CQ

FEBRUARY, 1949

The Radio Amateurs' Journal

35¢

ANNOUNCING THE
Military Amateur Radio System

Published by RADIO MAGAZINES, INC. Subscription $3.00 a year

hallicrafters

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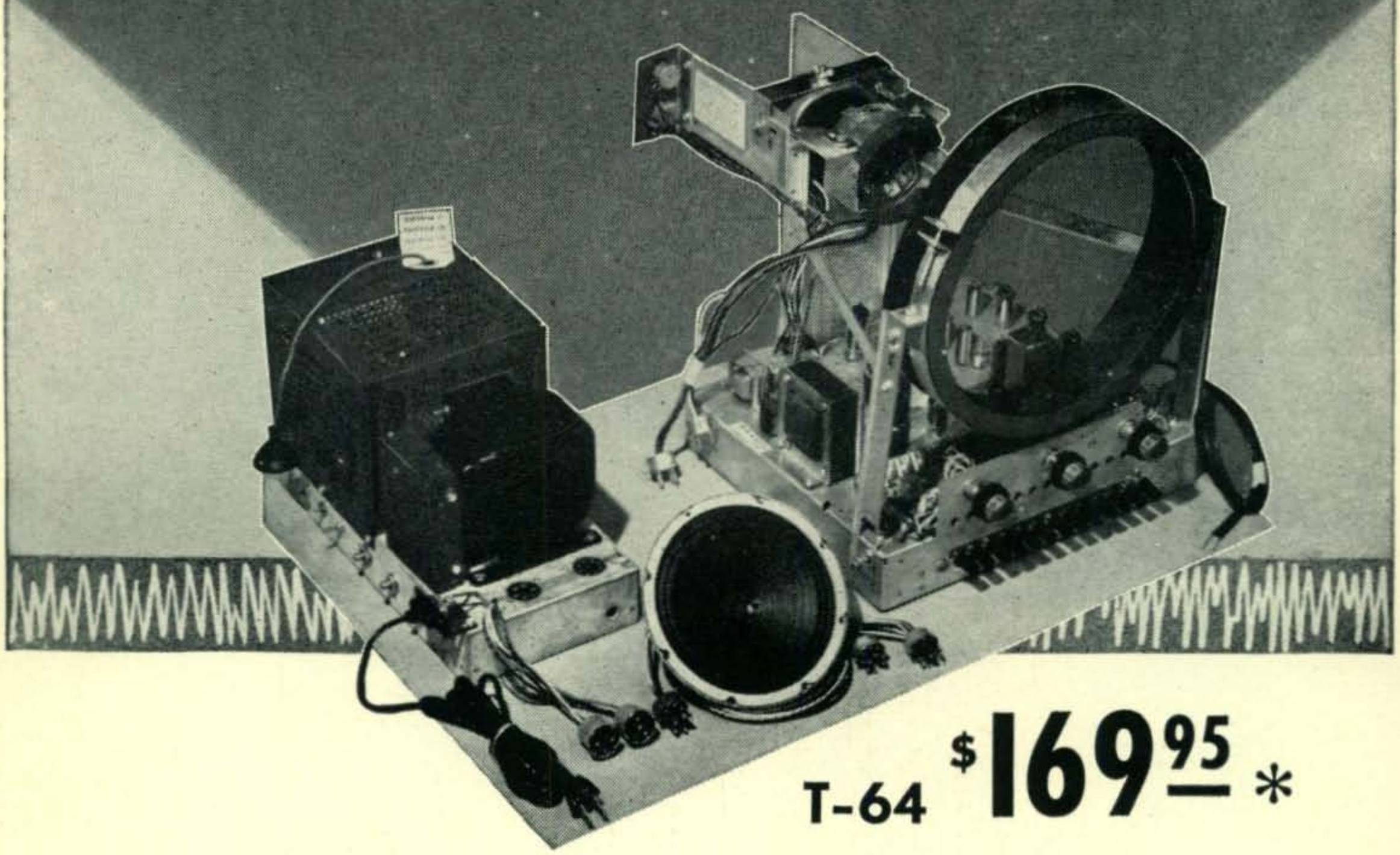

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1. Extremely efficient, they embody everything that any other condenser has PLUS a positive rotor wiping contact in the exact electrical and physical contact permitting the design of balanced circuits.
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3. Any of three methods of mounting can be used.
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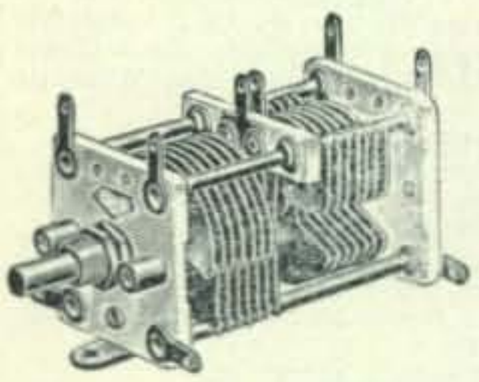
5. Two solder lugs on each stator permit the placement of other components for efficient, short lead design.



Catalog Number	PER SECTION Max. Cap.	Min. Cap.	No. of Plates	Air Gap	Distance Behind Panel	Dealer Cost
CE-2032	35	6	7	.030"	3 1/32"	$2.30
CE-2033	50	7	9	.030"	3 1/4"	2.45
CE-2034	75	8	14	.030"	3 21/32"	2.95
CE-2035	100	9	18	.030"	4 3/32"	3.15
CE-2036	150	10	27	.030"	5 3/16"	3.75
CE-2039	15	5	5	.060"	3 1/32"	2.70
CE-2040	35	7	11	.060"	4 1/32"	3.15
CE-2041	50	8	15	.060"	4 23/32"	3.40

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1. Any of the three methods of mounting can be utilized.
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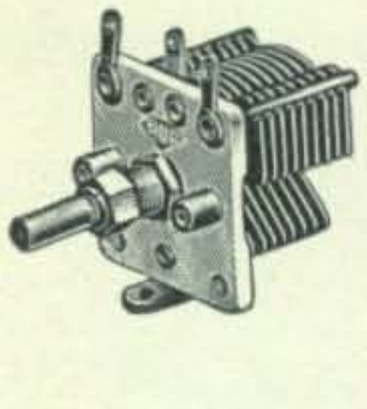

Catalog Number	Max. Cap. MMFD.	Min. Cap. MMFD.	Air Gap	No. of Plates	Over-all Length	Dealer Cost
CE-2020	15	4	.030"	3	1 11/16"	$1.15
CE-2021	35	6	.030"	7	1 29/32"	1.30
CE-2022	50	7	.030"	9	2 1/32"	1.40
CE-2023	75	8	.030"	14	2 1/4"	1.60
CE-2024	100	9	.030"	18	2 15/32"	1.80
CE-2025	150	10	.030"	27	3"	2.00
CE-2028	15	5	.060"	5	1 15/16"	1.35
CE-2029	35	7	.060"	11	2 7/16"	1.60
CE-2030	50	8	.060"	15	2 25/32"	1.75

Bud Radio, Inc. manufactures and catalogs over 400 different variable condensers for your use. See the Bud Display, Booth 231, at the I.R.E. Radio Engineering Show. March 7th to 10th.

The mark BUD *of perfection*

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2120 EAST 55th ST. CLEVELAND 3, OHIO

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The Radio Amateurs' Journal

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Vol. 5 FEBRUARY, 1949 No. 2

In This Issue

COVER—Major General F. L. Ankenbrandt, Director of Communications Department of the Air Force, and Major General S. B. Aiken, Chief Signal Officer, Department of the Army, enjoy a QSO over K4AF. These distinguished communicators are the heads of the Military Amateur Radio System, joint operation of the Department of the Air Force and Department of the Army.

★ ★ Letters ★ ★

Let's Migrate

121 Sherman Ave., Staten Island, N.Y.

Editor, *CQ*:

There is a lot of virgin amateur territory going to waste. This territory begins at about 420 mc and extends up into the highest bands allotted to hams. If we could step up the activity in these bands we'd find that we could have as much fun and excitement developing these frequencies as we did developing those wavelengths below 200 meters in the "good ole days." The problem of inactivity in these v-h-f, u-h-f and s-h-f bands resolves itself into the sporadic activity by isolated hams who after futile listening and calling for a period of time throw up their hands in disgust and quit the band in favor of the lower frequencies. What is needed is some concerted action. Of course, there are those who doggedly stick to these bands but this is not enough it seems. These dogged stickers-on need support—a lot of it.

I feel that amateurs who operate on the lower frequencies could do a great service for the higher frequencies by simultaneous transmissions—on their own frequency and on one of the v-h-f, u-h-f, or s-h-f bands. Having these signals on the higher-frequency bands would encourage many hams to park of these bands because of the many check points and the possibility of hearing DX. These sigs might also induce SWLs to explore the high frequency fields. SWLs could be of tremendous assistance to hams in these bands by reporting sigs heard. And the fact that the hams on the low frequencies would announce that they are simultaneously transmitting on high frequencies would advertise on the 1-f bands that these sigs are available on the v-h-f, u-h-f and s-h-f frequencies, further stimulating the 1-f boys to go on the high frequency bands, as well as helping the hams already there.

Too, there are many commercial companies who could make use of those signals and work with hams in compiling and disseminating data concerning the v-h-f, u-h-f and s-h-f frequencies and their characteristics. By this cooperation among commercials, hams and SWLs much valuable information concerning the high frequencies can be obtained. This would tend to further populate these high bands and relieve the low frequencies of some of their congestion.

Peter N. Saveskie, W2JFE

SSSC !!!

Riva, Md.

Editor, *CQ*:

Because I am very much interested in SSSC and have been using it on the 20-meter band for about five months, my remarks can be taken as very biased. However, even in view of this, it seems that something ought to be said in rebuttal to the manner in which it was dragged in to bolster a weak plea for maintaining "status quo" on the amateur phone bands by W1BGJ. If present investments were a good argument for resisting progress, how did we ever advance from spark to c.w.? Was the F.C.C. to blame for this change that enabled more than *one* station to use the

whole band? Don't get me wrong, I'm not saying the situation is identical in degree, but no one can argue the principle as different.

Aside from the merits SSSC may have over the present or other systems of transmission, such an attitude is incredible under any circumstances. Amateur radio hasn't been threatened with any new system. It certainly doesn't take a technical genius to stay out of the F.C.C.'s hair. Unfortunately, amateurs haven't been too hot with ideas either lately. What's so sacred about high level amplitude modulation of a Class C amplifier? Is it inconceivable that something developed by the commercials might be found vastly superior to it for amateur problems, or don't we have any problems?

By his own admission W1BGJ is not a rabid experimenter. While I, and perhaps a majority of others, respect this point of view, it's a good bet that he would have expended less effort *and* time learning how to tune a SSSC signal in on his receiver, than he did in writing his letter. This is hardly a bet, because had he tried he would not have implied that it wouldn't work! What good reason is there for blind rejection of anything new because it doesn't happen to be so simple that it takes no effort whatever to gain a complete mastery of it? This attitude even goes so far as to ridicule those who have learned a little about new methods and have made some *positive* statements concerning their *findings*.

It may also surprise W1BGJ, should he take the trouble to check on it, that the Army, Navy, and quite a number of commercials, whose *business* is communication, use SSSC wherever transmitter power, signal-to-noise ratio, bandwidth, and fading have any appreciable bearing on the situation. They are not greatly troubled with interference, but *amateurs* have found that it is less susceptible to it and causes less of it than what we have now.

Why deal ourselves a body blow by sticking our head in the sand? *Dave Mann, W3MBY*

Wanted: TG 10 F Keyer Tapes

715½ E. Stephenson, Freeport, Ill.

Editor, *CQ*:

Some time ago we obtained a type TG10F keyer made by Gray Mfg. Co. of Hartford, Conn. Along with the keyer we also obtained the fifteen tapes supplied by Maritime Switchboard. These tapes are all double spaced and not very good for use in our code practice program that we're carrying out with the would-be amateurs in town.

I wonder if anyone knows where we can obtain some typical single-spaced mixed-code and plain-language tapes for this machine?

W. C. Burnett, W9EHN

Thanks, OM

11656 Weddington St., North Hollywood Calif.

Editor, *CQ*:

Congrats on a nice December issue of *CQ*. Have just finished reading the very interesting article by Clayton Bane about his new "Final-Final." That article and Andy's fine DX column plus the new system on Monthly DX Predictions brings forth the missle here. From one reader, such articles as Bane's on the tetrode final and the recent article by Leigh Norton on his SSSC rig add plenty to this magazine.

C. B. McKnight, W6PQT

Feenix, Ariz.

Deer Hon. Ed:

At the moment Scratchi are lower than angle of radiation of rhombic antenna. For last couple of days I are writing thank-you letters to everybuddys who are sending Scratchi Xmas presents. You knowing what I mean "Deer Hon. Cousin-in-Law: Thanking you so much for lovely Xmas present. I are neerly jumping for joy when I are opening your box and finding that beautiful orange and green necktie" and all stuff like that there.

In firsts place, Arizona are place where Scratchi are not wearing many neckties, and in second place Scratchi are already rather colorful kid without appearing in public with Bright New Look in neckties. In fact, boys here on Brother Itchi's ranch are threatening to hold reel necktie party for me if I are caught wearing same.

Honest, Hon. Ed., it are neerly enough to drive self-respecting ham to taking up stamp collecting. I are coming from large family, and I are having relatives by the carload—aunts, uncles, cousins, great-aunts, great-uncles. If they are getting together and pooling resources they could be buying me one of these super-streamlined, multi-knob, miniature-toob, chrome-plated, 500-kc-to-500-mc, complete with accessory socket, speaker and power supply receivers every Xmas.

But no—each Xmas they are all rushing out at last minutes and buying me handkerchiefs, neckties, belts, suspenders, razor blades, shaving cream, face lotion (I are using an electric razor) and all other stuffs what are available at neerby drugstore. So, if you are thinking of investing in sailboat, Hon. Ed., and the XYL are handy with needle and thread and can be sewing handkerchiefs together, I are having plenty to making 1/c sail for sailboat. Coming to think of it, I are even having enough white ones for that, and maybe out of the colored handkerchiefs you would be able to making signal flags.

Of course not all of Scratchi's relatives are putting so little thought into buying Xmas presents. For examples, taking Hon. Great Grandmother from New Hampshires. She are sending Brother Itchi and I each a very nice suit of long flannel red underwears, complete with bomb bay. All I know, is that if we start wearing same, you can really be calling us Itchi and Scratchi.

Brother Itchi are saying it are always darkest before the dawning, and so he are getting ideas on how to using some of Xmas stuffs. He are particularly liking one necktie I are getting which are color of Arizona sunset. It seems he are sumtimes carrying stuff in station wagon which are extending too far out to rear, and he are needing sumthing specially bright to tying on end.

(Continued on page 8)

CRYSTAL CONTROLLED BUT NOT "ROCK BOUND"

Skip around as your heart desires . . . be a bandhopper with a vengeance . . . *and yet retain the priceless advantages of crystal control.* All you need is a half-dozen or more PRs. Multiple crystal operation is the answer to today's maddening QRM problems on phone or CW. It's most economical, too. See your jobber and select low-cost PRs from his all-frequencies stock. Be a gypsy on the band.

10 METERS, Type Z-5, $5.00 • 20 METERS, Type Z-3, $3.75 • 40 & 80 METERS, Type Z-2, $2.75

PR

SINCE CRYSTALS 1934

PRECISION CRYSTALS

USE "PR" and KNOW where You Are!

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

Scratchi are also kind of smart, and I are figuring out stuff same way. Handkerchiefs are coming in very handy when packing radio toobs in cartons, especially if are losing original packing. Shaving cream are seeming to work fb on gears in rotary beam. Only trubble, when using beam too much, lather starts running down pole. This are probably giving Scratchi clean signal anyway.

I are almost giving up on what to doings with the many bottles of shaving lotion, until I are discovering that it are seemly ok when mixed with Scratchi Cactus-Juice Supreme, especially when having big party and running low on cactus-juice. It are also having effect of ending party more quickly, which are ok anyhow when running low on latter-mentioned juice.

Scratchi's XYL-to-be, Lil, are giving quite a bit of thought to Xmas present for me. She and Itchi are having many secret sessions before Xmas, and so on Xmas day Lil are taking me in shack and showing me her Xmas present. She are having redone Scratchi's shack—flowered slipcovers on chairs, chintz curtains on windows and pictures on wall instead of calendars I are having there. I are so mad I are almost taking back the new microphone I are giving her for Xmas.

Itchi are just coming in and saying he are getting reel slick idea on how to using all those razor blades we are having. He are designing lawn mower to using same. I are better running and helping him before he are getting all cut up.

By the way, Hon. Ed., I are certainly wanting to thank you for the lovely Xmas present you are sending me. I are almost delirious when I are opening the box and seeing that hand-made necktie in red, white and blue. Thanking you so much.

Respectively yours,
Hashafisti Scratchi

Postscripts

War Surplus Bibliography

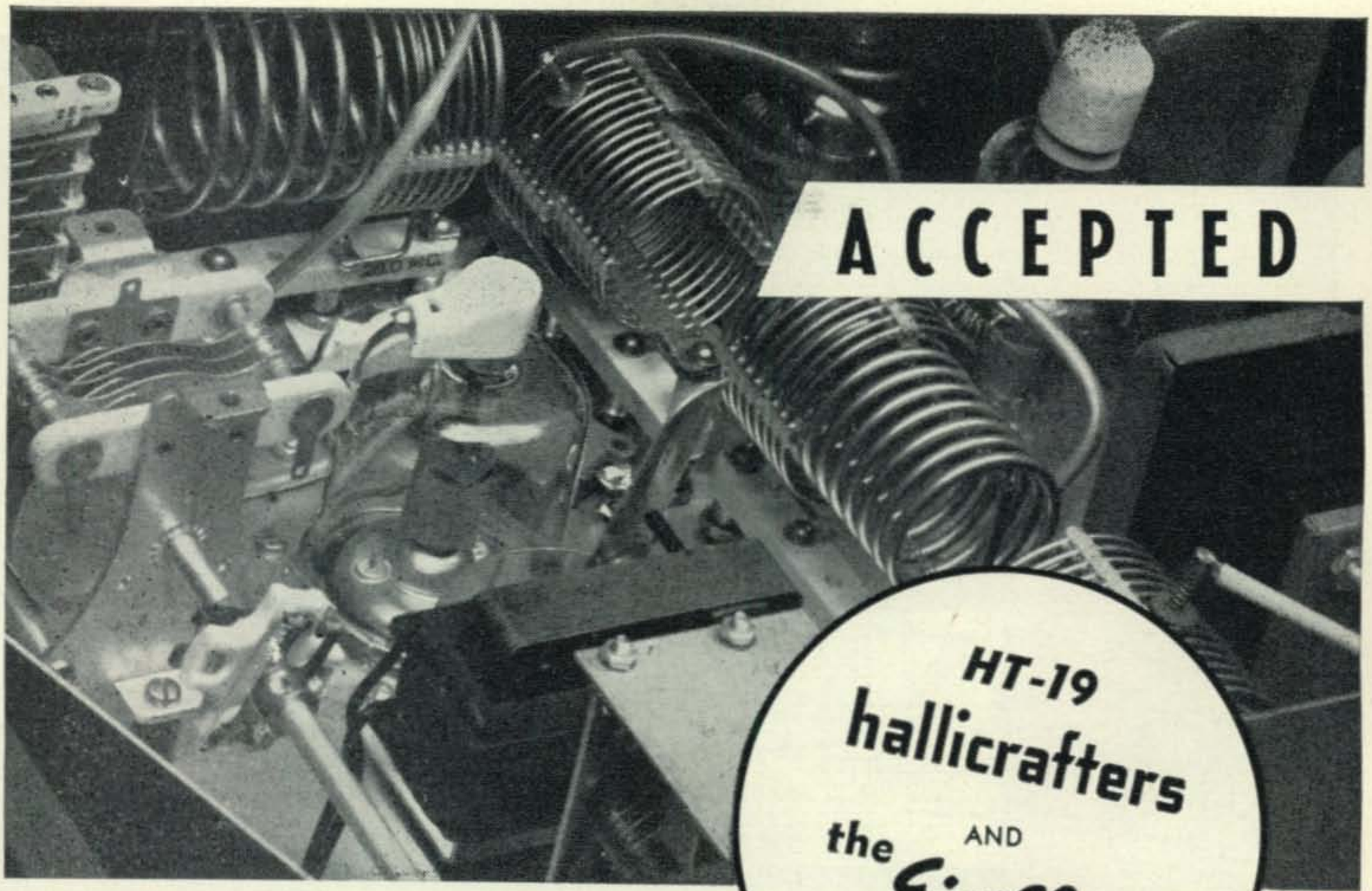
A 4-page mimeographed bibliography of 69 articles concerning conversion of war surplus equipment for civilian and school use is now available free upon request from the Office of Education, Federal Security Agency, Washington 25, D. C.

Britain Attacks QRN

The British government has announced that it plans legislation to enforce the use of suppressors on seventy different items that cause interference to radio and television reception, including such equipment as electric razors and car motors. The bill provides that any person who refused to use suppressors after a complaint had been made against him would be liable to a fine of $400, or three months' imprisonment.

Station K4USA Opens in Pentagon

The Army has resumed direct contact with amateurs through K4USA, its ham station in the Pentagon, after several years of absence from the amateur bands. K4USA will operate daily on 3.5, 7, 14 and 28 mc, using c.w. or phone. Transmissions on 20 and 10 will be with a Signal Corps BC610E transmitter in the Pentagon, and using a dual 10 and 20-meter three-element rotary beam. Transmitters for 40 and 80 are operated remotely from the Pentagon and are located at the transmitting stations of WAR at Battery Cove and Fort Myer, Va.



An Eimac 4-65A in the versatile Hallicrafters HT-19 medium-power amateur transmitter. The unit is completely self-contained, 20 x 10 x 18 inches in size and operates both narrow-band FM and CW, plus provisions for AM . . . to give maximum flexibility on five popular bands.

GENERAL CHARACTERISTICS

ELECTRICAL

Filament: Thoriated tungsten
- Voltage - - - - - - - - - 6.0 volts
- Current - - - - - - - - - 3.5 amperes

Grid-Screen Amplification Factor (Average - - 5

Direct Interelectrode Capacitances (Average)
- Grid-Plate - - - - - - - - - 0.08 μuf.
- Input - - - - - - - - - - 8.0 μuf.
- Output - - - - - - - - - - 2.1 μuf.

TYPICAL OPERATION

RADIO FREQUENCY POWER AMPLIFIER AND OSCILLATOR

Class-C Telegraphy or FM Telephony

D-C Plate Voltage - - - -	600	1500	3000 Volts
D-C Screen Voltage - - -	250	250	250 Volts
D-C Grid Voltage - - - -	—50	—75	—98 Volts
D-C Plate Current - - - -	140	150	115 Ma.
D-C Screen Current - - -	40	35	20 Ma.
D-C Grid Current - - - -	13	14	10 Ma.
Peak R-F Grid Input Voltage (approx.) - - - - -	145	180	170 Volts
Driving Power (approx.) - -	1.9	2.5	1.7 Watts
Screen Dissipation - - - -	10	9	5 Watts
Plate Power Input - - - -	84	225	345 Watts
Plate Dissipation - - - -	30	55	65 Watts
Plate Power Output - - -	54	170	280 Watts

Universally accepted as the dependable tetrode to supply ample power with extremely high stability, the Eimac 4-65A is appearing in ever increasing numbers in the most modern of amateur and commercially built transmitters.

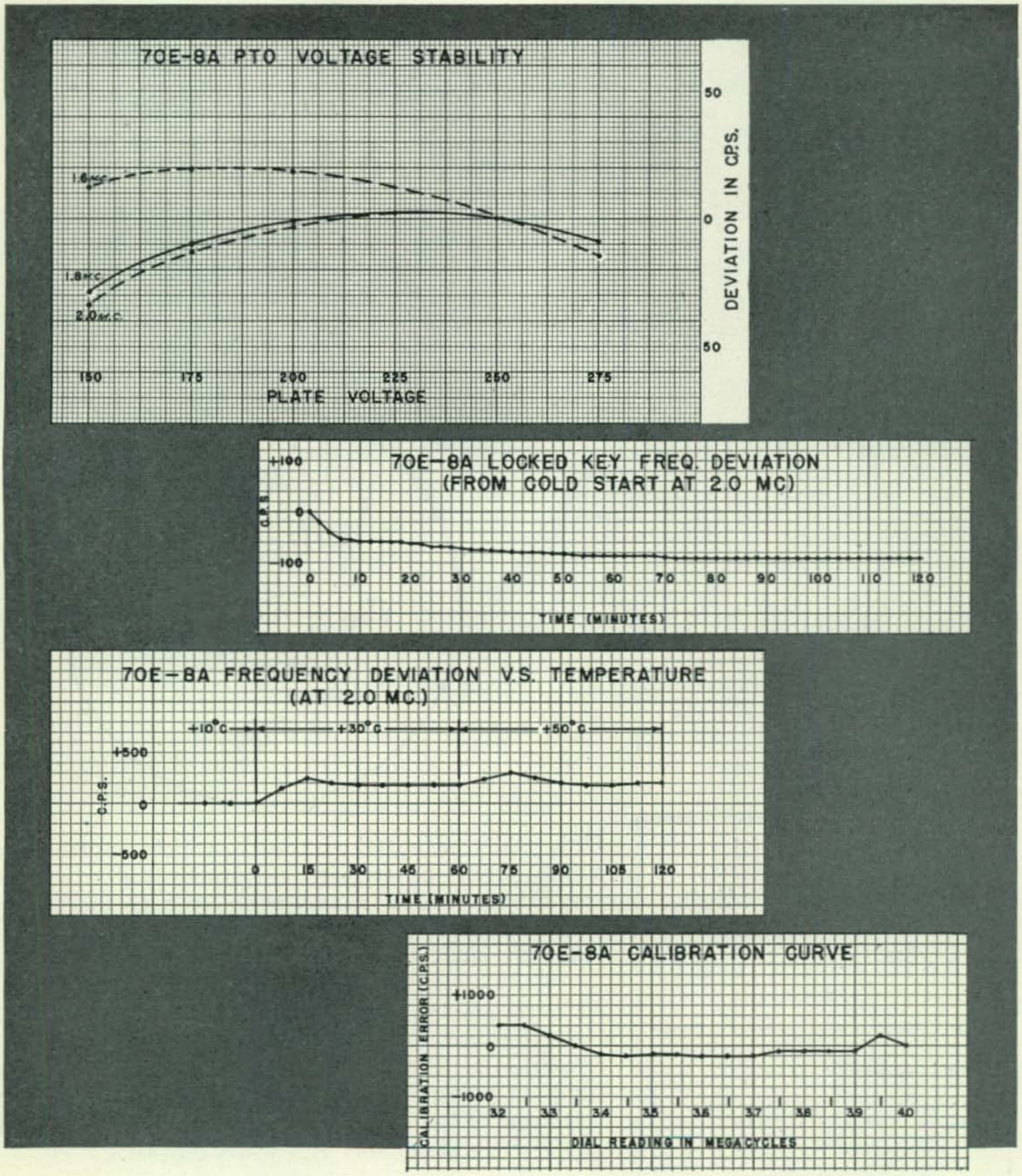
As an example of the trend, in the above illustration the Eimac 4-65A is pictured in the final amplifier of the new Hallicrafters HT-19. This compact transmitter gives maximum flexibility on five popular bands. The 4-65A runs at an input of 185 watts and delivers 125 watts output.

Complete technical data on the 4-65A, including its use as a Class-B linear amplifier in SSSC operation, may be found in a new 4-65A data sheet which is yours for the asking, write direct.

EITEL-McCULLOUGH INC.

208 SAN MATEO AVE., SAN BRUNO, CALIFORNIA

Export Agents: Frazar & Hansen, 301 Clay St., San Francisco, California



COLLINS 70E-8A Permeability Tuned Oscillator

The 70E-8A PTO is used as the VFO for the Collins 30K-1 and 32V-1 transmitters and the Collins 310B-1, 310B-3, 310C-1 and 310C-2 exciters. It is largely responsible for their extreme accuracy and stability. The curves on this page are plotted from actual data as measured in our engineering laboratory. The 70E-8A is also available separately from your Collins dealer at $40.00 complete with tube, slide rule and vernier dial, and instruction book.

COLLINS RADIO COMPANY, Cedar Rapids, Iowa

11 West 42nd Street, New York 18, New York **458 South Spring Street, Los Angeles 13, Calif.**

ZERO BLAST

EDITORIAL

URGENT

Are You Ready?

HEADQUARTERS, FIFTH ARMY
5 February 1951

TO : Commanding General, Eastern Defense Command

SUBJECT : Emergency Communications during attack of 2 Feb 51.

1. Functioning of emergency communications facilities began at 0230 hours, 2 Feb. 51, upon declaration by CG, Eastern Defense Command, that Plan Blue was in operation, and that a state of war existed between the United States and an unidentified foreign power.

2. Situation Intelligence Reports available at this HQ. as of that time indicated that a general aerial bombardment was taking place in the vicinity of New York City, launched at 0200 hours; communications centers throughout the operational area of the Fifth Army were under attack by rockets or guided missiles from undetermined launching sites. There was a very rapid deterioration of communications facilities from 0230 hours, but prompt action by all concerned succeeded in alerting defense organizations and local governmental authorities throughout most of the area.

3. Enemy action during the first two hours of attack was directed very intensively against telephone, telegraph and radio communication. Numerous acts of sabotage destroyed important wire installations, and particularly violent enemy measures were directed against radio installations at military and commercial airfields, clearly intended to prevent the organization of countermeasures, and to hamper civilian authorities in their efforts to control damage.

4. MARS Control Station at Garden City, L.I., was activated within 30 minutes of the initial attack, but was beset with difficulties in attempting to alert the net. Because of the surprise achieved by the enemy, no declaration of Condition Red was possible, and accordingly, few MARS stations were observing 24-hour watch. The prompt action of the chief operator at MARS control in recognizing this situation enabled emergency measures to be taken at once, and by 0300 hours, police and fire departments throughout the area had been requested over such communications facilities as then remained, to alert MARS stations in their respective localities.

5. Within the next 60 minutes, 26 out of the 30 stations in the Region reported into the net. the remaining four having been destroyed by sabotage. The following statement from one of these stations is typical:

"My name is Frank P. Carman, and I am a resident of Hewlett, L. I., a community 18 miles east of New York. I am the operator of amateur radio station K2FNX. I am a member of the ARRL emergency corps, and a network station of MARS. At 0300 hours, the fire siren of our local firehouse went off, awakening me. Naturally, I thought it was a fire—we have a volunteer fire department—until I realized the siren was sounding a continuous series of short blasts. We have no such regular alarm, so guessing something must be up, I dressed and ran to the fire house. By then I could see a tremendous pink glow in the direction of Manhattan, and I could hear definite explosions. At the fire house I was told that New York was under air attack, and that the telephone circuits had gone out immediately after the warning had come from Garden City. I ran back to my house and turned on my transmitter and a broadcast receiver. No broadcast signals were heard, but on 144.7 mc the net control was announcing Plan Blue in the agreed-upon cipher. I reported into the net.

"As South Shore coordinator my war emergency assignment is to provide a relay link for the stations at New York International Airport, MacArthur Field, and the net control at the telephone company central exchange in Garden City. International Airport did not respond and later checks indicated that the larger part of this field was destroyed in the initial attack. I reported this fact to Net Control.

"National Defense Net Eastern Link station was located at International Airport, but appeared inoperative; accordingly Net Control ordered me to put on the air my low-power m-f equipment to make direct contact with Jersey control. Contact was established at 0410 hours with K2USA, thus providing for the first time since the beginning of the attack communications between installations on Long Island and those in New Jersey. Newark Airport was comparatively slightly damaged and requested an open circuit to be maintained to MacArthur Field. Net Control approved this request and a telephone patch circuit was

If an emergency strikes your community tomorrow, would this report represent an accurate prohphecy of events? Or would the opposite be true? It is an unlikely story—but not impossible! It offers sobering thought, but is a fair appraisal of the amateur's importance to his fellow citizens. How to do something about it is told in the first story of the Military Amateur Radio System.

established: Newark — K2FNX — Garden City — MacArthur Field.

"At 0930 hours all commercial power failed in this community, with the result that K2FNX was inoperative for 14 minutes on 144.7 mc. Low frequency operations were not interrupted, due to the availability of an independent power supply. The Valley Stream fire department dispatched an emergency truck with generating equipment, and at 0944 operation was resumed on 144.7 mc.

"At 1100 hours, K2FNX was able to put on the air two more transmitters for high-frequency operation, and five operators were available, having been rushed in with the aid of local police. At this time Jersey control advised of failure of additional telephone circuits, but we were able to accept increased traffic using our expanded facilities.

"A total of 4,380 messages were handled by the three transmitters from the alert at 0300 until 39 hours later, when the American counter-attack had routed the enemy and communications were restored."

6. Complete operational reports of MARS activities will be forwarded to your HQ. upon completion by Statistical and Historical Section.

L. J. BARTH,
General, USA

This is Your

Military Amateur Radio System

Major R. H. Ralls, USAF, K4AF, W3RO,* and
Captain E. L. Nielsen, USA, K4USA, W4ODI**

THE OFFICE OF THE SECRETARY OF DEFENSE announced on November 26, 1948, the implementation of the Military Amateur Radio System (MARS), a joint project of the Air Force and the Army under the direction of Major General Frances L. Ankenbrandt, Director of Communications, Department of the Air Force, and Major General Spencer B. Akin, Chief Signal Officer, Department of the Army.

Brig. Gen. Tom C. Rives, ex-W2CXL, founder of the AARS.

MARS is, in effect, the reactivation of the pre-war Army Amateur Radio System (AARS)), under the joint direction of the Army and the Air Force. AARS, so familiar to old-timers, went out of business on December 7, 1941.

Cognizant of the fact that the amateur is indispensable to the military and to national defense in the event of an emergency, the scope of MARS has been broadened to encompass every amateur activity and interest and to lend encouragement to furthering his operating and technical proficiency.

The Advance of Radio Communications

The purpose of the Military Amateur Radio System is multifold. Primarily, it is to create interest and further training in military radio communication. In order to do this, MARS is dedicated to coordinating amateur radio procedure with military radio communication procedure, and in so doing will provide an additional source of trained radio communications personnel in the event of a local or national emergency. While the MARS program is military in concept, it is being executed by personnel who are both soldiers and radio amateurs. In other words, it is a program conceived and executed to be not only palatable to radio amateurs, but of tremendous direct and indirect benefit.

It is a known fact that the amateurs have derived great strength from the support of their activities by the military authorities. Appreciation of this fact alone would justify participation by hams in a program such as MARS. But the Military Amateur Radio System has been planned so instead of being even an obligation on the part of amateurs, it becomes a privilege to participate. MARS is an organized activity that combines most of the good features of ham radio, such as DXing, traffic handling and experimental work. It offers the participant a chance to perform a service to his country while enjoying his hobby and receiving the very definite benefits of membership in the MARS!

An advisory committee will be appointed to advise the Chief Signal Officer and the Director of Communications on matters of policy pertaining to MARS. This committee is to be composed of not more than nine military personnel, including the Army and Air Force, Chiefs of MARS and three civilians. At the time of this writing the military members had not met to nominate the civilian advisors. It is anticipated, however, that one of the representatives will be a member of the A.R.R.L. and one a member of the F.C.C. By composing the advisory committee of MARS in the manner outlined, civilian amateur members will be able to add their considerable weight on the committee in the guidance of MARS affairs. These members can effectively introduce civilian thinking and prevent MARS from becoming

*Chief, MARS, U. S. Air Force.
**Chief, MARS, U. S. Army.

purely a military organization. Thus, participants in the program are assured of an organization that, at all times, lives up to the original concepts.

The very first act of MARS was to reinstate the c-w nets of the Army and the Air Force on 3497.5 and 6997.5 kc with the addition of 14,405; 20,995 and 27,995 kc, which have been cleared by the Inter-departmental Radio Advisory Committee for operation within the United States. Clearance is now under way for the use of these frequencies to communicate with amateurs attached to millitary units at bases in American possessions and leased bases outside the United States.

Crystals for these frequencies will be supplied to the membership; however, v-f-o operation on the special MARS frequencies will also be authorized.

Basis of Organization

The Military Amateur Radio System will follow those channels of command currently prescribed for components of the U.S. Army and U.S. Air Force respectively. It is organized to provide a complete radio network throughout the continental limits of the United States that can be made readily available to military commanders and Red Cross representatives. This will be accomplished by placing the system at the disposal of the commanders of all components of the Armed Forces of the United States. The organization is based upon the division of the United States into six army areas.

These nets carry a three-fold purpose. First: The indoctrination of the amateur into joint military procedures and increasing his proficiency in the handling of c-w traffic. Second: To provide a channel for handling quasi-official traffic. Third: To provide an emergency military network. Ultimately the scope of operating activity will be extended to include voice operation, teletype and facsimile.

Time on the nets is divided equally between the Army and the Air Force with ample time left on all frequencies for free net operation. Suitable certificates of award for "WAAFB"

Lt. Gen. Curtis E. LeMay, USAF, one of the high staff officers active on the ham bands.

and "WAAP" meaning, of course, "Worked All Air Force Bases" and "Worked All Army Posts" are to be given qualifying members of MARS.

The nets will be integrated at certain levels between Army and Air Force and with the A.R.R.L.'s Amateur Emergency Corps. Top level net control stations are WAR (K4USA in the amateur bands) for Army and AF4AF for the Air Force (K4AF in the amateur bands). These stations are located at the Pentagon Building, Washington 25, D.C. Weekly broadcasts every Monday on c.w. on 6997.5 and 14,405 kc simultaneously, concerning net activities will be made over WAR at 0100 and 0400 GMT.

MARS will also enter the East Coast teletype net on 147.96 mc in the near future. This move is not to be construed as the Military moving into the ham bands, rather it is an effort to help the acceleration of interest in FSK teletype by aiding and abetting this newly established activity.

A number of facsimile machines are under procurement and request is being processed to use A4 emission on 20,995 and 27,995 kc. Due to the limited number of machines requested, they probably will be issued on a temporary loan basis upon request to the Chiefs MARS at Headquarters USAF and Office of the Chief Signal Officer levels.

A considerable quantity of surplus electronics equipment has been allocated to MARS from excess Signal Corps and Air Force stocks and some has been obtained from War Assets Administration. The great bulk of this material is useful

(Continued on page 72)

What is MARS?

- MARS is the abbreviation for the Military Amateur Radio System—a joint project of the United States Air Force and Army.
- Its program is designed to train amateurs in military procedure, equipment and technique; to bring to the military the benefit of amateur experience and know-how; and to permit joint action at maximum efficiency in any kind of emergency—local or national.
- It is open to licensed amateurs who are affiliated with any military organization—ROTC, Army, Air Force, Navy, National Guard, Coast Guard.
- Eventually scope will be broadened to permit participation by all qualified amateurs regardless of affiliation.
- Members are privileged to use special frequencies adjacent to, but outside of amateur bands (3497.5; 6997.5; 14,405; 20,995; 27,995).
- Special distinctive calls available to be assigned for use outside of and in certain cases inside of, amateur bands.
- Features include on-the-air activities, research and study projects, opportunities for learning.
- Equipment will be available for home station use on loan basis to qualified MARS members.

The Improved Dipper

WILFRED M. SCHERER, W2AEF*

Applications of the grid-dip oscillator were described last month. Here is a new model streamlined so the instrument can be manipulated in one hand.

THE IMPROVED Dipper includes several refinements over the original instrument described by the author.[1] It is a more compact design, greatly facilitating handling and operation.

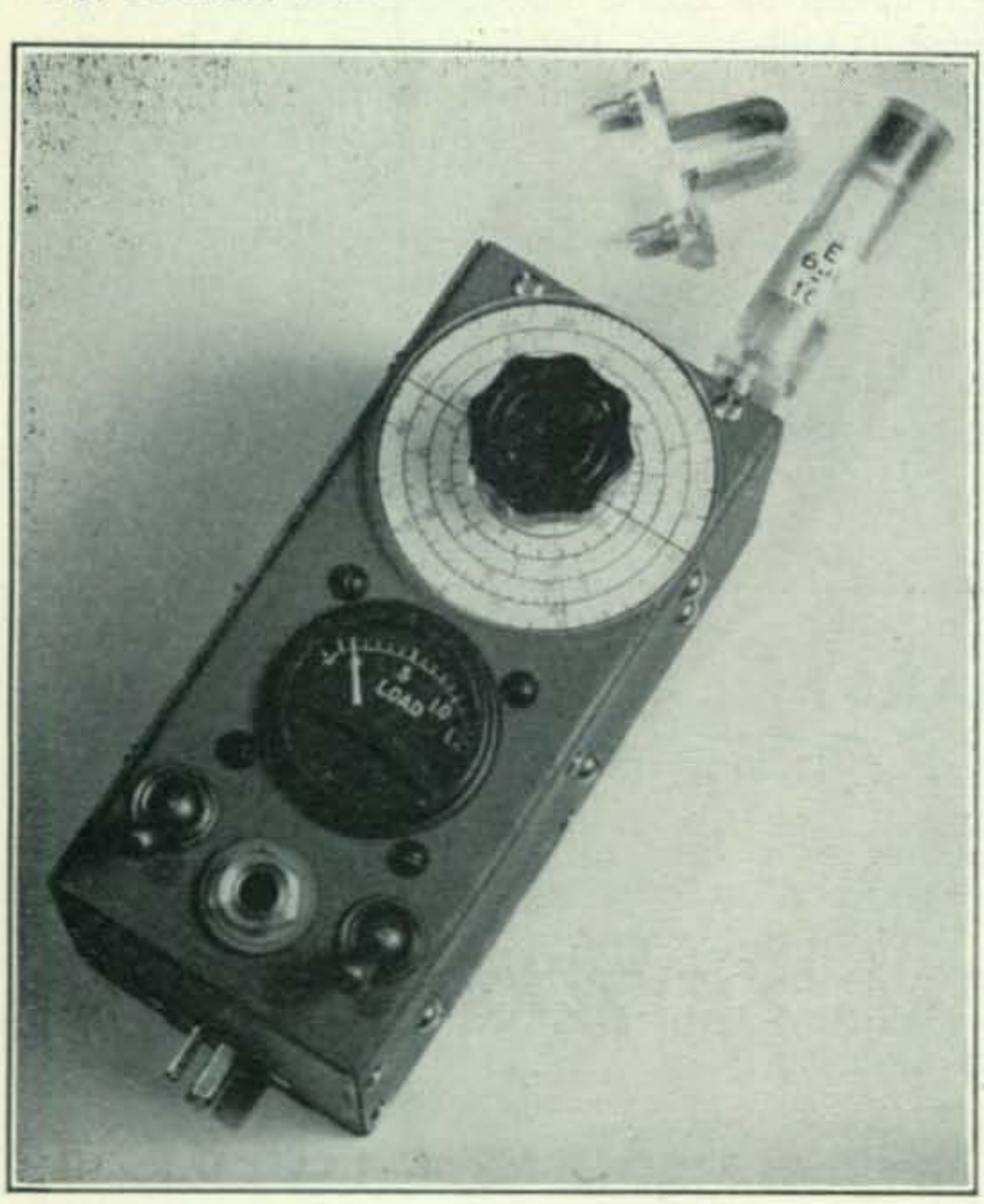
The new model is a-c operated and entirely self-contained in one small case, eliminating the inconvenience of an additional unit for the power supply. The grid meter is located directly in the same line with the tuning dial and the probe coil so it may be easily observed.

The line cord is connected by means of a plug for easy removal for substitution of a separate cable when battery operation is desired. Self-contained battery operation was at first planned, but was abandoned because available tubes' having small filament drain were not found rugged enough for general portable operation. The use of batteries, in most cases, is not required except under some conditions of antenna measurements where it may be more convenient. And batteries too often have a habit of running down at just the psychological moment.

The tuning dial is arranged so that the instrument may be held and tuned at the same time by one hand. The frequency range, 1.7 to 275 mc, is covered using seven coils, each having a tuning ratio of 2.5 to 1. The amateur bands are located at the low frequency end of each scale where there is slightly greater spread (the variable capacitor is one of straight line wavelength). Considerable overlap between ranges is also included so the second harmonic of each band may be read directly on its same scale. All the scales up to that covering 65 mc may be checked directly with WWV. The entire range of the instrument could be covered using only six coils, but with a sacrifice of overlap and spread on each amateur band. The range may be extended up to 350 mc or below 1.7 mc with additional coils for which an eighth dial scale, reading from 0 to 10, is provided for reference calibration. Each coil is protected by an insulated sleeve.

*100 East Palisade Ave., Englewood, N. J.

1 Scherer, "The Dipper," *CQ*, May, 1947.
Scherer, "Applications of the Grid-Dip Oscillator," *CQ*, January, 1949.



The improved Dipper, having a range of 1.7 to 275 mc. The 6.4-16 mc probe coil is in place, while the 110-275 mc coil may be seen at the upper left. The toggle at the lower left is the filament switch, the one at the right is the plate switch. The Jones power receptacle is at lower center bottom.

Circuit

The circuit is shown in *Fig. 1*. With the exception of the power supply, it is basically the same as that of the original instrument. The oscillator itself is the Split-Colpitts. Power is obtained directly from the 117-volt a-c line; however, complete isolation is included in order to eliminate the hazard of shock. This is accomplished by by-passing the negative of the power supply to the metal shield case with a .002-μf capacitor (*C7*). At first a .02-μf capacitor was used and, although its reactance at 60 cycles was sufficiently high to limit the current below the minimum safe value,[2] enough "tickle" was experienced between case and ground to scare one into dropping the instrument. No sensation is experienced using the .002-μf capacitor, even with wet hands.

Although headphones are usually completely insulated, an additional precaution has been included for their use. When the phones are plugged into the jack, a 50,000-ohm resistor (*R4*) is automatically inserted in the grid return to reduce the maximum possible current below the minimum safe value. The sleeve end of the jack is also connected to the case through a .002-μf capacitor (*C6*). The resistor could be left in the circuit at all times and the phone jack could then be

2 Nichols, "Life Insurance in the Shack!," *CQ*, November, 1947.

connected across the resistor through a small capacitor, but the grid current would then be too low when utilizing a 0-1 ma meter. (A 0-200 μa meter would be the obvious solution, but a 0-1 ma meter costs less).

Plate power is obtained through a half-wave selenium rectifier and *RC* filter. A resistor line cord of the correct value to operate a 6.3-volt .15-ampere tube was not obtainable; therefore, a resistor (*R5*) is connected in parallel with the tube filament to enable the use of a standard 390-ohm line cord. In the event the line cord should become defective, it may be easily replaced at the Jones power plug instead of requiring internal soldering of connections. When 117 volts a.c. is to be used, a jumper must be connected between terminals *1* and *4* of the line plug to connect the internal parallel filament resistor. When battery operation is to be employed, the jumper is omitted, removing the resistor and thereby reducing the filament battery drain.

The original Dipper utilized a 955 acorn tube which was soldered in place to eliminate socket inductance and thus increase the upper frequency limit. From a practical standpoint, it was deemed advisable to employ a tube with a socket. The 9002 was chosen because, compared with the 955-plus-socket, it takes up less over-all space and with a given high frequency coil it will oscillate at about the same frequency.

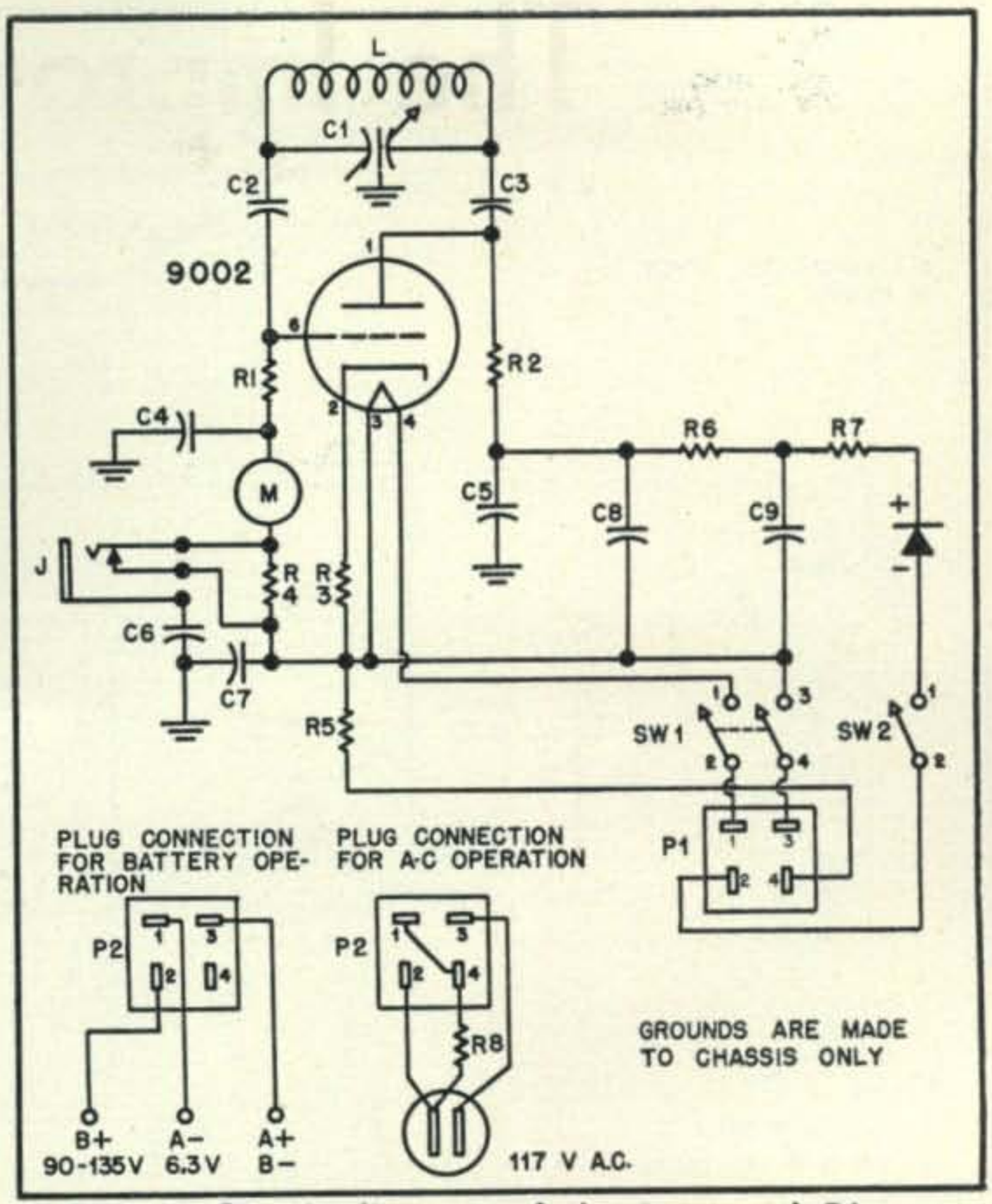


Fig. 1. Circuit diagram of the improved Dipper.

C1—100-100 $\mu\mu$f, National STHD-100,
C2, C3—60 $\mu\mu$f, Erie silver-mica button, flat ring mounting, Type 370 CB.
C4, C5—500 $\mu\mu$f, Erie silver-mica button, stud mounting, Type 370 FF.
C6, C7—.002 μf, 600 volts, Sangamo moulded paper.
C8, C9—Dual 20-20 μf, 150 volts, Solar Minicap.
R1—15K, ½ w.
R2—10K, ½ w.
R3—200 ohms, ½ w.
R4—50K, ½ w.
R5—39 ohms, 1 w.
R6—2250 ohms, ½ w.
R7—400 ohms, ½ w.
R8—390 ohms, JFD a-c line cord resistor.
J1—Closed single circuit midget.
M—O-1 ma meter, 1½ inch (see text), G. E. type G1 or MB Instrument type 152.
P1—Jones receptacle, P304AB.
P2—Jones plug, S304CCT.
SW1—DPST toggle, see text.
SW2—SPST toggle, see text.
Rect—Federal 50 or 100-ma selenium rectifier.
Tube Socket—Johnson Ceramic, type 267.
L—A 110-275 mc—see *Fig. 5.*
B 48-130 mc—2¾ turns #22 enamel, ⅛" between turns.
C 26-65 mc—8¼ turns #22 enamel, space wound.
D 13-32 mc—15¾ turns #26 enamel, close wound.
E 6.4-16 mc—30¾ turns #32 enamel, close wound.
F 3-7.5 mc—67¾ turns #38 enamel, close wound.
G 1.7-4.5 mc—160¼ turns #38 enamel, close wound, undercut on coil form must be ⅞" long instead of ½".

Construction

Dimensions for the case are given in *Fig. 2.* The material used is .040 inch No. 2S half-hard aluminum. Other material such as copper may be used. The bending can be done easily in the home workshop as follows: Using a pair of "C" clamps, secure the material between a pair of steel bars, or right angle stock, aligned with a scribed line where the bend is to be made. The bars should have a smooth and clean right angle edge. Place the bars securely in a vise and bend the material, using a heavy wood block for leverage. This will make a bend that is slightly round at the edge. To true up the edges, place a flat piece of steel on top of the bend and hammer the steel piece until the bent edge is clean and sharp. The "C" clamps are used only to keep the bars aligned with the scribed line until they are placed in the jaws of the vise. When making the scribed lines, allowance must be made in the dimensions for a slight loss in the bend. This is indicated in *Fig. 2* as "bending dimensions." Before making the final bends, it may be wise to make a few practice operations with scrap material.

The order in which to make the bends for the main body of the case is as follows: First make the two lips *A* and *B*, clamping the bars along the lip portion. Next make the two remaining bends at *C* and *D*, clamping the bars along sides *E* and *F*. When making the last bend, there may not be enough clearance along the top edge of the vise to permit the completion of the bend without having one of the lips hit the vise. If this is the case, allow bottom *G* to bend slightly as it may be readily straightened again by hand. Lip *H* on

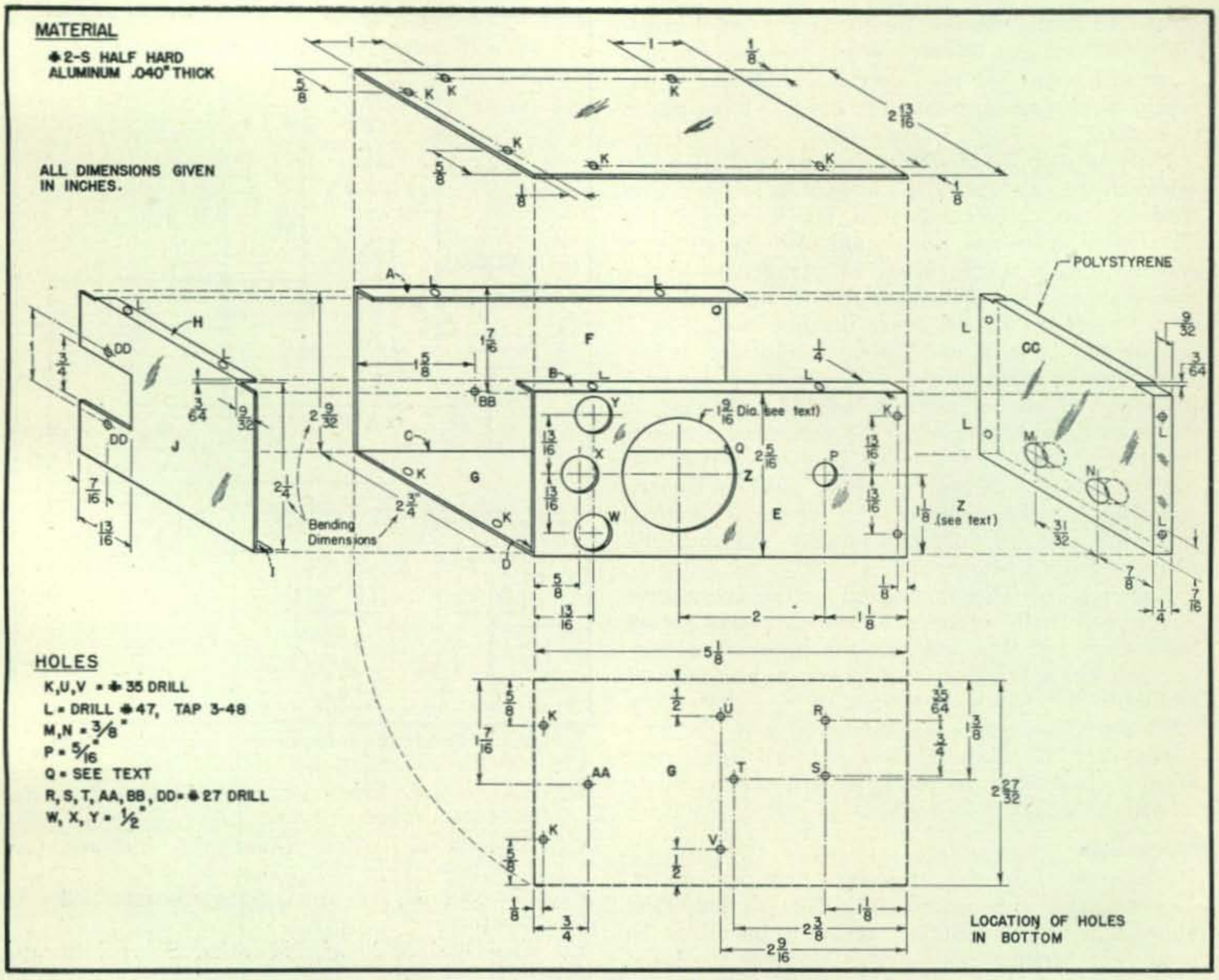


Fig. 2. Mechanical drawing of the specially constructed Dipper case.

side *J* should be flush with lips *A* and *B*. Lip *I* fits inside of bottom *G*.

On side *E*, of the main body, dimension *Z* should be centered; however, if the case dimensions do not turn out accurately, dimension *Z* should be 1⅛" from the inside of bottom *G*. This is required so hole *P* will be correctly positioned for the variable capacitor shaft. Holes *K* should be made before holes *L* and the latter located by a scribe through holes *K* while the sections are held in place by hand. 3-48 button head screws are used for holding the case together. If they are not obtainable from a local supply house, they may be taken from surplus equipment such as the ARC 5 series of units. If more convenient, 4-40 screws may be substituted.

Screw holes for the meter are not indicated because they may be marked when the meter is placed in hole *Q*, and they will vary, depending upon the type meter employed. The one shown in the photographs is a surplus 1½" meter with a square flange; however, except for the scale, it is identical with the G.E. type G1. The MB Instrument Co. 1½" meter type 152 may also be used. Either of the meters should be mounted from the rear of the hole in the Dipper case with the flange on the rear side so only the round lip of the meter face protrudes through the Dipper case. With the MB meter, the meter case is fastened to the flange by three small screws which must be removed and the holes thus left empty are used for mounting. The regular mounting hole at the top center of the meter will interfere with the Dipper dial.

Dimensions for holes *M* and *N* in the polystyrene end piece *CC* are given, but they should not be drilled until the variable capacitor is installed and their location is determined according to the exact position of the coil mounting posts which are to pass through the holes. The metal portions of the case may be painted with Ruf-Koat wrinkle varnish and then baked in the oven. Do not paint lips *A, B, H* or *I*.

Dimensions are given in *Fig. 3* for the brackets holding the coil posts and the d-c blocking capacitors, *C2* and *C3*. A left and a right-handed bracket must be made. The capacitors should be mounted and soldered in the brackets prior to installation of the latter. If the flat ring type of button capacitors are not available, those having a mounting stud may be used after first sawing off the stud. Any value from 50 $\mu\mu$f to 200 $\mu\mu$f may be used. If the head of the screw holding the coil post to the bracket is too large to pass over the edge of the stator plates, it should be filed down until sufficient clearance is obtained.

The soldering lugs should also be removed from the stators.

Before reassembling the capacitor, remove the loose mounting nut at the front bearing. It should not be used to fasten the capacitor to the case, because pressure exerted to the case or movement of the case at this point will tend to bend the capacitor frame enough to throw it slightly out of line. The surplus part of the threaded bushing, beyond the fixed nut, should be cut off so as not to interfere with the dial, and the end of the rotor shaft should be cut off so only 5/8" of it will extend outside the case.

The variable capacitor should be mounted in the case as shown in the photo. It should be fastened by 1/4" 6-32 screws through holes *R* and *S*. Tapped holes have already been made by the manufacturer at the bottom of the capacitor frame. Some realignment of the coil post brackets may be required so they will be parallel with the bottom of the case and equidistant from the edge. However, there is sufficient clearance at the holes in the ceramic end-pieces to permit this.

Correct Wiring Procedure

The miniature ceramic socket must be mounted next, but first, cut off the lugs of terminals *5* (extra plate lead) and *7* (extra cathode lead), because they are not used and are in the way. Solder *R3* in place between cathode terminal *2* and filament terminal *3*, so it lies along the side of the socket. Then mount the socket, securing it by a 3/4" 6-32 screw through hole *T* and through the center of the socket ground shield stud. A small size nut should be used and its corners should be filed down so it will fit into the small recess in the socket to permit complete insertion of the tube. Terminals *1* and *6* should face the variable capacitor and they should automatically coincide with the terminals of capacitors *C2* and *C3* on the capacitor brackets. Solder the junctions of these terminals. Mount capacitors *C4* and *C5*, securing them with 3-48 screws through holes *U* and *V*.

Next solder *R2* in place between the terminal of *C5* and the junction of socket plate terminal *1* and *C3*. Likewise, solder *R1* in place between the terminal of *C4* and the junction of socket grid terminal *6* and *C2*. A 2" lead should also be soldered to the terminal of *C4*. This lead will eventually be connected to the negative side of the meter.

Solder a 5" lead to socket filament terminal *4*. This lead will eventually go to one terminal of the filament switch. Then solder *C7* in place between socket filament terminal *3* and the grounded shell of *C4*. *C7* should lie in a plane parallel to the variable capacitor. A 5" lead should also be soldered to socket filament terminal *3*. This will eventually go to the other terminal on the filament switch.

Mount meter, trim and solder the 2" lead from *C4* to the negative terminal of the meter. Solder a 3" lead to terminal *1* of plate switch *SW2*. This will eventually go to the selenium rectifier. Mount *SW2* in hole *W* and be sure its terminals do not touch either the meter or the Dipper case.

Proceed to solder *R4* in place between the "tip " and "normal" of the phone jack *J1*. Mount the jack in hole *X* using fiber insulated bushings. The jack must not be directly grounded to the case. Trim and solder the 5" lead from socket filament terminal *3* to terminal *3* of filament switch *SW1*. This switch, and *SW2*, are G.E. toggle type, but any switch may be used if the overall dimensions are not greater than width 9/16", length 1 7/16", and depth behind panel 11/16".

Next connect the lead from socket filament

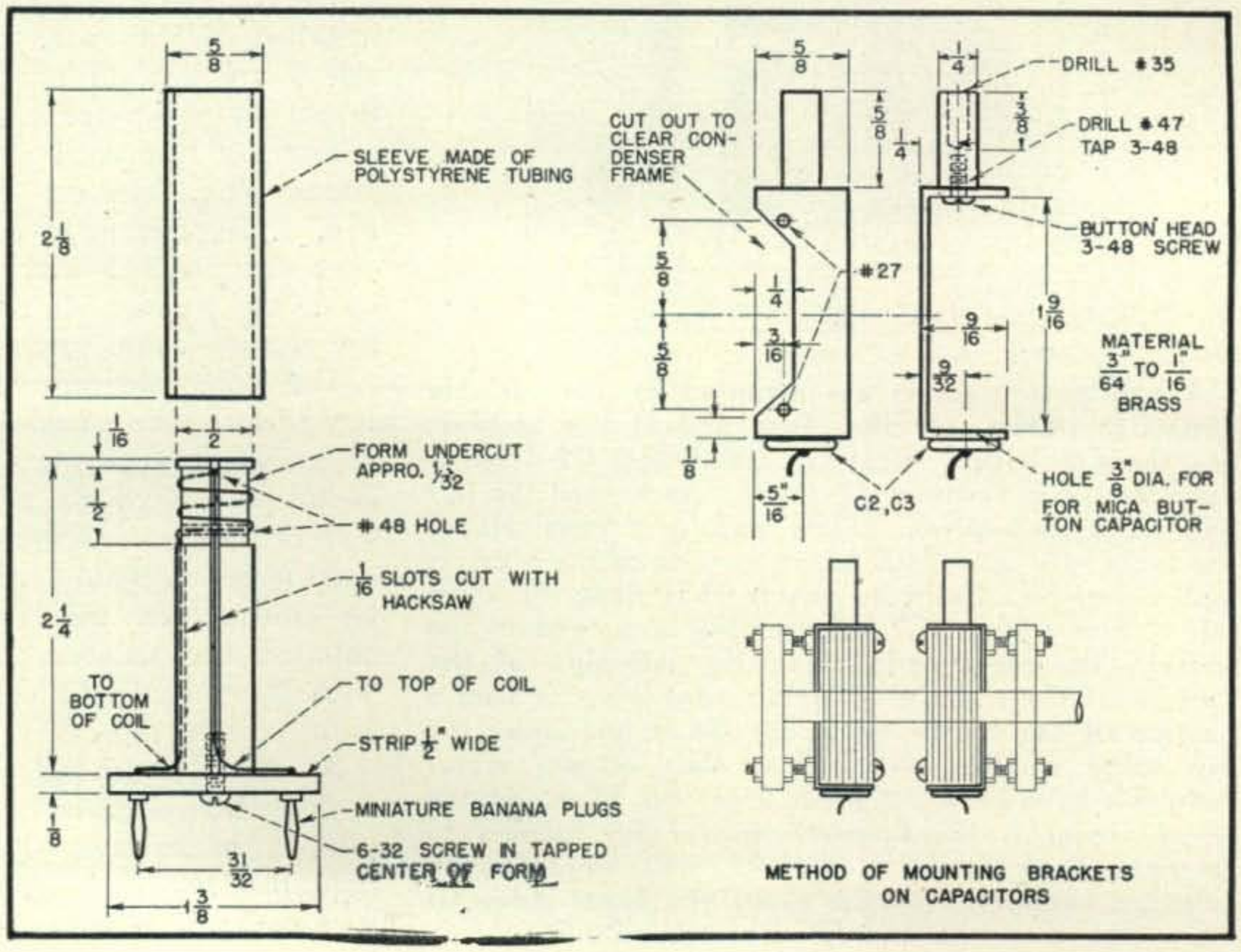
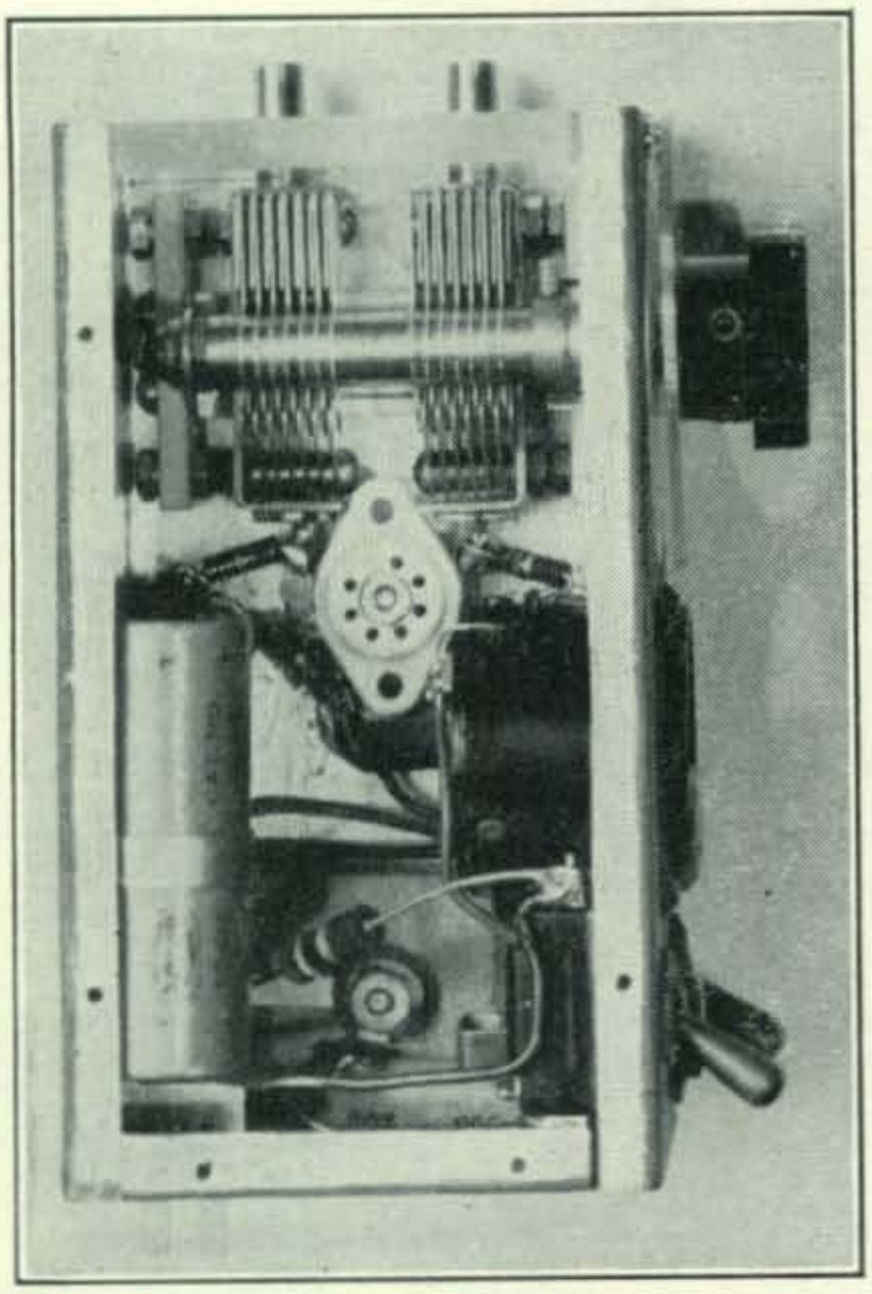


Fig. 3. Dimensions for specially constructed brackets holding the coil posts and the blocking capacitors. Also given are dimensions for the Dipper plug-in coil forms.

terminal *4* to terminal *1* on *SW1*, and mount the switch in hole *Y*. Its leads should be laid along the case and up and around the side of the meter and jack. Be sure its terminals do not touch the case.

Solder a lead from the positive terminal of the meter to the "tip" of the phone jack. From the "normal" of the jack connect a lead to terminal *3* on *SW1*. Mount the selenium rectifier with a 1" 6-32 screw through hole *AA*. The positive terminal of the rectifier should be on top and a terminal lug should be placed under the nut holding the screw. Between this lug (the case ground) and the "sleeve" of the phone jack connect *C6*.

The 3" lead from terminal *1* of *SW2* may then be trimmed and soldered to the negative terminal of the selenium rectifier. Solder the two resistors *R6* and *R7* so they are in series. The free end of *R7* should be soldered to the positive terminal of the rectifier, while the free end of *R6* should be connected to the terminal on *C5*. Mount capacitor *C8-C9* so it lies parallel with and under lip *A*. It should be held in place by a ¼" 6-32 screw



The coil post brackets are mounted on the variable capacitor stators. At the lower end of the brackets are the flat button micas C3 (left) and C2 (right). Plate and grid resistors R2 and R1 go toward the left and right respectively. Plate and grid terminals of the socket are connected to the junction of the resistors and capacitors. Cathode resistor R3 is along the lower left side of socket. C7 is under the lower end of the socket. The electrolytic along the left side of the case is C8-C9 and under its top edge may be seen a portion of the button mica C5. C4 is just under the top edge of the meter. The ends of the meter terminals have been cut off to clear the tube. At the lower center is the filament resistor R5 running to terminal 3 of SW1. Under R5 may be seen the selenium rectifier with C6 along the lower edge of the case. R6 and R7 are under C8-C9.

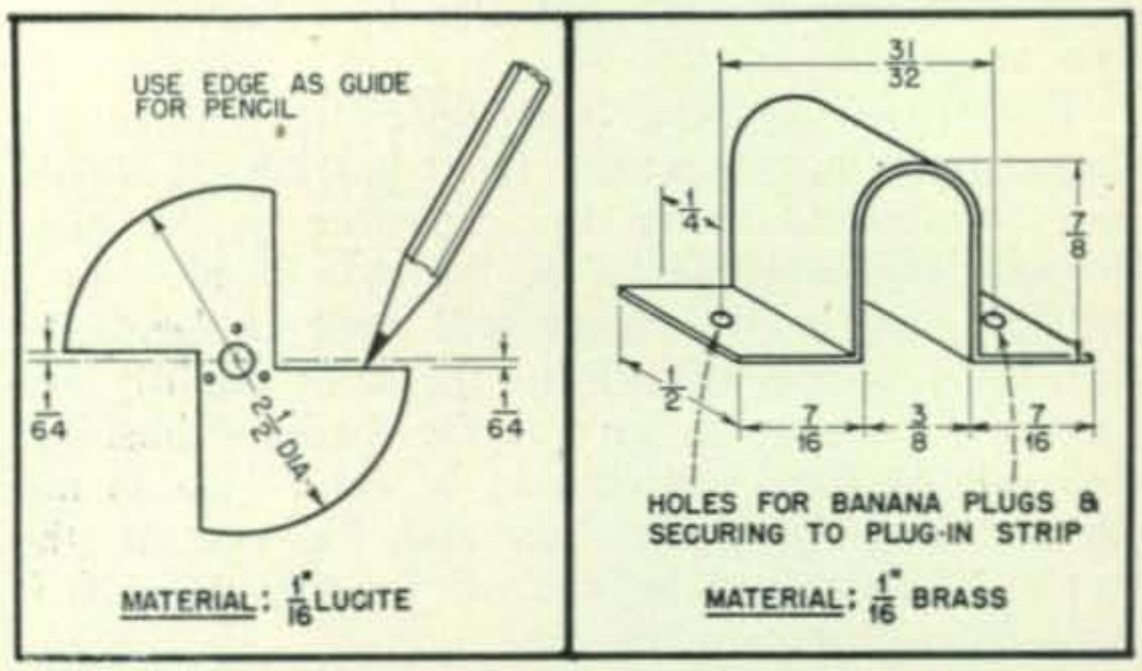


Fig. 4 (left). Substitute calibration dial to enable marking of the permanent scale. Fig 5 (right). Dimensions and method of construction for 110 to 275 mc inductance.

through hole *BB*. Connect one positive lead to the terminal of *C5* and the other positive lead to the junction of *R6* and *R7*. The negative lead should be soldered to terminal *3* of *SW1*. As a precaution, spaghetti should be slipped over the bare capacitor leads before they are connected.

Solder a 3" lead to terminal *4* of *SW1*. Do likewise to terminal *2* of *SW1* and to terminal *2* of *SW2*. These leads will go to the Jones receptacle. Mount the receptacle on side *J* and solder one end of *R5* to terminal *4* of the receptacle. Also solder the lead from terminal *2* of *SW1* to receptacle terminal *1*, the lead from terminal *2* of *SW2* to receptacle terminal *2*, and the lead from terminal *4* of *SW1* to receptacle terminal *3*. Mount side *J* on the case, securing it with two screws through the bottom *G* into lip *I*. If the Jones receptacle hits *C8-C9*, the latter may be pushed forward in its clamping ring. Solder the free end of *R5* to terminal *3* of *SW1*. The internal wiring of the Dipper will now have been completed.

The polystyrene end piece *CC* should now be installed in the case. Incidentally, this piece and side *J* are left off until completion of the wiring to permit easy access to the internal components.

The a-c line cord should next be wired to its Jones plug. Correct connections are shown in *Fig. 1*. Be certain to connect the jumper between plug terminals *1* and *4*. If batteries are to be used, the jumper should be omitted when wiring the battery cable to the plug.

The coils are wound on ½" polystyrene rod. Dimensions are given in *Fig. 3*. Each coil must be undercut approximately 1/32" where the wire is to be wound to allow passage of the polystyrene sleeve over the coil. If a lathe or machine shop is not available for this work, the sleeve may be omitted. In this case, if protection and insulation are desired, the coil should be coated with Amphenol 912 coil dope and then wrapped with scotch tape.

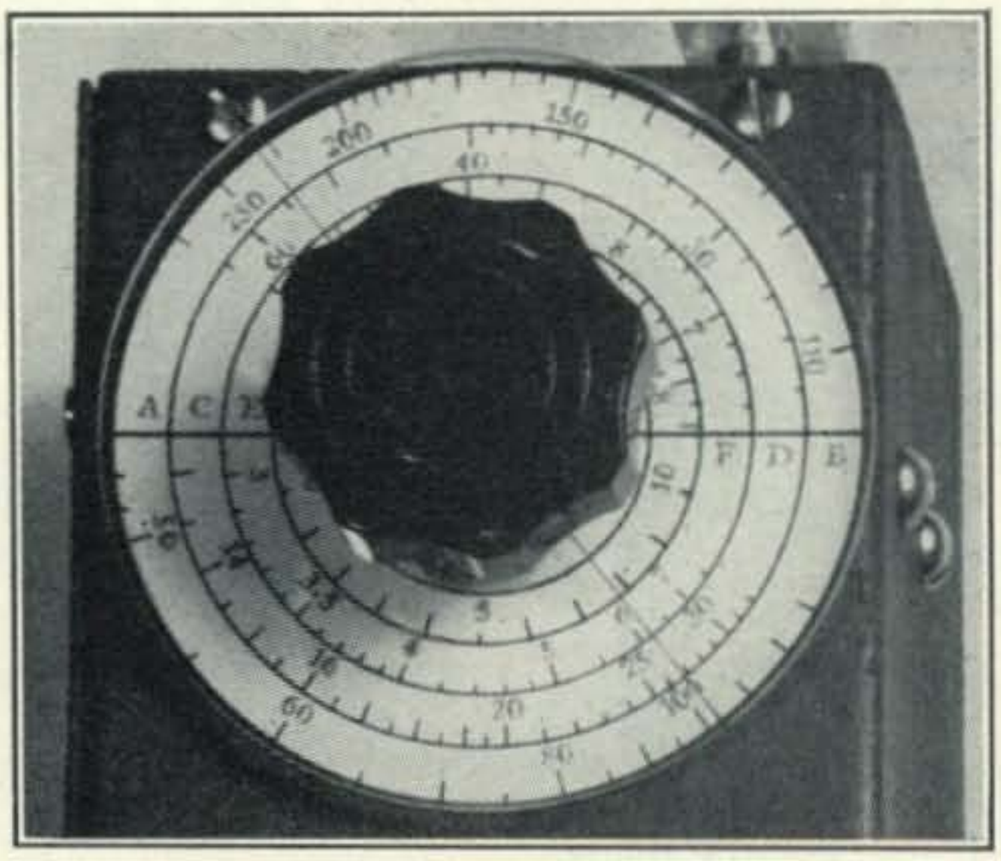
At the top of the coil-form a hole (No. 48) is drilled through its diameter. A slot is then cut, with a hack saw, about 1/16" deep from this hole lengthwise down the side of the rod. This will make it possible to bring the lead from the

top of the coil through the hole and down under the coil to one of the banana plugs on the base. The other lead from the coil is then brought through a hole drilled at the bottom edge of the coil and at right angles to the top hole. Another slot is cut from the lower hole so the sleeve will clear the lead running from this hole to the base. Each coil should be coated with coil dope.

When selecting the material for the coil forms and the sleeves, be sure the sleeve will slide snuggly over the rod. Before installing the sleeve, the coil dope must be dry to prevent smearing of the sleeve. Slide all but ⅛" of the sleeve over the coil form and, to cement it in place, put a drop of coil dope on either side of the form at the base of the sleeve. Slide the sleeve on until the top is flush with the top of the coil form. Place a coat of coil dope over both the edge of the sleeve and the coil form at the top.

The coil form is screwed to the plug-in base; however, coil dope should also be used as cement at this point to prevent accidental twisting of the rod and subsequent breaking of the leads running to the banana plugs. The banana plugs shown are those used in the ARC5 series of surplus equipment and are press fit and peaned in the plug-in strip. Other types of banana plugs may be used. The Johnson type 75D and the ICA type 419 are only slightly larger and are made to be rivetted in place. The Johnson type 75A and the ICA type 420 are still larger, but they may be fastened with a 6-32 nut. If these plugs are used, the coil posts will have to be made slightly longer and the holes in the plug ends made larger. Dimensions of spacing for banana plugs are given, but these should be first checked against the actual spacing between the receptacle holes after the coil posts are mounted.

The dial for the instrument is made of 1/16" thick lucite and is 2 ¼" in diameter. The fiducial line is scribed across the diameter and is then filled with black wax crayon. The dial is screwed to a standard 1 ⅛" knob which is supplied with three screw holes for this purpose. Before the regular dial is permanently mounted, a substitute calibration dial is first installed. This is shown in *Fig. 4*. It is cut out along its diameter to permit marking of the scale during calibration, using this edge as a guide for a hard pencil. The scale is made of white Bristol drawing board and is cemented to the case.



Note that the amateur band frequencies are at the low-frequency end of each scale with the second harmonic or the next higher frequency amateur band being at the opposite end. Considerable overlap between ranges may also be noticed. The inside scale nearest the bottom edge of the knob is a linear, 0-10 division scale for reference calibration when using special coils. The numerals are printed by hand with printer's 8-point type.

Testing

Before testing the Dipper, connect an ohmmeter to the two terminals on the 117-volt a-c plug. Turn on the filament switch, and *without* the 9002 in its socket, the ohmmeter should read approximately 430 ohms. This is the total series resistance of the line cord resistor and the parallel filament resistor. If this reading is not obtained, the filament resistor is not connected across the filament terminals. This should be checked to prevent damage to the tube. If the ohmmeter reads around 40 ohms, the resistor leg of the line cord is most likely incorrectly connected.

If the filament circuit is properly hooked up, insert the tube in the socket, plug the line cord into the 117-volt a-c line and turn on the filament switch. The 9002 filament should light. Measure the filament voltage at the socket terminals. It should be 6 to 6.3 volts.

As a personal safety measure, connect a 1000 ohm-per-volt a-c voltmeter between the instrument case and ground (water pipe, radiator, etc.). If no reading is indicated on the meter, reverse the a-c plug. The voltmeter reading should be no more than 10 volts. If the voltage is higher than this, either there is a short between the case and one side of the 117 volt line, or the isolating bypass *C7* is incorrectly wired or of the wrong value.

Insert the lowest frequency coil into the posts and turn on the plate switch. Grid curernt should be indicated on the meter and should vary between .6 ma and .9 ma over the tuning range of the variable capacitor. The other coils should be checked in order. It will be noticed that the grid current will be higher with the next lower frequency coil and then will drop off as each higher frequency coil is used. The highest frequency coil will vary between .1 and 3. ma. In all cases the grid current variation should be gradual.

The plate voltage should be measured between the B+ terminal on *C5* and the negative side of *C8-C9*. This should be approximately 117 volts. If the grid meter reading is too high (off scale) when using the lower frequency coils, it may be reduced by increasing the value of grid resistor *R1*.

Calibration

Calibration may be made using either an absorption-type frequency meter, a calibrated receiver, or a receiver in conjunction with a secondary frequency standard.

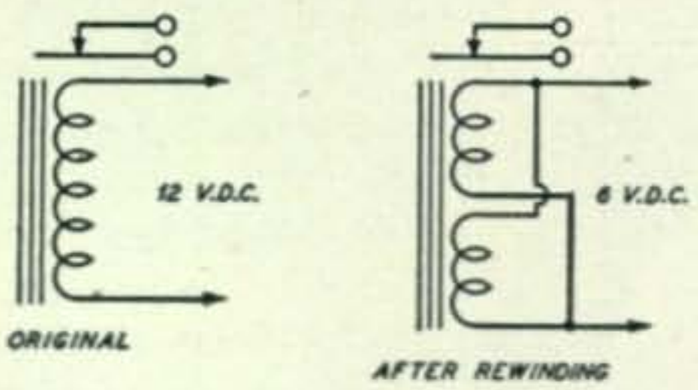
The following method is employed with the absorption meter. First, to check the range of each coil, set the Dipper capacitor at minimum

(*Continued on page 75*)

Inside the SHACK AND WORKSHOP

Converting 12-Volt Relays to 6-Volt Operation

If you have mobile equipment the numerous surplus 12-volt relays could often be put to use, if converted to 6-volt operation. One way to do this is to rewind the entire coil. A somewhat better method is to center tap the existing winding and operate the two sections of the coil in parallel. First check the total resistance of the relay coil. Then unwind it slowly until one-half the resistance



of the winding has been unwound. Cut the wire at this point and wrap a piece of friction tape or similar material around the coil, being sure to bring out enough lead for later use. Then rewind the wire that was removed and conect the inner and outer windings in parallel, so that the magnetic fields are aiding, not opposing. If this happens just reverse one pair of leads. Coat the winding with varnish to seal it against moisture and to hold the windings in place. Upon reassembling it will be found that the relay will work on 6 volts just as well as it did originally on 12 volts.

Hartland B. Smith, W8VVD

20-Meter Operation of the BC-459A

This is an improvement over the method suggested by W2VNU/8 (July, 1948, *CQ*, page 44). Instead of switching out the padder (*C67*) switch out the main tuning condenser (*C65*). With this arrangement the tuning condenser does not need to be disconnected from its worm drive shaft, and hence will still track perfectly on 40 meters. When operated on 20 meters, one of the two condensers must be tuned and this is more easily facilitated by cutting another hole in the chassis and adding a shaft extension to *C67*. An ordinary SPST power toggle switch works very well as a band switch. I have also found that the tuning is quite broad and the final tank condenser need not be retuned over the whole 20-meter band.

Willem Van Aller, W2VIK

Mobile Receiver Interference

After the careful installation of a 10-meter convertor in my Ford coupe followed by the application of the usual noise attenuating practices, I still could not hear weak signals when the engine was running at any speed above idling. The hash definitely did not come from the generator. Quite by accident, I discovered that the noise could be entirely eliminated by slowly turning the ignition switch toward the *off* position until the temperature, oil and gasoline gauges were disconnected, but the ignition circuit remained on. Apparently a peculiarity in the ignition switch permits this condition to be met. By-passing the gauges did not affect the hash interference. Possibly other mobile installations may be troubled by the same condition and can be cured in the same fashion.

Ed Rudisuhle, W3PUC

Increasing the Output of the T-Microphone

The sensitivity of the surplus T-17 microphone is very low in comparison with the usual carbon microphone. I have found that this is due to the use of only three small holes in the bakelite mouthpiece. Enlarging these holes wth a No. 30 drill and drilling out three more to form a circular pattern greatly increases the sensitivity and the output level. The microphone must be disassembled before drilling and enlarging the holes to prevent damage to the diaphragm. Some care must be exercised in this process. The cloth behind the mouthpiece may be removed or replaced as the operator desires.

Joe L. Pryor, W5MJD

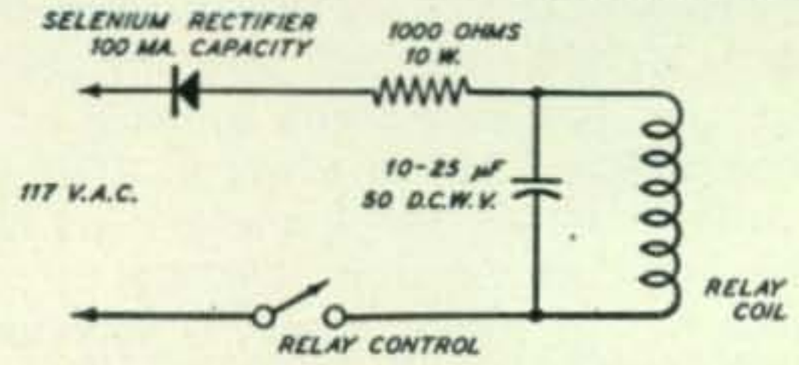
Improving 10-Meter Sensitivity on the SX-25

My SX-25 began to show decreasing sensitivity with increasing age. I discovered that it appeared to be due to insufficient oscillator voltage at the mixer grid on that band (range 4). A 4-$\mu\mu$f ceramic condenser was soldered between the ungrounded sides of the oscillator and mixer trimmers to increase the injection voltage. The oscillator and mixer stages were realigned and the S-meter showed a 2 to 3 S-point increase in signal strengths. As this condenser is only in the circuit on range 4 the other tuning bands are unaffected.

Harvey Hunter, W8TYX

Operating 28-Volt Surplus Relays

I have noted that there are literally thousands of surplus 28-volt relays which might be put to work. Since most of them have coil resistances of about 300 ohms they may be operated from a half-wave selenium rectifier. The schematic shows the



ncessary parts required. The relay coil must be shunted by at least a 10-μf electrolytic condenser, otherwise the relay will buzz and hum. The 1000-ohm resistor is used to limit the current flow to about 30 ma. However, when this current is not sufficient the series resistor may be dropped to about 750 ohms. With the values shown operation may be continuous with no over-heating.

Felix W. Mullings, W5BVF

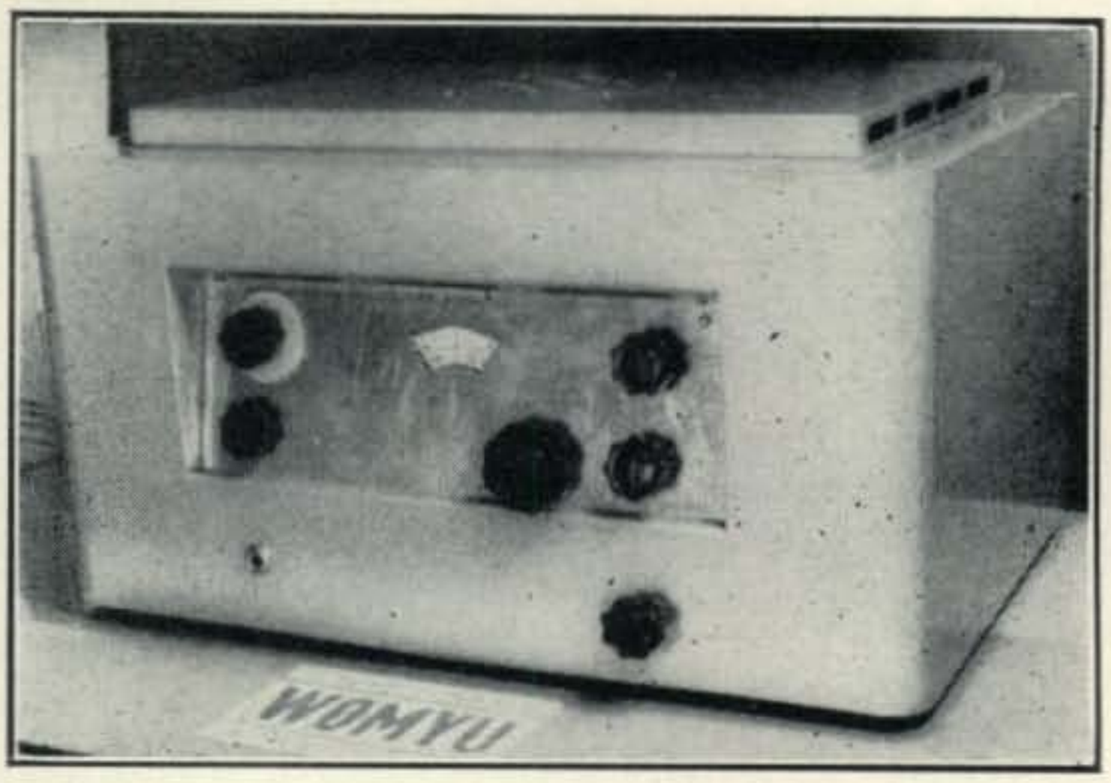


Fig. 1. The completely assembled double conversion receiver. Dial calibrations start at 0 above the line and 500 below the line. The 0 represents 7000 kc and 14,000 kc, while 500 represents 3500 kc. 50 kc is visible in the window. The BC-453 receiver is located in the center, tuned by the large knob. The r-f gain control and a-c switch is below the inset panel. The b-f-o switch is in the upper right corner.

A Double-Conversion Receiver for $30!

ALLEN A. ENGLEMAN, WØMYU*

You'll never know how good the BC-453 receiver is until you try this idea.

HERE is a relatively simple method of constructing a communications receiver, the performance of which is comparable to a far more expensive unit. Application of the fixed converter principle permits use of crystal-controlled high-frequency oscillators which provide stability that is unsurpassed. Combining fixed crystal-controlled converters with the BC-453 low frequency receiver results in exceptional stability and selectivity with an excellent degree of bandspread.

The circuit in *Fig. 2.* shows a converter which gives excellent results when used in conjunction with the BC-453 receiver. This converter uses a crystal oscillator which is 200 kilocycles lower in frequency than the low frequency end of the amateur band desired. Tuning is accomplished with the BC-453 functioning as a tunable intermediate frequency. The BC-453 tunes from 190 kilocycles to 550 kilocycles, a range which is sufficient to cover the 3.5 mc, 7 mc and 14-mc bands. The 3.85 to 4-mc phone band may be covered by plugging in another crystal which is 150 kc higher in frequency than the 3.5-mc band crystal.

The converter tube, a 6AC7, gives excellent gain and signal-to-noise ratio. The oscillator is an untuned Pierce which adds to the simplicity. If plug-in coils were used, one converter could be used to cover the 3.5-mc, 7-mc and 14-mc bands. The crystals could be either switched or plugged in. The image ratio would be good on the two lower frequency bands and fair on the 14-mc band.[1] However, because of the low cost of the individual converters our receiver employs a separate unit for each band.

*3324 Woodland Ave., Kansas City, Mo.

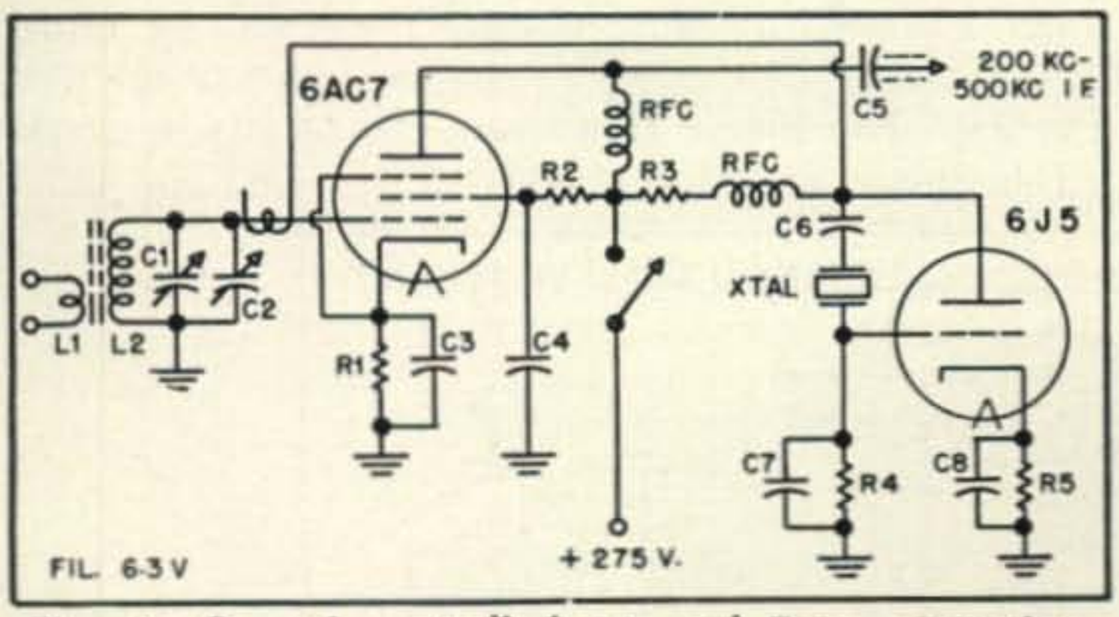


Fig. 2. Crystal controlled 3.5 and 7-mc converter.

C1, C7—50 μμf
C2—30 μμf
C3, C8—.01 μf
C4—.05 μf
C5—.005 μf
C6—.001 μf
R1—620 ohms
R2—150,000 ohms
R3—10 megohms
R4—25,000—50,000 ohms
R5—1000 ohms
RFC—2.5 mh
Coils—3.5 mc: L1, 8 turns; L2, 50 turns; 7 mc: L1, 5 turns; L2, 30 turns
Xtals—3.5-mc converter, 3300 kc. 7-mc converter, 6800 kc.

A Simple Super

Using these principles the author has developed a receiver which gives extraordinary performance considering the investment involved. The unit pictured in *Fig. 1* costs approximately $30.00 to assemble. It incorporates a converter for each of the three bands covered, 3.5 mc, 7 mc and 14 mc. The 7-mc and 3.5-mc units are identical except for the coils. The 14-mc converter uses a stage of tuned preselection and a converter tube which gives better selectivity than the 6AC7 in order to reduce the image response. This arrangement will give reasonable image rejection ratio on this band.

Bandswitching is accomplished by switching the output of each converter to the antenna circuit of the BC-453 receiver and simultaneously switching the positive plate voltage to the converter units. The addition of a new dial, calibrated from 0 to 350 above the center line and from 500 to 850 below the

1 The image ratio will be quite poor on all bands. It may be inferior to a conventional receiver with no r-f stage.

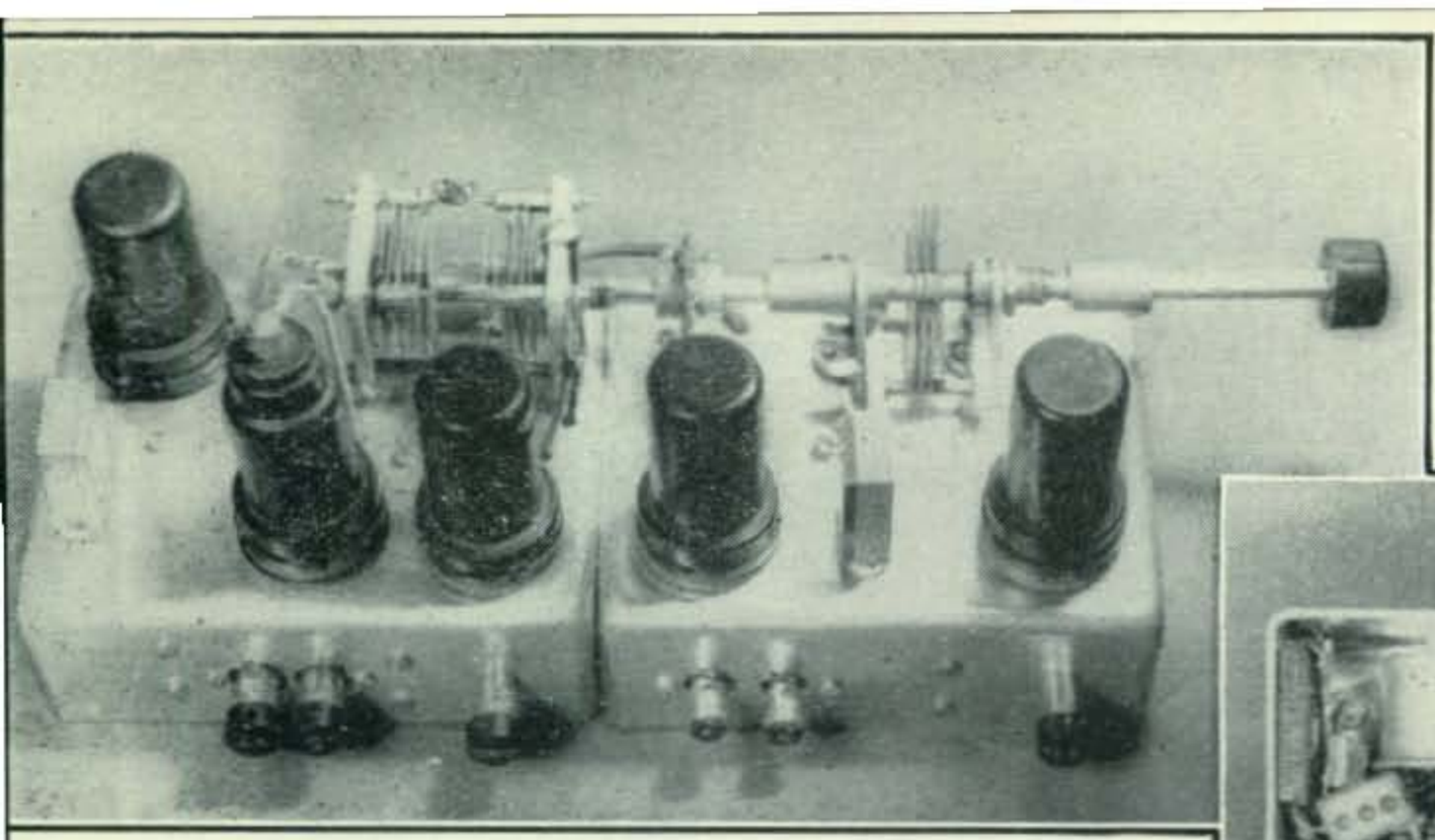


Fig. 3 (left). 7 and 14-mc converters. The tuning of both units is ganged to reduce the number of controls. The 7-mc converter with the trimmer condensers removed is on the right. The crystals are plug-in and different crystals may be used to cover other frequencies than the amateur bands. The individual chassis measures 3½" by 5".

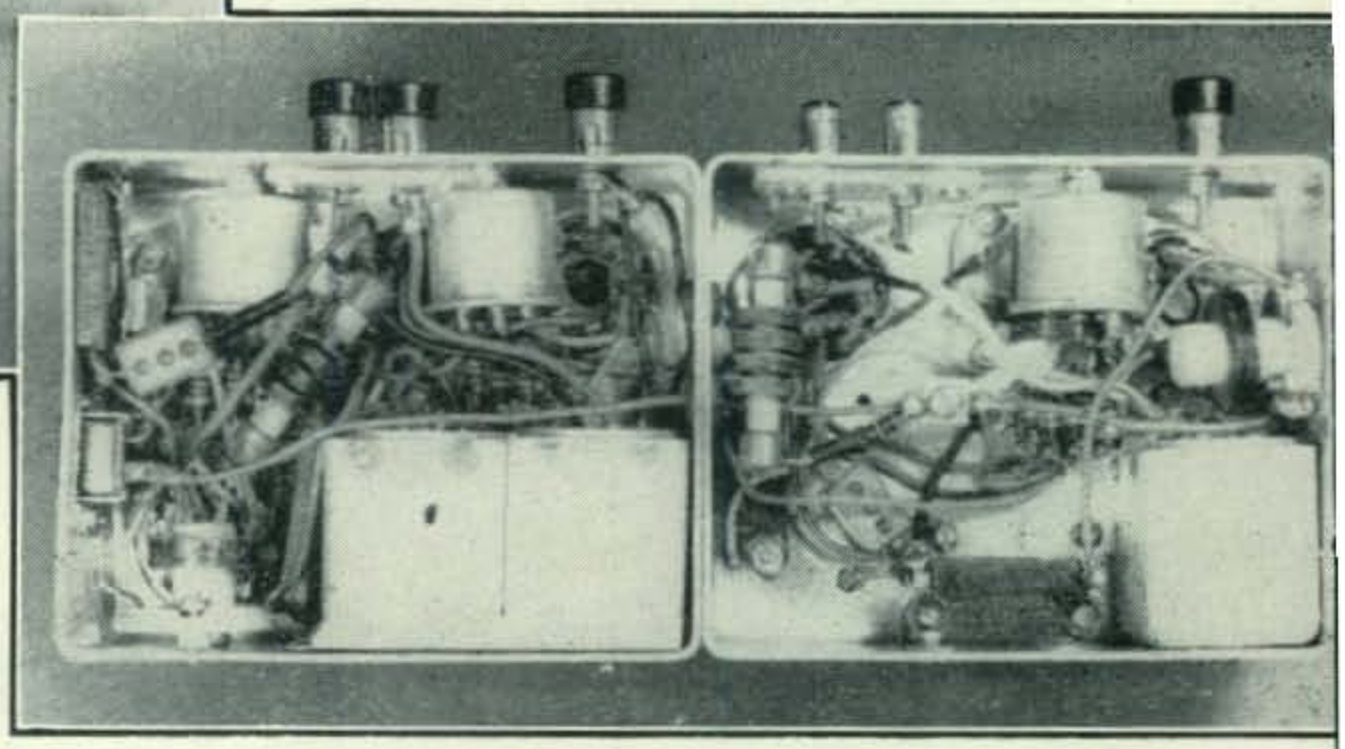


Fig. 4 (right). Under chassis view. The by-pass condensers, resistors, resistor holders and iron core coil forms, including shields, were obtained from surplus BC-453 receivers. A common power receptacle located on the extreme left supplies power to both units.

center line allows direct reading of frequency on all bands. Zero on the dial represents either 7,000 kc or 14,000 kc and 500 represents 3,500 kc. The dial is constructed by cutting an aluminum disk 3⅜" in diameter. Draw the new scale on a good grade of writing paper so that "0" corresponds to 200 on the original dial and 50 corresponds to 250, etc. This will provide accurate calibration provided the crystals are carefully chosen for the proper frequencies. Crystals may be obtained for less than one dollar on the surplus market. But if surplus crystals are used, purchase frequencies somewhat lower than those desired and carefully grind the crystals to the exact frequencies.[2]

The type of construction used for the converters is patterned after the BC-453 and most of the parts were obtained largely from two of these receivers that were "cannibalized." These receivers can be purchased for around $2.00 to $3.00 less tubes. One caution—do not attempt to use the radio frequency chokes found in this type of receiver because their inductance is much too low for successful use in the converters.

The conversion of the BC-453 receiver is not difficult. The filaments are wired in parallel instead of series parallel as is required for 28-volt operation. A 50,000-ohm variable resistor is added between pins number *3* and *1* (see *Fig. 7*) on the rear power socket and serves as a gain control. An OFF-ON switch for 117-volt a.c. may be added to this control. A switch for b.f.o. is added between pins number *4* and *1*. The headphone jack is wired to pins number *2* and *1*. Filament voltage is connected to pins number *6* and *1*. The plate voltage is connected to pin number *7*. Loudspeaker operation is obtained by connecting an output transformer with an 8000-ohm impedance primary to pins number *2* and *1*. Make sure that number *2* is connected to lug number *3* on the output transformer of the BC-453, as this is the 8000-ohm tap. Power supply requirements are 250 to 300 volts at 60 ma, and either 6.3 volts or 12.6 volts for the filaments, depending on the tubes used.

2 Johnson, "Crystal Grinding Simplified," *CQ*, Jan. 1949.

Receiver Alignment

Adjustment of the receiver for initial operation is as simple as the modifications. With the bandswitch set for the band desired, turn up the gain control on the BC-453 and set the alignment tuning condenser on the converter at half scale. Next tune the associated trimmer condenser for a distinct increase in noise level. This will be either the frequency desired or, possibly, the image frequency. The image frequency can be easily checked because it falls outside of the amateur band.

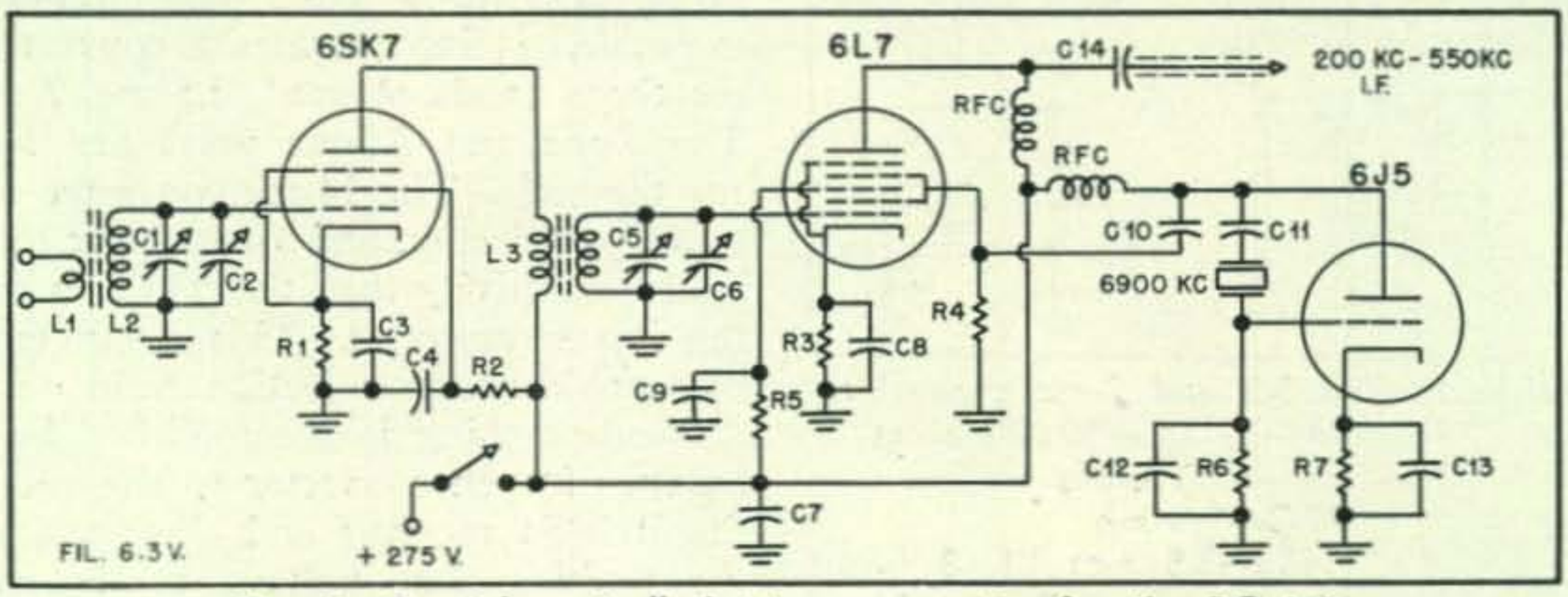


Fig. 5. Crystal controlled 14-mc converter for the BC-453.

C1, C5—15 μμf
C2, C6—40 μμf
C3, C8, C13—.01 μf
C4, C7, C9—.05 μf
C10—30-50 μμf
C11—.001 μf
C12—50 μμf
C14—.005 μf
R1, R3—620 ohms
R2, R4—50,000 ohms
R5—15,000 ohms
R6—25,000—50,000 ohms
R7—1000 ohms
RFC—2.5 mh
L1—3 turns
L2—15 turns
L3—10 turns
L4—15 turns

Now tune in a signal and adjust the trimmer for maximum signal strength. Once this setting is found it will need changing very little during complete band tuning. Repeat this process for each converter unit.

If the receiver does not operate check the appropriate crystal for oscillation. If it is oscillating sufficiently for adequate voltage injection to the converter the noise level will decrease noticeably when it is removed. Very little oscillator injection

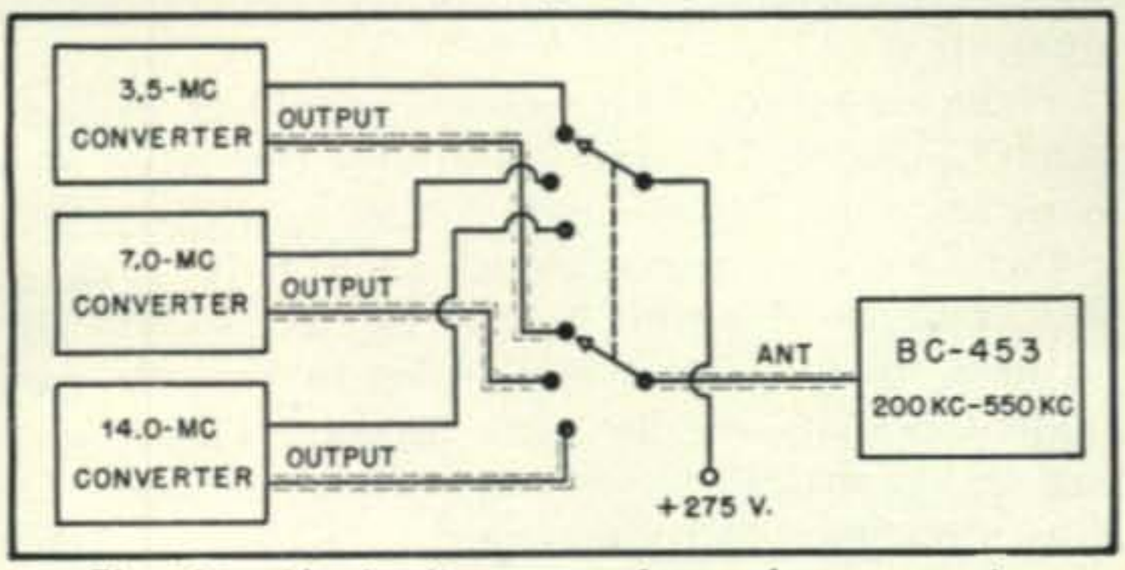


Fig. 6. Block diagram of receiver-converter arrangement.

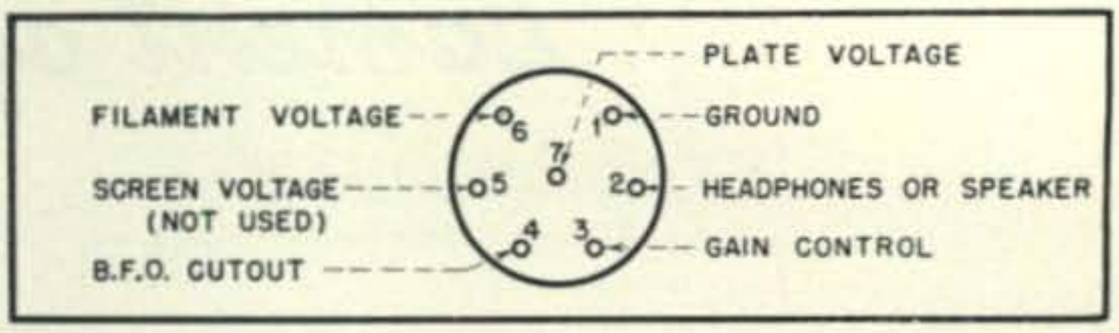


Fig. 7. Rear view of power receptacle connections.

voltage is actually required for the proper operation of the 6AC7 converters. For this reason the crystal oscillator plate voltage should be limited to 35 or 40 volts.

The over-all selectivity of this receiver is excellent. Single-signal reception is almost realized, one side of zero beat being very low. Additional selectivity would make intelligibility of phone signals poor. The substantial "skirt" selectivity offered in this receiver makes copying of weak signals possible right up to that kilowatt signal a few blocks away. As an interesting application of surplus and a good receiver at a modest investment this little super is a worthwhile shop project.

Postscripts

Grand Rapids Hamfest

The Grand Rapids Amateur Radio Assn. is holding a mid-winter hamfest on Feb. 19th at 8 p.m. at the Morton Hotel in Grand Rapids, Mich. Admission by ticket, 50¢ in advance, or 75¢ at the door. The price does not include dinner, which is available in the dining room or cafeteria in the hotel. For tickets or information write Harry Dinley, W8ASX, 619 Shamrock S.W., Grand Rapids.

11-Meter Band Assn.

A group of 11-meter enthusiasts have formed an association having membership to date in 40 states, with the following as some of their aims: To make 11 meters a friendly band by promoting closer relationship between members of the association with longer rag-chews and repeat contacts with less emphasis on working DX, to promote interest in the possibilities of duplex phone on 11, to promote study of propagational differences between 10 and 11 meters. To become a member a station must operate on 11 meters at least 75% of his operating time, and continue to do so to retain membership. Anyone interested should write to 11-meter Assn., 877 Cherokee Ave., S.E., Atlanta, Ga.

Believe It Or Not

Strange things happen in ham radio, but it's one hobby in which anything *can* happen. Recently Ken Moore called CQ while driving through Pasadena. It was answered by William Hart at Glenview, Ill., who asked Moore to pass on a message for him to his sister in Pasadena. Moore looked around to check his location and found he not only was on the right street but was just passing the right address—and at that moment a girl was backing a car out of the driveway. Moore stopped and asked her if she had a brother in Glenview, Ill. "I certainly do," she replied, "in fact I'm just leaving for Glenview." He turned his mike over to her and brother and sister had a half-hour QSO.

Rotary Fellowship Awarded Ham

James G. Ulmer, Jr., W5HWD, of Tyler, Tex., is studying at the University of Cambridge in England under the terms of a Rotary Foundation Fellowship, one of 37 fellowships recently granted by Rotary International to outstanding graduate students in 11 countries. W5HWD was licensed at the age of 15 and served as president of the Tyler Radio Amateur's Club for 1939-40. He is a graduate of the Massachusetts School of Technology, and while a student worked nights as an engineer for WCOP and WEEI, and on vacations at his father's station, KGKB in Tyler. During World War II Jim served as an officer in the Army, specializing in electronics and radar. At the University of Cambridge he is majoring in international relations, with special attention toward developing an international point of view in the fields of economics, law and science.

W5HWD

Club Certificate

The South Shore Amateur Radio Club is now issuing certificates to those who claim ten or more contacts with South Shore Club members. QSOs may be phone or c.w., any band or cross-band. Send your list to the club at P. O. Box 8, Quincy, Mass.

QSL Cards Distributed by Pan American Airways

The Latin-American Division of PAA distributed 1200 attractive blue and red QSL cards to its 15 ham employees at San Juan, Puerto Rico, a policy now extended to include every ham-employee of PAA over the entire globe.

Lament of an MYL*

SYLVIA A. FRANK**

CQ, CQ, CQ," he is saying—but not to me—"this is W2—, W2—in New York calling CQ. K someone please."

Since the radio bug (pesky little termite that it is) has entered our home, we have had to learn an entirely new language. No longer do we call our friends on the telephone; we now give them a "shout on the land line." Friends, did I say? Who has friends when there is a ham set in the house! B.R. (Before Rig) we had some nice friends of long standing, people with whom we could spend a nice sociable evening playing cards, listening to fights, or swapping jokes. Now, unless friend husband can interest them in the rig, they stay away. Of course, we have made lots of new friends over the air, and once in a while another "ham-widow" will accompany her husband when he comes over to admire, inspect, or criticize the rig.

"I'm reading you perfectly, Old Man. You are coming in Q5 and 15 db above 9," the voice in the receiver advises. This is music to the ears of my ever-loving spouse! For hours he sits down in the dreary cellar, gazing with fond affection at the collection of QSL cards pasted on the wall above, beside and around his set. When I go down to ask if I may use the vacuum cleaner, or to call him to dinner, he looks at me with considerable annoyance—to think that I would interrupt a transmission from North Dakota, or California or wherever the other fellow may be! Sometimes I go down to the "shack" and just sit and look at him.That's the only way I can keep his features fresh in my mind. Of course, I could hang his picture up in the kitchen, but that wouldn't be much more satisfactory. Sometimes I get so exasperated I feel like hanging him!

The conversation at dinner usually involves "folded dipoles," "four-element beams," "ten meters, eleven meters," "BCI, skip, DX, TVI," and many other words which to the ordinary layman would be as clear as Chinese. Naturally, an MYL is supposed to act as though she knows exactly what the Old Man is talking about—and darned if she doesn't after a while! B.R. we used to take in a movie about once a week and visit friends every now and then; but now, my sister and I sit home, night after night, listening to murder mysteries and kniting like a couple of old maids. Our husbands spend every evening to say nothing of entire week-ends, down in the shack. We do see them at meal times though, for which, I suppose, we should be thankful. Even then, radio is the master. In the middle of dinner one of them is apt to jump up and find the latest issue of *CQ* or an amateur's handbook to clinch an argument.

Now we approach the monetary subject. As any reader probably is aware, most rigs that have been built since the Peace began, contain lots of surplus Army or Navy parts. SURPLUS!! If I never hear that word again, it will be too soon! Any "gismo" that is listed as surplus in the ads gets highest priority on our bank account. I'd be willing to bet that if the government advertised surplus stretchers or coffins, my boy would buy one. "But, Honey, after all, it's SURPLUS! Do you realize what this article would cost if it were bought directly from the manufacturer? We'll never get another break like this!" says he. "Phooey on Surplus!" says I.

And the poor mailman. This article wouldn't be complete without a word of tribute to that faithful public servant, the mailman. Woe is the unlucky fellow who has a ham on his route. The QSLs, the magazines, the catalogues, and the advertising flyers that enter our house each week

through the mails would keep a Boy Scout paper collector happy as a lark. Luckily, we have a fairly good-sized cellar, but I hate to think of the folks who live in three-room apartments! Where do they keep all the stuff? Maybe they don't have any furniture. Maybe they hide it under the bed! I'd really like to know.

Most people— that is, those who have never had a ham in the family—cannot understand why we girls complain so much about our husband's lack of interest in anything that doesn't pertain to radio. "After all," they say, "it could be worse. They could be spending their evenings in some

(*Continued on page 77*)

* An MYL, or "married young lady," is usually referred to as an XYL, but the former term is often used to indicate a non-amateur.

** 1069 Sackett Ave., New York 61, N. Y.

The Radio Amateur and Upper Atmosphere Research

OLIVER P. FERRELL*

The unquestionable contributions being made by the proper application of amateur-gathered data is underscored by this one particular project.

TODAY physicists, meteorologists, aeronautical engineers and astronomers are placing increased accent on expanding our knowledge of the upper atmosphere. It is unique that only sixty miles removed from each of us are regions which hold unknown influences on our everyday existence. The problem is not one of discovery, but gathering data through indirect means which will eventually fit together to tell us the whole story of the ionosphere.

One of these so-called indirect means is investigation with exploring radio waves. In the past a few scientific institutions have used automatic equipment to explore the ionosphere and determine the heights and the electron densities. With this knowledge and by making a great number of assumptions, the composition, molecular density and temperature may be computed. To account for the existence of the ionosphere it is necessary to believe that the temperature above the stratosphere starts to increase and eventually at the level of the E-region it is approximately equal to the boiling point of water at sea level. Undoubtedly, as the earth rotates these temperatures must fluctuate and, not too unlike our surface weather, cause the flow of winds from the cooler to the warmer regions.

Authorities have stated that it would indeed be strange if in some fashion our upper atmosphere did not influence surface weather conditions. Also, we should not be completely surprised at the great velocities that we are likely to encounter at these heights. The physical laws of meteorology shows that the pressure difference to produce a given velocity is proportional to the density. In the E-region the density is extremely low and hence even a minute pressure fluctuation may give rise to very great circulation velocities.

A means to study the velocity and direction of circulation in the E-region which has received considerable attention is that using radio amateur observations made in the 6-meter band. Through the cooperation of a majority of the active 50-mc operators the writer has been able to make a qualitative examination of some of the data at hand.

Analyzing Sporodic-E Transmissions

The analysis of sporadic-E data is somewhat simpler than attempting to analyze the complexities of F2-layer propagation. The choice of the spectrum (50-54 mc) reduces the means of propagation to five[1] easily identified factors.

* Assistant Editor, *CQ*.

1 Ground wave, extended ground wave, sporadic-E, F2-layer and auroral.

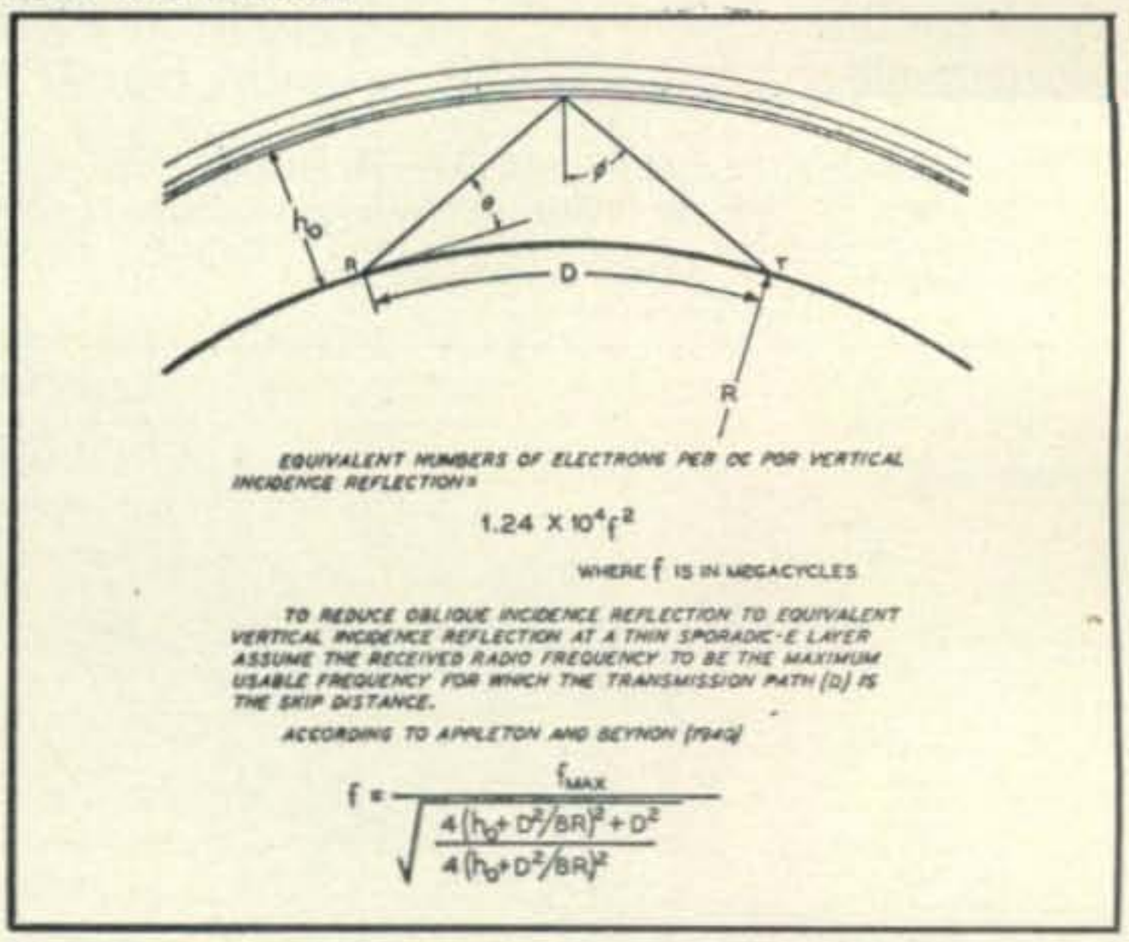


Fig. 1. The reflection of a 50-mc signal from an intensely ionized sporadic-E cloud may be considered a mirror-like reflection. Appleton and Beynon have solved the relationship of the maximum usable frequency to the critical frequency for different layer heights and various distances. The graph is a plot based on a reflecting height of 120 km. Dividing the received frequency by the appropriate ratio for the path length gives the equivalent penetration or critical frequency. This may then be changed into the free electron density required at the point of incidence.

With a few rules of the thumb (distance and signal strength) sporadic-E transmissions are easily identified. Various scientific observers using vertical incidence equipment have established that sporadic-E is a very thin layer possessing a steep ionization gradient. Very intense formations of sporadic-E may be likened to invisible clouds as they are limited not only vertically, but laterally as well. Radio waves below the MUF value of the cloud do not need to penetrate deeply into the formation before being reflected. Actually, propagation at 50 mc may for the most part be specular.

An important point is the constancy of the height of the sporadic-E clouds. The writer has shown[2] that from measurements made at Washington, D.C. from 1941 to 1948 the median height was approximately 110 km. This report collaborates similar measurements made periodically throughout the world.

To put radio amateur observations into a form which physicists may use involves translating the point of radio signal reflection in the ionosphere into terms of time, space and reflecting ability of the sporadic-E cloud. The simplest method is to assume that the sporadic-E cloud is composed of free electrons (the sluggish ions probably have little effect on the bending or reflection process). A well known propagation theory tells us that a certain number of free electrons are required to completely reflect certain radio frequencies. Using our standardized height of the sporadic-E cloud the Appleton-Beynon formula[3] may be applied to solve amateur observations. This is shown in *Fig. 1*.

2 CQ Magazine Propagation Research Report No. 4.
3 "The Application of Ionospheric Data to Radio Communication Problems," Appleton and Beynon, Proc. Phys. Soc., vol. 52, July, 1940, page 518.

Rather than solve the formula for each frequency and distance we can plot graphically the ratio of the operating frequency to the critical (penetration) frequency for a fixed height as a function of the distance between stations. The highest operating frequency between two stations is divided by this ratio for the appropriate distance. This gives us the equivalent critical frequency if D were the skip distance at which the operating frequency was the MUF. The result may be left as the penetration frequency, or put into terms of equivalent density. In the cases solved here the equivalent free electron density is used.

The Case of January 4, 1948

During the mid-winter months there are generally eight to ten good 6-meter openings attributable to sporadic-E clouds. One of the best last year was during the late morning of January 4th. The reports show that the band opened suddenly, shortly before 1000 EST. In the first half-hour such stations as W2RLV, W4HVT, W4JBF, W3OR, W8ZVY, W9BHT, W2BYM, W1CJL, W9UNS, W2IDZ, W3HC, W9QUV, W1DJ, and others were active. A sample number of paths between stations heard or worked 1000-1030 EST are shown at the left-hand side of *Fig. 2*. The circles with the crosses indicate the points of signal reflection in the sporadic-E cloud, if we were looking down directly on top of the ionosphere. Note the confined distribution of these points although paths both north-south and east-west are plotted. Using the formula (*Fig. 1*) the required density for each point can be found. Knowing the density at these points an isopleth, or contour of equal ionization can be drawn. This has been done over the map at the right-hand side of *Fig. 2*. The isopleth bounds the approximate loca-

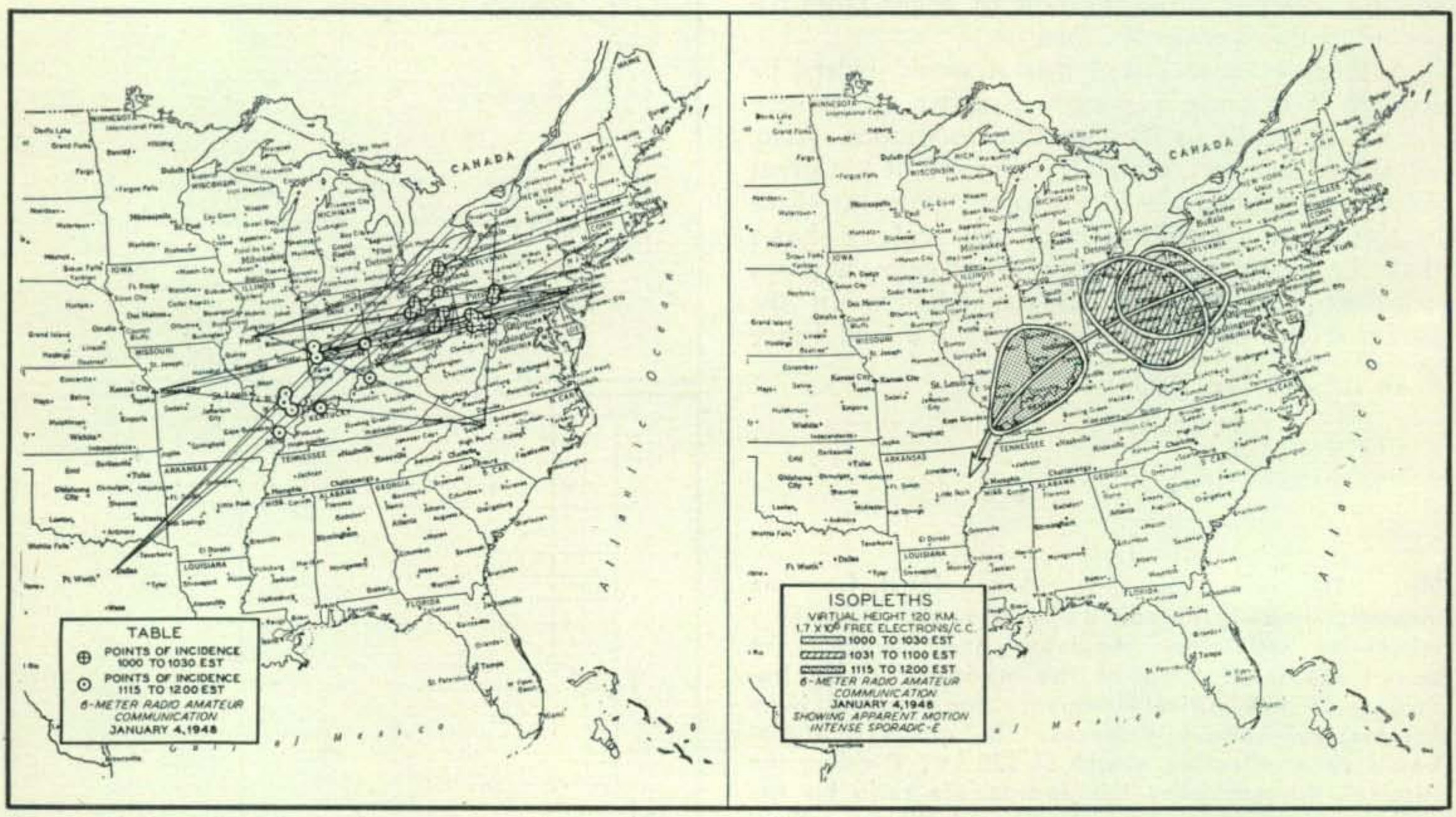


Fig. 2. Projected paths as they varied in time and space and the resultant density isopleths showing the apparent motion of the sporadic-E cloud. Only two periods of path projection are shown to reduce confusion.

tion of the sporadic-E cloud during this period[4].

Sample path projections for a latter period (1115-1200) EST) are also seen in *Fig. 2.* These are due to the cloud moving westward into the range ot WØNFM, WØKYF, WØJVE, W5AJG, WØZJB, WØINI and others. An isopleth shows that the cloud has drifted over the Ohio river valley and is now apparently turning slightly to the south. The circulation was not constant along the entire path, but for the most part averaged about 300 miles per hour.

The Case of May 9, 1948

The sporadic-E cloud movement during the late morning of May 9, 1948, was very pronounced and the effects especially for the New England stations are quite obvious. Sample projected paths and isopleths are drawn to show the movement in *Fig. 3.* The 6-meter band opened around 1000 EST and active were: W2AMJ, W4JEP, W2PWP, W4GYO, W1AF, W4EID, W4FLH, W4NEE, W1CGY, W2BYM, WØZJB/1 and others. An isopleth to show the position of the sporadic-E cloud from 1115 to 1145 EST is also shown in the right-hand map of *Fig. 3.* During this period the stations heard or worked included: W2RIS, W5JTI, W4FWH, VE3SB, W5NLP, W2RLV, VE3ASD, VE3KM and others. The cloud is then shown in another position almost one hour later. Stations W9JMS, W4JBF, W9LMX, W9ALU, W9ZHB, W9QUV, W9AEN, W9AQQ/9, W9PK, W9FHR, W9VPN, W8DLY, W8ZVY, W9GRV and others were heard and worked from New England and the Middle Atlantic States. The movement of the cloud was to the northwest and the rate of velocity was about 190 miles per hour.

Distance Versus Angle of Radiation

Within the group of periods analyzed above all contacts were made via a one-hop skip. The longest single path was between Dallas, Texas (W5AJG), and Toronto, Ontario (VE3AXT). This is a path length of 1204 miles, corresponding to an electron density of just slightly greater than 10^6. It is interesting to note that this corresponds to an angle of radiation of 2° for a layer height of 120 km. Either this is indicative of some extremely good low angle radiation on the part of W5AJG (he also worked VE3KE, VE3APF and VE3ARV) or it means that the sporadic-E cloud having run its course on January 4 was now starting to rise vertically into the ionosphere. For optimum transmission the ground reflection and absorption severely limit the amount of appreciable radiation below an angle of 3° above the horizon. In view of the signal strengths observed during these contacts it appears likely that some additional effort should be expended toward investigating the rising of the cloud postulation. Possibly the lengthening of the skip just before the band fades out is not entirely due to a decrease in the density of the cloud, but to a vertical rise of the cloud further into the E-region.

Considerably more data needs to be collected and analyzed before this effect may be verified or disproven. However, a possible contributing factor is noted in that the position of the cloud (1220-1250 EST) is along the meridian of the subsolar point. Thus, the rise may be due to expansion of the air beneath the cloud forcing it upwards.

(Continued on page 76)

[4]Actually this area is somewhat greater than the area of the sporadic-E cloud at any one instant. Some drift occurs constantly and this is reflected as an enlargement of the contour area. More reports would reduce this error.

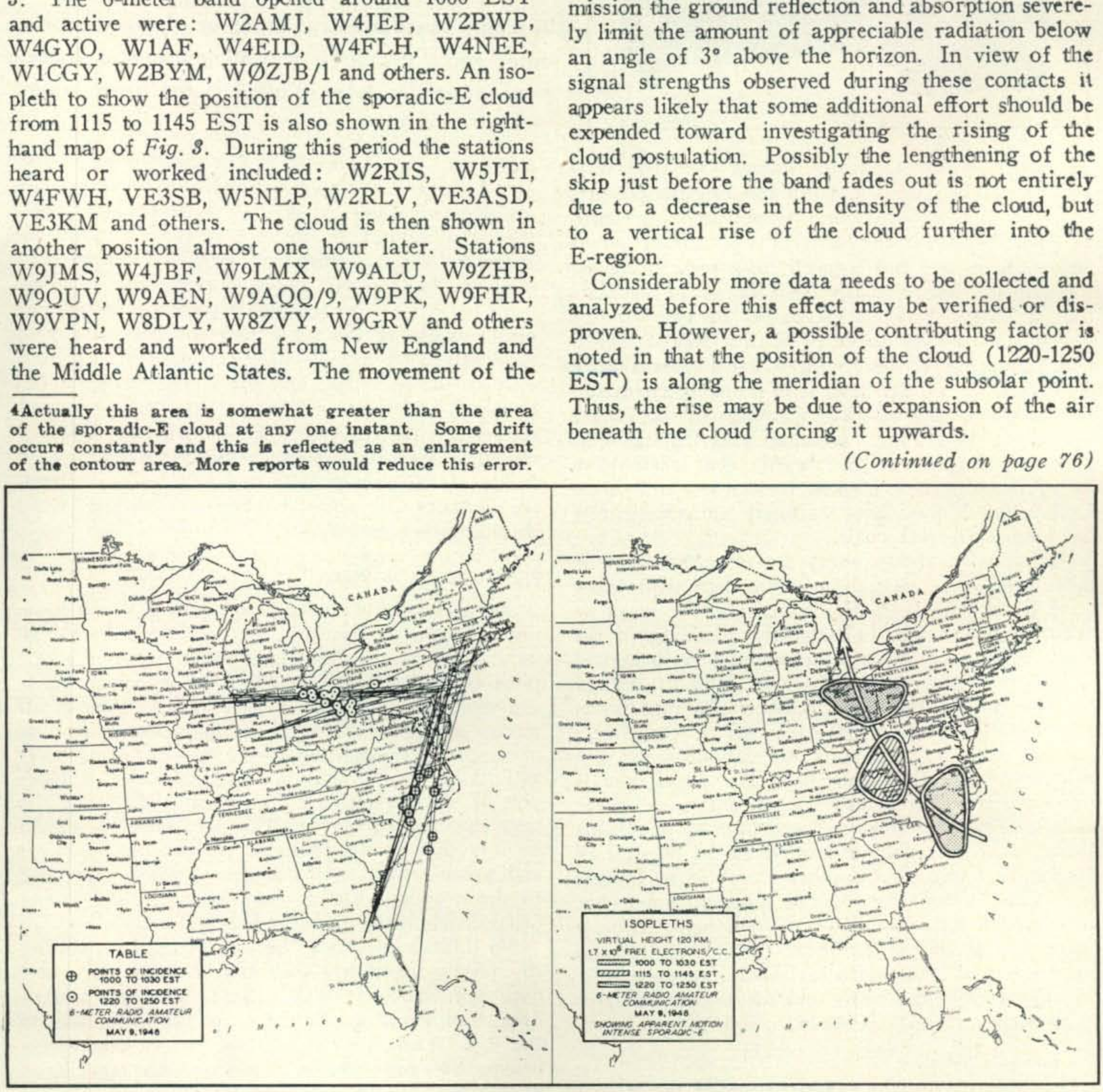
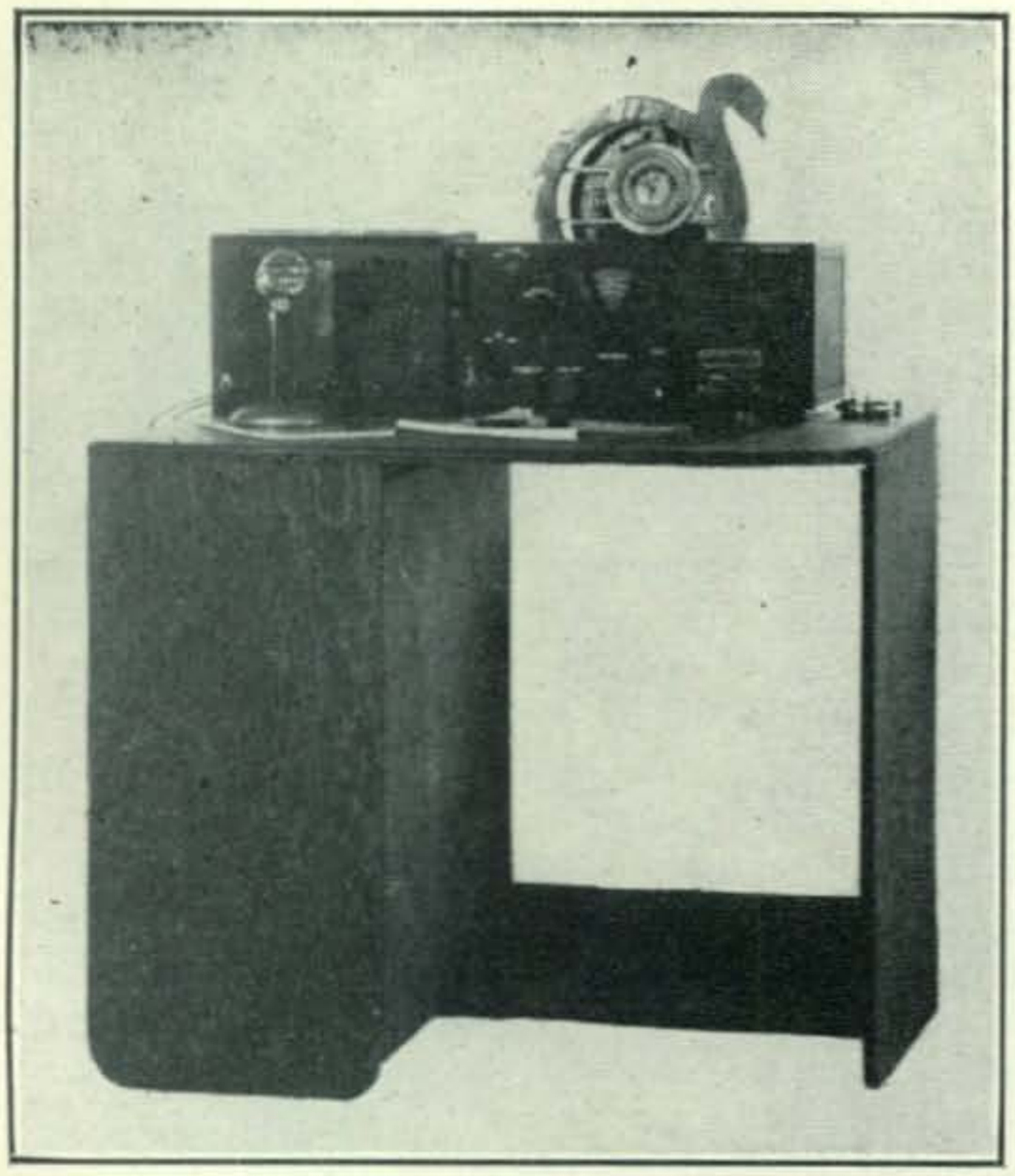


Fig. 3. Situation similar to that in Fig. 2 occuring four months later. This when compared to the winter drift shows a different direction and a slightly lower velocity.



The rig is housed in the hamsole cabinet, while the desk holds receiver and auxiliary equipment with ample room for writing space.

THE HAMSOLE

J. H. OWENS, W2FTW*

A single standard-size sheet of plywood fabricated into a complete operating position, attractive enough to take its place in the living room.

ALMOST EVERY AMATEUR knows that the term "ham" was derived from the English cockney pronunciation of amateur, "h'amateur," shortened to "ham," but for the most part amateurs' wives and mothers are not so well informed. Some of the fair sex have actually been known to insinuate that a "ham shack" is so-called because of the resemblance to the abode of a four-footed animal which happens to be the source of certain table delicacies. In all fairness, it is probably unreasonable to expect those female members of the family —who interpret circuit schematics as hair-net diagrams—to appreciate the beauty that rests in a lot of transformers, chokes, condensers and tubes. Especially if they are scattered indiscriminately on floor, table and chair.

Periodically, almost every amateur finds that he must couple his desire for home life with those good intentions of straightening out the mess he calls a rig. Sometimes under the prodding of the XYL he starts on a rack and cabinet (in beautiful bluish-gray) that would be the pride of Studio A. But the ensuing months become a nightmare. The rebuilding program calls for a completely new transmitter. The first several ideas did not work out as well as expected. The panel now is full of extra holes and the vacant eyes where meters were once fondly placed take on a hideous gleam. The rear door cannot be closed because of the cables (may need another jr. op if he doesn't stay away from there), the antenna tuner has appeared on the top and several one-inch gaps now space the front panels because the supplier did not have your size in stock. Finally, remorsefully, the disassemblying begins and the inevitable move to the attic or cellar is made.

The Hamsole Solution

One approach to the reincarnation of the station in a livable part of the home is the console, or in this case, the "hamsole." The basic idea is that all of the power supply and transmitter components are located inside of a desk type cabinet where they can neither be seen or criticized. Only the receiver, speech amplifier, key and microphone need to be located above deck. This arrangement constitutes an acceptable piece of parlor furniture while at the same moment performs very efficiently as a flexible ham console.

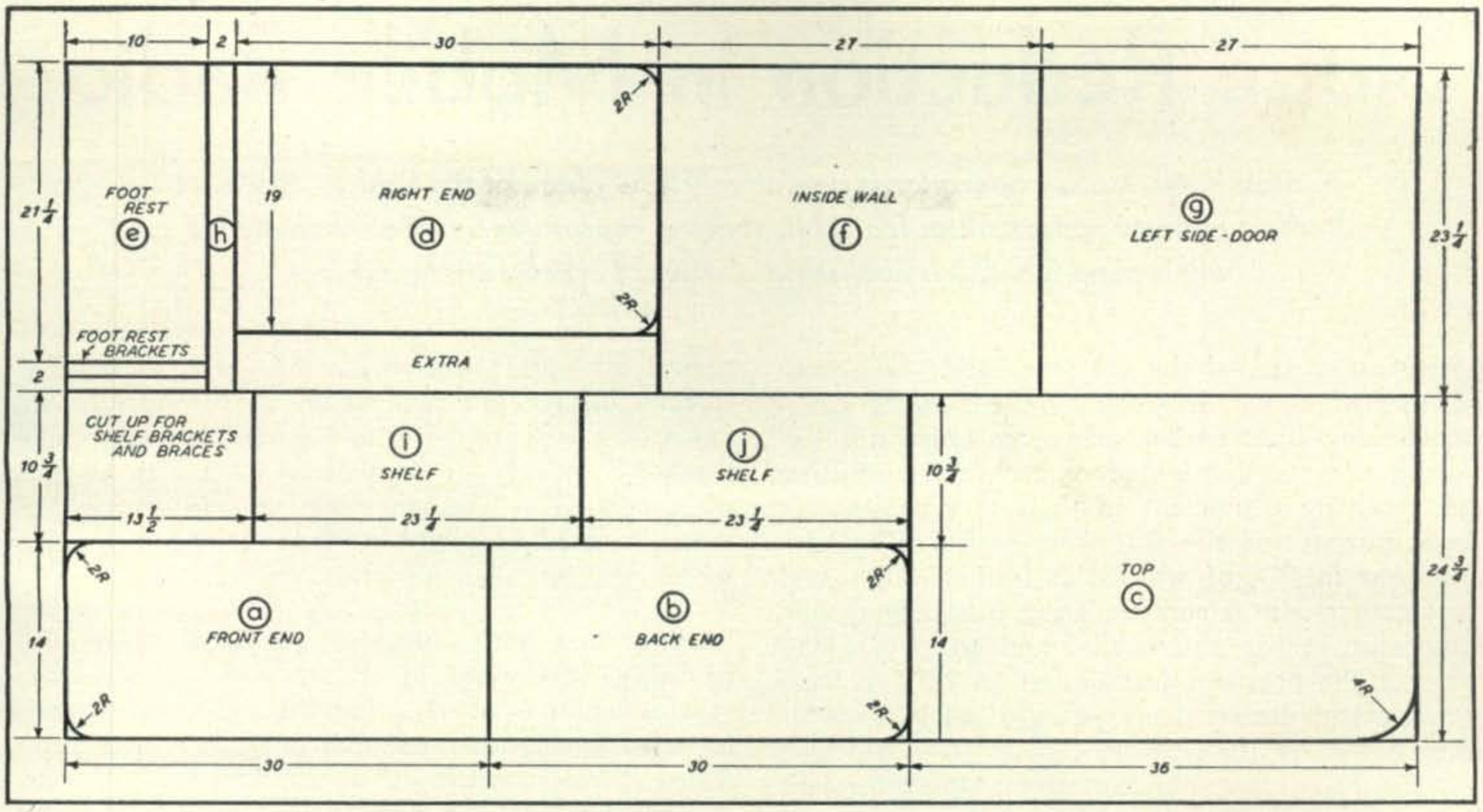
With the rig inside the end compartment, it can be wired and rewired, changed and short-changed, converted and inverted, but when the door is closed, *presto,* no one can tell what has happened inside. It is easy to build and relatively inexpensive without all the irritation of cutting holes through steel panels.

Plywood Goes to Work

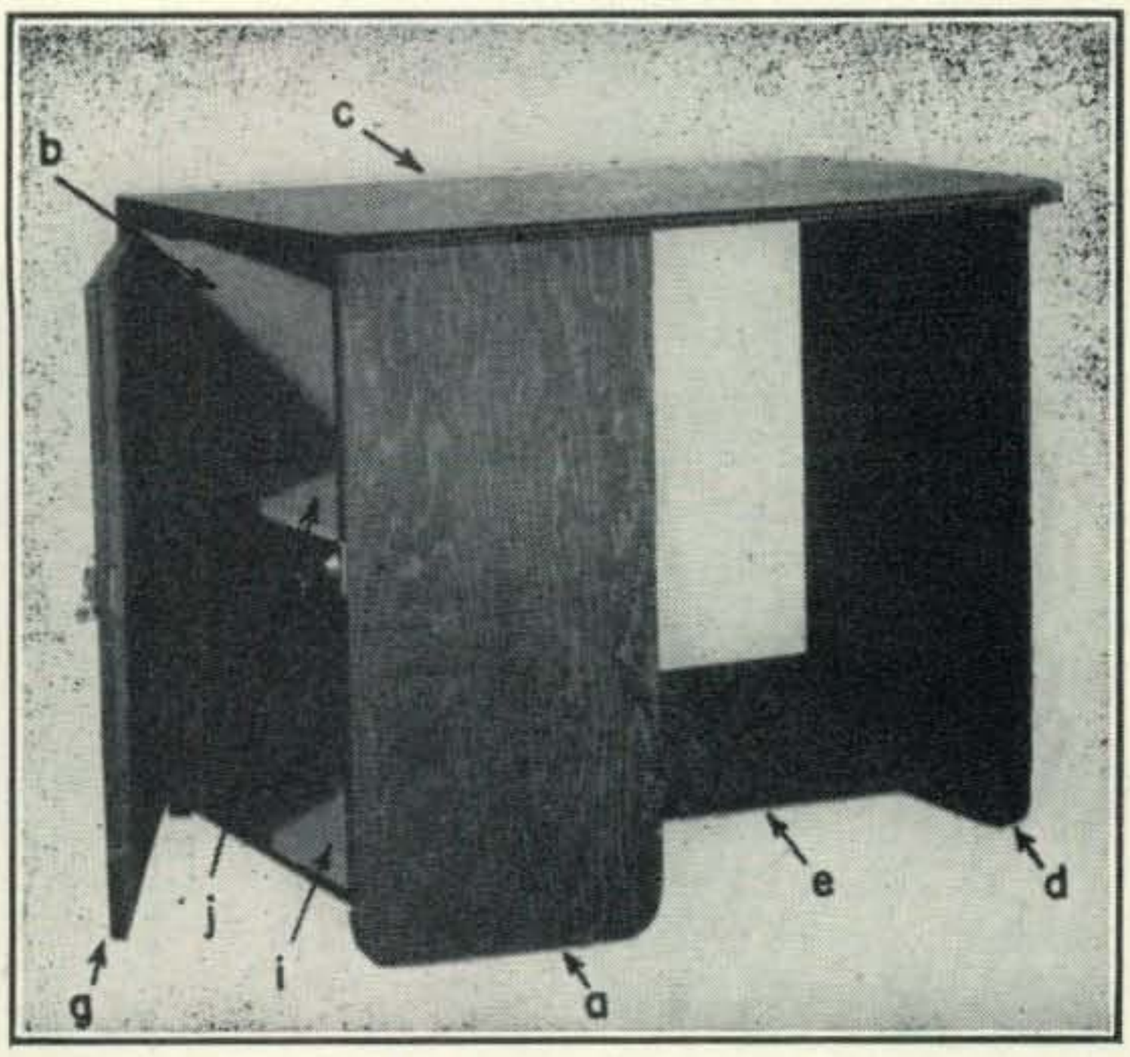
Another point of particular novelty is the manner in which the hamsole is constructed. As shown in *Fig. 1,* all the panels are cut from a single piece of ¾-inch plywood, 48 x 96 inches, a standard size. If cut out as shown in the drawing, all pieces should fit together without heavy planing or sanding. In addition to the woodworking tools and nails, two hinges, one sash-fastener, a half-pint of wood stain and a quart of shellac are the only materials required. The over-all cost should be less than fifteen dollars. Some lumber yards and planing mills will cut the plywood according to the drawings for a small charge, thus saving considerable time and trouble at home.

No difficulties should be experienced in putting the pieces together. Note that neither the outer door nor the inner wall (*G* and *F,* respectively) drop completely to the floor, or go completely to the top. Also, the two shelves do not completely bridge the gap between the door and the inner wall. This is done especially to provide a natural chimney for ventilation, although the use of a small blower is to be recommended.

*6931 Harvey Ave., Merchantville, N. J.



Here are the exact cuts necessary to obtain all the console parts from one sheet of 48 x 96 inch plywood.



The basic compartments are large enough to mount at least a 200-watt plate modulated transmitter and power supply. The main power line switch should be located inside the compartment so that when the door is closed and locked the little jr. op will not get his fingers burned. The entire transmitter may be shielded at a very low cost since it is only necessary to line the compartment with copper screen, or aluminum foil. Foil is readily available at most grocery stores under the trade name of "Reynolds-Wrap." This facility for shielding is an important consideration in curing BCI and TVI.

The hamsole may be finished by staining (we used Walnut) and then shellacking. Another system which has particular charm for use in a den is to cover the walls with a leatherette material. The seams can be finished with thickly placed broadhead upholsterer's tacks, or with aluminum trimming bands.

Postscripts

Putting the SCR-522 on 6

THE VERY LOW cost of the surplus SCR-522 has proven to be an all-important factor in populating the 144-mc band. Much the same can apply to the 50-mc band as these units may be easily adapted to 6-meter band operation simply by changing the r-f mixer and oscillator coils.

Through the use of grid-dip meter I found that the new r-f and mixer coils (part numbers *222* and *224*, respectively) should be made of 6 turns of #16 enameled copper wire, 5/8-inch in diameter and spaced the diameter of the wire. The oscillator coil should be 8 turns of #16 enameled copper wire, 5/8-inch in diameter and very close spaced. The antenna coil and r-f primary should be made from 4 turns of the same size wire and coil diameter and spaced about 1/8-inch from the grid coils.

Coupling from the oscillator plate to the mixer grid coil is obtained by wrapping 4 turns of pushback wire around a stiff piece of copper wire. One end of pushback wire is soldered to the plate end of the oscillator amplifier tuning condenser. The one end of the stiff copper wire is soldered to the grid end of the mixer tuning condenser. Both remaining ends are left free so this will form a "gimmick" condenser.

With this coil arrangement the 6-meter band will fall approximately where the 2-meter band falls with the original coils, i.e., with respect to the tuning condenser positions. Of course, the remainder of the conversion is the same as in various adaptations of the BC-624 to 144-mc operation. The usual playing around with the trimmers will bring the tuning into alignment, but this is a simple maneuver.—*W2JFE*

Noise Reduction in Mobile Radio

To most hams, mobile operation is a relatively new phase of the hobby. Because it offers unusual opportunities for public service, represents a technical challenge, and is good fun, CQ is publishing a series of articles on the subject.

NOW THAT ALL of the amateur bands have been opened to mobile work by the Federal Communications Commission many amateurs are exploring the possibilities of operating transmitting and receiving equipment in their automobiles. It is the purpose of the following series of articles to appear in *CQ*, of which this is the first, to aid the amateur who is contemplating installing mobile equipment in his automobile, and to pass along some of the practical installation tricks that have been learned during many years of mobile installation work by the author.

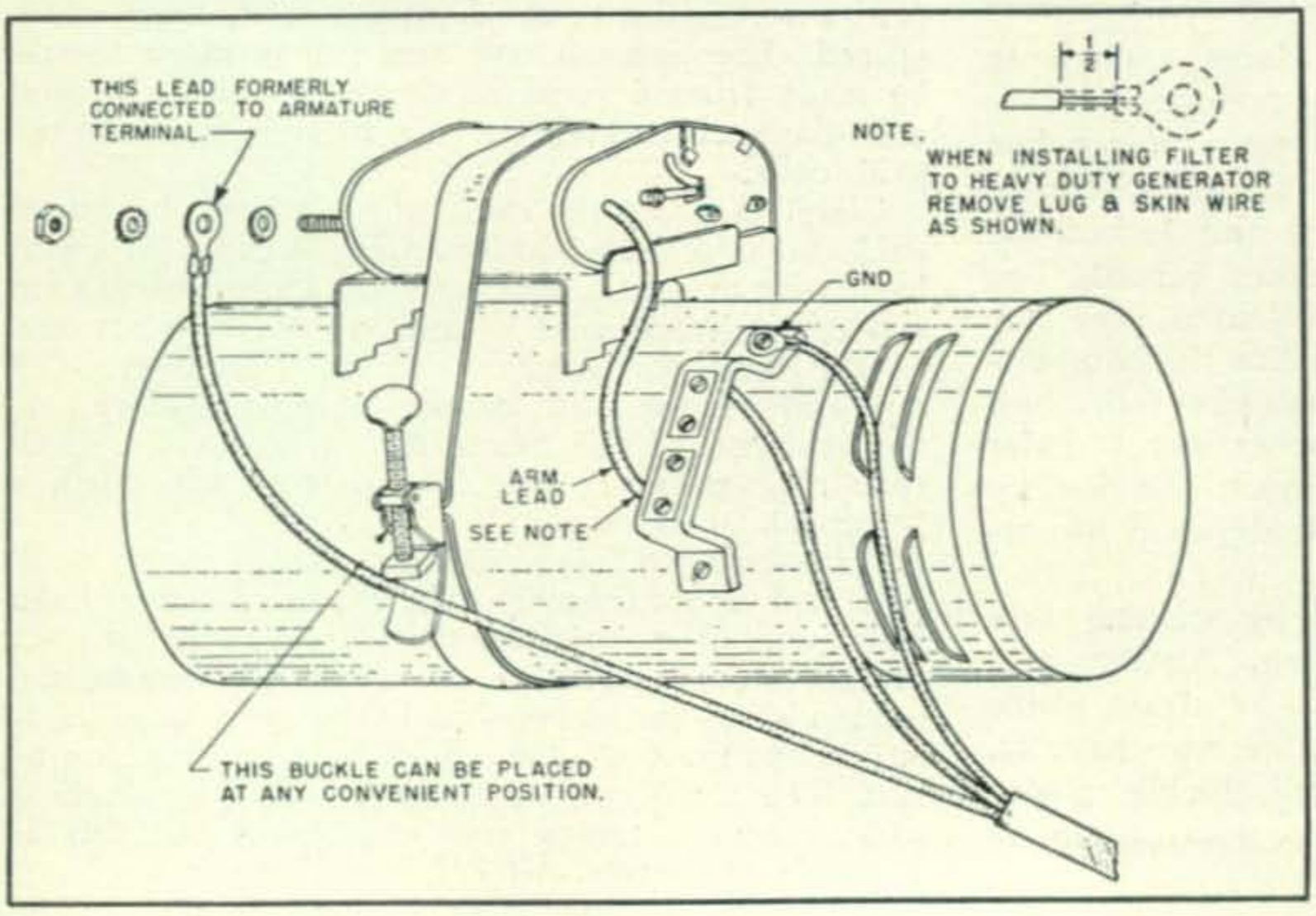
In this article, we shall not attempt to go through the various installation layouts of the equipment in automobiles. This will be covered in a later article; instead we will attempt to cover as many of the noise reduction applications as possible.

Generator Hash Noise

One of the first considerations in any mobile installation is the elimination of the hash-noise created by the automobile generator. This can be heard in the form of a grinding hash or a low or high-pitched whine mixed along with the other noise such as ignition interference, low-tension noise, gauge noise, and that from other noise-producing equipment on the car; and it is rather difficult to positively identify the source of the noise unless a stunt such as this is tried. It is suggested that the automobile be driven to an open highway where there is a minimum of traffic. The automobile should be accelerated to a speed of approximately 40-45 miles per hour, at which speed, with the car left in gear, the ignition switch should be turned off with the receiver gain wide open. By turning off the ignition switch all of the ignition noise, low-tension noise, and gauge noises should cease. The only noise remaining should be the noise created by the generator, outside of possible noises created by wheel static, and velocity static, which will be taken up later in this article.

As the car is coasting, the generator will be turning over and a decided generator hash will probably be noticed in the receiver. There are several methods of reducing this hash to a minimum. There is a commercial generator filter produced which consists of a coil and a condenser arrangement in the necessary shielded housing, and a mounting bracket to provide adequate grounding. Installed on the generator this filter will reduce the majority of the noise, in better than 80% of the d-c generating systems used on vehicles today. The accompanying diagram shows the physical installation of this generator filter. The purpose of the elevated bracket is to facilitate the mounting of the filter on the generator housing, and also to provide adequate grounding facilities for the generator filter to the generator frame. Further, the bracket elevates the generator filter away from the heat of the generator housing so that the condenser capacities will not be too greatly affected by the radiated heat of the generator.

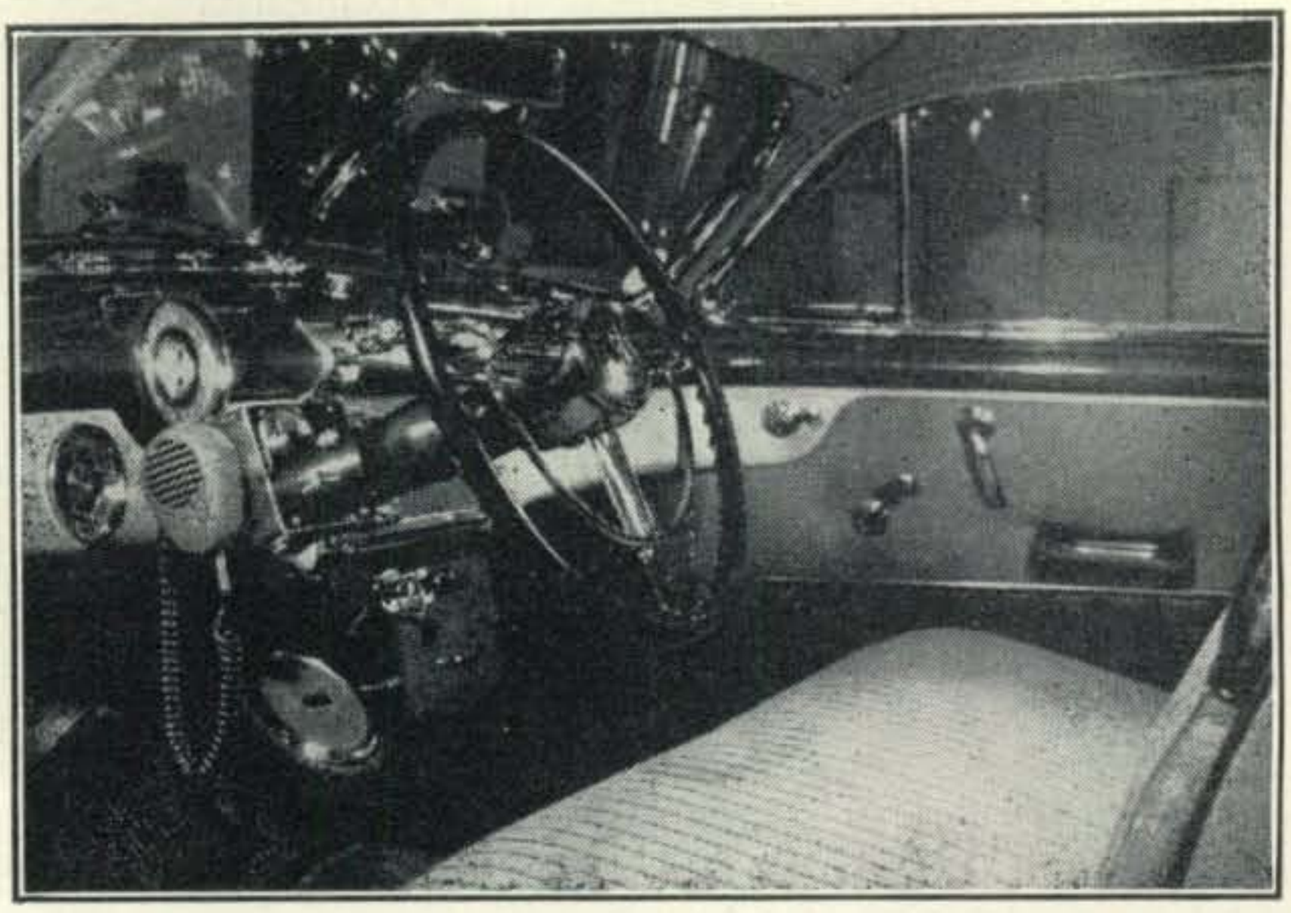
If this type of filter does not reduce the noise to a minimum, it is profitable to install a .01-μf condenser across the points noted in the diagram, which will further reduce the radiation hash. This



Typical generator filter. The Motorola P-346 filter is designed for the elimination of generator interference in mobile units. The rated capacity of this filter is 40 amperes and it should not be used with a generator having a rated output in excess of that value.

Installations

HARRY HARRISON, W9LLX*



A good mobile installation requires little space on the dashboard. This is W9QIO's 28-mc control position.

will work on certain vehicles where it does not seem that the noise is reduced efficiently by other methods. It is also good practice to remove the generator wires which run from the generator to the regulator from the usual conduit housing, which in most cases also includes the ignition system wiring of the vehicle. This will reduce the amount of capacity radiation created by the close proximity of the six-volt system to the high-tension system.

In certain generating systems where it is impossible to reduce or eliminate the noise with these precautions there are some cases which can be quieted by installing a 10-meter tuned trap (or a trap for any other desired frequency), which consists of about ten turns of No. 8 wire approximately one inch in diameter, spaced approximately the diameter of the wire and tuned by a 50-$\mu\mu$f condenser. This type of trap will be somewhat critical in adjustment, and it is suggested that if at all possible the fan belt be disconnected from the generator, and some means of turning the generator such as an induction type electric motor be employed to operate the generator so that the condenser may be tuned properly for maximum reduction of noise while listening to the receiver installed in the vehicle.

Ignition System Noise Suppression

In many vehicles, it will be noted that the low-tension lead from the spark coil runs in parallel to the high-tension leads. It is advisable to remove this lead from among the high-tension leads and separate it as far as possible, a step which will further reduce high-tension noises leaking into the low-tension system. The installation of spark plug suppressors will be necessary to minimize the high-tension ignition interference, and these resistors should be on the average of eight to ten thousand ohms. There should be one suppressor on each plug and one in the distributor lead. The input side of the spark coil should also be by-passed by a proper condenser. It will be noted that there are special condensers for this purpose. These condensers usually have a capacity of .5 μf and, since they are designed for this purpose, will stand up under heating conditions created by the motor of the vehicle. There are also ignition shielding systems which may be obtained commercially but are rather expensive. It is often necessary to completely enclose the distributor ignition system, and to by-pass the inputs of the distributor system to reduce the noise to an absolute minimum. These shielded systems are used by various services but as yet the prices are prohibitive for installation on a normal vehicle. And the fact of the matter is that it is possible to reduce the noise in your own vehicle only to a certain minimum because noises created by nearby vehicles become much greater than your own. It is needless to spend too much time trying to reduce the noise in your own vehicle more than a reasonable minimum.

There also are noise suppressors built into spark plugs manufactured at the present time by the Autolite Company. This is a special plug designed so the suppressor resistor is an integral part of the porcelain section of the spark plug. They are quite satisfactory and make a very neat installation. Incidentally, these plugs are designed not only to reduce ignition interference to receivers in the vehicle, but also to reduce ignition interference radiated from the car which would create disturbances to television receivers, and other radio receiving devices.

The gas gauge, heat gauge, oil gauge, and certain other instruments can provide a considerable hash level in the vehicle. The most practical way to determine this after the generator noise has been reduced, and the ignition interference has been reduced to a minimum, is to disconnect the "hot" side of all of the gauges. With the receiver gain turned up, one by one replace the connections on the gauges and listen for a change in noise level. The gauge noises usually take the form of a periodical rasping effect. Most of this can be reduced by installing a shielded condenser at the source of the gauge or at the position where the gauge is mounted, and grounding the condenser securely. It may be necessary in some cases to also provide another condenser from the gauge terminals on the instrument panel to a proper ground. It is very important that a proper ground

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be obtained, otherwise installation of the condenser is useless.

There are some cases where chokes can be inserted in series with the gauge lead and by-passed to ground which will reduce the noise; however, it is not usually necessary to go to this extreme because the gauge noise as a rule is not of too high an intensity. It is also possible to insert tuned traps in the circuits of the gauges. Traps should be installed at the gauge point and tuned. This precaution, however, is unnecessary in most cases. The trap would be approximately the same dimensions as used for the generator.

Antenna Installation Precautions

It is very important that the antenna which is used for transmitting also be used for receiving, since this is a periodic antenna designed to operate on the proper frequency and will have a maximum pick-up, provided the proper transmission line is used and the proper bonding of the transmission line to the frame of the car is adhered to. It is very important that the line be properly shielded, using coaxial line or high-impedance shielded line, depending on the input circuit of the receiver. It is also important that the end where the transmission line enters the receiver is properly grounded to the receiver, and that there are no open sections of this line to admit noise. If an antenna changeover relay is used, which would of course be necessary to use the transmitting antenna on receive, this relay must be properly grounded to the chassis of the car and to the shield of the cable leading from the antenna to the receiver. It is also necessary that the receiver itself should be properly grounded to the frame of the car with as low a resistance connection to the ground as possible. To obtain this proper ground, use a wide piece of braid. In many cases it is advisable to run a separate ground lead from the frame of the receiver to the grounded terminal of the battery. If the "A" voltage is taken from the ammeter position on the instrument panel, it also is necessary in most cases to by-pass this point to ground with the proper .5-μf condenser, to further prevent noise from entering the receiver.

If the antenna is of the usual whip variety, either of the surplus Army type or of the commercial police type, it will be noted that if the car is traveling at fairly high speeds under certain weather conditions on certain stretches of pavement and asphalt highways, a terrifically high-pitched whine or noise will be created in the receiver. This is known as velocity static, created by the metal area of the vehicle picking up static charges. The antenna generally being the highest point on the vehicle, it will dicharge this velocity static at a very high rate of speed creating the high-pitched whistle or noise known as velocity static. This can be eliminated by a simple process of putting approximately one foot of Cambric tubing over the top end of the antenna and securely sealing the top end of the Cambric tubing with model airplane dope or household cement. Or it can be done by wrapping friction tape on the tip end of the antenna and cementing this with shellac so that it will stay in place. It will be necsssary to replace this cap from time to time because of wear from striking various objects while the car is in motion. The Cambric tubing or friction tape or other plastic material will slowly diffuse or discharge the velocity static at a rate which will not be received in the receiver. This velocity static can become quite troublesome on even the strongest signals as anyone who has operated mobile or aboard an aircraft will testify.

There are other points of reducing noises such as: bonding the exhaust pipe securely in several places to the chassis of the vehicle and also bonding the motor which is normally isolated and suspended on rubber from the chassis of the vehicle to the chassis frame. This should be done by running heavy straps, such as the ground lead used to connect the battery, to the frame of the vehicle or to the motor block. Using this type of braid, bond the motor securely in several places to the chassis. In many cases it may be necessary to run shielded braid of at least one-half inch width from the flexible choke, temperature control leads and other instrument leads which enter the bulk-head through rubber grommets. These carry noise into the passenger compartment where the receiver is usually mounted.

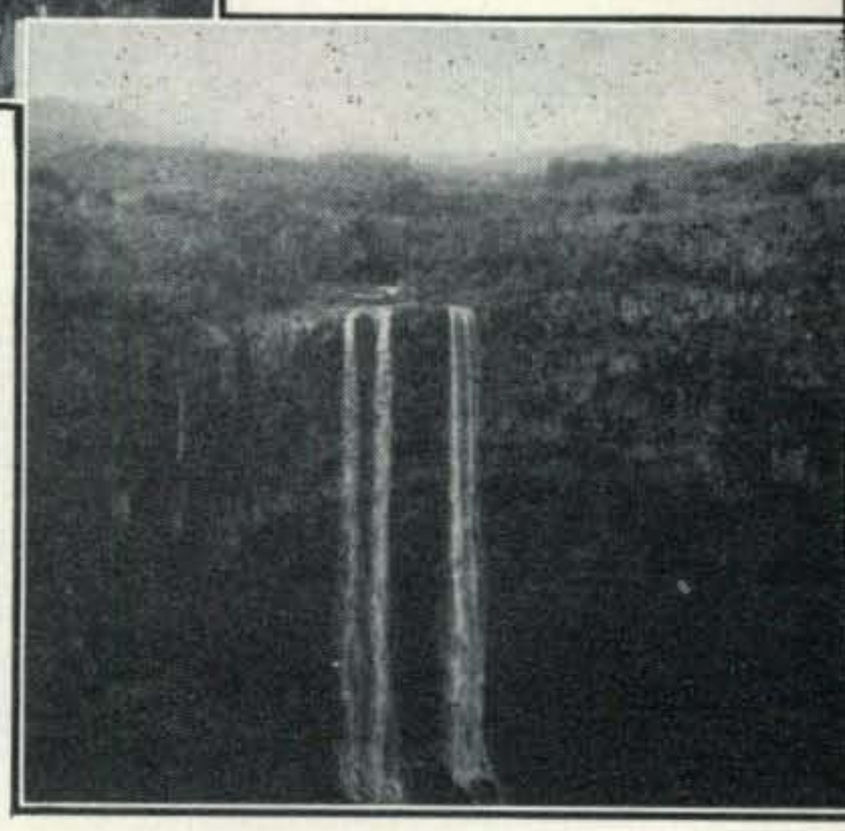
It may prove desirable to start the bonding at a point near where the metal housing of the control cables enter the bulk-head and to bond the braid securely to the bulk-head.

This covers the general considerations of noise reduction in most vehicles and should serve as a sound basis for satisfactory reception while operating.

Dollars for Watts

Not everyone likes to work DX, but the Editors of CQ feel that most everyone would like to read a little about the DX itself. What are the DX countries like? What are the people like? How does it feel to be on the receiving end of the hue and cry that goes up every time a DX station lets out a call. Starting off with Mauritius, VQ8 in Zone 39, we will occasionally print these combination travel and hamlogs. Let us know how you like them.

Sugar cane fields and bay at Baie du Cap in the South of Mauritius, and below, 300-ft. high Chamarel Falls.



Mauritius--

Pearl of the Indian Ocean

REX BOSMAN, ZS2X*

FOR MANY YEARS prior to my trip to Mauritius, I had been interested in the island. It started about 1930 when ZS6DX, then a ZS2 ham, showed some 16-mm film taken by his OM, while acting as W/O on a S/A survey ship. I was fascinated by them. Later, when I became a ham, I got to know VQ8AB very well and, through him, started corresponding with a YL over there. In 1937 I received an invitation to come and spend a holiday, but at the last minute circumstances made it impossible. In June, 1947, however, just ten years later, the YL (now the XYL) and I set out on the trip we had planned so long.

Shipping still being a problem, we were lucky in finding berths on a cargo ship which carried 30 odd passengers, mostly civil servants, taking up positions on the island.

Two days after leaving CR7, we passed Cape St. Marie, the southernmost point of Madagascar, and then headed northeast toward the Island of Reunion, which we sighted two days later. This island is extremely mountainous, and the northwestern extremity, which we passed, is unbelievably awe inspiring. When seen from a distance, this portion of the island has the appearance of a giant cone, but on closer approach, it becomes apparent that this cone is indeed hollow, forming a great crater thousands of feet deep, and several miles in diameter, within which has risen another sharp tipped crater of equal height. In so doing, it appears to have split the walls of the outer crater in several places, and creased it in many others, thus forming tremendous knife-edged cliffs, ravines, and chasms, which run right down to the sea. The chief port, Pointe des Galets, is in one of these ravines, and serves as harbour for St. Denis, the capital, which, although also a seaside town, cannot take much in the way of shipping, owing to the shallow water. The two are connected by a railroad which passes through innumerable tunnels blasted through the mountain ridges mentioned earlier. Incidentally, St. Denis was the home town of the late Prince Vinh San, prewar FR8VX who, although on exile, later joined the Free French forces. He was unfortunately killed in an air crash during the closing stages of the war. There are no hams on Reunion at present.

*120 Upper Valley Road, Port Elizabeth, Union of South Africa

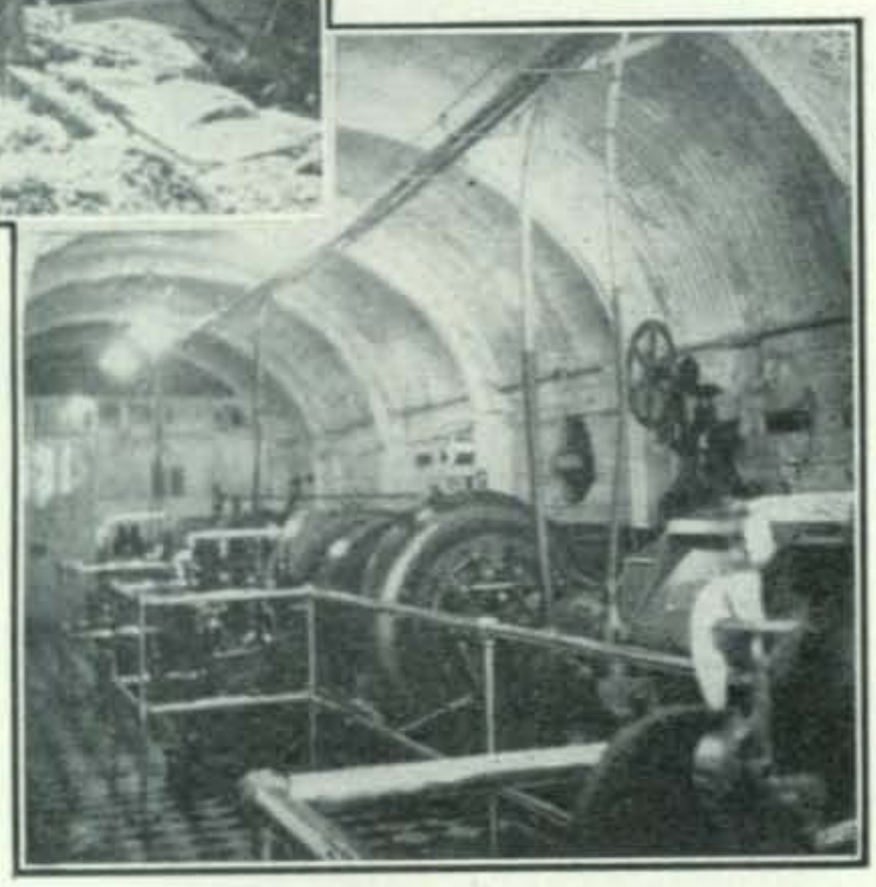
The author, his XYL on the right, and her sister, in a garden in the heart of the Port Louis business center.

Before Ham Radio

At 3 a.m. the following day, we dropped anchor outside Port Louis harbour, awaiting daylight. We had arrived! At this stage, I think it might be in order to throw some light on the history of Mauritius. I think I am safe in saying that there are very few islands, if any, which can match its historical, as well as romantic but often tragic. background.

Some 39 miles long by 29 miles wide, it lies between 19°58′ and 20°32′ South Latitude and between 57°19′ and 15°46′ East Longitude. It was

Reduit hydroelectric power station built into one side of a ravine 300 ft. deep, showing VQ8AD standing before small suspension bridge.



Interior of Reduit hydro-electric power station.

discovered some four centuries ago by the Portuguese, who named it Sant Appolonia. Later this was changed to the Mascarene Islands. Several years later, still other Portuguese passed by, and called it Cerne. Although they made no attempt to settle, they did land deer, goats, monkeys, and pigs!! This was in 1528.

No one visited the island again until 1598, when a Dutch admiral landed and took possession for Holland and named it Mauritius, after Count Maurice of Nassau. However, it was nearly a century later that the Dutch actually settled there. About 50 years later they abandoned the island due, so the story goes, to the innumerable rats that infested the island. Although the Dutch burned all their possessions, they did leave behind, in the dense forests, many fugitive slaves who caused succeeding settlers endless trouble. Very soon afterward the French, finding it deserted, called it Isle de France and settled there a few years later. In 1735, one, Mahé de Labourdonnais, was made governor. I mention him in particular because he did more than any other single person to make the island prosperous. It was he who introduced sugar cane, which immediately flourished, and to this day is the chief source of revenue of the island. For about a hundred years the French held the Island, but during the great wars that followed the French Revolution, several naval and land battles between the French and English finally decided the issue, and the island became, in 1810, a British possession. Owing to the generous peace terms, however, the people retained their language (French), law (Napolonic) and religion (predominantly Roman Catholic). The island was renamed Mauritius.

While all this history was in the making, something more exciting was also taking place. The island, being in a direct route of all the richly laden vessels returning to Europe from India, became a natural for the headquarters of pirates and French privateers. Being almost entirely surrounded by coral reefs, with comparatively few gaps, and these not easily discernible, together with large numbers of rivers affording secluded landing points, and with numerous volcanically formed caves in which to hide the loot, Mauritius' topography certainly favoured these light-fingered gentlemen. To this day, people continue to search for the caves, convinced that one day they will unearth the fabulous wealth that is believed buried there.

At daylight we caught our first real view of the island. We were close inshore; the buildings in Port Louis, the capital and only good harbour were still shrouded in the morning mists, but the jagged peaks of the mountain range which almost encircles it, stood out clearly, most prominent being the peaks "The Thumb" and "Pieter Both." Ships enter the harbour between two forts, Fort George and Fort William, and as there are no quays, except for use by small vessels, all ships lie at anchor down the middle of the harbour and approximately half a mile out.

There was the usual melee of native craft crowding round, as well as a few motor launches awaiting to take passengers ashore. Among the many friends and relatives (of the XYL) who were there to meet us, were of course, my ham friends, Volcy de Robillard, VQ8AF, and Paul Caboche, VQ8AD. Unfortunately, Leny Mazery, VQ8AB had left a couple of months earlier, for his appointment as W/O on the Chagos Islands, and therefore could not be present.

When the Bands are Dead

It is, of course, impossible to describe everything in detail, and I will therefore confine myself to the most outstanding features as they struck me at the time. These include the innumerable little rivers and canals, the narrowness of the roads and streets, the latter made positively dangerous in many villages by deep storm water ditches with no protective barriers to safeguard traffic. The beautiful green lawns surrounding the houses, and almost without exception, every plot enclosed by thick bamboo hedges up to 10 feet in height, all neatly trimmed. These grounds certainly made me envious—even the small ones would accommodate a couple of V beams! The houses are mainly of wooden construction, and have glass-enclosed verandas to provide protection against the terrific rains during the rainy seasons. There are teeming thousand of Indians who crowd the streets. Mauritius has a population of about 450,000, of which approximately 300,000 are Indians; the roads are heavy with traffic, mostly small British cars, and busses carrying about 20 persons.

It was surprising how soon one lost the feeling of being confined in such a small place. This may have been due to the fact that the roads wind between unending fields of sugar cane, and, on this account, a journey which should take 15 minutes, generally takes half an hour.

Candidly, I don't quite know how to describe the thousand and one beauty spots of the island. To me, the real fascination lay in the sudden changes in scenery. Here in South Africa, one must often travel hundreds of miles before noticing any change in landscape, but on the island, a

mile, even a few hundred yards in some places. discloses a complete and startling change in terrain. This is probably more noticeable on the south-western portion than anywhere else. There one can travel from salt marshland, with sparse grass and Aloe trees at the seaside, to the luxurious abundance of the tropics by merely negotiating a mountain pass less than a thousand feet high—to the Chamarel Plateau, where luxurious tropical trees thickly interspersed with cocanut, palm, and Traveller's trees all struggle to outgrow one another. The ground is overgrown with giant and lesser ferns, while orchids hang from the trees. But even there, when you least expect it, you stumble over traces of civilization—a little Indian trading store, a Catholic Mission, or just simply a banana grove with trees laden down with fruit.

You pass through this paradise to reach the world famous Chamarel (coloured earths). In only one other place in the world, New Zealand, is such a formation known. It consits of a central mound on whose sides, ridges and valleys have been formed, and the ridges are crossed by regular bands of coloured earths: colours ranging from bright red,

◆ ◆

VQ8AD, Paul Caboche, who also operated for some time from the Chagos Islands with the call VQ8AS.

◆ ◆

through purple and coal black. Other breath-taking sights are the delicate beauty of the Chamarel Falls, over 300 ft. high, where the water appears like lace falling past a huge cave formed in the cliffs of jet black rock. The never-to-be-forgotten view of the mountain gorges from Plaines Champagne and the grandeur of the Morne Brabant—the lonely mountain practically inaccessible with its sheer rock sides rising to a height of nearly 2000 feet.

A climb of "The Thumb"—2,668 feet— gives one a remarkable view of the whole island, with its volcanic mountain peaks, including Pieter Both —2,690 feet— which tapers to a narrow neck, and then bulges out into a great head of rock. Below the range on one side lays Port Louis, and on the other, the Moka Plains, with miles of sugar cane fields dotted with villages and cane mills. Then there are the rock plains of the north, where many square miles of lava beds have been broken up, the lava being only approximately 15 inches thick, and when not used for making roads, culverts, etc., is neatly stacked into rows between the cane. Dotted all over were numerous mounds, which, on closer inspection, turned out to be large masses of volcanic rocks which had been forced up to form chimneys for the escaping gasses, the rocks still marked and seared by them. However, no signs of volcanic activity have been observed since the island's inhabitation.

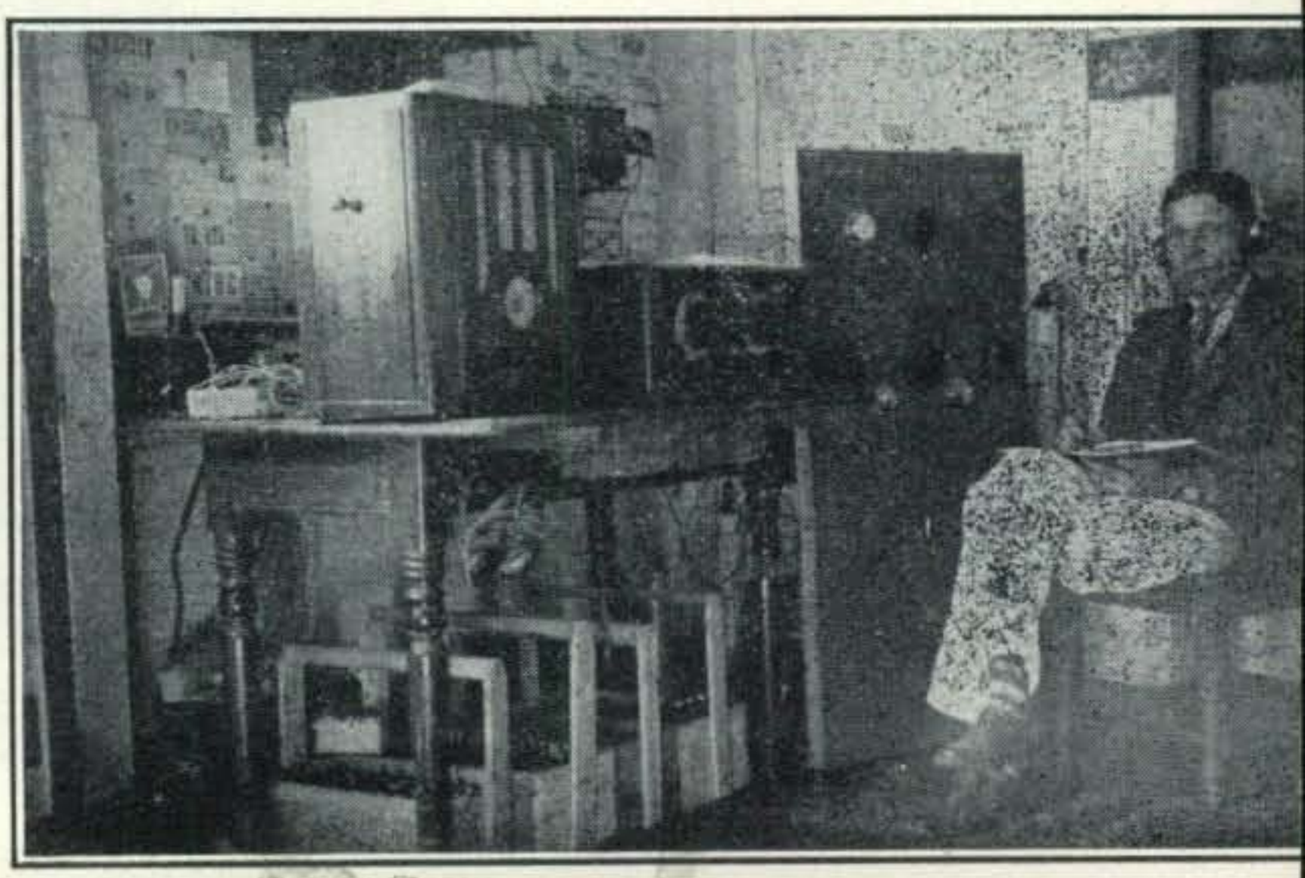
The beaches are truly beautiful, but are for the most part spoiled by washed up fragments of coral —in some places several feet thick. They are dazzling white, with Filao trees, a species of pine, growing right to the water's edge, and there are thousands of little bays formed by the sea gradually excavating the sand from between the black volcanic rock, which seems to crop up at regular intervals right around the island. On all its beaches, bungalows, hidden beneath the Filao trees, overlook these little bays, and are seldom more than 50 feet or so from the water's edge. These bungalows are occupied only during the winter months, as the mosquitoes, and particularly the malaria carriers, make it absolutely unsafe to stay anywhere near the coast during the summer months.

Malaria, however, is not the only blight on this beautiful island. During an average year, some 300 cyclones begin their short, but destructive, lives in this part of the Indian Ocean, and it is indeed fortunate that only a very small fraction of them ever pass over the island.

I nearly forgot to mention the Pamplemousses Gardens, which once ranked among the three best of the world. Here can be found practically every known variety of tree, some of them of colossal size. One palm, about 80 ft. high, flowers only when 100 years old, and then promptly dies. Two of them had just flowered before we arrived, and were already withering. Here also in rockwall enclosures are a dozen or so gigantic tortoises, originally brought from the Aldabra Island. One is reputed to be over 300 years old, and it stands about 2 feet high. They carry a full grown man on their backs as easily as I can work a W6!

What have I missed? Sport? The Gymkana Club at Vacoas provides grounds which would be difficult to equal anywhere, with separate grass-covered fields for cricket, football, tennis, etc., and the roughs of their golf course are like most South African fairways! Fishing? Mauritius is a fisherman's paradise: brown coral fish, rainbow coloured ones, and hundreds of other varieties up to several pounders can be caught in the lagoons—the water so clear, one can see them nibbling coyly at the bait—up to 500 pounders to be caught on the high seas just outside the coral reefs. For the bold—a motor boat, and there is the choice of as many man-eating sharks or barracuda as one would wish! Hunting? Here's the answer to the lazy man's prayer. It is generally indulged in by large parties: each hunter sits on a comfortable (?) platform built in a tree or on poles, with a space of some

(*Continued on page 74*)



VQ8AF, Volcy de Robillard, in his shack.

Monthly DX Predictions - February

OLIVER PERRY FERRELL*

THE METHODS DESCRIBED in National Bureau of Standards Circular 462 ("Ionospheric Radio Propagation")[1] making use of the CRPL-D series ("Basic Radio Propagation Predictions")[1] permits a fairly accurate estimate of radio transmitting conditions to be predicted in advance. Also of special interest to the radio amateur are the modifications outlined in an article in the November, 1948, issue of *CQ*.[2] Using the methods described in this latter text the following analysis was prepared based on these parameters:

A. 1000 watts effective radiated power.
B. Antenna gain factor = 1.
C. Noise discrimination factor = 1.
D. Service gain factor c.w.-to-phone = 14 db.
E. Receiving location free from man-made noise.

East Coast to Eastern Asia

40 meters: On ionospherically quiet nights the band may open gradually between 0315 and 0400 EST. Atmospheric noise becomes troublesome on far end after 0430 EST. Band closes about 0630 EST. *20 meters*: Weak opening of some length from 1645 to 2215 EST. Conditions only poor to fair at best this month. Considerable auroral absorption, phones largely unreadable because of atmospheric noise. Possibly some scattered c-w around 0730 EST. *10 meters*: Band will open on quiet days around 1715 EST. Signals build up in strength peaking before the band closes at 1830 EST. A good band when conditions are right.

East Coast to East Indies

40 meters: Some possibility of an opening on ionospherically quiet days over the direct path from 0545 to 0715 EST. However, atmospheric noise is 8 db above predicted field at far end of path. Not a good DX path this month. *20 meters*: Band may open around 0745 EST. Signals diminish rapidly after 0830 EST due to the absorption level. Strictly c-w in any case. *10 meters*: On about four or five days out of the month, an erratic opening around 0945 to 1045 EST. Same also applies for possible openings from 1745 to 1915 EST.

East Coast to Australasia

40 meters: Fair opening from 0330 to 0645 EST. Conditions will peak in the last hour before the band closes. *20 meters*: Scattered c-w around midnight. Phones good from 0730 to 0915 EST. C-W until 1015 EST. *10 meters*: Some scattered signals around 1500 EST. Best opening, though signal strength only fair from 1745 to 1945 EST. On good days the band may stay open until 2030 EST with improved conditions during the last hour.

East Coast to Middle East

40 meters: A gradual buildup after 1600 EST, although atmospheric noise is high on far end of path. Good conditions 1900 to 2300 EST. Band closes gradually after midnight. *20 meters*: Possibly a few weak c-w signals around 0500 EST. Band builds up after 1115. Peak from 1415 to 1600 EST. Closes after 1615 EST. *10 meters*: Good signals on quiet days from 0800 to 1115 EST. Peak during last hour.

East Coast to Deep South America

40 meters: Band opens slowly after 1800 EST. Closes just before sunrise. No definite peak in conditions predictable. *20 meters*: Improved conditions after 1600 EST. Phones come in around 1745 EST. Band closes erratically between 0300 and 0400 EST the following morning. Reopens with fair signals 0615 to 0830 EST. *10 meters*: Extensive opening from 0745 to 1830 EST. Best periods 0800 to 0930 and 1630 to 1800 EST.

Midwest to Equatorial Africa

40 meters: Gradual buildup under the atmospheric noise after 1530 CST. Best period probably 1830 to 2200 CST. Closes after midnight. *20 meters*: Some scattered c-w signals from 0030 to 0215 CST Not dependable. Slowly improving conditions from 1300 CST. Peak 1800 to 2145 CST. Phones in the last three hours. *10 meters*: Extensive opening from 0715 to 1715 CST. Vagaries of the MUF trend during this month. Probably undependable. Best period may be from 1400 to 1630 CST. 12 db change in signal strength during this opening.

Midwest to Western Australia

40 meters: Predicted field is not much better than average atmospheric level at far end of the path. Band may open around 0330 CST. Peak 0415 to 0615 CST. Band closes after 0800 CST. *20 meters*: Few c-w signals around 0200 CST. Sudden good opening around 0745 CST. Conditions drop off to fadeout around 1200 CST. Phones from 0800 to 0945 CST. *10 meters*: Weak signals from 1645 to 2000 CST. Slight improvement in last two hours. Fairly regular opening.

Midwest to Mediterranean Area

40 meters: Very high auroral absorption and atmospheric noise level. A few signals may get through between 2030 and 2215 CST. *20 meters*: Scattered c-w signals around 0500 CST, but not dependable. Possible phone opening from 1530 to 1645 CST. Only on ionospherically quiet days C-W from 1215 to 1715 CST. *10 meters*: Good opening on quiet days from 0745 to 1030 CST.

Midwest to Western India

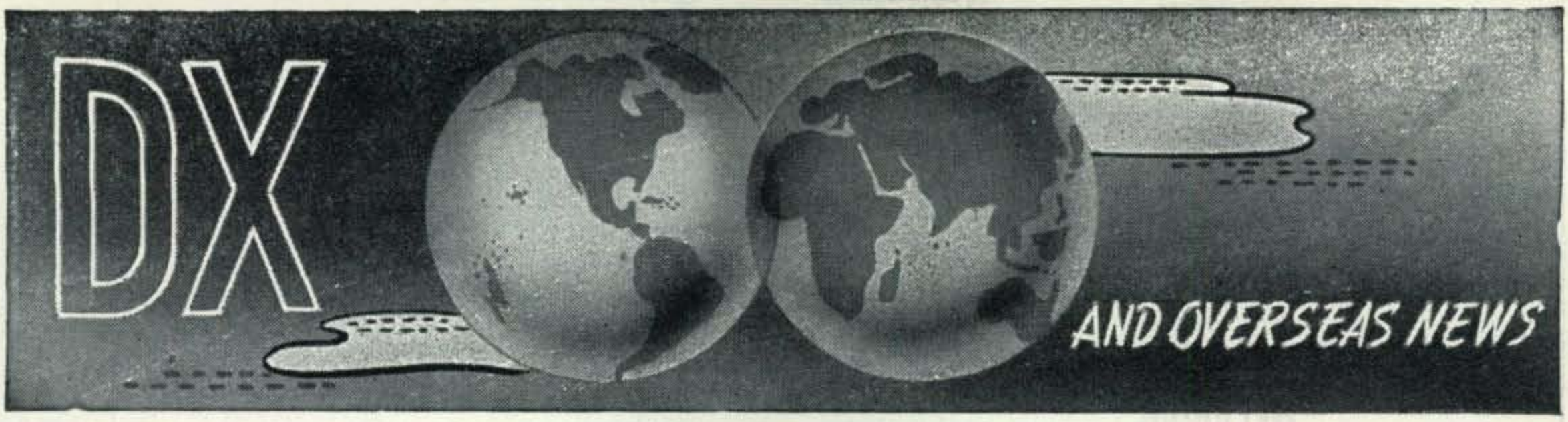
40 meters: Scattered signals from 1745 to 1915 CST. Very poor! *20 meters*: Erratic conditions and unsettled openings from 0700 to 2200 CST. This is an unusual polar condition and difficult to judge. Possible peak with a few readable phones from 1645 to 1730 CST. *10 meters*: No definite openings, but on a few days there may be some signals getting through from 0845 to 1015 CST. Strengths very good whenever this path opens.

(Continued on page 74)

*Assistant Editor, CQ.

1 Available from the Superintendent of Documents, Government Printing Office, Washingon 25, D.C.

2 "A New Method of Predicting Band Conditions" O. P. Ferrell, *CQ*, November, 1948, page 26.



Conducted by HERB BECKER, W6QD*

OUR SINCEREST congratulations to the following boys for making W.A.Z.:

89	JA2KG	Lloyd D. Colvin	40	145
90	W6UZX	Jim M. Ruys	40	142
91	W6LN	Thor La Croix	40	118
92	OK1LM	Alois Kovanda	40	141
93	W6MX	Walter H. Harrington	40	182
94	W6ZCY	Frank C. Willis	40	180
95	PK6HA	A. Hagers	40	124
96	W6PQT	C. B. McKnight	40	155
97	W6CEM	R. L. Norton	40	137
98	W6IBD	Darren Davis	40	161

In case you are wondering about *JA2KG*, he is ex-J2AHI. W6UZX and W6LN have been plugging along in there for quite some time and finally received their one missing card. *OK1LM* almost missed this issue for not sending a country list, but airmail is a wonderful thing. We sent him a country list form and received it properly filled out inside of ten days. W6MX and W6ZCY, both of them real old-timers, sent in their cards on the same day, and since both live in the same town, this is more than a coincidence: MX's envelope bore an earlier time in the post mark. *PK6HA*, from what we understand, will not be on the air again from that country, but he surely deserves his certificate for all the work he did while a PK6 . . . W6CEM, one of our staff members, has had all 40 cards for sometime, but the one for Zone 19 was mislaid, and he had to wait for another one to show up. W6IBD has been very consistently on the air since the war ended, and is located on the sand hills at Hermosa Beach.

New Countries

Well, what do you know . . . two new countries. Add these two to your list of countries:

Norfolk Island (VK9)
Vatican City (HV)

By reading between the lines, you probably knew we were about ready to make Norfolk Island officially a new country. Once again, for those reading about this for the first time, the station signing *VK9NR* is now operating from Norfolk Island. He is ex-VK3NR and will be on the Island for a couple of years. Norfolk is located midway between New Caledonia and New Zealand. He is trying to obtain a different VK prefix for Norfolk, as VK9 seems to be a bit out of bounds as compared with other VK9s we have worked in the past. If you happen to hear a VKØ or a VK1, don't be surprised; it may be his call. For quite some time, it has been suggested that we consider Vatican City as an addition to the country list, but just about every time we got serious about it, our lead would blow up, and we decided to take a rain check until something concrete and definite would justify the addition. Recently, G4NU received a card from *HV1AD*, and this was passed along like a triple reverse to G2MI, to W1QMI, to W6QD. There have been a couple of HV2s operating from there, but as far as I know, no one has seen anything from them. Let's hope more HVs pop up.

In a letter from *AC4YN* to W7EYS, it looks as though there will be another AC4 very shortly. Of course, I mentioned this some time ago, but, as yet, he apparently has not appeared on the air. This other station is *AC4RF*, Bob Ford. Things are being cooked up to get these fellows on the air, so don't be surprised if you hear a couple of AC4s on soon with good signals.

VE7HC has been hitting 80 lately, since 20 seems to be dead at night. He is gunning right now for *FA8BG* to make an 80-meter W.A.C. While talking about 80 meters, a lot of the boys have been after me to put a little heat on the 40-meter band and give 40 meters a little publicity. Well, I think many of you fellows know me from 'way back when "Life really did begin at 40." Some of the local boys have been knocking off Europe and South Africa in the a.m., usually around 5:30 to 6:00 PST . . . Makes me sleepy to think about it. In one way, I guess I'm a heck of a guy to preach 40 meters, what with the "bent-in-the-middle" half-wave that I'm using . . . However, I recall several of the DX clan using an antenna of this kind and doing quite well with it. Before the war, W8LEC did a good piece of 40-meter DX. Maybe I should mention, before going too far, this "bent antenna" consists of 33 feet vertical and 33 feet horizontal and fed in the center.

Right now I'm looking at letters from W6OMC and W2WC. OMC has been hearing stuff like *FM8AD* 7030, *TF3MM* 7009, *ZC1CL* 7025, *ZC8PM* 7030, *ZS2G* 7017, *PY7WS* 7011, *KM6AK* 7040, *G2HFO* 7052, *I1BEY* 7025, *FP8ES* 7030,

(Continued on page 54)

Major Lloyd D. Colvin and XYL. Winner of the FEARL phone DX test, JA2KG (ex-J2AHI) is WAZ.

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

W. A. Z. HONOR ROLL

C. W.-PHONE		
W6VFR	40	215
W2BXA	40	208
W8HGW	40	206
W6ENV	40	206
W6PFD	40	203
W6EBG	40	202
W6ITA	40	202
W6SAI	40	201
W6SN	40	199
G2PL	40	199
W6ADP	40	198
W3GHD	40	197
W4CYU	40	195
W3LOE	40	194
W4BPD	40	193
W6SA	40	186
W6MJB	40	186
WØYXO	40	186
W2CZO	40	185
W3EVW	40	185
W6MEK	40	185
ZL1HY	40	184
W6NNV	40	182
W6KRI	40	182
W6MX	40	182
VE7ZM	40	181
W6DI	40	181
W6ZYC	40	180
W2IOP	40	180
W7AMX	40	179
ZS2X	40	177
VK2DI	40	177
W7GUI	40	176
W9KOK	40	176
W6PCS	40	175
W6AM	40	175
W6TT	40	174
W6FSJ	40	172
W9VW	40	172
W6OMC	40	171
W6WKU	40	170
W5AFX	40	169
W6RM	40	168
VE7HC	40	168
W7FZA	40	166
W6DUC	40	166
W6AMA	40	165
W6PB	40	165
W6PKO	40	164
W7DL	40	162
W6DZZ	40	161
WØNTA	40	161
W6IBD	40	161
W7BD	40	160
VE4RO	40	160
KH6IJ	40	160
LA7Y	40	159
G3AAM	40	156
W6BAM	40	156
W7BE	40	156
W6PQT	40	155
W6KUT	40	155
G3DO	40	154
W6BPD	40	154
W6SRU	40	153
W6FHE	40	152
W1AB	40	151
W6SC	40	150
OK1FF	40	150
W6LEE	40	150
W6PZ	40	149
ON4TA	40	148
W6ANN	40	148
W6AYZ	40	147
W6TI	40	147
W7DXZ	40	146
W9NRB	40	146
W6QD	40	145
W6LER	40	145
JA2KG (J2AHI)	40	145
W6UCX	40	144

C. W.-PHONE		
W6UZX	40	142
OKILM	40	141
W6AOA	40	139
W6CEM	40	137
ON4JW	40	136
W6RDR	40	134
G3AZ	40	134
W6YZU	40	129
W7GBW	40	129
W6MLY	40	129
G5BJ	40	126
PK6HA	40	124
W6NRQ	40	123
W6LN	40	118
W6BIL	40	89
W3BES	39	206
W2GWE	39	200
W3KT	39	195
W2PEO	39	198
W2HHF	39	193
W9IU	39	192
W3JNN	39	191
W2HZY	39	191
W3DPA	39	191
W8BKP	39	190
WØNUC	39	189
W8RDZ	39	188
W2NSZ	39	186
W9ANT	39	185
F8BS	39	183
W5ASG	39	180
G6ZO	39	180
W3JTC	39	180
PY1DH	39	177
W9RBI	39	174
W8NBK	39	174
W3DRD	39	174
W1ENE	39	173
W2CWE	39	173
W1NMP	39	172
W4INL	39	170
W2CYS	39	170
W8LEC	39	169
W1BIH	39	167
W6RBQ	39	166
W6GDJ	39	164
W6MVQ	39	164
VK2ACX	39	164
CE3AG	39	164
W4BRB	39	162
W4DKA	39	162
W9LM	39	161
I1KN	39	160
G5DQ	39	160
WØGKS	39	159
W6RM	39	159
W9LNM	39	157
W4GG	39	156
G8KP	39	156
W2RDK	39	154
G6QB	39	152
W8SDR	39	152
G5YV	39	151
G2AJ	39	151
W2COK	39	150
W6EPZ	39	149
G2WW	39	147
D2KW	39	147
W2MEL	39	145
W6RW	39	145
W6EAK	39	143
W6OEG	39	143
W6JZP	39	142
W9DUY	39	141
G6BQ	39	140
G3FJ	39	139
W9VND	39	136
W6RLN	39	135
W6LRU	39	134
G5RV	39	132
G2VD	39	132

C. W.-PHONE		
W2GUR	39	132
G2FSR	39	130
W6DLY	39	129
OK1AW	39	128
W8VLK	39	125
VR5PL	39	124
G5VU	39	124
G3AAK	39	122
G5WM	39	120
G8RL	39	120
WØOUH	39	119
G6BS	39	117
W6NRZ	39	117
W7ETK	39	116
G3QD	39	116
G3TK	39	114
W6RLQ	39	113
W6LGD	39	111
W6MUF	39	108
W6ID	39	107
W7GXA	39	106
W6MI	39	106
KH6PY	39	104
KG6AL	39	104
W6LEV	39	103
W7ENW	39	101
W6WJX	39	101
W6AX	39	93
G6PJ	39	76
W1JYH	38	178
VE3QD	38	172
W3EPV	38	172
W3IYE	38	161
KP4KD	38	159
W1ZL	38	154
W8FJN	38	153
W3DKT	38	151
W4OM	38	149
W2PUD	38	149
W8CVU	38	142
W3KDP	38	141
SM5WI	38	137
TF3EA	38	134
W1KFV	38	134
W6SYG	38	133
W4FPK	38	132
W4VE	38	132
G8IL	38	131
W3ZN	38	130
G5CI	38	130
W2PQJ	38	130
W9FKH	38	127
G6LX	38	126
W9MZP	38	126
W9TB	38	124
GW3AX	38	123
WØSQO	38	123
W6IFW	38	122
W8WWU	38	121
WØEYR	38	120
GW4CX	38	120
W8KPL	38	117
W9YNB	38	117
W5CPI	38	113
OK1CX	38	110
G3ZI	38	107
G8IP	38	105
W9FKC	38	104
C1CH	38	84
G3BI	38	75
CM2SW	37	161
W3JKO	37	154
W3OCU	37	151
W2TJF	37	144
W2EMW	37	141
W3LVJ	37	138
GM2UU	37	133
W4ML	37	131
W2CNT	37	126
G4CP	37	117
VE1EA	37	116

C. W.-PHONE		
WØAZT	37	112
W2BJ	37	111
W6CTL	37	111
G4AR	37	108
W8HSW	37	104
W2BLS	37	100
G5MR	37	100
G3AAE	37	99
W2SGK	37	95
W7BTH	37	95
WØDU	36	138
W2RGV	36	137
W3LVJ	36	131
W3WU	36	127
OA4AK	36	128
W4DIA	36	120
SV1RX	36	119
MD5AK	36	118
G2CNN	36	114
G2AKQ	36	112
W3AYS	36	109
W2BF	36	108
VE1PQ	36	105
W4BK	36	101
G2AO	36	100
GM3CSM	36	98
W5CD	36	97
G6WX	36	95
W3FYS	36	93
W7PK	36	91
WØRBA	36	91
W7EYS	36	90
GM2AAT	36	75
W4DHZ	35	133
W4HA	35	128
W4LVV	35	125
W8ZMC	35	122
VE3AAZ	35	120
W2GVZ	35	120
W2GVC	35	118
W9WCE	35	117
W9CKP	35	116
W8AVB	35	113
VE3ACS	35	111
W9CKP	35	109
W6ZZ	35	104
G8VR	35	100
W2WC	35	99
W2HAZ	35	93
G2AVP	35	89
W8JM	35	86
D4ANM	35	80
G8RC	35	78
G3BDQ	35	74
W7FNK	35	72
W9FNR	34	109
G8QX	34	99
G8KU	34	96
VK4RC	34	91
W9LI	34	90
W8JM	34	89
G6XX	34	89
WØFWW	34	89
W2JA	34	84
W8PCS	34	80
W6WUD	34	68
J4AAK	34	66
W4QN	33	104
WØGBJ	33	79
G2LC	33	85
W8QUS	33	85
WØFET	33	81
G8VG	33	78
G3BFC	33	77
VE3AGC	32	108
W2OEC	32	105
W1BFB	32	94
HA1KK	32	78
WØFET	32	71

PHONE ONLY		
W6VFR	39	146
W6DI	38	163
W4CYU	38	163
W8BKP	38	145
W7HTB	38	132
W1JCX	37	158
W2BXA	37	148
W8BF	37	145
W1HKK	37	136
G3DO	37	131
G6LX	37	124
G2AJ	37	121
C1CH	37	83
W1NWO	36	145
W8REU	36	139
W1MCW	36	138
W2DYR	36	135
W9RBI	36	133
W6PXH	36	129
W1FJN	36	128
G2PL	36	128
GM2UU	36	127
G6BW	36	127
W3JNN	36	126
W9HB	36	126
W6WNH	36	123
W4INL	36	122
W4ESP	36	117
F8VC	36	114
VE7ZM	36	110
G5YV	36	106
G6WX	36	105
W3DHM	36	96
W6SA	36	92
F8DC	36	87
XE1AC	35	142
G3FU	35	115
W6CHV	35	113
W6PCK	35	109
W4OM	35	106
W9CKP	35	106
G8QX	35	100
W4HA	34	118
W2RGV	34	111
W8QBF	34	89
W5ASG	33	118
W2ZW	33	115
W8BIQ	34	109
W9BZB	33	108
W8ZMC	34	107
W2NXZ	34	65
W5LWV	33	100
W2PQJ	33	100
WØHX	33	95
VE3ZM	33	81
VE3BNQ	33	79
W2DRH	33	60
W9RNX	32	108
W9WCE	32	94
W2HY	32	85
W2SVK	32	84
W9GZK	32	72
W6UZX	31	85
W4LZM	31	85
W6AM	31	82
OA4AK	30	84
W9MIR	30	82
W2SVK	30	74
W7JUO	30	70
WØJED	30	61
W6ZZ	28	60
W8SXU	28	59
W2BF	27	52

VHF UHF

Conducted by VINCE DAWSON, JR., WØZJB*

As we write this column at the end of 1948, it is a good time to reflect on the past year. In terms of actual numbers, the fellows on 6 meters were very hard pressed in the face of the demon TVI. As the year progressed the weight of activity shifted from the East Coast to the West Coast. The TVI problem has not yet been solved, but much to our discredit, non-operation and giving up the band is not the answer either. On 2 meters there was a definite increase in nation-wide activity. Operating practices improved as did equipment, and 1948 should be recognized in our history as a good year for 144 mc. Still greater strides were made in the ¾-meter region, where many fellows found their old love of constant rebuilding and experimentation. Yes, 1948 wasn't bad at all.

Via W8LBH we learn that the boys within 50 miles of Akron, Ohio, have organized a 6-meter net they are calling the "potlickers." Meetings are on Mondays and Fridays at 1900 EST. W8CEQ, Kent, Ohio, is net control and W8LHV is alternate. On various roll calls as many as 10 stations have reported in. After a few transmissions and announcements they split up or leave the air. However, even these short get-togethers are serving as focal points for the fellows with new receivers, etc. Good work, gang, let's see more nets like these!

W9RQM complains that we shouldn't expect much 6-meter activity from him since he also chases DX (W6QD kind), relays traffic and acts as SCM. But then he idly mentions about 250 contacts last summer in 38 states and most of Canada. Guess some fellows are never satisfied. Anyhow, the rig ends in an 829B and feeds, of all things, the 20-meter 8JK. This throws out four nice lobes in assorted directions and easily solved the antenna problem. Seems like it did at that—I wonder?

W8QYD is happy with his 100-foot high beam, especially since it consistently reaches W9ZHL at 170 miles with no trouble at all . . . W9ALU passes along the information that our ex-W9CBJ, currently W4NHE, is soon to become a W3. George has just moved into Maryland . . . Bud Beck, W5FSC has been off the air quite a bit of late due to his father's illness and subsequent death on December 4th. You know you have the sympathy of the v-h-f gang, Bud.

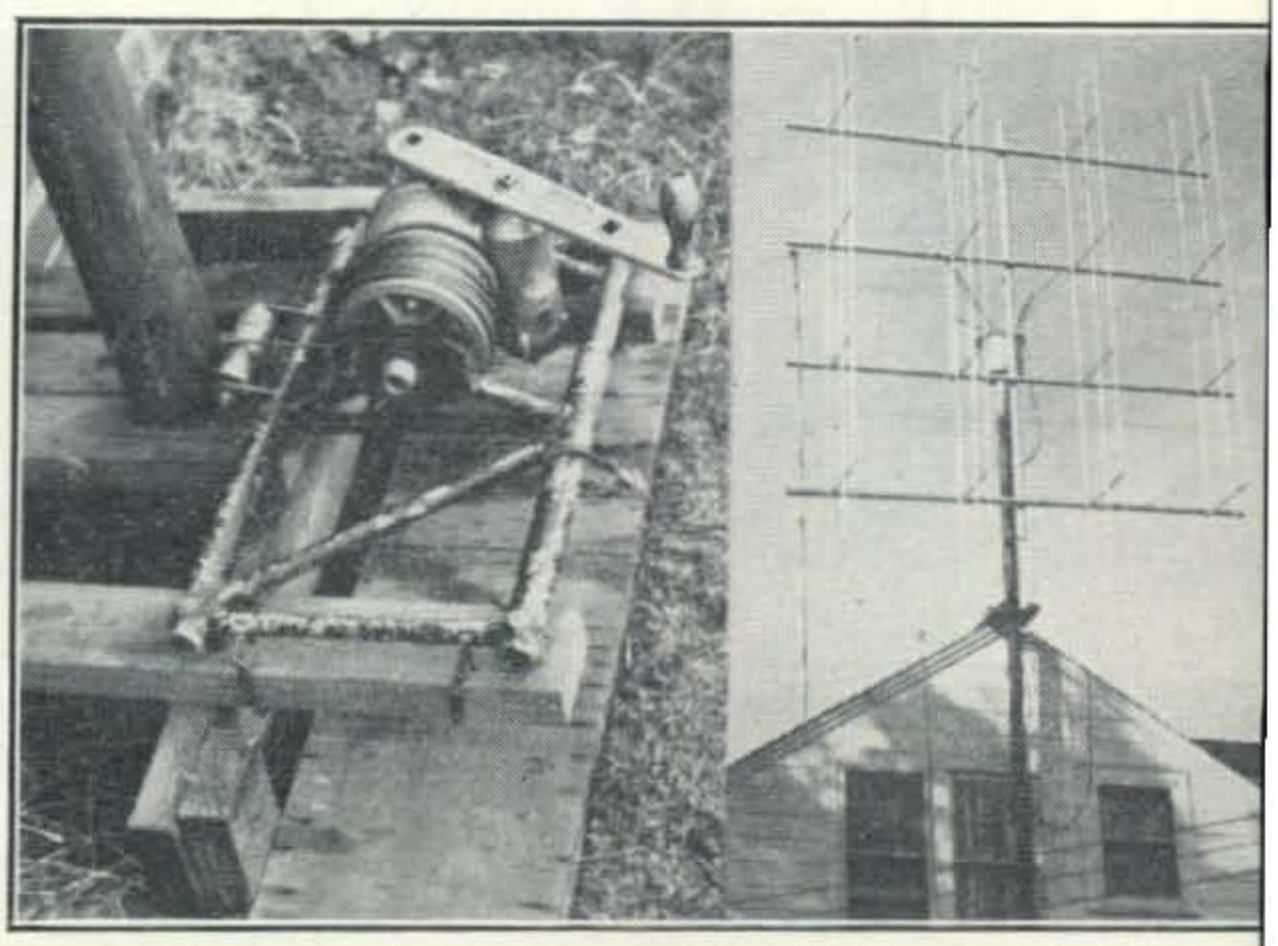
WØJHS finally broke down enough to say that 6 meters has been nearly deserted (except for WØQIN) up Twin-City way. Most of the boys have gone down to 2 meters. The famed bi-square used by WØJHS blew down recently, but the weather is too cold to do much about putting it up again . . . Don't be fooled if during one the next openings W3CIR signs "/7" for it is really so. Ed has gone out to Bremerton, Wash., and will haunt 6 meters from there until probably mid-summer.

Up to this writing around Xmas time, the 6-meter band had opened up for sporadic-E on several different occasions. On the 12th of December, at least two new stations were reported going strong. These were W4CPZ, Gaffney, S.C.. and W5MJC, Texarkana, Ark. The W1 to W3 area boys were especially glad to see W4CPZ as that South Carolina contact is still pretty rare. We hear a rumor that TV set owners were annoyed that day by a peculiar sparking interference. As it probably will be blamed on the amateurs anyhow, it was caused by the gnashing of teeth of the boys sweating out their turns.

W5VY drops us a note to say that he and W4LNG also worked HC2OT on November 21. HC2OT heard W1CLS and it so turns out that Doc had also heard a weak station with a southern drawl (ex-W5DNN) while he had his beam aimed west for the W7 area. Perhaps we had better train these meandering boys from the States to speak the local tongue, or an accent thereof. You know the old cliche about the Romans and their doings. If that happened to me, I'd be mad!

Speaking of HC2OT, B. J., XE1KE, says that the signal from Ecuador is very strong and has none of that fading and fluttering he associates with the LU stations. Also unlike the Argentine boys, HC2OT is likely to be heard as well in the early morning as in the early evening. On Nov. 22nd, HC2OT was overheard working a new one, PY7VA. Also on the 22nd, HC2OT was worked by XE1GE at which time the HC attempted to hook Jeff up with PZ1A. Gad! This sounds like

The experimenter's delight in a 144-mc beam antenna. Used by W5DFU, Tulsa, Okla., this 48-element beam can be rotated for either horizontal or vertical polarization. On the left is the surplus bomb bay winch which is used to raise and lower the beam in height above the ground. The excess mast drops into a hole in the ground.



Send all contributions to Vince Dawson, Box 837, Gashland, Mo.

the wrong column. Jeff says his last LU contact was on the 9th of October with LU9MA, an old standby.

From across the Atlantic, a peek into the MUF log of G5BY shows that the highest value was 48.6 mc, although the harmonic of WEK2 on 48 mc was very consistent between October 17 and November 30. Your scribe, in cross checking this log with the north-south openings, confirmed his impressions that neither path can be predicted from the conditions evident on the other. In fact, during the north-south openings the MUF across the continent and across the Atlantic was generally far below par. Possibly there is some ionosphere storm connection, but if so, it is certainly going to be hard to find. Or does someone have the answer?

ZK1AS, Cook Islands, writes that ZK1AX is operating an ionospheric recorder down there and the group of ZK stations is on the lookout for possible openings whether sporadic-E or F2. On Nov. 1st, the sporadic-E was registering an MUF of over 70 mc, but no signals in the 50-54 spectrum were heard . . . Going up to the colder climate, VE5NC, Moose Jaw, says that the F2 reception of the FM stations was not comparable to last year. This past season they were mostly garbled, but the year before they seem to have been very clear and loud. Highest MUF values were noted on Dec. 3, 8, 9 and 16, but no 6-meter signals at any time. On Nov. 24th a third harmonic of an XE1 was heard around 43 mc.

Yearly Cycle of 6-meter Openings

It is a pretty rough battle, but by carefully sifting the immense amount of preliminary data that went into the formation of the sporadic-E project we have been able to gather some interesting pointers. One thing that attracted our attention was a year-by-year comparison of the monthly number of possible sporadic-E openings. Ferrell has shown in the Propagation Report No. 4 that the openings will fit the frequency distribution curves obtained from vertical incidence records at Washington, D.C., when only criticals equal to or greater than 8.0 mc were tabulated. That is, when the vertical incidence critical is greater than 8.0 mc, the MUF is generally high enough (because of the patchy sporadic-E structure) to support 50-mc transmissions.

The result of this investigation can be seen in a bar chart shown at the bottom of this page. It is easily noted at first glance that there were about three times as many openings in the summer of 1939 as in the summer of 1948. Much the same applies to 1940 (ah, ah—we always thought *those* were the days!) and even during the winter of 1940-41 there were still more openings than this past summer season. (Isn't it disgusting?)

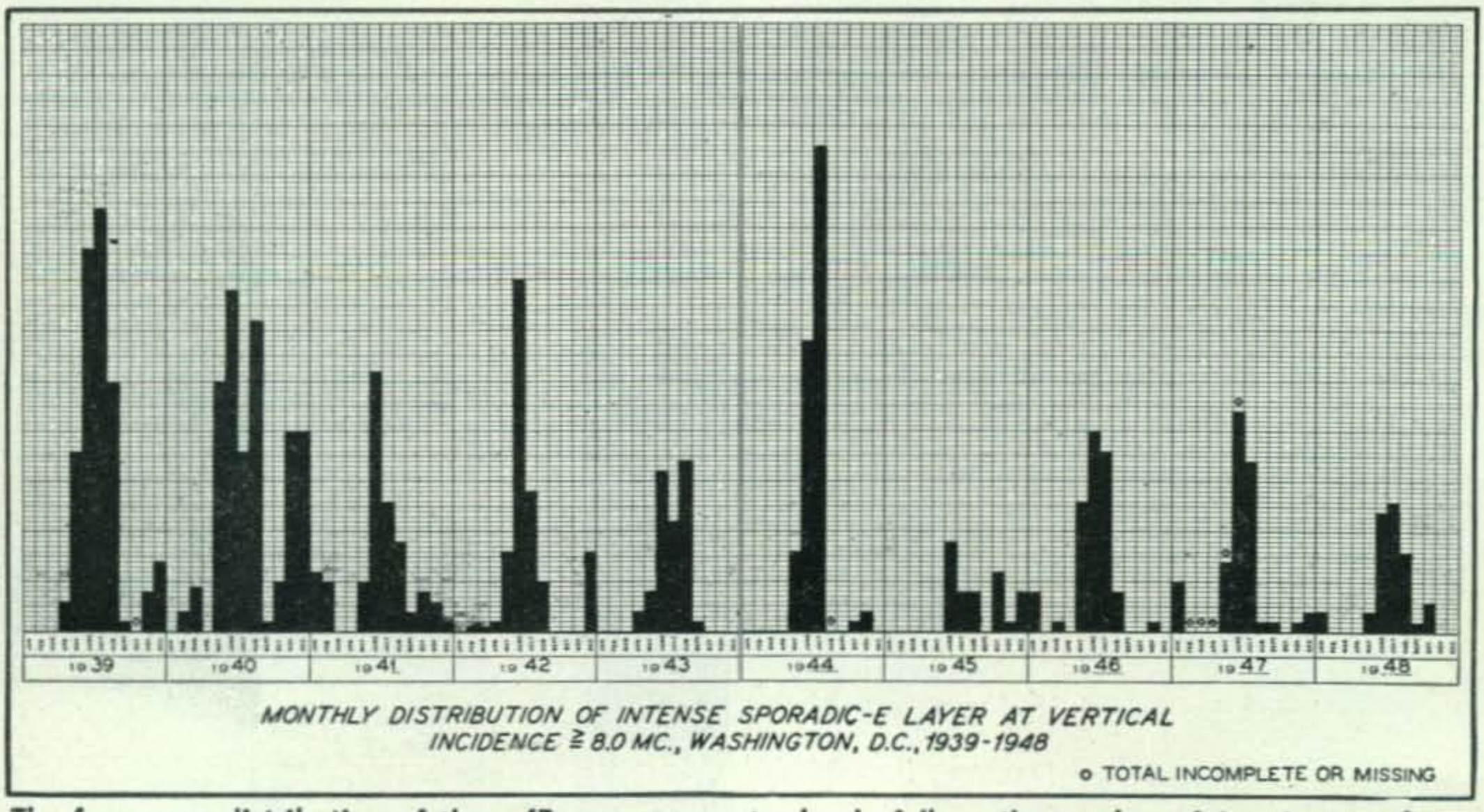
However, there seems to have been a decline from 1939 to 1941 and with the exception of June, 1942 (we were off, remember?), this cycle continued well into 1943. Finally, there were probably no openings in the winter of 1943-44. But the summer of 1944! That would have been the year to remember. Records show that some of the openings in June and July lasted up to 20 straight and uninterrupted hours. In sharp contrast, 1945 was a very poor year, although having a fair share of winter openings. 1946 showed a definite improvement, as did 1947, although here the records are incomplete.

At the end of 1947, indications were that 1948 would be a still better year based solely on the prima facie observation that more openings occur during the declining phase of the sunspot cycle. However, this did not bear out and as we know 1948 did not live up to expectations by a long shot. Now of course, it is practically anyone's guess what is in store for us in 1949. Unfortunately, data are insufficient to judge what happened before 1939, but it is interesting to note that the greatest number of openings in 1939 came exactly two years after the sunspot maximum of 1937. The summer of 1949 will be exactly two years after the maximum of 1947. Are there any odds?

6-meter Propogation Log

Nov. 23—XE1KE heard the harmonic of HCJB on 49.8 mc from 1805 to 2118 EST. W7HEA

(*Continued on page 68*)



MONTHLY DISTRIBUTION OF INTENSE SPORADIC-E LAYER AT VERTICAL INCIDENCE ≧ 8.0 MC., WASHINGTON, D.C., 1939-1948

o TOTAL INCOMPLETE OR MISSING

The frequency distribution of these fEs measurements closely follows the number of 6-meter openings.

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73, BIL HARRISON, W2AVA

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COR-LAB omnidirectional ground plane antenna for two meters. Supplied complete with instructions! Regular net price **$8.50**.....Winter Special **$7.35**

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Conducted by LOUISA DRESSER, W2OOH*

HOORAY for the FB publicity some of the YLs have been getting recently! The Los Angeles *Times* on Dec. 15th ran a long article on the YL Radio Club of L. A., with photos of W6CBA, Violet; W6UHA, Maxine, and W6NAZ, Lenore. The article described the YLRL in particular and the blessings of ham radio in general, and we hear it was a good and fairly accurate story. . . . Jackie, W9AYX, who held many skeds and arranged personal QSOs for the Gatti-Hallicrafters Expedition, was recently honored at a banquet in Chicago, with resulting FB newspaper write-ups . . . Clara, W2RUF, on offering via her local paper to transmit Xmas radio greetings to servicemen overseas, was subject of a feature story with photo. Clara, who made BPL last month, was so swamped with Xmas messages that she says she's bound to make BPL again this month! . . . Also on the Christmas theme, G5CP recently made a recording for BBC of messages from amateurs and descriptions of Xmas celebrations in various parts of the world on which our country was represented by Eunice, W1BEQ, while Ethel, XYL of VE3TW, represented Canada.

YL Club News

Latest news of the YL clubs includes election of officers in the New York City Club. For the 1949 season the president will be W2OWL, Ruth Siegelman; vice-president, W2TBU, Kit Zionson; secretary, W2RAQ, Catherine McFadden, and treasurer, W2PUY, Selma Tracer.

Out in the Golden State the San Diego YL Club held a gala Christmas party and dinner on Dec. 18th. The dinner was prepared by the YLs and their OMs were invited, with presents for all.

In Los Angeles, for their December meeting the gals had a luncheon and Christmas party at the home of Evelyn, W6NZP, in Long Beach, and along with exchanging Xmas gifts, the gals decided to "sponsor" some overseas YLs in the YLRL. The January meeting will be held at Maxine's, W6UHA, who will have as her guest the XYL of VE3TW, Ethel Williamson, who is studying for her own ticket. Maxine says Cyril and Ethel are a most interesting couple, Cyril being the operator of a lighthouse at St. Catherines, Ontario—just the spot for ham radio!

Maxine, by the way, is still having fun chasing DX, especially on 20 c.w., and has worked 140 countries and 40 zones (38 confirmed). She says her most interesting contacts recently have been with the expeditions located near the South Pole—VP8AM, VP8AJ, VP8AK, etc., and adds: "VP-8AM in a recent QSO requested my best recipe for sponge cake. I thought he was joking, but apparently he was serious so we passed along a recipe for an 8-egg sponge, only to learn that Terry was going to try it out with penguin eggs!"

YL of the Month

Theme of our YL of the Month writeup this time is international romance—via ham radio. The YL is Lillian Kelly, now W8ZGT of Ypsilanti, Michigan, and her story is one in which we shall begin way back at 200 meters and work down!

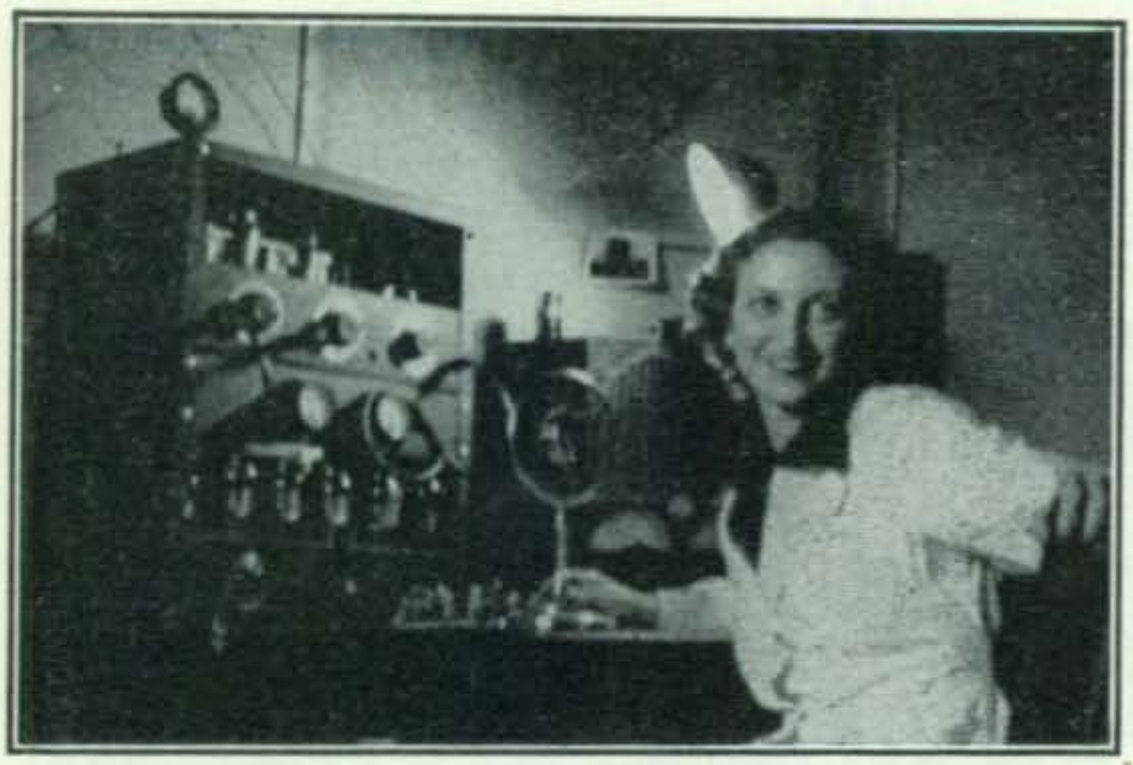
"The 200-meter part really belongs to Dad," explains Lillian. "He had his first QSO in 1908, working from Riverside Drive in New York City to the Brooklyn Navy Yard—real DX in those days. I mention this just so you'll realize I was destined to become a ham even before I was born! That event occurred in 1914 in Jamaica, B.W.I., and I lived most of my life in the West Indies, Central or South America. It wasn't until about 1934 that I became actively interested in radio when Dad got his first phone transmitter."

Lillian says she probably never would have become a real ham if her Dad had not refused to allow her to operate phone until she learned code and could operate c.w. And whether it was because the incentive was great, or because her Dad was a good teacher, she learned code in one weekend and had mastered 13 w.p.m. within a week. His call was VP5PA at that time.

In 1934 they moved to Haiti and took the rig along. "There wasn't much to occupy my time in Haiti," Lillian adds, "so HH5PA became quite well known. We worked 20-meter phone most of the time, but I had long since discovered the fun of c.w. so we also operated 20 and 40 c.w. I used to keep regular skeds with Australia, New Zealand and many other parts of the world on c.w., and was the only station outside the U. S. which was a member of the 20-meter 'sewing circle,' or 'breakfast club,' which consisted of 1KKP, 1FH, 1CND, 1KCK, 2JKQ (now 2KG), the late 2KAP, 4DYP (now 4GL), the late 5BDB (1BDB), 8ZN, the late 9WZW, and many more. I used to QSO several of these stations at other times

(Continued on page 53)

**Assistant Editor, CQ. Send all contributions c/o CQ, 342 Madison Ave., New York 17, N. Y.*



Lillian Kelly, W8ZGT, when operating HH5PA.

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Hallicrafters S47	229.50
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PARTS AND PRODUCTS REVIEW

Roto-Ranger Volt-Ohm- Milliammeter

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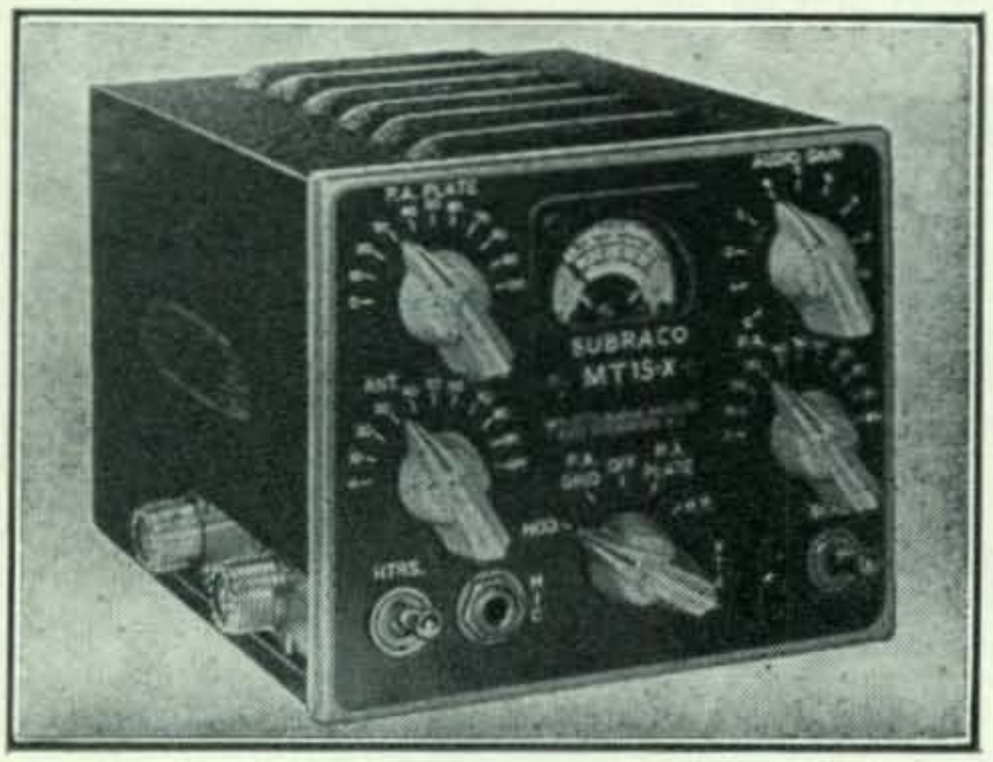
Mobile Transmitter

Suburban Radio Company, East Rutherford, N. J., is manufacturing an ultra compact mobile transmitter, the MT-15X. Small enough to mount



in the average glove compartment or under dash the transmitter measures 5¼" x 4¼" x 6½" and weighs 6 pounds. All controls including crystal jack are on the front panel. The MT-15X is designed to operate at approximately 30 watts input AM phone from any power supply delivering 300 to 400 volts at 160 ma. Push-to-talk, antenna changeover, and illuminated meter, are but some of its features. Further details can be obtained directly from the manufacturer.

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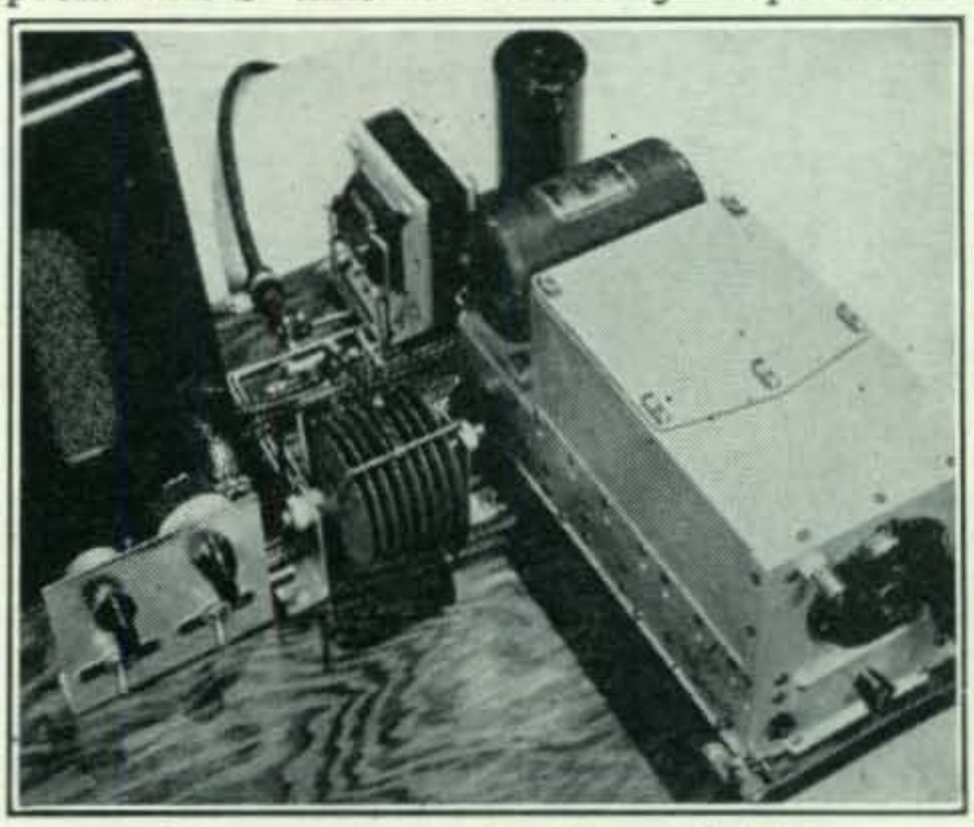

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Radio Products Sales, Inc., 1501 South Hill St., Los Angeles 15, Calif., is exclusive Pacific Coast Distributor for the RPS Power Conversion Units. A free copy of "How to Convert a.c. to d.c." will be sent upon written request to the above.

Air Wound Ham Inductors

Now available on request is a new E. F. Johnson Co. catalog titled "Air Wound Ham Inductors." This catalog introduces a new and comprehensive line of ham inductors and plug-in swinging link assemblies.

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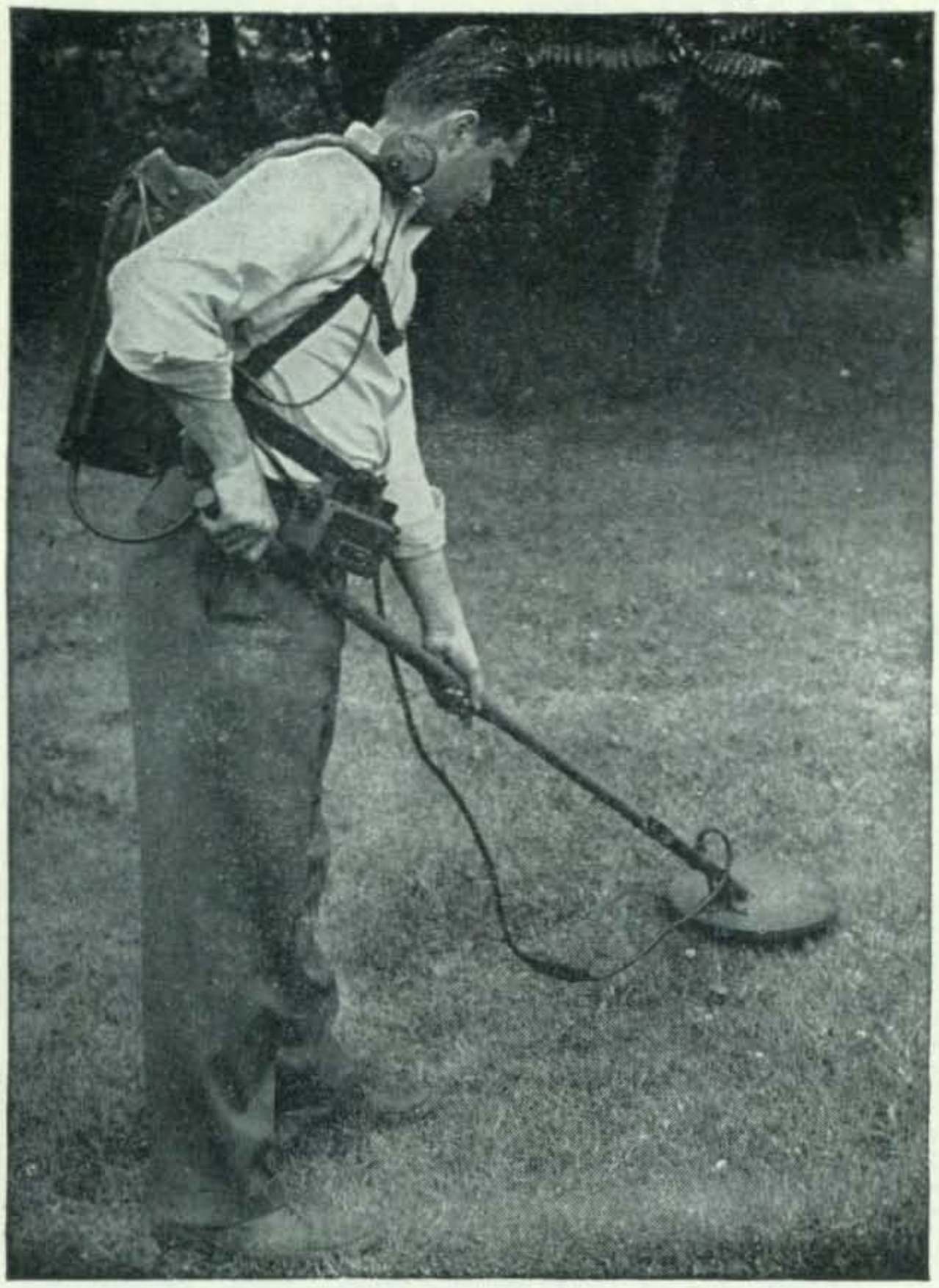


Below is a description of one of the finest metal detecting Mine Detectors ever built.

Operates in the manner of aural and visual method.

If you are looking for metal buried in logs, pipes in the ground, ore bearing rocks, underground cables, metallic fragments in scrap materials, metallic money buried or hidden in undetermined places this Mine Detector will probably surpass anything that was ever built. The United States Forestry Service has recommended procedure for using this detector to find concealed metal in tree logs and other timber products. Our government is reported to have paid several times the amount of our prices. They originally were sold by War Assets to jobbers for $166.00.

Unit consists of a balance-inductance bridge, a two tube amplifier and a 1000 cycle oscilator. The presence of metal disturbs the bridge balance resulting in a volume change of the 1000 cycle tone. Tubes used are low battery drain types such as 1G6 and 1M5. The circuit may be modified for control of warning signals, stopping of machinery etc., when metal is detected.

Operates from two flashlight batteries and 103 v (B). However a power supply operating from 115 v may be used.

This unit is brand new and comes complete with spare tubes, spare resonator and instruction manual—in wooden chest 8-1/4 inches x 28-1/4 inches x 6 inches. Weight in operation is 15 pounds. Packed in original overseas container.

We do not know exactly what the deepest possible penetration would amount to when this detector is used but we have had customers who have bought the detectors with the expectations that the detector would locate metallic objects buried several feet under the ground or under water and we have had absolutely no complaints whatsoever regarding the detector not living up to the customers expectations.

Price $79.50

Shipping Weight 125 Pounds

We can not over emphasize our belief that if an Army surplus mine detector could solve your problems in detecting metal this detector should fill the bill.

NOTE: Batteries are not furnished, we can supply for $4.50 extra.

ESSE Radio Co

130 W. New York St.

Indianapolis 4, Ind.

Unless Otherwise Stated, All of This Equipment Is Sold As Used
CASH REQUIRED WITH ALL ORDERS
Orders Shipped F.O.B. Collect

ESSE RADIO CO.

Esse's Special Offer

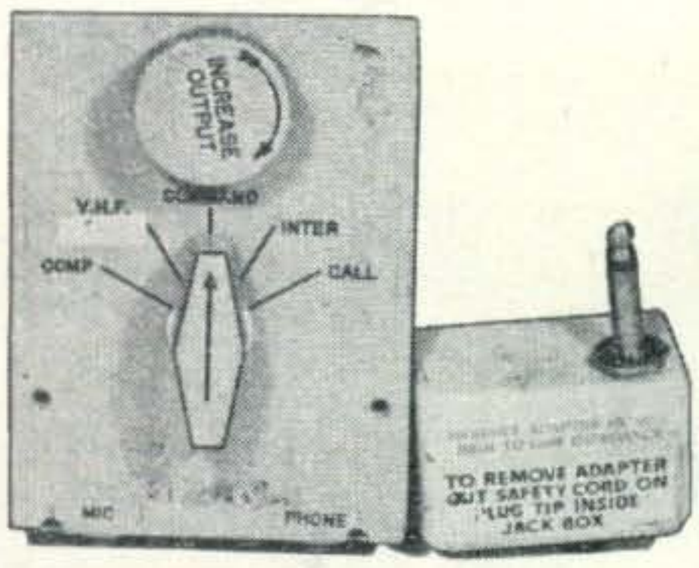
INDIANAPOLIS, INDIANA

SURPLUS RADIO CONVERSION MANUAL

Edited and printed by Techno-Graphic Publications. It contains 115 pages, size is 7" x 10½", printed on good paper stock, covers well bound. A partial list of contents includes complete information on the conversion of the following popular war surplus items: BC-221 Frequency meter, BC342, BC312, BC348, BC946B, SCR274N, SCR522, BC1068A receivers, BC412 cathode ray oscilloscope, BC645 transceiver for citizen's band, SCR274N transmitters, SCR522 transmitter, TBY transceiver, various dynamotors, and a cross-index on tube numbers, frequency allocation chart, electronic surplus index with listing of over 135 items and descriptions or functions or frequencies or tube line-ups etc. of same. Circuit diagrams of original items, and of converted jobs, together with values of various component parts abound in the manual. The text is clear, concise and easy to read and follow. The price per copy is.....**$1.25**

ULTRA-VIOLET FLUORESCENT COCKPIT LIGHT ASSEMBLY

Air Corps type C-5, 28 V. DC operated. Black plastic case about 1½" dia. x 3" long. Has adjustable mounting flange, 3 foot two conductor shielded cord and plug. Includes bulb. Brand new.....**$1.00**

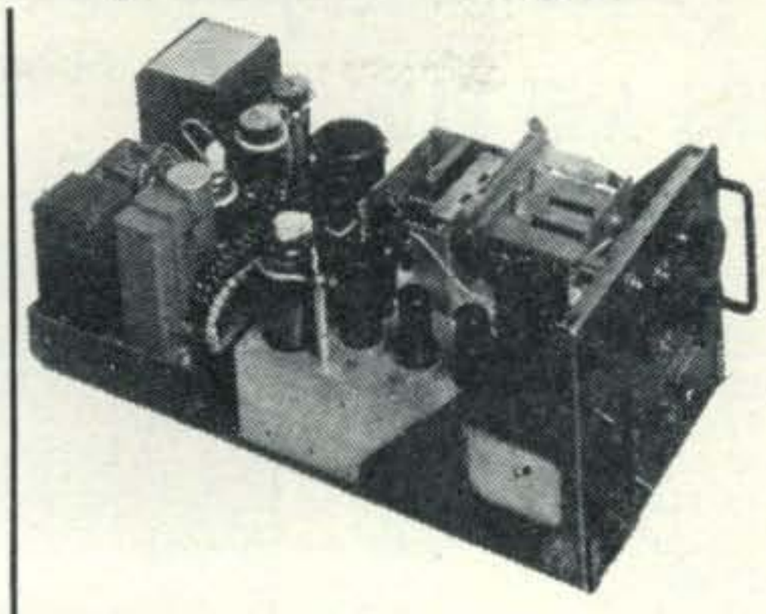


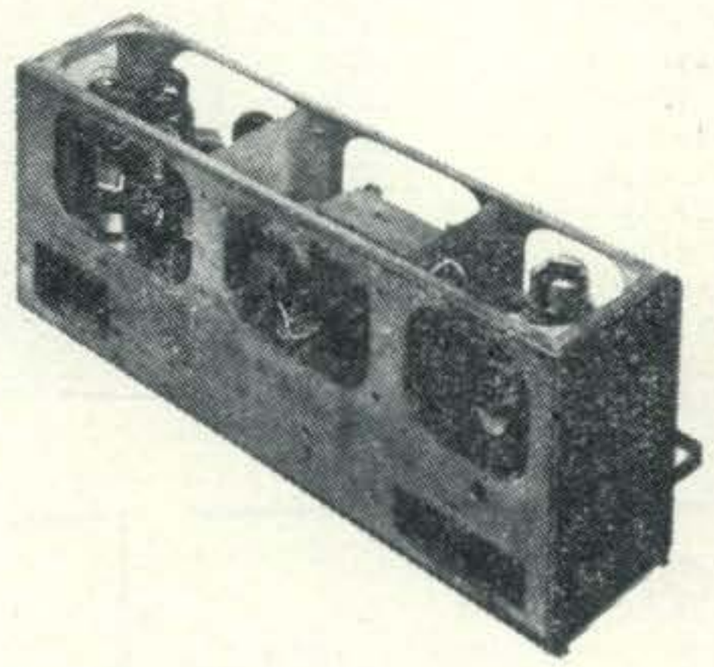
JACK BOX BC-1366

Contains 2-pole 5-position switch, rheostat, two phone jacks, etc. In aluminum case 3½" x 4⅜" x 2¼". Complete with headphone set adapter to match high to low impedance. Price **$1.25**

CAPACITOR: 2000 Mfd.

10% + infinity. Working voltage 50 V. DC. Test voltage 50 V. DC. Electrolytic. Bakelite case, hermetically sealed. Max. dimnsions 2-1/16" dia. x 4⅜". Soldering lug type terminals. Price.....**$1.25**



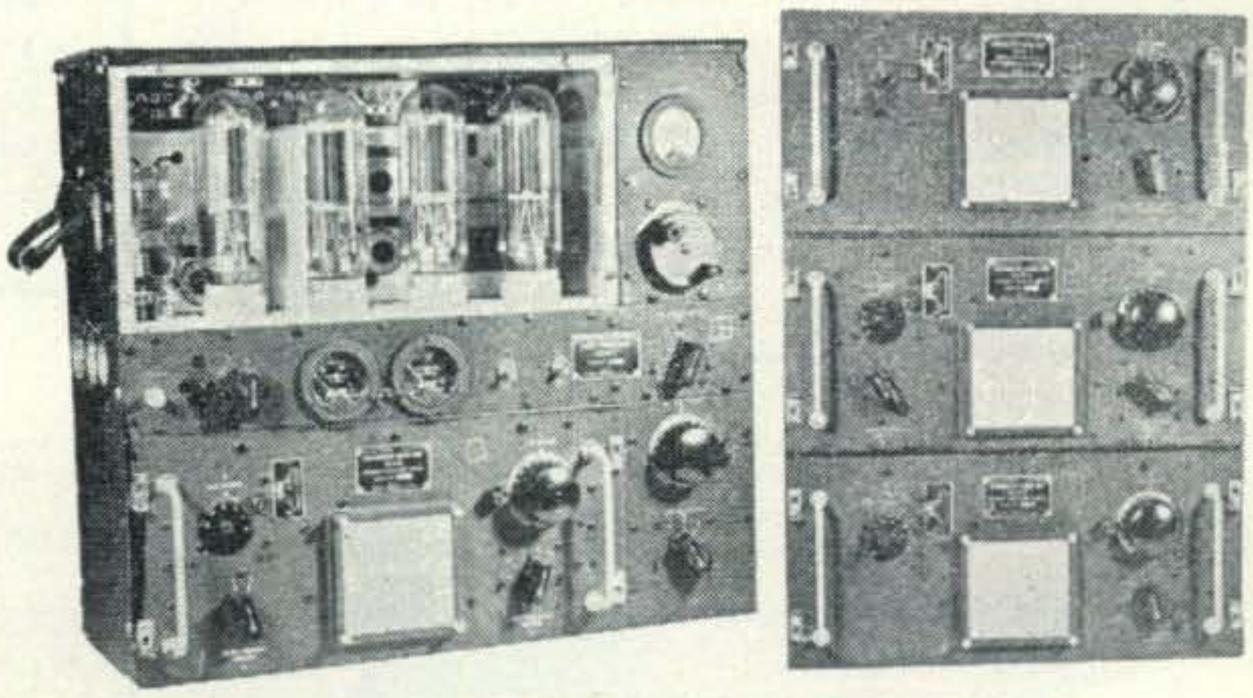


T-26 APT-2 RADAR TRANSMITTER

Contains tunable VHF circuit using 2—JAN CTL 703A's or 368AS tubes. Other tubes are: 2—5R4GY's, 1—2X2, 1—807, 1—6AG7, 2—6AC7's and 1—931A. Other parts such as 24 V. DC motor and blower, HV. condensers and transformers, terminal strips and Amphenol connectors, knobs, fuse holders, etc. make this unit invaluable for parts alone. Weight approx. 45 lbs. Size 21" L x 10½" W x 7¾" H, in metal case. **$9.75**

PP-2/APQ-5 POWER UNIT

400 cycle, 115 V. Contains 10 tubes as follows: 2—5U4G's, 1—6A5GT, 4—6Y6G's, 1—6SL7GT, 2—VR150-30 and numerous condensers, transformers and resistors. Weight 17 lbs. Size 21" L x 5¼" W x 7¾" H. Price....**$5.75**



BC-375 GE MOPA TRANSMITTER

The most famous of all surplus transmitters. Was used by the Army bombers and ground stations during the War. Frequency range is covered by means of plug-in tuning units as shown below. Each tuning unit has its own oscillator and power amplifier coils and condensers, and antenna tuning circuits all designed to operate at top efficiency within its particular frequency range. Transmitter and accessories are finished in black crackle, and the milliammeter, voltmeter, and RF ammeter are mounted on the front panel. **Frequency Range:** 200-500 Kc. and 1500-12,500 Kc. (Will operate on 10 and 20 meter band with slight modification). **Oscillator:** self-excited, thermo-compensated, and hand calibrated. **Power Amplifier:** neutralized class "C" stage, using 211 tube, and equipped with antenna coupling circuit which matches practically any length antenna. **Modulator:** Class "B"—uses two 211 tubes. **Power Supply:** Dynamotor which furnishes 1000 V. at 350 Ma. **Conversion** instructions and diagram for 110 V. AC furnished upon request for.....**$1.00.**

PRICES: As follows—

Transmitter only	**$19.50**
Tuning units TU-6B, TU-7B, TU-8B, TU-9B, TU-10B, TU-26B, choice	**2.50**
Dynamotor PE-73C	**4.95**
Antenna tuning unit (BC-306A)	**4.95**

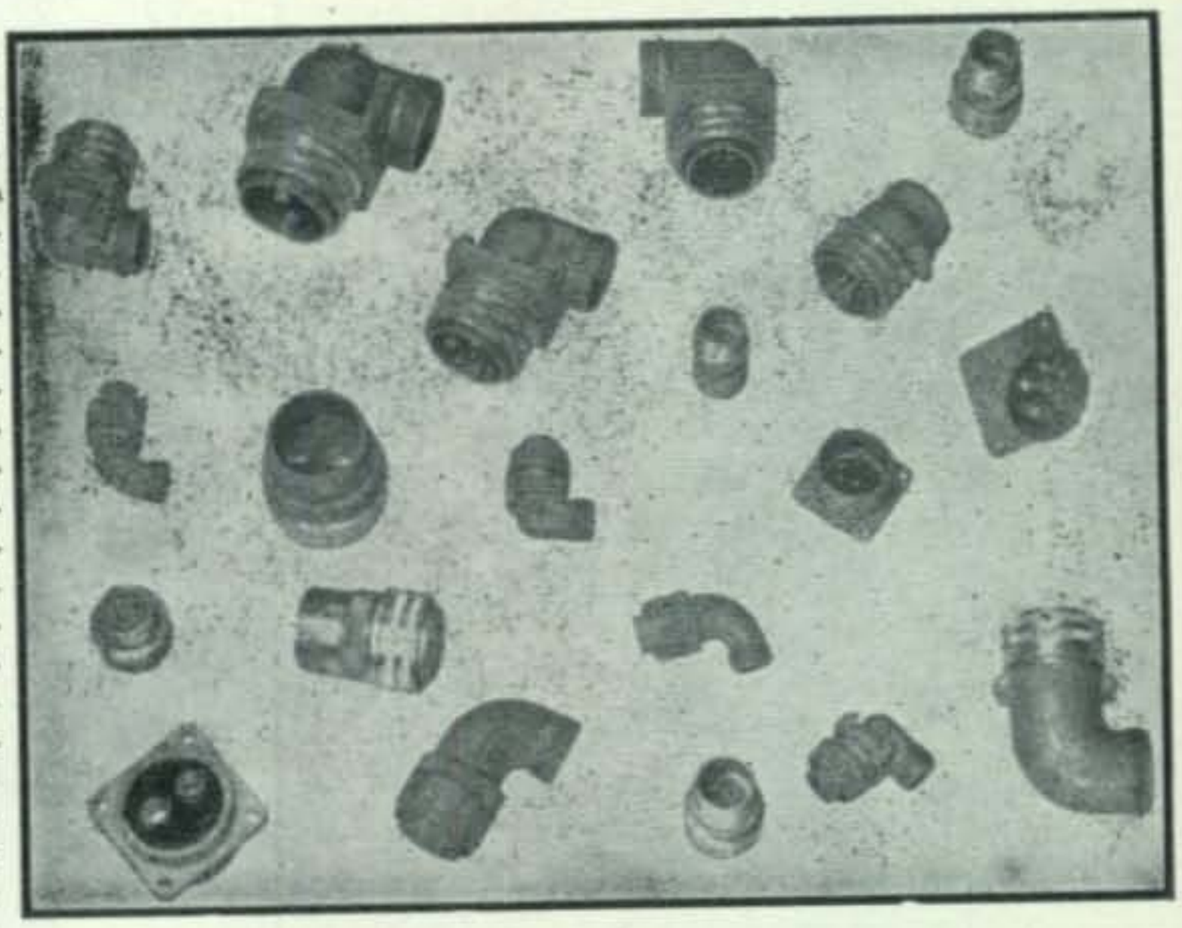
ESSE RADIO CO.

Esse's Special Offer

INDIANAPOLIS, INDIANA

CABLE CONNECTORS AND PLUGS

Manufacturer	Type	Price
Amphenol	AN3101-16-10P	.50 ea.
Amphenol	AN3101-18-18S	.70 ea.
Amphenol	AN3101-22-5S	.60 ea.
Amphenol	AN3102-22-15P	.60 ea.
Amphenol	AN3102-28-10P	.60 ea.
Amphenol	AN3102-32-5P	.60 ea.
Amphenol	AN3106-18-11S	.65 ea.
Amphenol	AN3106-18-18P	.65 ea.
Amphenol	AN3106-24-6S	.80 ea.
Amphenol	AN3106-24-7P	.90 ea.
Amphenol	AN3106-32-5S	.90 ea.
Harwood	AN3108-14S-*	.65 ea.
Aero	AN3108-14S-2S	.65 ea.
Cannon	AN3108-14S-2S	.65 ea.
Amphenol	AN3108-14S-2S	.65 ea.
Amphenol	AN3108-18-12P	.80 ea.
Amphenol	AN3108-22-5S	.80 ea.
Cannon	AN3108-22-5S	.80 ea.
Amphenol	AN3108-24-6P	.90 ea.
Amphenol	AN3108-24-16S	.80 ea.
Cannon	AN3108-24-16S	.80 ea.
Amphenol	AN3108-32-5P	.90 ea.
Amphenol	AN3108-28-10P	.90 ea.



TRANSFORMER

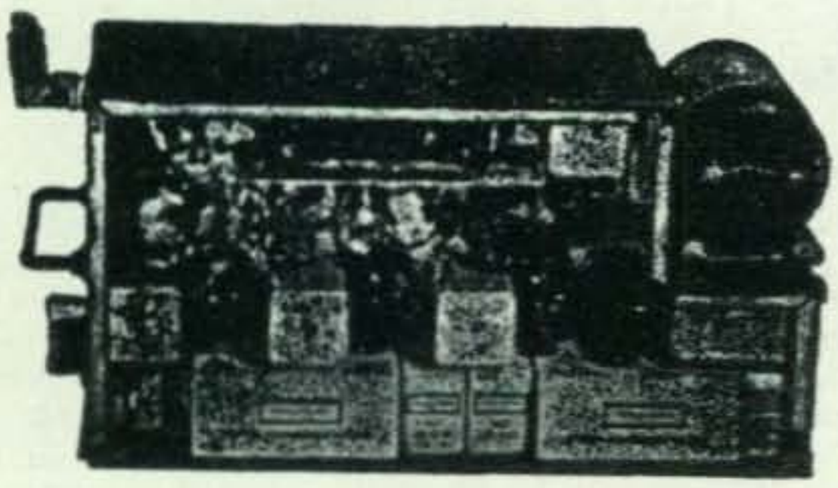
Transformer, 110 volts 60 cycle input; output being two secondaries—each giving 14 volts at 11 amperes, which can be used alone, in parallel, or in series for various voltage and current combinations. Size about 3½" x 3½" x 4" high. Ideal for operation of propeller pitch motors used for beam antenna rotation. Shipping weight 7 lbs. Manufactured for our company.

Brand new **$5.95**

PAPER CONDENSERS

.0475 Mfd. 200 V. Aerovox	$ .10 ea.
.0035 Mfd. 1000 V. Aerovox	.15 ea.
.1 Mfd. 400 V. Aerovox	.15 ea.
.05 Mfd. 400 V. Aerovox	.15 ea.
.5 Mfd. 400 V. Aerovox	.15 ea.
.001 Mfd. 1000 V. Solar	.15 ea.

BC-733D LOCALIZER RECEIVER



A part of aircraft blind landing equipment. Operates on any six of its predetermined crystal controlled frequencies in the range of 108-120 mc. Contains 10 tubes, three of which are WE-717-A's —and crystals. Ideal receiver for conversion to 144 mc. ham band or mobile telephone bands. For 24 V. DC operation. Size 14½" x 7" x 4⅝". Price with dynamotor..... **$5.95**

WESTINGHOUSE RECTIGON BATTERY CHARGER BULB

Style 289416, 6 ampere rating. For replacement in most chargers or for building power supply to use on D.C. operated equipment. Brand new..... **$2.50 ea.**

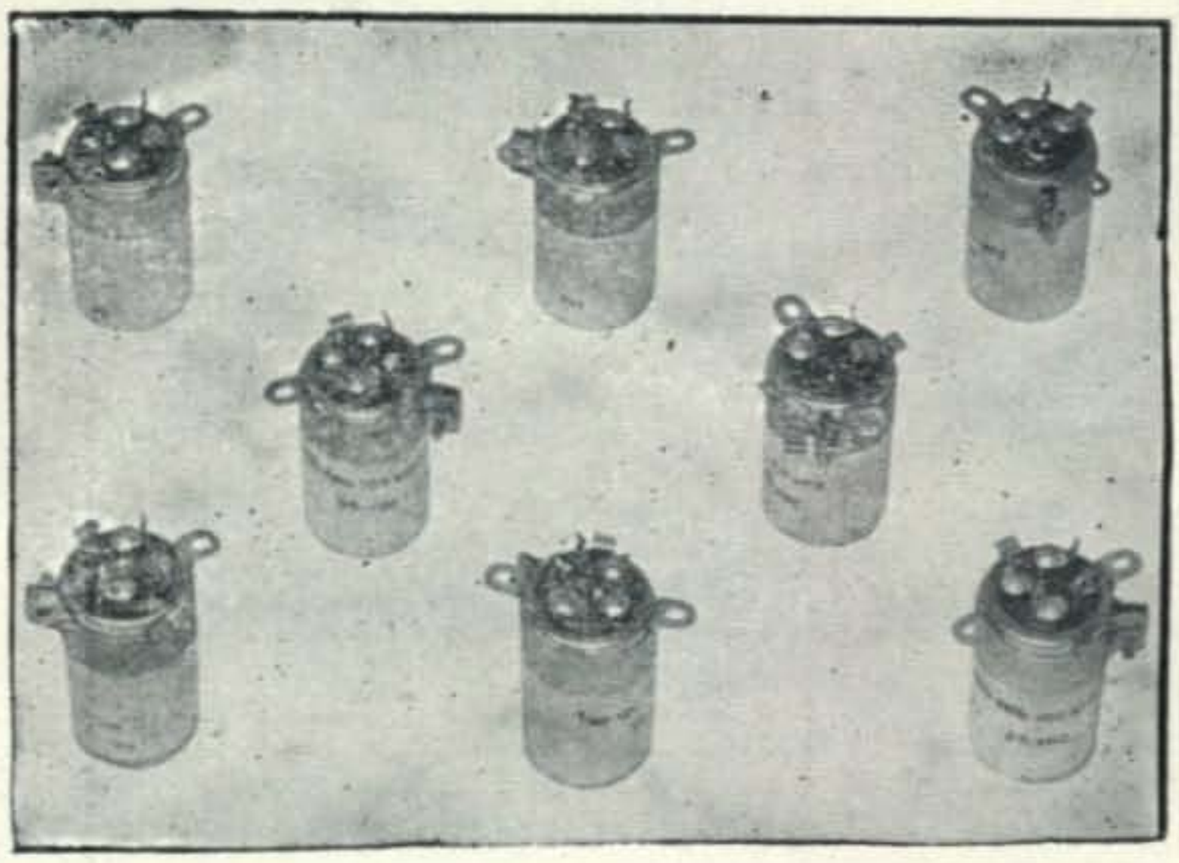
ESSE RADIO CO.

Esse's Special Offer

INDIANAPOLIS, INDIANA

ELECTROLYTIC CONDENSERS ALUMINUM CANS

30 Mfd.	450 volts	**60c.**
20 Mfd.	450 volts	**50c.**
40 Mfd.	450 volts	**75c.**
50 Mfd.	350 volts	**50c.**
2500 Mfd.	3 volts	**25c.**
100 Mfd.	25 volts	**50c.**
50 Mfd.	10 volts	**45c.**
1000 Mfd.	15 volts	**45c.**
30 Mfd.	150 volts	**35c.**
.14 Mfd.	50 volts	**15c.**
100 Mfd.	300 volts	**75c.**
100-100-100 Mfd.	35 volts	**65c.**
20-20-20 Mfd.	25 volts	**35c.**



HIGH VOLTAGE CONDENSERS

1 Mfd.	10,000 volts Aerovox	**$15.00**
.25 Mfd.	20,000 volts Aerovox	**$ 4.95**

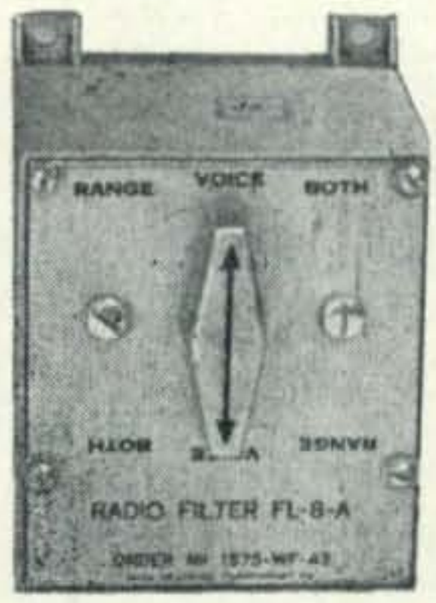
AIRCRAFT RADIO RANGE FILTER

For helpful reduction of QRM on crowded CW bands. When attached to output of any communications receiver:

1—Will pass signal of 1020 CPS, eliminating others.

2—Will pass voice frequencies and eliminate 1020 CPS code signal.

Compact, light weight, with switch. Size 2¾" x 2⅝"x3¾". Price $2.25



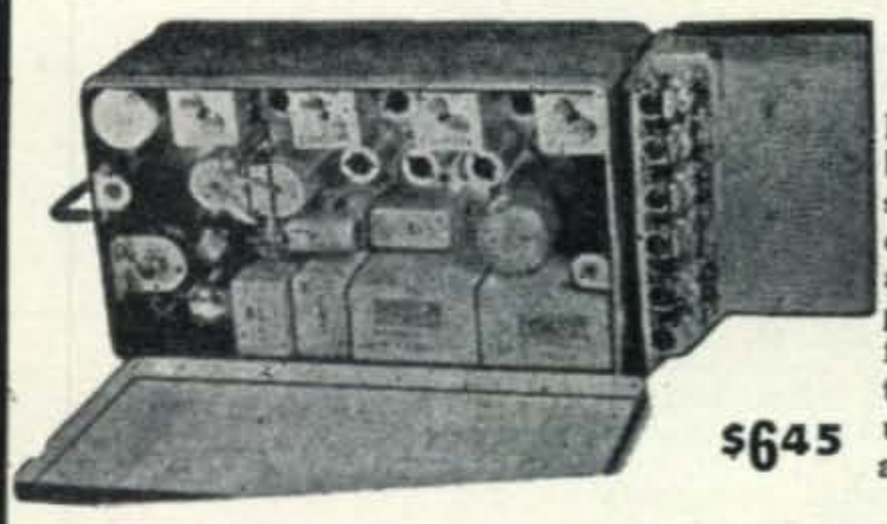
MARKER-BEACON RECEIVER

Can be adapted to radio controlled devices. Was used by pilots to flash a signal lamp on aircraft instrument panel when in range of a beacon transmitter. Responds to modulated signals over a variable range of 62 to 80 Mc. Tube plates and filaments operate directly from 24 V. DC. Can be adapted for radio control of experimental apparatus opening garage doors, etc. Circuit diagram and parts list included on either model shown below:
BC-357 — contains 12C8 and 12SQ7 tubes and sensitive relay (size 5⅜" x 5¼" x 3¼").

Price 2.95

BC-1033—contains 6SH7, 6SL7 and 12SN7 tubes, sensitive relay (size 5⅜" x 5¼" x 3¼").

Price $3.50

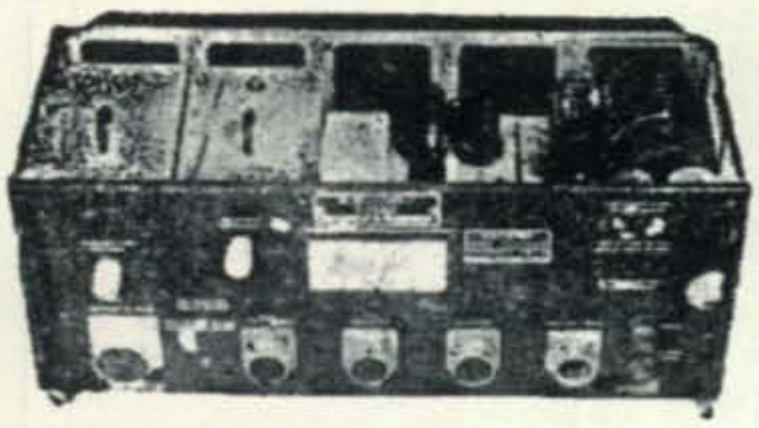


$645

R-89/ARN 5A GLIDE PATH RECEIVER

Formerly used for blind landing but adaptable to many other uses such as receiver for new police or citizen's band. Band of operation 326-335 mc. on any of three pre-determined crystal controlled frequencies. Contains eleven tubes, 6 relays, and other valuable parts. For 24 V. DC operation. Size 13¾" x 5¼" x 6⅜". Price, complete as shown.

APN-1 RADIO ALTIMETER



A complete 460 mc. radio receiver and transmitter which can be converted for ham or commercial use. Tubes used and included: 4-12SH7, 3-12SJ7, 2-6H6, 1-VR150, 2-955, 2-9004. Other components such as relays, 24 volt dynamotor, transformers, pots, condensers, etc., make this a buy on which you cannot go wrong. Complete in aluminum case 18" x 7" x 7¼".

Price $8.95

ESSE RADIO CO.

Esse's Special Offer

INDIANAPOLIS, INDIANA

NEW VOLUME CONTROLS

1 megohm, carbon 1" shaft	$ .35
1000 ohms, carbon, screw-driver shaft	.35
20 ohms, wire-wound, 1" shaft	.35
500,000 ohms, carbon, 2" shaft	.35
1000 ohms, wire-wound, 2" shaft	.35
6000 ohms, with switch, carbon, 1" shaft	.40
Dual 25000 ea., wire-wound, 1" shaft	.35
Triple 25,000-50,000-20,000, carbon, 1" shaft	.70

NEW RESISTORS – WIREWOUND

3 ohms, 20 watt	$ .10
2500 ohms, 20 watt	.10
½ ohm, 20 watt	.10
11269 ohms, 100 watt (has 5 taps)	.35

NEW RESISTORS – CARBON

	per hundred
100 ohms, ½ watt	$3.00
120 ohms, ½ watt	3.00
220 ohms, ¼ watt	3.00
270 ohms, 1 watt	3.00
470 ohms, ¼ watt	3.00
480 ohms, ½ watt	3.00
1200 ohms, ½ watt	3.00
6800 ohms, 2 watt	3.00
12,000 ohms, 2 watt	3.00
21,000 ohms, ¼ watt	3.00
56,000 ohms, ¼ watt	3.00
85,000 ohms, ¼ watt	3.00
150,000 ohms, 1 watt	3.00
270,000 ohms, ½ watt	3.00
830,000 ohms, ¼ watt	3.00
1,200,000 ohms, ½ watt	3.00
5,600,000 ohms, ¼ watt	3.00

NEW CONDENSERS

.5 mfd. 600 V., Oil, ¾"x1¼"x2"	$ .20
.5 mfd. 400 V., paper 1" dia. x 2¼"	.25
5.2 mfd. 50 V., Chicago Ind. Cond. Corp., Oil, 1 x 2½ x 3"	.25
4 mfd. 600 V. GE Pyranol, 1"x2½"x3"	.50
2 mfd. 600 V., Aerovox Oil, 1"x1"x3½"	1.25
8 mfd. 600 V., Chgo. Ind. Cond. Corp., Oil, 1" x 4" x 5"	1.50
1 mfd. 4000 V., C-D, Oil, 2"x4"x7"	4.00
.25 mfd. 600 V., mica	.50
4 mfd. 1000 V., Oil, C-D or Aerovox, 1" x 2" x 7"	2.50
30 mfd. 330 V. AC, GE pyranol	3.00
2 mfd. 1000 V., C-D, Oil, Single hole mounting, 1½" dia. x 4½"	1.75
4 mfd. 600 V., C-D, 1½" x 4½", single hole mounting	1.25
140 mmfd., variable, padder screwdriver adjustment	.25
7-17 mmfd., variable tuning, 5 plate, 2" shaft, ¼" dia.	.25
.1 mfd. 400 V., paper Aerovox	.15
.14 mfd. 50 V., paper	.15
.1 mfd. 1500 V. paper	.20
.05 mfd. 400 V. paper	.15

LIP MICROPHONE

Lip microphone, made by Western Electric, Navy type CW-51071, with instruction sheet, brand new **$1.50**

TYPE 813 TUBES

Type 813 tubes (New) ..... **$5.95** ea.
Type 813 tube sockets (New) ..... **.50** ea.

TELRAD 18-A FREQUENCY STANDARD

Checks signals in the range of 100 Kc. to 45 Mc. with a high degree of accuracy. Self-contained power supply is 110, 130, 150, 220, and 250 V. 25-60 cycle AC. Complete with tubes, dual crystal, and instruction book. Brand new. Price **$39.50**

CO-AXIAL CABLE

For high frequency low-loss, trouble-free, weather proof, durable service. Fully shielded, cut to length. Brand New.

RG8/U-52 ohm (marked RG8/U)
Price—100 ft. for **$4.95**

RG8/U-52 ohm (unmarked)
Price—100 ft. for **3.95**

RG29/U-ohm (marked)
Price—100 ft. for **3.95**

AN/PRS-1 MINE DETECTOR

The detector is designed to detect metals, non-uniformities (rocks, tree-roots) and may be used to detect metal buried in logs, to locate cables, pipes, sewer tile and etc. It is widely used by lumber camps, miners, prospectors, plumbers, treasure hunters and explorers.

A portable device used in the detection of both metallic and non-metallic by oral (ear) and visual (eye) means. These are brand new outfits, complete with instruction book and spare tubes. Shipped in original overseas moisture-proof container.

The set consists of the detector head with antenna and reflector meter, a meter housing and lower section of exploring rod, amplifier assembly, exploring rod extension, bag designated to carry equipment while operating, and wooden case for storing or transporting the complete unit when not in use.

Shipping weight, 125 lbs. Weight in operation only 22 lbs.

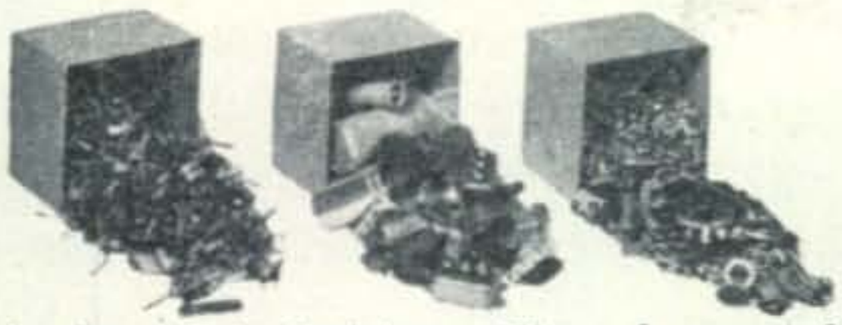
Batteries are not included but we can supply them for **$8.25** per set.

Price, brand new **$14.95**

ESSE RADIO CO.

Esse's Special Offer

INDIANAPOLIS, INDIANA



A—Insulated Resistors. Kits of assorted resistors of various wattages and values. Some gold band resistors. 100 for **$1.25**
500 for **$5.49**

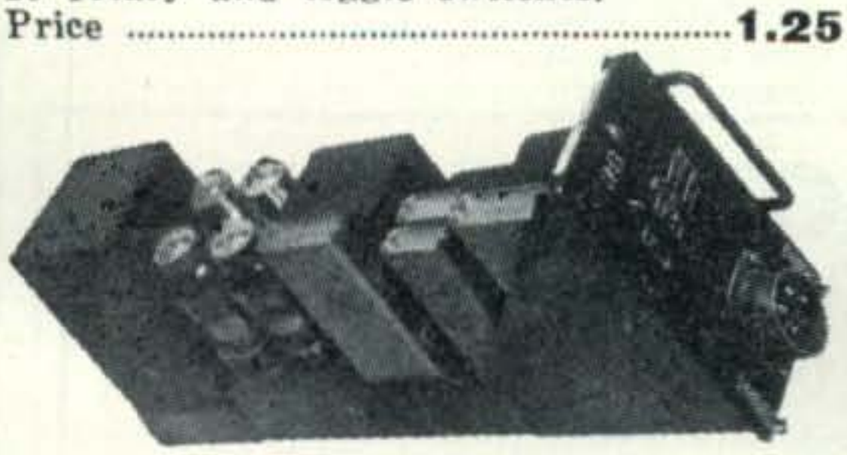
B—Condenser Kit. Contains assortment of 25 various condensers including 2-2Mfd. 600 V. filters, 1-1000 Mfd. 15 V. filter 4-1 Mfd. 400 V. paper by-pass, 3-3 gang midget trimmers. etc. **$2.65**

C—Hardware Kit containing about 5 lbs. of radio hardware including nuts, bolts, washers, shafts, gears, grommets, lugs, screws, spacers. It is a gold-mine of invaluable parts **$1.95**

D—Resistor mounting lugs and terminal strip kit. Assorted sizes and shapes. Many, Many, Many. **$1.00**

E—Tube Socket Kit. 25 or more assorted sockets having various usable sizes. **1.50**

F—Switch Kit consisting of assortment of 10 rotary and toggle switches.
Price **1.25**



PP-51/APQ-9
RECTIFER POWER UNIT

400 cycle 115 V. Contains 4—5R4GY, 2—4Mfd. 1000 V. DC condensers, 2—1 Mfd. 1500 V. DC condensers, 400-2600 cycle power transformer, resistors, etc. Weight 38 lbs. Size 21" L x 5⅝" W x 7¾" H.
Price **$7.95**

WIRE AND CABLE

(A) 3 stranded conductors inside of a shield. Each about 30" long. ..... **20c** each

(B) 2 conductors of stranded wire. Each strand about No. 8 gauge. Rubber covered twisted and cloth braid outer cover. ..... **$7.00** per 100 ft.

(C) Heavy duty rubber covered 2-stranded conductor flexible. Ideal for 110 V. AC power leads for heavy electrical machinery. ..... **$10.00** per 100 ft.

(D) 3 conductors of number 20 enameled cotton covered wire. Color coded, completely shielded. Moisture and fungus proofed. Ideal for intercom work..... **$2.00** for 50 ft.
$8.00 for 250 ft.

(E) 4 strands of braided wire each rubber covered and color coded, one strand being shielded cotton and cambric outer wrappng. ..... **$5.00** for 100 ft.

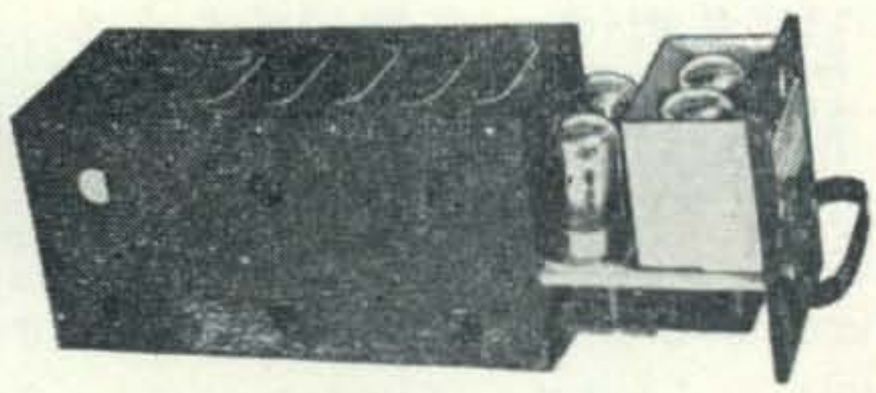
(F) 4 conductor wire No. 18 wires stranded rubber covered.
$6.00 for 100 ft.

(G) 4 conductor wire No. 18 wires stranded shielded rubber covered. ..... **$7.00** for 100 ft.

(H) 2 conductor wire solid rubber conductor twisted No. 18.
$1.50 for 100 ft.

(I) 3 conductor field telephone wire twisted. **$5.75** for 525 'roll

TURBO AMPLIFIER



Used for parts—shipped complete with the following tubes: 2—7C5's, 1—7Y4, 1—7F7.

Price ..... **$1.75** ea.

ARGON BULBS

2 watt, 110 Volt, Edison base. Ideal for R.F. indication, night light. Brand new. Box of ten..... **$5.00**

Portable Transmitter

Navy Department Model MI-2462 (made by RCA). Sound powered microphone transmitter with push-to-talk switch. Metal formed chestplate with adjustable strap for support about operator's neck. Pivot adjustment for placing of microphone. Has 7-wire colorcoded rubber covered heavy duty cable, 20 ft. long. Units will work up to several thousands of feet apart, no batteries or external power supply needed. Several units may be connectd together on same circuit. Indispensible for television antenna installation, electrical wiring work, plumbing contractors, and other point to point work. Brand new. ..... **$7.50** ea.

Glass Telephone Pole Insulators

Hemingway, size 680. Fits ¾" wooden crossarm pin. Overall height 5", diameter 4". Will hold two single steel wires, or two pair of stranded wire cables. Brand new. ..... **60c** ea.

BATTERIES

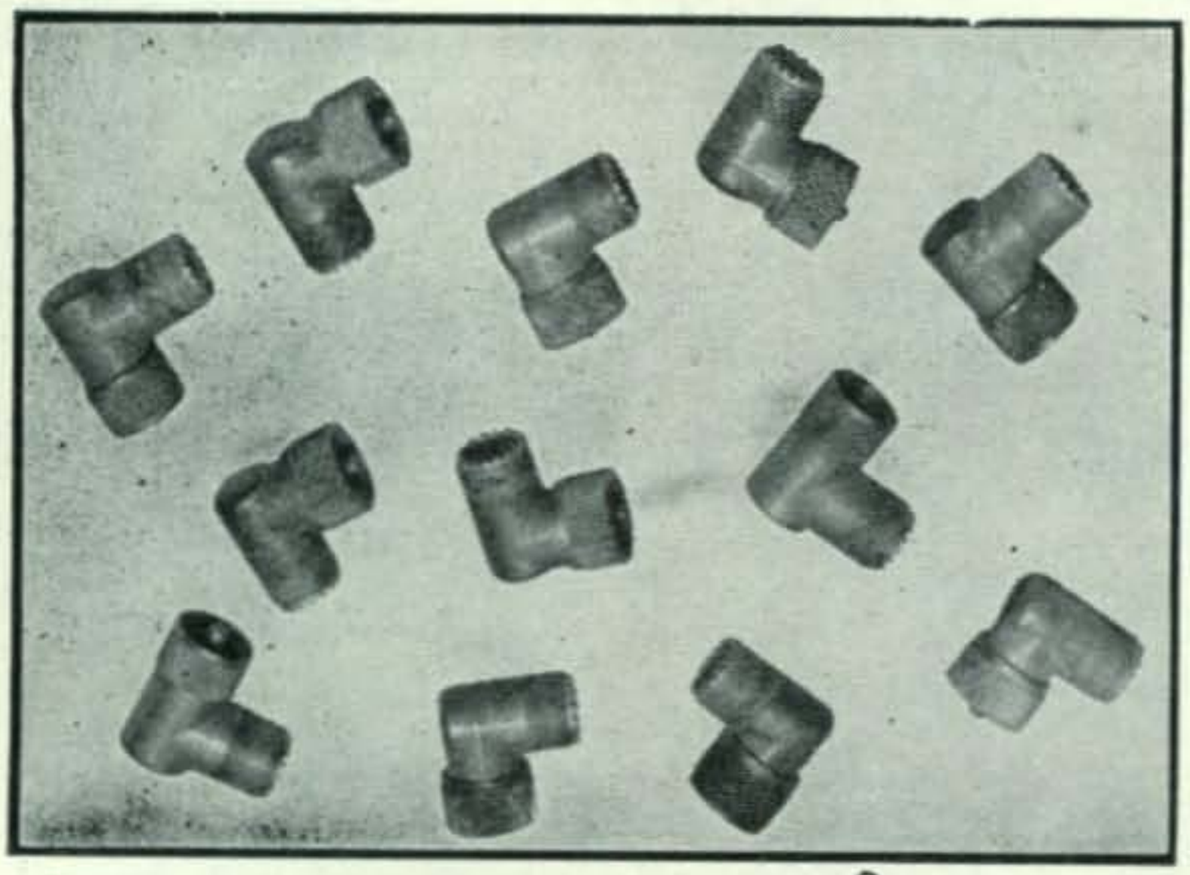
Battery type BA-38, 103.5 Volts, used in Handie-Talkie, BC-625 mine detector, or for any purpose where low current drain is required. Size 1" x 1" x 11½" long. Outdated but tests okay. Unused. **$3.00**

Battery BA-41, delivers 4½, 60, 25½ Volts. Used with BC-620 Transceiver, for bias supply, or portable equipment. Size 2" x 2¼" x 3½". Outdated but tests okay. Unused..... **25c**

Battery BA-32. 144, 4½ and 3 Volts positive and 13½ Volts negative. Used with BC-222 Walkie-Talkie Transceiver. Size 5" x 8" x 7". Husky and has long life. Outdated but tests okay. Unused.
$3.50 ea.
3 for **9.95**

ALUMINUM BOX, with lid. Size about 3" x 3" x 2½" with pointed end at top. Ideal for meter case, switch and fuse box, control box, for holding loose parts. Brand new..... **60c** ea.

PHILLIPS SCREWDRIVER. 6¾" overall length. Blade 3" long. Insulated non-slip handle ⅞" diameter. Brand new..... **25c** ea.



AMPHENOL LOW-LOSS UHF CONNECTOR for RG type cable. Rugged construction, heavily silver plated, provides easy asembly and positive connection. Type 83-1AP Angle Plug Adapter polystyrene insert, pin and socket—very special.....**20c each**

Type 83-1R Receptacle, chassis type, low-loss Mica filled insert, very special, ...**30c. each.**

PHONOGRAPH TURNTABLE and MOTOR
Turntable felt covered, 9" diameter, rim drive, sturdy 110 Volt 60 cycle AC motor, speed 78 Rpm, for continuous duty. Offset tone arm with crystal pickup. Metal mounting base 11" x 11¼" with schockmount grommets. Microswitch stops turntable at finish of recording. Shielded pickup output lead and plug. 4-prong plug and wires for 110 Volt control circuit. Brand new. .....**$5.50 ea.**

McCLELLAN SADDLES
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	1C5GT	1H5GT	1N5GT	1S5	1U5	5U4G	5Y3GT	5Z4	7E5/1201
75c ea.	0Z4	6AG7	6C8G	6Q6	6U6GT	12SA7GT	25Z6GT	41	80
	2A3	6AL5	6D6	6Q7	6U7G	12SF7	26	42	83
	2A7	6AQ5	6F5GT	6R7GT	6V6	12SH7	27	43	84/6Z4
	2A5	6AT6	6F6GT	6S8GT	6X4	12SJ7GT	30	47	85
	3A4	6AU6	6F8G	6SA7	6Y6G	12SN7GT	31	50	89
	3Q4	6AV6	6J5	6SA7GT	12A8GT	12SR7	35	51	117L7
	3Q5GT	6B4G	6J6	6SC7	12AT6	12SF5GT	35B5	56	117P7
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	3V4	6B8G	6J8G	6SH7	12BA6	14X7GT	35W4	58	182B
	6A3	6BA6	6K6GT	6SJ7GT	12BE6	19T8	35Z5GT	70L7	183
	6A6	6BE6	6K7	6SN7GT	12F5GT	24A	36	71A	482B
	6A8G	6BJ6	6K8G	6SQ7GT	12J5GT	25A7GT	37	76	483
	6AC5GT	6C4	6L6G	6SR7	12J7GT	25AC5GT	38	77	2050
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YL's FREQUENCY

(from page 52)

during the day, one being 1KCK. One day I told him we'd be off the air for a few months as we were planning to visit New York. He suggested we meet in New York, and while there we also met several other members of the gang.

"Instead of returning to Haiti, we moved to Colombia, South America. By that time I'd become a little weary of doing nothing so thought I'd try to get a job. Since c.w. was the only thing I knew well enough to work at, I applied to the Marconi-RCA Company. They flatly refused, saying Marconi didn't believe in hiring girls even as secretaries! About a month later the manager of the company phoned and asked if I were still serious about working. He told me he was on a spot as he was required by law to give his two operators two weeks leave every year and couldn't as he had no replacements. If I were willing, he said, he'd take the risk of hiring a YL for one month so his two operators could have their vacation. I agreed, but as it turned out one of the men became ill and had to leave and as I was already there they kept me on. I took quite a ribbing from the male operators. We sent all our traffic through Bogota, and the boys up there decided they'd give me a work-out—they did, too, but I'm glad to say I was able to hold my own.

"Within three months I had become chief operator and arranged to work the 7 a.m. to 2 p.m. shift. This left me a considerable part of the day for ham radio and I still talked to the gang. By this time a romance had got well under way with 1KCK and we kept two daily skeds—one at 6 a.m. and again at 9 p.m. By the end of 1938 we decided it would be nicer to share one rig, so I resigned my job to become Mrs. 1KCK. Incidentally, I believe we can claim one of the few international romances by ham radio, and I should very much like to know if there are any others."

Naturally, when they married, Lillian could not operate her own station as she was still a British subject. After living in the U. S. for three years she took out citizenship papers, but then the war intervened and it wasn't until 1945 that she was able to get her first ticket and call, W4ILN.

"The OM," adds Lillian, "has had several other calls, his first being 9BUR back in 1922. Unfortunately, he doesn't have the time to devote to ham radio that he'd like, but he uses W8ZGS for mobile operation, and we use my call, W8ZGT, for the home station. Doc is a professor of psychology at the University of Michigan and when we came here after four war years in Washington, D. C., we decided we would find a place that would be a ham's paradise. Luck was with us, and we live on a 60-acre farm about five miles outside of Ann Arbor. It is a great temptation to put up a rhombic, but since we like to QSO all directions we've decided on rotaries. Our transmitter is homemade, as is our e.c.o. We have an RME69 which has served us faithfully these past ten years, and since coming to the farm, we've been able to remove the noise silencer which we had to install to combat city QRM!"

The Kellys have two junior ops—a girl 8 and a boy 5. Lillian says they both show signs of ham interest, so no doubt in a few years they will add their bit of QRM on the air!

DX

(*from page* 37)

and here's a good one, *UAØKFQ* 7040. All of this stuff was coming through between seven and ten p.m. PST. *ZC8PM* also was heard around 6:00 a.m. on 40, and, of all things, on 3535 at 8:30 p.m. W2WC says business is picking up on 40 and 80 and, to prove it, he worked *ZC1CL* and *ZC6UNT* on 40, and then knocked off *ZC8PM* on 80.

W2AMA thinks the little man in ham radio should air some of his accomplishments, as they, too, can work DX. For example, on Dec. 8, within a period of 17 hours, he worked W.A.C. running what he calls an honest 72-watt input. He claims no assists nor pre-arranged skeds. AMA is using the same off-center fed Hertz he has used for 20 years.

W9LM and another one of the boys at WBBM (ex-W5BEN) were trying to figure out why December *CQ* was late. Hal says they finally came to the conclusion that our DX contest took so much out of head-man LeKashman and assistant Becker, etc., it just didn't get printed. Of course, that isn't the answer . . . but, I have often wondered what the engineers do while on duty at WBBM . . . Now, I know.

There's gold in them thar hills!

The accompanying photograph is printed with the hope of answering this question: "Is any DX man normal?" Before going too far, we better point out, this is none other than VE7HC, Gord Whitman. It is entirely possible that he got that way from the lack of DX, but it is more probable that he achieved this condition when he headed north prospecting for gold. Anyway, this is the way Gord looked to VE7ZZ who took the picture when he returned to civilization. We are wondering if he actually became a sourdough or not . . . He didn't get any gold, but for my money, he looks as though he got something else . . . Don't you fellows be afraid to work him now, as he has since shaved.

W9RBI finally got off the dime and worked four new ones on c.w.: *ZD9AA, UF6KAB, LU1ZA* (sure, we count it), and *CT3AA*. On phone Ross got Zone 39 by working *VQ8AE* on 28,410. Others that may be of interest to you are *C3EA* 14,315; *PJ5KO* around 14,400; *ZC6UNT* 28,320, and *VR2BC* 28,180. He is now looking for *AC4YN* and *C8KY*.

(*QSY to page 56*)

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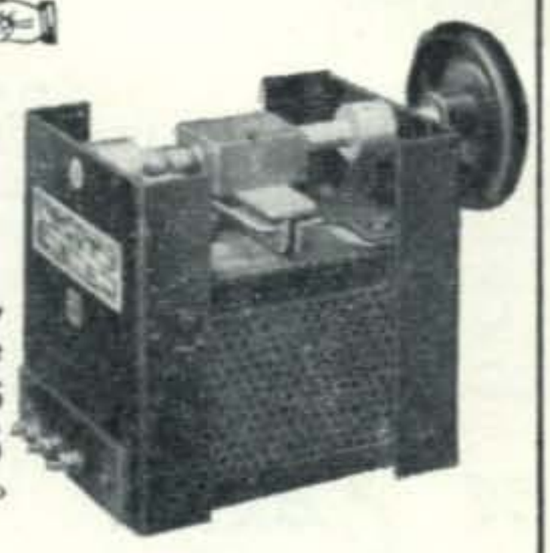

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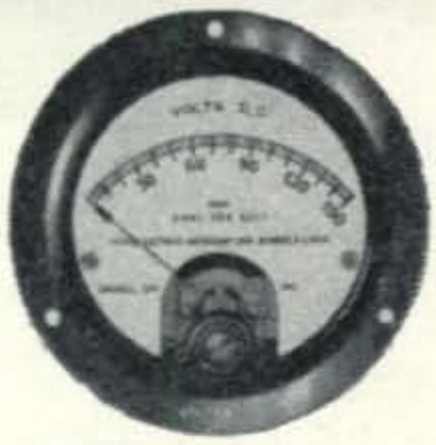

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C1CH says that I probably won't believe it, but the maximum power load he is allowed is 2½ amperes, but that he needs 15 amps, or more. This means his KWH meter is overloaded by over 500%. C1CH goes on, "Sorry it was burned out last month." He hopes to have a bigger meter in shortly. He's going in the right direction, at least.

W9HB, a good old-timer on phone, writes to say that just 21 months ago, he changed to NFM to get rid of BCI. Since then, he has worked 113 countries, and is sold on the stuff regardless of BCI. He is running a kilowatt into a pair of 4-400As, while his receiver is an HRO with an HF10-20 ahead of it . . . antenna is a Workshop 3-element rotary beam.

Someone told me there is a good chance that the new prefix for the Philippine Islands will be DU.

Look what's cooking now . . . A bunch of D4s are going to the top of the highest Alp in Germany, Zugspitze, and are going to plant rigs for the 2, 5, 10, and 20-meter bands. At the moment they have a request in for a special call for this occasion—D4AHF. If this request is granted, they will also have special QSL cards printed. The boys are going to try for DX marks on the 2 and 5-meter bands using 200-watt transmitters, while 500 watts will be used on 10 and 20 meters. If you are wondering how they are going to get the equipment up there, just stop worrying, because cable cars run to the peak of Zugspitze, and there's a fine hotel up there, too. The date of this test will be April 2 and 3, 1949. Any of you fellows hooking up with them, or hearing them . . . please let us know PDQ. Lt. Hal L. Eustace, the AACS European correspondent, also tells us that a request has been made to the chief signal officer at Heidelberg to place the D4s under regulations patterned after the FCC with certain necessary exceptions such as frequency allocations. The idea is to improve the technical quality of hams in occupied Germany. This initial meeting of the D4s drew 50 hams and 10 XYLs. The secretary of the Munich Amateur Radio Club addressed the gathering on the state of the German amateurs. Licensing of the German hams has been approved by the American and British au-

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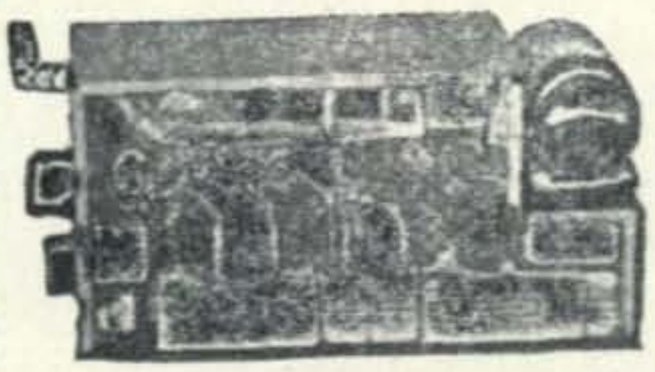

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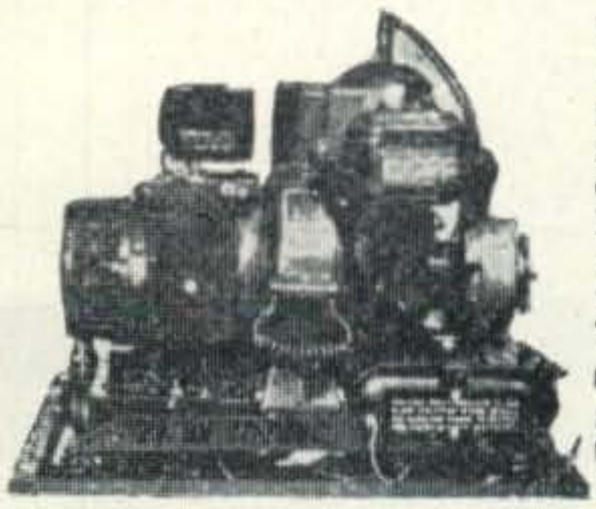

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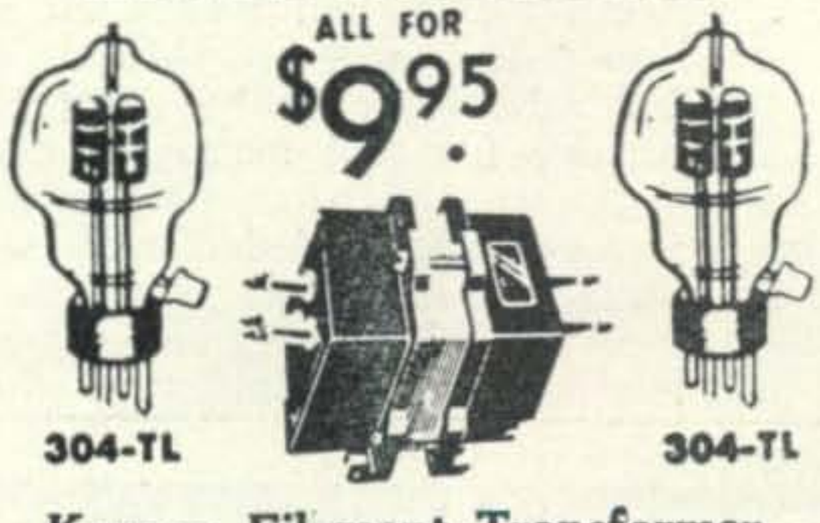

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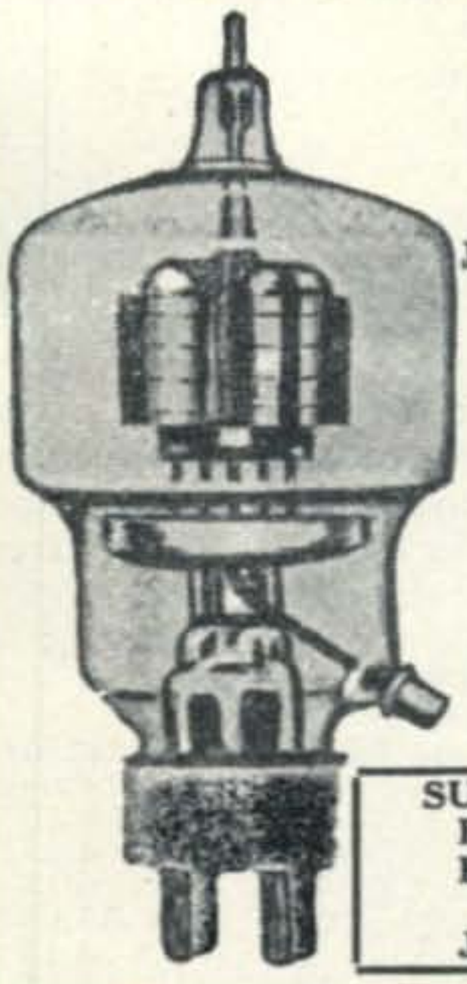

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thorities, and the question now is in the lap of the German Economic Council. He said that about 800 German amateurs have qualified for their new DL call signs. You my be hearing some of these by the time you read these very words.

Last month, we mentioned that W6DOK is now operating on the island of Tierra del Fuego, at the southern tip of Chile and signing *CE7AP*. He is a sound truck operator for a seismograph company and finds the work very interesting. He says they are just now getting into summer, but with the wind blowing, you would never know it. Daylight hours are from 4:00 a.m. to 10:00 p.m. in November, and around Christmas time, it is daylight around the clock. Once again, he is using a 7006-kc crystal, and on 20 it is, of course, double that frequency.

Phone Men -- Attention

You phone men who are listed in the Honor Roll know that your contacts should be two-way phone, that is, phone-to-phone. Every once in a while, someone asks the question, "If I am on phone, and the guy on the other end is on c.w., does that count as a phone contact?" Of course, it doesn't! We have preached phone-to-phone since the inception of the Honor Roll before the war in the magazine *Radio,* and picked it up again when the Honor Roll was started in *CQ* after the war. Obviously, it might be a little difficult for us, or anyone for that matter, to look at a QSL card from a foreign station on which he confirms a phone contact and decide if he was on phone or not. I am very sure that you fellows have been reporting phone-to-phone contacts, but there just might be a few instances where you are not too well acquainted with the rules, and if after reading this, you decide your list needs a little revising, you know what to do. Let's hear about it. It occurs to me that there is a slight chance that this may have happened with one or two of you, since ARRL apparently does not insist that DXCC phone QSO's be on two-way phone. This, of course, can be a little confusing, however, our phone section of the Honor Roll definitely covers phone-to-phone contacts. I hope you fellows will abide by the Honor Roll rules and report phone-to-phone QSO's only.

KB6AD Leaves Canton

On Oct. 3, Ken had his last QSO from Canton with W2UFT. By the time you read this paragraph, *KM6AE* and his XYL, W7LNF, will probably be on the air with the calls *KB6AH* and *KB6AI*. They took over Ken's shack when he left. Outside of that, the ham situation on Canton is pretty poor, since *KB6AG* will be in Honolulu until February, and *KB6AA* through *AF* no longer live on the island. *KB6AD* tells me, however, that there is a very good possibility of another VR1 getting on to give those who need it the British Phoenix group. It seems that one of the New Zealand PAA boys is studying for his ticket now. While on Canton, Ken worked all 40 zones, but, so far, has gathered in only 34 cards . . . countries stood at 144. He wants to assure the boys who haven't received his card that if they will be patient, they will get them as soon as his new batch of QSLs arrive from the printer.

"DX" Deadline

For the benefit of the fellows who have not seen it printed in this column before, my deadline

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for DX news, etc., is the 15th of each month. By the time we get through with the Honor Roll and the Marathon, plus milling out the column proper, ten days have elapsed before we get it into the hands of boss LeKashman. Normally, the stuff that you fellows contribute is read in this column about five or six weeks after my deadline. I say, normally, because the magazine is supposed to be off the press around the 25th or each month, and if no printers, trucking or railway strikes are in progress, you should receive it a few days thereafter. Some fellows think that since my deadline is the 15th, they should read it all in the very next issue which is due in a couple of weeks. So, remember my deadline here is the 15th, and if the material is used, it will appear in print five or six weeks later.

On January 1, the boys in Japan had their calls changed, bearing a new intermediate "JA". This will effect all call areas from 1 to 9. For example, J2AHI is now *JA2KG,* and the call J2USA is now *JA2US.* It looks as though some of the J2s, such as AAL, DND, and ROC, will be JA3, while J3s will be JA4, and J4s change to JA5. Likewise, J5 will change to JA7, and the old J6s will be JA8; J7s will be JA9. Don't shoot me if I am a little haywire on this, but, at least, they are changing to something.

HP1FD has been granted a license by the government of Panama, and at present is operating at 14,112 kc. He is with the United States Embassy in Panama, but the correct QTH for mail will be found at the end of the column. Read on. . .

Here and there: W6PZ says he has a date with a Coast Guard Cutter 500 miles off Alaska, in January . . . Brrrr! . . . W1JCX waited two years for a Zone 39 contact, and *VQ8AA* took care of this detail in November. JCX wonders why 6QD doesn't modulate the rig? (You see, it's this way—) . . . *CM2SW* couldn't get on in the World-Wide DX Contest because his antennas were down due to the hurricane season . . . W1JYH says the arrival of his second jr. op slowed down his DX somewhat . . . W6ZZ, ex-W1WV, was away for a month visiting his old home town near Boston. He is back in California now, however.

WØEFK is one of quite a number of hams in Japan who are civilians. It seems somewhat odd to me that they cannot obtain station licenses, but if they were in the armed occupational forces, they could get a J call simply by going to the Eighth Army Headquarters. These fellows are doing their share of work with North West Airlines, Aeronautical Radio, PAA, Bank of America, etc., and it does seem that they should be able to get a license some way. Most of them are operating commercial radio stations.

MD4BPC wrote a letter to W2IOP who also writes for this magazine, and wants to extend his apologies to those he has worked for not being able to send out QSL cards. It seems that Bill ordered some from a local printer in September, and after a couple of months, they told him they couldn't print them, so he sent the order to a printer in Kenya. He expects to have the cards by the time you read this. He has sent a few improvised cards, so the rest of you fellows just be patient, if you haven't already received yours. The

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1 *Heathkit* VACUUM TUBE VOLTMETER KIT

Everything you want in a VTVM. Shatterproof solid plastic meter face, automatic meter protection in burn-out proof circuit, push pull electronic voltmeter circuit assuring maximum stability. Linear DC and AC scales. AC and DC full scale ranges of 3V-10V-30V-100V 300V-1000V. A total of 24 ranges. Isolated DC test prod for signal tracing and measurements of voltage while instrument is in operation. An ohmmeter section accurately measuring resistance of 1/10 ohm to one billion ohms with internal battery. Extremely high input resistance 11 megohms on all ranges DC and 6.5 megohms on AC. All these features and many more are the reasons hundreds of radio and television schools are using Heathkit VTVM's and recommending them to all students. Like all Heathkits, the VTVM kit is complete, 110V. 60 cycle power transformer, 200 microamp meter, tubes, grey crackle cabinet, panel, test leads, 1% ceramic precision divider resistors and all other parts. Complete instruction manual. Better start your laboratory now.
Shipping weight 8 lbs..... **$24.50**

2 *Heathkit* SINE AND SQUARE WAVE AUDIO GENERATOR KIT

The ideal instrument for checking audio amplifiers, television response, distortion, etc. Supplies excellent sine wave 20 cycles to 20,000 cycles and in addition supplies square wave over same range. Extremely low distortion, less than 1%, large calibrated dial, beautiful 2 color panel, 1% precision calibrating resistors, 110V. 60 cycle power transformer, 5 tubes, detailed blueprints and instructions. R.C. type circuit with excellent stability.
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3 *Heathkit* CONDENSER CHECKER KIT

Checks all types of condensers, paper mica — electrolytic — ceramic over a range of .00001 MFD. to 1000 MFD. All on readable scales that are read direct from the panel. NO CHARTS OR MULTIPLIERS NECESSARY. A condenser checker anyone can read without a college education, A leakage test and polarizing voltage of 20 to 500 volts provided. Measures power factor of electrolytics between 0% and 50%. 110V. 60 cycle transformer operated complete with rectifier and magic eye tubes, cabinet, calibrated panel, test leads and all other parts. Clear detailed instructions for assembly and use. Why guess at the quality and capacity of a condenser when you can know for less than a twenty dollar bill.
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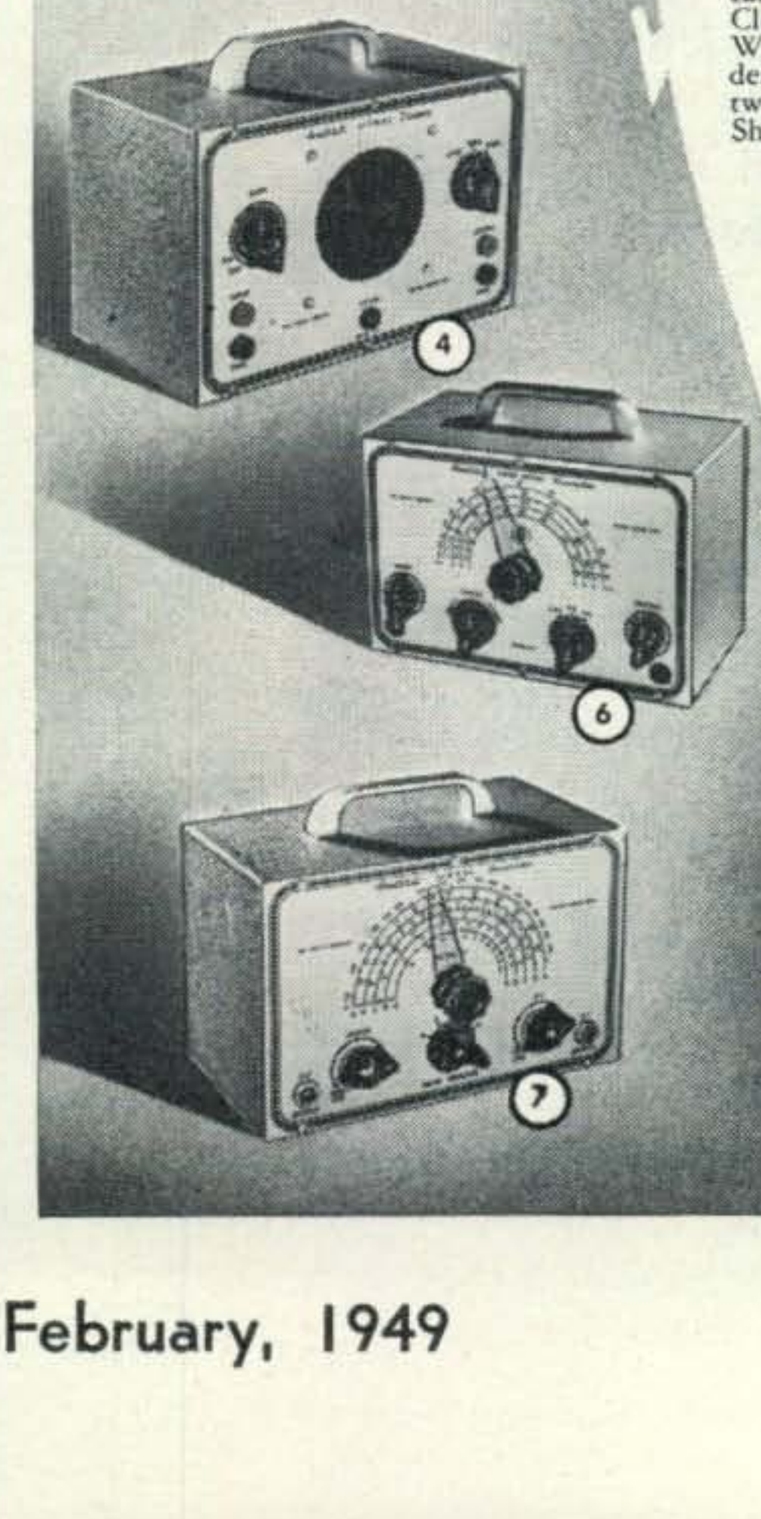

4 *Heathkit* SIGNAL TRACER KIT

Reduces service time and greatly increases profits of any service shop. Uses crystal diode to follow signal from antenna to speaker. Locates faults immediately. Internal amplifier available for speaker testing and internal speaker available for amplifier testing. Connection for VTVM on panel allows visual tracing and gain measurements. Also tests phonograph pickups, microphones, PA systems, etc. Frequency range to 200 Mc. Complete ready to assemble. 110V. 60 cycle transformer operated. Supplied with 3 tubes, diode probe, 2 color panel, all other parts. Easy to assemble, detailed blueprints and instructions. Small portable 9" x 6" x 4¾". Shipping Wt. 10 lbs..... **$19.50**

5 *The* NEW 1949 HEATHKIT 5-INCH OSCILLOSCOPE KIT

New improved model of the famous Heathkit Oscilloscope. Building an oscilloscope is the finest training for television and newer servicing technique and you save two-thirds the cost. All the features and quality of instruments selling for $100.00 or more. Supplied complete with cabinet, two color panel, 5BP1 tube, 2 5Y3 tubes, 2 6SJ7 tubes and 884 generator tube. Power transformer supplies 1000 volt negative and 350 volt positive. Sweep generator 15 cycles to 30 M. cycles. Has vertical and horizontal amplifiers. Oil filled filter condensers for long life. Complete blueprints and instructions included.
Shipping weight 25 pounds.
Express only..... **$39.50**

6 *Heathkit* FM AND TELEVISION SWEEP GENERATOR KIT

A necessity for television and FM. This Heathkit completely covers the entire FM and TV bands 2 megacycles ot 230 megacycles. The unit is 110V. 60 cycle transformer operated. Uses two 6J6 tubes, two 6C4 tubes and a 6X5 rectifier. An electronic sweep circuit is incorporated allowing a range of 0 to 10 MC. A sawtooth horizontal sweeping voltage and phase control are provided for the oscilloscope.

The coils are ready assembled and precision adjusted to exact frequency. As in all Heathkits, the best of parts are supplied, Mallory filter condenser, zero coef. ceramic condensers, all punched and formed parts, grey cackle cabinet, 5 tubes, test leads, etc. Better get it built now and be ready for the FM and TV business. Shipping Wt. 6 lbs... **$24.50**

7 *Heathkit* SIGNAL GENERATOR KIT

Every shop needs a good signal generator. The Heathkit fulfills every servicing need, fundamentals from 150 Kc. to 30 megacycles with strong harmonics over 100 megacycles covering the new television and FM bands. 110V. 60 cycle transformer operated power supply.

400 cycle audio available for 30% modulation or audio testing. Uses 6SN7 as RF oscillator and audio amplifier. Complete kit has every part necessary and detailed blueprints and instructions enable the builder to assemble it in a few hours. Large easy to read calibration. Convenient size 9" x 6" x 4¾". Ship. Wt. 7 lbs..... **$19.50**

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rig he has been using consists of an 807, and the receiver consists of an HRO and an R-107. He says he has been fooling around with a Bendix job, hoping to get some good results on 28 mc. However, his biggest worry is an uncertain power source in, what he says, this most unpredictable town. Full QTH elsewhere.

D5FF has worked 163 countries, but has cards from only 92. He says he appreciates the understanding shown by other hams he has worked throughout the world. His old D5FF cards are all out, and he is now sending out new QSL cards with, of course, his new and present call, *DA5FF*.

D4AFA who, Stateside, is WØHZA, relates that most cards are coming through OK when they are addressed to the proper bureau. He says, "Do not send D4 cards to the D.A.R.C." QTH for the D4 bureau will be found in the regular spot.

W2NXZ is still trying to achieve W.A.Z. on 10-meter phone. He admits that it is tough going, and he is often tempted to give up. If any of you fellows feel big hearted and can tell Earl who he can work in Zone 16 and 26 on 10 phone, I think you would make the guy very happy indeed.

From VE3QD's column in *Xtal,* I see where *SL5AB* is a Swedish army station, while *PI1RAT* is a radio school in Holland. VE3TB, after trying fourteen years to work Asia, worked it on the second QSO after putting up a new beam. From what VE3QD says, he is having a heck of a time getting the boys to contribute anything, and if business doesn't pick up, he is going to wash out the column. Doggone it, anyway . . . Roy gives his time and writes a good column, so why can't more of you VEs take just a little more time each month and send him some news and gossip. You can't kid me . . . There's plenty of DX being worked by you VEs, and I would like to see you give a little news regularly, each month, to *Xtal.* How about taking a little time out right now and putting down some stuff. Send it to Roy . . . today . . .

I see in the same issue, in the Ham Ads column, that VE3BWY (ex-G6WY) is advertising a 200-watt transmitter for sale. Gee, I hope this doesn't mean Ham is folding up.

YU7KX has written W2OST asking him if he would be kind enough to handle his QSL cards for him. It is not entirely clear to me what he has in mind, since he lists his own present address as OTON S. Bernard, Box 137 PC, Trieste, Europe, and yet he asks W2OST to collect his QSL cards for him. Anyway, it seems that YU7KX has worked 40 zones, but has received only 24 cards . . . out of 110 countries, he has only received cards from 41. He sent us four or five columns of calls of foreign stations from whom he has not received cards, and I am sorry that they cannot be run here due to lack of space. But, any of you fellows overseas who have worked YU7KX, although you may have QSL'd once, please do so again, as your first one might have gone astray. Let's see if we can get this fellow into the W.A.Z. category.

GM2UU says he got a big kick out of the *CQ* contest, but due to careless reading, he was making

DYNAMOTORS

Type	Input Volts	Input Amps	Output Volts	Output Amps	Radio Set	Price
BD 77KM	14	40	1000	.350	BC 191	$20.00N
						$14.00LN
PE 73C	28	19	1000	.350	BC 375	$24.50N
DM 21	14	3.3	235	.090	BC 312	$ 3.45N
DM 21CX	28	1.6	235	.090	BC 312	$ 3.45N
DM 25	12	2.3	250	.050	BC 367	$ 2.49LN
DM 28R	28	1.25	275	.070	BC 348	$ 8.75N
DM 33A	28	7	540	.250	BC 456	$ 5.50
DM 42	14	46	515	.110	SCR 506	$ 6.50LN
			1030	.050		
			2/8			
PE 55	12	25	500	.400	SCR 245	$ 5.25LN
PE 86	28	1.25	250	.060	RC 36	$ 3.95
PE 101 C	13/26	12.6/	400	.135	SCR 515	$ 5.25N
		6.3	800	.020		
			9 AC	1.12		
BD AR 93	28	3.25	375	.150		$ 4.95N
23350	27	1.75	285	.075	APN-1	$ 3.50N
35X045B	28	1.2	250	.060		$ 3.50N
ZA .0515	12/24	4/2	500	.050		$ 3.95N
B-19 pack	12	9.4	275	.110	Mark 11	$ 9.95N
			500	.050		
D-104	12		225	.100		$ 14.95N
			400	.200		
DA-3A*	28	10	300	.260	SCR 522	$ 8.95N
			150	.010		
			14.5	5		
#5053	28	1.4	250	.060	APN-1	$ 3.95N
DA-7A	26.5		1100	.400	TA-2J	$25.00N
CWD-21AAX	13	12.6	400	.135		$17.50N
	26	6.3	800	.020		
			9	1.12		
PE 94	28	10	300	.260	SCR	$15.00
			150	.010	522	
			14.5	5		

*For PE 94 Less Filter Box
N—New LN—Like New.

GREAT TUBE VALUES

01-A	$ .45	12SF7	.49	1005	.35
1B24	4.85	12SR7	.72	1619	.21
2C21	.69	15R	1.40	1624	.85
2C22	.69	28D7	.75	1629	.35
2J21-A		30 (Spec.)	.70	1961	5.00
	25.00	45 (Spec.)	.59	9002	.65
2J22	25.00	39/44	.49	9004	.47
2J26	25.00	35/51	.72	CEQ 72	1.95
2J27	25.00	227A	3.85	EF 50	.79
2J31	25.00	225	8.80	F-127	20.00
2J32	25.00	268-A	20.00	FC 258A	
2J38	35.00	355-A	19.50		165.00
2J39	35.00	417A	25.00	FC 271	40.00
2J55	35.00	530	90.00	GL 562	
2J40	65.00	531	45.00		75.00
2J41	75.00	532	3.95	GL 623	
2J49	85.00	559	4.00		75.00
3J31	55.00	562	90.00	GL 697	
2X2/879	.69	615	.89		75.00
3BP1	2.25	703-A	7.00	ML 100	
3C24	.60	704-A	.75		60.00
3C30	.70	705-A	2.85	QK 59	65.00
3D6	.79	†707-B		QK 60	65.00
3CP1/S1			20.00	QK 61	65.00
	3.50	714AY	25.00	QK 62	65.00
3D21-A	1.50	715-B	12.00	*RCA 932	
3DP1	2.25	720BY	50.00		.65
3EP1	2.95	720CY	50.00	VR 91	1.00
3FP7	3.85	721-A	3.60	VR 130	1.25
3Q5	.79	723-A/B		VR 135	1.25
5BP1	1.95		12.50	VR 137	1.25
5BP4	4.95	724B	1.75	VU 120	1.00
5CP1	3.75	725-A	25.00	VU 134	1.00
5FP7	3.50	726-A	15.00	WL 532	4.75
5JP2	8.00	800	2.25	WN 150	3.00
5J30	39.50	801-A	1.10	WT 260	5.00
6G	2.00	804	9.95	†with cavity:	
6L6GA	1.00	815	2.50	Cavity only	
6SC7	.70	836	1.15		5.00
7C4	1.00	837	1.95	*Photocell	
7E5	1.00	843	.59		
7E6	.72	860	15.00		
10Y	.60	861	40.00		
12A6	.35	874	1.95		
12K8Y	.65	876	4.95		

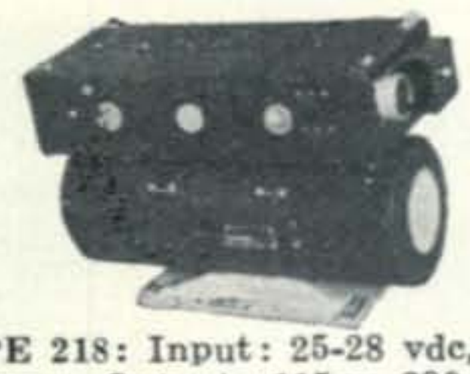
CERAMICON CAPACITORS $7.50 per 100

3 mmf	±5%	67 mmf	±20%
5 mmf	±5%	100 mmf	±5%
4 mmf	±5 mmf	115 mmf	±2%
8.5 mmf	±5 mmf	120 mmf	±5%
11 mmf	±5%	240 mmf	±3%
15 mmf	±2.5 mmf	250 mmf	—
48 mmf	±2%	500 mmf	+15 —30%
50 mmf	±20%	1000 mmf	±5%
60 mmf	±3%		

MICROPHONE ELEMENTS

Carbon transmitter element for TS11-J, TS11-L, TS13-E, TS15-A ..... $ .75 ea.
Element for microphone T-24, 30 ohm..... $ .95 ea.
T-17 elements ..... $ .85 ea.

INVERTERS



PE 218: Input: 25-28 vdc, 92 amps. Output: 115 v, 280-500 cy, 1500 va. New, export packed. (as shown) **$49.50**
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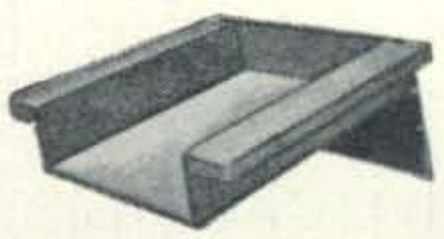
T-101, No. 55548	.95
T-102, No. 55545	.95
T-103, No. 55546	.95
T-104, No. 55547	.95
T-206, No. 55530	.95
T-206, No. 55530	1.65

Typewriter Desk Wells Mounted on Steel Panel for Standard Rack Mfg. 10½" H x 19" W x ⅛" Thick. Well is 22" Wide, 20" Deep, Affording Full Working Space. Grey Crackle Finish. New ..... **$9.90** ea.



CONVERSION COILS FOR ARC-5 TRANSMITTERS

M.O. Coils	P.A. Coils	Antenna Loading Coils	Freq. Range
$1.00 ea.	$1.00 ea.	$ .85 ea.	
6029	7247	6033	3-4 Mc.
6030	9293	6034	4-5.3 Mc.

CONVERSION KIT, consisting of 1-M 0 coil, PA coil, 1-ANTENNA COIL, in any one particular frequency range **$2.00**

ARC No. 4990, variable xmtg capacitor, 22-.4—145 mmf. .05" spacing, 11 rotors. Each..... **$1.00**

ARC 5632 Var. Xmtg. capacitor, 29.2—117 mmf. .06" spacing. 16 rotors, worm drive: 9:1..... **$1.00**

80 METER VFO KIT

Kit consists of the following: 1-6029 M.O. coil; 1-5632 tuning condenser; 1-4990 padding cap. 1-ARC-5 Xmtr. chematic. Complete kit..... **$2.75**

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only one contact in each country. That's too bad, Doug, but give them both barrels next year. He did work Zone 23 during the contest, however.

We have a new GM we would like to welcome into the Honor Roll; this one is GM3CSM. He says it is about time more GMs were getting in there, and, accordingtly, he has given zone and country log forms to GM6MD, 6MS, and 8CH. Ian then goes on to say that he feels some of us should QRP to 150 watts. And, being Scotch (and fond of it, he says), it should appeal to all, as a lot of cash would be saved on the "juice" account.

OK1AW has worked *C8LY* in Zone 23, but, as yet, has not received a card. Well, let's keep our fingers crossed for Alois. Yep, he was on in the *CQ* contest, but said he didn't have much luck due to his very QRP.

If any of you fellows happen to work *ZP1X*, he was none other than W7LUK from Phoenix, Arizona. No, he didn't operate from Phoenix, but he did operate from the ship Ypora in Paraguay. It seems that when Stan left Los Angeles for Asuncion, Paraguay, he arranged with the Paraguayan Minister of War, who was in Los Angeles, to use the call ZP1X during the trip. This was in connection with the delivering of four ships to the Paraguay Republic to be used in merchant service. When he arrived in Asuncion, he found the administration had been changed, and the Minister of War was on the outside. Naturally, ZP1X, at this point, was illegal in Paraguay, and Stan came within a whisker of losing all his radio gear aboard ship. However, it all came out O.K., as certain people intervened, and he saved his equipment. Stan was treated to a rather rare occasion, when, after delivering the ships, there immediately followed a two-day revolution in Asuncion that would make your hair stand on end. They got five-inchers in their hotel more than a few times. All in all, he felt very lucky when he finally caught a flying boat for Buenos Aires.

The Radio Club d'Haiti has been formed with the aim of developing better amateur activities in Haiti, as well as better understanding between Haitian hams and those in other countries. The president is HH2X.

KH6PY says his ham activity will probably slow down a bit now, as the fourth harmonic arrived on November 30. Being a boy, Jack is figuring on dragging out a code manual any day now. Oh, yes, everyone is doing fine, including the OM.

A couple of months ago, I thought there was something familiar about the call W4FIR when he wrote to say he was handling the QSLs for *EP2B*. It later dawned on me that he was chief engineer for National Airlines in Jacksonville, and that is where we met about five years ago. Don is now with Eastern Airlines in Miami, and says there are over 100 hams within the company. A few of them are W4CD, W4FWI, and W4FPK. Having met all four of them, you can take my word for it that they present rather a rugged quartet. They have what they call the Silver Liner Net, every Tuesday night at 8:00 p.m. on 7220 kc. Hmmmmm . . . I'll have to turn my verticle dipole in that direction some time.

It is not often that we get thanked for anything, but W9VW took time enough to drop the

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DM-21—Dynamotor: Part of BC-312 and BC-314. 14v in, 235v, 100 ma out _____ **2.47**

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PE-206—Inverter unit, rotary converted, 28v. in, 80V at 500VA, 800 cy. out. FOB Chicago only _____ **3.95**

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DM-53—Dynamotor used with the BC-733. 24v. in 240v., 60ma out. New _____ **2.95**

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New, FOB Chicago only _____ **24.95**
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Frequency 418-462 mc. FM with 14 tubes including 3- 12SJ7, 4- 12SH7, 2- 12H6, 1- VR150, 2- 955, 2-9004. 24v Dynamotor, used, in working condition _____ **$7.95**

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Hi-Fi. Used in Scott-made Navy receiver. Fully potted. Pri. 5000 ohms, output secondary 600 ohms CT, inverse feedback sec. 60 ohms CT. ONLY _____ **$1.49**

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Glide path receiver. Crystal control of local oscillator, 332-335MC, complete with relays, 7- 6AJ5, 1-12SR7, 2- 12SN7, 1- 28D7 and 3 xtals: 6497 KC, 6522 KC, 6547 KC. 90 cyc. band pass and 150 cyc. band pass filters, excellent for making an intermodulation checker. Beautiful cabinet and chassis as foundation for many interesting experimental and construction projects. Broad pass band on 20.7 MC. IF's ideal for television. Schematic furnished. Used, excellent. Only _____ **$6.45**
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New, FOB Chicago only _____ **$9.95**

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Sturdy, highest quality telephone at less than price of a better-class toy. With ringer. Requires only two flashlight batteries for each phone and two wires between each phone. Excellent condition. Used. Each _____ **$7.95**

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Suitable for 400 mc citizen band, ideal for UHF experimenters. With director and reflector elements mounted. BRAND NEW. 2 for _____ **$1.49**

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FM transmitter-receiver, crystal controlled, two channels, freq. range 27-38.9 mc, 13 tubes 2 crystals. NEW _____ **$16.95**

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FM transmitter-receiver, crystal controlled, two channels, freq. range 20-27.9 mc. 13 tubes, built-in speaker, dual meter for testing filament and plate circuits. Used, good _____ **$9.95**

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DX committee a line to thank them for the excellent treatment given his W.A.Z. cards while they were in our possession. Honestly, fellows, we really don't try to butcher them too much . . .

In the September column, I mentioned something about *HL1GB* being W2MAD. This should have been W5MAD. As a matter of fact, at this writing, he is located in J5, and hopes to get J5MAD. Bob's XYL is W5MAE and she will be the second op.

ZS2X informs me that *ZS2MI* is back on the continent from Marion Island, and from what he can learn, the new personnel on the island does not include a ham. Hey, Rex . . . how about doing a little missionary work? Apparently, there is a station on the air signing CAR, supposedly in the Nicobar Islands. He told Rex he was with the R.A.F. For full QTH, please QSY to the end of the column . . . as if you didn't know.

- The next appearance of the 1948 DX Marathon will be the final revised results. Awards will be made on the basis of that listing.
- Due to a printer's error, the name of G6ZO and LA7Y were transposed in January W.A.Z. listing. W.A.Z. certificate 82 went to Chris Amundsen, LA7Y, and 83 to Jim Kirk, G6ZO.

W4IYT is acting QSL manager for *EP1J*, and has about 200 cards he would like to get rid of.

Jesse Goldstein, whom you may remember as one of the ops at I6USA, was in town the other day, and among other things, told W6ADP and W6ENV that the station signing *ET1JJ, ET1AA,* and *ET2MW* was one and the same station. The bad news is this . . . the guy was *not* in Ethiopia but in Eritrea. To date, I don't know of anyone receiving cards from him, and it might be that some of you fellows better check your lists, as you may have to "scratch" one.

No Marathon 1949

For the benefit of those who did not see last month's column, we are again repeating, "There will be no DX Marathon in 1949." Remember this, however, that those of you who were in the 1948 DX Marathon up to the very end of the year, please get your revisions and additions in promptly, and we will publish the final tabulations as soon as we can. Most of you fellows, I guess, will be buzzing around getting ready for the first weekend of the ARRL DX contest coming up in February. Sure, I'll be in there trying, too, and maybe by that time I can get the bend out of that 40-meter wire of mine.

Before winding up this little clam bake, I would like to call your attention to the present standings in the Honor Roll. Just take a few minutes and gaze at some of those totals . . . look at how close some of them really are. Just imagine—W6QD only needs about 75 more counrties, and he will be tied with W6VFR. A few more years should do it, although, last month, I didn't even work a W9. Hmmmmm . . . 73.

QTHs

CAR	4000780, AC1 J. Smith, CAR, Nicobar Detachment via SHQ Signals, R.A.F. Changi, Singapore
CR9AG	John J. Alvares, GPO, Macao, Asia
D4 QSL Bureau	c/o M/Sgt. Varney, PMD Eucom, APO 757, New York City

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OUTPUT: 250-0-250 V.A.C. at 60 MA. 24 V.A.C. at .6 amps; 6.3 V.A.C. at .6 amps. Designed for Army surplus Receivers. CH-109.....**$3.00**
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OUTPUT: 24 V.A.C. at 2 amps. CH-111.....**$2.25**
OUTPUT: 2.5 V.A.C. at 10 amps. Center tapped and shielded. Open frame mounting insulated for continuous operation at 5,000 Volts. CH-113.....**$4.20**

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12/24 V. DC	F/No. 19 MARK II	P/S No. 3	9.50
13/26 V. DC	F/BC-645	PE 101	2.95
12/24 V. DC	500 V. 50 MA.	USA/0151	1.95
28 V. DC	F/Comm. Receivers	DM 32	1.95
14 V. DC	230 V. 100 MA	DM 20	3.95
12/24 V. DC	440 V. 200 MA & 220 V. 100 MA	D-104	9.95
28 V. DC	400 Cycle Inverter (Reconditioned)	MC-149 F	12.95

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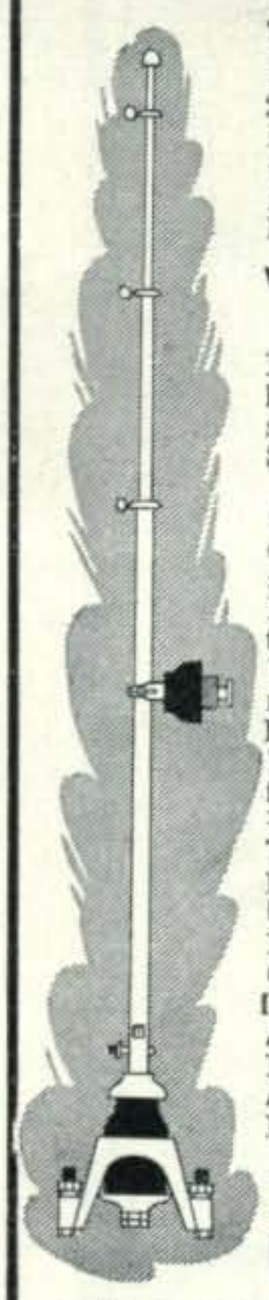

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Primary 110 Volt 60 cycle; 24 volt Sec. 1 amp.....**$1.95**
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SELSYNS: 110 Volt 60 cycle, 78411 Size V.....**$5.95 Pair**
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OUTPUT TRANSFORMER—Pri. 500 ohm; Sec. 6 ohm. Used with TCS equip. to match Output item to speaker. Size: 2⅜" Mtg. Holes. Price .....NEW: **$1.00**
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YU7KK	Oton S. Bernard, Box 137 P.C., Trieste, Europe

V.H.F. — U.H.F.

(from page 40)

and W7QLZ report peak trans-continental MUF as 46.5 mc. Considerable solar static throughout the day as reported by W9ALU and W8QYD.

Nov. 24—Trans-continental MUF was about 49.6 mc at 1415 EST. W5ML reports 44 mc MUF to southeast. XE1KE again heard HCJB around 1830 EST. Then worked HC2OT at 1910 EST. Short sporadic-E opening during the early evening from WØ to W8 as reported by WØINI and W8QYD.

Nov. 25—W7QLZ thought 6 meters was open at about 1245 EST for F2, but no stations were heard. W9ALU heard a burst of c.w. on 50.5 mc at 2141 EST.

Nov. 26—W7QLZ again thought 6 meters was open as the FM stations up to 49.5 mc were coming through. W7HEA only heard to 45.1 mc and W5ML to 43.5 mc.

Nov. 27—Beween 0944 and 1116 EST, HC2OT worked W5EEX, W5FSC, W5AFG, W5JLY, W5ZZF, W5VY, W5LBG, XE1KE and heard W1AEP. Was also heard by W9ALU. W5FSC worked W5VY and W5JLY on scatter-rebound with the beam south. Trans-continental MUF only peaked 45.0 mc.

Nov. 28—W9ALU heard bursting signal from W2AMJ at 1150 EST. Also testing c.w. at 1210 EST. Nothing else reported.

Nov. 29—30—MUF about 40 mc, nothing else reported.

Dec. 1—W9NJT heard the harmonic of NSS, no time given, but in the 6-meter band.

Dec. 2—Quiet.

Dec. 3—W9ALU heard a weak c-w signal on 50.1 at 1019 EST. Otherwise quiet.

Dec. 4—Quiet.

Dec. 5—Short sporadic-E opening from about 1930 to 2010 EST. Mostly W4EID and W4GYO to the W8 and W9 areas, although W5ML heard a weak W4 working (?) W5JLY.

Dec. 6—Quiet.

Dec. 7—Scattered sporadic-E openings from W1 to W4 in the afternoon and W9 to W5 in the evening. Very erratic. Sudden severe ionosphere storm begins.

Dec. 8—MUF to 41.0 mc, otherwise very quiet.

Dec. 9—Excellent opening from the eastern W7 area to W9 from 1703 until 1850 MST. W7JRG supported most of western end activity.

Dec. 10—11—Quiet.

Dec. 12—XE1KE worked HC2OT at 1045 EST with excellent signals both ways. At 1434 EST Ferrell heard VE1QY call CQ. Band opened from W8, W9 and WØ to W1, W2 and W3

50 MC HONOR ROLL

CALL	S.	C.	CALL	S.	C.	CALL	S.	C.	CALL	S.	C.	CALL	S.	C.
W9ZHB	48	6	W3CIR/1	42	5	W5FSC	37	8	W6AMD	34	3	W9MBL	28	2
WØZJB	48	4	WØINI	42	3	W2RLV	37	6	W7JPA	34	2	W1AF	27	5
WØNFM	47	5	W7HEA	42	3	W5JTI	37	5	W7JRG	27	2	W7ACD	27	2
W9QUV	47	4	WØKPQ	42	2	W4EQR	37	4	W1HDQ	33	6	W7JRG	27	2
W6UXN	47	3	W5ML	41	3	W5VV	37	4	W6PUZ	33	4	W5LBG	26	3
WØUSI	47	3	W8ZVY	40	7	W6IWS	37	3	W4WMI/4	33	3	WØDNW	26	2
W6WNN	47	3	W4QN	40	4	W6OVK	37	3	W4DRZ	33	3	WØYKX	26	2
W4GJO	46	4	W1LLL	40	4	W9NJT	37	3	W7KAD	33	3	W7BOC	26	2
W9DWU	46	3	W4FBH	40	3	W7DYD	37	2	W3MKL	33	2	WØUEL	26	2
WØDZM	46	3	WØSV	40	2	W9UNS	37	2	W1CLH	32	3	W6NAW	26	2
WØBJV	46	3	W4GIY	40	2	W7FDJ	36	3	W5WX	32	3	VE1QZ	24	6
W9ZHL	45	6	W5JLY	39	10	W3OR	35	6	W6FPV	31	3	W5LIU	24	3
W1CLS	45	5	W1CGY	39	6	W1GJZ	35	5	W4HVV	30	2	G5BY	24	19
W7BQX	45	4	W6ANN	39	3	W6BPT	35	4	WØDER	30	2	XE1KE	23	6
W9PK	45	3	WØDKS	39	3	W1JLK	35	4	W7QLZ	29	4	W9AB	23	4
W8NSS	45	3	WØYSJ	39	2	W9VZP	35	4	W4FNR	29	3	W8YLS	22	3
W7ERA	44	4	W4GMP	39	2	W9UIA	35	3	W8MVG	29	6	W7CTY	22	2
W7FFE	44	4	W2AMJ	38	6	W5HF	35	3	W5ELL	29	2	W8LBH	21	2
WØQIN	44	4	W5FRD	38	6	W5HTZ	35	3	VE1QY	28	4	W5HVP	20	3
W8QYD	44	4	W2IDZ	38	5	W5HLD	35	3	W9FKI	28	4	VE7NM	17	2
W5VY	43	11	W3OJU	38	5	W2BYM	34	4	W4FQL	28	3	VE7CN	15	2
W5AJG	43	8	W4FID	38	4	W3RUE	34	3	W1ATP	28	3	W8EP	14	2
W4EQM	43	3	W9RQM	38	2	WØJHS	34	3	W5ESZ	28	2	KH6PP	5	7
W9ALU	42	5												

from 1515 to 1600 EST. W4 and W5 to W1, W2, W3 and VE3 from 1550 to 1900 EST. Long opening but conditions erratic with little short skip noted on 10 meters.

Dec. 13 to Dec. 20, inclusive—No openings reported at this writing. Conditions were generally down throughout the country.

Dec. 21—Fair evening opening from western WØ to W5.

Dec. 22—Unusually short skip (about 450 miles) from WØBJV and WØCJS to WØZJB and WØINI between 1850 and 2010 CST. Good opening W5 to W8, W9 and WØ from 1945 to 2210 EST.

144-mc Experimenters' Delight

About a year ago, W5DFU, Tulsa, Okla., got one of those magnificent urges to build a 2-meter beam to make even the super-beam East Coast

gang sit up and take notice. Apparently somewhat more ambitious than many of us, this dream beam came true and the result is shown at the bottom of page 39.

The basic beam is 48 elements, consisting of 16 three-element sections. The reflectors are spaced 0.2 wave and the directors 0.15 wavelength. Each driven element is fed with a 165-ohm Q-section from a 300-ohm line. The entire array is of dural tubing construction, the main booms being 2¼-inch tubes, the secondary booms ½-inch tubes and the elements ⅜-inch tubing.

To minimize wobbling of the elements in high winds, each of the in-line elements are coupled to the ones above and below with polystyrene rods. So far the array has withstood a gale with 85 mph gusts, thus speaking well for its rugged construction. The actual weight of the beam is about that of a 3-element 10-meter parasitic array.

In order not to be caught short in the midst of the polarization arguments, the array can be rotated around a horizontal axis at the top of the mast. This effects an easy change in the polarization of the emitted wave. If this alone were not enough, the entire array can be raised and lowered about 18 feet. The excess plywood mast drops into a hole in the ground. The raising and lowering operation is controlled by a surplus bomb bay winch.

Preliminary checks show that the power gain is about 100 over the simple dipole radiator. Although the best DX has only been 45 miles, W5DFU is on nightly looking carefully in each direction for any possible calls. How about you boys in Oklahoma City, Enid, Wichita and Joplin trying to arrange schedules? There can be little doubt that this antenna offers any number of possibly very important and interesting tests. In addition to polarization checks, it probably will be found that small changes in the height of the array above ground will produce very noticeable changes in the angle of radiation, and hence signal strengths. Probably, also, a day-to-day variation will be found as the height of the steepest atmospheric gradient varies.

144-mc Here and There

Hilton, G5BY, Bolt Tail, S. Devon, reports a contact with ON4AG, near Antwerp, Belgium, on 145 mc. This is a distance of about 350 miles. Since Belgium had never been worked on either 5 or 6 meters this brings the above 50-mc country total to an even 20. Although the British boys have lost their 5 and 6-meter bands (due to television) the move to 2 meters has been thorougly enjoyed by everyone. Since most of the DX paths from England reach out across bodies of water the DX situation is much better than anything we have here in the States. More power to you boys; let's hear how you make out.

After a long seige of just talking to themselves, the Roanoke, Va., gang began hearing 2-meter stations from the south on Dec. 2. On the 9th, W4KQC heard W4DKG in Asheboro, N.C. While this may not stack up as DX to the flatlanders, W4CA says it is pretty good for a location surrounded by mountains. Now that ice has been broken the gang is hepped up and ready to take on any schedules.

Around Columbus, Ohio, W8WRN and W8BAX seem to be the only ones showing con-

tinuous activity. Ken, W8WRN, agrees with the idea put forth by the Lake Erie gang last month on holding roundtables several times a week. In the meantime the schedules with W9UCH have been running off in good shape . . . Omaha-Council Bluffs activity has increased with WØQXR, WØLRD, WØFBK, WØCCY and WØJRY all going strong. WØCCY has a nice stacked 10-element beam which we want to describe next month. Contact has been with WØWHZ in Red Oak, Iowa, some 50 miles to the south. WØJRY is sporting a new RME 2-11 Compact and a 12-element H array atop his *dreamy* 10-meter beam. Frequencies are pretty well set around 144.9 and 146.0 mc.

W7JRG, Sheridan, Wyo., has eeked out five grid mills to an 829B outboard and so is running about 90 watts on 144 mc. A converter is under construction having improved sensitivity . . .In speaking of receivers W2RPZ (who's that?) has a new commercial v-h-f job which surprised him and everyone on first trials. Says if you can't read them on super-regen try straight regen. Guess the receiver!

Stepping up to 420 mc for the time being, W7QLZ says the 435 mc net around Phoenix, Ariz., has been going great guns. Considerable antenna experimenting is the current project, with the folded dipole and square corner reflector plus a ground screen 0.5 wavelength below the array giving the best results. Roundtables each evening at 2000 MST and Sundays at 1500 MCT. Presently active include; W7KWO, W7MIW, W7MIV, W7KTJ, W7QLZ and WØLFA/7.

It has been quite some time seen last hearing from W1BBM, but Bernie has been keeping busy by confining his activity above 3500 mc. Bernie would like to hear from anyone interested in building gear or has gear that would like to run some tests this coming summer. It has been found that a 2C40 as a cavity oscillator does fairly nicely even on 3500 mc. Details are probably available to anyone contacting Bernie directly.

Well, in closing this column we feel it is about time to start thinking seriously about 2 and 6-meter activity for the coming summer. Don't forget, *CQ* is in the market for good ideas and pays for them with cold cash. If you think you have something, just drop us a line and describe it. No need to write a fancy article right off the bat. Keep this in mind as it helps others to get interested and get on the air.

144-Mc Honor Roll

	States	Dist.		States	Dist.
W8UKS	15	6	W3GV	8	5
W8WJC	14	6	W4FBJ	7	5
W8WXV	13	5	W8PYY	7	4
WØNFM	12	4	W9PK	7	4
W1JFF	12	4	WØBZE	6	3
W1IZY	12	4	WØGOK	6	3
W1PIV	12	4	W8DRZ	5	4
W3KUX	12	5	WØWG	5	4
W3RUE	11	5	WØHXY	4	2
W9BBU	11	5	WØJHS	4	2
W3GKP	10	5	WØRNC	4	2
WØIFB	9	6	WØKPQ	3	2
W9AB	9	5	WØDDX	3	2
W9ZHB	9	4	WØMZH	3	2
W2JPA	9	4	WØSV	2	1
W1CTW	9	3	W2RPZ	2	1
W9LWE	8	5	W5FSC	2	1
W1CTW	7	2	WØZJB	1	2
W9IPO	8	5			

MILITARY AMATEUR RADIO SYSTEM

(*from page 13*)

only for its components, although some complete transmitters and receivers will be made available to active and reserve units. Supply procedures are outlined in the joint directive and the MARS monthly bulletin will carry lists of available equipment.

In addition to carrying lists of equipment available for MARS stations, the bulletin, which will be issued monthly to its members, will contain operating notes on its nets, new ideas on modification of GI gear for amateur operation, as well as technical articles. It will have a forum section where members can air their gripes or make suggestions. Direct communication with Chief, MARS, USAF 4 CIO67 and Chief, MARS, Army, Sigca-6, 3 B 337, Pentagon Building, Washington 25, D.C. is authorized.

Brigadier General Tom C. Rives, present chief of Electronics Subdivision of the Engineering Division, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio, founded the old AARS in 1925 when he was a Captain in the Signal Corps. General Rives believes that members of MARS can be of great assistance in prosecuting the radio research and development program of the Air Force and proposes to ask for their help on unclassified projects such as propagation studies, ultra-high frequency communications problem, etc. From the great number of amateurs interested in radio research and development, the General anticipates many worth while contributions to the art. It is hoped some method can be worked out to suitably award those members of MARS whose work is of outstanding merit.

Distinctive Call Signs

MARS call signs will carry an "A" prefix for Army and an "AF" prefix for Air Force with the numerals following the F.C.C. districting. Thus, K4AF becomes AF4AF when operating on MARS frequencies or W9USA becomes A9USA when it enters the regular Army net.

Allocation of blocks of "K" calls has been made for MARS stations with "K" numeral FAA through FZZ for the Air Force and K numeral WAA through WZZ for the Army. These calls can be assigned to individual amateur stations for use in the ham bands and details on how to obtain them are being formulated. To date these calls have been assigned only to stations making applications of F.C.C. form 602.

Membership in MARS is open to any individual in the military service, active Organized Reserve Corps, National Guard or Officer's Reserve Corps (Air Force, Army, Navy) who possesses a valid amateur radio license issued by the Federal Communications Commission.

Applications for membership in MARS will be similar for Air Force and Army participants

with the exception that in certain Air Force Major Commands (FEAF, USAFE, SAC, AMC, ATC and ATRC) applications will follow command channels, addressed to the Commanding General of the particular command to which the applicant is attached, marked to the attention: Chief, MARS.

In all other Air Force units in the ZI and in the Army nets the applicant will be governed by his geographical location, sending his application to the Commanding General of the Army Area or the Commanding General of the numbered Air Force which is contiguous to the Army Area, in which he lives. The command to which the application should be sent is listed, by states, in the appendix.

Upon receipt of an inquiry for enrollment in MARS, the Signal Officer of the Army Area or the MARS Air Force Director will forward application blanks to the applicant. When these are processed, a MARS call sign and net allocation will be made at the proper command level and official certification of membership in the Military Amateur Radio System issued.

Think hard about it OM—if the siren sounds in your town tonight, tomorrow, next week—will you be ready?

Army Headquarters for MARS Applications

Amateurs residing in New York, Vermont, New Hampshire, Maine, Massachusetts, Connecticut, New Jersey, Delaware should apply to:
First Army Headquarters
Commanding General, First Army
Governor's Island
New York, New York, Attn: Signal Officer —or:
Commanding General
Headquarters, First Air Force
Fort Slocum, New York, Attn: MARS, Air Force Director

Amateurs whose residence is in the following states: Pennsylvania, Indiana, Ohio, Kentucky, West Virginia, Maryland, Virginia and the District of Columbia, should send their applications to:
Second Army Headquarters
Commanding General, Second Army
Fort George G. Meade, Maryland, Attn: Signal Officer —or:
Commanding General, Headquarters 14th Air Force
Langley Air Force Base
Langley Field, Virginia, Attn: MARS, Air Force Director

If you live in Tennessee, North Carolina, South Carolina, Mississippi, Alabama, Georgia or Florida and want a MARS ticket, you should apply to:
Third Army Headquarters
Commanding General, Third Army
Fort McPherson, Georgia, Attn: Signal Officer —or:
Commanding General, 9th Air Force
Greenville Air Force Base
Greenville, North Carolina, Attn: MARS, Air Force Director

Those who live in Oklahoma, Texas, New Mexico, Arkansas or Louisiana will send their applications to:
Fourth Army Headquarters
Commanding General, Fourth Army
San Antonio, Texas, Attn: Signal Officer —or:
Commanding General, 12th Air Force
Brooks Air Force Base
San Antonio, Texas, Attn: MARS Air Force Director

Amateurs who reside in Wyoming, Colorado, Kansas, Nebraska, Missouri, Iowa, North Dakota, South Dakota, Minnesota, Wisconsin or Illinois should send their applications to:
Fifth Army Headquarters
Commanding General, Fifth Army
Chicago, Illinois. Attn: Signal Officer —or:
Commanding General, 10th Air Force
Fort Benjamin Harrison
Indianapolis, Indiana, Attn: MARS Air Force Director

(*Continued on page 74*)

Amateurs who are residents of Washington, Oregon, California, Nevada, Arizona, Idaho, Montana or Utah should send their applications to:
Sixth Army Headquarters
Commanding General, Sixth Army
San Francisco, Calif, Attn: Signal Officer —or:
Commanding General, Fourth Air Force
Hamilton Air Force Base
Hamilton Field, Calif, Attn: MARS Air Force Director

DX PREDICTIONS

(*from page 36*)

West Coast to Middle East

40 meters: A fair opening from 1745 to 2015 PST. On ionospherically quiet days this is the best DX frequency for this path. *20 meters*: Extensive but weak opening from 0700 to 1230 PST. Phones way down, c-w only. *10 meters*: Possible erratic opening around 0830 PST. Not dependable, but phones good whenever the band opens.

West Coast to Europe

40 meters: Only on ionospherically quiet days, an opening with fair signals from 1800 to 2215 PST. *20 meters*: Split opening, c-w from 0545 to 0730 PST and 1200 to 1415 PST. Phones possibly during latter opening, but very weak and unsteady. *10 meters*: On quiet days, a good strong opening starting about 0845 PST. Closing down after 1100 PST.

West Coast to South Africa

40 meters: This opening is still limited by atmospheric noise at far end of the path. Peak time probably 1815 to 2015 PST. Some signals may be heard until after 2200 PST. *20 meters*: Good phone opening from 1745 to 2015 PST. C-W signals from 1345 to possibly 2130 PST. *10 meters*: Mostly c-w from 0845 PST. Phones possibly from 1015 to fadeout around 1200 PST. Fairly regular opening.

West Coast to Deep South America

40 meters: Signals start to come in and build up after 1600 PST. Band fades out after 0100 PST the following morning. Peak period 2100 to 2330 PST. *20 meters*: Extensive opening from 1445 PST until 0330 PST the following morning. Peak time probably just before midnight. *10 meters*: Excellent extensive opening from 0700 until 1830 PST. Peak period 1530 until closing.

West Coast to Southeastern Asia

40 meters: Unsteady, but possible opening from 0415 to 0615 PST. High absorption levels and atmospheric noise. *20 meters*: Band opens rather suddenly between 0800 and 0845 PST with good signal strengths. Signals slowly drop into noise level after 0930 PST. Possibly a few scattered c-w signals around midnight. *10 meters*: Consistent opening from 1545 PST until 1800 PST. Phones very good.

MAURITIUS

(*from page 35*)

hundred feet or so separating each, the whole strung along some previously determined line. The deer are then driven toward them by boys with dogs, and the rest is easy—at least for those who are good shots!

As this article is written for a radio magazine it might be as well to mention radio sometime or

other before I finish! Conditions in Mauritius appear to be very similar to those found in ZS land. except the bands seem to peak an hour or so earlier, which, of course, is only natural. The only major difference found was in the case of South America. Here in ZS they are very easy to work almost the year round, but on Mauritius, they are hard to get. Static makes the low frequency bands of very little use. With the cooperation of my friendVQ 8AF I kept a weekly sked with my own station, operated by ZS2DQ. These were thrilling occasions, and not often experienced by hams: hearing what *their* own rigs sound like over two thousand miles away! VQ8AF uses a converted all-wave bc receiver for his ham work, and his rig ends up in an 807 with 50 watts input. He keeps frequent and regular skeds with VQ8AB on the Chagos Islands, and a weekly one with me, so does not get very much free time for DXing. He used to be very keen on photography, and showed me some fine photos he had taken. He also keeps a complete record of all the cyclones that have hit the island for about the last 23 years, showing their complete life cycle in graph form. He is unmarried and works as bookkeeper for a firm of chemists.

VQ8AD is a maintenance engineer at one of the power stations, and is very keen on DX. He uses a HRO receiver, and his rig is an FB semi-remote controlled affair running at about 100 watts. He is married, and has three fine youngsters. To these fine hams go my grateful thanks for their kindness and hospitality.

Well OMs, that's my story. I'm sorry there's not much about radio in it, but believe me, my time was so fully occupied in other ways that I gave DXing almost a complete rest. After all, chasing for DXCC and then WAZ has its limits—a guy must rest sometime! But I still remember those huge grounds, and the uninterrupted view at Floreal—something keeps telling me a rhombic would complete the picture! A VQ8 call has a nice rhythm about it too. Ah, well, who knows? Someday maybe . . .

THE IMPROVED DIPPER

(*from page 19*)

and, with the absoprtion meter loosely coupled to the Dipper coil, adjust the absorption meter to the point where the Dipper's meter shows a marked dip. This then indicates the highest frequency attainable with the particular coil in use. The same procedure is followed for checking the low frequency end of the coil with the Dipper capacitor set at maximum. Then, for point to point calibration, the absorption meter is set at the desired frequency and the Dipper capacitor rotated until dip is indicated. The scale should be marked accordingly, using a hard sharp pencil and the special calibrating dial. The marker points may be inked after calibration. As mentioned previously, the grid current will vary gradually over each range; however, resonance is indicated only at the point where a pronounced dip occurs.

When calibrating with a receiver it is merely necessary to turn on the receiver beat oscillator

and tune in the Dipper signal. Care must be taken so as not to become confused with harmonics or receiver images. Calibration points are marked according to the Dipper beat heard on the receiver, instead of observing the grid meter dip.

The instrument may be checked against itself in the following manner: Set the Dipper at 1.75 mc and tune in the second harmonic at 3.5 mc. Then, with the receiver left tuned at this point, set the Dipper at 3.5 mc as indicated on its scale. The signal should then be heard on the receiver without any further tuning. This should be repeated at 7 mc, etc., right down the line. If WWV can not be heard at the higher frequencies, the instrument may be set at a lower WWV frequency and then checked on the harmonics in the above manner.

If an absorption meter or receiver is not available for use at the highest frequencies, Lecher wires may be set up and the same proceedure followed as with the absorption meter. For general calibration a signal generator may be employed by listening for the generator beat on a pair of phones plugged into the Dipper. With the lowest frequency coil there is about a 2% error with the phones plugged in due to the addition of the 50,000-ohm resistor in the grid return. On the other ranges, the error is negligible and may be discounted.

It must be remembered that the accuracy of the Dipper can not be any greater than that of the calibration source and the care excercised during calibration. When employing the Dipper, greatest accuracy is realized when the probe coil is placed as far away as possible from other metal objects and when the coupling to the circuit under test is as small as permissible while obtaining an indication of dip.

UPPER ATMOSPHERE RESEARCH

(from page 27)

Except for a few other isolated instances of skip beyond 1100 miles (e.g., W4GJO, Orlando, Florida to WØZJB/1, Holliston, Mass., May 9, 1103 miles) the largest group of skip distances fall within the limits 650 to 900 miles. For the assumed layer height of 120 km this works out to angles of radiation between 5° and 9½° above the horizon. Over the shortest paths (e.g., W2RLV, Honeoye Falls, N.Y. to W4JBF, Covington, Ky., January 4) of between 425 and 475 miles the highest usable angle would be about 16°. This shows that for normal sporadic-E work it is better to concentrate most of the radiated power below an angle of 10°.

It is interesting to speculate on the cause of a few instances of extremely short skip on January 4 (W3OR to W8TOB—381 miles, W8ZVY to W3BKB—397 miles, etc.) which required densities of the order of 36 x 10^5. These cases when plotted according to the normal reflection law all had points of incidence falling within a small area at the heart of the sporadic-E cloud. This position was overhead western Pennsylvania. It might be conjectured that we were witnessing the birth of a sporadic-E cloud since we have not received any reports of

contacts earlier than 0952 EST. Had this cloud appeared further to the east than its first plotted position in *Fig. 2* we would have expected reports of W1s working into northwestern W4 and lower W8 prior to 0945 EST. While this is an unfavorable time of day (although it was a Sunday morning) it seems strange that twelve stations simultaneously came on the air between 1000 and 1005 EST. A more likely explanation appears to lean towards the birth hypothesis.

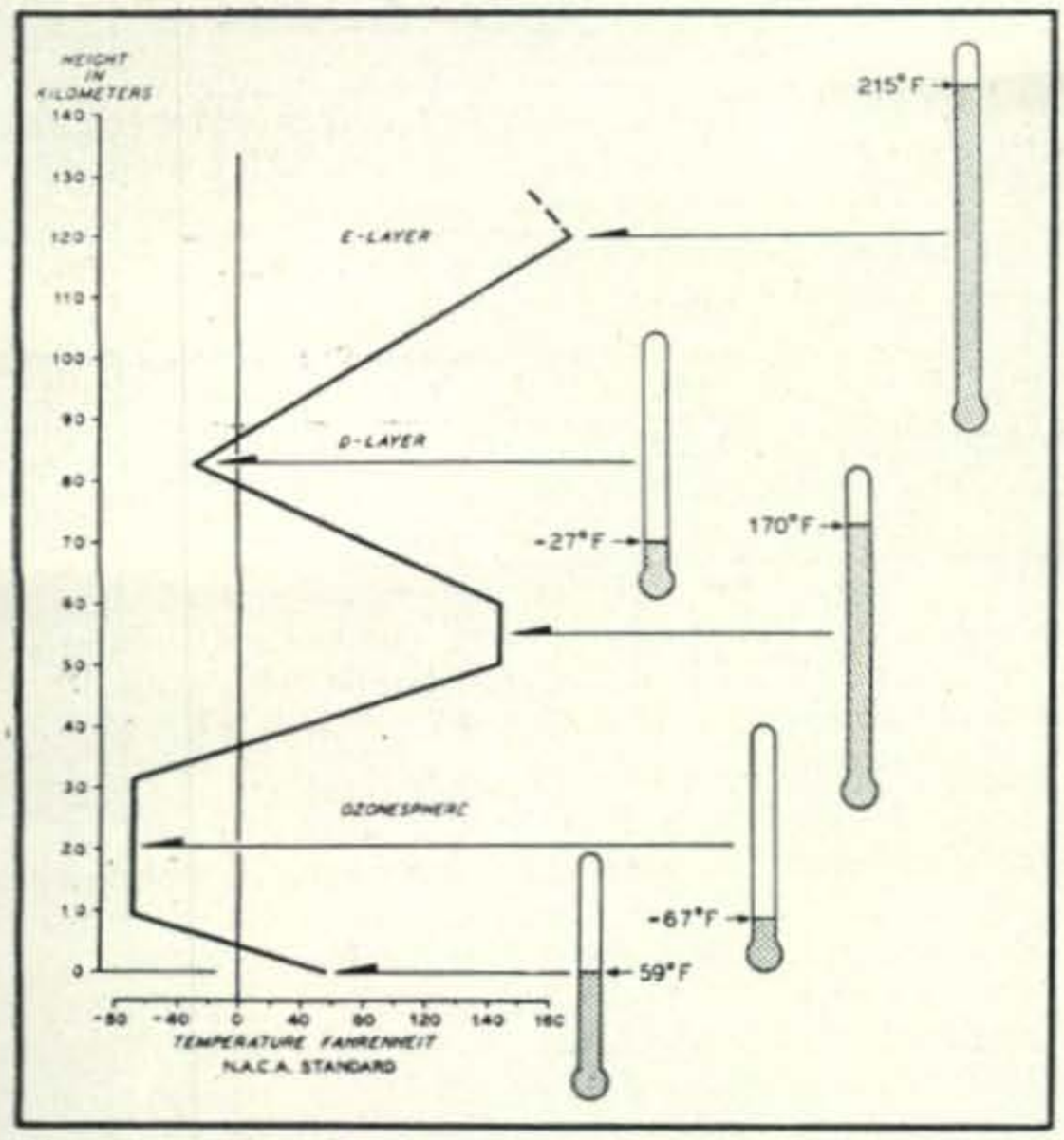


Fig. 4. Theoretical temperatures of the upper atmosphere as used by aeronautical engineers. At the level of the E-region the temperature is above the boiling point of water at sealevel. Because of the extremely low pressure and density a person would scorch immediately.

From our preliminary investigation it is possible to draw several purely tentative conclusions. The meteorological implications show that the generalized winter drift in the E-region to be to the west and southwest. During the late spring and early summer morning the drift is north and northwest. Whether this qualitative explanation will stand the test of further investigation remains to be seen. and for 6-meter amateur operators to prove.

LAMANT OF AN MYL

(*from page 24*)

gin mill, or gambling, or even running around with other women!" Maybe they are right, but until a gal has had actual competition from a radio set, she'll never realize what a lucky wife she was before that squealing, humming, backtalking demon of a rival entered her little lovenest. The aforementioned pitfalls may be overcome by talking, coaxing, petting, or any number of other methods, but not so with radio.

My audio is starting to fade, now that I've gotten all these little things off my chest, so I guess I'll say 73. This is the MYL of W2—off and clear!"

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. 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.

QSL's, SWL's. MADE the way you want them. Samples? W9BHV QSL Factory, 857 Burlington, Frankfort, Indiana.

WANTED: Teletype 1/40th HP synchronous motor. W6ITH, Moraga, Calif.

BC-375 TRANSMITTER, two sets tubes, seven tuning units, plugs, antenna tuner, instruction book, all new, $50; eight SCR-274N tuning cables, 50¢ each; 28 v. d-c 4 a. selenium power supply, filtered, chassis mounted, $20; BC-454 and BC-455 receivers in rack with dynamotors and plugs, $11; BC-453 190-550 kc, $10; new PE-103, spare brushes, output plug, $8.50. Fred Humke, WØHRQ, 1527½ Central Avenue, Dubuque, Iowa.

QSLs QUALITY CARDS priced right. Samples. W9UTL, 1768 Fruitdale, Indianapolis, Ind.

10-METER 3-ELEMENT BEAMS—$19.50. Send card for free information. Riverside Tool Co., Box 87, Riverside, Illinois.

PERSONALIZED book matches . . . call letters or name and address . . . samples with prices. Miss Amanda Martin, Box 1123, Rochester 3, N. Y.

QSL CARDS: New, original, exciting. New modern designs exclusive with us from one to multiple color cards. Your own design reproduced at small additional charge. Our prices are the most reasonable, consistent with quality work. Fast service. Send for free samples of price list. The W2PEO Press, 24 Villa Road, Larchmont, N. Y.

AMATEUR RADIO LICENSES. Complete theory preparation for passing amateur radio examinations. Home study and resident courses. American Radio Institute, 101 West 63rd Street, New York City.

QSLs. Samples for stamp. Henry L. Carter, Jr., W2RSW, 747 S. Plymouth, Rochester 8, N. Y.

WANTED: Aircraft Radios; BC-348, AN ART-13, RTA-1B, AN/APN-9, R5A/ARN-7, AN/ARC-1, AN/ARC-3, SCR-718, BC-788-C, I-152, MN-26-C, Tests set with TS or I prefix. State quanity, condition and best price first letter. HI-MU Electronics, Box 105, New Haven, Conn.

QSLs, SWLs. Quality cards. W5FAY Press, 6118 Goliad, Dallas, Texas.

SELL - RADIO MAGAZINES: QST, Jan. '25 to Dec. '45, $35.00; Radio News, June '22 to Oct. '43; Service, Sept. '32 to Dec. '46; Radio Engineering, Sept. '22 to June '32; Popular Radio, May '22 to May '28; Radio Broadcast, June '22 to Dec. '29; Radio-Craft, Nov. '29 to Sept. '42; all complete. Radio, misc. '23 to July '42; '29 and '30 complete. Miscellaneous others, send for list, WØREG, Carl Fastje, Denison, Iowa.

NEW NATIONAL HFS and power supply, $125. Converted BC1068A, $35. GP-7 with tubes and 80 meter tuning unit, new condition, not converted, $30. New York City area only. W2PHF.

WHY WAIT? Join N.A.R.C. today. The best $2.00 investment ever made for the good of the amateur. Send your application with handle, QTH and class of license to: National Amateur Radio Council, Inc., 23 Main Street, Champaign, Illinois.

BC459A WITH 750 OR 600 volt power supply, no surplus, $50. express paid, or best offer. Elkins, % Star, Elizabethton, Tenn.

VX101 JR. BANDSWITCHING VFO 80, 40, 20 meters, $45. Ralph Cabanillas, Jr., Room 803, 9 Maiden Lane, New York, N. Y.

FOR SALE: BC603, BC604 transmitter-receiver with dynamotors, $40. George Ashley, 22 Lynacres, Fayetteville, N. Y.

FOR SALE: BC-312 with ac supply, excellent condition, prefer buyer Philadelphia area. Price $45. W. T. Corl, W3OPR, 1503 Hickory Lane, Rosemont, Penna., Telephone Bryn Mawr 0907-R.

HALLICRAFTERS PORTABLE amateur receiver, S39. Very good condition. $70 or photographic equipment. W7TSZ, Box 152, Seligman, Arizona.

MUST SELL: 150 watt cw rig with antenna network in two foot rack. Finest components. Four meters, 6L6, 807, PP 807's. All bands with B & W coils. First money order for $100. W5LVX, 2020 Pocahontas St., Baton Rouge, La.

BC348-P RECEIVER, brand new, with 110 volt ac power, separated RF and AF gain controls, phasing of crystal filter added, extra stage audio added, with LS-3 speaker, manual, $75. Hallicrafters SX-28 receiver re-aligned, re-tubed, excellent condition throughout, $125. BC453A command type Q5-er receiver unconverted, $12.50. BC459A transmitter brand new, $15. Johnson condenser V200DD70, $8. Echophone receiver EC-1A, $22.50. Cased compact RCA power transformer, 700 volts 300 milliamps, DC output $8. Satisfaction guaranteed. Howard O. Severeid, W9DPL, 2924 Station St., Indianapolis, Ind.

BARGAINS: New and reconditioned Collins, National, Hallicrafters, Hammarlund, RME, Millen, Sonar, Meissner, Meck, receivers, transmitters, etc. Reconditioned S38 $35.00, S49 $59.00, S53 $59.00, NC46 $59.00, DB20 $29.00, VHF 152 $59.00, RME-45 $99.00, HQ129X $139.00, Meck T60 $89.00, DB-22A, HF-10-20, SX43, SX42, SX28A, HT18, HT9, BC610, NC173, NC183, HRO7, other receivers, transmitters, VFOs. Easy terms. Shipped on trial. List free. Henry Radio, Butler, Missouri.

FOR SALE: Meissner 150-B with or without Meissner model EX signal shifter. Band switching. All bands 10-11, 15, 20, 40, 80. Crystal mike input. Price with shifter, $285; less shifter, $225. Set spare tubes included. W5LCZ, General Delivery, Benton, Arkansas.

COMMAND SETS: ARC-5/274N transmitters, 3-4 mc. new $14.95, used $9.95; 7-9.1 mc. new $12.95, used $8.95; 2-3 mc., 4-5.3 mc. or 5.3-7 mc. new $9.95, used $6.95. Receivers, 190-550 kc., 520-1500 kc. or 1.5-3 mc. new $15.95, used $12.95; 3-6 or 6-9.1 mc. new $9.95, used $7.95. Splines 25c, crank knobs 75c. Used sets in excellent condition—satisfaction guaranteed. W5EAL, 1110 Winbern, Houston 4, Texas.

Note: In W5EAL's November classified ad a line of copy was inadvertently omitted so that the ad incorrectly read "Receivers, 190-550 kc, new $9.95, used $7.95." The correct advertisemnt appears immediately above this notice.

BARGAINS: New and used transmitters, receivers, parts. 10 meter ac beam rotator $23.97; new 150 watt phone $199.00; 60 watt phone $99.00; Globe Trotter $57.50; Abbott TR-4 $29.50; HT-9 $295.00; MB-611 $59.00; Silver 701, 800, 801, 802 $29.50 ea.; NC-173, SX-28 $149.00 ea.; HQ-129X, HRO $139.00 ea.; RME-45, SX-25 $99.50 ea.; RME-9D $39.50, SX-24 $75.00; BC-348, S-40 $65.00 ea.; S-20R $49.00; NC-44, S-38 $35.00 ea.; Many others. Large stocks, trade-ins. Free trial. Terms financed by Leo-WØGFQ. Write for catalog and best deal to World Radio Labs., Council Bluffs, Iowa.

DB22A, VHF-152A, HF-10-20 (all slightly used) bargains! W8QJC, P.O. Box 218, Holland, Michigan.

SELL PERFECT TEMCO 75-GA, complete for all band operation, phone or c.w. and HQ-129-X receiver, also Turner crystal mike. $550. Write W5KJV, U-Ark Apt. 3, Fayetteville, Arkansas.

FOR SALE: Small portable AEG German oscilloscope. Uses EF12, S1/10.2 and HR1/60/0.5 two-inch cathode ray tube. Built for radar testing. Either 110 or 220 volts ac. Complete with leads and in excellent condition. $35. Box 30, CQ Magazine, 342 Madison Ave., New York 17, N. Y.

COLORTONE QSLs! "Nuff sed"! Big Variety! Samples? Colortone press, Tupelo, Miss.

ALUMINUM TUBING, angles, channels and pipe. Write for list. Willard Radcliff, Fostoria, Ohio.

SELL NEW HALLICRAFTERS SX-42 receiver and R-42 speaker. Perfect condition $195. Write 222 24th St. Drive, Cedar Rapids, Iowa.

WANTED: Stancor 60P, 10P, or 110 transmitter. State best price and condition. Allen Kohl, Box 491, Gunnison, Colo.

WANTED: Coils for Meissner signal shifter covering either 10, 20, or 80 meters. State price. David Gee, Hill Military Academy, Portland, Oregon.

QSLs? SWLs? one-day service. Samples 10¢. Sackers, W8DED, Holland, Michigan.

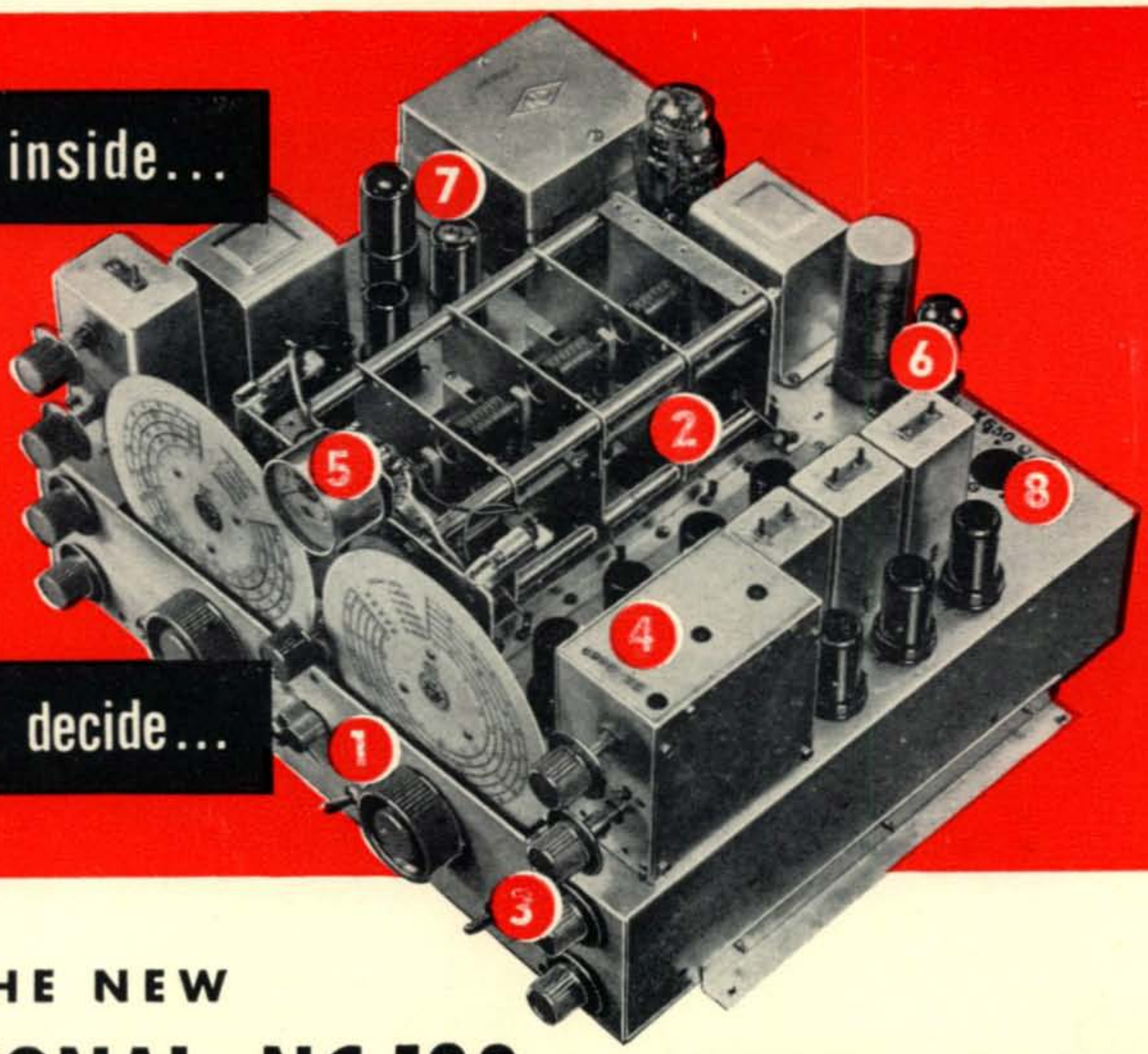
GET WISE to latest British-European radio-television developments. Follow famous British experts, keep up with ham activities, special television features, detailed analysis of newest transmitters and receivers. You'll find them all in Practical Wireless —Britain's top radio journal—a must for every American enthusiast. For one year's subscription (12 issues) mailed direct to your address from London, send only $2.00 to George Newnes, Ltd., (PW. 26), 342 Madison Avenue, New York 17, N.Y. Two years $3.75.

KILOWATT, CONSERVATIVELY RATED, excellent condition, B & W coils 80 through 10, Eimac 4-250A's P. P. final, same in modulator. Spare 4-250A's. Blower cooling. B & W Butterfly final tank capacitor. Adequate relays and meters. Rugged construction. Complete in 82 inch rack cabinet. Plug in crystal, mike, connect antenna, power line, go on air. Sell for $600 cash, or trade for Collins 32V1 and $200 cash. Philadelphia area buyer preferred, cash and carry. W3DX, 718 Concord Avenue, Drexel Hill, Penna.

2 AND 10 METER mobile includes 522 transmitter and superregen receiver, Motorola transmitter and converter, $80. BC654A 75 and 80 mobile transmitter and receiver, $25. National 1-10, coils and power supply like new, $30. 600 watt ac generator (rewound Dodge), $27. S20R receiver and 6L6 transmitter, $45. W6INP, 1005 S. Wagner Avenue, Stockton, Calif.

CQ Ad Index

see inside...

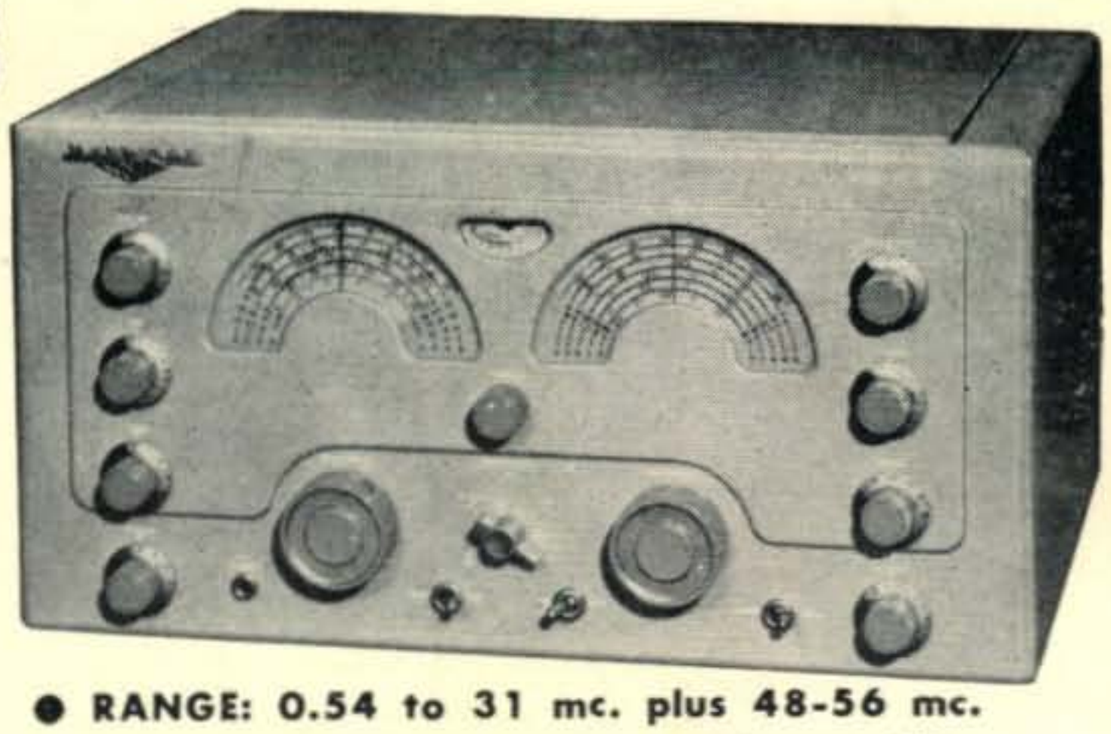


then decide...

ON THE NEW

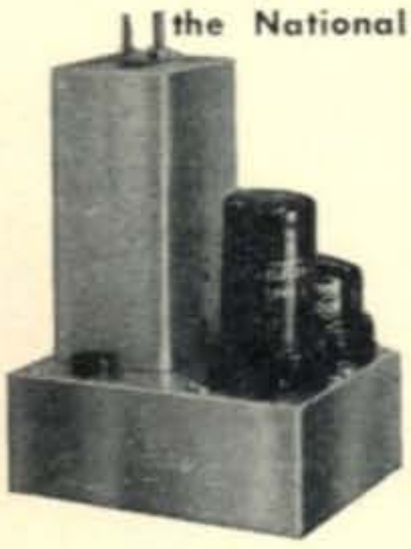
NATIONAL NC-183

1. Calibrated amateur bandspread for 6, 10-11, 20, 40 and 80 meter bands. Gear drive tuning dials.
2. Two RF stages on all bands! Image rejection 40 db at 28 mc!
3. New "double-diode" noise limiter, effective on both phone and CW!
4. New crystal filter provides 6 steps of selectivity!
5. S-meter with adjustable sensitivity for both phone and CW!
6. Temperature compensation and voltage regulator provide outstanding stability!
7. High-fidelity push-pull audio output! Ideal for phonograph attachment. Tone control.
8. Accessory socket for NFM adaptor!



- **RANGE: 0.54 to 31 mc. plus 48-56 mc.**
- **TUBE COMPLEMENT: 14 plus rectifier and voltage regulator.**
- **AUDIO OUTPUT: 8-watts undistorted**

The brilliant new National NC-183 incorporates the latest in circuit design. Check its 8 outstanding performance features. Note the rugged, heavy-duty quality of the National-designed, National-built components at your dealer's today. When you see inside, you'll decide on the National NC-183.



$268 *(less speaker)*

Also available in rack model at same price.
(Prices slightly higher west of Rockies)

NFM-83 adaptor makes the NC-183 a top-notch NFM receiver. Instant selection of AM or NFM from front panel.

$16.95

National

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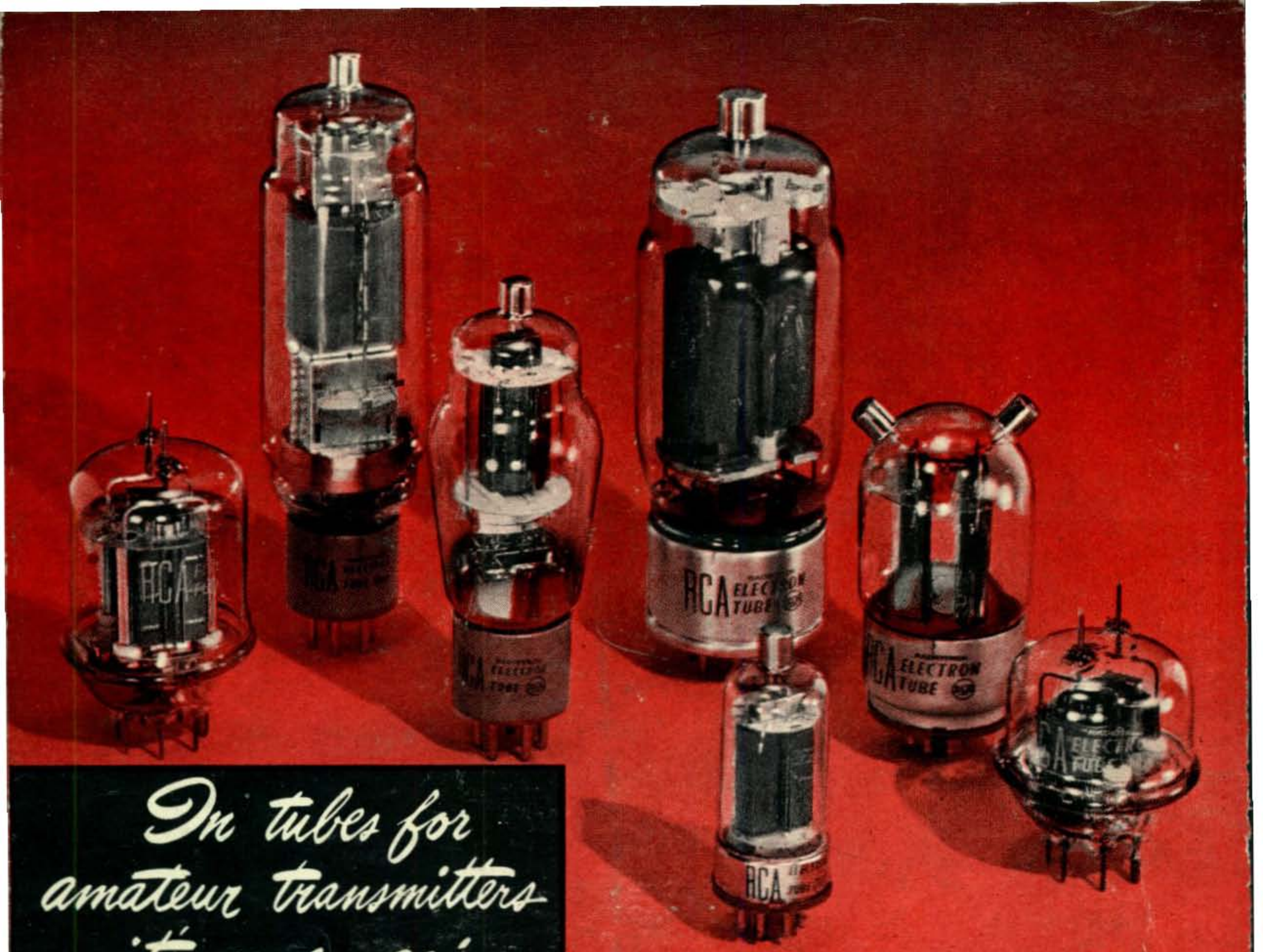
NATIONAL COMPANY, Inc.

MALDEN, MASSACHUSETTS



In tubes for amateur transmitters it's power-gain that counts . . .

YOUR CHOICE OF RCA BEAM TUBES FOR TRANSMITTER SERVICE					
Type No.	Approx. grid drive (watts)	Max. d-c plate input (watts)	Max. d-c plate volts	Max. freq. at Max. ratings (Mc)	Amateur net price
2E26	0.2	40	600	125	$3.85
807	0.2	75	750	60	2.50
813	4	500	2250	30	16.00
815	0.2	75	500	125	6.90
828	2.2	270	1500	30	13.75
829-B	0.8	150	750	200	16.25
832-A	0.2	36	750	200	11.75

NOTE: Class C telegraphy (ICAS) ratings are shown except for 832-A which are CCS.

The Fountainhead of Modern Tube Development is RCA

. . . and RCA beam power tubes have it to spare

● It's incredible how little excitation it takes to drive RCA beam power tubes to full plate input. Receiving tubes do it easily. In addition to power gains of 90 to 1 or more, these transmitting huskies deliver more output at lower plate voltage than any other tubes of similar ratings.

In addition to the advantages of fewer stages and components, simplified control, and a less expensive power supply, RCA beam power tubes seldom require stabilization in well-designed "all band" circuits. Where difficulties may arise, permanent stabilization is simply achieved by neutralization or degeneration . . . at no sacrifice in efficiency.

To get all the performance and life *you* pay for . . . buy RCA beam power tubes. Your local RCA tube supplier has them in stock.

SCOOP OF THE YEAR ON TVI . . . John L. Reinartz, W3RB, discloses simple circuit for curing TVI in Nov.-Dec. issue of "Ham Tips." Your local RCA tube supplier has a copy waiting for you.

TUBE DEPARTMENT

RADIO CORPORATION of AMERICA

HARRISON, N. J.