CQ

SEPTEMBER, 1947

The Radio Amateurs' Journal

35¢

THIS MONTH

CATHODE FOLLOWER V.F.O.
REBOUND SCATTERING ON 10
A BANDSWITCHING FINAL
SIMPLE 2-METER SUPERHET
6-METER HIGHLIGHTS

Published by RADIO MAGAZINES, INC. Subscription $2.50 a year

FOR AMATEURS

RME

WITH PROFESSIONAL TASTES

The New DB22A *Preselector*

Coverage .54 to 44 Mc. — Average Gain 30 DB

Here's the new DB22A completely redesigned for greater efficiency and higher signal to noise ratio. It uses new 6BA6 miniatures. Image ratio is better than 50 DB with a communications receiver having a single stage of RF. It's calibrated, has smooth planetary tuning, self contained power supply, antenna bypass switch, gain control and many other features. Connect the DB22A to your receiver just like an antenna — no wiring — no plug in coils. It's entirely self-contained — entirely in a class by itself!

The RME 84

For Home, Portable or Mobile Operation

A quality receiver in the lower price field that will give you the most for your money. Operates from 115 volts AC, batteries or from the VP-2, a six volt power pack, optional with the RME 84. Also optional, and illustrated, is the CM-1 — Carrier Level "S" Meter.

The VHF-152 *Converter*

For Two, Six, Ten and Eleven Meters

At a cost that an amateur can afford — the new VHF-152 used with a communications receiver will give you peak performance on the very high frequency bands, utilizing an efficient double conversion system. Unit has built in power supply, voltage regulator and temperature stabilized oscillator circuits. Provision is made for connection of 4 separate antennas.

Illustrated Folders On Request

TIME WILL TELL

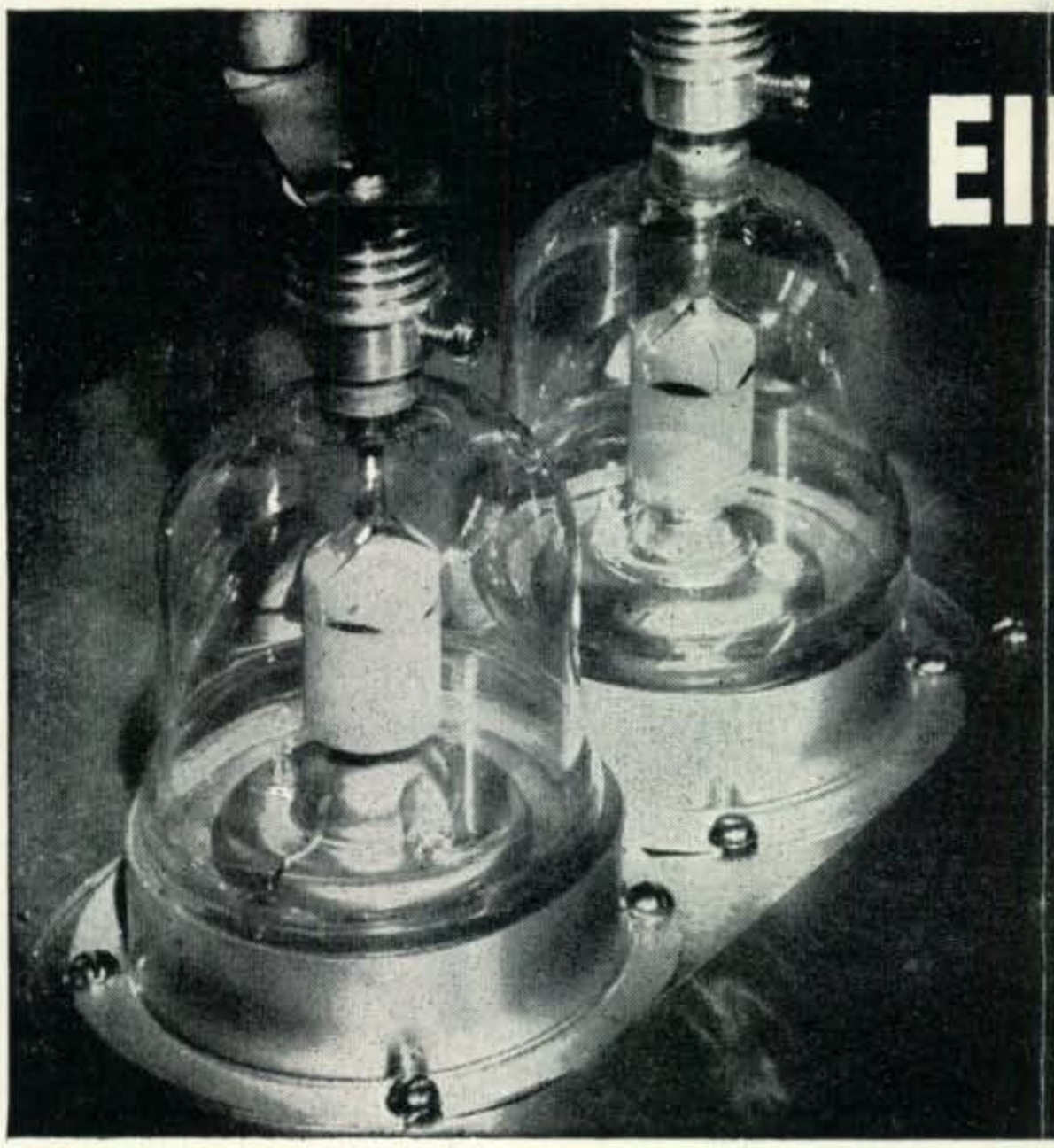
RME

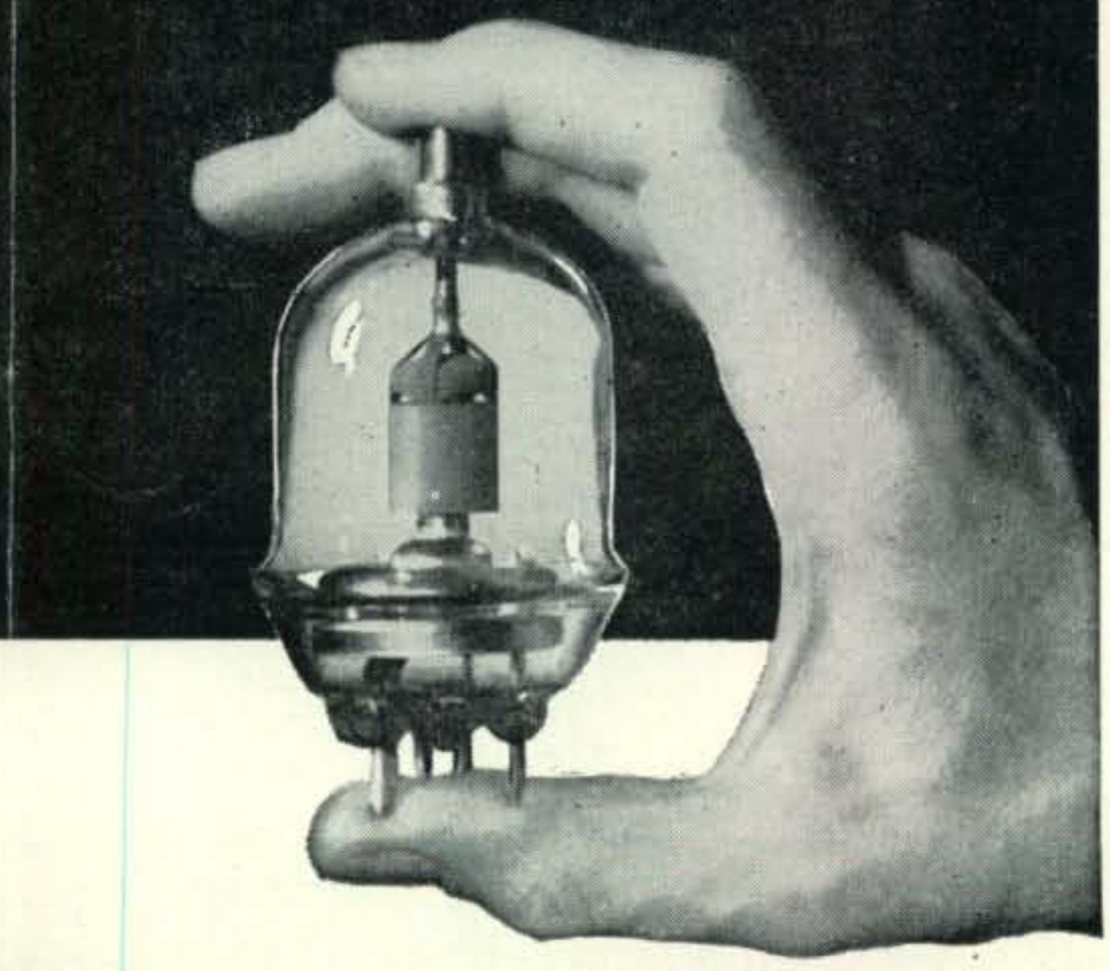
FINE COMMUNICATIONS EQUIPMENT

RADIO MFG. ENGINEERS, INC.

Peoria 6, Illinois U. S. A.

NOW - A SIXTY-FIVE WATT EIMAC TETRODE TYPE 4-65A





- *Hard Glass*
- *Non-Emitting Grids*
- *Instant Heating Filament*
- *Low Drive*
- *Low Voltage*
- *Low Feed-Thru Capacitance*
- *Low Cost*

$14.50

TYPE 4-65A

ELECTRICAL CHARACTERISTICS

Filament: Thoriated tungsten	
Voltage	6.0 v
Current	3.5 amp
Grid-Screen Amp. Factor (Av.)	5
Direct Inter-Electrode Capacitances (average)	
Grid-Plate	0.08 μμf
Input	8.0 μμf
Output	2.1 μμf

TYPICAL OPERATION
Class C Telegraphy or FM Telephony
(Key Down Conditions, 1 Tube)

D-C Plate voltage	400	1000	2000 v
D-C Screen voltage	250	250	250 v
D-C Grid voltage	−40	−50	−70 v
D-C Plate current	100	125	125 ma
D-C Screen current	40	37	35 ma
D-C Grid current	13	16	16 ma
Peak R-F grid input voltage	135	155	180 v
Driving power (approx)	1.8	2.5	2.9 w
Screen dissipation	10.0	9.2	8.8 w
Plate power input	40	125	250 w
Plate dissipation	12	30	50 w
Plate power output	28	95	200 w

THE ANSWER TO THE TRANSMITTER-MAN'S PRAYER

Available now, type 4-65A is a small radiation cooled, instant heating tetrode. Devoid of internal insulating hardware, the 4-65A was designed as a transmitting tube . . not a blown-up receiving tube. This rugged new Eimac tetrode really performs at low voltage, and its instant heating thoriated tungsten filament makes it ideally suited for mobile installations. The 4-65A operates well into the VHF, beyond the 160-Mc. band, and is capable of delivering relatively high-power with a plate voltage range from 400 to 3000 volts. As do other Eimac tetrodes, type 4-65A embodies the inherent characteristics of low grid drive, low feed-thru capacitance, and general stability of operation.

Type 4-65A's versatility of operation is demonstrated in the adjacent data showing typical operation at 400, 1000, and 2000 volts. Additional data on the 4-65A are now available, write direct.

EITEL-McCULLOUGH, Inc.
1737 San Mateo Ave., San Bruno, California

Follow the Leaders to Eimac TUBES *The Power of R-F*

EXPORT AGENTS: FRAZAR AND HANSEN, 301 CLAY STREET
SAN FRANCISCO 11, CALIFORNIA, U.S.A.

Presenting the NEW MODEL SX-43

. . . to give amateurs:

MORE VALUE
Never before all these features at this price

GREATER PERFORMANCE
AM-FM-CW all essential amateur frequencies from 540 kc. to 108 Mc.

LOWER PRICE
$169.50
Sets available after August 1947

Built in the Hallicrafters Classic Tradition

The new SX-43 is built in the Hallicrafters classic tradition: providing custom quality, precision engineering, excellent performance and wide frequency range at a medium price. The SX-43 offers continuous coverage from 540 kc. to 55 Mc. and has an additional band from 88 to 108 Mc. AM reception all bands. CW on four lower bands and FM on frequencies above 44 Mc.

New LOW PRICE Transmitter

$69.50

MODEL HT-17

- **Ham bands from 3.5 to 30 Mc.**
- **15 watts power output on low frequency bands.**

Here's real Hallicrafters transmitter performance with maximum convenience and economy. A pi-section matching network, as well as a link, provides coupling to any type of antenna or permits the HT-17 to be used as an exciter for a high power final amplifier. Coil sets extra.

Added technical details on all these models in Hallicrafters New Catalog, No. 38. Ask your local distributor for a copy.

NEW BETTER QUALITY AM WITH NARROW BAND FM

Exclusively designed— VARIABLE MASTER OSCILLATOR $110
(amateur net)

Here is the hottest transmitter item available today. Packed with outstanding features never before available in one low-priced unit. Add to the HT-18 one or two amplifier stages and you have a complete, high quality transmitter permitting operation on phone or CW up to 1 KW.

MODEL HT-18

Narrow band FM . . . direct frequency calibration . . . finger-tip control of entire station . . . full frequency deviation on all ham bands to 29.7 Mc. . . . only 1/10 the distortion of comparable units . . . excellent stability . . . clean keying . . .

BUILDERS OF *Skyfone* AVIATION RADIOTELEPHONE

hallicrafters RADIO

THE HALLICRAFTERS CO., MANUFACTURERS OF RADIO AND ELECTRONIC EQUIPMENT, CHICAGO 16, U. S. A.
Sole Hallicrafters Representatives in Canada:
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The Radio Amateur's Journal

Published monthly at 28 Renne Ave., Pittsfield, Mass. by RADIO MAGAZINES, INC. Executive and Editorial Offices: 342 Madison Ave., New York 17, N. Y. Telephone: MUrray Hill 2-1346. Entered as Second Class Matter March 28, 1946 at the Post Office, Pittsfield, Mass.

Branch Offices: Chicago — 82 W. Washington St., Chicago 2, Ill., ANDover 1395. Los Angeles— J. C. Galloway, 816 W. 5th St., Los Angeles 13, Cal., MUtual 8335.

Subscription Rates: in U. S. A., Possessions and Canada 1 year $2.50, 2 years $4.00. Elsewhere $1.00 per year additional. Single copies 35 cents. CQ (title Reg. U. S. Pat. Off.) printed in U. S. A.

Foreign Subscription Representatives: Radio Society of Great Britain, New Ruskin House, Little Russell St., London, W.C.1, England; Harris & Floyd, 297 Swanston St., Melbourne C. 1, Victoria, Australia.

Vol. 3. SEPTEMBER, 1947 No. 9

In This Issue

COVER

Howard Zeh, W8JLQ, lost out on plenty of DX while waiting for the right moment to take this dramatic shot of W8NKJ's 4-element 6-meter rotary. The striking beauty of this photo should be enough to convince the most reluctant XYL that there *is* something beautiful about a rotary beam.

The New MEISSNER
...the outstanding variable

With more amateurs going on the air almost daily, the ability to dodge QRM has become of utmost importance. As the ham bands become increasingly crowded, amateur operators all over the world have come to regard the Meissner Signal Shifter as their most useful single piece of equipment. Built-in band switching, all controls on front panel, crystal control on all bands plus many more new, exclusive features all combine to make this new instrument the finest variable frequency exciter ever offered. At your dealers or write to the address below for full information.

Meissner Signal Shifter (Model EX), less all coils and less power supply but with aluminum strips attached to turret.
Amateur Net $66.50

Power Supply Only (Model PX),
Amateur Net 13.00

Coils, per set
Amateur Net 4.00

CHECK THESE FEATURES:

BAND-SWITCHING is accomplished by a six position shielded turret.

CRYSTAL CONTROL. Not only does the Shifter function as a variable frequency oscillator, but by plugging in a suitable crystal it may be converted into an excellent crystal controlled exciter for any band (especially desirable for net operations).

TUNING. Only two controls select any operating frequency; the band selector switch to move coil strip into position and the precision vernier control to rotate the ganged condensers. Illuminated dials for 0-500 calibration. Exceptionally stable.

KEYING. Two jacks for CW or phone. May be keyed in oscillator or amplifier circuits. Tuning eye checks keying.

POWER. Input 110V 60 cyc. AC. Output in excess of six watts.

TUBES. 6V6GT/G oscillator doubler, 807 amplifier-doubler, 2-5Y3 high voltage, 0D3/VR150 osc. voltage reg., 6U5/6G5 tuning eye.

COUPLING. Output impedance 300 ohms. Coupling possible into grid circuit of single-ended or push-pull stage of transmitter; into crystal stage with crystal removed; into plate tank of crystal oscillator with tube removed.

CABINET. Gray-wrinkle metal, 13 13/16 by 13¼ by 8¾.

Meissner

ELECTRONIC DISTRIBUTOR AND INDUSTRIAL SALES DEPARTMENT

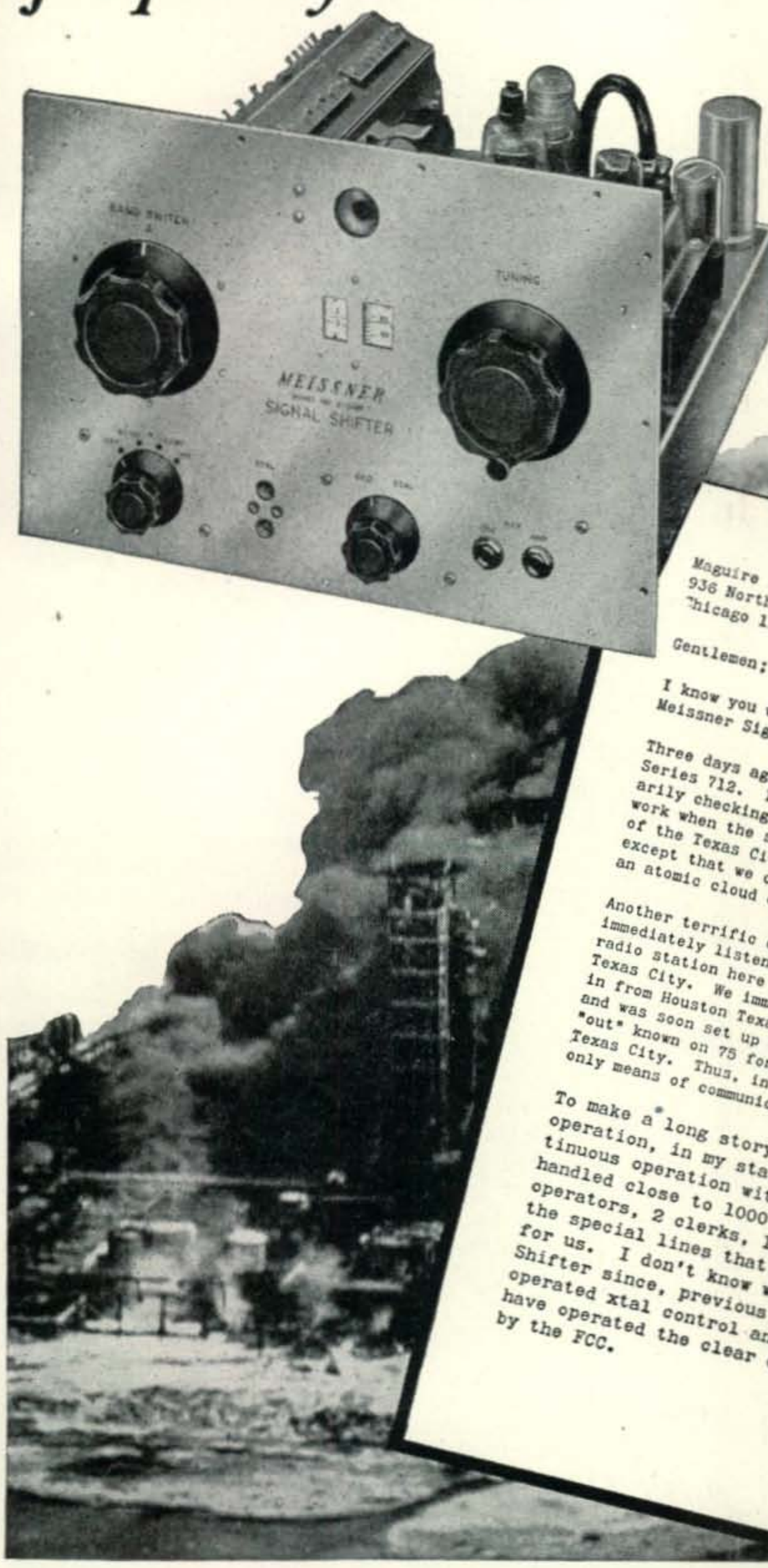
MAGUIRE INDUSTRIES, INCORPORATED

936 NORTH MICHIGAN AVENUE, CHICAGO 11, ILLINOIS

SIGNAL SHIFTER

frequency exciter

Plays Important Role In Texas City Disaster



Maguire Industries, Inc.
936 North Michigan Ave.
Chicago 11, Ill.

c/o CAA Box 779
Galveston Texas
April 20, 1947
W5KVM

Gentlemen;

I know you will be interested to learn what an important role your Meissner Signal Shifter has played in the recent Texas City disaster;

Three days ago I got delivery on my new Meissner Signal Shifter, #3007, Series 712. I had just about gotten it out of the box and was temporarily checking it into the xtal stage of the xmitter for 75 meter fone work when the shack was rocked by the explosion from the first blast of the Texas City disaster. At first we did not know what had happened except that we could see high flames and black smoke mushrooming like an atomic cloud over Texas City, nine miles away.

Another terrific explosion followed on the heels of the first and we immediately listened in on the BC band. In a few minutes our local radio station here in Galveston advised us that a ship had blown up in Texas City. We immediately got on 75 fone and inquiries started to pour in from Houston Texas, 50 miles away. W5FQQ started out for Texas City and was soon set up over there on 75 fone. At that time I was the only "out" known on 75 fone and 5FQQ the only means of communication into Texas City. Thus, in those first few hours, our two stations were the only means of communication between the stricken city and Galveston.

To make a long story short, your Signal Shifter stayed in operation, in my station W5KVM, for two solid days of continuous operation without "missing a beat". In that time we handled close to 1000 messages and utilized three radio operators, 2 clerks, 1 shorthand operator and two others on the special lines that the telephone company ran into W5KVM for us. I don't know what we would have done without the Shifter since, previous to purchasing it, I had always operated xtal control and thus would never have been able to have operated the clear channel of 3860 Kcs assigned to us by the FCC.

Very truly yours,

Julius J. Bamberg W5KVM

EXPORT ADDRESS—SCHEEL INTERNATIONAL INCORPORATED
4237 NORTH LINCOLN AVENUE, CHICAGO 18, ILLINOIS—CABLE HARSCHEEL

• • Letters • •

A Topic of Conversation

810 Cedarcroft Rd., Baltimore 12, Md.

Editor, *CQ:*

Regarding "Zero Bias" in July *CQ*—especially the last paragraph.

Well-composed, regular, national advertising builds up a manufacturer's reputation to the point where most people will make a strong defense against any criticism of products which they have not even seen or used. If you have ever tried quoting excerpts from buyers' guides, such as "Consumers' Research," you will know what I mean.

However, anyone should be glad to listen to a logical and intelligent criticism. Anyone who judges and purchases a product solely on the basis of a manufacturers' claims and price, has more money to throw away than I have. (But I have done it at times.)

Manufacturers *do* make mistakes. Manufacturers do *not* always make satisfactory or cheerful adjustments on guarantees, especially when the faults are in an entire production run. I can attest to that after many years of experience in electrical and radio wholesaling.

I own a receiver, purchased at a time when it was the only one available. Experience with the set and a test of all sets in the dealer's stock, has convinced me that it would be a fairly good buy—at one-half the present price—if you got a good set. To a friend I would make a strong enough case to prevent his buying this set. In a casual QSO I would appear only foolish if I ventured on unasked for criticism because the set has a vaguely good reputation.

You seem to indicate that manufacturers' motives are always of the highest order and their mistakes few in number, and this is somewhat irksome.

Eugene Smith, W3GI

Thanks to the Iowa Emergency Net

117-119 E. Main St., Ottumwa, Iowa

Editor, *CQ:*

I wish to take this means of thanking each and every one of the amateurs of the Iowa Emergency Net, located here in Ottumwa, Iowa; especially the hams who did such splendid work in cooperation with KBIZ in the recent flood of Ottumwa, Iowa.

L. F. Heggstrom, Chief Engineer, KBIZ

HA1KK

Budapest XII, Nemetvol gyi-ut 12, Hungary

Editor, *CQ:*

HA1KK is the army station of the signal troops and I am the operator there. About condx here I can't tell you anything good; about all the ideas coming from the East. Till now only a few stations have legal licenses for transmitting, such as 1KK, 4EA (Capt. Radnai), and a few more.

During the war everything perished here and was destroyed, even QSL collections, shacks, logs, and also my own home. You can imagine how poor we are in shortwave materials from which we must begin to build new transmitters and receivers. Especially we need new literature—handbooks, antenna books and details about the American tubes. Could you help us somehow? We would appreciate it very much if some help would come from you or other amateurs.

About myself, I am 26 years old, unmarried and 1st lieutenant of the army's signal troops. I have

...GO PR

and KNOW WHERE *you are!*

"Looks like you're out of the band, old man. Of course, my receiver may be off but according to my readings you're . . . etc." — "There's a CW sig on you . . . better check your frequency" — "I can't find you since you moved up, Bill. You said you'd move up 25 kaycees but can't hear you there" — "Sorry, Charlie, I am monitoring the spot set for our sked but no soap. Guess you must be on the wrong frequency." — *How much of this kind of talk do you hear these days?* Plenty. Unless you are CRYSTAL CONTROLLED you can never be sure *where* you are. Get set to enjoy yourself this winter. Pick PR Precision CRYSTALS at your jobber's for your favorite spots. Go PR . . . and KNOW WHERE YOU ARE! — Petersen Radio Company, Inc., 2800 W. Broadway, Council Bluffs, Iowa. (Telephone 2760)

SINCE 1934

PR Precision CRYSTALS

10 METERS PR Type Z-5.	Harmonic oscillator. Ideal for "straight through" mobile operation. High activity. Heavy drive without damage in our special circuit $5.00
20 METERS PR Type Z-3.	Harmonic oscillator. Low drift. High activity. Can be keyed in most circuits. High power output. Just as stable as fundamental oscillators $3.50
40 & 80 METERS PR Type Z-2.	Rugged, low drift fundamental oscillators. High activity and power output with maximum crystal currents. Accurate calibration $2.65

been a radio amateur since 1937 as HA8S and made W.A.C., c.w., on 7 and 14 mc. Before the war, used 100-watt transmitter CO-FD-PA RK20 final. Receiver was home-built.

Lt. Peter Somssich, HA1KK

CQ will be pleased to forward any back copies of radio magazines, handbooks, or text books that readers may want to donate to DX stations.—Ed.

DXing on 40 and 80

Royal Netherland Marines, Volkel, Holland

Editor, *CQ:*

The other day a friend of mine, PAØHR lent me copies of *CQ*. In my opinion they are very good indeed. One copy was the March, 1947, issue, and I should like to comment about "Zero Bias" on utilizing the bands.

I fully agree with you on what you say about 40 meters. Most nights, turning on the receiver this side of the pond, I hear S7-8 sigs from all sorts of inter-W QSOs, W1, 2, 3, 4, 5, 8 and 9 being regulars. Just like you say, "dig under that layer" and you'll find plenty of DX. What about FB8 or ZC6 calling CQ all night amidst lots of Ws chewing the rag?

And the same applies to gud ole 80. FB band. Worked three continents on it and hope to become WAC—hi. During our early mornings, especially winter time, the band over here is full of S6-7 sigs from Ws doing all sorts of net work, etc. And, of course, W1AW always gets through magnificently. But I have noticed most Ws don't care for DX on 80. Is it laziness to pick up weak sigs, or what? This coming winter lots of fellows over here plan to do some hot DX work on 80. If there are Ws who have the same interest, I will gladly furnish details. May 7th I worked NY4CM, Guantanamo Bay on 3.5.

Eric Ludwig, PAØLU, Sub. Lt., R.N.N.R.

Additional Notes on the SCR-522

1124 S. W. 40th St., Oklahoma City 9, Okla.

Editor, *CQ:*

I have converted an SCR-522 transmitter and receiver, partially following the article in July *CQ*. There are a few points which should be brought out to avoid confusion in converting this set. The article covered receiver BC624A, while I have the receiver BC624C, which is a later version. Most A series receivers have some modifications in them, but not all.

On the receiver power supply plug (Jones), terminal No. 6 must be grounded to allow the a-v-c circuit to work satisfactorily. The C series will not work at all unless this is done, and the A series will work better. The A series has a relay in the squelch circuit and a 12J5 audio output tube, while the C series has a 12A6 audio and a 12AH7 replacing the squelch relay.

Terminals 9, 10, 11 and 12 on the Jones supply plug referred to above are in a crew microphone circuit, which permitted use of the set as an intercom. system if necessary.

A tip about 400-cycle power supply components may not be amiss. They won't operate on 60-cycle supplies because they have about 30% of the required number of primary turns for that frequency. Three of them can be operated with primaries in series and secondaries in parallel if desired, although heating will be a little more than in 60-cycle equivalents. These transformers do have heavy cores, however, and the higher wattage types especially can be rewound and made useful.

Arthur C. Mitchell, W5AIA

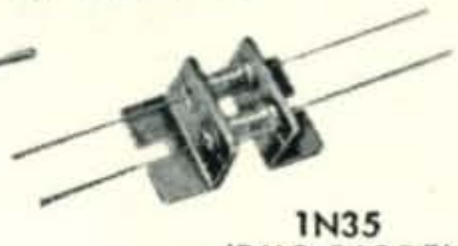
HAMS . . . HERE ARE SOME SYLVANIA PRODUCTS OF INTEREST TO YOU

CRYSTAL DIODE VARISTOR (1N40)

The 1N40 consists of four specially matched germanium crystal diodes. Point contact utilized in these diodes reduces capacitance to the order of a few $\mu\mu$f. As a result the useful frequency range is greatly extended. Stability is improved, and the contact potential effects occurring in vacuum diodes are practically eliminated.

GERMANIUM CRYSTALS

1N34
(DIODE)



1N35
(DUO-DIODE)

1. Small size.
2. Eliminates heater supply and possible source of hum.
3. Pigtail construction—can be soldered into place.
4. High resistance to vibration and shock.
5. Tested for matched r-f loading in a tuned circuit.
6. Low shunt capacitance.

The 1N34 and 1N35 are ideal for use in lightweight and portable equipment. Fields of application include: field strength meters, detectors, clippers, discriminators, series noise limiters, demodulators, meter rectifiers.

TECHNICAL MANUAL

You'll surely welcome this handy reference manual, with its important features including: Fundamental Properties of Vacuum Tubes; The Characteristic Curves; General Tube and Circuit Information; Resistance Coupled Amplifier Data—and many more. We urge you to get your copy right away—because we know you'll find this volume invaluable.

TEST PROD OHMMETER

With the Sylvania Pocket Test Prod Ohmmeter in your tool kit, you can locate shorts or open circuits in a jiffy!

This handy-size meter gives direct readings of resistance from 600 to 10,000 ohms . . . reaches easily into hard-to-get-at corners and awkward spots. Completely self-contained—powered by 1.5 volt "penlight" battery. Only 5¾" long, ⅞" diameter.

MODULATION METER

(Model X-7018)

Now you can monitor your modulation percentage and speech quality with the new Sylvania Model X-7018 Modulation Meter. Compactly styled. Economical. Of great assistance in complying with FCC regulations on overmodulation. Helps keep your average percentage up between 60% and 90%. Also indicates carrier shift. Designed for use through the 54 megacycle region.

TRANSMITTING TUBES

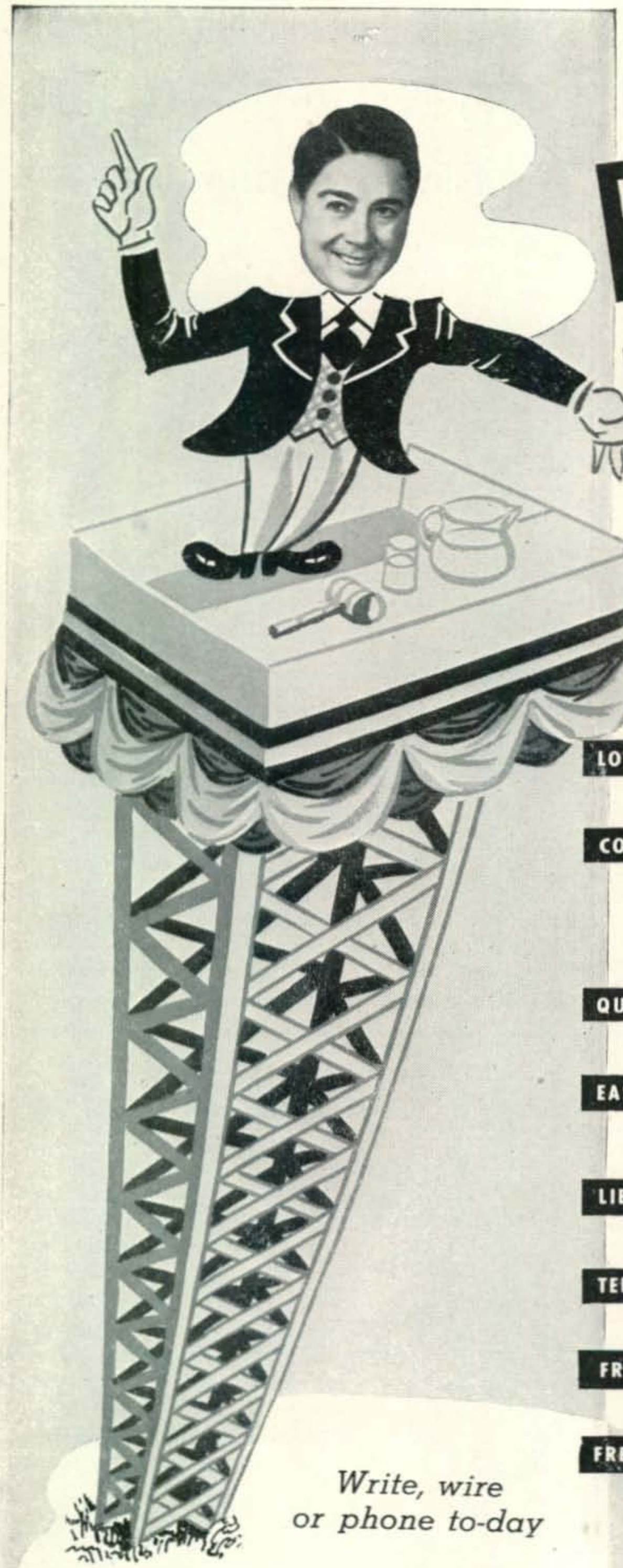
(Type 3D24)

First of Sylvania's new line of transmitting tubes, the 3D24 is a four-electrode amplifier and oscillator with 45 watt anode dissipation. An outstanding development is the electronic graphite anode, which allows high plate dissipation for small area and maintains stable grid-plate and anode characteristics.

See your Sylvania Distributor or order from Sylvania Electric Products Inc., 500 Fifth Avenue, New York 18, N. Y.

SYLVANIA ELECTRIC

MAKERS OF RADIO TUBES; CATHODE RAY TUBES; ELECTRONIC DEVICES; FLUORESCENT LAMPS, FIXTURES, WIRING DEVICES; ELECTRIC LIGHT BULBS



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LOW PRICES

I guarantee to sell to you as cheap as you can buy anywhere.

COMPLETE STOCKS

Hallicrafters, National, Hammarlund, Collins, Millen, RME, Pierson, Temco, Meissner, Supreme Transmitters, Meck, Gordon, Amphenol-Mims, RCA, Vibroplexs, Sonar, all other amateur receivers, transmitters, beams, parts, etc. If it is amateur or communications equipment—I can supply it.

QUICK DELIVERY

Mail, phone, or wire your order. *Shipment within four hours.*

EASY TERMS

I have the world's best time sale plan because I finance the terms myself. I save you time and money. I cooperate with you. Write for details.

LIBERAL TRADE-IN ALLOWANCE

Other jobbers say I allow too much. Tell me what you have to trade and what you want.

TEN DAY FREE TRIAL

Try any receiver ten days, return it for full refund if not satisfied.

FREE NINETY DAY SERVICE

I service everything I sell free for 90 days. At a reasonable price after 90 days.

FREE TECHNICAL ADVICE

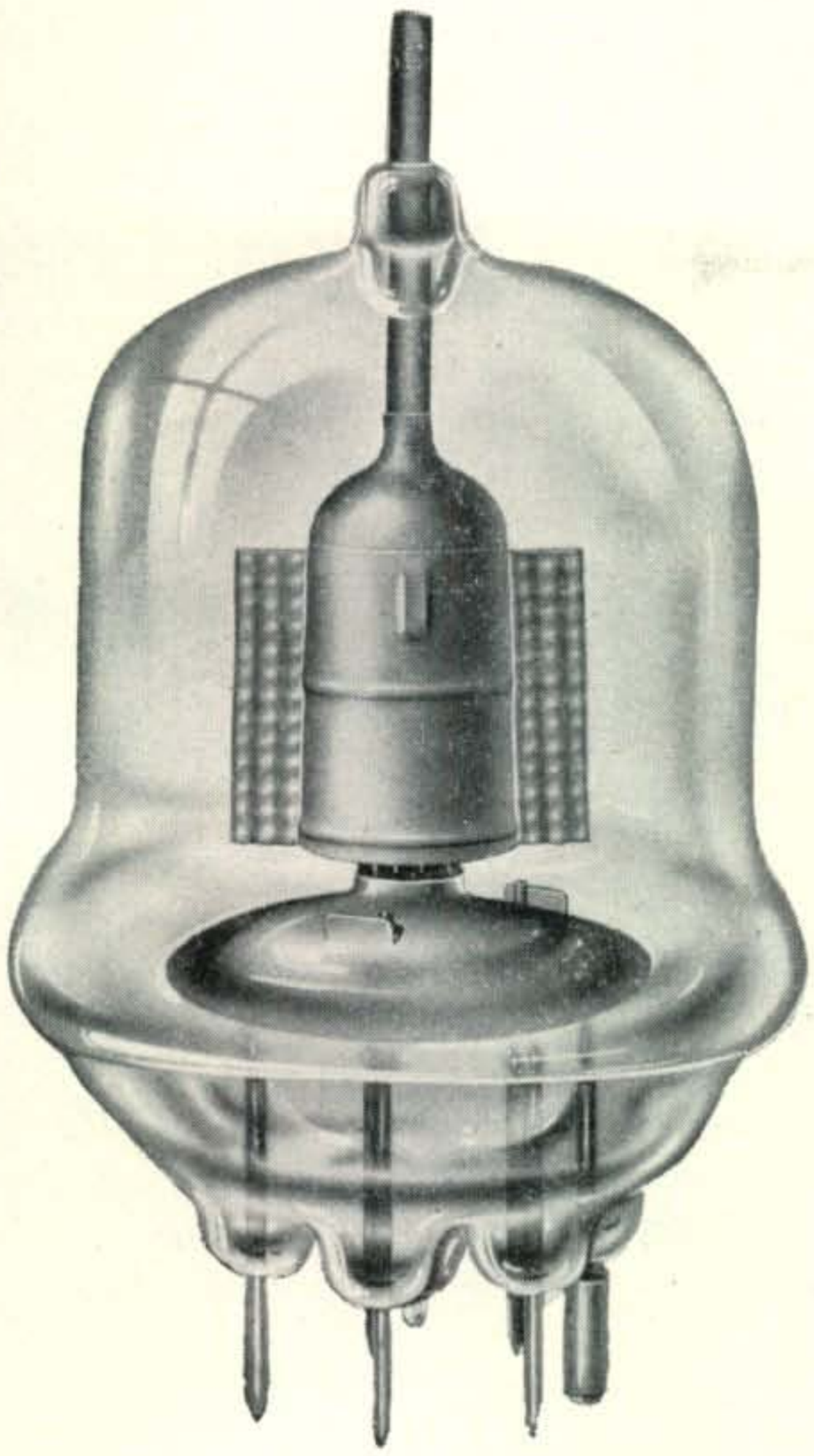
and personal attention and help on your inquiries and problems.

Orders from outside continental U. S. A. also welcomed.

Write, wire or phone to-day

Butler, Missouri **HENRY RADIO STORES** Los Angeles 25, Calif.

"WORLD'S LARGEST DISTRIBUTORS OF SHORT WAVE RECEIVERS"



ANNOUNCING THE NEWEST *Gammatron*

HK-57

BEAM PENTODE

MAX. POWER OUTPUT	
Class C R.F. Unmodulated	250 Watts
PLATE DISSIPATION	50 Watts*
MAX. SCREEN INPUT	25 Watts
MAXIMUM RATINGS:	
D.C. Plate Volts	3000 Volts
D.C. Plate Current	150 MA.
D.C. Screen Voltage	500 Volts
D.C. Screen Current	20 MA.
D.C. Control Grid Voltage	400 Volts
D.C. Control Grid Current	15 MA.
D.C. Plate Input	300 Watts
MAX. FREQUENCY	200 Mc.
INTERELECTRODE CAPACITIES:	
Plate-Grid	.05 mmfd.
Input Capacity	7.29 mmfd.
Output Capacity	3.13 mmfd.
FILAMENT VOLTAGE	5.0 Volts
FILAMENT CURRENT	5.0 Amps.

Continuous rating. Intermittent rating 75 watts.

The HK-57 is a 50-watt* radiation cooled beam pentode that may be operated even at very high frequencies without neutralization. Its driving power requirements are very low, reducing the number and size of preliminary stages needed.

Tantalum plate and grid elements allow the HK-57 to withstand high plate and screen voltages, and to take large momentary overloads without gassing.

In addition to its exceptional performance as an r.f. power amplifier, the HK-57 makes an excellent high power exciter for amateur service.

Write for data sheet showing characteristics.

$175 AND 25 MONOSETS GIVEN

To Winners of This

EASY CONTEST!

RADIO AMATEURS

Just write 50 words or less telling us why you like the TELEX MONOSET *better than old style earphones.*

WIN:

$100 and a Monoset

$50 and a Monoset

$25 and a Monoset

PLUS
TELEX MONOSETS to 22 Runner-ups!

HERE'S ALL YOU DO:

1. Go to your *parts jobber* and ask him to let you try out the revolutionary under-the-chin TELEX MONOSET.
2. In 5 minutes you'll get at least half a dozen good, WINNING ideas. Be sure to get *all* the facts and an OFFICIAL ENTRY BLANK.
3. Then write 50 words or less telling us "Why the TELEX MONOSET is Better than Old-Style Earphones." Clearness and sincerity will count most.
4. Print or type your answer on the OFFICIAL ENTRY BLANK your jobber will give you.

Mail direct to: TELEX, INC., Telex Park, Minneapolis 1, Minnesota, before Midnight October 15, 1947.

FIRST PRIZE: $100.00 cash and a TELEX MONOSET
SECOND PRIZE: $ 50.00 cash and a TELEX MONOSET
THIRD PRIZE: $ 25.00 cash and a TELEX MONOSET

TELEX MONOSETS to the 22 next best opinions. In case of a tie, *duplicate* prizes will be awarded.

Employees of Telex, Inc. and their advertising agency not eligible to enter this contest.

NO BOX TOPS!
NO JINGLES!
Get Entry Blank From Your Parts Jobber

CONTEST CLOSES MIDNIGHT OCTOBER 15, 1947!

TIPS TO GET STARTED WITH:

1. TELEX MONOSET is quickly replacing old-style, cumbersome headsets because you wear it under-the-chin instead of over-the-head.
2. Featherweight: Only 1.2 oz. No ear fatigue.
3. Excellent fidelity. Clear, natural reception of sound.
4. Reliable performance assured by TELEX precision engineering.
5. Exclusive, TELEX designed, volume control—permits individual adjustment of volume.

Decision of impartial judges will be final. All entries become property of Telex, Inc. Winners will be notified by mail approximately November 1, 1947. Contest subject to all state and federal regulations.

Remember, wherever a headset is used—
TELEX MONOSET will do the job better.

HEARING AT ITS BEST
TELEX INC.
ELECTRO-ACOUSTIC DIVISION
TELEX PARK
Minneapolis, Minn.

. . . Zero Bias . . .

CQ DX

QUITE a few of our readers have written in to inquire about the new handbook published by *CQ*. It seems that our advance publicity didn't quite cover the territory it was expected to. We *do* have a handbook, called *CQ DX* It is written by *DX* men for *DX* men. Copies are available from your local jobber, or directly from us. Comments from amateurs who have read it range all the way from, "Now I know why I don't get out," to, "The best fifty-cent value I ever received." The DX Handbook will be an annual, and we might add that you'd better hurry and get your copy of the first edition because there won't be many left at the rate they're going.

The Atlantic City Conference

ALL is not well at the Atlantic City Conference. Present indications are that foreign amateurs have surely lost the top 100 kc of 40, which may remain open to Americans on a shared basis with international broadcast stations. This is a hollow victory to those amateurs who remember what the terrific high-power European BC stations did to 40 in pre-war days. However, until the official word is released it is too early to contemplate the action which we can take as individual amateurs. It is certain that by some wholehearted cooperation the 40-meter international propaganda band could be made untenable to foreign powers, at least in the U. S.

It was a foregone conclusion that Europeans and others would have their activity further curtailed on 80, a band that they have been forced to share for many years. Atlantic City confirmed this, although final figures are not available at this writing.

Prospects for the new 15-meter band are excellent. In fact we face the happy situation in which the band may be 450 kc wide, instead of 400 kc, as originally proposed. One thing which should be stressed at this time is the necessity to avoid rumors. Many tales have come to our attention during the conference. Until we get the official word, all reports must be treated with caution. But once the decisions are made they are well nigh irrevocable until the next conference. Whatever the outcome of this one, it will not be one day too early if we start preparing for the next conference now.

More on QSL Cards

NEXT time we lose our temper over a QSL card we're going to think twice. Not that we still don't believe there are some downright lazy, indolent, or otherwise ornery hams who could QSL, but don't. But recently we got a liberal education from one prominent DX station located south of the border. A letter to him pointed out that we have had many QSOs over the past 12 years, working each other in every DX contest for years. Not a single card has ever been acknowledged, so we said that to reward our persistence he should break down and QSL. We also told him that the "500" cards he garnered from the DX contest should be promptly replied to . . . that they were the price of entering such an affair. That 500 figure was just a guess on our part, a pretty poor one as it turned out. In a pleasant, but obviously weary reply, this station told us that out of 3906 DX contest QSOs on phone and c.w.over 2,450 cards had been received. Just imagine facing a pile like that!

To check each individual QSO against the log, fill out the card, address it and mail it is surely a six months' spare-time job, if he doesn't get another card in the intervening time. We don't know how to answer his earnest and obviously harassed plea, "What shall I do?" What would you tell him?

My recommendation was that he announce *before* the DX contest that cards would not be sent for contest QSOs, that stations would have to use the contest log for proof of the QSO. In special instances where the card was requested for W.A.Z., etc., he could specify that an international reply coupon, or an addressed return envelope be sent to obtain his card. The QSL bureaus were created for fellows like him, but it it a difficult problem when the quantity of cards reaches such a staggering volume. A little more patience is the lesson we learned from his correspondence.

Worked All Zones

DX men are already familiar with the Worked All Zones DX system, but for the uninitiated, the W.A.Z. award was created in answer to a need for a more equitable measure of operating achievement than counting countries. One amateur in each of the 40 Zones, into which the world has been divided, for purposes of the award, must be contacted and the QSO must be confirmed. An Honor Roll listing the relative position of top DX stations is carried every month in the DX column. The system became immensely popular in the years prior to the war, and immediately upon resumption of amateur activities after the war, the records for W.A.Z. were revived by *CQ*. In the old days, it was an achievement to work all continents, but soon this became commonplace and 100 countries became the goal of every DXer. But even though it took many years of hard operating, by 1941 100 countries as an operating achievement had lost its luster. Not so with W.A.Z. At the outbreak of hostilities only three stations in the entire world had confirmed contacts with the 40 Zones. They were G2ZQ in England, ON4HC in Belgium, and Japanese amateur J5CC.

This long standing record was smashed for the first time, when two Americans, within a matter of days, submitted proof of contact with all the zones. W2BXA, B. H. Stevenson, Cranford, N. J., by virtue of submitting his confirmations first becomes the fourth station in the entire world and the first American to ever confirm W.A.Z. W6VFR, M. W. Gonsior, Los Angeles, becomes the second W and the fifth station in the world to receive the W.A.Z. award. All the more remarkable is their feat, since all 40 Zones were worked and confirmed since the war. Congratulations and a "well done" to W2BXA and W6VFR.

W2IOP

The following letter from Chas. F. H. Johnson, Jr., is published with his permission:

"I just had to let you know how pleased I am with the 30-K. When those nine big cases arrived last Saturday, I was counting the days when I'd be on the air. You can imagine what a thrill I got when after getting things all lined up and reading the instructions at least nineteen times, I got up enough courage to pull the switch. In true Collins tradition, everything went off beautifully.

"I listened on 20 and heard WØQLX calling CQ. When he got through, I went back at him and much to my surprise, discovered that he was in Cedar Rapids and a member of the Collins family. I know the first QSO in a long time always gives you a big thrill, but that made it doubly exciting. I thought his reports on the rig might be a little bit prejudiced (Hi), but when I got back later in the evening, I listened around and finally heard VK4BA calling CQ. I went back at him and he came right back. And so No. 2. He gave me a fine report and told me I was the only W2 on the band.

"There remained only one check to make and that was with the neighbors and the family receivers in the rest of the house. As usual, not a bit of QRM from W2IUV, and I certainly can say that it pays to be right. It gives you a fine feeling of comfort to know that you're enjoying yourself and not bothering anybody else."

Yours sincerely,
Chas. F. H. Johnson, Jr.

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Cathode follower v.f.o. and c-f-o adapter. Controls are for changing bandspread coverage on the dial, direct-reading tuning dial, and 6AQ5 amplifier tuning. This later control can be set for the center of the band being worked and generally requires no further adjustments.

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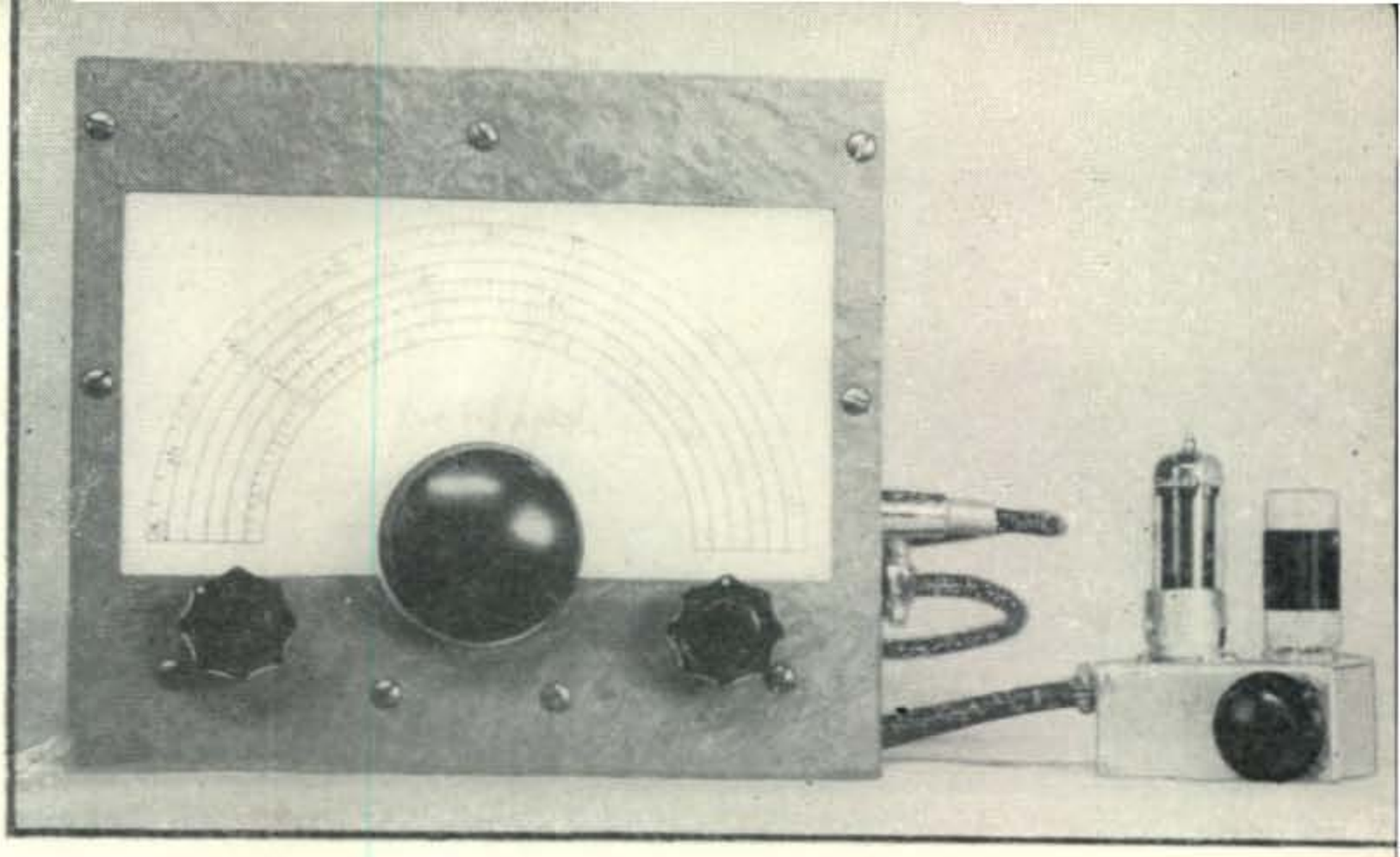

The Cathode-Follower V.F.O.

WILFRED M. SCHERER, W2AEF*

The cathode-coupled grounded-grid amplifier circuit adapted to a v. f. o. that is simple to adjust and offers crystal stability and beautiful keying.

HAVING ALWAYS been a confirmed adherent of crystal controlled transmitters, but still wanting to shift frequency around the amateur bands, the writer decided to set up his transmitter crystal oscillator with a selector switch for choosing any one of twenty different crystals. This was quite attractive in view of the fact that crystals, with holders, were available at extremely low prices. Unfortunately this just did not work out, as in most cases the desired operating frequency fell between the crystal frequencies. The answer definitely turned to the v.f.o., provided, crystal stability and dependability could be assured.

Considerable time was spent trying out different types of standard oscillators. Of these, the conventional e.c.o. was about the best, but it does have some undesirable characteristics which, even though they may be either tolerated or compensated for to a certain extent, present themselves as a nuisance or require valuable time-consuming adjustments. Our main objection to the e.c.o. is that a cathode tap must be made on the oscillator coil at exactly the correct point for maximum frequency stability. The proper screen voltage is also relatively critical. Another objection is that frequency modulation is often noticeable, particularly at the higher frequencies. In some cases this may be eliminated but again it is a nuisance and may not always be remedied. Often the conventional e.c.o. is subject to microphonics or frequency modulation through vibration of the tube elements.

But the basic e.c.o., nevertheless, is time tested and has proven itself a worthy oscillator for v-f-o use. By modifying the cathode-coupled grounded-grid amplifier circuit so it becomes a cathode follower oscillator (c.f.o.) we have found the answer to our search for a simple oscillator easy to adjust and with crystal stability.

The Cathode Follower Oscillator

As derived from the cathode-coupled-grounded-grid amplifier, the basic circuit is shown in *Fig. 1*. *T1* is coupled to *T2* thru a common cathode resistor *Rc*. With a positive voltage applied to the grid of *T1* there is an increase in *T1* plate current which flows thru *Rc*. This raises the positive voltage at the cathodes which has the same effect as increasing the negative voltage at the grid of *T2*, the result being a 180 degree shift in voltage between the grids of *T1* and *T2*. The negative voltage then at *T2* grid is shifted another 180 degrees thru *T2*, the net result being a 360 degree reversal with the input of *T1* being in phase with the output of *T2*. Thus the trans-

*Fayson Lake, Butler, N. J.

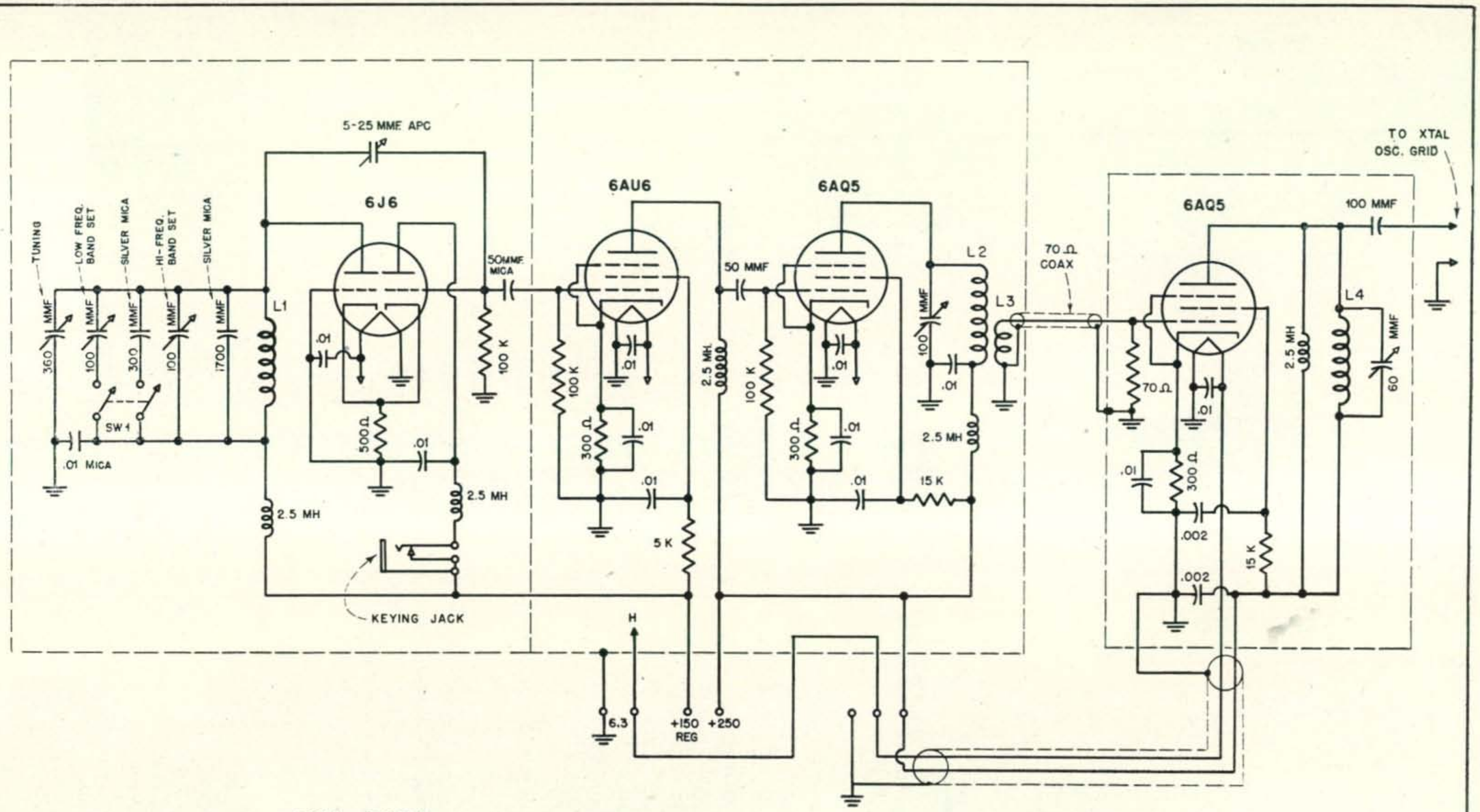

Fig. 2. Circuit diagram of c.f.o. and adapter.

COIL DATA

L1 – 11 T. #22 ENAMEL
$1\frac{1}{4}$" DIA. CERAMIC FORM
WINDING LENGTH $\frac{7}{8}$"

L2 – 3.5 MC. – 37 T #22 ENAM.
CLOSE WOUND ON $1\frac{1}{8}$" DIA.

L3 – 10 T. #26 ENAM. CLOSE
WOUND AT BOTTOM OF L2

L4 – 3.5 MC. – 48 T. #26 ENAMEL CLOSE
WOUND ON $\frac{3}{4}$" DIA. AMPHENOL
MINIATURE PLUG-IN COIL
FORM.

7.0 MC – 22 T. #22 ENAMEL CLOSE
WOUND – SAME AS ABOVE.

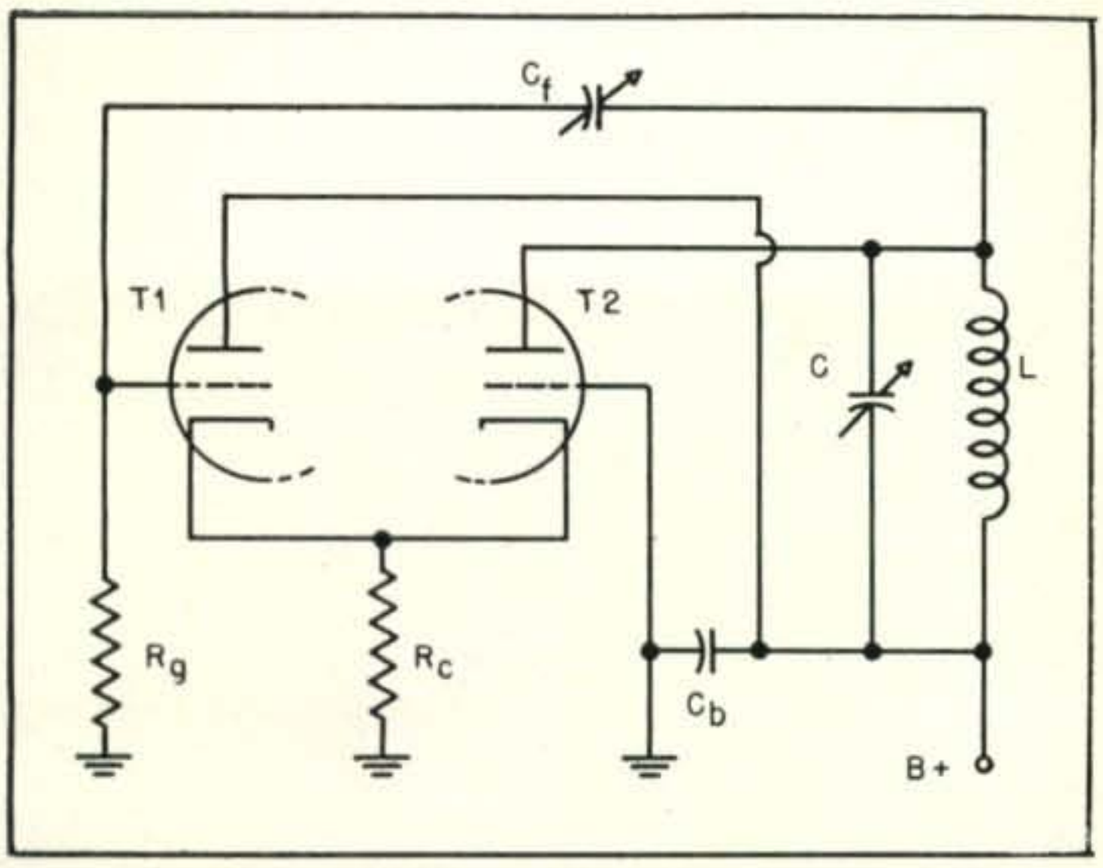

Fig. 1. Basic circuit of cathode follower oscillator

conductance is negative and oscillations will occur when a resonant circuit is inserted in *T2* plate circuit and *T2* plate is coupled back to the grid of *T1*.

Tubes of the double triode type, such as the 6J6, 6SN7, 6SL7, etc., are all well suited for the c.f.o. The miniature 6J6 is exceptionally good as its interelectrode capacitances are small and it transmits little heat to the chassis and components of the oscillator.

Frequency drift through thermal changes of tube capacitances is very low. On several models it has been no more than 50 cycles at 3.5 mc after running an hour from a cold start. With the c.f.o. the tube capacitances are pretty well washed out due to the fact that the c.f.o. functions excellently into low impedance or very high-C tanks. Typical values of *C* are 2000-3000 $\mu\mu$f at 1.75 mc, 1100-1500 $\mu\mu$f at 3.5 mc, and 600-750 $\mu\mu$f at 7 mc. In some special cases where low frequency operation is not desired, it is quite feasible to operate the c.f.o. at a higher frequency than is advisable so to do with other types of oscillators. For operation with high-C tanks, coils and condensers must be of high "Q".

As with any oscillator, operation should be on a frequency lower than that of any of the following stages. It is a very rare case to find an oscillator where straight thru frequency operation of a following stage does not have some effect on the oscillator frequency.

It will be noticed that the c.f.o. is not eiectron coupled. This is of no disadvantage as it may be fed into one or two untuned isolation stages, a precaution which should be taken with any type of self excited oscillator. Even without isolation, little frequency shift is exper.enced when the oscillator output is taken from the tube cathodes.

Higher output may be obtained from the grid of *T1*, but the following tube is then coupled to the frequency determining circuit through the feedback condenser and slight loading effects are more likely to be found.

Design Features

The c.f.o. using the miniature 6J6 followed by other types of miniature tubes may be built up in a variety of compact arrangements. One of these layouts is shown here as a general purpose v.f.o. together with a novel v-f-o adapter. *Fig 2* shows the circuit. Constructional details may be observed from the photographs.

With *SW1* closed, the oscillator range is 1.7 to 1.86 mc so, when doubling in the output stage, the range covers the low frequency portion of the 3.5-mc band and through following frequency multipliers covers the entire portions of the other bands up to 28 mc. When *SW1* is open, the oscillator range is 1.84 to 2 mc permitting coverage of the high frequency section of the 3.5-mc band. This arrangement was devised to keep bandswitching at a minimum while allowing sufficient bandspread. The innermost dial scale is calibrated from 3.68 to 4 mc. The next scale is 3.4 to 3.72 mc with those for the other bands correspondingly calibrated for the 7, 14, 21, and 27-28-mc bands, the latter being at the outside. As previously stated, this v.f.o. is a general purpose unit, so for specific or limited applications some bands or portions thereof may be eliminated for obtaining greater bandspread—i.e., leaving out the 27-mc band or a section of the 28-mc band, etc.

One of the most important items to consider is the tuning condenser. With the high-C oscillator tank it is necessary to us a variable condenser of relatively high capacitance for the desired bandspread and it should also be one of straight line capacitance. Unfortunately, most condensers of this type are not too well suited for stable v-f-o use because they generally have poor sleeve bear-

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Rear view of the c.f.o. and adapter. The 6J6 oscillator is nearest the oscillator coil shown with shield can removed. The 6AQ5 output tube is directly behind the output coil and the 6AU6 isolation tube is on the rear chassis. Power plug and keying jack are on back chassis apron. Adaptor power plug and coax line plug into left hand side of chassis.

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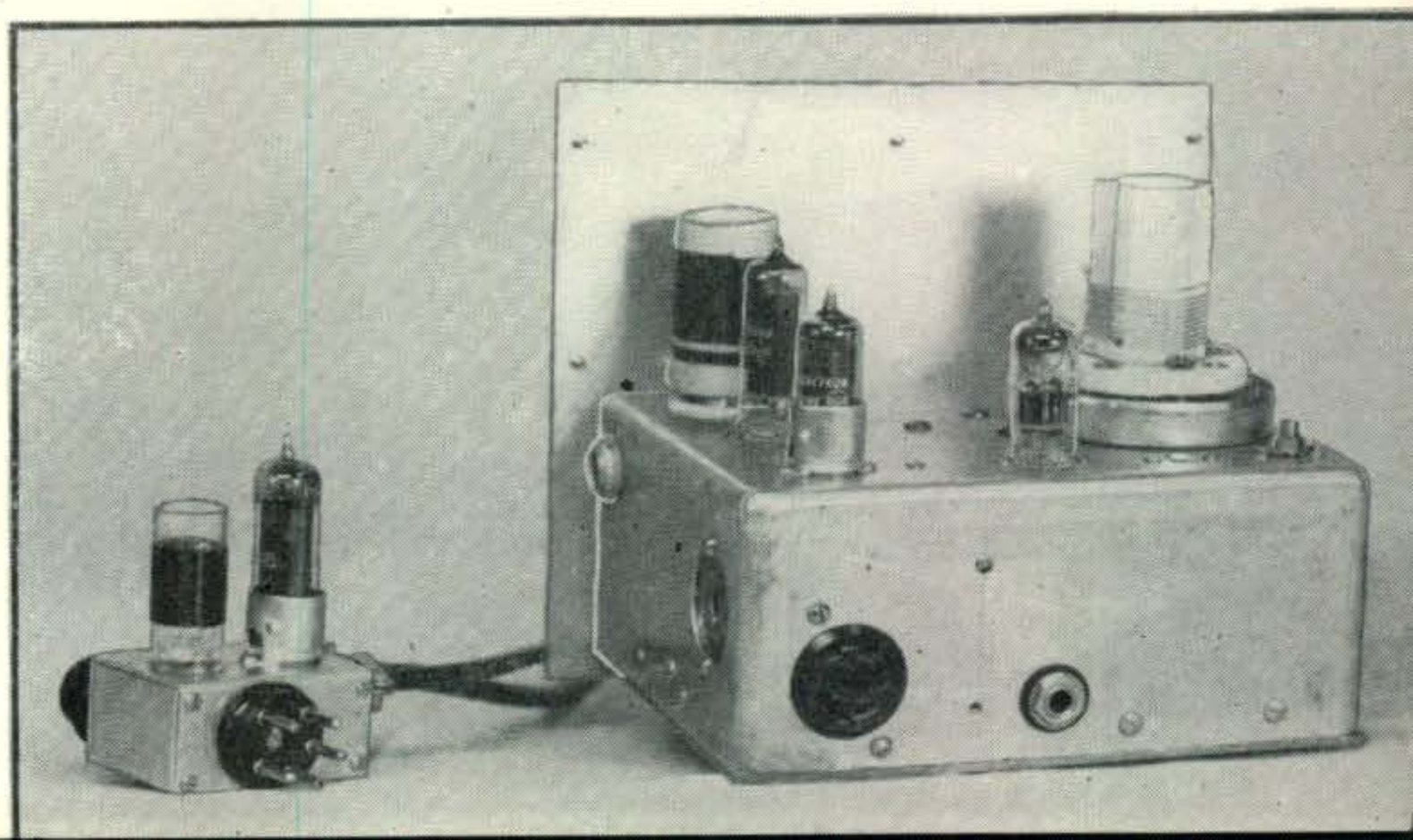


ings which sooner or later develop play or other wise become sloppy. A compromise may be made by utilizing a well constructed midget broadcast receiver condenser having good ball bearings. Due to their being of the straight line frequency variety, some waste of bandspread space must be tolerated because of excessive spread at the high frequency, while some narrowing at the low-frequency end takes place. This compromise, however, is well worth while to obtain mechanical stability. Incidentally, only one section of the tuning condenser obtained for this unit was employed.

Theoretically, the tuning condenser should be insulated from ground, for d.c. only. With the rotor grounded it is necessary to bypass the bottom end of the coil to ground. Some instability could occur at the bypass, as it becomes part of the tuned circuit. With the high-C tank employed and with the low end of all the padders connected directly to the coil, when the bypass is a good mica condenser of about .01 μf, stability will be excellent because the capacitance of this bypass in series with that of the tuning condenser is small compared with the total capacitance across the coil. The tuned circuit could be placed in the grid of *T1* with the condenser rotor grounded, but the oscillator will not function satisfactorily into very high-C tanks under this condition.

Mechanical Details

The oscillator coil is wound on a grooved ceramic form. Before winding, the wire was slightly heated and then stretched as tight as possible during the winding process. The coil is mounted above the chassis in a 3″ diameter shield can as shown in the photographs. It would be preferable to mount the coil below the chassis where it would be less subject to temperature variations, but an adequately shielded inductance of high "Q" would require too much space under the chassis.

The panel is duraluminum 7″ x 8″ x 1/8″ and the chassis is 5″ x 7″ x 3″. The 6J6 oscillator is at the rear center with the 6AU6 isolator at the corner while the 6AQ5 doubler is next to the unshielded output coil. Tube shields are not used because they transmit excessive heat to the chassis. The components of the isolation and doubler stages are separated from the oscillator by a shield installed under the chassis.

The variable feedback condenser is located directly at the rear of the oscillator coil and next to the 6J6. The high frequency bandset condenser is mounted at the rear left corner with the low frequency one mounted at the front left corner.

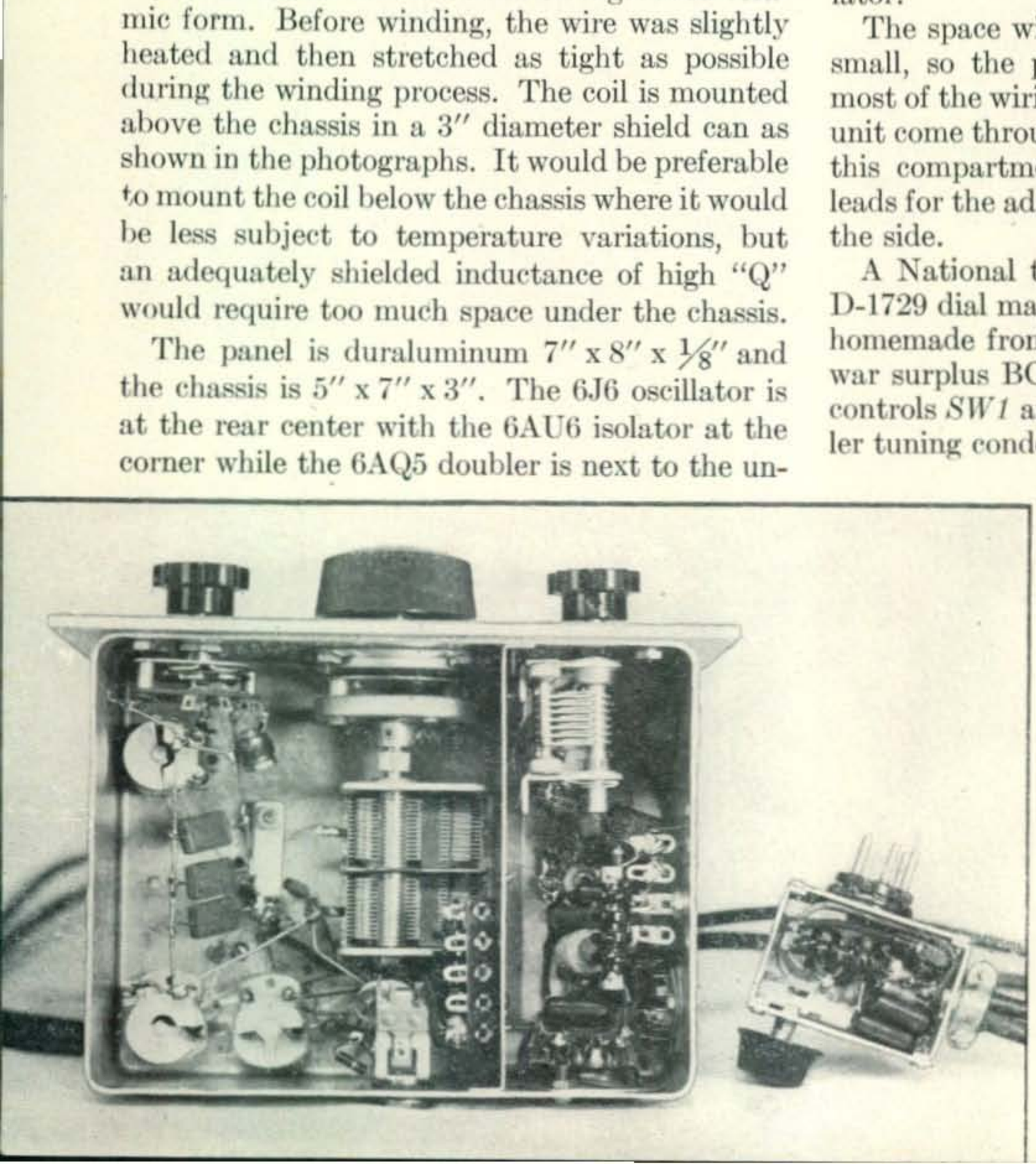
Wiring within the oscillator compartment should be rigid and all the oscillator grounds should be returned to the same point on the chassis. Power leads should be run right next to the chassis. The fixed mica padders may be seen mounted in a row near the center of the oscillator section. Several were required to make up the total fixed tank C. Note that these padders are the silver mica type. No zero or negative temperature coefficient condensers were required in this unit.

The c.f.o. is best keyed in the plate of *T1*. Keying is absolutely clean with no trace of chirps. Some key clicks, though, are present, but they may be minimized by using two chokes in series with the key leads and .005-μf condensers across both key and line. The constants given leave no trace of chirp or tails even at 28 mc. The plate of *T1* is 150 volts above ground so, as a safety precaution, a keying relay is advisable. The keying jack is mounted at the rear of the oscillator.

The space within the doubler section is rather small, so the partition shield was removed for most of the wiring procedure. Power leads for the unit come through a five prong plug at the rear of this compartment while the output and power leads for the adapter are connected to plugs along the side.

A National type ACN, Millen 10035, or Bud D-1729 dial may be used. The one shown here is homemade from a planetary drive taken from a war surplus BC 375 tuning unit. The left knob controls *SW1* and the right knob tunes the doubler tuning condenser.

[*Continued on page 82*]



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Bottom view of c.f.o. and adaptor. The c.f.o. is divided into oscillator compartment and isolation stage compartment with the shield running from front to back in the chassis. Placement of parts should be followed with reasonable care, but is not critical.

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Ten-Meter Propagation by Rebound Scattering

D. W. HEIGHTMAN, G6DH*

WITH THE GENERAL use of multi-element beam antennas there can be few 10-meter operators who have not observed, at one time or another, fairly weak but reasonably consistent signals from stations well within the skip zone and yet obviously situated too far for the ground wave to be audible. We refer to the reception of signals from stations from 50 to 500 miles distant. These signals frequently seem of a DX nature, but do not generally suffer from the deep fading often associated with DX. The reason for these signals is at present somewhat of a puzzle; however, it is the purpose of this article to describe some experimental tests made in Europe during the past winter which may throw some light upon the agency which causes this form of scattering.

For reasons which are outlined later in this article, the writer refers to this type of signal propagation as a *rebound* scattering. This serves to distinguish it from other forms and other theories of scattering which at the present time do not appear applicable to this effect.

A series of tests with PAØUM at Rotterdam, Netherlands (137 miles east of G6DH) and other tests with PAØUN (177 miles east) and G4QL (120 miles W.S.W.) have already yielded interesting results. It has become evident that the signals scattered within the skip zone are *rebounds* from the same direction as that to which they are transmitted, i.e. both receiving and transmitting beam antennas must point in approximately the *same* direction and not at one another. This is illustrated in *Fig. 1*. Preliminary results from these tests also indicate that best or greatest signal strengths are obtained when the beam antennas point to a direction where the F2-layer density and correspondingly the MUF (maximum usable frequency) can be expected to be high.

Around the years 1938 and 1939 it was thought that scattering of this type was primarily a sunrise and sunset effect. However, in this post-war period many of the scheduled trans-Atlantic contacts on 10 meters about 1300 hours GMT, were reported as being received quite well by PAØUM and PAØUN. During these schedules, of course, the beam antenna at G6DH was pointed W.N.W., or almost completely opposite the true azimuth between G6DH and PAØUM and PAØUN. Our first experimental test transmission, with PAØUN listening was made by turning the G6DH beam antenna towards the east, whereupon the signals almost completely disappeared. This appeared to rule out the possibility of extended ground wave or tropospheric direct or indirect route propagation.

From January 21, 1947, until February 14, 1947, many tests were made with PAØUM on the following general basis: At 0830 hours PAØUM would call (using c.w.) G6DH with his four-element beam antenna pointed east. This transmission would last about two minutes. PAØUM would then transmit for one minute with the antenna pointed to the southeast, and then to the south for one minute, progressively around the compass till the antenna was again pointing eastward. To facilitate reception PAØUM would give his call and the direction of his antenna continuously, with long dashes for checking the signal strength. In the meantime at G6DH the best direction for reception was checked con-

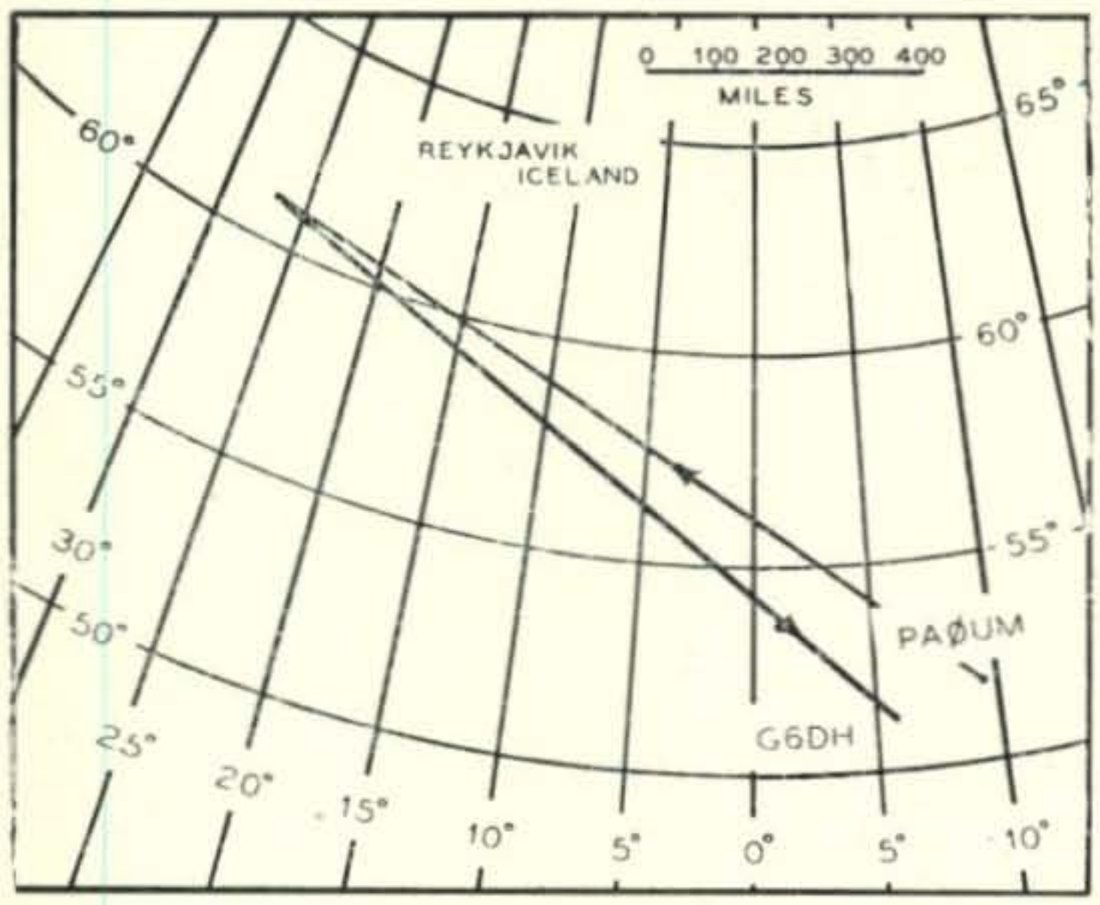


Fig. 1. A skeleton map showing the positions of G6DH and PAØUM and the probable path of a rebound scatter on a winter day at 1400 hours GMT. Both beams are directed approximately northwest.

*234 Burrs Rd., Clacton, Essex, England

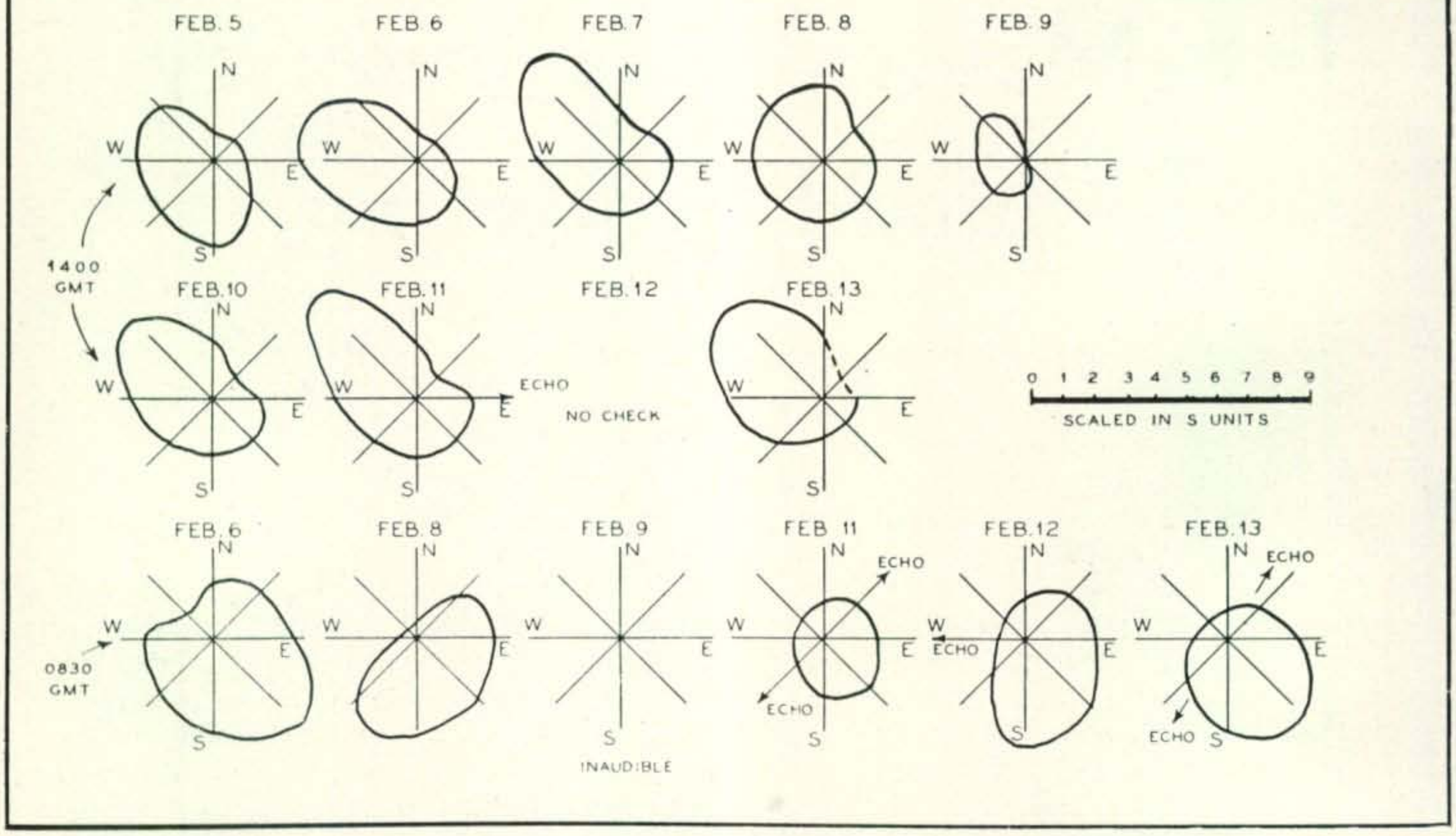


Fig. 2. Polar coordinate outlines showing the signal strengths observed over various azimuths. The transmitting station was PAØUM located 137 miles east of G6DH at Clacton-on-Sea, England. The outlines were made at G6DH and show the azimuthal variation in the scattering effect.

tinuously by rotating our three-element beam antenna. At 1400 hours GMT, a somewhat similar procedure was followed, with the exception that the transmission commenced to the west of PAØUM and proceeded clockwise around the compass.

Invariably, for best reception and greatest signal strengths, it was found that the beam antenna at G6DH should point in the same direction as that given by PAØUM. Normally the signal strength would reach a broad maximum in a direction which showed some day to day variation. Polar coordinate plots of this form of signal strength response from various directions is shown in *Fig. 2*.

Correlation with MUF

It was normally found that no signals were received when the MUF for the hour of tests was lower than about 33.0 mc and that good signals were observed when the MUF was 35.0 mc or higher. The improvement in signal strength when the MUF exceeded 35.0 mc was not pronounced. Referring to *Fig. 2* the test at 0830 hours GMT February 9 is an example of a period when no signals were received, the MUF at this time being approximately 28.0 mc. The MUF was somewhat higher at 1400 hours GMT and weak *rebound* signals were heard at that time. It will be noted that at 1400 hours GMT on February 5 the maximum signal strengths were from the south. On February 6 the maximum is to the west and on the 7th of February the maximum is to the northwest. These responses check very closely with the MUF observations made at G6DH for the days in question and also with the general buildup in the MUF to the W.N.W. prior to 1400 hours GMT. For example the reception of WGTR (Paxton, Mass., FM broadcast station) on 44.3 mc began on February 5 at 1340 hours GMT, on the 6th of February WGTR was first heard at 1330 hours GMT and on the 7th it came through at 1250 hours GMT.

It is our experience that peak MUF to the southernly directions do not occur on days when the MUF to the north of east or to the north of west are high. This is also evident from the diagrams. This *rebound* checking would as a matter of fact serve as a means of finding the direction of the maximum F2-layer density and the MUF at any time. Of the days under consideration in these tests February 11th had the highest MUF noted in the trans-Atlantic path to the United States. The MUF was observed to be about 50.0 mc at 1320 hours GMT. It is interesting to note that round-the-world echo was apparent on the *rebound* signals at both 0830 and 1400 hours on this day. The MUF on February 12th was also observed to be very high and round-the-world echo was apparent in the morning test. On February 13th there was a very noticeable echo at 0830 hours but no echo was observed at 1400 hours GMT. This corresponded with some apparent absorption of 28-mc signals on this afternoon, al-

though the MUF was observed above 40.0 mc. On the best days of last winter it was found that, so far as ordinary propagation was concerned, strong signals were obtained over the whole spectrum from 28.0 mc up to the MUF. Presumably on such days the F2-layer is concentrated and particularly stratified, thus acting as a very good reflector for all radio frequencies, whereas on other days there is greater vertical development, as well as possibly somewhat greater lower level absorption which tends to attenuate the lower frequencies.

It is impossible at the present time to reach any definite conclusion as to the mechanism responsible for the *rebound* type of signal scatter. It has been suggested that these signals are received by long and short scattering as normally applied to the much lower frequency spectrum. The writer, however, does not favor this possibility insofar that the *rebound* signals are much too consistent, the signal intensities are much greater than would be expected for normal type scattering and *rebound* signals are most frequently obtained or observed in the winter in the northern hemis-

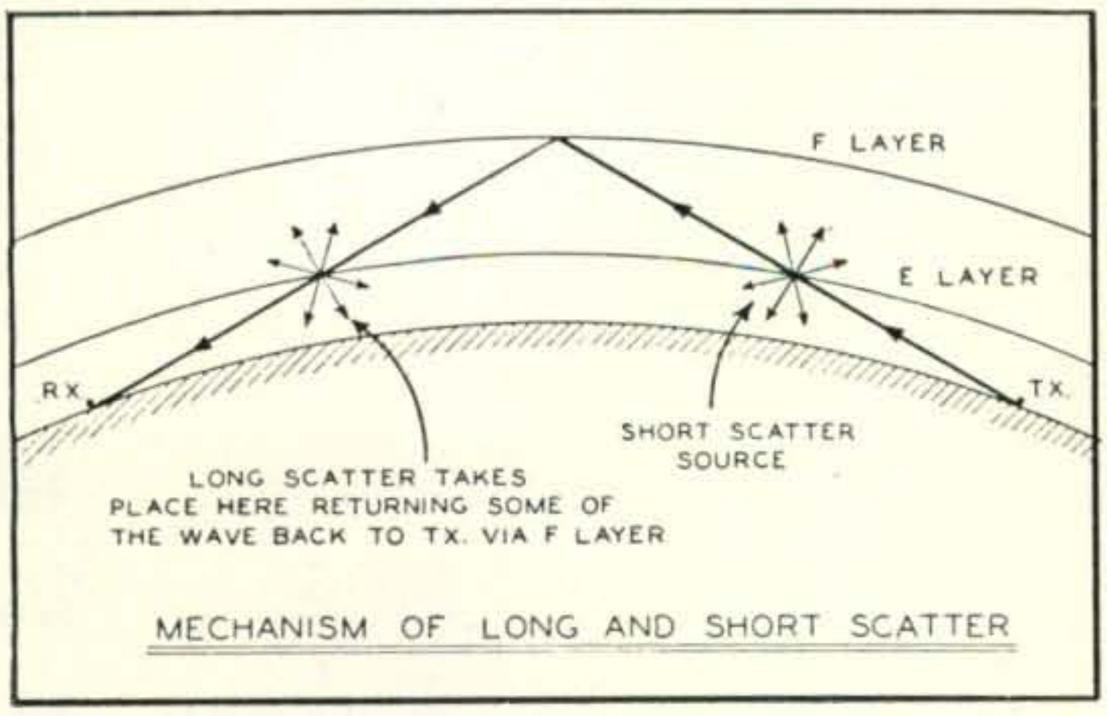


Fig. 3. The present theory of long and short scattering is based upon the cloudy nature of the E-layer. Scattering occurs as the wave is reflected in all directions from these clouds.

phere, from the northeast and northwest directions where the E-layer (said to be chiefly responsible for scattering) has a very low ionization level.

Theory of Scattering

For those who are not familar with the theory of long and short scatter, *Fig. 3* illustrates what presumably takes place. The C.R.P.L. Propagation Handbook has this to say about scattering. "In general, radio waves of frequencies high enough to pass through the E-layer are scattered in all directions by the patches in the layer. Most of the energy travels forward in the general direction which the waves had before they entered the layer, but appreciable amounts of energy may be scattered at large angles to this direction and even backward toward the transmitter . . . . . For short distance single hop transmission (less than about 1000 miles) these scattered reflections cause transmission within the skip zone of the regular layers. In this case the reflections are complex and jumpy, thus causing signal distortion and flutter fading, and are almost useless for radiotelephone communication. They are, however, useful for radiotelegraph communication."

"In general, radio transmission by scattered reflections can be divided into two categories:

(a) 'Short scatter'—the first reflection to reach the receiver, coming directly off the lower edge of the scattering patches or clouds.

(b) 'Long scatter'—the reflections return to the receiver from the upper surface of the scattering patches or clouds, via the F, F2-layer, after having reached the scattering patches via the F, F2-layer.

"Long scatter is the most common cause for reception in the skip zone."

Assuming that the *rebound* signals are some form of scattering, it would seem to the writer that this occurs directly from the F-layer and not over the somewhat complex path described for the long scatter effect. It appears that the *rebound* signals are reflected directly by irregularities in the F2-layer. In *Fig. 4* a wave leaving the transmitter at a very low angle, which would be more or less tangent to the earth's surface at that point, will for an average F2-layer height impinge upon that layer after traveling a distance slightly in excess of 1200 miles. Due to this low angle of radiation the F2-layer presents to the

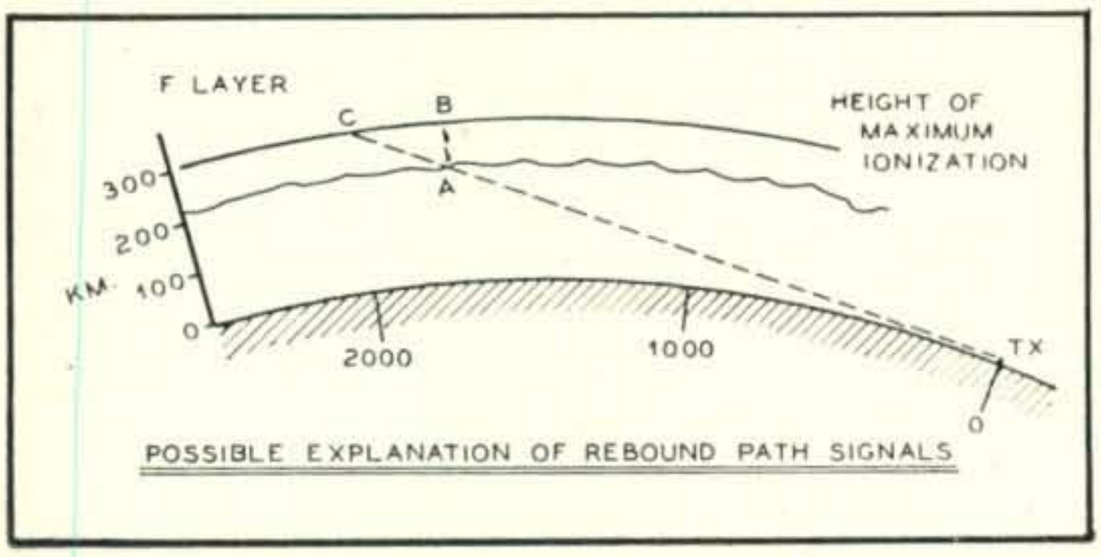
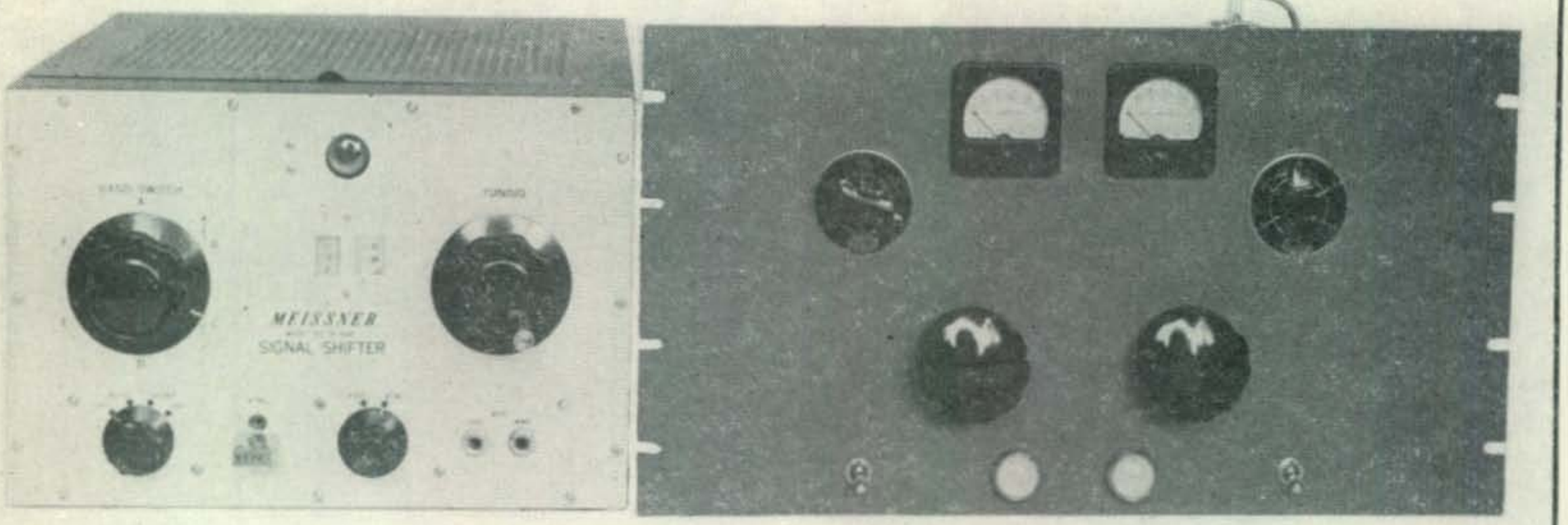


Fig. 4. The rebound type of scatter may be due to the cloudy nature of the F2-layer as well as the depth of penetration of the low angle of radiation. In this illustration it is assumed that the receiver is located near the transmitter.

wave front a much greater *thickness* than if the wave front were proceeding vertically (as is done in the measurement of F2-layer height and critical frequencies) i.e., the distance AC is approximately three or more times as great as the distance AB and due to this longer path of travel in the ionosphere layer a wave of much

[*Continued on page 85*]



A Medium-Power BAND SWITCHING FINAL

EDGAR E. NEWMAN, W2RPZ*

WITH THE APPEARANCE on the postwar market of numerous all-band v.f.o.s, a logical design problem was the construction of an equally versatile power amplifier. The final model of this companion unit was shown on the cover of our April issue and here is the rest of the story.

With due consideration for the contest multiplier allowed for "100 watts and under," a 4D32 was chosen; in actual operation the rig has been running at 150 watts input for some months, doing a good job on 7 and 14-mc DX at W2RPZ. Larger tubes, such as the 813, 814, 4-125A, etc., could be used in this layout, with appropriate changes in power supply and plate tank circuits.

Editorial Assistant, CQ

Circuit Considerations

Break-in was facilitated by the use of the screen "resistor-plus-tube" d i v i d e r introduced by W6BCX* just before the war.

In connection with this circuit we have had some inquiries lately which indicate that a brief review of this idea would be a help to those of the gang who missed the original write-up.

*(A substitute for Safety Bias When Using Screen Grid Tubes," W. W. Smith, RADIO, December, 1941).

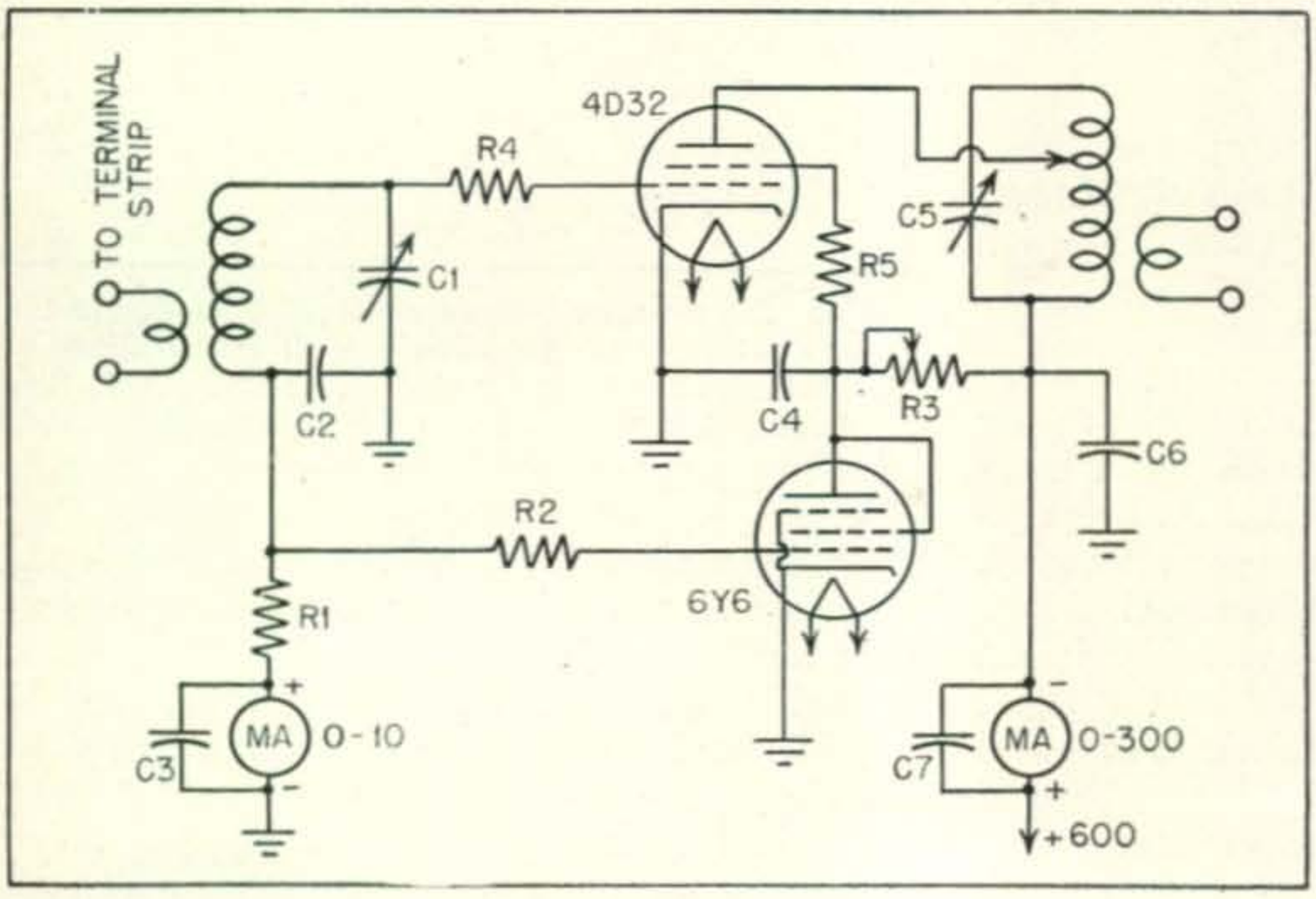


Fig. 1. Circuit diagram of medium-power bandswitching final.
C1—150 $\mu\mu$f, variable, National TMS-150
C2—.001 μf, 600 volts, mica.
C3, C7—.001 μf, mica or paper.
C4, C6—.001, 1200 w.v., mica.
C5—150 $\mu\mu$f, variable, National TMK-150
R1—31K, 2 watts.
R2—47K, ½ watt.
R3—50K, 25 watts, adjustable.
R4, R5—Parasitic suppressors, IRC Type NAB.
B & W Type BEL and Type BTEL bandswitching turrets.
Antenna terminal post, National FWG.
Terminal strip, Millen 37105

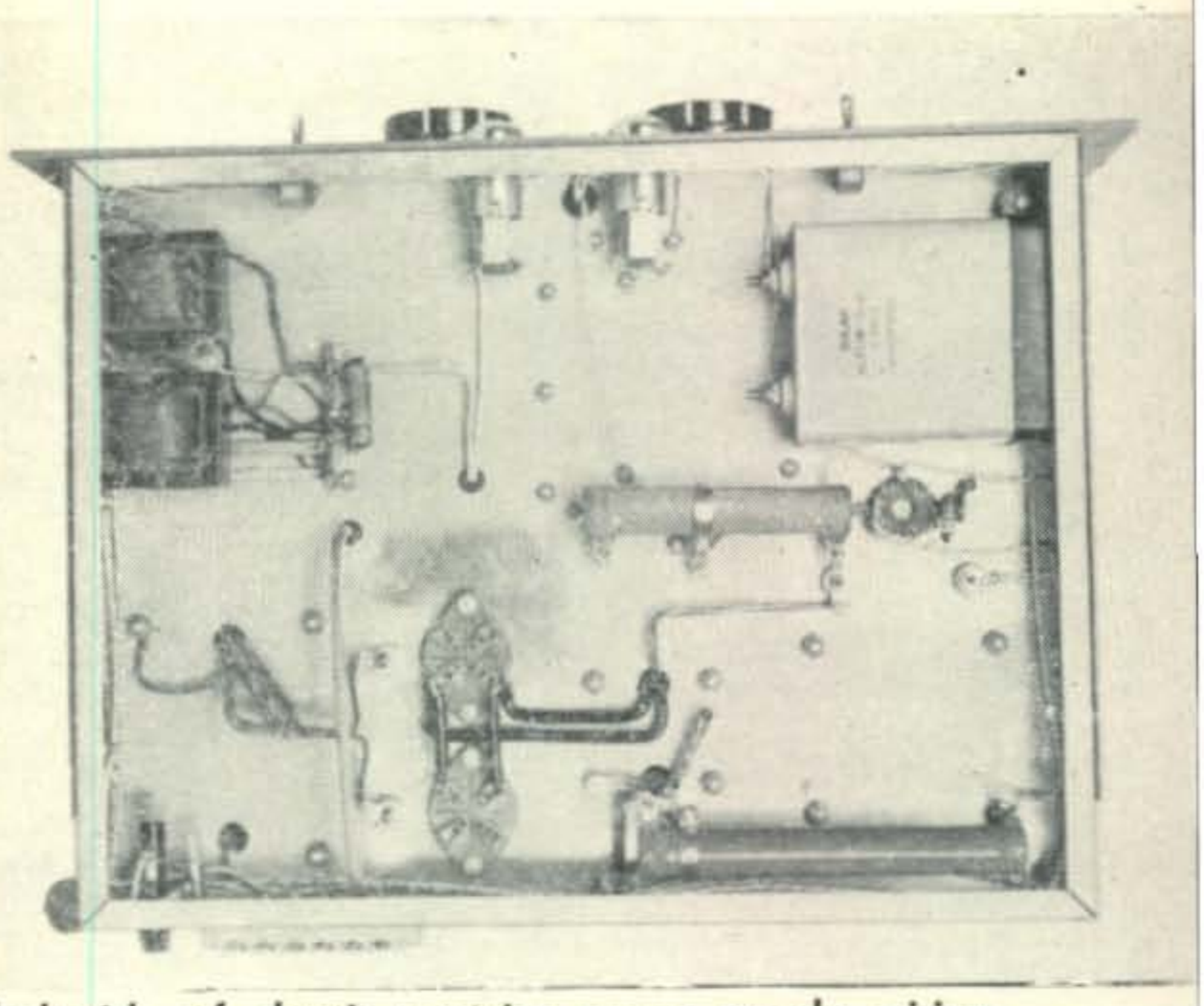
In this system the screen voltage divider is composed of a screen dropping resistor in series with a ballast tube. The resistance of the dropping resistor is determined in the usual manner, that is,

$$R = \frac{\text{E supply—Esg.}}{\text{Isg.}}$$

The resistance of the ballast tube is considered infinite as long as excitation is applied, since the ballast tube grid is cut off by the amplifier's developed bias; when excitation is removed, either deliberately, as under keying, or accidentally due to circuit failure, the ballast tube appears as a very low resistance section of the voltage divider, and the screen potential falls to a value sufficiently low so that idling plate current and plate dissipation are within safe limits. In other words, under no excitation, the amplifier tube idles with zero grid bias and full plate voltage but subnormal screen voltage.

To insure satisfactory operation the ratio of screen dropping resistance to ballast tube plate resistance must be high. With low-voltage high-current types such as 807 and 4D32, this ratio implies operation at or near maximum rated plate voltage so that sufficient screen resistance can be used.

In this rig we started out with a 6V6-GT ballast tube and a 600-volt plate supply. Idling plate current was uncomfortably high under these conditions. With the final choice of a 700-volt supply and substitution of a 6Y6-G for the 6V6-GT, idling current runs under 40 ma which represents plate dissipation well below the rated 50-watt figure. It should be noted that the meter indicates not only plate current but also current passed through *R3* in series with the ballast tube.



Underside of chassis contains power supply wiring. Resistors are R3 and power supply bleeder.

Special Requirements of the 4D32

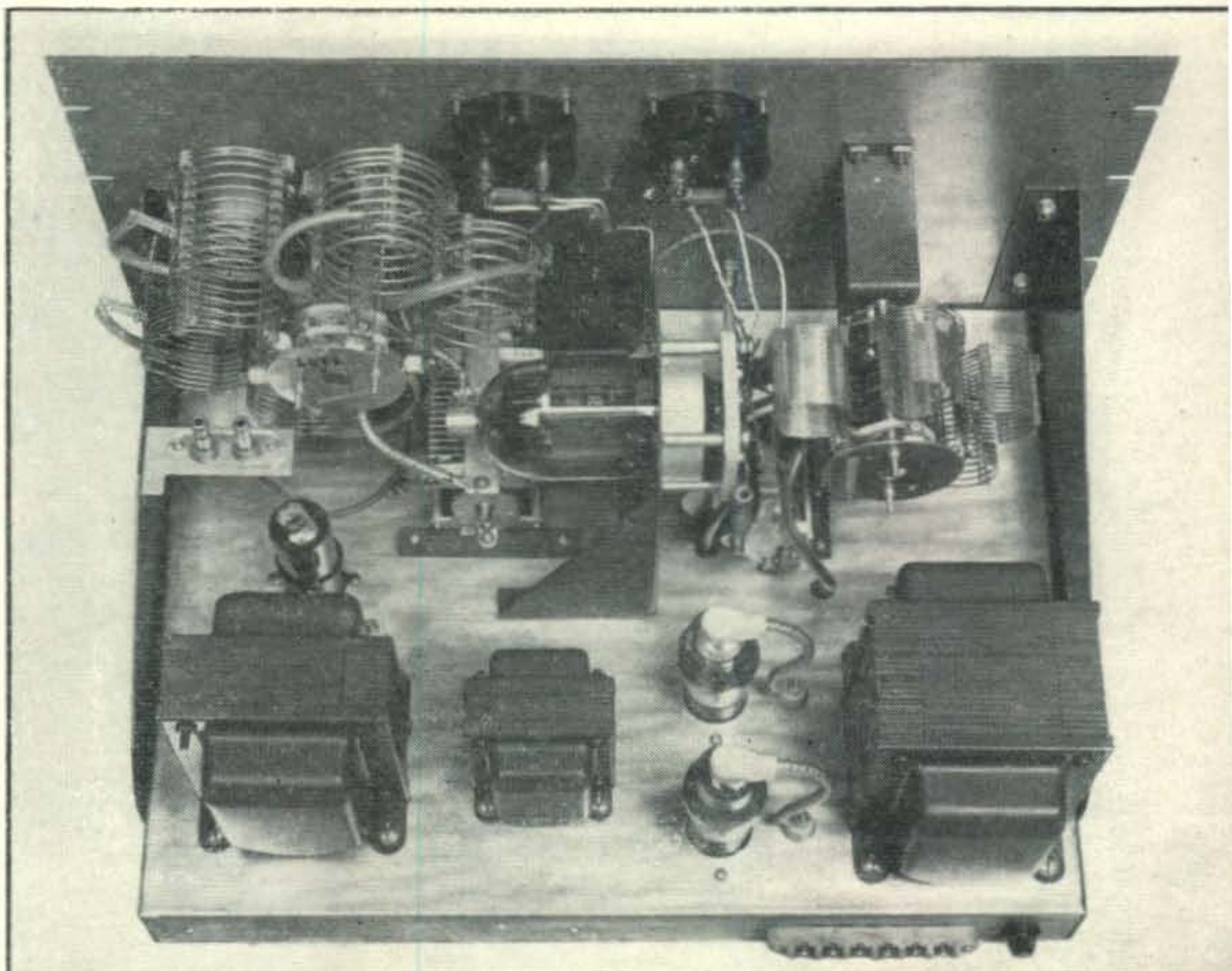
As our initial plans called for low-voltage high-current operation of the 4D32, a special turret was ordered from Barker & Williamson. This has flexible leads to permit tapping the plate of the tube down the coil, in order to obtain reasonable circuit "Q" without resorting to an outsized tank condenser. The subsequent shift to a higher voltage plate supply made tapping unnecessary on any but the 3.5-mc band.

A simple method of setting this tap is to operate the amplifier with a dummy load, such as a 75-watt or 100-watt lamp, and in repeated tries move the tap toward the free end of the coil until a point is reached where maximum output and minimum plate current no longer occur at the same setting of the plate condenser; the tap should then be moved back a few turns below

❖ ❖

Layout of transmitter is clearly visible in this top view. Power supply utilizes 816 rectifiers. Details of the supply are not given because of wide variety of components that will supply voltage and current requirements of transmitter without any change in physical layout.

❖ ❖



this point, toward the B+end of the coil. The midpoint of the coil is a good starting point for the 80-meter band.*

Mechanical Details

Electrically, the PA is relatively straightforward. The principal problems encountered were in doing a neat mechanical job. The two band-switching turrets occupy considerable panel space. In order to permit the use of a 13½" panel which allows the amplifier to fit into a standard 15" cabinet, careful component placing was required.

The entire PA and power supply is built on a standard 17" x 13" x 2" chassis. From the photographs it will be observed that there are three special brackets, one holding the output link terminals, another supporting the 4D32 tube socket, and the third holding the grid turret in position. Dimensions for these brackets are shown in *Fig. 2*, with the exception of the link output support which may be any random size "L" shaped bracket large enough to hold the National FWN bushings.

By referring to the circuit diagram it will be observed that the plate tuning condenser is above ground. In order to insulate it from the chassis and yet avoid using standoffs, the condenser was mounted on two strips of insulating material, in this instance Mykroy, but almost any of the plastics such as Polystyrene could be substituted. The mounting screw is countersunk and covered with another small piece of the same material, or the chassis can be drilled out to allow clearance for the screw head. The grid tuning condenser is fastened to the chassis by an "L" shaped bracket

[*Continued on page 87*]

*Incidentally, this tapped-coil scheme of letting a low-capacity tank condenser do the work of a high-capacity affair is not a "something for nothing" proposition. For example, suppose we are operating an r-f amplifier under conditions such that our handbook charts call for a 400-$\mu\mu$f tank capacity in the conventional circuit. We decide to avoid this by using a 100-$\mu\mu$f condeser, tapping the plate halfway down the coil. If the coupling between the tapped section and the rest of the coil is fairly tight, this will be about the right point, as our amplifier tube will see an impedance about one-fourth the total tank impedance, or in other words, it will see the same impedance that would be offered by our original design using a 400-$\mu\mu$f condenser. The catch is that the voltage rating of our new 100-$\mu\mu$f condenser must be considerably higher than would be required of the larger condenser used in the conventional circuit. This can be seen from the fact that the same amount of power is handled in either case, with the same effective circuit Q; therefore the energy storage in the tank condenser is the same in both cases, and can be calculated from the expression $W = \frac{1}{2}CE^2$. If W remains the same when C is reduced by a ratio of 1:4, obviously E^2 has been increased by the same factor, which means that E (our tank voltage) has been doubled, and a tank condenser of twice the normal voltage rating must be used.

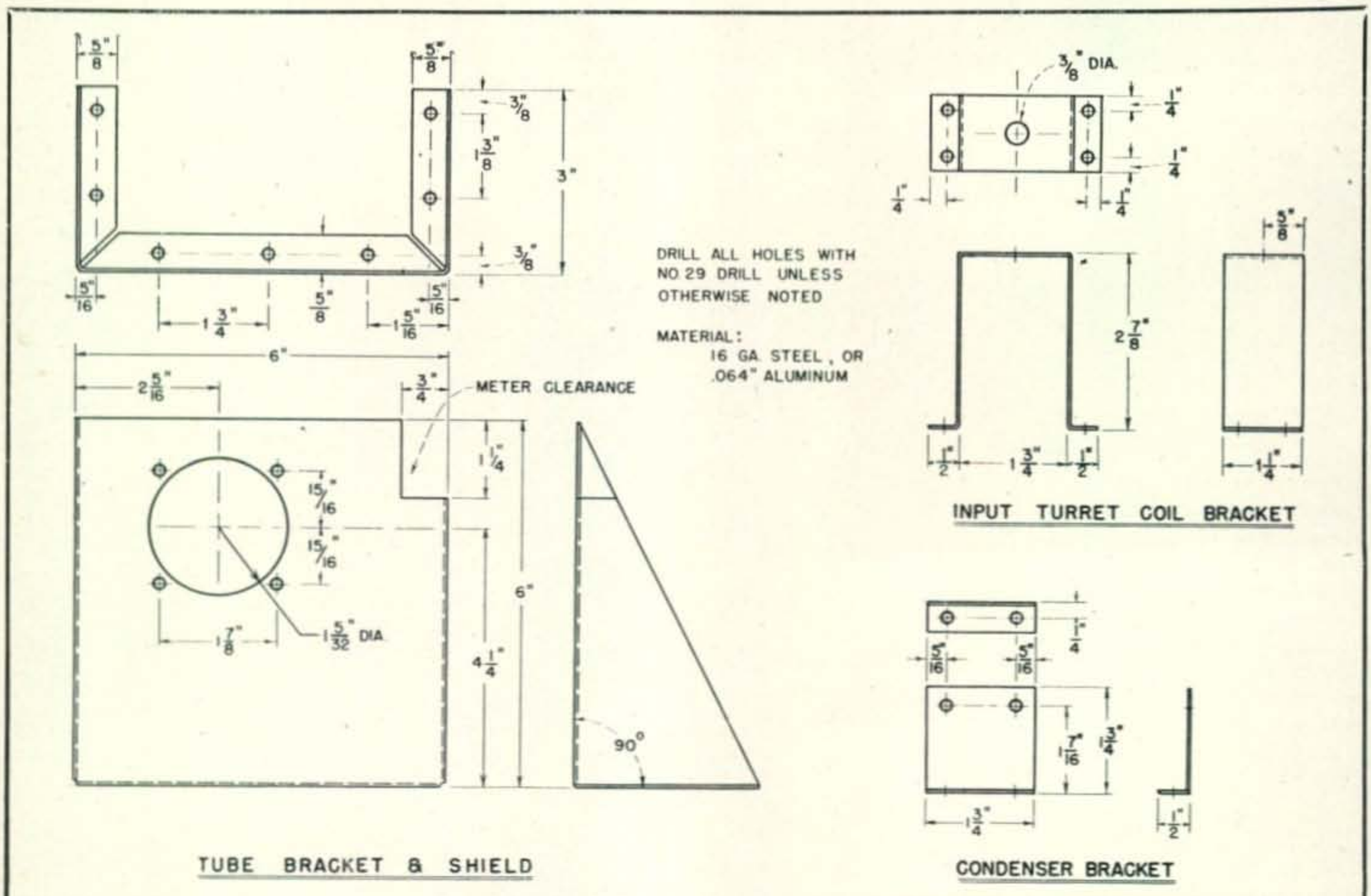


Fig. 2. Mechanical details of three special brackets required for transmitter.

Some Legal Aspects OF AMATEUR RADIO

MAURICE J. HINDIN, W6EUV*

AMATEUR RADIO as a hobby owes its very existence to enactments of law. It is therefore a natural sequence that amateurs from time to time may inquire as to the legal background of the hobby. Specific problems which arise from time to time are far too numerous to discuss in this first article, and the purpose here is to direct the amateur to the basic questions most frequently asked:

1. What is the legal background of radio in the United States and of the FCC?

2. How do local city, county and state laws and regulations affect the amateur?

The first international radio convention was held in the United States, at which general rules of conduct for radio stations were adopted, as were international signals. On August 13, 1912, the first general law relating to radio was enacted.[1] The Secretary of Commerce, designated in that Act as the government official to issue licenses, had no powers other than that of a ministerial officer, and was provided with no regulatory powers.

This was so held in a decision of the United States Circuit Court.[2] Several resolutions were enacted between 1912 and 1927 which effected no material change in the situation,[3] and are interesting only to indicate Radio's growing pains.

The first modern radio statute was enacted in 1927 as the Radio Act of 1927,[3] which established the Federal Radio Commission and conferred the broad powers to issue licenses, regulate radio services, control schedules of transmission, power, and conferred most of the powers now exercised by FCC. Thereafter in 1928, 1929, 1930 and 1932 this act was amended by Congress.[4] These amendments enacted administrative changes and in no way affected amateur radio.

Substantive radio law had its greatest change in 1934 with the enactment of the "Radio Act of 1934[5]." This act repealed the former radio act, abolished the old Radio Commission and created the Federal Communications Commission. This act has been amended from time to time but mainly in its administrative provisions.[6]

Since a solid understanding of the basic laws relating to radio is desirable and a definite asset to the amateur, it is suggested that all amateurs secure a copy. Copies of this "Radio Act of 1934 as Amended" may be secured from the Government Printing Office at Washington for a very nominal charge.†

Constitutional Authority

It may be of considerable interest to amateurs to know that the Constitution of the United States is involved when they ask if regulation of radio has fallen by accident or usurpation to the Federal Government rather than to the governments of the several states. Aside from expediency and convenience in having a central authority and single law for the country at large, there is sound, logical and legal reason for this. Among the powers specifically granted to Congress by the Constitution is: "to regulate commerce with foreign nations and among the several states . . ." It should naturally follow to the amateur, (usually a reasoning and highly intelligent citizen) that radio communication legally

*1041 S. Crescent Heights, Los Angeles, Calif.

†*Temporarily out of print; 15c when available.*

[1]Act of August 13, 1912; 37 Statutes at Large 302; U.S.C. Title 47, Sections 51-60.

[2]Hoover vs. Intercity Radio Company, (286 Fed. 1003)

[3]Act of February 23, 1927, c 169; 44 Statutes at Large 1162.

[4]Act of March 28, 1928, c 263, 45 Statute at Large 373; U.S.C. Title 47, Section 89; the "Act of March 4, 1929, Chapter 701, 45 Statute at Large, 1559"; the "Act of December 18, 1929, c 7, 46 Statute at Large 50"; the "Act of July 1, 1930, c 788, 46 Statute at Large 844"; and the "Act of May 19, 1932, Chapter 192, 47 Statute 160."

[5]Act of June 19, 1934, c 652, 48 Statutes at Large 1102.

[6]Act of May 20, 1937, c 229 Statute at Large; the "Act of January 22, 1936, c 25, 49 Statute at Large 1098"; the "Act of March 6, 1943, c 10, 57 Statute at Large 5"; and the "Act of March 23, 1941, c 24, 55 Statute at Large 46."

constitutes "commerce" with foreign states and among the several states. Then, under the Constitution, the Federal Government and not the States have the right to regulate in this field. Uniform pronouncements of the courts have definitely declared this to be the law.[7] The courts have also held that transmissions (even if the signal is wholly confined to the territory of one state and doesn't cross any state lines) are a matter of interstate commerce.[8] It should, therefore, be clear to any reader that it is well settled law, that the Federal Government alone has the power to regulate and control radio transmissions.

The Amateur and Local Law

Though the law is quite clear that neither individual states, counties, cities or local communities may pass a law which licenses, regulates, or interferes unreasonably with interstate commerce, legalistic distinctions may nevertheless impose certain general obligations on the amateurs—to whom this may appear paradoxical. The courts have quite uniformly held that a state may impose general property taxes on all property located within the state even though the property is used in connection with interstate commerce.[9] It should, therefore, be clear to the amateur that his equipment and rig may properly be the subject of state property tax laws or other local tax laws much the same as would be a piano, automobile or other personal property.

How zealously the Federal Government guards the powers delegated to it by the Constitution is best illustrated by a case involving the State of North Carolina. This state, in its attempt to circumvent this basic fundamental principle, sought to collect an annual license on radio receiving sets on all radio receivers in the state. Suit instituted by a broadcast station in the Federal Court resulted in a decree of injunction which forbade the collection of the tax on the grounds that the law was not a general property tax.[10]

Local safety laws regulating the use of electrical equipment and electrical appliances are generally held to be equally applicable to radio stations.[11] It should be borne in mind that most local laws touching on safety requirements are designed for the public protection. Since radio amateurs are among the best informed individuals as to technical electrical and radio matters, they generally realize the desirability of complying with all safety regulations. It would seem that only on the rarest occasion would an amateur run afoul of local safety regulations.

Occasionally amateurs run into problems concerning local zoning restrictions. A recent case involving an amateur radio operator reached the Supreme Court of Minnesota. The case is believed to be of general interest to amateur station owners.

Zoning Restrictions

A suit was instituted by a Minnesota city to compel a radio amateur operator to remove his antenna poles from his home on the grounds that the antenna poles constituted improper structures for a residential zone. The lower court ordered the poles removed and the amateur took the case on appeal to the Minnesota Supreme Court. The Supreme Court reversed the lower court's decision and held that the maintenance of antenna poles was not an improper use of property in a residential zone. A quotation from the court's opinion may be of interest. The court in part said:

"While many aerials are attached to poles above the roofs of dwellings, and even to trees, the use of separate poles or masts for this purpose still prevails when a householder seeks the best reception. Such equipment is certainly customarily incident to a residential establishment. The use of shortwave amateur sets for both reception and transmission is so common in the United States that the Federal Communications Commission licenses such sets for transmission within certain wavelengths, and there is an American Radio Relay League of the proprietors of Amateur stations. That many, if not most, of these amateur stations are operated in connection with residences is too well known a fact to be ignored."[12]

Should an amateur's station emit unusually loud, or objectionable noises, or otherwise constitute a nuisance, the operator would be liable for prosecution under the local law. The good sense of the amateur and his repeatedly demonstrated good citizenship will not make this type of legal action probable. Local ordinances which restrict the use of loudspeakers which disturb neighbors are a valid type of legislation.[13]

While the Federal Government has the right to regulate amateur radio operations, the amateur must abide by local laws as well. In the event that local laws usurp the powers of the Federal Government as to radio matters, the Federal regulation will prevail.

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[7]Federal Radio Commission vs. Nelson Brothers et. al. (289 U.S. 266)

[8]Whitehurst vs. Grimes, 21 Fed (2) 787.

[9]Lelube vs. Mobile, (127 U.S. 640)

[10]WBT vs. Poulnot, 46 Fed (2) 671

[11]N.Y. & N.H.H. Ry. vs. New York, (165 U.S. 268).

[12]St. Louis Park vs. Casey; (16 NW 2nd 459).

[13]Stodder vs. Rosen Talking Machine Co. (247 Mass. 60).

Simple Superhet
FOR 2 METERS

EVERETT G. TAYLOR, W9KIB, ex-W8NAF*

THE PURPOSE OF THIS article is to describe a very simple superhet that has excellent sensitivity and noise-limiting qualities. Its primary advantage is to provide operation in the two-meter band without the super-regenerative radiation problem that was so common before the war. Our final version is really a combination of the superhet principle and the super-regenerative principle. It employs a conventional mixer and oscillator with a super-regen second detector and one stage of audio.

The Mixer Stage

A two-turn coil is used to couple the antenna to the mixer grid coil. As can be seen in *Fig. 1*, this coil is soldered directly to lugs which are held in place by two push-type binding posts. These posts are insulated from the chassis by a National type FWB polystyrene strip. The mixer grid coil is made of number 14 wire and consists of 5 turns about one-half inch in diameter. The oscillator coil is wound with 6 turns and is also about one-half inch in diameter. Both coils are soldered directly on the 25-$\mu\mu$f band-setting condensers.

*720 Ohio St., Columbus, Ind.

When the coils are properly mounted as shown in *Fig. 1*, there will be sufficient coupling between the two coils for proper mixing action. Therefore, this circuit needs no coupling condenser from the oscillator to the mixer stage.

The main tuning condenser is a modified 35-$\mu\mu$f per section Hammarlund. It is cut down to two rotor plates and one stator plate per section. An insulated coupling is inserted between the rotors to minimize eddy current coupling and to permit separate grounds for the oscillator and mixer stages.

Although the wiring schematic shows a 9003 tube as the mixer, a 9001 may be used without any noticeable change in sensitivity. A 9002 tube is used for the oscillator. It is good practice to use either mica-filled bakelite or polystyrene sockets for these tubes. Grid-leak detection is used in the mixer. Some experimentation may be necessary with the oscillator coil tap, but usually a tap one-tenth of the way up from the ground end of the coil is satisfactory. Too much oscillation will give birdies across the band and not enough feedback will make the tube inoperative.

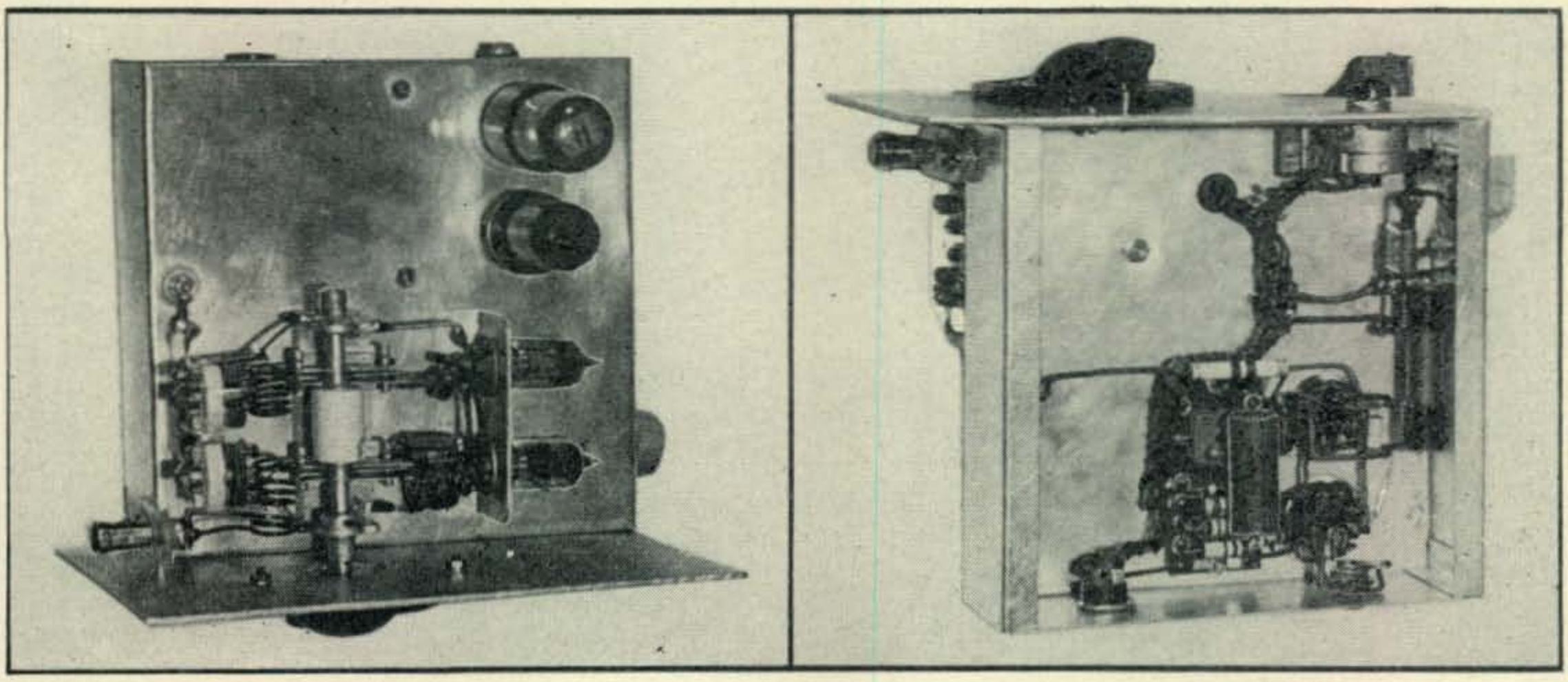


Fig. 1. Top-side view of the simple two-meter superhet. The antenna terminals are in the upper left-hand corner of the chassis near the front panel. The two band-setting condensers are used to support the mixer and oscillator coils. The 9000 series tubes are mounted on an "L" shaped piece of aluminum. The knob just visible in the lower left-hand corner of the chassis is the second detector regeneration control. Fig. 2. Bottom view of the simple two-meter superhet. The special homemade i-f coil may be seen along the chassis wall. Note how the underside wiring is sewed together with fish line cord to give the unit a more commercial appearance.

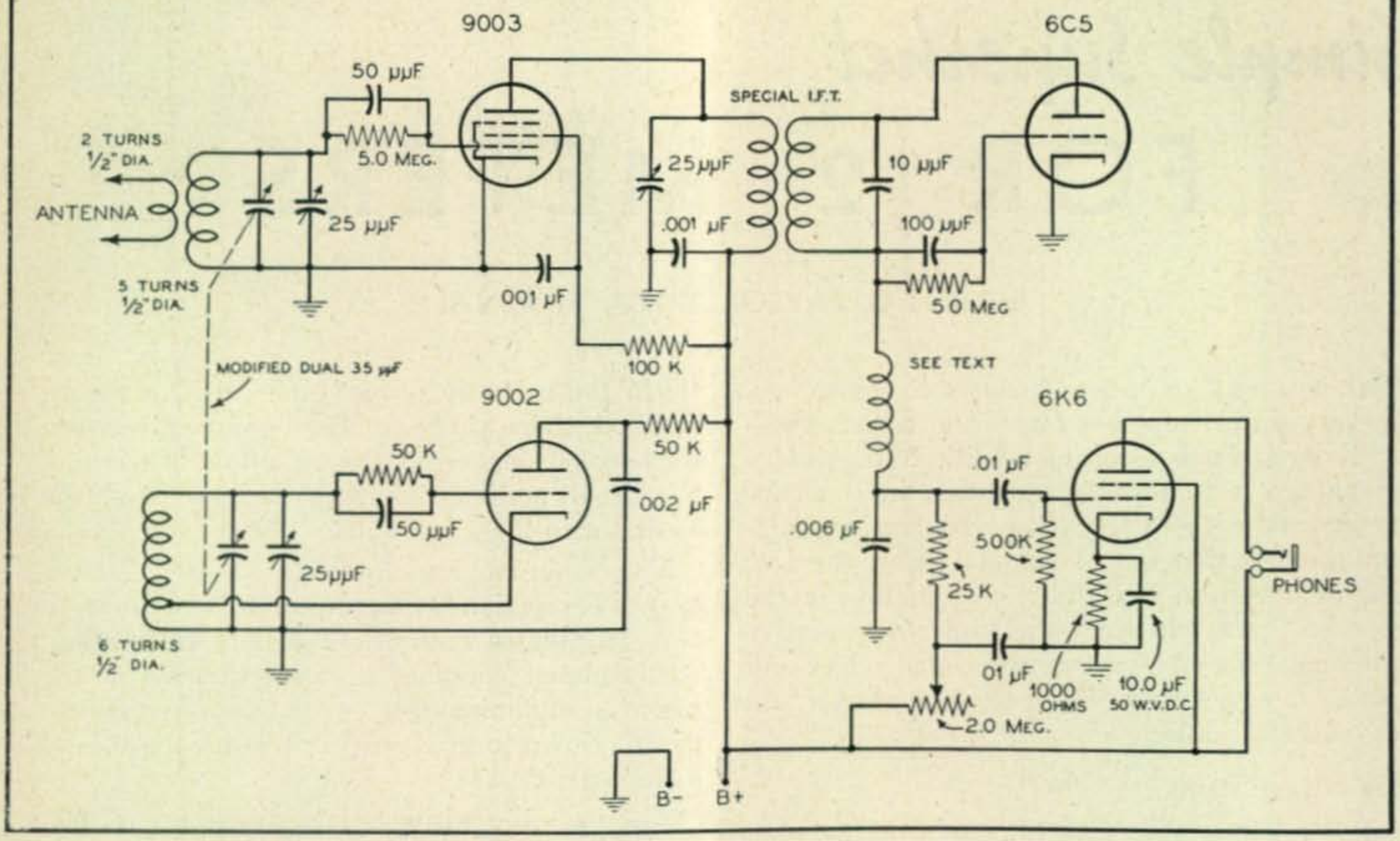


Fig. 3. Circuit diagram of the simple two-meter superhet.

The Second Detector and Audio

Coupling between the mixer stage and the second detector is accomplished in a homemade i-f transformer. A plastic dowel of about one-half inch in diameter was obtained and two coils of 9 turns each of number 14 wire were wound with a separation of about 1⅛ inches. The primary is tuned with a 25-$\mu\mu$f condenser, the shaft of which protrudes through the side of the chassis and may be seen in *Fig. 2*. Some trouble may be encountered in the optimum coupling between the two coils; for this reason the primary of the transformer should be movable along the form. The coupling is arranged to give smooth operation of the regeneration control.

Almost any of the popular triodes may be used as the second detector, although we found that the 6C5 worked quite satisfactorily. The r-f choke in the plate of the second detector is a standard 2.5-mh choke with two pies removed. This reduces the inductance value which in conjunction with the .006-μf by-pass condenser provides effective squegging without excessive oscillation. A 2-megohm potentiometer is used to control the regeneration in the second detector. Generally this control may be set or adjusted once and left alone. B+ voltage should be around 180.

The audio circuit is straightforward with a 1000-ohm cathode resistor to limit the plate current to a reasonable value for headphone operation.

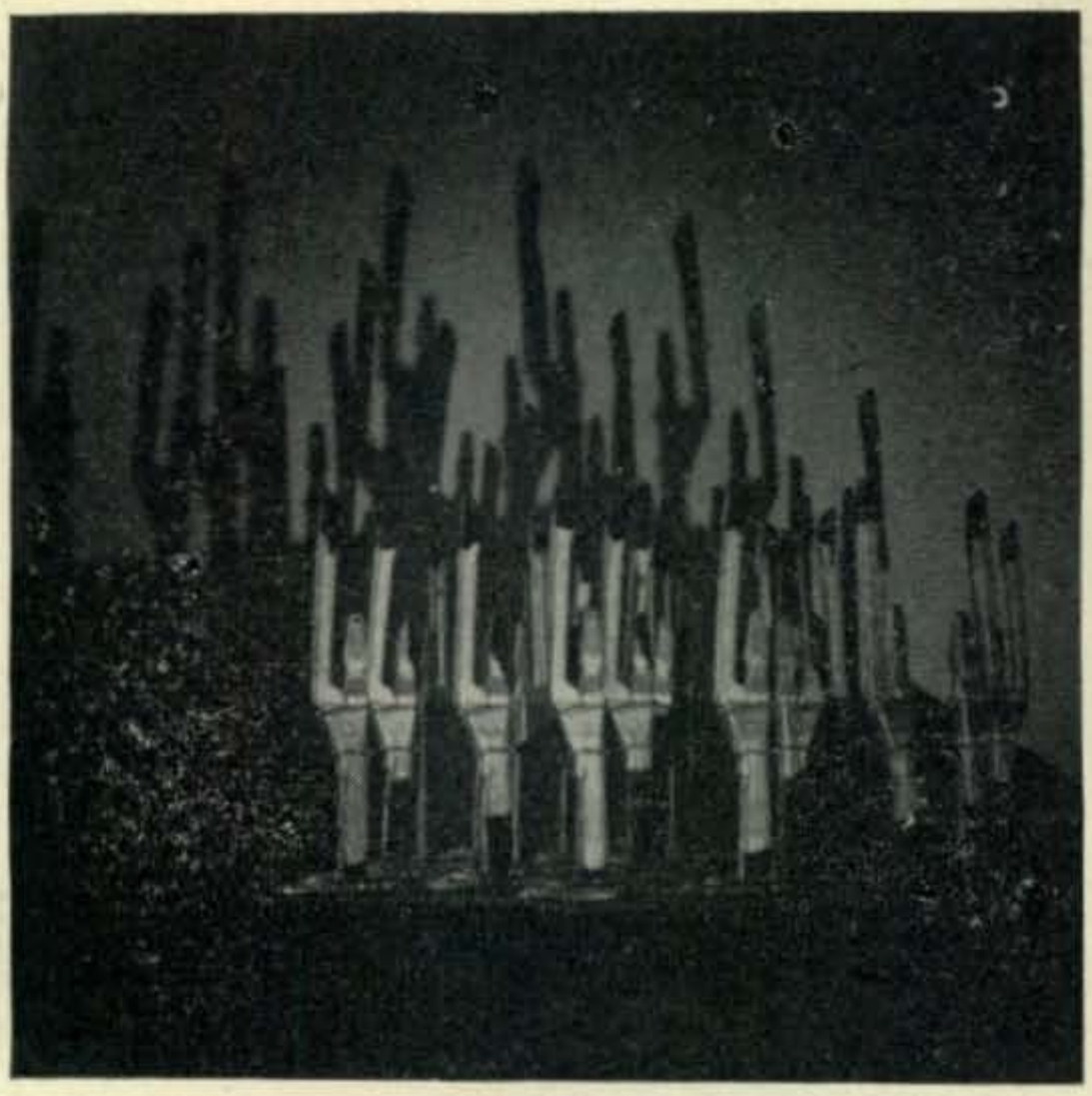
The entire receiver is mounted on a 7 x 7 x 2-inch plated chassis. A small piece of aluminum serves as a mounting for the 9000 series tubes in the mixer and oscillator section. It is bent in an "L" shape and may be observed in *Fig. 1*. The output jack for the headphones is mounted on the back drop, directly behind the 6K6. A simple antenna may be used on this unit with satisfactory results. We have heard signals in Indianapolis, which is about 45 miles distant and airplanes over Wright and Patterson Fields in Dayton, Ohio, about 120 miles away, under all kinds of conditions. As a simple superhet we have found this a most effective receiver.

Postscripts

F. C. C. Rulings

The F.C.C. has amended Section 12.21 of its rules governing amateur radio, eliminating the requirement of an applicant having held an operator license within *five years* prior to application for Class A license. The new ruling makes eligible to apply for a Class A amateur operator license any citizen of the United States who *at any time* prior to the receipt of his application by the Commission has held, for a period of a year or more, an amateur operator license issued by the Commission.

The Commission has further issued a new order, 77-H, suspending for another year Section 12.27 which requires a showing of service or use. The new order makes it unnecessary to show proof of use in applying for renewal of operator license, through June 30, 1948.

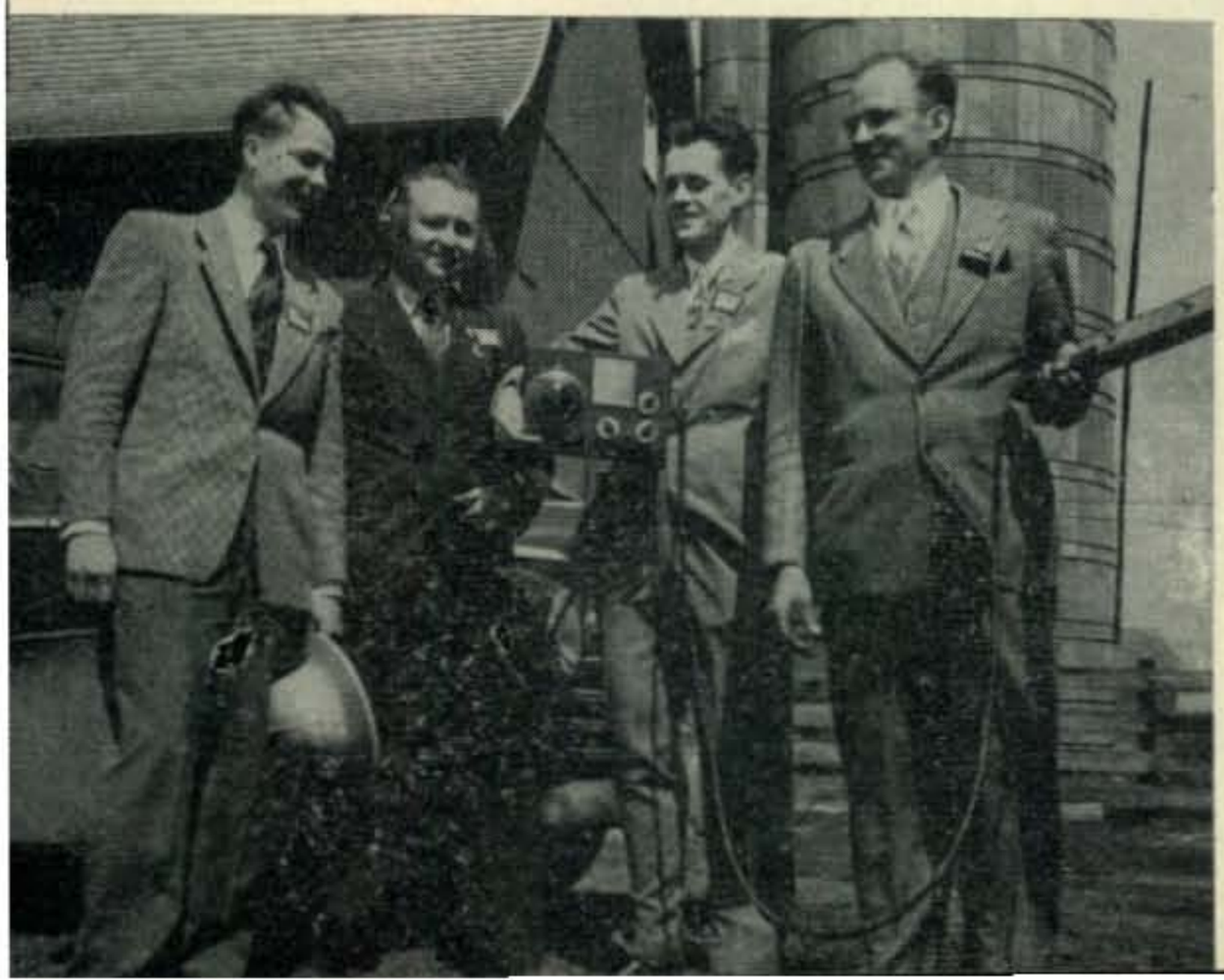


Tall Corn Hamfest

A bang-up affair was the Tall Corn Hamfest held at Hawkeye Downs, Cedar Rapids, Iowa, on May 24-25, with a total attendance of 610 persons. The program included technical sessions, exhibition of equipment, tours through The Turner Co. and Collins Radio Co. plants, a banquet, dance and a hidden 144-mc transmitter hunt. Of particular interest were the numerous 10-meter mobiles in evidence, by means of which many cars were directed to the convention. Prizes, some of which may be seen in the above photo, totalling $3,000.00 in value were distributed.

Photos, except as indicated, by J. Reynolds, The Cedar Rapids Gazette.

Above: Wouff-Hongs cast weird shadows foretelling dire happenings to those who risk initiation into the Royal order of the Wouff-Hong. *Photo by John Ridge, Collins Radio Co. Right:* The hidden 144-mc rig run by K. L. Klippel on a farm near the Cedar Rapids Municipal Airport. *Lower right:* The gang listening to signals from the hidden transmitter before the hunt. *Bottom left:* First on the scene, but not winners of the hunt because they did not get to the rig first, were (*l. to r.*): V. D. Strang, WØRFT; A. J. Lompe, WØTBE; C. Sampson, WØTHU, and R. R. Rosenkrans, WØMG. *Bottom right:* Chow time, Sunday. *Photo by J. Ridge.*



The Shortened Beam

ARNOLD M. WEICHERT, W2OOL*

Models of W2OOL'S beam have been reduced to a fraction of their original length. Results reported by amateurs using the beams are surprisingly good. The idea, as applied to amateur frequencies, is worth investigation.

AMONG THE NUMEROUS types of antennas employed by radio amateurs there have been many which have used lumped resonant circuits to bring the entire array to resonance. This method is particularly applicable when the electrical and physical length of the radiating element is not cut to the operating frequency. A somewhat similar problem was encountered when W2OOL wanted to get on 20 meters with at least a two-element beam that would really work. A regular full-size beam array was just too large for our confined quarters. We found the solution to be in the development of a beam with considerably shorter elements and the loading of each element with an LC combination at the center. This LC loading circuit was used to compensate for the reduction of physical length and, as in the case of many of our prototypes, it tuned each element to resonance.

Design of the Shortened Radiator

From a constructional viewpoint, it was possible to erect an antenna with a total radiator length of approximately twenty-four feet. This is about ten feet shorter than the usual 20-meter element lengths. Fortunately, the twenty-four foot length also constitutes two standard twelve-foot lengths of dural tubing, thus greatly simplifying the construction of the elements. We further determined that the twenty-four foot elements could be center loaded with a split coil in series with a variable condenser. The entire element could then be tuned to resonance. By compromising the coupling of the beam to the transmitter and the coupling of the feeder line to the radiator it is possible to use v-f-o operation throughout the band without losing too much gain or directivity.

The electrical schematic for this system is shown in *Fig. 1*. While we were prepared to do a lot of pruning and winding to find the correct coil size, we were agreeably surprised to find that a commercially available push-pull type 20-meter tank coil would work excellently in this arrangement. Naturally, the idea of shortening the radiator can be carried to far greater lengths than we have shown here. As an experiment, a truly compact beam using four-foot element lengths was constructed. The shortened element length was compensated for in the loading effect of the coil. It was found that the r-f voltage on the dural tubing where it was supported by the insulators was so high that the leakage was excessive except on extremely dry days. A slight film of dew at night was sufficient to permit plainly visible arcing across the insulator to the supporting member.

The radiator uses a split coil with a swinging link. The link is slightly over-coupled at the antenna to broaden the response of the radiator. The r-f feed line consists of RG-11U 72-ohm coax cable. The coax is terminated at the transmitter with another swinging link and the outer braid is grounded to the transmitter chassis. This type of coupling appears to lend itself to matching a very wide range of feed line impedances. Several other types of transmission lines have been tried.

*20 Bonn Pl., Weehawken, N. J.

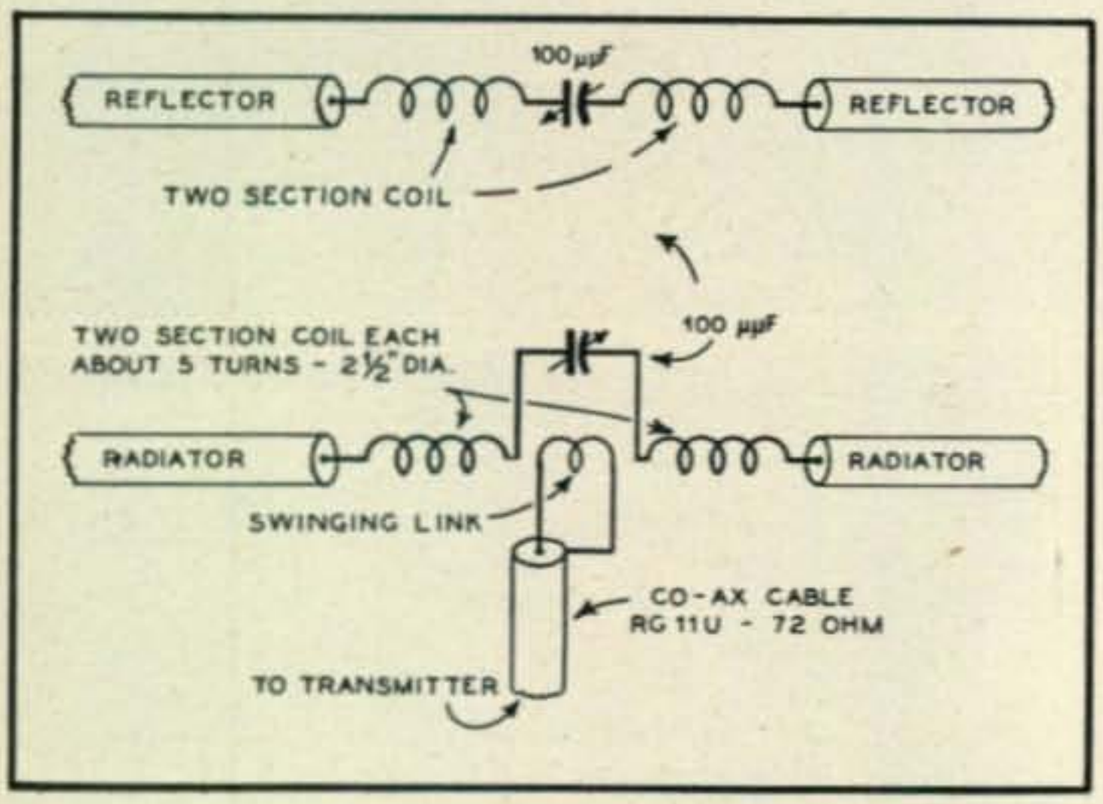


Fig. 1. The electrical connections for the 14-mc beam consist of two split coils commonly used in push-pull circuits. One of the split coils has a swinging link which is used to load the antenna. Both elements are brought to resonance with the tuning condensers.

These included the RG-8U (52 ohms), 300-ohm ribbon, 2″ spaced line (450 ohms) and a 6″ spaced line (approximately 600 ohms). All of these appeared to work quite well, although the coax is to be preferred since it will reduce feed line radiation, thus cutting down on the problem of BCI. The length of the feed line does not appear to affect the transmitter loading.

Because of the displacement of the r-f voltage nodes it is particularly necessary to use good insulators to support the elements. The variable series tuning condenser in the center of the element is located at a very low voltage point which is one of the particular design advantages of the split-coil arrangement. A 100-$\mu\mu$f or a 140-$\mu\mu$f variable condenser will work quite well at t s point. To be on the safe side we have been using a condenser with 0.062-inch spacing. In the final design the array is adjusted so that a minimum of voltage appears on both sides of the tuning condenser. It should be possible to touch either the stator or the rotor section of the condenser with a neon bulb and not have it ignite. The tuning condenser should be housed in a water-proof metal box. This is desirable to protect the condenser from the weather. The method of mounting the radiator loading circuit is shown in *Fig. 2.*

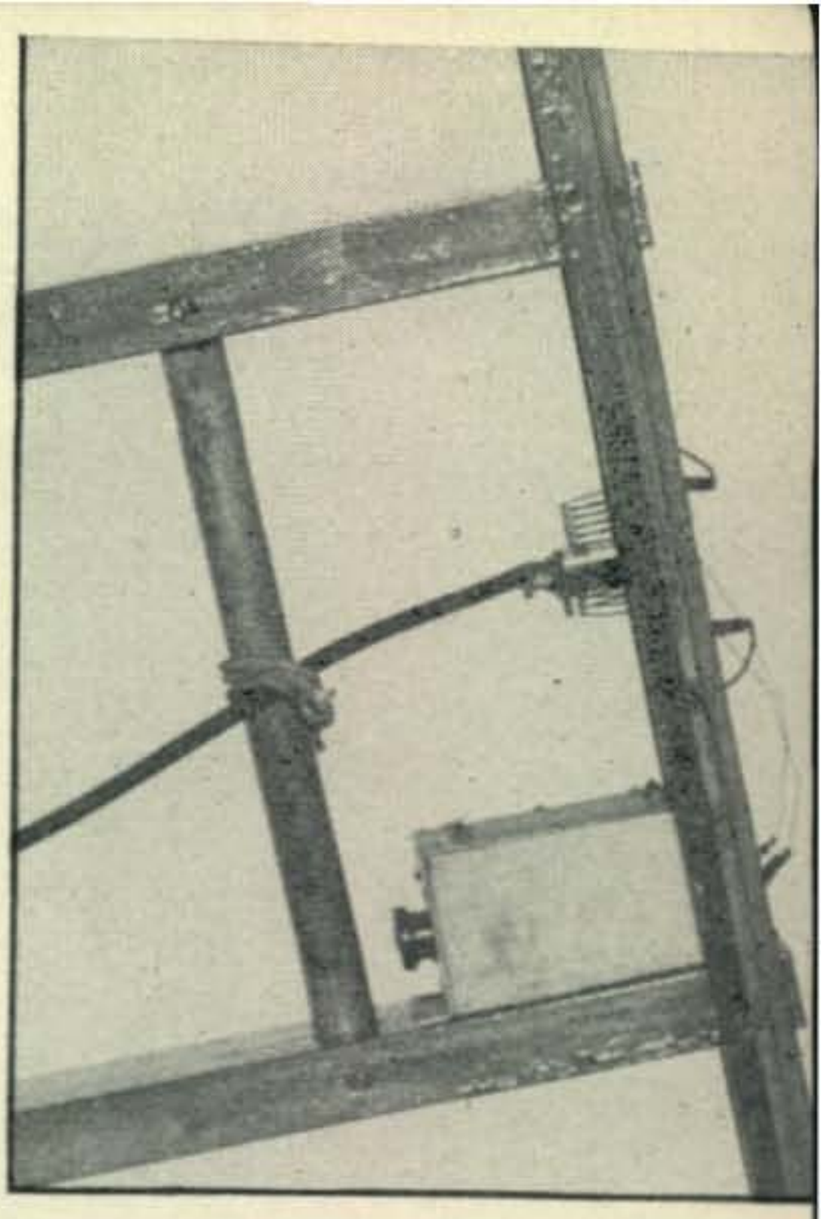


Fig. 2. The method of mounting the shield can for the radiator tuning condenser. A water-proof can is used to protect the condenser from the effects of the weather. A coax cable is used as a feedline. The commercial coil must be split by the builder.

Designing the Parasitic Element

The parasitic element is mounted six feet, eleven inches from the radiator and is center loaded and tuned with another split coil (without the swinging link) and either a 100-$\mu\mu$f or a 140-$\mu\mu$f variable condenser. We originally constructed the beam with the idea of using the parasitic element as a director. In practice the difference in performance between a director or a reflector is quite evident with this type of beam. A reflector parasitic element is now used in our beam.

The reflector might be considered a compromise as the maximum forward gain was achieved with a spacing between the elements of 0.15 wavelength. For maximum discrimination the reflector was spaced at 0.1 wavelength. At the latter position the discrimination was good while the forward gain dropped slightly. The recommended spacing is about 0.14 wavelength. This gives a fairly good front-to-back ratio with a worthwhile forward gain.

Tuning up the entire beam is relatively simple. The radiator is tuned up first by leaving the center connections to the coil of the parasitic element open. For a start, the swinging link is pushed about half-way in on the radiator loading coil and the variable condenser is rotated while a visiting ham checks the loading of the final. The swinging link at the radiator should be slightly over-coupled to allow the degree of loading to be governed entirely by the link at the transmitter.

The parasitic element is tuned by placing a field strength meter between forty and fifty feet from the antenna and approximately in the same horizontal plane. The type of field strength meter is immaterial. In our case we made good use of a Weston model 425 r-f galvanometer which had been strung up with sixteen feet of wire as quarter wave elements from each terminal on the back of the meter. The antenna is then rotated with the radiator element previously tuned to resonance until an arbitrary maximum forward

[*Continued on page 81*]

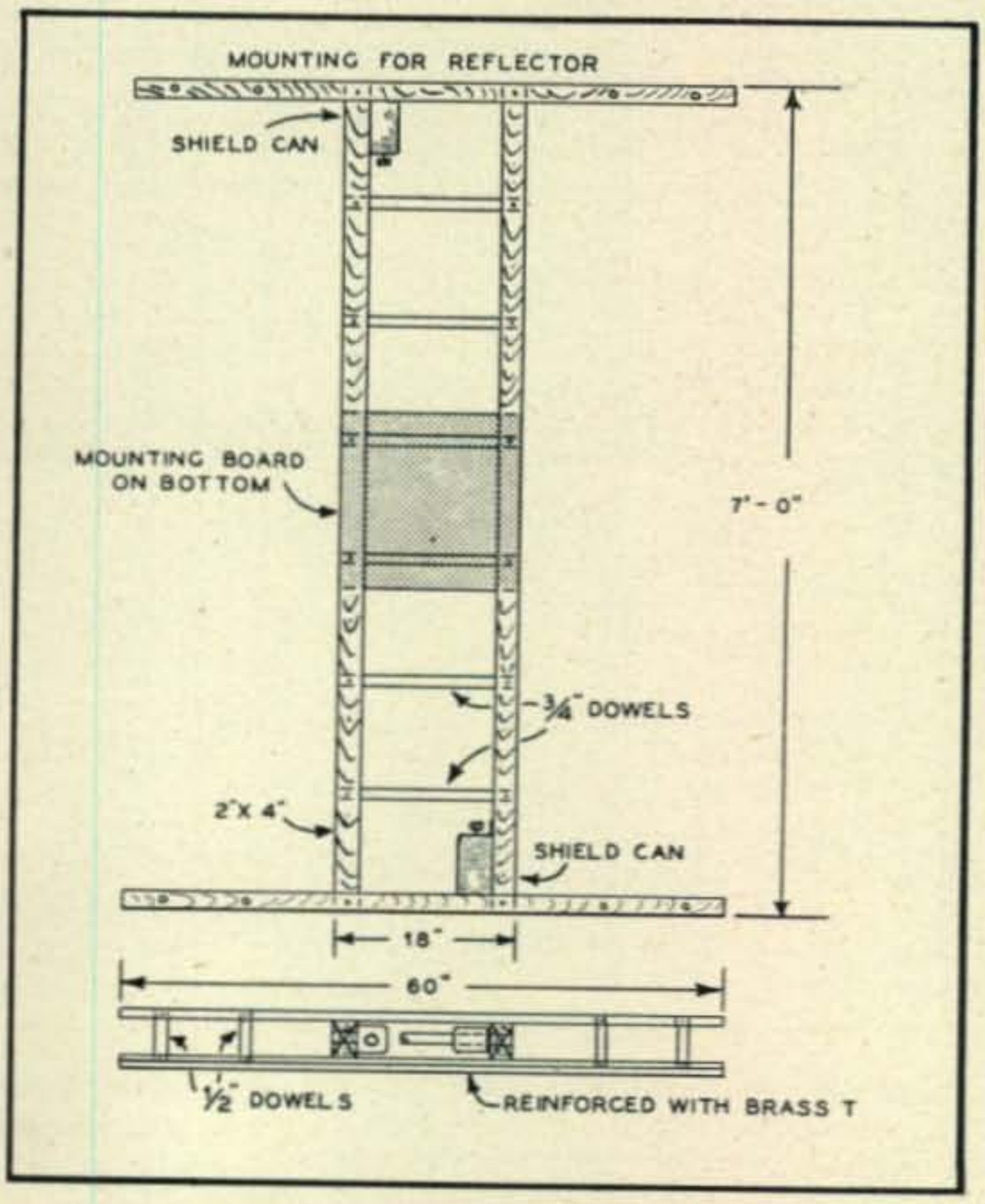


Fig. 3. Constructional details of the shortened beam mounting framework.

PACKAGED POWER

McMURDO SILVER*

There are two distinctive approaches to commerical design of amateur equipment. One features deluxe construction that is beyond the engineering and shop facilities of the average amateur. The other tries to give maximum performance at minimum cost by sticking to a basic package and taking advantage of mass production. Such a unit is discussed in this latest review of commercial apparatus for the amateur.

DURING TODAY'S acute housing shortage, when living space is at a premium, the XYL often begrudges even one cubic foot to the indulgence of her husband's hobby. Because of this condition, and because material is still not easily obtained, it is believed that compact design in a commercial transmitter that solves the construction problem, yet is still low priced, should be welcome. Model 701 transmitter, manufactured by McMurdo Silver Company, and affectionately labeled "Atom-X" is a compact 6-band, 75-watt phone or c-w transmitter that incorporates the desirable features outlined and offers still others as a bonus. Power output is sufficient to guarantee a fair share of QSOs even on crowded bands, and it lends itself as a driver when future plans call for QRO. But most important, the r-f and a-f portion of the transmitter measures only 10" x 5" x 5¼".

The diagram, *Fig. 1*, represents a relatively straight-forward approach to the circuit. The ever-popular Tri-tet oscillator is built around the high-performance 6AQ5. This proven dependable oscillator drives the 807 as a Class C final amplifier. A Class A push-pull beam tetrode modulator for phone operation is also built in.

The new 6AQ5 miniature tube lends itself ideally to compact construction which in turn yields extremely short inter-stage leads. The 6AQ5 is, for all practical purposes, the 6V6GT

*1249 Main St., Hartford 3, Conn.

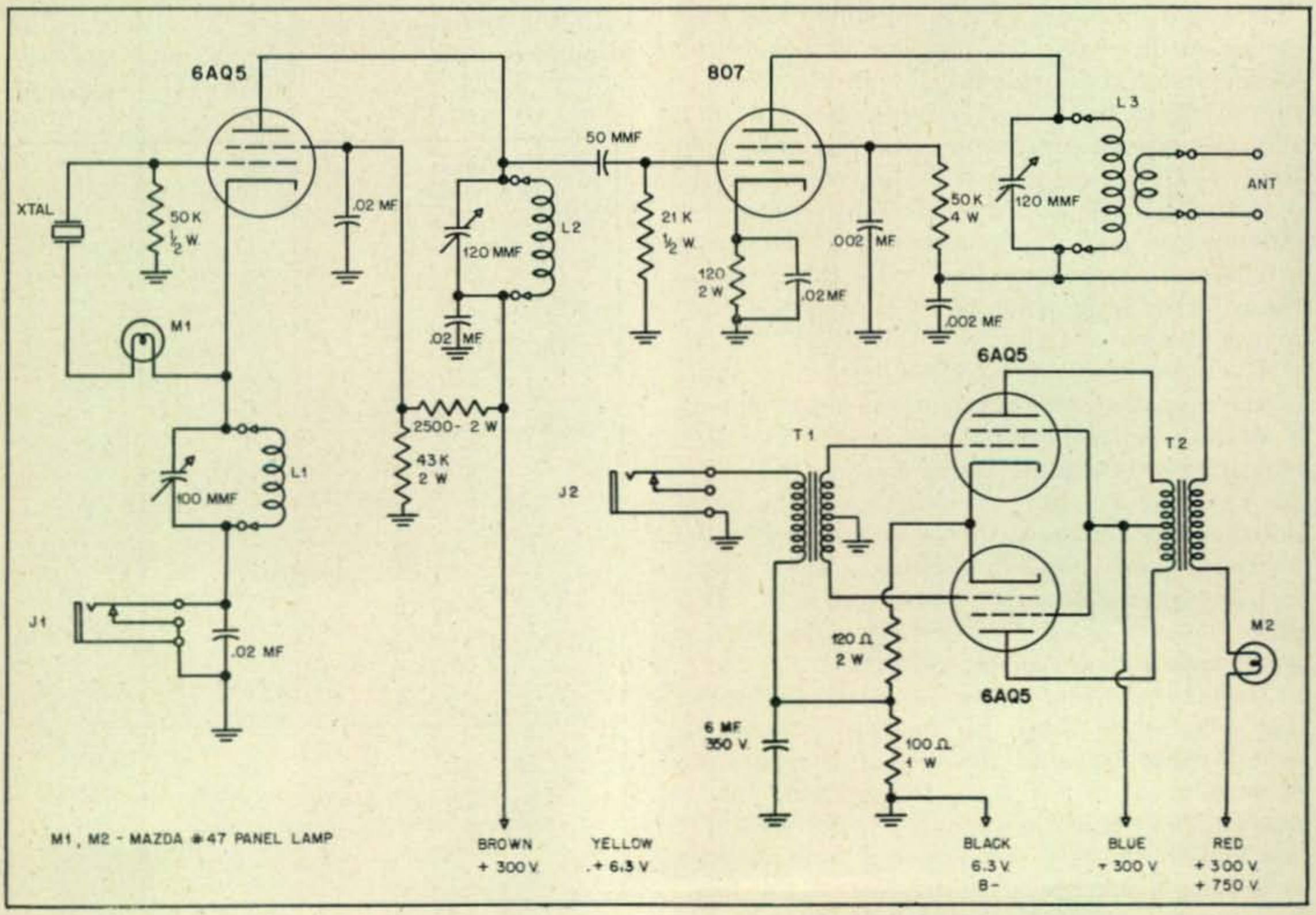
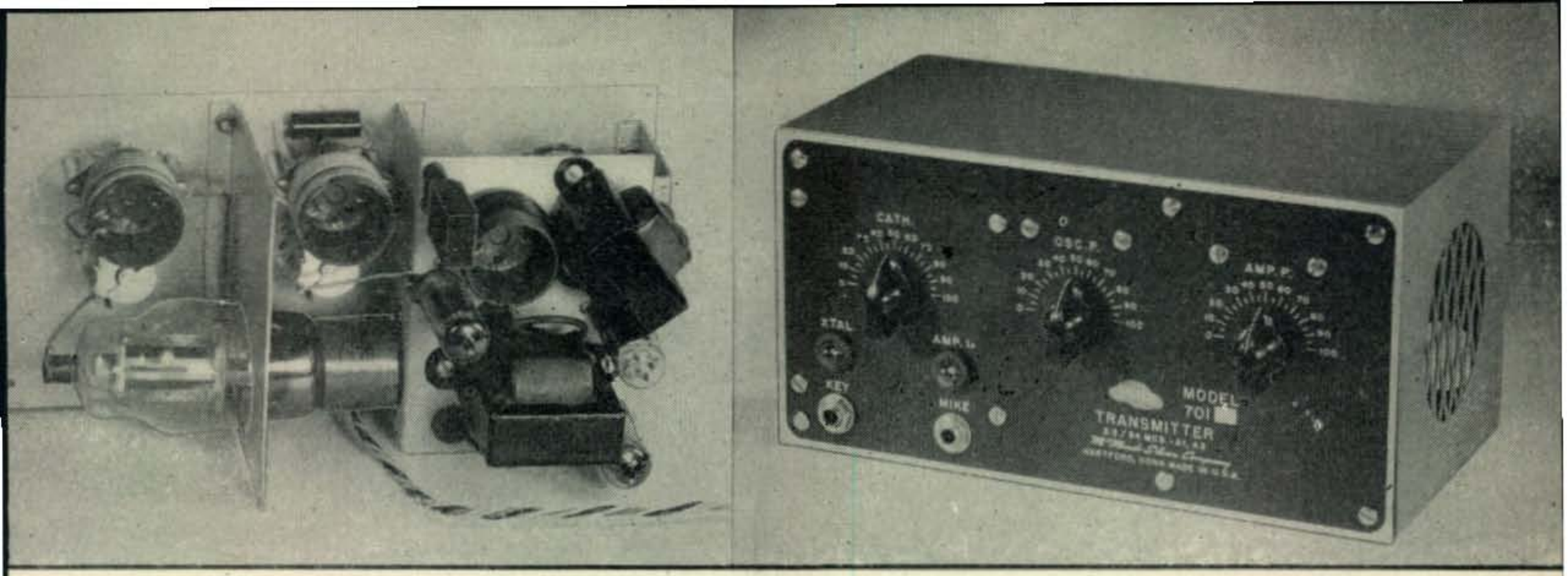


Fig. 1. Circuit diagram of McMurdo Silver Model 701 transmitter.



Compactness and simplicity of transmitter is clearly visible in these views of the Model 701

beam tetrode modernized and reduced to miniature size. The button base reduces lead length, minimizes base inductance and capacity and in general is the reason for good operating performance down to 6 meters on this tiny transmitter package.

Small tuning capacitors, so that they will not progressively turn into inductances as frequency is raised, make possible good efficiency in both oscillator and amplifier plate circuits through 54 mc. By mounting these capacitors close to their associated circuits and mounting small inductors suitable for h-f operation close to both tuning capacitors and tubes, efficiency is further improved over this extended range.

The new 6AQ5 in enabling the modulator to be very compact also lends itself well to this transmitter for audio. In intermittent speech operation with 300 volts on the plate, more than 14 watts of audio output can be obtained from a pair of these tubes. Recognizing that broadcast station quality is neither desirable nor readily obtainable, a carbon microphone with resultant saving in speech equipment is used. The modulator consists of nothing more than a push-pull microphone transformer, push-pull modulation transformer, two 6AQ5s and one resistor! By splitting the resistor used to provide cathode bias for the modulator tubes, and adding an electrolytic condenser, microphone current without the bother of batteries is obtained.

Break-in operation is decidedly desirable, so oscillator keying is provided for. The final amplifier uses both cathode and excitation bias. Plate current will rise slightly when the key is up and drop slightly when the key is down and excitation is applied to it from the oscillator. At maximum plate voltage on the 807, while no harm is suffered by the 807, for the increased plate current of key-up condition is well within its plate dissipation ratings, this rise in 807 plate current can be eliminated by one of several methods. Those that lend themselves best to this transmitter are the application of fixed bias to the 807 in the form of a small 45 or 90-volt battery, or keying the 807 cathode simultaneously with the oscillator.

The front panel of the transmitter is etched with all required nomenclature, finished in frosted white upon a black enamel background. On the panel are mounted the three small tuning capacitors, the key and mike jacks, the 807 inter-stage shield, the panel lamp "meters," and the frosted aluminum channel carrying the oscillator and modulator components as well as the 807 socket. Even though the transmitter is so compact, there is sufficient spare room in the 5¼" deep cabinet in which to store spare crystals and plug in coils for all six bands!

On the underside of the separately assembled and wired channel, the only chassis is the transmitter panel itself. Every part is accessible as may be seen in the photo.

Meters were dispensed with in favor of using small panel lamps as current indicators. This has not only eliminated costly meters, but the panel lamps serve ideally as fuses to protect circuits and tubes in the event of unintentional overload. Plate voltage required can be between 300 and 750 volts. Current required will run about 200 ma under phone conditions and 135 ma for c.w.

Operation

The Model 701 transmitter will operate at the crystal frequency, or with frequency doubling or quadrupling taking place in the Tri-tet oscillator, or in the final amplifier, although it is preferable that the 807 amplifier always works straight through. A crystal in the 80-meter band will give output on 80, 40, and 20 meters. A 40-meter crystal will give output upon fundamental, second, third, and fourth harmonics to cover the 7, 14, 21, and 28-mc band. A 14-mc crystal will cover 20 and 10. Output on 50-54 mc requires a crystal cut to ¼ the output frequency, or between 12.5 and 13.5 mc.

Final amplifier plate efficiency averages about 66%. 75-watts input on c.w. gives about 50-watts output on any frequency from 3.5 through 54 mc.

[*Continued on page 80*]

6-Meter DX Highlights

VINCENT G. DAWSON, WØZJB*

TERRIFIC SUMS up the DX worked on six meters during the months of May, June, and July! More long distance contacts have been made than ever before, from coast-to-coast. Two stations, WØDWU and WØZJB, have worked *45* states, and with the addition of XE1KE, in Mexico City on the band, many U. S. stations have worked 3 countries.

Of particular interest is the fact that W4GJO in Orlando, Fla., has worked 44 states, W3CIR/1 in Boston, Mass., has 41 states, and other East Coast stations have 40 states. This is unusually difficult for eastern stations as the normal skip on six meters is from 800-1300 miles. But double-hop has permitted the coast-to-coast work on many occasions.

On the West Coast at last count W6UXN in Inglewood, was leading with 39 states, W6PUZ with 33, W6ANN 32. W7FDJ, 36, W7FFE, 34, W7ERA, 32, all in Oregon, lead in the Northwest.

Actually it would be impossible to list the total contacts made by stations, in these pages. Reports received show lists as long as 40 contacts during a single opening. Total contacts run into the thousands, so it is possible only to present the highlights of the exciting DX on 6 meters.

The Big Openings

From May 22nd to July 16th there were only two days that the band was not open to some part of the country—June 9th and 10th. Some of the openings were minor, while others were of the "double-hop nature," but all good openings to certain sections of the country. Reports indicate that the north-south path still holds predominance. W4DRZ, in Ft. Lauderdale, Fla., worked 33 states in 11 days, from May 11th to 30th. On May 27th, W4DRZ, worked W7FFE, in Oregon, and exchanged calls with W7DF, in Washington. These contacts are nearly as far across the U. S. as can take place. The evening of May 28th W7ERA, near Portland, Ore., raised W4FLH in Miami, for another long haul. In fact, on May 26th, 27th and 28th, the band never died for the West Coast. Early morning contacts were made and continued all day and evening. Lots of sleep was lost by such die-hards as W6UXN, W6ANN, W6PUZ, W7ERA.

June 1st, was another good day for double-hop with W8s working W7s, and W1s working W6s. W7BQX north of Seattle worked 38 stations in 21 states, over half of them *east* of the Mississippi! This was one of those openings where stations in the middle west were hearing the W6s-W7s very nicely, while the W1s-W4s were very weak, although the W1s were very loud in Illinois. Evidently the second bounce, to the west, was around Colorado or northern.New Mexico, as stations were heard in between from both directions.

Double-hop was on again June 5th when W7QAP in Tuscon hooked W4WMI and W8PUK. W8QYD worked W7BQX. W8NKJ says this was *the* day he had been looking for when he got W7JPA in Washington and heard several others 7s, but the QRM was several layers deep.

June 8th, was a corker for W4GJO who rolled up 45 contacts in the Eastern U. S. and Canada. W7ERA worked W3ENZ in Washington, D.C., for a cross-continent QSO. W7FFE also worked W3ENZ later.

June 16: W7QAP heard W1LSN in N. H., W1CLS in Waltham, Mass.; W1GJZ in R. I., and W1LLL-W1HDQ combination in Hartford. W6QUK got W4GIY in Orlando for a nice hop. W5AJG in Dallas mentions hearing W6s work the East Coast, but he was unable to hear anything from the east. W6OVK heard W8VIB, W9QUV, FMU and W1CLS, LLL, with conditions spotty.

June 18: W6QUK worked W4GIY in Fla. W5AJG heard W6s working W1-2-3 but did not hear the east. W4GJO heard W6QUK.

June 19: W4GJO worked W6QUK, PUZ, FPV, UXN. W7QAP in Tucson hooked W4EID in Fla. and W2PWP in N. J. and heard W4HVV, WMI in N. C. and W2AMJ in N. J.

June 20: W8NSS in Dayton QSOd W6QUK, UXN, OB, URL, OFT. W7QAP worked W4EID, W4WMI, ØWOW/4 in the early a.m. W3CIR/1 had a fragramentary QSO with W6OB for 20 mins! Very short skip set in and W3CIR/1 in Boston worked W2RND in N. J. at 260 miles, and heard W4s in Va., W3s in Md., and the Philadelphia area, all on Es-skip. W6AMD hooked W9CZD, W1JLK, HDQ, W3CIR/1, and heard W2JWO. W4QN got W6PUZ and W6QUK.

June 23: W7QAP heard W1CLS.

June 27: W4QN worked W6PUZ. W8JLQ heard W6FPV, AMV, UXN, ANN, W7BQX, DYD, FDH, FFE, ERA. W8QYD got VE1QZ, VE7VY, W7ERA, FFE, JPA, W6OVK worked W4EID, QN, GJO, EQR, GIY, W8KQC, RFW. W6YX worked W1-2-3. W4QN got WACA by getting W7ERA and hearing W7FLQ. W6AMD worked W8NKJ. W4QN got W6GGM, IWS, OVK, YX. W4GJO worked W6OVK, GGM, IWS, BPT, YX. W7ERA hooked W1CLS, W8NSS. W7FDJ and W7FFE were working into W1-2-3. W4BBR made first Ga.—W6 QSO on 6 meters by getting W6IWS. VE3AZV says that the W7s were coming in Oshawa, Ont., from Wyo. and Ore., with W7FDJ in for over an hour. Also heard W6AMD and YX. W6IWS

Raleigh, N. C., 6-meter gang. From left to right: W4HVV, W4AVT, and W4WMI.

*V.H.F.-U.H.F. Editor, CQ.

got W4BBR, CNK, EID, GIY, GFO, QN and heard W1ATP, CLS in Mass., and W4EQR in Florida. VE3ANY heard WØ, 5, 6, and 7 very well. W6PUZ worked W8ANN, QQS, 9PK, QUV. VE1QY heard W6YX for a nice long haul, and W5HF in West Texas.

June 30: W4GJO got W7BQK, ILL, JPA, FDJ, ACD, HEA, BOC, ERA, and heard W7SP in Utah. W7ERA worked W4FQI, GJO. W4QN got W7ACD, BQX, and heard W7JPA, FDJ, ERA, FFE.

July 3: W7QAP heard W4GJO. W4GJO got W6IWS, TMI, NLZ, OB, YX. W6AMD got W4EID, GIY while W6IWS QSOd W4GJO, GIY in Florida.

July 4: WØDKS worked XE1KE. W7TXM in Ariz., heard WØWOW/4 in N. C. W4GJO rolled up W6ANN, AMD, LSN, PUZ, NLZ, UXN, TJZ, BOS. W5HF got XE1KE. W6PUZ hooked W4GJO, CDC, GIY, QN.

July 6: W6PUZ worked W4CDC, and W4GJO got W5ZZF in W. Texas.

July 8: W6IWS heard W4CNK in Fla. and W4EQM in Ala. W5HLD in Okla. worked XE1KE for his sixth QSO on 6 meters!!

July 10: VE1QY in Yarmouth, N. S. worked W5FSC in Houston, Texas.

July 12: W7TXM worked W8NSS, ZVY, 9LMX and heard W8JLQ, QYD, W4JBF in Ky. W7QAP hooked W8KQC, and heard W8QQS, JLQ, CYE, NSS, QYD, W4JBF, WMI and W3ENZ in D. C. W7ERA worked W8ZVY, W4FBH, CDC, WMI, GLB, EQM and heard W9QUV, W8QYD, W4GIY. VE3BKL heard XE1KE. W6PUZ got W4EMM, BBR, FBH in Ga., W4ELV, GLB in Ala., and a nice one with W4FLH in Miami.

July 13: W7TXM heard W1CLS, W2BYM, W3CIR/1. W5HF in W. Texas worked VE1QY and heard W1-2 weakly.

This covers the double-hop contacts reported to us; this is by no means all that took place.

Foreign DX Highlights

While the DX on 6 meters has been rolling up new records, work outside the U. S. has been progressing and interest has increased all over the globe.

XE1KE, B. J. Krogrer in Mexico City, got on the band early last winter but had to wait until the Es-skip (sporadic-E layer), to make contacts. BJ finally made the grade on May 29th when he hooked W5VY, ex-W5EHM, in San Antonio, Texas, at 1450 CST. W5VY started hearing harmonics in the 50-mc band from Mexico about 2 hours earlier, so he got on 28 mc and hooked XE1KE to tell him the band was open. Naturally BJ had the 50-mc rig torn down, but gave a listen for W5VY and came back on 28 mc to tell him that he was S-9. XE1KE then spent a feverish hour getting the rig back on 50 mc to make the first and initial XE-W contact on 50 mc. At 1502, BJ, got W5GVZ in Ft. Worth and at 1518 W5FRD in Ft. Worth, the band going out around 1620 CST.

XE1KE had to make a trip to California but returned on July 4th; hurriedly kissed the XYL and dove for the rig to find the band wide open. (Thanks, Perry, he says). From 1740 to 2032 CST he worked W5HF, WX, ZZF, ELL, AJG, ZS, LIU, EYZ, LCZ, EEX, MLE, GNQ, VV, HTZ, DYN, W7TXM, QAP, W9IKI/5, W4EQR, CNK.

On July 5th from 1210-1220 CST XE1KE had a

WØTKX/MM running 10 watts has been one of the top mobile signals during summer opening.

brief contact with W5ELL in New Mexico. July 8th was a much better day. Feature contacts were with W4FBH, in Decatur, Ga., and W4EQM in Alabama. Others made happy by a contact were: W5ZZF, WX, ML, VV, FEZ, HF, IYU, HLD, ZS. Some double-hop got W4FBH, EQM, W9AKF, PK, IWX, ZHL, UNF (UNS?). Heard were W2BYM for a good haul, W8NMU and WØNFM, all this taking place from 1640-2015 CST.

The rig at XE1KE is 75 watts to an 829B, feeding a 4-element beam 90′ high. The receiver is a Gonsett converter into an HQ-129X. XE1KE has worked 12 states in 5 U. S. districts, and adds, "It's more fun than working with the Mexicanna movie actresses."

Another DX contact for Ws has been WØTKX/-MM aboard the S/S FT. WINNEBAGO. Bob has been aboard a tanker which makes regular runs from Philadelphia to Beaumont, Texas, and is now outfitting for a trip possibly to Europe and around the world. Rig is a 7C5 doubler with 10 watts. Antenna ½-wave doublet, converter is a 956 r.f., 954 mixer, 954 oscillator.

June 1: Bob made his first contacts on 6, as a mobile marine without a call area suffix, by getting W9UED and W9NVY, the location being about 200 mi. east of the Virginia coast.

June 22, approximately 350 mi. East of Jacksonville W5ZS called him but QSBd out. W5LET was in solid, as well as W5IOP and W5ML, all in a local QSO in La. Then W5JLY came in with W5VV, the latter very loud. After W5VV faded, W5FRD in Ft. Worth came in nicely. No contacts were made as Bob was on duty at the time.

June 23: Location 15 miles off the Florida coast, near Palm Beach, W4HTZ was worked. W9QHR was heard along with WØZJB. Later the same day within sight of Miami a WØ in Iowa was heard, but no ground wave from the Miami area except the ninth harmonic of a commercial station.

June 24th: 150 mi. N. of Havana, Cuba, Bob started hearing diathermy at 1055 EST and at 1200

Oregon "double-hop specialists." From left to right: W7FFE, W7ERA, and W7FDJ.

WØQIN, R. E. Clark, Minneapolis, Minn.

the FM station of WEFM in Chicago on 44 mc. At 1205 W8KZT in Cincinnati was worked and W8MVG was heard on c.w. At 1245 the band shifted and WØZJB, W9UED, and W9VZM were worked, hearing W9OLN. QRT then for watch, but an hour later WØINI was worked and WØZJB heard. Later in the day, position 200 miles N. of Havana, Bob heard W9NVY, VZM, QUV, NSD, W3OMY, WØTQK and WØYUQ. The final thrust was WØQIN heard working New England stations.

June 25: 80 miles southeast of Pt. Arthur, Texas, starting in the afternoon to midnight, stations were heard in this order: S. Dak., Wisc., Texas, Ohio, Ind., Ky., Tenn., Ill., Fla., Pa., N. J., Md., W. Va., Minn. Best sigs from Ky. and Tenn. Bob worked W2PWP in N. J., and heard W2AMJ, BUM, KQT, W3FQZ, W8TDJ, RFQ, BFB, WSE, ANN, W4JBF, GIY, GIO, WØIFB, ZJB, W9HGE, LMX, LHL, DWU, FKI and WØWOW/4.

June 26: Approaching dock at Pt. Arthur, WØQIN was heard in the a.m. with W8MVG and W7TXN. QSO with W7QAP, the first since the days on 5. Also heard W2AMJ and W2BYM.

June 27: 175 miles SE of Pt. Arthur at 1715, WØTXK heard the Mexican commercial c-w harmonics with point-to-point traffic, on 49.6 and 50.5 mc. From 1945-0000 heard WØDNW, YUQ, W4BBR, W5AJG, HF, MLE, and W7BQX in Pt. Angeles, Wash. W8ANN, APG, NKJ, QQS, RFW, VID, W9GGH, GRV, IOD, IWX, LMX, PK and W9QKM were also heard. W2BYM and W9HGE were contacted, with sigs spotty.

June 28: 400 miles NW. Havana, Cuba. At 1200 contacted W5EXO and heard W4VY. At 1930 QSO was made with W2AMJ, QVH, BYM. Heard the harmonic of XCE on 50.5 mc, W1GJZ, HMS, IWY, VC, W2PWP, RLV, W3CIR/1, W3HTO, JAY, MWE and a W6/4, with WØINI last to fade.

June 29: Passing through Florida Straits within sight of Miami, W9ZHL heard at 2100, W5LCZ, HTZ, and W4FLH off the back of his beam, very weak.

June 30: 200 miles E. of Jacksonville. QRN was very bad but W5GNZ, VV, HTZ, were heard from 2000-2130 EST, with W5VV outstanding.

July 1: 50 miles off Cape Hatteras, N. C., 1900-2100 EST. WØYUQ was heard along with W4CNC, EQE, GJO, GNK, JEP, KIP, W5ML, VV, W9OLN. Florida stations were very loud.

July 2: At the dock in Ft. Pifflin, Pa., around 2230, W5FSC, ZS, ML were heard.

XE1KE, B. J. Kroger, looks mighty pleased after giving many Ws a new country on 6.

July 3: On Delaware river, proceeding towards sea, W5KDK in Okla. was in for a nice QSO, as well as WØCXB. Stations heard from 1807-2000 EST. were: W9VZM, W4GJO, QN, DCD, W5VY, FEZ.

July 5: 200 mi. E of N. J. heard WØHXY, ZJB, JHS, W8YLS, W9ZHB, JMS, VE1QZ. W9PK, ZHL and WØQIN were worked. As soon as stations hear Bob's call, they point the beam towards WØ so naturally their sigs go out, making it rough.

July 6: 298 mi. E. of Richmond, Va., at 1148 EST a strong sig was heard discussing troubles on 2. Who was this, as Bob is worried? W8MVG, W9QHR, LF, GZH, ZHL, UNS, JMS were heard around 1300-1400 weakly. At 2025 WØINI, ZJB, W4GNK, W2BYM (ground wave about 300 mi.) and W2PWP were heard. This location not far from Bermuda and VP9F!

July 7: 200 mi. E. of Richmond, Va., W3CIR/1 at Boston was heard in QSO. This is over 300 miles SE. of Boston and shows how an over all-saltwater path will really bend signals. At 2013 W4GIY was heard with a bad flutter. W4ELD with deep QSB ended the band for the night.

July 8: 100 mi. off the Virginia coast, WØINI and WØCXB were heard weakly.

July 9: 100 mi. off Virginia coast, WØZJB was heard calling WØYUQ. Several other stations were also heard.

Another mobile marine, W5BSY, aboard the CREST OF THE WAVE, gave the following stations a new DX contact, while 150 miles east of the Bahama Islands: W2BYM, W3OMY, W4FBH, BBR, EQM, WMI, HVV, W5JLY, W8ANN, CMS, NSS, CYE. The rig at W5BSY/MM is an 807 doubler with 40-watts input.

G6FO, in *Short Wave Magazine* says there was another flutter of excitement the evening of May 24, when from 1800-2100 DST, 50-58 mc opened wide in an amazing fashion. Harmonics of real DX commercials like WAU, WEAN and WJC were coming in at strengths up to S-8, and the hiss phenomenon was strongly in evidence, coming in great waves right up to 60 mc. The really important point about all this is that evidently there was a good path open across the Atlantic! This means that a 50/58 mc G/W contact could have been made. No Ws were heard on 50 mc, but stations in and around that band were very loud, and at times drowned out by the hiss noise.

Sporadic E skip has hit the European continent on the G/58.5-60 mc band, and G6FO further reports in *Short Wave Magazine*, that skip was in on the following dates: May 23, 24, 26, 29, 30, June 2, 4, 6, 7, 10, 12, 13 (a good one), 14, 15, 17, 22. Of particular interest are the contacts with W5BSY/MM, who after leaving the Ws all aflutter,

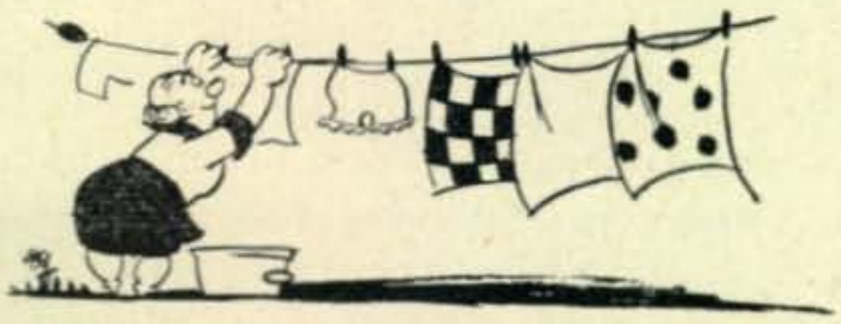
[*Continued on page 80*]

The Hams and I . . .

*by an ex-BCL — whatever that is.**

THERE IS A GADGET on my radio set—a switch, I think, is the technical term—which I turned quite by accident one day. The lower half of the dial face lit up, disclosing some mysterious numerals I had never noticed before. These were numbers with decimals,—not just plain 6, but 6.0, 6.5, 7.0, and so on up to 18. A scientist of my acquaintance explained that I had discovered the short-wave band on my radio.

The short-wave band, I have learned, consists of vast expanses of silence, considerable areas of



static, and an occasional spot where one can overhear the conversations of radio amateurs or hams.

From this fortunate accident of discovery, I have truly gained the peace that passes all understanding. I say this advisedly, for having listened to the hams for quite some time now, I must say they certainly pass my understanding. But I have found peace.

I have not been urged a single time to order a crispy or even a crunchy modulation kit from my favorite dealer, or to breakfast on a transformer with milk or cream and sugar. Not once has a ham troubled to disclose what "oscillation" spells backwards. I have not even heard the word "soap." No one has tried to sell me a thing. I have, indeed, found peace. I have found a refuge which I commend to anyone who has had all he can endure of singing commercials.

To the uninitiated I hope to give some idea of what may be heard in this fascinating sphere.

Tuning the twenty-meter band one night, I

heard a party whom we shall call W5YSK, tho that isn't really his name. It's a kind of a nickname, short for Sam. Sam was speaking to another amateur, W7TYU, and, as is very often the case, he was discussing his radio equipment. Sam, or W5YSK, was quite enthused over his new antenna, which, as nearly as I can remember it, was a three-element beam of the dipole, rotating type, underfed, with modulated resistors in the unbalanced transmission lines to offset the distortion from the impedance coil below the water tank. I may not have this strictly accurate. At any rate, W5YSK, or Sam, had had considerable antenna trouble, he was telling W7TYU, until one day his grandmother mistook the antenna for the wash line, and loaded the thing with several pounds of diapers and other dainties. From that day on, Sam has contacted Egypt, Madagascar, the South Pole just as easy as you please.

There was a charming girl I tuned in one night. Lily, I think her name was. Lily of W7QGH. She had a lovely voice. The kind one would expect to give cooking recipes on that other band—what do they call it? Oh, yes, long wave. Did she bore me with how to mix a batter for a date nut loaf? Not a bit of it. Lily was explaining to

Gertrude, W4ZOP, how she coupled her regenerative phase inverter to an attenuated filament circuit without even using a potentiometer. "I never use a potentiometer, Gertie," Lily said emphatically. "It's too hot this time of year." Of course I couldn't hear what Gertrude said, but later Lily replied: "Thanks, Gertrude, for the suggestion about the bobby pin. I'd never have thought of that." And she tuned off.

Now the average person would never have thought of coupling a phase inverter to a filament circuit with a bobby pin, which is why I say that listening to hams is not only good fun, but very helpful.

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*Norman Lawson, *215 South Willaman Drive, Beverly Hills Calif.*

Among hams, too, it is a common thing for perfect strangers to come to know one another through the medium of radio and to develop close and lifelong friendships. I recall tuning in a contact between two ham operators, Ed, W7UTC, and Roy, W7UOI, who were strangers to one another, although both were located in the same city. This was their first contact, and as usual, they got to comparing notes on their respective equipment. Ed explained to Roy that after

waiting for four years, he had finally got delivery of the latest model, newly designed, transmitter for which he had paid $450, and which he had temporarily stored in his garage. How temporarily he had learned only when he discovered that the next-door neighbors kids had driven a bicycle into it, and hacked it to pieces in an orgy of good-natured child's play. Roy was extremely sympathetic and invited Ed to come over and see his rig. Ed thanked him and reciprocated with a like invitation. The two exchanged addresses. It developed that Ed and Roy lived next door to each other, and for some reason, I have never heard either of them again.

Operating a ham station requires considerable patience and stamina, and overlong hours at the mike take their toll. I tuned in Frank at W6ZOX one night when he wasn't feeling well. He had considerable trouble reading, and he was unable to hear Jack, W7VBN, due to spots. Also he had been having parasitic oscillations all day. He tried rectifiers, pentodes, even a coaxial transformer. Nothing helped. I felt sure at the time, that sunshine and plenty of rest would have done the trick. It worked wonders for my father when he was suffering from the same thing . . . or was that paralytic ossification?

I could never get his name, but QRM is one of the most popular hams on the band. He is spoken of in almost every broadcast, and he must have a wonderful sense of humor, because frequently I've heard one ham say to another, QRM was terrific tonight. I like a good laugh myself, so I have tuned my set very carefully the whole range of the band, but I've never heard QRM. Probably too much static, or too many stations.

That may give some idea of my life among the hams. Tuning in the band has afforded me a new interest and pleasure in radio listening. And, as I think must be apparent, has taught me a little something of the mechanics of radio. Recently, I have had so little occasion to listen to other broadcasts, that I have had the standard broadcast band removed from my set. I often wonder what Ma Perkins is doing these days.

CLOSE - SPACING?

THE GENERAL RUN of amateur-built parasitic two and three-element beams are holdovers from theoretical designs based on optimum radiation resistances and forward gains. However, in a report by McPetrie and Saxton of the British National Physical Laboratory we learn that ofttimes this results in a considerable loss in another desirable quality, that of maximum front-to-back ratio. Messrs. McPetrie and Saxton base this statement upon experiments conducted in 1941 on a wavelength of 1 meter. Quite possibly these observations apply to all frequencies.

The nominal spacings are illustrated in *Fig. 1*. Employing sectional elements Messrs. McPetrie and Saxton determined experimentally that the maximum front-to-back ratio occurred with a director spacing of 0.05 of a wavelength. In *Fig. 2* the numbers on the curves represent the

[*Continued on page 85*]

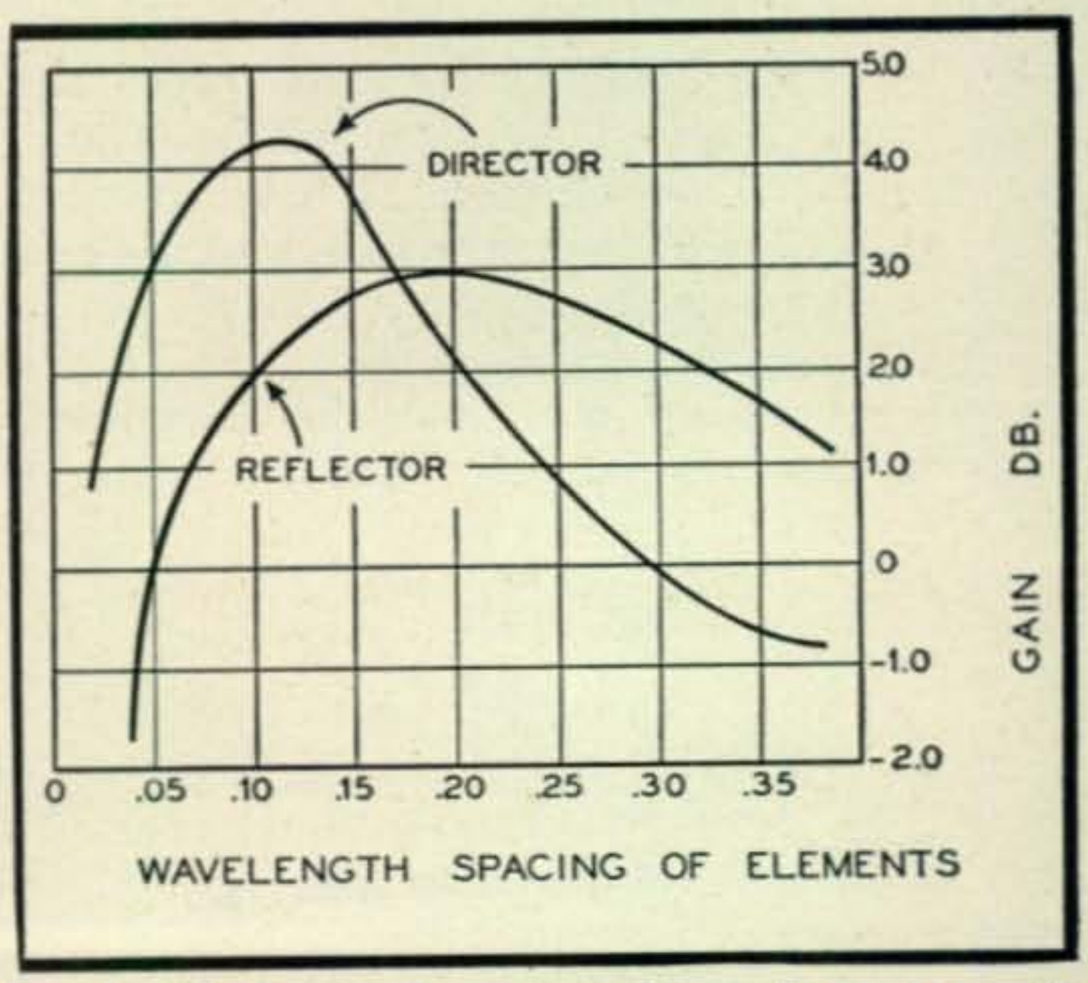
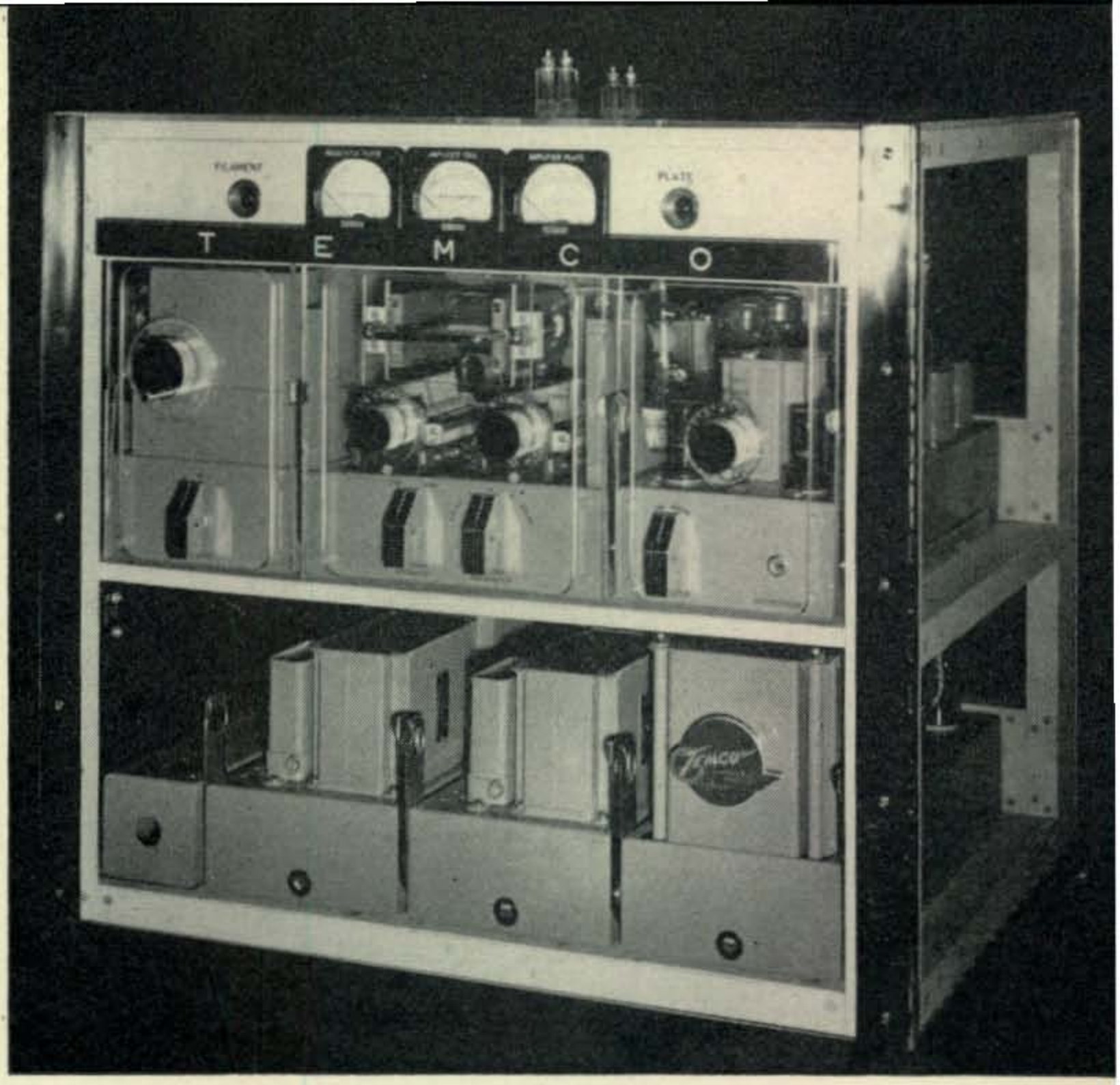


Fig. 1. The nominal spacing of two element parasitic beams reported in a special report by the British National Physical Laboratory.

❖ ❖

You don't need X-ray eyes to see what the plates of the tubes in this transmitter are doing. When W2KR had his model shop turn out the first complete transmitter in his new line it was fitted out with a transparent front panel. The result is a unique looking piece of equipment.

❖ ❖



DEPARTMENTS

- *Monthly DX Predictions*
- *V. H. F.-U. H. F.*
- *CQ DX*
- *The YL's Frequency*
- *Parts and Products*
- *Postscripts and Announcements*

Monthly DX Predictions - - September

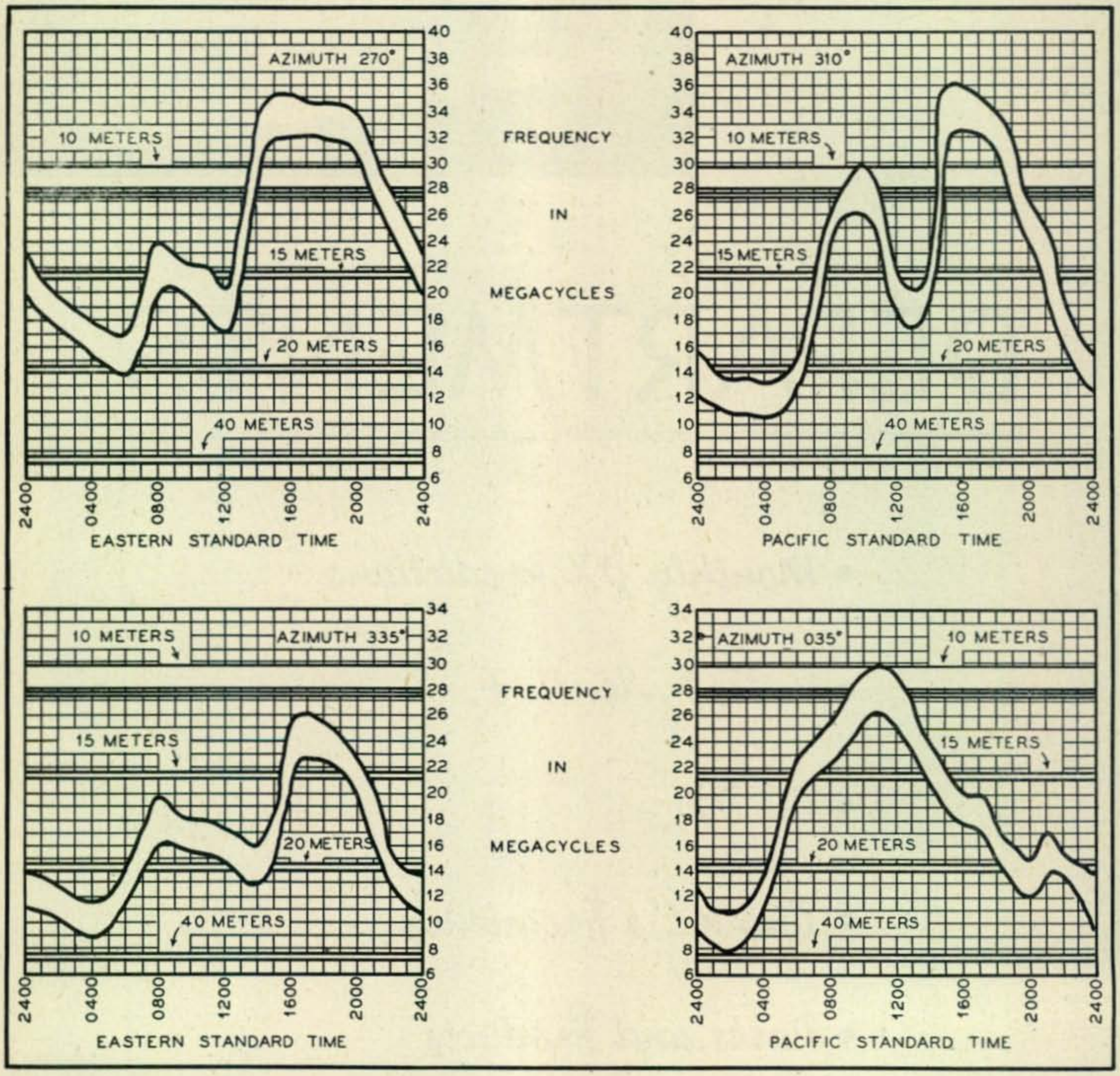
OLIVER PERRY FERRELL

GENERALLY SPEAKING we would usually forecast the month of September as a rather good period to get equipment in order for the fall DX season. However, at this peak of the current sunspot cycle it appears very likely that some choice DX may be worked in September, thus keeping the DX-man more or less on his toes.

The high density areas in the F2-layer are now slowly moving northward across the equator. This means that there will be definite daily changes in the duration of the 10-meter openings. On 20 and 40 meters, the atmospheric background noise level is slowly dropping and the absorption over long paths will not be as noticeable. By the end of the month of September and the first two weeks of October the very rapid rise in the maximum usable frequencies (MUF) will cause 10, 20 and 40 meters to be wide open except for a few trans-polar paths.

This month in *Fig. 1* the average transmitting

[*Continued on page 60*]



September 1947 average propagation conditions. Fig. 1 (upper left). Eastern United States to Eastern Australia and New Zealand. Fig. 2 (upper right). Average conditions from Western United States to Malay States and Burma. Fig. 3 (lower, left). Average conditions from Eastern United States to Japan and Korea. Fig. 4 (lower, right). Average conditions from western United States to Italy and the Balkans.

V.H.F.-U.H.F.

by Vince Dawson, Jr., WØZJB*

600 Miles on 2!

W2PAU, W2PFQ, and W3EKK operating portable on Mt. Cadillac, near Bar Harbor, Maine, contacted W3KUX, Washington, D.C. The Maine station jointly operated by the three v-h-f men was using a modified SCR-522 with an 829 in the PA, running approximately 80 watts input. Receiver was a superhet. A full vertical rhombic 22.4′ high, 26′ per leg, terminated, and feed with a quarter-wave matching section into 300-ohm cable was used as the antenna. 9 states and 125 stations a distance of over 200 miles away were contacted during the expedition which took place on July 31, and from August 2 to August 7. A feature story will cover the details next month.

"Six meters supporting communication to South America in September," is staring v-h-f operators in the face, after a rather hectic session of sum-skip DX.

At this writing, we are entering the peak period of sunspot activity and it is forecast that this peak will continue for about three or four more months before there will be any noticeable decline in the sunspot numbers. This peak has been higher than any other observed during the history of radio communication. The relationship between sunspot activity and radio transmitting conditions meaning real DX is well known to the v-h-f man. On the average it is possible to fully expect that the maximum usable frequencies (MUF), during this coming fall of 1947, will be between 8 and 12 mc above that observed in the fall and winter of 1946, when G5BY and G6DH heard the 6-meter signals of W1HDQ for nearly an hour, and W4IUJ, W4GJO and W4QN were able to contact OA4AE in Lima, Peru.

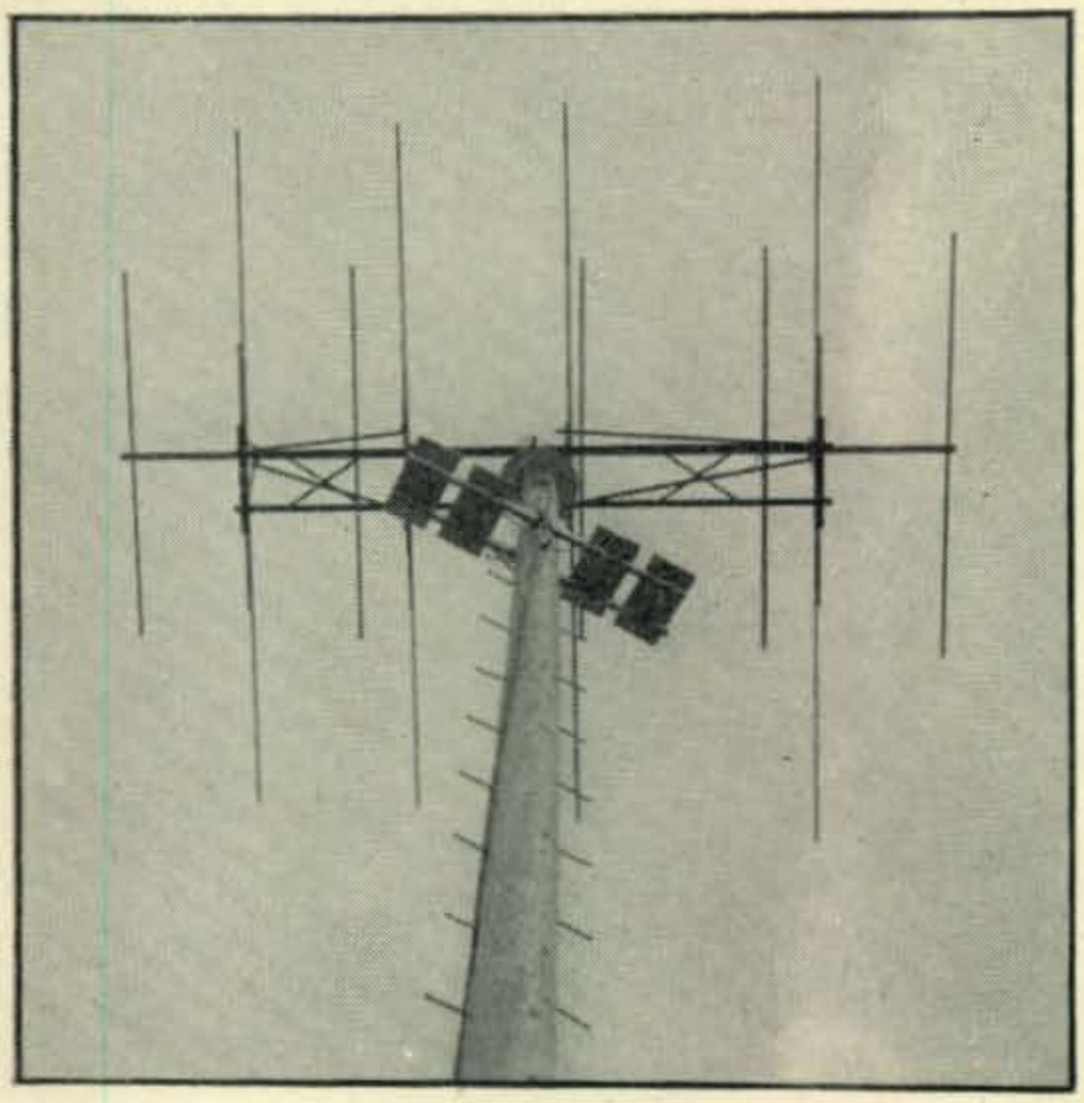
This distinctly means that the 6-meter band will be open for long-range F2-layer transmissions about the North American continent, and from the latest data on hand our propagation editor, Perry Ferrell, has prepared the following extended forecast.

During the entire month of September there will be a steady rise in the day-to-day MUF on paths to the south, east and west of the North American continent. It is expected that after the second week of September the F2-layer will support 50-mc communication from Florida and southern Texas to Peru, Ecuador and northern Brazil. The peak time is predicted as 1300 hours EST and 1300 CST. The band may open as early as 1200 hours on good days, possibly not closing until 1430 EST. By about the third week in October, the F2-layer high-density area will move sufficiently far north above the Equator to support 50-mc communication to the *northern section of South America*, (Columbia, Venezuela, Ecuador, British and Dutch Guinea), from Georgia, S. C., Alabama, Mississippi, and Louisiana between 1215 hours EST and 1530 EST. The peak period will be between 1245 and 1400 hours EST. Lower Texan stations will find the band open on the same path from 1230 to 1400 hours CST. On good days there are indications that the area of the opening may extend as far north as the 37th parallel in the eastern section of the country. Also during the last half of October it is expected that stations in S. California and Arizona will be able to work into Hawaii. The peak MUF should be about 50.0 mc at 1530 hours PST. There also appears to be the possibility that on very good days during the last week of October and whole month of November that erratic 50-mc paths will form directly across the Atlantic Ocean to *Southern France, Italy and N. Africa*. The peak MUF to England is expected to be about 37.0 mc in Sept., 45.0 mc in October and 48.0 mc in November. On individual days there are excellent indications that the MUF may exceed 51.0 mc from November 10th to December 5th, 1947. Peak times are as usual, 0930 to 1130 EST.

With the above facts in mind, now is the time for you to line up skeds with foreign stations via 28 mc. OA4AE, W7ACS/KH6, J2AAO, J2JCQ, W2CDJ/Yokohama, W5DIV/Iwo Jima, W3CDJ/-J2, J9AJR, J9ABX, J9AAK, XE1KE as well as numerous stations in England and the European continent have indicated they will be looking for any signs of 6-meter DX. Along with these same stations we have WØTKX/MM and W5BSY/MM, both of whom will be on the high seas and looking for 6-meter contacts as they travel around the world.

As we learn of schedules that any of these stations will make, we shall present them to you in these pages. The first one that comes to our attention is from Buz Busby, OA4AE, in Lima, Peru. OA4AE will be on 50 mc even, during week days from 1730 to 1900 GCT (1230-1400 EST) daily; calling CQ DX at 05, 20, 35, and 50 minutes after each hour. Saturday and Sunday transmissions from 1300 to 1730 EST, calling same time after each hour and listening in between for DX. Nightly skeds will be 1900 to 2200 EST, when Buz is in town.

Well that is it fellows. Let's get into gear and



Dual 4-element 10 and 5-element 6-meter beam of W6UXN, Ray Brody, Inglewood, Calif.

*D & S Radio Supply, 107 South 3rd St., Manhattan, Kansas.

50-MC DX HONOR ROLL

Calls	States	Districts	Others
W9DWU	45	10	
WØZJB	45	10	VE2-3-4-7
W4GJO	44	10	VE1-2-3-OA4
WØDZM	43	10	VE1-2-3-7
WØQIN	43	10	VE1-2-3-7
WØTQK	42	10	VE2-3-4-7
W9ZHB	42	10	VE3-4-7
W1CLS	42	10	VE1-3
WØYUQ	42	10	VE3
W3CIR/1	41	10	VE1
WØINI	40	10	VE2-3-4
W8NSS	40	10	VE1-4-VP7
WØSV	40	10	VE7
W6WNN	40	10	VE7
WØDWU	39	10	VE1-2-3-7
W5ML	38	10	VE3-XE1
W6UXN	38	9	VE3-7
W4QN	37	10	VE2-3-OA4
WØYSJ	37	10	VE2-3
W5JLY	37	10	VE7-XE1
W5VV	36	10	VE7-XE1
W5AJG	36	10	VE3-XE1
W7FDJ	36	9	VE7
W5HF	35	10	VE1-3-4-7
WØBJV	35	10	VE2-3
W8QYD	35	10	VE1-4
W5VY	35	8	VE7
W2BYM	34	10	VE1-VP7
WØDKS	34	10	VE3
W1LLL	34	10	VE1
W5FRD	34	10	VE7-XE1
WØJHS	34	10	VE1-2
W7FFE	34	9	VE7
W1HDQ	33	10	VE1
W9UNS	33	10	VE4
W4DRZ	33	10	VE1-2-3
W6PUZ	33	10	VE3-7
W7KAD	33	10	VE7
W2RLV	32	10	VE1-2-3
W9PK	32	10	VE3-7
W7ERA	32	9	VE7
W1JLK	32	9	
W5LCZ	31	10	VE3-XE1
W3OMY	31	10	VE1-VP7
W9ALU	31	10	VE2-3-4
W4HVV	30	10	VE1-2-3
W5WX	30	10	VE4-7-XE1
W5RSC	30	9	VE7-XE1
W4EQM	29	10	
W3RUE	29	10	VE1
W7HEA	29	9	VE7
W4WMI	28	9	VE1-3-7
W4EQR	28	10	
W6ANN	28	9	VE3-7
W1CGY	28	8	VE1
W6OVK	28	8	VE7
W7ACD	27		
W5LBG	26	8	VE7-XE1
WØDNW	26	10	
WØYKX	26	10	VE2-3
W6NAW	25	9	VE7
W4FBH	25	8	VE1-2-3
W5ESZ	25	8	VE7
W7BQX	25	7	VE7
W7JPA	24	8	VE7
W5AOT	23	9	VE7
W5EEX	23	8	VE7
WØKQO	22	10	VE2-3-7
W9AB	22	9	VE1-2-3
W3RUE	22	9	

take advantage of 6-meter DX while the time is ripe. Of course, we would like to hear from you on any skeds of DX of any type you may work. Be sure to get them to us by the 20th of each month though, it will help.

International Notes

As mentioned in last month's flash, there has been more DX happenings in the Pacific area. The following message was received from no less than these stations: WØMAE, WØQAS, W4BAO, WØRBA on the lower frequencies, to whom we owe a debt of thanks. "Two way contact between Okinawa and Japan took place on 22 June, Sunday, 1947 STOP Don J2AAO called CQ and Tex J9AAK came right back STOP Contact lasted for over two hours from 1030 and maintained until 1230 STOP Sigs both ways 5/9 again established contact J9AAK 1330 until 1355 STOP J9ACS heard here in Toyko same date at 1000 until 1600 STOP First 50-mc contact between Japan and Okinawa STOP Contact first by c.w. and then phone STOP On June 28 W3CDJ/J2 Yokohoma made two-way contact with W5DIV/ Iwo Jima STOP Sigs 5/9 bothways STOP First contact ever made on the 50-mc band STOP Tests are being continued by J2AAO-J9AJR–J9ABX and W2CDJ/-J2 STOP Efforts being made to contact Australia STOP Rig at J2AAO is BC-640A with 3-element beam STOP Signed Don J2AAO."

While in the midst of this column we were surprised to have a visitor drop in the shack, the visitor being none other than Bob Mitchell, KH6DD. Bob is on his way to his new station with the Marines at Quantico, Va. Naturally he has a rig that will be on six as soon as he finds a house, so you will be hearing KH6DD/W4 on very soon. During his travels around the Pacific Islands Bob set his rig up on automatic keying and took a 2-tube converter along and was able to copy the home station on Oahu while at Guam, Wake and other islands. This shows that lots more good 50-mc DX could have taken place if more stations on these islands would get on the band. So take a hint fellows out there in the Pacific; put that rig on and see what happens this fall, when the MUF goes sky-high for you.

From Peru way we get the latest on OA4AE, Buz Busby. Buz is W5AGG, and has been with Pan-American Airways in Lima since 1939. Of course, his XYL's handle is "Tex," being they both hail from that FB state. Well to make it short, after all the nice contacts with the W4s last winter, Buz is now a confirmed 6-meter DX hound and has taken his rig off 28 mc so skeds can't interfere with his hunting QSOs on 6 meters. The schedule that Buz will keep and he means keep, is mentioned at the start of this column. He has another station on there with OA4BG just joining him. Now if we could get some of the lads on in northern-South America to take advantage of the conditions this year, some real fun would be had by all.

WØTKX/MM says that the only days that he hasn't heard any 6-meter DX sigs have been June 18th and July 4th. A marked difference from a year ago or even 3 months ago. Bob is still looking for good bending hauls and wants the East Coast boys to scout the band more often, with their beams out over the Atlantic. Some nice hauls could be made, with an almost all-salt-water path to do it over.

In Canada we note from VE3ANYs v-h-f column in *XTAL*, that the 6-meter DX record there is held by VE3AZVs contact with W6UXN on

[*Continued on page 52*]

CQ DX

By HERB BECKER, W6QD

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

W2BXA—No. 1 Postwar W. A. Z.

OUR congratulations to W2BXA for the first postwar W.A.Z.! Yes sir, boys, Ben Stevenson has achieved the first W.A.Z. award since the ending of the war. Forty confirmations were received, and it might be of interest if we would list the call letters of the 40 stations involved, so cast your eyes below and read 'em.

Zone	Call	Zone	Call
1	KL7AD	21	HZ1AB
2	VO6F	22	VS7IS
3	W6QNA	23	C8YR
4	WØACB	24	CR9AN
5	VE1HI	25	W3EKK/J2
6	XE1FW	26	XZ2KM
7	TI2GG	27	W8WUE/KB6
8	NY4FB	28	PK6HA
9	PZ1OY	29	VK6RU
10	OA4BG	30	VK3HG
11	PY2OE	31	W6NQG/KM6
12	CE3FM	32	ZL2GO
13	LU8AK	33	F7AE
14	F9BE	34	SU2GV
15	OH1OD	35	EL5B
16	RAEM	36	OQ5CE
17	UA9CC	37	CR7AD
18	UAØUA	38	ZS6IR
19	UAØKQA	39	VQ8AB
20	YR5V	40	OX1B

Obviously, W2BXA leads the pack at the top of the Honor Roll with 40 Zones and 166 countries.

As we said last month, there are, no doubt, a lot of you who have worked all 40, and maybe before you read this column some of you will have sent your confirmations to me. I know of a number of instances where the boys are waiting for one last zone; in most cases, Zone 19 or Zone 23. Why don't you go out after the missing confirmations? Maybe they need a little individual needling.

W6VFR Second W. A. Z.

No sooner do we get the mill cooled off from writing up the above W.A.Z. than W6VFR, Marv Gonsier, pops in with his 40 confirmations. We don't have to tell you that he must have a keen DX ear, and being there when the stuff is on has helped considerably. As Marv said today, he believes his DX, from now on, will suffer somewhat as his grades at U.C.L.A. have suffered during the past year. Our congrats to W6VFR, who is close on the heels of W2BXA with 40Z and 161C.

AC4YN is in Again

On July 9, *AC4YN* came through for a while working W6SC and W6WN. The following morning, he was in for an hour or so working W6OMC, and W6CEM. All four of these fellows are some of the Eimac gang who really take their DX seriously. W7FZA worked AC4YN which might be Reg's first W7. He also worked other W6s at this same sitting, but, as yet, I haven't been able to pin down just who they are.

Speaking of W6OMC, he now has worked 40Z and 114C. If I remember correctly, this guy, prewar, was operating either 160 or 5 meters, but something got him 180° out of phase, and he is really plowing into this DX business like he had been doing it for years. Quoting W6OMC, "AC4YN says W6s are rare, but I didn't think to tell him AC4s are rare *here*, too." Gee, after all this Zone 23 talk, the rest of the stuff may be somewhat mild. Anyway, let's see what goes on.

After checking with G2MI, as well as others who we think know more about these fellows than we do, the DX committee decided to delete ZD8A and ZC1AN from all lists If you fellows check your zone and country totals in the Honor Roll and find them one or two shy of what you think they should be, this may account for it. We are not going to take the trouble of notifying you individually if we have deleted these from your list, as you will know better than anyone if either or both of these countries were submitted to us.

In the many country lists we have been receiving, there has been a little uncertainty as to what VP2 station would be in the Leeward and which would be in the Windward group. In order to pin this down for you fellow, W6ENV stayed off the air long enough, missing *FQ3AT*, to collect the following data. The Leeward group consists of seven islands: Antigua, Anguilla, Barbuda, Dominica, St. Kitts, Nevis, and Montserrat. The Windward group consists: St. Lucia, St. Vincent, Granada, and The Grenadines. You can usually tell the island on which the station is located by the first letter following the numeral in the call: for example, if there was a VP2DY, it would be on the island of Dominica.

C-W Chatter

The old timers will remember *ZS2A*. He is back on the air signing *ZS6DO*. For some reason or another, years ago, he was nicknamed Pye. It was good to chew the rag with Pye again, and, as usual, he was blasting away on the low end of 20.

W3AYS is too lazy to write up his own zone and country list, and, at the moment, he is looking for some gullible steno. If any of you fellows have an extra steno, (must be gullible) get in touch with W3AYS. Bayard isn't too lazy to work DX, however, and he has found by putting a set of "Q" bars 16′ 6″ from one end of his 138′ 7″ wire, he can raise and hear stuff which he never could before with his Zepp feeders. W2PUD, one of the Rochester DX Association boys, has worked a few new ones; *WØTKK/VK9*, *MB9AM*, *UO5AC*, *VR6AA*, and *ZM6AF*.

KS4AC says he is going to lay off for a while; at least until he gets his QSL cards. In the meantime,

❖

CO2LY
Popular
20-Meter
Phone Man.

❖

Bill Wayne, *KS4AE*, will do most of the brass pounding. *W5LMT/KS4* should increase his activities, but, as yet, has not been on the air very much.

G2PL complains that he does not have the QTH he used to have. The present one is 22′ by 70′ and is located opposite Croyden Airport. Obviously, his antenna ambitions are limited. Peter's present rig uses a couple of 807s with 150-watts input on 10 meters; while on 20, he is running a single 813. G2PL has 39 zones and 158 countries postwar, with an all time total of 170 countries. One of these days, he'll take time out and shoot us a list. Many of you will recall, ten or twelve years ago, G2PL requested a picture of Ginger Rogers, and we saw to it that he received it. He still has it on the wall of his shack, but his latest request is for one of Jane Russell. We're working on this for him now, although I am wondering what Betty, his XYL, may have to say.

[*Continued on page 68*]

W.A.Z. HONOR ROLL

	POST WAR [C.W.& PHONE]		ALL TIME	
W2BXA	40	166	40	175
W6VFR	40	161		
W2GWE	39	169		
G6ZO	39	166	39	174
W8BKP	39	166		
W8RDZ	39	162		
G2PL	39	158	39	179
W6ITA	29	152	39	160
W6ENV	39	148	39	164
W8HYC	39	143	39	152
W6MJB	39	142		
W6ADP	39	137	39	164
G8KP	39	135	39	159
W6SA	39	134		
W8LEC	39	133	39	163
G6QB	39	130	39	152
W6SN	39	129	39	151
W9NRB	39	126	39	135
G2CDI	39	126		
W6RDR	39	123		
WØYXO	39	122		
W6TT	39	122		
W6SAI	39	121		
G5WM	39	120		
D2KW	39	120		
G6BS	39	117	39	138
W6WKU	39	117		
W7FZA	39	117		
WØGKS	39	116	39	142
W6OMC	39	114		
G3AAK	39	114		
W6LER	39	105	39	120
W6QD	39	91	39	155
W3JNN	38	148		
W2CYS	38	144		
G2WW	38	136		
W4BRB	38	133		
W2PEO	38	130		
W3IYE	38	130		
W9IU	38	130		
G2AJ	38	130		
G3DO	38	127	38	141
W2IOP	38	127		
W3GHD	38	126	39	166
G5YV	38	123	39	136
W8FJN	38	122	38	134
G8IL	38	115	39	142
W5CPI	38	113		
W8CVU	38	112		
W9RBI	38	112		
W2RDK	38	111		
G3ZI	38	107	38	115
G5RV	38	106	39	141
ON4JW	38	103		
WØNTA	38	103		
W6UZX	38	98		
OK1AW	38	94		
W6LEV	38	79		
W4CYU	37	145		
W3EPV	37	132	39	165
W4OM	37	126		
W3EVW	37	117	39	151
W1JYH	37	114		
W8NBK	37	111	38	129
W1NMP	37	111		
GW3AX	37	110	37	114
W4FPK	37	110		
W6TI	37	103		
W7GXA	37	99		
W6ANN	37	95		
VK2ACX	37	94		
W9YNB	37	93	38	117
W4ML	37	93		
WØSQO	37	92		
W5ASG	36	141	38	155

	POST WAR [C.W.& PHONE]		ALL TIME	
PY1DH	36	114		
G8RL	36	101		
G3QD	36	98		
W1BIH	35	105	35	111
KP4KD	35	100	36	123
W6AM	35	95	36	108
W2TJF	35	89		
G8QX	34	99		
G2CNN	34	98		
W3JKO	34	91		
W9VND	34	90		
W4DIA	34	86		
G5MR	34	74	35	87
W9MZP	34	72	36	105
W7FNK	34	54	36	64
W8LO	33	111		
W3JTC	33	90		
GM2UU	33	79	36	105
W2JA	33	74		
W3KDP	33	74		
CM2SW	32	99	34	106
G8FF	32	78	33	87
GW4CX	32	76		
W9FNR	32	74		
WØOUH	32	71		
G3VA	31	101	31	102
G2AO	31	77		
W6ZZ	31	76		
W4HA	31	75		
WØAZT	31	75		
W6MI	31	73		
W6LRU	31	71		
W9KMN	31	66		
W2PUD	30	78		
WØLAW	30	67		
W1DQH	30	65		
W9WEN	30	62	30	71
W6LN	30	51		
	[PHONE]			
W6DI	37	114	38	132
W1HKK	37	112	38	124
W4CYU	36	124		
W1JCX	36	120		
W8BKP	36	112		
W2BXA	36	105		
G3DO	36	101	36	114
W3DHM	36	96		
W1MCW	35	105		
W8BF	35	101		
W1NWO	35	92		
W9HB	35	89		
W6PCK	35	82		
W6SA	34	69		
W8LO	33	109		
W5ASG	33	83	33	99
W2DYR	33	82		
GM2UU	33	77	36	104
W9RBI	32	80		
W8BIQ	32	79		
W2NXZ	32	57		
W6PXH	31	74		
W2HY	31	72		
W5LWV	31	72		
WØSQO	30	74		
W4HA	30	64		
W2DYV	29	82		
W2NSD	29	72		
W8NOH	29	68		
W9FNR	29	65		
J9ABX	27	58		
W9GZK	27	56		
W6ITA	26	66		
W6ZZ	25	45		
KH6IL	23	38		
W4HKJ	12	22		

You're Looking at the Finest—

—a complete Hammarlund station

An HQ-129-X receiver, the choice of thousands of well-satisfied owners. And a Four-20 Transmitter with its companion Four-11 Modulator, a combination that is getting out all over the world. R9+ reports from China, Argentina, Hawaii, Australia . . . coming in to the many amateurs now using the Four-20 on the air.

You, too, can be in this picture . . . Equip yourself with a complete Hammarlund station.

There will be no new Hammarlund receiver in the price range of the HQ-129-X until the spring of 1948 at the earliest.

THE SIGN OF QUALITY
ESTABLISHED 1910

HAMMARLUND

THE HAMMARLUND MFG. CO., INC., 460 W. 34TH ST., NEW YORK 1, N.Y.
MANUFACTURERS OF PRECISION COMMUNICATIONS EQUIPMENT

Write for Descriptive Booklet

The YL's Frequency

by Louisa Dresser, W1OOH/2

With another election of national YLRL officers "over and clear," we're happy to report the results, which, by the way, show Californians in three top offices.

The new president is Helen Cook, W6MWO, of Beverly Hills, who was formerly secretary. Lenore Conn, W6NAZ, of Los Angeles, succeeds Louise Baker, W9JTX, as vice-president, while another W6, Lou Willomitzer, W6VWR, of Los Angeles, is the newly elected secretary. Former president, Lou Lacy, W5IKC, is now editor of *YL Harmonics*. And publicity chairman is your former column editor, W2OLB, Amelia Black (Mrs. Norman Lobenz).

New district chairmen, who can supply information about local YLRL clubs and their activities, are:

1st District: A tie; to be reported later.
2nd District: W2MEG, Wilhelmina Grabner, 7012 Polk St., Guttenberg, N. J.
3rd District: W3UUG, Miriam Blackburn, Ingomar, Pa.
4th District: W4JCR, Anita C. Bien, RFD 3, Asheville, N. C.
5th District: W5FJW, Judy Caraway, P.O. Box 497, Monroe, La.
6th District: W6UXF, Enid Aldwell, 111 W. 107th St., Los Angeles, Calif.
7th District: W7HHH, Bea Austin, 1137 Federal St., Bend, Ore.
8th District: W8SJF, Gladys Nichols, 203 S. Wood St., Wapakoneta, Ohio.
9th District: W9EFW, Esther Davis, 1008 Hugh St., Fort Wayne, Ind.
10th District: WØJWJ, Joanna Brawley, 724 N. Florissant Road, Ferguson, Mo.
Canada: To be appointed.
England: G2YL, Nell Corry, Petersmead, Walton-on-the-Hill, Tadworth, Surrey, England.

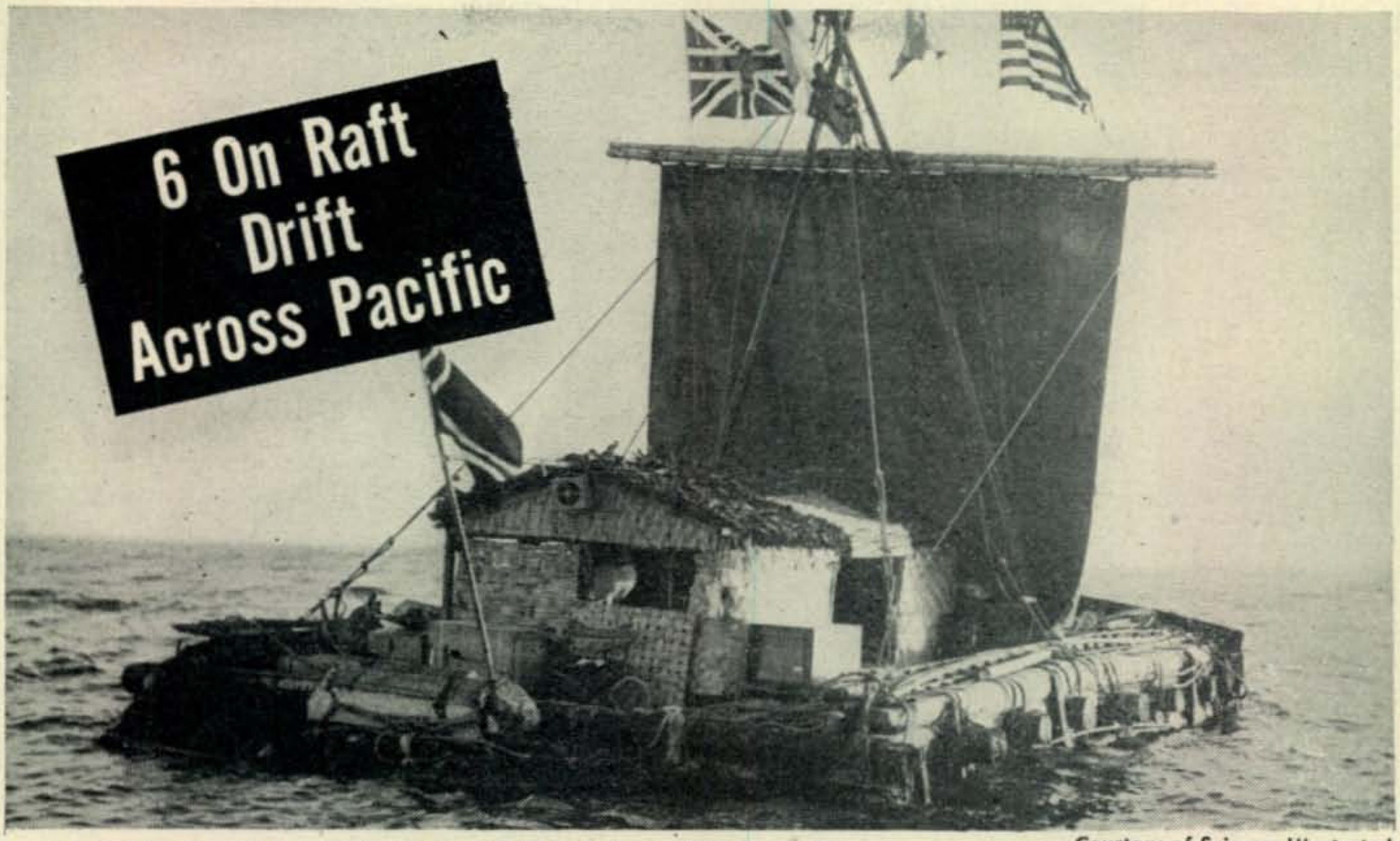
All of the new YLRL officers from W6 may be seen in the FB photo below, taken at a recent meeting of the Los Angeles YLRL Club. Incidentally, how about group pictures from other local YLRL city clubs? We'd surely like to have more such pictures for your column.

QRA?

W1FOF, Eloise Cook ("Cookie"), has a couple of questions: First, "Why do you always confuse the terms YL and XYL? YLs want a man, we hope, and XYLs, they done got one."

[*Continued on page 64*]

Los Angeles YLs hold a club meeting at the apartment of Helen Cook, W6MWO, newly elected president of national YLRL. Says she, "They made me hold that cake. I've always been envious of a beam which I don't have—hi!" *Front row, left to right:* Helene Leonard, W6QOG; Maxine Willis, W6UHA, L.A. YL Club secretary; Helen, W6MWO, holding the cake; Naomi Turk, W6YZU; Ellen White, W6YYM, up from San Diego for the meeting; and Evelyn Scott, W6NZP. *Rear row:* Dorothy Newcombe, W6WSG; Lenore Conn, W6NAZ, vice-president national YLRL; Lou Willomitzer, W6VWR, secretary national YLRL; Enid Aldwell, W6UXF, D/C YLRL; Clara Dishong, W6TDL, L.A. YL Club president; Carol Witte, W6WSV; Sandy Sarver, W6YRL.



Courtesy of Science Illustrated

KON-TIKI EXPEDITION PICKS NATIONAL RECEIVERS

Somewhere in the vast loneliness of the Pacific a frail, balsa wood raft is drifting westward, carrying six Norwegian scientists toward the Polynesian Islands. Their mission: to prove that the Polynesians could have been settled by prehistoric Peruvian Indians.

Courage, yes, recklessness, no. These adventurers are scientists, not stunt men. Before setting out from Peru they made sure that they would have the finest radio equipment in the world . . . National receivers, of course (Models NC-173 and HRO-7).

For safety . . . to bring in the weakest signal in the worst kind of weather . . . *for science* . . . to exchange vital weather and navigational data with land stations thousands of miles away. Battered by wind and sea for months on end these superb National receivers aboard the Kon-Tiki Expedition raft are still functioning as reliably as ever.

What better testimonial than operator Knut Haugland's cheerful "All's Well" radioed from the Tuamotu Archipelago . . 4000 miles across the Pacific, and still going strong.

Congratulations are also in order to W6AOA, W6EVM, and W3YA who have been in regular contact with LI2B. 27.98 and 14.142 megs have been assigned for general contact. Next time you go on the air, why not see if you can contact Haugland and get the Expedition's story first-hand.

National
Company, Inc.
Malden, Mass.

National
NC
EST 1914

National Receivers of the Type Selected for the Kon-Tiki Expedition

HRO-7

Brand-new successor to the famous HRO used throughout the world. 11 tubes plus a voltage regulator. . . . Frequency coverage from 50 to 430 and 480 to 30,000 kc. . . . Adjustable Threshold Noise Limiter. . . . Streamlined grey cabinet. AM phone and code reception.

NC-173

A new and versatile receiver, popularly priced. Frequency coverage from 540 kc to 31 mc plus the 48-56 mc range. Calibrated amateur band spread on 6, 10-11, 20, 40 and 80 meter bands. Phonograph or Microphone pick-up jack.

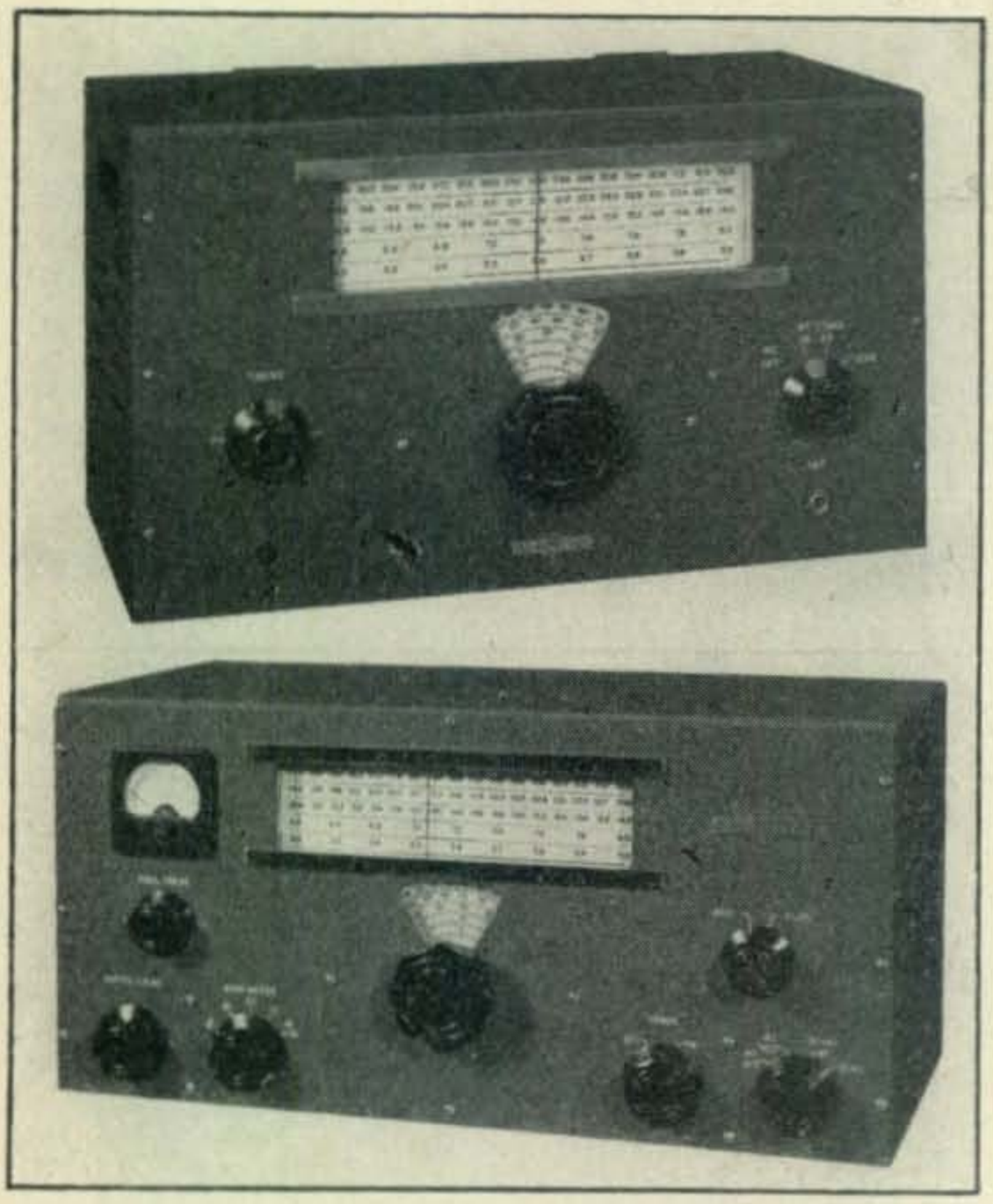
MAKERS OF LIFETIME RADIO EQUIPMENT

parts & products

R-F Exciter Units

Collins Radio Company has recently announced completion of three new r-f exciter units for radio amateurs.

The type 310B exciter utilizes the Collins 70F-S permeability tuned oscillator for its frequency control. Calibration is directly in frequency and accuracy is within .015%. Linear tuning is provided with an accuracy of 150 cycles per mc. The 310B is conservatively rated at 15 watts output on all bands under 32 mc. A key jack is provided for c-w operation, and stand-by switch is included. Power supply is self-contained.



The 310C-1 r-f exciter provides all the frequency control advantages of the 310B exciter but is designed as a crystal replacement unit. It has an r-f output of 80 volts rms, and a frequency range of 3.2-4.0 mc. The output can be plugged into an 80-meter or 40-meter crystal socket to provide accurate and stable frequency control of existing transmitters. A stand-by switch is included.

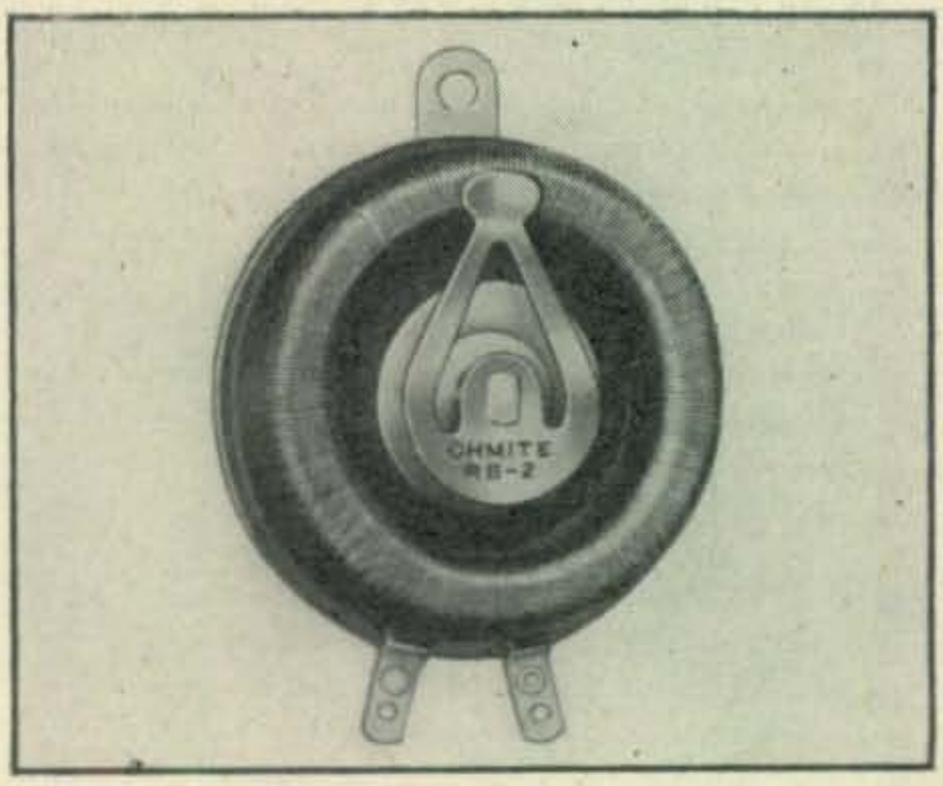
The 310C-2 r-f exciter is similar to the 310C-1 exciter with a self-contained power supply.

V.F.O.

High stability, new logging accuracy, and rugged mechanical qualities are claimed for the new Beach model 1700 variable frequency oscillator. This new v.f.o. uses an improved type of electron coupled circuit which maintains the cathode at ground potential and almost completely eliminates frequency shift due to voltage variations.

The vernier dial ratio is approximately 7.5 to 1 and furnishes more than 30″ of dial area. This is in addition to direct calibration in frequency each 25 kc over fundamental range from 3350 to 4000 kc.

Power supply requirements are 115-v. 60-cycle a.c. and output is approximately one watt over the entire range. All metal case 6 x 5 x 5½″ with black crackle finish, aluminum ventilating shield, cream colored vernier dial and high lustre tuning dial. Additional information may be secured from Beach Manufacturing, Inc., Inglewood 3, Calif.



Direction Indicator Potentiometer

To provide a simple, low-cost method of indicating the position of a rotary-beam antenna, or other rotating device, Ohmite Manufacturing Company has developed the model RB-2 direction-indicator potentiometer.

For use as a rotary-beam antenna direction-indicator, the shaft of the RB-2 potentiometer is coupled to the rotary-beam antenna in such a way that the shaft of the potentiometer rotates with the antenna. The potentiometer is then connected to a six-volt battery and an ordinary 0-1, 0-1.5, or 0-2 milliampere direct-current meter (with specially marked scale.) The milliameter will indicate the position of the antenna. The maximum current drain is only a few milliamperes. For complete information and circuit diagram, write for Bulletin 128, to Ohmite Manufacturing Company, 4855 Flournoy Street, Chicago 44, Illinois.

Features

...YOU'VE WANTED
...YOU NEED
...YOU'LL LIKE

STANCOR'S ST-202-A TRANSMITTER KIT

has them all

In the ST-202-A, STANCOR engineers have pooled valuable ideas gleaned from years of pre-war amateur kit design as well as war-time transmitter production to create a versatile combination of features which every amateur desires.

Integrated in a compact unit of pleasing appearance, a transmitter has evolved incorporating substantial power output, separate high and low voltage power supplies, a highly novel, but simple, exciter band switching arrangement and extreme ease of adjustment and operation.

Every consideration was given to the ultimate user of this piece of equipment . . . the amateur; that is why a choice is given of several different R. F. output tubes . . . that is why the circuit design is straightforward and reliable . . . that is why the ST-202-A is properly priced.

See your STANCOR dealer for the ST-202-A descriptive bulletin.

Amateur net price of ST-202-A transmitter, less accessories **$92.80**

- 100-125 WATTS INPUT TO FINAL AMPLIFIER.
- COVERS ALL AMATEUR BANDS BETWEEN 3.5 AND 30 MCS.
- THREE STAGE R. F. CIRCUIT.
- BAND SWITCHING OF EXCITER STAGES.
- ONLY TWO TUNING CONTROLS *(EXCITER AND AMPLIFIER).*
- SELECTION OF SIX CRYSTAL POSITIONS.
- ADJUSTABLE LINK OUTPUT CIRCUIT.
- TWO SEPARATE POWER SUPPLIES INCLUDED.
- EASE OF CONSTRUCTION *(CABLED WIRING HARNESS SUPPLIED)*
- SMALL SIZE—APPROXIMATELY 14" x 13" x 9".
- PROVISIONS FOR USE WITH AM OR FM MODULATOR.
- PRICED RIGHT.

SEE YOUR AUTHORIZED STANCOR DEALER FOR DISCRIPTIVE BULLETIN

STANCOR

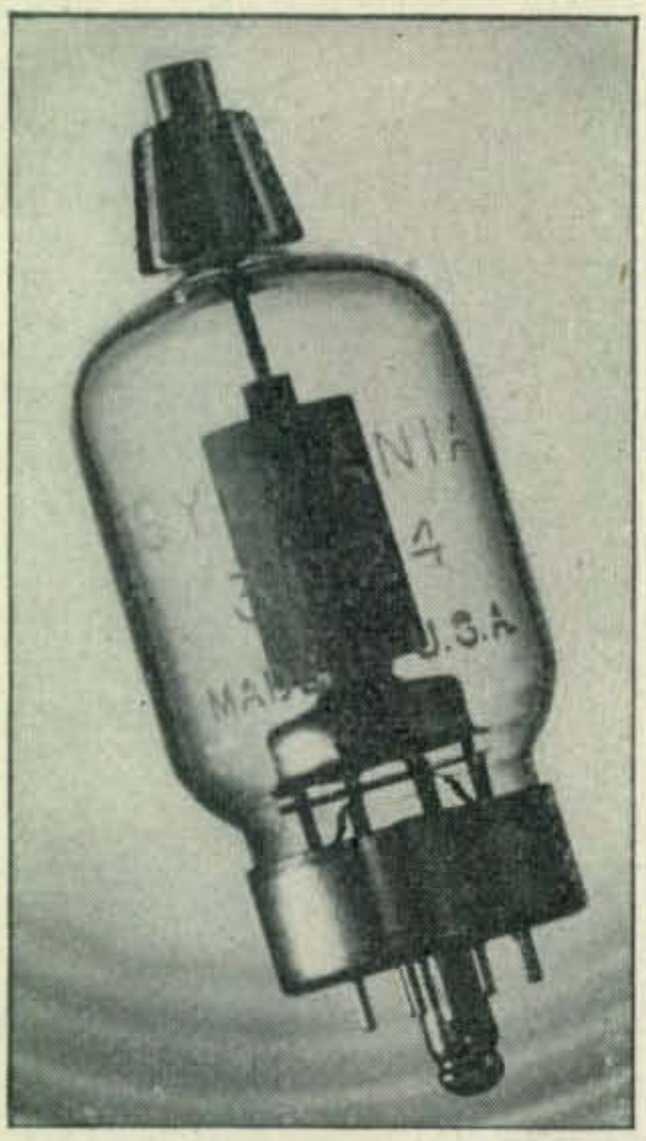
STANDARD TRANSFORMER CORPORATION

ELSTON, KEDZIE AND ADDISON • CHICAGO 18, ILLINOIS, U. S. A.

Compact Beam Power Tetrode

A new beam power tetrode designed especially for amateur, marine and mobile radio transmitters has been announced by the Electronics Division, Sylvania Electric Products, Inc. This new transmitting tube, measuring less than 4½" overall, provides high plate dissipation, low driving power and compact structure with high conductivity leads essential for efficient performance at frequencies up to 125 mc.

High plate dissipation is made possible through the use of a new high purity porous graphite anode having approximately twice the heat dissipation



area of similar metal anodes. Actually the zirconium coated surface will safely dissipate four times the amount of heat that can be dissipated in the case of metal anodes since the graphite anode material is infusible and will not warp or twist.

A radiator having milled cooling fins is threaded to the top anode lead and is secured with a set screw to provide maximum contact area, increased cooling and short current path. The tube is supplied with a hard glass bulb and a standard receiving type lock-in base, providing high conductivity shielded leads.

The tube has a carburized thoriated tungsten filament rated at 6.3 volts, 3.0 amperes. The number one grid is of the vertical bar type with two support leads for improved performance at high frequencies. The number two grid is connected to an internal heat-reflecting shield which also contributes to the low grid-to-plate capacity characteristic. Three rigid shield supports provide a good r-f ground path.

No metallic getter flash is deposited on the bulb; hence maximum heat dissipation is assured. The precise machining of the graphite anode structure tends to hold electrical characteristics uniform even at high temperatures. Low interelectrode capacitance eliminates the need of neutralizing circuits when components are properly arranged.

Typical operating conditions for the type 3D24:

Plate voltage, d-c.....	1500	2000
Control grid voltage, d-c	–300	–300
Screen grid voltage, d-c..	375	375
Plate current, d-c.....	90 ma	90 ma
Control grid current, d-c	10 ma	10 ma
Screen grid current, d-c.	22 ma	20 ma
Peak r-f grid input volt..	400	400
Full driving power.....	4.0 Watts	4.0 Watts
Plate power output....	105.0 Watts	140 Watts

Antenna Lead-in

Lead-in cables designed to connect antennas with receivers for minimum transmission loss, have been announced by the Specialty Division of General Electric Company's Electronics Department.

Available in three sizes with impedances of 100 and 300 ohms, they may be used also for amateur transmitters and special purpose wiring in electrical instruments.

Feature of the new low-loss cables is the use of extruded polyethylene insulation. This highly-effective insulating material insures resistance to water, oils, acids, alkalies, and aging.

The type size of the lead-in cables is prescribed by its specific application. For example, the 300-ohm cables both have a capacitance of 5.8 $\mu\mu$f per ft. and 82 per cent velocity of propagation. One size is somewhat larger and more heavily insulated because it is recommended for long-span and outdoor installations.

Also for special application is an r-f cable which has an impedance of 100 ohms with a capacity of 15 $\mu\mu$f per ft. and 72 per cent velocity of propagation.

Further information and specification sheets on the newly-announced lead-in cables are available on request to the Specialty Division, G. E. Electronics Department, Wolf Street Plant, Syracuse, N. Y.

Illuminated Meter

A solution to the important but troublesome problem of how to illuminate the dials of panel meters and similar instruments has been offered by the Simpson Electric Co., Chicago, Ill., manufacturers of electrical measuring instruments.

The Simpson patented method of illumination does away with translucent dials and floods every

fraction of the dial face with an even radiance. An ingeniously shaped Lucite cone carries the light from a recessed bulb in the back of the instrument through the front edge of the cone which entirely surrounds the dial face. This makes possible the use of the standard Simpson metal dial. The new Simpson illuminated meters are available in 2" and 3" sizes, in both rectangular and round cases.

Catalogs

A new parts catalog is now available from the E. F. Johnson Company, Waseca, Minn., or their distributors. It's their Condensed General Products Catalog No. 969 covering Variable Transmitting Capacitors, Inductors, Tube Sockets, "Q" Antennas, Insulators, Plugs & Jacks, Couplings, R. F. Chokes, and Tube Cap Connectors. In addition to these established items new lines appearing for the first time are the Multi-Wire Connectors, Tip Plugs & Jacks, and the Pilot Dial & Panel Lights.

Here's a new way to read meters ...in the dark!

How often have you wished for a meter you could see *clearly*—the whole scale of it, wherever you were using it—in the dark, under low lights, or even in the kind of glare that causes reflections on the glass—a really illuminated meter for your transmitter? Well, here it is—the result of a new Simpson patented method of illumination.

On these new Simpson Illuminated Meters (A.C. and D.C. voltmeters; D.C. milliammeters; and Radio Frequency ammeters), every fraction of the dial face is flooded with a full and even radiance—there isn't a spot of shadow.

An ingeniously shaped Lucite cone carries the light from a recessed bulb in the back of the instrument through the front edge that surrounds the entire dial. This makes possible the use of the standard Simpson metal dial. Unlike translucent dials, it cannot fade or discolor so that reading becomes difficult. It cannot warp or buckle, causing the pointer to stick, or distorting readings. The bulb recess is neoprene sealed.

Behind this refinement to the basic reason for preferring Simpson instruments—their in-built accuracy. That high quality which is the indispensable component of every Simpson instrument makes sure that the accuracy will *stay* there, year after year.

ASK YOUR JOBBER

3" Rectangular Case. Width, 3"; height, 3-1/8". Mounts in round hole. Body diam. 2¾".

2" Rectangular Case. 2-3/8" square. Mounts in round hole. Body diameter, 2-3/16".

THE NEW SIMPSON MODEL 240

"HAMMETER"

Today's version of the first self-contained pocket portable instrument built expressly to check high voltage and component parts of transmitters and receivers.

Ranges: 0-15, 150, 750, 3000 A.C. volts; 0-15, 75, 300, 750, 3000 D.C. volts; 0-15, 75, 300, 750 D.C. milliamperes; 0-3000 ohms (center scale 30). 0-300,000 ohms (center scale 3000); 1000 ohms per volt A.C. and D.C.

SIMPSON ELECTRIC COMPANY
5200-5218 West Kinzie St., Chicago 44, Ill.
In Canada, Bach-Simpson Ltd., London, Ont.

Simpson

INSTRUMENTS THAT STAY ACCURATE

V.H.F.-U.H.F.

[*from page 42*]

June 1st, a distance of 2250 miles. VE7AEZ is leading in the Canadian DX Derby with 98 contacts in 19 states, a very nice showing from his section of the country. June 25th brought the first recorded QSO inter-provincial, between VE3DC, VE3KM and VE1QZ, the QSO lasting for 30 minutes. On July 12th VE3BKL heard XE1KE on six, which really has the boys hopping for more DX.

With the coming of this fall's high MUF we have had repeated requests from G5BT and G6FO for the Ws to remember that their band is 58.5-60 mc. When good days are indicated by harmonics throughout the 30-50 mc range they urge Ws to make use of c.w. and to also check 28 mc for replies. Of course, the golden time of 0930-1130 EST holds for the best trys to UK and Europe.

Listed below are the Beam Approach transmitting frequencies between 30-40 mc that are very good indicators of the MUF. These 20-watt rigs were heard in the states from California to Maine last year and will be of infinite help in indicating to which part of the world the v-h-f bands should be good. These lists have been supplied by G6FO of British *Short Wave Magazine* and Mr. F. Muenzi, Zurich 2, Alfred-Escherstrasse 4, Switzerland, to whom we owe a debt of thanks for coming to our rescue and identifying the signals.

Country	*Airfield*	*Call*	*Freq.*
Denmark	Aalborg	none	30.0 mc
"	Kastrup	"	33.3
Finland	Turku	TA	33.3
"	Vaasa	VK	33.3
Ireland	Dublin	none	33.3
Norway	Orlandet	"	31.5
"	Oslo-Fornebu	"	33.3
"	Oslo-Gardemoen	"	34.8
"	Stavanger	"	33.3
Sweden	Goteburg	"	33.3
"	Malmo-Bullt	"	33.3
"	Stockholm Br.	"	33.3
Switzerland	Zurich	"	33.3
Portugal	Lissabon	"	33.3
Slovakia	Prague	"	33.3
England	Driffield	DR	35.4
"	Hullavington, Glos	HV	33.6
"	Jurby, Isle of Man	JY	35.4
"	Little Rissington	LR	39.6
"	Middleton, St. George	GG	34.0
"	Shawbury, Shropshire	SY	39.4
"	Spitalgate, Ches.	VJ	37.2
"	Swindergy, Lincs.	SZ (SY)	40.0
"	Topcliffe, Yorks	TO	35.8
"	Bishops Ct, Staffs	BA	34.8
"	Feltwell, Norfolk	FL	35.0
"	Moreton-in-Marsh	MO	39.2
"	Leuchars, Fife	LY	36.4
"	Lyneham, Dorset	LA	37.6
"	Manston, Kent.	MQ	38.4
"	Prestwick, Ayshire	PI (500 W)	36.2
"	St. Eval, Cornwall	SZ	36.4
"	Defford, Worcs.	DF	37.0
"	Dyce	GJV	33.3
"	Nutts Corner, Eire	MWC (500 W)	36.8
"	Ronaldsway, Isle Man	GJE	33.3
"	Whitchurch, Somerset	GJB	34.8
"	Bovingdon, Herts	MZZ	33.8
"	Watchfield, Berks	WW	34.6
"	Northolt, Middlesex	MVT	35.8
"	London, Airport	NW	34.8
"	Croydon, London	GED	36.6
"	Aldermaston, N. Eire	AN	35.2
"	Hurn, Hants	MVH	36.6
"	Turnhouse, Edinburgh	MWF	33.8

All these Beam Approach stations have 20 watts of power except those indicated with 500 watts. Authorities in Great Britain are interested in any reports of their reception from the States or elsewhere. Please send reports of their reception to us and we shall forward them on to the proper authorities.

[*QSY to page 54*]

Raise An Effective Antenna in TEN MINUTES!

De Luxe GROUND PLANE ANTENNA

Ground plane antennas are particularly good for increasing signal strength to other vertically polarized antennas such as used on mobile equipment. Also because of the low angle of radiation, it is quite effective for distance work.

The antenna consists of five sectional elements of copper plated steel tubing. The vertical element is electrically a quarter wave in length or about 8' for the 10 meter band. It is mounted on a large ceramic insulator which feeds through the metal horizontal element support. The lower end of the vertical element terminates with a coaxial cable connector so it is only necessary to connect a suitable length of RG8U, or other low impedance coax cable, to your transmitter.

- Easiest of all antennas to put up
- Low angle of radiation
- No tuning problems
- Built to withstand weather
- Requires a minimum of space
- Low priced

The antenna is shipped complete with a strong steel chain clamp assembly that may be mounted on a chimney, tree, mast or any vertical or horizontal support.

The Ground Plane Antenna is made to withstand extreme weather conditions. One of the nation's leading antenna manufacturers built them to rigid Army standards at a cost of several times our low price.

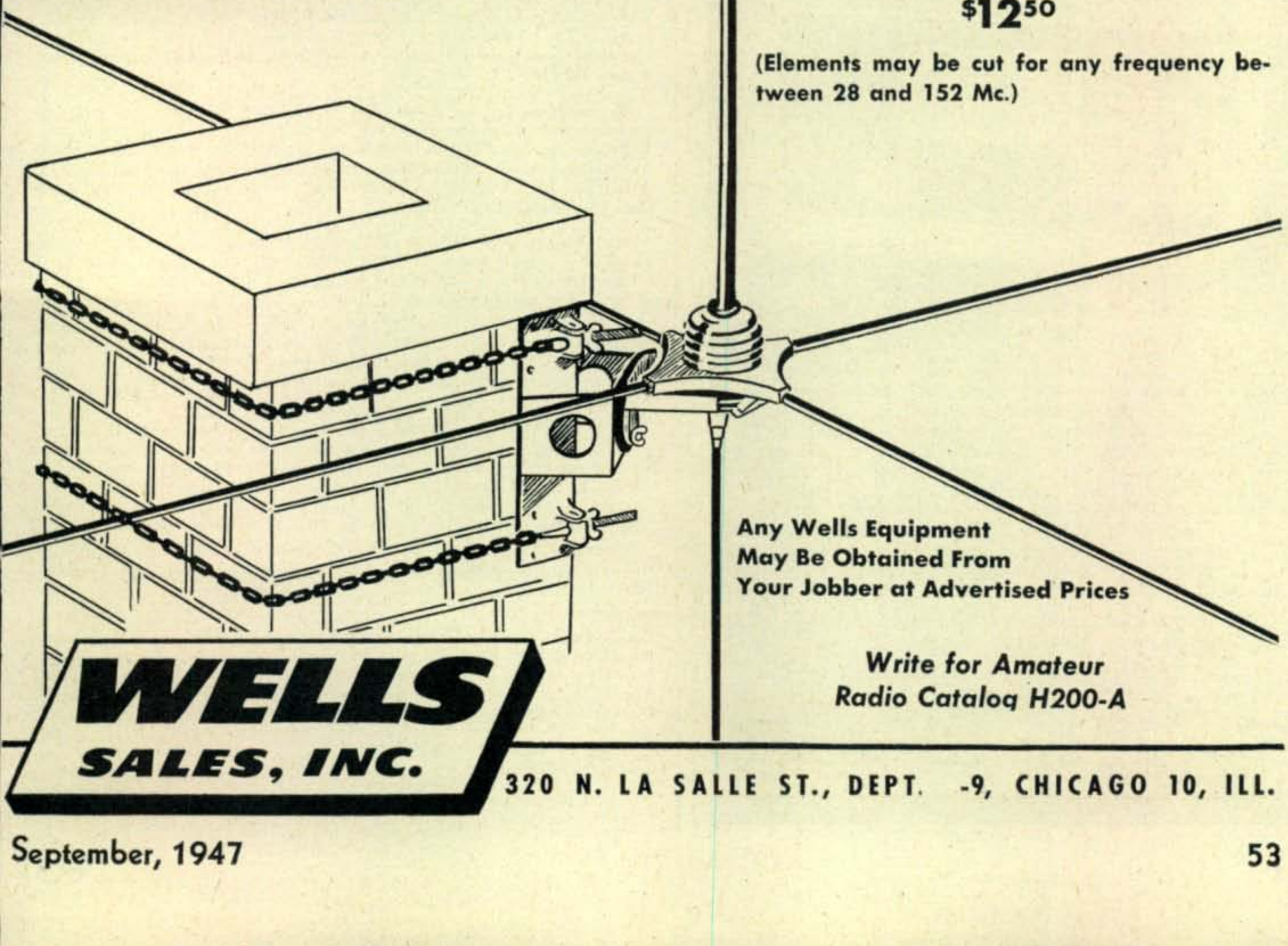
Ground Plane Antenna for 10 meter operation

$12.50

Ground Plane Antenna for 2 meter operation

$12.50

(Elements may be cut for any frequency between 28 and 152 Mc.)



Any Wells Equipment
May Be Obtained From
Your Jobber at Advertised Prices

Write for Amateur
Radio Catalog H200-A

WELLS SALES, INC.

320 N. LA SALLE ST., DEPT. -9, CHICAGO 10, ILL.

Skip DX and the Gang

Since the last writing, covering reports to May 22, we find no dead days other than June 9-10, until the present time July 22. While the WØs are getting a gradual tapering off of the band in July, it is noticed that the southern stations from coast to coast are still enjoying some nice openings. Actually it would be impossible to publish all the openings with calls worked, as they would fill a catalogue of some well-known mail-order houses. But to try to give the story we have prepared an article on the highlights of 50-mc DX. This article, starting on page 34 in this issue, gives the days that double-hop has taken place, which is something compared to past DX seasons. We wish to thank each and every one of you for your cooperation in sending us reports, and even though they haven't been reproduced they have been sent on to Perry Ferrell, propagation editor of *CQ*, who is making his Sporadic-E predictions from them. So they have been used and to a distinct advantage. In the very near future we will have some v-h-f report forms that will be sent out to those requesting them and to the regular reporters. Drop us a line for them and they will be on their way to you. Also, please note our new QTH for sending in reports in the future.

W8NSS in Dayton is the first W8 to report having worked 40 states or over. Carl has had quite a few double-hop contacts but still prizes the QSO with W5BSY/MM, 150 miles east of the Bahamas. In addition he has added VE1-3-4-7, an impressive score for just 3 months' operation on the band. The rig is a pair of HK-54s with 300 watts and a 7-element beam.

Howard Zeh, W8JLQ, of Toledo, decided to go west for his vacation and, being an ardent v-h-f man, took a mobile rig along with him, and had fun working the gang on Es and ground wave. June 29th while near Aurora, Ill, he heard W4GJO for the first skip DX. June 30th at Blair, Nebraska, W5JLY was heard along with W7SP. July 1st at Chappell, Nebraska, he heard W4CDC, GIY, ELV, W5VV, W7BQX and W9QUV. W9UED and W5LCZ were worked. July 2, at Rock Springs, Wyo., Howard worked W6OVK, GGM, and WØQIN. July 6th, W5ML of Shreveport was worked. No prearranged skeds were made and other stations were worked while in motion and a visit was made with WØJHS and the Minneapolis gang. The rig was an 832 final with 12-watts input, the receiver a superregen with 954 r.f.; a half-wave "whip" bent back 45 degrees, served as the antenna.

Down Austin way, in Texas that is, we find Wilmer Allison, W5VV, busy getting ready to take his summer vacation in Harrison, Maine. Of course his route will take him to Miss. and S. C., so more states should be added to some one's list. July 17th while at Anderson, S. C., he did add new states for W1LLL, W3CIR/1 and others who we haven't heard from. Wilmer now has 36 states, WACA, XE1, VE7, and still isn't thinking of going back to the QRM on the lower frequencies which he used to haunt.

W4BBR, in E. Point, Ga., says that Perry's predictions are averaging 70%, and that on June 27th he worked what he thinks is the first Georgia-California contact, when W6IWS came in for a nice QSO.

From Boston, we find that W3CIR/1 finally had an unfragmentary contact with W6OB, who was running 20 watts. Ed also mentions the very short skip when he worked W2RND at Atlantic City, 260 miles on skip, and heard the Philly gang, Md., Va., and D.C. boys nicely, with S-9 sigs; not like on bending, but really skip signals.

Bill Carley, W4WMI, is spending the summer at Georgetown, Ky., and has made 17 states, 9 call areas and VE1-3 while there. The score at the home station in Raleigh, N. C., is 29 states, 9 call areas and VE1-2-3-VP7.

Russ Haller, WØVIK, in Denver, has been giving lots of the gang their Colorado contact. Russ has worked 20 states, 7 districts and VE7 since getting on the band in May. He has yet to hear or work any East Coast stations, but is still looking for them.

July 7th, W5ELL, in Albuquerque, made the hop to W5MLE in Los Alamos, N. Mexico. The distance is only 80 miles, but they have a range of 9,000′ mountains in between them. Ed, W5ELL, says that signals during July have been fewer and not as good as in the past months, reminding us that we can expect the openings to become fewer and further between.

Kentucky's other addition to the band, W4JMI in Williamsburg, is up to 16 states and VE2-3, in less than a month's operation.

Bob Wells, W5HLD in Enid, Okla., had as his sixth QSO on the band none other than XE1KE on July 8th. Bob uses 300 watts to a pair of 35Ts and a folded doublet, the receiving combination being a Gonsett-HQ-129X. On July 9th he worked W5HTZ in Cromwell, a distance of 125 miles. Now if these boys can make the hop to WØYUQ or WØZJB the Eager Beaver Net would be expanded considerably, possibly into Chicago. Anybody wanna try getting a message from Oklahoma to Chicago?

Out California way comes word from W6PUZ, better known from 28 mc, as portable on Tinian Island in the Marshals.

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Don has a kw to a pair of VT-127As, the antenna is a 4-element wide-spaced rotary about 38′ above ground. The receiver is a rebuilt Gonsett with a grounded-grid preselector, feeding into an HRO. With this set-up W6PUZ has worked 33 states and VE3-7 in about 2 months' operation. Don would like to see more c.w. work, especially on the F2 work this fall. He expects to spend a lot of time in digging for the boys in the Islands, and extended ground wave. So far he has heard XE1KE on skip and has had reports of his signals being heard around the Bay area and S. F. but nothing definite as yet. He reports that W6KD (W6OIN), of 5 meters is back on now to try six.

A call mentioned very frequently in these pages is that of W4GJO in Orlando, Fla. Grid has 44 states to lead in the East and South. His rig is a pair of 35Ts with 300 watts and his new antenna (he wants everyone to know), is 45′ in the air. The only states that Grid lacks for WAS on 50 mc are S. C., Colo., Utah and Nevada. With this fall's MUF Grid really expects some nice contacts with the boys in South America and possibly to European points.

From W4HVV we hear that W4CNK of Pensacola is going relative visiting in S. C. and will take a portable rig along to gladden some of the gang's heart. Ground wave skeds will also be arranged with W4HVV in Raleigh, just to see what can be done from down south way on bending. Perhaps this will awaken some nice fellow in S. C. who will join the band as a permanent party—it has happened you know!

Out Tucson way we find W7TXM and W7QAP somewhat livened up now that W7KAD in Douglas, some 100 miles away, is getting his signals through. July 16th was the reunion night when W7KAD had a nice shiny new VHF-152 to try against the old DM-36. Of course, the results were very satisfying, so now all are happy. The rig at W7TXM is 35 watts to PP 2E26s, into a 3-element beam. At W7KAD we find a kw to 250THs and a 4-element beam 50′ high. W7QAP at Rhombic Acres still has the 65 watts to an 829B, and the 8-element H with reflectors.

Course wouldn't be news for a column these days without the mention of "flying saucers." The first news to reach us is from W5AJG who says the XYL can provide them in the form of sure enough ones out of china if needed. Leroy has a new beam a la 1947, the boom and all out of aluminum, weighing about 4 lbs., against the old 1939 vintage of 45 lbs., both being 4 elements. Leroy wants to know who gets what, if someone on 6 contacts a flying saucer in flight—probably a strait jacket my fran!! W5AJG has 36 states WACA, VE3-XE1 for 1947.

W5HF in Amarillo now has a total of 35 states, VE1-3-4 and XE1. Irv, the OM, is traveling now and Jean, the XYL, W5HYF, is doing the operating except for week-ends when Irv is back. A mobile job is planned for the near future, what with the good luck they have had at the home station on six.

The first we have heard from VE6 is that W7SP, in Saltair, Utah, contacted VE6AY and VE6DV on June 23, for their first out-of-town contact. Zim has a high line in front of the shack and the power leak has held him back on the receiving end, although so far he has 18 states and VE6-7 for this year's DX.

In Western Nebraska at North Platte, we find WØDNW with 30 states and WACA. WØDNW has been giving the boys their Nebraska contact, since WØDYG apparently gave up.

W2RLV in W. New York says that the weather is too warm for ham radio but he did get W6YX at Stanford University for WACA on June 23rd. This brings Bill's total to 32 states, WACA and VE1-3.

Bill Copeland, WØYKX, says that activity during the day must be low as on July 16th with the band wide open all day he just worked W3CIR/1 three times. Well, Bill, me boy, there are such trifles as trying to exist these days, and that means a job and work during the day. Bill has 38 states, WACA and VE2-3. He has bandswitching for 10-6 meters, with slug tuned coils. He says that with the 6AS6 mixer the converter is plenty hot, even with bandswitching.

W6IWS, at Brookdale, Calif., says that due to his QTH being in the mountains he hears only the high-angle signals, but got in on some of the double-hop to bring his states worked up to 21. The antenna is 6 half-waves in phase with reflectors fixed north and another similar one fixed east.

Harold Klass, W4QN, W4GJOs running mate in Orlando, now has 37 states, WACA and VE2-3, OA4. Come the Fall Harold is expecting lots of contacts with South America. So are lots of others.

WØJHS says the Upper Miss. Valley gang around the Twin-Cities are just plugging the band for all its worth and that W9DWU/Ø now leads with 45 states since Shorty, WØDZM, has become sick. Wish you a speedy recovery, Shorty, ole boy. Betcha a contact with some DX outside the country might fix you up.

News of the Raleigh gang comes from W4AVT. Harry says that W4HVV is leading in states at 30. W4WMI is a prof in EE at N. C. State College. W4HVV is a senior in EE at the same college (and we thought WØOTV had a good go with his pappie head of the Journalism Dept.) and W4AVT, is a building contractor.

The ole Hermit of Buck Horn Canyon, W7QLZ, claims that his 14 states in 7 districts should be tops for mobile operators.

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Clyde is still looking for game, or vice-versa, but rumor is that he has been prospecting and when he strikes it rich there will be quite a party somewhere for the 50-mc gang. Let's get diggin', man!

From W3GKP comes word that stations working the edge of the band in the Washington, D. C., area would be covered by the 2nd harmonic of WWV on 25 mc, and he suggests that for this winter's DX trys, the DX go outside the band a ways, or up into the band at least 20 kc. Actually, the outside part sounds better to us as would take advantage of the MUF more often.

Bert Arnold, W5WX, in Amarillo, says the band has been open there in July, but not as often or strong as in May and June. Bert has 30 states VE4 and XE1. On July 13th the band was open all day the 12th and over to the 13th, with some W1-2 and VE1 heard.

W1CLH, in Bridgeport, Conn., says his VHF-152A finally came and he is now settling down to some good 6-meter DX. Ed got W3CIR/1 in Vermont and W5JTI in Miss. for some good ones. His rig is a pair of 807s into a 4-element beam. Ed has also heard W7SP but wcouldn't raise him.

W5LOW, ex-W9BDL, will be off six for at least a month as he is going on vacation to Illinois and see the gang. Watch out for those flying-saucers around Greybill, Ill., Elmer. 'Tis rumoured the old "powerful postman" started all this and the discs are in reality the wheels off Ed's car flying through space when six is open and Ed wants to get back home off the postal route, but quick.

W9FKI in Rantoul, Ill., says the Twin-City Radio Club of Champaign-Urbana, Ill., had a hidden transmitter hunt and with 20 members present. They split up into 5 teams and took off after it. Lots of fun was had and they are planning another real soon.

Vic Pennington, W8RFW, tells us about his vacation when he went to Washington, D. C., along Skyline Drive, Blue Ridge Parkway and the Smokies in Tenn. and Kentucky. What no mobile, Vic? Traitor!

The Sad Sack Net in Southern Washington, is now minus W7CTY, CAM and AWX, just getting on the band once in awhile. Just restless, says W7HEA. They had better be back or the wrath of the Sad Sacks will descend on them. Bish, W7HEA, says that he doesn't think so much about using c.w. when the band is open for double hop. The general reaction there is that none of the boys pay any attention to c.w. sigs when the band is open, and the idea is losing contacts for the boys in the East. Bish goes on to say that c.w. is fine when the band is about to pop open, but after once open c.w. is forgotten as much more can be said by phone and more can be said in a shorter time. This also applies to ICW, as W2AMJ and W2BYM were inaudible on ICW, but good copy on phone. Well, this is another slant on how to work DX, but we agree that the advent of the rush box is over and ICW is not as easily copied as phone and keying the carrier would be better. Bish adds that some day he hopes to get a W1 and become a WACA instead of WACKY!

A c-w man exclusively is W8MVG of Ohio, Mich. (The traitor—we just worked him on phone). Chas. has 400 watts to a pair of HK-54s, and a 3-element beam on top of a 65 windmill tower which he purchased for $7.50; a good deal even in Scotland. Chas. has 15 states and 7 call areas and will be found on 6 meters only, using c.w. on all contacts.

From W6OVK we learn he has a new noise circuit limiter, which would have improved his DX contacts during June, as he has quite a bit of ignition noise from the big highway near him. W6OVK has 28 states, 28 districts and VE7.

W5ML in Oil City, La., has been giving the band fits and has on his Brag-List 38 states, WACA and 3 countries with VE3 and XE1. Bates has 100 watts to a 3-element beam and is also doing some nice ground wave DX to W5LCZ in Benton, Ark., and into Texas.

Nick Laub, WØIIC, in Minnesota, has 17 watts to an 832, while rebuilding the rig to a pair of 257-Bs and 500 watts. Nevertheless, Nick got W6NLZ and W6OB with the small rig.

144-mc Gang

Gang, did we call it? Well, only two reports for this band, and most of the rest will come from Bill McNatt's *VHF News*. Bill, incidentally, is celebrating his 1st anniversary of *Th V HF News*. Good luck in the future, Bill, also.

June 29th saw the crossing of Lake Michigan by W9ZEL/9 south of Michigan City, Ind., and W9CYT in Evergreen Par,k, Ill., near Chicago. The distance is around 50 miles and the rigs were 30-watt FM jobs with one-quarter wave ground planes vertically. Another check is planned very soon.

W7DLR in Ogden, Utah, is on 144 mc with a pair of 7193s in a unity-coupled oscillator, and a 6-element beam. The receiver is a Navy BO-1. Jack is trying to work into the Salt Lake area.

Poncho, W6WNN, says that there may be activ-

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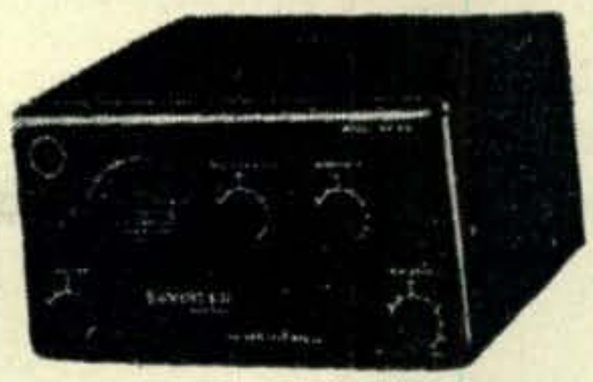

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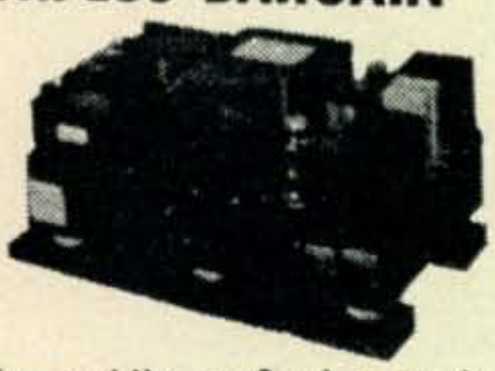

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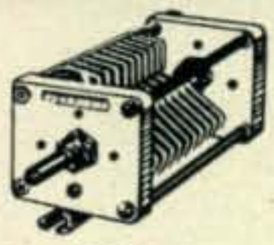

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3GPI	3.00	954	.75
5API	4.50	955	.75
5BPI	3.38	956	.75
5BP4	3.38	957	.75
5CPI	3.38	958A	.75
5CPIA	6.00	959	.75
5LPI	9.00	1613	.75
6AK5	.90	1616	3.00
6D4	.45	1619	.75
7BP7	5.25	1624	.90
9JPI	2.25	1625	.53
10Y	.75	1626	.60
12DP7	6.00	1629	.27
12GP7	11.25	1641	.90
OC3/VR105	.75	1665/2050	.90
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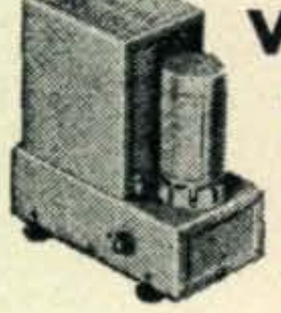

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ity in San Diego on 144 mc, but he has yet to hear any one other than W6KD, who is mobile. Poncho has a new VHF-152A and is looking for the gang in San Diego.

Well, gang, that's the lot of reports for 144 mc. How can we give the picture if we get no reports? We would like to run each month a picture of some of your rigs, antennas or group photo, so how about it???

The Dawn Patrol, led by W3QKI, is still after some good DX in the wee hours, but so far nothing has reached us. Actually, though, here in the Mid-West there has been little inversion on 50 mc as the weather is far from normal for the summer months. Perhaps this will clear up and some nice record will be broken during August or September.

Bernie Bates, W1BBM, now has a mobile rig on 3000 mc and is ready to run skeds with anyone around the North Harwich area. Bernie has sent data on his 1275-mc gear that we hope to present to you soon. He says it's easy to get things going if a little pain is taken on the physical layouts.

Again, gang, note our new QTH for sending reports to in the future. What started as a friendly QSO on 6-meters with WØYUQ, has ended up in a business venture in Manhattan, Kansas. So its farewell to Megacycle Farms at Gashland, which we do hate to leave. After all, it's been our location that has helped to eek out those weak signals. Thanks for reports and CUSN.

Mt. Shasta Hamfest

The Mt. Shasta Amateur Radio Club is sponsoring a Northern California-Southern Oregon hamfest and dance at the City Park and Lodge, Sept. 27-28, 1947. The assortment of prizes promises to be outstanding and for those interested in trying for v-h-f records Mt. Shasta rises 14,000 ft. not ten miles away.

DX PREDICTIONS

[*from page 40*]

and receiving conditions over a path from the W1, W2, W3 and W8 call areas to eastern Australia and New Zealand are shown. The top variable line indicates the maximum usable frequency (MUF) predicted over this path. During exceptional days this MUF may be exceeded by as much as 15%. The lower variable line, which is approximately 0.85 of the MUF is the optimum working frequency. The OWF may be used as a basis for establishing schedules. The white area between the OWF and the MUF outlines is generally considered usable from an amateur standpoint. In *Fig. 1* the midnight MUF is predicted to be 23.0 mc. The MUF will drop to a low of about 16.5 mc at 0600 hours EST. The usual morning upswing in the MUF is expected to begin around 0620 hours EST. A peak will be reached at about 0800 hours. This particular period corresponds to good 20-meter conditions.

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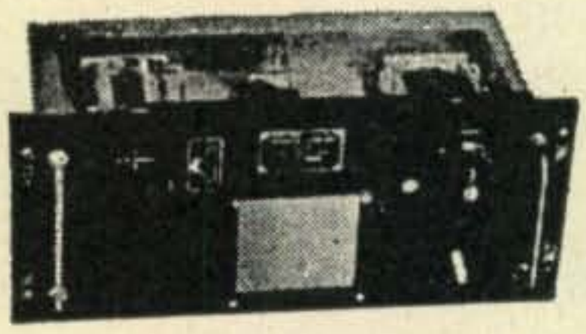
.005 mf 15,000V	22.00
.006 mf 10,000V	17.50



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No. 5190—6180V @ 200ma **14.75**

No. 5057—6.3CT 1A, 5V CT 3A, 5V CT 3A **2.75**

No. 5104—6.3V @ 1A, 6.3V @ 1A, 6.3V @ 1A **2.45**

No. 5126—5V CT 3A, 5V CT 3A, 5V CT 6A **3.25**

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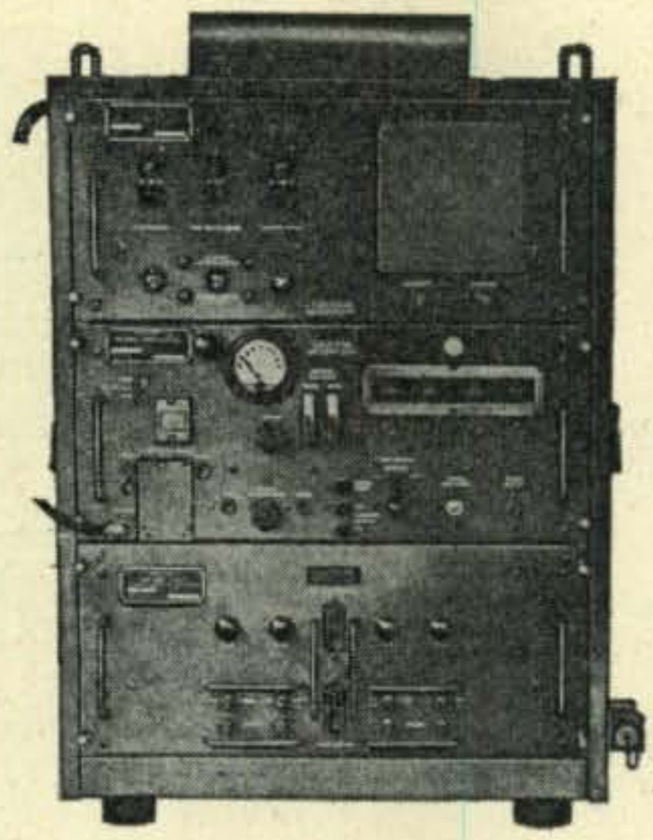

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WE 720BY (S band).	20.00
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KLYSTRONS

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2C40 Lighthouse tube.	2.50

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11 METERS

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There will be absorption over this path after 1030 hours EST. At about 1400 hours it is expected that a 10-meter opening will occur. Good 10-meter conditions are not anticipated until after 1700 hours EST. This band should close over this path around 2030 hours.

Fig. 2 illustrates the average predicted conditions for paths from W6 and W7-call areas to the Malay States, Borneo, Siam and Burma. It is expected that the 20-meter band will open quite sharply around 0630 hours PST. Good to very good conditions should be observed until about 1100 hours. Some scattered 10-meter signals may also be heard between 0845 and 1030 hours PST. The MUF at the Asiatic control point drops after 1130 hours PST, reaching a low at 1300 hours and then sharply rising to about 36.0 mc at 1500 hours. This second opening will be particularly favorable for 10-meter signals. The 10-meter band should close after 1900 hours PST. Some 20-meter signals may be heard after 2100 hours.

The average conditions for a path from the W1, W2, W3 and W8-call areas to Japan, Korea and Manchuria are shown in *Fig. 3*. A fair to good 20-meter opening is predicted at about 0615 hours EST. This opening should be quite sharp and may vary about this average time—some openings on very good days occurring as early as 0515 hours EST. There will also be a gradual tendency toward earlier 20-meter openings at the end of the month of September. Peak period over this path is 0745 hours EST. The conditions will change noticeably after 0815 hours and some absorption may be expected around 0930 hours. No 10-meter opening is predicted although the MUF is predicted to go to 26.0 mc at 1630 hours EST. There will be considerable absorption in the 20-meter band at this time—although some scattered signals may be expected after 1900 hours until the band closing at about 0030 hours the following day.

Fig. 4 depicts the average conditions from the Pacific coastal areas to France, Italy and the Balkans. Similar conditions will also be noted to Egypt and the Middle East. The midnight MUF should be about 13.0 mc. A low of about 11.0 mc is expected at about 0300 hours PST as this path crosses the polar zone. A steadily rising MUF should be observed after 0600 hours and there are indications of scattered 10-meter signals between 0930 and 1230 hours PST. Conditions should show a very marked improvement over this path throughout the month. Fair 20-meter conditions may be noted after 1700 hours until 2000 hours PST.

Otherwise the transcontinental MUF from the East Coast to the West Coast should peak at about 35.0 to 36.0 mc at 1500 hours EST. The 10-meter band should open around 0830 hours

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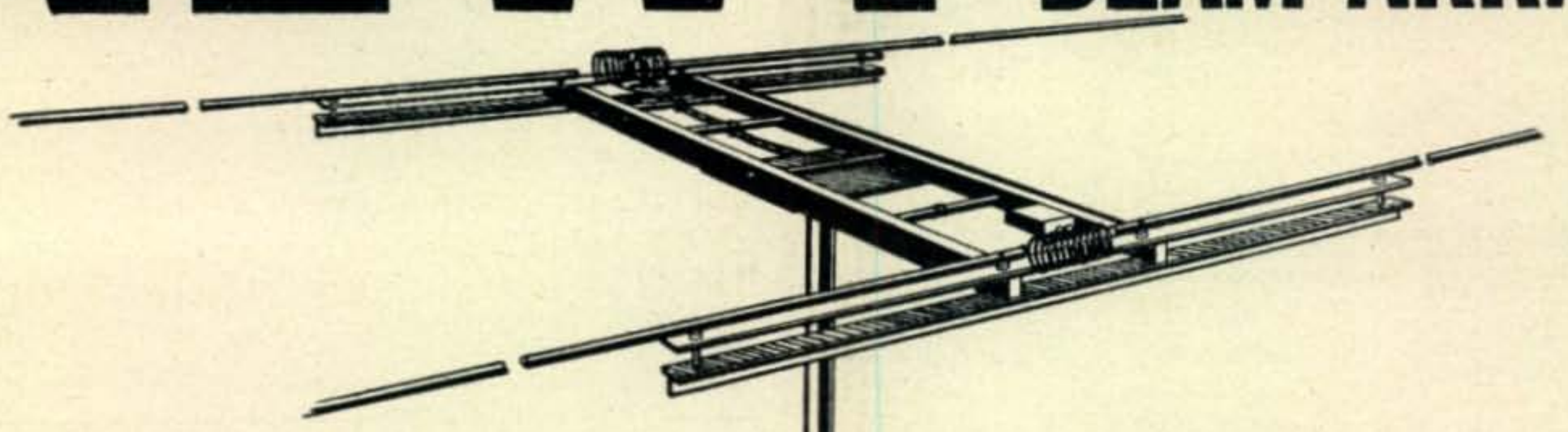

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EST and close around 2100 hours. North American paths to South America show extensive promise with the possibility of a 6-meter opening at 1300 hours from Florida to Peru and Ecuador. The trans-Atlantic MUF should rise to 37.0 mc by the end of the month. The 10-meter band to Europe should be quite regularly open after the 10th of September.

The data for the predictions graphs are drawn from the *Basic Radio Propagation Predictions. . . Three Months In Advance* as issued by the C.R.P.L. of the National Bureau of Standards. These booklets are available on a subscription basis from the Superintendent of Documents, Washington 25, D. C. A detailed description of the method of operating these graphs and the C.R.P.L. Booklets is contained in the Handbook *CQ DX*.

THE YL's FREQUENCY

[*Continued from page 46*]

It seems to us that there is still room for confusion. YL is fine; we can all agree that the term refers to a licensed "young lady" radio amateur who is unmarried. Now, when she gets married we change her nickname to XYL, but (and here is where the catch comes in) this same term XYL is in almost all cases used by OMs in referring to their wives—whether or not the wives are licensed operators. So when we use the term XYL, do we know whether the gal is an amateur or whether she is absorbing ham radio by proxy in the person of her OM? Maybe we need a third term to clarify—or add to—the confusion. Hi!

Some of the gals use the term MYL when they are married to a ham but are not licensed themselves. To be really technical about it, we might start with YL for "young lady", LYL for "licensed young lady", YF or OW(?) for wives of hams, XLYL for a married LYL . . . Wow—we give up!

Cookie also brings up another subject of interest:

"Way back when we used to be a member of YLRL we found how very unpopular one could be by being interested in phone communications instead of c.w., and we have always wondered why.

"There is Jeanne at W1DQK's transmitter and Mac at W2OOG's transmitter, to say nothing of unlicensed XYLs, who do a swell job at carrying on an intelligent conversation which is creditable to ham radio—and that is more than you can say for a great many of the men.

"Now, what I want to know, are the rest of these girls so completely thrilled at their ability to copy code and so ashamed of their ability to make conversation on the air that they never get on phone? How about it, do I start something?"

How about a poll? How many of you YLs and XYLs prefer c.w. to phone, or vice versa?

Just a reminder. Don't forget the dates September 26, 27 and 28—the occasion of the 1947 Hudson Division ARRL Convention sponsored by the Monmouth County Amateur Radio Assn. and the Jersey Shore Amateur Radio Club at the Berkeley-Carteret Hotel, Asbury Park, N. J. There will be big doings for the YLs and XYLs. For details see the YL Frequency in your August issue.

See you at the convention.

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414	431	447	472	492	507
415	433	448	473	493	508
416	434	451	474	494	509
418	435	453	475	495	511
419	436	456	477	496	512
420	437	457	479	497	515
422	438	458	481	498	516
423	440	459	483	501	518
424	441	462	484	502	519
425	442	463	485	503	522
426	443	466	487	504	523
427	444	468	488		

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391	397	405
392	398	406
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394	402	408
395	403	409
396	404	411

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374	380	386
375	381	387
376	383	388
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Balancing the Book

NO, WE ARE NOT talking about accounting or even about starting up a juggling act for the term *balancing the book* refers to the state of equilibrium of the text material in each issue of *CQ*. Basically, a good balance of material in each issue is not something left to the fates. Rather it is something that constitutes the biggest editorial headache in the operation of a magazine. During the extreme paper shortage this resulted in a very awkward "on the fence" position for the Editor. Many readers felt that the number of construction articles had suffered at the hands of the usurping Department Editors, while others were loud in their belief that their names were cut out of the shortened *YL, DX* and *V.H.F.* departments. Beyond that we encounter the whims and fancies of each and every reader. Some speak only in terms of kilowatt rigs, others in multi-element antennas, while others would probably never be seen dead below 50 megacycles. Naturally, it is impossible (without printing a handbook each issue) to adequately cover the entire amateur field in every copy of *CQ*.

Whenever possible a transmitter story appears in each issue. Also an article or a short article relating to antennas. A third prerequisite is a general feature story that may be a combination of transmitter, receiver and antenna. Heavy theory articles are kept to a minimum, but on the average an article appears every other month which is definitely theoretical in character. The average of humor stories is steadily increasing, while in each issue we try to present some gadget or piece of equipment which will be of use around the shack. All in all we try to be fair to each and every reader, so if your favorite topic is not receiving ten or twelve pages this month, remember some other fellow is probably quite happy at the display his favorite subject is getting and will very likely be just as sad as you next month when the tables are turned.

Lectures and Talks

Every now and then certain members of the editorial staff receive requests to speak before amateur club meetings and Hamfests. Generally, if it is at all possible, the talk is given and we are glad to say that, to date, they have been quite successful. The purpose in bringing up this point is to clarify the impression that the staff members accept this as a part and parcel of their responsibility. Naturally, if that were the case it would be a very broad imposition upon their free time. For program committees who want members of the staff to give talks before their clubs, please contact the Managing Editor well in advance of the desired date. We will do our best to help out, but if unable to assist, please understand our position.

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DX

[*Continued from page 44*]

By now, it will probably be old news to you, but *C8YR* in Kansu Province, Zone 23, lashed out with a fury July 15 on c.w., putting in a swell signal, on the West Coast, at least. He knocked off W6s and W7s, and as far as I can tell, the guy was on from about 1400 to about 1615 GMT. As this is being written on the 16th, I can tell you he was in there again this morning with even a better signal due to improved conditions. As we have told you before, C8YR has been on phone and given Zone 23 to a few of the boys via this method. C8YR knows doggone well he is giving plenty of DXers the most elusive zone of all. C8YR has a good T9 signal, and, thus far, has been between 14,000 and 14,010 kc.

Let's take a look at the W1s. A new one to our fold is W1JYH who sends through a nice list of 37Z and 114C. He is on c.w. exclusively, running 300 watts; the antenna being a 139' wire. Then there is W1DQH who starts in with 30Z and 65C. Dick is

[*QSY to page 70*]

QTH'S

C9YC	Y. C. Hwang, Telephone Communication Administration, Malden
EK1TF	R.C.A. Comm., Tangier Zone
F8NE	Jean Periquoi, 37 Cours Napoleon, % M. Duret, Ajaccio, Corsica
HC1JW	Box 756, Quito, Ecuador
HK1AM	U. S. Naval Mission, Base Naval, Cartagena, Columbia, S. A.
J2VFW	Hq. ASA, APO 500, % P.M. San Francisco, California
KG6AV/VK9	APO 246, Unit 2, % P.M. San Francisco, California
KM6AB	% P.A.A., Midway Island, Pacific Ocean (Via Honolulu, T. H.)
MB9AM	Klagenfurt, Austria, via R.S.G.B.
OQ5AV	Box 77, Leopoldsville, Belgian Congo, Africa
PK1MD	Max J. Sigmond, Petodjooedik 20, Batavia, Java
PK6AS	Radio Station 3VB, Biak Island, Dutch New Guinea, N. E. I.
PK6BY	Jim Barclay, George Street, Trangie, N. S. W., Australia
PK6TO	Col. Stoop, Box 76, Macassar Celebes, N. E. I.
TF3AE	Box 1080, Reykjavik, Iceland
VE8NR	Maurice Benoit, Aklavik, N.W.T.
VK9BI	Post Office Port Moresby, Papua, New Guinea
VK9BM	% PM Port Moresby, Papua, British New Guinea
VP6JC	Box 260, Barbados, British West Indies
VP6ZI	Box 260, Barbados, British West Indies
VR2AO	Nandi Airport, Nandi, Fiji Islands
VR5IP	Box 25, Nukualofa, Tonga
W6WCN/KG6	Naval Air Station, Kobler, Navy 957, % FPO San Francisco
KJ6AA (ex-W9OTK)	145 A.A.C.S. Sqd., Detachment 16, Navy 311, % FPO San Francisco
XAMC	T/4 Leo J. Griffin, RA 39825405, 18th Sig. Co., APO 88, % P.M. New York City.
XZ2KM	379 Dalhousie St., Rangoon, Burma
YN1MH	Colonia San Jose, Managua, Nicaragua
ZD4AL	West African Signals, G.C., Accra, Gold Coast, West Africa

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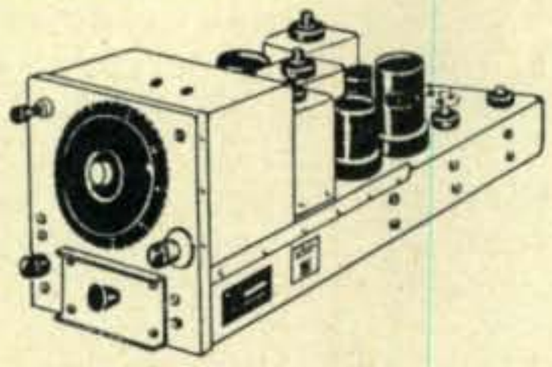
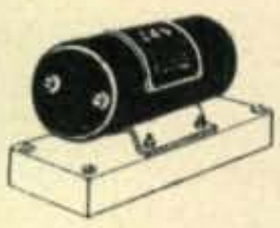
RECEIVERS BC 455B Brand new with 6 tubes range 6-9.1 Mc. 3 gang cond., one RF, two IF stages, uses 3-12SR7, 1-12A6, 1-12K8, in original carton with tubes, at lowest price ever offered..... **$4.95**



COLLINS AUTOTUNE

100 watt transmitter complete with tubes. Conversion article in CQ. Ideal amateur rig 2-18 Mc. As removed from military aircraft less dynamotor..... **$69.50**

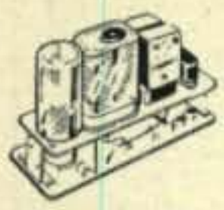
DYNAMOTORS



DM36 Western Electric 24V in. 220V at .080A output. Brand new **$1.50**

DYNAMOTOR DM34 12V input, 220V at .080A output..... **$1.95**

Dual Crystal TUNING UNIT



BC-746. Contains transmitter crystal, slug tuned tank coil. Receiver ant. coil, tuning condenser, crystal with sockets, etc. Ideal foundation for small amateur rig, complete, in case **$1.00**

HS-30 MINIATURE TYPE HEADPHONES

the best of military headphones, with headband, cord and 2 sets ear plugs, new..... **$1.00**

HICKOK VTVM

Model 202, Reads AC-DC-Mills at 2.5-10-50-250-1000 volts 0-1000 megohms. Used but excellent condition... **$19.50**

POWER SUPPLY

from BC1073A radar unit. Supplies 330V at 85 MA, 6.3VAC at 7.5A. Includes 14 tube pulse generator less tubes. Brand new **$5.95**

NAVY ARB RECEIVER

6 tube 4 band covers 195 KC. to 9 Mc. including b'cast, complete with tubes and 24V dynamotor vernier calibrated dial as removed from Navy aircraft... **$17.50**

35 Ft. Sectional ANTENNA

7 pieces 1½" rustproofed steel tubing 5' long which fit together to form mast, easily erected, with canvas base **$19.50**

DYNAMOTOR 6 volt input output 500 volts at 160 mills, brand new, special..... **$6.95**

12 FT. TUBULAR TELESCOPIC ANTENNA, brass, ideal for mobile or portable rig..... **$2.95**

8 FT. TUBULAR TELESCOPIC ANTENNA. As above..... **$2.95**

TUBES NEW BULK 6SN7, 6H6, 6SA7, 6V6, 955, 6AK6, 6J6, 6AQ6, 3A4, 12C8, 6A6, 6AC7, 6J5, 6F6, 1G6GT, 1LH4, 6SJ7, 6SL7, 7C7, 7L7, 7N7, each..... **$ .49**

POWER TRANSFORMER from super-pro supplies 465V at 160 M.A., 300V at 11 M.A., 6.3V at 7.5A, 5V at 3A., 5V at 2A, cased brand new..... **$4.95**

T-30 THROAT MICROPHONES Brand new with cord..... **$1.00**

4GANG VARIABLE CONDENSER 12-147 MMFD made by G. I. Corp..... **$1.00**

455 KC. IF. TRANSFORMERS alum. can slug tuned special..... **39c or 3 for $1.00**

BEAT FREQ. OSC. COIL 455 KC. Shielded..... **$ .50**

50 MMFD CERAMIC VARIABLE CONDENSER screw driver adj. special..... **5 for $1.00**

MICROSWITCHES blade or plunger type.. **3 for $1.00**

AMPHENOL CONNECTOR KIT matching multiple type..... **10 for $1.00**

POTENTIOMETER Kit—long shafts 5000 ohms to 1 meg all different..... **10 tor $1.95**

RESISTOR KIT ½-1-2 watt 50 ohms to two megohms, excellent..... **100 for $1.95**

RG-8/U COAXIAL CABLE per foot..... **$ .05**

CASED FILTER CHOKE 10 henries at 200 M.A.. **$1.95**

MICA CONDENSERS—Regular and silver kit of 25 for..... **$1.00**

BC605 INTERPHONE AMPLIFIER uses two 1619 tubes (2.5V 61.6's), used, makes ideal call system—interphone, etc..... **$2.95**

OIL FILLED CONDENSERS

CAP	W.V.D.C.	Price	CAP	W.V.D.C.	Price
4	500	$ .49	4	1000	$1.75
5	600	.49	8	1000	1.95
8	600	1.95	8-8	1000	2.95
2.5-2.5-5	600	1.95	8	2000	3.95
5-5-5	600	2.59	4	2000	2.95
8-8-8-8	600	4.95	2	2500	2.95
2-6	800	1.95	.05	7500	2.95

MICA TRANS. CONDENSERS

CAP	W.V.D.C.	Price	CAP	W.V.D.C.	Price
.002	6000	$3.49	.005	1200	$.49
.0002	5000	2.49	.02	1200	.69
.0001±2%	3000	.95	.01	1200	.49
.01	2500	1.49	.05	600	.99
.0002	2500	.89	.02	600	.59

Free With all orders over $10.00 include name of your jobber and we will send FREE kit of 25 mica condensers.

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THE HEATH COMPANY
BENTON HARBOR, MICHIGAN

running a kilowatt into a couple of 4-250As. W1BIH added a couple in *ZB1AF* and *UO5AD*, which gives him 35Z and 105C.

W2RDK, ex-W8JSU, is doing all right. In fact, more than all right with 38Z and 111C. His latest include *KM6AB*, *EK1AA*, and *UR2KAA*. W2PEO adds 12 countries, now making 38Z and 130C. Some of the best are *ZC6AL*, *J9AAX*, *W2WMV/C9*, *UI8AA*, *YI2AM*, and *YU7LX*.

W2JA is off the air for a while. He says it is to put up a couple of 70' sticks and change the transmitter to handle a kilowatt. At this point, he has 33Z and 74C, and now that he has the itch to QRO. I can see these totals really growing. W2GWE punched the key pretty hard bagging *VR2AO* around 1425 GMT, *FQ8AT* and *F8EX/FC*. Pete says F8EX has left Corsica, and is back in France. I just knew this was too good to last. Anyway, W2GWE has 39Z and 169C. W2TJF adds five zones and about fifteen countries, bringing him up the ladder to 35Z and 89C. Some of the good ones are *UD6BM*, *CR6AI*, *HE2UD*, *VK9BI*, *CT1DD*, and *ZD2KC*. Almost forgot *SU1US*. Incidentally, from what some of the boys say, SU1US could make a lot of them very happy if he would pick one or two days a week for the purpose of giving the DXers a country. It seems as though there are about as many gunning for an SU as some of the really rare countries.

I can't help but mention W2BXA again to tell you that his all time total is 175C. Boy, doesn't that sound swell . . . 40 Zones and 175 countries all time, and 40 Zones and 166 countries postwar? Almost forgot W2IOP, who has been working them by leaps and bounds. In fact, his little daily notes clutter up my desk. After figuring out all of them, it boils down to 38Z and 127C. Some of his latest include *GD2FRV*, *UD6AA*, *KB6AA*, *VR6AA*, and *EA7A*. W2IOP is doing a good job, but just take a quick peek and see where ole QD is in the Honor Roll this month. Thanks to *UA9CC*, *LI2CL*, and last, but by no means least, *C8YR*. Of course, Larry has 127C to my 91C, but all he has to do is put out a magazine once a month and work DX!! Now if I can get some of you big hearted souls to hook me up with a few countries like XE and CM, and other tough ones, it will be appreciated. Oh, yes, then there's always that one last zone; in this case, Zone 2. Well, I guess you just can't have everything.

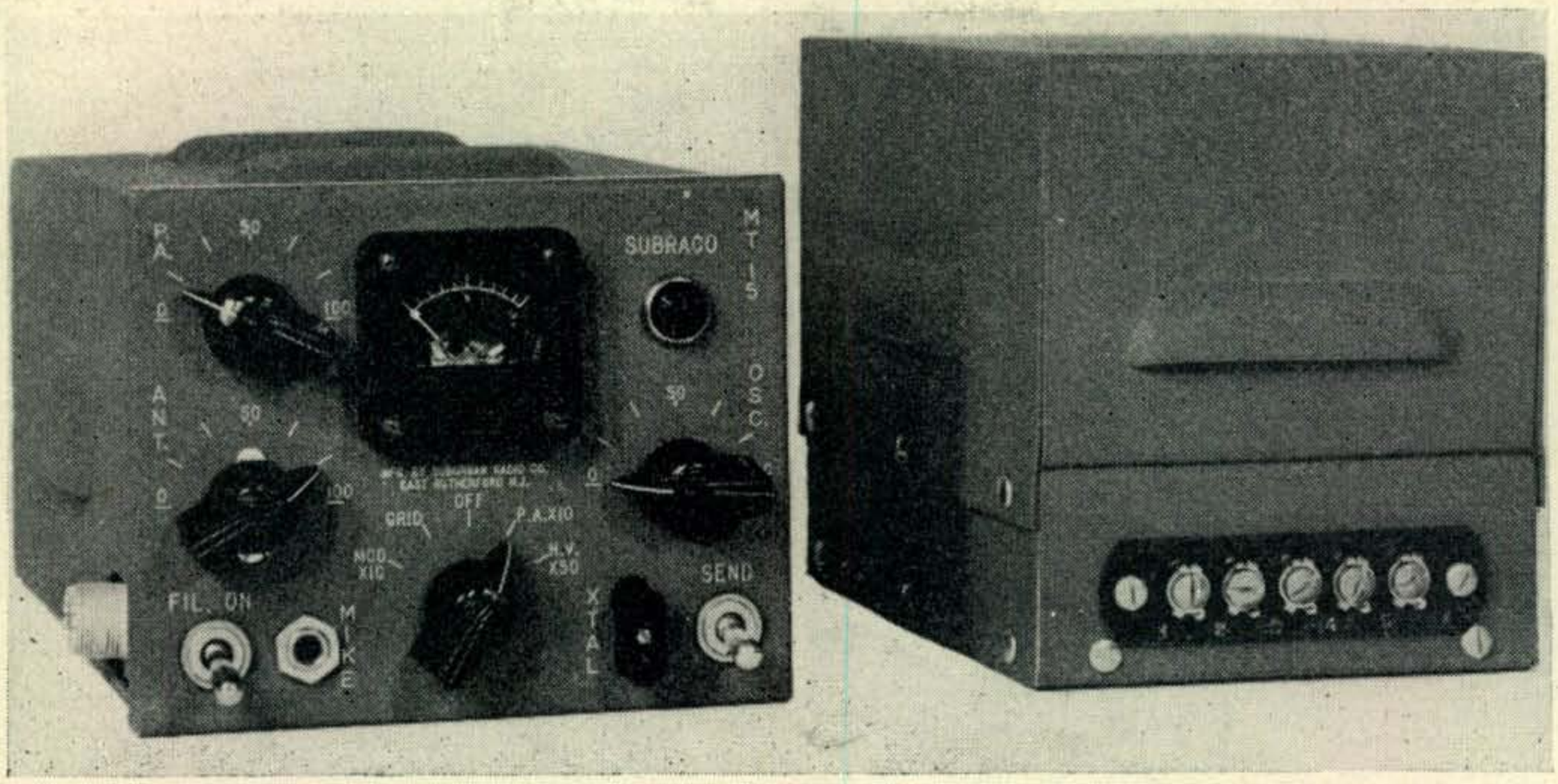
W3EPV is still banging away geting *TF3EA*, *UA6KOB*, *UD6BM*, *UQ2AB*, *UH8AF*, and *ET1IR*. This gives him 37Z and 132C, and 39Z and 165C. While in the 3rd district, we want to mention a couple of new ones to the Honor Roll: W3JKO with 34Z and 91C, and W3KCI with 23Z and 46C. Another one is W3JTC with 33Z and 90C. W3JNN picked up a zone in working *UAØKQA*, as well as half a dozen countries which are *UD6AE*, *OY3IGO*, *VR5PL*, *CR6AI*, *J9KC*, and *ZC6WF*.

W3IYE is just about set to put up a 3-element rotary beam. He has been using a Vee beam pointed at 45°. W3KDP, who is ex-W8EUY, is doing O.K. considering the fact he is starting all over in a new district. Right now, he is up to 33Z and 75C. Ren also is getting ready to put up a 3-element rotary for 20. He has a 4-element job which he uses on 10.

The Old Soap Box

This will probably be as good as any place to drag out my soap box and make a speech. In the last few months, I've made a couple of Eastern trips, as well as getting around California a great deal, during which time I have had a chance to chew the rag

Your Patience Rewarded with



SUBURBAN'S *Sensational* "SUBRACO MT-15"

Styled for under dashboard mounting, facilitating rapid frequency change, and eliminating cumbersome cable arrangements.

The "SUBRACO MT-15" is capable of delivering twenty watts of 100% modulated carrier, with a tuning range from 27 to 31 megacycles. (It is possible to double, in the power amplifier stage, at reduced inputs; coils, however, are not yet available).

The "SUBRACO MT-15" incorporates the use of a 6V6, low crystal current and drift, "tritet" oscillator, quadrupling from 7 to 28 megacycles, which drives a 2E26 as a power amplifier operating conservatively at an input of approximately 30 watts.

The modulator consists of a 6V6 speech amplifier, using a single button carbon mike input, that drives a zero bias, twin triode, class "B" amplifier, capable of delivering 15 watts of undistorted audio.

The "SUBRACO MT-15" features the revolutionary idea of being able to change frequency at will, since all controls, including tuning and crystal jack, are located directly before the "operator-driver."

A meter switch enables you to read; modulator plate current, grid current of the power amplifier, plate current of the power amplifier, and high voltage.

Tuning controls consist of: oscillator plate tuning, power amplifier plate tuning, and antenna loading.

The antenna coupling is accomplished by a series tuned loop, the output of which is fed through a female coaxial connector at the lower left front of the cabinet.

The mike jack is of the three circuit type allowing "push-to-talk" operation of the transmitter when the use of the "SEND" switch is not desired.

A pilot light indicates transmitter "on."

The transmitter is encased in a slide-on grey wrinkle cabinet, measuring: 5½ inches wide, 4½ inches high, 8 inches deep, with terminal strip connections provided at the rear of the chassis.

The power supply consists of a dynamotor delivering 350 volts at 150 mills, continuous duty, at a rated input of 5.6 volts D. C. It is mounted on a separate chassis with its own cover, along with the dynamotor starting relay and filter. All connections are brought out through a terminal strip, with the exception of the battery terminals, which are located at the opposite end of the chassis.

The dynamotor case also comes in grey wrinkle, the complete supply measuring only: 5 inches wide, 5¼ inches high, and 7 inches long, designed for fire-wall mounting.

The only cable connections required for the complete installation, are two leads to supply the battery voltage to the dynamotor case, and a five wire inter-connecting cable from the dynamotor unit to the transmitter.

This procedure of divorcing the power supply from the transmitter eliminates electrical, mechanical disturbances, and allows shorter connecting leads from the dynamotor to the battery.

The "SUBRACO MT-15" may also be used in conjunction with an A.C. power supply delivering 6.3 volts for the filament, and 300 to 400 volts filtered D.C. No A.C. hum will be introduced into the mike input circuit since mike voltage is obtained from the cathode of the 6V6 speech amplifier.

We believe, the "SUBRACO MT-15" is the "Ham's" answer to ease and convenience of mobile operation.

The "SUBRACO MT-15" is foolproof! Truly no finer transmitter has been designed.

The "SUBRACO MT-15" comes complete with power supply, all tubes, and male antenna connector, but less crystal, microphone, and cables.

All transmitters are unconditionally guaranteed, excepting tubes, for a period of ninety days after purchase.

All transmitters are F.O.B. East Rutherford, N. J. and require a deposit of 20% in U. S. A. 30% elsewhere.

Immediate delivery of a limited quantity. Price: $129.50

SUBURBAN RADIO COMPANY

82 HERMAN ST. EAST RUTHERFORD, N. J.

Cable: "SUBRACO"

with quite a lot of DX men. It seems to me that practically everyone you bump into has a few pet peeves aimed at certain W stations around the country. The odd part of it is, each locality which I visited seemed to have its gripes leveled at a different set of the DX boys around the country. These gripes generally consist of a fellow working the DX station too long, not moving off the frequency when finished, calling the station while he is QSOing someone else, or calling a DX station about twice as long as anyone else in the pile-up, thus messing up the deal for everyone. I am sort of wondering if all these gripes are actually justified. While it might be true that there are intentional abuses of air etiquette (if you can call it that) on the other hand, don't you think it is possible for a fellow to do one of these things unintentionally? I have had my share of, shall we say, disappointments, when it was impossible to tell to whom the DX station was coming back, due to one or two fellows still calling him. Then too, I have done my share of waiting for some W to get through chewing the rag with a DX station. Sure, I was anxious to work these guys, but I am wondering if some times in our enthusiasm and anxiety we don't explode before reasoning from the other fellow's point of view. A lot of you are going to explode at me by this time I am sure, but let's not be too hasty in accusing some W station of doing this, that, and the other thing. Who knows, maybe someone is saying the same thing on occasions about you. Briefly, let's have a little less griping, and a little more DX. I think the DX gang as a whole are good guys . . . let's keep them that way. Now I'll get down off the soap box.

Getting into the fourth district, we find W4ML going up to 37Z and 93C. Some of the better ones include *ZC6WF*, *ZD4AB*, *CT2AB*, and *W2WMV/C9*. W4DIA says that *CR4AA* is O.K. as G5SR has a card from him. W4DIA adds a zone by getting *YI2AM*, making him 34Z and 86C. W4BRB worked *UAØKAA* in Zone 18 for number 38. His countries now total 133, thanks to *FQ3AT* and *G3AGC* on the Isle of Man. W4HA worked *MP5PD*, *J9CRP*, *CT1UU*, *J9AGR*, and *YS1MK*, making 31Z and 75C. Down Miami way, we have W4FPK up to 37Z and 110C. Some of his latest are *UQ2AB*, *UO5AD*, *UD6BM*, *SU1US*, *KM6AA* and *UG6WD*.

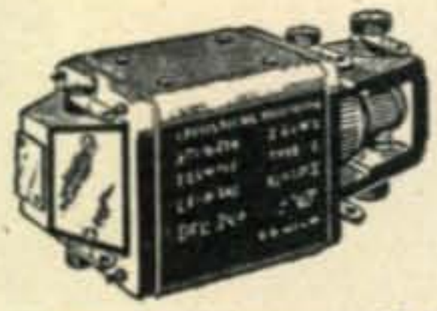
W5ASG has worked a lot of stuff bringing his postwar count up to 36Z and 141C with an all time total of 38Z and 155C. A few of the choice ones include *PX2B*, *TA3SO*, *UAØKQA*, *HA1KK*, *VR2AL*, and *YI2AT*.

W6TT breaks down and sends in an imposing list of 39Z and 122C. This guy, as well as W6TI, is one of the most rabid DX men in the San Francisco bay area. It really runs out his ears. W6TT runs about a kw, and he has a 3-element rotary on top of a nice tower, which in turn is on a hill in Oakland, making for a good location. While we are talking about W6s, we may as well cover them all at once. I see W6LER has 39Z and 105C, his latest being *UG6WD*, *KH6KL/KS6*, *OQ5BM*, *UJ8AC*, *KB6AA*, and *ZD4AL*. His all time total is 39Z and 120C. W6RDR is a new one in there with 39Z and 123C. W6UZX is doing a swell job and has added *UA1PA* in Zone 17 for number 38Z, while boosting his countries to 98.

W4BPD has been off the air for a couple of months moving down to his 150-acre farm. He has always wanted one of those super antenna layouts, and here's what Gus has at the moment: one rhombic with 5¼ waves per leg, another with 16¼ waves per leg, a 10-element Sterba curtin, one extended vertical Zepp for 10 meters, and another for 20. In

"TAB"

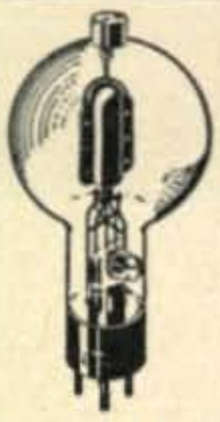
NEW GUARANTEED — *That's A Buy* — ELECTRONIC PARTS



DYNAMOTOR NEW TAB TESTED GTD 6V inpt/3 Amp. outpt 240V/100ma or 125ma int duty. Hi-EFF P'MAGNET AL-NICO 12/24V inpt. Rated 500V/50ma at 12 or 24V inpt..... **$3.49**

Dyn 12-24Vinpt, 275V/110ma &12V/3A..... **$1.95**
Dyn 12&28 Vinpt/250V/60ma outpt wgt2 lbs.. **1.85**
Dyn 12 or 24V in/225V/100ma & 440V/200ma **6.75**
Dyn 28V /300V/260ma & 150V/10ma/14.5V/5A **3.95**
Dyn inpt & outpt filtered & voltage regulator starting relay 28Vin/300V/260ma/150V/10ma/14.5V/5A; for SCR522/PE94A..... **8.95**
Gas generator set 1400Watts/115VAC & 27DCV/400W. Complete; special..... **100.00**
Handie Talkie BC611 chassis Coils & Xtal new **7.95**
IF Strip 30mc's/85DB gain, 8/6AK5 & 1/6AL5 2x11x2⅜"H, 12mc's band width outpt jack & Coaxial inpt plug Television Video IF..... **9.49**
Transf Modulation PP parallel 6L6's or 807's to PP RF 807's or 2000ohm lead..... **2.95**
Transf 115V/60cy-7.5V/12amp H.V. insl..... **2.95**
Choke swinging 15-29Hys/150ma..... **2.95**
Aircraft Autosyns AY1&5/24V-60cy or 28V/400cy used gtd like new.....**Two for** **3.95**
CW3 Wilcox Rcvr new Complete..... **14.50**

CW&F3 coils 5.1-10 or 9.4-16.5mc's. Each.... **$2.95**
Used S.C. & Navy equipment "TAB" Gtd 1-222 Xtal Calib Sig-Generator, Freq meter, monitor, op 110V/60cy complete covers IF ranges FM & Television, Dual osc. 8to15&45 to 77mc's; 2nd, 3rd&4th harmonics useable to 230mc's. Six tubes micro vernier dial reads 1/10div. Rugged design. SPECIAL.... **39.95**
SCR 522 comprises BC624 & 625 Receiver, Transmitter 100-156mc's coverage, Xtal control, modulated 15W outpt, 17 tubes..... **18.00**
Navy RBC Rcvr 4to27mc's, 16 tubes. Best Rcvr made SPECIAL..... **75.00**
BC1073A-VHF Wavemeter-Sig-Generator op 110VAC Range 150-210mc's, 19 tubes can be converted to receiver SPECIAL.....**24.95**
Voltage Regulator new Raytheon adj V inpt 95-130V/60cyinpt/115V/.58Amps outpt regulation 0.5% new Tropicalized rugged design..... **10.95**
Voltage Regulator Hviduty input tapped 198 to 242Volts/50or 60cys, Outpt 220V/i500watts/0.5% regulation—Raytheon Trop-calized Relay Rack mtging wgt 70lbs. size 18-3/4L 8W 9½"H "TAB" SPECIAL PRICE **$39.95**
WE Dynamic mike 20ft cable..... **$7.95**
Vacuum Condsrs GE 50mmf/7500V **$3.95** @.....**2 for** **5.90**
Vac Condsr GE 100mmf/7500V **$4.95** @ **2 for** **7.95**
Vac Condsr JEN 50 mmf/20000V **$6.95**@ **2 for** **12.95**
Stroboflash Cond 4sec/32mfd/660VAC/2000WV **8.95**
ARC 5/BC455A **$4.50**, with dynamotor..... **6.35**
Crystal Std 200KC/0.1% accy Vacuum..... **5.95**
Crystal Std 7010KC/0.1% accy.....**Two for** **1.00**



RCA 808; 446/2C40.....**Two for** **$5.00**
304TL/$3.95 @; 450TL/$29; 807 **.95**
813/$6.95; 815/$2.19; 810..... **3.75**
829B/3E29/$2.90, 3EBP1 & Sock. **3.99**
5BP1, 5CP1, 5BP4. Each..... **.90**
954/50c, 5 for $2; 2C26/75c; 1625 **.65**
2V3G/75c; 872A & Sockets **Two for** **5.40**
6V6/90c, 6SN7-12SA7 @ 81c; 6J5 **.55**
2050, 2X2, RK60, 6SL7, 1E7G... **.89**
6SA7/61c; 6B8G/95c; 6C6..... **.55**
6AR6/$1.49; 6AC7/80c; 6J4..... **1.45**
6C8G, 6F8G, 6F7, CK1005, 12A6@ **1.00**
Tubes gtd except breakage & burnouts. Send order for all Tubes & new lists.
Amertran 2600V/750ma 115V/60cy inpt.... **24.95**
WRITE US FOR S. C. TECH MANUALS.

$2 Min. order FOB N.Y.C. Add Postage all orders and 25% deposit. WHitehall 3-3557. Send for catalog 300. Specialists in International Export. School, College & Industrial trade. Money back "TAB" Guarantee.

AUDIO AMPLIFIER—Line, Dynamic or carbon mike inpt to class B grids. Noise level less than minus 55DB, Dsgnd for use Collins ART13, Uses 2/6V6G and 12SJ7, includes sidetone amp and hdphone monitoring jack. Less tubes and power. COMPLETE with instructions.... **$4.95**
WITH TUBES 2/6V6 and 6SJ7..... **7.49**
Kit Spaghetti Sleeving assorted.....**75 ft. for$** **1.00**
Kit Hardware Good assortment..**one pound for** **.99**
Kit Grommets Rubber assorted.....**100 for** **.99**
Kit motor brushes assorted.....**100 for** **1.00**
Kit fuses assorted BUSS & L.F.....**300 for** **1.95**
Willard battery 2 volt **$1.89** @.....**Two for** **3.49**
Kit rotary switches assorted.....**SIX for** **1.75**
Kit power Rheostats 25&50 watt.....**SIX for** **4.95**
Kit wire would Vitreous Resistors.....**20 for** **1.00**
Kit Resistors BT½&1 Watt/50 to 2megs. **100 for** **2.50**
Kit Controls 50to2megohms Pots AB/J....**10 for** **2.50**
Kit Silver & Mica Condensers.....**50 for** **2.00**

Kit radio solder lugs assorted types.....**100 for** **$1.00**
Kit Radio Elastic stop nuts assted.....**75 for** **1.00**
Kit sockets octal, loctal & others asstd....**50 for** **2.95**
Kit G&P tube grips ¼/5-16/3-8" asstd...**50 for** **1.00**
AUTOSYNS Type 5/115V/60cy, NEW....**2 for** **18.00**
AUTOSYN Type 5 Differential 115VAC..... **6.95**
AUTOSYN Type II/115V/60cy NEW....**2 for** **18.00**
AUTOSYN Type 5/50V for 115V/60cy...**2 for** **8.95**
Autosyn Type 5 Snychro Differential 50V..... **3.95**
Westghse "DB" mtr. 3½" Sq. B'C-10 plus 6DB **4.95**
Westinghouse 3½" Sq. Bkl case 0-1 ma RX35mtr..... **4.50**
DeJur 2½" B'case 0-1ma Standard scale..... **2.95**
GE RF Mtr Thermo 2½" B'Case either 1 or 5 Amp..... **3.95**
WESTON 476 AC 0-15Voltmtr 3½" Sq. B'case. **4.95**
GE DW41 mtr 2000V/1000ohmperV 2½" B'C.. **5.95**
GE AO22 mtr 0-150VAC 3½" Rd B'C..... **4.95**
McClintock 3½" B'C 0-1ma Meter..... **3.95**
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Wstghse 2½" B'C 0-30 Volts Aircraft..... **2.75**
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Crystal diode 1N34 @ **$1.39**,..2 for **$2.40;** 4 for **4.50**
Trumpet & Nine drivers WE. 125 to 250 watts Audio. Beachmaster complete..... **125.00**
Choke Kenyon 15Hy/400 ma/125 ohms/15KV insulation 20Hy/300ma cased 40 lbs..... **$7.95**
Trumpet & Driver 35 to 55 watt. W.E. head.. **29.95**
Crystal diode 1N26 @ $1, Two for **$1.50** 4 **for** **2.50**
Crystal diode 1N21 @ 45c, 3 for $1....**Ten for** **2.50**
SPEAKER PM 4" Alnico ....V **$1.39;** .....5" **$1.59**

Consists of two Jan new 866A Tubes, Transformer Gardner Elec Cased 2.5V 10-AMP. 115V/60cyinpt. H.V. insltd 9000V wkg similar to illustrated unit; "TAB" Tested 160000 VAC Test; Same mtg as Kenyon T389—Sockets Ceramic, Johnson 224..... **$5.95**
TRANSFORMER for 2/866A..... **$3.95**
872A Combination Transf. Tubes & sockets.... **12.00**
Transformer for 2/872A ins 12500V wkg..... **6.95**

"TAB," Dept. Q9A, Six Church Street, New York 6, N.Y., U.S.A.
CORNER OF CHURCH & LIBERTY STS., ROOM 200

addition to these, he has a couple half-wave doublets, which I suppose are utility antennas. He says he still has a little more land left and expects to fill in the weak spots in the globe with more antennas. Whew!!

W6KW passes along a bit of news about *KM6AA* on Midway. He is ex-W6OAN and is getting quite a bang out of working DX from what he calls the "rock." Johnny is quite amazed at the results since he is using only a 66′ end-fed Zepp. He is on 7 and 14 mc quite consistantly, and is running 475 watts into an 810 final. The receiver is an HQ-129X. KM6AA says it is an ideal place to spend his leisure time as they have a swell beach, and th weather is "not too cold, and not too hot, but just right." W5KC is up to 39Z and 117C, although, as yet, we haven't seen his list. W6MLY wants to know if *LU1ZA* is really in the South Orkney Islands. W6ZZ, like many of us, has worked three stations in Zone 19, but, as yet, has no confirmation. Chances are, they will all start dropping in at about the same time, and you will have Zone 19 cards to burn.

Although 80 meters isn't considered much of a DX band, W6EA has worked a number of KL7s, a couple of KH6s, VE1, VE7, and XE. He runs 200 watts into a pair of 809s. W5LVD tells us some of the best DX men in his neck of the woods include W5BE, W5FNA, W5GKI, and W5LGG. W4MZ is not doing too badly at his new QTH working *KG6AN*, *KS4AE*, and *VK9BI*.

Bumped into Doc Stuart, W6GRL, in one of the local radio stores, today. Although Doc's only been home from China a few days, he was buying some stuff to get his Ventura station on the air. Doc and Mrs. Stuart apparently had a very interesting time and took about 4,000′ of colored movies. These should be highly enjoyable entertainment for some Hamfest.

Attention DX Stations!

You fellows are in the only position to eliminate some of this piling up on your own frequency after sending out a CQ. I don't have to tell you that the boys in the States really have DX fever, and, in self-defense, it is almost necessary to do what the other guy is doing, if you want to work any DX at all. This usually means, when one of the W stations zero beats your frequency, the pack piles on, not only making it difficult for you sometimes to pull someone out, but also makes it extremely bad for the W you decide to work. If, in calling you, we Ws would call the same length of time, it would help, but there is always someone calling longer than the next guy, thus, making almost impossible conditions for a good QSO. You can easily see that it is up to the overseas DX stations to control the situation.

There have been many ideas suggested, and we of *CQ* do not propose to say which procedure is the best. Here are a few suggestions, and each will accomplish about the same thing.

A lot of the boys like to use the QLM-QML system, which, of course, means you are going to tune from the low end of the band toward the middle, or from the middle to the low end. This, of course, will get the boys off of your frequency, and the main draw-back seems to be that the pileup will occur on the band edges.

Another suggestion would be for you to never work anyone within 15 or 20 kc of your frequency. If the boys found out you were not answering anyone 15 or 20 kc plus or minus of your frequency, they would soon spread out. One way of getting this in-

formation to them, when you CQ, simply insert "15 kc," every now and then. This would give us an idea that you *wouldn't* answer anyone within 15 kc of your spot.

Still another suggestion, this one proposed by W6ENV, and we think has considerable merit, and that is, when you CQ DX, simply to insert the frequency on which you are going to listen. For example, if you transmit on 14,105, and you find a relatively clear spot at 14,130, you could either insert "14,130" or, reducing it, to "130." By putting this in a few times with your CQs, the boys would soon get the idea. Naturally, we Ws all wouldn't land exactly on 14,130, but the approximate frequency would be good enough to serve the purpose.

As I see it, any of the above suggestions would tend to create more complete QSOs, thus allowing both you fellows and we in the States to work more DX. Why not spread the word around among the other DX men overseas whom you might know.

W6WO found enough time to work *UAØKQA VQ2JC*, and *VO6U* for new zones.

KS4AE says he thinks ham radio is here to stay, and the only regret he has is that he can't work more Ws. He says that due to QRM, QSB, QRN, and just plain weak signals, they don't all get through. At the time of writing his letter, Bill had only been on the air three weeks and had worked 35 countries. Another little item of interest is that in the three weeks time, KS4AE has had 500 QSOs, while KS4AC has had over 1000. That's a lot of brass pounding.

W6ADP, who is one of the more consistant DXers on the air, worked *LI2JC* giving him, 39Z and 134C with an all time total of 163C. W6SN, who is banging away everyday adds 3 new ones in *KH6KL/KS6*, *TA1B*, and *UA3BD/UC2*. This puts Bill at 39Z and 129C with 151C for all time. W6ITA is right up there with 39Z and 152C, his newest being *FQ3AT*, *UJ8AC*, and *UI8AB*. W6ENV manages to wade through a battery of electric razors in the mornings to get *PX2B*, *FQ3AT*, *ZC6FP*, *UA3BD/-UC2*, *PK5LK*, and *GD2FRV* . . . his all time is 163C.

W6VFR picks up 5 giving him 40Z and 161C. This, of course, allows Marv to lead the pack of W6s. New ones are *ZC6FP*, *ZS4P*, *FT4AN*, *VU7BR* and *UJ8AC*. Along comes W6MJB with nine new ones for a total of 142C . . . Zones, 39. W6SA hasn't forgotten how and now has four new ones to make 39Z and 134C. New ones that helped are *VU7BR*, *ZC6DD*, *ZD4AL*, and *PK5LK*.

As far as I know, all of the above 39ers have worked *C8YR*, during the last two days, which probably will make 40 Zones for them. As we have mentioned before, and for the benefit of the new readers of this stuff, I would like to say that we do not show any 40 zone totals in the Honor Roll until 40 confirmations have been received and approved.

More W6 activities include W6LN who worked *W6WSC/KW6*, *KV4AD*, and *UA1KEB*, making him 30Z and 51C W6AM is up to 35Z and 95C, has latest being *UAØKFC*, *HR1CE*, *VR1AP*, *VR6AA*, *KS4AC*, *CP1AX*, *CT2AB*, and *W7ELL* in the Bonin Islands

W7FZA mentioned before, is one of those lucky guys who grabbed *AC4YN* on July 10. Incidentally, the time might be of interest to a few. So far, it seems that AC4YN sneaks through between 1430 and 1600 GMT. Anyway, W7FZA now has 39Z and 117C; two other new countries being *UG6AB* and *FT4AN*. Last month, Dick said he and W7AMX were about ready to put up a 3-element rotary, but after the session with AC4YN, etc., he

thinks he might hang on to the long wire. W7GXA is a new W7 to the Honor Roll with 37Z and 99C.

W8FJN hasn't been exactly loafing, and adds a zone, as well as six countries. This gives him 38Z and 122C, with an all time total of 134C. W8NBK has been doing his share of pitching, and now has 37Z and 117C. W8RDZ has really been at work, and since last month has added 9 new ones. This keeps him leading the W8s. Two new ones for him of particular interest are *W9OTK/KJ6*, and *FK8NQ*. Jerry's totals are 39Z and 162C. W8QUS is getting started and now has 23Z and 45C.

Ah, those W9s and WØs . . . here they are. New ones to the Honor Roll are W9MZP, W9YB which is the Purdue Radio Club station, and WØOUH. W9MZP goes in with 34Z and 72C, while WØOUH has 32Z and 71C. W9YNB picks up a few such as *UG6AB, HZ1AB, ZD2K, YI2ZM, CR6AI*, making 37Z and 93C with his all time reaching 38Z and 118C. W9WEN adds a new zone in *OX3DG*, making 30Z and 62C. W9FNR has added three new zones and nine new countries making a total of 32Z and 74C. WØGKS, really gets in there, and is now up to 39Z and 116C, with an all time total of 142C. His newest are *W6RWQ/VR6, GC4LI, W2WMV/C9, ZB2B, UG6AB, FQ8AT*, and *KB6AA*.

KP4KD has been going to town and now is up to 35Z and 100C . . . all time is 123C. Ev is running 450 watts, and has a 3-element beam. VK2ACX is up to 37Z and 94C, and some of his better ones are *UB5AC,,TG9JK, W2WMV/C9, KV4AA, CR7VAL*, and *VR5PL*. The new zones are *VE8MF* and *UAØKQA*.

PY1DH is not wasting any time, making his totals now read 36Z and 114C. Stations like *UO5AC, ZB1AD, VU2KM, W3EKK/VK9, VP9K, OY3IGO, LI2BO, PK6HA, W7KLQ/J9*, and *VS7MB* really did the trick for him.

KL7JF is located at Waterfall, Alaska . . . the shack being perched on a rock with salt water 80′ below. He is using a 3-element rotary which is only 7′ above the peak of the roof, but works very well, probably due to the actual electrical height above ground being something on the order of 80′. The shack is located at a large salmon cannery where he works when not DXing. The rig consists of a pair of 4-250As in one of W2IOP's Lazy Kilowatt lash-ups. Andy gets a little irked when he puts out a directional CQ; for example, CQ Norway, and then having practically every other European country calling him, giving him very little chance to hear a LA station if it was there. Andy also says he is getting a bit tired of these ten or fifteen second QSOs where you exchange a report, give you 73, and sign off. I have heard others who will echo his feelings.

On the Phone Front

W4CYU is doing a good job on phone, and is up to 36Z and 124C. His newest and best are *KG6AV/VK9, VR4AA, VK9NK, MB9AJ, KP6AA, YSINK, VR2AP, VR6AA*, and *GD6IA*.

W6DI goes up a zone and another country in working *UA3AG/UAØ* for Zone 19. This gives W6DI 37Z and 114C with an all time of 38Z and 132C. It was swell of UA3AG to get on phone, because, as far as the West Coast is concerned, phone QSOs with the U.S.S.R. have been practically nil. I can't go on without mentioning W6DI dragging out his key and getting on c.w. again after quite a number of years. Of all things to work first, it was *UA9CC* in Zone 17. It's good to see a phone man like Guy still knowing the code.

[*QSY to page 79*]

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342 Madison Av., New York 17, N. Y.

W1FJN, as of June 30, had been on 20-meter phone just one year. On June 30, he worked country number 100. That, to me, is a lot of DX in a year's time. He now has 104C with the zones at 35. W1JCX knocked off *ST2AM*, *ZC1AL*, and *W9OTK/KJ6* giving him 120C . . . Zones, 36. A new one to the phone list is W9GZK with 27Z and 56C. All his work is done on 10-meter phone, and he is using a pair of 811s with 150-watts input.

J9ABX is also a new one to the Honor Roll, and goes in with 27Z and 58C. You may remember J9ABX as being secretary of the J9ers Radio Club. The new secretary is J9AGT, from whom we will hear about club activities in the future.

W9FNR is also a new one with 29Z and 65C. W4HA works a few new ones bringing him up to 30Z and 64C. W2BXA adds a couple to his total giving him 36Z and 105C. We are glad to see KH6IL in here, too, with 22Z and 38C. We can use a little more activity from over KH6 way.

W6IKQ adds a couple in *W9OTK/KJ6* and *C9YC* in Mukden. W9KYM knocked off a couple of new ones, *OI2KAK*, and *SV1AH*. They both promised to QSL. W6HJP is now operating portable in Minneapolis and has deserted the c-w ranks for some phone DX. Some of his best from his new QTH are *W8OK/KG6*, *J3GNX*, *VK2TE*, *KP6AA* *ZS6DW*, etc. W9UJ worked *MD5AFA*, on 10-meter phone, and the MD said he was a phoney, but shortly after that, W9UJ received his QSL card through the Bureau.

The DX Marathon

Last month, we mentioned something about starting a DX Marathon, and when you fellows send in your DX news, we would appreciate your

reaction . . . whether for or against it. Briefly, the DX Marathon will be a contest open to everyone, whether or not he is in the Honor Roll, and it will last one year. The 1939 Marathon made a hit with quite a number of the boys, because DX interest for the old timers had hit a low point, and the Marathon stimulated new interest. At least, it was a good reason to go out and work the same fellows all over again. Then, too, it gives the newcomers to the DX clan an opportunity to compare their skill, for a period of one year, with some of the old-timers.

The way things are going now with so many knocking off Zone 19 and Zone 23, I wouldn't be a bit surprised that by the first part of the year, a lot of you will like to get out there and see what you can do for a period of 12 months. In order to have this Marathon of world-wide interest, we are kicking around the thought of having a winner for each zone. I would appreciate some of you fellows sounding out the boys overseas on their reaction to a Marathon. More on this later.

That winds up the little clam bake for this month, and just about the time you are reading this column, I would like you to picture this little deal in your mind. Two people taking it easy on a little boat anchored in one of the coves at Catalina Island . . . swimming . . . eating . . . sleeping . . . yes, even a tall cool one, once in a while, will help make a lazy vacation. Oh, yes, the two people? . . . W6QD and his XYL. 73.

6-METER DX HIGHLIGHTS

[*from page 36*]

after contacting them on May 16th 150 miles east of the Bahama Islands, got on the approaching Europe and made QSOs with the European boys. On June 13th, off the S. Coast of Spain, W5BSY/MM worked or heard the following: G2MV, XC, G5BD, BY, CP, MP, G6DH, ON4T, ON5G, ON4KH, PAØPN and PAØUM. June 14, off Gibraltar, W5BSY/MM worked G5BY. June 16, G2XC was worked by W5BSY/MM, still in the Mediterranean.

Those are the highlights of the 6-meter summer DX season. With the coming of Fall, particularly this one of 1947, even more thrilling DX is expected, as the MUF is expected to permit contacts with South America during September and October. In November and December there is a good possibility of contacts with the European continent and Great Britain. To the west, the path from the West Coast of the U. S. to Hawaii, and other islands is expected to open for contacts. For further details on these and other happenings on the very highs, you are invited to read the V.H.F.-U.H.F. column starting on page 41.

PACKAGED POWER

[*from page 33*]

The 807 input is cut down to about 30 watts input for phone operation at optimum efficiency. An external switch may be provided to open the modulator B-plus lead for c.w., and a 50-watt resistor added in series with the main B-plus lead to the 807 to drop the 807 plate voltage for phone operation. This resistor must be bypassed with a 4-μf or 8-μf condenser to prevent loss of audio across the dropping resistor.

A link winding is provided on the final amplifier plate coil. This link may feed a suitable antenna

directly, may feed an antenna tuner, or it may feed a link winding coupled to the tuned grid circuit of a high-power final for which the ATOM-X serves as an all-band driver. If preferred the 807 plate may be capacity-coupled to the grid of an added high-power final. For a small package, McMurdo Silver has produced a commercial unit that offers a distinctive approach to transmitter design. Many of the ideas are worth considering for home constructed stations that must operate in a minimum of space.

THE SHORTENED BEAM

[*from page 31*]

reading is obtained. The split coil for the parasitic element is then plugged in or is connected in series with the twelve-foot elements. This element is then tuned to resonance while the radiator is being excited in the same fashion as described above. When the parasitic element is tuned to resonance it will be noted that the final plate current will change. The links can be reset and the tuning procedure repeated, if necessary.

After this approximate tuning has been made, the antenna should be tuned for the best front-to-back ratio as noted on the r-f galvanometer. If it is desired to test out the performance of the parasitic element as a director, it will be necessary to turn the variable condenser in series with this element to a little less capacity to effectively shorten this element. In tuning the parasitic element as a reflector the capacity is increased as readings on the field strength meter are noted in a forward direction.

Construction

There is little that can be said regarding the actual construction of the Compact Beam which can not be seen in the accompanying picture and in the structural detail drawing, *Fig. 3*. No mention of the rotating mechanism has been made since this is not within the scope of this article. Metal or wood may be used for the supporting members and the boom sections without any noticeable change in the operating characteristics of the beam.

This type of beam does not lend itself to suspension in a fixed position using wire elements. This is because the r-f voltages at the ends of the wires would be extremely high and insulation would then become the limiting factor. Quite likely a loosely strung wire type beam would not perform very well with the elements swaying to any great extent. It is possible to stack a 10-meter beam above a 20-meter using this idea if certain precautions are observed. They are necessary for minimum interaction between the beams. The 10-meter array should be at right angles to the 20-meter array. When the beams

are tuned the 10-meter beam should be tuned first and then the 20-meter array. If the reversed procedure is used in tuning up, it will be found that the 10-meter array will seriously affect the tuning of the 20-meter array.

The performance of the Wing-spread Beam has been excellent. With about 125 watts input, we easily made WAC shortly after putting the beam into operation. We have been able to work DX consistently and have managed to keep skeds with VP3LF, D4ABV and W2CDJ/J2, all of which we credit directly to this antenna.

CATHODE FOLLOWER V.F.O.

[*from page 18*]

Adjustment of The Oscillator

With *SW1* open, the high frequency bandset trimmer should be adjusted so that 1.84 mc may be found with the bandspread condenser set at maximum capacitance. At minimum, the oscillator frequency should be a little over 2 mc. *SW1* should then be closed and the low frequency trimmer adjusted so that 1.7 mc may be found with the condenser at maximum. At minimum capacitance, the oscillator frequency should be approximately 1.86 mc, resulting in a slight overlap when switching between the two positions of *SW1*.

The simple final adjustment is that of the feedback condenser *Cf*, for maximum frequency stability vs. plate voltage variation. Set the oscillator around 1.8 mc and zero-beat it with a receiver or a secondary frequency standard. Remove the VR 150 voltage regulator from the power supply and substitute a VR 105. Note the shift in oscillator frequency. Repeat this process with different settings of the feedback condenser until a maximum shift is dectected. This should be only a few cycles. The feedback adjustment should be made while plate voltage is applied to all the tubes in the unit.

No other adjustments are required except the tuning of the doubler stage and the adapter. Inasmuch as there is sufficient drive from the adapter, in most cases, these two stages may be stagger tuned so no further tuning is needed when operating over any of the amateur frequency ranges.

This c-f-o unit is extremely stable. As previously mentioned, the frequency drift at 3.5 mc is only 50 cycles after an hour's operation from a cold start. The chassis or panel may be knocked and bumped with no trace of frequency modulation even at 28 mc. If it is desired to place the unit in some sort of a cabinet, the cabinet should provide good ventilation on all sides and at the top.

The V-F-O Adapter

A rather unique companion feature of this v.f.o. is the adapter which enables the unit to be coupled to the transmitter, via a coaxial line of

almost unlimited length, simply by removing the transmitter crystal and plugging the adapter into the crystal socket. The output is equivalent to that obtained from the crystal and eliminates the necessity of any rewiring of the crystal unit, as is sometimes necessary.

Ordinarily, the v.f.o. is connected to the transmitter either by link coupling through a tuned circuit inserted in the grid of the crystal tube, or by feeding the low impedance line from the v.f.o. directly to the grid or cathode of the oscillator tube. When the former method is used, the crystal stage oscillates t.p.t.g. fashion if straight through frequency operation is attempted. With the latter method, the output is low, an extremely undersirable condition, expecially when trying to double, such as in the plate of a former tri-tet crystal oscillator. This solution to a very troublesome v-f-o problem can, of course, be applied to almost any v.f.o. with almost any transmitter.

The adapter is an r-f amplifier or doubler fed from the c-f-o (or v-f-o as the case may be) unit by a low impedance line connected directly to the adapter grid. A matching resistor equal to the line impedance is shunted across the line at the tube grid. The coupling line could also be fed to the 6AQ5 cathode, but matching the line while maintaining the proper tube bias is not readily accomplished. The output with either method is about the same.

When output from the adapter is used to replace a 3.5-mc crystal the adapter plate tank coil is removed. The amplifier then becomes an untuned stage. When tuned for operation on other bands the 6AQ5 circuit plate has to be peaked in the center of the band only, with the possible exception of 28 mc, where some retuning may be required.

Where the crystal oscillator tube is a 6L6 operating at about 300 volts, more than enough drive to push an 807 may be obtained on all bands except 28 mc where it is just "under the wire." In the case of a Tri-tet, the cathode coil must be shorted out just as it would normally be for straight-through operation. Where a Pierce oscillator was formerly used, some rewiring of the crystal socket is necessary to obtain a ground connection and to eliminate the crystal plate connection. In this case straight through frequency operation only is obtainable.

The adapter illustrated was made to plug in the crystal socket of a Millen exciter. For use where the crystal socket is mounted on a chassis, the output plug shown at the rear of the adapter may be mounted at the bottom of its chassis. The adapter chassis is $1\frac{3}{4}'' \times 2\frac{1}{2}'' \times 1\frac{1}{8}''$ and the components must be arranged so they all may be squeezed into the small space within the chassis. The tuning condenser is a Central type 83 Z with a shaft soldered to its tuning nut.

CLOSE-SPACING

[*from page 38*]

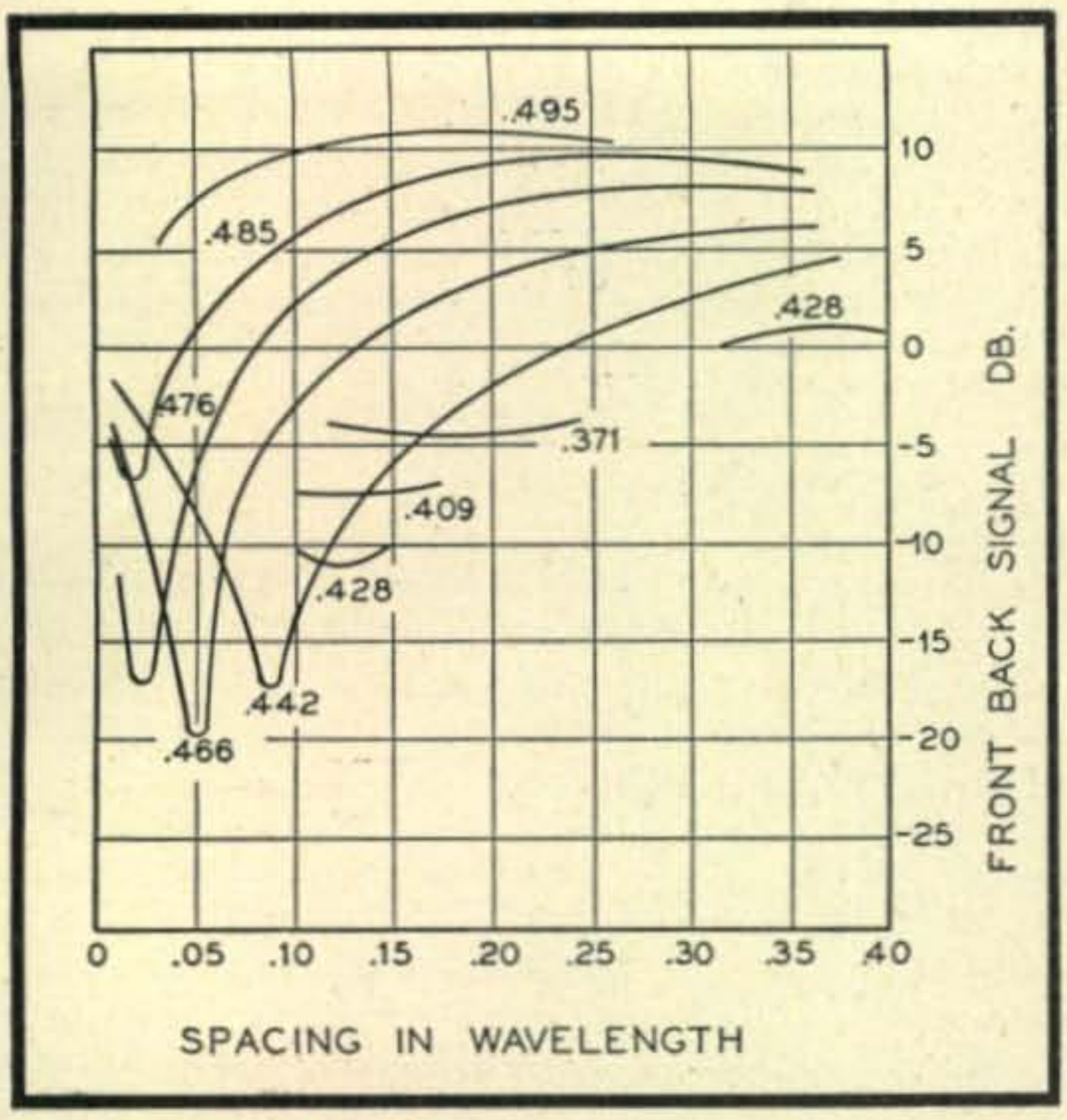

Fig. 2. From British antenna experiments with a single parasitic element the resulting dimensions have been determined. The numbers on the curves represent the various lengths of a wavelength for the parasitic element. A positive value indicates that the parasitic element is on the further side of the radiator, or is acting as a reflector. With a negative ratio the parasitic element is nearer the transmitter and is acting as a director.

various lengths of the reflector elements. The vertical scale is in db which can be expressed either positive or negative. When it is positive the parasitic element is a reflector and when negative may be considered a director.

10-METER PROPAGATION

[*from page 21*]

higher than normal critical frequency will be returned to the transmitting point. The fact that the surface of the F2-layer will almost certainly be undulating (i.e., there will be a tendency to cloud formation) will also assist in this form of reflection.

Rebound signals have been received from stations up to 500 miles distant with little or no obvious reduction in signal strength compared to that of the nearer stations—which is what would be expected for the above effect. The average F2-layer skip distance on 28 mc is of the order of 1000 to 1200 miles. So far the writer has not received any evidence of *rebound* scattering above 500 miles, though it would appear that this should occur even more so than on nearer stations since the angle of reflection is not so sharp or acute.

[*Continued on page 87*]

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QSLs? SWLs? Samples 10c. VHF-152? RME-45? Sackers, W8DED, Holland, Mich.

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CRYSTAL KIT: Includes 4 low drift, highly active crystals, 2 holders, abrasive instructions, treatise. State band preferences from 3500 to 8500 kilocycles. $1.00 complete. Breon Laboratories, Williamsport, Penna.

HIGHEST BIDDER takes all or individually: Mims 20M. beam, signal splicer, shifter coils, 2A turrets. W2JIL.

FOR SALE: Abbott TR-4, new condition, for 2 meters, with commercial built power supply AC and Pioneer Genemotor for portable operation, mike and ant.—all for $50.00. May be returned if not satisfied. Also Jackson Model 665-J-2 voltohmmeter—$10. Pioneer Genemotor 500v at 200 mils—$10. f.o.b. Tampa. W4LEP, Rt. #2, Tampa, Fla.

FOR SALE: HQ-129-X with speaker—$135. 16 Amp Amertran voltage control—$15. D.P.D.T. Advance KW antenna relay—$3. All in A-1 condition. 1606 Commercial, Waterloo, Iowa.

QSLs-SWLs. High quality, low prices. Samples for stamp. W3MQN, Moosic, Penna.

COMMUNICATIONS RECEIVER—Kaar Model KE-23A. 500 Kc to 42 Mc. Speaker, S meter and external crystal filter. First $75 takes. Hurry. WØZCI, Harold Timmerman, 2017 Freeman, Kansas City 2, Kansas.

WANTED: January and February 1945 issues of CQ. R. Yeager, 4423 Sheridan Road, Chicago, Ill.

KILOWATT POWER SUPPLY. Matched Thordarson. 2000/2500 V.D.C. 500 ma. Completely wired. New. $100. C. R. Thon, W3EOP, 533 Northampton St., Easton, Penna.

QSLs. 15 Sample reproductions in booklet, 12 cents. Stamps OK. Three "shack" signs and subpoenas with order in clear plastic box. Westerners see at Ham Stores. Others write direct. W6GFY, 1408 South Grand, Los Angeles, California.

WANTED

Back Issues of "CQ"

We will pay $1.00 per copy for the January and February 1945 issues of "CQ". Please address replies to:

Miss Alice Clasen, Librarian, Seeburg Technical Library
J. P. Seeburg Corp. 1500 Dayton St. Chicago, Illinois

As we more nearly approach the skip distance the path followed by the wave will become more and more close to the great circle path—assuming that the direct path is allowed by the F2-layer density. In this connection there is considerable evidence that after the direct route has passed into darkness and the MUF has fallen below the operating frequency, the signals may still reach the receiver via the *rebound* scatter or the long scatter coming from areas of high density but displaced laterally from the direct route by some hundreds of miles. Thus, for a path between Africa and England, the signals rebound from a more westerly direction. In the southern sections of the United States, *rebound* signals should be heard many hours after sunset due to the rebound effect from the high density F2-layer areas just north of the equator. In the latter case, the antenna would be south to southwest. There seems to be a possibility, incidentally, that when the trans-Atlantic route to Europe from America is subject to an ionosphere disturbance or the MUF is low, contact might be established by *rebound* by aiming beam antennas at the higher ionization areas in the 20 to 30-degree latitude belts.

BANDSWITCHING FINAL

[*from page 24*]

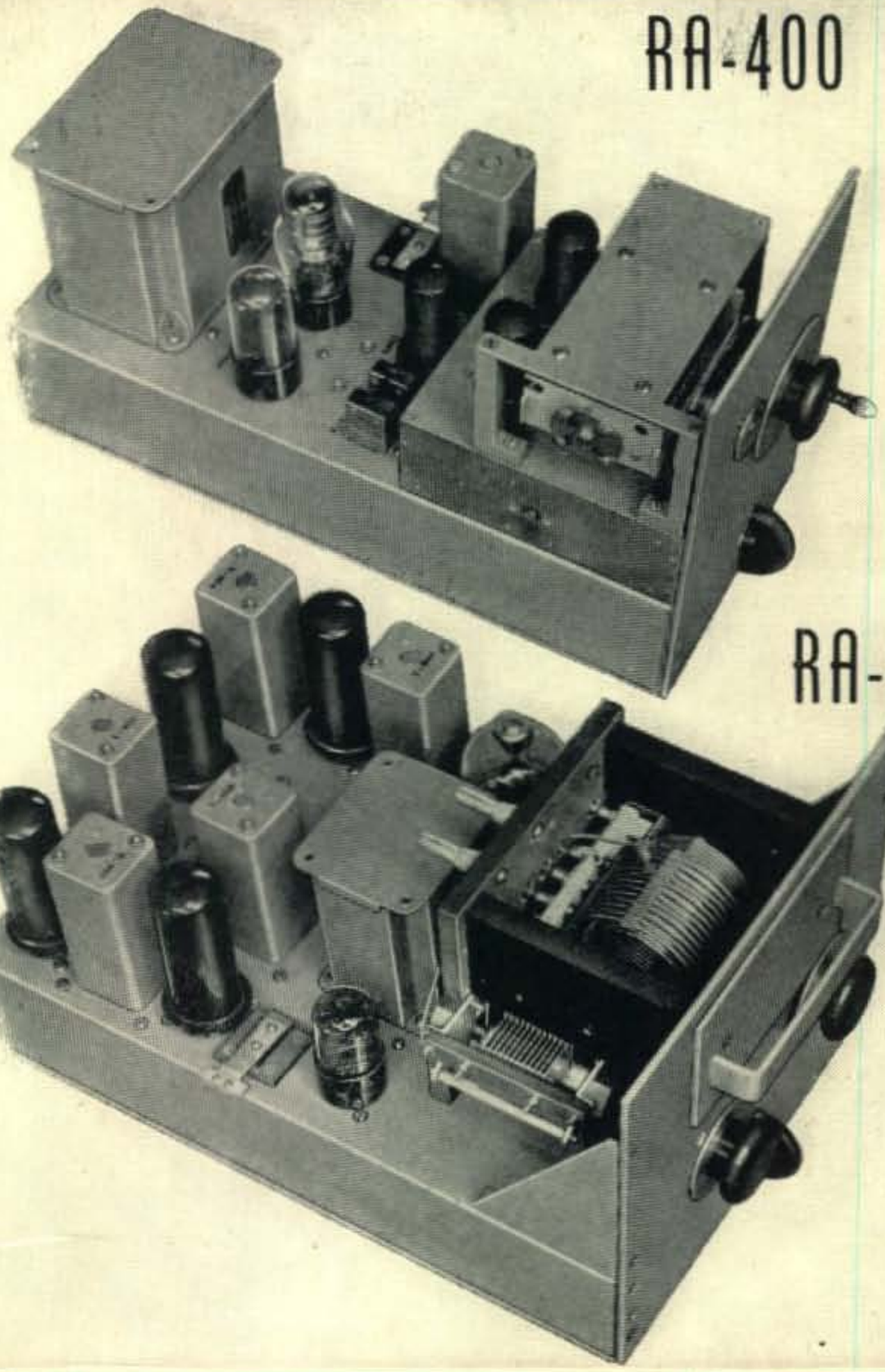
which was bent from some scrap metal in the shop. Angle irons can be used in place of this bracket, but they may require some redrilling to align the condenser shaft with that of the PA tuning condenser.

The photographs adequately showing placement of parts and general layout. Of interest will be the two small filament transformers which are paralleled to give 4 amps at 6.3 v. for the 4D32. No single transformer could be obtained which was small enough to fit below the chassis, hence the two units each rated at 2 amps.

A few changes were made after the accompanying photographs had been taken. The original links on the grid turret were modified to obtain optimum and equal grid current readings on all bands; the replacements were of No. 20 high-voltage push-back wire doped to the coil itself with poly cement. The 115-volt a-c input was removed from the terminal strip and fed through a male and female plug, the male part being mounted on the chassis.

While we did not encounter any hash from the mercury rectifiers the possibility of getting this type of interference from mercury rectifiers always exists. Should such interference develop, a suitable hash filter should be installed at the plate cap of each rectifier. This should consist of a 300-ma r-f choke or a special filter made for this purpose.

CQ Ad Index



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RA-400 FREQUENCY METER TYPE VFO AND CRYSTAL OSCILLATOR

This unit consists of a highly stable, temperature compensated Variable Frequency Oscillator followed by a class A isolator and a wide band frequency doubling stage, with complete voltage regulated power supply for all stages. By means of a selector switch, the Class A isolator stage functions as a crystal oscillator with provisions for two crystals. Approximately 40 volts rms output is obtained from both the VFO and crystal oscillator; more than ample to drive succeeding frequency multipliers. Frequency coverage is continuous from 3.3 to 4.2 mcs. VFO frequency stability is comparable to that obtained from direct crystal control. Resettability is within 100 cycles at the fundamental frequency. Approximately 3000 dial divisions are available for the 900 KC range of the VFO. Plug-in type chassis with all controls mounted on front panel.

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The series of amplifiers and frequency multiplier stages preceding the final power amplifier, require no tuning adjustments within a single band of frequencies. Bandpass action is accomplished by coupled circuits, which, once adjusted, require no further tuning. Panel switch for band selection. Final amplier stage (with either 150 or 250 watt input ratings) employs a panel inserted plug-in inductor. Tuning and vernier loading by panel controls. Frequency range: 3.5-4 mcs, 7.0-7.3 mcs, 14-14.4 mcs, 21-21.5 mcs, 27.1-29.7 mcs. Output impedence range: 50 to 1000 ohms, balanced or unbalanced loads. Those interested in only one or two bands may economize by buying only required sets of coils. Automatic RF input and output connections. All power connections emerge through rear chassis plug.

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