidden the privilege of transmitting on frequencies above 250 mc—this is a part of the Potsdam agreement, according to DL4CK. A two-way cross-band circuit was established, with DL4AY in on the deal as star witness. He was re-broadcast on 420 by DL4CK and was able to hear his signals coming back via a rebroadcast from DL3NQ on two meters! As yet no bonafide two-way all-420 QSOs have taken place. However, during the summer DL4XS will be back on the hill he made famous last season, and he expects to be equipped for both 144 and 420 mc. Jo will probably provide a good test signal for the ON4s, PAØs and the Gs on "seventycems"!



DL4CK's two-meter antenna system. The radiator of the lower bay is driven through a "T" match, which also feeds the top radiator through a transmission line and "Y" match.

New Ideas For Two Meter Mobile Reception

The recent announcement by the Gonset Company of a converter designed especially for two-meter mobile work, has aroused considerable interest. Thanks to W2EH, the local Gonset "rep", we were able to inspect and test one of the first of these converters to be released.

The device is a true converter—it is designed to work into the antenna input circuit of a standard broadcast-band receiver, which for two-meter reception is tuned to the intermediate frequency of one megacycle. As any ham who has ever tried to design a tunable v.h.f. converter will recognize, this is an unusually low intermediate frequency. One consequence of using a low i.f. in a simple superheterodyne is bad image response. The Gonset engineers have accepted this situation and have put it to good use! By proper selection of the v.h.f. oscillator frequency range, they have located the "image" frequency range *within* the two-meter band. As the converter is tuned across the lower half of the band, its "image response" tunes across the *upper half*. To be specific, if the local oscillator of the converter is tuned to a frequency of 145 mc, the converter responds, due to its one megacycle i.f., to 144 mc and also to 146 mc. When the oscillator is set to 147 mc, both 146 and 148 may be received. By tuning the oscillator through only a two megacycle range, the four megacylces of the two meter band can be completely covered. This is "Super-Imposition" tuning!

Certain disadvantages of his system are obvious. Won't a signal 2 megacycles away from the one you're copying come in as QRM? Right, but by a slight displacement of the i.f. receiver tuning this sort of QRM can be "moved over". There is an ambiguity of dial indication, too, that could be annoying. More important, the receiver is able to pick up noise impulses via both of its modes of reception, effectively doubling the noise bandwidth. But engineering is always a matter of compromise. The advantages inherent in this approach to the mobile receiver problem are significant. It permits the full use of the broadcast receiver's high gain and good selectivity, with the fewest possible tubes and circuits in the converter. The fact that the oscillator need be tuned through only two megacycles cuts down by half the normal range of frequencies which must be covered in tuning the band. This is a big factor in mobile work, where conditions are hardly ideal for fishing for weak signals. QRM is seldom a problem on two meters, so the possibility of image-signal interference is usually remote. The loss of 3 db in the potential signal-to-noise ratio is what hurts the most. But, by virtue of the high degree of selectivity furnished by the i.f. tuner, this converter will hold its own in competition with most of the mobile receiving systems now in use on two meters.

This matter of extreme selectivity will probably bother some people. Those who have attempted network operations on two meters have found that the usual net is not a spot-frequency affair, but is generally scattered—due to random drifts of the various transmitter frequency-control crystals. Any converter which possesses selectivity comparable to that of a broadcast or communications receiver will seem too sharp for such net operations. But, speaking from experience, Ye Ed will cast one vote in favor of the selective receiving system because of the worthwhile improvement in sensitivity which is realized. Comparing the i.f. bandwidth of a typical SCR 522 receiver with that of a typical automobile broadcast set we find that the 522 is about ten times as wide—and hence would permit ten times as much noise energy to sift through to its output. This implies that one would require ten times as much transmitter power to override the receiver noise than would be required with the narrow-band set. Ten db is a heck of a lot of db! And if we had used one of those megacycle-wide super-regen receivers as our reference the result would have been still more startling! In W2PAU's mobile set-up, shifting over to a narrowband receiver has meant *in many cases* the difference between solid copy and no signal at all!

Extreme selectivity has its headaches. The problem of networking has been mentioned before.

If the use of narrow-band receivers becomes general, it may be necessary to exercise better control of transmitter frequencies; or perhaps use "alert" call systems in which the net control station might emit a broad-band calling signal to insure hitting the frequency of all the net receivers. Receiver oscillator stability must be of the highest order. The Gonset converter uses half of a 12AT7 as a high-C Colpitts oscillator. The stability is surprisingly good, but with all the precautions taken in the design, some drift is caused by changes in filament voltage. Since automobile battery voltages may fluctuate as much as ten percent as the generator charging rate changes from zero to maximum, it was necessary to provide means for holding the oscillator filament voltage more nearly constant. The designer's choice was to use a dry battery to light the oscillator filament—and this dry battery need only be switched in when the car motor speed is fluctuating widely.

The remaining features of the new converter are quite conventional. A 6CB6 is used as an r.f. amplifier, and the remaining half of the 12AT7 serves as the mixer. A voltage regulator tube stabilizes the plate voltage. The output of the mixer is not tuned—the antenna coil of the broadcast receiver is supposed to supply the required peaking at this point. The tuning dial has a big step-down ratio—it requires about 20 turns of the knob to cover the band!

We hope that this brief description of what we think is a novel and practical mobile two-meter converter is of interest to some of our readers. As a matter of editorial policy we do not make a practice of recommending or condemning any commercial product. We just try to pass along the facts as we see 'em!

Speaking of narrow-band mobile receivers, some of the gang have discovered that it is easy to include two-meter coverage on a ten-meter or twenty-meter converter provided that the l.f. unit tunes across a band at least four megacycles wide. Some of the popular "band-spread" jobs easily provide this much coverage. By using a broad-band fixed-tuned two-meter converter working into the lower frequency receiving set-up, good v.h.f. performance can be achieved. W2FXN has found that a CML two-meter converter, using the i.f. band from 13 to 17 mc, into his regular mobile converter does a fine job on two. Ye Ed is using a crystal-controlled front end, beating the band down to the range from 24 to 28. (Use of a v.h.f. overtone crystal is recommended, as many screwy beats can be developed by a low-frequency rock!) Devices of this nature should especially appeal to the hams who are already equipped for l.f. mobile work. (If we can just get 'em to try two meters for a while, they'll stick around!)

There are still quite a few stations working mobile on the two-meter band with super-regen receivers. They will be interested to hear that the Deutsche Post has banned super-regenerative receivers as illegal unless they are equipped with an r.f. stage. If our FCC ever gets around to enforcing the proposed laws governing incidental and spurious radiations, the same thing could (and should) happen here! Nuf sed.

W8WRN, of Columbus, Ohio, who is another v.h.f. man busy with the problems of Civil Defense, writes, "Modulated oscillators and super-regens are OUT, HERE". (Better there than here, Ken!) Seriously, a radiating super-regen is out of place in any populated area. Such units are usually more of a liability than an asset in CD nets. A shielded hiss-master equipped with an r.f. stage can do a fair receiving job without creating harmful interference. Without the r.f. amplifier——!

May in Review

The month got off to a good start. During the late afternoon and early evening hours of May 1st, one of the best aurora openings on record took place. Several of the boys were warned that something was up when their TV receivers disclosed peculiarly gurgling signals on most of the lower channels. A quick check on six meters would have been enough to convince anyone. It sounded like eighty meters on a good night! Conditions seemed to be uniformly good over the entire northeast section of the country, and all sections from Northern Maine to Western Illinois were heard and worked by stations as far south as the Washington D.C. area. All signals, even the locals, were affected by the auroral "garble" and use of straight c.w. was essential.

On two meters, conditions seemed to be equally good, if not better than on six meters. Ye Ed logged W1IZY, W2ACY, W2EH, W2PV, W4AO, and W3NKM. We worked W9UCH, W9SUV, and W9EHX before having to QRT (not on account of TVI— 'twas a radio club meeting!) W1IZY worked W2GJC, W3NKM, W2ERX, W4AO, VE3RM, W2TBD and, at last, W9UCH! W4AO's score sheet lists W1BCN, W1IZY, W2ACY, W2SFK, W3MON, W8UIX, W9EHX, W9FJB, W9LIR, W9SUV and VE3AIB. Ross heard W1HDQ, W2PAU, W3NKM, W3RUE, W8WJC and W9UCH. According to Ross, maximum signal strengths, even on the W1's and W2's, was obtained with the beam slightly to the West of North. (So far, that has seemed to hold true in all the aurora sessions we have encountered, too.) Horizontal polarization seemed to be the standard mode. Though there were several exclusively-vertical DX men active in our neck of the woods, they were wondering what the excitement was all about!

50 Mc.

On May 2nd, during the early evening hours, six meters opened up for the W5s, 6s, and 7s. W6WNN sends in a long list of W5's and W7's which he logged. W6CDQ, W7QLZ, W5AJG, W7ACD, VE5NC, VE7ALL, WØELL and many others were active during this opening. In the East, W2MEU reports that he copied W1HDQ's signals, apparently via aurora. Again, on May 3rd, reports of aurora effects were turned in by W9VPZ and WØTJF.

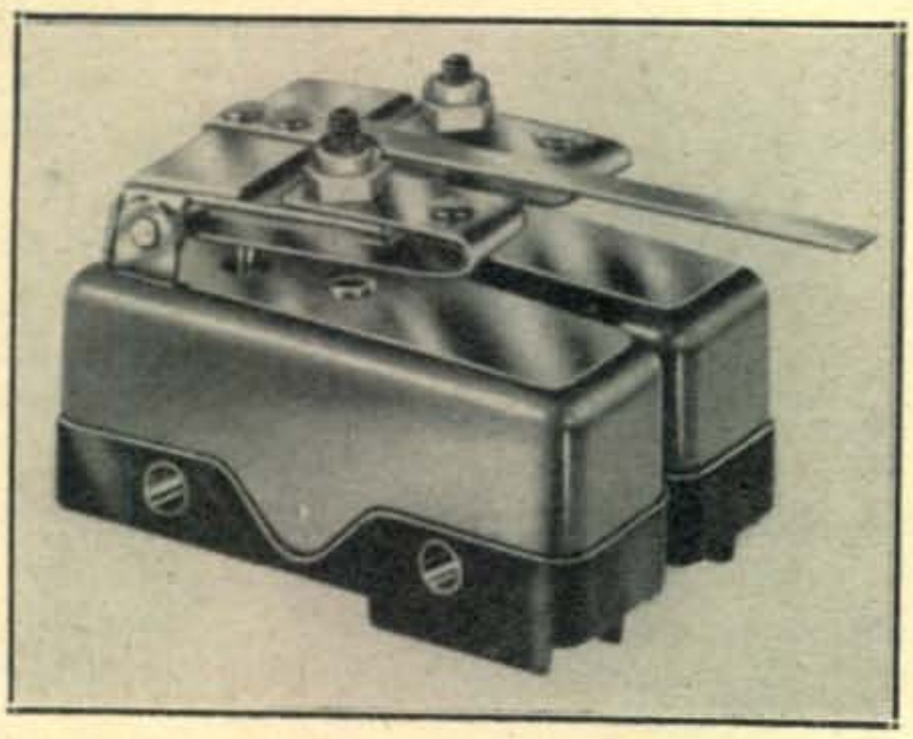
On Saturday, May 5th, an early-morning opening found quite a few of the gang on deck. W4VV

(Continued on page 54)

Parts and Products

Ganged Switches

Unimax ganged-switch assembly provides for operation of two snap-acting SPDT switches by a single actuating mechanism. The operating point in each assembly can be set individually. A rigid bar joins the individual switches so that they work together. The operating point for each switch is adjustable by a set screw that moves a "U" spring toward or away from the actuating



pin. The "U" spring also absorbs over-travel of the actuator arm. The set screw is held by an elastic stop nut. Stainless steel and corrosion-resistant finishes are used. Data Sheet 515-A, giving dimensions and operating characteristics, is obtainable from: UNIMAX SWITCH DIVISION, W.L. MAXSON CORPORATON, 460 West 34th Street, New York 1, N. Y.

Tube Manual

Pocket-size handbook on receiving tubes listing essential characteristics of every type of receiving tube likely to be found in ham and home receivers is announced by G.E. Basing diagrams and data are given for 586 different tubes. To aid the ham in properly evaluating information presented in this 107 page handbook, a section "Interpretation of Ratings and Technical Data" has been included. A chart of recommended types provides a valuable guide to tubes likely to be found in late-model receivers. Information presented in this handbook is industry-wide in scope, and inclusion of a tube in the publication does not necessarily imply that only G.E. manufactures that particular type. Priced at 35 cents, the book is available through GENERAL ELECTRIC and KEN-RAD tube distributors.

VTVM Book

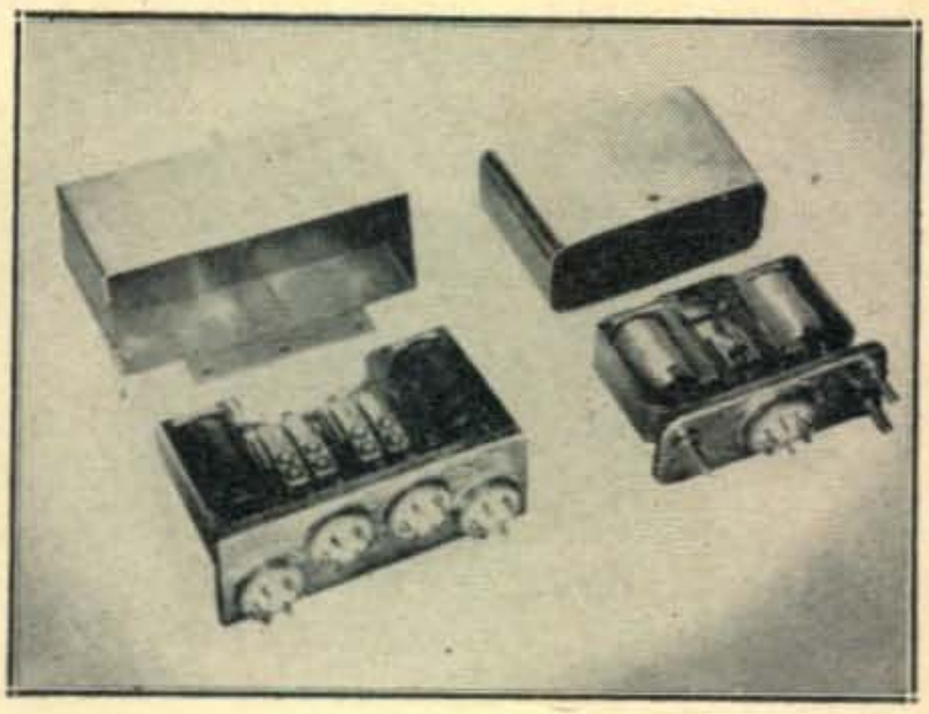
Rider's revised vacuum-tube voltmeter book is now available. It covers all types of vacuum-tube voltmeters: diode, triode, rectifier-amplifier, slide-back, etc. Starting with the theory of the instrument, the text discusses design, construction, calibration, testing, maintenance, and applications. Of particular value to the ham, service technician, engineer and student are the step by step procedures in using vtvm units as explained in the chapter on applications. A new chapter on d.c. and r.f. probes discusses the different types of probes and what measurements they can make. It also explains how to adapt the probe to particular jobs and extend its range. A chapter is devoted to more than 40 commercial vacuum-tube voltmeters, listed by manufacturer and model number with an accompanying schematic and parts values. Write the publisher: JOHN F. RIDER, PUBLISHER, INC., 480 Canal Street, New York 13, N. Y.

Q & A Manual

A supplement to the publication "Radio Operator's License Q & A Manual" is available as a separately bound booklet. It is Element VIII and gives questions, answers and discussions on Ship Radar Techniques. The booklet contains forty 5-1/2" x 8-1/2" pages; heavy durable cover; priced at 78¢. Available from: JOHN F. RIDER, PUBLISHER, INC., 480 Canal Street, New York 13, N. Y.

Multiple Relays

Sealed multiple relays, 2-in-a-can and 4-in-a-can, developed by Potter and Brumfield, feature compactness and miniaturization. The 2-in-1 assembly carries four form C with 2-ampere palladium contacts on each relay. It has overall dimensions of 3 x 1⅛ x 2 inches and weighs 6 ounces. The 4-in-1



assembly has four form C on each relay with 5-ampere silver contacts. It measures 3-7/8 x 1½ x 2 inches and weighs 13 ounces. The multiple relay assemblies are sealed in inert gas to give protection from dust, fumes, climatic conditions and human hazard of tampering. For details, write: POTTER AND BRUMFIELD, Princeton, Indiana.

Mobile QSO Book

"A Guide To Mobile Communications For Civil Defense", an interesting booklet describing the role of two-way radio in times of emergency, is available from the LEECE-NEVILLE COMPANY, Cleveland 14, Ohio.

Monthly DX Predictions

GEORGE JACOBS, W2PAJ*

SUMMER SEASONAL PROPAGATION trends continue. In the Northern Hemisphere, daytime and nighttime maximum useable frequencies (MUFs) reach their annual minimum and maximum values respectively.

In July 10 meter DX is not likely to be very frequent, with few circuits from the USA expected to have MUFs in excess of 24 mc. Twenty meters will be used for the majority of DX QSOs. Both 40 and 80 meters will be too far below the MUF to produce consistent signal levels necessary to overcome seasonably high absorption factors and high atmospheric noise levels.

The smooth monthly Zurich sunspot number forecast for July, 1951 is 58. This Zurich sunspot number is based upon observations made at Zurich Observatory and its stations at Locarno and Arosa, Switzerland. The number is obtained by a formula that takes into account the number of individual groups of spots observed as well as the total number of spots. First these numbers are calculated for each daily observation. These daily observations, however, have little correlation with radio conditions and are subject to a considerable amount of variation from day to day. For example, during April 1951, a minimum count of 20 was observed on the 4th while a maximum count of 150 was observed on the 14th.

These daily readings are then averaged for the month, and it is these monthly averages that exhibit the trend that develops into a well-known 11 year cycle. There exists some variance in these monthly averages as can be seen from the following table. Although the average sunspot count in April (count of 92.5) was greater than that observed for March, 1951, when these values are compared to April and March of 1950, we see that the counts for 1951 are lower than the corresponding periods of 1950, and will become progressively lower until the minimum is reached in the vicinity of 1954.

Comparison of Average Monthly Zurich Sun Spot Numbers.

	1950	*1951*
January	98.8	56.3
February	94.6	57.9
March	108.9	55.6
April	113.1	92.5

Ionosphere storms are not usually as prevalent or as severe in intensity during July, but at the time of writing, based upon the 27 day recurrence tendency, the most likely periods during which disturbances may occur are: July 3-5, when a minor disturbance is expected, and July 8-17, which is a recurrence of a group of severe disturbances. Conditions are expected to be subnormal on some North Atlantic transmissions, but little effect, if any, on more southerly circuits. A moderate disturbance may occur during the period of July 21-24.

Statistical observations seem to indicate that many times when a moderate to severe ionospheric disturbance is noticed in the evening hours during the month of July, the 50 mc band may possibly open for long distances in a north-south direction the following day.

In previous discussions we have continually referred to the maximum useable frequency (MUF) of a circuit, which generally speaking, is the highest frequency that will be reflected back to the earth from specific layers of the ionosphere. This value is dependent only upon the height and density of the layers of the ionosphere and the distance separating the transmitter and receiver. Nowhere in determining the MUF of a circuit does power of the transmitter, or gain of the antenna system used enter into the solution. The MUF is completely independent of effective radiated power (power into the antenna multiplied by the gain of the antenna). Theoretically, therefore, if no other factors had to be considered, it would appear that if a transmitter was operated at a frequency below the MUF its signal would be reflected by the ionosphere to the receiver location regardless of power used. This we know is not the actual case, and other factors besides the value of MUF enter into determining whether a transmission path is open or not.

In order to insure good reception the transmitted signal field strength at the receiver must exceed that of the noise present at the receiver by a certain value. The minimum signal strength for tolerable reception is referred to as the "required field strength" and this value will vary geographically according to the field strength of the noise present at the receiving location.

The field strength will also vary considerably according to the gain of the transmitter and receiver antenna used, as well as the power output of the transmitter. As this power is increased, naturally the field strength of the received signal increases.

As the frequency used for transmitting is decreased below the MUF for the circuit, the losses due to ionospheric absorption (collision of the radio wave with the ions that constitute the various layers of the ionosphere) increases and the signal field strength at the receiving location consequently decreases. Eventually a frequency is reached at which the signal field strength is so reduced that it just equals the required field strength necessary at the geographical point where the receiver is located. This frequency represents the

*3620 Bedford Ave., Brooklyn 10, N. Y.

lowest useable high frequency of the circuit and is termed the LUHF. If we transmit below this frequency, the signal theoretically will still be reflected from the ionosphere since the frequency is well below the MUF, but the absorption of the signal will be so great that the field strength at the receiver will be less than the noise level and the signal will not be heard intelligibly.

Since as mentioned previously, an increase in the effective radiated power of a transmitter will increase the field strength produced at the receiver location, we can see that one way to overcome the losses due to ionospheric absorption is to increase our transmitting power or the gain of the transmitting antenna. Therefore, unlike the MUF which is entirely independent of power, the LUHF can be lowered by increasing the effective radiated power and therefore depends for its determination upon these factors of effective radiated power, antenna gain, ionospheric absorption and noise levels.

Much has been written on the determination of the MUF of a circuit and the solution is not difficult.* However, the determination of the LUHF is quite complicated since there are so many variables. For this reason we shall not attempt here to lay down any precise rules for its determination other than to refer interested readers to National Bureau of Standards Circular 462, "Ionospheric Radio Propagation."

By referring to Figure 1, we can completely analyze a specific circuit and see how the MUF and LUHF determine a transmission path. The path in this example is from the East Coast USA to Central Europe for July 1951. We see that there exists a band of frequencies which are useful for communications. This band is bordered on the upper limit by the MUF (solid curve), and on the lower limit by the less easily definable LUHF. The dashed curve representing the LUHF for a transmitter having an effective radiated power of 100 watts c.w. and the dashed-dot curve represents an LUHF based on an ERP of 5KW (50 watts into an antenna system with a power gain of 10). In the case of the 100 watt transmission we see that between 1100- 1600 GMT the LUHF exceeds the MUF. During this period communications on the circuit is impossible. For an ERP of 5 kw we see that the circuit is open although it may be rather noisy. Also note at no time is the 40 meter band available to the 100 watt transmitter, while between 2300 - 0700 GMT it is available to the 5 kw transmitter.

So while the determination of the MUF is independent of the effective radiated power of a transmission system, we see that power does enter into the picture when we consider all the factors necessary in determining a transmission path.

For calculating band openings in this article, all LUHFs are determined on the basis of an effective radiated power of 100 watts c.w. Since it has been determined that c.w. has a 17 db

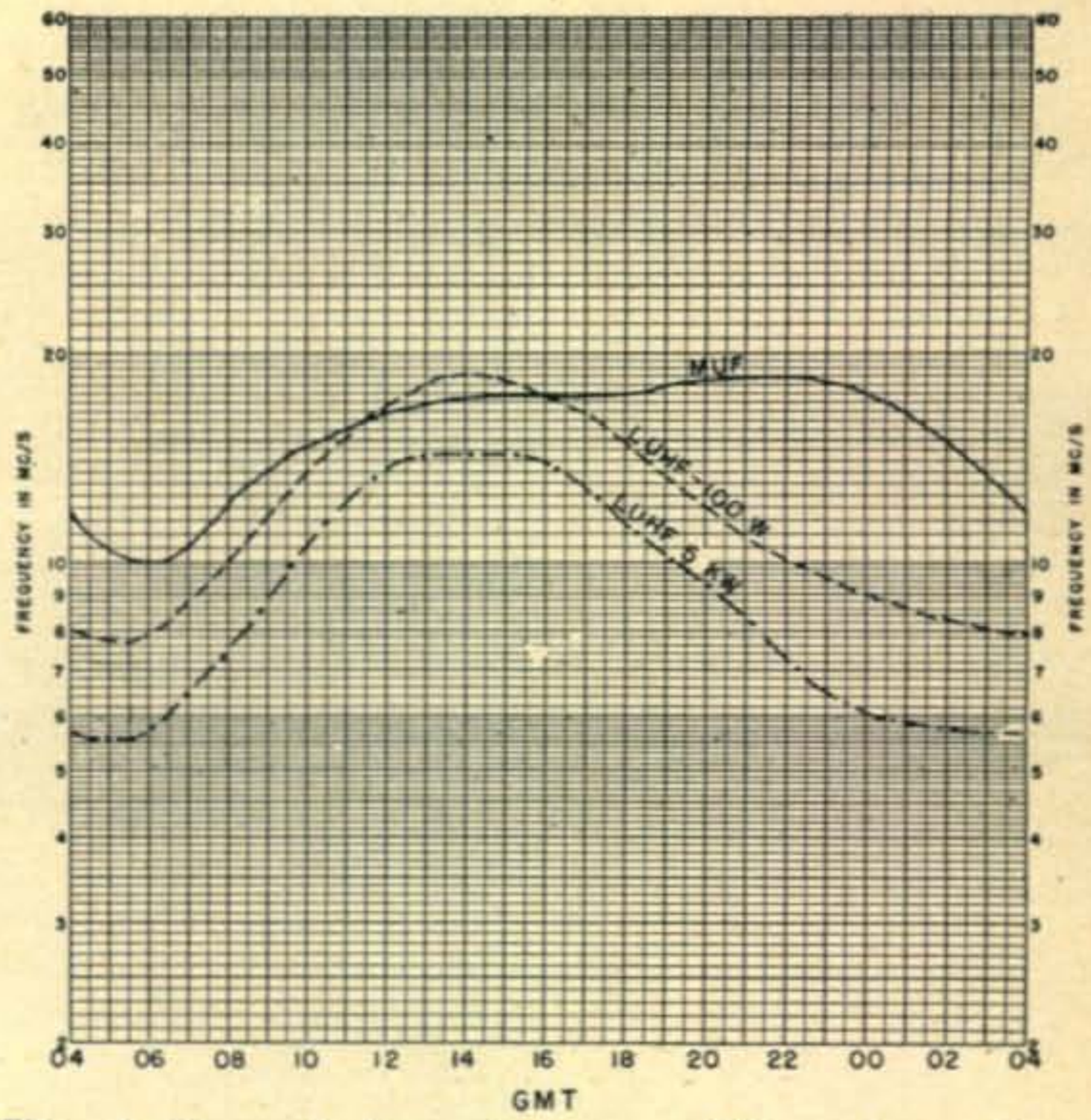


Fig. 1 General transmission conditions from East Coast USA to Central Europe during July. The interpretation of this graph, including the odd-looking situation where the lowest usable frequency actually exceeds the MUF, is explained in the text.

advantage for intelligible reception over that required for double side band radiotelephony and approximately 9 db improvement over single sideband radiotelephony, we see that these prediction charts should apply for an effective radiated power of 100 watts c.w., 800 watts of single sideband and 5 kw of double sideband transmission.

General Propagation Conditions for July, 1951

EUROPE:

The MUF for European transmission paths are not expected to reach much over 19 m.c. During the month of July so that no ten meter trans-Atlantic openings are expected.

Almost all trans-Atlantic DX activity should take place on 20 meters and the band will open quite early and stay open late into the evening.

Some spotty openings from the USA East Coast and Mid West should take place on 40 meters when both terminals of the path are in darkness, between the hours of 0100-0500 GMT.

Not much European DX is expected on 80 meters as these frequencies are expected to be below the LUHF based on a c.w. power of 100 watts. Possibly you fellows in Northern New England and the Canadian Maritime Provinces will work across on some quiet evenings between 0100-0430 GMT.

SOUTH AMERICA:

July is the month of lowest peak MUFs on these North-South circuits and not too much 10 meter activity is expected. On some days between 1900 and 0000 GMT the band should open for the East Coast and Mid West and between 2000 to 0200 to the Pacific Coast, but openings are expected to be very frequent.

Twenty meters is expected to be hot for DX on these circuits with the band open almost around the clock.

*National Bureau of Standards Circular 465 "Instructions for the Use of Basic Radio Propagation Predictions."

On nights when the atmospheric noise level is low, some 40 or 80 meter openings may occur during the hours when darkness covers the path. Openings to the Carribean area and Central America will be more frequent than openings to South America.

FAR EAST:

Trans-Pacific circuits are probably the most difficult to analyze, especially during the summer propagation season. The maximum useable frequency which, remember, is independent of power and is a function of the ionosphere, reaches approximately 21 mc during the peak MUF period. However, because of the tremendous distances of these circuits which necessitate extraordinary multihop transmissions, absorption factors are exceedingly high and signal levels on a good many days will probably not be strong enough to overcome existing high noise levels. In other words, for a good portion of the day the LUHF may exceed the MUF.

(Continued on page 50)

20 METERS—ALL TIMES IN GMT = EST + 5 HRS.

TO:	FROM: East Coast	Central U.S.A.	Pacific Coast
Northern & Central Europe	1000-1200(2-3) 1200-2000(1-2) 2000-0100(3-4)	1000-1100(2) 1100-2200(0-1) 2200-0200(3)	1400-1500(1) 1500-2230(0-1) 2230-0200(3)
Southern Europe & N. Africa	1000-1200(2-3) 1200-2000(1-2) 2000-0200(3-4)	1000-1100(2) 1100-2200(0-1) 2200-0230(3-4)	1330-1500(1) 1500-2230(0-1) 2230-0300(3)
Near East	1900-2300(1)	1900-2330(1)	2200-0200(0-1)
Central America & Northern South America	1000-1300(3-4) 1300-2230(2) 2230-0600(4-5)	1100-0000(2-3) 0000-0800(4-5)	1300-1600(3) 1600-0100(2) 0100-0900(4-5)
South America	0900-1200(2-3) 1200-2200(0-1) 2200-0800(3-4)	1100-2300(1-2) 2300-0600(3-4) 0600-1000(2-3) 1000-1100(0-1)	1230-1500(1-2) 1500-0000(0-1) 0000-1000(4)
Hawaii	1500-0200(1-2) 0200-0400(3-4) 0400-0630(4)	1500-0200(1-2) 0200-0530(3-4) 0530-0900(4)	1500-1900(3-4) 1900-0200(3) 0200-1200(4-5)
Oceania	1900-0200(0-1) 0200-0630(3)	1830-0400(0-1) 0400-0730(3)	1830-2000(1-2) 2000-0200(0-1) 0200-0900(3)
South Africa	1300-1800(0-1) 1800-2100(2-3)	1500-1900(1) 1900-2130(2-3)	2130-0000(1-2)
Japan & Far East	1230-1530(2) 1530-0200(0-1) 0200-0430(2-3)	1300-1600(2) 1600-0200(0-1) 0200-0700(2-3)	1500-1830(2-3) 1830-0700(0-1) 0700-1200(3)
Guam & Pacific	1200-1430(1-2) 1430-0200(0-1) 0200-0600(2-3)	1230-1430(1-2) 1430-0300(0-1) 0300-0700(2-3)	1530-2100(2) 0400-0700(2-3) 0700-1000(3-4)

East Coast to West Coast	10 METERS	20 METERS	40 METERS	80 METERS
	0100-0400(1)	0300-0630(4-5) 1300-0300(1-2)	0300-1000(1-2)	0400-1000(1-2)

Symbols for % of days of month path open.

(0) None (1) 10% (2) 25% (3) 50% (4) 70% (5) 85% or more.

All basic propagation data used for determining these charts are obtained from National Bureau of Standards Series D Publications.

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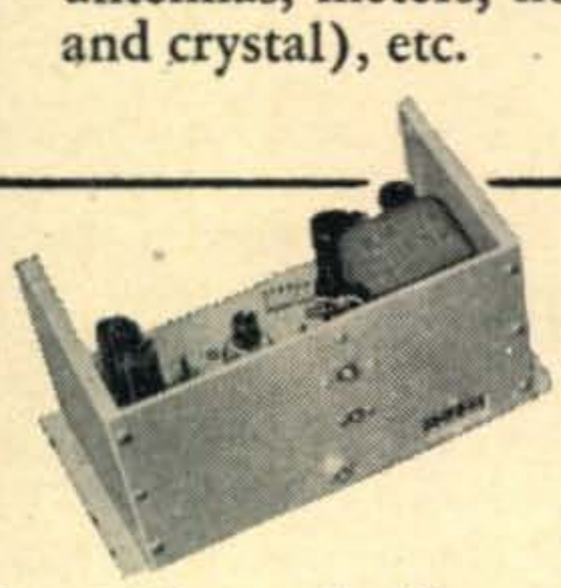

Crystal Controlled Transmitter

Designed for stable, trouble-free operation in the 144-150 mc bands. Couples to any co-ax fed 2 Meter antenna. Uses any power supply providing 300v. at 200 ma. Screw-driver adjusted tuning controls. 7 tubes. Components and tubes are standard for replacement ease. Co-ax connectors. 5½ x 9½ x 5½ in., with universal mounting flanges. Prices are less power supply.

Transmitter $74.95
Wired and tested

Transmitter $49.95
In kit form

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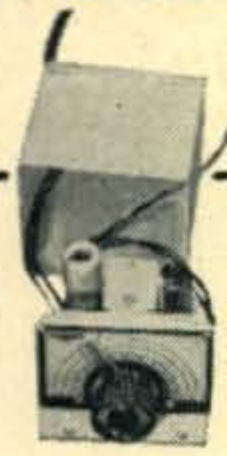

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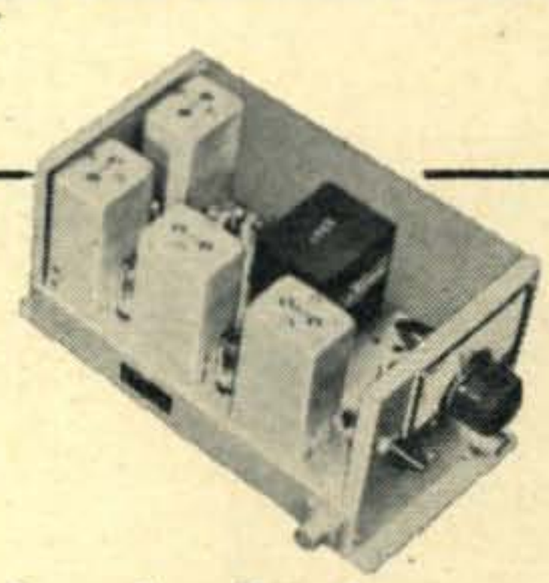

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3-30 Gonset Converter; 10-11 Gonset Converter; 20 Meter Gonset Converter; 75 Meter Gonset Converter. Shipping weight each, 4½ lbs. **$44.75**
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NURSERY JUKE-BOX

(from page 21)

since the total load is light and excessive voltage will tend to make the 6F6 perform like a kw radiant heater, and maybe melt in its socket.

The turntable and pick up is a replacement type (which we got for $2.99 complete) and finishes the electronic arts involved. If you're impatient you can make some tests just to keep things quiet on the home front, before you go out to the garage to tackle the cabinet.

An old Post Toasties carton would serve as a console—which is what we call the cabinet,— but around our house we use that as a toy box. So we went down to the lumber yard and got some ¼ inch plywood, a few screws and some 1 x 2 white pine. The snappy drawings will show our own method of competing with Grand Rapids Chippendale, but better use your wife's judgment. Aside from the volume control stop, the only requisite is that the rear of the amplifier compartment be suitably enclosed to keep those inquisitive fingers away from chance shock or burn.

Two coats of paint, a couple of ten cent decalcomanias to dress up the front and top and you've got a swell juke box. All your favorite aunts will immediately give your children hundreds of records all about Bozo the Clown, etc., and you can read the latest issue of your favorite magazine (CQ, of course!) in comparative quiet. We adjusted the volume control stop so that a slight nuisance value of sound resulted to let us know that the little ears were glued in fascination to the speaker, and not to what we were saying about the Joneses or our favorite congressman.

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RUSSELL D. VALENTINE

W2GX

FRIEND, ASSOCIATE AND

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His Key is Forever silent

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PREDICTIONS

(from page 48)

No ten meter openings are expected to the East Coast or Mid West USA. Some very infrequent and erratic openings, characterized by deep and rapid fading, may take place between the Far East and the USA Pacific Coast, between 0500-0700 GMT.

Twenty meters will be much better for DX, with fairly good signal levels to all sections of the USA during specific times of the day.

When darkness sets in at one or both terminals of a circuit, ionospheric absorption decreases considerably. On evenings when atmospheric noise levels are lowest some 40 meter DX may take place from the USA Pacific Coast (and possibly extend eastward) to the Far East between 0930-1100 GMT.

No 80-meter activity is expected on these paths during July.

OCEANIA (AUSTRALIA AND NEW ZEALAND.)

Since it is winter in this area, the day time MUFs peak to rather high values on these circuits.

No 10 meter activity is expected to the East Coast and Mid West. Conditions favor Pacific Coast openings and some solid openings are expected between 0000-0500 GMT.

Conditions on 20 are expected to be fair to good. Signal levels should be good between 0200-0900 GMT for Pacific Coast locations and 0200-0730 GMT for East Coast and Mid West locations.

Some 40 meter openings may take place to the USA Pacific Coast between 0700-1300 GMT and on some occasion may extend into the Mid West and East Coast between 0600-1200 GMT.

No 80-meter activity expected during July.

Sporadic E is usually very prevalent in July. At present it is impossible to predict when the MUF of a particular path will rise to high values as a result of sporadic E ionization so that these charts do not take sporadic E into consideration. However, for paths up to 1400 miles sporadic E will provide circuits on both 10 and 20 meters (short skip) up to 75% of the days during July.

COMPACT HALF KW

(from page 19)

the whole unit ran a little hot without the fan. R_{76} drops the voltage to the fan motor, allowing it to run at a slow, quiet, yet entirely adequate speed.

Power Supply Unit

The power supply consists of two conventional choke input supplies using an 83 and 866s. The low voltage supply comes on with the filaments, but the high voltage supply and pilot bulb LP_2

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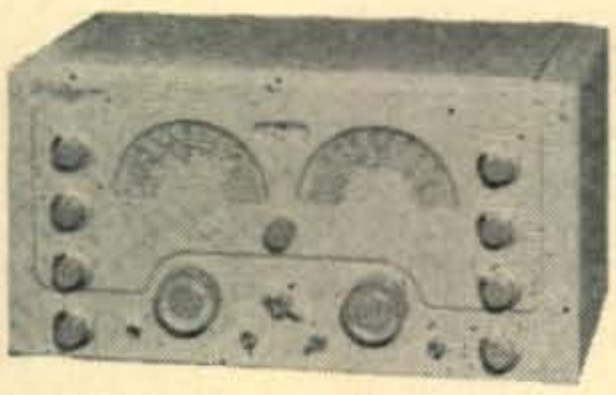
$383.50
(less speaker)
LOW DOWN PAYMENT

10" PM Speaker in matching cabinet **$16.00**



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Sixteen tubes (including rectifier and voltage regulator) are employed in a modern high-gain super-heterodyne circuit. HF oscillator termperature-compensated on all bands; phonograph pick-up jack; accessory connector socket; illuminated signal strength meter with adjustable sensitivity; self-contained output transformer with 500 ohm and 8 ohm terminals; operates from 115 or 230 volts 50/60 cycles or, in emergency, from batteries or vibrator power supply; narrow band FM adaptor available. Frequency coverage: 540kc. to 31mc. and 48 to 56 mc.

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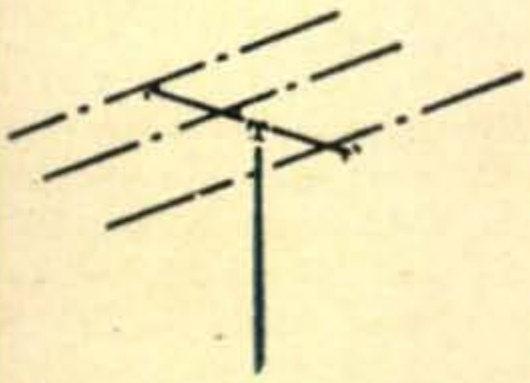

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1.8 to 1.825 — 1.875 to 1.9
1.9 to 1.925 — 1.925 to 2.0

$1.25 ea.

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come on only in the "transmit" position. K_4 is so arranged that wiring between line input and T_{12} are as short as possible to eliminate excessive line drop. All a.c. wiring in the power supply is done with #12 stranded wire. Fuses are provided in both low and high voltage supply circuits, and additional protection is provided by the interlock switches S_{11} and S_{12}. These kill the entire rig whenever either the top or back door is opened. It's a little extra work but do it — you may live longer!

Other switches on the power unit are: S_{13}, emergency power off, cutting everything from the front panel; S_{14}, a test switch across the key jack; $S_{15a,b}$ in parallel with S_4 and S_5 on the exciter unit and giving transmitter control from the power supply unit if desired; and S_{16}, Hi-Lo voltage change over on the high voltage supply. The power transformer supplies either 1250 or 1500 volts d.c. depending on the setting of S_{16}. Normally, 1250 volts is used for AM and 1500 for c.w. and FM operation. But when a real rare one is in there, an extra 20-25% power is available at the flick of S_{16}. The advantage is mainly psychological, but the 814s haven't blushed too violently yet.

C_{86}, C_{87}, and L_{19} comprise a simple lo-pass pi filter that has taken all traces of r.f. off the power line. Why not two chokes in a balanced arrangement? Well, one side of the line is grounded so let's keep it so. Just turn over the plug in J_{18} for best results in the nearest miniature a.c.-d.c. broadcast receiver, and try reversing the receiver plug too if you have any BCI at all. That grounded side of the line can be a great advantage in many cases.

J_{16} is a utility a.c. outlet on the power supply chassis. It has proven handy innumerable times for v.t.v.m., soldering iron, etc. Again, its not necessary for operation and you therefore won't get it on a commercially manufactured rig. But, take a little time to build in these convenient items and your rig will assume individuality and give you real pleasure in operation.

Tuning Procedure

Tuning of the entire transmitter is quite straightforward. Adequate metering is employed to permit check on r.f. driver, modulator, and final. The v.f.o. can be swung across a good section of the dial with no reset necessary on other tuning controls. This is normally done with monitor switch, S_2, on to permit zero-beating another station being heard. A flick at driver plate, final grid, and final plate tuning can be done if desired while actually transmitting.

Grid drive to the final need be set only once of course for any band. As mentioned before, accurate setting of the grid drive is most important for TVI-free operation. Loading of the final, too is controlled from the front panel and usually will change little across a band. This will naturally depend upon the type of antenna used, whether an antenna tuner is used (highly recommended for any antenna system), etc. The 814's can be

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413 434 474 496
414 435 477 497
415 436 479 503
416 438 481 504
418 440 483 506
429 441 484 507
420 442 485 509
422 443 487 511
423 444 488 516
424 446 490 518
425 447 491 519
526 448 492
427 462
429 468 — EACH
431 472 — **49c**

390 401
391 402
392 403
393 404
394 405
395 408
396 409
397 411
400

EACH **79c**

372 381
374 383
375 384
376 386
377 387
379 388
380

EACH **39c**

450 530
452 531
461 533
465 536
526 537
529 538

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SPECIAL 200 KC XTALS without Holders. 21/32 x 23/32

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6006	7740	7973	5706	5925	6540	7473	7706
6040	7773	8273	5740	5940	6573	7506	7806
6073	7806	8306	5750	5973	6606	7540	8340
6106			5760	6273	6640		
6140	**49c**	EACH	5773	6373	6673	**99c**	EACH
6173			5775	6406	6705		
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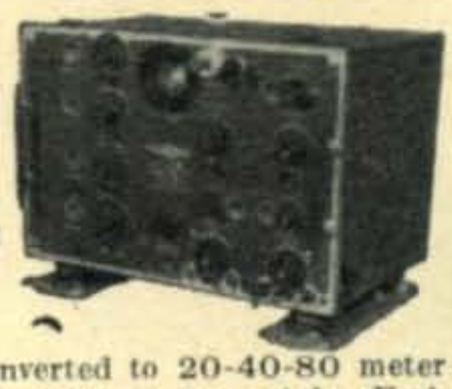

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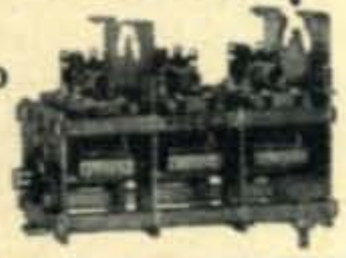
2 GANG - 220 MMF per section $1.29

3 GANG - 220 MMF per section $1.59



BRAND NEW with CONCENTRIC AIR TRIMMERS

ANTENNA RELAY UNIT—BC-442A with R.F. Ammeter & Vacuum cond. **$2.89**

WAVEMETER BC-1073A

Used. Good Condition. Covers 150-210 MC Companion to BC-1068A receiver. Contains resonant cavity wavemeter, oscillator, heterodyne amplifier, tuning eye, 110 VAC 60 Cycle Power Supply.

LESS TUBES $4.95

SHIPPED COLLECT ONLY

RADAR TRANSMITTER BC-1072A

Used. Good condition. Covers 150-210 mc. Contains many parts, such as 110 V AC Blower, Gen. Radio—1 AMP variae, kilovolt meter, circuit breaker, 110 volt HI & LO voltage power supply, tubes, oil condensers, and many others. Companion to 1073A. Operates from 110 V AC 60 Cycles.

$19.95
Less Tubes **9.95**

SHIPPED COLLECT ONLY

BC-645 UHF RECEIVER TRANSMITTER

"The Citizen's Radio" covers 420-450 mc. Consists of complete transmitter, modulator system and receiver, 15 tubes, and simple complete conversion instructions for Citizen band operation. Brand new **$14.95**

FAMOUS MAKE BUTTERFLY CONDENSERS

ALL NEW — ⅓ OFF!

.500 GAP.	.375 GAP.	.250 GAP.
96-22.15	11- 8.15	111-16.80
115-25.20	106-20.15	127-18.25
124-26.65	130-21.60	143-19.85
	141-24.50	159-21.00
	153-25.95	175-22.50
		192-23.95
		208-25.95

Note: Figure in Left Column is Max. Cap. per Section

NATIONALLY KNOWN FAMOUS MAKE HEAVY DUTY SINGLE & DOUBLE STATOR TRANSMITTING CONDENSERS.

Max. Cap.	Gap	Price
300	.077	$ 5.32
230	.171	5.57
250	.219	12.85
500	.219	17.22
75	.344	8.96
245	.344	14.11
50	.469	7.05
100	.469	11.62
150	.469	12.95
75	.719	12.85
100-100	.219	14.11
100-100	.344	15.64
60-60	.469	14.11

CQ TO ALL HAMS DE W3PPQ

Handle here is "Pick" . . . call or write me for anything you need in ham gear or parts—Will be happy to expedite your order with best quality merchandise. 73's

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.

loaded to 300 ma on any band and at 1500 volts they handle close to half a kw. These tubes are not rated at 1500 volts in modulated service but have taken it time and again on DX contacts. Here the normal transmitting periods are short and adequate cooling during and between transmissions is assured by the cooling fan.

The 811's provide 100% modulation for the 814s with ease. Proper modulation level should be determined with sine input well clipped and observed on a scope. Set R_{72} for full scale reading on M_4 with S_{10} depressed. Modulation level is controlled by R_{46}, clipping by R_{42}. The amount of clipping to employ is best determined by a listening test although the author can run R_{42} at full input with only a little "graininess" reported in the speech. The use of the clipper assures high modulation and communication efficiency at all times.

In operation the rig has proven well worth the time spent in planning and building. With provisions built in to disable the receiver and shift the antenna; to spot on any incoming signal; to shift bands by changing just two plug-in coils; to turn the rig on automatically when operating c.w. to change over emission from AM to FM to c.w. from front panel; to control power level to a limited degree; and to operate concurrently with Faye Emerson, Hopalong, and Garroway—all are features that once you've had you'll not do without. But if you are a 100% c.w. man, you'll insist on full break-in operation. If you're looking for new horizons, SSB is your meat. Whatever the requirements you want and need most, no single rig will meet them unless you plan and build it yourself. This rig includes only those that were at the top of the author's own list.

VHF-UHF

(from page 44)

and W2BYM started off around 8:45 a.m. The main opening seemed to be between the third district and Florida, but it was extensive enough to permit W1GJO to work W4FWH and W4IVJ to hook W1LSN. W1MMY and VE3BC.

The following day, just before noon, a good opening showed up between the Gulf states and the Ohio area. W5FSC, W8KZT, VE3DDO, W8VOZ, W5CXS, W9QUV and of course W5AJG, W4FNR, W4MS, and W4LAW and many others were active during this one. Meanwhile, in the far West, things were looking pretty good, with W6WNN reporting W7ACD, WØMVG and WØLNW at about nine a.m. W6CQC, W7QLZ, W6NAW, W7CJN and VE7AAH were in there, too. The opening continued until about 11 a.m.

The next few day were relatively quiet. During the early evening of the 9th traces of aurora were noted by VE3AET who logged the VE9RB beacon and W2ZGP at Ithaca. On the 10th W7JPA heard W6VNH and W6CCY at about 8 p.m. Another fairly spotty opening hit the West Coast on the 13th, just before noon, when W7KBB, W7CJN, W7ACD and others were heard by

HARRISON HAS IT!

LARGEST, MOST COMPLETE STOCK for MOBILE OPERATION and CIVIL DEFENSE

LYSCO MOBILE TRANSMASTERS FOR 10-11, 20 and 75 METERS

A new series of compact mobile transmitters featuring 25 watts power. clamp type audio for 100% AM modulation. streamlined drawn metal cabinet finished in black wrinkle. built-in antenna relay for push-to-talk operation. etc. Case 4" W x 4½" H x 6". All controls and xtal socket on front panel for fast QSY! Coax output to 52-ohm line. Requires 300-500V DC at 125 MA.. 6.3V at 1.35 amps. Use T-17 type microphone.

BAND	TUBES USED	MODEL — PRICE (with tubes)		MODEL — PRICE (less tubes)	
10-11 Meters	3-6AQ5	A129T	$33.55	A128	$29.95
10-11 Meters	3-6V6GT	B129T	$33.55	B129	29.95
20 Meters	3-6AQ5	A114T	33.55	A114	29.95
20 Meters	3-6V6GT	B114T	33.55	B114	29.95
75 Meters	3-6AQ5	A175T	33.55	A175	29.95
75 Meters	3-6V6GT	B175T	33.55	B175	29.95

LYSCO CAP TRANSMITTERS

Identical in size and design to 25-watt mobile transmitters described above. Operate on 2374 KC from airplane. auto. boat or fixed location. Supplied complete with tubes. Only $33.55
Uses three 6AQ5's. Model A-140T

STANCOR ST-203A MOBILE XMTR

Stancor's ever popular 10-11 meter transmitter. Mobile operation from dynamotor or vibrator supply—use AC pack for home or portable use. 6V6 Osc., 2E26 Final – conservatively rated 25 watts! 6J5 Speech Amp., Push-pull 6V6 modulators for 100% AM modulation. Handy xtal switch. antenna loading system. and changeover relay. Attractive case finished in silver-gray hammertone – novel spring fasteners allow instant removal. 8⅝" W x 7⅜" H x 6¾". Kit comes complete with instructions. less only accessories and tubes.

STANCOR ST-203A KIT — $47.50
Wired model has been discontinued.

HARVEY-WELLS BANDMASTERS

For Portable — Mobile — Fixed Station

Here's America's most versatile xmtr! Ideal for old timer or novice operator. (Covers Novice Frequencies: 80 CW, 11 CW, and 2-Meter Phone) 40 to 50 watts to 807 final – Phone or CW – Completely bandswitching – just turn knob to work 80, 40, 20, 15, 11, 10, 6 or 2 meters. 100% break-in operation. All controls and xtal sockets located on front panel for quick QSY – provision for VFO input.

YOUR INVESTMENT PROTECTED!
All Bandmasters remain modern as unique factory plan permits addition of all newly developed features to older models.

BANDMASTER SENIOR – Carbon Microphone Input	$111.50
BANDMASTER DELUXE – With pre-amp for crystal mike	137.50
APS-50 Power Supply for 110V AC Operation	39.50
DPS-50 Dynamotor Supply for 6V DC Operation	87.50

GONSET CONVERTERS

New! Two-Meter Converter – 144 to 148 MC	$44.50
Tri-Band Converter for 75, 20, and 10 meters	47.60
6, 10-11, 20, or 75 meter converters. Your choice	44.75
Latest Model Gonset Noise Clipper	9.25
Universal Steering Post Mount for all Gonsets	3.90

TWO METER ENTHUSIASTS

Send for complete listing of all currently available two-meter transmitters, receivers, converters, antennas, etc. Get away from TVI, QRM! You'll like two meters!

FREE MONEY?

Well, here's the nearest thing to it! Save $1.00 on each of your next four orders for radio parts or equipment! Send only $1.50 for our mammoth, 1200-page Radio's Buyers Guide Catalog (describes and illustrates the products of every leading electronics manufacturer with prices and trade discounts) PLUS four credit slips, each worth $1.00 on any order totaling $5.00 or more. Your money back if you don't agree that this is the biggest bargain in radio history!

HOME & MOBILE EMERGENCY RECEIVERS

A new series of high-performance, emergency band FM receivers for home and mobile use—ideal for Police, Firemen, News Photographers, Reporters, Civilian Defense Workers, Emergency Auto Service Units, etc. etc.

HEAR: Police Calls — Fire Alarms — Bus Dispatchers — Petroleum Guards — Border Patrol — Railroad Communications — Ambulance Calls — Taxicabs — Forest Rangers — Ships-at-Sea — Mobile Telephone — Etc. etc.

BOTH TYPES FEATUBE: • 5 tubes plus rectifier • Ratio Detector • Sensitive Superhet Circuit • Quiet When No Signal • 100 KC Selectivity • 5" Alnico V Speaker • Drift Compensation • Illuminated Airplane Type Dial • 10 Microvolt Sensitivity • Other Outstanding Features.

MONITORADIO

MOBILE FM RECEIVERS

Complete receiver comes in Gray Hammertone cabinet with provision for under dash or universal mounting. Built-in vibrator supply and speaker. VR tube added for extra stability.

Model M-101 Covers 152 MC to 162 MC Band	$72.50
High Frequency Antenna for use with M-101 (A-101)	7.50
Model M-51 Covers 30 MC to 50 MC Band	72.50
(Use Master Mobile 96" Whip with Model M-51)	
Specify whether for 6 or 12 volt DC operation.	

POLICE ALARM

For HOME or Fixed Location

Housed in attractive walnut finish plastic cabinet. Operates on 115 volts, AC or DC.

Model PR-31 for 30 MC to 50 MC Emergency Band	$44.95
Model PR-8 for 152 MC to 162 MC Emergency Band	$44.95

MOBILE ANTENNAS? HARRISON HAS THEM ALL!

MASTER MOBILE

Universal Body Mount – Model 132	$8.75
Body Mount with Heavy Duty Spring – Model 132X	9.85
96" Tapered Steel Whip for 10 Meters – 100-96S	5.25
All-Band Antenna with coil for 20, 40 or 75	8.75
Extra coils for above – 20, 40 or 75 – Specify	3.30
New High-Efficiency Coaxial Antenna for 2 Meters. Fits all Master Mounts. 12' Coax Lead. Model 114	9.95

PREMAX

New Universal Ball Mount with Spring – Model RS	$11.76
96" Step-Tapered Stainless Steel Whip – AS-196	3.65
Base-Loaded 3.5 MC Antenna with Coil – BLS-386	7.94
Center-Loaded 3.5 MC Antenna with Coil – BXC-386	9.12

WARD

Roof-Top Antenna for 140 to 160 MC. Install entirely from outside. Includes 12' coax lead. Model SPP-18	$3.96
Here's the antenna that you've been reading about! Single 55½" whip for 10 or 2 meter mobile. Single hole mount. Fitting for coaxial connector. Full Instructions.	$13.50

Write for new Master Mobile and Premax catalogs.

SPRAGUE "HYPASS" BYPASSES

Special feed-thru type condensers for VHF filtering and bypassing. Unsurpassed for TV Interference elimination.

Capacity	DC Working	Catalog No.	Net
.005 Mfd	600 Volts	46P8	$1.26
.01 Mfd	600 Volts	47P6	1.38
.005 Mfd	1000 Volts	47P12	1.41
.01 Mfd	1000 Volts	47P13	1.53
.005 Mfd	2500 Volts	47P14	1.70
.01 Mfd	2500 Volts	47P15	1.82
.002 Mfd	5000 Volts	47P16	1.88
.1 Mfd	600 DC/250 AC	48P8/48P9	1.53

HARRISON

NEW YORK 7, N.Y.
225 GREENWICH STREET
(10 West Broadway, at Barclay St.)

W6NAW and W6WNN. On the 14th VE3AET, the ol' aurura watchdog, spotted W2ZGP, plus W8RUF and W3BGT. Reg logged W3BGT again on the 15th, and VE4EX heard the VE9RB Beacon.

On May 16, about 7 p.m. local time, a dandy opening developed between the North Central section of the country and the Gulf States. Texas was well represented by W5's JLY, ZZF, VV, BDT, FSC, ONS, SFW, MJD and many more. W5AJG was on, both with his "beacon" rig, which was reported by many observers, and with his mobile job, which netted some good DX QSOs. This was such an extensive opening that we could not hope to list even a small percentage of those active.

A good aurora session took place in the late afternoon of the 17th. W9VPZ, W8RFW, W3BGT, VE3AET, W9OCA, W8SQU and W8NQD were in there pitching.

From there on, the reports start to get confused! On the 18th, about noon, conditions were good from WØ to W5, with a few W9s and W4s mixed in there also! On the 19th, there was another mid-morning opening between W6 and W7. The opening seemed to hang around, as during the evening W5SFW hooked several W6s and also WØSZU. W7FIV also reports QSO with several sixes.

During the evening of the 20th came one of those wide-open deals. The W4s were working nines and zeros. The W8s were breaking thru into the Deep South. W1GJO reports QSOs with W4's, 8's and 9's. It seems as though the whole Eastern half of the country got in on this one. The 21st, 23rd, 24th and 25th were likewise good dates. But even these sessions were only a sample of what was in store. On the evening of the 29th, a swell double-hop situation developed, and the East Coast stations reported excellent reception of stations in the Far West. Many QSOs took place—as yet we do not have the details. On the 30th, Memorial Day, the band was open from the Northeast to the Gulf states practically continuously. The opening seemed to hold on tenaciously—all that Ye Ed can say is that it was open when we went to bed on the night of the 30th, it was still open when we got up the following morning, and the last station we logged before hitting the hay on the 31st was W5AJG! Wow, what a session! It provided an opportunity for anyone who had six meter equipment to work DX as easily as falling off a log. For fear of the "Indians" Ye Ed kept cutting back on the power input. Though we finally stopped at about 50 watts, it made no difference in the results! And we believe that a crystal detector could have received some of those S-9 plus signals with good volume!

144 Mc.

W5ONS and W4GFE report on the intensive effort made to bridge the Gulf of Mexico on two meters. Schedules were set up and cross-band checks made between two and six meters. On the evening of the 29th W4LAW heard W5BDT and W5DCV, both of Austin, Texas but no QSO was made. This is a haul of about 938 miles—WOW! During the same session W5ONS of Victoria, Texas, hooked W5JTI on two meters—a new state for Herb.

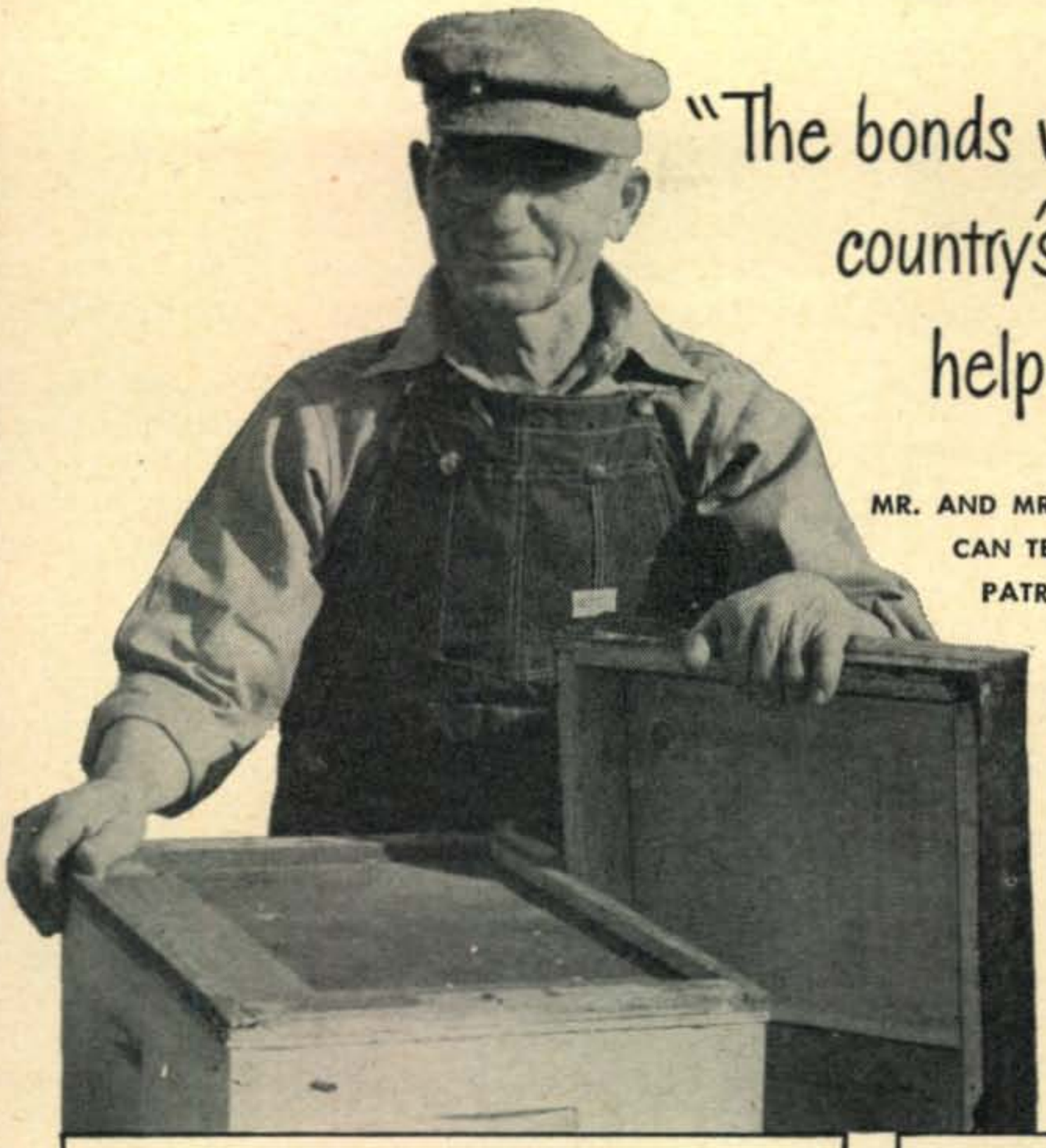
The DX contest results have taken quite a bit of our available space this month. We'll just have to hold some of the news items over until next time. But keep 'em coming... We sincerely appreciate all the letters that you have sent in, and we've trying to get around to answering them all.

Brownie, W2PAU.

SAIL & SERVE

(from page 15)

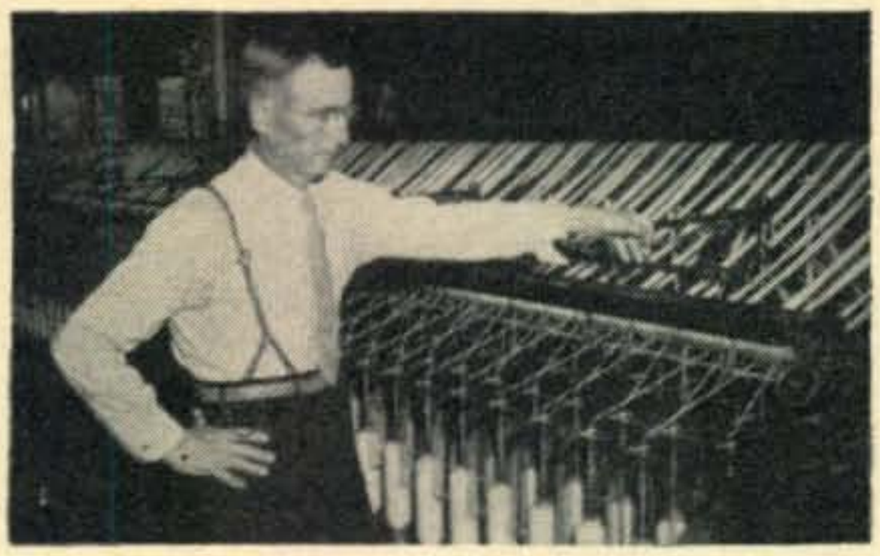
bonus areas you sail in, and amount of overtime worked. Room and board is provided free of any



"The bonds we bought for our country's defense bought and helped equip our farm!"

MR. AND MRS. CHARLEY L. WHATLEY OF CUTHBERT, GA. CAN TELL YOU—IT'S PRACTICAL AS WELL AS PATRIOTIC TO BUY BONDS FOR DEFENSE

Mr. Whatley inspects a beehive on his 202-acre Georgia farm. "My wife and I wouldn't own a farm, clear, today," he says, "if it weren't for U. S. Savings Bonds. They're the best way to save."



Charley Whatley says, "Mrs. Whatley and I joined the Payroll Savings Plan in 1943. Our pay averaged about $40 a week apiece and we put about a quarter of it into bonds. We had saved $6,925 by 1950."

"$4,000 in bonds bought us our farm and house, more bonds went for a new truck, refrigerator and electric range. We're still holding about $1,800 in bonds. Everybody should buy U. S. Savings Bonds!"

The Whatleys' story can be your story, too!

Your dream can come true, just as the Whatleys' did. *Start now!* It's easy! Just take these three simple steps:

1. Put saving *first* before you even draw your pay.

2. Decide to save a regular amount *systematically*. Even small sums saved this way become a large sum amazingly soon!

3. Start saving by signing up *today* in the Payroll Savings Plan where you work or the Bond-A-Month Plan where you bank.

You'll be providing security not only for yourself and your family, but for the free way of life that's so important to us all.

U. S. SAVINGS BONDS ARE DEFENSE BONDS— BUY THEM REGULARLY!

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charge, including taxes, and it is on a scale comparable to your status as a ship's officer.

You are a licensed ship's officer, by Act of Congress during the 1948 session. By law, until you have served six months at sea as an assistant on a passenger ship, you are not permitted to sail as sole Radio Officer on a freighter, tanker or collier. Since passenger ships compose less than choice of openings will be yours after you have ten percent of the active merchant marine, greater completed six months of sailing.

Veterans, Note: The FCC will accept, toward the required six months service, sea time as radio operator on Navy, Coast Guard or Army vessels, upon presentation of evidence of such sea time, usually obtainable through the Veterans Administration.

Chances for YLs

Women have rarely broken into this profession, though some few have licenses, and at least one is sailing at present. Quarters problems arise for female Radio Officers on passenger ships, where assistants sometimes share rooms or bathrooms, and the position of being the only woman on a freighter is one that admittedly takes considerable maturity and poise to maintain. Any YL who feels she might like to try the field, despite the difficulties, and despite this warning, might as well start now, since there'll never be a better time, and there'll certainly be periods a lot less favorable.

Amateurs with physical handicaps that would not clearly prevent them from performing radio duties during emergencies at sea will find no impediments to entering the maritime field. Check with the FCC as to whether any specific physical handicap would bar you. Many men with one artificial arm, leg or eye, to list a few handicaps, are now sailing. Henry F. Wiehr, a one-armed Radio Officer, was credited by the crew of his ship with saving all their lives when the SS Fort Dearborn broke in two during a severe Pacific storm. Other handicapped Radio Officers in the field who have performed their duties under the most trying circumstances, in peace and in war, have secured a firm place in the annals of maritime radio history.

Racial discrimination, while by no means completely eradicated, has been considerably diminished in maritime radio, and ever-widening opportunities exist for Radio Officers, regardless of race or color or creed.

Hams desiring to enter this line will do well to start before very long. During the immediate future the doors will remain wide open for newcomers to ship radio operating. What the possibilities will be for a rank beginner in a year or so no one can say with certainty, however. A chance to sail and serve exists right now for interested radio amateurs who want to "reconvert" to professional radiomen. It may be the chance you were looking for to turn your hobby into the starting point of a career in radio. So act now, and you can soon feel the throbbing of ship's engines under your feet as you put to sea, and turn in at night in a bed that the sea rocks like a cradle.

(In a forthcoming article, Mr. Crane will outline the differences between amateur and maritime radio operating procedures, law and equipment, and tell how to get and handle that first job on a ship; also tips on shipboard etiquette, seasickness and the perils encountered in waterfront joints.)

MONITORING POST

(from page 39)

were worked on 80 cw—a single 813 in the final at 275 watts. . . . *VE2QC* is now at Dorval, Que., having been VE1MW until recently. . . . Nothing but minor troubles with half kw rig at *VE1PP*. . . . *VE1PK* is on Campobello Island and a good one to watch for. . . . *VE1PC*, on 3715 kc., Prince Edward Island, is heard regularly on Mondays, Wednesdays, and Fridays at 0900, MST.

The Wheaton Community RC, Villa Park, Ill., elected officers for the coming year with *W9FRE* as prexy; *FYT*, v.-p.; *IYL*, treas., and *VFB*, sec. . . . Congratulations to the *W2ZLLs*—a junior op. . . . The same to the *W2FWs*. . . . TVI is still an important subject on the air and off the air. After so much has been written on the subject, and ways and means of lessening, if not eliminating it, have been described, it should no longer be a very important topic of discussion. With amateur radio scheduled to play a very important role in civil defense communications, TVI will have to be licked, and the sooner the better, so it is up to us to roll up our sleeves and get to work. Radio and TV stations are an important part of civil defense communications; while v.h.f. mobiles and fixed stations will be extremely important, their importance will not overshadow the use of TV stations in the CD effort, and as all must work together, TVI will have to be licked very soon. Amateur radio civil defense organizations will have to tackle the TVI problem and beat it.

DX & OVERSEAS

(from page 38)

W4HKJ, W4EEO, W5ONL/5, W7NDQ, VE2WW, VE7WL, KZ5BL, TF3SG, GI4RY, PAØLY, PAØGMU, LA4K, and SM6OE.

Although the contest results have taken over the regular DX column space this month, the following contributions from Jack Moore, W5ALA, seem worthy of crowding in. CE1CQ says he would like to go to Easter Island for a little ham operating if the transportation situation would only improve. At present, there is but one ship in and out per year; however, there is a rumor of monthly sailings soon to encourage tourists. VR5GA is returning to New Zealand in July and the remaining ham on Tonga shows no signs of activity. KZ5MD says that the first DX station submitting confirmation of 300 KZ5 contacts will

receive by air a beautiful Panamanian YL! Although the three gals who have applied for the job speak only Spanish, KZ5MD thinks this will present no problem if the winner is a W.....the gal will still make a nice fourth for Canasta! According to W9AND, SM5LK has moved to the USA and will live close to Wes. Wes now has a two acre spot on a hill and expects to have an antenna farm soon. Apparently radio parts are scarce in FY7, which may well explain the lack of a phone signal from there. Someone in a generous mood might round up a modulator suitable for an 807 with 550 volts on the plate. FY7YB would be the one to discuss it with. EA8AX is building a preselector for his S38, and VP7NH is busy getting a converter built for 28 mc phone. ZK2AA plans to attend the ARRL National Convention in Seattle this summer. FG7XA (CM9AA) reportedly had 2146 QSO's in 110 countries during 11 days of operation. W2NIO is now LU2CX. QTH: Robert R. Creighton, Las Heras 3807, Apt. 11 F, Buenos Aires, Argentina.

MOBILE CORNER

(from page 27)

organizations use it for net operations. It is obvious that the use of 29.640 for other than calling nullifies its effectiveness for the original purpose. This editor knows of one instance where the report of a bad accident and the request for an ambulance was delayed over one-half hour because several mobiles had the frequency tied up with local rag chews. While no one is asserting any particular right to this frequency, it is generally believed that with over 1000 kc available, no one would knowingly use this frequency for a normal contact if he knew it was interfering with a national emergency calling plan. The great majority of mobile organizations have provided for an additional frequency adjacent to 29.640, with all stations capable of quick QSY. 29.640 is then used to make the initial call (for any purpose - even a casual QSO), and then both stations shift frequency as soon as contact has been established. Some groups limit the call to "emergency only." The editor would like suggestions from mobile groups for "standards" for the use of this frequency.

Maritime Mobile Amateur Radio Club

Fixed stations: Send your 36 MM QSLs to W3OB for the MM certificate. W3OB requests that hams operating MM for the first time, or fixed stations working a new MM, please advise him in order that a correct list of MMs can be maintained. The total number of MMs, from the latest records of the MM Club, is 217. Although ten has been terrible, a few contacts are squeezed out now and then. W6YYT recently took off from Galveston for Van Nuys, Calif. to visit his father. While there, W6HK and the gang rallied around for a good time. W5OFO is still QRT. He's running to Europe. W1LFY was not on the "ESSO SUEZ" at the time of the collision in the Gulf; however, he has worked on the ship and knew some of the injured. W5GAN has just completed

his first trip after a 34 day vacation. Says while in W5-land tried some Hadacol but still thinks I. W. Harper will do more good. W7RH is working MSTS running to Alaskan ports. Has been having trouble with arthritis and in addition is short of operators. W5AXI is still running to SA. Somehow he found out W5KTL is peddling "Peek-a-boo" boxes. Guess Ed believes if you can't beat 'em, join 'em. W3OZA is hauling, among other things, water - 300 tons of it. Looks as though there must be some heavy drinkers aboard. W2ALZ tho' not on the air keeps up in the MM Club. He is on the SS OHIO and was in Sidon, Lebanon in May. W4NF has a fine story on "Weather" in the MM Bulletin. He is Chief Forester at the National Airport in Washington, D.C. The story gives dope on NSS Weather and how the whole job is done. New member is W4OPS, operating cruises out of Brunswick, Ga. Uses a TBS-50 along with a commercial ship-to-shore rig.

SCRATCHI

(from page 4)

This are most confusing, then I deciding that I picking up wrong rock, so Brother Itchi and I get in jeep and driving out to spot where I hearing the clicking. Sure enough, Geiger counter are going mad again. Itchi take couple of rocks, we drive away till clicking stops, then try counter on rocks. No luck. We dash back and get more samples and drive away. Still no luck. Finally Brother Itchi having idea. Maybe uranium is buried under ground! Thinking is doing, so we go to ranch house, get shovels, and drive back to hot spot.

We dig and dig and dig. Finally have hole about 6 feet across and 4 feet deep, and Geiger counter clicks are even faster. So, we take a sample piece and try it. Again no luck. Back to the salt mines. We dig and sweat and perspire and dig. There we are, Itchi and Scratchi, about 8 feet down in ground, digging like mad, when WHOOSH an earthquake. At least, Itchi and I both falling in a big hole, only it not an earthquake. It are the biggest gopher hole you ever seeing. And Hon. Ed., you never saw so many gophers in your life. Millions, billions, trillions of them. Itchi and I practically buried alive in them, except that they all scrambling and running like seventy.

What a hole. Evidentally we disturbing the Southwestern Conference of Gophers. What a convention. Finally we work our way out of the ground, thinking now we getting near the uranium. We take the Geiger counter down in the hole. Hackensake!! there are no clicks, at least, only a few. Where is all the uranium gone? Very sad and discouraged, Itchi and I sit on edge of hole, trying to figure out what happened. We try the Geiger counter on the earth we dug out. No luck. I take it down in the hole again. No luck.

Classified Ads

Advertising in this section must pertain to amateur radio activities. Rates: 25c per word per insertion for commercial advertisements. 5c per word for non-commercial advertisements by bona fide amateurs. Remittance in full must accompany copy. Phone orders not accepted. No agency or term or cash discounts allowed. No display or special typographical ad setups allowed. "CQ" does not guarantee any product or service advertised in the Classified Section. Closing date for ads is the 25th of the 2nd month preceding publication date.

REVOLUTIONARY copyrighted discovery! Learn Morse Code alphabet in 15 minutes with amazing new code teacher "PHILKODA." 50c postpaid (group size $5.00). Philip W. Miner, 7120 Lasher, Birmingham, Mich.

HOTTEST surplus list in the country, Electronics-hydraulics-aircraft Gadgets. Dick Rose, Everett, Wash.

BEAMS AND ANTENNA ELEMENTS. Send card for information. Riverside Tool Co., Box 87, Riverside, Illinois.

SX28 $135. HQ129X w/spkr $129, Patterson PR 15 $80, S2OR $49, Hickok 288X $119, 277X $105. 'Scope alignment. "New" appearance. Electronics Labs, Box 1821, Lincoln, Nebraska.

QSL's? SWL's? Modernistic? Cartoons? Photographic? Mobile? QSL samples 10c (large variety). Sackers, W8DED, Holland, Michigan. (Veteran).

FOR SALE OR SWAP: One like new Webster wire recorder model 80 - cost $149.50 net. 1 Webster wire mechanism model 79 - cost $59.92 net. Make offer on anything you have. Donald Clark, 105 N.W. Main St., Blackfoot, Idaho.

GOING TO TRY for your amateur radio operator's license? Check yourself with a written test similar to those used by the F.C.C. Surecheck tests, novice class $1.50. General, conditional and technical classes $1.75. Advanced class $2.00. Answer key is included. Amateur Radio Supply, 1013 Seventh Avenue, Worthington, Minnesota.

WILL PAY CASH for TBS 50D with AC supply, crystals, mike etc. Also thirty to forty feet self supporting steel tower, rotor, ten meter beam, cables etc. Must be in excellnt condition, separately or together. W2ZGE, West Sayville, New York.

STATION complete except HV: BC-348, VFO, 813 RF chassis, etc. Write for photos. $125.00. Fisher, W3KNG, 1314 Hepburn Street, Williamsport, Pa.

BARGAINS new and used transmitters, receivers, parts: Globe King $315.00, HT9 $199.00; HR07 $199.00; Temco 75GA 225.00; Collins 32RA $125.00; Collins 75A1 $295.00; new 150 watt phone $199.00; KP81 $189.00; HRO-5T $175.00; Hallicrafters S-47 $119.00; RME45 $99.00; SX17 $89.50; NC46, S40A $69.50; VHF 152A $69.00; SX24 $69.00; Bud VFO 21 $39.50; Globe Trotter $57.50; New Meissner signal calibrators $24.95; MB611 $29.00; 90800 exciter $29.50; Gonset 10-11 converters $25.00; XE10 14.95; and many others. Large stock trade-ins. Free trial. Terms financed by Leo, WØGFQ. Write for catalogue and best deal to World Radio Laboratories, Inc., Council Bluffs, Iowa.

SELL: TCS- 12, Dumont #241 scope, SA- 2 radar complete, RA-34, BC-654. T. Howard, 46 Mt. Vernon St., Boston 8, Mass. (W1AFN)

SALE or trade for 1951 Fluid Drive Sedan. Over $2500 worth of ham gear. One lot only, send for list, highest bidder. W2CJZ, 90 Blvd., Bayonne, N. J.

SELL: W4DWF TRANSMITTER, described June and July CQ. Guaranteed perfect working condition with all tubes, coils, mike, spare set tubes. Will deliver in person to your nearest airport not over 800 miles from Washington, D. C. First $395. Also 7EP4, $5. 7JP4, $7. Pair 100THs, $10. Prop pitch motor, in sealed container, instructions, $10. W4DWF, 911 26th Place So., Arlington, Va.

BARGAINS: New and reconditioned Collins, National, Hallicrafters, Hammarlund, RME, Millen, Gonset, others. Reconditioned S38 $29.00, S40A $69.00, SX42 $199.00, NC57 $69.00, HFS $99.00, NC173 $149.00, HRO7 $189.00, NC183 $199.00; HRO50 $289.00, HQ129X $139.00, RME45 $89.00, DB22A $49.00, HF-10-20 $49.00, VHF152A $59.00, SX43, SX28A, SP400X, HR05TA1, Collins 75A and 32V, others. Terms. Shipped on approval. List free. Henry Radio, Butler, Mo.

10 and 20 meter beams $23.25 up. Aluminum tubing, etc. Williard Radcliff, Fostoria, Ohio.

WANTED: BC-654, PE-104A, PE-103A, TCS-12, RA-34, surplus test equipment, transmitters, receivers. Arrow Appliance, 525 Union, Lynn, Mass.

FRIENDLY SERVICE from Northern New England's largest ham supply house by interested personnel. Write W1BFT at Evans Radio, Concord, N.H.

WANTED: APR-4 receiver and tuning units. State condition and price. W2DB, 274 Boulevard, Scarsdale, New York.

NEED ART-13, ARC-1; DY-17; TS-12; TS-13; MN-26 J or K; BC-342; BC-312; BC-611 Handie Talkie (or any part); I-100; BC-348; BC-788 A, AM, B or C; I-152A, AM, B or C; TS-67; teletype, test or any other equipment. Will trade. Write: Bob Sanett (W6REX), 4668 Dockweiler, Los Angeles, California.

SELL: VFO's—Millen 90700, 40 and 20 meters, $28. Millen 90711, all band, $98, like new. Sgt. Sackett, 1901st AACS, Travis AFB, Calif.

F. M. RECEIVER BC603 with tubes, Trans. BC604 with tubes, generator, 80 crystals, all $50. G.M. Watkins, 1056 Murfreesboro Rd., Nashville, Tenn.

WANT: Marconi, DeForest, Wireless Specialty, Clapp Eastham, Electro Importing Apparatus, Wireless Age, Modern Electrics, Electrical Experimenter, wireless books before 1920. Cash or trade QST-CQ-old apparatus. L. Rizoli, W1AAT, 100 Bay View Avenue, Salem, Mass.

WANT TO BUY - Hammarlund HQ129X. State your best price, condition. Ernest Nettum, Kindred, North Dakota.

CONVENTION NOTICE! ARRL West Gulf Division Convention in Austin, Texas, August 18th and 19th, 1951. The Convention Committee is planning a great program with fun for the whole family! Plan for a great time in Austin in August! For general information, write: Austin Amateur Radio Club, Box 1716, University Station, Austin, Texas.

16"—17"—TV CHASSIS. Brand new in original carton unopened. All tubes, less CRT. Regal model #2217 with Standard tuner. Excellent for prize at hamfest, etc. $100 F.O.B. 47-47 39th Place, L. I. C. 4, N. Y. W2PDH. ST 6-2259.

Maybe Geiger counter on bum? Nope, as still getting background clicks. Scratchi are looking at Itchi and Itchi are looking at Scratchi, then we both looking at each other, when suddenly Geiger counter start to click faster, then faster. We look around, and there comes a little gopher, walking back to the hole (evidentally he coming back for his hat or something.) As the gopher walk over to us, the Geiger counter starts clicking like fury. Then it dawning on me. You know what I doing when I soldering those wires back in place? Scratchi are inventing a Gopher Detector!! I telling this to Brother Itchi, and he throwing his hands up in disgust, getting in jeep, and driving home. Oh well, I manage to walk home before dark.

So, there it is, Hon. Ed. Scratchi are the only man alive who can telling you how to find gophers electronically. Think what that means. I'm thinking of making units commercially. Can't you see the ads now: "You'll go for our Gopher Detector". Get it Hon. Ed., you'll go for—gopher (ain't funny ... Ed.)

If you wanting to be in the first crack out of the box on this sensational deal, sending me quickly fifty bux and I getting some stationery printed and going in business. Oh, by the way, have you any idea who wanting to find gophers—except other gophers?

Respectfully yours,
Hashafisti Scratchi

YL's FREQUENCY

(from page 41)

never tire. Lyre birds, bell birds, sanctuaries for native animals, fern gullies, waterfalls, etc., are among the attractions.

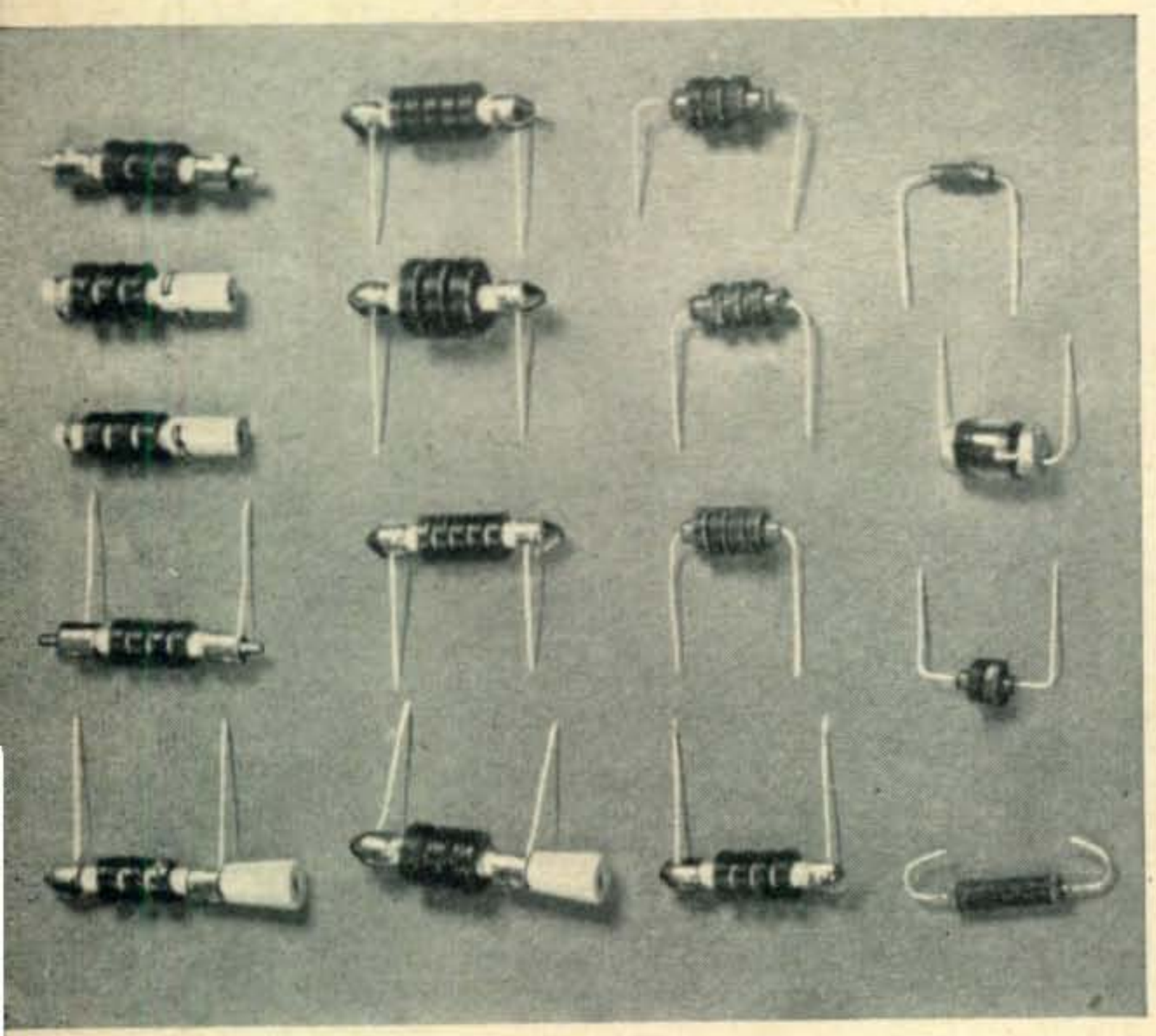
"As regards life in general, there seem to be two distinct groups in both young and older people. In one group individual activities are most popular —tennis in small clubs, swimming, sailing on the bay (which is fairly safe and many teenagers have their own boats), hikes in the country, weekends in the snow areas, camping, caravanning, movie clubs, parties and musical groups. In the other section, spectator sports are more favored. Average Saturday is spent attending the football matches or the races and at night attending the trotting, fights, cabarets, theatres, etc. Sunday is observed very conservatively. No shops are open, no amusements and a big proportion of the cafes are shut. Recently more musical entertainment has been provided with Sunday concerts and open air 'Opera for the People,' as it is called, in our botanic gardens.

"Regarding dress, most of the older women are conservative, but the younger girls dress amazingly well out of their comparatively small salaries and are usually smart and attractive. Sports and casual clothes are greatly favored. Housing is still somewhat of a bugbear, but food, entertainment and transportation are reasonable."

Sounds mighty nice, Clarice, and we'll bet more than a few YLs wish VK-land wasn't so definitely DX!

NATIONAL

- **P**roven
- **D**ependable
- **Q**uality



PRECISION-WOUND R.F. CHOKES

National makes a complete line of quality R.F. chokes to meet virtually every electronic need. In addition, National's engineering staff and production facilities are capable of winding chokes to any set of specifications for commercial or military applications. Close tolerances guaranteed. Write for complete catalog or send your specifications.

National

EST. 1914

NATIONAL COMPANY, Inc.
MALDEN, MASSACHUSETTS

CQ Ad Index

866 Fil Xfrmr 2x2.5v 6 Amp. **$2.95**
400 MA 10 Hy Choke 90v **$3.75**
C.H. Toggle Switch SPST Bat Handle, Leads .... **18¢ ea.** **10 for $1.50**
866 Fil XFRMR 2x2.5v 6 Amp. **2.95**
BC604 w/Tubes & Dyn. **19.95**

274N (ARC 5) Xmttrs VFO Drivers 40 Watt Output
4-5.3 MC-**$5.95** { Used, Good
5.3-7 MC- **5.95** { w/Tubes
BC605 Amplifier, New. **$3.95**
BC429 Rcvr. w/Dual TV **3.95**
MD7/ARC5 w/dyn & Tubes **6.95**
WRITE FOR NEW FLYERS
RARGAINS GALORE

COMMUNICATIONS EQUIPMENT CO.
131 Liberty St., Dept. Q7 — New York 7, N. Y.

WANTED
- PE-237 POWER SUPPLY
- 1306 TRANSMITTER RECEIVER
- GN-58 GENERATOR

BEST PRICES—NO QUANTITY TOO BIG, NONE TOO SMALL.

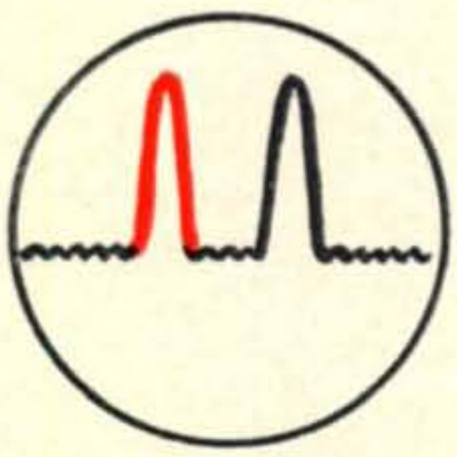
WRITE TODAY GIVING DETAILS TO — Box 984, CQ MAGAZINE, 67 W. 44 St., N. Y. 18, N. Y.

The news
hundreds have been
waiting months
to hear!

$383.50*
(less spkr)

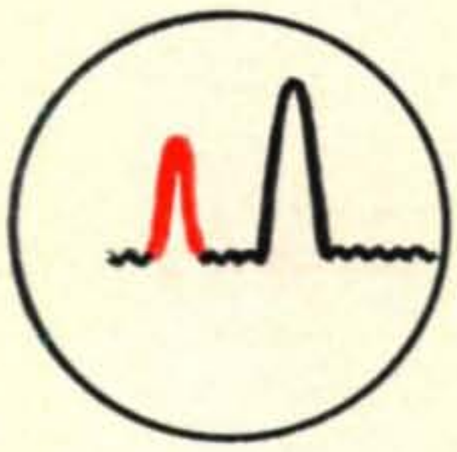
NOW AVAILABLE FOR IMMEDIATE DELIVERY

the new HRO-50T1 with 12 permeability-tuned I. F. circuits!

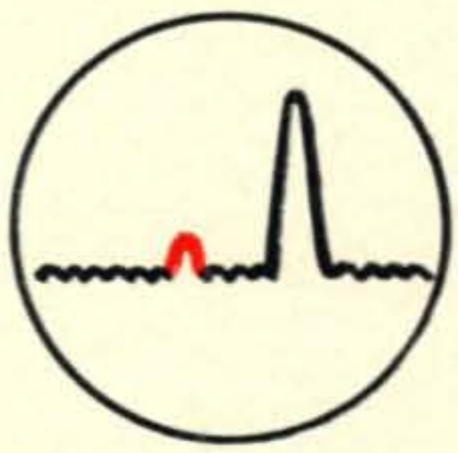


Input to I.F. Section

Now, at last, the receiver you've been waiting for is waiting for you at your dealer's. It's the new HRO-50T1, featuring, beside all the improvements developed in 17 years of building HRO's, the highest degree of "skirt" selectivity ever achieved in a general communication receiver! Don't wait another day to see and hear National's finest!



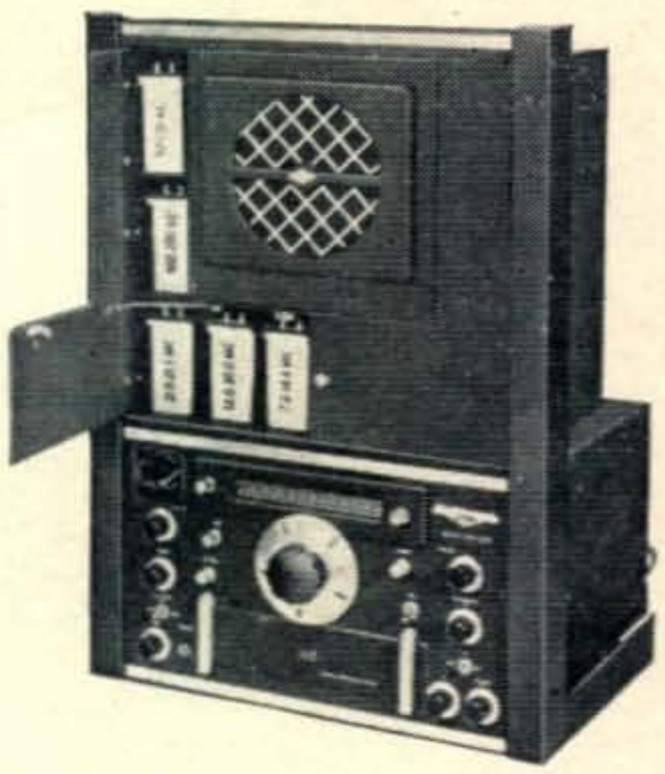
Output of *good* I.F. Section (down 20db)



Output of *HRO-50T1* I.F. Section (down 60db *without using crystal filter!*)

Desired signal

Interfering signal only 5kcs. away



Deluxe rack model of the HRO-50T1 with coil compartment and built-in speaker in one complete unit.

*Price slightly higher west of the Rockies.

National

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MALDEN, MASSACHUSETTS

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