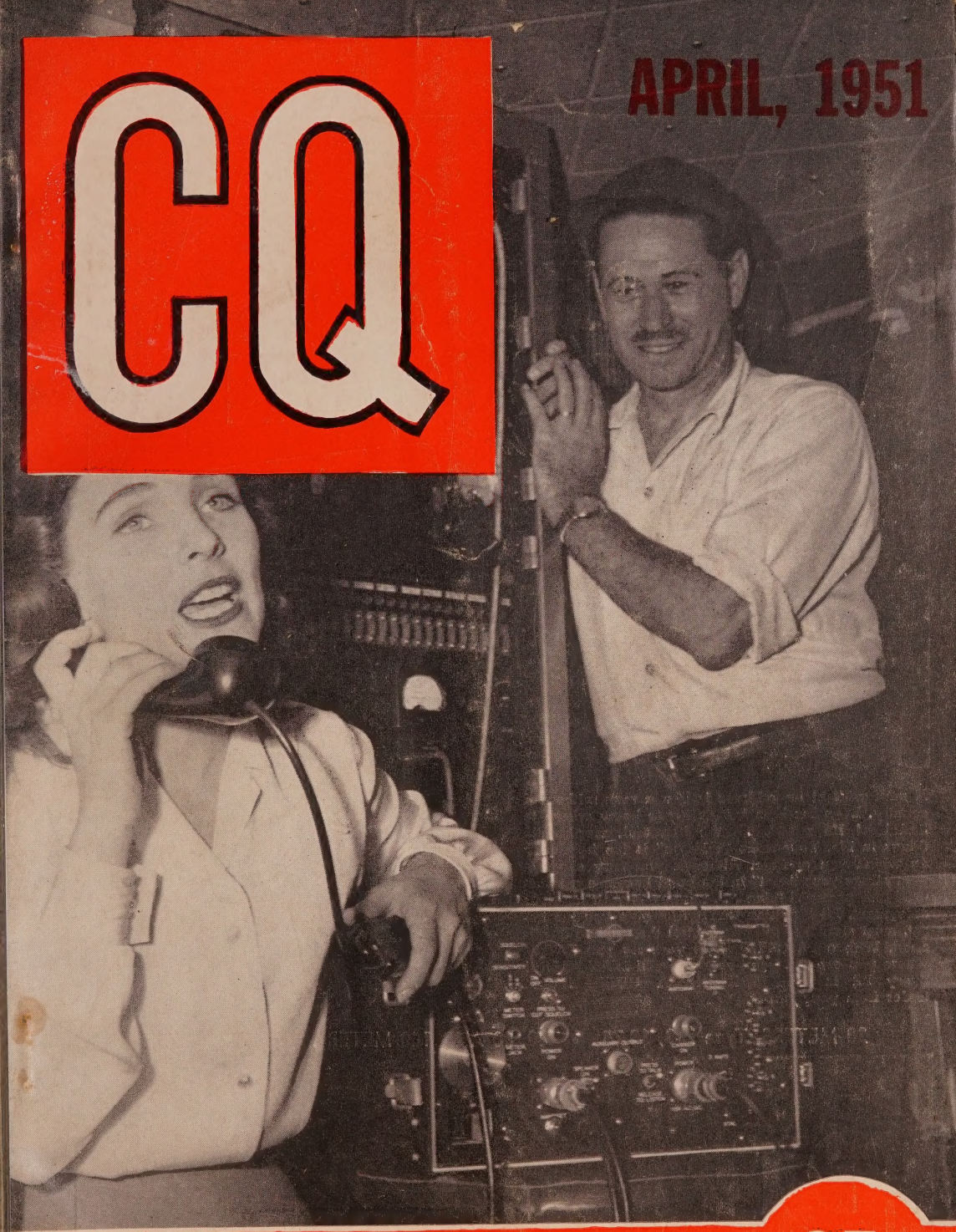
CQ

APRIL, 1951



The Radio Amateurs' Journal

35¢

ADDRESS UNKNOWN



A man without an address is like a man without a country. Even his best friends never know where to find him! He misses all the beautiful, worthwhile things in life. Your radio "address" is the frequency on which you operate. Although you may share it with others your "spot" in the band becomes a treasured and personal thing . . . the key to your amateur enjoyment. PR Precision CRYSTALS give you the finest, most stable, frequency control the art has developed. With a PR CRYSTAL in your rig you KNOW where you are . . . you know you will STAY THERE! Every PR is UNCONDITIONALLY GUARANTEED. Order from your jobber.

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

PR Crystals

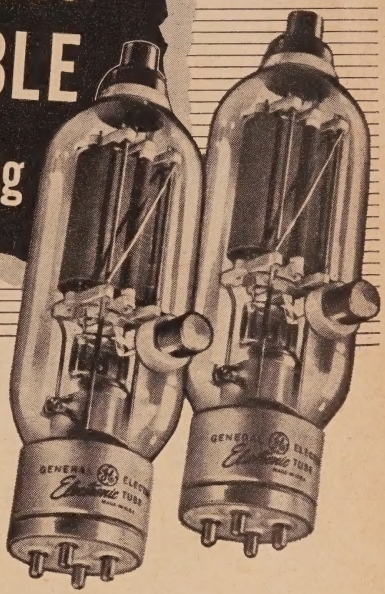
Since 1934

USE PR AND KNOW WHERE YOU ARE

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

LESS TIME SPENT CHASING TROUBLE

More time for rag-chewing



GL-810 **GL-8000**

...that's your reward when you invest in these sturdy G-E triodes!

HAMS who use triodes know how easy they are to install and operate. Circuits can be less complex . . . neutralizing, once accomplished, is over and done with . . . minimum effort need be spent in knocking down parasitics in order to get a clean signal.

After firing up a pair of GL-810's or GL-8000's, your time can be devoted to mike and key while your repair-kit collects dust.

Exceptionally long-lived, these triodes! This means there are fewer of the annoying shifts in electrical characteristics that occur when tubes are nearing the end of usefulness. Heavy-duty 45-w filaments; large graphite anodes able to handle high momentary overloads; these extend tube life and ward off operating trouble.

The GL-810 and GL-8000 are versatile—both will serve in audio or r-f work. But the GL-810 is best as an a-f amplifier, needing only —60 v of grid bias when putting out 725 w of audio.

GL-8000 is an ideal r-f tube. A pair asks for only 16 w of drive when taking a full kilowatt's input on CW. And this is the CCS max input, with ICAS top rated at 1½ kw. Plenty of power here!

The value-clincher is price. Either tube costs you *less than half* what most types of equal input sell for! Ask your G-E tube distributor today for the exact low figure. Or write for prices and data sheets ETX-150 and ETX-215 to *Section B, Electronics Department, General Electric Company, Schenectady 5, New York.*

	GL-810	GL-8000
Filament voltage	10 v	10 v
Filament current	4.5 amp	4.5 amp
Amplification factor	36	16.5
Max ICAS input, Class C Telephony, per tube	500 w	500 w
Max ICAS input, Class C Telegraphy, per tube	750 w	750 w

ELECTRONIC TUBES OF ALL TYPES FOR THE RADIO AMATEUR

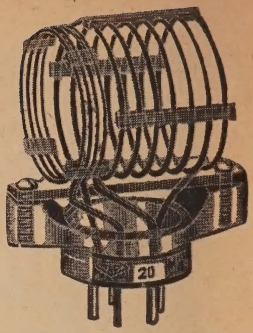
GENERAL ELECTRIC

184-KA3

the COIL that foils breakage

BUD 75 WATT COIL

with Polystyrene Plastic Base



Now Bud gives you improved performance, better appearance and long lasting quality in these 75 watt coils with the new Polystyrene base. Polystyrene has proven superior to porcelain for many reasons, including

1. Far greater resistance to breaking or cracking.
2. The Q of the coil is exceptionally high due to the extremely low power factor.
3. Pins are moulded in place—always remain perfectly alligned.
4. Sharp corners eliminated—no danger of chipping.
5. Transparency adds to smooth modern appearance.

Bud 75 watt coils are furnished with fixed or adjustable center links and fixed or adjustable end links. They are air wound, mount into 5-prong tube sockets and can be used on bands from 6 meter to 160 meter. OEP and OCP Coils are designed for use in circuits using Pentode tubes with high output capacity such as 6L6, 807, etc.

Catalog No. Fixed End Link	Catalog No. Fixed Center Link	Catalog No. Adjustable Center Link	Catalog No. Adjustable End Link	Band	Capacity*	Dealer Cost
.....	.....	OLS-160	.....	160 Meter	100 MMFD	$2.28
.....	.....	.....	OES-160	160 Meter	86 MMFD	2.28
OEL-80	OCL-80	OLS-80	OES-80	80 Meter	75 MMFD	1.95
OEL-40	OCL-40	OLS-40	OES-40	40 Meter	52 MMFD	1.92
OEL-20	OCL-20	OLS-20	OES-20	20 Meter	40 MMFD	1.83
OEL-15	OCL-15	OLS-15	OES-15	15 Meter	30 MMFD	1.80
OEL-10	OCL-10	OLS-10	OES-10	10 Meter	25 MMFD	1.74
OEL-6	OCL-6	.....	.....	6 Meter	17 MMFD	1.41
.....	.....	OCP-10	OEP-10	10 Meter	45 MMFD	1.74
.....	.....	OCP-20	OEP-20	20 Meter	50 MMFD	1.83

* Denotes tube plus circuit plus tank plus output coupling capacity required to resonate coil at low frequency end of band.



• SHIELDED • COIL LINKS

These links are made to fit RLS, VLS, and MLS series of coils. This link will prevent capacity coupling between the tank coil and the link and would reduce TVI by greatly attenuating harmonics. The links can be used on co-ax or balanced lines.

Catalog Number	DESCRIPTION	Dealer Costs
AM-1300	Used with RLS coils (150W)	$1.92
AM-1301	Used with VLS coils (500W)	2.19
AM-1302	Used with MLS coils (Kilowatt)	2.61



• ADD-A-LINK

When the circuit that you are using requires a different number of turns on the coil link than is furnished with the standard coil, the links listed below can be used to replace the standard link.

Cat. No.	Used With	No. of Turns	Dealer Cost
AM-1303	RLS	3½	$ .52
AM-1304	RLS	4½	.54
AM-1305	RLS	5½	.68
AM-1307	VLS	3½	.52
AM-1308	VLS	4½	.54
AM-1309	VLS	5½	.68
AM-1310	VLS	6½	.72
AM-1311	MLS	3½	.81
AM-1312	MLS	4½	.96
AM-1313	MLS	5½	1.06
AM-1314	MLS	6½	1.14

Bud products include coils, condensers, R.F. chokes, sheet metal ware, etc. See the complete Bud line at your local distributors.

BUD

The Mark of Perfection

BUD RADIO, Inc.

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CQ

VOL. 7, NO. 4 CONTENTS APRIL, 1951

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OUR COVER

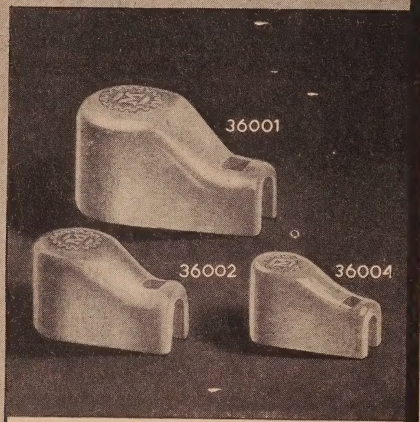
At first thought, there might not seem to be any connection between movie actresses and emergency communications, but the picture proves otherwise. Movie sound man Art Dixon, W6YW, keeps a surplus 10 meter rig (Collins MBF) in his sound truck, and occasionally finds time to use it on the set, between filming of scenes. This shot was taken during production of RKO's "Sealed Cargo", with co-star Carla Balenda talking to a lucky KZ5. ("Please QSL!!").

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Designed for

Application



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Ceramic Plate or Grid Caps

A new addition to this series of exclusive Millen "Designed for Application" products is the 36004 for use on tubes with ¼" diameter contacts. Efficient, compact, easy to use and neat appearing. Soldering lug and contact one-piece. Lug ears annealed and solder dipped to facilitate easy combination "mechanical plus soldered" connection of cable. No. 36001 for 9/16" tube terminals. No. 36002 for ⅜". No. 36004 for ¼".

JAMES MILLEN MFG. CO., INC.

MAIN OFFICE AND FACTORY

MALDEN

MASSACHUSETTS



Fenix, Ariz.

Deer Hon. Ed;

Well, Scratchi's Haven of Harried Amateurs are going along at a great clippity. As you are undoubtless recalling, when I writing you last I telling you how I are inheriting hole island in Pacific Ocean, and how I planning to make it a DX factory. Any ham what are wondering what it is like being hots DX can coming out and operating, for a small fee, natchurly.

I had just about given up on finding a barge (have to have something like that, as island is too small to do anything on) when west coast ham who are hearing of my plan are telling me he can lending me a barge to use if I letting him come to Scratchi Island for free anytime he wanting. I taking him up on this reel quickly, not only because I needing barge, but because this fellow are big-shots DX hunter and he also on DX Committee. So, we making the deal, and he saying he try to see that Scratchi Island are made a new country if Scratchi letting him give OK on the fellows that get to come to Scratchi Island. I also telling him that I heer he are having trouble working W9's recently, so I promising to fix up a few schedules for him.

After taking quick trip to Los Angeles to see barge, I coming home full of plans. Barge are reel nice, and about half of it are a nice big cabin, and the other half I planning to cover with canvas. That way can be having first class and tourist class rates. Can also calling cabin one prefix, like QRM2, and canvas-covered part another prefix, such as QRM3. Are already having rigs fixed up for QRM3 zone, as are investing in some old second-hand juke boxes. I getting them about a week ago, and you should seeing them now. I taking out all the record-changing mechanism, and where that used to be are now installed snappy two-tube regenerative receiver.

Underneath where big speaker are formerly residing are putting in one-tube transmitter, xtal controlled (not needing VFO, on acct. we are the DX, letting other fellow come to our frequency). Are using power supply what are already there, and now each juke-box is nice station —transmitter, receiver and all. It is arranged so that when fellow puts quarter in slot the power are coming on and staying on for five minutes. That are giving time for two or three QSO's, and if wanting more, just having to feed another

(Continued on page 53)

"SYLVANIA SURE IS A HELP IN THIS TUBE SHORTAGE"

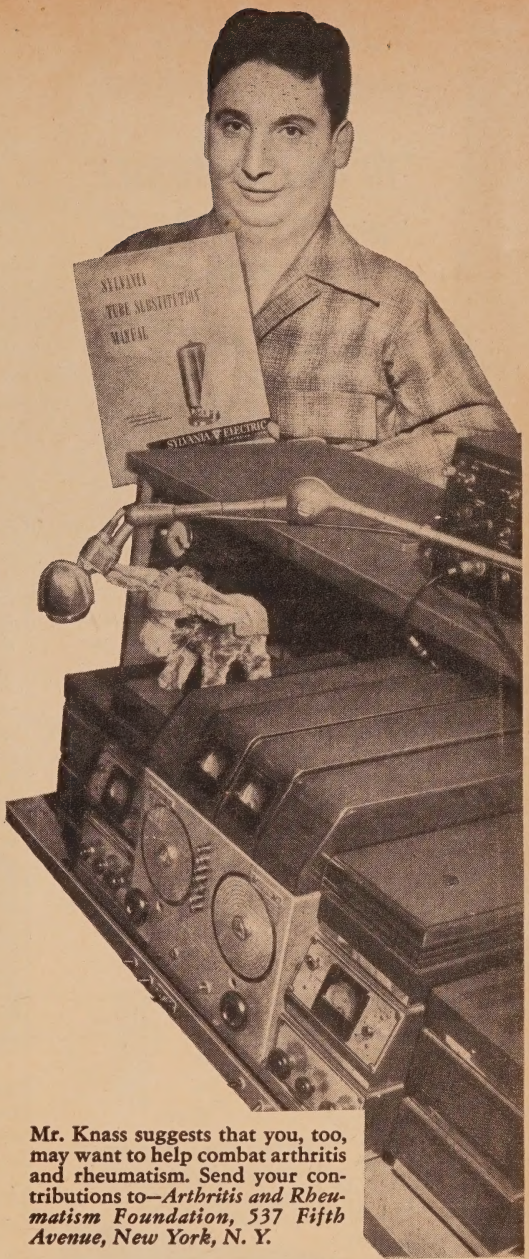
says LeRoy Knass, W6RIA

To many hundreds of people today the call letters W6RIA are the world's most welcome signals. For, these letters identify the two stations of LeRoy Knass, who is devoting most of his time relaying messages between U. S. Servicemen in Tokio, Guam, and Hawaii, and their families here at home.

Mr. Knass, an arthritis victim since 1935, is grateful for the opportunities offered by Ham radio work. And naturally, he is particular about the equipment and parts he uses. About tubes he says: "Give me Sylvania Tubes for powerful performance and long life. Also, Sylvania's up-to-the-minute Tube Substitution Book offers a lot of helpful pointers about redesigning circuits to eliminate hard-to-find tubes."

Have you received your copy of this free book? Here are answers to many problems caused by today's tube shortage. Includes circuit modifications and substitution notes for all critical types of tubes . . . even including television receiving tubes and picture tubes. 40 pages of information of real value to every Ham.

See your Sylvania Distributor or mail coupon for free copy of Sylvania's Tube Substitution Manual.



Mr. Knass suggests that you, too, may want to help combat arthritis and rheumatism. Send your contributions to—*Arthritis and Rheumatism Foundation, 537 Fifth Avenue, New York, N. Y.*

SYLVANIA ELECTRIC

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

Sylvania Electric Products Inc.
Dept. R-4004, Emporium, Penna.
Please send me a copy of the new Sylvania Tube Substitution Manual.

*Name*_____

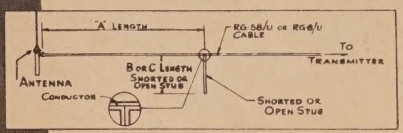
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*City*_____ *Zone*___ *State*_____

HOW TO HOOK UP

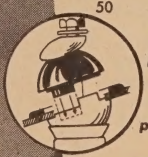
WARD SPP-143 ANTENNA *for* 10 METER MOBILE and BROADCAST RECEIVING

Ward's exclusive 8-Ball mount requires but one hole for installation on car fender, cowl or flat rear deck. The short 55½" solid rod reduces overhead damage. When using the Ward SPP-143 for both transmitting and receiving on 10 meters and receiving on standard broadcast, an open stub is required for loading. The shorted stub is installed when the antenna is used exclusively for 10 meter mobile. The additional capacity of the stub is less than that of the long lead connecting a rear mounted whip. Performance matches and in some factors exceeds rear mounted whips.



LOADING CHART

F in Mcs.	A" to Ant.	B" shorted stub	C" open stub
24	60	3	84½
26	53⅛	3	78
28	47¾	3⅛	73⅛
30	42½	3¼	68½
32	37¾	3⅜	64⅜
34	33¼	3½	61
36	29	3⅞	58⅛
38	25	4⅜	55⅞
40	21¼	5	53¾
42	17½	5¾	52¼
44	14	6¾	51¼
46	10½	8	50½
48	6½	9¾	50½
50	1	12	50



NEEDS ONLY ONE HOLE FOR INSTALLATION

Sold at leading radio parts jobbers.

WARD SPP-143 AUTOMOBILE TRANSMITTING **ANTENNA**

THE WARD PRODUCTS CORP.

Division of The Gabriel Co.

1523 EAST 45TH ST. • CLEVELAND 3, OHIO

★ ★ Letters ★ ★

Loading Coils and Mobile Antennas

14 Kingsland Road,
North Tarrytown, N. Y.

Editor, CQ:

Since my article, "High Efficiency Loading Coil For Mobile Antennas", appeared in January CQ I have had a number of inquiries from amateurs in various parts of the country regarding a source of supply for the large diameter polystyrene rod and tubing specified. It no longer seems to be available in New York, but I have checked in Chicago, and understand that the 1¾" rod can be obtained at $3.50 per foot from:

Colonial Kolonite Co.
Attention, Mr. Leonard
2212 W. Armitage
Chicago, Ill.

They also have 2" o. d. tubing, but it has only a 0.090" wall, which sounds a little thin. I believe it would be better to use just the rod, and waterproof it with several generous coats of polystyrene cement.

I have also received a communication from W4KDV questioning some of the statements in the article. I am enclosing his letter and my reply, with the thought that they may have enough general interest to justify publication.

With regard to center vs. base loading, my statements apply particularly to antennas mounted well up on the body of the car as indicated in the photographs in the article. If bumper mounting is used, it is probably a good idea to use a two or three foot rod below the coil and get it up away from the body of the can and the trunk door. This still leaves the coil low enough so that it is mechanically protected by the car body, and reduces to a minimum effect on the tuning of the position of the trunk door during tuning and the swaying of the antenna when the car is in motion.

George M. Brown

Hampton, Va.
16 January 1951

Editor, CQ:

As sure as I am that the article entitled "High Efficiency Loading Coil for Mobile Antennas" by George M. Brown will raise a storm of protests and counter-protests among the Mobile Gang, I might as well get my licks in too.

Basically I agree with the precepts set forth in the article, however there are one or two points on which I disagree.

The principal point on which Mr. Brown and I disagree is that ground losses are negligible in a mobile installation. As he has stated, the reactance of the eight foot antenna is about 1590 ohms on 75 meters; however the reactance between the car body and earth is, in most cases, less than one-twentieth of 1590 ohms. Because of this low reactance between the car body and ground, most of the return currents from both the radiation field and the induction field must flow through the earth's surface and concentrate in the area under the body of the car. Although the ground resist-

(Continued on page 61)



Hallicrafters Block Long Main Plant—Chicago, Ill.

hallicrafters

"The Radio Man's Radio"

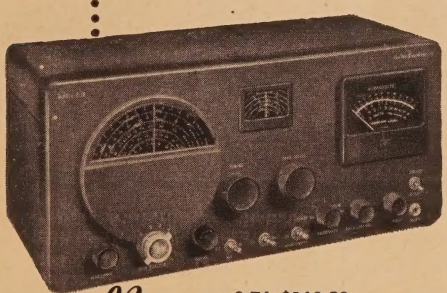
Precision Radio

famous throughout the world . . .

Hallicrafters precision instruments have been sold in 89 countries, used by 33 governments. They are remembered by veterans, prized by experts, and preferred by radio amateurs throughout the world who want a radio that is all radio.

The BIGGEST *"Ham Shack"* in the World...

From the block-long building above comes more Ham equipment than any place else in the world. Its elegant Georgian design gracefully conceals the modern precision laboratories and humming production lines within.



New **S-76 $169.50**
DUAL CONVERSION RECEIVER WITH 50-KC 1-F

You've read about it, you've heard about it, now here it is—with the most wanted features, at the lowest possible price.

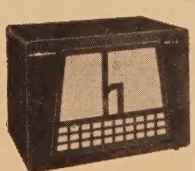
DUAL CONVERSION (1650 kc and 50 kc)—more usable selectivity than the best crystal.

GIANT 4-in. "S" METER—calibrated in microvolts and "S" units.

OTHER FEATURES: Four bands 538-1580 kc, 1720 kc to 32 Mc. Calibrated electrical bandspread. 5 position selectivity. Sensitivity 2 microvolts or better with .5 watt output. 9 tubes plus regulator, rectifier.

SX-71. 11-tube Double conversion receiver. 538 kc to 35 Mc. 46-56 Mc. Crystal filter.....$199.50

SX-75. New, complete Transmitter-Receiver. Ideal for novice class. $89.95

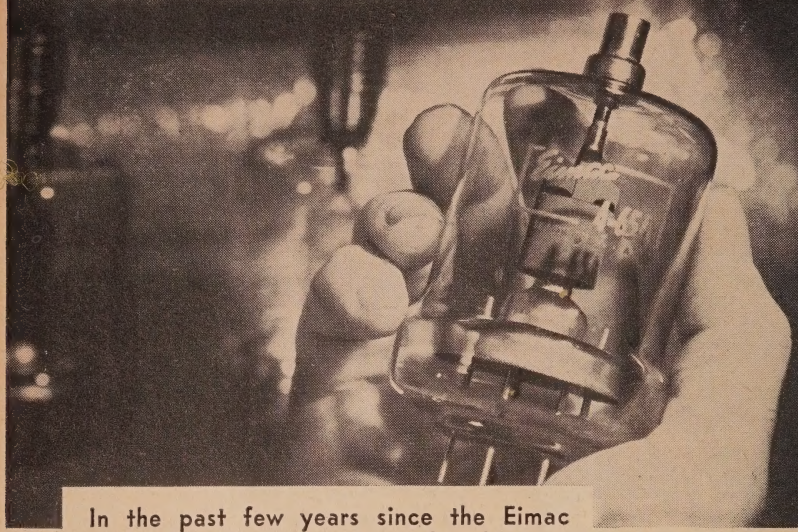


R-46 SPEAKER
New 10" PM in Satin black cabinet. 80 to 5000 cycle range. 500-ohm matching transformer. 15" wide, 10⅞" high, 10⅛" deep....$19.95

the hallicrafters co.

WORLD'S LEADING MANUFACTURER OF PRECISION RADIO & TELEVISION • CHICAGO 24, ILLINOIS

For top performance . . . the 4-65A



In the past few years since the Eimac 4-65A became available, it has become one of the most widely used transmitting type tetrodes in its power class. The reason is simple . . . It is a better vacuum tube built not to meet a price but to surpass commonly accepted performance and quality standards.

The 4-65A is a ruggedly constructed tube incorporating the best principles of design found in high-power transmitting tubes. It is extremely versatile, operating over a wide range of plate voltages and well into the vhf.

If you're interested in CW . . . one 4-65A will handle 345 watts (class-C) with less than 2 watts grid drive permitting direct drive from a VFO with power to spare. For phone . . . one tube, when plate modulated, will handle 270 watts input with 2500 plate volts.

Why not use a tube made for transmitting service. Enjoy dependable performance and at the same time have power to spare . . . investigate the Eimac 4-65A . . . write for complete data today.

EITEL-McCULLOUGH, INC.
San Bruno, California

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

4-65A
GENERAL CHARACTERISTICS

ELECTRICAL

Filament: Thoriated Tungsten
- Voltage - - - - - 6.0 volts
- Current - - - - - 3.5 amps.

Grid-Screen
Amplification Factor (Av.) - - - 5
Direct Interelectrode
Capacitances (Av.)
- Grid-Plate - - - - 0.08 uuf.
- Input - - - - - - 8.0 uuf.
- Output - - - - - - 2.1 uuf.

RADIO FREQUENCY POWER AMPLIFIER AND OSCILLATOR
Class-C Telegraphy or Telephony
MAXIMUM RATINGS
(Key-down conditions, per tube)

D-C Plate Voltage	3000 Max. Volts
D-C Screen Voltage	400 Max. Volts
D-C Grid Voltage	-500 Max. Volts
D-C Plate Current	150 Max. Ma.
Plate Dissipation	65 Max. Watts
Screen Dissipation	10 Max. Watts
Grid Dissipation	5 Max. Watts

Eimac TUBES

280

the 4-65A is another Eimac contribution to electronic progress

ZERO BIAS

EDITORIAL

ALTHOUGH AMATEUR RADIO has been generally fortunate in receiving favorable press publicity, there have been at least two recent cases where our prestige has suffered.

In the first instance, a national news magazine reported the location and closing-down of an unlicensed broadcast station by the FCC. This station was described as being the outgrowth of somebody's ham rig, and yet all concerned in its operation pleaded ignorance of the fact that a license was required. The outcome of the episode was that no action was being taken, since the "proprietors" were all enlisting or reinlisting in the Army or Air Force.

It doesn't seem possible that anyone capable of building a composite BC transmitter from surplus could be unaware of the legal angles; it seems almost equally improbable that all of the local hams in this area could be totally ignorant of what was taking place. Yet, apparently nobody let out a peep, and things went along until the FCC monitoring service stepped in. The result is a fair-sized black eye for ham radio; a large national readership is informed that some hams are either just plain dumb, or both stupid and irresponsible.

The second item was even more unfortunate. A dispatch on the front page of one of our metropolitan newspapers carried the accusing headline that signals from a West Coast amateur 'phone, chatting about trivial personal matters, had interrupted important UN military communication in Korea. The story was then passed along by a number of radio news reporters. CQ and ARRL protested to the originating newspaper and asked that the story be checked at its source, while FCC and the Army also investigated; as had been expected, the accusation was undeserved. Although the paper subsequently devoted a fair amount of space in an attempt to right matters, no doubt this received less nationwide attention than the original story.

While it is regrettable that a news story based on slim and inaccurate reporting should receive such widespread publicity, the most significant point in the publication and repetition of the story is this: In the minds of many people, we have failed to justify our existence.

To counteract this, we need more good publicity—in radio, newspapers, magazines and by word of mouth. Clubs and Civil Defense groups should draft one or more of their members to serve as publicity or public relations officers. The rest of us will have to back up these boys by doing a better job on C. D. so they'll have something to beat the drums about. In visiting clubs lately, we've heard too much of things like "Aw, C. D. was all politics in my town, so I got out," or "Sure, I ought to do something about C. D., but I've worked hard to get where I stand in the DX gang, and I don't want the rest of 'em to beat me out." No kidding! What does it take to convince fellows like these that they can't afford to coast now?

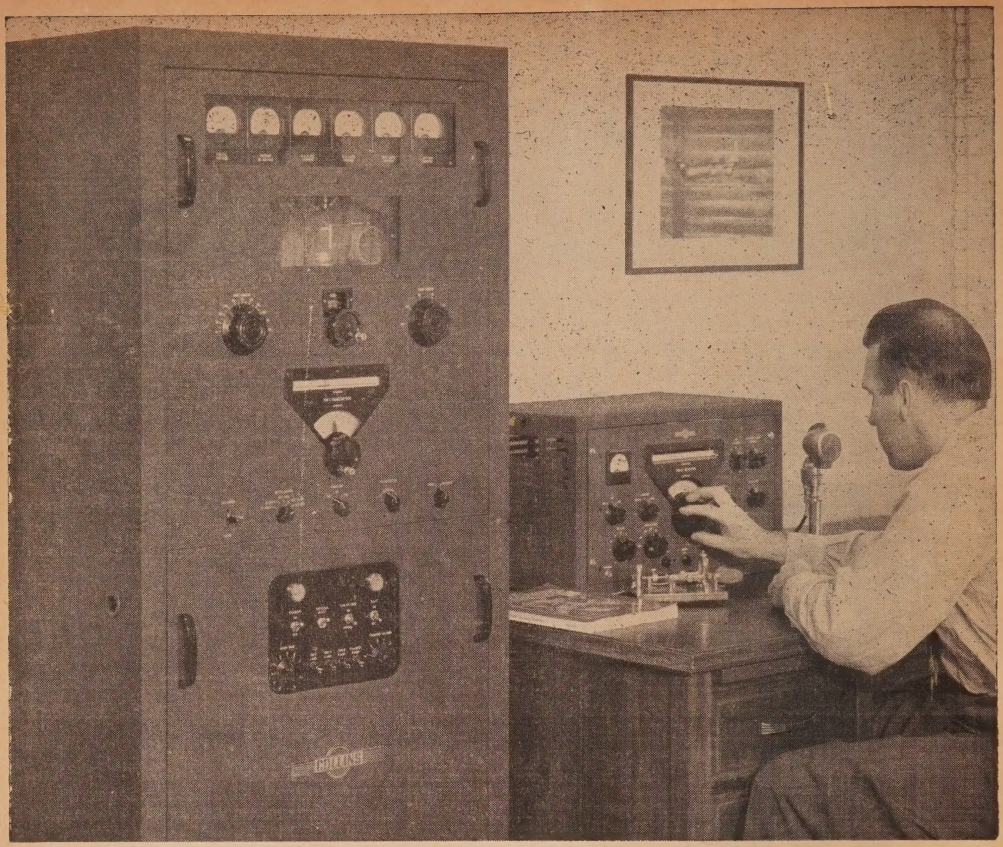
FCC Establishes Disaster Communications Service

The FCC has announced adoption of final regulation establishing a Disaster Communications Service in the frequency band of 1750 to 1800 kc., to become effective March 21, 1951. Although other services now occupy this band and may continue to do so on a shared basis, Disaster Communications will have complete priority in cases of emergency.

The intent of this action by the Commission is to provide a recognized emergency communications service, similar to amateur emergency nets, but open to government and other stations, as well as amateurs. Application must be made for a construction permit and license, submitted with proof that the proposed station will be part of a coordinated system directed by a competent local authority. Although this authority may be a Civil Defense official, Disaster Service is a permanent assignment and not intended primarily for Civil Defense.

Due to the narrow band available, certain technical restrictions are imposed. The band is assigned as 14 channels: 8 CW channels, spaced 1 kc apart, between 1750.5 and 1757.5 kc; a "Scene of Disaster" channel at 1761.5 kc which may be used by CW, ICW or voice; finally, 5 voice channels, spaced 7 kc apart, between 1768.5 and 1796.5 kc. In every case, frequency tolerance is 0.015 per cent, which is in the order of 250 cycles; on voice, 99 per cent of the radiated power must fall within a 6kc bandwidth. These restrictions may make it difficult for some amateurs who would otherwise participate in a planned program. Vfo's are obviously out, suitable crystals will probably be expensive, and the 'phone bandwidth limitation implies the use of a respectable audio filter. However, the rules specifically permit Disaster stations to establish communications with non-network stations if required by an emergency, and also to conduct training drills with non-network stations. By taking advantage of these provisions, we may maintain effective cooperation with Disaster stations, even though we remain on our own amateur frequencies.

—Gene, W2ESO



PROGRESS REPORT ON THE KW-1

Since the KW-1 one-kilowatt amateur transmitter was announced, the engineering model has been subjected to a series of operational shakedowns by Collins engineer-amateurs.

In actual daily service as a ham communications transmitter, the rig has proved basically sound and a joy to operate. Amateurs we have worked have spontaneously remarked on its power — seemingly greater than kilowatt — and its excellent audio.

Continuous use has suggested several improvements, which have called for minor changes in engineering design. These changes are nearing completion as this message goes to press.

All materials were ordered months ago. Delays in delivery to us of some components, notably transformers, have been encountered. Suppliers of these components believe they can make delivery within six months. KW-1 production will commence as soon as all materials are received. We hope to be able to start shipments to Collins distributors next fall.

FOR THE BEST IN AMATEUR RADIO, IT'S . . .

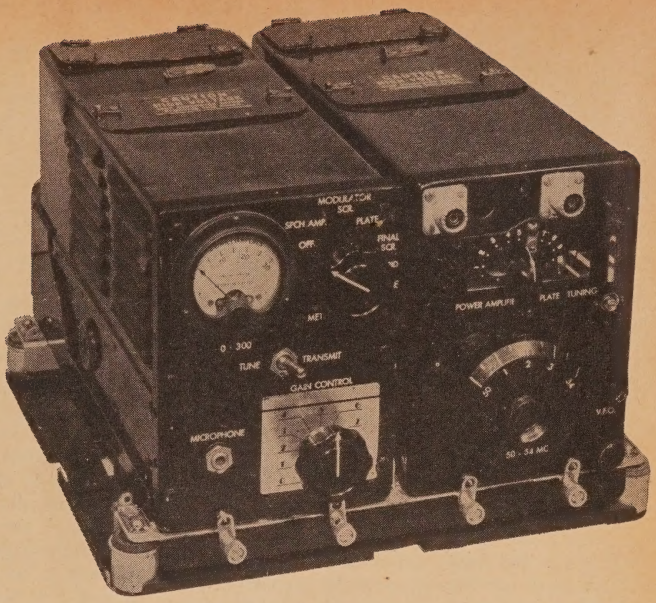
COLLINS

COLLINS RADIO COMPANY, Cedar Rapids, Iowa

11 West 42nd Street, NEW YORK 18 **2700 West Olive Avenue, BURBANK**

P. S. RAND, W1DBM*

WAR SURPLUS for CIVIL DEFENSE



Probably the most popular equipment in surplus, many of the ARC-5 series are still available. Here is W1DBM's conversion for CD mobile use.

THIS ARTICLE WILL DESCRIBE THE CONVERSION of war surplus SCR-274 transmitters for use on the newly announced Civil Defense frequencies[1]. These particular surplus units are very well suited for emergency use, first, because they are v.f.o., second, because they are available, and third, because they were originally designed for mobile use and may be used with their original shock units.

During the last war, the author was Radio Aide for Middlesex County in Connecticut, and remembers that when the W.E.R.S. net frequencies were changed from time to time, it was so difficult to obtain new crystals that v.f.o.s. were finally built for the two net control stations. Now again in 1951, we must change crystals because the Connecticut Emergency Mobile crystals, 29680 kc, are not in the Civil Defense bands.

1 Editorial, CQ, Feb. 1951

* *Laboratory of Advanced Research, Remington Rand Inc., South Norwalk, Conn.*

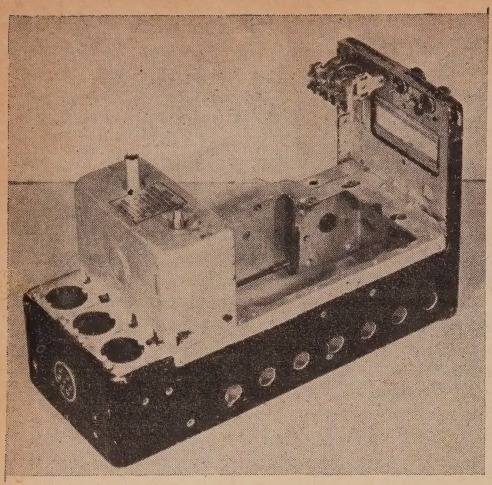
Circuit

With the above in mind, five of the popular SCR-274 command sets were converted for use as either fixed or mobile transmitters. These transmitters are so laid out that they may all be used with the same modulator and power supply by simply plugging the desired unit into the shock-mounted rack, and connecting the coax feed lines to the antenna and converter.

For mobile use on 28, 50 and 144 mc, instant heating filament type tubes are used, while for fixed stations, a heater type of tube such as a 6AQ5 and 2E26 may be used if preferred. There is a very great saving in storage battery life if the transmitter is off completely during standby. Therefore, the former is recommended.

The tubes are 2E30's and 5516's, manufactured by Hytron, although comparable types by other manufacturers could be used as well[2]. The v.f.o section uses a 2E30 connected as a triode, followed by 2E30 pentodes as frequency multipliers, with

2 Comparable Tubes 2E30, 5618, 6AQ5, 5763, etc. 5516, 2E24, 2E26, etc.



The first step is to strip the chassis.

two 5516's in the final. The modulator unit is constructed on a similar chassis and consists of a 2E30 triode connected as a speech amplifier followed by a 5516 as a clamp tube[3] screen grid modulator. A PE-103 Dynamotor is used for mobile use.

3 For more information on clamp tube modulation see:
"Practical Screen Modulation," CQ, Dec. 1949, p. 24
"Screen Modulated Command Set," CQ, Sept, 1949, p. 35
"Clamp Tube Modulation," QST, Mar. 1950, p. 46
"High Output Grid Modulation," QST, Feb. 1951, p. 40

TABLE I

28 mc Coil Data for v f. o. 4. 666 mc to 5. 000 mc using variable condensers C_1 and C_2 across coils.

Coil	Frequency Coverage	No Turns	Dia.	Length	Wire	Form	uh
L1	14 to 15 mc	28	1/2"	5/8"	#24	XR-50	5. 0
L2	28 to 30 mc	14	1/2"	5/8"	#18	XR-50	1. 4
L3 & L4	Links	2	1/2"		#16		
L5	28 to 30 mc	15	3/4"	1"	#16	Poly	L 8
L6	28 to 30 mc	14	1"	2"	#12	Air	1. 8
L7	Ant. Link	3	1"		#16	Air	

Coil Table for 28 mc conversion.

28 mc Conversion

Referring to Fig. 1, the area within the dotted lines indicates that part of the original ARC-5 circuit is retained with minor changes in the three highest frequency units. The lead from the grid coil going to the magic eye tube has been removed, along with the tube and its resistors, as they are no longer needed. The crystal is also removed. The neutralizing condenser, which was formerly attached to the secondary of the v.f.o. coil, is discarded. For 6 volt heater operation a 6J5 may be used in place of the 1626 without change in socket connections. However, for the filament type 2E30, it is necessary to remove the octal socket and replace it with a 7-pin miniature. At this same time, all three octal sockets are removed and a small plate with two 7-pin miniature sockets is screwed on the rear edge of the chassis. The second socket is for an OA-2 voltage regulator tube. This is shown in the photographs.

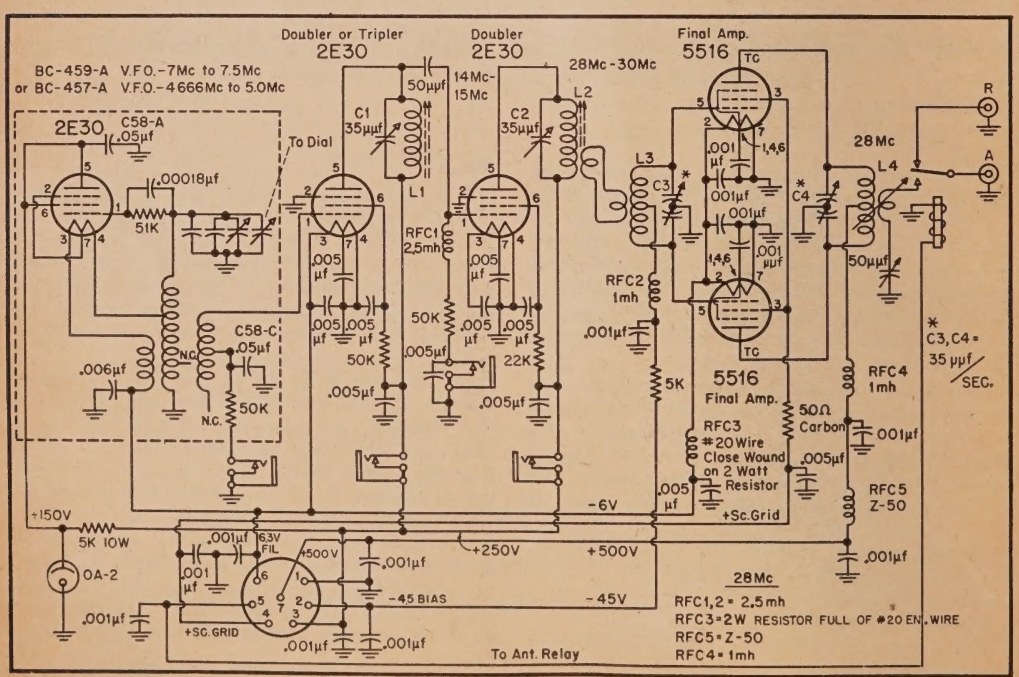


Fig. 1. Ten meter conversion circuit diagram.

A further study of the diagram reveals that the first frequency multiplier is inductively coupled to the oscillator, and capacity coupled to the second frequency multiplier. The output of this second stage could be capacity coupled to the final as far as output is concerned; however, we used inductive coupling in an effort to keep harmonics from feeding through to the antenna. The final amplifier may be either single ended or push-pull, using either 2E30's or 5516's[4], depending on the dynamotor available. In our case we chose push-pull 5516's for added power inasmuch as screen grid clamp tube modulation is not very efficient at best, due to the low average screen voltage. A send-receive antenna relay is mounted next to the antenna coax fittings on the front panel, and a low pass filter is used externally on the ten meter unit.

TABLE II

	GRID		PLATE		SCREEN	
	-Volts	MA	∱ Volts	MA	∱ Volts	MA
Osc. 2E30	30	1	150	5	---	--
1st Mult. 2E30	30	1	250	15	110	5
2nd Mult. 2E30	150	3	250	18	80	7
Final 2-5516	95	10	500	75	150	10
Sp. Amp. 2E30	10	-	250	10	---	--
5516 Clamp Mod.	25	-	150	25	---	--

Measurements made with V.T. voltmeter and milliammeter

Operating voltages for 28 mc conversion. Transmitter and Modulator.

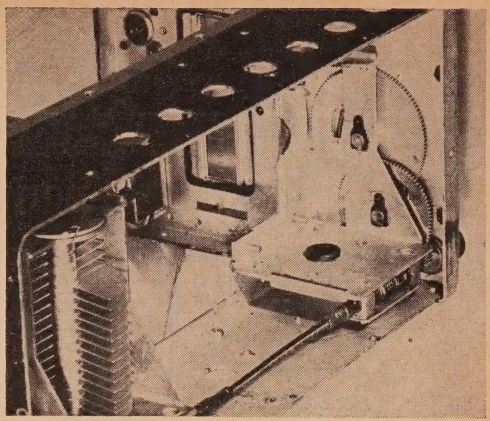
Construction

Or should we say destruction? Before starting to rewire these units, it is first advisable to remove all parts that will not be used in the final version, and this means everything above and below the chassis ahead of the master oscillator. Start with the coils, then the variable condensers, the 1625 tube sockets, and finally all the small parts, relays, etc. All this junk, of course, is saved for some future use. Take another look at the photos.

Now, with a keyhole saw, cut a nice rectangular hole about 2 inches wide and the width of the chassis where the 1625's used to be. This hole will later be covered by an aluminum plate, 2½" x 5", upon which are mounted the two 2E30 multipliers, along with their tuning condensers, coils, resistors, etc.

The front variable condenser that holds the tuning dial and worm drive mechanism to the chassis, which you have already removed, must now be taken apart and cut with a hack saw so that all that remains of it is part of the frame—just enough to still hold the dial and worm drive.

4 Screen resistor and clamp modulator changed accordingly.



This is the condenser frame after alterations.

This can now be replaced in the unit so that we will have a means of tuning the v.f.o. from the front panel, and yet will have enough space above and below the chassis to mount the 5516 sockets, grid coil and condenser. The two coax fittings and 6V antenna relay are now mounted on the rear of the front panel at the top.

A small bracket is bent up to hold the 35 uufd per section tank condenser high enough off the chassis so that a shaft extension can be brought out through the plastic window on the front, for tuning the final amplifier plate coil. The final amplifier grid is tuned through a clearance hole in the right hand side of the chassis.

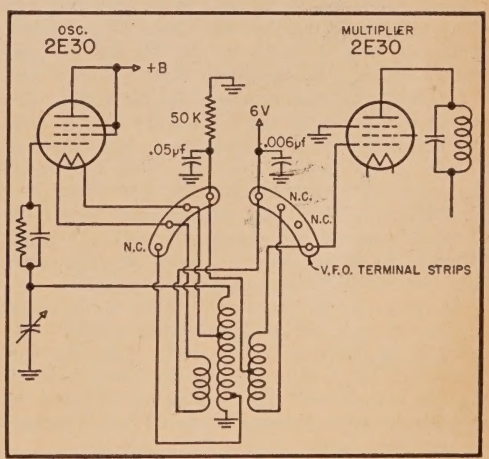


Fig. 2. V.F.O. coil connections.

Closed circuit jacks for metering the various stages are mounted along the side of the chassis and insulated from it with fibre washers. These jacks may seem unnecessary; however, they will save a lot of time in tuning up and trouble shooting later on.

These metering jacks were added after the photographs had been taken, and therefore do not show in the pictures.

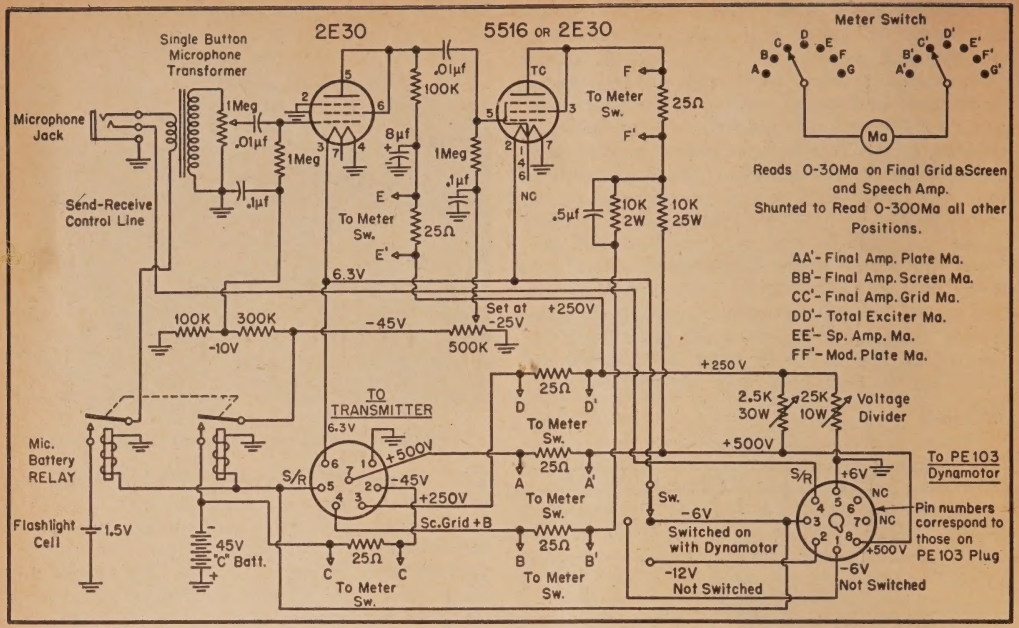


Fig. 3. Modulator circuit diagram.

Frequency Multipliers

The frequency multiplying strip is a small subassembly built up on a piece of aluminum large enough to cover the rectangular cut-out in the chassis where the 1625's used to be mounted. The parts are so laid out that the first 2E30 frequency multiplier grid is close to the tap on the secondary of the v.f.o. grid coil assembly. See Fig. 2 for v.f.o. coil connections. The plate coils and tuning condensers of the 2E30's are located near the edges of the aluminum strip with the two 2E30's in the middle, allowing room to pile up the necessary plate, filament, grid and screen grid by-pass condensers. This arrangement allows the operator to tune the condensers and coil slugs through the access door on top of the dust cover that was formerly used to get at the 1625's.

As shown in the photos, the 5516's are mounted on the left side of the final tank condenser, and the coil is mounted on the right side. The antenna coupling link is adjusted by hand by bending its pigtails and the loading is adjusted by varying the series antenna condenser which mounts on the front panel.

The link line between the last doubler plate coil and the final grid coil is a short length of receiving type 72 ohm twinlead, anchored at each end on tie points.

Coils

The 2E30 coils are wound on National XR-50 slug-tuned coil forms or equivalent, according to the coil table, and are mounted and preadjusted to resonance with a grid dip oscillator before mounting the aluminum strip in the main chassis. The grid coil of the final is wound on a plain ¾" diameter coil form, and after adjustment with the grid dipper is cemented with coil dope. The final plate coil is wound with #12 wire and soldered to the condenser terminals.

To cover from 28.5 mc to 29.7 mc, the v.f.o. frequency range will be 7.125 mc to 7.425 if a BC 459-A is used, requiring two doubler stages. If you are using a BC457-A, the frequency range will be 4.750 mc to 4.950 mc, necessitating a tripler and a doubler. If you are using a BC 696-A, the frequency range is 3.166 mc to 3.300 mc, following with two triplers. Of course, a BC 458-A can be made to tune the 7.125 to 7.425 mc range by opening out the air padder that is in the shield next to the v.f.o coil, or to tune the 4.750 to 4.950 mc range by closing in the same air padder. The latter will give better band spread, and that is what the writer did. Rotor plates may be removed from the oscillator tuning condenser with a pair of pliers for increased band spread.

The writer ended up by removing 2/3 of the rotor plates. This gave considerably more band spread on the V.F.O. dial than is shown in the photos. Care must be exercised in twisting these plates and pulling them out with a pair of long-nosed pliers. The force should be exerted with a twisting motion by the pliers between the plates and the rotor shaft and not with a straight pull between the plates and the chassis, as there is danger of pulling the rear rotor shaft bearing out of its socket. (If this does happen, be sure to catch all the tiny ball bearings so that the condenser may be repaired. This is done by removing the condenser from the chassis and removing the

rotor so that the ball bearings may be replaced. To do this, drive out one of the taper pins in the flexible shaft, remove the screws holding the condenser to the chassis, unsolder the connections to the coil and tube, remove the spring-loaded gears on the condenser shaft, and unscrew the bearing on the opposite end of the condenser shaft. The rotor now lifts out easily. Holding the condenser vertically with the shaft end down, drop the ball bearings into the race with a pair of tweezers and replace the rotor shaft. Holding the rotor shaft so that the balls cannot fall out, reverse the position of the condenser and replace the balls in the other bearing and then replace the screws. The condenser is now as good as new, and may be put back in the unit. If any balls are lost, they may be replaced from one of the two condensers that you have previously removed. You may even practice on one of these before trying to remove plates from the V.F.O. condenser if in doubt.)

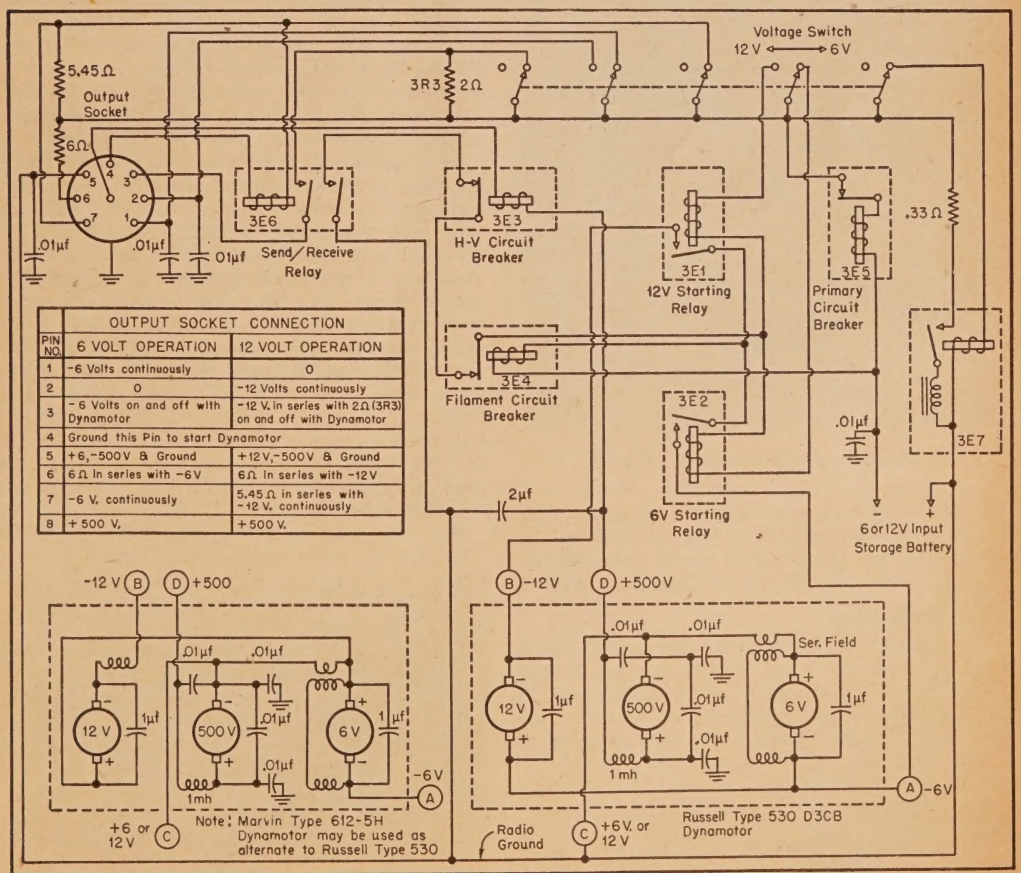
Modulator

The speech amplifier-modulator unit is built on a SCR-274 transmitter chassis so that it may be plugged into a double shock-mounted transmitter rack alongside the transmitter. The circuit diagram is shown in Fig. 3, and consists of a 2E30 triode driving a 5516 clamp tube modulator. If desired, the reader can build up almost any type of modulator[5]; however, for the power involved and the overall battery drain, we decided in favor of the clamp tube[3], especially since no modulation transformer was needed. Since it is not feasible to use a cathode resistor with a filament type tube, a "C" battery is necessary to set the operating bias for the clamp tube. This same 45V battery supplies fixed bias for the RF units and in this way provides protection for the 5516 tubes in the case of excitation failure. A one megohm pot is connected across the battery as a convenient means of adjusting the clamp tube bias. One leg of this parallel resistor is broken by a relay during receive, so as not to run down the battery. This same relay also breaks the mike battery for the same purpose.

The Modulator unit carries an 0-30 ma meter with meter shunts[6] on the switch for reading the final plate, grid and screen grid in addition to

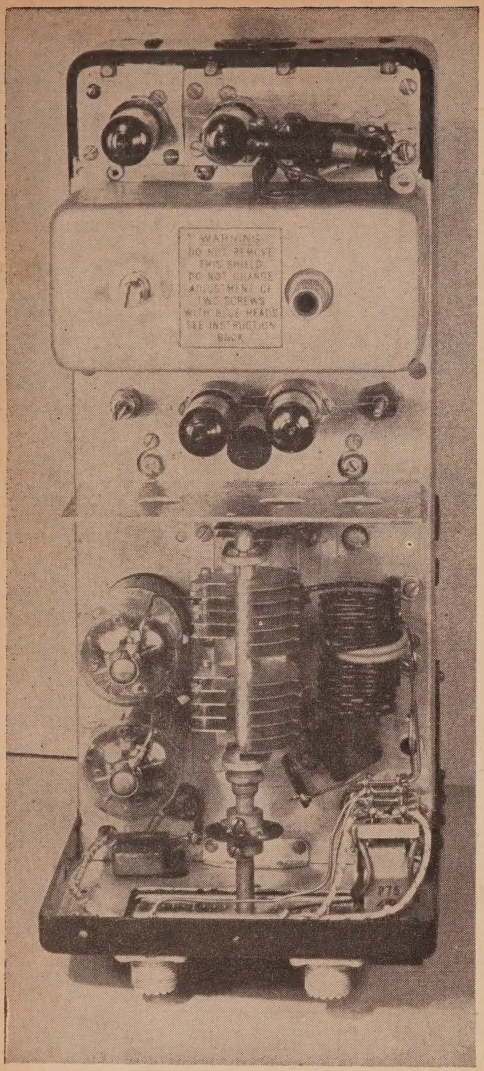
5 Next month a plate modulator will be described that is interchangeable.

6 Correct meter shunts for your particular meter may be calculated from the formula in the ARRL Handbook, p. 18



PIN NO	OUTPUT SOCKET CONNECTION	
	6 VOLT OPERATION	12 VOLT OPERATION
1	-6 Volts continuously	0
2	0	-12 Volts continuously
3	- 6 Volts on and off with Dynamotor	-12 V. in series with 2Ω (3R3) on and off with Dynamotor
4	Ground this Pin to start Dynamotor	
5	+6, -500V & Ground	+12 V, -500V & Ground
6	6Ω in series with -6V	6Ω in series with -12V
7	-6 V. continuously	5.45Ω in series with -12 V. continuously
8	+500 V.	+500 V.

Fig. 4. PE-103 dynamotor plug connections and circuit diagrams.



Top view of the completed r.f. unit.

modulator plate current which is necessary when tuning up. The voltage divider for the exciter stages, as well as the final screen dropping resistor, are also included in the modulator unit.

Shock Mounting

A standard SCR-274 double transmitter shock-mounted rack is utilized to hold the two units in place either for mobile or fixed station use. A power connector plug is mounted on this rack or one of those already there may be used to make connections to additional racks. The PE-103 dynamotor connects to the modulator chassis. Fig. 4 gives the circuit and output plug connections for the PE-103.

Wire the plugs on the rack into which the transmitter and modulator plug in parallel; that is, pin 1 to pin 1, pin 2 to pin 2, etc. Now make suitable connections between them and the plug that goes to the other rack. See Fig. 5. At the dynamotor, the wiring must be arranged so that the filament voltage is switched on simultaneously with the primary to the dynamotor if other than a PE-103 is used. A switch at the modulator turns the filaments on continuously when using the low frequency units to be described later.

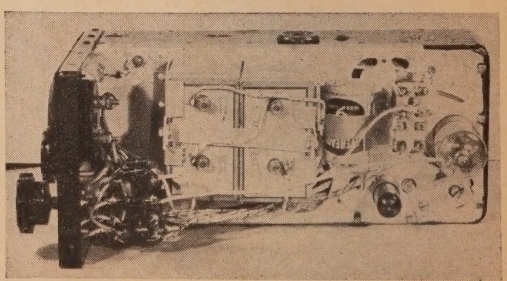
The switches shown in Figure 5 are mounted on the rear of the racks and are for breaking the filaments and plus 250V on the units that may be plugged into the additional racks, but which are not in use at the moment. This feature allows the operator to have up to three racks all connected in parallel, with five transmitters and a modulator plugged in. Any transmitter may be put in operation simply by turning filaments and plus 250V on. The others remain inoperative because their filaments are off. The plus 250V switch prevents all the unused OA-2 voltage regulators from igniting and drawing current.

PE-103 Dynamotor

Figure 4 gives the complete circuit diagram, copied out of the base of one of these units with some difficulty. It will be noted that the output power plug contains all the necessary voltages for operating the rig without any alterations. A S.P.D.T. toggle switch at the modulator selects pin #1 for 6 volt continuous heater operation for use with heater type tubes and pin #3 for 6 V intermittent filament operation for use with instant heating filament type tubes. Note that the + 6 volts is grounded while the —6 volts is above ground. Pin #3 is used to operate antenna relays because it is only energized when the send/receive relay #3E6 in the PE103 is operated.

The push to talk button on the mike, one side of which is grounded, connects to pin #4 to operate relay 3E6. The other contacts on relay #3E6 operate either the 6 volt or 12 volt dynamotor starting relays depending on the position of the 5PDT wafer switch at the top of the diagram. This circuit will be broken if either the H.V. or L.V. circuit breakers, #3E3 and #3E4, kick out due to an overload or short. #3E3, #3E4 and #3E5 are the three big switches behind the door on the side of the PE103 base, #3E5 is the primary circuit breaker.

For six volt operation, the S.P.D.T. wafer



The modulator. Batteries are for mike and bias.

switch, located under the cap on the top of the base next to the output connector, must be turned with a screw-driver to the six volt position. If it is desired to cut down on battery current, two six volt batteries may be used in the car; however, in this event, resistor 3R3, two ohms, must be shorted out and the filaments of all the tubes in the transmitters must be put in series-parallel for 12 volt operation. In addition, 12 volt antenna relays must be used. In the two low frequency conversions, the original 1625's and 1626's may be retained by wiring their heaters in parallel as they are 12 volt tubes. The PE103 wafer switch is now set for 12 volt operation. The filament/heater switch in the modulator unit referred to above is wired between pins #2 and #3 instead of #1 and #3.

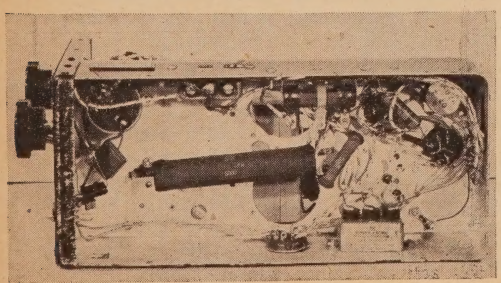
If trouble is experienced with the H.V. circuit breaker #3E3 kicking out too easily, it may be corrected by soldering a 10 ohm 1 watt resistor in parallel with the coil. This will increase its current handling ability, but will still allow it to kick out on a H.V. short circuit.

The two dynamotor diagrams at the bottom of Figure 4 are two different combinations that you may find in the PE103.

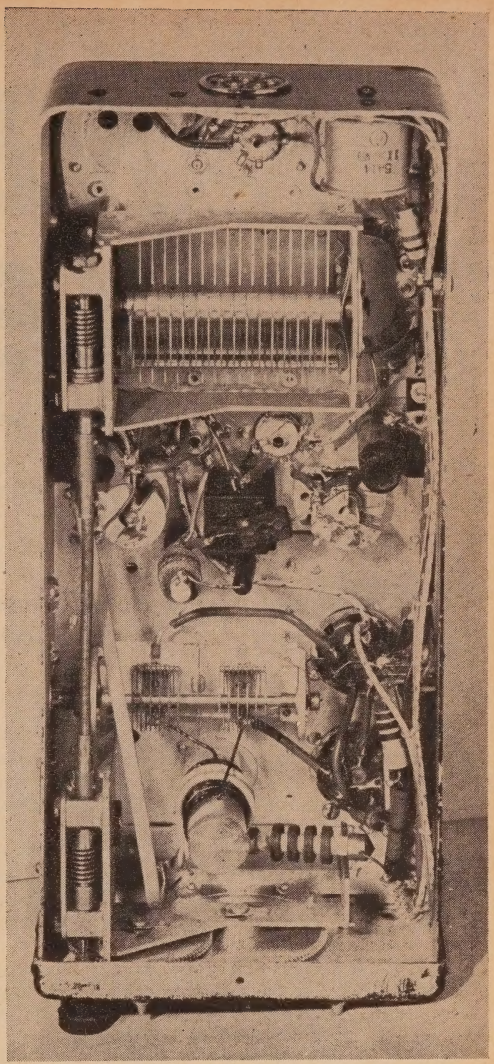
Tuning Up

The first step is to recalibrate the v.f.o. section. The dial is given a coat of Automobile Touch-up Black paint to cover the old calibrations and is then marked with a pencil and later the new calibrations are painted white with a fine pointed paint brush. The frequency lettering may be put on with "decals" if desired. With all the tubes removed except the oscillator, 250V is applied and the oscillator is adjusted until the frequency coverage is about right. Next, all the tubes are replaced in their sockets and the coils are tuned up with a grid dipper to their proper frequencies. Now, with the final plate and screen voltage temporarily disconnected, the plus 250 is again applied and the 2E30's are tuned for maximum final grid current. With the transmitter operating in this condition, the main v.f.o. dial should be calibrated directly in output frequency so that you will not have to carry a slide rule to calculate your frequency each time you QSY.

You will find that you can move around in the band quite a lot without retuning the two 2E30's, especially if you stagger-tune them a bit. It is perfectly possible to put in band-pass couplers if desired; however, they will not be covered in this article.



Bottom view of the modulator unit.



Bottom side of the converted r.f. chassis.

The unit under test should now be plugged into the dual rack alongside the modulator and the whole works turned on. An antenna or dummy load should be connected to the antenna coax connector so that the final can be loaded up to the rated plate current. The clamp tube bias is adjusted to approximately -25V, and the screen dropping resistor is adjusted until the screen voltage on the 5516's is about 150 volts. When modulation is applied, this voltage will swing up and down at audio frequency. Adjust the antenna coupling or loading until a flashlight bulb coupled to the tank brightens up when modulation is applied. Table 2 gives operating voltages and currents for the transmitter.

(Continued on page 44)



J. C. DRUMM, W3MXF*

A behind-the-scenes story of the part played by amateur radio during the "bombing" of Camden, N. J.

AT FOUR MINUTES PAST NOON, a group of children skated happily on the ice that covered the lake in Johnson Park. Nearby, mid-city stores were filled with Saturday shoppers. Eight lanes of traffic flowed endlessly across the Delaware River Bridge, past the brick buildings that housed the RCA plant. Camden, N.J., on the 13th of January, 1951, was going about its usual business of being one of America's large industrial centers.

But that was at *four* minutes past noon.

At 12:05, fire sirens throughout the city screamed for ten unbroken seconds, were silent for five, then screamed again, RED ALERT! Enemy aircraft within striking distance!

At 12:13, seven "bombers" roared by, 1500 feet overhead, and a simulated bomb crashed into Johnson Park. Where the children had been playing, suddenly there was (theoretically) nothing but a muddy bomb crater. Just as suddenly, one of the RCA buildings became a theoretical mass of theoretically flaming rubble.

Camden, the first large industrial center to subject itself to mock air attack during the present emergency, had set up a problem in Civil Defense. The story of how that problem was solved is also a story of amateur radio in action.

Thirteen minutes before the Red Alert, two amateur net control stations had already gone on the air, alerting their mobile nets. Twenty-one amateur mobile stations, operating in automobiles, had been dispatched to pre-arranged areas: One each to Camden's three hospitals; one to the Red Cross Emergency Center; one to the Civil Air Patrol emergency flight strip; two to the central airport; others to the Civil Defense Control Center in City Hall. Four fixed stations in the suburbs had been alerted for net-control duty in case the City Hall stations should become disabled.

Widely scattered amateur mobile stations checked into an aircraft-spotting net; their reports enabled Civil Defense plotters at City Hall to keep track of approaching "bombers" (who were, in reality, CAP planes loaded with defense pamphlets instead of bombs).

At the instant when the bomb "exploded" in Johnson Park, all power and telephone facilities at City Hall were presumed to fail. One of the mobile stations cruised up to the building, was handed a field telephone connected to a hastily rigged emergency switchboard, and took over net control until the two regular stations were extricated from the "ruins" and placed on the air with emergency power supply. Operation was then continued as before, with radio carrying the full load of communications that had been shared previously with the now hypothetically defunct telephone system.

During the 50-minute "air raid", 210 "patients" were removed to hospitals; 250 "homeless evacuees" were given shelter at Garden State race track; CAP planes were dispatched by the Red Cross, and returned with blood plasma and other medical supplies; every piece of fire-fighting equipment in the city was at work in the "bombed" area. It required hundreds of messages to coordinate all this activity. Police, fire-department, and taxi-cab radio systems were tied into the communications system, to replace the "disabled" telephones. So

* *213 Morgan Avenue, Collingswood, N. J.*

were the local broadcast stations. But an essential part of this work was done by 27 amateur stations, operating on 10 and 2 meters.

That much of the Camden Story has appeared in newspapers and magazines and on the air. This article was written, not to repeat what has already been said, but to show what happened behind the scenes. There is no question that the amateurs did a good job—it was so good that it won official commendation. But the operation was not all beer and skittles. Things that should not have happened, did: Critical equipment broke down; certain types of 2-meter mobile antennas proved themselves woefully inefficient; dead spots and shadows threatened to wipe out communications with one of the hospitals and with certain areas at the airport; and the fallacy of trying to operate a mobile net without a single net frequency was forcefully demonstrated. This article is intended to warn other amateur groups of the difficulties they can expect when they undertake emergency-communications work. It proposes to show how these difficulties can be overcome, and how a smoothly working ham organization might save thousands of American lives when, where, and if the bombs should ever contain something more lethal than paper.

First, let us take a look at the way in which the two Camden nets were set up. The NCS of the 10-meter net used an input power of 30 watts and against a grounded metal plate two feet square. The 2-meter NCS had a power input of 100 watts to a vertical folded dipole. Both stations were located on the sixth floor of City Hall, and operated under the call K2AA (the club call of the South Jersey Radio Association). Thirty watts was found to be ample on 10 meters, and 100 watts was more than was needed on 2 meters.

Ten mobiles on 29.56 mc had an average power of 20 watts, which also proved quite adequate. The eleven mobile stations on 2 meters had an average power of 4 watts, which definitely was not enough.

The four suburban stations, located outside the anticipated bomb area, used higher power in order to reach mobiles that might range as far as 20 miles from these standby net control stations; the 10-meter suburban stations used 200 watts each, while those on 2 meters had inputs of 100 watts.

During the 50-minute practice period, several weaknesses were discovered in the amateur setup. In the approximate order of their importance, these were as follows:

1. Lack of emergency power supply.

Failure of all power lines would not have affected the mobile stations. They all operated from 6-volt storage batteries; in case of actual emergency, special police officers could commandeer batteries from parked cars to furnish any additional power needed. But the net control stations would have been put off the air completely by a power failure. This fact has been pointed out to Civil Defense authorities, and plans are under way to obtain portable gasoline-driven power units for use by NC stations in future emergencies.

2. Lack of a properly organized message center.

Within the first five minutes of the test, it became evident that a message center was needed worse than anything else, except emergency power. The net-control operators, in addition to running their nets, were called upon to answer telephones, take down messages for transmission, answer questions, and flag down passing couriers to deliver received messages. Sometimes, they were even required to leave the operating position in order to deliver a message themselves. This left the net to shift for itself for five minutes at a time, under the supervision of a suburban net-control station that was miles removed from the Civil Defense center. A situation like this could never be tolerated



The operating position for the 10-meter net control station, K2AA, is shown. The two-meter station is not visible here. The people in this shot are: Foreground, with mike, W2SDO, Tony Maugeri; Behind him, W2GQO, Bob Young; Standing, left to right: Lloyd Gainey, W2UCV, Camden County ARRL Emergency Coordinator; R. W. Pearson, Deputy Director in Charge of Communications, Camden CD; George A. Brunner, Mayor of Camden, N. J.; and Harold B. Curriden (Deceased), Director of Civil Defense for Camden County.

(Courtesy Philadelphia Evening Bulletin)

in a real emergency. After a while, a detachment of Boy Scout and Girl Scout couriers was assigned to the NCS, but there was still no mature personnel other than the operators who could be responsible for routing of the messages.

A solution for this problem has been undertaken by Emergency Coordinator Lloyd Gainey, W2UCV. He is organizing a ladies' auxiliary, made up of the XYLs of his net members. The girls are being trained in the reception of messages by telephone, the proper method of recording them for radio transmission, and the delivery of received messages by courier. This is intended to free the NC operators for their vital job of controlling the mobile nets.

3. Operation of the 2-meter net without a specific net frequency.

While the 10-meter mobile net was operating smoothly on 29.56 mc, the 2-meter net got off to a bad start. The original call-up showed a number of stations missing. Their absence was explained when other mobiles began reporting, "W2—is calling you. He's up around 146.6 mc," and "Somebody's calling you on 144.5. I didn't get his call." Gradually, the 2-meter NC operator got everybody logged, but had to rely upon stand-by stations to listen for the off-frequency members of his net. This situation is being remedied by obtaining crystals that will put all stations on the same frequency.

4. Inefficient 2-meter antennas and equipment.

Many of the 2-meter rigs, with their BC whips, J-section whips, and the usual assortment of 2-meter car antennas, experienced difficulties during the test. W2PAU, who kept an analytical eye on the proceedings, sums it up this way:

"The 2-meter receivers, because of their wider bandwidth, had about four times as much noise as the average 10-meter receiver. The car transmitters on 2 had only about one-fifth as much power as those on 10. This combination put the 2-meter gang at a 19-db disadvantage.

"I think the answer lies partly in more elaborate mobile antennas on 2. Some kind of colinear arrangement would be an improvement; a small beam would be even better. Given an antenna gain of 6 db, plus narrower receiver bandwidth (good for another 6 db improvement), plus 3 db or so due to increased power in the 2-meter transmitters, and 2 meters would be back in business on an equal footing with 10—and without the danger of being swamped by out-of-town QRM in case of a sudden band opening.

"There is absolutely nothing wrong with the 2-meter band. The trouble lies in the inferior equipment we have been trying to use there. I think any group of hams planning emergency communications should count upon using 2 meters right along with 10 for their mobile nets."

5. Lack of a second operator in each car.

The operators of mobile stations frequently found themselves in a most unenviable position, unless they had a second operator in the car. A typical occurrence was as follows: A one-man station was fighting its way through heavy traffic, about to attempt a left-hand turn, when the loudspeaker announced, "W2—— from K2AA. Message." With one hand on the wheel and the other groping blindly for microphone and switches, the operator managed to stall off the message, (and, incidentally, to hold up the net) until he could get out of traffic and park the car. Then it developed that the message had to be delivered to a physician at one of the hospitals. Upon arrival at the hospital, there were no couriers in sight; W2—— had to sign himself out of the net, leave his car, and spend 15 minutes tracking down the addressee.

After net members had compared notes, it was decided unanimously that, hereafter, two operators would be assigned to each car; one to drive and to stand by the radio while parked, the other to operate while in motion and to deliver messages when necessary.

6. Equipment failures.

In the midst of the test, one of the NCS receivers went dead. Fortunately, a spare was available. In fact, a complete stand-by station (transmitter, receiver, mike and phones) had been provided for each of the two City-Hall stations. This is obviously impossible in the case of mobile stations— if one of them quits, nothing short of on-the-spot repair will do any good. However, weekly drills are being held by both mobile nets. In this way, operators usually have advance notice of impending breakdowns. In addition, it is strongly recommended that mobile-station owners make frequent check-ups by testing all tubes, inspecting power supplies, looking carefully for loose connections, and the like. This is a lot of trouble, but in emergency work it ceases to be a question of merely losing a QSO; it may become a matter of life or death—perhaps your own.

7. Dead spots and shadows.

Two-meter mobiles, especially, were plagued by dead spots and radio shadows that frequently made it difficult to raise the NCS. Sometimes, moving the car a short distance corrected the trouble; at other times, a whole area appeared to be completely dead. To make matters worse, large dead areas were discovered near Our Lady of Lourdes Hospital, and in the vicinity of important hangars at the airport— points that definitely had to be covered by mobile stations.

It has been recommended to Civil Defense authorities that they erect permanent 10-meter and 2-meter antennas on top of buildings in unfavorable areas. Each antenna would have a feed line terminating in a standard plug, mounted in a weatherproof box at street level. In cases of emergency, and for test purposes, mobile stations could drive up to the terminal boxes, plug in their antenna cables, and at once be provided with antennas located well out of the shadow area.

It has been suggested, also, that the net members devote a weekend to making a "radio map" of the city, showing the exact location of areas where operation is difficult or impossible. With a fixed station in continuous operation at the proposed NCS site, and with several cars driving system-

(Continued on page 51)

A Lattice Boom for 14 mc Antennas

W. I. Orr, W6SAI* and L. Abrahams, W6FHR**

When a top-notch aircraft stress engineer and a hot shot DX man team up on an antenna design, you can look for something super. The strength of this lightweight boom has been demonstrated by supporting the ends on sawhorses and having three husky W6's sit in the center and bounce up and down!

THE TREND IS TOWARDS BIGGER AND BETTER 14 mc beam antennas. Many beams have been constructed along the lines recommended by W6SAI[1]. This antenna is very satisfactory for the average installation. However, additional problems of ice and wind loading arise in severe climates. It was felt that a stronger structure could be devised that would be self-supporting, on the order of a trussed bridge. With careful choice of materials, this new design would not weigh any more than the present design, nor have appreciably greater wind resistance. It should be guyless, eliminating these ice-collectors, and it would be able to support many times the weight of the elements. A boom of this type would be a distinct advantage in windy, wintry climates. It would provide the ultimate in strength and safety.

A preliminary design was established and two experimental booms were constructed. The object of this paper is to describe the engineering and construction of this type of structure, so it may easily be duplicated by others.

* *555 Crestline Dr., Los Angeles 49, Calif.*
** *11339 Gladwin St., Los Angeles 49, Calif.*

General Design

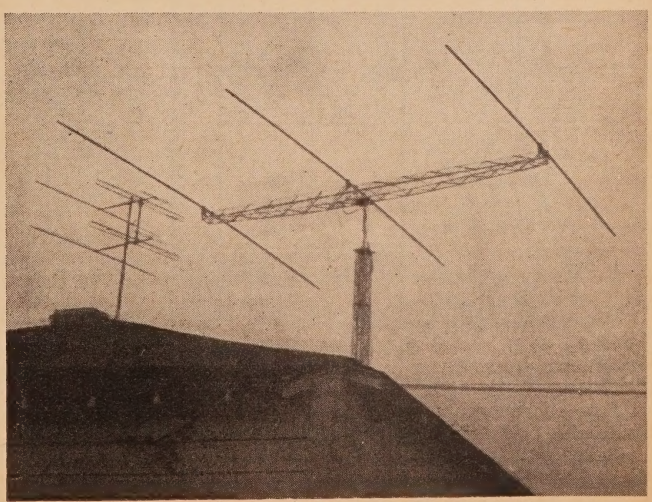
The trussed boom is twenty-four feet long. This allows fourteen feet director-to-antenna spacing and ten feet reflector-to-antenna spacing. This spacing provides the maximum gain for the overall length of the boom. The overall weight of the boom is 44 pounds, compared to 37 pounds for the "plumber's delight" type of boom, including crossarms and guys. The element cross arm supports, as well as the guys which are needed on the "plumber's delight" are eliminated. This means the two types of construction are comparable in weight.

The longerons are made of four twenty-four-foot sections of 1" x 1" x .125" 61ST dural angle stock. An additional 160 feet of ½" x ¾" x .040" stock is needed for lacing material.

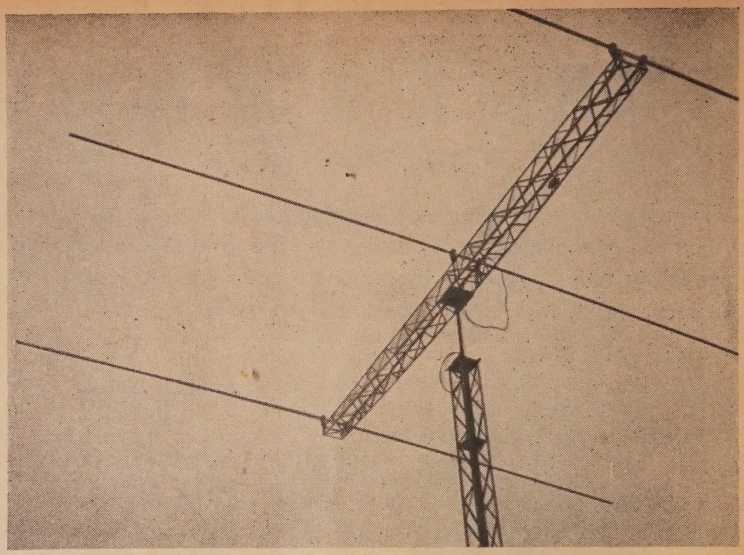
This angle stock may be clear or primed material. It should not be anodized, as this finish has a very high surface resistance. The elements are clamped to the boom by means of special micarta clamps. (Fig. 1) The cost of new material for the boom is approximately $25.00. Surplus material should cut this cost figure appreciably.

The 61ST material for the boom and elements was selected for two reasons:

1 "Building A Wide Spaced Twenty Meter Rotary Beam." April, 1950 "CQ", page 11.



Big Brother and Little Brother at W6FHR.



A close-up of the lattice boom at W6FHR.

1. It is cheaper than 24ST.
2. It is more corrosion resistant than 24ST.

Along this line, if one purchases surplus material, one should not accept any material in the soft or "O" condition. At this temper the material is highly susceptible to corrosion and should be avoided even if it has sufficient strength. The 61ST material has good corrosion properties and though about 15% lower in strength than 24ST, the element deflection will be the same. Contrary to general belief, equal sizes of tubing or stock angle will deflect the same amount regardless whether it is made of soft or hard stock. Deflection is purely a function of the size and load on the part, and of the modulus of elasticity of the material. These factors are practically the same for a given type of material regardless of its strength.

The boom has a cross-sectional area of 12" x 12" at the center, tapering to 12" x 6" at each end. (Fig. 2)

The boom may be fabricated with either 1/8" aluminum aircraft type rivets or 3/16" A-N type bolts. If an airgun is not available for driving the rivets, a hammer and a rivet set will work satisfactorily providing care is taken not to damage the surrounding structure. If bolts are used, even greater care must be exercised in maintaining proper edge distance than if rivets are employed.

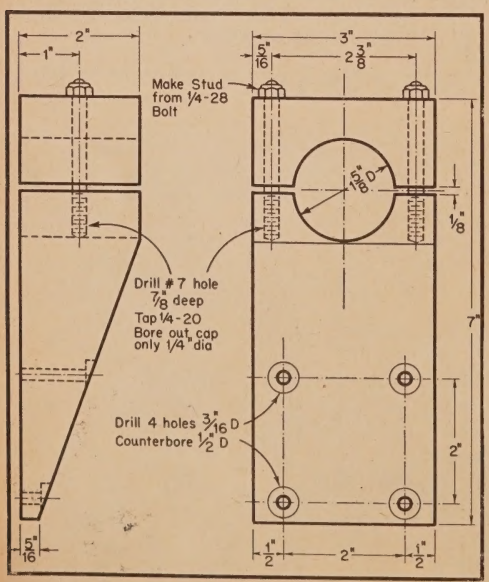


Fig. 1. Mechanical details of the micarta clamps used to hold the beam elements.

Construction

The two sides of the boom are constructed first. The material should be laid out in a flat driveway or on a sidewalk. A top longeron is clamped to a 2" x 4" piece of wood 24' long to stiffen it and keep it straight. The two blocks of wood 11¾" long are then spaced between the longeron and a bottom longeron. These blocks are spaced one foot on each side of the physical center of the longeron.

The ends of the bottom longeron are now brought up to within 6 inches of the top longeron. Two pieces of stock 5½" long are cut and clamped to hold the ends in place. If both ends of the bottom longeron are brought up to the top longern simultaneously, the natural bend of the material will be the same on both sides of the center. (A goodly supply of "C" clamps on hand will do much to speed production work.)

It is best to start at the center of the boom and work towards the ends, since in this way any build-up in tolerances will be cut in half, and a more symmetrical structure will result.

The first pair of laces is started at the center of the top longeron. The lacing is cut square on the ends so as to be at right angles at each top joint.

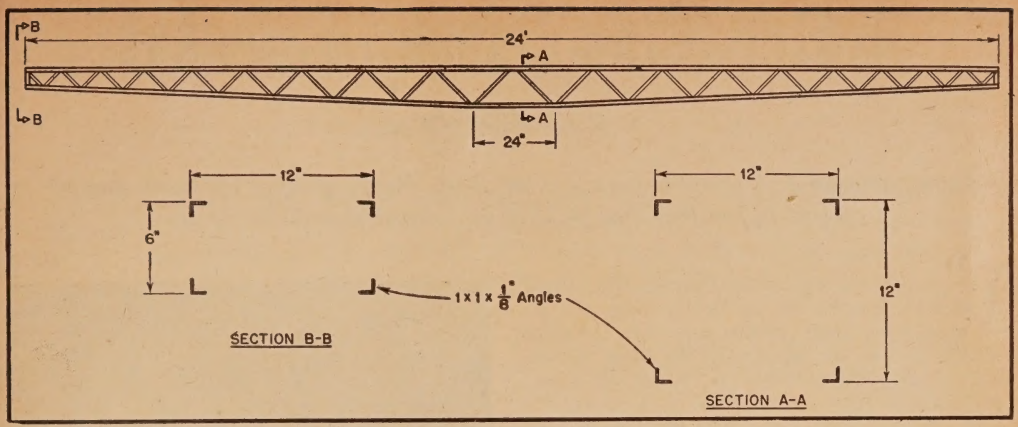


Fig. 2. Dimensions of the tapering boom structure.

(Fig. 3) It is best to cut the lacing as one progresses along the tapered sides, although four of each length may be cut at once so as to make up the opposite side. The work should progress towards each end simultaneously, and the tolerance build-up can be compensated for as the ends are approached. Care should be exercised in drilling the joint holes for the rivets or bolts to make sure that adequate material is left at the edge of the hole.

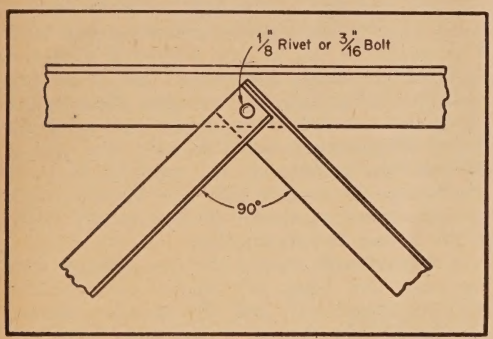


Fig. 3. Details of a typical lacing joint.

After the two side members are made, they are stood on edge with the top side down to provide a flat edge and are spaced 12" apart by means of wood blocks and "C" clamps. They are clamped into position and squared up with a carpenter's square. The top and bottom lacing is cut and installed. In the case of this lacing, it may all be cut at once. Again, it is recommended that work progress from the center of the boom towards the ends. If the 90° lacing angle is maintained, little or no interference with the previously made side joints will result. Slight irregularities or warps in the boom will easily be compensated for by the element mounts; so if these problems occur, just ignore them!

Painting

Now the boom is completed, and is sitting on two sawhorses in all its glory! The next step is to paint it. The best protective coat consists of a first coat of zinc-chromate primer and a second coat of flat gray enamel.

A simpler paint job consists of one coat of aluminum paint. In moderate climates, this will last for a year or so. Under no circumstances should the boom be used without a protective coating of paint.

We sincerely recommend that a spray gun be used for this job, as there are many nooks and crevices that must be reached which cannot be touched with a brush.

Mounting

A suitable mounting attachment must be devised to connect the boom to the vertical rotating pipe and thrust bearing. The boom should be attached so as to permit it to be tilted to a vertical position. In this way the boom may be raised into position and the elements attached to it at a later date,

(Continued on page 51)

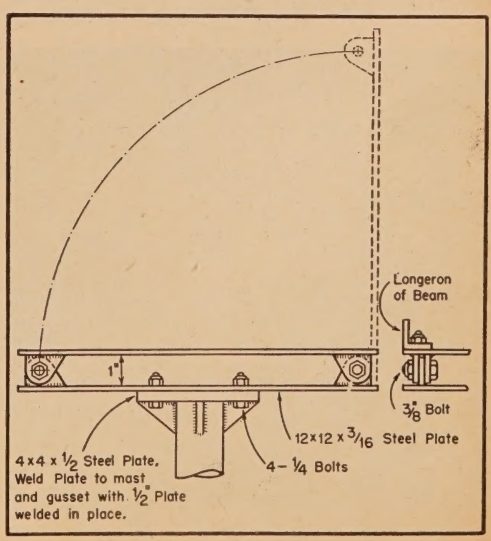


Fig. 4. The tilting method used by the writers.

Water Tank Dummy Antennas

G. K. HICKIN, W2OUT*

A dummy antenna is an essential item in every shack. Here's another approach, possibly inspired by the fact that W2OUT is a chemical engineer by day.

IN SEARCHING FOR a satisfactory—but cheap, dummy antenna for use in his shack, the author read some recent and very excellent articles [1], [2] on the subject. In the latter treatise, Lighthouse Larry mentioned a "tub of salt water" as a possible load, but neglected to point out any pros and cons concerning such an unusual electronic component. Obviously it should be covered lest visiting fireman drink or bathe in it—and it might spill or freeze, but what is the situation electrically speaking? Probably the subject was thoroughly explored in the dim past of amateur experience but any data on it, good or bad, was unknown to the writer. Accordingly, he set out to learn something and was delighted to find that a practical RF tub could be devised. As a result there is a new piece of equipment in the W2OUT shack. Careful! Don't step in that water!

The first attempt at construction quickly showed that the tub should be made of wood. A 10 quart pail (metal) was filled with water, some salt added to lower the resistance, and the capacity from the pail to the center electrode was measured. Water is a good dielectric so, with a center electrode of ¼" copper only immersed a ¼", the capacity was found to be in the order of a few hundred uufd. This might be fine if you wanted a condenser (did the old timers use them?) but it scarcely resembled a non-inductive resistor. Nevertheless, r.f. power was fed to the thing, whereupon the second disadvantage reared its ugly head. All of the heat was produced in the top layer of water which came to a quick boil. The several pounds of water meant to absorb the heat merely sulked in the bottom and stayed cool.

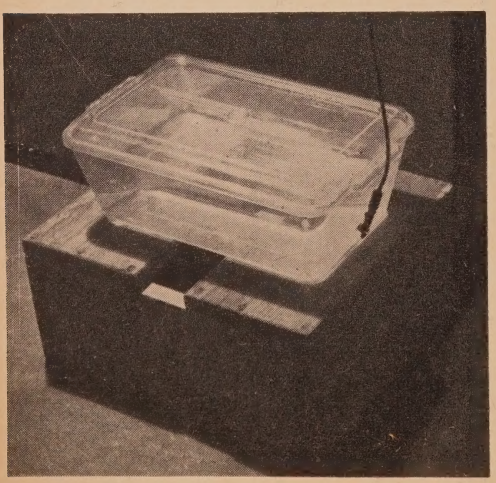
A little thought showed that two changes were necessary, they being (a) Smaller electrode area to lower the capacity and (b) agitation, thermal or otherwise, so that all of the water would get a little warm. The problem was easily solved with plastics (not available in the old days). For $1.50 the local hardware parted with a rectangular Styron tank marked "Voges Item No. V124." It measured 6" x 10" on the bottom and flared to 7⅞" x 11¾" on the top, was 4" deep and had a cover (for the visiting firemen). Filled to 3½" depth, the tank holds about 9½ lbs of water. Two holes for the electrodes were drilled 1" up from the bottom in the center of the narrow side with a #28 drill. Thus the electrodes were 10" apart, and when using 6/32 brass machine screws the capacity was found to be 12 uufd, a value low enough to be negligible for low impedence dummy loads. The screws were inserted from the inside with a thin sheet rubber gasket between the screw head and the tank. A lock washer, flat washer and nut on the outside tightened the assembly and prevented leakage.

(Continued on page 50)

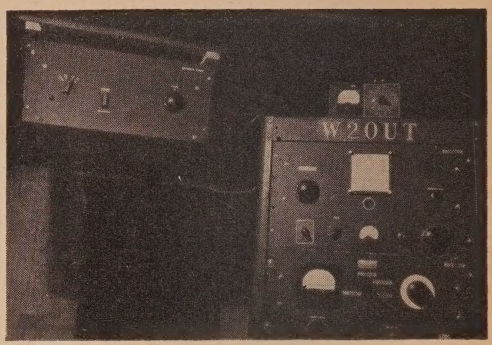
1 "Power & Resistance Ratings of Incandescent Light Bulbs," CQ, Jan. 1951, p. 30

2 Technical Tidbits, Ham News, Jan., Feb. 1951, page 6, Lighthouse Larry

* *50-13 Oceania Street, Bayside, New York*



W2OUT's inexpensive high power dummy load.



When in use, the dummy is placed on a shelf beneath the antenna tuner, to keep r.f. leads short. W2OUT's rig is completely bandswitched, including a home-made multi-band tank in the 300 watt final.

NAVAL RESERVE and the HAM

CAPT. R. R. HAY, U.S.N.*

This article describes a Naval Reserve Electronics Unit. There are approximately 500 such units throughout the United States. Many of them operate amateur radio stations under the familiar "K" calls (K1NR, K6NRA, K9NAC, etc.). More than 1000 licensed amateurs are associated with the Naval Reserve Electronics Program.

ON THE EVENING OF MARCH 6, 1947, five Naval Reserve Officers met with Commander Harvey Wahl, USNR (WØHED), a representative of the Commandant Ninth Naval District, at the U. S. O. building in Waukegan, Ill., to discuss the possibility of organizing a Naval Reserve Volunteer Electronics Company. The group agreed that there was a definite need for such an organization to provide training for reservists who held such highly technical rates as electronics technician, radioman, sonarman and radarman and to keep them abreast of advances in the electronics field. It also was recognized that such an organization could provide basic electronics training to new Reservists. The assembled officers were enthusiastic and offered their full support. From this small beginning evolved one of the country's outstanding Naval Reserve Electronics Units.

Commander G. L. Tucker USNR (W9HF) received orders from the Commandant Ninth Naval District on March 10, 1947, to organize Volunteer Electronics Company 9-186 and was appointed its Commanding Officer. Commander Tucker, with the assistance of four other reserve officers, worked hard to find quarters for the organization and to fill its complement. The basement of the old Post Office Building at 325 West Washington St., Waukegan, was selected as suitable quarters. Newspaper announcements, radio news broadcasts, direct contact with veteran reservists and general recruiting were the tactics used in obtaining men to fill the compliment.

There was a great deal of work involvled in implementing the company. First the quarters had to be made into class rooms, tool rooms, radio shack, etc. These rooms had to be decorated and equipment installed. This was all accomplished by the men who joined the company and cooperated enthusiastically, giving up evenings and weekends to complete the facilities. Meetings are now held every Tuesday evening from 1730 to 2200.

On May 23, 1947, Commander Tucker was detached as Commanding Officer to go on active duty at Ninth Naval District Headquarters. Lieutenant Commander R. C. Nickel, USNR, assumed command at that time.

A training program has been established to train seamen, radiomen, radarmen, electronics technicians, quartermasters and yeomen. The results of the training program can best be exemplified by the success of the communications instruction. The radio operators continue to remain in the

* *Naval Communications Divn., Office of the Chief of Naval Operations, Washington 25, D. C.*



Operating position at K9NAC, Naval Reserve Electronics Company, Waukegan, Illinois. Left to Right: W. B. Glasel, RMNC; G. E. Hamer, RMN3 (W9KXX); D. G. Kauffman, RMN2; O. C. Kuberski, RMN3 (W90SV).



Combat Information Center (CIC) Instruction at Naval Reserve Electronics Company, Waukegan, Illinois. Left to Right: C. R. Zewe, SA; J. V. Clayburn, SA; W. Howard, SN; Lcdr. R. C. Nickel, Commanding Officer; E. F. Vollmer, SA; H. R. Nehls, SN.

top bracket of the District radio network each week. Members who are also amateur radio operators have participated in various amateur contests, climaxing their excellent performance by placing first in the Ninth Naval District and seventh in the U.S. in the 1950 Armed Forces Day QSO Contest. The men training for radarman have been responsible for working maneuvering board problems each week. The annual District inspection for 1950 resulted in an above-average rating. Another example of the effectiveness of the company's training program may be seen in the service record of R. E. DeLance, SA, USNR, who upon his return from the Pt. Barrows training cruise in 1949 had entered in his service record by the commanding officer of his ship a statement that "although this man is only rated as a seaman recruit he is found to be fully qualified as a seaman."

Combat Information Center (CIC) equipment has been installed. The first problem was set up and carried through on October 31, 1950. All members of the Company are to be trained in this field. One problem is worked at each meeting before continuing with the regular course of study. Those men in training for radarman rates are in charge of the CIC program. Electronics Company 9-186 was the first volunteer company in the Ninth Naval District to have CIC equipment installed and a training program inaugurated.

The Company has an amateur radio station—K9NAC—and is working closely with the Lake County Amateur Radio Club. Some local radio amateurs have become Naval Reservists and some Naval Reservists have become "hams." J. F. Payne, W8SWH, C. J. Halteman, W9CGY, O. C. Kuberski, W9OSV, and A. J. Hoover, W9GCJ, are hams who have joined the Naval Reserve. A. G. Impson, W9LFM, and G. E. Hamer, W9KXX, are reservists who have earned their amateur radio operators' license through training received in the Naval Reserve. V. R. Abele, W9VUD, is both an old-time ham and Naval Reservist.

The roster of personnel is as follows:

LCdr. R. C. Nickel, Commanding Officer
Lt. G. F. Funk, Executive Officer

V. R. Abele, RMC (W9VUD)
W. B. Glasel, RMC
A. G. Impson CCM (W9LFM)
B. E. Nordmark, SKGC
J. F. Payne, ATC (W8SWH)
D. A. Bell, SA
J. V. Clayburn, SA
R. E. DeLance, SA
C. J. Halteman, RM3 (W9CGY)
G. E. Hamer, RM3 (W9KXX)
A. J. Hoover, SA (W9GCJ)
W. Howard, SN
D. S. Kauffman (W) RM2
O. C. Kuberski, RM3 (W9OSV)
W. C. Messer, SN
H. R. Nehls, SN
E. F. Vollmer, SA
C. R. Zewe, SA
D. J. Klockow, SR
J. Nelson, SR

The personnel of the Waukegan Electronics Company are average every-day citizens who are interested in radio and electronics. The commanding officer, LCdr. R. C. Nickel, is a Social Science teacher at the Waukegan High School. Ten members of the unit are employed as civilians at the U.S. Navy Electronic Supply Office, Great Lakes, Ill. They are Lt. G. F. Funk, Management Control Division; O. C. Kuberski, RM3, C. J. Halteman, RM3, E. F. Vollmer, SA, J. F. Payne, ATC, H. R. Nehls, SN, R. E. DeLance, SA, G. E. Hamer, SA, and J. Nelson, SR, Technical Division; and D. J. Klockow, SR, Machine Records Division.

The company is proud of its one Wave, D. G. Kauffman, RMN2, an excellent radio operator. In civilian life she is employed in the message relay center at the Ninth Naval District Headquarters, Great Lakes, Ill.

A. G. Impson holds a carpenters rating (CCM), but don't let that fool you; he is a qualified radio operator, has a ham license and is studying to

(Continued on page 60)

AMATEUR COMMUNICATIONS and CIVIL DEFENSE

DANIEL J. SCHERER, W2NVH*

If your community is still in the early stages of planning its Civil Defense Communications organization, these observations by the Public Relations Director of New York's Civil Defense Amateur Radio System should be of value.

THERE ARE A NUMBER OF BASIC FACTS which should be established from the outset in a discussion such as this, if we, as amateurs trying to serve our communities, are to benefit. The first thing to remember is that there can be no rigid blueprint for civil defense communications. There is no master plan which can be applied to each and every community. True, there are and will be more federal, state and municipal directives, policy memos and the like. But, there must be sober consideration of any attempts to bind the hands of either the community or amateur service organizations in setting up civil defense communications. Naturally, some authority will define limits as has already been done in the case of frequency allotments. But, as has been demonstrated time and again, that American genius for getting a tough job done flourishes best in a climate of freedom.

The principles which we shall outline briefly are offered as guideposts, and not as a blueprint.

Initially, local amateurs must help determine the needs of their own community. An amateur service organization must have a goal. It is for the community officials to decide what they want in the way of an amateur contribution to civil defense communications. It is pointless to attempt to force amateur facilities down the throat of civic officials. There are, conceivably, many communities that have adequate communication plans and facilities. In the majority of communities, however, there will be a need for amateur services, generally to supplement existing facilities. The community may decide to parallel its facilities with an amateur service throughout, or it may choose to allocate certain communications functions entirely to the amateur. This is the concept of community need in the broadest sense. Naturally, one cannot hope to chronicle the needs of each and every town in a short article. Drawing upon the proposed plans for a city the size of New York, it becomes clear that the large community may call upon the amateur to provide service for specific arms of the civil defense machinery and to form a second line of defense behind the permanent services. This aspect, in New York City itself is being worked out through the standing organization of the Amateur Radio Emergency Corps. Their aim is to bring the metropolitan amateur right into the city's civil defense picture. This reference to AREC brings us to phase two of our stocktaking process, in which the question is asked—What have you got? Most communities can take advantage of the AREC organization. It can be supplemented with new recruits and by calling on the old WERS personnel who might inject some helpful notes into the planning processes. When adding up the assets, it might also be well to make a survey of available equipment.

The third step is to equate the needs and the assets. At the outset you may find that it is best

(Continued on page 46)

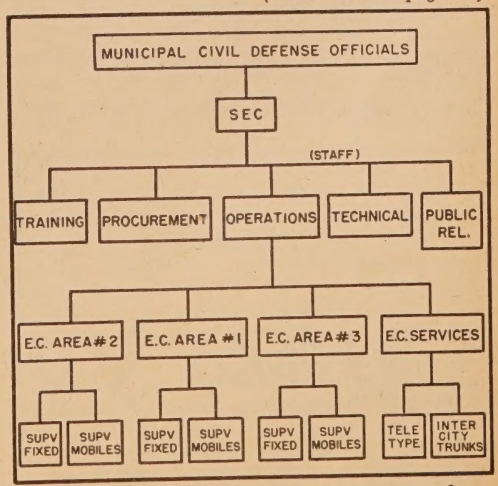
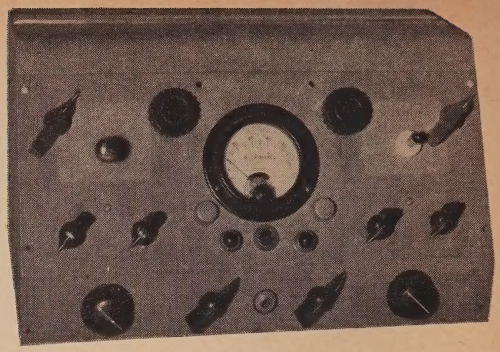


Diagram A, a suggested organizational setup for a large municipal area.

* *110-57 65th Ave., Forest Hills, N. Y.*

ZERO BANDWIDTH



DR. HECTOR NECTAR, KØOKU*

Maybe it's due to sunspots, or perhaps it's only the arrival of Spring—anyhow, its surprising how many wonderful inventions bloom in April.

UNTIL RECENTLY THERE HAS PERSISTED in the field of electronics a superstitious notion—an idea that somehow, in some manner, modulation is tied up with sidebands[1]. These theories will have it that since side frequencies are produced during modulation (because of non-linearity of the modulator), these sidebands are necessary to carry along the intelligence. Moreover, they will have us believe that the carrier plays no part in the transmission of intelligence at all! This is sheer nonsense. As anybody can see by inspecting any number of diagrams, or by looking at a modulation-monitoring oscilloscope, the envelope is seen to change in amplitude in accordance with the impressed modulation[2]. Not only do they say that the carrier needs port and starboard running lights, but there are no passengers on the ship!

1 Terman: **Radio Engineering** (3d Ed.): p. 468 f.

2 **Radio Amateur's Handbook**, 1949 ed., p. 257. p. 293.

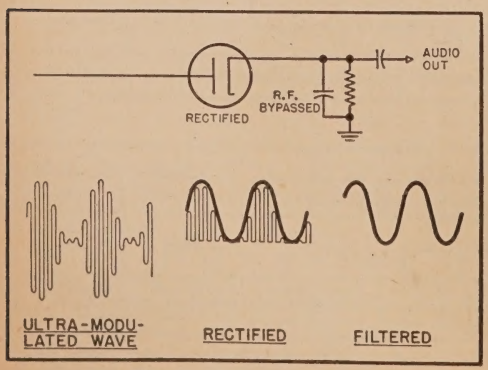


Fig. 1. So far, so good.

All of this is ridiculous and old-fashioned. It is apparent that modulation sidebands are really parasitic in nature, and being parasitics, they should be suppressed. As soon as we eliminate all sidebands, we will see the phone bands become uncluttered. The proponents of this classic notion cite vector diagrams, equations, etc. etc.—but have they ever tried it? In fact they have hinted at the right idea by introducing single-sideband operation: eliminating one of these spurious sidebands. They even overdisplay their zeal and eliminate the carrier, only to have to reinsert it by some tricky means in the receiver. It is surprising that SSSC should work at all! What they should have done is to eliminate *both* sidebands. Then they would have achieved real narrow-bandwidth operation, and the crowding of phone bands would be eliminated. In fact, with the sidebands removed, a carrier becomes theoretically *zero-bandwidth*, narrower even than c.w.

I shall call this new system of modulation Ultra-Modulation. To illustrate its operation, let us denote the old-fashioned system by X and Ultra-Modulation by Y.[3]

Then, let $x=y$

$x^2=y^2$

$x^2-y^2=0$

Factoring: $(x+y)\ (x-y)=0$

Solving: $x=-y\quad x=y$

$x=x$

$-y=y$

$0=2y$

Dividing both sides by Y:

$0=2$, Q.E.D.

Anyway, you can see that the old system of sideband modulation is now obsolete, and entirely

3 This is really a simplified derivation.

* *Roamin-in-the-Gloamin, Wyomin'*

obviated by Ultra-Modulation because it possesses even less bandwidth than c.w.

The detection of Ultra-Modulation is accomplished in exactly the same way as is ordinary AM. In fact there is no noticeable difference[4]. As shown in *Figure 1,* the incoming Ultra-Modulated wave presents a picture just as that of AM. It is first rectified in the detector, and then the r.f. component filtered out. Only the audio plus some d.c. is left, which is blocked out by the condenser (and used for a.v.c. operation). Thus we have detection of Ultra-Modulation—which is precisely the same as that of AM. No tricky beat oscillators have to be used. In fact, the crystal filter can be turned into its narrowest position without affecting speech quality.

Now that we have completely disproved the classical superstition that sidebands are necessary for the transmission of modulation, we shall proceed to discuss the means for generating Ultra-Modulation.

It is unfortunate that any non-linear circuit will produce sidebands. It is therefore necessary that we dispense with all frequency doublers, mixers, etc., after the Ultra-Modulated stage. It is required that we carry out all operation on the final frequency.

There are essentially two methods of generating Ultra-Modulated signals. The first is similar to

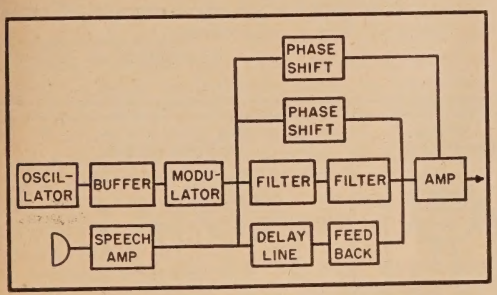


Fig. 2. Huh?

SSSC, and is accomplished by "brute force," by simply filtering out sidebands. For this it is necessary to employ three crystals. If, say 3900 kc. is the desired frequency, the three crystals are 3899.-995 kc., 3900.000 kc., 3900.005 kc. These tolerances are necessary to get proper operation. I am sure that any amateur with a knack for crystal grinding can accomplish this without too much difficulty. As an alternative to crystal-controlled operation, three gang tuned circuits may be employed, Reasonably high-Q coils must of course be used. In this system, the r.f wave produced by a crystal oscillator using the center-frequency crystal is AM-modulated in the usual sense, and the resulatant wave passed through a dual-crystal filter which is phased to eliminate both sidebands com-

4 Terman: Op. cit. p. 471.
Radio Amateur's Handbook, loc. cit.

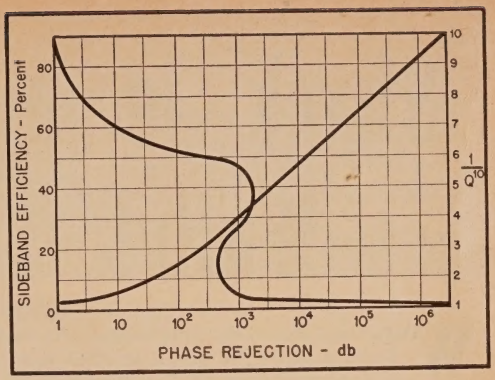


Fig. 3. The good (?) Doctor neglected to tell us what this one's for. We suspect he accidentally slipped us an oscillogram of one of his brain-waves.

pletely, and pass only the carrier. Following this is the usual set of linear amplifiers.

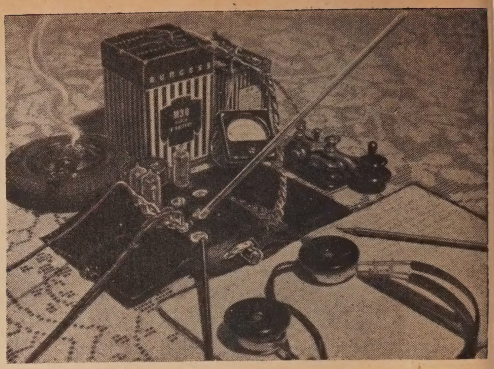
The other, more refined method of operation on U-M, is by a phasing method somewhat analogous to SSSC. Two modulators are used, one a linear AM modulator, and the other a balanced modulator which produces only sidebands. The outputs of the two are then added exactly 180° out of phase, canceling out the sidebands and leaving only the pure carrier to be amplified. The tolerances called for include an accuracy in the phase shifts of at least 0.05 degrees, carrier-suppression in the balanced modulator of 250 db., and exact matching of amplitudes. Naturally, the modulators must be linear devices. No doubt the necessary parts can be found in the average junk box; no trouble should be encountered.

The circuit in use at this station is a modification employing both methods. A block diagram for the system is shown in *Figure 2.* The photograph shows the control circuit for the first modulator. Notice the simplicity of adjustment.

On-the-air tests with Ultra-Modulation show its capabilities. After lining up the unit, we put it on the air and called CQ. No answers were forthcoming, although some people were heard to remark that "Some station seems to be testing his carrier on the frequency." Further investigation showed that the person was ourselves, but this reaction was no doubt due to the extreme narrowness of the signal, which phone men are not accustomed to. After some time, stations were raised, but they reported that the modulation seemed down. Again an illusion due to the narrow-band nature of U-M. Some people commented that it showed just like single-sideband-with-carrier. A little investigation showed that one of the sideband filters had shorted out. However further tests are being conducted. The results of these, as well as circuits, will be published in a future article.

Ultra-Modulation opens a new era in radio. It is the most progressive thing since the invention of the audion. Chalk up another victory for amateur radio!

Shack in a Wallet

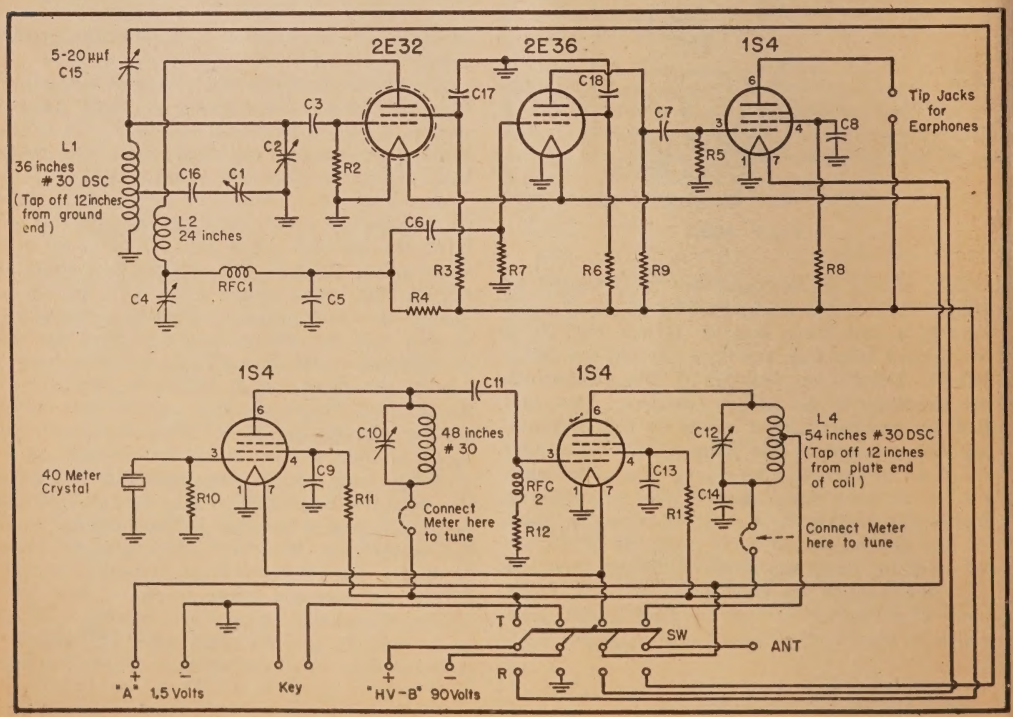


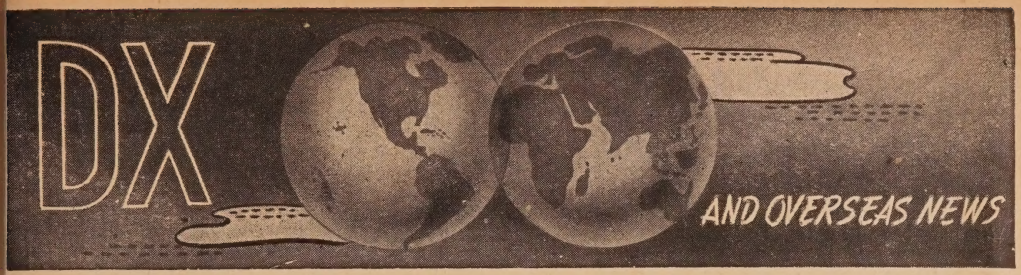
WE'VE SEEN RIGS BUILT INTO EVERYTHING from boxes to books, but here is a topper in novel construction. It's a 1 watt crystal controlled transmitter with a regenerative receiver, both built into a *billfold!* W1KWU built it and says it not only works dx but it solves the problem of what to do with the wallet he got for Christmas. The editor didn't get a chance to try it out, but the idea of this rig is cute and rates telling about.

If you'd like to do a similar construction, you'd best take the measurements of your own wallet and, following W1KWU's experiences, use some mechanical ingenuity. The tubes and all components are mounted on a strip of masonite board which then serves as the chassis. Figure 1 gives you a good idea of the layout. Figure 2 is the schematic wiring diagram. The 2E32 and the 2E36 tubes are the sub-miniature type. They can be soldered directly to their associated components and laid flat to take up a minimum of space. The three 1S4 tubes require 7-pin sockets and are too big to be mounted flat. When putting the "station" away, or moving it to a new location, W1KWU removes the 1S4 tubes.

When the chassis board and its components have been fully assembled and wired according to Figure 2, it is inserted into one section of the billfold. Openings are cut into the leather for the three 1S4 tubes. Smaller holes are cut for access to C2 (main receiver tuning), C1 (bandspread tuning), C4 (regeneration control), C10 (transmitter oscillator tuning), C10 (transmitter output tuning). A slit is made so that SW, a flat type 4PDT key switch, protrudes. This is the transmit-receive switch. A polystyrene alignment screwdriver serves to reach all tuning adjustments.

(Continued on page 46)





Conducted by HERB BECKER, W6QD*

THIS MONTH WE HAVE BUT ONE DX man being awarded a WAZ certificate. Although lacking in quantity we are *not* shy of quality, and are very happy to announce and congratulate WØNUC on achieving WAZ.

255 **WØNUC** Leo E. Olney 40—218

A New One—Saarland

The addition of Saarland to the official country list is probably not too much of a surprise to most of you, as there are a number of legally licensed amateurs now operating in the country. The effective date is November 8, 1947, since that is when the constitution of the autonomous state was adopted. Obviously, any QSO's made on or after this date can be sent in to us for credit.

Amsterdam Island

In the November issue we announced Amsterdam Island as being counted along with the Kerguelen Islands as one country. Due to some information the REF very kindly submitted to us, it appears that a change in the country status of Amsterdam Island is in order. In view of this recent information and the close proximity of St. Paul Island to Amsterdam, we are now changing the grouping as follows:

Amsterdam Island and St. Paul Island will count as one country, while the Kerguelens will be counted as another one, or in other words, reverting to its original status. This, of course, shouldn't make any of you unhappy, and for the most part it will probably give many of you a new one.

By the way, it might be of interest to you to know that FB8XX is on again in the Kerguelen Islands.

While talking about this country business, there have been occasional inquiries from some of the boys relative to their going to an out-of-the-way spot on the map and their putting it on the air for a week or so. In the first place, we all should acknowledge that it is a noble gesture for anyone to take the time and trouble to go to an out-of-the-way place, but what worries us is the fact that if some of you do this, and this "spot" is not later considered a country, then we are called a number of impolite words.

I believe it would be a safer plan if any of you are contemplating an expedition, to pick some spot that is now on the country list and having no Ham activity, rather than picking a place and then hope that it will be considered a country later on.

All of us can argue until the heavy side layer collapses on what *should* constitute a country, and what should *not*. While we at *"CQ"* cannot speak for ARRL or the RSGB, I feel that we are in general agreement on what is a country and what is not. So, if any of you are contemplating an expedition to some place which has never been considered as a country, it might not be a bad thought to drop a line to one of the three mentioned above.

W2WZ hits the double century mark by working YI2AC, 14109 and VQ5AU, 14156. Al is once again using a 3-element beam instead of the 2½ which existed for a while. He is quite sure it works better. . . . W2GVZ, after five years of trying, got through to KW6AR, 14040, when the West Coast competition was off guard for a moment. . . . It is good to hear from W2RDK. He found enough time, although off the air during 1950, to bring his country totals up to date. Charlie's company has transferred him, and now he is living on Long Island. Since he doesn't have his shack completed yet, he left his station equipment, including log books and cards, stored away in the attics and cellars of W3BES.

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



Jorge Janer, EA3GI, of Barcelona.

W. A. Z. HONOR ROLL

CW & PHONE

WAZ

W6VFR	235
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W3BES	232
W6ENV	231
W2BXA	229
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W4BPD	206
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LU6DJX	205
W6MVQ	205
W6PQT	205
W6ZCY	204
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VK2DI	204
KH6CT	204
W6GDJ	204
W4CYU	203
ZS2X	203
VE4RO	203
W7GUI	203
W6RM	202
W6OMC	202
W6PB	202
W6AOA	202
KH6IJ	202
W6DLY	202
W6TS	201
W9KOK	200
KH6BA	200
VK5JS	200
W6RBQ	200
PY1GJ	199
W6EFM	198
W2IOP	197
W0DU	197
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PY1AJ	196
W6WB	196
G2FSR	196
G4CP	195
W6UCX	195
W5KC	195
G6QB	195
OK1FF	194
W6GAL	193
W6TI	193
ZL1BY	193
W6AVM	192
W0SQO	192
VK2NS	191
W6VE	191
W6RW	190
W6SRU	190
W6EPZ	190
CE3DZ	190
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W6PUY	160
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VK2QL	151
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W6FHE	150
W0EYR	150
W6RLQ	150
W6LER	150
W6ATO	149
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W6LS	147
W4CYY	147
W7KWC	147
KH6PY	147
W7DXZ	146
W6AYZ	146
VE6GD	146
W9NRB	145
W6MUC	145
OK2SO	145
ON4TA	144
G3BI	144
W7LYL	143
I1XK	140
W6AOD	140
W6ONZ	139
W6ID	138
ZC1CL	138
W6NTR	138
OK1WX	135
G3AZ	133
W6TEU	133
W6RDR	133
W6AUT	132
W6OBD	131
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W7ASG	129
W6BIL	129
W7GBW	127
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G5BJ	126
PK6HA	124
G5VU	124
W6NRQ	123
W6MLY	123
VK5MF	121
ZS6CT	113
KG6AL	103
VK6SA	103
W7KWA	98
W6DUB	89
W7IYA	59

39 Zones

W3DPA	220
W9ANT	218
W2NSZ	216
W9RBI	215
W0NUC	211
W3OCU	210
W1ENE	209
W1BIH	209
F8BS	209
W2HHF	208
W1JYH	208
W3EPV	205
W5ASG	203
W5LVD	203
W9IU	201
VE3QD	201
W2HZY	200
W2WZ	200
W4GG	197
W3DKT	195
W2CWE	192
W9LNM	192
W1HX	191
W2AGO	191
W1AWX	191
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W9MXX	189
W2EMW	187
W8SYC	187
W3JKO	186
W0EYR	186
W1ZL	186
KP4KD	185
W8RDZ	184
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W3KDP	181
W1DQH	181
W9TQL	180
W2RDK	180
VO6EP	179
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W9FKC	175
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W2CNT	173
W8CVU	172
W4LVV	171
W2RGV	171
W7PGS	171
VE3AAZ	171
W9LM	170
W6CTL	169
W1NMP	169
W3JTK	169
OZ7EU	169
W4VE	169
HC2OT	169
PY2AC	168
W4DKA	168
W2CYS	167
W4RBQ	167
W8LEC	166
W4BRB	162
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W0AIW	157
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W9ABA	156
VK4DO	156
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W8VLK	155
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W6KYV	143
TF3EA	142
W9DUY	140
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W6KYT	135
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W7ETK	132
W6TE	131
W6WJX	131
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W5CPI	130
OE3CC	128
DL1DA	127
VR5PL	124
W6MUF	122
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W6JWL	114
W6EYC	114
KL7GG	114
W6FBC	114
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W2PUD	181
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W8KPL	173
4X4RE	168
W8FJN	167
W2SHZ	162
W2GVZ	160
W8EYE	158
W2UEI	156
LU7CD	155
W3LVJ	151
VE2BV	145
ZS2AT	145
W5MET	145
W8ZMC	143
W0AZT	143
ZL3AB	143
W9FKH	135
VE3ACS	134
W6ETJ	132
W4FPK	131
W2PQJ	130
W4LQN	130
W3ZN	129
W0RBA	127
W9MZP	126
FE8AB	126
W9TB	122
GW4CX	120
W0FET	118
ZL1QW	117
VE7VC	116
W6CAE	113
KL7PJ	112
W7EYS	107
W6FXL	92
C1CH	84

37 Zones

W1KFV	171
W2ZA	160
W3WU	157
W4IWO	149
W3FYS	147
ZL3CC	143
GM2UU	142
W4ML	140
W9WCE	140
W2WC	136
W2AYJ	133
W7HKT	130
W4DIA	129
W1APA	128
VE5JV	126
W9LNH	122
OE1FF	117
VE1EA	116
W6AX	110
W0FWW	108
W7PK	104
W8HSW	104
W2BLS	99
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OH3OE	93
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36 Zones

W4HA	151
OZ7BG	130
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F8TM	124
W9LI	124
W2BF	115
4X4BX	112
G3BPP	111
W5CD	108
EA1AB	103
W2JA	102
W5BK	99

35 Zones

W2OST	146
W1BFT	141
W3MZE	134
W4DHZ	132
W9CKP	132
W5FXN	125
OE5YL	122
W5JUF	121
G6QX	121
W6ZZ	120
W9RQM	119
CO6AJ	119
W9DGA	115
W9FNR	114
W8AVB	113
W0GBJ	110
W2HAZ	109
KZ5IP	108
KL7CZ	80

34 Zones

W1DEP	150
W8NSS	133
W1NLM	130
W4IYT	127
W1MRP	118
W5NTT	107
W8JM	102
G2BVN	91
W9WEN	83
W8PCS	80
W6EUV	66
W6OKL	61

PHONE ONLY

39 Zones

VQ4ERR	196
W6DI	192
W6VFR	174
W7HTB	161
G8IG	159
VE7ZM	145
DL1FK	125

38 Zones

W2BXA	168
W4CYU	160
ZL1HY	157
W1HKK	153
W6KQY	151
W9NDA	149
F9BO	145
W6AM	144

37 Zones

XE1AC	196
W9RBI	180
W1JCX	179
PK4DA	170
W3LTU	169
W8REU	163
CE3AB	163
W7MBX	158
VK3BZ	158
W6WNH	157
G3DO	155
W6PXH	153
W3JNN	150
W8BF	146
W6TT	142
F8VC	124
W7MBW	107
C1CH	83

36 Zones

W1NWO	176
W1MCW	172
W1BEQ	164
W9HB	160
W4ESP	152
W2DYR	140
W9BZB	139
GM2UU	135
W9HP	131
W6PDB	130
W4INL	129
W1FJN	128
W8AUP	128
G6BW	127
VE3BNQ	126
VE7HC	123
W0HX	120
W3GHD	114
W8CYL	112
W3DHM	96
W6SA	92
F8DC	87

35 Zones

HC2JR	165
ZS6Q	156
W4HA	142
W6PCK	141
W9RNX	140
W2RGV	136
HC2OT	134
W6CHV	133
W2GHV	131
W0EYR	131
W0PUE	131
W9BVX	130
W0PRZ	124
W9CKP	124
W0ANF	124
G8QX	123
W8ZMC	122
W5LWV	108
W4OM	106
W3PA	105

34 Zones

W5ASG	142
W3KT	129
LU8CW	129
W2ZVS	126
W5KC	125
W4LZM	124
I1AXD	124
W6UZX	123
W8BIQ	122
W3EVW	122
W5JUF	117
W1BPH	105
W8UIG	100
W4IWO	100
W8QBF	92
W0BFB	70
W2NXZ	65

33 Zones

W9MIR	131
W5ALA	128
W9WCE	121
W2ZW	115
I1VS	115
W8BFQ	114
W8SDR	113
W8NSS	112
VE3PQP	108
W2PQJ	100

DL4FA (WØHZA) has moved to a new QTH, and will soon get on with an F7 call, so if any of you fellows still want to get in touch with him for QSL purposes, here is the most direct method:

1st Lt. W. Snyder, Asn-0-2055167
7966 Eucom Det.
APO 58, % P. M.
New York City, N. Y.

Speaking of QTH's, ZS9F claims that some of the cards he has been getting lately have been in route to him for a year or more. W3DHM kindly passes word along on the best and quickest way to get a card to him. The full QTH will be found in the usual spot at the end of the column.

Well, of all things, up pops W1AB out of nowhere. Of course he will probably take offense at this since he will contend that Essex, Connecticut is *somewhere*. Anyway, the last communique from W1AB seems to have been issued somewhere in the Summer of 1949. We are glad to see that he has answered the appeal to bring his country totals up to date. Right now he is working toward a new achievement—that of licking TVI, and getting 200 countries. I presume the latter depends largely on the former.

W3LVJ explains that he has no startling additions, but would like to add eight to his list, such as, EA6AF, EA8BC, 4X4CR, AR8AR, VK1RB, PJ5FN, ZS3Q, and UN1AB. . . . FG6GC has all zones worked and confirmed except number 40. His nightly prayers right now include a kind thought for any OX or TF. . . .

W6EFV got a card from KC6WB who told him his call has now been changed to KC6WD. He is located on Ulithi Island and the full QTH will be in the usual spot. 6EFV worked FI8GD, 14055, as well as VR3A, who is supposed to be on Washington Island, but now has returned to England.

W5MET is still plowing right along. His new ones in January include UR2KAA, ZD2DCP, ZB2I, and VP5BM. The latter on 80 while the first three were on 20. . . . VE3IJ is hot after VE3QD but still has a few countries to go. As far as zones are concerned, he still is pleading for 23.

4X4RE has been building a 300 watt transmitter, but unexpectedly the authorities put on a limit of 50 watts, so for the time being that is what he will have to use. Let's hope they get the legal limit raised again, as Egor spent quite a bit of time and money on this new rig.

W6AM worked VT1AC on 14055, and was his first W. In a letter to Don he relates that he is the only one in Kuwait using c.w. but there are four others there using phone. His rig consists of a 6V6 v.f.o and two 6L6's in push-pull. For phone operation, he has another 6L6 as a screen modulator. VT1AC goes on to tell Don that he is going to operate at regular times, which will be as follows, except on Fridays. The times are GMT 1300 to 1600, 0430 to 0500, and 1030 to 1100. On Fridays he will be on for a number of hours starting at 1100. Read on for the full QTH.

VK4EL has a flock of nice ones he is adding to his country total. For example, some of the latest are: UO5KAA, YN4CB, PJ5RE, EQ3CR, and VQ8CB—all of these on 14 mc. c.w. By the way, Eric, as some of you know, has been keeping regular skeds with G5ZA and he is now up to 500.

W9WCE claims he has been a bit of a laggard in keeping up his country total. I would say that is putting it mildly, but there again, I can say it—I know the guy. But that's the trouble, he *is* a laggard. John is a good egg, but I understand he is deserting 28 mc for 160 meters. . . . W3DPA, one of the Wilmington boys worked EAØAB, which is a nice one to add any time. . . . .

Speaking of adding, W6AMA logged VP2DC on phone and AR8AB, c.w. . . . W6RLN has been missing out on a lot of stuff on account of working a night shift, but he has added such things as CR5AD, VK1RF, and FQ8AE . . . FQ8EJ, being a bachelor, is not troubled with YL QRM and this probably accounts for him getting up early in



One of the most consistent European stations on any band, "Mick," ON4QF.

the morning for a lot of this DX stuff we hear about every now and then.

From G2MI's column the following is lifted: VQBFC is ex-MT2BFC and he is in British Somaliland, of course, and is on phone around 14200 kc. He hopes to be there for a year. . . . According to CT3AA, the QSL Manager in Madeira Island, CT3AF and CT3MB are pirates. . . . 3V8AV is in Fezzan, which is a separate part of Libya under French Millitary rule. Fezzan issues its own stamp; however, it is not a separate country. . . . Red Fenton left for ZD9AA December 29th and should be on about now. . . . If you don't get a card out of VP8AP quick like, it is only because the mail goes out of there once a year, in October.

Don't be surprised if you hear 3A2AC on the air shortly. If it happens, it will be none other than Don Torbett, DL4QH/W6YCW. This was passed along by DL4FS who, as you know, was one of the boys at 3A2AB.

Bill Shuler, ex-KH6VP, who as I told you before, is now located in Los Angeles, is back on the air. His new call is K6CU. Bill doesn't think there is much chance, however, of making another WAZ from this area

W6ENV, as you all know, has been consistently one of the most active DX men on the air. One of the reasons helping this situation was that he was "agin" TV, or maybe putting it in his words, he wasn't "fer" it. This, of course, meant, too, that he wouldn't be "suckered" into having one of the flicker boxes. These are the conditions that prevailed up until today.

Time has marched on and if the usual ENV signal is missing, ten to one it is due to Gorgeous George. Yes sir, Andy has fallen off the TV wagon and if you find such strange things appearing in the Honor Roll as Kukla, Fran & Ollie, Durante, Berle, and Groucho, please make allowances. But you should see what happens to Channel 2 when Andy punches the key. (Shh! He just phoned and said he is still "agin" it.)

A snicker was had from a postcard sent by W9GJY. Says he: "Why all the fuss about VQ9AA? Bill Orr, W6SAI, worked him 'way back in 1949. See "CQ" for December, 1949, page 22." Most of you will remember Bill's article called "RST 519—Solid Copy". It just so happened that when Bill wrote the article a year and a half ago, VQ9AA would be a call to make anyone drool. So, he picked this one for an example in his story. Hi!

W7BTH drove into Los Angeles recently but hurried back and worked ZS3K and VR1C. . . . According to a WØ-SWL, CM8CM is making a concerted effort in studying the English language via Ham radio. . . . I hear HB9AW is visiting in New York and the other day dropped in to pay his respects to Big Chief Editor, W2ESO. Gene probably talked him into getting on 160. . . .

(Editor's Note: Now and then they raise some sour grapes out west. Of course, with characters like HC1JW running umph kw on 160, it may simply be that this league is too rough for old worn-out guys who have to struggle for W9's on some old worn-out band . . .)

W1RAN took a couple of cracks at sending cards to VS1CW and finally received one in return, and this came from England. VS1CW is also ex-VK5SC. The QTH will be found in the usual place. . . .

The Southern California and Northern California DX Clubs had their second annual joint clambake in Fresno—which happens to be halfway between San Francisco and Los Angeles—the latter part of January. There were about 100 that showed, which was a better turnout than last year.

It is pretty well established that at the banquet W6GAL had three shrimp cocktails, three salads, and at least two "olives". . . . W6ATO was the presiding host, W6SAI gave a few additional highlights of his trip to FP8, some slides were shown of stations belonging to the Northern California DX Gang, as well as some from the Rochester DX Club. . . . W6CEM gave an illustrated talk on W1FH's final amplifier, and after a roaring time was had by all, everyone fell into their cars, train, or what have you, and went home.



The very trim-looking operating position at LU8CW.

Some of the 7 mc stuff leaking through to the West Coast include ZS3K, FQ8AC, FQ8AE, FF8AC, FF8JC, ZD4AE, ZD4AB, CT3AB, CT3AN, EA8CL, and VS7NG. . . . W6OEG worked ZS3K on 80. Most of the above was lifted out of the "Southern California DX News."

40 meters has shown up very well at times in the last couple of months and a number of the boys are hot after some of the overseas stuff being heard on 80. On the East Coast neither of these bands are as much of a problem as they are in certain sections of the Middle West and also the West Coast.

At this particular time there is quite a lot of interest in this year's ARRL DX Contest. The first c.w. weekend is past and here is hoping conditions are O.K. for the remainder of the phone and c.w. As usual, some new stuff pops out and it will be interesting to see what new countries you fellows send in to add to your list. It looks like OM Becker won't be able to take even a little whack at this year's brawl. The inconvenience of out-of-town trips certainly is felt every now and then.

Well, Gang, let's keep it in mind to send in your zone and country list additions and let's bring those totals up to date. There is still a lot of dead wood in the Honor Roll that hasn't been touched for a year or so.

Well, I will be seeing you on the low end, I hope. 73,

QTH COLUMN

G2FK	Frank King, 5. Bure Lane, Christchurch, Hants, England.
KC6WD	R. G. Booth ET:3, US.C.G. Depot Box 3, Navy 926, c/o FPO, San Francisco, Calif.
VP8AP	Base H, Falkland Island Dependancy Survey, Port Stanley, Falkland Island.
VT1AC	Box 54, Kuwait, Persian Gulf.
W6RVO/KJ6	A.P.O. 105, San Francisco, California
ZS9F	J. C. Warren, P.O. Box 4, Victoria Falls, S. Rhodesia, South Africa.



Conducted by LOUISA B. SANDO, W5RZJ*

THE FIRST WAC/YL CERTIFICATE—a special handmade job courtesy *W6NAZ*—officially has been awarded to *W2QHH*. Howy worked YLs on all continents some time ago but no YLRL certificate had been printed, hence the special one. Among the YLs Howy worked for this award were: N. A.: *CO6AV, KL7YG, KP4HR; S.A.; PY2KT, HC8GRC* (*HC2TR* YL op); Africa: *ZS6KK, ZS6WJ;* Oceania: *VK3YL, VK7YL;* Asia: *J2AHI;* Europe: *G3ACC, G6YL, I1MQ* (YL, now *I1ADA*), and *DL3RN*. These were all worked on c.w. with *W2QHH's* usual low power.

Here and There

Bertha Bland, *WØRAW*, and her OM, whom we visited in their trailer at Bolivar, Mo., on our way West, took to the road again with their trailer shortly thereafter and have been spending the winter at Weslaco, Texas. Along the way Bertha has had a chance to meet some of the YLs, and writers: "Ruby Word, *WØTAB*, was disappointed that you didn't have time to go by and see her. She and her OM have sold their store at Willard, Mo. He is planning to renew his commercial radio license and I expect they will go back to California. Then I met two relatively new YLs. They were *WØYHD*, Johnny Lukenbill, of Willow Springs, Mo., and *WØBWC*, Lorena Coffman, at Springfield, Mo. She has a sister and brother-in-law in Peru and listens daily to try to contact them on the air. Then at Joplin, Mo., I met Letha Dangerfield, *WØOUD*. She is strictly a c.w. ham. She and her OM don't even have a microphone in the house. She is nearly blind but she really does do a lot of radio work and is very active on the Missouri Emergency Traffic Net. A very pleasing personality.

"Then at Austin, Texas, I met *W5PYK*, Bea Faubion. She is the XYL of a doctor and has two little girls. She got her Class A license while we were at Austin. Then here in Weslaco is *W5SBN*, Martha Andersen, who has had her license only about three months and is only on 160 meters so far. She is the mother of two little girls, and also is a grand person to know.

"Guess that brings you up to date on our travels. We like it very much down here. We're about 30 miles from Brownsville, where the temperature hits in the 80's most every day and there are palm trees and citrus groves along every road." FB, Bertha; quite a change from Kansas City!

From *W1FTJ* we learn that a YL friend, whom Dot met personally in '46, ex-*W6SGD*, Kitty Aitken, of Prescott, Ariz., met a tragic death on December 30th when the automobile she was driving was crushed by a truck near Carlsbad, New Mexico. Kitty's OM (*W6RWW*) formerly was SCM of Arizona. He was bedridden and Kitty did all of the building of rigs for both of them until he died a few years ago.

No doubt most of you saw the FB cover photo and write-up about *W8GJX*, Helen Cloutier, in a recent issue of *Radio News*. Seems Helen has been busy as ever with her writing, photography, running her beauty shop, looking after her OM and two jr. ops—and hamming. Now we hear the latest venture for Helen and her OM is the chinchilla business. Helen describes them as nice little creatures; says they started with one pair and now have quite a herd. Of course, chinchilla fur is still fabulously expensive, so it sounds like an FB business.

W6NAZ is back on the air in another TV show, "Occupation Housewife." Says Lenore, "I'm an odd person to be doing such a show, but they say I may convince myself of its truth and want to stay home for a change!"

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



YLs attending the Oregon Amateur Radio Convention held in Portland last April. L. to r., seated: W7JFM, KL7AX, K7GLK, W7HHH; standing: W7FWR, W7ENU, W7EIU, W7JWC. At the convention but not in the picture: W7FKS, W7NOB, W6MPS.

We hear that *W9ILH*, Carrie, is active in a military traffic net and can be heard handling it 90 miles an hour—FB!

Local hams threw a hamfest for *W2CKD* and *W2EHR*, Tex and Marguerite, while they were at the Palladium in Hollywood. Must be a continuous round for these two as they travel about the country!

Ada Garibaldi, known to you on the air and through this column as *I1MQ*, has just come up with a new call. *I1MQ* actually was her father's call, and she shared operating the rig. Ada now has her own call, *I1ADA*—most appropriate!

A letter from *ZS6GH*, Diana Tuck, with South African news. In their contests *ZS5KG*, Muriel, won the Bee Trophy; *ZS5DZ*, Bee, won the Iris Hayes Cup; *ZS6KK*, Marie, won the Diana Cup, this last being a strictly c.w. contest. YLRL is growing in the Union with a third branch just being formed in Pietermaritzburg. Newest YL call is *ZS6AAL*, Peg, of Johannesburg. Diana, herself, has moved to a new QTH (still in Johannesburg but better for hamming) and is active on 20 c.w. working into W1, 2, 3, 8 and 9 every evening. Look for her around 10-11 p.m. (ZS time). Diana, by the way, has just had a bout with the mumps, but while she had to be at home put the time to good use by working Pacific DX!

Novice Class License

Expected as copy was being prepared for the last issue, now as you know, the FCC has announced its new regulations covering licensing of hams. As mentioned last month, the Novice Class —which will become effective July 1st—is of special interest to YLs. There are many would-be YLs to whom this Novice Class license will offer an ideal stepping stone. Be on the lookout for them—students, housewives, XYLs of hams—and give them a hand getting started. Even code at 5 wpm and simple theory require help and encouragement.

YL of the Month

It's remarkable how much a little encouragement from one YL will help along another who is just beginning in this ham game. Our YL of the Month, Louise ten Herkel, *PAØZC*, of Wassenaar, Netherlands, received just such a helping hand, which changed her laissez-faire interest in hamming to one of keen enjoyment.

Louise's OM had once been a ham but it had become a long forgotten hobby. Then during 1945-1948 when they were both in Montreal, Canada, he saw so much beautiful radio equipment that when they sailed for home he had with him a complete station, including the beam. Hans insisted that they both should apply for a license, and their first c.w. lessons were had on the ship, given by the captain himself.

"I tried to be a good sport and studied very hard," says Louise, "but I am now ashamed to say I was not very interested even after we both obtained our licenses and I received my own call. I never touched the mike and at that time radio



PAØZC, Louise ten Herkel.

for sure was not my hobby. I felt very shy when Hans dragged me into a QSO.

"Being, at that time, the only XYL operator in the Netherlands, Radio Nederland PCJ asked me for an interview and demonstration which was intended for broadcast. I was scared to death; until then I had never made a QSO alone. But still I had no courage to refuse. So I was forced to practice. I shall never forget that morning when I was all alone in the house and decided to make a start. I sat down and wrote out an imaginary QSO just to be prepared. After a while with the receiver I heard *W8VPO* calling. It took all my courage to press the switch, and how I did hope he would not come back. He never knew, though, that he was my very first QSO—I just read the QSO I had on my piece of paper. As soon as this contact was finished (I surely made it short) I was very much surprised to be called by a YL. It was *W1FTJ*! We had the most wonderful chat for about half an hour in which Dot even introduced me to the YLRL. How excited I was!

"I really think it was due to this QSO with Dot that from that time on I could hardly leave the switch alone. I must have been really bitten by the radio bug for I made one QSO after the other. When PCJ arrived a few days later with two microphones and three reporters I was not a bit nervous and *VE3TW*, Ethel, and I made the finest QSO you could wish for (it has been beamed to the States and Canada). I am no longer mike shy and Hans and I have our daily competition working DX."

10-meter phone is *PAØZC's* favorite band, but she occasionally works 20, 40 and 80. When 10 is open she is very often on between 12-17 GMT. Their transmitter is three stages push-pull, 807 in the final, 100 watts, plate modulated. Receiver is an SX71, plus an R9'er for 28 mc. Antenna on 10 is a 4-element wide-spaced beam. On the other bands they use a flat-top dipole.

Louise goes on to say that she was born in Canada in the Province of Quebec. Married to a Dutch dentist (*PAØZD*), she has spent most of her life in Holland, but has visited the States and Canada several times. They have one son, Freek, aged 8 years, who is much interested in

(Continued on page 46)



Conducted by E. M. BROWN, W2PAU*

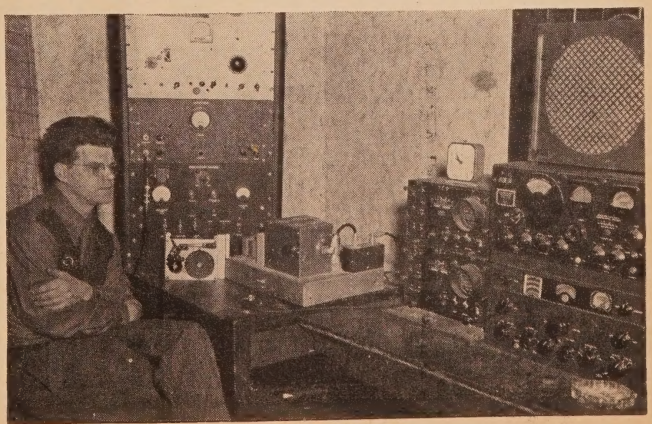
FEBRUARY, 1951, MIGHT BE described as a typical mid-winter month on the v.h.f. bands. Several surprise band openings took place as if to demonstrate conclusively that there is no closed season on v.h.f. DX. Auroral effects were felt in the northeastern part of the country on more than one occasion on both six and two meters. It seems to us that these openings were nearly as wide-spread geographically as were the big openings during the fall of 1950. However, due to the prevailing low level of activity and lack of advance warnings of these ionsphere pranks, the number of DX QSOs was unfortunately relatively limited. A few sporadic E manifestations were noted on six meters, not as extensive as the big openings of the previous month, but enough to keep interest alive on this band. The "beacon" transmitter program supported by the Canadian Government and a few American amateurs proved its worth by helping the fellows to spot these openings and take advantage of them. And, not to be outdone, the lower atmosphere cooperated in producing its share of extended-range ground wave contacts on the higher bands. Although nothing like the "wide open" nights experienced in the past summer and fall, these openings provided opportunities for the v.h.f. workers to compare notes with out-of-town stations and renew old acquaintances. And the more serious DX workers have been working scheduled contacts this season over distances that would have been considered impossible a few months ago. More details later.

But the biggest story of the winter of 1951 is the story of the development of Civil Defense activity. All over the country civic-minded hams are working on the development of equipment and organizations to aid in the event of an emergency. The recent announcement by the FCC to the effect that certain amateur frequencies will be reserved for use by the amateurs in case of war has added fuel to this new fire of ambition that has sprung up in amateur ranks.

The availability of limited quantities of ready-to-use surplus equipment and the existence of a corps of experienced two-meter operators has led to the inclusion of this band in the early plans of most CD groups, although the ten meter band seems to be bearing the lion's share of emergency net activity (especially mobile activity) at this time. Attempts have been made to interest the CD planners in the six-meter band as well as our various u.h.f assignments but as yet they have met with little success.

We wish that we could state here that the two-meter band has been found to be ideal for this sort of work, and put in an un-qualified plug for further exploitation of this band. However, the sad truth is that in some early tests the performance of typical ham v.h.f. equipment has been relatively unsatisfactory when compared with that

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



Ken V. Evans, W9MBL, New Castle, Ind., and his v.h.f. equipment, including his well-known 6-meter beacon transmitter. The beacon is in the center with the code wheel on the table in front of the big rig for 2-6-10 meters. The receiving equipment includes an S-27 and an AR-88 complete with individual panadapters. A complete description of this station will appear in next month's column.

of the typical ten-meter net. In fact, in many sections, these tests showed v.h.f. band performance to be so poor that v.h.f. activity is in danger of being dropped from future CD planning in these sections. It is going to take a good sales job on the part of the v.h.f. enthusiasts to dispel this bad first impression.

The question is certainly going to be raised—why try to include v.h.f. activity in CD work if it is difficult to achieve good performance? If the ten-meter stations are able to do a satisfactory job with existing facilities, why not go all-out in an attempt to expand activities on this band and forget the higher bands for the time being? The answer to this line of reasoning can best be illustrated by the experiences of the mobile communications services such as police, forestry, and similar agencies. They were firmly established on the lower channels a few years ago and they experienced excellent local-range communications. However, they also experienced serious QRM from similar services in other cities. The hams are now in the same predicaments. There are simply not enough channels to spare for an activity of the scope of our CD networks so that each city or county can figure on holding open a clear channel on a nation-wide basis. And our local ten-meter enthusiasts who now brag about the ease with which they can copy a mobile W6, 2500 miles away, would sing a different tune if said W6 were breaking up the signal from their net-control station during an important emergency net drill—especially if the W6 were participating in a similar operation in his home town. This sort of thing is not as far fetched as it seems. In the Philadelphia simulated emergency test of 1948, the ten-meter mobiles were practically knocked out of business by the powerful skip signals, and the burden of mobile traffic handling fell on the two-meter units, most of which were (ugh!) modulated oscillators and transceivers. Though the proponents of ten-meter specialization will state that this sort of QRM is less likely to happen now that sunspot activity is on the wane, the fact remains that ten meters still opens often enough to constitute a hazard, and there will be sporadic E—short skip—openings next summer which may occur almost daily. (Sporadic E activity does not follow the sunspot cycle, according to present theory). These considerations alone would be ample justification for moving the CD nets to the v.h.f. bands, even as the police, aircraft, etc. services have moved. And the extra communications channels available in the v.h.f. spectrum may be essential if we continue to expand our services at the present rate.

Getting back to the original theme—why has the performance of the two-meter band in early tests been so much poorer than might be expected? The answer is simple—most hams havn't been giving the band a break by using decent equipment.

Transmitters should have at least as much power as the rigs used on the lower bands if we are to compare the performance of these rigs with the same yard-stick. The flea-powered receiving-tube transmitters that are generally in use now are makeshift. They can do a job, but not a man's job.

The typical two-meter mobile antennas are modest affairs that hardly distinguish a car as a mobile radio station! Ever since the boys have found that a cowl-mounted broadcast antenna will radiate a two-meter signal there has been a fad to see how low and how un-obtrusive an antenna can be and still get out—a little. W2BDI discovered that he got nearly normal coverage with his antenna sitting *inside* the car—we hope that this will not set a new style! Mobile operations need every bit of gain that can be obtained, so why not pick up a few db in the antenna? Ye Ed discovered that extending the roof-top whip from 1/4 wave to 5/8 wavelength (which required a special matching system) brought about a really obvious improvement. A collinear ten feet high mounted on the bumper will do even better. Maybe sky-scraping mobile antennas do not look pretty—but there's a job to be done. Make an honest effort to develop the best antenna possible for v.h.f. mobile work—not see how poor a device you can get away with!

Receivers represent our toughest problem. In this department we are almost certain to remain inferior to the low-frequency workers. Stuck with about five times worse instability, five times the spread of transmitter frequencies in our nets, etc., it is quite apparent that a narrow-band receiver which might be practical for mobile net operation on ten meters would be entirely too sharp to handle for a similar type of operation on two meters. But we can at least build receivers that approach the optimum performance within the limitations of band-width imposed by mobile network operations. Let's put good, quiet r.f. amplifiers in the receiver input stages and do a good job of eliminating noise sources in the automobile. Our receivers should have sufficient selectivity so that we can truthfully say that if they were anv sharper they would be too selective. More effort should go into an investigation of noise-limiting techniques. One should not conclude that two-meter mobile receivers just naturally are not as good as the ten-meter jobs until he has tested a really adequate receiver in his car.

Let's all devote some real serious thought and a little hard work to the problem of supplying reliable v.h.f. communications to the CD organizations. Remember that this type of operation may be all that is left for us, if the international situation gets any worse. If any of our readers has designed a piece of equipment which seems to fill the need, he should make every effort to publicize his success. Most magazines catering to the amateurs—including CQ!—are on the lookout for such articles and some pay well for printable material. Editors especially want papers describing home-brew equipment which can be built from standard, readily-available parts. Simplicity and low costs are important, but as we have just gone to some lengths to prove, these points should not be overstressed at the expense of performance.

Some of our readers may be connected with



The group photograph includes almost all of the better-known 6 and 2-meter men in the Southern Ontario area.

Front Row - left to right - VE3AQG (winner ARRL VHF contest) VE3KM, VE3ANY, VE3BOW, SWL Arnoldi, VE3AGW.

Second Row - left to right - SWL Gorrelle, VE3BNK, VE3BQH, VE3AZV, VE3-DDO, VE3BF, VE3BQN, VE3DAN, VE3ATB, VE3DIR.

Third Row - left to right - VE3DAA, VE3IZ, VE3IR VE3DBV, VE3BHN, VE3LU, VE3AOT, VE3DHD, SWL Horton, VE3BYZ, W2SJV.

Fourth Row - left to right - VE3UT, VE3AZY (front) VE3AIB (back), VE3DJP, VE3AKL, VE3SE (back), VE3VT, VE3DFW, VE3ANT, unidentified, (front), VE3-BQK, VE3BGY, VE3BUO, unidentified, VE3DDT, VE3-BAD.

Fifth row - centre to right - unidentified, VE3IL, VE3-ASE, SWL Prior.

Back Row - left to right - VE3FT, VE3DBY, VE3AZX, W2QNA, VE3DLD, VE3-AWR, VE3EAH, VE3QT, unidentified, VE3DHL, VE3-DHG, VE3DHQ, SWL Dissette, VE3XZ, VE3AJJ, VE3-ARV.

Present but not shown - VE3AET, W2TBD, W2UDD.

companies who are in the business of manufacturing and selling equipment to the hams. We realize that in the past, the volume of business involved in v.h.f. ham activity has been too small to warrant much effort on the part of the engineers and salesmen to invade this market. But doesn't this CD work put a new face on things? Ye Ed, for one, would like to know where he can buy at a fair price a decent two-meter mobile antenna—one with a little gain over the roof-top whip. We know that designs are already in existence for such antennas for police and similar services. Why not try to sell some to the hams? A few manufacturers have recently announced receiving and transmitting equipment specifically designed for two-meter mobile use. We sincerely hope that these projects succeed. Most of the mobile operators on the lower frequencies are using either "store boughten" equipment or surplus gear in their cars. Mobile activity on the v.h.f. bands is certain to perk up if *good* commercial gear can be obtained. We emphasize the word "good" because there is no tougher proving ground than the v.h.f bands. Any new equipment designs will be compared *not* with the super-regenerative receivers and war-surplus gear in use a few years ago, but rather with carefully-peaked home-brew equipment using the latest developments in circuit techniques and components. The poor reputation gained by most commercial v.h.f gear in the past was based on its inferior performance. A smooth dial and fancy case will not sell a receiver which drifts or has a high noise level. A transmitter which produces TVI will not be popular in the areas where most of the potential customers are situated. But if someone builds a better mousetrap . . . .

Beacons in Action

Have you ever wondered, on tuning across the six-meter band, whether there are any stations at all active on this band, anywhere? Since there is so little local activity in many areas, one must wait for unusual propagation conditions to discover the capabilities of the band, and to discover

that there are plenty of congenial souls watching conditions in other sections of the country, just waiting for a chance to bring the band to life! There is a sort of satisfaction in knowing that there are a few transmitters operating continuously at widely-separated points around the North American continent that can be depended upon to furnish an indication that good conditions are present.

The Canadian Government has established two such beacon transmitters. Their primary purpose is to provide data on the frequency and extent of unusual propagation conditions. A newcomer to the beacon system is VE9RA, operated by the Canadian Naval Research Establishment at Halifax, Nova Scotia. VE9RA operates on 49.99 mc continuously, except for occasional shut-downs, for maintenance. Automatically-keyed CW transmissions announce the call-letters and purpose of the station. This station employs an 829 final amplifier, feeding into a ground-plane vertically--polarized antenna.

VE9RB, at Ottawa, Canada, operated by the Radio Propagation Laboratory, also operates 24 hours a day, on 49.98 mc. Power and antenna equipment are similar to those at VE9RA.

It should be emphasized that the Canadian beacons are operated by the government, and are not amateur stations. They are not intended for communication work.

We have reported on the work of W9MBL, of New Castle, Indiana in earlier CQ columns W9MBL has been operating a beacon transmitter on 50.1 mc during the period from 0845 to 2200 EST every day during the past several months. Since January 17, this rig has been on the air continously. The data furnished by this has proved of sufficient value to the Air Force (in connection with the six-meter observing project) that W9MBL has been awarded a special letter of commendation by the Air Force officials. Congratulations, Ken.

The second amateur beacon to go into action in this country was designed and built by our old friend, W5AJG. Located in Dallas, Texas, this rig is currently operating from approximately 7 a.m. to midnight, CST, each day. Bernice, W5AJG's XYL and holder of the call W5JKM, is the operator in charge while Leroy is out earning a living. Using an 815 final at about 30 watts input, feeding a vertical folded dipole antenna, this beacon operates on 50.04 mc. Plans are under way to shift to the "calling frequency" of 50.1 as soon as a new crystal can be obtained. Operation of the beacon transmitter has already started to pay off. On the 11th of February, W5AJG stood by on the band and found that the little rig had lined up W4VV and W4LAW (who is almost ready to go with his own beacon set-up), and good QSOs resulted that might have otherwise been missed.

O. P. Ferrell, RASO Project Supervisor, has prepared a special bulletin which contains specific recommendations as to the optimum frequencies, power, antenna design, and operating procedures for beacon equipment. Those who are sincerely interested in this program should contact Perry direct to obtain this information.

Things in General

W1HDQ takes exception to our report in last month's column that he lost his 10-6-2-meter stacked antenna system in the recent windstorm. Sez Ed, "The feeders were broken off, but I was back in business by noon the following day. These antennas were put up to stay, and stay they did.....!" Sorry about the exaggerated report, Ed. Guess we'll have to admit that we read it in the VHF news!

W4LAW reports plenty of two-meter action in the region around Tampa, Forida. The 75-meter gang are moving down to two meters to open a state-wide emergency net. Bill expects that in the near future there will be at least six active stations in Sarasota, alone. Those now active in Tampa are W4HAD, W4LEP and W4LAW; in St. Petersburg, W4GFE, W4FPC, W4BG, W4OJH and W4KQR; in Clearwater, W4AYX and in Sarasota, W4CCR. If skeds are desired, contact Bill Warning, W4LAW, Tampa, Florida. Bill would also like to have a little more local activity on the six-meter band—he claims that it could use a big publicity campaign!

W6ANN finally got back on six meters with "a little power". What Bill calls "a little power" is a cool 600 watts—another California DX man!—but he adds "apparently no TVI". (Wish we knew the secret!) He also has 400 watts on two meters feeding a four-over-four horizontal. Bill admits that he feels like an outcast on two meters with this antenna in the predominately vertically-polarized Southwest.

Another rugged individualist is W2EH, who has steadfastly refused to flop his ten-element array over to vertical this winter despite the needling of the local fringe area gang. Harry's contention is that he knows about what to expect from the band after several seasons of routine operation using a vertical antenna and he wants to find out just what can be done if he stays 100% on horizontal. Harry does pretty well with the locals despite the cross-polarization, and sees no real reason for fooling around with flip-flop mechanisms or two separate beams even in the "off season".

To balance out this polarization story, we have word that W5GLS, one of the hold-out vertical antenna men in the Houston, Texas, area, has finally swung over to horizontal, sporting a brand-new 15-element array that really pokes out a big signal.

In last month's column we reported that W4AO and W2PAU had been running tests using field-strength recording equipment, to determine, among other things, which polarization provides the more consistent signals over the 125-mile path between Falls Church, Va. and Westmont, N. J. After five weeks of tests, we can only report that the recorded results are so similar that there is no obvious decision possible at this time. We intend to analyze the data as to mean field strength, num-

(Continued on page 55)

The Monitoring Post

gleaned by THE BRASSPOUNDER

WITH THE PRESSURE GAUGE on the boiler downstairs registering something like 1,000 mils, *W2NFH,* a polio-crippled ham, listened to steam pipes crack and groan, unable to do a thing about it. At home alone at 12:30 P.M., and the telephone temporarily out of order, NFH turned on the 10-meter rig and called *W5RMK,* a mailman of White City, N.M., who in turn called *W2LOY* in New Jersey to explain hurriedly the plight of NFH. LOY telephoned the N.Y.C. police and at 12:40 two radio cars were rushing to the home of NFH. But NFH did not know that his plea to RMK had brought any result until the policemen arrived, and by 12:45 the police officers had the boiler back to normal, after shaking down the white-hot coals and running the necessary additional water into the boiler, probably preventing an explosion of the furnace by a matter of minutes. And W5RMK's XYL, who never before had a good word for ham radio, is now completely sold as a result of this assistance given by her mailman husband.

That annual feud over high score in the Sweepstakes between members of the Potomac Valley RC and the Frankford RC was settled for another year at the get-together of the two clubs. A merry time was had with a suitable program of entertainment, including a hilarious pantomime skit by *W4KFT,* and an interesting talk by *HB9AW;* civil defense radio was an interesting topic as were other short talks by well-known hams. The Potomac club was the host this year, and its officers. *W3GRF,* pres.; *W3EIS,* v.-pres.; *W4EMJ,* sec.; *W4CC,* treas., and *W4KFC,* activities manager, made the affair an outstanding one, M.C.d by *W3EIS.* Among those on hand were : *W2ESO, HEH, IOP, UOL; W3AEL, AYD, BES, BXE, CPV, CTU, EQA, EVW, FQB, GD, HRD, IL, JKO, JTC, JYS, KDP, KT, LTU, MCG, MSK, WU, WV; W4ESK, FF, IA, LAP, LIM, LRI, NND, NTZ, PNK, PWR, RH and SYJ.*

The Sandia Base RC is ready to issue a Friendship Award to any ham working 25 stations within the Alberquerque area, or within a radius of 25 miles airline of downtown Alberquerque. Provide written confirmation, showing date, time, band and station contacted as soon as 25 such stations are worked: forward your confirmations to: Secretary, Sandia Base Radio Club, % General Delivery, Alberquerque, N. M., together with first class return postage. This Friendship Award certificate will not be easy to earn; at present, about 85 stations are licensed in this area, with most of them on 10-meter phone. The club officers are: *W5IH,* pres.; *WRS.* v.-pres.; *FBP,* sec., and *QPK,* treas. . . . *W7FIS* operates a cabin resort at Hayden Lake, Idaho. . . . *W7EKA,* a mail carrier, is well over the 100 countries worked on phone mark.

ZS6XQ, a former schoolboy athlete with his eye on Olympic competition, slipped and fell while swimming, dislocating several vertebrae in his neck and injuring the nerves to the extent of complete paralysis. An operation at Johannesburg brought only the use of facial muscles and partial use of his arms. Ham radio became an interest, and his brother and a friend built his first ham rig. After QSOing 75 countries XQ came to America for further surgery, and after two operations here is regaining a little more movement and feeling in his body as time passes. The Veteran Wireless Operators' Assn., at their 26th anniversary dinner


SANDIA BASE RADIO Club

FRIENDSHIP AWARD

JOHN Q. DOE, W5ZYX

HAS PRESENTED AN AUTOGRAPHED LOG CERTIFYING TWO-WAY CONTACT WITH 25 AMATEURS IN THE ALBUQUERQUE AREA.

THE SANDIA BASE RADIO CLUB HEREBY PRESENTS THIS FRIENDSHIP AWARD ON January 15, 1951 DATE

O AWARD NO.

C. T. Carlberg, W6TM PRESIDENT

E. H. Morford, W5FPB SECRETARY

held in N.Y.C. on Feb. 24, presented ZS6XQ with a Marconi Memorial Scholarship in the Home Study Division of Capitol Radio Engineering Institute of Washington, D.C., which will, no doubt, provide a great deal of interest and encouragement for XQ's future.

W4MRB had a bit of bad luck recently—his beam fell down, whereupon he gathered and stacked the pieces neatly to prevent further damage to what was left. The trash man picked them up and took everything to the dump...

The Staten Island ARA assisted the Civil Air Patrol in their simulated bombing attack at Donovan

(Continued on page 54)

HAMFEST CALENDAR

The 1951 Annual Hamfest of the Atlanta Radio Club will be held on Sunday, June 10 at Robinson's Tropical Gardens. The program will include planned activities for the ladies and children and dinner will be served, buffet style, indoors with tables seating 800. In addition to regular drawings for prizes, a separate drawing will be held for a Collins 32V-2 Transmitter. ARRL is being requested to furnish a guest speaker. Literature containing the program and ticket reservation forms will be mailed to Southeastern hams about May 1.

Prices (including dinner) are: $2.50 for adults and $1.75 for children between 4 and 12, (children under 4 free), with tickets on the Collins at $1.00 each. Advance reservations can be made by writing Lee Connell, W4NQO, Secretary of the Club. Only 800 Hamfest tickets will be sold. So get them early.

"The Annual Hamfest and Banquet of the Wisconsin Valley Radio Association, will be held Saturday, April 21, at the Youth Building, Wausau, Wisc. Starting at 6 p.m., a well rounded program has been arranged, featuring an excellent banquet, entertainment, and hamfesting galore. Also scheduled for 3 p.m. is a Wisconsin Section meeting of League Appointees, including membership of both Fone and CW Nets. Please make reservations in advance to assist with meal plans. Tickets, $2.75, are available from Lawrence Lapinske, W9EWM, P.O. Box 179, Wausau, Wisconsin.

The Delaware Valley Radio Association will sponsor its 7th Annual Old Timer's Nite Round-up and Banquet on Saturday evening, April 21, 1951. The affair will be held in the Grand Ball Room of the Hotel Stacy-Trent, W. State & Willow Sts., in downtown Trenton. A Turkey Dinner will be served promptly at 6:30 p.m.

Guest speakers will include radio personalities, some of them famous in wireless history and allied branches of the art. W2ZI's now famous collection of Old Time Wireless Gear, which is creating so much interest, will be on display. Bring along your oldest dated commercial and ham tickets (licenses) as awards will be made to the holders of those with earliest dates. A special award will be presented to the GRAND OM whose radio and wireless experiences date back to the pioneers' times.

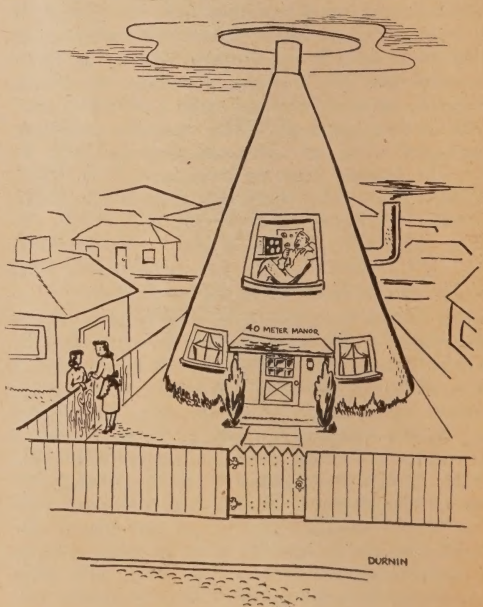
Tickets are by reservation only and may be obtained, before April 17th, by writing Ed G. Raser, W2ZI, General Chairman, 315 Beechwood Ave., Trenton 8, N.J., at $5.00 per person, with late comers being assessed $6.00 if purchased at the door. As in the past, the party will be STAG.

COMMUNICATIONS PERSONNEL ARE SOUGHT FOR ARMY SIGNAL CORPS INSTALLATIONS

The U. S. Army Signal Corps wants to employ communications personnel for work in and near Washington. Specialists are needed for the Army Communication Center in the Pentagon, and for radio transmitting and receiving stations in nearby Virginia and Maryland.

Specialists needed include teletypewriter operators, on both manual and semi-automatic equipment; code clerks; teleptypewriter mechanics; radio transmitter and receiver repairmen; power unit repairmen; and electronic engineers. Salaries range from $2,650 to $5,400 per year.

Further information may be obtained from the Civilian Personnel Branch, Office of the Chief Signal Officer, Room 2-C-280, The Pentagon, Washington 25, D. C. Information may be obtained by letter or by personal interview.



Well—it's a little hard to hang pictures—but my husband is very happy here!

HARVEY is HQ for CD emergency communications gear

New—ELDICO—2 Meter XMITTER-RECEIVER



VHF superhet for amateur, civilian defense and CAP . . . mobile or fixed station operation. 144-150 mc. 10 tubes. Sensitive, stable, selective. Vernier tuning.

TRANSMITTER — Crystal controlled, 144-150 mc. 7 standard tubes. Coax connectors. Uses any power supply providing 300 v. at 200 ma. Screwdriver adjusted tuning controls.

Metal cabinets, in baked hammertone enamel, 5½ x 9½ x 5½ in., with universal mounting flanges.

Receiver, in kit form, net **$59.95**
Receiver, wired and tested, net **94.95**
For external local oscillator, add $5.00 to above.
Transmitter, in kit form, net **$49.95**
Transmitter, wired and tested, net **74.95**

Prices are less power supply & speaker



TR-1 TRANSMITTER KIT

A conservative 300-Watt phone and c.w. rig 6V6-6V6-6L6-813, Class B 811 modulators. All bands, 80, 40, 20, 15, 11, and 10. Exciter broad band, single control PA tuning. Three power supplies delivering 1500 v.d.c. at 350 ma, 500 v.d.c. at 200 ma, and bias supply. Punched aluminum chassis, tubes, transformers, capacitors, resistors, antenna changeover relay, meter, wire, hardware and coils included. Electro-Voice 915 high level crystal microphone part of the package. Plug in the crystal and line cord and you're on the air. Shpg. Wt. 180 Lbs. ..... **Only $199.95**



TR-75 TRANSMITTER KIT

Loafing along at 75 watts this is the c.w. man's buy of the year. Simple enough for the beginner to assemble. Punched chassis. Uses the time proven 6L6 oscillator-807 amplifier combination. Pi-network output. Husky power supply delivers 600 volts to the 807. Complete . . . including a punched chassis and a smartly shielded cabinet to minimize television interference. Unbelievably low priced at **$44.95**

Shpg. Wt. 80 Lbs.

NOTE: In view of the rapidly changing price situation in both complete units and components we wish to emphasize that all prices are subject to change without notice, and are Net, F.O.B., N.Y.C.

New GONSET TRI-BAND CONVERTER — Most versatile for amateur mobile use on 10, 20 or 75 meters $47.60

GONSET Noise Clipper **9.25**

MD-40 LOW POWER MODULATOR

40 watts of audio, the MD-40 is a kit of the same superior parts that go into its bigger counterpart, the MD-100. In place of the 807's, two 6L6s are used. 200 ma. additional power available in MD-40-P. Complete, including the same standard communications Electro-Voice 915 high-level crystal microphone, only $34.95

MD-40-P with built-in power supply $44.95
Shpg. Wts.: MD-40—15 Lbs.
MD-40-P—30 Lbs.

MD-100 MEDIUM POWER MODULATOR

100 watts of audio ending in two 807's. Includes E-V 915 mike. Shpg. Wt. 35 lbs.
Kit form **$49.95**

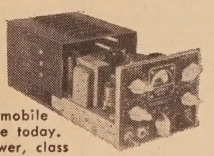
ELDICO ANTENNASCOPE



Now you can be sure of maximum antenna performance with this Antennascope based on design of W. M. Scherer, W2AEF published in CQ, September. Used with a Grid-Dipper, you can measure radiation resistance, resonant frequency of antenna, line impedance, receiver input impedance, feedline s.w.r. Reduce TVI, increase xmttr efficiency, improve receiver performance, by knowing and measuring your rig. Eldico Antennascope is available in kit form or completely wired and tested.

Kit form **$24.95**
Wired and tested **$29.95**

THE NEW SUBRACO MT 15X



The finest in mobile rigs available today. 30 watts power, class B 100% modulation, with push-to-talk and built-in coaxial type antenna relay. Xmttr complete with tubes, coaxial antenna connector, mounting brackets, etc. *Shipping weight 15 lbs.*

Complete with Tubes **$99.55**

HALLICRAFTER SX-71



Calibrated bandspread, double-conversion, built-in NBFM, xtal filter, S meter. Range—538 kc to 35 Mc and 46-56 Mc. Many important features.

Less Speaker **$199.50**
Shpg. Wt. 40 lbs.

HALLICRAFTERS S-38B

4 full wave bands. Continuous range from 540 kc to 32 mc. AC-DC super het circuit with many features usually found in more expensive receivers. Recommended for SWL and new amateurs. Complete with tubes. Only **$49.50**

HALLICRAFTERS S-40B

A great receiver! 4 bands covering 540 kc to 43 mc. Exceptionally good signal-to-noise ratio and selectivity. Usual features plus automatic noise limiter, variable BFO, built-in PM speaker. 7 tubes plus rectifier. Only **$99.95**

HALLICRAFTERS SR-75

New transceiver for novice class or amateur beginner. Receives 540 kc. through 32 mc. Transmits on 10, 11, 20, 40 or 80 meters. Operates on 115v. 50/60 cycle AC. Complete with coils but less crystals **$89.95**

NATIONAL HFS

VHF receiver with range from 27 to 250 mc. Can also be used as a converter or front end of hi-fidelity FM. **$142.00**

POWER SUPPLY, NATIONAL 5886. **$ 22.43**

NATIONAL NC-125

New—with built-in Select-O-Ject. Covers 550 kc.—36 mc. in 4 bands. Voice, CW, NFM (with adapter). Desirable features. Audio essentially flat to 10,000 c.p.s.

NC-125 ..... **$149.50**
NC-125TS (matching speaker) . **11.00**
686S (vibrator supply for 6v. operation) **34.16**

NATIONAL SW-54

New—Superhet covering 540 kc. to 30 mc. An ideal, low-priced standby that can double as a home table radio. Unique bandspread dial. New miniature tubes. **$49.95**

Telephone: LUxemburg 2-1500

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103 West 43rd St., New York 18, N. Y.

MUNICIPALITIES AND EMERGENCY SERVICES

are invited to consult us on any of their emergency radio communications equipment problems. Six members of our staff are fully qualified and licensed operators. Their services are available to you. No obligation, of course.

ARC-5 FOR CD

(from page 17)

Clamp tube modulation, if correctly set up and adjusted with a scope, does a good job and sounds fine. However, it is not something you just wire up with a handful of parts, connect to any screen grid final and get good-sounding 100 per cent modulation. The wave form shown on an oscilloscope can be about as awful as the writer has ever seen if the clamp tube bias, the final grid current, the final screen voltage, or the antenna loading are incorrectly adjusted. Without the screen dropping resistor, by-passed for audio, between the clamp tube plate and the final screen, it is difficult to get more than about 50 per cent modulation. If you try to increase the percentage by opening the gain, all you do is produce square waves with the resultant distortion. On the other hand, if you set the thing up right with a scope, it will sound fine and becomes a very economical means of modulation. Straight transformer type of screen grid modulation could be used if desired, by utilizing one of the modulation transformers, T52, out of the original SC274 modulator, BC-465-A. The plus B goes to terminal #1, the 5516 modulator plate to terminal #2, terminal #4 goes to the final screens, and terminal #3 goes to plus 150V for the final screen voltage. Terminals #6 and #7 are not used. See Figure 6.

In any form of screen grid modulation, the screen grid voltage must be run at about 1/2 of the normal plate modulated value with the resultant reduced output. The stage must also be run more like a class B linear amplifier with the decreased efficiency of such an amplifier.

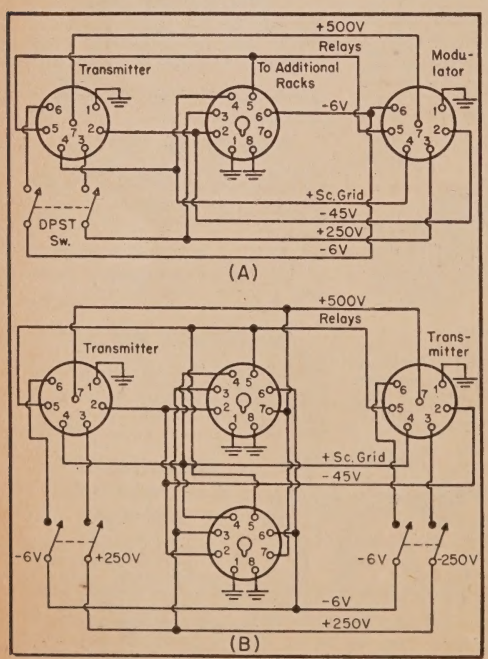


Fig. 5. Shock mounted rack connections.

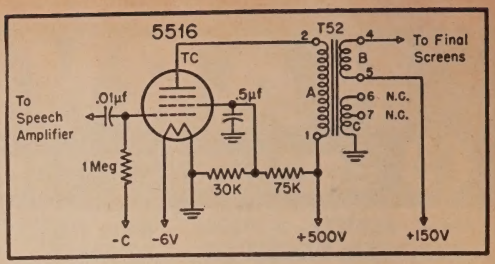


Fig. 6. Optional modulator, using transformer T-52.

By far the most efficient form of modulation is narrow band frequency modulation. This is excellent for mobile use providing crystal control is used with a phase modulator. However, all the mobiles and net control stations should be equipped with FM receivers (NBFM adapters) which might not always be practical. V.F.O. could not be used because the vibration of the V.F.O., in mobile use should produce frequency modulation. With AM modulation the FM component is not objectionable because the signal is tuned "on the nose", and there the FM is the weakest.

The circuit diagram of the clamp tube modulator shown in Figure 3 calls for either a 5516 or a 2E30. Either may be used with slight difference in performance. The writer used a 5516 because one was available. For further information, on clamp tube operation, the reader is referred to the footnotes.

Neutralizing

The final amplifier should be checked for neutralization by observing whether or not the grid current changes when the plate circuit is tuned through resonance with both the plate and screen voltages of the final turned off. A grid current change indicates the need of neutralization. It was found necessary to neutralize the 5516's in our case, and this was done in the usual fashion by crossing over the grid leads and extending two pieces of stiff insulated wire about 2 inches long up beside each tube. These wires were bent towards or away from the glass envelopes while reading a crystal diode wavemeter, coupled to the final tank, for the lowest possible indication.

TVI and Antenna

This 10 meter transmitter incorporates the most essential TVI measures, such as filtering of the power leads, link coupling to the final and the use of a low pass filter in the 52 ohm coax feeding the whip. It is not 100 per cent TVI-proof but if the dust cover and bottom plate are screwed on well, it does not bother Channel 2 unless the car is parked right in front of the house containing the TV set.

Added TVI proofing can be accomplished by improving the shielding on the transmitter itself by covering the louvres, the rear corners and the plastic window on front with copper screening.

SEE LEO FIRST FOR... National RECEIVERS



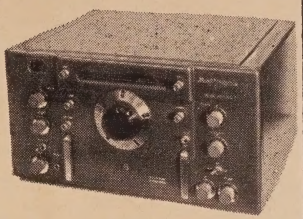
Leo I. Meyerson
WØGFQ

Fellows Interested in **NOVICE-TECHNICIAN** *Licenses,* see me today. Have complete equipment on hand.

All Sets on Hand for IMMEDIATE DELIVERY!

HRO-50 RECEIVER

Built-in power supply on separate chassis. Front panel oscillator compensation control. 20 to 1 precision gear drive. Provisions for NBFM adapter. Push-pull audio output. Speaker matching transformer built into receiver with 8 and 500/600 ohm output terminals.

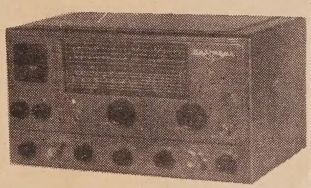


$359.00
(less speaker)
LOW DOWN PAYMENT

HRO—TS, 10" PM Speaker in matching cabinet **$16.00**

NC-125 RECEIVER

Covers 550 kcs to 36 mc in 4 bands. Voice or CW. National Select-O-Ject built-in. Includes AVC, automatic noise limiter, antenna trimmer, variable CW pitch control, separate R. F. and audio gain controls, jack for phone or NFM-73B adapter, volt rg, stabilized oscillator.



$149.50
(MATCHING SPEAKER) ... $ 11.00
LOW DOWN PAYMENT

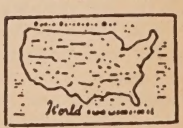
NATIONAL RECEIVERS

NC-57 B	$ 99.50
SELECT-O-JET 3	$ 24.95
NC-183 (WITH MATCHING SPEAKER)	$295.00
SW-54	$ 49.95



FREE

Send for the 1951 complete WRL catalog containing everything new in radio and television. Deal with the "World's Most Personalized Radio Supply House."

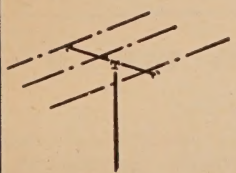


CU ON 20 - 10 & 75 METERS

GIANT RADIO REFERENCE MAPS

Just right for your control room walls. Approximately 28" x 36". Contains time zones, amateur zones, monitoring stations. Mail coupon today and.. **25c**

NOW YOU CAN AFFORD TO OWN A BEAM



10 METER BEAM

Plumber's delight 3 element beam quickly assembled; furnished with Gamma match. Extremely light; all aluminum construction; grounded antenna; very low priced. Furnished less mast and lead. Full instructions furnished.

Narrow spaced **$15.95**
Wide spaced **$17.95**

GUARANTEED CRYSTALS IN HOLDERS Type FT-243

160 METER

1.8 to 1.825 — 1.875 to 1.9
1.9 to 1.925 — 1.925 to 2.0
$1.25 ea.

80-40 METER

3.5 to 4.0 — 7.0 to 7.4
98c ea.

Please state frequency. We will come as close as possible. No refunds or exchanges, please.

WRITE FOR DETAILED SPECIFICATION EQUIPMENT SHEETS
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Please send me:
- ☐ SW-54 Info.
- ☐ New Catalog ☐ Radio Map
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- ☐ NC-57 Info C-4
- ☐ NC-183 Info
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- ☐ Select-O-JECT INFO
- ☐ HRO-50 INFO

Name_____
Address_____
City_____ State_____

The standing wave ratio should be checked on the RG8-U line feeding the whip, with an "Antennascope," or resistance bridge, and the length of the whip adjusted for a minimum SWR at your operating frequency. This will insure that the Niagara low pass filter will work properly. In my case, the whip length turned out to be about nine feet long, to reflect 50 ohms at the transmitter. An eight foot whip looked like 15 ohms. The RG8-U in my installation was only two feet long. Signal strength reports were about the same with both whip lengths, however.

Part 2, next month, will cover additional r.f. units converted to Civil Defense frequencies that may be plugged into the shock-mounted rack interchangably with this 28 mc unit, as well as a Class AB_1 plate modulator.

WALLET RIG

(from page 30)

Coils Easy To Wind

The coils are all air wound and W1KWU, whose finger size we do not know, says L1, L3 and L4 are "wound scramble, on the end of the little finger, slipped-off and laced with thread to hold its form". Coil L2 is wound on the end of a pencil, slipped-off and similarly laced. L2 fits inside L1. The wire lengths are critical and are given in the parts list.

Batteries Are External

W1KWU's construction is shown in Figure 1 with heavy-duty type batteries. For greater transportability, it is recommended that the miniature hearing-aid type of battery be used. The battery leads from the "billfold shack" terminate at a screw-terminal strip. By bringing out the oscillator, power amplifiers and receiver plate voltage leads as separate lines, a milliameter can be inserted in series for tuning-up.

Space can be saved by mounting the chokes with polystyrene cement after removing the ceramic forms they are wound on. This is best done with a vise and patience; the vise to hold the ceramic, and the patience to give you caution not to break the choke wire.

QSO Report

W1KWU reports that he operated this rig for a week at Boscawen, New Hampshire, last August, 1950. The antenna was a 133 feet long wire with the far end atop a flood light pole about 30 feet above the ground. Running 1 watt input on 7105 kc after midnight, he worked a thousand miles into the W4 and WØ zones. Maybe this again proves that good operating, the right band conditions and patience are just as essential to working-out as is high power.

PARTS LIST

R1, R6, R8, R11,—4700 ohms.
R2—1 megohm.
R3—1,000 ohms.
R4, R9—10,000 ohms.
R5—470,000 ohms.
R7—270,000 ohms.
R10—47,000 ohms.
R12—22,000 ohms.
C1, C10, C12, C15,—5-20 uuf Ceramicon Variable trimmer.
C2, C4—7-45 uuf Ceramicon variable trimmer.
C3, C5, C11—100 uuf (disc type).
C6, C7, C8, C9, C13, C14, C17, C18—.005 uf (disc type).
RFC1, RFC2—3 mh rf chokes with ceramic forms removed (see text).
L1—36 in. Tap 12 in. from ground end.
L2—24 in. All coils wound with #30 dsc. See text for winding instructions.
L3—48 in.
L4—54 in. Tap 12 in. from plate
SW—4p2t flat type switch (Centralab).
Antenna—133 ft. long flexible #14. Wind on spool when not in use.

YL'S FREQUENCY

(from page 36)

radio. Their dog (a "sausage dog"), says Louise, is called DX because of the long distance between her head and tail. For other hobbies besides radio Louise likes stamp collecting and gardening.

We've had the pleasure of doing it many times in this column for other YLs—now we're mighty happy to be able to make such an announcement for ourselves. That's right, W5RZJ and OM are the happy parents of a jr. YL. She arrived on February 16th and will answer to the name of Deryn.

Also on the personal side, we have a new QTH (again!), as you may have noticed at the beginning of this column. One highlight, of course, in moving to town is to have current —and two days after we got here we were on the air, courtesy of W5CA and W5FVO. CUL.

AMATEURS AND CD

(from page 27)

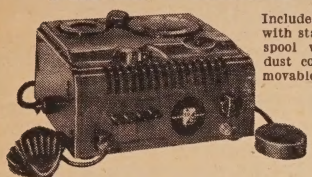
to make do with what you have. If men are needed, they can be recruited, trained, and assigned. If equipment is needed, it can be built. Here again a basic principle is involved, that of standardization and interchangeability. If you're building, build them alike. Quick repairs may mean the difference between the success or failure of an important mission. Standardization is also a term that can be profitably applied to operator training. Think in terms of uniform procedures. Back them up with drills. And keep the drills interesting, so that interest does not lag. In the setting up period, one big problem will be the allotment of frequencies. From what is available, it seems that the

SOMETHING NEW UNDER THE SUN

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Brand New — Discontinued Model



Includes microphone with stand, ¼ hour spool wire, plastic dust cover, and removable foot switch

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For Doctors, Dentists, Lawyers, Accountants, Secretaries, Clergymen, Speakers, Businessmen, Hams, etc. Including the following exclusive Webster-Chicago features.

- Automatic stops—shut off machine at end of wire
- Pushbutton record-listen switch.
- Immediate playback thru 2 inch speaker
- Neon recording volume indicator
- Removable take-up drum
- Elapsed time indicator

DRASTICALLY REDUCED FROM ORIGINAL PRICE OF $135.00 TO AN ALL TIME LOW OF

ONLY $89.50

RECORDING WIRE
1 hour | ½ hour | ¼ hour
$3.50 | $2.10 | $1.40

PORTABLE CARRYING CASE — Reg. $12.50 — ONLY $8.95

CRYSTALS FOR S.S.B. EXCITER

Also many other uses— in FT 241-A Holder—⅓" Pin SPC. Marked in 54th or 72nd Harmonic MC Freq. Listed Below by Fundamental Frequency. Fractions Omitted. Lo Freq.

412	433	473	493	390	401	372	381	450	530
413	434	474	496	391	402	374	383	452	531
414	435	477	497	392	403	375	384	461	532
415	436	479	503	393	404	376	386	465	536
416	438	481	504	394	407	377	387	526	537
418	440	483	506	395	408	379	388	529	538
419	441	484	507	396	409	380			
420	442	485	509	400	411				
422	443	487	511			EACH		EACH	
423	444	488	516			39c		99c	
424	446	490	518						
425	447	491	519			SPECIAL 200 KC XTALS			
526	448	492				without Holders.			
427	462			EACH		21/32 x 23/32			
429	468	EACH				69c ea. 3 for $2			
431	472	49c		79c					

HAM CRYSTALS

4190	6873	7840	3735	3850	6473	7340	7573	
5030	6906	7873	5305	5873	6475	7406	7640	
5485	6973	7906	5677	5906	6506	7440	7673	
6006	7740	7973	5706	5925	6540	7473	7706	
6040	7773	8273	5740	5940	6573	7506	7806	
6073	7806	8306	5750	5973	6606	7540	8340	
6106			5760	6273	6640			
6140			5773	6373	6673	99c	EACH	
6173	49c	EACH	5775	6406	6705			
6206			5806	6425	6740	10 for		
6773	10 for		5825	6440	6806	$9.00		
	$4.50		5840	6450	7306			

SUN RADIO

OF WASHINGTON, D. C.

938 F STREET, N. W. WASH. 4, D. C.

SCR-522 XTALS

5910	6407.9	7480	EACH
6370	6522.9	7580	
6450	6547.9	7810	$1.29
6470			

BC-610 XTALS

2 BANANA PLUGS — ¾" SPC

2045	2260	2415	3215	3570
2105	2282	2435	3237	3580
2125	2300	2442	3250	3945
2145	2305	2532	3322	3955
2155	2320	2545	3510	3995
2220	2360	2557	3520	EACH
2253	2390	3202	3550	$1.29

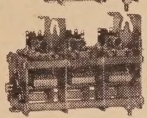
PAYMENTS must accompany order. Enclose 20c for Postage & Handling. Crystal shipped packed in cloth bags. All Shipments Guaranteed.

VARIABLE CONDENSERS

From SCR-522



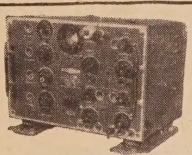
2 GANG - 220 MMF per section
$1.29



3 GANG - 220 MMF per section
$1.59

BRAND NEW with CONCENTRIC AIR TRIMMERS

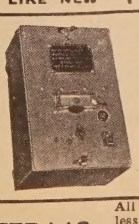
BENDIX 100-W. TRANSMITTER C-W



Easily converted to 20-40-80 meter VFO and 10 meter crystal. Each ECO dial has 3000 divisions enabling quick precision shifting. This transmitter was constructed of the highest quality precision parts. Four separate output tanks; one 4 position selector channel switch having 7 sections which changes the ECO, IPA, and output tanks simultaneously. All controls are mounted on the front panel. The housing is cast aluminum. Shields and case are sheet aluminum dimensions 11x12x15 inches, WT-35 lb. Complete instructions furnished. Uses 3-807, 4-12sk7 — each a separate master oscillator. Has a 5 AMP R.F. meter. Requires 750 volt 300 MA power supply and modulator for phone operation. We cannot supply either the power supply or modulator. This is a complete coverage transmitter for the new or experienced amateur. A true ham value. Complete with tubes, not many of these units left. So hurry and get yours while they last.

NOW ONLY **$29.95** LIKE NEW

NOW ONLY **$19.95** USED



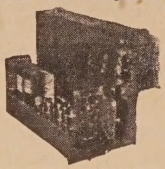
NAVY VHF Brand New CW TRANSMITTER

Battery operated (67½V."B" and 1½V."A") Frequency 80 to 105 MC uses 2 1G4 Tubes - with instruction manual - less tubes and batteries.

$4.95

WAVEMETER BC-1073A

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



LESS TUBES

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RADAR TRANSMITTER BC-1072A

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

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Less Tubes . . **$9.95**



BC-645 UHF RECEIVER TRANSMITTER

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

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ALL NEW — ⅓ OFF!

.500 GAP.	.375 GAP.	.250 GAP.
96-22.15	.11- 8.15	111-16.80
115-25.20	106-20.15	127-18.25
124-26.65	130-21.60	143-19.65
	141-24.50	159-21.00
	153-25.95	175-22.50
		192-23.95
Note: Figure in Left		208-25.95
Column is Max. Cap. per Section		

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

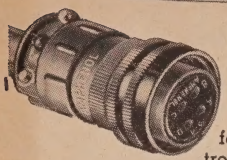
Max. Cap.	Gap	Price
300	.077	$ 5.32
230	.171	5.57
250	.219	12.85
500	.219	17.22
75	.344	8.96
245	.344	14.11
50	.469	7.05
100	.469	11.62
150	.469	12.95
75	.719	12.85
100-100	.219	14.11
100-100	.344	15.64
60-60	.469	14.11

CQ TO ALL HAMS DE W3PPQ

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

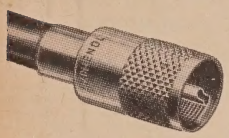
TERMS All items F.O.B., Washington, D.C. All orders $30.00 or less, cash with order. Above $30.00, 25 per cent with order, balance C.O.D. Foreign orders cash with orders, plus exchange rate.

AMPHENOL



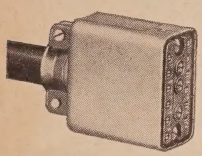
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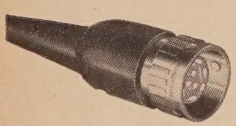
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CITY_____ STATE_____

220-225 mc band deserves careful study, if for nothing else than light portable gear that can go where mobiles cannot. Most communities have found so far that each mobile should be provided with at least one walkie-talkie and an operator to get right into the heart of an operation.

While acknowledging the importance of minimized interference in the bands of any one community, there is the even more important consideration of reducing or eliminating interference with nearby towns. This is best resolved by close liason and exhaustive tests. Again we draw on New York City for an example, although this does not imply that similar steps have not been taken in other cities. At one of the initial planning sessions of New York's AREC staff, the Emergency Coordinator for Westchester County was present. He was given a complete breakdown of the metropolitan frequency set-up so that he could plan his allocations and thus reduce interference to a minimum. Similar liason was instituted with the EC of neighboring Nassau County and with officials of New Jersey organizations.

At this juncture it might be well to mention one of the primary tasks facing those who plan the communications organization. This is the concept of chain of command. Although this may be a distasteful idea to some, it is necessary in that it serves to line up the responsibility in the organization and provides an excellent basis for an alerting plan. Primarily, a staffing pattern must be flexible. It must be ready to expand, contract, or consolidate in line with community needs. One of the many possible staffing patterns for civil defense communications is shown in Diagram A. Any number of alternatives immediately come to mind when one studies this model. It must be kept in mind that the danger we face is a physical one. It is a danger capable of isolating segments of the population, and this must be considered when establishing manning tables and area assignments. While we are on the planning phase, the word "alternative" is a good one to keep in mind. If one plan looks good, there is bound to be one almost as good—one that can be put into use if plan number one goes aground. Any alternate plan should embrace reserve elements of the organization and their equipment. Not only is a reserve a feasible approach to the alternative problem, but it also eliminates the overloading of the operating organization with excess personnel.

Of course, in any development of civil defense communications, there are steps that over-lap, especially in the planning and operational phases. Any steps suggested herein can be carried on simultaneously without harm to the end product. There are long range aspects that can be taken up, with particular stress in large communities. One of these is the formation of an operations manual. It's an invaluable aid in organization training, and it will settle a lot of arguments before they get out of hand. Also in this category of long range factors, there are the by-products of any such activity. They're not limited to industrial processes. They can come from human effort. In this instance, they include improvement of equip-

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EXCLUSIVE! Harrison Has It!

NEW! GONSET TWO-METER Superheterodyne Converter...

...for dual conversion reception

GONSET's sensational 2-meter superheterodyne converter is now coming off the production lines! Designed for use with any auto radio, home BC set or communications receiver for "hot", dual conversion 2-meter reception!

NEW SUPER-IMPOSITION TUNING!

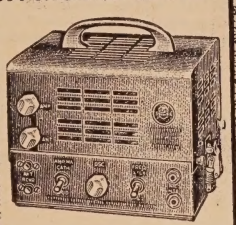
With this new exclusive Gonset feature, you actually tune both the top half and the bottom half of the entire 144-148 MC band simultaneously! Effectively doubles the already extremely wide bandspread! Positively no images from police, taxicabs, radiotelephones, etc., etc. – source of most 2-meter commercial interference!

• Rock-stable VR oscillator immune to voltage changes or mechancial vibration! • High gain 6CB6 RF stage! • Same size and appearance as famous Tri-Band! • Plenty of Bandspread! • Requires only 135 to 185V at 10 MA plus filament current! • Excellent selectivity! • Coax input to match usual mobile or home antennas! • Etc., etc., etc.!

2-meter Converter Complete with tubes **$44.50**

Rush order now for earliest delivery!
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STANCOR ST-203A MOBILE XMTR



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

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

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KATO



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Famous KATOLIGHT, precision-engineered AC power plants are ruggedly designed to give long, dependable service. Low operating cost – easiest installation! Delivers 115 Volts, 60 Cycle AC and DC to charge batteries. Filtered and shielded. Conservatively rated – do not confuse with economy-type power plants. Use anywhere – boats, cabin trailers, fixed locations, etc.

500 Watts	(Hand Start Model)	$172.80
500 Watts	(Push Button Start)	206.90
700 Watts	(Hand Start Model)	216.80
700 Watts	(Push Button Start)	250.40
1200 Watts	(Push Button Start)	325.60
2500 Watts	(Push Button Start)	431.20

Early Delivery All Models — Prices F.O.B. Minnesota
Other sizes to 25 KW – Write for literature.

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



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

BAND	TUBES USED	MODEL — PRICE (with tubes)	MODEL — PRICE (less tubes)
10-11 Meters	3-6AQ5	A129T $33.55	A129 $29.95
10-11 Meters	3-6V6GT	B129T $33.55	A114 29.95
20 Meters	3-6AQ5	A114T 33.55	B129 29.55
20 Meters	3-6V6GT	B114T 33.55	B114 29.95
75 Meters	3-6AQ5	A175T 33.55	A175 29.95
75 Meters	3-6V6GT	B175T 33.55	B175 29.95



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

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High Frequency Antenna for use with M-101 (A-101)	7.50
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(Use Master Mobile 96" Whip with Model M-51)	

Specify whether for 6 or 12 volt DC operation.

POLICE ALARM — **For HOME or Fixed Location**

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

Model PR-31 for 30 MC to 50 MC Emergency Band	$44.95
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MOUNTS (Tapped for ⅜" threaded stud)

Model 132	Universal Body Mount	$8.75
Model 132X	Same with Heavy Duty Spring	9.85
Model 132S	132 with Stainless Steel Spring	10.75
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Model 142	Bumper Mount – No Spring	3.25
Model 92	18" Adjustable Extension Bar	3.25

STAINLESS STEEL ANTENNAS

100-96S 96" Whip ⅜" Stud for All Mounts	5.25
106-96S 96" Whip, Plain end to fit 92 Ext.	4.50
All Band Antenna with 20, 40, or 75 meter coil	8.75
Extra Coil for 20, 40 or 75 meters, Each	3.30
(Use All Band Antenna on 10 by shorting coil)	

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Terado's new Senior Model Inverter delivers 45 watts of 110-volt, 60 cycle AC from any 6-volt DC source! Ideal for your car, cabin, boat, house trailer, etc. Use for operating phonographs, lamps, electric shavers, motors, flourescent lights, etc., etc., etc. Compact—only 2½" x 2½" x 4" long. Complete with cord and provision for plugging into cigarette lighter socket. Standard AC receptacle provided for output.

6V DC to 110V AC – 60 cycles Model No. 6-1160 **$10.95**

ient, antennas, and high frequency techniques. The list is long.

Finally, before your group gets rolling toward the goal of community service, remember the tale of the man who tilted with windmills. Your most important job is in the field where you have the most experience—disaster communications.

There's been talk about using amateurs to man warning circuits and the like. One fact should be kept uppermost in the minds of all planners. Any undertaking in civil defense communications must, of necessity, be a twenty-four hour proposition. It's going to take a lot of operators. Our ranks may be depleted by the military services. Community life must not stop; factories must run, people must eat. Let not the means destroy the ends. The means are full and honest cooperation with civic officials while maintaining a normal existence as a citizen. The ends are a secure and prepared community—secure in the belief that the utmost has been done to protect it from the tragedy which we pray will never strike.

DUMMY ANTENNAS

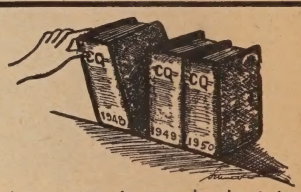
(from page 24)

Now all that remained to do was to fill the thing with water and adjust the resistance to the proper value. New York City tap water (yes- it's available again) showed a resistance of 52K ohms at 43°F so salt solution was added and thoroughly stirred in until the resistance was down to 9K ohms, approximating the W2OUT long wire antenna. Final amplifier loadings at similar antenna coupler settings showed that the dummy was a pretty reasonable facsimile. Of course, the resistance can be lowered to any value such as 300 or 52 ohms to duplicate a flat twin lead or coax line.

Assuming that you are now at least partially "sold" on this dummy, here comes the catch. You cannot measure the resistance very well with an ohmmeter due to the electrolytic effect! The resistance can, however, be easily determined with an impedance bridge which can be constructed out of junk box components and no shack is complete without one anyway. See ARRL Handbook, 1950, page 494. If you are allergic to bridges you can still make a dummy of water by gradually lowering the resistance with salt water until it acts like the antenna you wish to duplicate. It may take a little time but it will enable you to transmitter test in the legally approved fashion.

This particular tub has absorbed some 300 watts of r.f. for 30 minutes without steaming, although it pops a bit around the electrodes. Thermal circulation is good and should permit one to utilize the greater portion of the water for effective heat absorption. The relationship to remember is that 0.293 watthours equals 1.0 BTU which, in turn, equals the amount of heat required to raise the temperature of one lb of water 1°F. Thus 9½ lbs of water with an input of 200 watts for 30

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minutes will increase 36°F, assuming no heat losses. The conductance increases in a linear fashion with temperature the rate being about 1½%of the initial value for each degree F. This means that if you adjust the resistance to 300 ohms it can go up about 70 degrees F before you get a 2 to 1 mismatch with the resulting 150 ohm tank. Since this will take an hour with 200 watts, or 15 minutes with 800 watts (output), it would seem that the 9½ lb tank should serve most amateur purposes.

The writer's conclusion is that with the aid of modern plastics and some water, the amateur can construct a cheap and satisfactory dummy load for any amateur power rig. While not very portable, the device apparently does not have any other serious limitations and you are hereby invited to give it a try.

LATTICE BOOM

(from page 23)

simply by tilting it to a vertical position and putting the elements in place while standing on the tower. A tilting mount that has worked satisfactorily for this beam is shown in Figure 4.

Insulators

In order to eliminate the cross arms usually present on beams of this size, a high strength insulator was devised as shown in Figure 1. Since the locations of the insulators are at low voltage points along the elements, a material such as paper or cloth base micarta was found to be suitable and to be amply strong.

After the insulators are made, they should be given several heavy coats of spar varnish to prevent moisture absorption.

To date this beam has weathered several 50 mph winds with hardly a whistle out of it, much to the relief of several neighbors who dwell in its shadow. No vibration or whipping actions are noticeable. It seems to be well worth the extra effort needed to construct the trussed boom. Try it and see!

RED ALERT

(from page 20)

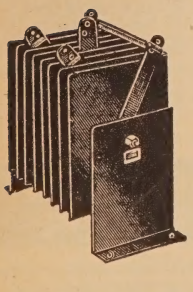
atically up and down all streets in the area it is proposed to cover, the mapping process should not be too difficult. Of course, a different map would be required for each NCS location.

One of these maps, placed in each car during emergency operation, would eliminate the time-consuming process of driving around in search of a likely spot from which to contact the net-control station. It would also be useful in selecting sites for the permanent antennas mentioned above.

No such map would be needed for 10 meters. Only one 10-meter "dead spot" has been found in the entire city—an area blanketed by a local broadcast station. The erection of permanent antennas for this band is still considered a good idea, how-

Outstanding **POWER CONVERSION UNITS**

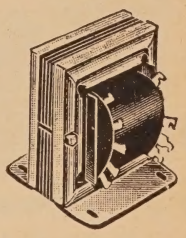
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Specially designed to convert any d-c receiver, transmitter, etc., into a-c use. No rewiring necessary—simple, easy, quick installation. No tubes! Instant Warm-up! Cool operation! No maintenance! Low cost!

These units are available for any current and voltage rating—applicable to all d-c operated equipment. These units are designed especially for radio amateurs and will operate efficiently on all dynamotors. When inquiring about other power conversion units than those listed, please give full particulars as to input and output voltage and amperage rating of dynamotor. Special units are available—prices and delivery dates quoted at time of inquiry.



INSTALLATION DATA

VICKERS SELENIUM RECTIFIER

Code No.	D-C Volts	Amps. Out.	Wt. Lbs.	Net Each
S-295A	14, 13.3	2	1.25	$8.95
S-458A		4.5	1.75	8.95
S-167A	12.6, 12	10	3.75	12.95
S-292A		40	12	35.95
S-296A	28, 27	1.8	1.25	6.95
S-344A		5	5.75	13.95
S-172A		10	6	19.95
S-291A	25, 24	20	12	35.95
S-297A		40	23	62.50

Select proper rectifier and transformer from table for your specific application. After proper selection has been made proceed as follows: Connect secondary terminals of transformer to yellow lugs of rectifier selected, connect black lugs to NEGATIVE input terminal of dynamotor, connect red lugs to POSITIVE input terminals of dynamotor. No changes in switching circuit of dynamotor are necessary if cables are included or cable are to be used with unit. Provide "on and off" switch in primary of supply transformer. Rectifier output can be connected to any dynamotor giving good regulation.

THERMADOR TRANSFORMER

RPS No.	Sec. V.	Sec. Am.	Extra Sec. Taps	Wt. Lbs.	Net Each
8883	17	3	18.6, 17.5, 16	3.5	$4.45
8884	15.5	5.2	16.6, 16.2, 15	5.5	4.95
8885	19.2	12	21.4, 20.4, 18.8	12	7.15
8886	17.2	46	19, 18.2, 16.5	35	22.95
8888	33	2	36, 35, 31	5	4.95
8889	32	6	36.7, 35, 31	12	7.95
8892	32	12	36, 34, 31	25	13.45
8890	32	33	36, 34, 31	32	22.25
8891	32	46	36, 34, 30	78	58.95

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ever, because it might become necessary for a mobile to take over net control, or to engage in point-to-point communication with fixed stations outside the city.

Two additional facilities, while not absolutely necessary, would have proved very helpful:

There was a definite need for amateur aircraft stations to report traffic jams along main highways, make quick estimates of bomb damage, and locate fires in areas cut off from telephone communication. Several New Jersey amateurs are now planning light portable equipment that can be carried into a CAP plane and taken aloft to be operated by an amateur. It will be easy enough to build such gear—one watt of power on 144 mc has been found adequate to cover a radius of well over 50 miles. But suppression of electrical noise in the aircraft may be something of a problem.

A few walkie-talkie stations would also have come in handy. The second operator of a mobile station could have used such equipment to relay messages to his car from inside a hospital, for retransmission by the car to the net control station. He could have entered "bombed" buildings and reported immediately the number of victims there who required ambulance service. The South Jersey Radio Association plans to develope suitable walkie-talkie gear as a club project.

Emergency Coordinator W2UVC played a major part in organizing amateur participation in the test. Lloyd offers the following suggestions to other ECs and to amateur groups interested in emergency work:

Contact your local Civil Defense authorities and acquaint them with what amateurs can do in case of emergency. Tell them exactly how many mobile and fixed stations are available, explain what types of service they can render, and indicate how many stations have emergency power supplies. Leave with the Civil Defense people the phone numbers of amateurs who can alert the net.

Contact the local Red Cross and give them the same information. If possible, the EC should arrange to become a member of the Red Cross Disaster Committee.

Organize efficient mobile and fixed nets, and

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1—1600 MFD @ 12V
1— .5 MFD @ 400V
2— .5 MFD @ 50V
1— .01 MFD @ 400V
2—20 Watt Resistors
2—Filter Chokes
3—RF Chokes
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1—4 MFD - 600 VDC Pyranol.
1— .1 - 600 VDC Bathtub.
1— .5 - 600 VDC Bathtub.
1—8,000 ohm 20 w. w.w. resistor.
1—10,000 ohm 20 w. w.w. resistor.
5—Resistors - 1 & 2 w.
4—Mica Condensers.
1—Phone Jack.
1—Ceramicon Socket.
2—Terminal Strips.
$6.95 each

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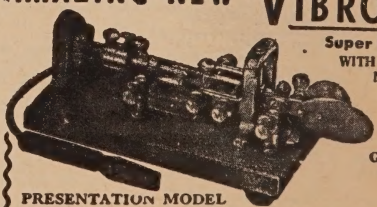
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drill them regularly—once a week, if possible. Inject enough variety into the drills to maintain interest. An interesting feature of a recent South Jersey net meeting was the playing by Roger Barrington, W2LY, of a wire recording of all 10-meter net activity that occurred during the Camden "raid".

Arrange a tie-in between emergency nets in neighboring areas. Cooperation between the New Jersey nets and those in nearby Philadelphia is being arranged by their local Emergency Coordinators.

Make arrangements with the proper authorities for identification cards, stickers, and arm bands for use during emergencies. These should be available to all essential personnel. In the Camden area, Red Cross arm bands are to be issued to participating amateurs, for their use in either war- or peacetime emergencies. The State of New Jersey is printing identifying placards for all mobile stations and their operators.

But remember—and this is extremely important—that the amateur nets must not become the exclusive property of the Civil Defense organization, the Red Cross, the Civil Air Patrol, or any other single group. Amateur nets, in order to be of the greatest possible value, must serve the entire community, just as the telephone system serves it. The amateur communications organization must take orders from whatever authority commands the overall emergency activity, but must avoid tying itself down to any particular group or activity.

The Camden "bombing" is probably only the first of many such drills that will be held this year, in large industrial centers throughout the nation. Tests like these provide the amateur with a priceless opportunity to prove that he can offer his community a vital facility—an auxiliary communications system that can go anywhere, at any time, and do an outstanding job with or without commercial power. Once this has been demonstrated to enough people, the future of amateur radio in the United States will never be in question.

SCRATCHI

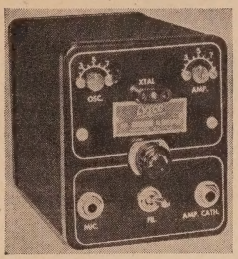
(from page 4)

quarter in slot. Scratchi were hoping to find a way to make juke-box take four-bit pieces or silver dollars, but I decide if monkeying with mechanism are likely to find bunch of washers, slugs and Mexican money in the cash drawer, so letting well enough alone.

Plans for cabin are a little more elaborate. Will have things arranged so person can sitting down to operate, and will put in reel classy fifty-watt rig for both fone and see-w. This rig will use the fancy antenna, not whip antennas like the juke-box rigs. I are figuring that I anchoring barge off island, and the running antenna from island to a buoy, so that center-feed line is near barge. This are making for nice balanced antenna, are you not thinking?

CIVILIAN DEFENSE UNITS by LYSCO

TRANSMITTERS



25 WATTS PEAK POWER

CLAMP TUBE MODULATION

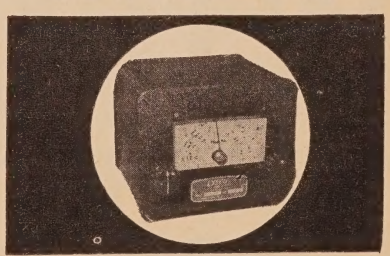
Here's a new line of mobile Amateur Units typical of Lysco engineering skill. Installed in beautiful rounded drawn case - black wrinkle finish with attractive silk screened front panel. Dimensions 4" wide x 4½" high x 6" deep. Power input 500v DC. 125ma. 6.3v AC/DC 1.35 Amps.

MOD.	BAND	TUBES	MOD.	BAND	TUBES
A-114	20 M	3-6AQ5	A-129	10 M	3-6AQ5
A-140*	160 M	3-6AQ5	B-129	10 M	3-6V6GT
B-114	20 M	36V6GT	A-175	75 M	3-6AQ5
B-140*	160 M	3-6V6GT	B-175	75 M	3-6V6GT

* Models A-140 and B-140 cover C.A.P. 2374 Frequencies

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Amateur Net - less tubes.....**$29.95** ea.
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Dimensions 4¼ x 4¾ x 4"

MOD.	BAND	TUBES	MOD.	BAND	TUBES
130	10 M	2-9002, 1-6AK5	132	20 M	2-9002, 1-6AK5
133	75 M	2-9002, 1-6AK5	135-C.A.P.*		1-6BE6

MODELS 130-132-133 — Complete with tubes.
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BEST

Not having any luck finding buoy yet—that's a switch, Scratchi looking for a buoy, instead of a girl, HA HA joke— but somewhere on west coast most be a loose buoy I can obtaining, even if I have to row out with wire cutters and loosen one from its anchor. This should be even easier than getting a pole-transformer. One reason I want to have antenna strung on buoy is that as the buoy rocks back and forth in the water the antenna will be moving around, and I thinking this give a slick QSB to signals, just like DX ought to have.

This may all sound to you like pretty inexpensive way to become a DX station, if you only have to pay two-bits to use juke-box rig, but then I figuring ham are going to have to pay for Scratchi Island license, and I probably setting price on this at ten bux. Also, ham are having to get to Scratchi Island, and who do you think is having the ferry concession? Scratchi, natchurly. Also, ham are bound to get thirsty, especially because I planning on giving out, for free, plenty of salted peanuts. Now it just so happens that I are having, in basement, several large crocks of slitely aged cactus juice. (And if this running out, are always able to make genuine one-year old cactus juice in matter of couple of days). So, should be having plenty to quench thirst of hams if they visit cactus-juice bar—at two-bits a shot.

Will also arranging some cots so peoples can staying overnight, if they can coughing up two bux. Speaking of money are also reminding me, Hon. Ed., are you interested in operating from Scratchi Island? If so, letting me know, so I can arranging reservation for one of the soft cots for opening night. I can also fixing you up with nice two-letter call. Matter of factly, can even arrange to give you any letters you want to have in call if you paying five bux extra. Scratchi are charging only one bux for making reservation, so if you wanting to make one, sending me one bux for that, ten for license, five extra if you choose your own call, and . . . oh heck, telling you what. Just sending me check and don't bother to filling in amount, and I'll figure it out here and fill it in. What say, Hon. Ed?

Respectfully yours,
Hashafisti Scratchi

MONITORING POST

(from page 41)

Hughes Airport, S.I., when ten CAP planes, based at Miller Field, were dispatched to the airport to evacuate "casualties"—six litter cases and five others—to be brought back to their base. Throughout the entire operation the S.I. ham club furnished communications between the "bombed" airport and CAP headquarters at Miller Field. Two mobiles stationed at the airport, the field under attack, handled takeoff and arrival times of planes and information regarding casualties, while the other forwarded traffic to the commanding officer at the

CAP base. A third mobile, stationed atop a hill overlooking Miller Field, reported all air traffic taking off and landing at the field. Other stations, totalling nine, had their specific duties to perform, with the entire event progressing smoothly and efficiently, bringing high praise from CAP officials. *W2ZRA/2* was the station at Miller Field, using a TBS-50-C, and an SX71 receiver; others participating in the event were: *W2JLC, NFH, EFA, EXJ, PFL, VKF, OFD,* and *GNX*. The club recently installed new officers at their annual dinner, when *K2AR,* Col. Saulnier, spoke of his visits with hams all over the world: W2PFL cheffed the beefsteak dinner, and *W2VKF* and *NCH* supplied music for the occasion; *W2JLR* is the new prexy, and *VKF,* treas.

W4BZ, one-time president of the Atlanta RC, seems to have quite a record in ham radio. First known on the air as 4BW, his initials, his spark rig was well known in the South. His first official call was 4DX, and later held 4BZ and 4XC; credited with being the first in the South to QSO Europe on 110 meters, he also was heard in India and New Zealand. Came 1933 and the call W4CBY until '38 when W4BZ was reissued to him. He'll be heard on the air again very soon, so watch for this old-timer, you old-timers.

Civil Defense radio is the important topic now. And this means civil defense radio by the nation's hams. CD planning toward subsequent operation, and in some spots, actual operation of CD nets, such as in New York City, has caused a flurry of construction of v.h.f. gear. The problem of the best rig to use for walkie-talkie operation in thickly-populated sections seems uppermost in the minds of those charged with the planning, and the shortage of component parts and many types of tubes must be considered. However, we are confident that ham radio will do the job and do it well, and now, as never before, all hams must work together as one team to accomplish this work. Teamwork is the order of the times, so let's face it immediately so that we may progress quickly and put ham radio on top in the eyes and minds of all connected with civil defense. This, in turn will bring to the attention of all Americans the job being done by amateur radio in emergency communications.

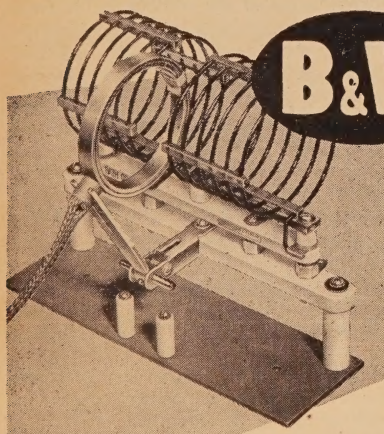
VHF-UHF

(from page 40)

ber and depths of fades, etc. Not that we expect to change anyone's mind, but we may be able to find some basis for making up ours!

W9UIA reported hearing KH6OV on six meters during a short-skip opening on January 25th. Ralph simply states that he fainted! (He found out upon revival that KH6OV was operating portable from San Aneglo, Texas!)

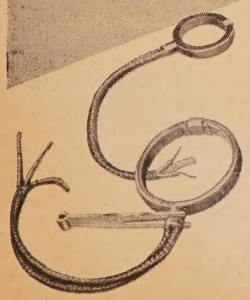
VE3ALD reports that he is holding regularly-scheduled six-meter round table QSOs with VE3DDO, Welland, Ontario, VE3DFW at Port Robinson, Ontario, and W2ZUW at Bliss, N.Y. Good results have been obtained over the 50-mile-plus distance involved in this circuit. Since



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the boys have to dig pretty deep for the signals under normal conditions, and since the schedules are held quite frequently, it is a pretty good bet that six-meter band openings will not be overlooked by this group

Speaking of long-distance scheduled contacts, here is one to really write home about. W2NLY, Oak Tree N. J. and W3QKI, Erie, Pa., have both been doing an outstanding job on two meters during the past season. Recently they decided to set up a schedule to determine if it were even remotely possible to detect each other's signals under normal conditions, over the rugged 330-mile path that separates their stations. Optimists! But take a look at the results—during the past 4 weeks, W2NLY's score stands at only 2 *misses* out of 13 tries! And this despite the un-settled weather of January and February, 1951. Jim admits that signals were "seldom Q5"! CW was used exclusively. Herb, W3QKI, had a little less luck in hearing Jim, but nevertheless, has been able to identify W2NLY's signals on almost every test. Both stations are using relatively high power during the scheduled tests, W2NLY in the order of 350 watts, and W3QKI a bit more. Horizontal polarization has been used exclusively. W2NLY's antenna is the 30-element array described in CQ for November, 1950. The tests will be continued, three nights per week, between 10:00 and 10:30 p.m. EST. Jim also hopes to be able to try the tests at different time of day to check the effect of diurnal variations of propagation conditions.

Two Meter Activity in Germany

DL4CK submits a list of the stations in his neck of the woods who are currently active on the two meter band. From the descriptions that Jack has provided, it seems to us that there is a very good chance of the world record for v.h.f DX moving across the pond if these guys get a break in conditions. Last summer, the only reason DL4XS didn't do better was that he "ran out of land to the West!" Here is Jack's list:

DL3JI—144.14 mc—Runs 80 watts phone or CW; 10-element beam; Wallman converter. QTH is Trais-Horloff.

D13NQ—144.35 mc—80 watts on CW, 25 watts phone, 12-element beam; converter uses two stages triode-connected 6AK5 r-f. QTH is Weinheim.

DL1DA—144.01 mc—30 watts phone and CW, more soon; 4-element beam; using a souped-up BC 639 receiver. QTH is Stuttgart.

DL4DD—144.58 mc—200 watts, phone or CW; 32-element beam; Wallman converter. QTH is Freising.

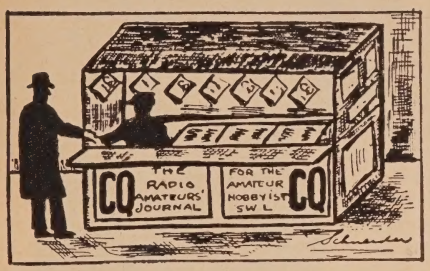
DL4CK—144.74 mc—100 watts, phone or CW; 8-element beam; VHF-152 plus Wallman job; QTH is Weisbaden.

DL4XS—144.45 mc—100 watts phone or CW; 8 element beam, Wallman converter; QTH is Frankfort-am-Main but hopes to find another mountain-top for next summer's operations.

DL3MH—145.62 mc—100 watts input; 4-element beam and (quoting DL4CK) "a blamed 522 receiver which no doubt accounts for his ability

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to not hear signals from down here!" (Seems to us that v.h.f. men the world over sound about the same.)

There are many other stations on two meters over there, but the above are the most consistently active. As yet the boys have heard no v.h.f ham signals from the Russian Zone. There are rumors that one Polish station is on two meters, but no data on authenicity or legality of this station is available at this time.

Radio Teletype News

John Williams, W2BFD, the ol' teletype man, reports that he has plans for a two-meter relay station, located in one of the tall buildings in New York City, which will provide automatic relaying of RTTY signals on the two-meter band. John's idea is to have a crystal-controlled receiver monitoring the RTTY calling frequency, 147.960 mc. A teletype signal entering this receiver would be filtered, and any noise on it would be eliminated by the use of a polar relay system keying a local mark-space tone generator. The "cleaned up" audio would be applied to the modulator of a low-powered two-meter transmitter operating on 144.138 mc which would squirt a signal down into the local metropolitan area. Thus the New York City RTTY boys could monitor the channel on the low end of the band and be triggered by the DX carriers received at the vantage point of the relay station. Automatic shut-off circuits and unusually discriminating triggering systems would insure that the relay station would not operate except when properly coded RTTY signals were received on the monitoring receiver. W2BFD has applied to the FCC for a special license to operate the relay station un-attended, and there is reason to believe that the FCC may look with favor on the idea.

The RTTY network is continuing to expand. W4FJ and W4CYW in Richmond are doing a good job on the southern end of the chain. Ye Ed is currently on RTTY using a machine loaned out by W4JCV as a publicity model. The idea is, after using this model for a while, one is usually bitten by the bug and procures a machine for permanent use. The idea works! We hope to pick up our own machine next week.

W6LS is the "ringleader" of 33 active two-meter RTTY stations in the Southern California area. There are now about 55 machines in that section, and it is hoped that the rest will be on the air shortly.

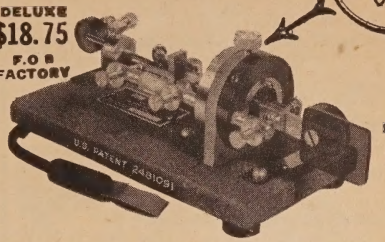
Aurora Signals Photographed by Amateurs

W2ZGP, at Ithaca, N. Y., is investigating the effects of aurora on radio signals as part of his Senior Project work at Cornell. He is now equipped with a W1KIM six-meter converter feeding into a Super Pro, two 8-element stacked arrays (one horizontal, the other vertical), a transmitter which runs 160 watts into an 829 final, and a collection of test and measuring equipment which should help him to pin down the peculiar effects that have been noted so often on aurora-reflected signals. During the opening of February 5-6 the

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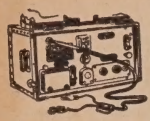
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antennas were down for changes, so Ken missed a swell chance to try his equipment. But, on the 22nd, he hit it on the nose. The signals from VE9RB were copied and high-speed oscillographic photographs were made. Later, VE3AET was worked, and he held his key down while longer records could be made. Although the results are not particularly significant at this stage of the investigation, since all of the aurora signals at the time were too weak to permit accurate evaluation of the data, they represent probably the first high-speed recordings of ham aurora signals. Ken is now looking for schedules with several high-powered stations within his aurora-skip range. He also wishes that during aurora openings stations would send occasional long dashes which would permit him (and others who are equipped for oscillographic observations) to study the signals. A couple of seconds would be enough. We might suggest that during CQs the long dash could be included between your call sign and the next string of CQs. After hearing your signals for a short time Ken could predict when the dash was coming up and shoot his camera during the time. He expects to be on the job until the end of May.

That's about all we have room for this time, so 73. See you next month.

Brownie, W2PAU.

NAVAL RESERVE

(from page 26)

change his rating to Chief Radioman. Impson is in the Photography business in Libertyville, where he has his own studio. He is also president of the Lions Club of that city.

V. R. Abele, RMC, who installed most of the Unit's equipment, is employed as a physicist in the electronic laboratory of the Fansteel Metallurgical Corporation, North Chicago. He is attending college evenings in Chicago in order to attain a degree in electrical engineering.

B. E. Nordmark, SKGC, acting as yeoman for the Unit, owns his own insurance agency in Zion, Ill. J. V. Clayburn, SA, considers himself on a "busman's holiday" on meeting nights. He is employed as a civilian in the Industrial Managers Office, Great Lakes, Ill., and travels much of the time installing electronic equipment in Naval activities throughout the Ninth Naval District.

A. J. Hoover, SA, is employed at Abbott Laboratories, North Chicago. W. Howard, SN, is a ticket agent for the Chicago, North Shore and Milwaukee Railroad. C. R. Zewe, SR, is employed with the Snow White Laundry in Waukegan. W. C. Messer, SN, is a student at Lake Forest College. D. A. Bell, SA, is a draftsman for the Johns Manville Corporation, Waukegan. W. B. Glasel, RMC, is a radio operator at the Bell Telephone Company's radiotelephone station at Lake Bluff, Ill.

The company is fully equipped and prepared to set up emergency communications in any location when needed. Its equipment has been used on field trips and in field day competition with ama-

teur radio operators. The portable radio equipment has been used for civic functions, such as furnishing mobile communication for the Boy Scout Klondike Race from Zion to Waukegan, Ill.

An open house program was held on Navy Day in 1948 and 1949, and again on Armed Forces Day in 1950. The Unit provided an exhibit of Navy equipment at the Waukegan-North Chicago Chamber of Commerce meeting on May 17, 1950, in conjunction with the Armed Forces Day program.

LETTERS

(from page 6)

ance is quite variable under these conditions, I have found that a good average estimate is twenty ohms. From this point of view, it is easily seen that radiation efficiencies of the order of 25% are not attained under any conditions with a bottom loaded whip with a radiation resistance of one and one-half ohms.

Another point of disagreement is the Q to be expected from the coil which was specified. I have found that in order to obtain a coil with a Q of 300 with 63 microhenries inductance, it is necessary to wind number ten wire on a four inch diameter form with spacing between turns equal to the wire diameter. A commercial inductance of a continuous strip edge-wound of silver plated copper gives a Q of 400. However it is quite heavy and bulky for mobile installation.

It appears to me from experience both with a mobile rig on 75 for two years and four years research on small mobile transmitters for a navigation system called Raydist, that a more efficient antenna for 75 meter mobile may be possible by loading a whip in the center in such a manner that it becomes a doublet; that is, hot on both ends and cold in the middle of the center loading coil. This will undoubtedly cause increased losses in the center loading coil since its inductance must be increased; however the transfer and ground losses may very possibly be reduced enough to more than compensate. I am using such an antenna on my present mobile with considerably better results than any previously tried system.

Very truly yours,
Fred S. Howell
W4KDV
Consulting Engineer

January 22, 1951

Fred S. Howell, W4KDV
Hampton Va.
Dear Fred.

Gene Black, W2ESO, Editor of CQ, has sent yours of Jan. 16 concerning my loading coil wheeze to me for comments. I always like a good argument with someone who seems to know what he is talking about, so welcome the opportunity of answering it.

I will admit that I have very little information on the reactance or the resistance to ground of an automobile, and that is why I did not include it in calculating "coupling efficiency". You will notice that I did not use the term "radiation efficiency", and that the first time I used "coupling efficiency", second col. on page 21, I define it as "neglecting

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BARGAINS NEW AND USED TRANSMITTERS. Receivers. Parts. Collins 32V1 $395.00; Globe King $299.00; HT-9 $199.00; HRO-7 $225.00; Temco 75GA $225.00; Collins 75A1 $295.00; new 150 watt phone $199.00; HRO-5T $175.00; NC-173 $139.00; Hallicrafters S-47 $139.00; SX43 $129.00; RME45 $99.00; NC-46, RME69 $69.50; VHF 152A $69.00; SX-24 $69.00; NC-100 $59.00; Globe Trotter $57.50; HT-17 $32.50; New Bud VFO 21 $39.50; New Meissner signal calibrators $24.95; S-38 $29.95; MB-611 $29.00; 90800 exciter $29.50; Gonset 10-11 converters $25.00; XE-10 $19.95; and many others. Large stock trade ins. Free trial. Terms financed by Leo. WØGFQ. Write for catalog and best deal to World Radio Laboratories, Inc., Council Bluffs, Iowa.

FOR SALE: Mackay 167BY console 750 watts cw, nfm, vfo 2-24 mc., Variac, Hallicrafters SX-43 built in, R-44 spkr., ICA audio osc., McElory CP-500 bug, Brush xtal fones, Natl. 1" oscilloscope. All for $400.00. W9LTY, 1506 Summit Dr., W. Layfayette, Ind.

WILL DONATE old callbooks, magazines, some parts and tubes to any DX station writing and willing to pay transportation. Al Meyer, W7GBY, Powell, Wyoming.

FOR SALE: BC-610 modulator unit!! Amertan plate transformer, new. Best offer. Al Meyer, W7GBY, Powell, Wyoming.

SURECHFCK tests for amateurs. Class B & C $1.75. Class A $2.00. Amateur Radio Supply, 1013 Seventh Avenue, Worthington, Minnesota.

BARGAINS: New and reconditioned Collins, National, Hallicrafters, Tammarlund, RME, Millen, Meissner, Gonset, others. Reconditioned S38 $29.00, S40A $69.00, SX43 $129.00, SX42 $199.00, NC57 $69.00 NC173 $149.00, NC183 $199.00, HQ129X $139.00, RME84 $69.00, RME45 $89.00, DB22A, HF-10-20, VHF152A, SX28A, HRO50. Collins 75A1, BC610, others. Terms. Shipped on trial. List free. Write. Henry Radio, Butler, Missouri.

STANCOR 125 w xmitter $55, spotless. WRL Globe Champion modulator $75; guaranteed new in factory crating. Will swap radio hobby for photographic equipment. Joe Swanson, 107 Colrain S.W., Grand Rapids, Mich.

NEED ART-13, BC-348, DY-17, PS-12, PS-13, I-100, ARC-1, ARC-3, etc. Also signal generators, microvolters and any other type test and laboratory equipment, tech. manuals. Also have equipment to trade. Advise what your needs. Write: Bob Sanett, W6REX, 4668 Dockweiler, Los Angeles, California.

FOR SALE: Raytheon power transformer 3650-0-3650 at 700 ma. Size 9 x 10 x 14 high — wanted National NC240D. W1CPI.

TRADE BC221 or HRS 100 watt all-band mobile xmtr like new for condenser checker voltohmist or sweep generator. No junk. Barbara Burris, 1026 Ecther Drive, Concord, California.

FOR SALE: Used Hallicrafters SX42 receiver. Excellent condition. $165.00. J. W. Hopwood, R.D.#1 Garretsville, Ohio, Phone: Horam 2399.

200 WATT 20 to 80 mtr. FB any Antenna. Fully metered. 4 x 4ft. $100.00 W6JQP.

FOR SALE: HT-18 VFO all band exciter, perfect condition, $72.50; 120 watt modulator complete with power supplies, beautiful quality performance, commercial appearance, all on 13 x 17 x 3 inch chassis, $75.00; 220 watt 813 PA complete with power supply, 80, 40, 20 mtrs on 10 x 13 x 3 chassis, no bugs, $75.00; 3 units above make a very compact rig for service man or cliff dweller. First certified check for $200.00 will receive postpaid shipment for the lot including spare tubes, 3 band edge xtals and mike. W3QWX, La Plata, Maryland.

WANTED—Recorder BC 1016, Receivers BC 312, BC 342, S36, S36A, Hammarlund Sp400X. Good condition only, name your price. R. Blum, 250 W. 91st St., Apt. 6N, N. Y. C. or phone CI 6-7813.

JOHNSON Viking I kits assembled, with tubes, as a complete transmitter carrying a 90-day guarantee, for $275.00 at Evans Radio, Concord, N. H.

QSLs? SWLs? "Made-to-order cards!" Samples 3c Sackers QSJs, W8DED, Holland, Michigan.

SELL: BC-221AA with regulated power supply $55 FOB or swap for Gonset Tri-Band converter. Richard N. Lord, W1JSY, Fort Fairfield, Me.

SWAP: 600 watt plate modulated phone transmitter. All band HQ129X & speaker. Bud VFO, Elincor 3 element 10 meter beam, lots of extras. Will consider extra good boats, outboards, shot guns, rifles (hi-power) etc. or $50.00 cash. W5JOD, Homer K. Howe, Blackwell, Okla. Beams and antenna elements. Send card for information. Riverside Tool Co., Box 87, Riverside, Ill.

HOTTEST surplus list in the country. Electronics-hydraulics - Aircraft-gadgets, Dick Rose, Everett, Wash.

CONVENTION! ARRL National Convention in Seattle July 27, 28, and 29th, 1951. Plan your vacation in the Evergreen Playground during Seattle Centennial Year. The event of a lifetime! General Chairman: W7RT.

AM INTERESTED IN CORRESPONDING with fellow hams of scientific turn of mind who have been playing around in field of radio astronomy in the VHF and UHF bands, particularly those who have adapted war surplus radar gear for the observation of celestial phenomena. Would also like to hear from hams investigating RF absorption by gasses in low centimeter ranges, particularly those who have built their own oscillator gear. I'm not trying to sell you anything nor seeking to buy from you. I just want to learn where you are, who you are and what kindred spirits know about this fascinating new branch of our hobby. W2PFM, Apt. 3-B, 101 Perry Sa., New York, N. Y.

Wanted: the following issues of CQ. January, February, March, May, June, July, November, December 1945; January, August, December 1946; April 1947. A. Sambolin P. O. Box 744, Ponce, Puerto Rico.

SELL: BC-654 sets, new or used, easily converted 3500-4000 kc. Navy TCS portable transmitter, receiver, 1.5-12 mc. Want RA-34 rectifier. T. C. Howard, 46 Mt. Vernon St., Boston 8, Mass. Richmond 2-0916 (W1AFN)

WANT: BC-654, PE-103, PE-104, GN-45, RA-34 rectifier, TCS equipment, parts. Arrow Appliance, 525 Union, Lynn, Mass.

SPECIALIZED QSLs-SWLs! Samples! Ace Print, WØQFZ, 2705 So. 7th, Council Bluffs, Iowa.

MILLEN R-9er complete with tubes and ten meter coil, $15. National Selectoject $13. B & W 52 ohm 10-pass filter $12. All in original cartons and guaranteed. W4MXP. 700 E. Broad, Falls Church, Virgina.

TECHNICAL WRITERS

WANTED

experienced in the field of radio-electronics, to write technical manuals, instruction books, etc. Must have good radio-electronics background. Experienced writers preferred. Write Box 51, CQ Magazine, 67 West 44 Street, New York 18, N. Y.

such variables as ground resistance.....", which is quite a bit different from saying that ground losses are negligible.

Actually, what data I have indicate that your figure of 20 ohms is somewhat high. As you will note from the photos, my antenna is mounted high on the car, and well in the clear, to minimize stray capacity to the car body. With this installation, and my old loading coil with a Q of 160, I measured the current into the whip at the top of the loading coil. Then substituting the new loading coil, Q of approximately twice that, or half the resistance, the current went up 3 db, with the same transmitter loading. This figures out to the same loss in the coil with 3 db more current, and twice as much radiated power. If the ground resistance was 20 ohms, or two to four times the coil resistance, where did the extra power to push the 3 db more current through that come from? I'll admit this isn't a very accurate way to measure ground resistance, but it is an indication that it is considerably lower than 20 ohms. The 3 db figure is confirmed by field strength measurements, both with my installation and others, which consistently come out with 3 db better radiation with my coil than with one which has a Q of approximately 160.

I'll stand by my Q measurements. I used a Meas. Corp. Model 80 signal generator, loosely coupled to the coil, the coil tuned by an air condenser to resonate at approx 4 mc. and the relative voltage across the tuned circuit measured by an HP 410A VTVM, with the probe close to but not touching the top of the tuned circuit. Of course the Q of the entire circuit is equal to the ratio of the center frequency to the band width, and the Q of the coil alone is somewhat better than that. Any probable error, except that in measuring frequency or the 3 db points of the resonance curve, and these should not be greater than 5% or so, would be in a pessimistic direction. In order to be conservative, however, I call the coils 300, even though I did measure as high as 357 for circuit Q. I don't have a Q meter available but Jim Millen, (James Millen Mfg. Co.) wound up a few of the coils, and measured 290 on a Boonton. He did not correct for losses in the Q meter, however, and I suspect that the Q of their tuning condenser at 25 mmfd and the loss in their VTVM, connected across the coil, was higher than it should be. It is pretty close, anyway, so you'd better get some lower loss material for the form of your #10 coil 4" in diameter.

From theory, your center-loaded half-wave mobile antenna should be excellent. However, I am of the opinion, not confirmed by measurements, that the additional loading coil loss and additional loss in the base insulator, (at a high voltage point), and additional loss in obtaining high enough voltage to feed the end of the antenna (it will take several thousand volts), more than make up for the reduction in ground loss. And assuming a total length of the two halves of the antenna of 8 feet, or four feet each, what is the radiation resistance of a 4 foot whip at 4 mc? Double that, then figure the current through your loading coil, with over twice the inductance of mine, and see where you come out. I think you'll find a good base-loading coil will do at least as good a job, and isn't waving nearly so high in the air.

George M. Brown

Columbia
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R-100/URR PORTABLE RADIO RECEIVER: 220/110 V. AC-DC or battery pack. Covers broadcast 80, 40 & 20 meters in 3 continuous bands from .54-19 mc. DON'T PASS UP THIS DEAL! Take it to the beach, picnics, trips, or use at home for SWL. Metal case can really take a beating. Use built-in speaker or phones. Good cond. .....ONLY $34.95

ARC-4 VHF TRANSCEIVER: 140-144 mcs. Xtal controlled. Xmtr has 832 in final. Modulated by 6L6's, 10 W. output. Has 13-tube receiver. Excel. cond., with 24V. dynamotor, less tubes. Like new $16.95

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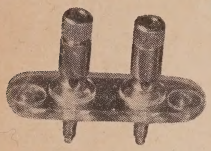
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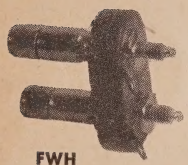
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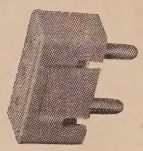
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8 WIRE CONTROL CABLE

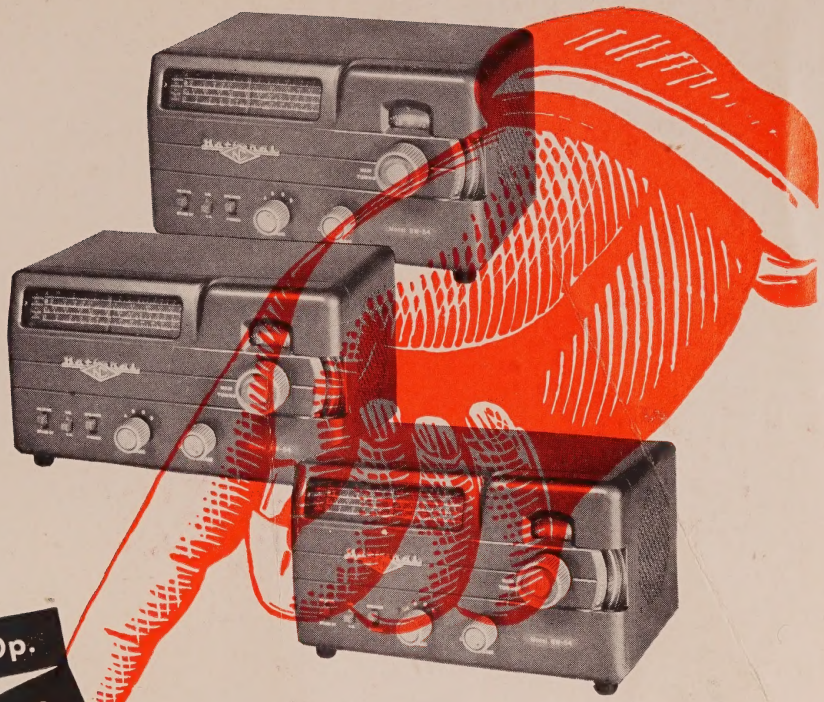
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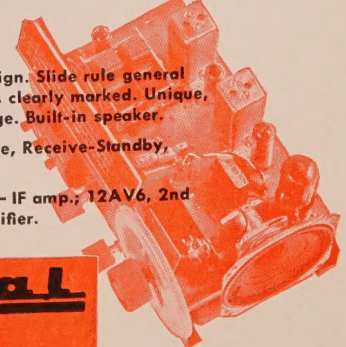
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