May 1962
50¢

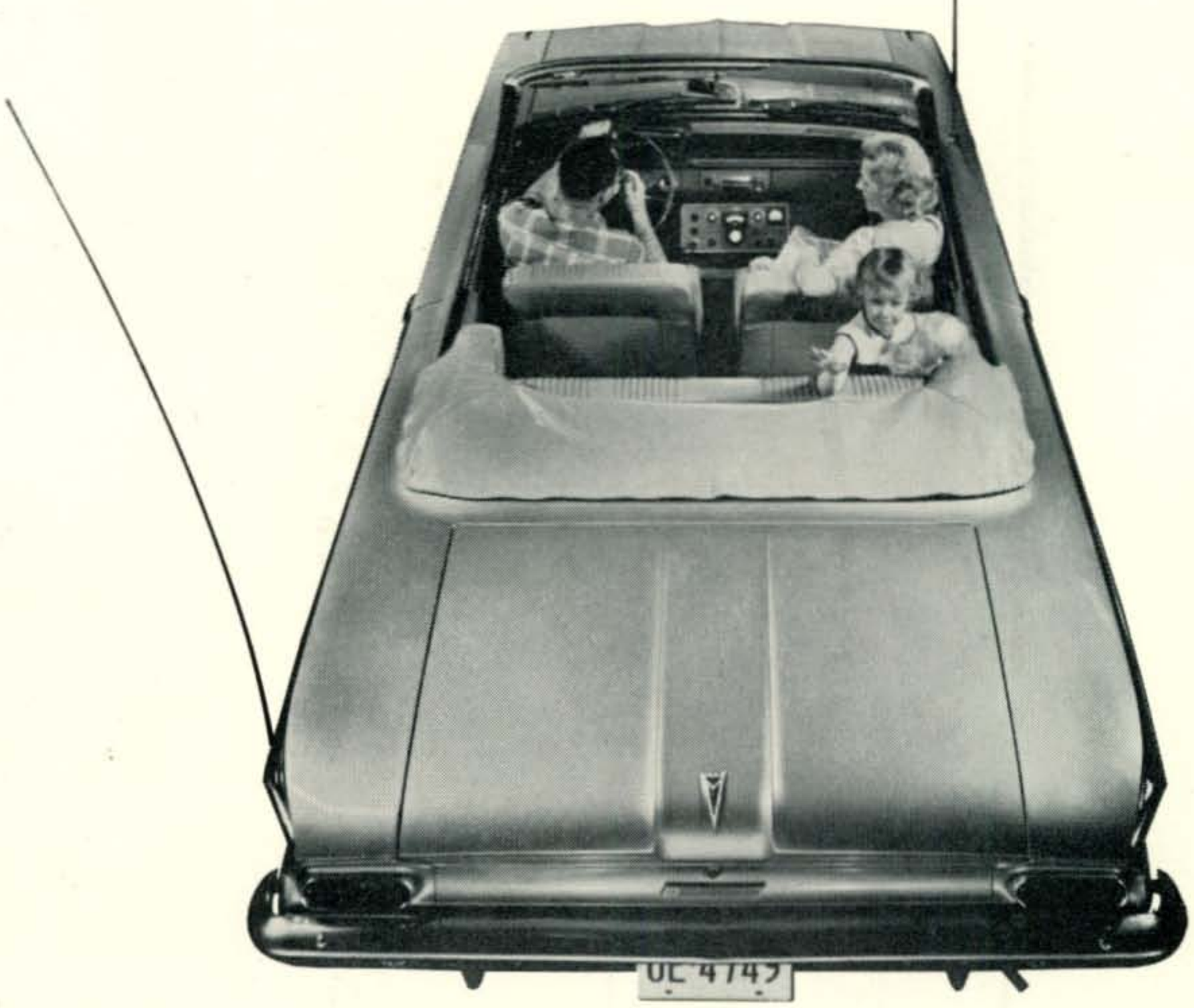
5-3-62

CQ

The Radio Amateur's Journal

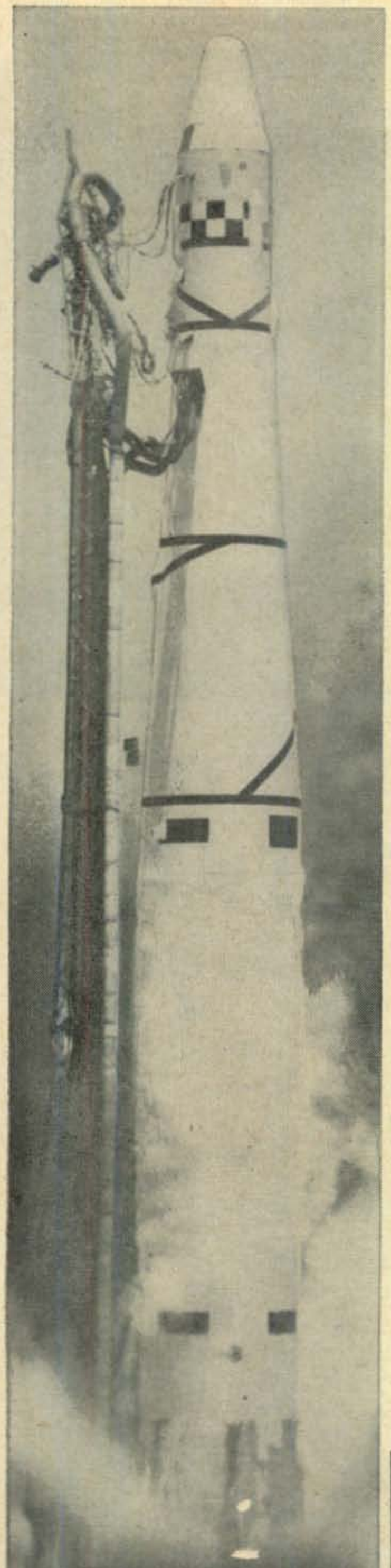
COLLINS

Take it with you



When your vacation arrives and it's time to hit the road, the *versatile Collins KWM-2* SSB Transceiver is one hobby you can *take right along with you.* At home or on the highway, this light-*weight unit covers the popular* HF ham bands. Providing ample *power on 80 through 10* meters with 175 watts PEP input *on SSB, or 160 watts on CW,* the KWM-2 connects automat-*ically in your car's mobile* mount. So, whether you're taking *a long trip this summer* or just going to visit Grandma, put *the KWM-2 on your vacation* list. Contact your distributor today!

For further information, check number 1, on page 110



Here the Agena Satellite, 19 feet long, takes off on its long journey into orbit. — Photograph courtesy of Lockheed Missiles and Space Division.

HIGH ADVENTURE FOR PR CRYSTALS

When Agena, the world's first polar orbit satellite, was launched from Vandenberg Air Force Base, California, in the Air Force Discoverer program, it was a great triumph for the Air Force Ballistic Missile Division and Lockheed Missiles and Space Division. Even greater triumph was the FIRST CAPSULE from space, recovered near Hawaii, after being ejected from the orbiting Agena satellite on its 17th trip around the earth.

The 300-pound capsule, separated from the satellite and de-orbited by retro-rockets, was tracked in its progress back to earth, by radio signals (telemetry) received on recovery planes and ships.

Petersen Radio Co., is proud that PR Crystals are making an important contribution to the Lockheed/Air Force Satellite Program. In this field where split-second timing, precision and dependability are vital to success, PRs are being used in circuits in the various tracking stations. These stations perform many functions during the orbital life of the satellite, including the recovery sequence of the re-entry body.

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USE PR AND KNOW WHERE YOU ARE

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For further information, check number 2, on page 110

A New Dimension in Amateur Radio

The Hammarlund HQ-110A looks like the 110—but basic design changes create the subtle difference between excellent and exquisite! A joyful performer as the HQ-110, the new HQ-110A reaches new heights of operating pleasure by including such extras as:

"Personal Touch" Electronic Keyer—HK-1B

Twice the value—half the cost. The all-transistorized HK-1B is comparable feature-for-feature with keyers costing **twice as much.** Adjustable "personal Touch" ratio for dots/dashes. Suitable for automatic, semi-automatic (bug) or straight key operation.

only **$39.95**
(less battery)

- Significantly tighter mechanical and electrical stability
- Accessory socket for pre-amp or converter application
- Expanded dial—with 144-148 MC calibrations for use with 2 meter converters
- Separate 6 meter coax input for rapid shift from VHF to LF operation

This 12 tube, dual-conversion superheterodyne receiver covers all amateur bands, from 160 to 6 meters—with optimum reception of CW and SSB signals through a separate linear detector.

You have to try this receiver to see just how good it really is—but if you can't—send for the new, informative brochure on the HQ-110A—or pick one up at your local Hammarlund distributor.

Still only
$249.00

24 hour clock timer $10 optional

For further information, check number 3, on page 110

Established 1910

HAMMARLUND
MANUFACTURING COMPANY, INC.
A Giannini Scientific Company
53 West 23rd Street, New York 10, N.Y.

CQ The Radio Amateur's Journal

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Postmaster: send Form 3579 to *CQ*, 300W. 43rd St., N. Y. 36, N. Y.

TABLE OF CONTENTS

DEPARTMENTS

A few of these 37 "volume"

A few months ago, while moving to additional new facilities in Chicago, we assembled in one place all 37 models of the amateur and general coverage equipment currently manufactured by Hallicrafters.

It was quite a display. The most extensive line of its type in the world, by a country mile. And it suggested some facts we thought might interest you.

More than $1,800,000 of *basic engineering cost alone* went into their original design. Hundreds of thousands more each year produce the modifications, few of which show on the surface.

For several of these models, the predictable market is only a few hundred units—hardly worth building, if you're after "volume". Engineering requirements often far exceed those of the less sophisticated units.

We make and sell them anyway. Here's why:

Our company was founded over 30 years ago on the needs and wants of amateur radio. Those needs are highly technical in character, tremendously diverse. They cost more to manufacture—*but are needed nonetheless.*

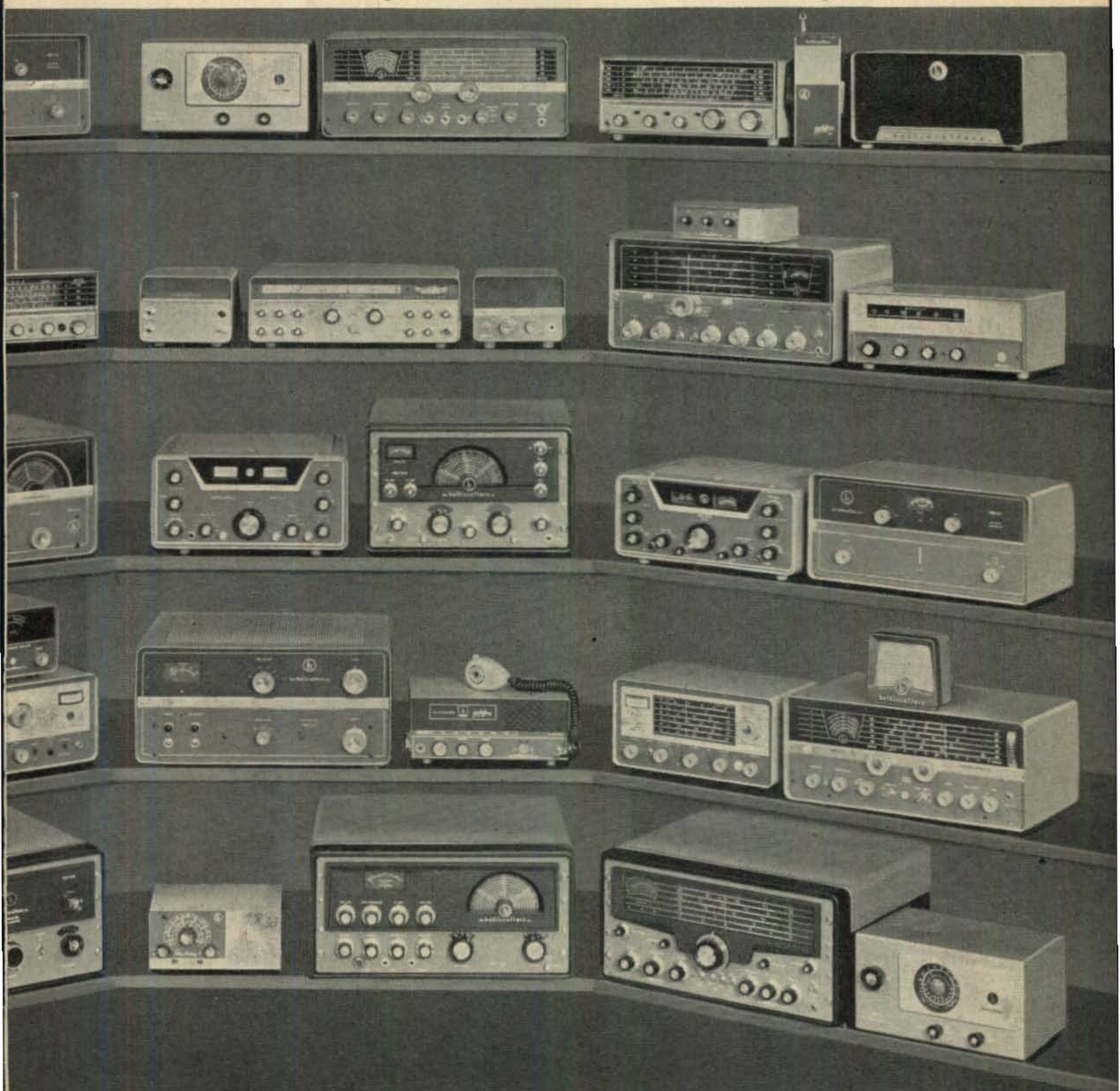
Hallicrafters has grown through the years by doing its level best to serve *all* the requirements of the amateur fraternity, *all* of the time, with engineering creativeness and technical precision. Not just the most profitable parts.

This is one of the responsibilities of leadership. It's also more fun.

hallicrafters...*Where the*

Chicago, Illinois

current Hallicrafters products are not items. Here's why we make them, anyhow.



new ideas in

communications are born

Would you be interested in a list, with prices and brief description, of all the equipment Hallicrafters has ever made? We've just finished revising it, and would be glad to send you a copy.

For further information, check number 4, on page 110

SEE and HEAR
the imaginatively designed

MOSLEY CM-1 receiver

- *First low priced receiver with double conversion and crystal controlled first oscillator.*
- *First receiver with 5 dual-purpose tubes of one type and 4 semi-conductor diodes which perform all functions usually requiring 12 or more tube sections.*
- *First low priced receiver with selectivity, sensitivity and stability that equals receivers selling for $100.00 or more higher.*

FEATURES AND PERFORMANCE:

Diode detector for a.m. and product detector for s.s.b. and c.w.
Calibration every 5 kc.
WWV reception at 15 Mc.
Selectivity: ½ microvolt for 10 db. signal-to-noise ratio on ten meters.
Sensitivity: 2.5 kc. at -6 db. Automatic noise limiter.
Stability: Less than 500 cycles drift after one-minute warm-up. Less than 200 cycles change for 10% line voltage change.
Image and i.f. rejection: 35 db. minimum.
"S"-meter functions on a.m., c.w. or s.s.b. with or without b.f.o.
Audio output: ½ watt at 6% distortion into a 4 ohm speaker.
Rear chassis accessory facilities: Transmitter relay terminals, accessory power socket, external speaker/VOX terminals.
Power consumption: 33 watts. (115 volts a.c., 50 to 60 c.p.s.)
Write for complete descriptive brochure and the name of the dealer handling the CM-1 in your area.
Amateur Net, $182.70 * (All crystals included)
Matching Speaker, Model CMS-1. Amateur Net, $16.95 *

New! MOSLEY 160 METER CONVERTER
Model CV-160

Converts the 160 meter band, 1750-2000 kc. to 3700-3950 kc. for reception on most 80 meter band receivers.

Designed to attach directly to rear of the Mosley CM-1 and adaptable to most other amateur band receivers.

Connects only to antenna and ground terminals of receiver. No other connections are required.

Transistorized, crystal controlled, printed circuit, self powered by two penlite cells (not included).

*Amateur Net, $14.95 **

*Slightly higher west of Rockies and outside U.S.A.

Mosley Electronics Inc.
4610 N. LINDBERGH BLVD. BRIDGETON, MO.

For further information, check number 6, on page 110

ZERO BIAS

PROBABLY the greatest single by-product of increased single sideband operations during the past few years has been the extraordinary use of the phone patch. What was once a rather rare piece of station equipment has now grown into a commonplace adjunct and the phone operator isn't a good one unless he's able to render this service.

Undoubtedly the most appreciative recipients of this aid have been members of the armed forces, especially those operating from remote outposts such as Thule and Marie Byrd Land. For these men, the phone patch has meant the difference between family companionship and loneliness. If *you* have ever been placed in a position where the phone patch was the only means of communication with the outside world we're sure you will agree that *it is* a wonderful feeling to know you can talk to home from thousands of miles away.

It appears, however, that many MARS stations abroad and civilian amateurs here at home have taken undue advantage both of the phone patch and of the operator making the call, via his personal telephone. A great number of patches during recent months have been made, simply because the amateur was in QSO with a city or town in which a friend or relative "just happened" to be. Many patches have been for business reasons and conflict with telephone company regulations. We assume, from what we hear, that nine out of ten amateurs do not inform the telephone company of their phone patch installation; a requirement, by the way.

Since there is some doubt about the legality of phone patching, the ARRL has cleverly avoided publishing articles having anything to do with telephone hook-ups and also refuses advertising commercial equipment of this type on the basis that . . . "the League cannot put itself in the position of appearing to encourage violations of the regulations." This thinking is basically, sound, and if phone patching was openly declared as being illegal, then *CQ*, too, would not publish articles on this gear. Phone patching, however, has so greatly increased over the past few years that it is high time the League recognized the potential problem instead of sticking their head in the sand, hoping the problem will go away.

CQ is, and will continue to be for "legal" phone patching! Phone patches provides as much service to amateurs and their families as any well organized traffic network. *CQ* has published articles and advertising about these items and will continue to do so until this "doubt" is firmly resolved.

We are opposed, however, to the flagrant abuse and misuse of nuisance patching by amateurs, which, if continued, will undoubtedly result in complete revocation of the privilege. The crux of the situation lies, not with the amateur who asks to be patched, but with the "good guy" who doesn't want to appear a killjoy. It is high time we started asking; "Is this patch really necessary?" by firmly refusing patches that are unproductive, the amateur's telephone bill will greatly decrease and valuable spectrum space, which may be used for more important traffic, will become available.

This phone patch problem is a serious one. It is up to those who use them and the ARRL Board of Directors to seek an immediate equitable solution so that our reputation of self-policing will continue unblemished.

Amateur radio is not in competion with the telephone and telegraph companies; let's hope it remains that way.

OUR COVER

CONGRATULATIONS are in order for the Quarter Century Wireless Association on the success of their 5th Annual QCWA QSO party. Ed Zimmerman, W4FNQ, is this year's winner with 267 contacts, 186 of which were QCWA members. More details in next month's CALENDAR.

tells how

FREE

Completion of the Master Course (both Sections) will prepare you for a First Class Commercial Radio Telephone License with a Radar Endorsement. Should you fail to pass the FCC examination for this license after successfully completing the Master Course, you will receive a full refund of all tuition payments. This guarantee is valid for the entire period of your enrollment agreement.

Your FCC Commercial License —or your money back

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"I sat for and passed the FCC exam for my second class license. This meant a promotion to Senior Radio Technician with the Wyoming Highway Department, a $25 a month raise and a District of my own for all maintenance on the State's two-way communication system. I wish to sincerely thank you and the school for the wonderful radio knowledge you have passed on to me. I highly recommend the school to all acquaintances who might possibly be interested in radio. I am truly convinced I could never have passed the FCC exam without your wonderful help and consideration for anyone wishing to help themselves."

CHARLES C. ROBERSON, Cheyenne, Wyoming

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- ☐ Manufacturing
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- ☐ Broadcasting
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- ☐ Other

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In what branch of Electronics are you interested?.....

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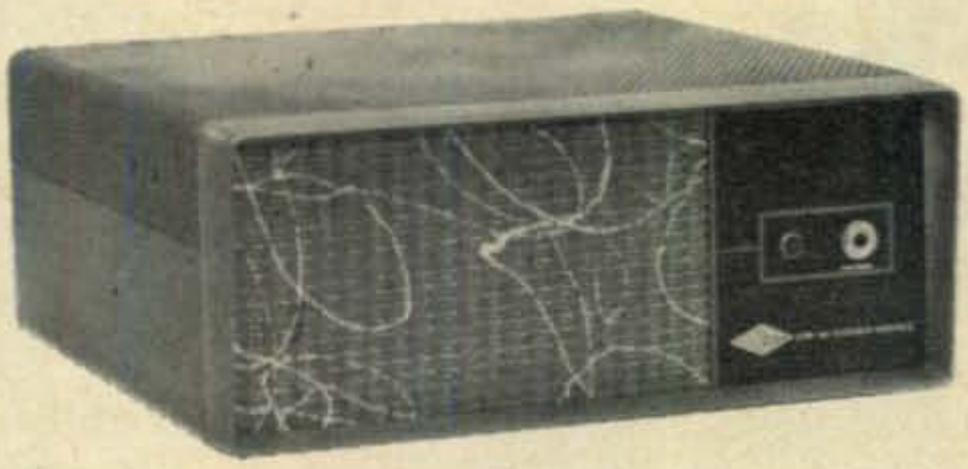
Name ..... Age.....

Address .....

City..... Zone..... State.....

CQ-88

THE GONSET G-76 IS EQUALLY ADAPTABLE TO MOBILE USE OR FIXED STATION!



The G-76 is the ONLY single package 100 watt ALL BAND AM transceiver built today. It provides the maximum in versatility. It is compact and easily installed in vehicle, office or home. As a fixed station with AC power supply and speaker, the Gonset G-76 occupies no more space than a typewriter and is completely compatible with the 3357 VFO, to provide amateurs with the popular 6 meter band coverage.

The Gonset G-76 with either the DC or AC power supply is capable of operating on low or high power—from 20 watts to 100 watts AM phone and 20 to 120 watts C.W. The power supplies include all necessary cables for fixed station or mobile installation.

This moderately priced transceiver offers excellent communications on six amateur bands: 6, 10, 15, 20, 40 and 80 meters, will mount in any auto or boat, and converts in 60 seconds from mobile to fixed when used with the AC speaker power supply, model 3349.

For additional information on the Gonset G-76 contact your nearest Authorized Gonset Distributor or write Dept. CQ-5.

GONSET®

DIVISION OF YOUNG SPRING & WIRE CORPORATION

801 SOUTH MAIN STREET, BURBANK, CALIFORNIA

For further information, check number 8, on page 110

INTERNATIONAL AMATEUR CRYSTALS

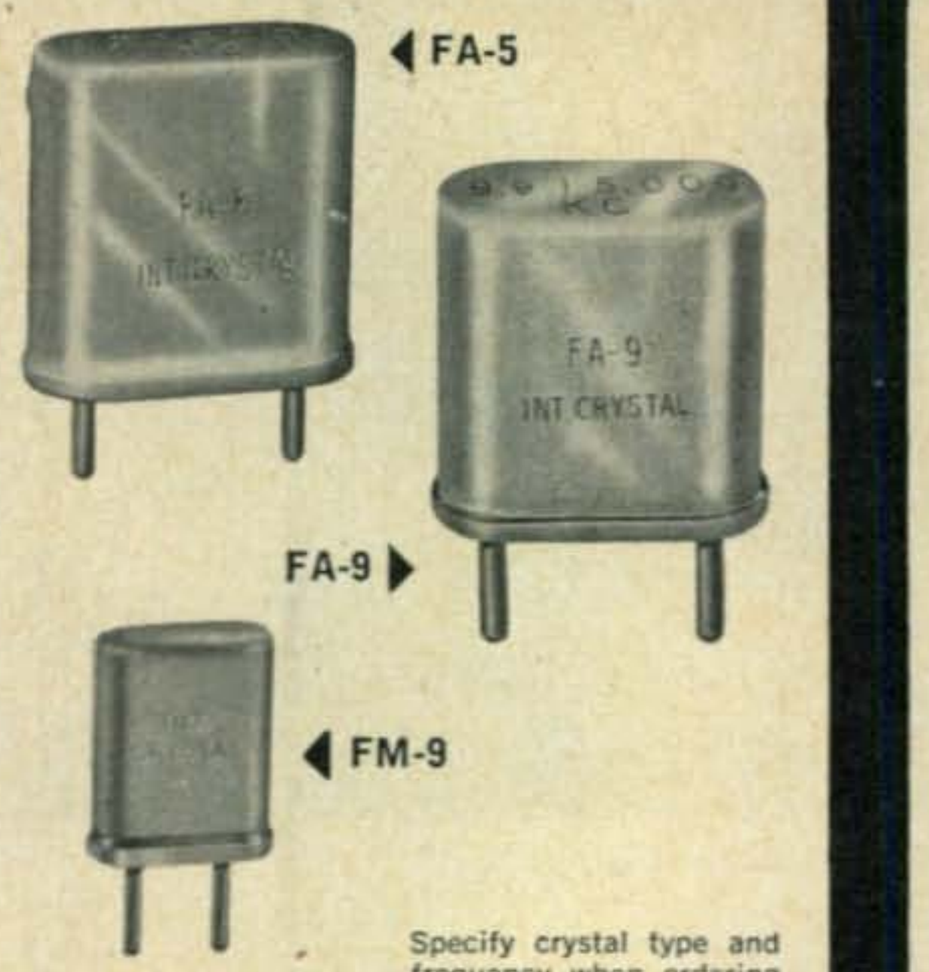
Amateurs throughout the world depend on International crystals for precision frequency control.

Manufactured by the same highly skilled craftsmen who produce International commercial crystals for the broadcast industry, two-way radio communication, and our space and missile program.

International Amateur Crystals
1000 kc to 137 mc — .01% tolerance

Wire mounted, plated and hermetically sealed in metal holders. FA-5 and FA-9 are HC/6U pin type. The FM-9 is an HC/18U pin type.

Priced from $3.30 to $10.00



Specify crystal type and frequency when ordering.

	FA-5 and FA-9	FM-9
Fundamental	* 1000 - 1499 kc * 1500 - 1799 kc * 1800 - 1999 kc 2000 - 9999 kc 10000 - 14999 kc 15000 - 20000 kc	Not available Not available Not available 8000 - 9999.999 kc 10000 - 15000 kc 15001 - 19999.999 kc
Overtone (3rd)	10 - 14.99 mc 15 - 29.99 mc 30 - 59.99 mc	Not available 20 - 39.99 mc 40 - 59.99 mc
Overtone (5th)	60 - 75.99 mc 76 - 99.99 mc Not available	60 - 89.99 mc 90 - 100 mc 101 - 109.99 mc
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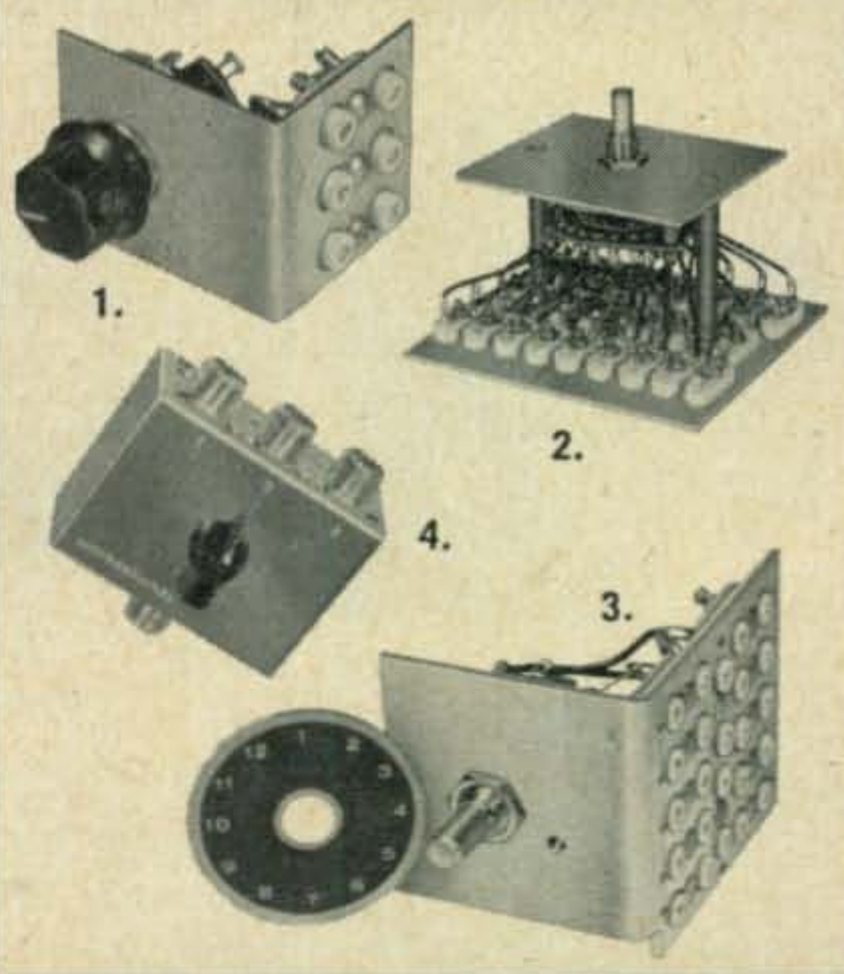
* Allow three to four day processing.

the PERFECT combination for FREQUENCY CONTROL

INTERNATIONAL CRYSTAL SWITCHES

When you design or build . . . combine International crystals and crystal switches. Switches available from 3-position to 24-position. For antennas and laboratory work use International coaxial switches.

Priced from $2.75 to $19.50



1. S-121 Triple Socket Crystal Switch. Cat. No. 150-126.
2. AC-44 Single Pole, 24-Position Crystal Switch. Cat. No. 150-131.
3. 12-Position Crystal Switch. Cat. No. 150-163.
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Write today for International's Free catalog of precision made crystals and equipment.

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For further information, check number 9, on page 110

your choice of
2 GREAT EICO® TRANSMITTERS...

designed by Hams... for Hams...

to the highest Ham standards

90-WATT CW TRANSMITTER* #720
Kit **$79.95** Wired **$119.95**
*U.S. Pat. #D-184,776
"Top quality"—ELECTRONIC KITS GUIDE
Ideal for veteran or novice. "Clean" 90W CW, 65W AM-phone with EXT plate modulation. 80 through 10 meters.

60-WATT CW TRANSMITTER #723
Kit **$49.95** Wired **$79.95**
"Compact; well-planned layout. Clean-sounding, absolutely hum-free carrier; stable." — ELECTRONICS WORLD.
Perfect for novice or advanced ham needing low-power standby rig. "Clean" 60W CW, 50W AM-phone with EXT plate modulation. 80 through 10 meters.

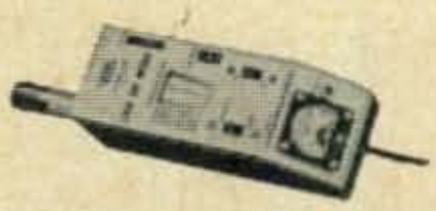
TRANSISTOR CODE PRACTICE OSCILLATOR #706
Complete with battery
Select variable tone, flashing light, or both together.
Phone jack for private use. Efficient speaker: clean loud signals.
Kit **$8.95** Wired **$12.95**

New!

CITIZENS BAND WALKIE-TALKIE #740
Complete with rechargeable battery and charger. 9 transistors, 1 diode. Full superhet. U.S. made.
Kit **$54.95**
Wired **$79.95**

CITIZENS BAND TRANSCEIVERS
Superhet; prealigned xmitter osc; match different antennas by variable "pi" network. Single & multi-channel models.
From Kit **$59.95** Wired **$89.95**

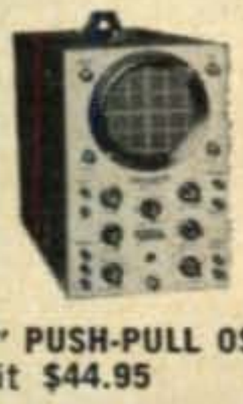
HIGH-LEVEL UNIVERSAL MODULATOR-DRIVER #730
Kit **$49.95** Wired **$79.95**
Delivers 50W undistorted audio for phone operation. Can plate-modulate transmitters having RF inputs up to 100W. Unique over-modulation indicator. Cover E-5 $4.50.



GRID DIP METER #710
Kit **$29.95** Wired **$49.95**
Includes complete set of coils for full band coverage. Continuous coverage 400 kc to 250 mc. 500 ua meter.

PEAK-TO-PEAK VTVM #232
& exclusive
***UNI-PROBE®**
Kit **$29.95**
Wired **$49.95**
VACUUM TUBE VOLTMETER #221
Kit **$25.95** Wired **$39.95**

*U. S. Pat. No. 2,790,051



DC-5MC LAB & TV 5" OSCILLOSCOPE #460
Kit **$79.95**
Wired **$129.50**
5" PUSH-PULL OSCILLOSCOPE #425
Kit **$44.95** Wired **$79.95**

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Add 5% in the West.

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For further information, check number 10, on page 110

Letters..... to the Editor

Are You Color-Blind?

Editor, *CQ:*

I would like to convey an item of pertinent interest to any of the *CQ* readers who are amateur radio operators and who are contemplating entry into the armed forces. It concerns, in general, entry into a military electronics field by an amateur radio operator, and in particular, the physical requirements of that field of endeavor.

As has so often been assumed, an amateur radio operator of today is confronted with little or no difficulty in his being assigned to an electronics field upon his entry into the military service. However, it should be made known that a sizeable number of these potential radio operators and technicians are denied entry into an electronics field because of color-blindness, even though color-blindness does not in itself negate a person's military obligation either voluntary or involuntary as the case may be.

At this point the disappointed and disenchanted ex-electronics aspirant is confronted with a restricted selection of several of the support administrative fields. Usually, the person soon discovers that he has little or no real interest in any of these proferred fields and but slowly realizes that this is his lot for several years to come.

Color-bindness can be readily detected by means of several simple tests, but even so, this knowledge would in no way deter a determined individual from the impecunious pursuit of amateur radio, and as is quite often the circumstance, many color-blind persons are totally unaware of this existing condition. Obviously, a professional military pursuit of electronics is an entirely different consideration, and for most purposes, unobtainable.

Consequently, it would therefore behoove the amateur radio operator who is pending entry into the armed forces to research this matter completely prior to his actual induction.

A/2C George M. Wolf, K5SQN
HQ European GEEIA Region
APO 332, New York, N.Y.

Citizens Band

Editor, *CQ:*

I was very happy to read ZERO BIAS in the March issue of *CQ*. I agree with your observations about the CB situation and with the solutions offered—particularly the backing of ARRL. I do not know if this is a recent change in *CQ* policy to even mention ARRL in a favorable way, but I had the impression that in years past that *CQ* was anti-ARRL. It seems to me that there is room for both *CQ* and *QST* in the ham ranks, both fulfill needs of mine and I am sure that this is the case with others. At this point in the history of Amateur Radio, unity, not division is needed. Keep up the good work!

Hugh T. Hodges, W6RRE
1215 N. Grandview Ave. Apt. 4
Glendale 1, California

Editor, *CQ:*

Congratulations on your editorial in the March issue regarding Citizens' Band. It's about time somebody realized that CB is no laughing matter, but that in many ways it indeed represents a threat to the future status of our hobby. Even though I am in back of the ARRL one-hundred percent, I am somewhat disappointed with the stand that the League has taken regarding CB. They seem to feel that if

◀ information, check number 11, on page 110

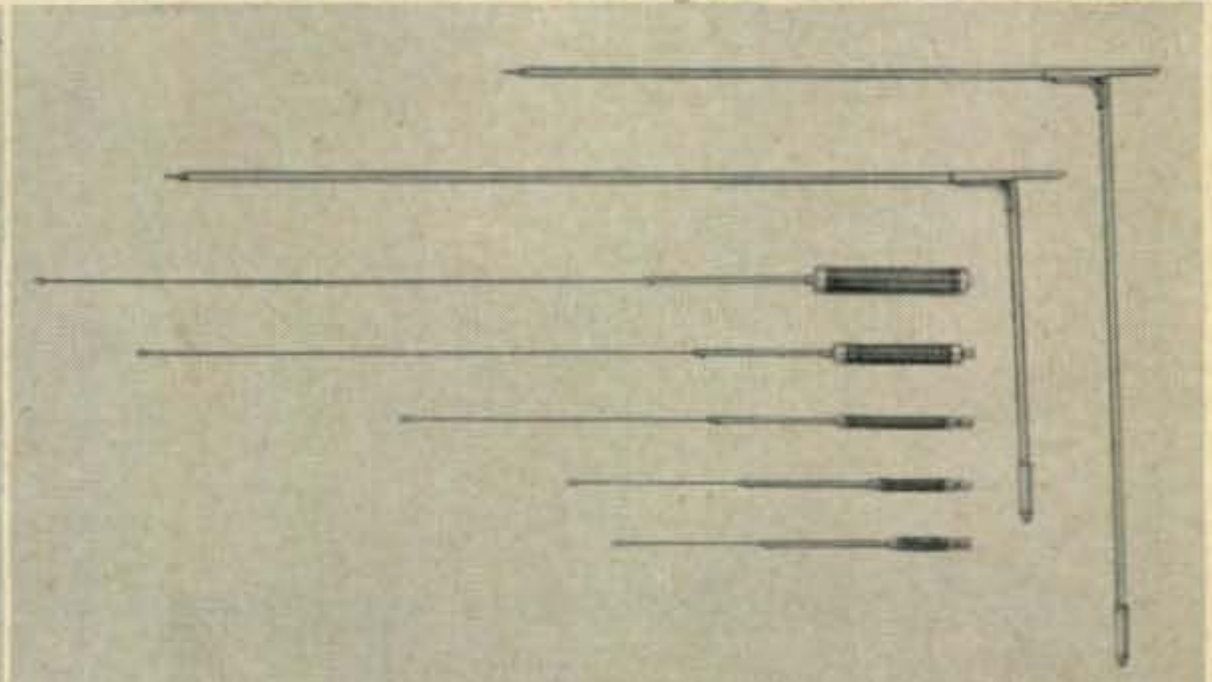
the WINNER

JOHN NOWACKI
K8VZU

● *Everybody's going mobile with the*

HUSTLER

10-15-30-40-75 METERS
NEW-TRONICS
MOBILE ANTENNA



● *Now, Get Fixed Station Reports with the "HUSTLER"*

Buy only the mast and resonators for the bands you operate. No need for matching devices, no feed line length problems. Use any length of 52 ohm cable. This is a new, efficient concept of center loading. Each of the five resonators has a coil specially designed for maximum radiation for a particular band. Center frequency tuning is by means of an adjustable stainless steel rod in the resonator.

The 54-inch fold-over, heat treated, ½-inch aluminum mast permits instantaneous interchange of resonators. Mast folds over for garage storage. When opened to full height, the two sections of the permanently hinged mast are held rigidly in position by a shake proof sleeve arrangement. Mast has ⅜-24 base stud to fit all standard mobile mounts. Power rating is 75 watts dc input A.M. — 250 watts PEP input for SSB.

ANTENNA ASSEMBLY CONSISTS OF 1 MAST and 1 RESONATOR

Part No.	Description	Total Height of Antenna	Amateur Net
MO-1	54" Mast folds at 15" from base	(For Rear Deck or Fender Mount)	$ 7.95
MO-2	54" Mast folds at 27" from base	(For Bumper Mount)	7.95
RM-10	10 Meter Resonator	Maximum 80" — Minimum 75"	5.95
RM-15	15 Meter Resonator	Maximum 81" — Minimum 76"	6.95
RM-20	20 Meter Resonator	Maximum 83" — Minimum 78"	7.95
RM-40	40 Meter Resonator	Maximum 92" — Minimum 87"	9.95
RM-75	75 Meter Resonator	Maximum 97" — Minimum 91"	11.95

ANY MAST OR RESONATOR MAY BE PURCHASED SEPARATELY

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of Complete HUSTLER Assemblies:

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Robert Hintze	K6AUF	Don Tyrrell	KØWVW
Ken Holladay	K6HCP	Peter J. F. Shaw	K4LDR

NEW-TRONICS 3455 Vega Avenue • Cleveland 13, Ohio

For further information, check number 12, on page 110

we amateurs will keep our noses out of the matter it will eventually straighten itself out, but it doesn't seem to be working that way.

My question is this: based on the efficiency of our own self-policing system, why won't the FCC allow us hams to act as volunteer Citizens' Band monitors? This would lessen the Commissions regulatory task considerably, since admonitory notices locally, and the Commission would have to be called in only in the case of problems which, for various reasons, might require drastic action. There are certainly many interested hams throughout the country who are ready, willing and technically able to carry out this task, and as soon as the CB "pseudo-hams" realize that their clowning around can easily be stopped by legal action, the number of violations will fall off sharply.

If all interested amateurs would drop a line to the Commission's Washington office, volunteering their services and emphasizing the fact that this venture will lessen the Commission's paperwork and not increase it, we may be able to perform a new service to the government, as well as to ourselves and those forgotten souls who really do have a legitimate use for CB.

Roger Bean, W1QNP
RFD 1
East Princeton, Mass.

Editor, *CQ:*

Congratulations on your editorial in March *CQ*. It should be required reading and rereading for every radio amateur.

Carl C. Drumeller, W5EHC
5824 N. W. 58th Street,
Oklahoma City 22, Okla.

USA-CA

Editor, *CQ:*

Many thanks for your USA-CA program—it is just like taking a new course in United States History.

—W8WUT

Editor, *CQ:*

I would like to offer my hearty congratulations on your USA-CA program. It seems to offer something for everyone, whether going all out or specializing on individual states. The very readable coverage of it in *CQ* is the first thing I turn to every month. Let's have lots more of it.

—W9CMC

Editor, *CQ:*

May I commend you on your sponsorship of the USA-CA program. I find a great deal of pleasure in working for new counties and the awards program has added a great deal to my enjoyment of ham radio. In this connection, I believe that the K6BX's columns in *CQ* each month has become your best column. At least I turn to it first each month and derive a great deal of satisfaction from reading it.

—KØDEQ

Editor, *CQ*:

. . . Your USA-CA program is the first thing I read when I receive my *CQ*.

—W9DBO

Editor, *CQ*:

Sure enjoy your USA-CA coverage. . . . Looking forward to receiving my USA-CA 500 soon.

—WØARO

Editor, *CQ*:

Your USA-CA program is a welcome addition. Congrats to you and the staff for including it.

—K8TBR

Editor, *CQ*:

. . . I'd like to see the OLD MAN write the whole doggone magazine. Keep up the good work.

—WA4AWP

Editor, *CQ*:

. . . I enjoy reading what Clif Evans, K6BX has to write in his USA-CA Column. I noted that he rated over 3 pages in the March issue and that's FB.

—K2PFC

"6N2" TRANSMITTER — This compact VHF transmitter offers instant bandswitching coverage of both 6 and 2 meters. Completely shielded and effectively TVI suppressed, the "6N2" may be used with the Viking "Ranger II", Viking "Valiant", or similar power supply-modulator combinations capable of at least 6.3 VAC at 3.5 amp., 300 VDC at 70 ma., 300 to 750 VDC at 200 ma. and 30 or more watts of audio. Power input is rated at 150 watts CW and 100 watts AM phone . . . shaped keying results in excellent wave-form. May be operated by external VFO or built-in crystal control. 8 to 9 mc. crystals are used in a pentode oscillator which doubles in plate circuit. Silver-plated balanced tank circuit with parallel lines provides maximum efficiency on 2 meters. With tubes.

Cat. No. 240-201-1 Kit Amateur Net.....**$129.50**
Cat. No. 240-201-2 Wired, tested Amateur Net.**$169.50**

"6N2" THUNDERBOLT AMPLIFIER—Rated at 1200 watts P.E.P. (with an auxiliary SSB exciter) input SSB and DSB, Class AB_1; 1000 watts CW input Class C; and 700 watts input AM linear, Class AB_1. Drive requirements approximately 5 watts in Class AB_1 linear or 6 watts Class C continuous wave. Continuous bandswitched coverage on 6 and 2 meters—effectively TVI suppressed and filtered—wide range pi-network output. Outstanding efficiency—losses on 2 meters held to approximately 5%, instead of common 25% losses experienced in some other 2 meter circuitry! This is possible due to the unique silverplated Hi-Q coaxial line; silver-plated inductors; capacitors; and switch! With tubes.

Cat. No. 240-362-1 Kit Amateur Net.....**$524.50**
Cat. No. 240-362-2 Wired, tested Amateur Net.**$589.50**

"6N2" VFO—Exceptionally stable and compact—designed to replace 8 to 9 mc. crystals in frequency multiplying 6 and 2 meter transmitters, including types using overtone oscillators. Temperature compensated and voltage regulated for minimum drift and high stability. Plexiglas dial calibrated from 144 to 148 mc., 50 to 51.5 mc., 51.5 to 53 mc., and 53 to 54 mc. With tubes and pre-calibrated dial.

Cat. No. 240-133-1 Kit Amateur Net.....**$34.95** **Cat. No. 240-133-2** Wired, tested Amateur Net..**$54.95**

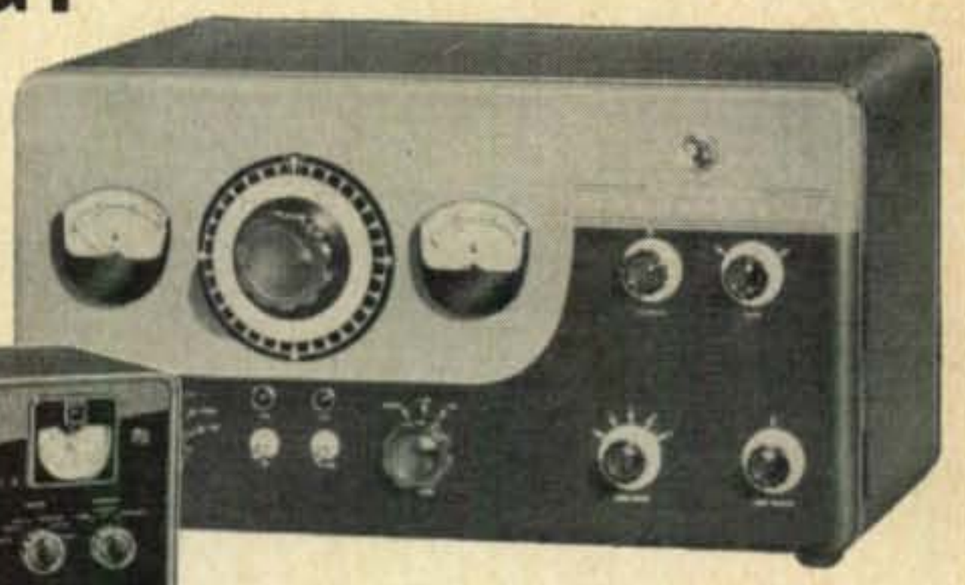
"6N2" CONVERTER—This compact Viking "6N2" Converter provides instant front panel switching from normal receiver operation to either 6 or 2 meters. Maximum sensitivity and low noise figure . . . excellent image and I.F. rejection. With tubes. Available kit or wired in either 26 to 30 mcs., 28 to 30 mcs., 14 to 18 mcs., or 30.5 to 34.5 mcs. ranges. Specify range desired.

Kits Amateur Net.....**$59.95** **Wired, tested** Amateur Net.....**$89.95**

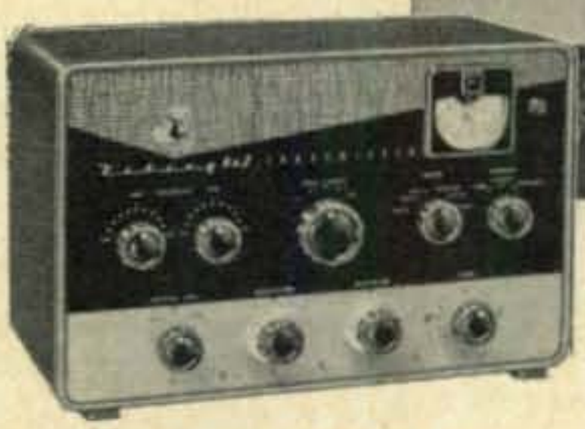
for 6 and 2 meters ...nothing outperforms a VIKING!

"6N2" VFO

"6N2" CONVERTER



"6N2" THUNDERBOLT AMPLIFIER



"6N2" TRANSMITTER

New Catalog

In addition to the equipment described above—E. F. Johnson Company also manufactures a complete line of higher power transmitters; SSB equipment; amplifiers; station accessories; keys and practice sets . . . all described in detail in our newest amateur catalog. Write for your copy today!

E. F. JOHNSON COMPANY
WASECA, MINNESOTA, U.S.A.

FACTORY AUTHORIZED SERVICE Instead of shipping to our factory, equipment to be serviced may also be sent to:

Electrosony Corp.—Empire State Div.
65-37 Queens Blvd.
Woodside 77, New York

Park-Armature Co.
1218 Columbus Ave.
Boston 20, Mass.

Heights Electronics, Inc.
1145 Halsted Street
Chicago Heights, Ill.

B and S Electronics, Inc.
6326 W. Roosevelt Rd.
Oak Park, Ill.

Radio Comm. and Engr.
Pinehurst Place
Charlotte 9, N. C.

For further information, check number 14, on page 110

Trailerite Amateurs

"Mid" Middleton, W5CA/W7ZC is interested in hearing from amateurs who make their homes in trailer camps or mobile home parks. He's interested in knowing bands operated, power, antennas, etc. He's also looking for good pictures. His QTH is Box 808, Tijeras, New Mexico.

Annual Auction

The Lehigh University Radio Society will hold its annual auction on Saturday, May 5th from 1:30 to 5 P.M. in Packard Laboratory auditorium on the campus. W3AEQ will monitor 50.25 mc for visiting mobiles.

Moline, Illinois

May 27th is the date set by the Quad City A.R.C. for their annual hamfest. It's being held at the Rock Island County Fairgrounds in Moline. Reserve tickets are $1.50 and $2.00 at the gate. WA9AGS is handling the incidentals.

Starved Rock Hamfest

The Starved Rock Radio Club Hamfest will be held June 3rd at the La Salle County 4-H Home and Picnic Area, southwest of Ottawa, Illinois. Advance registration is $1.50 and must be received before May 25. Gate price, $2.00. Along with the usual events, special recognition will be given those in attendance whose names appear on the 1934 Hamfest registration list. W9QLZ is secretary and will give you more info via RFD 1, Box 171, Oglesby, Illinois.

Breeze Shooters Inc.

The 8th Annual Breeze Shooters Hamfest is scheduled for Sunday, May 20th at the North Park Lodge near the Butler Valley Interchange of the Penna. Turnpike. Programs start at 9:00 A.M. Chuck Hoover, W3YPH will fill you in on the incidentals.

Providence Radio Association

Forty-one years is a long time to be scheduling an annual Dinner-Dance and this year is no exception. May 19th is the date and Johnson's Hummocks in Providence is the place. Interested parties can contact the club at Box 2903, North Station, Providence 8, R.I.

Bremerton Washington

The Amateur Radio Association of Bremerton is holding its annual banquet on Saturday, May 19th at the Sons of Norway Hall in Bremerton. W7UWT is handling the tickets and indicates that tickets go for $4.00 prior to May 14th and $4.50 at the gate. Ray's address is 2812 Hayton Ave., Bremerton, Washington.

Topeka, Kansas

The Kaw Valley R. C. will hold their annual "Hamaroma" on Sunday, May 13th at Garfield, Park. Talk-ins on 3920 kc and 29.6 mc. KØTMO is handling the incidentals, *i.e.* tickets for $1.50.

Florida

The Orlando A. R. C. is holding their annual Hamfest, May 4, 5 and 6 at the Cherry Plaza Hotel. The theme of the Hamfest will be "Half Century of Ham Radio." Distributors will display their latest equipment and there will be forums, code contests, etc. Further information is available from the Orlando A. R. C. at Box 2067, Orlando, Fla.

Lancaster, Penna.

Saturday, May 12th at Hostetters Banquet Hall in Mt. Joy, Pennsylvania is the time and place for the Lancaster Radio Transmitting Societies' 17th annual Banquet. Registration can be made through W3OY at 136 Springhouse Road, Lancaster, Penna. Phone: Ex 2-6093.

CHART YOUR COURSE TO EIMAC

for dependable, high quality power tubes

EIMAC TYPE	CLASS OF OPERATION / SERVICE	TYPICAL OPERATION — SINGLE TUBE								
		D.C. PLATE VOLTAGE	D.C. PLATE CURRENT (AMPERES)	D.C. SCREEN VOLTAGE	D.C. GRID VOLTAGE	APPROX. MAX. DRIVE POWER (WATTS)	APPROX. D.C. SCREEN CURRENT (AMPERES)	APPROX. D.C. GRID CURRENT (AMPERES)	APPROX. MAX. POWER OUTPUT (WATTS)	FILAMENT VOLTS / AMPERES
3-400Z	B / SSB	3000	.100 / .333(3)	—	0	32	—	.12	655	5.0 / 14.5
3-1000Z	B / SSB	3000	.240 / .670(3)	—	0	65	—	.30	1360	7.5 / 21.3
4CX250B(1)	AB1/SSB	2000	.1/.25(3)	350	−55(5)	0	0/.005(3)	0	300	6.0 / 2.5
	C/CW	2000	.25	250	−90	2.9	.019	.026	390	
	C/AM	1500	.20	250	−100	1.7	.02	.014	235	
4CX300A	AB1/SSB	2500(6)	.1/.25(3)	350	−55(5)	0	0/.004	0	400	6.0 / 2.5
	C/CW	2500(6)	.25	250	−90	2.8	.016	.025	500	
	C/AM	1500	.20	250	−100	1.7	.02	.014	235	
4CX1000A	AB1/SSB	3000	.25/.90(3)	325	−60(5)	0	−.002/.035	0	1680	6.0 / 10.5
4-65A	AB1/SSB	3000	.015/.065(3)	360	−85(5)	0	0/.006	0	130	6.0 / 3.5
	C/CW	3000	.112	250	−105	1.6	.022	.009	270	
	C/AM	2500	.102	250	−150	3.1	.026	.013	210	
4-125A	AB1/SSB	3000	.03/.105(3)	510	−95(5)	0	0/.006	0	200	5.0 / 6.5
	B/SSB(4)	3000	.02/.115(3)	0	0	16	0/.03	0/.055	240	
	C/CW	3000	.167	350	−150	2.5	.03	.009	375	
	C/AM	2500	.152	350	−210	3.3	.03	.009	300	
4-250A	AB1/SSB	3000	.055/.21	600	−110(5)	0	0/.012	0	400	5.0 / 14.5
	C/CW	3000	.345	500	−180	2.6	.06	.01	800	
	C/AM	3000	.225	400	−310	3.2	.03	.009	510	
4-400A	AB1/SSB	3000	.09/.30(3)	810	−140(5)	0	0/.018	0	500	5.0 / 14.5
	B/SSB(2)(4)	3000	.07/.30(3)	0	0	40	0/.055	0/.10	520	
	C/CW	3000	.35	500	−220	6.1	.046	.019	800	
	C/AM	3000	.275	500	−220	3.5	.026	.012	630	
4-1000A	AB1/SSB	4000	.17/.48(3)	1000	−130(5)	0	0/.04	0	1130	7.5 / 21.0
	B/SSB(4)	4000	.12/.67(3)	0	0	105	0/.08	0/.15	1870	
	C/CW	4000	.70	500	−150	12	.137	.039	2100	
	C/AM	4000	.60	500	−200	11	.132	.033	1910	
3CX100A5 / 2C39A	C/CW(7)	800	.08	—	−20	6	—	.03	27	6.3 / 1.0
	C/AM(7)	600	.065	—	−16	5	—	.035	16	

(1) Ratings also apply to 4X250B.
(2) Ratings apply to 4-250A within plate dissipation limitation.
(3) Zero signal and maximum signal dc current.
(4) Grid and screen grounded, cathode driven.
(5) Adjust to give stated zero-signal plate current.
(6) For operation below 250 Mc only.
(7) At 500 Mc.

Above you see popular Eimac tube types suitable for ham transmitters. Remember this chart when you need a tube. And remember the name Eimac. It means power. Quality. Dependability. For Eimac has more know-how, more experience with power tubes than any other manufacturer. Your local Eimac distributor can supply you with any of these tubes listed and Eimac sockets to match. Or for complete data, write Amateur Services Department, Eitel-McCullough, Inc., San Carlos, California. Subsidiaries: Eimac, S. A., Geneva, Switzerland; National Electronics, Geneva, Illinois.

Eimac

The "Hustler"

New-Tronics, manufacturer of a new line of mobile antennas, who recently sponsored a contest to name their product line, has announced a winner. John Nowacki, K8UZV, a 16-year-old high school sophomore from Columbus, Ohio, came up with the "Hustler" and won himself first place. Universal Services, of Columbus, also won a prize, since John does most of his purchasing there. By the time you read this, John should be well on his way to learning all about sideband with his new KWM-2.

Rome, N.Y.

The 10th Annual Ham-Family Day sponsored by the Rome Radio Club will be held at Beck's Grove in Rome, starting at noon on Sunday June 3. Six and two meter hidden transmitter hunts, auction, mobile judging and nationally known speaker will be featured. Steak and Chicken Dinner $4.00 before June 1, $4.50 at the gate. Children $1.25. Talk-in on 3.9, 50.6 and 145.38 mc.

Fresno

The Fresno Hamfest will be held on Saturday, May 12th at the Towne & Country Lodge in Fresno, Calif. Registration starts at 8:00 A.M. and activities start at 9:00 A.M. Banquet begins at 7:00 P.M. and is included in the registration fee of $5.75. Reservations should be made through the Fresno Amateur Radio Club, Inc. P. O. Box 783, Fresno, California. Room accommodations can be made with Towne & Country Lodge, 3093 North Freeway 99, Fresno, California.

Washington, D.C.

The Marshall Hall amusement park is the spot the National Capital V.H.F. Society has chosen this year for its Hamfest. The park is 20 miles southeast of Washington on the shores of the Potomac. Picnics, lunches, prizes, games, etc. will be featured. Mobile guidance will be offered by K3LUK on 50.4 and 145.1 mc.

Visiting London?

The RSGB London Members Luncheon Club elected officers in March. Stan Vanstone, G2AYC was elected Chairman, Clem Jardine, G5DJ, Treasurer and Frank Fletcher, G2FUX, Secretary. The object of this club is to entertain overseas visitors while they're in London. The club normally meets on the third Friday of each month at the Bedford Corner Hotel, Bayley St., Tottenham Court Road, London WC 1 and the time is 12:30 P.M. in the bar. Visitors can notify Frank of their impending visit via 11a Ickenham Road, Ruislip, Middlesex, (Phone Ruislip 2763) or, through RSGB Headquarters.

Nebraska

The Pine Ridge A. R. C. will hold its annual family picnic at Nebraska State Park, ten miles south of Chadron, Nebraska, on Sunday, June 3rd starting at noon. No charge. Coffee and soft drinks will be furnished by the club and families are asked to bring their own food. Swap tables, door prizes, and transmitter hunts are all on the agenda. Visiting XYLs will be initiated into SWOOP. Lynn Bilyen is handling the info. He's at 406 Henkens Drive, Chadron, Nebraska.

Third Party

SS BULLETIN 1003C
February 20, 1962

FEDERAL COMMUNICATIONS COMMISSION
Safety and Special Radio Services Bureau
Washington 25, D. C.

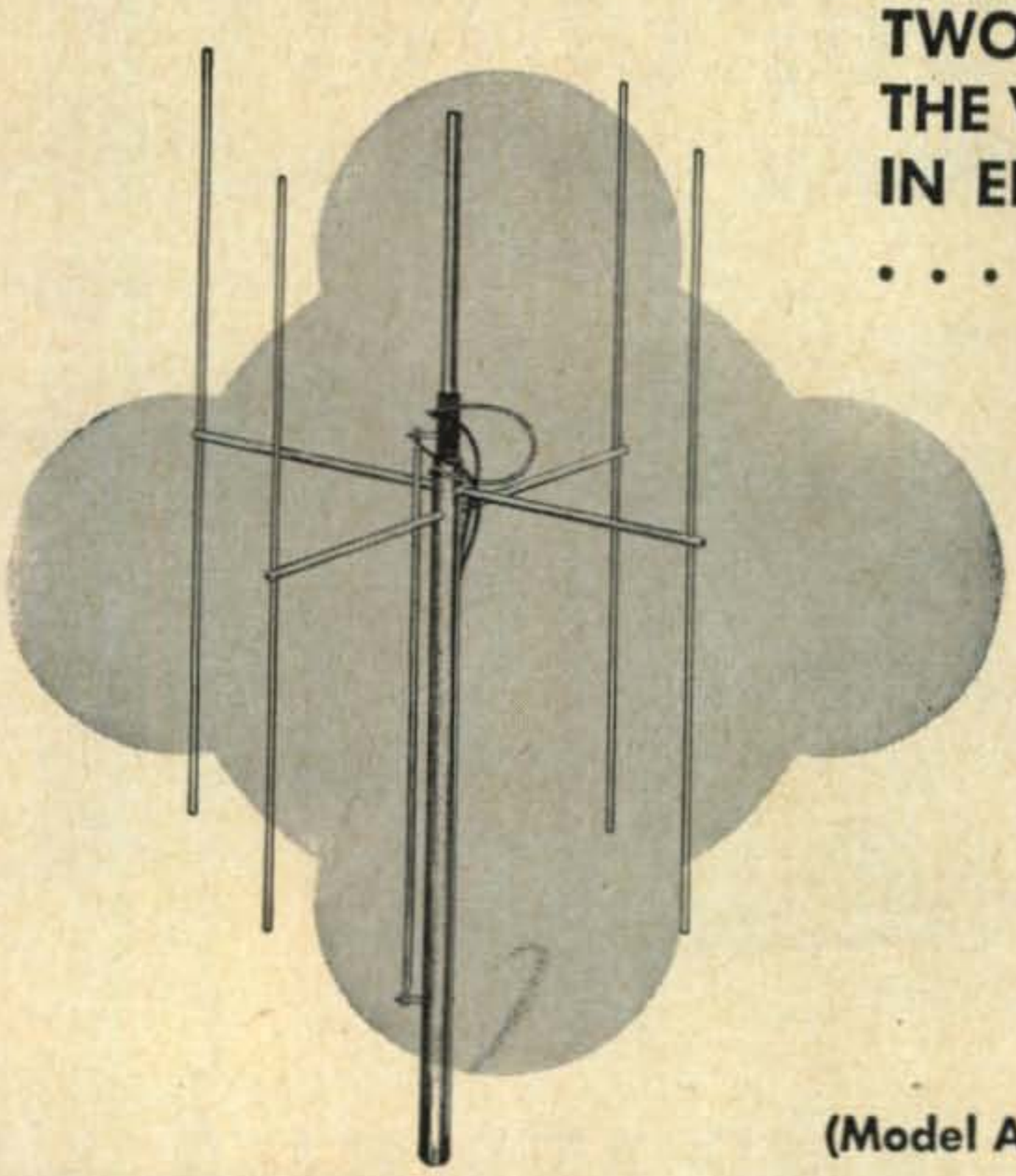
INTERNATIONAL AMATEUR RADIOCOMMUNICATION

The following recapitulation of the International Radio Regulations (Geneva, 1959) concerning com-

[*Continued on page 88*]

NEW from Master Mobile

TWO NEW 2-METER ANTENNAS FOR THE VHF HAM WHO WANTS THE MOST IN EFFICIENCY AND SIGNAL QUALITY . . . AT REASONABLE PRICES



TWO-METER CLOVERLEAF

A brand new concept designed to provide additional gain without the directional characteristics of a beam. Ideal for permanent or portable use. Lightweight, but extremely rugged. Pre-tuned to 146.0 mc., with no more than 1.5:1 SWR from 144 to 148 mc. with normal installation. Omni-directional pattern with increased gain! Supplied complete with balun to match 52 ohm coax.

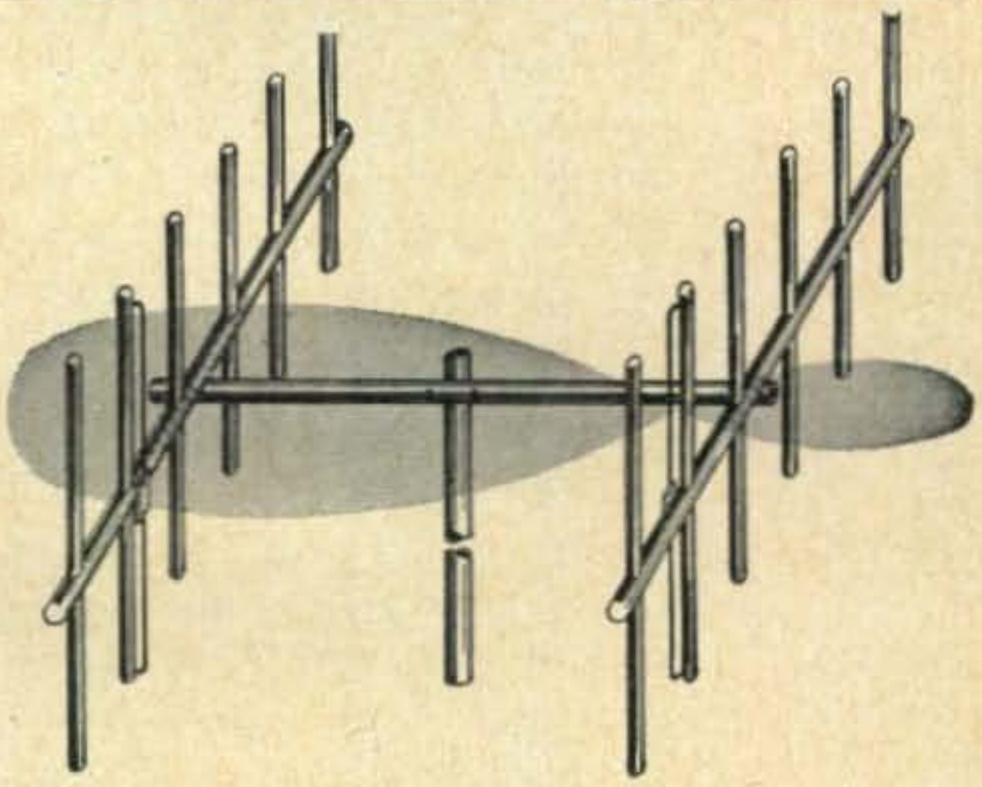
(Model AM-25)

Amateur net **12.95**

TWO-METER TWIN-SIX BEAM

Provides 12 db. forward gain, with excellent front-to-back ratio. Rugged aircraft-type construction for strength and light weight. Will withstand high winds and heavy ice loading. Rotate with any TV rotor. Vertical or horizontal polarization. Supplied complete with baluns, matching harness and 3 foot mast. Matches 52 ohm coax.

Amateur net **16.95**



(Model AM-5)

AVAILABLE AT YOUR LOCAL HAM DEALER.
WRITE FOR NAME OF DEALER NEAREST YOU.

JUST OFF THE PRESS . . . giant new catalog from Master Mobile . . . creators of signal-building antennas. Master Mobile, producers of the famous Master Mobile mounts, springs and whips, now manufactures a **complete** antenna line for ham, CAP, CB and marine frequencies . . . including beams, ground planes and verticals.

Master Mobile MOUNTS, INC.

4125 W. JEFFERSON BLVD. LOS ANGELES 16, CALIF.

For further information, check number 17, on page 110

ANNOUNCING!!

FOR THE PROFESSIONAL . . . FOR THE AMATEUR

RELiant® L-103 1 KW LINEAR AMPLIFIER

Here is a piece of commercial gear . . . to fascinate the discriminating amateur. Brilliantly designed—as modern as tomorrow—the REL L-103 1 KW Linear Amplifier sets new standards of performance and achieves the distinction of proven, **measurable** power output of 1000 watts PEP, CW, SSB, and FSK.

This completely self-contained, two-tube grounded grid linear amplifier measures only 7" high, 15" wide and 12" deep—yet gives you the **big** signal you want—consistently.

Matching power supply provides plate power and regulated screen voltage for the amplifier.

CHECK THESE FEATURES!

- ✻ Complete Coverage 3.4 MC to 30 MC.
- ✻ Built to MIL Specifications
- ✻ VSWR and Power Output Meter
- ✻ Peak Limiter Indicator
- ✻ Hi-Lo Antenna Output Switch
- ✻ High Efficiency Grounded Grid Circuit
- ✻ 4CX300A Beam Power Tube
- ✻ RF Wattmeter for Simplified Tuneup
- ✻ Top Performance on CW, SSB, and FSK Operation

RELiant . . . A Radio Engineering Laboratory Product by

Reeves Instrument Corporation
Route 524 Lakewood Road
Farmingdale, New Jersey

GENTLEMEN:

Please send me complete technical data and price of the new REL type L-103 1 KW Linear Amplifier.

NAME.....

ADDRESS.....

.....

For further information, check number 22, on page 110

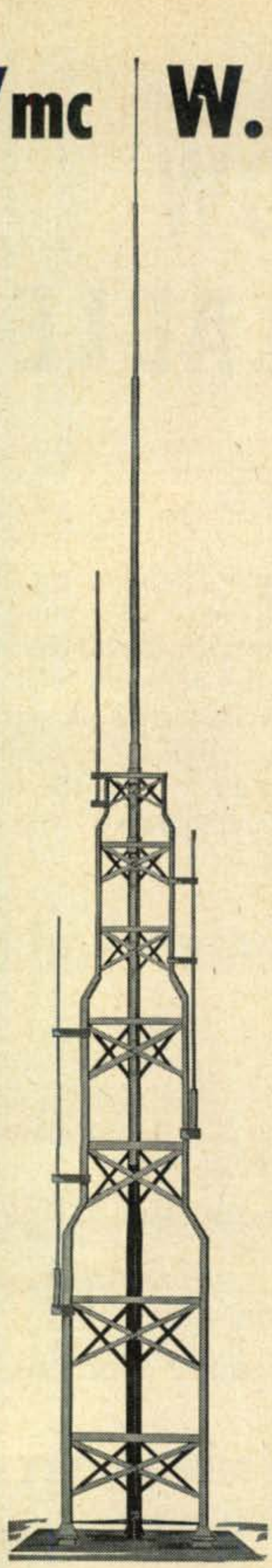
7mc | W.A.C. in 1 hour 11 minutes

An Amazing Accomplishment with the Hy-Gain Hy-Tower by W6BYB

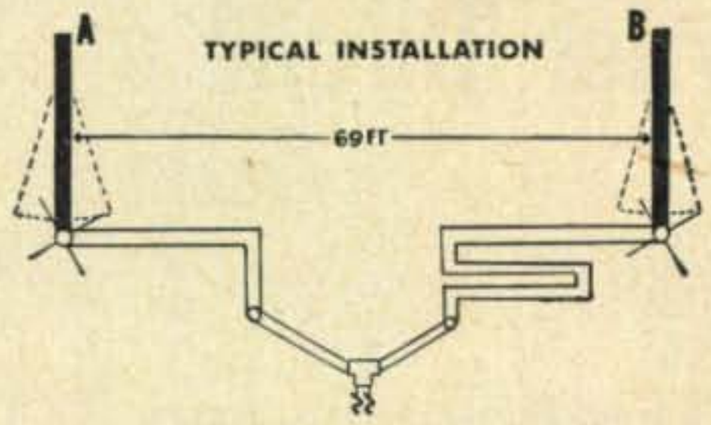
". . . I can honestly tell you that after over a year's use with this (Hy-Gain 18HT) tower it is the best thing I have ever used — especially on 40 and 80M. I'm not running a California KW into it either . . . On February 12th, 1961, I worked all continents on 7mc in 1 hour, 11 minutes . . . I have all cards confirmed* . . . I also have worked all continents on 80M — receiving a 599 report from ZSIA, Capetown — 579 report from G5WP, etc. Also last March I won the plaque from the North California DX Club for best total 40/80M score in our annual low frequency contest. So you see I am really happy with the performance . . ."

John Mayes, W6BYB Sebastopol, California

*EA 8 CG	0838 GMT	JA 3 CB	0927 GMT
LA 8 FG/P	0850 GMT	VK 2SA	0942 GMT
PY 5 OF	0910 GMT	VE 4 MZ	0949 GMT



PHASE TWO FOR 3DB GAIN



For the ultimate antenna system on 80 and 40 meters, two 18HT Hy-Towers may be mounted 69 ft. apart with the phase switched in order to obtain gains of the order of 2.2db end fire, 3.9db broadside on 40 meters and 4db cardioid on 80 meters. The Hy-Gain Hy-Tower is a multi-band vertical antenna system with automatic band selection of 10-80 Meters by means of an unique stub decoupling system. Single 52 ohm coax fed. Completely selfsupporting tower 24 ft. high. Top mast extends to 50 ft. No guys required.

Model 18HT $139.50 ham net

WORLD'S MOST POPULAR VERTICALS

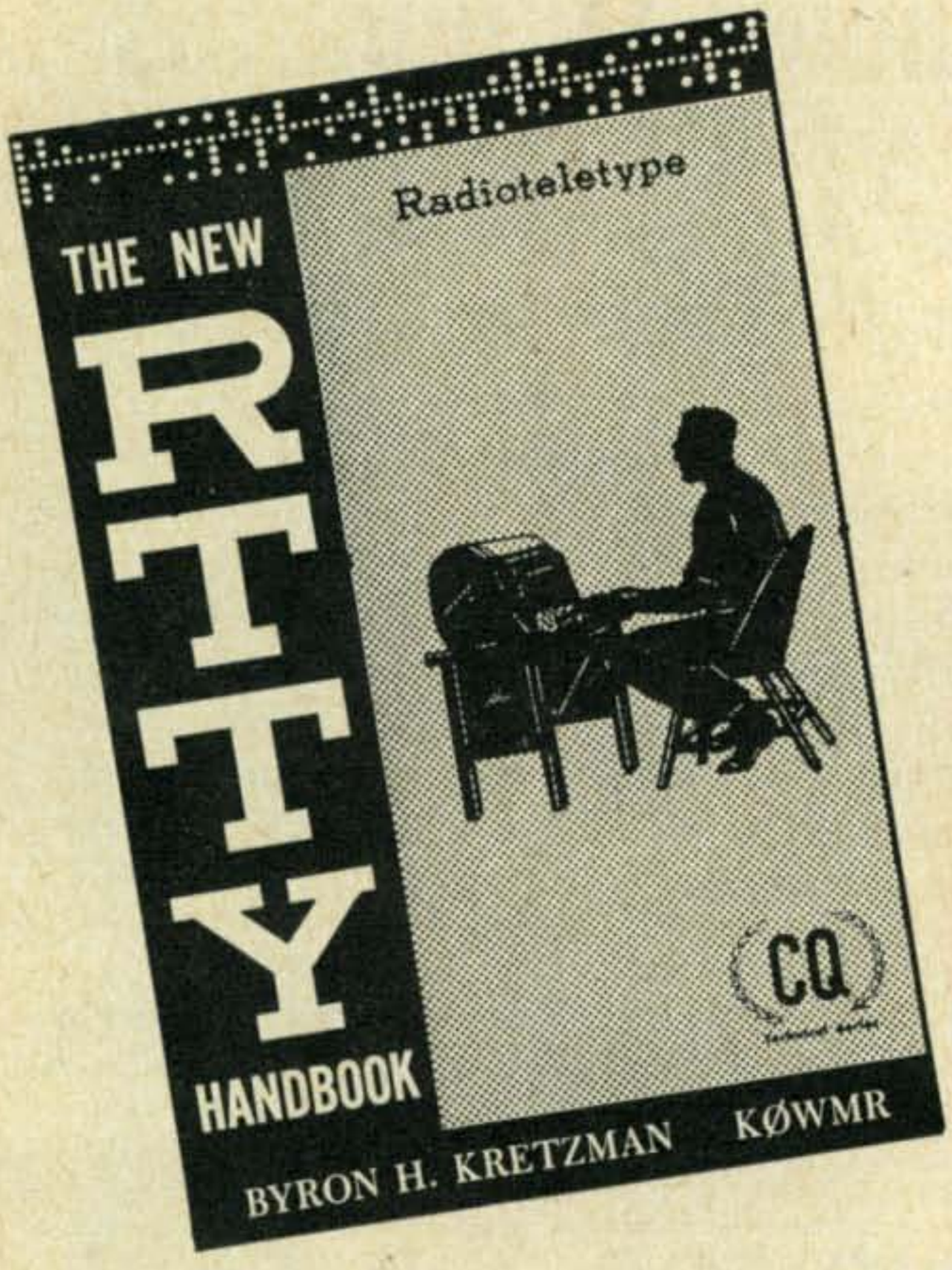
14AVS — Trap vertical for 10-40M, 21 ft. high **$29.95**
12AVS — Trap vertical for 10-20M, 13.5 ft. high **$21.95**

Send for Free Catalog and Complete Information on Entire Hy-Gain Line!

DEPT. 125 hy-gain antenna products **LINCOLN, NEBR.**

"World's Largest Manufacturer of Amateur Communications Antennas"

For further information, check number 19, on page 110



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A treasury of vital and "hard to get" information. Loaded with equipment schematics, adjustment procedures, operating procedures, etc. A valuable asset to both the beginning and the experienced RTTY'er. Special section on getting started, all written by Byron Kretzman, W2JTP, a well known authority in the field. This book is a *must* for your library!

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GLOBE ELECTRONICS

The Curtain is Going Up On The ALL NEW HG-303 AMATEUR TRANSMITTER

MODEL HG-303 No. 65-430

AMATEUR NET

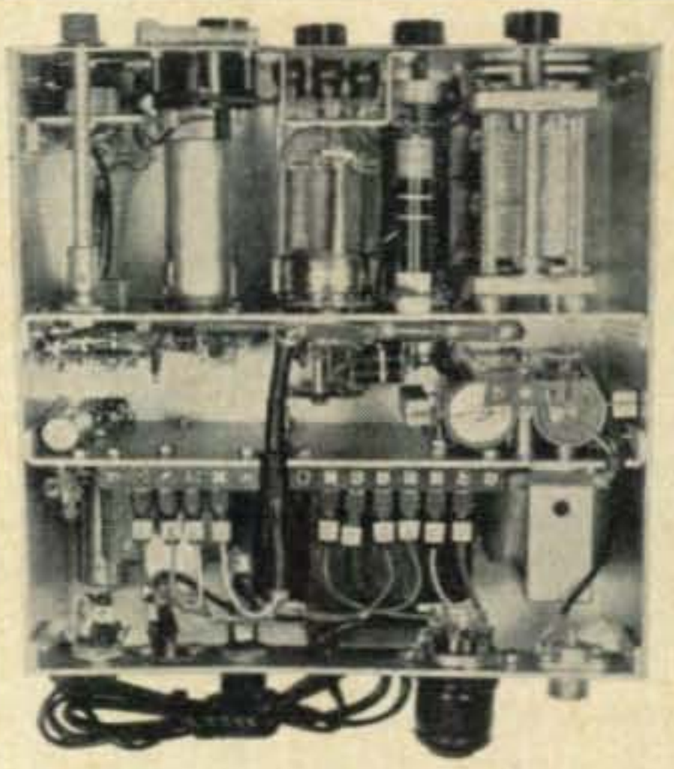
Only **99.95**

ONLY THE NAME IS THE SAME . . . on this all-new Globe Amateur Transmitter, model HG-303. Handsome enough to put in your living room, with plenty of quality features on the outside, but the best is inside where it counts! Quality . . . reliability . . . durability . . . this is the new Globe line. Compare and see for yourself. And the HG-303 is only the first of a whole new series of outstanding products.

MODULAR CONSTRUCTION . . . AND PLUS FEATURES TOO

Interchangeable front-mounted crystal, selector switch for 3 crystal frequencies or VFO. Grid block keying, 6146 transmitting tube, wide range Pi-Net coupling, transmitting type variables, low voltage switching, dual power supplies, 8 silicon rectifiers, rugged chassis. Clean and easy to service, too, thanks to modular construction. 75 watts (nominal) input. Measures only 4-5/8" high x 9-1/8" wide x 9-1/2" deep. $99.95 amateur net.

Write for complete specification sheet and catalog.



TOP VIEW OF HG-303 CHASSIS

GLOBE ELECTRONICS

GLOBE ELECTRONICS CO.
Division of GC-Textron Electronics, Inc.

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MAIN PLANT: 400 S. Wyman St., Rockford, Ill., U.S.A.

WATCH FOR ANNOUNCEMENTS OF ADDITIONAL NEW GLOBE AMATEUR RADIO EQUIPMENT TO BE RELEASED IN FORTHCOMING MONTHS.

For further information, check number 18, on page 110

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First complete filter-type SSB transmitter in kit form . . . over two years in development. An outstanding array of features, combine with neat, functional styling, clean open circuit layout. Quality construction and materials bring you performance, convenience and dependability unheard of in this low price range! Special features include: Precision gear-drive tuning assembly with approximately 10 kc per turn for precise frequency settings . . . smooth action; a full-function accessory socket provides for receiver muting, amplifier cutoff bias, 117 vac antenna relay power, etc.; A switched 117 vac outlet powers monitor scope or other accessories; "Spot" control; Voice control (VOX); Drive level control and many, many more! All control functions are located on the front panel for convenience and ease of operation . . . no doors or hatches to open . . . no equipment to move! Here is a transmitter you will be proud to own and use for years to come! Allow 60 hours for assembly. Complete details available on request. 92 lbs.

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SPECIFICATIONS—Types of emission: SSB (Upper or lower) and CW. **Power input:** 90 watts PEP, SSB and CW. **Output impedance:** 50 to 75 ohms with not more than approx. 2:1 SWR. **Frequency range** (MC): 3.5 to 4; 7.0 to 7.5; 14.0 to 14.5; 21.0 to 21.5; 28.0 to 29.5 (using crystals furnished; extra crystal required for 29.5 to 29.7 MC). **Frequency stability:** Overall frequency stability within 100 CPS after warmup. **Carrier suppression:** 50 DB below peak output. **Unwanted sideband suppression:** 55 DB below peak output. **Keying characteristics:** Grid block keying throughout. **Audio input:** High impedance microphone. **Power requirements:** 6.3 V at 8 amps. or 12.6 V at 4 amps.; —125 volts 20 milliamps; 300 volts 100 milliamps; 600 volts 130 milliamps (uses Heath HP-20 or HP-10 power supplies). **Cabinet size:** 12¼" W x 6¼" H x 9¾" D.

Heathkit HR-20 SSB MOBILE RECEIVER

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Kit HR-20 . . . 17 lbs.

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SPECIFICATIONS—Frequency range: 80 thru 10 meters in 5 bands: 3.5 to 4.0; 7.0 to 7.3; 14.0 to 14.35; 21.0 to 21.5; 28.0 to 29.7 MC. **Intermediate frequency filter:** Center frequency, 3.0 MC; Bandwidth at —6 db, 3.0 KC; Bandwidth at —60 db, 10.0 KC Max.; Hermetically sealed. **Panel controls:** Sideband Select; R.F. gain; A.F. gain—Off—On; Noise Limiter; AVC select; main tuning; band switch; antenna trimmer; SSB, CW-AM switch. **Signal-to-noise ratio:** 10 db at 1 microvolt or less. **Output impedance:** 500 ohms and 8 ohms. **Power requirements:** 6.3 V at 8 amps. or 12.6 V at 4 amps. AC or DC, 300 volts DC at 120 MA. (Uses Heathkit HP-10 or HP-20 power supplies). **Cabinet size:** 6¼" H x 12¼" W x 19¾" D.

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L. F. and V. L. F., A New Challenge

BY DON SELWYN*, W2GFR

Antennas, when operated submerged in sea water, have drastically reduced lengths for the same frequency in air. W2GFR suggests experimentation with submerged antennas as an aid to the U.S. Navy's low frequency experiments and for increased use of 160 meters.

If the title of this article caught your eye, it did so because it might have captioned an article in a radio magazine or engineering paper of forty or even fifty years ago. No, this is not a reprint of a historical paper; it is a new article, written in 1962, for which the title is just as applicable as it was in 1912. It is true, but not without misgiving, that exciting new developments in microwave and optical techniques have distracted attention from and retarded development of low frequency (l.f.) and very low frequency (v.l.f.) communication. The significance of this lag to the nation's defense is well known and has been widely publicized. The reasons for it and the potential remedies are, however, somewhat more obscure.

Recently, the Navy's new radio station in Maine, a multi-megawatt v.l.f. station now designated NAA, was completed. Operating in the 18 kc range, this station provides long distance one way communication with ships and submarines of the U. S. Navy practically anyplace in the world. Much has been written about this new station and others like it, dating back to the first world war. Little attention has been devoted to its importance and to techniques for increasing its effectiveness, however, except by the Navy. Because of this, these stations can still conduct only one way communication with submerged submarines just as during and after World War I.[1] This is and has been a serious handicap. Previously, submarines would receive messages while submerged just beneath the surface, but would wait, before attempting to reply, until they had to surface for air and to recharge their batteries. Today, with Snorkel underwater breathing devices and atomic motive power, submarines can remain submerged as long as they like except as compelled to surface for the purpose of making radio transmissions.

Why is there not a means for submarines to transmit while underwater? If they can receive while submerged, do not the same principles and techniques assure transmission? Why hasn't the technology of submarine communications kept pace with the technology of submarine powerplants? What can be done now to overcome this gap and by whom? The radio amateur? Industry? The military?

These are all significant questions. The reasons for the obvious lag are many. The stress has been on air power, microwave communications, weapons systems, advanced propulsion systems, etc. The possibility of radio transmission from submarines has been considered by both the Navy and industry. It is believed and has been proven, in theory at least, that underwater transmission is possible on the basis of the same principles as underwater reception. The problem is thought to be mainly a matter of efficiency. After all, a land station can afford to erect and use a v.l.f. antenna hundreds of miles long. A vessel cannot. A land station can run megawatts of power; a vessel cannot, and so on. Nevertheless, new techniques for attaining higher efficiencies in the generation and reception of r.f. and advancements in antenna design may make such underwater transmission possible[2] where as it wasn't one, two or three years ago. Unfortunately, both the Navy and industry have spent so much money on this objective that there just seems to be no more money for further research. Few companies, if any, are now willing to undertake such programs on their own as self-financed Research and Development simply because of the poor results obtained previously. Yet, as you will see, this is the ideal area for amateur experimentation with simple and inexpensive equipment.

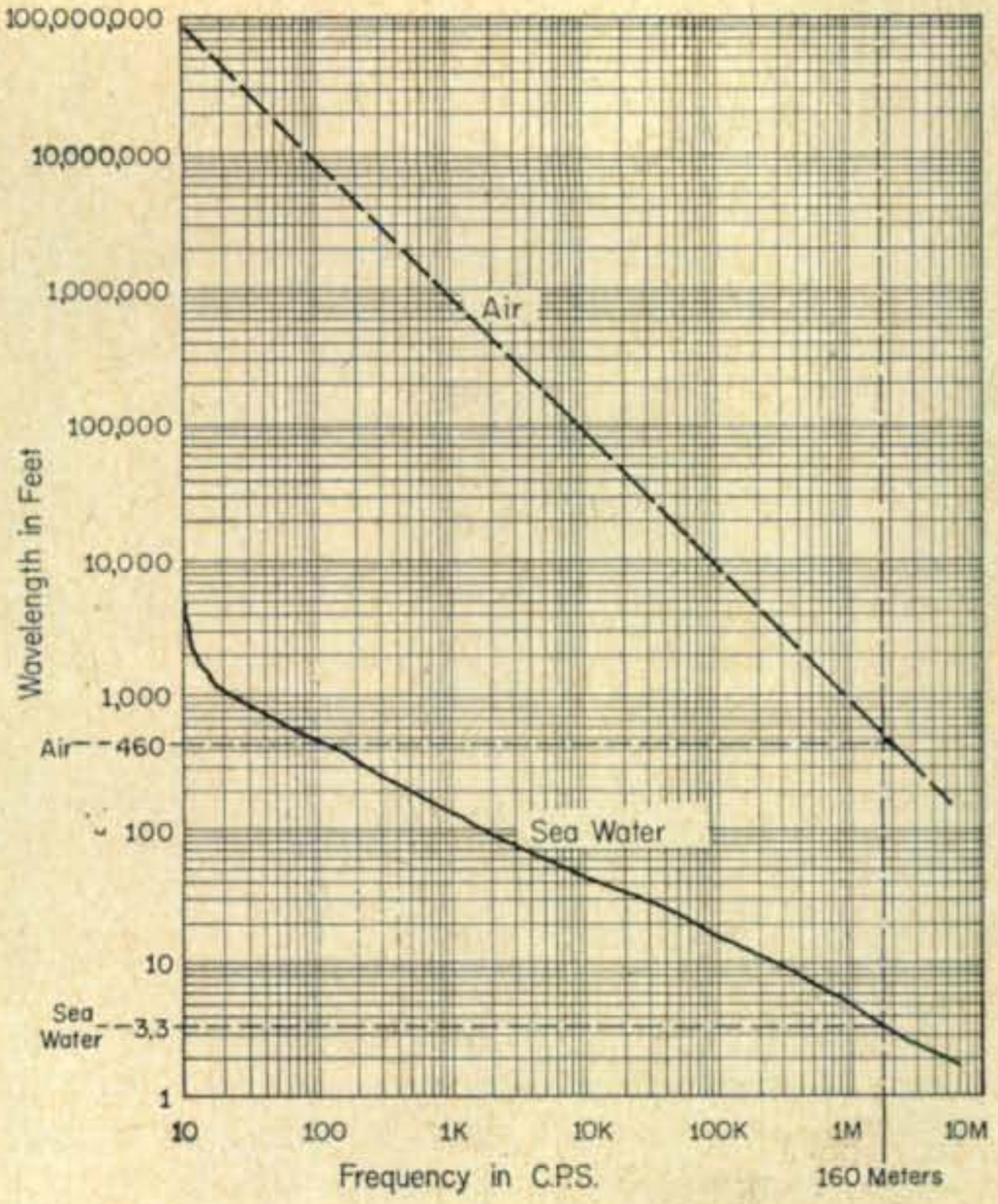
Amateur Experiments

The radio amateur, often unable to experiment in the microwave region because of limited finances, inadequate machine shop facilities and other practical limitations can still advance the state of the art, serve his country and put the 160 meter amateur band to immediate and good use. He can do so by undertaking, himself, with his regular communications receiver and the simplest of transmission

*13 Yale Way, Oakland, New Jersey.

[1] A. Sommerfeld, "Uber die Austreitung der Wellen in der drahtlosen Telegraphie," *Annalen der Physik*, vol. 28, p. 44; 1909.

[2] Durrani, S. H., "Air-to-Undersea Communication: Electromagnetic Fields in the Two Media, Caused by Vertical and Horizontal Electric Dipoles in Air," *Engrg. Exper. Sta., University of New Mexico, Albuquerque, Tech. Rept. EE-61;* September, 1961.



Wavelength In Air In Feet	Frequency In C.P.S.	Wavelength In Water	
		In Meters	In Feet
93,600,000	10	448.8	1472.4
46,800,000	20	316.2	1037.4
15,600,000	60	182.6	599.1
9,360,000	100	141.5	464.2
4,680,000	200	100.0	328.1
3,120,000	300	81.7	268.0
2,340,000	400	70.8	232.3
1,872,000	500	63.3	207.7
1,560,000	600	57.7	189.3
1,337,142	700	53.5	175.5
1,170,000	800	50.0	164.0
1,040,000	900	47.2	154.9
936,000	1,000	44.7	146.7
624,000	1,500	36.5	119.7
46,800	20,000	10.0	32.8
18,720	50,000	6.32	20.7
9,360	100,000	4.47	14.7
4,680	200,000	3.16	10.4
1,872	500,000	2.00	6.56
936	1 MC.	1.41	4.63
468	2 MC.	.999	3.28
312	3 MC.	.815	2.67
234	4 MC.	.706	2.32
187	5 MC.	.631	2.07
156	6 MC.	.576	1.89

Fig. 1—Graph of wavelength versus frequency for signals in air and those in sea water. Note the considerably shorter lengths for those propagating through sea water. On the right is a tabular presentation of the graph including metric lengths of submerged antennas.

equipment, the research and experimentation which industry has failed to undertake and which is so urgently needed. Most of the research which is still required has to do with underwater antenna design and with practical feed system designs. The problem should not be as formidable as might seem were we dealing with antennas as long as their counterparts in air. As will be shown, the relationship of electrical wavelengths to frequency is very different in a conducting medium from what it is in air. Theoretically, the length of a half wave antenna in water is much smaller than it is in air for operation on the same carrier frequency. It simply remains to be determined, by experimentation, whether a half wave dipole will radiate in water and the best types of insulation, matching and feed techniques, etc.

Referring to fig. 1, note that wavelength, in feet, is plotted against frequency for both air and water. Selecting any frequency, say 1.9 mc, note the corresponding wavelength in air (approx. 460 feet) and in water (approx. 3.3 feet). Half wave antennas for these frequencies are, respectively, 230 feet and 1½ feet. So you see, theoretically, at least, an antenna smaller than a 220 mc dipole might serve on 160 meters in seawater.[3,4] Of course there are a number of practical difficulties which will have to be overcome before successful experimental results can be expected.

[3] Banos, A. and Wesley, J. P., "The Horizontal Electric Dipole in a Conducting Half-Space," *Marine Physical Lab. Repts. No. 55-33* and *54-31:* University of California, Los Angeles, 1953-54.

[4] Moore, R. K. and Blair, W. E., "Dipole radiation in a conducting half-space," *J. Res. NBS Sec. D, vol. 65,* pp. 547-563; November-December, 1961.

Theoretical Considerations

Before we continue with specific suggestions as to where and how the amateur can prove or disprove the feasibility of underwater transmission, let us digress for a moment and discuss some theoretical considerations. Experience and experiment indicate that electromagnetic energy is totally reflected from perfect conductors much as light is reflected from a silvered mirror. Seawater is not, however, a perfect conductor. Therefore, some energy is transmitted. This is, in fact, the familiar skin depth penetration which can be derived from Maxwell's equations. Two practical problems enter into underwater transmission. These are, respectively, the distance of penetration, which seems to be greater for lower frequencies, and the problem of antenna design which becomes more complex with decrease in frequency. The former problem cannot, the writer believes, be overcome. The latter problem may be defined and overcome with sufficient experimentation. Referring once again to fig. 1, note that, at 20 kc and below, the ratio of wavelength to frequency is no longer a constant and increases rapidly. It is in this region that seawater attenuation is at its minimum. That is why NAA and other Naval Bulletin Stations use frequencies between 10 kc and 25 kc. Despite the low frequency and the high power, penetration is still poor so that, even for reception, the receiving antenna must be within 20 to 30 feet of the surface. The signals do not travel through the water laterally but travel through the air, above the surface of the water, where they enter and penetrate the water from above the submarine.

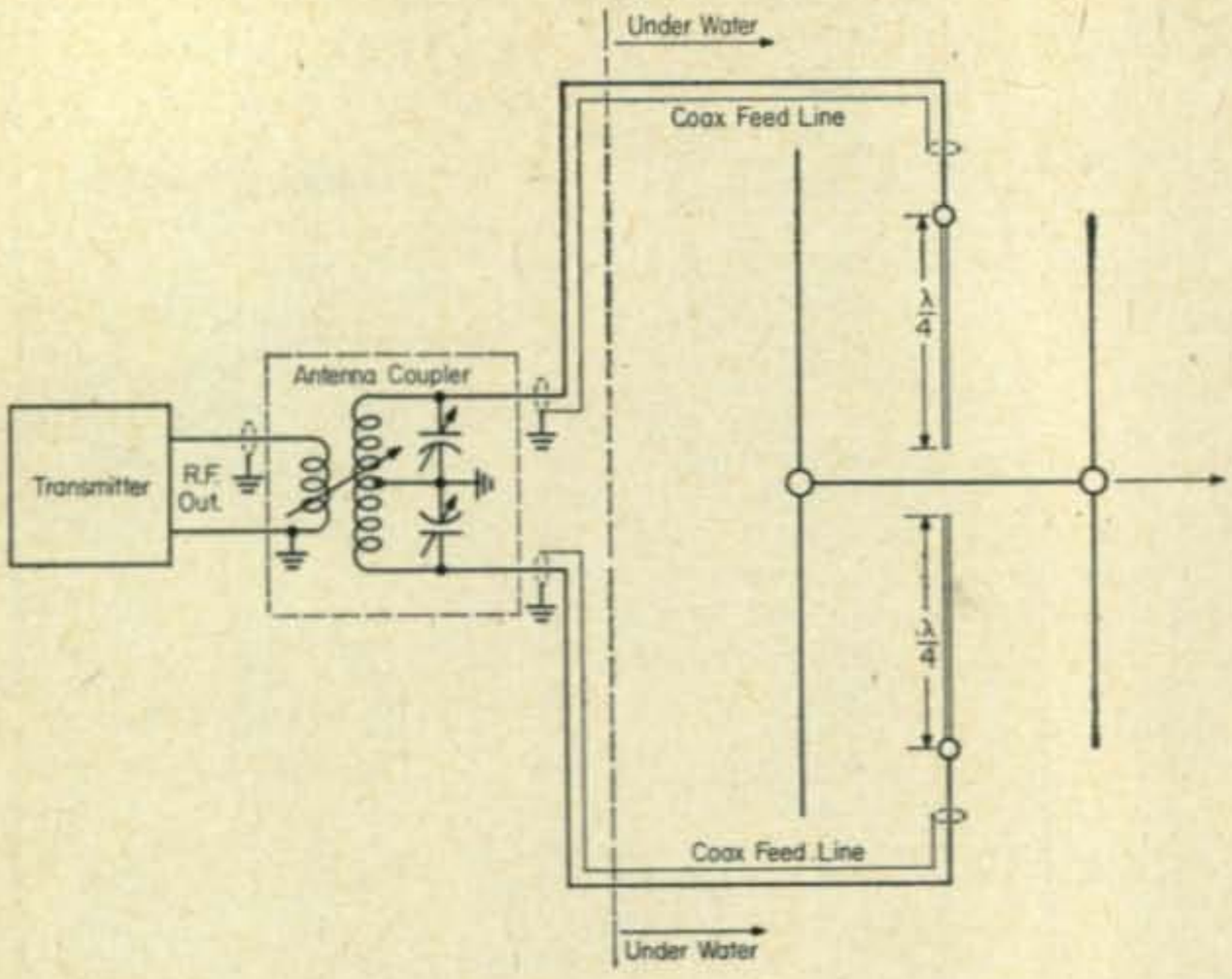


Fig. 2—Parasitic array and feed system for a submerged experimental antenna. The antenna elements should be constructed from insulated materials such as 300 ohm line.

Practical Approaches

Initial amateur experimentation on 160 Meters is suggested for several reasons. First and foremost is the fact that this is the lowest frequency band that is now authorized for amateur use. In addition, most communications receivers, and even broadcast radios, can be made to tune this band. Additionally, simple one or two tube or larger transmitters can be employed, with any mode of transmission, a.m., s.s.b. or c.w., as preferred. All equipment can be located above water, on the ground, in a station wagon or in a boathouse. Insulated and shielded antenna cables can be employed. If sufficiently separated to avoid direct pickup, the receiving antenna can be located in the air and may be a conventional full size 160 meter antenna or a smaller size antenna with a loading coil or impedance matching device. The transmitting antenna, 1.64 feet long for 2.0 mc, should be insulated so that no part of it will come in contact with water. All submerged feed cables and the feed coupling must be similarly insulated. The entire assembly may then be submerged in the water.

Experiments may be conducted with the antenna in first the vertical position and then in the horizontal position while submerged. Polarization of the receiving antenna, whether above ground or underwater, may also be varied. Experiments can then be made with underwater probes attached to the receiver's antenna terminals in order to evaluate the transmitting antenna's radiation pattern. Those hams who also happen to be skin divers will find this especially interesting. They should exercise caution and avoid any direct physical contact with the antenna, its feed line or any other wire.

Figures 2 and 3 illustrate one possible method for feeding an underwater transmitting antenna. The use of end fed elements rather than center fed elements may be advisable because it would be desirable to avoid too low a line termination impedance caused by the water between the closest parts of the radiating elements. Also, the use of waterproof 300 Ohm ribbon or open wire might be advisable as might the use of two, specially connected co-

[*Continued on page 98*]

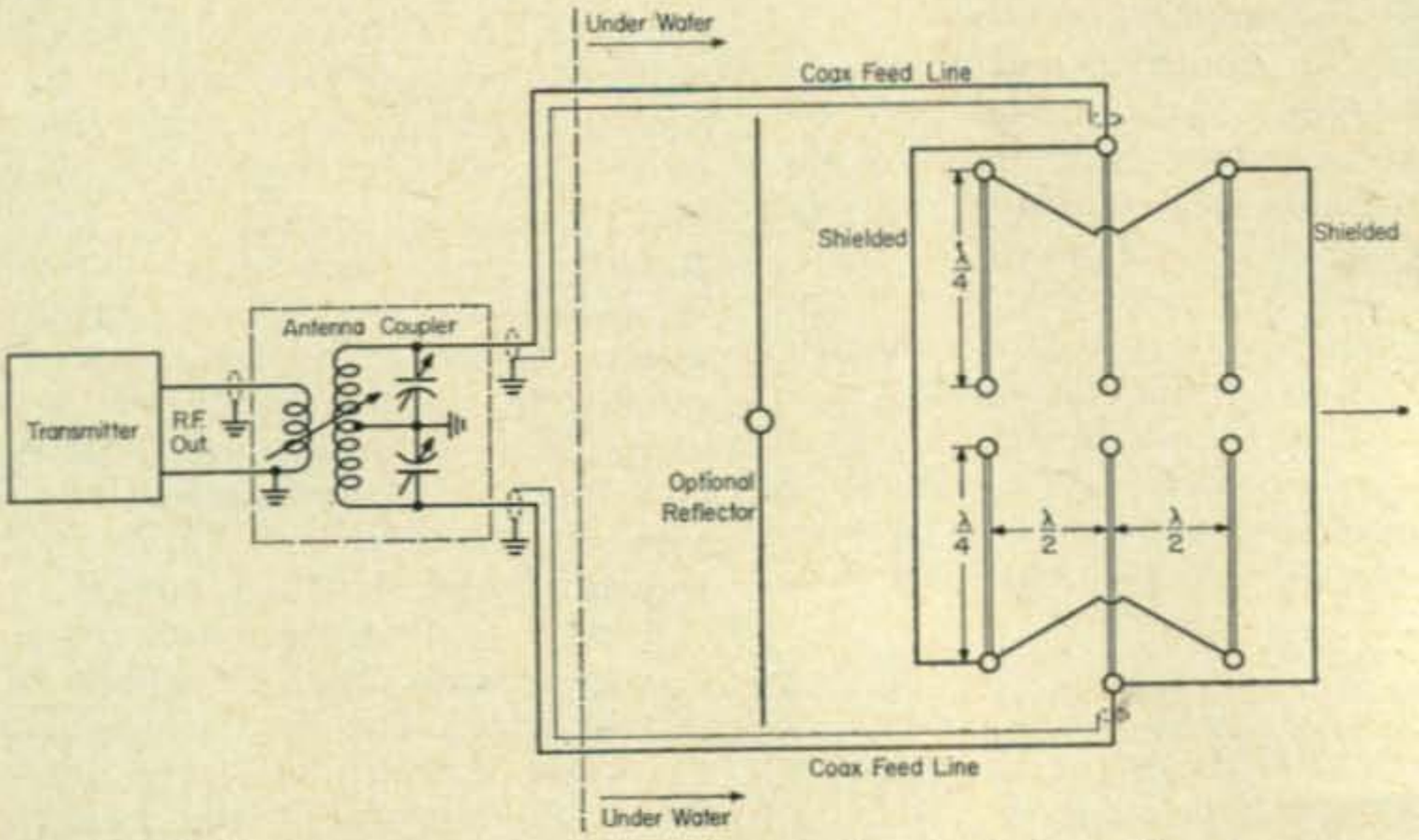


Fig. 3—A phased driven element array for submerged transmissions. The element spacing, in all probability, will not conform to free space formulas and will require experimentation.

The Mobile Monobander

BY V. P. POLTON*, W9BDF/6

A 15 watt, 75 meter, mobile hybrid transmitter is described below. It includes a v.f.o. and a transistorized modulator. The simple controls, including a spotting switch, permit rapid and simple QSY, so necessary when mobiling.

ANY mobile enthusiast who has operated in the 75 meter phone band with a crystal controlled rig has surely found that he is badly handicapped by being rock-bound. Many times the difference between a solid QSO and QRM is just a few kilocycles. Wanting a v.f.o. mobile rig just for 75 meters and finding nothing commercially available to fill the bill, I decided to build my own. The result is the "Mobile Monobander" described below.

This transmitter, because it was designed only for use in the 75 meter band, made possible a number of features not permissible in multi-band rigs. One important feature is simple transmitter adjustment, obviously very desireable in mobile work where a minimum of transmitter manipulation contributes to driving safety. Another feature is compact size; however, despite its size this rig has a stable v.f.o., spotting switch, 15 watt final amplifier, all transistor modulator, and press-to-talk operation. Everything is contained within this unit except for power supply.

Circuit Description

The circuit consists of a 6AU6 v.f.o. oscillator capacitively coupled to a 6AK6 buffer-driver stage. The v.f.o. circuit makes use of capacitors placed across the tube's interelectrode capacitances thereby making the circuit practically insensitive to capacity changes within the tube. This results in excellent oscillator stability. The v.f.o. fundamental frequency is directly in the 75 meter phone band. The 6AK6 stage operates as a straight amplifier and provides isolation between the v.f.o. and the final to prevent "pulling" the oscillator frequency while tuning the final. The output of this stage is capacity coupled to the grid of a 2E26 and is peaked for the proper amount of drive by adjusting the slug of L_2. The final is tuned through resonance by C_{14}, and a fixed link, L_4, couples the final to the antenna.

The final is plate modulated by a push-pull class B transistor modulator, Q_3 and Q_4, which furnishes up to 10 watts of audio power and can handle up to 20 watts of r.f. input power. A thermistor (R_{18}) is part of the Q_3-Q_4 bias network and acts to protect these transistors against damage where high ambient temperatures are encountered. If this protection is not desired a 100 ohm half-watt resistor can be substituted. A 200 ohm carbon microphone is coupled to Q_1 through impedance matching transformer T_1. Microphone current is supplied by the automobile battery and flows through R_8 and the primary of T_1. Transistor Q_1 is a current gain amplifier which supplies the audio signal to the base of transistor Q_2. The load for Q_2 is the primary of driver transformer T_2; the secondary of T_2 provides the audio power to drive the bases of Q_3 and Q_4.

The power requirements for this rig are 300 volts at 100 ma, and 12 volts d.c. at approximately two amperes. The 400 volts is dropped to 170 volts for the screen of the 2E26 by means of R_7; the regulated 150 volts for the v.f.o. is developed across an 0A2. The automobile 12 volt battery supplies filament power, relay power, and also powers the entire transistor modulator section. The meter is permanently placed in the B+ lead between the modulator and the final where it is used to indicate resonance; it is also useful in determining whether modulation is present by observing slight needle deflections under periods of heavy modulation.

*2076 Reed Ave., San Diego 9, Calif.

Front view of the Mobile Monobander. Modulator gain is screw-driver adjusted through the hole below the meter. The device to the left of the on-off switch is the panel light.

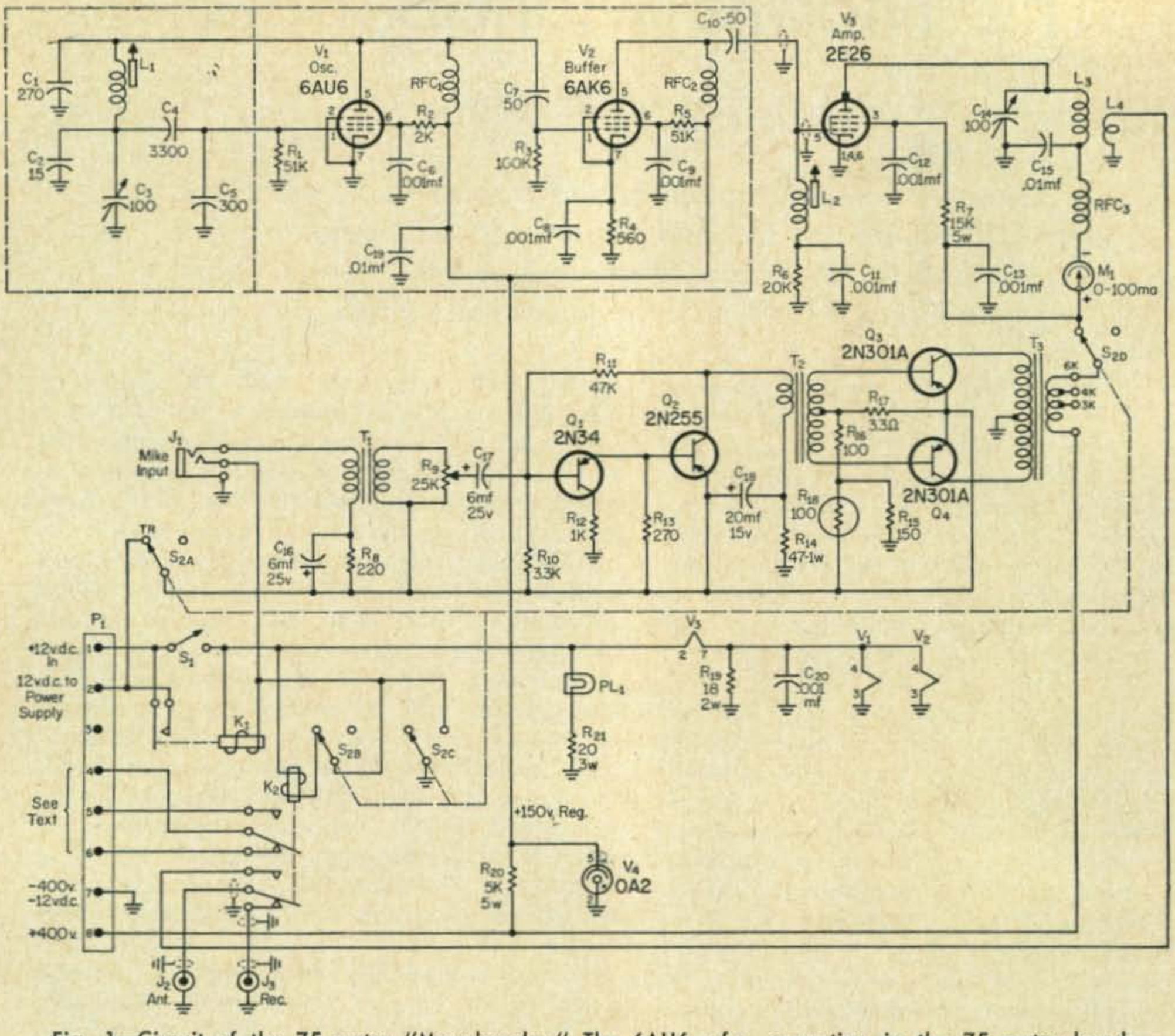


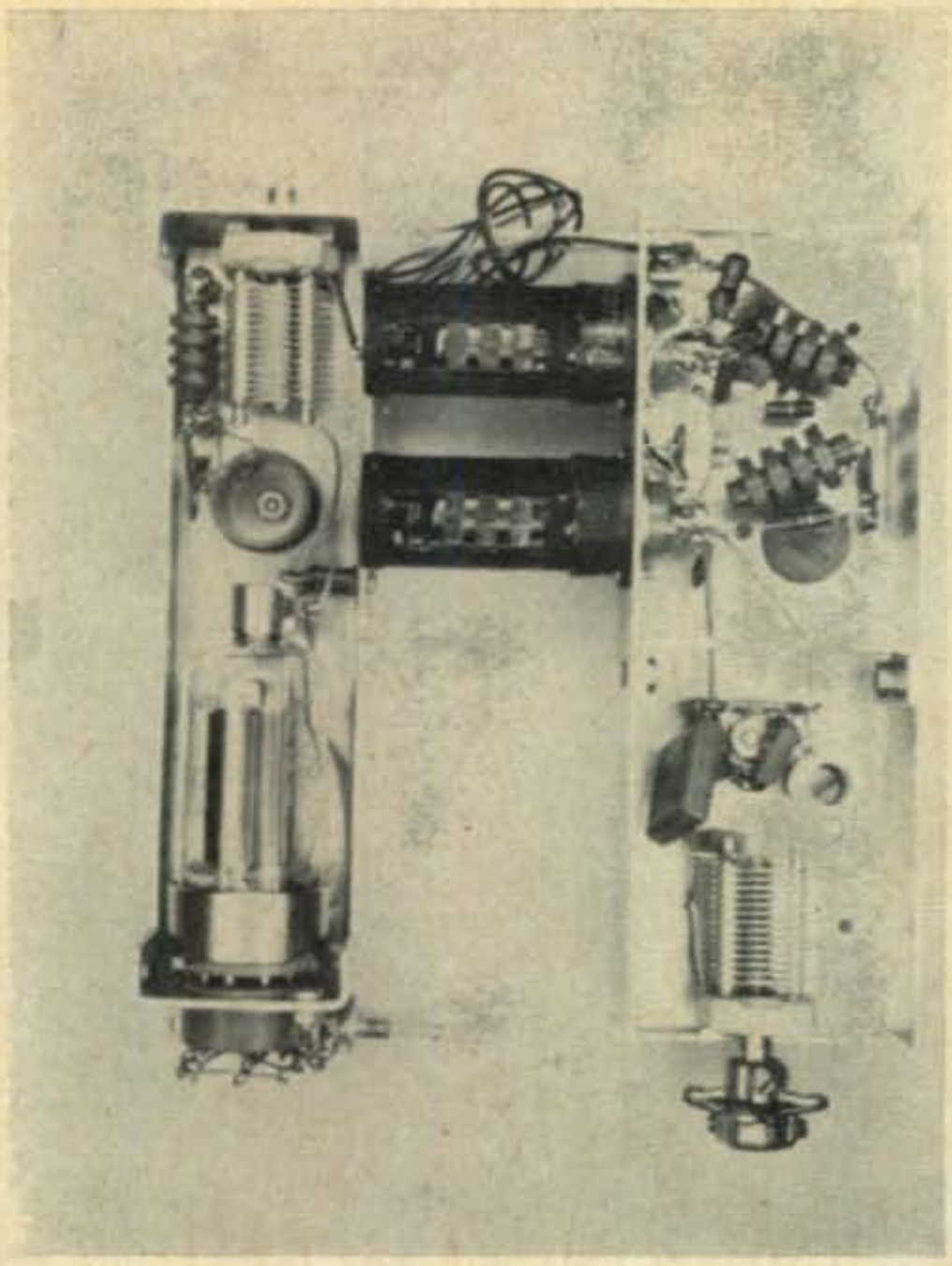
Fig. 1—Circuit of the 75 meter "Monobander." The 6AU6 v.f.o. operating in the 75 meter band, drives the 6AK6 buffer. The output feeds a 2E26 which is plate modulated by Q_3 and Q_4 operating in class B. All resistors are ½ watt and all capacitors are in mmf unless otherwise noted. All micas are silver mica and the .001 and .01 values are disc ceramics.

J_2 J_3—Double phone jack, Cinch Jones 81B or equiv.
K_1—S.p.d.t. relay, 12 v.d.c. Potter Brumfield KA5D or equiv.
K_2—D.p.d.t. relay, 12 v.d.c. Advance AM/2C/12VD or equiv.
L_1—35t, #36E, closewound on ⅜" form, Millen 69052.
L_2—60t, #38E, closewound on ¼" form, J. W. Miller 4500.
L_3—40t, #24E, closewound on ¾" form.
L_4—1 to 3t, #22 plastic ins., closewound on cold end of L_3.
P_1—Male chassis plug, 8 contacts. Cinch Jones P-308-AB or equiv.
PL_1—Panel Light. Dialco 4-1930 with #328 bulb or equiv.
R_{18}—Thermistor, 100 ohms at 25°C. Veco-21WI.
RFC_1, RFC_2—2.5 mh. National R-50 or equiv.
RFC_3—2.5 mh midget type. Millen or equiv.
S_2—4 p.d.t. switch. Mallory 3242J or equiv.
T_1—Mike input, 200 ohm pri., 15K secondary. Argonne AR-107 or equiv.
T_2—Driver, 100 ohm pri., 100 ohm c.t. secondary. Tried TY61X or equiv.
T_3—Mod. trans., 32 ohm c.t. pri., secondary tapped 3000, 4000 and 6000 ohms. Triad TY-65Z.

The operating controls are the spotting ZERO-TRANS switch, the VFO vernier dial immediately below, and the final TUNING vernier dial to the right. The modulator's AUDIO gain control is a screwdriver adjustment. The spotting switch and v.f.o. controls were placed one above the other to allow zero-beating a signal easily and quickly without having to take one's eyes away from the road; a quick glance only is required to dip the final. The v.f.o. dial is not calibrated in frequency. The receiving equipment can be used to establish a particular frequency by setting the receiver to that frequency, then zero-beating with the v.f.o. A miniature panel illuminating lamp has been included to aid in nighttime transmitter adjustments.

Construction

The entire transmitter is enclosed in a 3½" × 6" × 8" aluminum box (BUD CU-3009A). The rig is roughly divided into two layers by means of a 3/32" aluminum mounting plate onto which several subassemblies are attached. The lower layer consists of the v.f.o. and final amplifier subassemblies while the upper layer holds the two relays, driver transformer T_2,



Bottom view of the v.f.o. chassis, with the cover removed, alongside the amplifier assembly. The upper tube is V_1. The filament, B plus and shielded v.f.o. output leads are taken out below V_2. Note the partition that isolates the v.f.o. tuning components. The grid coil, L_2, is located at the 2E26 socket and is supported by R_6 and C_1 which are not visible.

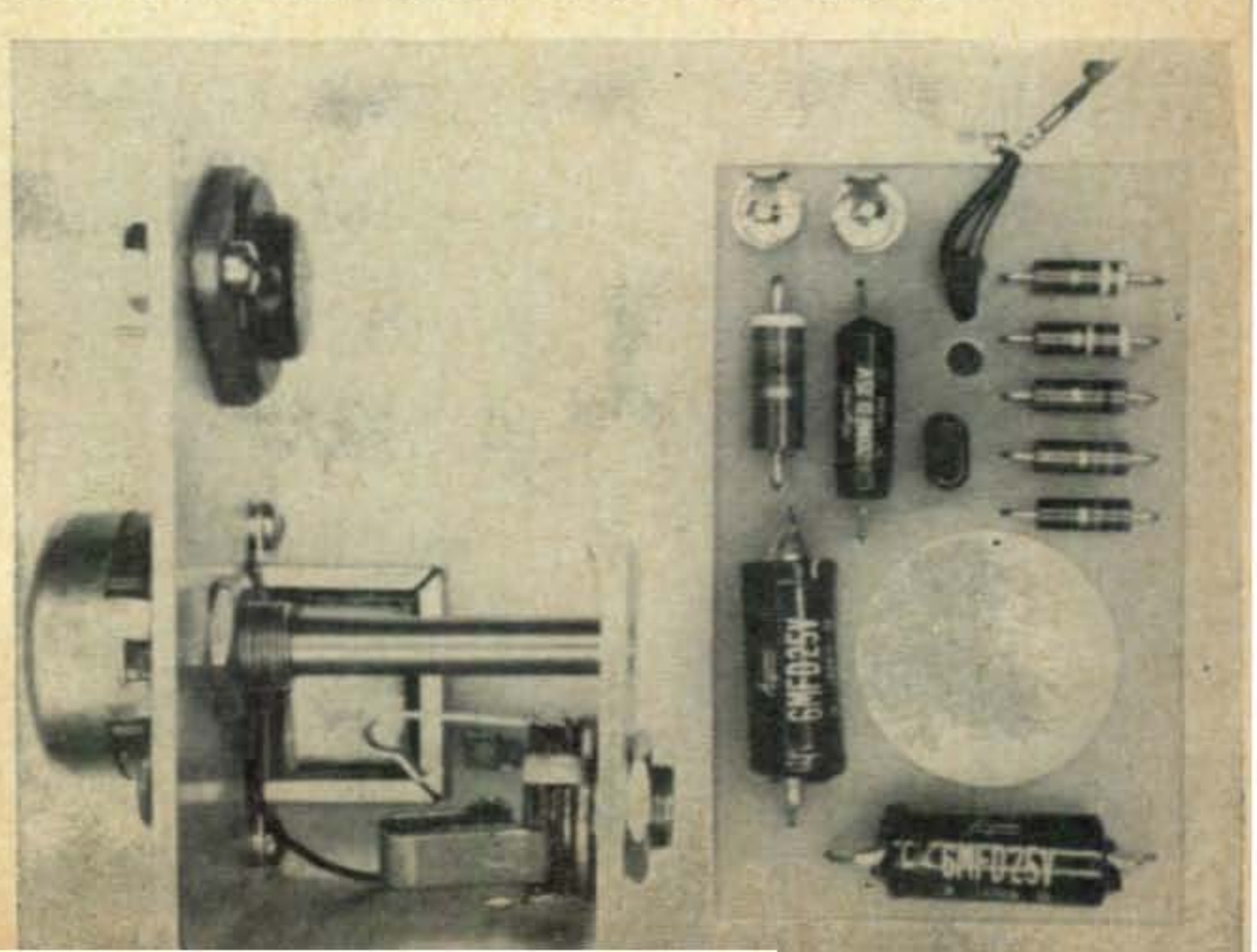
and the voltage regulator subassembly. The mounting plate with subassemblies attached is set into the case during the latter stages of assembly. Reaching into both layers are modulation transformer T_3 and the modulator subassembly.

The v.f.o. assembly is a self contained unit built into a compact aluminum box (LMB 650). A "U" shaped partition provides a shielded compartment for the frequency determining components (see dotted portions of fig. 1). Maximum mechanical stability must be the goal while assembling parts in this compartment. All wires and leads should be short and direct. Inductor L_1 is tightly wound on a ceramic slug tuned form. The collars of this form are movable to adjust to coil length; after the coil is wound and the ends soldered, the collars are cemented in place. Two holes in the partition allow wires to pass from the shielded compartment to the socket of V_1. A two lug terminal strip is mounted with the lugs adjacent to the holes in the partition. Capacitors C_1 and C_5 are soldered in place between the terminal strip and a ground lug.

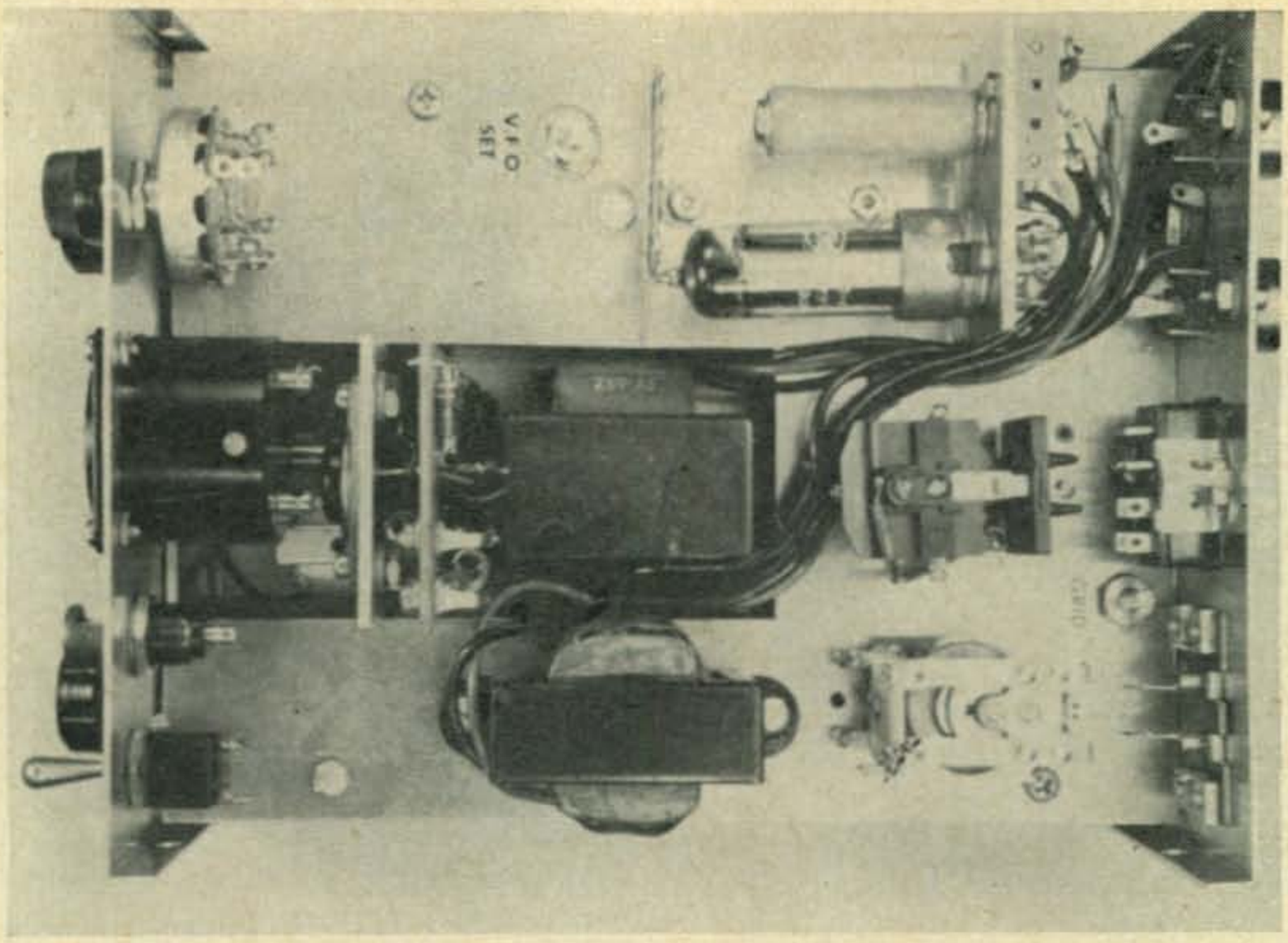
The remaining section contains V_1, V_2 and the balance of the electrical components shown inside the dotted portion of fig. 1. Filament bypass capacitor C_{20} is soldered directly to pin 4 of V_1. Filament and plate power leads, and the shielded v.f.o. output lead are brought out of the unit near the base of V_2. Layout of parts in either compartment is not critical; more emphasis is placed on short direct leads and mechanical rigidity. Both V_1 and V_2 are firmly secured in place by heat dissipating tube shields (I.E.R.C. Cat. No. TR50Z0H).

With the cover securely in place, the v.f.o. unit is ready for test and adjustments. Apply 6.3 volts to the filaments and 150 volts to the plates. Tune a receiver, with b.f.o. on, to just over 4.0 mc. Set C_3 to minimum capacity and tune the slug of L_1, the v.f.o. set, until the v.f.o. signal is zero-beat on the receiver. Lock the slug in this position. Now increase the capacity of C_3 while following the v.f.o. signal with the receiver. With C_3 fully meshed the v.f.o. frequency should fall below 3.8 mc. My v.f.o. bandspreads the 3.8 to 4.0 mc range over 80 percent of the dial. If the v.f.o. does not reach 3.8 mc with C_3 closed and L_1 set to maximum inductance, add more turns to L_1.

The final amplifier stage is assembled on a "U"-shaped chassis which supports final tuning capacitor C_{14} at one end and V_3 at the other. Inductor L_3 is located between C_{14} and V_3 and is supported in a horizontal position. Midget choke, RFC_3, is soldered to standoff terminals along side C_{14}. A lug under one of the standoffs serves to ground tank bypass capacitor C_{15}, and one end of link coil L_4; the other end of L_4 is supported by a standoff terminal. The number of turns on L_4 should be determined experimentally for best loading with the antenna system to be used; one or



View of the modulator assembly before board is mounted on the bracket. The bracket contains the input jack, J_1; the modulation control, R_9; the mike transformer, T_1, and the driver transistor, Q_2. The board contains Q_1, located just above the hole and all the required components for the amplifier and driver. The board mounts on the back of the bracket with the hole clearing R_9, the modulation level control. The base and emitter pins of Q_2 pass through the holes in the board above Q_1 and are fastened via the clips shown.



Top view of the "Monobander" before installation of the interconnecting harness. The voltage regulator assembly is located in the upper right corner. The output transistors are to the right of the v.r. chassis and are mounted on the chassis flange above the power plug. The upper relay is K_1, the power relay, while the lower unit is the antenna relay. The modulation transformer is to the left of the K_1 and the driver transformer is to the left of K_2. The modulator assembly is located between the panel meter and the modulation transformer.

two turns will usually be sufficient. The loading should remain substantially constant over the entire phone band thereby eliminating a loading control from the panel.

Neutralizing the final amplifier was found to be unnecessary because of the excellent shielding between the grid and plate circuits afforded by the physical construction and layout. Ventilation for the 2E26 is accomplished by a series of holes along the bottom and side of the case near the tube. This arrangement of holes allows heat to be removed by convection currents flowing up into the bottom holes and out the holes at the side. The holes are given a finished appearance by the use of aluminum eyelets obtainable from most "five-and-dime" stores.

After the v.f.o. and amplifier assemblies are fastened under the mounting plate, grid coil L_2 is set in place. Grid leak R_6-C_{11} is located close to the chassis between L_2 and the socket of V_3. Screen dropping resistor R_7 and filament resistor R_{19} are also under the mounting plate and are held by component mounting clips (Atlas E.E., catalog number 100 200-5-12). The voltage regulator assembly, T_2, and both relays are on top of the mounting plate. The rear of the transmitter is arranged to mount antenna jacks J_2 and J_3, power connector P_1, modulator output transistors Q_3 and Q_4 and thermistor R_{18}.

Sheets of mica insulation and fibre shoulder washers are used to insulate the body of the output transistors from the case. A similar arrangement holds the thermistor in place. The thermistor is located near the output transistors so that it can sense the temperature at which they are operating.

The modulator assembly is built around a J-shaped bracket which sits in a cut out portion of the mounting plate. The assembly is held in place against the panel by microphone jack J_1 which passes through both the bracket and the panel. The shaft of modulation control R_9 is cut just even with the face of the bracket and is slotted. With the bracket in place against the panel the slotted shaft is immediately behind a ¼" hole in the panel labeled AUDIO. Occasional changes in modulation level can be made through the panel with a screwdriver. The bracket supports microphone input transformer T_1, modulation control R_9, driver transistor Q_2 and an insulating board which has mounted to it Q_1, R_8, R_{10}, R_{11}, R_{12}, R_{13}, R_{14}, C_{16}, C_{17} and C_{18}. Components are mounted to the board by their leads which are inserted through small holes drilled in the board. The leads are clipped to approximately ⅛" and connections are made to these ends. Solder connections to Q_1 must be made quickly; prolonged application of a soldering iron may damage the transistor. Two bushings support the board away from the bracket. The collector of Q_2 is connected into the circuit after the board is in place. Connections are made to Q_2 base and emitter pins by passing contacts through holes in the board and onto the pins. Suitable contacts can be removed from a seven or nine pin miniature tube socket.

The voltage regulator assembly is an L-shaped bracket which supports V_4 and R_{20} on one side, and the network of base bias resistors R_{15}, R_{16}, and R_{17}, which are on the other side and supported on miniature terminal strips.

Another terminal strip holds each end of the secondary winding of T_2; from here connections are made to the bases of Q_3 and Q_4 by means of two more pin contacts. The three secondary taps of T_3 are connected to a 3 lug terminal strip located near the tip of V_4, but only the 6000 ohm tap is used.

Operation

Placing spotting switch S_2 in the ZERO position performs four switching operations necessary to put the transmitter into this mode of operation; section C operates K_1 which in turn supplies battery power to energize the high voltage supply. Section D disconnects the final amplifier. Section A disconnects the modulator and Section B disconnects K_2. This combination of connections allows high voltage to enter the transmitter where it is dropped to 150 volts by V_4 and puts the v.f.o. into operation. Relay K_2 is left in the receive position to allow signals to be received in order that the v.f.o. can be zero-beat against them. Disconnecting the final prevents over-loading the receiver; disconnecting the modulator prevents possible damage to the modulation transformer during this period when the secondary is unloaded. When S_2 is in the TRANS position the modulator and amplifier are connected into the circuit and both relays are ready to operate. The transmitter is put into operation by connecting the tip contact of J_1 to ground by means of the press-to-talk switch.

Relay K_2 has two sets of s.p.d.t. contacts. One set switches the antenna from the receiving circuits to link coil L_4. The other set of contacts silences the receiving equipment to prevent audio feedback during periods of transmission, either by opening a B plus lead in the receiver or by shorting the speaker voice coil; pins 4, 5, and 6 are available at P_1 for this purpose.

Testing

The r.f. portion (v.f.o. buffer, and final) of the transmitter should be bench tested before assembly into the case and before connecting in the modulator circuits. A 300 volt, 100 ma B plus supply, and a 12 volt d.c. source (auto battery) are required. Also, a noninductive 50 ohm resistor should be connected across link L_4 to load the amplifier. A milliammeter is temporarily inserted in the final grid circuit between the grid leak and ground, and L_2 is adjusted for approximately 3 ma of grid drive. Screen voltage should be 170 volts. With this power input the approximate power output is 13.5 watts. The input to the 2E26 amplifier can be boosted to 20 watts by using a 400 volt supply and changing resistor R_7 to provide 200 volts to the screen grid. Tuning capacitor C_{14} must also be changed to a unit having .025 inch plate spacing (Johnson type "J" series). Grid drive should be adjusted to approximately 3.5 ma.

Tests of this transmitter has shown excellent v.f.o. stability even over rough roads and varying battery voltage. Audio quality is good with most of the speech concentrated in the 100 to 3000 cycle range. To make the transmitter manipulations even easier a flat plug is used on the microphone cable; this allows the hand to move quickly from the VFO dial across to the TUNING dial. ■

ANNOUNCING ARMED FORCES DAY MAY 19, 1962

OVER 4,000 amateur-to-military contacts were made during the 1961 Armed Forces Day Communications Program, and 1,273 certificates of merit were mailed to operators who submitted perfect copy of the c.w. and RTTY messages. These figures are indicative of the many amateur radio operators who have participated and collected, since the program's beginning in 1957, the special commemorative Armed Forces Day QSL cards and certificates of merit.

This amateur radio program features a c.w. and RTTY receiving contest. Special messages from the Secretary of Defense will be transmitted. The text of the two messages is different but amateurs can, if they have the equipment, copy both messages and obtain two Department of Defense certificates of merit. Each certificate bears the name of the amateur operator and the Secretary of Defense's signature and seal.

The c.w. receiving competition is open to any amateur or short-wave listener who can copy International Morse Code at 25 words per minute. The radioteletypewriter (RTTY) message is transmitted at 60 words per minute and is open to any amateur or other individual.

The three programs add up to the possibility


Department of Defense

CERTIFICATE OF MERIT

ARMED FORCES DAY 1961

This is a sample of the Certificate of Merit issued in 1961. It can be yours if you copy the Secretary of Defense's message, transmitted at 25 w.p.m. on c.w. or on RTTY at 60 w.p.m.

of an amateur receiving five mementoes consisting of *three* QSL cards and *two* Certificates of Merit. The amateur may receive a Department of Defense certificate of merit for perfect copy of the c.w. or RTTY transmission. If he successfully copies both messages, then he may receive two certificates.

Headquarters radio stations of the Army, Navy, and Air Force will operate on spot frequencies outside the amateur bands. A military-to-amateur contact may be made with an Army station (WAR), a Navy station (NSS), and an Air Force station (AIR).

Each transmission for the c.w. and RTTY receiving contests will commence at the indicated times with a ten minute CQ call to permit the participants to adjust their equipment. The ten minute CQ will be immediately followed by the message from SECDEF. It is not necessary to copy more than one station and no extra credit will be given for so doing.

Transcriptions should be submitted "as received." No attempt should be made to correct possible transmission errors. *Time, frequency,* and *call sign* of the station copied should be indicated as well as the name, call sign (if any), and address of the individual submitting the copy.

Competition entries should be submitted to the Armed Forces Day Contest, Room 5B960, The Pentagon, Washington, D.C. and postmarked not later than 31 May 1962.

The complete operating schedules and competition procedures for the 1962 Armed Forces Day Communications Program are as follows:

C.W. Receiving Competition

Time	*Station*	*Frequencies*
200300 GMT (2200 EST)	WAR/AIR (Wash., D.C.)	3347, 14405, 20994
200300 GMT (2200 EST)	NSS (Wash., D.C.)	3319, 4010, 6970, 13975.5
200300 GMT (1900 PST)	A6USA (San Francisco, Calif.)	6997.5
	NPG (San Francisco, Calif.)	3319, 7595, 14927.5
	NPD (Seattle, Wash.)	7455
	AG6AIR (Hamilton AFB, Calif.)	7832.5

RTTY Receiving Competition

Time	Station	*Frequencies*
200335 GMT (2235 EST)	WAR (Wash., D.C.)	3347, 14405, 20994
	NSS (Wash., D.C.)	3319, 7895, 14480
	AIR (Wash., D.C.)	7915
200335 GMT (2135 CST)	A5USA (Ft. Sam Houston, Texas)	5395
	NDS (Great Lakes, Ill.)	7455
	AG5FFR) (Randolph AFB, Tex.)	7305
200335 GMT (1935 PST)	AG6AIR (Hamilton AFB, Calif.)	7832.5
	A6USA (San Francisco, Calif.)	6997.5
200345 GMT (2145 CST)	NDF (New Orleans, La.)	7380
	NDW (San Francisco, Calif.)	3319, 7375
	NPD (Seattle, Wash.)	7455

Military-to-Amateur Test

Military stations WAR, AIR, and NSS will be on the air from 191500 GMT (1000 EST) to 200500 GMT (2400 EST) on 19 May 1962 to contact and test with amateur stations. Amateur contacts will be discontinued from 200245 to 200400 to allow the Armed Forces Day c.w. and RTTY broadcast competition in accordance with the schedule above.

Station	*Military Frequencies*	*Appropriate Amateur Band*
WAR (Army Radio, Wash., D.C.)	4020 (a.m.)	3.8 to 4.0
	4025 (c.w.)	3.5 to 3.8
	6997.5 (c.w.)	7.0 to 7.2
	20994 (c.w.)	21.1 to 21.25
NSS (Navy Radio, Wash., D.C.)	4010 (c.w.)	3.5 to 3.8
	6970 (c.w.)	7.0 to 7.1
	7380 (c.w.)	7.1 to 7.2
	*13975.5 (c.w.)	14.0 to 14.2 21.1 to 21.25
	†4012.5 (a.m.)	3.8 to 4.0 7.2 to 7.3
	14385 (s.s.b.)	14.2 to 14.35
	3319 (RTTY)	3.5 to 3.8
	7895 (RTTY)	7.0 to 7.2
	14480 (RTTY)	14.0 to 14.2
AIR (Air Force Radio, Wash., D.C.)	3397.5 (c.w.)	3.5 to 3.8
	13995 (c.w.)	14.0 to 14.2
	20873 (c.w.)	21.0 to 21.25
	‡7305 (s.s.b.)	7.2 to 7.3
	‡14405 (s.s.b.)	14.2 to 14.35
	7915 (RTTY)	7.0 to 7.2

Military stations will listen for calls from amateurs within the appropriate amateur bands. Contacts will consist of a brief exchange of location and signal report. This is a test of military-to-amateur communications and no traffic handling or message exchange will be permitted. ■

* The Novice Section of the 15 meter band will be monitored primarily for those new operators who may be unable to work into the 40 and 80 meter bands. Contacts will be acknowledged on 13975.5 kc.
† Operator transmitting on 4012.5 (a.m.) will listen in the a.m., s.s.b., sections of the 40 and 75 meter bands for a.m. or s.s.b. stations.
‡ Operators transmitting on these frequencies will listen for a.m. or s.s.b. signals within the appropriate bands.

The Zipper Bag Transmitter

BY ED MARRINER*, W6BLZ

Here is the traveling man's companion, a c.w. transmitter small enough to fit in a shaving kit. It uses a single 6CX8 and has a 1 watt output on 40 meters.

I FIRST conceived the idea of building a miniature transmitter while on a business trip by air and allowed only to carry a brief case and a zipper bag. I reasoned a small rig would cheer me up away from home, boxed up in a gloomy hotel room. Surely it must be possible to make local contacts and get acquainted or perhaps bridge the 500 mile gap to home and the kids.

Back issues of *CQ* carried several articles on small receivers[1] but I guess transmitters were taken for granted. When I arrived home, I did get around to trying my idea. I was pleasantly surprised to find just how reliable a one watt portable transmitter operated on the 7 mc amateur band.

Antennas

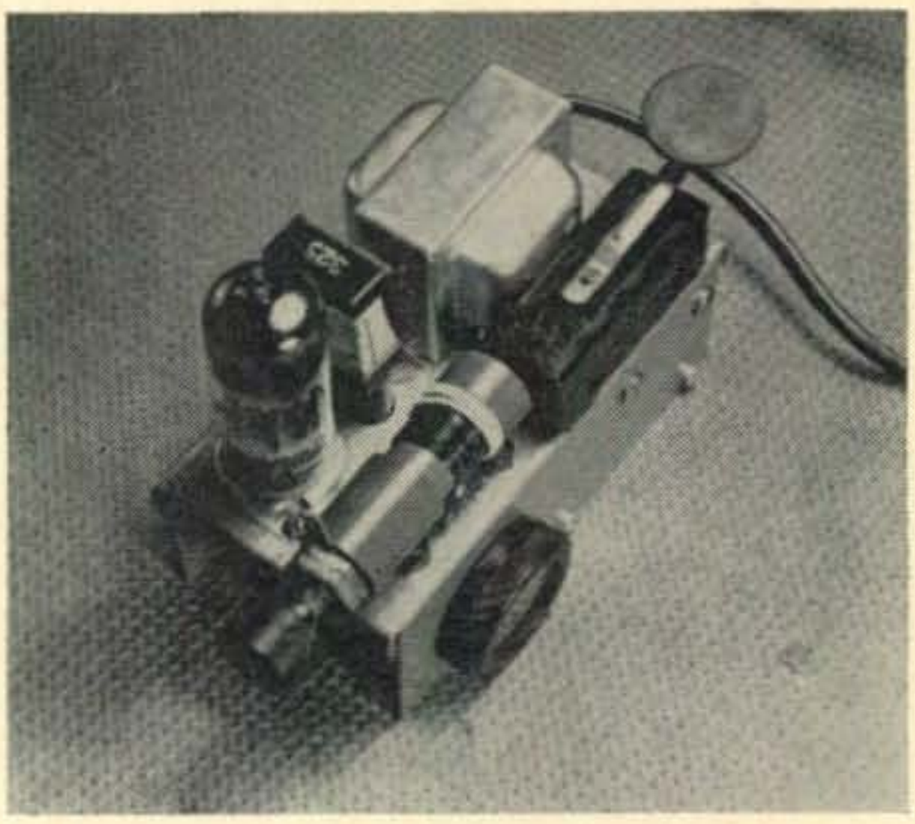
Several model antennas were made that would coil up in my fist and tuck away in the corner of the zipper bag. I found 30 feet of #26 wire dangling out the hotel window was close enough to load out. With information supplied by W6DLY, a dipole antennas was made using very small micro-dot 52 ohm coax feed line and #26 wire, which I could string out at motel locations.

Circuit Description

With simplicity foremost in my mind as I started out, the new GE 6CX8 caught my eye. It is a triode-pentode tube with a 5 watt plate dissipation. It didn't take long to come up with the workable circuit shown in fig. 1. After a few trials at squeezing parts into a LMB box 1½ inches wide and 4 inches long, I thought I could make it. Imagination is at once the source of all hope and inspiration but also of frustration. A voltage doubler circuit I originally intended to use had to be rejected in favor of the half wave rectifier. The transformer just wasn't heavy enough and the series capacitor took up too much room. This was a good decision as the difference in voltage did not make enough difference in output r.f.

Many of the parts shown in the schematic can actually be omitted. For instance the cathode bypasses $C4$ and C_7 seemed to make no difference. The use of a series tank circuit eliminates the need for an r.f. choke. The short lead to the 80 mf filter made the screen bypass unnecessary in actual practice. At this low power many liberties can be taken just in fun and still have a working rig.

Excellent keying was accomplished by leaving the oscillator run during the on-the-air time. A switch was used to turn the oscillator voltage on and off for T-R purposes. A microswitch with a miniature knob became the telegraph key in the pentode section cathode.



Top view of the transmitter showing component locations. The key is a microswitch with a home made knob attached.

Tuning Procedure

The crystal oscillator in the untuned circuit gives enough drive to kick the 6CX8 to full output of 20 ma when loaded into the antenna. With the antenna disconnected, tune the slug of L_1 for a dip in plate current. Attach the antenna; if the coil of L_2 is not too tightly coupled there will still be a slight dip at the 20 ma reading. It is not likely that you will have a feld strength meter when traveling so, the next best tuning method is to couple a blue bead dial lamp to the coil with two turns of wire. Now tune the slug of L_1 and C_1 for maximum brilliance. If a regular 40 meter antenna is used, C_1 will not have much effect.

General

Some one is sure to ask, "Can I use a pi-

*585 Colima Street, Jolla, California

[1] Green, J. K. "The RXT-2," *CQ*, April 1961, page 54.
Howell, F. S. "A 40 Meter C.W. Station," *CQ*, October 1961, page 56.
Hexter, M. "A Complete Portable 40-Meter C.W. Station," *QST*, December 1951, page 11.
Vreeland, R. W. "The Mountaineer—A Hiker's Portable," *QST*, September 1950, page 17.

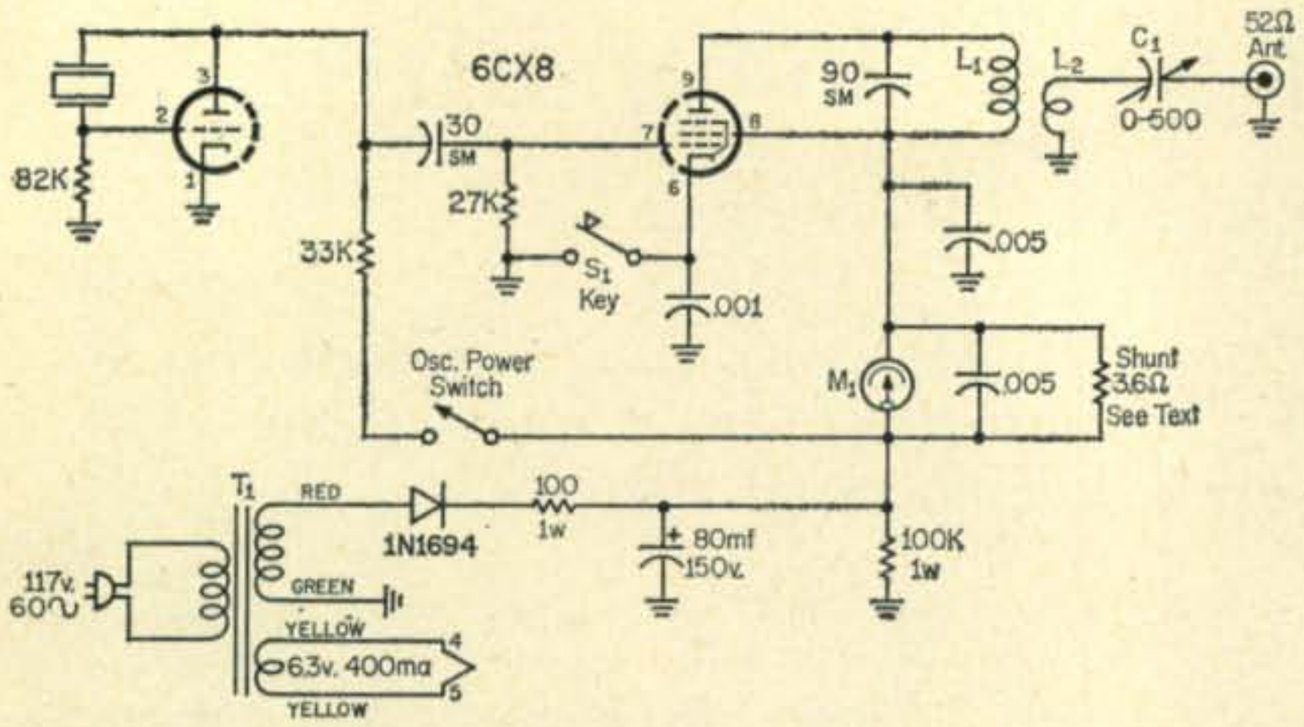


Fig. 1—Circuit of the compact 1 watt transmitter for 40 meters. The entire unit fits into an LMB chassis 4" × 2½" × 1⅝". All resistors are ½ watt unless otherwise noted. All capacitors values greater than one are in mmf, less than one, in mfd.

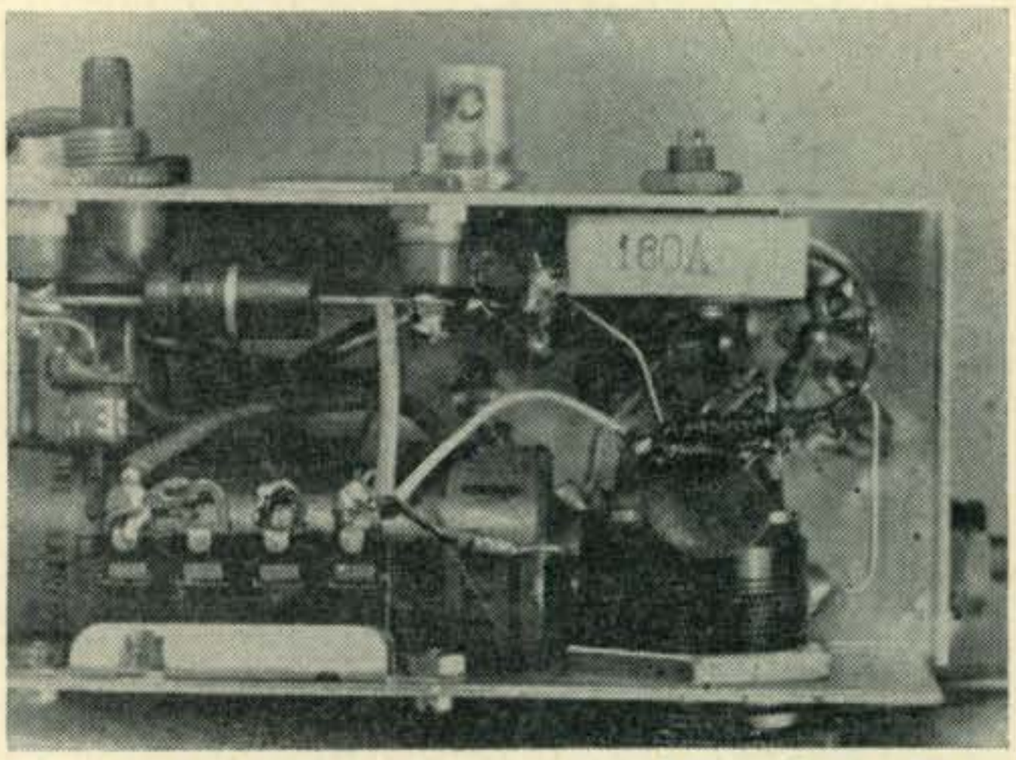
C_1—9-500 mmf compression trimmer.
L_1—24 t, #21 E. on National XR-50 form.
L_2—3 turns of hookup wire on cold end of L_1.
M_1—0-200 microammeter, sub-miniature, 1" diam. surplus unit. Arrow Elect. Inc. 65 Cortlandt St., N.Y.C.
S_1—Microswitch #BZ-RL2.
T_1—250 v.c.t., 25 ma, 6.3 v., 1 a. Stancor PS-8416 or Equiv.

network output tank?" The answer is, yes, you can, but it is more complicated to tune and very little difference was detected in operation. The parallel feed saves some parts and is not so hard to tune on field location. The value of C_1 can also be obtained in the 1000 mmf compression mica capacitor if it is desired to use the pi-network output.

The one inch 0-200 microammeter meter was surplus and a shunt made from resistance wire (3 ohms per foot) so that the meter read 0 to 40 ma. The determination of shunt value has been explained in previous articles.[2] The meter can be purchased new in any current range without making a shunt, but the cost will be higher.

That's it! My zipper bag rig, for those who do not know or have forgotten the joy of discovery, puts out one watt and still gets out.■

[2]Young, E. J., "Shunting the Milliammeter," *CQ*, March 1960, page 40.



Bottom view of the transmitter shows the compact wiring. Back flange of the transmitter contains the oscillator switch, antenna jack and PA plate tuning capacitor.

What's Wrong With A Hertz?

BY FRED S. HOWELL*, W6MTY

Not a thing! In fact, the non-critical single wire feedline, low v.s.w.r., and low r.f. voltage at the shack make the Hertz an excellent choice for many difficult installations.

THE new off-center fed Hertz has been up at W6MTY on 40 for about a month now and I'll have to admit that it works as well as any doublet I have ever put up. From now on I will always consider the Hertz when I contemplate a new antenna installation. Yet very seldom have I heard anyone report using a Hertz since before World War II. Getting mine to load was a problem and I suspect this may be the reason for the Hertz not being used more generally.

I chose the Hertz because the feed point came out directly over the shack and it just turned out that I didn't have enough transmission line lying around to make a doublet.

Loading Up

After the antenna shown in fig. 1 was up and the feeder was attached to the insulator in the

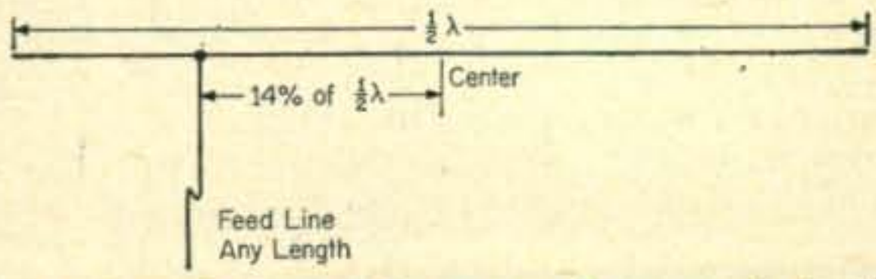


Fig. 1—Specifications for an off-center fed Hertz antenna. For 40 meters the overall length is 32 feet with the feedline 9 feet from center.

* 9173 Croydon Avenue, Los Angeles 45, California

side of the shack, the problem of feeding it had to be faced. As in most shacks these days, for television interference suppression, receiver noise reduction and just handy signal handling, everything up to the antenna tuner is coax. My first attempt at matching the coax to the 600 ohm unbalanced feeder was to build a π net work and use components that were available in the antenna tuner. The circuit was that of fig. 2.

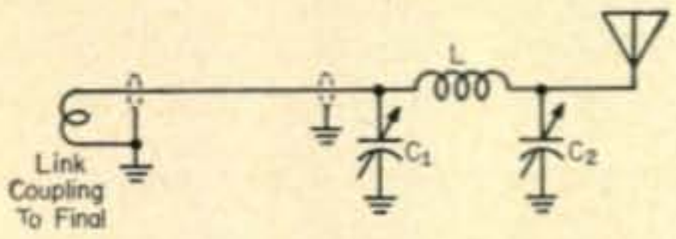


Fig. 2—Pi-network that was unsuccessfully employed with the off-center fed Hertz.

The only way it would work was with C_1 at around 500 mmf, C_2 indeterminate and L at the lowest tap. A check of the feeder showed a high standing wave ratio, and the stator of C_1 was hot, indicating that C_1 and the link to the final were resonating on the operating frequency.

At this point, I went back to the old college textbooks and got a clue to the trouble. Everett[1] notes in his discussion of the π network that in the solution for the reactances of C_1 and C_2 there appears the term:

$$\sqrt{Z_g Z - X_L{}^2}$$

For those who have forgotten their algebra, this means that if the square of the reactance L exceeds the product of the input impedance multiplied by the output impedance, an imaginary number appears in the solution. What this means to you when you try to use a π network is that if the reactance of L is too high to satisfy the equation:

$$X_L \leqq \sqrt{Z_g Z}$$

You cannot transfer much power through the π network. In my own situation the reactance of L that came out of the equation was smaller than the reactance of the antenna inductance on the lowest tap, and in order to deliver power to the feeder standing waves had to be induced.

Antenna Tuner

At about this point I began to think about all the π networks that have given trouble in the past and was about to the stage of flipping a coin to decide between ripping the coil out of the antenna tuner or tearing down the Hertz when it suddenly occurred to me that if I couldn't reduce X_L maybe I could increase $Z_g Z$. I modified the circuit of fig. 2 to that of fig. 3 and immediately things took a turn for the better. The antenna loaded properly, the feeder was flat and the whole system began performing as it should. Quite important was

[1] Everett, W. L., *Communications Engineering*, 2nd Edition McGraw Hill, pages 263-265

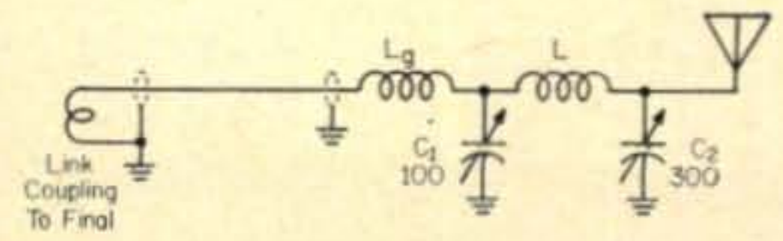


Fig. 3—The modified antenna tuner that permitted proper loading. Inductors L and L_g are 20 turns of #14 wire, wire spaced, with a 1½ inch diameter. Capacitor C_1 must be spaced for high r.f. voltage and C_2 must be able to withstand 800 volts (at 1 kw) with v.s.w.r. of 1:1.

the aspect that there was no television interference even without a low-pass filter.

To explain why the added inductance helped the situation let's take a look at fig. 4 which is an equivalent circuit of fig. 3. The combination of L_g and the link coupling to the final as an inductance, and the capacitance of C_{1a} (which is a part of the C_1 of fig. 3), is resonant on the operating frequency and point A is a very high impedance. The π network now consists of C_{1b}, which is the capacity left in C_1, L and C_2. This network must match the very high impedance at point A with the 600 ohm feedline, and this is a relatively easy job to accomplish with conventional size components.

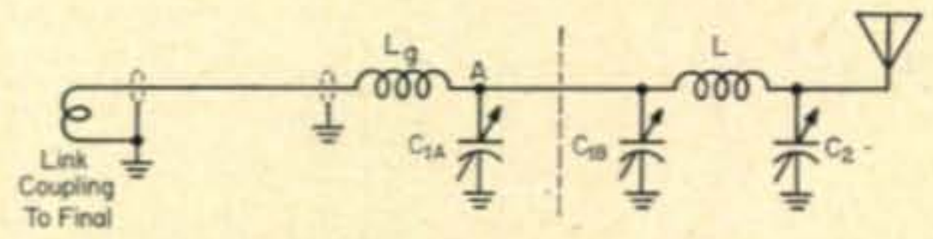


Fig. 4—The equivalent circuit of the antenna tuner shown in fig. 3. Operation is explained in the text.

Advantages

Now, what are the advantages of a Hertz?

1. Easy and inexpensive to build.
2. Unbalanced feed system does not require a balun or coil tapping to connect to a coax signal distribution system.
3. 600 ohm line losses are usually less than low impedance lines such as coax or 72 ohm twisted pair.
4. May be made to work on frequencies higher or lower than its design frequency.

The next time you are trying to decide on a new antenna ask yourself the question, "What's wrong with a Hertz?" But be sure and try the antenna tuner of fig. 3. I think you will be in for a pleasant surprise. ■

OUT OF THE DARKNESS

BY D. H. WOOD and S. A. LAKE*

Although "Miss Surprise" was not called a Hurricane, it brought to the east coast of the United States, and especially New Jersey, the greatest devastation in history. As always, the amateur was on the job, maintaining communications when all other facilities were out. This is the story of that terrible storm that took dozens of lives and accounted for millions of dollars of property damage.

Anne Morrow Lindbergh, wife of Charles Lindbergh, spoke of radio thus: "Living proof of that bond with the world. Touch of flesh and blood to the doubting. Sound, mind, spirit, cutting across space, over water, through wind—unwavering, undeterred, like light through darkness."

The very essence of these words was portrayed by the memorable part amateurs played in the recent storm disaster suffered by South Jersey. To single out one individual and elaborate on his role would be a newsworthy story in itself. But this would be neither possible nor fair. Every amateur in the area cooperated. We have chosen, therefore, to exemplify the value of *all* amateur radio operators through the few incidents related here.

March 6, 1962: Dame Nature stages sneak attack.

QTH: Atlantic Coast Line.

The handle here: *Miss Surprise*.

The rig: 84 m.p.h. winds, tides up to nine feet above normal.

The output: Disaster . . . Death . . .

In the deadly clutch of *Miss Surprise*, Atlantic City, Ocean City, Brigantine, and many other coastal communities of New Jersey were completely isolated as the ocean and bays swelled under hurricane force winds. Tides ran rampant, knocking out telephone communications, electrical service. Food and water supplies ran dangerously low. Each of the four commercial broadcast stations in the area were inoperative. One of their towers, grotesquely twisted, lay slumped in four feet of icy water. Roads from the coastal cities that might have lead to safety on the Mainland were rendered impassable by six to eight feet of surging water.

All was silent for people beyond the howl of the Killer Storm. All was still, except the mounting apprehension, for those having loved ones in the stricken areas. Rumors of devastation, a holocaust, death, fired the terrible fear that among the nameless victims there might be one of their own.

March 6, 1962 . . . Out of the darkness came a voice, a reassurance, a precious link: "QRZ 6 for traffic." Urgent traffic, as *Miss Surprise* raged on into her second destructive day. Ham operators kept a sleepless, round-the-clock vigil. A precious link.

Where did it start? Perhaps with WA2QOI in Margate, New Jersey relaying a simple "I am fine" message through twenty mile jumps

*316 Spruce Street, Absecon, New Jersey.

This is a view of what was once the famous Atlantic City Boardwalk. Mountainous waves and hurricane force winds tossed giant timber as if they were match sticks.

An Atlantic City policeman surveys the grim results of the storm's fury.

to concerned relatives in the Philadelphia area. Or, perhaps with Maryan Bouchard's (K2BKG) suggestion to activate the RACES facilities located at the Atlantic City Race Track. Or, perhaps by an amateur's retrieval of a pet Collie from an evacuated area.

One of the operators, WA2QOI, transmitting from Margate, an area very close to Atlantic City, was handicapped by an inoperative rotor. Consequently, the antenna could not be turned. Nevertheless, a steady flow of traffic was maintained. Messages originating with this station could be transmitted only as far as the Mainland, eight miles away.

There were occasional interruptions: the rescue of a family from their flooded home, the futile search for two vehicles feared missing, the wait while National Guardsmen helped to extricate the amateur's own truck which had bogged down in deep sand while transporting storm refugees.

Two children in an evacuated family had been confined with the measles, were awestruck, terrified by the storm. This family was brought to shelter in the home of WA2QOI, and he returned to his rig to resume traffic relays.

For a few short hours during the storm, the tides receded. At this time, WA2OCT, from the Mainland, traveled eight miles over the debris-ridden route to Brigantine, an extremely devastated island community. His mission was two-fold. First, to survey the damage, describe the havoc wrought by Miss Surprise, and, if possible, to reassure. And second, to rescue a child's pet left behind when the family was forced to quickly evacuate their home.

Boats were strewn about the highway like matchsticks. The amateur noted a huge cabin cruiser which had floated through the streets and lodged itself on a restaurant parking lot among several cars. Portions of floating homes were given the right of way as he proceeded to his destination.

He attempted to establish contact with the Mainland with his mobile rig, but due to QRN he could not copy signals from the operators standing by to relay any traffic from the island. However, the second part of his mission was entirely successful. After the eight-mile return journey, which took two hours, the dog was reunited with his seven year old mistress. The child was to enter the hospital that night. Who can estimate the value of her pet's return?

March 7, 1962 . . . In the height of the raging storm, three mobiles worked through the night in Ocean City. A mobile set up inside the high school, in a shelter, was relaying urgent messages to Civil Defense Headquarters. Trouble with the natural gas! It had to be shut off, bottled gas was needed. Four cardiac patients were housed in the high school, a request was made for a resuscitator and oxygen to be sent, for use on a stand-by basis.

Important incoming traffic, water feared contaminated! Evacuees warned to boil water until special water tanks arrived. And more, many more, while the Killer Storm continued. The hams worked relentlessly throughout the night.

March 9, 1962 . . . In the wake of the Killer Storm, overtaxing of partially repaired telephone lines was feared. "Operation Post-Mortem" was begun by Maryan Bouchard, Director of RACES, Captain Lon Benson of the U. S. Air Force and head of MARS, and Bob Rosenberg, Emergency Coordinator of the Amateur Radio Emergency Corps. An appeal was issued for all amateurs to stand by for traffic. Mobiles were sent into the devastated areas to survey damage and relay the information to out of state property owners, and to relay personal traffic from stricken families.

The hams' response to the appeal of "Operation Post-Mortem" was startling. At least two hundred answered the call, many from distant states, among them Virginia, Maine, and Massachusetts. Commercial radio stations were now back in operation and they joined newspapers in urging storm victims who wished to contact relatives to get in touch with the Net Control Center located at the Atlantic City Race Track.

Messages from mobile facilities in direct areas of the devastated Jersey coast were transmitted on six meters, to the Net Control Cen-

[*Continued on page 92*]

An Inexpensive Mobile Converter

"The Scotchman's Delight"

BY T. W. GWIN*, K5BNS

Here is a simple inexpensive mobile converter that will permit coverage of the 40 and 80 meter band with a 3000 kc crystal.

HAVING owned many various and sundry types of mobile converters and receivers, I suddenly discovered that my pocketbook was taking quite an unnecessary beating, that is, as far as mobile reception goes. Surely, I thought, there must be some way for the Novice, s.w.l., and even the more advanced amateur to have mobile reception without a large outlay of cash.

With this in mind I went to work scanning the many radio and electronic publications to which I subscribe (another costly aspect of this wonderful hobby) for an idea. After many hours (and some days) of searching I came to the conclusion that other fellow amateurs had the same idea. I found many excellent circuits and articles on simple converters but none of which met the qualifications I wanted. So—— why not combine the good qualities of several? By doing this I have come up with one I call the "Scotchman's Delight."

As you can see by the simple circuit diagram shown in fig. 1 and accompanying photo, the converter consists of a bare minimum of parts. Most of these parts can be obtained from the average junk box. Even if you have to purchase all the parts new, the outlay of cash should run only a few dollars.

*2819 Copeland Road, Tyler, Texas.

Construction

The parts layout of the converter is not at all critical. As proof of this, I crowded the same circuit and parts into one corner of my home-brew transmitter with excellent results. The unit can be built as a sub-assembly such as this particular one was and it may then be mounted in a standard Mini-Box, or the builder may elect to build it on an aluminum partition mounted in the box. In any case, the finished unit should be well shielded to prevent the pickup of ignition noise etc.

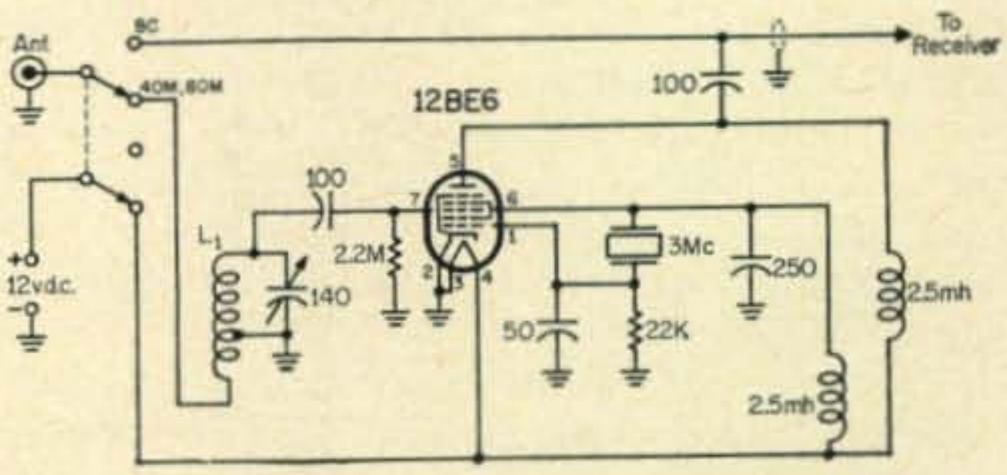
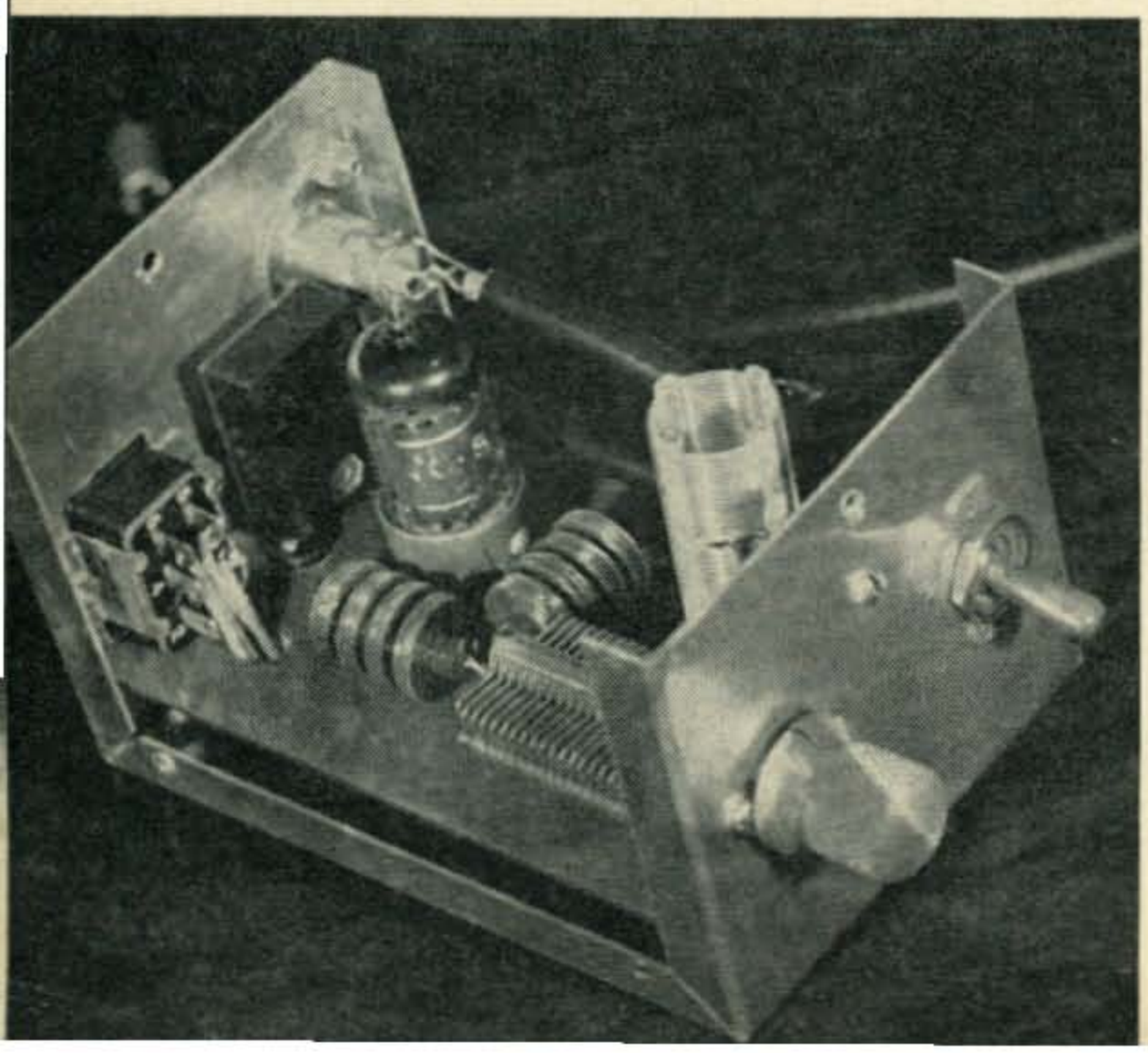


Fig. 1—Circuit of the one tube crystal controlled mobile converter that operates in the 40 and 80 meter band. The antenna coil, L_1, is described in the text.

A 12BE6 tube was used in this converter because it happened to be available. Any of the new 12 volt tubes such as a 12AD6 may be used just as well.

The coil used in the input circuit is a B&W 3008 tapped and grounded 18 turns from the antenna end. The rest of the coil is hooked across the 140 mmf input capacitor. With a 3000 kc crystal in the circuit the unit will tune 80 and 40 meters by changing the setting of the dial on the auto receiver and tuning the input capacitor for maximum signal.

This converter has been used by many amateurs in this area for several years with excellent results so I can honestly say that, cash wise, this is truly a "Scotchman's Delight." ■



Three quarter view of the mobile converter. The front panel controls are R.F. Tuning and the On-Off switch. The crystal is mounted to the rear of the phenolic board chassis. The B & W antenna coil may be seen behind the front panel.

CRANIUM QUERIES

DX hunting with no success?
Turn off your rig and give it a rest.
Here is a puzzle to give you a test;
If you can work it, you're one of the best.

The first letter of each word is the last letter of the preceding word. Work in a clockwise direction towards the center dot and you'll be on the beam. Answers to this "roundword" puzzle can be found elsewhere in this issue.

1. Without them, amateur radio would not exist.
2. Shorted or open antenna system impedance.
3. Directional antenna array.
4. Given when distressed.
5. Name of an antenna.
6. Nature's signal reflector.
7. Last word.
8. Surrendered.
9. Let your rig do it and the FCC will be unhappy.
10. Signals coming and going.
11. Basic unit of alteration.
12. Parallel.
13. Supports part of your rig.
14. Chewed or used for dusting rig.
15. Lower end connection to Marconi.
16. Station not nearby.
17. May use lipstick instead of loopstick.
18. Type of coupling.
19. Practiced for proficiency.
20. Class of amateur radio license.
21. Drift compensating circuit.
22. Undesirable sounds on dits and dahs.
23. Product of I^2R.
24. Type of frequency meter.
25. Mobile operators may have reason to discuss it.
26. Open connection.
27. Garage door openers operate on this band.
28. Type of switch.
29. Switch which throws both ways.
30. Legal document.
31. Day after today.
32. Name of Amateur Operator who invented multi-band transmitting antenna.
33. One million times unit of frequency.
34. Limiter.
35. A.C. peak value.
36. Effect noticeable at high-frequencies.
37. Type of frequency modulation.
38. Top frequency that's usable.
39. Its pattern usually shown on polar diagram.
40. Tube or semiconductor having two elements.
41. Abbreviation for another name for potential difference.
42. Type of modulation having constant amplitude.
43. You might talk to him or it.
44. Voltage on the second grid.
45. World time reference.
46. Terminal that transmits.
47. Tuned grid.

1								2			3
12				13				14		15	
	24			25				26	27		
11		34						35	28		4
		33	40				41				
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8		7									6

Temporary Splicing of Coaxial Cable

BY HARVEY HUNTER*, W8TYX

Did you ever accidentally stick a spade through your buried coaxial cable? Well, I did with my RG-58/U and rather than replace it at the time, I spliced it. This method is recommended for temporary use only as any form of splice will introduce an impedance "hump" and effect the s.w.r. Taking all this into consideration, here is how to do it.

You will need about a foot of slack to work with. Fortunately, my break was only a few feet from the house, so I was able to pull some slack cable from the house to the place where the break was. If you can't slide the cable in it's trench, you will either have to dig it up or make two splices.

On each end of the break, remove the vinyl outer covering for about three inches (fig. 1a). Then carefully slide back the braid from the cut end of each line for about an inch (fig. 1b). Now cut off about ½ inch of the center conductor with the polyethylene covering. Remove the wire from these pieces and save the plastic. Bare the center conductor of each end of the line for about ¼ inch and bend a small hook in the wire (fig. 1c). Hook the two center conductors together and solder them. Now take the two small pieces of plastic and using your soldering gun or iron, melt the plastic and flow it over the joint you just made and melt it into the plastic covering the center conductor (fig. 1d). Take it easy here and be sure that you cover the joint completely and fuse the covering you have made into the plastic on the cable. Make your plastic joint about the same diameter as the plastic in the cable.

Now work the outer braid from one side of the splice down over the plastic joint and work the other piece of braid over the first. Smooth the braid down against the plastic and wrap it with a couple of turns of small, bare copper wire to hold it in place while you solder it (fig. 1e). Soldering the braid is the touchiest part of the whole operation. You must have a good electrical connection or the line will not work properly, but you must be careful not to melt the plastic joint and short out the line. I applied soldering paste to the braid and with a good hot soldering gun applied heat and solder just long enough to flow the solder into the braid.

After this, test the line to be sure you haven't shorted it while soldering the braid. If it is all right, finish the job by wrapping the splice with plastic electrical tape. In my case, I reburied the cable, but this splice would be suitable for other types of installations. ■

*1106 Carolyn Ave., Columbus, Ohio

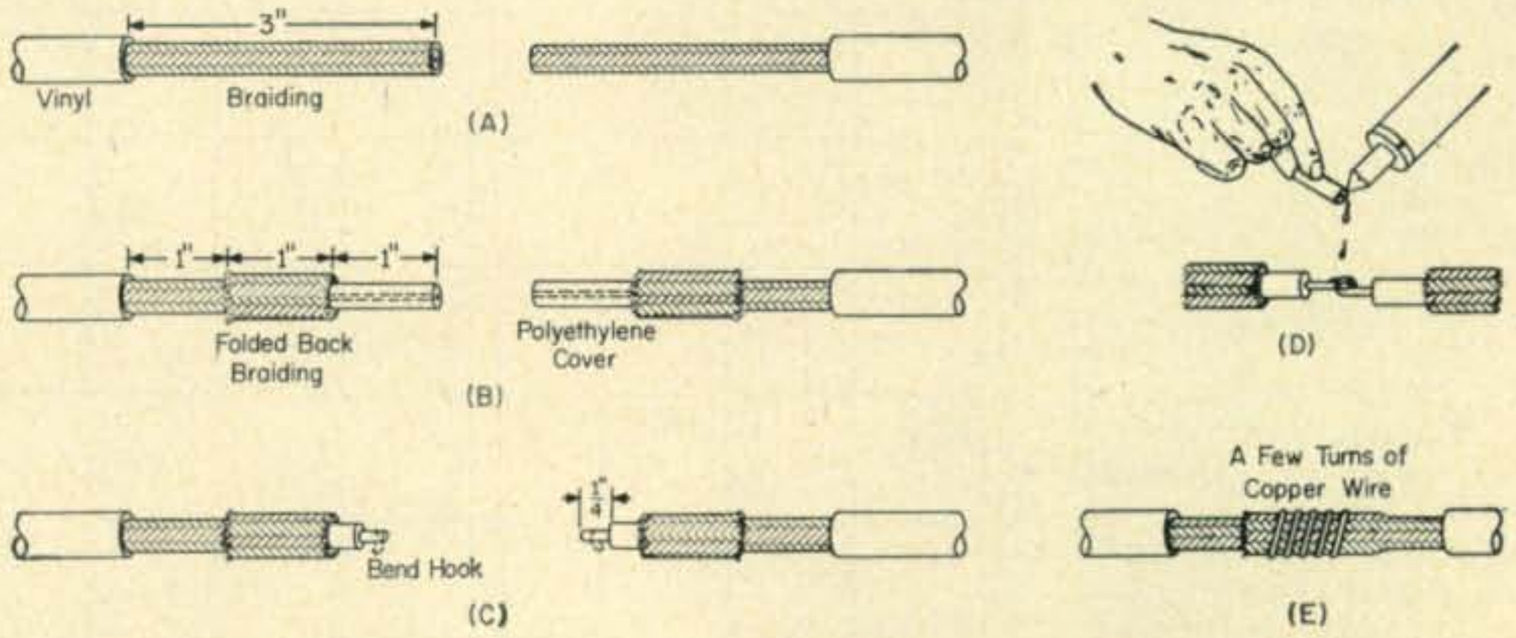


Fig. 1—Step by step method of splicing coaxial cable for temporary repairs. See text for details.

Art Collins Wins Navy Citation

Arthur A. Collins, WØCXX, who founded the Collins Radio Company more than 30 years ago in Cedar Rapids, was presented the "Secretary of the Navy's Distinguished Public Service Award Citation" by Vice Admiral Robert Pirie, deputy chief of Naval Operations for Air on March 8th.

The citation signed by Navy Secretary Fred H. Korth cited Mr. Collins as inventor, pioneer and industrialist, who gave "unstintingly of his time and genius in helping the Navy to maintain its leadership in the complex areas of airborne communications, electronic navigation and high speed data transmission."

The long Navy-Collins relationship was highlighted in 1940 when the Navy conducted tests on three competitive transmitters for use on naval aircraft.

The AN/ART-13 designed by Art Collins won the competition.

Collins built 90,000 of these transmitters and some Navy aircraft are still using them today. All services and the British used them during World War II.

Admiral Richard E. Byrd, on his first expedition to the South Pole in the late 20's, was one of the first to recognize the quality of Collins amateur radio gear.

Art Collins, WØCXX, receiving the Navy's highest civilian award from Vice Admiral R. B. Pirie. In accepting the award, Mr. Collins remarked that it was a deep honor and that he considered the Navy's award "A testimony to the talents, efforts and professional achievements of the many fine people who have worked with me throughout the years."

During a period of several days Adm. Byrd was unable to communicate with Washington, but Art, in Iowa, was receiving the voice from down under loud and clear.

Upon his return to the United States, Adm. Byrd paid a visit to young Collins and acquired some of his equipment which he used during his second expedition to the Antarctica in 1933.

Award of the Navy citation, which is made to an individual rather than a company or organization, noted these achievements, adding:

"The inventions in design leadership provided by Arthur A. Collins continue to make significant contributions to all phases of naval communications and flight instrumentation. Every Navy ship, aircraft and shore station has equipment made possible by his personal inventive genius.

"Although some of the earlier products of his creativity are still in use in fleet ships and aircraft, he is not content to rest on his laurels, but continues to seek out new challenges in new, more demanding areas.

"In recognition of the national significance of his contributions to naval communications, and in appreciation of his continuing efforts in behalf of the United States, this award is approved this eighth day of March, 1962." ■

Vacation With A Purpose

CAMP Albert Butler nestled on the crest of the Blue Ridge Mountains, 60 miles from Winston Salem, North Carolina is offering a two week vacation for those who have passed their Novice, or Technician License, or can copy 5 w.p.m. The purpose of this two-week outing is designed to prepare Novices or pre-Novices for their General examination.

The Gilvin Roth Chapter of the YMCA in Elkin, North Carolina is host. An impressive staff of instructors, all amateurs by the way, starts off with C. L. Peters, K4DNJ who is camp director. Jim Thurston, W4PPB, head of the Electrical Engineering Department at Clemson will share the instruction chores of the 14 lessons with Mr. B. L. Dennison, W4ECD, professor of Electrical Engineering at Virginia Polytech, and John Wallace, W4ZCC, a Professor of Electrical Engineering at Georgia Tech. Lawrence Snyder, K8TTW, is the camp Chaplain and will also instruct the code.

The camp has five fully equipped stations including excellent facilities for code practice. A test lab is also available, equipped with 'scopes, generators, etc. An excellent reference library is available to all.

Besides the regular radio courses each day, free time is alloted for recreation in riflery, archery, swimming, horseback riding and astronomy. Nature trails and waterfall hikes are available and many points of interest are included for the nature lover.

The two-week course begins August 4th and tuition is $150.00, which covers all expenses including notebooks, textbooks, health and accident insurance. A free brochure is available by writing the Gilvin Roth Y.M.C.A. c/o C. L. Peters, K4DNJ, Box 770, Elkins, North Carolina.

See you there? ■

Two views of Camp Albert Butler. The enthusiastic bunch in the dining room last year attest to the excellent food. Below is a sample of the informal air in which the theory classes are conducted.

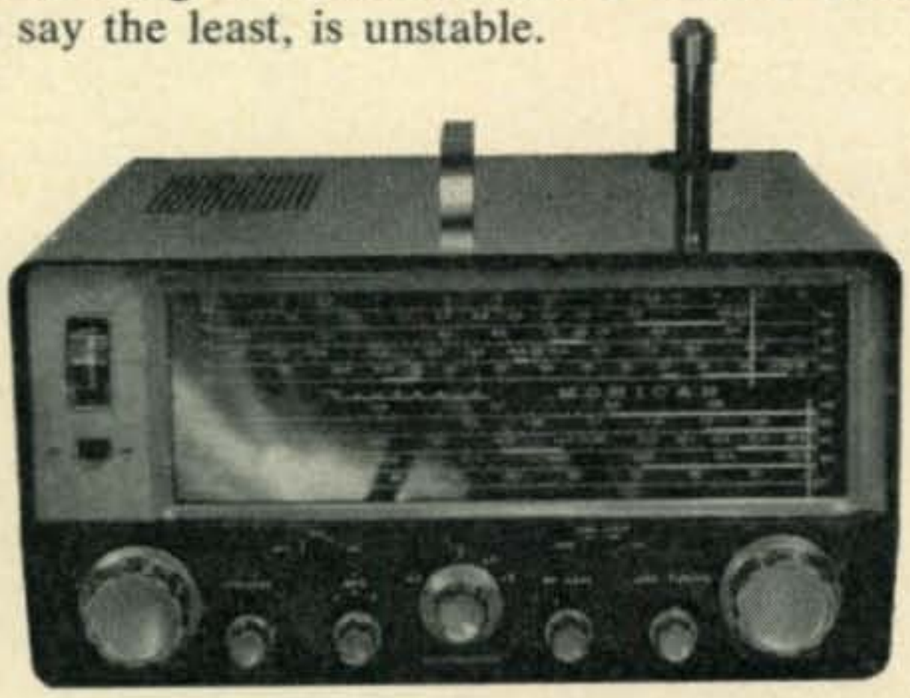
CQ Reviews:

The Heath GC-1A Receiver Kit

BY DONALD L. STONER*, W6TNS

LATELY I have been receiving quite a bit of mail on the subject of the Heath GC-1A. Generally, the letters read something like this; "Tell me, off the cuff, is the Heath GC-1A really as good as it appears to be? Are there any simple modifications which will improve its performance?"

Ordinarily a kit or equipment reviewer is expected to exhibit self restraint and objectivity when doing his job. I confess at the outset, and "on the cuff" so to speak, that the new GC-1A has me excited. *I like it!* After reviewing the circuit features with me, I think you will also. The Heath Company is to be congratulated for introducing this receiver into a market which, to say the least, is unstable.



I believe I can safely say that there is no other wired receiver that will provide the same dollar value as the GC-1A. Its performance equals or exceeds any receiver (wired) in the $130 price class.

Specifications

The Heath GC-1A is a 10 transistor receiver of the general coverage type. It is calibrated between 550 kc and 30 mc in five ranges and separate electrical bandspread is provided on all amateur frequencies, plus the Citizens Band. Although it is advertised as a general coverage receiver, it is quite capable of communications receiver performance. A 455 kc i.f. is used to obtain a 3 kc bandwidth at the 6 db points. A 2 microvolt signal is required for a 10 db signal-to-noise ratio. The average image rejection is 30 db.

Eight size "C" flashlight cells power the receiver, or a 117 volt a.c. power pack is available for fixed station operation. The battery life is approximately 400 hours.

These specifications are right out of the Heath manual, and the receiver lives up to every one of them. Two points should be brought out, however. The shape factor provided by the four i.f. filters is approximately 4 to 1, and the 60 db bandwidth is approximately 12 kc wide. The *average* image rejection (taken at approximately 15 mc) is better than 30 db. However, at 30 mc this figure drops below 30 db, with the exact amount of rejection depending on how carefully you align the front end.

Circuitry

The r.f. section uses three premium RCA "drift"-type transistors which have 100 mc alpha cutoff ratings. There are no short cuts taken in the design of the front end. Each stage and band has a separate coil (15 total) and the coil-bandswitch assembly occupies four-fifths of the total chassis area. In addition, each band has an individual slug and trimmer for tracking the r.f., mixer, and oscillator at each end of the dial. Five-percent capacitors are used in the front end signal circuits, along with copper-stator tuning capacitors, to insure low-drift performance.

R.F. Section—A 2N1396 Q_1 is used in a common base configuration for constant alpha gain. R.f. from the 52 ohm input is applied to the emitter. When using the whip antenna, the signals are coupled to the "hot" end of the antenna coil in use. A.v.c. voltage is applied to the r.f. stage. The r.f. gain control varies the bias, for forward conduction, applied to the base of Q_1.

Mixer—The amplified signal from Q_1 is capacitively coupled to the mixer transistor (Q_2, a 2N1225) from low impedance points on the r.f. coils. This stage operates in the common emitter configuration and the oscillator energy is injected into the transistor emitter. A different coupling capacitor (between oscillator and mixer) is switched into the circuit on each band, thereby maintaining the correct injection current on all ranges.

*VHF Editor, *CQ*.

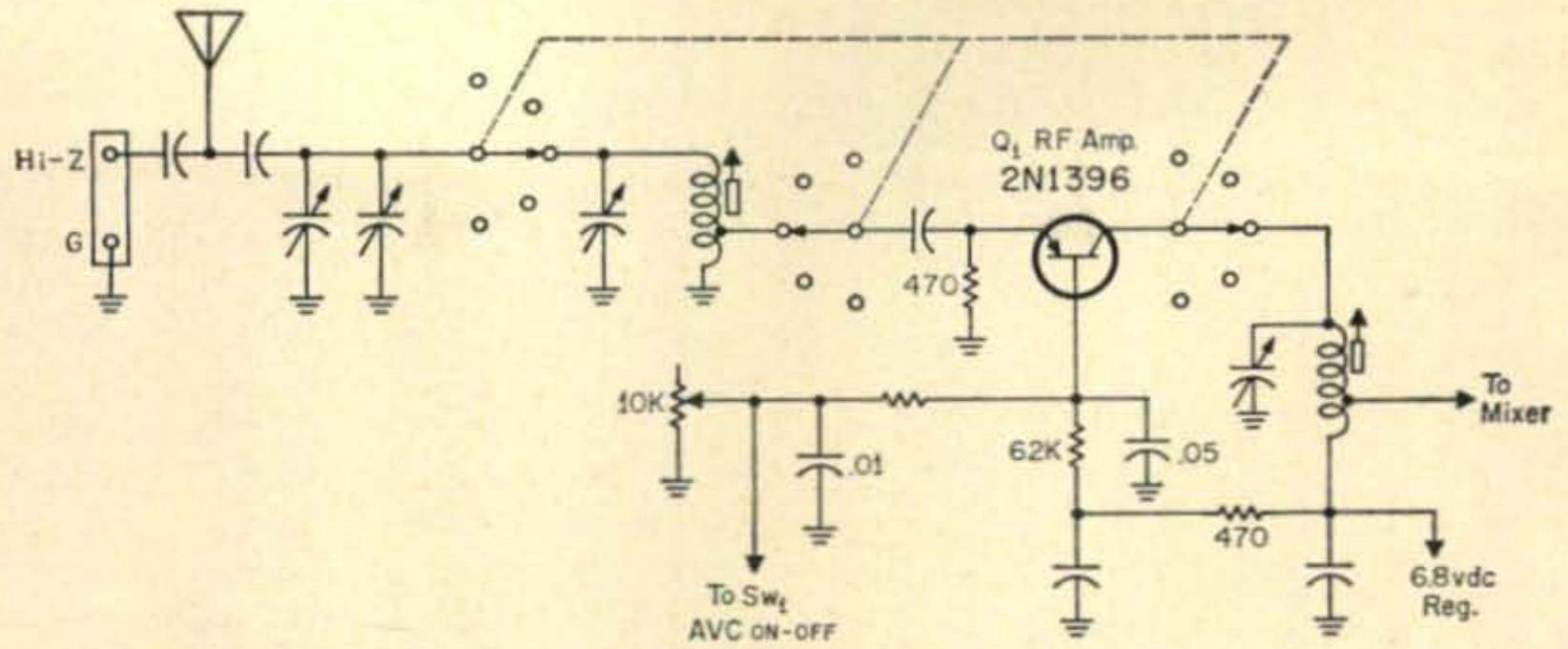


Fig. 1—Circuit of the Heath GC-1A r.f. stage. Transistor Q_1 is an RCA drift-type with an alpha cutoff of 100 mc. Each of 5 bands has an individual slug tuned coil and trimmer in each stage of the rf., mixer and oscillator.

Oscillator—The local oscillator (Q_3) is another 2N1225 operating in the common-base configuration. A zener diode regulates the power source. Changes in potential, caused by heavy current drain in the Class B audio stage, or aging batteries, have no effect on the oscillator frequency. A section of the oscillator bandswitch selects the proper *RC* feedback components to maintain the oscillator level across the band in use. The remaining switch section selects the coil to be used. The oscillator is always 455 kc above the incoming signal. Therefore all stations are converted to 455 kc and applied to the i.f. amplifier.

IF Section—The GC-1A i.f. strip uses three 2N373 RCA "drift" type transistors (Q_4, Q_5 and Q_6). The input transformer (T_1) matches the mixer to the 1st i.f. stage, which is also connected to the a.v.c. line as shown in fig. 2. An "S" meter in the collector circuit measures the current drawn by this stage when the a.v.c. voltage changes. The output of this stage drives a Clevite ceramic "Transfilter." (Z_1, Z_2) These units were described in the July 1959 issue of *CQ*[1]. They provide excellent bandpass characteristics in addition to matching the i.f. collector to the following base. In addition, "Transfilter" emitter bypass units (Z_3) are used to increase the i.f. selectivity. These filters have near-zero reactance at 455 kc, but stage degeneration rises sharply on each side of this frequency. Only two interstage and two emitter bypass "Transfilters" are needed to obtain the 3 kc bandwidth at 6 db down.

The last i.f. stage (Q_6) is transformer coupled to the diode detector and audio amplifier. The collector signal on the last i.f. stage is also rectified to provide an a.v.c. voltage.

B.F.O.—The beat frequency oscillator uses a 2N409 operating in the common-base configuration, with feedback between collector and emitter as shown in fig. 3. The frequency of the beat oscillator is adjusted by a front panel potentiometer which varies the potential on a diode capacitor. This stage is also stabilized by the zener diode.

Audio—The audio section consists of a 2N407 driving a pair of 2N407's in class B. The circuit is slightly different than you be may be used to in this application, for a "bootstrap" or "long-tail pair" configuration has been used to eliminate the need for an output transformer. Although a 35 ohm speaker is used, either 8

[1] Stoner, D. L., "SEMICONDUCTORS," *CQ*, July, 1959, page 81.

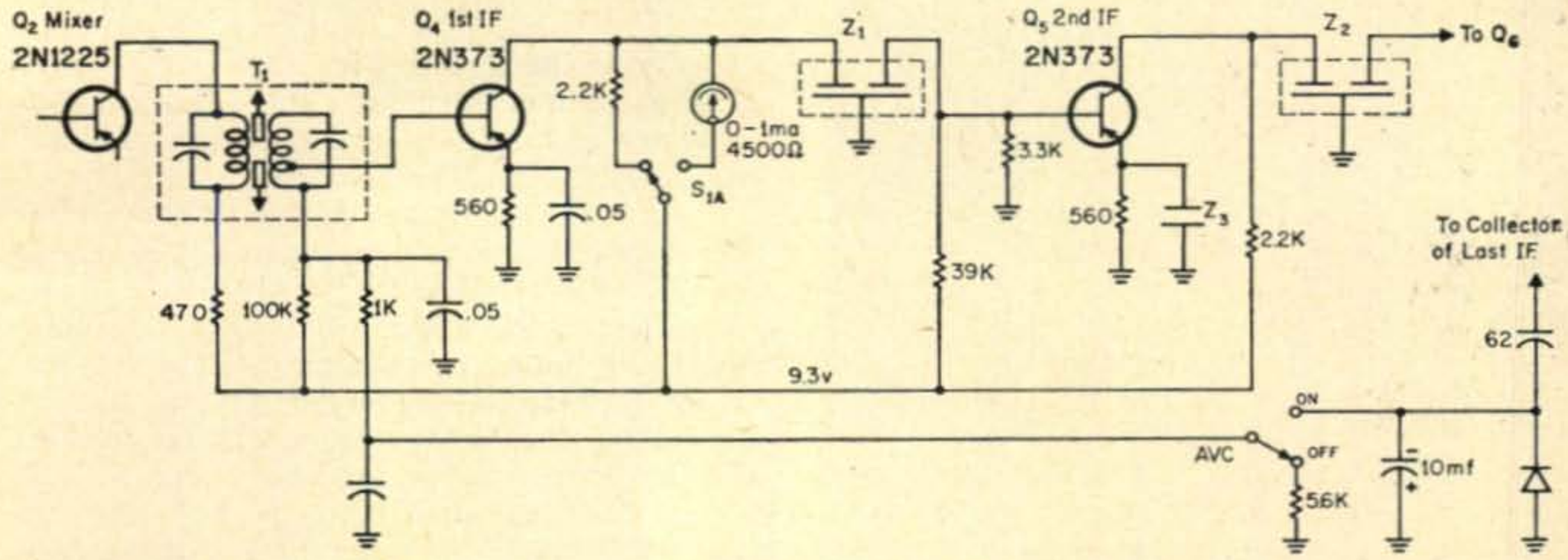


Fig. 2—Partial circuit of the i.f. stages of the Heath GC-1A. Only two conventional i.f. transformers are used for input and output. The i.f. response is further shaped by the filters, Z_1, Z_2 and Z_3 as explained in the text.

or 2,000 ohm headphones will provide ear shattering volume. A pair of compensating diodes automatically adjust the operating point of the output stage with changes in temperature and-or battery potential.

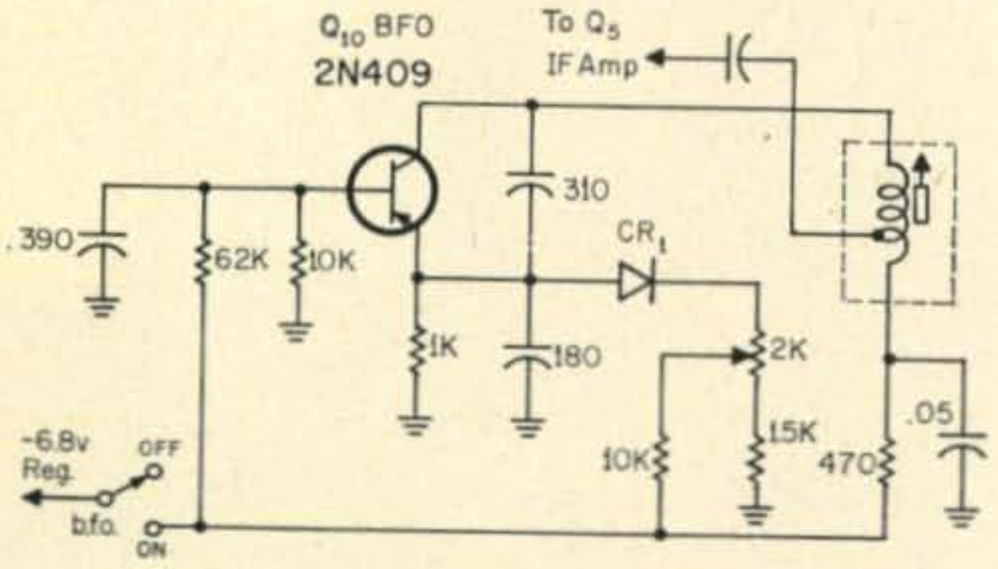


Fig. 3—B.f.o. circuit employed in the Heath GC-1A. Tuning is accomplished by varying the voltage applied to CR_1, a diode variable capacitor.

Mechanical

The GC-1A has several interesting mechanical features. The r.f. mixer, and oscillator sections are completely isolated by heavy shields, which also serve to mount the bandswitch and front end transistors. The variable capacitors are securely mounted to the heavy chassis, providing excellent mechanical stability.

The battery pack is very clever. It plugs into the rear panel and may be easily interchanged with the a.c. supply.

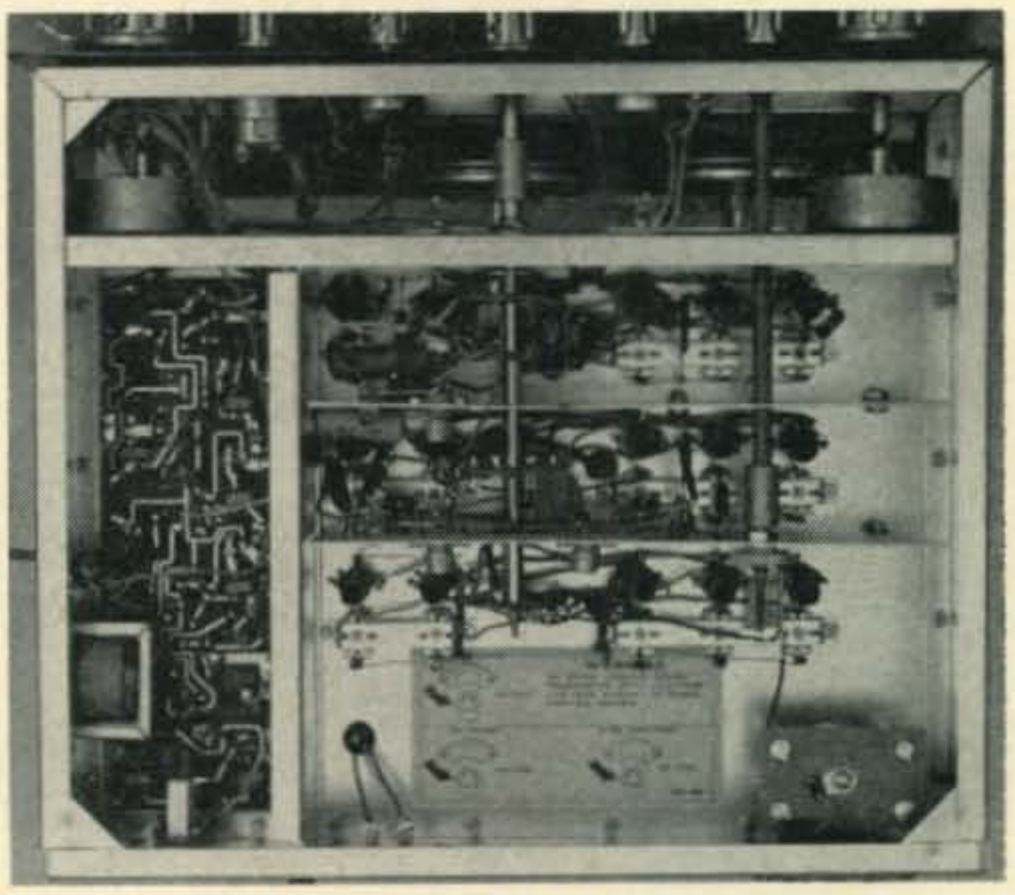
Observations

The GC-1A is not what you might call an easy kit to build. Although the instruction manual makes it as painless as possible, anything this complex is bound to be a time consuming project. Also you are required to work in some rather tight spots in the r.f. assembly. Plan on about 35 hours to construct, test, and align the GC-1A.

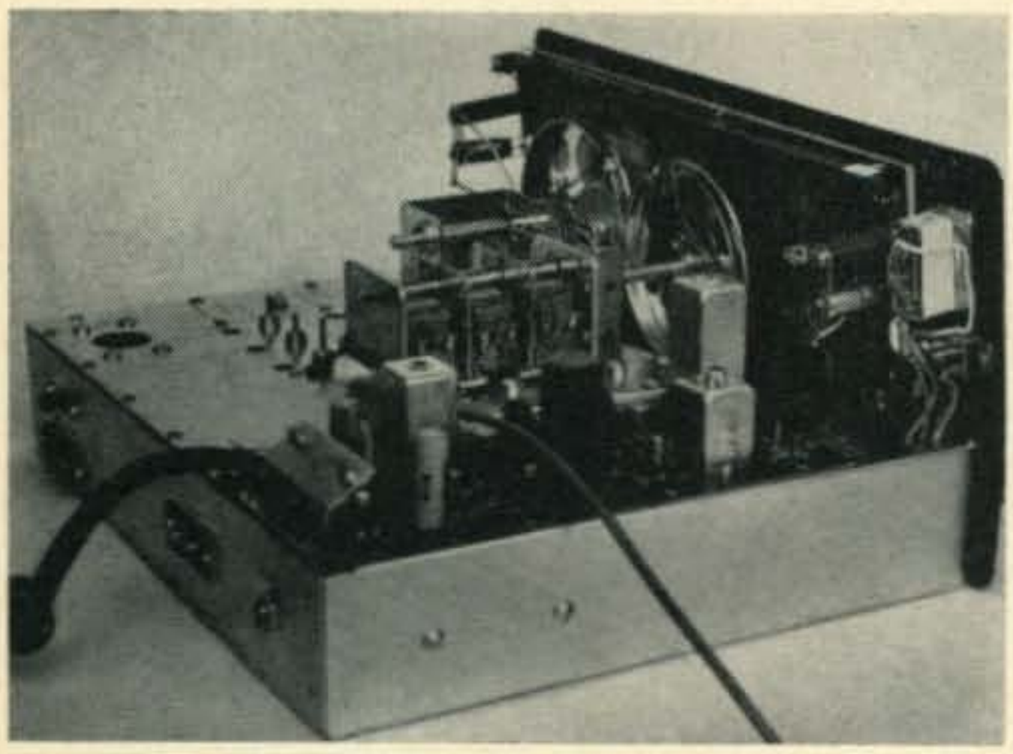
The GC-1A gives you the impression that it is just as hot on 10 meters as it is on 75. It's not just an illusion either. It will pull in anything on 10 that the comparable vacuum tube receiver can detect. The high-alpha transistors used in the front-end provide a truly excellent noise figure on 10 meters.

The dial accuracy is uncanny considering it is a printed production item and covers many megacycles, rather than a few hundred kilocycles.

At this point everyone is wondering about stability. Someone has been spreading a rumor that transistors are not as stable as vacuum tubes. The writer hesitantly admits that there is some truth to the statement, but hastens to add that you wouldn't know it by listening to the GC-1A. The only instability which can be traced to transistors in this receiver is a strange "warble" on s.s.b. stations. This is caused by random arrival of minority carriers in the oscillator transistor and is not a fault of the receiver. Some receivers will exhibit the effect, others will not. You can improve the s.s.b. reception by swapping the front end transistors around. In most cases s.s.b. sounds the best when r.f. amplifier and oscillator are reversed.



Bottom view of the Heath GC-1A transistorized general coverage receiver. The bulk of the area is taken up by the front end, with the i.f. strip along the left side. The front end stages are isolated from each other by shielding. The plate in the lower right supports the whip antenna.



Side view of the Heath GC-1A. The i.f. and audio strip is in the foreground. The balance of the chassis is occupied by the r.f. section. The three gang tuning capacitor is mounted in the center of the chassis and to the rear of it is the single section bandspread capacitor that tunes the oscillator.

This change does not seem to affect receiver performance on 10 meters, for all front end types used in the GC-1A come frome the same family.

The bandspread tuning capacitor only tunes the oscillator section. It was noted that, on 10 meters, the sensitivity and image rejection suffered slightly when using bandspread to tune the receiver lower in frequency.

The skirt selectivity of the receiver can be improved noticeably by adding a lower termination impedance to the Clevite filters. This is accomplished by connecting a .002 mf disc capacitor between the filter output (base connection) and ground. Start with a 500 mmf capacitor on each filter and increase the value

[*Continued on page 90*]

Results of the

1961 CQ World-Wide DX (Phone) Contest

BY FRANK ANZALONE*, W1WY

WE WERE more than pleasantly surprised when a final tabulation of the phone logs showed that returns this year were almost exactly the same as the number received last year. In 1960 we received 569 logs as compared to 576 this year. However the country total was higher last year, 116 as compared to 111 countries heard from this year.

That's not bad though, not bad at all. The day after it was all over five would have gotten you ten, in our book, that this year's returns would hit a new low.

As a matter of fact, they almost did from this country, only six logs from the 3rd district. But the foreign contingent made up for our laxity. Strangely enough it was Asia that made up the difference, since other areas were about the same as in previous years.

There is no question as to this year's Champ. None other than our old friend Ricardo Sierra, CX2CO, Jr. that is, the OM seems to have retired from active participation. His score was more than double that of his nearest competitor. This is the highest score ever turned in by a phone station, Single or Multi-operator. Rick said that it was s.s.b. that made it possible for him to make over 1,000 contacts in 106 different countries. So, that horrible weekend everybody up here was moaning about, evidently didn't exist down Uruguay way.

Next in line is Layne LaBaume, KW6DG out in the Pacific, who would have had a much higher score if he had a larger multiplier to back up his 826 contacts.

Susan Van Zyl, VQ2WZ got back home from a trip to the States, just in time to unpack, fire up her a.m. rig and nail down the third spot in the Top Ten. You fellows had better watch out, one of these days somebody is going to put Sue wise to this thing called sideband.

It's good to see Doctor Mike back again this year and move 5N2JKO two notches up the ladder.

The call HC1AGI is new to the Top Ten but not so to Don McClenon, the voice behind the microphone. Don used to buck the QRM on 80 c.w. as W3EIS. He snagged only 5 European countries; normally, over 40 are available from Ecuador.

Our old standby KH6IJ is closely followed by XT2Z, which was put on the air for the contest by Louis Kaiser, 9G1DP. All but 12 of Lou's 587 contacts from Upper Volta were made on 21 and 14 mc. Man, did his pile-up murder the bands.

PJ2AF and ZE7JV are not exactly new comers to our contest, but this is probably the first time they went at it seriously.

I don't recall having seen 4X4OC in the contest listing before. Not bad, making "The Box" on his first try, and using a.m. only.

The Single Band Award, the Barry Briskman, K2IEG Cup was handily won by Peter Lamont, ZS7P on 14 mc. Peter not only had the most contacts on a single band but his multiplier of 38 Zones and 101 countries is the highest ever turned in on phone. Pete really worked for this one. His rig was put out of business when it was struck by lightning 8 days before contest time. He managed to get the loan of a 20A exciter and hastily built a 100 watt linear as described by W9VMQ in the September '61 issue of *CQ*. A 5-element Gonset beam did the rest.

Most of the activity and all the higher scores were produced by the overseas stations on the 20 meter band. Indicating that they must have experienced much better conditions than we had here on the North American continent. Those who made scores in six figures were DJ1BZ, DL5HI, G3NNT and KH6DLD in that order.

The gang on 21 mc gave a good account of themselves, even though their activity was limited by the abbreviated opening of the band.

There isn't too much spread in the scores at the top of the list. ZB1HC leads the pack. Dave was wondering what happened to the stateside stations on 21 mc. We in turn were wondering what happened to all those necessary European multipliers.

Not to be outdone by the OM who was creating a man sized storm over across the border in Upper Volta with his XT2Z expedition, Ruth, 9G1YL was creating her own little pile-up on 21 mc.

The 15 meter activity out in the Pacific was curtailed by a complete blackout on the second day, but Pete, VR2DS came up with the highest score for the area, using only 35 watts and a G4ZU beam.

And that rare AP2MR didn't have a single W/K in his 189 contacts on 21 mc.

*Contest Committee Chairman, *CQ*.

The happy DJ3OU crew, multi-transmitter entry. L. to r:—DJ4OT, DJ6WI, DJ3OU, DJ3YV, DL6NK, DL9GU and DL1HC. Now what do you suppose brought on all those smiles?

Over here on our baliwick, W2WZ and W4AXE were the only two with outstanding scores.

The signals on 10 have now faded down to a whisper. Conditions were very spotty with practically no openings to Europe. However those who stuck it out came up with some rewarding scores.

Our friend "Jaycee," LU1DAB leads the field by a wide margin. Even so, Juan was not happy. "Not a single JA," he complained, "worked 62 of them last year." The equipment he used was modest; 200 a.m. watts to a Mosley TA33 beam.

Wouldn't you know it, the two highest 28 mc scores in the country had to come from the same district.

Bet Herb Schoenbohm is muttering to himself. "Why couldn't I have done it from my home QTH as WØVXO?" But Augustana College is located in Illinois, which makes him a W9, so he has to settle for 2nd place behind W9PWU. The latter was operated by Don Miller, better known for his c.w. exploits as W9WNV. Both used a.m. only but Don had the advantage in power, 700 as compared to 150 watts. It was a close one. As a consolation Herb, we are issuing a 2nd Place certificate for your fine effort.

The anticipated European opening on 40 didn't materialize and pickings were pretty slim over here. The two Bobs, K2GXI and K2DGT did well to dig up 24 and 18 countries respectively. K2GL in the multi group also had a nice total on 40.

Fact is, things were tough all over and those 22,000 odd points made by 4X4DK is quite an accomplishment on 7 mc phone. It was s.s.b. that lured Ami back to contest competition. This is his first contest since 1956 when he won the All Band Trophy on phone.

Phone activity on 80 was strictly a European affair with I1AIM making 205 contacts and high score for the world. However it was our lone entry W1BU who had the outstanding signal on 3.8 mc. Imagine knocking off 40 countries on 80 phone in one week-end. Sam Harris must be using some of his secret v.h.f. technique on the l.f. band. Come on Sam, let us in on the secret.

The team of R. F. B. Featherstone and Henning Overgaard, two well known contest men, combined their talents at VQ4RF and won the Don Merten, K2AAA Trophy. Now each one can display a Cup since Henning won the single operator award last year from his home station, VQ4DT. Henning expects to do some traveling and will be QRT for the next two years.

5A3CAD was also a two man team. The boys found Libya more productive, score-wise than their home location back in England.

An interesting sidelight was the operation of OH5SM. This was a family affair, OH5SM Carola the XYL, OH5NW Axel the OM and OH5NQ Peter the brother-in-law. Both Axel and Peter are winners of many awards in the past. And OH5NW won the Single Band Trophy on 28 mc back in the lush days of 1958. Wonder if ham radio was the cupid that brought Carola and Axel together.

Wonder if CT1EY, a familiar call in past contests, is also a family affair.

Not listed in "The Box" but very active and very much in demand was HV1CN. The operation of I1CNS, W2BBV and W2BIB is pretty well known by this time so any additional coverage would be repetitious. Their score would have been much higher but for the fact that they were hemmed in by the multitude of Europeans looking for that rare multiplier.

The multi-operator contestants here in the USA worked hard but none came up with an outstanding score. The two highest scores were turned in by W4HXC and W2JT.

The multi-transmitter activity was very disappointing. With a skeleton crew and only a short period of multi-transmitter operation, K2GL still came up with the highest score. Having won the Don Wallace, W6AM Trophy last year, they of course are not eligible for the Trophy this year. Therefore the Cup goes to DJ3OU with a score lower than some of the single transmitter stations. Unless this classification shows more activity we will have to eliminate it from the contest. The average "multi groups" are not getting the most out of their possibilities. As an example, it took eleven club members at DL5BR to nose out a two man crew at DL4FX. And 11 operators at G3OHM found the contest too long and suggested the operating time be cut down to 36 hours.

Maybe the multies in the c.w. section will show a better return for their efforts. Next month's issue will tell the story. That is if Andy W1GYE, Ben W2JB and Mac W2BO can dig themselves out from under the mountain of logs that have still to be processed.

73, for now, Frank, W1WY

Top Ten

ALL BAND—SINGLE OPERATOR

CX2CO	**876,304**		
KW6DG	349,492	KH6IJ	259,341
VQ2WZ	337,176	XT2Z	257,153
5N2JKO	302,222	PJ2AF	250,746
HC1AGI	290,928	4X4OC	244,016
ZE7JV	220,239		

Top Five

MULTI-OPERATOR SINGLE TRANSMITTER

VQ4RF	**542,244**		
5A3CAD	338,100	DJ3VM	233,412
OH5SM	254,664	CT1EY	200,169

Top Five

MULTI-OPERATOR MULTI-TRANSMITTER

K2GL	319,144		
DJ3OU	**220,818**	DL4FKT	58,286
K6EVR	103,170	I1KQ	40,608

Continental Leaders

SINGLE BAND

28 Mc		**14 Mc**	
LU1DAB	79,643	**ZS7P**	**225,597**
VQ2WR	33,456	DJ1BZ	145,452
W9PWU	24,642	KH6DLD	102,179
DJ1LP	4,956	MP4BBW	83,032
		CE3VU	74,844
		KP4CL	61,074
21 Mc		**7 Mc**	
ZB1HC	57,009	4X4DK	22,410
9G1YL	51,000	K2GXI	2,680
AP2MR	34,240	G3JUL	2,666
W2WZ	31,980	**3.5 Mc**	
PY3AHJ	29,039	I1AIM	7,560
VR2DS	18,656	W1BU	3,760

U. S. A.

Leaders and Runners-up

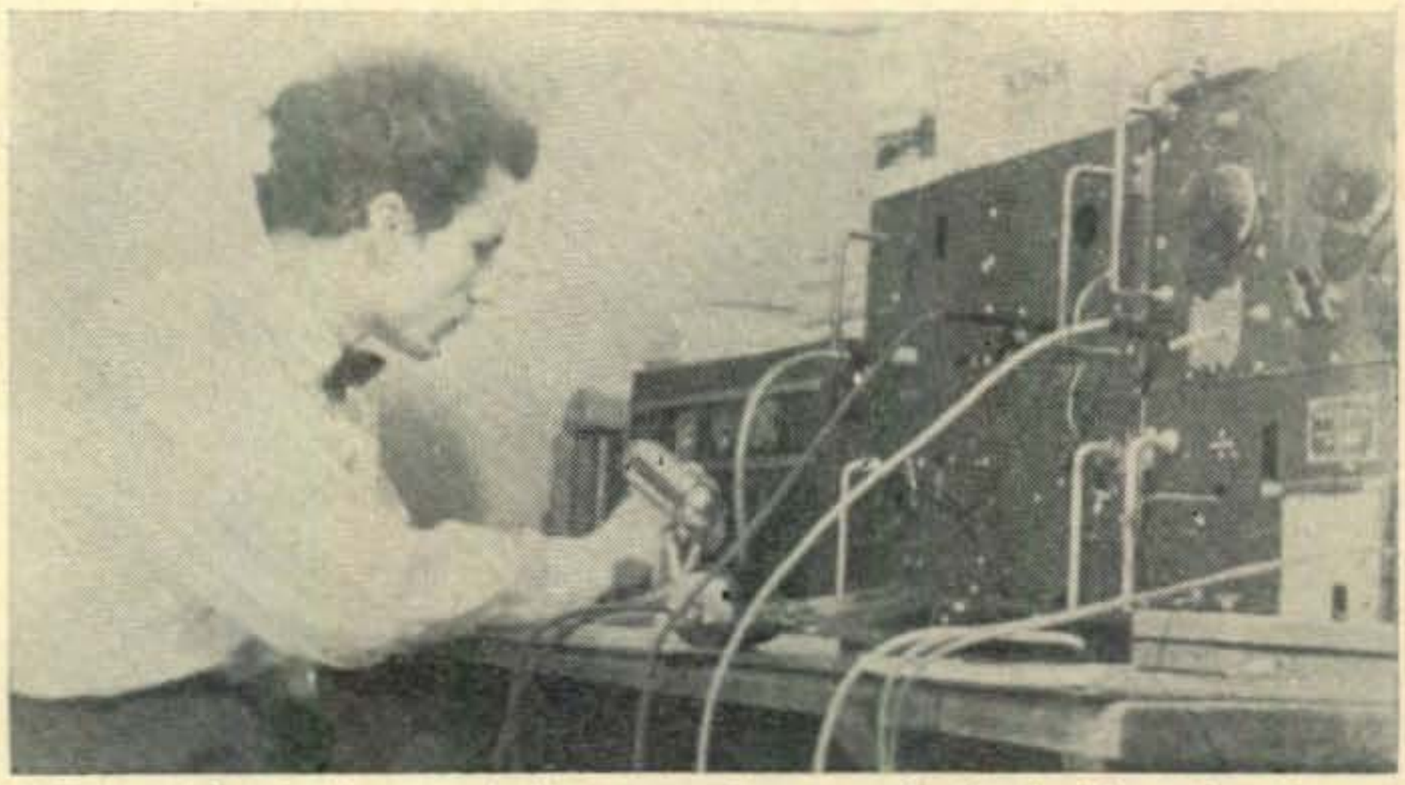
All Band	W5MDX	157,883
28 Mc	WØVXO/9	24,242
21 Mc	W4AXE	22,350
14 Mc	K2IEG	35,245
7 Mc	K2DGT	1,612

SINGLE OPERATOR

North America

United States

W1ONK	**A**	**128,812**	**272**	**60**	**136**
W1FZ	"	37,281	119	50	79
W1CKA	"	12,825	67	32	53
W1BIH	"	12,348	57	36	48
W1WY	"	5742	48	30	36
W1APA	"	5672	46	22	30
K1RTB	**14**	**30,358**	**142**	**27**	**59**
W1BU	**3.8**	**3760**	**43**	**13**	**40**
W2VCZ	**A**	**142,112**	**277**	**71**	**148**
W2BXA	**A**	**89,474**	**221**	**56**	**110**
W2FXN	"	34,809	109	48	75
K2DCA	"	31,164	110	34	72
W2YTH	"	29,988	117	46	73
W2LV	"	22,750	90	32	59
W2AOX	"	20,025	94	33	56
W2TQC	"	18,564	77	40	62
W2TP	"	8255	56	27	38
W2JVU	"	6440	59	21	35
W2QKJ	"	4462	43	20	28
W2GT	"	225	9	7	8
W2FGD/2	**28**	**3936**	**43**	**13**	**35**
W2WZ	**21**	**31,980**	**171**	**25**	**57**
K2IEG	**14**	**35,245**	**175**	**25**	**70**
W2OKM	"	32,660	138	28	64
K2GXI	**7**	**2680**	**36**	**16**	**24**
K2DGT	"	1612	32	13	18
W3FDH	A	2530	30	20	26
W3JTC	**14**	**24,768**	**108**	**27**	**59**
W3AYD	"	18,325	100	24	51
K3BGX	**28**	**5760**	**62**	**13**	**32**
W3EGD	"	2822	38	12	22
W3ZEQ	"	1682	26	12	17
W4DHZ	**A**	**43,840**	**159**	**54**	**86**
W4OM	**A**	**42,108**	**132**	**47**	**85**
W4OPM	"	31,232	108	44	78
K4ASU	"	23,100	102	37	63
K4HMX	"	12,495	70	33	52
W4SSU	"	6313	52	21	38
W4DS	"	4814	43	26	32
W4ZM	"	2580	29	20	23
W4EEO	**28**	**1428**	**19**	**10**	**18**
K4CVQ	"	280	9	5	9
W4AXE	**21**	**22,350**	**136**	**24**	**51**
W4NQM	"	18,612	124	21	45
W4DRW	"	6713	57	17	32
K4TJL	**14**	**22,428**	**114**	**25**	**59**
W4HNW	"	15,762	78	27	47
W4KFC	"	9150	62	21	40
W4HUE	"	7540	57	17	35
W4NYF	"	5724	53	20	34
W4RLS	"	4998	41	18	31
W4SHL	"	361	13	8	11
K5MDX	**A**	**157,883**	**322**	**70**	**143**
W8RMF/5	"	16,015	73	40	55
W5SU	"	3213	33	24	27
K5SBN	**28**	**4407**	**59**	**12**	**27**
W5LGG	"	1504	22	15	17
W5WZQ	**21**	**6486**	**61**	**17**	**29**
W5KC	**14**	**14,560**	**95**	**24**	**46**
K5UYF	"	1380	23	14	16
K6CTV	**A**	**20,793**	**100**	**38**	**49**
WA6LYX	"	15,743	86	44	47
K6UFX	"	340	10	10	7
K6CT	**28**	**1464**	**30**	**10**	**14**
WA6DNM	21	390	11	7	8
W6EKZ	**14**	**25,110**	**114**	**31**	**59**
W7ESK	**A**	**62,634**	**210**	**58**	**88**
W7DQM	"	1166	29	10	12
W7DLR	14	60	4	3	3
K8CFU	**A**	**17,954**	**86**	**37**	**57**
W8TWA/8		16,647	79	36	57
W8WT	"	9869	69	27	44
W8SMQ	"	9180	56	26	42
K8RMK	"	3038	36	21	28
W8UMR	**28**	**8195**	**71**	**17**	**38**
W8RTF	21	1820	30	15	20
W8KIA	**14**	**26,448**	**123**	**26**	**61**
W8JIN	7	900	25	10	15



SP5XM, John Ladno, and his somewhat unorthodox-looking rig. It was still good enough to win the All Band award.

Capt. Bart Blakeley, DL4PB, another service-man winner. This one on 40 phone, a tough assignment from Europe. That's a DX-100 with an s.s.b. adapter.

Djuro and Mira and the neat lay-out that made YU1AG the winner on 20 phone. They really build them over there. All that equipment for 70 watts.

DJ6WI keeping busy at the 40 meter operating position at DJ3OU.

W9NZM	A	42,442	145	62	90
W9EWC	"	40,689	147	53	84
W9PWU	28	24,642	147	24	50
WØVXO/9		24,282	143	23	48
K9ECE	21	6650	60	19	31
W9WIO	"	1410	21	13	17
W9EGQ	14	2812	37	16	21
WØNFA	A	14,976	89	30	48
WØBTD	"	6664	44	31	37
WØMCX	"	2220	28	15	22
KØLFY	21	2275	37	14	21
WØOMH	14	4158	47	18	24
Alaska					
KL7FBC	14	6344	154	14	22
KL7JDO	"	2392	39	12	14
Bahamas					
VP7BP	A	50,735	655	33	40
Barbados					
VP6AM	28	11,832	141	18	33
Bermuda					
VP9AK	A	49,206	232	44	74
Canada					
VE2AFC	21	1430	29	8	14
VE2NV	14	4730	50	14	29
VE3BOG	A	25,894	130	44	63
WØAIH/VE3		23,166	97	52	65
VE3BMB	"	13,452	109	29	47
VE3CBY	21	3638	69	13	21
VE4SD	A	5562	71	23	31
VE5QC	A	7850	135	26	24
VE6HG	A	5088	52	25	28
VE6TP	14	6750	47	23	31
VE6VK	"	4797	53	18	23
VE7EH	A	15,620	145	30	41
Canal Zone					
KZ5TD	A	92,877	257	59	107
KZ5SW	"	11,390	264	17	17
KZ5LC	14	49,650	546	28	47
Costa Rica					
TI2WA	28	16,254	164	21	42
Cuba					
CO2CT	A	27,432	146	43	65
Grand Turk					
VP5CH	A	25,484	505	21	25
Greenland					
KG1FD	A	10,412	186	16	22
Guatemala					
TG5HC	A	548	26	8	10
Haiti					
HH2ML	14	2450	67	9	16
Jamaica					
VP5BL	A	86,397	778	42	51
Mexico					
XE1FFX	A	1035	22	10	13
XE3BL	21	5320	71	15	25
XE1ZE	14	28,785	421	23	34
Panama					
HP1AC	A	2340	39	16	20
Puerto Rico					
KP4AOO	A	23,016	186	35	49
KP4CL	14	61,074	405	26	61
KP4AVQ	"	7205	155	13	22
St. Vincent					
VP2SY	A	11,660	96	23	32

Africa

Angola					
CR6CA	14	60,350	292	25	46
Canary Is.					
EA8CN	A	3,300	38	11	19
Egypt					
VE3BQL/SU	A	106,122	273	38	100
Ghana					
9G1YL	21	51,000	213	21	64
Libya					
5A3TY	A	189,826	372	53	129
Madagascar					
5R8AD	21	3108	43	14	23
Morocco					
CN8EU	A	105,588	306	36	90
CN8BB	"	11,322	80	17	34
Mozambique					
CR7CI	A	3737	41	13	24
Nigeria					
5N2JKO	A	302,220	485	65	165
5N2RSB	21	23,170	130	18	52
5N2SMW	14	5136	46	17	31
Rhodesia, No.					
VQ2WZ	A	337,176	543	68	155
VQ2MS	"	70,890	195	45	94
VQ2JG	"	682	23	9	13
VQ2WR	28	33,456	174	19	49
Rhodesia, So.					
ZE7JV	A	220,239	366	69	142
ZE1JE	14	36,080	166	26	56
Spanish Guinea					
EAØAB	21	4329	51	13	26
South Africa					
ZS2HI	14	13,053	91	21	36
Swaziland					
ZS7P	14	225,597	562	38	101
Upper Volta					
XT2Z	A	257,153	587	46	105

Asia

Aden					
VS9AAC	A	39,272	123	35	59
Bahrain Is.					
MP4BDC	A	21,567	114	25	54
MP4BBW	14	83,032	293	29	78
Burma					
XZ2SY	A	43,086	161	45	84
Ceylon					
4S7YL	A	19,285	103	35	60
Cyprus					
ZC4FC	A	14,790	100	11	40
India					
VU2NR	14	45,243	183	27	72
VU2CK	"	9100	98	17	35
Iran					
EP2AT	A	43,788	201	26	56
EP2BB	"	3285	34	18	27
EP2BE	21	20,445	102	28	59
EP2AG	14	43,056	197	27	65
Israel					
4X4OC	A	244,016	429	61	155
4X4MJ	"	19,825	105	18	47
4X4DK	7	22,410	147	12	42
Japan					
JA1BK	A	41,280	162	45	75
JA1BWA	"	38,350	154	46	72
JA2XW	"	11,627	79	32	45
JA3IW	"	7502	58	24	38
JA1BUI	"	3280	46	17	24
JA1BOZ	"	1628	22	16	20
JA1YL	"	1512	29	12	16
JA4AS	"	1156	26	14	20
JA1BYM	"	812	21	12	17
JA7KY	"	630	18	10	11
JA3AA	"	621	22	8	12
JA1ALX	"	350	15	6	8
JA4AQR	"	228	13	6	7
JA6NP	21	13,510	93	26	44
JA2AEY	"	12,672	92	26	40
JA1FSL	"	9720	80	22	38
JA3BEA	"	6519	60	20	33
JA1CIB	"	4185	50	19	26
JA6GT	"	2880	43	15	25
JA1CYV	"	1836	32	13	21
JA6PY	"	1530	26	14	20
JA3BBG	"	1300	26	9	16
JA1DEX	"	1012	19	9	14
JA1DEU	"	866	21	8	11
JA1CYG	"	860	25	8	12
JA1HIE	"	800	24	7	13
JA1DDR	"	760	23	8	12
JA1HGY	"	740	18	8	12
JA1FAF	"	684	16	9	9
JA9UU	"	495	14	6	9
JA6NL	"	400	13	10	10
JA1DFN	"	338	13	5	8
JA1EHA	"	180	9	4	6
JA1DDH	"	99	9	5	4
JA8AAC	"	70	7	3	4
JA3CED	"	2	1	1	1
JA2JW	14	22,344	131	26	50
JA8FC	"	6958	79	19	30
JA2ANX	"	4368	59	18	24
JA6AK	"	1716	29	14	19
JA6AV	"	1344	28	11	17
JA1ANA	"	713	13	10	13
JA1BLC	"	700	28	10	10
JA3ASU	"	475	19	9	10
JA1AJA	"	416	16	7	9
JA1MJ	"	357	13	8	9
JA1AS	"	252	13	5	7
JA8GR	"	9	3	1	2
JA3CUK	"	6	2	1	2
JA1BRK	7	192	7	5	7
KA2JL	14	75,194	332	28	54
KA2MA	"	54,560	251	28	52

		Korea				
HM1AP	A	216	24	3	6
HM4AQ	**14**	**17,596**	**156**	**21**	**32**
		Laos				
XW8AS	**14**	**9350**	**88**	**20**	**35**
		Lebanon				
OD5CN	**14**	**48,114**	**214**	**21**	**60**
		Pakistan, West				
AP2MR	**21**	**34,240**	**189**	**24**	**56**
		Ryukyu Is.				
KR6NB	**21**	**8,448**	**134**	**20**	**28**
KR6LJ	**14**	**25,776**	**155**	**26**	**46**
KR6OH	"	2,838	66	15	18
		Thailand				
HS1B	**A**	**18,128**	**122**	**32**	**56**
HS1K	**14**	**3946**	**56**	**17**	**25**
		U.S.S.R. Asiatic				
UA9CH	**A**	**12,870**	**137**	**22**	**56**
UA9DN	**21**	**15,336**	**119**	**13**	**41**
UAØLO	"	5 143	99	16	21
UA9DT	**14**	**32,109**	**163**	**21**	**56**
UA9OI	"	12,824	104	16	40
UA9VS	"	2 813	42	10	19
UAØKUA	"	54	17	3	3
		Georgia				
UF6FB	**14**	**28,840**	**153**	**17**	**53**
		Armenia				
UG6AW	**14**	**4 212**	**56**	**6**	**20**
UG6AG	"	3,050	42	5	20
		Kazakh				
UL7FA	**A**	**21,450**	**127**	**22**	**53**
		Kirghiz				
UA1CC/UM8	**14**	**19,282**	**133**	**20**	**42**

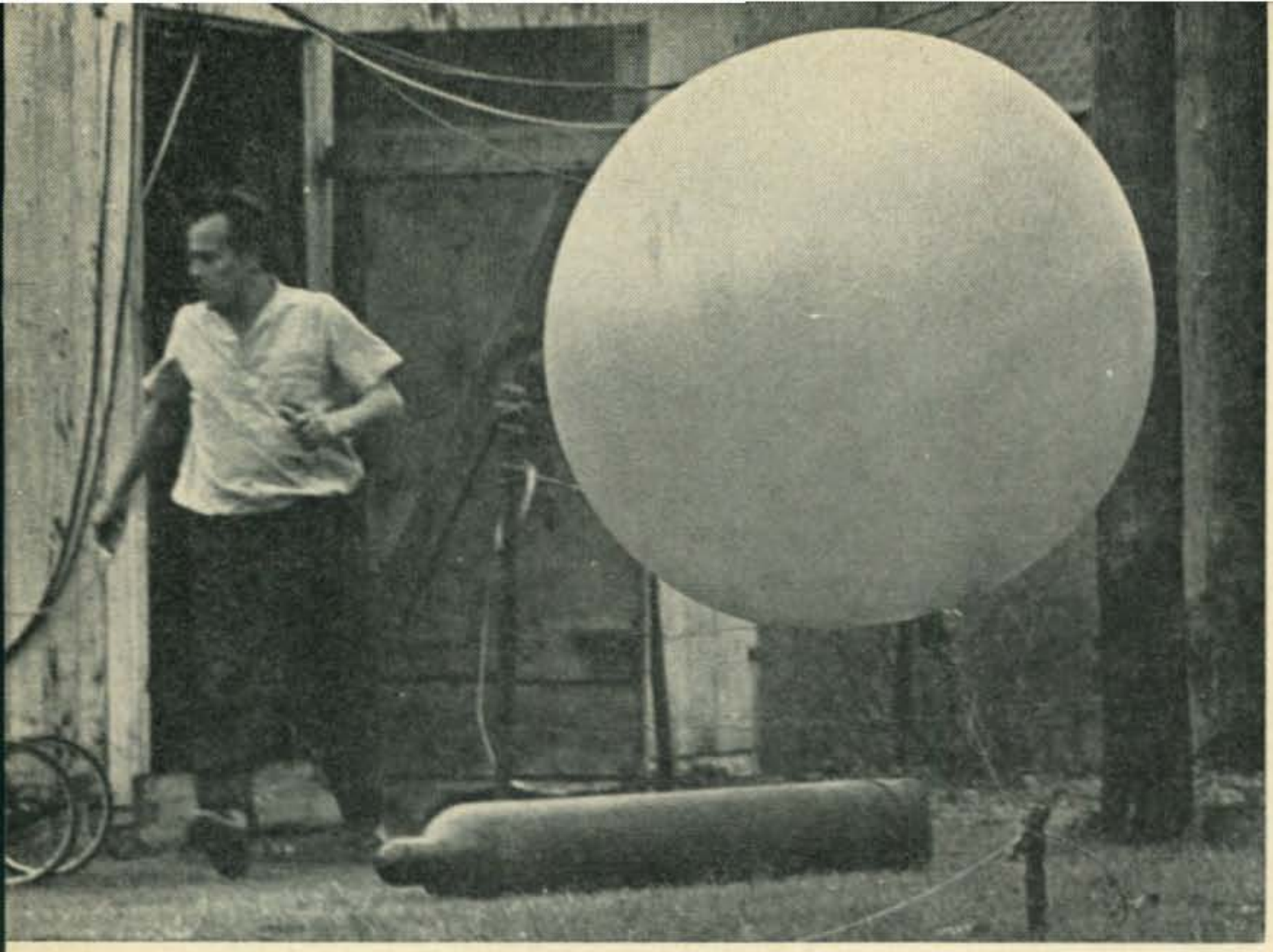
Europe

		Austria			
OE1DH	**A**	**127,916**	**376**	**57**	**169**
OE1WO	"	924	34	6	22
OE1RZ	**14**	**79,072**	**316**	**32**	**80**
		Belgium			
ON4SZ	**A**	**119,280**	**283**	**59**	**173**
ON4QX	**14**	**4320**	**52**	**19**	**35**
ON4LJ	"	1120	28	7	25
		Bulgaria			
LZ1KDP	**A**	**24,000**	**191**	**25**	**75**
		Czechoslovakia			
OK1ZL	**A**	**44,380**	**269**	**27**	**113**
OK1JX	"	31,059	214	28	91
OK1KNL	"	7303	90	16	51
OK2LN	"	3816	72	16	37
OK2WE	"	528	19	5	11
OK1VB	**21**	**4 100**	**61**	**9**	**32**
OK3KAB	**14**	**26,400**	**265**	**22**	**66**
OK3KGI	"	7232	130	12	37
OK2KOJ	"	5412	118	9	32
OK2QU	"	1144	40	7	15
OK2KRO	"	760	39	4	16
OK2BBC	"	595	36	5	12
OK1MP	**3.5**	**1491**	**72**	**3**	**18**
		Denmark			
OZ5KG	**14**	**27,864**	**180**	**25**	**56**
OZ7JV	"	**27,200**	**195**	**24**	**61**
OZ5KQ	"	17,136	149	18	50
OZ7BQ	"	9936	97	19	50
OZ8EA	"	7268	118	11	35
OZ9QM	"	6493	139	7	36
OZ5JT	"	3612	46	14	29
OZ3KE	"	1320	44	2	15
OZ6RL	"	121	7	4	7
		England			
G3NFV	**A**	**30,284**	**134**	**40**	**94**
G3LNG	"	17,856	163	24	69
G3DKR	"	15,698	109	28	66
G3MWZ	"	504	26	4	14
G3FXB	**21**	**50,648**	**228**	**22**	**82**
G3NNT	**14**	**108,968**	**520**	**27**	**79**
G3KXA	"	71,500	318	28	72
G3MEA	"	19,170	140	19	52
G2AJB	"	1872	43	9	27
G3JUL	**7**	**2666**	**81**	**6**	**25**
		Finland			
OH5QN	**A**	**59,250**	**236**	**39**	**119**
OH2MK	"	6720	116	10	46
OH2KL	"	260	14	8	12
OH5NB	"	15	3	2	3
OH5OQ	**21**	**4719**	**94**	**9**	**30**
OH2RZ	**14**	**8568**	**111**	**15**	**41**
OH3TY	"	**8401**	**88**	**18**	**41**
OH5PF	"	4800	100	9	31
OH2GF	"	972	30	8	19
OH2GC	"	836	37	5	17
OH2CM	"	459	26	5	12
OH3NY	"	30	5	3	3
OH1VA	**7**	**1300**	**50**	**6**	**19**
		France			
F8WE	**A**	**35,211**	**245**	**29**	**92**
F3OX	"	25,602	166	33	69
F3PK	"	12,118	104	24	59
F2QH	"	3120	68	10	30
F8TM	"	240	11	6	10
F8XP	**21**	**4704**	**60**	**13**	**36**
F2RO	14	851	29	6	17
F9LO	"	532	28	3	16
F2YT	**3.5**	**2357**	**89**	**4**	**23**
F7HM	**14**	**37,233**	**281**	**18**	**45**
		Germany			
DL1FK	**A**	**84,337**	**285**	**38**	**83**
DL1JW	"	**64,944**	**233**	**52**	**124**
DJ2AA	"	64,032	224	38	136
DJ2YA	"	61,451	297	33	130
DJ7CL	"	36,125	188	31	94
DJ5BVA	"	33,411	222	26	103
DL3DW	"	27,248	116	39	92
DL7BQ	"	15,035	97	27	70
DL7EN	"	10,720	76	26	54
DJ2UU	"	8892	109	15	63
DM2BEL	"	4667	83	15	44
DJ1PN	"	4235	49	14	41
DL3DC	"	4120	56	12	28
DJ1LP	**28**	**4956**	**51**	**14**	**28**
DL3TJ	**21**	**35,200**	**175**	**23**	**77**
DJ1ZG	"	14,490	92	19	50
DL1NT	"	520	15	7	13
DJ1BZ	**14**	**145,452**	**473**	**32**	**92**
DJ3KR	"	**62,016**	**262**	**32**	**82**
DL7HU	"	25,925	170	24	61
DJ3CP	"	17,544	112	20	66
DJ2YS	"	3444	63	10	32
DL6EY	"	2886	44	11	28
DJ6BI	"	1767	49	6	25
DL5GP	"	1286	41	7	22
DL9YC	"	1092	28	8	18
DM3XL	3.5	45	9	2	3
DL5IX	**A**	**7936**	**68**	**20**	**44**
DL5HI	**14**	**114,121**	**469**	**29**	**90**
DL5BK	"	35,784	204	26	58
DL4NQ	"	35,244	185	28	61
DL5EI	"	3293	83	9	28
DL4PB	**7**	**2190**	**73**	**5**	**25**
		Gibraltar			
ZB2AD	**21**	**10,712**	**154**	**12**	**40**
		Greece			
SVØWL	**14**	**8024**	**97**	**15**	**44**
SVØWB	"	345	20	5	10
		Hungary			
HA9OZ	**A**	**59,164**	**311**	**34**	**110**
HA9KOB	"	9328	150	14	39
HA5DG		1716	41	16	28
		Ireland			
EI8P	**14**	**18,963**	**180**	**17**	**46**
		Italy			
I1CSP	**A**	**22,310**	**192**	**29**	**68**
I1PHN	"	5734	81	14	44
I1ZRW	"	1102	35	8	21
I1ZLW	**21**	**27,405**	**161**	**22**	**65**
I1CMA	"	9145	68	15	44
I1AIM	**3.5**	**7560**	**205**	**5**	**31**
		Malta			
ZB1HC	**21**	**57,009**	**428**	**22**	**71**
		Netherlands			
PAØHBO	**A**	**64,565**	**243**	**43**	**142**
PAØWWP		34,155	187	30	85
PAØUC	"	22,684	146	27	80
PAØHSJ	"	9514	105	18	53
PI1PT	"	3283	67	10	39
PAØGMU	**21**	**1769**	**37**	**8**	**21**
PAØPRF	**14**	**31,524**	**177**	**21**	**50**
PAØEEM	"	19,320	218	15	55
PAØATY	"	6681	106	8	43
PAØBEA	"	2160	67	5	25
PAØKF	"	378	13	6	12
PAØLV	**3.5**	**4368**	**156**	**3**	**25**
		Northern Ireland			
GI3JIM	**A**	**54,536**	**295**	**37**	**99**
		Norway			
LA5ID	**A**	**52,256**	**300**	**31**	**111**
LA8WF	**21**	**8600**	**124**	**10**	**40**
LA1OE	"	1817	71	4	19
LA4LG	**14**	**1725**	**69**	**4**	**21**
		Poland			
SP5XM	**A**	**38,272**	**219**	**32**	**96**
SP9KJ	"	13,825	105	20	59

ET3RS and Max de Henseler, ex-HB9RS. How's that for a neat layout? It also includes a 3 element beam and the QTH is 8200 ft. above sea level. The station was erected with the assistance of YN1EP. The arrival of OD5CT the day before the contest completed the 3-man crew. The boys are on the U.N. staff at Addis Ababa.

Roger St. Laurent, F7HM, the 14 mc winner for the service men in France. They are classified separately, you know.

Dr. Mike Dransfield, 5N2JKO, one of the Honored Ten. Not in the photo is the 45 watt transmitter used to run up that fine score.



DJ3YV jumping out of the blockhouse of DJ3OU preparing the 40 meter vertical via a hydrogen inflated balloon.

SP5QU	"	3705	65	15	40
SP7WZ	"	1110	25	11	19
SP9RJ	"	54	4	3	3
SP9RF	**21**	**8927**	**99**	**15**	**44**
SP8CK	"	5326	82	10	29
SP5BT	**14**	**7203**	**129**	**9**	**40**
SP5HS	"	2730	51	10	29
SP9KAJ	"	1122	45	6	16
Portugal					
CT1KF	**A**	**39,680**	**248**	**31**	**73**
CT1HX	"	10,578	70	27	55
CT1QF	**21**	**21,024**	**147**	**18**	**54**
CT1FM	"	14,625	106	18	47
CT1PK	"	13,481	110	17	44
CT1IC	"	13,322	110	16	45
Roumania					
YO3RK	**14**	**4838**	**93**	**11**	**31**
Scotland					
GM3BCL	**A**	**21,780**	**200**	**20**	**70**
GM3JDR	**14**	**27,972**	**253**	**20**	**54**
GM3NQB	"	2700	109	3	22
Sicily					
IT1ZDA	**A**	**73,313**	**306**	**40**	**127**
IT1TAI	"	6825	86	15	50
Spain					
EA4GR	**A**	**61,420**	**238**	**46**	**102**
EA2EL	"	28,672	152	30	82
EA3NA	"	6936	60	23	45
EA7IT	"	3569	72	13	30
EA2CK	**21**	**13,923**	**114**	**18**	**45**
EA3LA	"	8322	89	13	44
Sweden					
SM3BIZ	**A**	**71,040**	**314**	**39**	**121**
SM5CZF	"	24,300	189	27	81
SM7AIA	"	8330	97	19	51
SM6BDS	"	299	24	4	9
SM5ZCK	"	96	8	6	6
SM5APP	"	90	10	2	7
SM3VE	**21**	**11,515**	**180**	**10**	**39**
SM7TV	"	308	20	3	11
SM6SA	**14**	**90,016**	**418**	**26**	**71**
SM5BLA		**50,004**	**289**	**30**	**78**
SM5AQV	"	43,409	227	24	59
SM7ACB	"	16,132	155	19	55
SM5CZQ	"	11,658	166	12	46
SM5CAK	"	7560	193	6	34
SM5BFE	"	2178	59	8	25
SM6AOQ	"	1176	33	8	20
SM5AIO	"	360	23	3	15
SM5CAQ	"	105	15	2	5
SM3AZI	7	280	18	3	11
Switzerland					
HB9UD	**A**	**6496**	**89**	**15**	**43**
HB9KO	**21**	**14,003**	**101**	**16**	**51**
HB9DX	"	1920	29	10	22
Wales					
GW3CDP	**A**	**22,936**	**192**	**21**	**73**
Yugoslavia					
YU3OV	**A**	**31,059**	**214**	**29**	**90**
YU1AG	**14**	**11,750**	**234**	**9**	**38**
U.S.S.R.					
European					
UA1DZ	**A**	**91,224**	**346**	**52**	**129**
UA3TZ	"	11,657	135	18	53
UA3CR	**14**	**50,505**	**247**	**31**	**80**
UA4PW	"	7011	117	12	39
UA4LK	"	1560	43	7	23
UA1NA	"	546	19	6	15
Ukraine					
UB5FJ	**A**	**93,210**	**323**	**45**	**150**
UB5FG	**21**	**21,894**	**162**	**21**	**61**
UB5LV	"	18,040	139	19	59
UB5CI	**14**	**50,862**	**317**	**25**	**73**
UB5KED	"	3440	71	12	28
White Russia					
UC2AA	14	60,030	325	30	88
Latvia					
UQ2AN	**A**	**19,976**	**149**	**28**	**75**
Estonia					
UR2BU	**21**	**11,446**	**102**	**18**	**41**
UR2AT	"	748	27	5	17
UR2AO	**3.5**	**960**	**67**	**3**	**12**
Oceania					
Australia					
VK2AHT	**14**	**3724**	**39**	**15**	**23**
VK2APK	**21**	**2806**	**46**	**12**	**11**
VK5NQ	**21**	**9912**	**86**	**18**	**24**
VK6RU	**A**	**25,926**	**120**	**38**	**49**
VK7WA	**A**	**480**	**16**	**9**	**11**
Cook Island					
ZK1AR	**A**	**20,064**	**110**	**35**	**41**
ZK1BS	**14**	**5332**	**74**	**14**	**17**
Fiji Island					
VR2DS	**21**	**18,656**	**129**	**22**	**31**
Hawaii					
KH6IJ	**A**	**259,341**	**660**	**54**	**83**
W5BJZ /KH6	**21**	**14,724**	**155**	**14**	**22**
KH6DLD	**14**	**102,179**	**497**	**28**	**49**
Marshall Island					
KX6BU	**14**	**84,150**	**315**	**35**	**67**
New Zealand					
ZL1HA	**A**	**12,810**	**108**	**16**	**26**
ZL1AAS	**14**	**23,532**	**161**	**21**	**32**
ZL3RT	"	3006	61	9	9
Wake Island					
KW6DG	**A**	**349,492**	**826**	**71**	**117**

South America

Argentina					
LU9FAH	**A**	**34,086**	**165**	**31**	**47**
LU1DAB	**28**	**79,643**	**383**	**22**	**51**
LU2FAO	"	6960	65	17	23
Brazil					
PY7YS	**A**	**41,736**	**196**	**21**	**53**
PY3AFO	"	2376	34	15	18
PY3UY	"	1363	20	12	17
PY1AQT	**28**	**34,040**	**167**	**22**	**52**
PY3AHT	"	3948	36	18	24
PY3AHJ	**21**	**29,039**	**149**	**25**	**46**
PY7EC	"	6954	69	15	23
PY2EJ	**14**	**56,560**	**252**	**26**	**54**
Chile					
CE3CQ	**21**	**3540**	**48**	**14**	**16**
CE3VU	**14**	**74,844**	**291**	**30**	**54**
Colombia					
HK3LX	**A**	**186,961**	**389**	**58**	**105**
HK4EB	"	130,500	330	52	93
HK3JK	"	95,352	292	42	74
HK2YO	"	25,051	171	21	26
HK3RQ	"	14,948	76	32	42
Ecuador					
HC1AGI	**A**	**290,928**	**755**	**56**	**76**
Netherlands, W.I.					
PJ2AF	**A**	**250,746**	**557**	**61**	**97**
Peru					
OA1W	**A**	**18,480**	**113**	**29**	**37**
Uruguay					
CX2CO	**A**	**876,304**	**1070**	**88**	**198**
CX6AR	"	20,079	113	29	40
CX9AW	"	2886	38	19	20
CX1OR	"	620	13	10	10
Venezuela					
YV5AGD	**A**	**167,824**	**325**	**66**	**118**
YV1EE	"	102,924	330	45	63
YV4DU	"	94,620	348	34	61
YV1EL	"	36,024	158	30	46
YV2CJ	"	17,139	77	39	48
YV5AMP	"	1404	19	11	15
YV5AHG	**21**	**3054**	**62**	**8**	**12**
YV3BW	"	3010	36	15	20
YV5AFF	**14**	**53,369**	**215**	**25**	**58**
YV5AFJ	"	10,051	152	9	14
YV5AKP	"	858	13	10	12

MULTI-OPERATOR
Single Transmitter
North America

United States					
K1MBC	**60,236**	**178**	**54**	**94**
	(K1MBC, K9KKK)			
W1DDD	1674	24	10	17
	(K1LZW, K1JLD, K1KCB)			
W2JT	**85,641**	**220**	**65**	**114**
	(W2JT, W2DEW, W2HTI)			
K2SUX	50,511	158	53	96
	(K2SUX, W2HZY)			
K1BVI/2	13,600	97	24	44
	(K1BVI/2, WA2PWO)			
K2OLC	4720	43	25	34
	(School Station)			
WA2IEK	3 510	48	23	31
	(WA2IEK, K2RVT)			
W4HXC	**110,349**	**258**	**71**	**130**
	(W4HXC, K4GUX, W4QKK, K4WXC, W9DVM/4)			
K6EXO	**48,960**	**195**	**55**	**81**
	(K6EXO, K6YRA)			
W6CX	952	26	18	16
	(K6TFB, K6TFC)			
W8NGO	**42,765**	**136**	**55**	**90**
	(W8NGO, W8ONA, K8YEI)			
W9YT	**20,600**	**92**	**40**	**63**
	(K9ABP, W9SZR, CE2JW)			
K9WTS	4788	44	25	32
	(K9WTS, K9KGV, K9ZSE)			
WØHNS	2961	29	22	25
	(WØHNS, WØNXZ)			
Cuba				
CO8RA	**56,875**	**285**	**49**	**76**
	(Rod & Ray)			

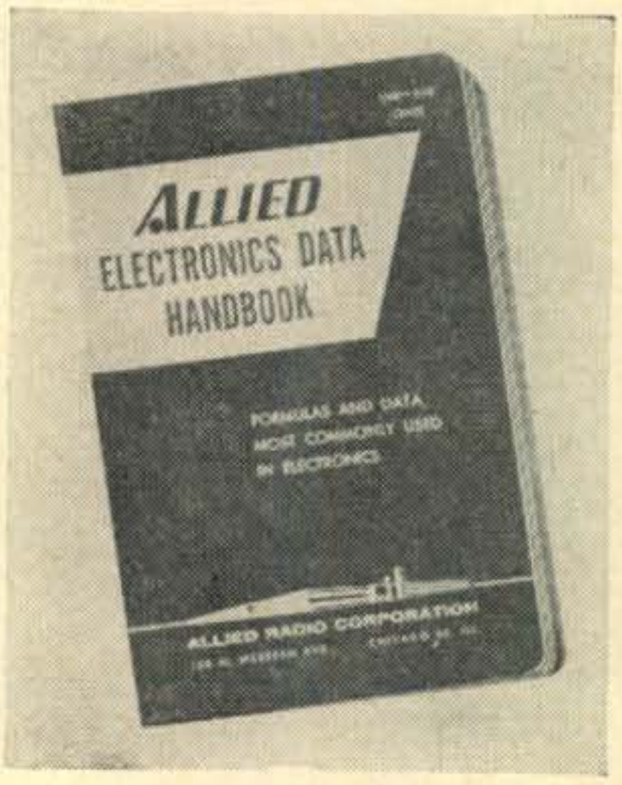
[Continued on page 88]

New Amateur Products

Globe HG-303 Transmitter

THE first model of a completely new line of amateur equipment has been announced by Globe Electronics. Featured in the new HG-303 transmitter are: 80-10 meter coverage, 75 watts input to a 6146 final, grid block keying, dual power supplies, silicon diodes in the high voltage supply, pi-network output circuit, lever type meter and function switches, switch to select either a front panel crystal socket, two internal crystals or external v.f.o. operation. The unit is quite small and attractive and is a c.w.-only rig. For more details check A on page 110.

Data Handbook



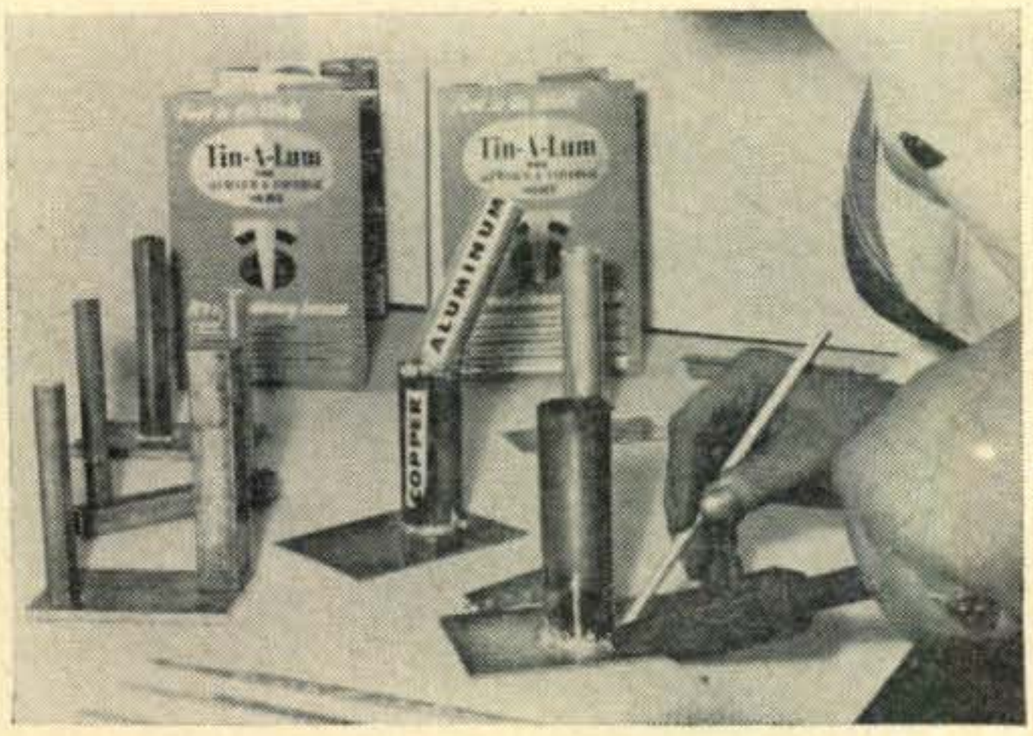
A REVISED and enlarged edition of the *Allied Electronics Data Handbook*, containing an up-to-date listing of most commonly used tables, formulas and reference material, has been published by Allied Radio Corp. Edited by Lt. Cdr. Nelson M. Cooke, USN (Ret.), well known electronics authority and author, this third edition of the popular handbook is a practical, informative guide for amateurs, technicians and engineers.

New data in the revised edition includes basic transistor formulas and symbols, common emitter and amplifier circuit configurations and vacuum tube counterparts; a transistor radio and mercury battery interchangeability guide; charts showing direct interchangeability between American and British tubes; the latest Greek alphabet designations and information on db gain and loss.

The 80 page *Handbook* is priced at 35¢ and is available post paid in the U.S.A. from Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill.

Codome

THE Accentronone Corporation, at 117 Crestmont Terrace Collingswood, New Jersey is manufacturing an item they call the "Codome." Complete with an instruction manual which also contains a little basic radio theory, this unit is ideal for the Novice in that the automatically transmitted morse characters are reproduced at 6 w.p.m. A nine position rotary switch selects coded groups which are repeated. The last position provides use of a built in key for sending. An audible buzz as well as a flashing light are produced simultaneously. The unit operates from 110 v.a.c. and employs a rotating printed circuit board. The price is $17.95. More information can be obtained by circling B on page 110.



Aluminum Solder

A NEW solder has been announced by Production Metal, Inc., of Jersey City, N.J. The new material should prove to be a boon to hams and experimenters since it enables the soldering of almost any metal including aluminum, steel, pewter, white metal and a host of others. All this is done without flux of any kind and requires only the average soldering iron or gun for excellent results on small work. The resultant bond, in most cases, is stronger than the metals it joins. For information on this revolutionary solder, called Tin-A-Lum, check C on page 110.

DX DX DX DX DX DX DX DX

URBAN LE JEUNE, JR., W2DEC
BOX 35, HAZLET, NEW JERSEY

The following certificates were issued between the period from February 4th, 1962 to and including March 3rd, 1962.

CW-PHONE WAZ

1644	W5CK	Glenn H. Pickett
1645	ON4IX	Alain Lheureux
1646	F3YP	Jean-Marie Gaucheron
1647	W5LBI	B. W. Weinland
1648	VK3RJ	Ray E. Jones
1649	W4LRN	J/P. C. Martineau
1650	UC2AD	T. P. Korolenko
1651	UA3HI	Boris Desxusyk
1652	UA4HP	Vic Bukuiop
1653	W5QK	C. S. Blood
1654	WØFLK	John M. Gowen
1655	WØVAF	Charles W. Moore
1656	DJ4HR	Willy Neirich
1657	YO2BU	Dan Constantin

ALL-PHONE WAZ

127	W8EWS	G. W. Fuller
128	W3WGH	Robert W. King
129	W2BOK	S. A. Rubinstein
130	PY4CB	Homero Braga Fontes
131	DJ2AA	Peter Huber
132	W4TDW	Robert G. Affel
133	K1IXG	Dr. Alvin Liftig
134	LU1DAB	Juan Carlos Naon
135	K9EAB	Cliff Corne

SSB WAZ

61	G3DO	D. A. G. Edwards
62	G2BVN	R. F. Stevens
63	EI4O	Rev. James A. Stone
64	WØKFA	C. R. Miller
65	WØBMQ	Kenneth J. Fattmann
66	W5AFX	Arthur R. LaMarche
67	ON4DM	Fernand Mouraux
68	K1IXG	Dr. Alvin Liftig
69	K9EAB	Cliff Corne

CW WPX

277	W8YAH	D. M. Hilsabeck
278	W7CNL	John H. Hotchkiss
279	W4OMW	Robert H. Knapp
280	WØCDP	H. A. Miller
281	W2BOK	S. A. Rubinstein
282	DJ4OP	Werner E. Katte
283	YU1AG	Ing. Arch. Djuro Borosic
284	W6RLN	K. C. Jones
285	ZB2I	Edwin D. Wills
286	DL1PM	Ernst Manske
287	G8KS	S. L. Hill
288	G5GH	C. R. Emary
289	F9BB	Louis Fenu
290	SM7MS	Rune Rasmusson
291	DJ4HR	Willy Neirich

PHONE WPX

56	DL6VM	Ella Jacobs
57	PAØSNG	G. Mulder
58	YU1AG	Ing. Arch. Duro Borjosic
59	W6YY	John Knight
60	G8KS	S. L. Hill
61	PZ1AX	H. W. Green
62	I1PDN	Dr. Ettore Cerulli

SSB WPX

92	G3DO	D. A. G. Edwards
93	W6YY	John Knight
94	W1AOL	William A. Dickson

MIXED WPX

01	W5PQA	H. W. Merideth, M.D.
14	W4NNH	Bob Willoughby
15	K3COW	Raymond E. Murphy
16	W8WT	Lester A. Jeffery
17	W4BQY	Gordon B. Fisher, Jr.
18	YU1AG	Ing. Arch. Djuro Borosic
19	W5LGG	Leonard G. Parsons
20	W6YY	John Knight
21	G6VQ	T. E. Wilson
22	VE7CE	R. J. M. Gauvreau
23	G8KS	S. L. Hill
24	DL1YA	Hans Schleifenbaum

WPX ENDORSEMENTS

	Mode	Total	Continent	Band
K2CPR	CW	489		
W2FLD	CW		E	20
K2TDI	SSB	264		
W4PLL	CW			20
W4YWX	CW	350		
W5LGG	CW	495	E	
	Mixed		E	
W6ID	CW	350		20
W6YY	CW	502	E	20
	Phone		E	20
	Mixed		E	20
K9EAB	Phone	366		
	Mixed		E	20
W9GFF	CW	471		
W9YHE	SSB	211		
DL1YA	Mixed	456		
DL6VM	Phone	376		
F9BB	CW		E	
G2GM	CW			
G8KS	CW	357		
	Phone	372		
	Mixed	471		
PZ1AX	Phone	413		
SM7MS	CW	510		
VE4OX	CW	350		
YU1AG	CW		E	20
	Mixed		E	20

A-Asia; *E*-Europe; *F*-Africa; *N*-North America; *O*-Oceania; *S*-South America.

Here, There and Anywhere

AC3 and AC5 Sikkim & Bhutan: The VU2NR DXpedition to AC3 and AC5 have been cancelled. Although licenses were on hand, the Indian Government has refused Raju the permission to make the trip.

FB8W Crozet Island: We learned via W8PQQ that for some time to come no activity by FB8WW from Crozet Is. can be expected. Although they definitely have arrived at Crozet, they, for the time being, are too busy installing a commercial radio station. It is not known as yet when this job will be finished, but it may be assumed very safely that Crozet will be reachable on ham-bands in the near future, since FB8WW will stay behind as one of the ops of said commercial station. G3AAM reports to W7YGN that he talked to FB8XX.

WPX HONOR ROLL

CW WPX

W2HMJ	651
W8KPL	553
W2EQS	547
W9YSX	544
W5KC	541
K6CQM	538
W4OPM	531
W6KG	528
W2HO	526
W1IJB	513
W6WO	511
W2GT	510
SM7MS	510
W8LY	506
K2UKQ	505
G3EYN	503
W2NUT	502
W6YY	502
W1EQ	500
W2MUM	500
W5LGG	495
K2CPR	490
SM5CCE	488
YU1AG	482
W8PQQ	481
W4HYW	478
W9GFF	471
W3OCU	466
K6SXA	464
G2GM	462
K2ZKU	461
W3BCY	457
W4BYU	456
K9AGB	454
W9UXO	453
K9EAB	451
PAØLOU	451
W3PGB	450
W8JIN	450
W8RQ	445
W3BQA	437
K5LIA	428
OK1MB	428
W3CGS	426
W1EIO	425
WØPGI	420
W5AWT	412
W5DA	412
W2PTD	411
K5LZO	411
W4DKP	410
K4JVE	407
W5AFX	407
W2KIR	405
DL3RK	403
JA2JW	403
VE6VK	403
PY4OD	402
IT1TAI	401
W9SFR	400
VK3KB	400

PHONE WPX

W8WT	545
W9WHM	510
G3DO	487
CT1PK	479
W9YSQ	471
W6YY	448
MP4BBW	431
VK6RU	421
PZ1AX	413
TG9AD	381
DL6VM	376
G8KS	372
PAØSNG	369
W1UOP	368
K9EAB	366
PAØHBO	363
SM3EP	361
W5ERY	358
W8JIN	356
W9UZC	356
DL3TJ	354
PY2CK	354
5A5TO	353
LA5HE	351

SSB WPX

MP4BBW	392
W4OPM	372
TI2HP	356
K9EAB	350
W8PQQ	315
HB9TL	315
W3MAC	307
G3DO	296
K2TDI	264
K2MGE	263
W2VCZ	261
W2YBO	257
W3VSU	256
UR2AR	255
TG9AD	252
W1ORV	250
G3NUG	250

MIXED WPX

W6YY	570
W8WT	565
K9EAB	553
HB9EU	551
W2GT	528
W5LGG	509
K2ZKU	482
YU1AG	482
WØMCX	476
W3CGS	475
G8KS	471
W9DWQ	465
W4BQY	459
DL1YA	456
PAØLOU	452

The information is that the gang will be very busy setting up the weather facility and there is a possibility that there is going to be very little amateur activity. The biggest problem is lack of space for equipment and time for operating. The best bet on frequencies are 14020, 025, and 050, c.w. exclusively. They have been heard testing the commercial rig they are installing and it is believed FB8WW has already been in QSO with FB8XX. (PAØ *DX-Press*, Tnx Florida *DX Report*)

OD5 Lebanon: According to Rundy, OD5CT, now operating as EP2BH, from Teheran, all OD5 licenses have been suspended, as a result of the political situation. Rundy now asks to QSL via ISWL. (Tnx Veron *DX Press*)

TD8 Togo Republic: Louis, 9G1DP/XT2Z, has applied for a license to operate from Togo (ex-FD8). (Tnx Veron *DX Press* and WGDXC)

VKØ Heard Island: The VKØVK DXpedition to this island has been cancelled. (Tnx Florida *DX Report*)

VQ1 Zanzibar: Dave, W2GLM, dished out quite a few VQ1 QSOs recently using a KWM-1 and dipole. QSL via W2TSD.

VS4 Sarawak: VS4RS is active frequently on 7 and 21 mc c.w. while VS4RM prefers 14070 kc c.w. around 1200 GMT. (Tnx Veron *DX Press*)

XT2 Upper Volta: The Veron *DXPress* reports XT2AA active on 14 mc c.w.

The Times Square of Bechuanaland. This is Francistown, the capital of the Bechuanaland Protectorate.

ZA Albania: The following excerpt from a letter received from OK1ZL by K2UYG should clear up some questions: "There are now OK hams presently in Albania, the last one to operate from there was OK7HZ/ZA. No one here knows the stations you mentioned (ZA2KBC, et al). No one from OK land will operate from there in the near future. I was planning an expedition to ZA land with OK1A and OK1GT, but for certain reasons this plan was impossible to realize." (Tnx WGDXC)

OE1FF reports "Due to the changes in world politics, several OEs with myself will try to start a DXpedition to ZA the coming summer".

DXpeditions

ZE3JJ/ZS9: Ivan, ZE3JJ, was kind enough to relate the following on his trip to ZS9 this year:

"In 1959 and 1960, Mal (ZE3JO) and myself spent some time in Nyasaland operating various rigs, with the object of contacting as many stations as possible in the time available.

"During 1961 we agreed that another "rare country" could be visited, and considered Bechuanaland which, although larger than Southern Rhodesia, has a very small radio amateur population.

"Norman, ZS9P and Patricia ZS9C, who met each other through the medium of amateur radio, and who subsequently married, very kindly extended an invitation to Mal and myself to visit them. We planned to drive to Francistown in a station wagon, taking with us two complete rigs.

"Shortly before the planned date of departure, Mal, who had been having trouble with his left leg for years, was summoned to the operating table by his surgeon, and was soon minus the lower leg. As the dates of the DXpedition had been announced and as Mal would be many weeks immobilised, it was agreed to make a one-operator trip. On October 21st, I boarded the night train to Salisbury bound for Bulawayo, where I was met the following morning by Buster, ZE6JJ at whose

UA9KOG has confirmed 108 countries as well as 35 Zones on phone. Their wallpaper, part of which may be seen here, includes; W 100 U, DXCC, 101, DUF, OHA, WUNA, WAC, CCC, Torino #1 on 21 mc, and WAEDS all on phone. They are working for WAS and have 32 states confirmed. They are looking for stateside QSO's on phone the last weekend of every month from 0000 to 0300 GMT. Thanks to Vlad Chavkin, UA9OAP, for this picture.

home I was made most welcome during a short visit before catching the connecting train.

"After a short trip I alighted at Francistown, Bechuanaland Protectorate where Norman and Pat, together with their six-month old daughter, Bernice, had come to meet the train. I soon changed into clothing suitable to the intense heat of this lower-lying semi-desert (October being one of the hotter months) and was introduced to other amateurs in Francistown (including Norman's father ZS9A). I was given the full run of the shacks by Norman and his father, which was a truly magnificent gesture. The small portable which I had brought with me was only used as a crystal maker.

"Most of the operating was done in the evenings and early mornings, and during the day I made several visits to the swimming pool, without missing the main DX openings. Although phone and c.w. were both available on the main DX bands, the majority of contacts were made on 21 mc c.w. This was not due to an inherent preference for this band and mode, but because this appeared to be the most effective way of making many contacts. Operating was normally 'contest-style' and in about five operating days, about 230 contacts were made which, considering general conditions, represented quite a bit of band watching and brass pounding.

"The most extraordinary contact of the trip took place on 7 mc c.w. I had just finished working two stations back home in Salisbury one evening when I was called by W4VCA/KH6, whom I worked. At that moment, ZS9P came into the shack and quietly pointed out that I had forgotten to change the antennae, and was in fact working the Antipodean point of Hawaii on 7 mc on a G4ZU beam. . . .

"Norman and Patricia were starting leave on the day that I had to begin the return trip and we traveled up to Bulawayo together in their car. The following morning, after another night trip by train, I returned to Salisbury, and went straight to my office to collect the mail. Imagine my surprise when I found a number of QSL cards from the USA already there, which were in response to the one-week trip which had just ended. . . .

"1962 should see another DXpedition from ZE and by that time, Mal (ZE3JO) should be mobile once again. We both look forward to working the world again from some exotic spot."

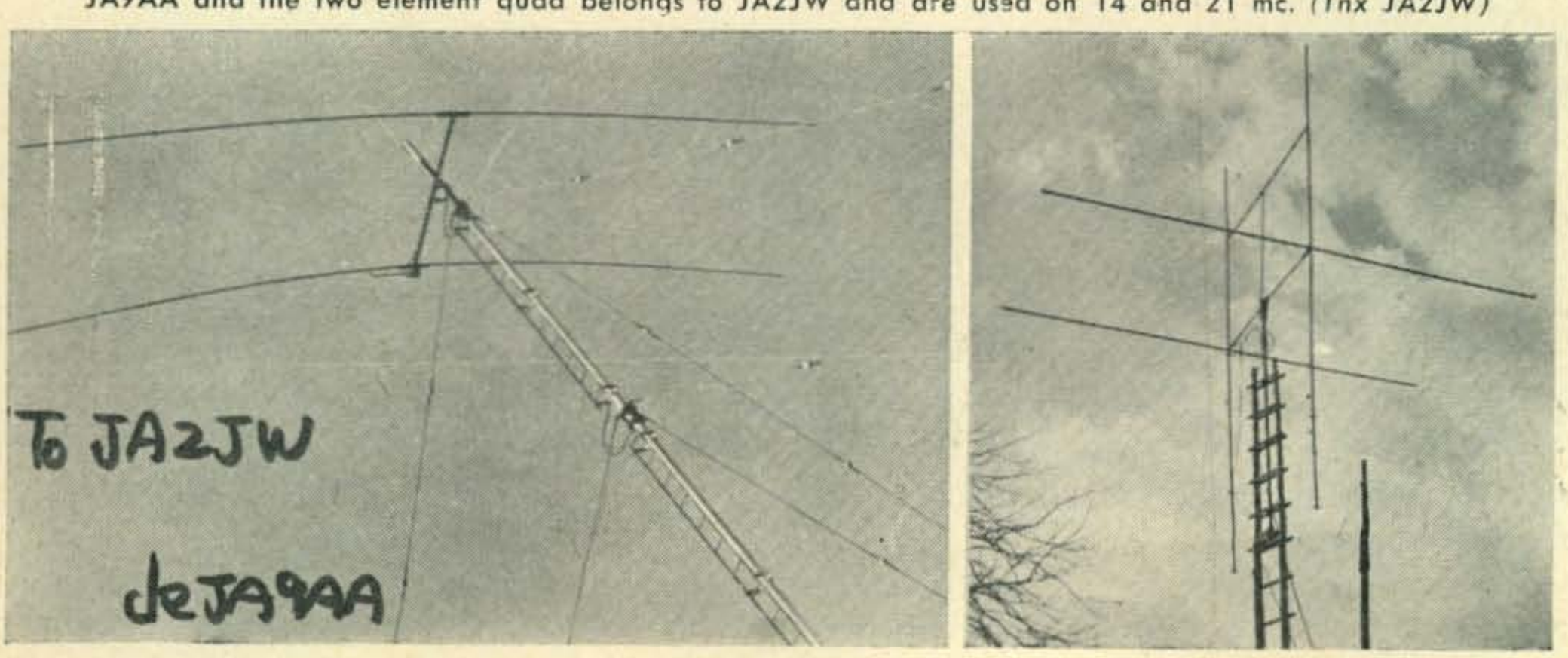
W4BPD

W4ECI brings us up to date on our wandering DXpeditioner, Gus, W4BPD:

"Licenses have already been issued for several very juicy spots . . . one of them being VQ7 for the Aldabra Islands. All equipment has been shipped to those places where we deem it necessary. Gus will carry with him a 32S-1 and 75S-3 together with all the associated equipment.

"He will be leaving the States some time during the month of March. Present plans call for him to be operating from the Aldabra Islands for the fourteen days during the last part of April. Gus will divide his time between s.s.b.

This is where two of the finest signals from JA-land leave home. The two element beam belongs to JA9AA and the two element quad belongs to JA2JW and are used on 14 and 21 mc. *(Tnx JA2JW)*



& c.w. in order to give everyone an equal chance for their particular mode of operation. I might mention that in every case Gus will positively not listen on his frequency. In c.w. operation, QSO will be acknowledged with stations operating plus or minus 10 kc from his frequency. As to s.s.b., the operating frequency will be *below* the American phone band and listening *in* the American phone band other than to work the foreign fellows.

"All the QSL's should go to W4ECI and must be accompanied with s.a.s.e. Speaking of QSLs, let me say here that even tho' we will keep those fellows who have helped making this DXpedition possible informed as to what's going on and Gus' whereabouts, all will receive confirmation of QSOs regardless of whether or not they have made a contribution to the cause. I will be assisted in all matters by W3RIS, W4ARR and W4ZRZ. If you have any inquiries, please contact any of these.

"Looking for and awaiting those big pile ups and hoping conditions will be favorable for all."

Ack now has all the logs from Gus' first DXpedition. Anyone who did not receive a card should drop Ack the info with a s.a.s.e. or an IRC.

160 Meters

W1BB passes along the highlights of the 160 meter activity. New firsts are: Hawaii to South America and Hawaii to Bahamas. QSOs by Nose, KH6IJ: KH6IJ-HC1AGI and KH6IJ-VP9NY. Congratulations! South America to New Zealand, HC1AGI-ZL3RD; South Orkney to South America, VP8GQ-HC1AGI; South Orkney to USA, VP8GQ-WØIFH (#1), VP8GQ-W1BB/1 (#2); South Orkney to Canada, VP8GQ-VE1ZZ. Quite some doings on 160. W5SOT was the first 2 mc signal heard in Europe by G3PU.

Outstanding DX signals: HC1AGI, HR3HH, GI6TK, VP8GQ, G6GM, G3PU, G3FRN, G6BQ, KH6IJ, GD3UB, ZL3RB.

Can anyone explain this? Lots of 160 meter DX and W/VE hams wondering why, at times, DX from west and south from W/VE are excellent, but no European DX getting through

The operators of UA9KOG, The Amateur Radio Club of Siberia. L. to r. Stan, presently UQ2FX, Vlad UA9OAP and Dmitry, UA9OI. UA9OI was the first station in Zone 18 to operate on s.s.b. The transmitter runs from 300 to 500 watts input to a P-800 final. Receivers are a BC-342, AR-88-D and a KW-m. The antennas are a ground plane and a windom.

at all. Any ideas? Example: Jan. 14 HC1AGI, HR3HH, KH6IJ, XE2OK having a "Field Day," But no European DX came through. Why?

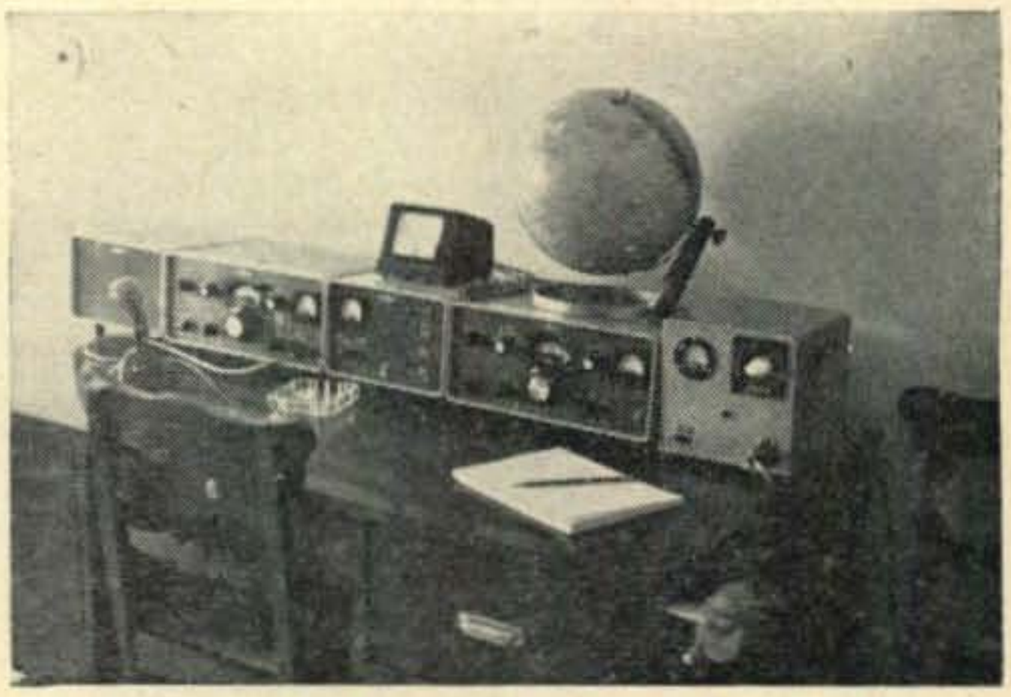
Certificates

Worked Scandinavia Prefixes. "WSPX" Issued in three classes, I, II, III and requires cards from 40, 30 and 20 different Scandinavian prefixes like LA1-9, OH1-ø, OZ1-9, OY1-9, SM1-7. (SL is the same as SM in this case) SM8 does not count nor the LA/P stations. Price is 5 IRC per certificate and it is issued for c.w., Phone, Mixed or Separate bands. It is also open for s.w.l.s. No cards needed, only Log data, list of the cards signed by two other amateurs. Apply to Polar Bear Radio Club, Sven Elfving, Solgardsgatan 15, Ornskoldsvik, Sweden.

Millenium SP-Award 1. The award called Millenium SP-Award is established and offered by the Polski Zwiazek Krotkofalowcow on the occasion of the thousandth anniversary of the Polish State.

2. Amateur radio operators and s.w.l.s everywhere in the world may apply for this special MSPA award.

3. This award is issued only for radio contacts (s.w.l. reports) made in the celebrations



The QTH and rig, of Buck, EP2AG in Teheran, Iran. Buck pleads for more activity from Utah, Idaho, Wyoming, Montana, North and South Dakota. All the fellows in EP land need one or more of these states.

of Poland's Millennium, *i.e.* from January 1st 1960 to December 31st, 1966.

4. The award can be obtained after submitting the confirmations of the following QSOs (s.w.l. reports):

a. European amateurs, 25 QSOs (s.w.l. reports) with SP amateur stations of all nine SP call areas (SP1-SP9) made on any amateur band from 3.5 mc to 28 mc.

b. Non-European amateurs, 20 radio contacts (s.w.l. reports) with SP amateurs located at least in five SP call areas made on any amateur band from 3.5 mc to 28 mc.

5. All QSOs (s.w.l. reports) made with any type of emission will be valid for this award.

6. The Millennium SP-Award will be issued upon the receipt of a list of radio contacts (s.w.l. reports) made in accordance with the possessed QSL cards. The list of QSL cards must be certified by the Award Manager of the respective amateur association or radio club.

7. The cost of the award is 5 IRC and covers the forwarding registered postal expenses.

8. Applications for this award should be sent to Polski Zwiazek Krotkofalowcow, Awards Manager, P. O. Box 320, Warszawa 10, Poland.

9. The final date for forwarding the applications is January 31st, 1967. (Tnx W1WY)

FEARL (M)

The following is the new QTH for all FEARL (M) awards: FEARL (M) QSL Bureau, Attention: Awards Manager, HQ 5th A.F. Box C-5, APO 925, San Francisco, Calif.

Here and There

Alex, VE2AFC (Box 382, Quebec, Canada) has been your appointed Representative for Canada of the R.E.F. from France and if you readers (the French speaking ones, of course) would like to get details about the French National Society and Magazine, they can get in touch with Alex who will be pleased to help them. The U. S. Representative is F9MH who lives in New York.

Vlad, UA9OAP giving a report to F8US while Stan looks on.

ZB2I on the island of Gibraltar. Edwin is a recent recipient of WPX. It must be very difficult to work any DX yourself when you have a rare prefix as ZB2.

HB9GX, Bob Thomann of the Swiss Broadcasting Corporation conducts a DX news broadcast of interest to amateurs on the second and fourth Fridays of the month. Time: 1400 and 1645 GMT. Frequencies: 21520, 11865, 6165 and 9535 kc.

QTH's and QSL Managers

South Georgia QSLs—Mike, ex-VP8GE, writes that QSLs for all QSOs will be sent as soon as QSLs are printed. He bought enough So. Georgia stamps for 322 QSLs, and will stamp them and send the parcel to a friend in South Georgia to be mailed there, so it will take some time for some to get through. (Tnx WGDXC)

Radio Club de Cuba en Exilio—3797 E. 10th Avenue, Hialeah, Fla.

Argentine Stations on Antartic (LU Z)—All Army stations with last letter in call D, J, U, V, W, X. QSL to Cap. Evert Portillo, Red SIRME, Sec. Comunicaciones, Comando en Jefe del Ejercito, Cabildo 65, Buenos Aires, Argentina. All Navy Stations with last letter in call A, B, C, E, F, H, I, L, M, O, P, Q, R, S, T. QSL to Subof. Ppal, Aldo Venaria, Estado Mayor General Naval, Communicaciones, Cangallo 55, Buenos Aires, Argentina. Army and Air Forces Station, LU1ZAB. QSL same as Army Stations. (Tnx LU9DAH via WGDXC)

DJØFQ	Sanford Cole, Jr., Box 216, 7406 Support Sqn, APO 57, N.Y., N.Y.
EP2BK	Box 224, Abadan, Iran, Robert Snyder.
ex FG7XC	P. A. Habazac, Rue de la Maison-Blanche 1, Paris 13, France.
FG7XL	Monique, Box 109, Pointe-A-Pitre.
FG7XN	P.O. Box 387, Pointe-a-Pitre, Guadeloupe.
HC1AGI	Don McClendon, c/o NASA, U.S. Embassy, Quito, Ecuador.
HC1IU	Box 5200, Guayaquil, Ecuador.
HC1JU	Box 2951, Quito, Ecuador.
HS1A	Maj. Kenneth Barzel, 4203 Jerome St., Madison 4, Wisconsin.
ex-HS1R	Capt. L. P. Rose, 804509, 31st Arty Bde (AD) Oakdale, Pa.

[*Continued on page 90*]

PROPAGATION

George Jacobs, W3ASK
11307 Clara St., Silver Spring, Md.

LAST MINUTE FORECAST

The following is a forecast of day-to-day propagation conditions expected during May 1962. This forecast attempts to predict *specific* days upon which openings shown in the Propagation Charts in this c lumn are most likely to occur, and the expected quality of the openings. For example, the following forecast shows that circuits rated (2) in the Charts are most likely to open with "good" quality (B) when conditions are above normal (May 13-15 and 25-27), and with "fair to poor" quality (C-D) on days when conditions are expected to be normal. Circuits rated (2) are not expected to open on those days forecast to be "disturbed," etc.

PROPAGATION CONDITIONS and CIRCUIT QUALITY

Prop. Chart Forecast Rating	*Above Normal Days* May 13-15, 25-27	*Normal Days* May 3-9, 12, 16-24, 28, 31	*Below Normal Days* May 1-2, 29-30	*Disturbed Days* May 10-11
(1)	C	D-E	E	E
(2)	B	C-D	D	E
(3)	A	B-C	C-D	D-E
(4)	A	A-B	C	E

Where:

A—An excellent opening with strong steady signals.
B—Good opening, moderately strong signals, with some fading and noise.
C—Fair opening, signals fluctuating between moderately strong and weak, with moderate fading and noise.
D—Poor opening, signals generally weak, with considerable fading and high noise level.
E—Very poor opening, or none at all.

General Conditions

As the sun rises higher in the northern skies, the seasonal trend of *lower* daytime maximum usable frequencies (m.u.f.s) and somewhat *higher* nighttime m.u.f.s continues through the late spring months. Static levels also increase considerably during May, and signals are expected to be somewhat weaker on long-distance openings.

During May, there is usually a considerable increase in Sporadic-*E* ionization. This should result in frequent short-skip openings (up to distances of approximately 1400 miles) on most h.f. bands, and down to 6 meters.

Except for an occasional daytime opening to some southern or tropical areas, very few DX openings are predicted for 10 meters. Frequent short-skip openings between distances of approximately 750 and 1400 miles should be possible during May.

Fifteen meters is expected to open on fewer days and to fewer areas of the world than during the winter and early spring months. Numerous short-skip openings between approximately 600 and 1400 miles are predicted for May as a result of the expected increase in sporadic-E propagation. Conditions on 15 meters should peak during the late afternoon and early evening hours.

Twenty meters is expected to be the best band for DX openings during May. Opening shortly after sunrise, good DX conditions should prevail to one area of the world or another, through the evening hours. The band is expected to remain open to some southern and tropical areas during the hours of darkness as well. During May DX conditions usually peak on 20 meters in the late afternoon and early evening hours. Numerous short-skip openings should be possible between distances of 350 and 1300 miles as a result of sporadic-E propagation, and F-layer short-skip openings between 750 and 2300 miles are predicted throughout most of the daylight and early evening hours.

Fewer 40 meter openings are expected during May as a result of higher static levels, and fewer hours of darkness. Fairly good openings to several areas of the world should still be possible, however, from shortly before sunset, through the hours of darkness, until shortly after sunrise. Good daytime short-skip openings are forecast for distances between 150 and 750 miles, with nighttime openings extending up to 2300 miles.

DX conditions on 80 meters continue to decline during May as a result of higher static levels and increased ionospheric absorption. Openings are predicted, however, to some areas of the world during the hours of darkness. Regular short-skip openings between distances of 50 and 250 miles are predicted for the daylight hours, with nighttime openings extending out to 2300 miles. On longer circuits, noise levels may be high, and signals weak.

Propagation conditions on 160 meters have passed their peak until next fall. Short-skip openings beyond approximately 50 miles are very unlikely during the daytime hours, due to intense ionospheric absorption. As the sun sets, the skip is expected to increase, and during the hours of darkness regular short-skip openings up to 1000 miles should be possible. Occasional openings up to 2300 miles, and to some DX areas of the world, may also be possible on some nights.

CQ SHORT-SKIP PROPAGATION CHART

MAY AND JUNE, 1962

BAND OPENINGS GIVEN IN LOCAL STANDARD TIME AT PATH MID-POINT

Band (Meters)	50-250 Miles	250-750 Miles	750-1300 Miles	1300-2300 Miles
10	NIL	7 A - 9 A (0-1) 9 A - 1 P (0-2) 1 P - 5 P (0-1) 5 P - 9 P (0-2) 9 P - 11P (0-1)	7 A - 9 A (1) 9 A - 1 P (2) 1 P - 5 P (1-2) 5 P - 9 P (2) 9 P - 7 A (1)	7 A - 9 A (1-0) 9 A - 9 P (2-0)
15	NIL	6 A - 9 A (0-2) 9 A - 1 P (0-3) 1 P - 5 P (0-2) 5 P - 7 P (0-3) 7 P - 11P (0-2) 11P - 6 A (0-1)	6 A - 9 A (2) 9 A - 1 P (3) 1 P - 5 P (2) 5 P - 7 P (3) 7 P - 11P (2) 11P - 6 A (1)	6 A - 9 A (2-0) 9 A - 1 P (3-0) 1 P - 5 P (2-0) 5 P - 7 P (3-1) 7 P - 11P (2-0)
20	NIL	6 A - 9 A (0-2) 9 A - 4 P (0-4) 4 P - 8 P (0-3) 8 P - 11P (0-2) 11P - 6 A (0-1)	6 A - 9 A (2) 9 A - 4 P (4) 4 P - 8 P (3-4) 8 P - 11P (2) 11P - 6 A (1)	5 A - 6 A (1-2) 6 A - 9 A (2-3) 9 A - 3 P (4-3) 3 P - 8 P (4) 8 P - 10P (2-3) 10P - 11P (2) 11P - 5 A (1)
40	7 A - 9 A (0-2) 9 A - 3 P (1-4) 3 P - 7 P (2-4) 7 P - 9 P (1-2) 9 P - 11P (0-1)	7 A - 9 A (2) 9 A - 3 P (4-2) 3 P - 5 P (4-3) 5 P - 7 P (4) 7 P - 9 P (2-4) 9 P - 11P (1-3) 11P - 7 A (0-2)	7 A - 3 P (2-1) 3 P - 5 P (3-1) 5 P - 7 P (4-2) 7 P - 9 P (4) 9 P - 11P (3-4) 11P - 2 A (2-4) 2 A - 7 A (2)	7 A - 5 P (1-0) 5 P - 7 P (2-1) 7 P - 2 A (4) 2 A - 4 A (2-3) 4 A - 6 A (2) 6 A - 7 A (2-1)
80	7 A - 10A (4) 10A - 6 P (4-3) 6 P - 10P (4) 10P - 1 A (3-4) 1 A - 5 A (2-3) 5 A - 7 A (3)	7 A - 10A (4-1) 10A - 4 P (3-0) 4 P - 6 P (3-1) 6 P - 8 P (4-2) 8 P - 1 A (4) 1 A - 5 A (3) 5 A - 7 A (3-2)	7 A - 8 A (1-0) 8 A - 4 P (0) 4 P - 6 P (1-0) 6 P - 8 P (2-1) 8 P - 10P (4-3) 10P - 1 A (4) 1 A - 5 A (3) 5 A - 7 A (2-1)	7 A - 6 P (0) 6 P - 7 P (1-0) 7 P - 8 P (1) 8 P - 10P (3-2) 10P - 1 A (4-3) 1 A - 5 A (3-2) 5 A - 6 A (1) 6 A - 7 A (1-0)
160	5 A - 7 A (4-1) 7 A - 9 A (3-0) 9 A - 6 P (2-0) 6 P - 8 P (3-1) 8 P - 10P (4-2) 10P - 5 A (4-3)	5 A - 7 A (1) 7 A - 6 P (0) 6 P - 7 P (1-0) 7 P - 8 P (1) 8 P - 10P (2-1) 10P - 12M (3-2) 12M - 3 A (3) 3 A - 5 A (3-2)	5 A - 7 A (1-0) 7 A - 7 P (0) 7 P - 10P (1) 10P - 12M (2-1) 12M - 3 A (3-2) 3 A - 5 A (2-1)	5 A - 7 P (0) 7 P - 8 P (1-0) 8 P - 12M (1) 12M - 2 A (2) 2 A - 3 A (2-1) 3 A - 5 A (1)

HAWAII

OPENINGS GIVEN IN HAWAIIAN STANDARD TIME***

TO:	10*/15 Meters	20 Meters	40 Meters	80/160** Meters
Western USA	8 A - 6 P (1)* 9 A - 3 P (1) 3 P - 6 P (2) 6 P - 8 P (1)	4 A - 6 A (1) 6 A - 11A (2) 11A - 3 P (3) 3 P - 7 P (4) 7 P - 9 P (2) 9 P - 11P (1)	5 P - 7 P (1) 7 P - 8 P (2) 8 P - 2 A (4) 2 A - 4 A (3) 4 A - 5 A (2) 5 A - 7 A (1)	7 P - 8 P (1) 8 P - 9 P (2) 9 P - 2 A (3) 2 A - 3 A (2) 3 A - 5 A (1) 9 P - 2 A (1)**

ALASKA

OPENINGS GIVEN IN ALASKAN STANDARD TIME****

TO:	15 Meters	20 Meters	40 Meters	80 Meters
Eastern USA	NIL	3 P - 5 P (1) 5 P - 7 P (2) 7 P - 8 P (1)	NIL	NIL
Central USA	4 P - 6 P (1)	3 P - 5 P (1) 5 P - 7 P (2) 7 P - 9 P (1)	12M - 3 A (1)	NIL
Western USA	4 P - 6 P (1)	3 P - 5 P (1) 5 P - 8 P (2) 8 P - 10P (1)	1 A - 5 A (1)	NIL

***Hawaiian standard time is 5 hours behind EST; 4 hours behind CST; 3 hours behind MST; 2 hours behind PST.

****Alaskan standard time is 4 hours behind EST; 3 hours behind CST; 2 hours behind MST; 1 hour behind PST.

*Possible 10 meter openings.
**Possible 160 meter openings.

Forecast Ratings

The numerals appearing in parenthesis following each predicted time of opening indicate the total number of days during each month of the forecast period that the opening is expected to occur, as follows:

(1) Less than 7 days
(2) Between 8 and 13 days
(3) Between 14 and 22 days.
(4) More than 22 days

On the Short-Skip Propagation Chart, where two numerals are shown within a single set of parenthesis, the first applies to the shorter distance, and the second to the longer distance, for which the forecast is made.

For the specific days of each month on which a particular opening is most likely to occur, as well as a day-to-day forecast of reception quality (signal, noise and fading levels), see "Last Minute Forecast" which appears elsewhere in this column.

A - A. M. P - P. M. N - Noon M - Midnight

The CQ Short-Skip Propagation Charts are based upon a CW effective radiated power of 75 watts from a half-wave dipole antenna, a half-wave or higher above ground. The Charts are valid through June 30, 1962. These forecasts are based upon basic propagation data published monthly by the Central Radio Propagation Laboratory of the National Bureau of Standards, Boulder, Colorado.

Sunspot Cycle

The Zurich Observatory has recently published the official (definitive) monthly sunspot numbers for 1961. Several of the final values differ a bit from the provisional values reported in this column during the past year, and the official counts are given in the following Table.

January	57.9	July	70.2
February	46.1	August	55.8
March	53.0	September	63.6
April	61.4	October	37.7
May	51.0	November	32.6
June	77.4	December	39.9

Table 1—Official monthly Zurich sunspot numbers, observed, 1961

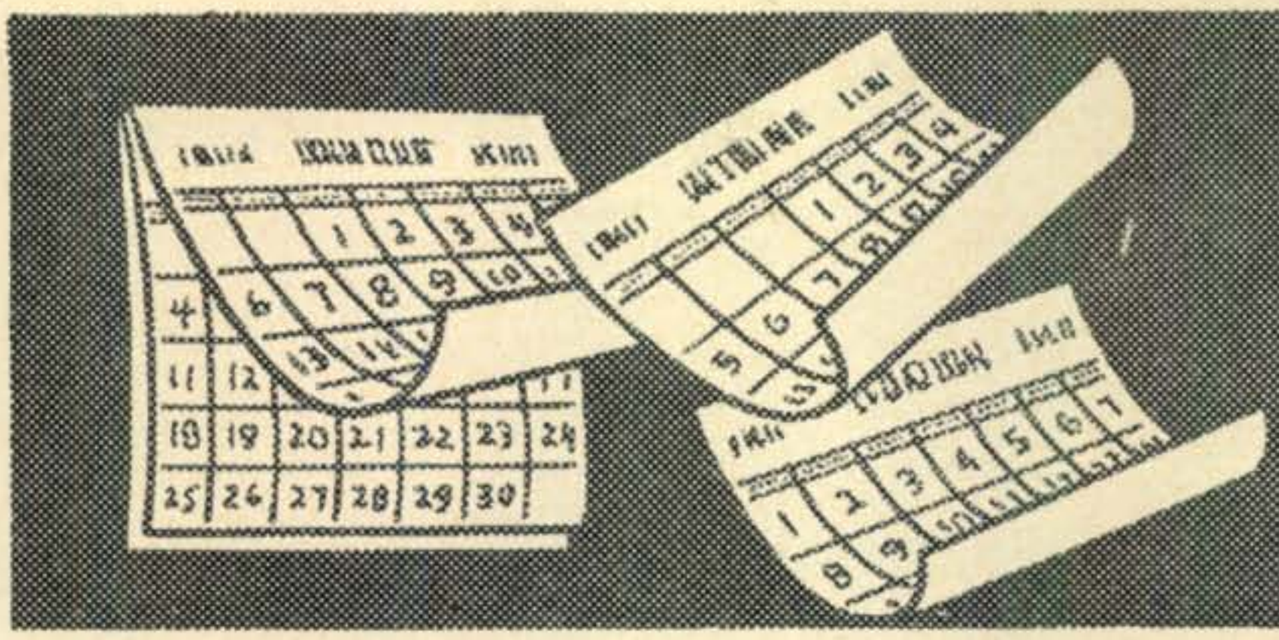
The yearly mean sunspot number for 1961 was 53.9, the lowest recorded since 1955. The 1961 definitive monthly sunspot numbers result in the following 12-month running smoothed sunspot numbers, upon which the sunspot cycle is based:

1960		*1961*	
July	109	January	80
August	102	February	75
September	98	March	69
October	93	April	64
November	88	May	60
December	84	June	56

Table 2—12 month smoothed sunspot numbers, observed July 1960-June 1961

The Zurich Solar Observatory reports a monthly sunspot number of 48 for February 1962. This results in a smoothed sunspot number of 52, centered on August 1961. A smoothed sunspot number of 35 is predicted for May 1962, as the solar cycle continues to decline. Solar activity and shortwave radio propagation conditions, during the spring months of 1962,

[*Continued on page 90*]



CONTEST CALENDAR

FRANK ANZALONE, W1WY
14 Sherwood Road, Stamford, Conn.

CALENDAR OF EVENTS

April	28-29	PACC C.W.
May	5-6	PACC Phone
May	5-6	USSR DX
May	13-14	Bermuda Party
May	27-28	Bermuda Party
June	1-4	CHC/HTH Party
June	23-24	ARRL Field Day

PACC

C.W.

Starts: 1200 GMT Saturday, April 28th.
Ends: 2000 GMT Sunday, April 29th.

Phone

Starts: 1200 GMT Saturday, May 5th.
Ends: 2000 GMT Sunday, May 6th.

Rules are same as in previous years and a complete rundown was given in last month's CALENDAR. Also a list of the provinces.

If you're a certificate seeker keep in mind that your contest log will be honored for the PACC-100 certificate. (Working 100 different PA stations.) Stickers are also now available for PACC-200 and PACC-300.

Logs should be mailed no later than June 15th to: Mr. P.v.d. berg, PAØVB, Contest Manager, Keizerstraat 54, Gouda, Netherlands.

USSR DX

Starts: 2100 GMT Saturday, May 5th.
Ends: 2100 GMT Sunday, May 6th.

This is a world wide contest so don't concentrate on USSR stations only if you want to run up a good score. Operation is confined to c.w. only and on all bands 3.5 through 28 mc. Contest logs can also be used for certificate credit.

W 100 U, for working 100 different Soviet stations.

R 6 K, for contacting all six continents.

R 150 C, for working 150 different countries.

See last month's CALENDAR for other details and awards. Mail your log no later than May 15th to: The USSR Central Radio Club, Att: Chief Judging Board, P.O. Box 101, Moscow, U.S.S.R.

Bermuda

Starts: 0001 GMT May 13th & 27th.
Ends: 0200 GMT May 14th & 28th.

The Radio Society of Bermuda is once more holding its annual VP9-W/VE party on the 2nd and 4th week-ends in May.

1. Both phone and c.w. contacts are permitted on all bands 3.5 through 28 mc. However only one contact can be made with the same station on any one band.

2. W and VE stations will give RS and RST reports as their serial number, while VP9s will also include their parish.

3. Each contact is good for 3 points. The multiplier is determined by the number of Parishes worked on each band. VP9 stations will compute their multiplier by the number of W/VE call areas worked.

4. The final score therefore will be the total contact points from all bands multiplied by the total Parishes worked on all bands.

5. A certificate signed by His Excellency The Governor goes to the highest scorer in each USA and Canadian call area. But don't stop when you think you have it all sewed up for your area. Just keep plugging, top man on the Totem Pole will be specially honored by the Bermuda boys.

6. Competition is limited to single operator stations but there is no limit to the power and equipment used, provided of course it's within the limit of your license.

7. Keep times in GMT and each contestant is expected to compute his score and check his log for duplications. PRINT your name and address and sign the usual declaration that all rules and regulations have been observed.

Official log forms can be obtained by dropping a card to the Contest Committee, Radio Society of Bermuda, P.O. Box 275, Hamilton, Bermuda. Your logs must be in the hands of the committee no later than June 30th, 1962.

CHC/HTH

Starts: 2300 GMT Friday, June 1st.
Ends: 0600 GMT Monday, June 4th.

The Certificate Hunters' Club will be on hand June 1-4, for their annual QSO-Party to give amateurs the world over an opportunity to

[*Continued on page 92*]

The USA-CA Program

BY CLIF EVANS*, K6BX

AN EVEN dozen USACA winners came in during the past month, bringing to seventy-one, those whose walls now will be adorned by the *biggest, most colorful, most significant* of all hamdom's awards.

CHCer Norman, W5NXT, was winner of USA-CA-1000 number 4. CHCer Helen, W1HOY, made history when she came in for her USA-CA-500 with all 500 counties worked on 50 mc A3 phone. Helen, as you will remember, XYL of famous v.h.f.er Sam Harris, W1FZJ, is the gal who won her CHC laurels by accumulating more than twenty-five achievement awards on v.h.f. alone. Here she is making more hamdom history and showing others that v.h.f.ers can compete with the best of them. Congratulations Helen.

CQ and the OLD MAN congratulate the following new USA-CA winners:

USA-CA-1000

W5NXF 4

USA-CA-500

W7RZY	57	W5EHY	63
W1FPS	58	W6UBP	64
W8OQV	59	W9CLH	65
K2UKQ (YL)	60	W9YT	66
KØHUU	61	W1HOY (YL)	88
W5DWO	62		

Of the above winners, six are CHCers; W7RZY, K2UKQ, W5DWO, W5EHY, W9CLH and W1HOY. As special tribute to W1HOY's v.h.f. feat, we gave her #88. Second YL winner was none other than CHC's 1962 "Queen of the Hunt," Kay, K2UKQ. W9YT is the Badger Amateur Radio Society of the University of Wisconsin which banners the fact that club stations also may win USA-CA awards. The seventy-one winners have a spread representing twenty-four States and eleven Countries.

Virginia Joins USA-CA Program

Last month we flashed that Virginia soon would sponsor a County award to add to the almost complete list of states now in the USA-CA Program. Well, here it is, The Old Dominion Award, ODA, by the Roanoke Valley Radio Club for contacts with the 98 counties of Virginia. The award is issued in three classes as follows:

Class 3 is the basic certificate which will be endorsed with seals for higher classes. Special endorsements for all one band or mode. Cities may count for one and only one of the counties with which they share a common border. Send GCR list (list certified by an officer of a radio club or two licensed amateurs that cards sighted) alphabetical by counties with call, band/mode data and 50¢ or 5 IRC to ODA Manager, K4WVT, Steve Thompson, 1802 Bridle Lane, S.W., Roanoke, Virginia.

Virginia County Award

	Class 1 *Countries Required*	Class 2 *Countries Required*	Class 3 *Countries Required*
States East of the Miss. R. Inc. VE 1, 2, 3.	98	75	50
States West of the Miss. R. Inc. VE 4, 5, 6, 7, 8.	98	60	35
All DX Stations Inc. KH6, KL7 and /MM.	98	50	25

We will bring you a picture of this award, now under design, in a later issue.

South Carolina Joins UCA-CA Award's Parade

Like the OLD MAN told you last issue . . . the "Palmetto" state of South Carolina is sponsoring a county award in support of USA-CA Program. The certificate proper is being designed and we will bring you a picture of it in a later issue, but here are the rules: The Greer Amateur Radio Club sponsors the South Carolina Award for working 25 South Carolina Counties with seal endorsements for 35 and 46 Counties, and special endorsements for all one band or mode or mixed operations. The award is to the individual regardless of calls held, QTHs or dates of contacts. General USA-CA rules apply as to County identity. Send GCR list

*United States of America Counties Award Custodian, Box 385, Bonita, California.

Walter, DL9PF, demonstrates his pleasure on being notified he was USA-CA-500 winner No. 1 for Europe. Walter is ex-LX3PF and ex-PX1PF. Since the advent of USA-CA, Walter along with many Europeans, keep their beams headed toward the land with 3079 "rare" Counties.

alphabetically by counties; data to substantiate endorsements, and $1.00 or 10 IRC to Custodian, K4SFW, Joe M. Forrester, Greer Amateur Radio Club, Route #3, Greer, South Carolina. For seals at later date, send only s.a.s.e. or 1 IRC.

Kentucky Colonels Being Gagged

Kentucky has an award for working Kentucky Colonels but not for Colonels in Kentucky's 120 counties . . . and they feel slighted that they are being denied USA-CA's world-wide publicity . . . so, a few swabs already have concocted a most exciting Bluegrass Awards series which, when the 'right' sponsor is found, will really put Kentucky and its Colonels, and its 'thoroughbred' women and pretty horses in the world's limelight. Watch this column for later announcement of Kentucky developments now abrewing in bond. See the picture story of Kentuckiana Colonel Award (and corrected nomenclature).

Idaho Getting "Itchy" for USA-CA Fun

The *Ham-Bone News* published by Ray, K7HLR, has quieried Idaho hams if they want to get on the world-wide USA-CA publicity bandwagon by sponsoring an Idaho county award . . . so folks, just be patient and the OLD MAN will soon be bringing you news and pictures from that rare state of Idaho. These Idaho pokes are natural born 'hunters.'

Take Your Choice—Zone 4

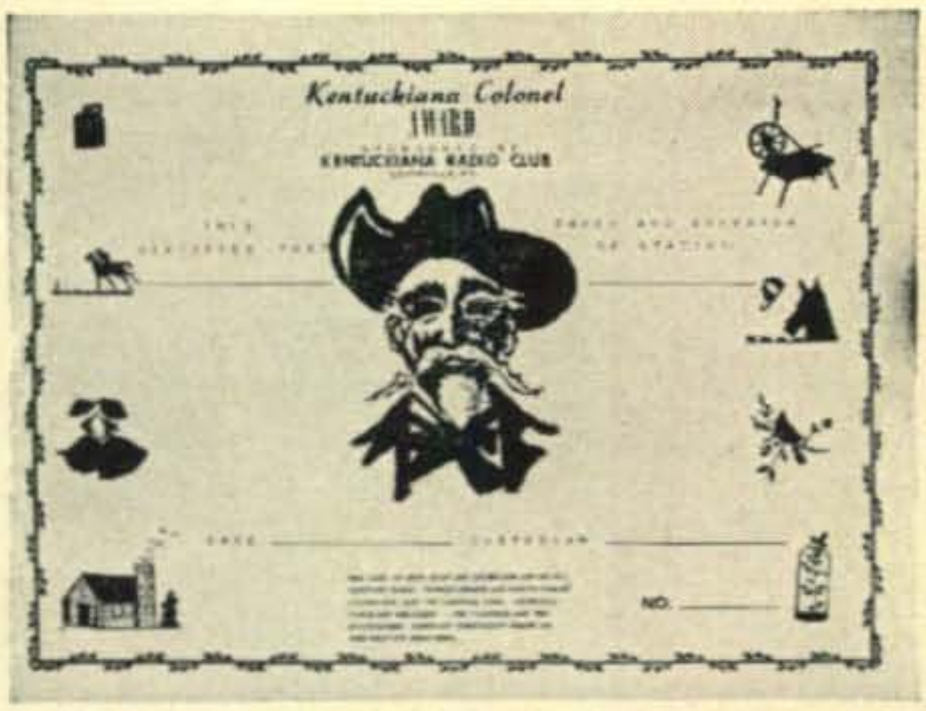
Some confusion has arisen because we ended up with two Zone 4 awards. While there is nothing wrong with two awards covering the same general territory, obviously each dilutes the value of the other. Just points up what the OLD MAN has said . . . if you are planning an award, it costs nothing to put in a query to "feel out" the situation and maybe get some factual advice.

In this issue we have pictured both Zone 4 awards with general requirements, so take your choice, *or* both.

Georgia Holds First QSO Party

Georgia, the state with 159 counties, and the state with probably the most rare counties, will hold its *first* QSO Party commencing 2300 GMT, Saturday, May 12, 1962, and ending 0500 GMT, Monday, May 14th. Awards will be given to highest scoring station in each State, Province, Country and Georgia County, plus second and third place winners if entries justify. Entries must be post-

Pictured here is the Zone 4 Award sponsored by the DX Club of Greater St. Louis, Missouri for confirmed contacts with all Districts (call areas) in Zone 4. Send GCR list (certified list), 50¢ or 3 IRC to Custodian, CHCer Art Jablonsky, WØMCX, 1022 N. Rochill Rd., Rock Hill 19, Missouri.



Pictured here is the Kentuckiana Colonel Award sponsored by the Kentuckiana Radio Club, Louisville, Kentucky, for working 15 members after Jan. 1961. All Kentucky hams are eligible to be Colonels in the Club and fees are a tremendous 10¢. What gave the OLD MAN a giggle was the caption on the certificate which says: "The land of mint juleps and bluegrass and My Old Kentucky Home. Thoroughbreds and pretty women, Golden Rod, and the Cardinal Song. Churchill Downs and the Derby—The Colonels and the Mountaineer—Kentucky hospitality makes me wish that you were here."

marked no later than May 31, 1962, and go to the Columbus Amateur Radio Club, Inc., c/o CHCer Rusty Epps, K4BVD, 1638 Forest Avenue, Columbus, Georgia.

Suggested frequencies are 3595, 3995, 7060, 7260, 14060, 14260, 21060, 21310, 28060 and 28560 kc.

General rules: No restrictions as to band/modes and c.w. to phone is permitted but no cross band operations. A station may be contacted only once per band. Georgia stations will identify by signing DE GA W4XXX; others call CQ GA. Each exchange consists of a QSO number RS or RST, County, State, Province or Country as applicable. Logs should show QSO number plus normal log data and info exchanged.

Scoring: Count one point for each report sent and QSLed and one point for each report received. Georgia stations will multiply the number of dif-

Pictured above is the Worked Zone 4 Award sponsored by the Ohio Amateur Radio Society and issued in ten classes covering all mode/band operations possible. W and VE stations must have confirmed contacts with VE3 through VE6 and all States located within Zone 4. (28 in all.) Others need but three of the four VE-Districts and but 21 of the States located in Zone 4. Send GCR (certified list) to Custodian, CHCer W8AJW. Jack Siringer, 2972 Calgue Road, North Olmsted, Ohio along with 50¢ or 5 IRC.

ferent states, provinces or countries worked by the total number of QSO points to determine final score. Others multiply QSO points by the number of Georgia counties worked to determine final score.

Nebraska Land Rush—No Fooling

Maybe you've read in your history books about how in the "Wild West" days, folks were permitted to engage in "Land Rushes" wherein they lined up in some adjacent town and upon fired signal . . . all went dashing toward the opened lands to stake out a claim. Well now, just like J.F.K. told you, we still have new "Frontiers" and no less than the State of Nebraska is here to prove it.

Nebraska, through Homesteader-PICONa Radio, Inc., the amateur radio society of the Greater Beatrice, Nebraska, area makes the following triple award in the interest of the *Centennial Celebration of the National Homestead Act* of 1812: (available to worldwide hamdom).

1. Each of the first five-hundred amateurs who work at least one radiotelephone, or c.w., or RTTY station operated by a member of the above-mentioned radio society, will receive a bonafide deed to one square foot of land within a tract adjacent to the original homestead site, which is known as the Homestead National Monument," located near Beatrice, Nebraska. (These deeds, which ordinarily sell for $1.50, are printed in unique form, 8½" × 14", on fine parchment stock and are ideal for display—see picture of deed.)

2. Also, the first five-hundred amateurs who work one radiotelephone, or c.w., or RTTY station as indicated in above paragraph, will receive a certificate of personal recognition for his participation in the commemoration of the First Homestead Act of 1962. (See picture.)

In adition, any amateur who works one radiotelephone, or c.w., or RTTY station as set forth under the conditions above described, will receive a first day cancellation of the First Homestead Commemorative Stamp to be issued at Beatrice, Nebraska, on May 20, 1962. Regarding this first day cancellation: Your requests must be made in writing on the QSLs which you send . . . and before May 20, 1962.

K6BX NOTE: This Nebraska contest begins concurrently with the appearance of this announcement and ends after five hundred deeds and/or certificates have been issued, or, on December 31, 1962, whichever occurs first. Okey folks . . . the shot has been fired . . . head your beams toward Nebraska and become a proud land owner, deed and all. This contest and awards program goes to illustrate what the OLD MAN has been talking about many times . . . that awards can be used to promote one's State, one's Country, one's national monuments, one's clubs, one's counties, cities and community . . . and we opine that if such is being prompted . . . then amateur radio's welfare is being enhanced.

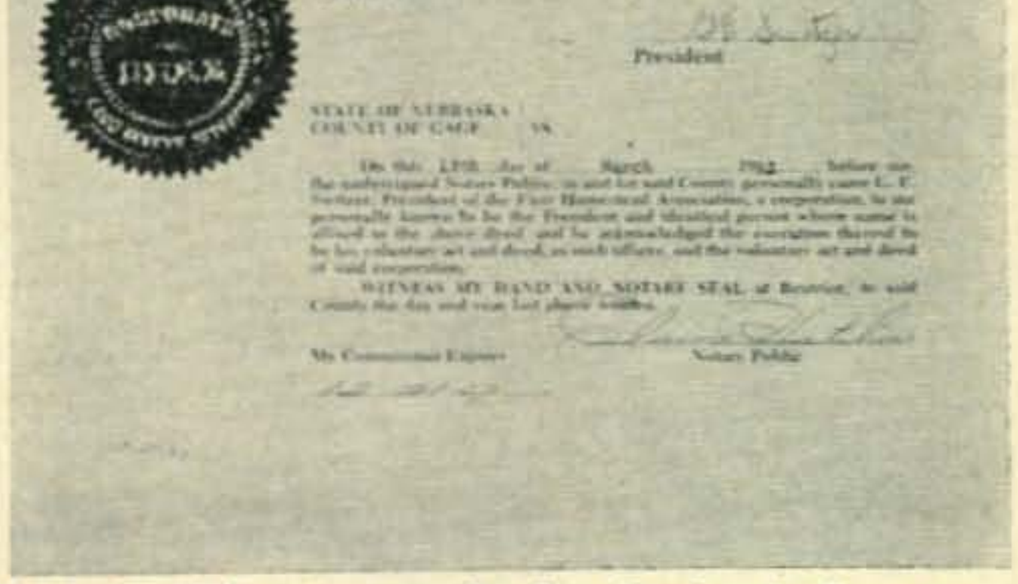
Country Cousin Outcasts—S.W.L.s

In all major countries except the United States, national level hamdom leaders and organizations recognize short wave listeners as members of a common and mutual fraternity. In these other countries the s.w.l. is included in hamdom programs wherever possible and the s.w.l. is considered the embryo from which hams are born. He is actively encouraged to become a ham.

We won't go into the illogical past policy of our leaders in this matter, but we will question the wisdom of its continuance in this atomic and space age when 'progress' threatens the very survival of many of our privileges. It is now time that the ARRL s.w.l. curtain be lifted.

Let's take a look at the dangerous aftermath of


Certificate of Appreciation


DEED

BETWEEN

FIRST HOMESTEAD ASSOCIATION

A corporation organized and existing under the laws of the State of Nebraska of Beatrice, Gage County, Nebraska, Party of the First Part, and

A. S. BURMAN, MRTJ, MITO

party of the second part.

WITNESSETH: That for a valuable consideration fully paid, the receipt of which is hereby acknowledged, the Party of the First Part has bargained and sold, and does hereby convey, unto the Party of the Second Part the following described tract of land in Gage County, Nebraska, to-wit:

Section Number 44 - 5A

As shown by description recorded in the office of the Register of Deeds, Gage County, Nebraska, this being a portion of a tract of land owned by Daniel Freeman and his wife, Agnes S. Freeman, in the year of 1867, such land joining the original Homestead of Daniel Freeman and located in the same section thereof, to-wit:

Section 26, Township 4 N., Range 5 E., Gage County, Nebraska

The title of the said Party of the First Part having been derived from Frank Thimm and Emily H. Thimm, his wife, by warranty deed, such being filed of record August 26, 1961, in the office of the Register of Deeds of Gage County, Nebraska, in Deed Book 189, Page 702.

To have and to hold the same unto the Party of the Second Part in fee simple with covenant of General Warranty.

In testimony whereof, witness the signatures and corporate seal of the First Party this 13th day of March, 1962.

FIRST HOMESTEAD ASSOCIATION

ATTEST:

President

STATE OF NEBRASKA)
COUNTY OF GAGE) SS

On this 13th day of March 1962 before me the undersigned Notary Public, in and for said County personally came L. F. Herbert, President of the First Homestead Association, a corporation, to me personally known to be the President and identical person whose name is affixed to the above deed and he acknowledged the execution thereof to be his voluntary act and deed, as such officer, and the voluntary act and deed of said corporation.

WITNESS MY HAND AND NOTARY SEAL at Beatrice, in said County the day and year last above written.

My Commission Expires Notary Public

The beautiful 8½ × 11", gold bordered certificate on the left will be given to the first five-hundred amateur stations of the world that contact a member of he Homesteader-PICONa, Inc., an association of Radio Amateurs and their supporting colleagues in The Greater Beatrice, Nebraska Area, the site of the First Homestead in the United States of America. Pictured right is a bonafide Nebraska Land Deed for one square foot of land in Section 26, Township 4 N., Range 5 E., Gage County, Nebraska as filed and recorded in the office of the Register of Deeds of Gage County, Nebraska, in Deed Book 189, Page 702. Five hundred such parcels of land have been offered FREE to amateurs of the world . . . see story above.

the League's past irrational policy which, over the years, has wrongly denied s.w.l. 'kin' to amateur radio and thereafter banned the s.w.l. like an outcast. Today there are around 220,000 licensed hams . . . today Citizen Band licenses exceed this number and within a year will be twice that of amateurs. There is no stopping the CBers . . . they represent mass citizen public interest needs and we might as well face such facts. In a short tomorrow CBers will outnumber hams ten to one . . . tomorrow, cars will be coming off the assembly lines fully equipped with optional CB gear and commercial interests will thrust CB upon the public in volume. The CBers will organize . . . many CB journals will spring up overnight, and once organized, by their very nature, CBers will present a tremendous political power. What threat does this pose to amateur interests? What happened to our 27 mc band? Where will a million CBers go? What channels will they seek to obtain through political pressure in an equalization process? Where else can they go except on one or another of our ham bands? Are we fools to believe that hamdom occupies some exalted secure position in the public domain? Could not CBers take over many of our Civil Defense and disaster functions? Who's kidding who? What is in the public interest?

You ask what has this to do with the League's past policy in denial of s.w.l. kin? Plenty. S.w.l.s, are clammering to be admitted into our house where they rightfuly belong. Several million s.w.l.s by association can influence other citizens who also vote. Tomorrow, amateur radio in the U.S. becomes a 'minority' group and the CBers a majority group, unless we have the foresight to organize the masses of s.w.l.s into our fraternal ranks where they belong.

Too many hams have been led by propaganda to believe that the FCC, petitioned by the League, has power to solve all our problems and that all we have to do is support the League and all will be well. This may have been true to some degree in the *past* . . . but not tomorrow. The true facts of the situation are that FCC does not make the laws that govern radio communications. FCC is a regulatory body which, within laws passed by Congress, regulates and, within such laws, interprets and enforces the laws. It is Congress that passes the kind of laws that might take communication channels away from us and give them to CBers. CBers will get what they can pressure FCC to give them within FCC's authority, and when that is not satisfying, the CBers will go to Congress to get, by law, what they want. That is exactly what hamdom's faced within a not too distant future.

If you have followed Congressional action in other controversial public interests matters, you already will have perceived that Congress pays very little attention to the recommendations of a government agency . . . cares less for organizations like the League, and makes its decisions pretty much along party lines or the pressures of mass opinion. The retention of many hamdom privileges and channels in the future depends, not so much, on what happens at international conference tables, as it does right at home, warding off the Citizens' Band grabs that are sure to come. Make no mistake, CB is here to stay and CB commercial aspects make it a major public interest . . . it is not just a case of 'if' we are to lose some of our bands but, with increased political strength, how much can we salvage. Today, hamdom has little political lobbying strength and is too few in numbers to sway a Congress.

Dr. Aaron Schlechter, K3OEC, left, receives the first PAGODA Award of the Reading Radio Club presented by Steward J. Ringler, W3EYN, right, club President. Smiling approval is Albert J. Brailer, W3UQC, Secretary. See picture story about PAGODA award.

That brings us right back to our 'blood' kin, the thousands of s.w.l.ers who would be more prone to support hamdom's cause than the CB cause when political pressures are the order of the day.

Let our League review the errors of its past s.w.l. curtain-policy in the light of immediate and pending threats . . . let there be more effectual light and truths with re-education of U.S. hamdom as to the facts of our kin to the s.w.l. fraternity . . . let us waste no time welcoming the masses of s.w.l. citizens back into our family where they rightfully belong, and let us thereafter enlist their mass support for amateur causes.

Leaping the U.S. SWL Curtain

Regardless of the U.S. s.w.l. Curtain, both hams and s.w.l.s have been leaping the 'leadership' barriers on a person-to-person basis, acting as a free press.

As General Dwight D. Eisenhower recently said in his Liberty Memorial Rededication speech immediately following his acceptance of the Chairmanship of the People-to-People Program from President Kennedy.

"The People-to-People Program should be, on our side, an effort to learn more about and understand our fellows, accompanied by an expanding crusade to portray the American way, the American system, the American people as was done by the hospital ship *Hope* . . . in all areas of our national being, cultural and intellectual, recreational and social, professional and economic . . . so doing, we shall help the world's peoples to achieve mutual understanding based on *truth* proudly and fully understood." But General Eisenhower has said even more; "If we are going to take advantage of the assumption that all people want peace, then the problem is for people to get together and *leap* governments . . . if necessary to *evade* governments . . . to work out not one method, but thousands of methods by which people

The Texas County Award, pictured above is sponsored by the Dallas Amateur Radio Club for working various numbers of Texas' bountiful and somewhat 'rare' 254 counties. No wonder a mobileer takes two days, border-to-border. In the center of the certificate, not too well shown because yellow doesn't photograph well, is a Texas cowpoke on a large bucking bronko . . . and dog gone, OLD MAN'S eyes might be deceiving him . . . but believe he's pullin' leather.

The PAGODA Award issued by the Reading Radio Club of Reading Pennsylvania for confirmed contacts with ten club members. No charge. Contacts to be after August 13, 1961; otherwise no restrictions. Send list with log data to Club Sect'y, Al Brailer, W3UQC at Club's QTH, 133 Thron Street, Reading, Pa.

can gradually learn a little bit more about each other."

Today, in spite of the s.w.l. curtain, tens of thousands of U.S. hams are 'communicating' with millions of s.w.l.s the world over . . . each time a ham talks, hundreds listen . . . to the end, today, millions are listening and learning truths.

Two years ago when the OLD MAN took over the publication of the copyrighted *Directory of Certificates and Awards,* the U.S. s.w.l. curtain was so tight that only a few U.S. hamdom achievement awards were available to s.w.l.s. To bring about an end to this hoax and farce, the *Directory* set about creating a s.w.l. Section with an active campaign to induce sponsors of U.S. and other awards to include s.w.l.s in their programs. Today, hundreds of sponsors have made what once were strictly amateur awards, available to our s.w.l. cousins on a heard basis. Each day a sponsor sees the light. The tide is turning.

Because of our efforts in this field, we receive hundreds of letters from overseas s.w.l.s voicing thanks for our interest in s.w.l.s and all the good will, people-to-people contacts it promotes. It can be said that the USA-CA Program also is a People-to-People Program, and sets in motion a good will machine which facilitates millions of contacts equally accommodating both amateurs and s.w.l.s and all folks within their influence. USA-CA could be called "Goodwill Unlimited" as it breaks down all 'curtains' and barriers, People-to-People, and its very basis carries a story of truths.

QSL Card Economy

The tremendous upsurge in desire of people to meet people both over the air and through correspondence exchange, precipitated both by the challenge of the 'hunt' and a natural desire of People-to-People, has introduced a need for mass availability of an appropriate QSL card on a truly economic basis. Hamdom had such a card at one time but its sponsors dropped it, and all hamdom felt the loss. It is hoped another sponsor with economic capacity will step forward and provide this urgently needed service.

Behind The USA-CA Scenes

Folks seem always interested in "What's Cooking" . . . it seems to whet the appetite. Well now, let's see, we have in the pot, County awards for South Dakota, Kentucky, Alabama, Idaho and maybe the couple that's left . . . so be patient and these good folks will start pulling their USA-CA oar in due time.

We've got this need for mass availability of QSLs in the pot; we know the urgent need exists from our correspondence, but so far we haven't sold a sponsor on the idea it would bring excellent Public Relations returns. We tell them a right kind of deal from the right kind of sponsor would bring undying gratitude from all hamdom and also SWLdom . . . tell you what, if you want such QSL cards in bulk at reasonable cost . . . flood the OLD MAN with letters and cards on the subject and we will use this as added ammunition in inducing sponsorship. Okey folks, we'll sell the idea to lowest bidder.

The pot is full of the OLD MAN's favorite concoctions however, that Bloke Editor in New York keeps saying we are supporting RCC by too lengthy gab, so guess it's about time to turn the fire down on the pot and let things simmer 'til next month.

Don't forget the 13th is Mother's day and that also means XYL day, so don't spoil a whole year's fun by forgetfulness. Take time out from hobbies on the 13th long enough to show that you do care.

Speaking of communication history . . . and transportation is communications, did you know that the Transcontinental Railway in the U.S. was completed this month, 1869, so few years ago. Also, the first steamship, flying the American flag, arrived crossing the Atlantic, in May 1819. Then Lindbergh landed this month, 1927, in Paris. And the 30th is Memorial Day.

Let's hear from you . . . pro or con . . . matters not . . . just so we don't have to hold our fingers up to find out which way the wind is blowing. Send us awards information and supporting pictures . . . as you already found out, USA-CA is a tremendous Program, and give the OLD MAN opportunity, he'll plant the flag of truths on the Moon and elsewhere.

Thanks for listening folks. Be with you in June even tho the annual CHC/HTH QSO Party comes right at time we get this column out . . . June 1st through 4th, see our CALENDAR this month. So with hamdom's joyful cry of 'Good Hunting" we say, CUL.

THE OLD MAN, K6BX

Space Communications

GEORGE JACOBS, W3ASK
11307 CLARA STREET,
SILVER SPRING, MARYLAND

This month's column contains a recapitulation of the entire space picture as it looked as of March 15, 1962.

Since October 4, 1957, that historic day when the first artificial earth satellite was successfully launched, 106 satellites* have been rocketed through the earth's atmosphere into space. Of these, 43 are presently in orbit. Radio transmitters in 10 of the satellites presently in orbit are still on the air relaying back to earth valuable scientific data.

Space Log

A complete listing of successful satellite launchings, and what has happened to the satellites since launchings, is given in the tables beginning on the next page. This Log is compiled from official data released by the National Aeronautics and Space Administration (NASA).

Each successful launch is designated officially in alphabetical order, in accordance with the Greek alphabet. Each year the designation begins over again with the letter Alpha, the first in the Greek alphabet. If more than a single object orbits as a result of the launching (multiple satellites, rocket casings or other debris), the alphabetical designation is broken down further into numerical sequence. For example; the TIROS 4 satellite has been designated 1962 BETA 1, while the rocket body which went into orbit with the satellite is designated BETA 2, and two other large pieces of debris which also went into orbit as a result of the TIROS launch are designated BETA 3 and BETA 4.

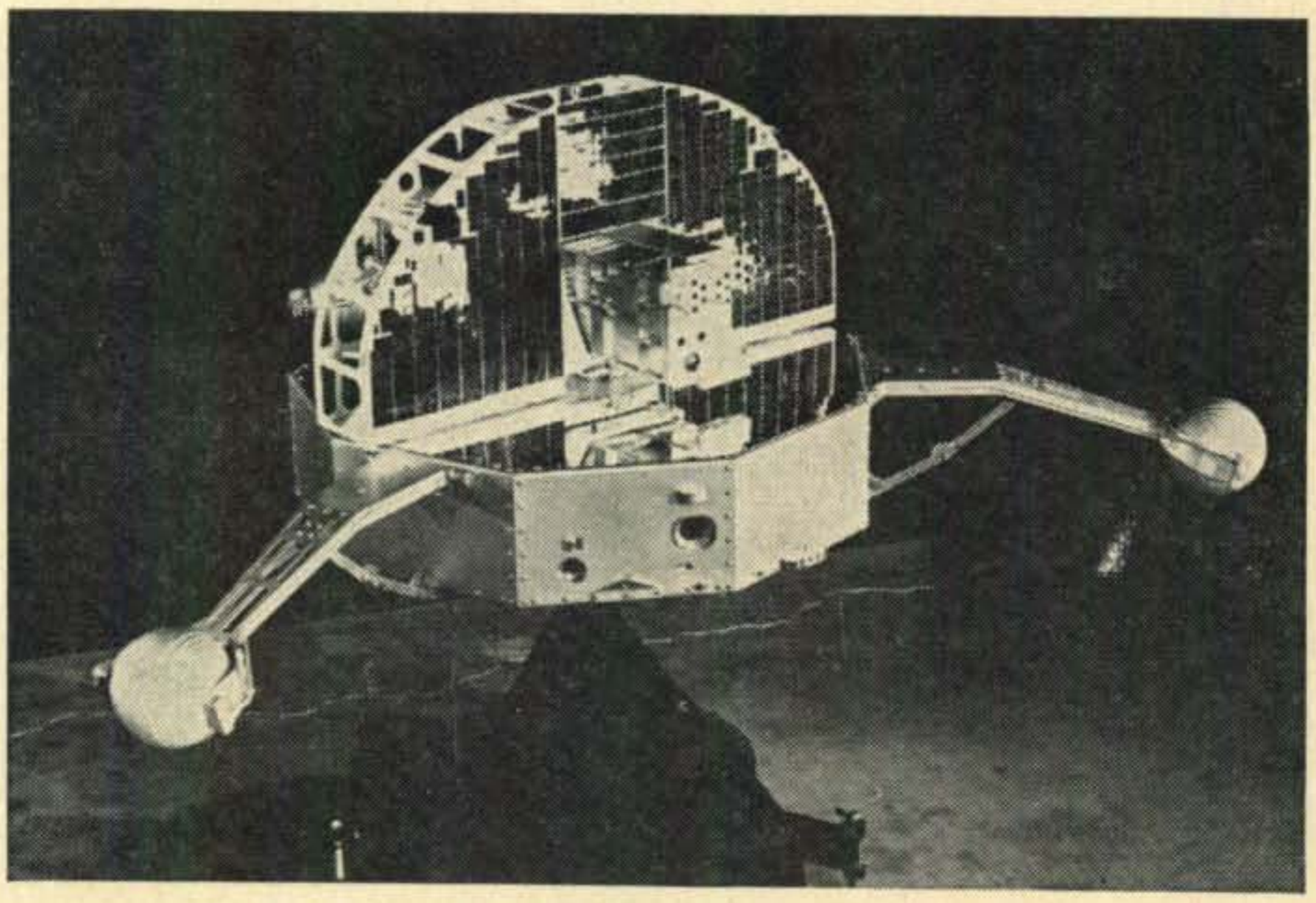
Besides its official designation, which is agreed upon internationally, each satellite usually has a common name, or project name, assigned to it by the launching country. Sputnik and Lunik have been among the common names chosen by the U.S.S.R. for many of its satellites, while U.S. satellites usually bear names such as Discoverer, Explorer, Oscar, etc.

Also shown in the Space Log are the inclination and period for each satellite presently in orbit. The inclination is the angle the satellite's orbit makes with the equator; the period is the time it takes for a satellite to complete an orbit around the earth. The Log also lists frequencies for those satellites that are still transmitting data back to earth.

The Score

Of the 106 satellites placed successfully into orbit through March 15, 1962, 90 are credited to the United States and 16 to the Soviet Union. The U.S. has orbited 90 satellites with 67 successful launchings (many of the U.S. launchings contained multiple satellites), and the Soviet Union has had 16 successful launchings. Forty of the American satellites are presently in orbit, as are 3 of the Russian's. The U.S. has successfully placed 3 satellites into orbits around the sun, while 2 Russian satellites are in solar orbits. Russia so far has been the only country to land a satellite on the surface of the moon. Three men have successfully orbited the earth in artificial satellites; two Russians (Gagarin and Titov), and one American (Glenn).

*This number includes 90 satellites, 15 capsules and a nose cone, all of which have been orbited successfully. In addition, hundreds of pieces of rocket carriers and other debris have also gone into orbit as "space junk."



Orbiting Solar Observatory satellite which was successfully launched by NASA on March 7. When commanded, the satellite transmits stored data from instruments aboard the 458-pound payload on a frequency of 136.74 mcs. The same frequency is used for tracking purposes. (Official NASA Photo)

DECAYED OBJECTS

As of March 15, 1962

Object	*Name*	*Launched By*	*Launch Date*	*Burn-Up Date*	*Comments*
1957 ALPHA 2	SPUTNIK 1	USSR	4 Oct 57	Early Jan 58	
1957 BETA 1	SPUTNIK 2	USSR	3 Nov 57	14 Apr 58	
1958 GAMMA 1	EXPLORER 3	US	26 Mar 58	28 Jun 58	
1958 DELTA 2	SPUTNIK 3	USSR	15 May 58	6 Apr 60	
1958 EPSILON	EXPLORER 4	US	26 Jul 58	23 Oct 59	
1958 ZETA 1	ATLAS	US	18 Dec 58	21 Jan 59	
1958 ETA 1	PIONEER 1	US	11 Oct 58	12 Oct 58	
1958 THETA 1	PIONEER 3	US	6 Dec 58	7 Dec 58	
1959 BETA 1	DISCOVERER 1	US	28 Feb 59	Early Mar 59	
1959 GAMMA 1	DISCOVERER 2	US	13 Apr 59	26 Apr 59	
1959 DELTA 1	EXPLORER 6	US	7 Aug 59	Prior Jul 61	
1959 EPSILON 1	DISCOVERER 5	US	13 Aug 59	28 Sep 59	
1959 EPSILON 2	CAPSULE	US	13 Aug 59	11 Feb 61	
1959 ZETA 1	DISCOVERER 6	US	19 Aug 59	20 Oct 59	
1959 THETA 1	LUNIK 3	USSR	4 Oct 59	Apr 60	
1959 KAPPA 1	DISCOVERER 7	US	7 Nov 59	26 Nov 59	
1959 LAMBDA 1	DISCOVERER 8	US	20 Nov 59	8 Mar 60	
1959 XI 1	LUNIK 2	USSR	12 Sep 59	13 Sep 59	Landed on Moon.
1960 DELTA 1	DISCOVERER 11	US	15 Apr 60	26 Apr 60	
1960 THETA 1	DISCOVERER 13	US	10 Aug 60	14 Nov 60	
1960 THETA 1	CAPSULE	US	10 Aug 60	11 Aug 60	Re-ent. & Recov.
1960 KAPPA 1	DISCOVERER 14	US	18 Aug 60	16 Sep 60	
1960 KAPPA 1	CAPSULE	US	18 Aug 60	19 Aug 60	Re-ent. & Recov.
1960 LAMBDA 1	SPUTNIK 5	USSR	19 Aug 60	20 Aug 60	Re-ent. & Recov.
1960 MU 1	DISCOVERER 15	US	13 Sep 60	18 Oct 60	
1960 MU 1	CAPSULE	US	13 Sep 60	15 Sep 60	Re-ent., Recov. failed.
1960 OMICRON 1	DISCOVERER 17	US	12 Nov 60	23 Dec 60	
1960 OMICRON 1	CAPSULE	US	12 Nov 60	14 Nov 60	Re-ent. & Recov.
1960 RHO 1	SPUTNIK 6	USSR	1 Dec 60	2 Dec 60	
1960 SIGMA 1	CAPSULE	US	7 Dec 60	10 Dec 60	Re-ent. & Recov.
1960 SIGMA 1	DISCOVERER 18	US	7 Dec 60	2 Apr 61	
1960 TAU 1	DISCOVERER 19	US	20 Dec 60	23 Jan 61	
1961 BETA 1	SPUTNIK 7	USSR	4 Feb 61	26 Feb 61	
1961 GAMMA 3	SPUTNIK 8	USSR	12 Feb 61	25 Feb 61	
1961 ETA 1	TRANSIT 3-B & LOFTI	US	22 Feb 61	30 Mar 61	
1961 THETA 1	SPUTNIK 9	USSR	9 Mar 61	9 Mar 61	Re-ent. & Recov.
1961 IOTA 1	SPUTNIK 10	USSR	25 Mar 61	25 Mar 61	Re-ent. & Recov.
1961 MU 1	VOSTOK 1	USSR	12 Apr 61	12 Apr 61	Manned flight
1961 XI 1	CAPSULE	US	16 Jun 61	18 Jun 61	Re-ent. & Recov.
1961 XI 1	DISCOVERER 25	US	16 Jun 61	12 Jul 61	
1961 PI 1	DISCOVERER 26	US	7 Jul 61	5 Dec 61	
1961 PI 1	CAPSULE	US	8 Jul 61	9 Jul 61	Re-ent. & Recov.
1961 TAU 1	VOSTOK 2	USSR	6 Aug 61	7 Aug 61	Manned flight
1961 PHI 1	RANGER 1	US	23 Aug 61	30 Aug 61	
1961 CHI 1	EXPLORER 13	US	25 Aug 61	28 Aug 61	
1961 PSI 1	DISCOVERER 29	US	30 Aug 61	10 Sep 61	
1961 PSI 1	CAPSULE	US	30 Aug 61	4 Sep 61	Re-ent. & Recov.
1961 OMEGA 1	DISCOVERER 30	US	12 Sep 61	11 Dec 61	
1961 OMEGA 1	CAPSULE	US	12 Sep 61	15 Sep 61	Re-ent. & Recov.
1961 ALPHA ALPHA 1	MA-4 (Mercury)	US	13 Sep 61	13 Sep 61	Re-ent. & Recov.
1961 ALPHA BETA 1	DISCOVERER 31	US	17 Sep 61	26 Oct 61	
1961 ALPHA GAMMA 1	DISCOVERER 32	US	13 Oct 61	13 Nov 61	
1961 ALPHA GAMMA 1	CAPSULE	US	13 Oct 61	14 Oct 61	Re-ent. & Recov.
1961 ALPHA DELTA 2	NOSE CONE	US	21 Oct 61	5 Dec 61	
1961 ALPHA ZETA 1	DISCOVERER 35	US	15 Nov 61	3 Dec 61	
1961 ALPHA ZETA 1	CAPSULE	US	15 Nov 61	16 Nov 61	Re-ent. & Recov.
1961 ALPHA THETA 1	RANGER 2	US	18 Nov 61	20 Nov 61	
1961 ALPHA IOTA 1	MA-5 (Mercury)	US	29 Nov 61	29 Nov 61	Re-ent. & Recov.
1961 ALPHA KAPPA 1	CAPSULE	US	12 Dec 61	16 Dec 61	Re-ent. & Recov.
1961 ALPHA KAPPA 2	OSCAR	US	12 Dec 61	31 Jan 62	
1962 GAMMA 1	FRIENDSHIP- 7	US	20 Feb 62	20 Feb 62	Manned flight
1961 ALPHA KAPPA 1	DISCOVERER 36	US	12 Dec 61	8 Mar 62	
1962 EPSILON 1	CAPSULE	US	27 Feb 62	3 Mar 62	Re-ent. & Recov.

OBJECTS IN ORBIT
As of March 15, 1962

Object	*Name*	*Launched By*	*Launch Date*	*Period (Minutes)*	*Inclination (Degrees)*	*Transmitting Frequency (Mc)*
1958 ALPHA 1	EXPLORER 1	US	1 Feb 58	105.8	33.2	
1958 BETA 2	VANGUARD 1	US	17 Mar 58	134.0	34.3	108.024
1959 ALPHA 1	VANGUARD 2	US	17 Feb 59	125.3	32.9	
1959 ETA 1	VANGUARD 3	US	18 Feb 59	130.0	33.4	
1959 MU	LUNIK 1	USSR	2 Jan 59	Orbiting Sun		
1959 NU	PIONEER 4	US	3 Mar 59	Orbiting Sun		
1959 IOTA 1	EXPLORER 7	US	13 Oct 59	101.0	50.3	19.991
1960 ALPHA	PIONEER 5	US	11 Mar 60	Orbiting Sun		
1960 BETA 2	TIROS 1	US	1 Apr 60	99.00	48.4	
1960 GAMMA 2	TRANSIT 1B	US	13 Apr 60	94.60	51.3	
1960 EPSILON 1	SPUTNIK 4	USSR	15 May 60	91.00	65.0	
1960 ZETA 1	MIDAS 2	US	24 May 60	94.20	33.0	
1960 ETA 1	TRANSIT 2A	US	22 Jun 60	101.6	66.7	162, 216
1960 ETA 2	GREB	US	22 Jun 60	101.6	66.7	
1960 IOTA 1	ECHO 1	US	12 Aug 60	116.3	47.3	
1960 NU 1	COURIER 1B	US	4 Oct 60	107.0	28.3	107.971
1960 XI 1	EXPLORER 8	US	3 Nov 60	112.5	50.0	
1960 PI 1	TIROS 2	US	23 Nov 60	98.20	48.5	
1961 ALPHA 1	SAMOS 2	US	31 Jan 61	95.00	97.4	
1961 GAMMA 1	VENUS PROBE	USSR	12 Feb 61	Orbiting Sun		
1961 DELTA 1	EXPLORER 9	US	16 Feb 61	118.0	38.8	
1961 EPSILON 1	DISCOVERER 20	US	17 Feb 61	92.30	80.9	
1961 ZETA 1	DISCOVERER 21	US	18 Feb 61	91.40	80.7	
1961 KAPPA 1	EXPLORER 10	US	25 Mar 61	Position Uncertain		
1961 LAMBDA 1	DISCOVERER 23	US	8 Apr 61	90.70	82.2	
1961 LAMBDA 2	CAPSULE	US	8 Apr 61	94.00	81.9	
1961 NU 1	EXPLORER 11	US	27 Apr 61	107.8	28.8	
1961 OMICRON 1	TRANSIT 4A	US	29 Jun 61	103.8	66.8	54, 150, 324,
1961 OMICRON 2	INJUN-SR-3	US	29 Jun 61	103.8	66.8	400, 136.5
1961 RHO 1	TIROS 3	US	12 Jul 61	100.3	47.9	
1961 SIGMA 1	MIDAS 3	US	12 Jul 61	161.5	91.5	
1961 UPSILON 1	EXPLORER 12	US	12 Aug 61	1590.8	33.9	
1961 ALPHA DELTA 1	MIDAS 4	US	21 Oct 61	166.00	95.9	
1961 ALPHA EPSILON 1	DISCOVERER 34	US	5 Nov 61	95.70	82.5	
1961 ALPHA ETA 1	TRANSIT 4-B	US	15 Nov 61	105.6	32.4	136.8, 54, 324, 150, 400
1961 ALPHA ETA 1	TRAAC	US	15 Nov 61	105.6	32.4	136.65, 54, 324
1961 ALPHA LAMBDA 1	NONE	US	22 Dec 61	94.10	89.6	
1962 ALPHA 1	RANGER 3	US	26 Jan 62	Orbiting Sun		
1962 BETA 1	TIROS 4	US	8 Feb 62	100.3	48.3	136.23, 136.92, 235, 237.8
1962 DELTA 1	NONE	US	21 Feb 62	No information available		
1962 EPSILON 1	DISCOVERER 38	US	27 Feb 62	89.70	82.2	
1962 ZETA 1	ORB. SOL. OBS 1	US	7 Mar 62	95.80	32.9	136.744
1962 ETA 1	NONE	US	7 Mar 62	No information available		

Spacewarn Frequencies

Through the cooperation of the Voice of America, special space news broadcasts prepared by CASPAR are transmitted on shortwave six days a week (Monday through Saturday) from 10:30 to 10:35 P.M. Eastern Standard Time. These broadcasts contain latest information (including orbital data and radio frequencies) on new satellite launchings, and up-to-the-minute revised statistics on satellites already in orbit. The Committee on Space Research of International Scientific Unions (COSPAR), sponsor of these broadcasts, is an international body responsible for the coordination of rocket and satellite projects on a world-wide basis. The U.S. National Academy of Sciences participates in the work of COSPAR on the behalf of the United States.

Charles "Rockets" Gross, 8-year old space enthusiast of Silver Spring, Maryland, holding the OSCAR II radio amateur satellite. There is a good chance that OSCAR II will be launched during May, 1962.

These broadcasts, called SPACEWARN, are intended mainly for tracking stations and scientific organizations in Central and South America. The broadcasts, however, should be received well in many other areas of the world, especially if a good communications receiver is used.

SPACEWARN broadcasts are in English, and should prove of interest to anyone desiring latest launching and orbital information concerning OSCAR II (once it is in orbit). The following schedule for SPACEWARN broadcasts is expected to be in effect from May 6 through September 1, 1962:

9650 Kc	WIWO	15270 Kc	WDSI
9750 Kc	WBOU	15290 Kc	WIWO
11830 Kc	WBOU	15325 Kc	WBOU

73, George, W3ASK

sideband sideband sideband

SIDEBAND

IRV and DOROTHY STRAUBER,
K2HEA/K2MGE
12 ELM STREET, LYNBROOK, NEW YORK

SSB DX HONOR ROLL

T12HP	261	W2LV	203
VQ4ERR	258	PZ1AX	201
W8PQQ	255	W3LMA	200
W8EAP	254	TG9AD	200
W6UOU	245	K1EJO	200
W2ZX	244	W2VZV	198
W2FXN	240	W2YBO	194
WØQVZ	236	K6LGF	188
K9EAB	235	G8KS	186
K2MGE	229	G2BVN	185
W2JXH	228	W1AOL	183
W6PXH	227	K2FW	181
K8RTW	226	W5RHW	180
K4TJL	226	K4PUS	179
W4OPM	225	K6MLS	177
W6RKP	224	K4AJ	176
MP4BBW	224	G3NUG	175
W6BAF	219	W1ORV	175
W6WNE	218	PJ2AA	170
W3MAC	213	K4ASU	168
W5IYU	209	W7DLR	165
WØCVU	206	WØPGI	163
K6ZXW	206	WA6HOH	160
W3KT	205	K2TDI	159
WØUUV	205	W2BQM	155

CQ SSB STICKERS AND CERTIFICATES

Worked 225
K4TJL

Worked 175
K4AJ

Worked 125
K8ONV W3ICQ

Worked 100
*K6VVA UA3CG
KP4AQQ DL3DW
W8CIQ OH2NB
W2MOF OE1FF
YN1TAT ZS7P

Worked 75
*K6VVA

Worked 50
*K6VVA UW9CC
W1FJJ K8BTL/6
WA6KNE

*As of August, 1961

IN last month's column on 20 meter operation, we quoted from a plan advocated by Dale Kentner, W2ZX. Inadvertently, a sentence was omitted which Dale felt changed the meaning of his proposition and that was that there be "adjacent W 'DX listening' regions on the high side for s.s.b. DX and on the low side for a.m. DX (as before)". Dale also pointed out that it was not his intention to box all the s.s.b. DX stations up in the top 20 kc of the band but rather to reserve this section for rare DX and DXpeditions to transmit off frequency to Ws, if they choose to use it. "As always, most foreign stations can legally operate phone anywhere from 14000 to 14350, and, if a foreign s.s.b. DXer wishes to accept W calls 'on frequency' in the W portion of the s.s.b. band, he is free to do so."

While we can see exactly what Dale is driving at and appreciate the great amount of work he has done to bring his views to the attention of sidebanders and ARRL officials, recent practice on our part has confirmed the practicality of moving down the band from 14270 and working foreign stations in the 14100 to 14150 segment. Despite the efforts of some a.m. stations to deliberately interfere by throwing their carriers on the frequency, contacts were maintained for a satisfactory limit and without the difficulty of copying through local strong W sideband activity. All we can say is that we've tried it and it works; how about *you* moving down as low as 14250 and listening down the band for your DX contacts?

V.H.F. Gets A Shot In the Arm

We've been having a ball at our house with the new Hallicrafter HA-2 Transverter the past couple of weeks! If you still haven't heard of this magic box, it's a two meter sideband converter to be used in conjunction with a 28-30 mc transmitter/exciter and receiver. We expect that Don Stoner, W6TNS, will review the unit

We are delighted to bring you this fine photograph of Mirko Vosnjak, YU1AD, of Belgrade, Yugoslavia, for many years the only YU station on sideband. A superior technician and operator, Mirko's appearances on sideband recently have been infrequent due to the pressure of work but we can guarantee a wonderful contact whenever he comes on the band. His mastery of English has never ceased to amaze us!
(Photo courtesy of W4VZO)

The French have a word for it and right here it seems to be "Happiness!" The happy group above left consists of (l. to r.) Jack, F7AF; Betty, F7CR's XYL; Russ, F7CR; Jean F9ZE; and Jean, F3QZ. In the second photograph taken during an Xmas, 1961 party at the home of F9ZE, we meet Andre F2BL; and F9ZE's sister-in-law. Russ, F7CR, has been very successful in introducing sideband to many of the French hams and we look forward to much more participation of French sidebanders in the future.

with his usual technical fluency in his v.h.f. column, so we will limit ourselves to a brief description of the unit. Basically, it converts the 28-30 mc output of any exciter/transmitter, from ½ to 100 watts, to the 144 mc band and with a built in receiving converter, converts the received signal to 28-30 mc for your receiver. The unit will respond to any mode of emission of which your exciter/transmitter is capable; c.w., a.m., s.s.b., f.m., p.m., f.s.k., etc. There are two levels of input; low level or about ½ watt p.e.p. and high level for the higher powered exciters of about 25 to 100 watts. Power output is rated at 50 watts for s.s.b. and c.w.; 12.5 watts for a.m. (with carrier).

It is not our purpose to go technical, but we would like to add a bit of advice to new users. The manual suggests that you first try the high level input with your exciter; an exciter in the 10 to 20 watt class should be tried first at the high level input and if there is not enough drive, through a suitable pad to the low level input. A word of warning—a ½ watt p.e.p. is not much drive and it is very easy to over drive the unit at that input level. We are driving the unit from the exciter section of a KWS-1 and we have a surplus of driving power available. Without the pad we must watch the audio gain control very carefully to prevent overdriving and splatter. In fact, we are in the process of constructing a pad to enable us to operate with the normal setting of the audio control as used on the lower frequencies.

After several weeks on the air with the unit, we can only find praise for the designers of this unit. Not only have the reports been most flattering from the stations we have worked but the receiving section has worked beautifully with our 75A-4. Stability is of the highest order and we have been able to keep a two meter station tuned in without our hand on the receiver knob, something we haven't been able to do with a number of outboard converters tried previously. All in all, we are high on the future of s.s.b. on v.h.f. At the moment, there are too few active s.s.b. stations on 2 meters, but we venture to guess that we will see many more in the next several months. The a.m. stations we have contacted were all very much interested and after setting up their receivers to copy s.s.b., their comments ran something like this—"What did you do there? Turn on more power?"—"Holy Cow!! You almost knocked the receiver off the table!!!" The acid test was passed one evening when, after trying to make contact with W3UCA, about 140 miles away, on a.m., I switched to s.s.b. and from then on, it was Q-5 all the way!!

The HA-6, the six meter transverter, will make its appearance about the time you read this and we have hopes of putting one on 6 meters to try that band. We are real curious to see the effects of s.s.b. on TV in our neighborhood. There has been no trouble from the HA-2 thanks to the suppression measures built into the transverter and we expect that adaquate measures will be taken to insure trouble free operation of the six meter unit.

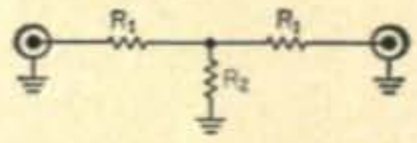


Fig. 1—Basic circuits of a padder suitable for use between the new Hallicrafters HA-2 and its companion exciter. Values for R_1 and R_2 are shown in the table below.

Below are listed several values for pads for both low level and high level input use. We suggest that you limit the output of your exciter to provide enough drive for the unit at the normal audio setting used on the exciter for low frequency use. Splatter is no more excusable on 6 or 2 meters than it is on the lower frequencies.

Exciter Output (Watts)	Input to HA-2 (Watts)	db Attenuation	R_1	R_2
100	50	3	8.55	141.9
100	25	6	16.61	66.9
20	0.5	16	36	16
15	0.5	15	35	23
10	0.5	13	30	25

Here is still another view of the Vatican amateur radio station, HV1CN, with (left) Father Ralph Bastian, K9LED, and (right) Father Len Kaufer, W7DXH/EI7DXH, at the operating controls during Spring of last year. *(Photo courtesy of W7DXH)*

While it might not be necessary to swamp the output of your exciter, should you want to make sure that you are not overdriving, the swamping might be advisable. Remember, only *non-inductive* resistors should be used. Since these values might not be available, you can parallel several different values to get near the required one.

It's amazing the different rigs you find on 2 meter s.s.b.; everyone seems to have their own way of rolling their own. Lou, W2JPW, Allendale, N.J., uses a 20-A as the s.s.b. generator, generates 130 mc with an ARC-5 and drives a 4-400A final. Ron, WA2JAM, Somerville, N.J., uses an SB-10 to help him get up to 144 mc as does "Pa," W2UM, also from Somerville. Mac, W2KDX, Glen Cove, L.I., takes a different approach; he uses an HT-32 on 21 mc and generates an injected signal at 123 mc to drive a 4CX250 final. Mac is a real "old timer" on 2 meters; he's been active on the band for 5 years!! Ben, W2QZ, a regular on 3999.9, has deserted that frequency to put, of all things, a 522 on 144 mc s.s.b.!! We had the pleasure of working Ben one evening and the conversion sounds real interesting and not too difficult. If we can convince Ben to make some time for that purpose, maybe he'll write it up for publication on these pages.

We'd like very much to hear from active or "near" operators on the v.h.f. bands; any and all contributions to help advance s.s.b. on 6 and 2 meters will be most welcome.

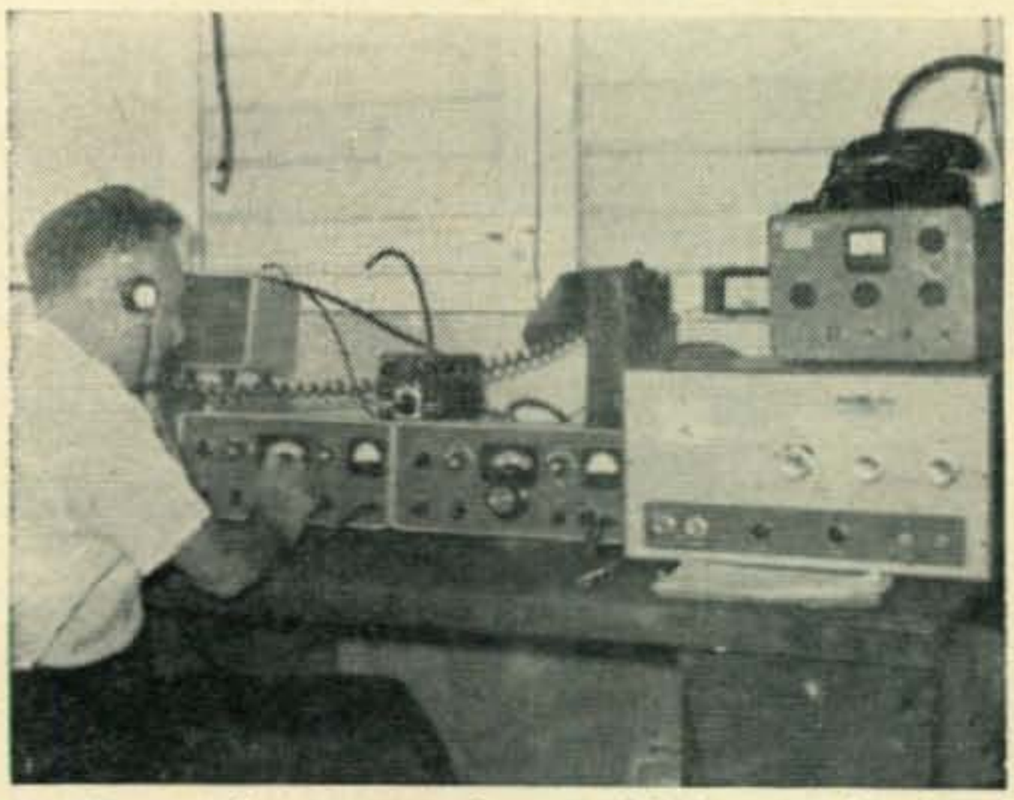
This Is News ?

Betty Kuegeman, K6UTO, sends along a clipping from the San Diego *Tribune* captioned, "New Radio Hailed" which goes on to tell about the great communication advance since the Korean War. The story tells of the use of s.s.b. by the 1st Marine Division during recent field exercises. Praising s.s.b. as of tremendous value to military communication, the suggestion is made that battery operated "man-packed" units are being thought of for the future. KWM-½?

We have before us an interesting suggestion made by a W4 station; one that had been used by our friends in ZS-land with good effect. That is the use of frequencies being used by commercial stations within the ham bands as "tune up" frequencies. It had worked very successfully for the "ZS" operators and could do the same in this section of the world. However, in this case, the commercial stations were operating in the frequency sections which were purely "ham" frequencies and had no legal right to be there. We must bear in mind, however, that some of the frequencies we enjoy the use of in this hemisphere are not "ham" frequencies in other sections of the world. We refer specifically to sections of the 75 and 40 meter bands which are given to the commercials in Europe and Africa. No matter how we feel about this, we must respect the agreements made in frequency allocations. But, where these stations are operating frequencies which are "ham" in nature, we should rightly seek to preserve them for ham use. Protests made to the FCC giving time, date, frequency are the proper way and should be followed. If enough protests are filed in this manner, we feel sure that the FCC will take the matter up with the State Department. However, who can really blame the ham who needs to tune up a transmitter in the ham bands?

Sideband Around the World

Slowly but surely, more and more of the rare areas in the world are being represented on sideband. Akin, YA8PB, (PO 6131, Kabul, Afghanistan) was worked by Barry, K2IEG in Mid-February. Akin was crystal controlled on 14.285 but Barry has since sent him additional crystals so keep your ears open. . . . Other welcome additions to the sideband fraternity are YK1AD, JT1KDA, and 9U5KU. . . Gordon, GI3-POS, who is newly licensed, has been making the most of improving band conditions and puts out a tremendous signal on 15 and 20 meters. He is a radio technician and lives 21 miles southwest of Belfast, . . . The XYL here received her Golden City Award,



World traveller, Les Harlow, W4CVO, tries his hand at operating KP4AUQ at NAS, Roosevelt Roads, Puerto Rico. This station operates in the Navy's Intercontinental SSB Net, 14.325 mc. at 1400 GMT daily. From October to December, Les worked 25 countries in North America, Europe, and South America the hard way—in person!!

thanks to the cooperation of the sidebanders in Johannesburg. You must work 15 ZS stations with "Johannesburg" in their address and have each contact confirmed to qualify for the award which is well worth framing. . . . How wonderful to welcome back Jane, ON4AD/OQ5IE to the ranks of active sidebanders. Despite the fact that her ground plane is literally "on the ground," she has been putting in a very Q-5 signal to the East Coast. We were very sorry to learn that her OM, Paul, OQ5GU, had suffered a heart attack in January, but thank goodness, is well on the road to recovery Those who may wish to remember Paul with get-well cards may write to Hiernaux, 52 Avenue Centrale, Raversyde/Middelkerke, Belgium. . . . Jonny, G3OGW, enjoys the rare distinction of being the only licensed XYL in Great Britain whom we've heard on sideband. But wonder of wonders, Jonny still prefers a.m. and will get on sideband only when OM, Bill, G3BWY, flips the switch. . . . Another DX XYL to listen for is Ilda, CT1SQ, now on sideband from Lisbon, Portugal. . . . Correspondence with Robby Kratzenberg, LX1RK, reveals the fact that he is now in traffic control with the U.N. in the Congo, with, so far, no permission to obtain a 9Q5 license. . . . Joe, EI8P, is now back on sideband with a 100V and a new Telrex beam which he hopes will help him put a potent signal into the States. . . . The Antarctica stations have again been coming through with consistent signals into the Northeast part of the USA; how wonderful to have one's CQ answered by a KC4 as early as 2230 GMT! . . . Jim, ex-VS4JT, is now in the Netherlands West Indies but has not communicated with his QSL manager, Walt, for over a year, so Walt regrets that he is no longer in position to issue any VS4JT cards. . . . We specially bought a long-playing Twist record to tape and send to Kees, PAØCS, for the benefit of his three teenaged daughters but, after listening to it, we wonder how much harm would be done to Holland-American relations if we kept our promise!! . . . Roland, SM6FB, really knocked us off our feet when he revealed that the S-9 signal he was putting into our receiver came out over an indoor antenna! . . . Now that DX conditions are showing decided signs of improvement, it's wonderful to look forward to hearing many sidebanders in foreign countries who have long been missing from the bands.

Band Hopping

George, KØRDP, has been chosen Emergency Coordinator for the upper third of the state of Minnesota and finds that his operating time has been sharply curtailed as he seeks to marshal a dependable crew of amateurs for use in emergency communications.

John Hipp, K1EJO, of New Milford, Connecticut, is our youngest sidebander to achieve the "worked 200" Certificate (much as this column's XYL hates to admit it!) An 18 year old student, John has displayed consistently excellent operating technique far beyond his years.

Here's "Mr. Phone Patch King" himself—Bob Westcott, W8DNY, of Jackson, Michigan, who has unselfishly and devotedly put the facilities of his fine sideband station at the disposal of servicemen all over the world where third party traffic is permitted

Knowing George, however, we have no doubt that his section will be ready, willing, and able under any circumstances which may arise. . . . Hearty congratulations to Bob, W4MCM, and XYL, of Atlanta, Georgia, who became proud parents for the first time during February. . . . What a pleasure to learn that Sister Emiliana, W1HUH, is now on sideband with a KWM-1. . . . Prose, WØDCA, now with the Collins Company in Cedar Rapids, is ex-W4CXA, formerly a VIP with the National Association of Broadcasters. . . . Mibbs, ex-YN1MW, is back home in Grand Forks, North Dakota, hoping to get her stateside license so that she may renew friendships made when she operated from Nicaragua. . . . One of the sweetest feminine voices that we've heard on sideband belongs to Marti, KØEPE, XYL of Pete, WØJYW, in Denver, Colorado, when this gal gets on the air, the pile-ups assume tremendous proportions! . . . And speaking of pile-ups, Bob, W2VCZ, was almost in the position of a rare DX station when he operated from aboard the U.S.S. *Randolph* right after the man shoot. Using the call, W9GBH/mm, Bob worked the callers at a furious rate and promised a special QSL card to commemorate the occasion. . . . Good luck to Mary, W2FGD, and his family who are now comfortably ensconced in a

[*Continued on page 92*]

Close-up of the operating panel of the Collins console shows how the complete system is human-engineered to offer maximum operating ease and efficiency. In the lower rear of the desk is a fan to provide additional air for the equipment. The screened panels above the three S/Line operating units are designed for easy removal so that future equipment may be installed in their slots.

ham clinic

CHARLES J. SCHAUERS, W4VZO
c/o CQ, 300 WEST 43rd ST.,
NEW YORK 36, N. Y.

We have received and are continuing to receive large amounts of mail from young students seeking assistance with their school science fair projects. Some of these students are hams who are interested in electronics.

The big question which seems to be in nearly every letter reads something like this: "Would you please suggest a project to me that would be relatively easy to build and is covered by an article which appeared in one of the electronic-radio or radio amateur magazines?"

In answering these engineers and scientists of tomorrow, we try not to duplicate suggestions. Knowing however, that science teachers monitor the efforts of their students and actively assist them with the intricate technical details envolved in project construction, we have little fear that there will be much duplication.

After reading some of the letters describing the projects which some of these young student hams have in mind to accomplish, we wonder if some of them have not taken on too great a technical load.

Before a student selects his science project he should research out his idea as fully as he can. Only he can determine whether or not he is capable of completing a project successfully. However, a complicated project done badly is better than doing no project at all. At least in the process the young technician will have learned something.

After seeing some of the projects made by Soviet students at the Brussels World's Fair in 1958, I am inclined to think that because of the easy availability of electronic components in the United States that our students are way ahead of their Soviet counterparts, contrary to what some people think. Surely, a triple conversion all-band superheterodyne receiver is a much greater accomplishment than is the construction of a simple crystal detector!

Here is a list of suggested projects for the young ham to consider for his science fair effort: 6 meter converter using the low noise Nuvistor tubes; 10 meter transistorized walkie-talkie; simple telemeter transmitter and receiver; capacity alarm system; oscilloscopic display of transistor characteristics; a tunnel diode oscillator; an emergency low power c.w. transmitter; remote camera flash unit; a simple transistorized computer; a tiny oscilloscope; a model of an ionospheric radio sounder; a device for measuring the resistivity of liquids and semi-liquids; a geiger counter; a scanning spot TV system; a transistorized vacuum tube voltmeter; a transistorized s.s.b. exciter; using the earth for audio frequency communication; using neon lamps as oscillators; a model Laser; communicating with infra-red rays; the effect of radio waves on amoeba and paramecium; super-sonic oscillators and their uses; a model electron microscope; an electronic lie detector; demonstrating computer modules; how batteries are made and how they operate; a light activated control system; using solar cells; a heat seeking missile (using infra-red rays); how submarines are detected with Sonar; a simulated radar unit; oscilloscopic analysis of s.s.b., c.w. and a.m.; using a TV set as an oscilloscope; how relays are used in telephone work; a model active communications satellite; a magnemometer for measuring the earth's magnetic field; an ion chamber (using transistors for the high voltage power supply); and an automatic star tracker.

Now there is a large amount of information on the projects just mentioned but it is not available through one source. It is necessary for the science student to do a lot of serious "digging" if he is to come up with the information he will need to come up with a project that is different. It is easy to copy another's effort but very difficult to affect the necessary modifications which make your own effort unique and original, but it can be done.

The young ham is well fitted for coming up with a project which has as its basis a thorough knowledge of basic radio-electronic principles.

Whether you are an amateur or not, HAM CLINIC will be happy to help you with your science project efforts as long as they are confined to radio-electronics. If we do not have the answers (and you can bet we will not in every case) we will direct you to a possible source.

Any student who *places* in his group at his local science fair if he is a ham and has used one of our suggestions will be awarded an additional useful prize by HAM CLINIC! Let us know!

Observation

Every month in the pages of *QST*, we who are members of the ARRL read how amateur radio was used wisely and well to save lives and property and to provide assistance in a number of emergency situations.

The ARRL sponsored AREC (Amateur Radio Emergency Corps) is a good organization and one that is needed by the nation. Aloof from selfish aims and restricted aims, politics, empire building and any other ulterior motives, it deserves individual as well as group support.

There are too many American hams who know little about the AREC because they are not interested (oddly enough) to get the facts on it. Too, some hams feel that because they belong to a local RACES or other emergency communications group that they should steer away from the AREC, we believe this is wrong thinking.

Let us not forget that regardless of what any ham thinks, the ARRL is organized, has been and is effective in doing many good things for ham radio and is internationally recognized as the representative organization of the American radio amateur. It stands solidly behind the AREC effort on a nationally organized basis.

But the AREC can only be as strong, effective and cooperative as its membership desires it to be, on a local as well as a national basis.

In these days of the "cold war" it is up to each radio amateur to be ready to use his radio equipment properly when an emergency arises. Individual effort is fine, but when it is not part of an organized effort then there is bound to be duplication, confusion and poor communication.

We do not frown on the organization of local emergency ham radio communications groups, *but these groups should liaison with the AREC* and not take the attitude that the AREC wants to "cop the credit" for a local emergency performance.

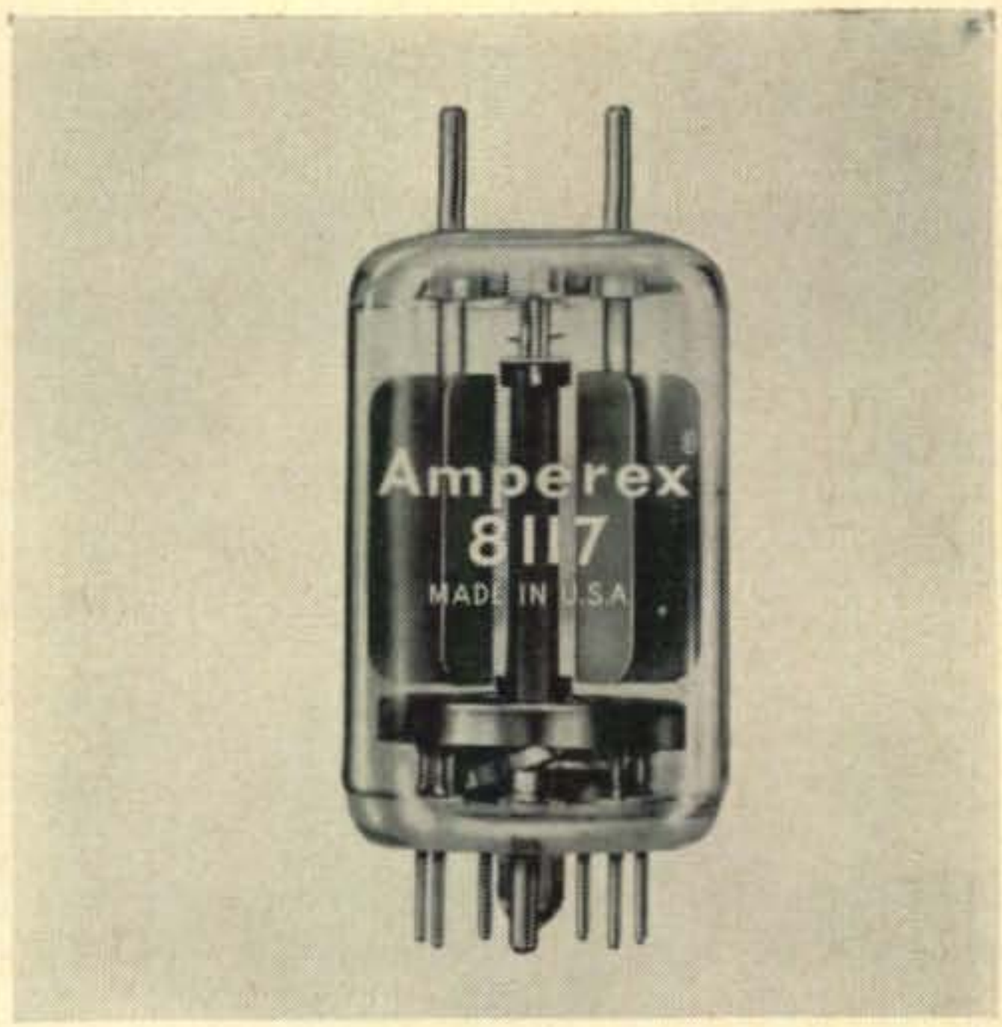
Observed: Most hams are unselfish and, when needed, are willing and able to use their communications knowledge and ham equipment for emergency communications purposes. However, a knowledge of designated national calling and emergency frequencies (see below), efficient net operating procedures and net relay station locations is needed for full operating effectiveness.

Recommended: That you do join the AREC, and if you already belong to a local emergency communications unit that you urge an active liaison with the AREC. In an emergency it is always nice to know what others are doing to prevent duplication of effort and its resultant waste in manpower, time and equipment. Do contact the ARRL for more information relative to AREC activities.

National Calling and Emergency Frequencies

The following frequencies will be monitored during a communications emergency to expedite the handling of emergency traffic. After suitable contact has been established, arrangements should be made to move immediately to another frequency for the actual traffic handling.

C.W.—3550, 7100, 14,050, 21,050, 28,100; **Phone**—3875, 7250, 14,225, 21,400, 29,640, 50,550, 145,350.



New Amperex twin tetrode designed for s.s.b. linear amplifiers.

Questions

The Amperex 8117 for S.S.B.—"I have heard that Amperex is making a new tube which they claim to have the highest efficiency ever achieved in s.s.b. tubes for linear operation. Is this true and what is it?"

The Amperex 8117, a twin tetrode designed for use as an r.f. linear amplifier in single sideband systems has a plate dissipation rating of 30 watts per anode, 50% greater than that of the 5894. It features a high reserve plate dissipation. Its p.e.p. output is 141 watts and the tube can be obtained with a 6.3 or 12.6 volts filament. The tube's high linearity is characterized by its low 3rd order intermodulation distortion which is better than 30 db down (measured without external feedback). A photo of the 8117 appears here. For more information write the Power Tube Division of the Amperex Electronic Corporation, 230 Duffy Ave., Hicksville, L.I., N.Y. This tube has, in my estimation, a very bright future.

Vertical Coax Antenna — When KH6ABH (now WA2TQR) was stationed in the French Frigate Shoals, he needed a simple antenna which did not require much material for its construction. W6DKD gave him the idea for the antenna shown in fig. 1. The dimensions are for 10 meters but it will work very well on 20 meters if connected to a transmitter having a pi-network.

Essentially, it consists of 18 feet of RG-8/U coax (plus whatever an individual needs to reach from its base to the shack), one coax connector and one insulator. To make it, cut the rubber insulation 9 feet back from the end as in figure 1A, being careful not to injure the wire shield. The length of 9 feet was picked for about a quarter wave on ten meters but it does not seem too critical. Next, turn back the wire shield, inside out and pull over the rubber insulation as shown in figure 1B. Do

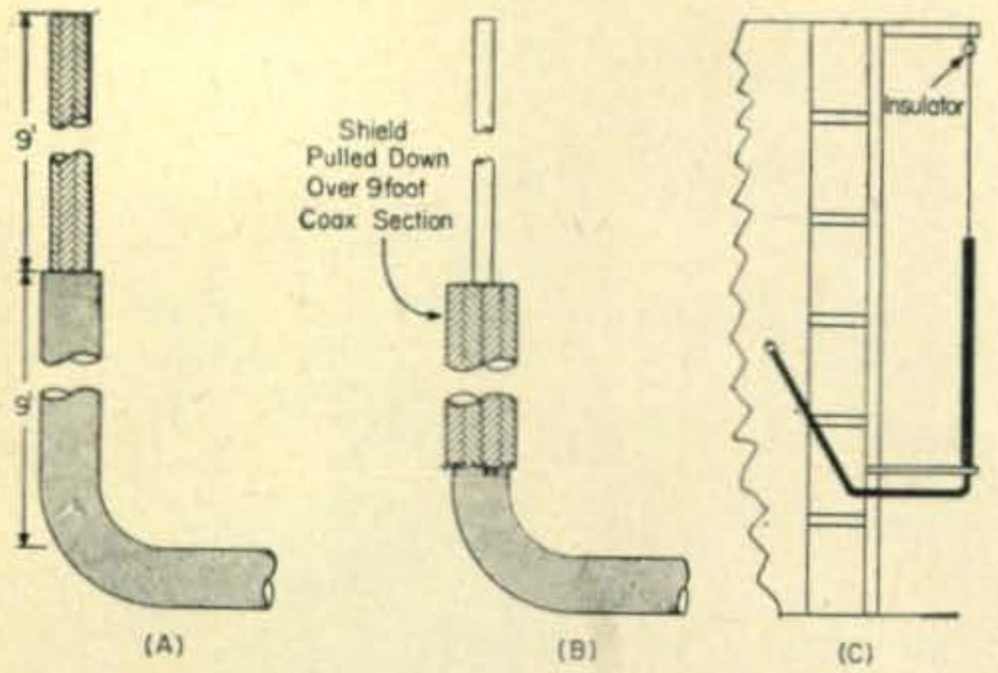


Fig. 1—Construction details of the 10 meter coaxial vertical antenna.

not remove the teflon center insulation. Put the insulator on the center conductor, the coax connector on the end that goes into the shack and you are ready to hang it. Figure 1C shows how it was hung at KH6ABH. An enclosed ladder goes up the roof of the shack. Two stand-offs were nailed to this enclosure and the antenna was mounted as shown. The bottom was eight feet above the ground, so the top of the antenna is about 26 feet in the air. The whole project took under two hours. Some of the stations worked with it were: (on 10 meters) WA6JRK, ZP9AY, KL7DRW, W9RZC and KØVBX. On 20 meters, JA2ST, KB6BS, KH6CQV, KG6AKR, ZL1HA, VR4CB and VK2AIG. Thank you so much Al Klapetzky.

Heath AR-3 Receiver—"I'd like to use my AR-3 receiver to listen in on the frequencies between 2 and 2.7 mc but it does not have enough bandspread. Can you help me? Although I'm just a novice I think I can follow any modification instructions you give me."

Thanks to Randy Kaeding here is some band-spreading info on the set. On coil DO (#40-76, oscillator coil), put a 365 mmf tuning condenser between the two windings. Use a shielded coax to make the connections from the condenser to the coil. Install the condenser in a shielded box to minimize hand capacity effects. That's all there is to it.

Scope Shielding—"I built up a 2 inch scope and it works okeh except when I place it on top of my receiver. When I do this I get pattern distortion when making modulation checks. Any hints as to my trouble?"

Yes. First check the shielding of your c.r.t. If you have no shield install one. Next, make sure that your receiver ground is a good one and that your scope is connected to the common station ground (transmitter, receiver, etc.). Try moving the scope around on top of the receiver, remember there is a power transformer in your set and it could be radiating enough magnetic energy to distort your patterns.

TX-1 V.F.O. Chirp—"My TX-1 developed a c.w. chirp. I've checked everything and even tried a new 6AU6 tube. What gives?"

Before you do anything else, check the v.r. tube for the v.f.o. Next, install a 6AH6, bet your chirp disappears. It isn't the set, it is the tube.

RCA 2N247—"What transistor can I use to replace a hard-to-get 2N247?"

Try an RCA 2N1632.

Taping in Close—"Any tips as to how one can tape wires whose ends are hard to get at (sic)? What I mean is that I need some method for insulating the ends of some wires attached to a rotary switch but I can't see how it can be done without removing the switch."

Suggest you get a bottle of Liqui-Tape made by the Beaver Labs of Mineola, N.Y. This tape comes in a bottle, dries hard and will not crack, chip or peel. It has a very high dielectric strength and can be used around antenna systems as well as inside of equipment. It is merely brushed on and ideal for those hard to get at connections.

Speaker Matching—"What happens if I connect a 4 ohm speaker to an 8 ohm secondary of an output transformer?"

There is a two to one mismatch. If the primary of the output transformer is 4000 ohms the reflected Z (impedance) will be halved and become 2000 ohms.

Telephone Pickup Tip—An ordinary 2000 ohm earphone can be used as a phone pickup merely by removing the cover and diaphragm and placing the unit under the phone near the induction coil. Couple the headphone via a transformer having a 1000 ohm primary and 50K ohm secondary to a mike input, etc. Be sure to shield and ground connecting leads.

Buffer Needed—"For simplicity I'd like to construct a 10 meter phone rig using only a v.f.o., final r.f. stage and a modulator. I can find no diagram for such a rig. How come?"

Because this is not good design practice. You need a buffer between the v.f.o. and the final for stability. Without the buffer you no doubt would have f.m.'ing as you modulated the final. In low power transistor rigs it is possible to modulate an oscillator and get away with it, but this is something I do not recommend; you would still have a lot of f.m.'ing.

Tube Tester Info.—"Can you tell me how to adapt my old surplus tube tester to check the new tubes?"

See the *big* HAM CLINIC column next month.

Multi-Tester Trouble—"What do I look for first in trying to find why my multi-tester (volt-ohmmeter) will operate only on d.c.? The trouble started when I used the set to check out some surplus transformers."

Check the meter rectifier with an ohmmeter for an open or a short and any small resistors in series with the selector switch. If these are okeh, examine your switch contacts and your a.c. change switch.

32V—"What is your personal opinion on my changing the 4D32 in my Collins 32V transmitter with a pair of 6146s?"

[*Continued on page 98*]

VHF

50mc. 144mc. 220mc. 420mc. and above

DONALD L. STONER, W6TNS
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DID you ever wish that you had a small, portable transistorized receiver for the two meter band? Me too; I am particularly fond of hand-held battery operated equipment, which may be one of the reasons that I enjoy working with transistors so much.

The Wee-Ceiver

The circuit shown in fig. 1 is for a completely transistorized receiver, designed primarily for the two meter band. It can however, be used on six meters, the f.m. band, or even Citizen's Band. More about this later. The source of power is an inexpensive set of three penlite cells which provide 4.5 volts for the collectors.

The receiver is no world beater—it has its faults—but no one is implying that this simple super-regen detector is in the same league with a Nuvistor converter! Actually, the sensitivity will astound you. It will pull in signals within 15 miles with only a 19 inch whip. With a beam, and assuming that the band is not crowded, signals from 50 or more miles away can be heard. If this appeals to you, and you can ignore the shrieking on strong signals so characteristic of the super-regen detector, let's proceed.

Transistor Q_1 is the detector and is operated in the common base configuration to raise the high frequency gain. Capacitor C_2 feeds back energy from the collector circuit to the emitter and the stage oscillates. However, another *R-C* circuit, consisting of capacitor C_3 and the bias divider components, makes the circuit quench at a high frequency (between 20 and 30 kc). This breaks up the oscillation and creates a sensitive detector action. Coil L_1 and capacitor C_1 are tuned to resonate in the two meter band and couple energy from the antenna to the transistor. Capacitor C_4 eliminates audio degeneration and the shunting capacitor C_5 (with less inductance) acts as an r.f. bypass. Audio output appears across the primary of transformer T_1 (a standard 10K to 2K transistor interstage transformer) and is coupled to the first audio transistor Q_2. Capacitor C_6 filters out the quench voltage while R_4 and R_5 act as bias dividers. Transistor Q_2 acts as an emitter follower to match the input impedance of the audio output stage, Q_3. Note that this stage is connected to drive the speaker voice coil directly. Actually this provides quite enough audio for walkie talkie service where the speaker is close to the ear. If more audio is required the primary of a 500 to 8 ohm (or 3.2 ohm, depending on the type of speaker used) transformer should be connected in place of the speaker. Then you will be able to hear the audio all over the house and in noisy locations.

The 3½ turn coil shown in fig. 1 is correct for the two meter band and would be used in conjunction with a 4.7 mmf capacitor for C_1. The f.m. band can be received by increasing the value of C_1 to 10 mmf. These values will also permit reception of the aircraft band. For six meters increase the number of turns to 6½ and use a 15 mmf capacitor for C_1. For Citizen's Band reception, use a 25 mmf capacitor for C_1 and wind 15 turns of #28 enamel wire on the coil form.

The r.f. choke is not critical and one consisting of 50 turns of very fine enamelled wired on a ½ watt, 1 megohm resistor works well from 27 to 160 mc.

When the construction is completed, you may have to adjust the value of R_5 to produce a total battery current of 30 ma. A value between 3.3K and 5.6K will be required de-

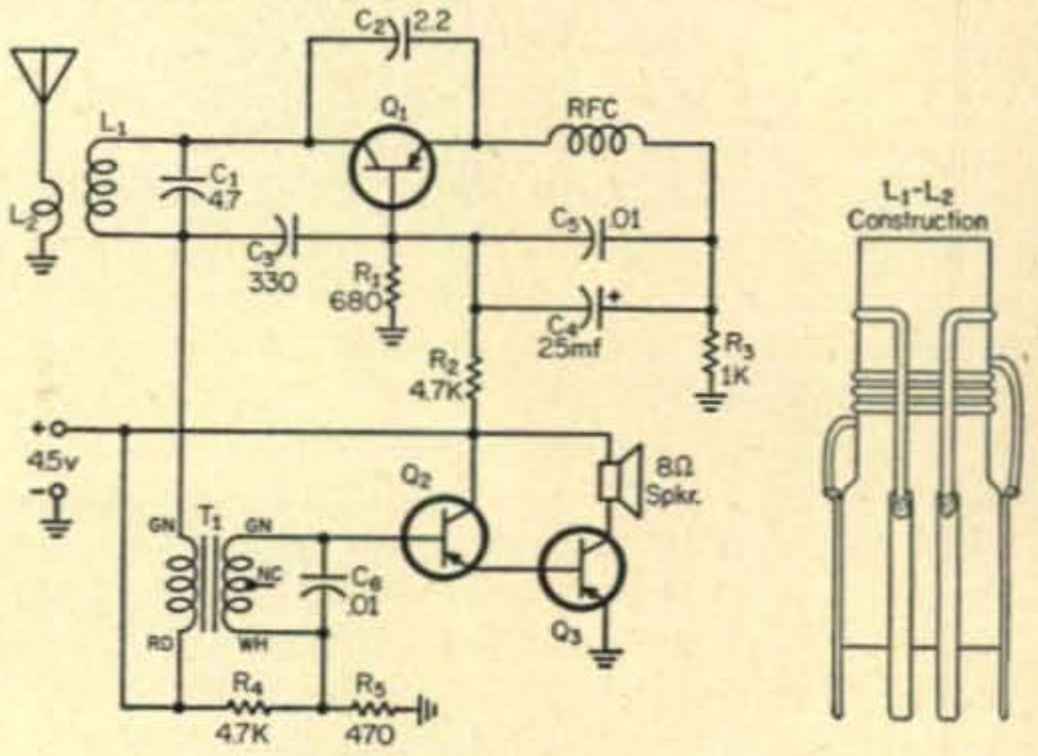


Fig. 1—Circuit of the "Wee-Ceiver," a transistorized 2 meter superregenerative receiver. Coil L_1 and capacitor C_1 as shown tunes 2 meters. See text for other frequencies.

C_1—4.7 mmf. See text.
L_1—3½ t. #22 plastic covered hookup wire on 5/16" dia. coil form. See text.
L_2—1 t. #22 plastic covered hookup wire on same form as L_1.
Q_1—2N1745 or 2N2189.
Q_2, Q_3—2N1380.
T_1—Transistor audio transformer, 10K to 2K c.t. Triad TY-56.

pending on the beta of the 2N1380 transistors. It may also be necessary to increase the value of R_1 if the Texas Instruments 2N2189 is used. The values shown are correct for the 2N1745.

To avoid hand capacitance effects, the receiver should be mounted in a metal chassis box. Note that the antenna link is near the top of the coil form so that the coupling between it and the secondary can be adjusted for best reception.

VHF Around the World

From North of the border, up Canada way, R. J. Henry, VE6DB, writes: "Things have been quiet here since before Christmas as far as 6 meters goes. We have had a break through or two from W6 back in January but short ones. It was nice to hear that gang again and gives us hopes for this year again. We've heard no DX on 2 meters and no one is properly set up to check the higher bands. However, we will be, shortly, if all goes as planned.

"We have VE6IP, VE6ON, VE6LK and myself on 2 meters with about a dozen on 6 meters including most of the gang who were on last year. So keep the old beam toward Alberta once in awhile—we're monitoring and calling whenever possible, particularly on weekends.

"I would like any data you may have on Pandapters. Best regards, VE6DB." Thanks for the news, OM and the Editor informs me that he is preparing an article on a v.h.f. "pan" which will appear in a forthcoming issue. Also see "Basic Spectrum Analysis" in August, September and October 1961 *CQ*.

The High Nets

Ed Tobias, WV2VKK, says that he and a few other fellows are starting the Boy Scouts of America Emergency Service 2 meter net. He says, "The net meets every Wednesday evening at 7:00 P.M. on a frequency of 146.30 mc. The net is open to all who wish to join, not just Boy Scouts. Its purpose is to be prepared for any emergency where communications are needed and will be run just like a regulation AREC or RACES net. In order to have a successful net, we need coverage of at least all five boroughs in New York City. Any stations wanting information on this net can contact me at 280 First Ave., New York 9, or telephone OR 7-1434.

Let's Get Technical

The APX-6—This 1200 mc transceiver has been around now for nearly 2 years. Many of the beginners on the u.h.f. bands have put them on the air and found them to be very dependable. During this time, Stephen L. Mieth, W6YFK, has come up with some hints which add to its performance.

The September 1960 issue of *QST* carried an article on the surplus conversion of this unit which is good to start with. One should follow this fairly closely and incorporate the following ideas in the process.

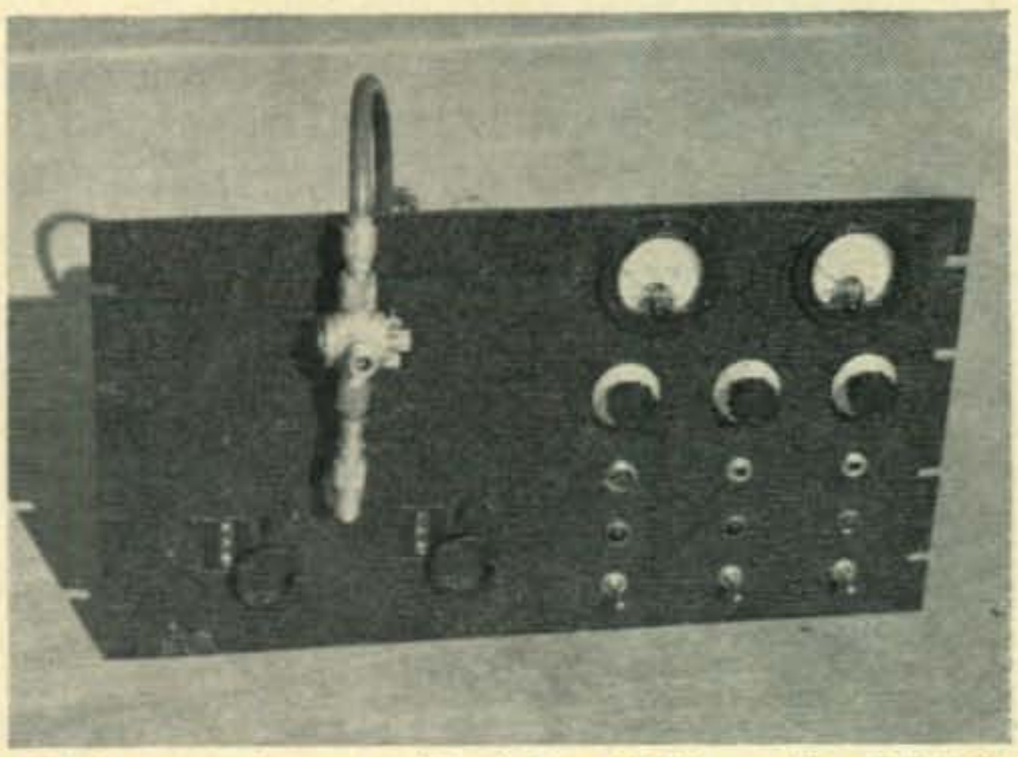
If operation in the high end of the 1200 mc band is desired, it will be necessary to install a false bottom 1⅜" below the mounting flange of the cathode cavity of the transmitter. This can be made of 3/64 or heavier copper or brass sheet cut to fit the donut shape of the cavity. The feedback loop connecting cable will have to be shortened to about 7" tip-to-tip in order to obtain maximum output. The plunger which tunes the transmitter plate cavity may also have to be cut down 0.250" so it will tune to the high end.

The output link in the cavity for transmitter output leaves something to be desired. Though most users never change it, by inspection it can be seen that a more efficient system could be developed. A moveable link mounted in the same plane as the old one, somewhere else on the cavity, would increase the output. The link should be nearly resonant to the frequency used and turned about 15° away from the plate line's axis.

The transmitter cavity, once modified, is very versatile. With the feedback loop connecting cable removed, and 1200 mc energy injected in the cathode, it works as an amplifier. If the cathode circuitry is modified to tune 432 mc, it can be used as a low powered tripler to 1296 mc.

A 500 ohm wire-wound potentiometer should be inserted in the cathode circuit of the transmitter tube. With a plate voltage of 300 volts, it should be adjusted for 60 ma of plate current, at which point maximum output is achieved. There are many substitutes for the 2C42, which are capable of the same power input, now available on the surplus market.

Most of the converted units use a carbon microphone modulator. W6YFK found that these units tended to lack in modulation and



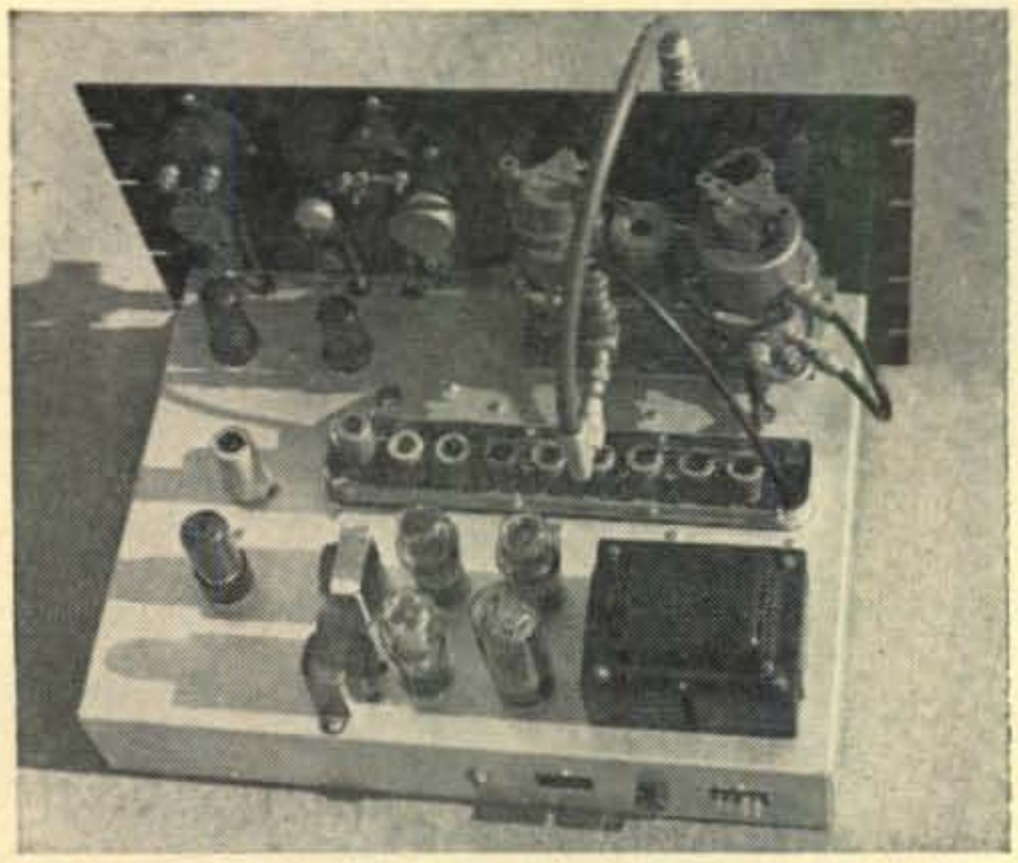
APX-6 transceiver modified for 1296 mc by W6YFK. A proper u.h.f. type coaxial antenna relay is seen on the front panel at the left. The turns counter dials are Transmitter Tuning (left) and Receiver Tuning. Beneath the crystal current and plate current meters are the R.F. Gain, Mod. Gain and Bias controls. Toggle switches are A.C. On-Off, Trans.-Rec. and Audio Amp.-Video Amp. Jacks are for mike, phones and video amp. output.

he used a 12AX7 crystal microphone preamplifier to drive a 6V6 modulator. To save cost, the primary of a center-tapped audio output transformer was used (secondary left disconnected). One side goes to the plate of the transmitter tube (2C42) and the other to the plate of the 6V6. The center-tap goes to the screen of the 6V6 and the B+ circuit (300 volts regulated). Run a check on the air to determine the amount of modulation needed as too much audio will cause f.m.'ing.

In the i.f. strip, V_{301} was replaced with a 6AQ5 audio amplifier. An audio gain control was not incorporated in the unit, but its inclusion is strongly recommended. The 6AQ5 is run from the 300 volt (unregulated) supply in receive position. A VR-105 is used to give 105 volts for the i.f. strip. The local oscillator tube (2C46) should be run from about 250 volts (a tap on the dropping resistor for the v.r. tube will suffice). There are usually two swamping resistors, from a 6AK5 grid to ground, which makes the strip broad-banded. If these are removed, the bandwidth can be decreased. Tube V_{304} has one which is a 4.7K, ½ watt resistor. The other resistor (same value) may be on any one of the other i.f. amplifier 6AK5's. It may be necessary to replace one of the resistors if the strips tend to go into oscillation.

Antenna changeover relays at this frequency are usually very poor, for they tend to eat up energy. A hand switching system or knife switch action u.h.f. relay with Type N connectors is the best bet. Many of these units are available on the surplus market, but require 28 volts d.c. at a heavy current. The relay part can be separated from the actuator and used manually with good results.

Many thanks to W6YFK for supplying this APX-6 information. An examination of Steve's converted APX-6, shown in the accompanying photos, indicates that not only does he know his APX-6's, but is a real craftsman.



Chassis layout and cavity details of W6YFK's APX-6 transceiver. Note antenna injection into mixer diode mount. The tubes nearest the panel are video amplifiers for scope monitoring of signals.

Who's News?

W7YJE, Seattle, Washington, advises us that the "Royal Order of Hootowls" (A six meter society) will be holding their family picnic at the Seattle World's Fair, June 16-17. The first day will be spent viewing the fair, with the picnic on the 17th. K7USA and W7YJE will monitor 50.4 for mobiles coming into the area.

Armond M. Noble, K7MFA (Mighty Friendly Amateur), Box 456, Billings, Mont., edits a bulletin titled *The Technician* and is, of course, devoted to that class of operator. Armond is doing a good job, with news and tips, and should develop quite a following. Drop him a line for more information.

Stolen from the Evergreen Society *VHF News*—"During the period of January 12-19 there were some very good 6 meter DX openings during the early evening hours. QSO's were held with stations in Arizona, California, Colorado, Wyoming and South Dakota. Since that time there has been little DX activity except the forward scatter work of K7DTH and W7ZQX. These two operators work very diligently every Saturday and Sunday A.M. and have established c.w. contacts in California. They are presently trying to work up skeds with Wyoming and Montana. K7AAD, near Portland, Oregon, has been heard in Seattle with a booming c.w. signal.

Don Harris, W4BUZ, and Roland Mangum, K4GPL, report via *The Ragchewer* that there have been very few openings on 6 meters lately. Spring should bring new interest to the band with the increase of Sporadic-*E* Layer openings for short skip DX and new states. WA4AET has built a second transverter for six s.s.b. operation (how about some dope for the column fellows?—ed.). Operation on 432 is starting to roll in North Carolina with W4OAB, SVP, and CAH active. Their mainstay is the resurrected 432 tripler circuit which will be featured in the column next month. I recall using one of these in the early '50's and it works very well considering the simplicity. The only ingredients required are an 832A, some copper tubing and an existing two meter rig. Back to the news—W4OAB is building a flying spot scanner rig for 432 TV but is bogged down by the deflection oscillator. The cost of parts is getting high too and he cannot seem to find anyone else interested in A5. Six stations in Charlotte are considering 1215 mc and are pricing APX-6's.

Dennis L. Stahl, A/2C, AF 16651532, 1957th Comm. Gp., Box 560, APO 953, San Francisco, is looking for a receiver that will tune from about 100 mc to approximately 320 mc. I would like one myself, so that I can listen in on the *Friendship 7* spaceflights.

Woody Gimbel, RFD #1, Culpeper, Va., says that Fair Radio Sales has RG-54A/U for $1.95 per 70 ft. It is 58 ohms, 0.250 diameter

[*Continued on page 98*]

RTTY

BYRON H. KRETZMAN, W2JTP
431 WOODBURY ROAD,
HUNTINGTON, NEW YORK

RTTY Operating Frequencies

Nets centered on frequencies given; operation usually ± 10 kc.

80 meters	3620 kc
40 meters	7040 kc
20 meters	14,090 kc
15 meters	21,090 kc
6 meters	52.6 mc

THOSE of you familiar with the history of radioteletype and landline teleprinter history know that just about all machines in commercial use in the United States are made by one of two companies, both of which use essentially the same (and quite old) mechanical principles to achieve the required printing on tape or page. Within the last few years, however, another machine, made by the Mite Corporation of New Haven, Connecticut, has appeared on the scene. This machine, the MITE, was designed on principles completely new and different from its competitors. It is smaller, lighter, and easier to service, yet it is capable of all the standard operating speeds up to 100 words per minute.

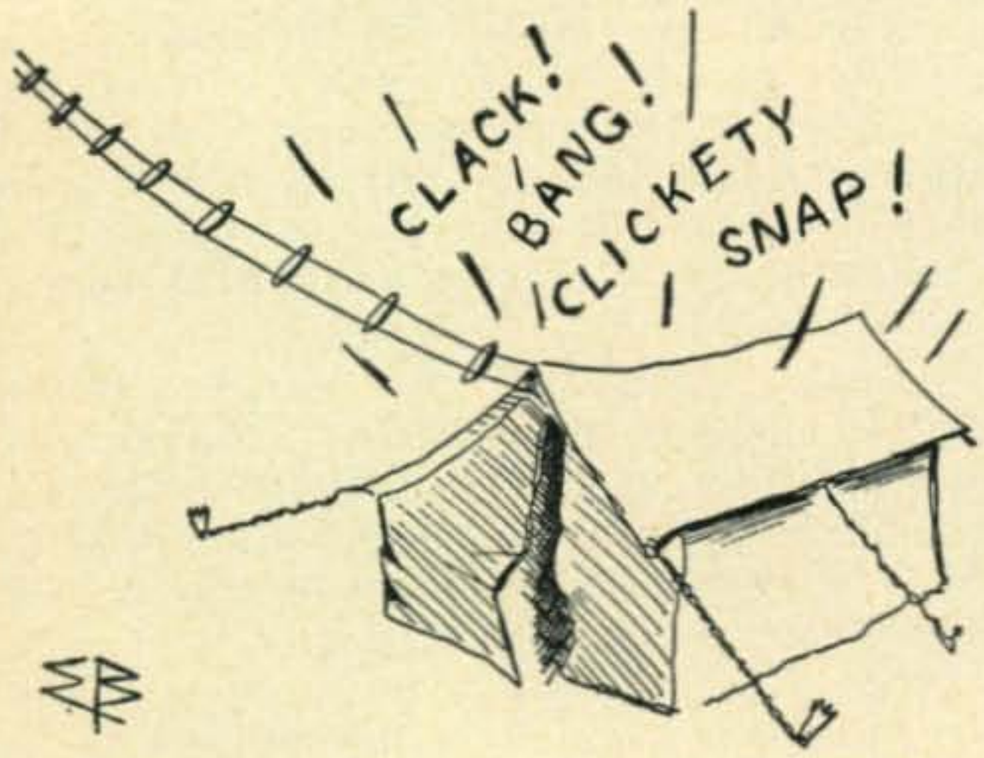
Recently your RTTY Editor was privileged to visit the engineering laboratories of the Mite Corporation. Demonstrations witnessed of both page printer and tape equipment left little doubt that here, at long last, was "something new under the sun" in the way of teleprinter equipment. In particular we were fascinated by the AN/TGC-14(V), a highly reliable military version of the standard Mite Model 105 page printer. At present the Mite Corporation is building a very large number of these compact lightweight portable units for the U.S. Marine Corps. Now, we realize only too well (and sadly) that it will be a long time before the AN/TGC-14(V) appears on the surplus market, but in accord with our policy of keeping RTTYers posted on the latest in teleprinter tcehnical topics, we therefore bring you the story.

AN/TGV-14(V) Teletypewriter Set

The entire AN/TGC-14(V), including a local loop power supply, cables and a shock and immersion proof carrying case weighs only 39 pounds. It can operate in temperatures from –67° F to 131°F, and is ruggedized to withstand severe shock and vibration as well as to operate continuously in a high dust or salt spray atmosphere. The motor and the power supplies are all plug-in units and the MITE can be quickly changed from 60 cycle to 400 cycle or to 28 volt d.c. operation. Operating speeds can be almost instantaneously changed between 60, 75, and 100 w.p.m., without tools by changing self-stored gears, very much like the chart speed gears in an Esterline-Angus recorder.

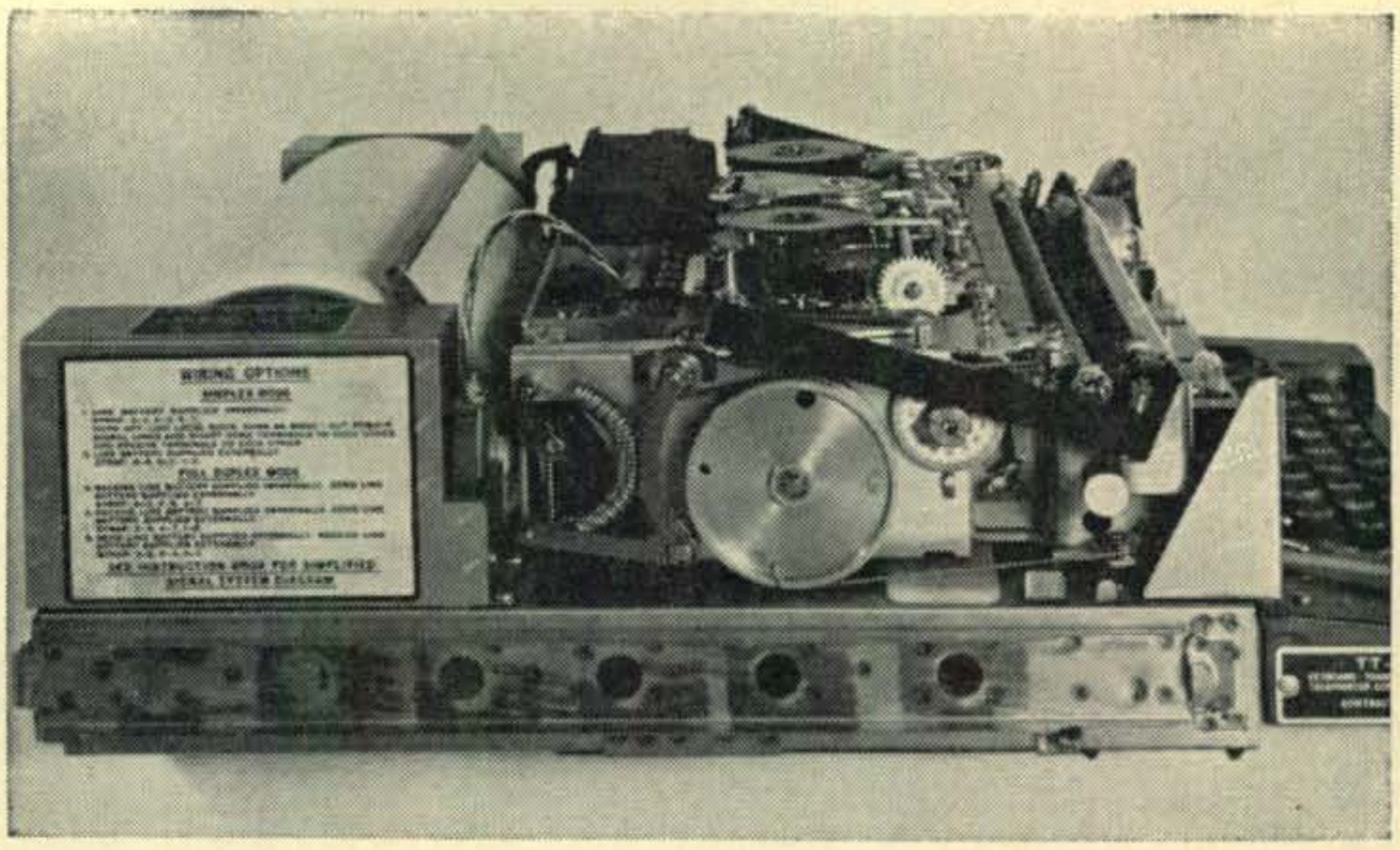
Particularly interesting in the AN/TGC-14 (V) is the fact that the selector magnet, which converts the telegraph line impulses into the mechanical motions required to start the character printing cycle, does not operate directly from the telegraph loop, but is driven electronically by a transistorized "line sensor" unit which presents a pure resistive load to the line. This line sensor unit has strapping and line current adjustment controls that permits oper-

RTTY The Hard Way... No. 10.



"Are you sure there are extra contest points for using Model 12's?"

A U.S. Marine carries two compact, lightweight teleprinter MITES to the helicopter pilot at Floyd Bennett Field, New York, for installation in the aircraft.



The MITE teleprinter with the covers off. Note the range control just under the ribbon.

ation in the 20 to 80 ma range or in the 1 to 5 ma range. In addition, patching facilities are available on the rear of the unit to permit a wide variety of operating loop arrangements, including the supply of either send or receive loop current, and duplex operation.

Dual Identification

The following is the result of an ARRL petition to the FCC concerning the relaxation of the dual identification procedure on RTTY.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington 25, D.C.

In the Matter of

Petition to amend Section 12.82 of the Commission's Rules governing the Amateur Radio Service to relax identification requirements in radio teletype operation. } RM-277

MEMORANDUM OPINION AND ORDER

By the Commission: Commissioner Ford absent.

1. The Commission has before it for consideration a petition filed by the American Radio Relay League, West Hartford, Connecticut, which seeks amendment of Part 12 of the Commission's Rules so as to eliminate the requirement for dual identification when radioteletype emission is being employed.

2. Section 12.82 of the Commission's Rules now requires that, when an emission or mode of communication other than radiotelephone or radiotelegraph is being employed, identification be made in either radiotelephone (A3 emission) or radiotelegraph in the International Morse Code as well as in the emission or mode of communication being employed.

3. The petitioner states that the present dual identification requirement is inefficient and time consuming.

4. The dual identification requirement is necessary for the Commission properly to perform its duties. Amateur stations are not assigned specific frequencies, and as a consequence, the interference resulting from the overlapping of signals makes identification difficult at best. Infraction notices are issued only upon positive identification. Without the dual identification requirement, positive identification would be very difficult for the monitoring stations, and practically impossible for the Commission's mobile units which are not equipped to receive radioteletype transmissions. It appears to the Commission that the advantage to the Amateur service as a whole in having proper and prompt enforcement of the Amateur Rules and Regulations outweighs any possible advantage to be gained from the relaxation of the present identification requirements.

5. Accordingly, in view of the above, IT IS ORDERED, This 21st day of February, 1962, that the petition filed by the American Radio Relay League for the relaxation of the Commission's identification requirements in the Amateur Radio Service, IS DENIED.

FEDERAL COMMUNICATIONS COMMISSION
BEN F. WAPLE
Acting Secretary

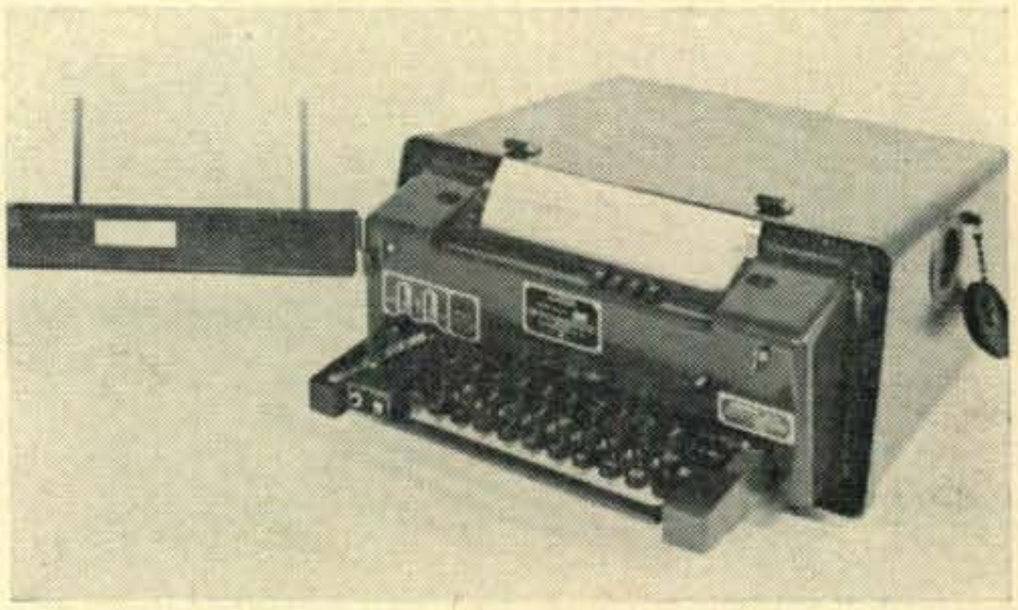
Printed Circuit Boards

No doubt you have read with interest our description in the February, March, and April RTTY COLUMNS of the transistorized terminal gear designed and built by W2JAV. We have gotten quite a few cards and letters from fellows interested in obtaining printed circuit boards for this equipment. Our own efforts, up to now, in obtaining these boards have shown us quite clearly why Phil calls this "Project Despair." Now, just as we go to press, it looks like we *will* be able to supply these boards to RTTYers at a very reasonable cost. Unfortunately there are still some economic details, like money, to be ironed out; however, by the time you read this, the boards should be available. Next month's RTTY COLUMN will carry the details, but if you can't wait, drop a line to your RTTY Editor at 431 Woodbury Road, Huntington, New York. A stamped self-addressed envelope enclosed assures that you get a quick reply, by the way.

On the Bauds

K3BCD of Baltimore, Maryland, is building the Twin City TU but can't find the input transformer. *(Use the s.s.b. special, OM.)*

[*Continued on page 94*]



The AN/TGC-14(V) Teletypewriter Set, cover off and copy holder swung out, ready for operation.

Novice

BY WALTER G. BURDINE, W8ZCV
R.F.D. 3, WAYNESVILLE, OHIO

HERE I am starting my third year as editor of this column and I must say thanks to all of you that have sent letters saying they are glad that I am back. I appreciate all of the good wishes and the suggestions for the column. I do wish that some of you would have sent some pictures this month, I didn't want to use a picture of me with the flu, or pictures of the ice storm that passed through here taking down most of the antennas. I need your cooperation to make this section more interesting for all of our readers. Others are interested in what you are doing and how you are doing it. They want to learn everything they can about the necessary equipment to set up a successful amateur station and just what they can expect to work with that station. Send a picture and description of your station to me and I will do my part in helping these newcomers.

Heard All East Africa Award

The Radio Society of East Africa takes pleasure in advising you that an entirely new award is available to all short wave listeners throughout the world for QSLs from the VQ stations. Full information may be obtained from: Mr. A. J. Sainsbury, Esq., P.O. 1951, Nairobi, Kenya. Certificates will be awarded for s.s.b., phone, c.w., and for mixed claims.

RTTY Anyone?

The technician license grants the licensee all amateur privileges above 50 mc except those of 144 to 145 mc and 147 to 148 mc, therefore he can use RTTY on six and two meters if he so desires. If you are desireous of learning the theory and practice behind this interest phase of our hobby, I strongly recommend *The NEW RTTY Handbook,* by Byron H. Kretzman, W2JTP our RTTY editor. Boy, he sure has all of the necessary information packed in between the covers of that book. I now have the equipment, but need the electricity and some time to get the unit on the air, then I'll BCNU on RTTY. I have a model 15 printer and a model 14 reperforator which I hope to get working before long, but building a new house in my spare time and making that daily v.h.f. contact doesn't leave too much spare time for RTTY. I'll get it going soon as the power company hooks up the electricity to the shack.

The Dayton Ham-vention

The Dayton Ham-vention at the Biltmore Hotel in Dayton, Ohio April 27 and 28 is the largest gathering of amateurs that I have ever attended and there will be something there to interest everyone attending. Meetings and forums on every phase of amateur interest will be attended by amateurs from most states and likely every call area. About three thousand amateurs and their XYLs will attend this, the biggest show for your money, in hamdom. I will see you there and have a nice ragchew with you.

Modulation

In listening around on the air and trying to find out where the most trouble occurs in the ham station I find most of the talk leads to the subject of modulation. This subject is most often discussed than any other subject with the antenna system leading a close second, receivers and transmitters following in close formation.

When taking the examination for an amateur license some of the questions are asked about these subjects and it will be better for you if you can answer these correctly. I will try to cover the subject of modulation this time. You should be able to understand the subject well enough to build a modulator.

According to Webster: Modulation-Radio-to cause the amplitude, frequency, phase, or intensity of the carrier wave to vary in accordance with the sound waves or other signals, the frequency of the signal wave usually being very much lower than that of the carrier: frequently applied to the application of sound wave signals to a microphone to change the characteristic of a transmitted radio wave.

Modulation is really the mixing or combining of two frequencies to form a modulated carrier wave. In other words, to transmit a voice frequency it is required to add the low frequency voice frequency to a higher radio frequency carrier wave. Modulation can be used to carry intelligence ranging in method from the simplest c.w. through video modulation used in television and further, to the complex

modulation systems used in telemetry circuits carrying hundreds of bits of useful information to equally complex receiving systems.

This discussion will center around amplitude modulation (a.m.), the process of varying the amplitude of the radio frequency carrier at a syllabic rate to correspond to the voice frequencies. A brief discussion of amplitude modulation principles will be given. Since plate modulation is the most widely used method of amplitude modulation in use today, it will be the method discussed.

Plate Modulation

In order to 'plate modulate' an r.f. amplifier in a transmitter, we must first have a large amount of audio available. Normally, we need about half as much audio as we have r.f. input. Therefore, in a 50 watt transmitter, about 25 watts of audio is needed for "100% modulation," which incidentally, is the ideal condition for a.m. Less audio will give a lower percentage of modulation and will reduce the readability of the phone signal. Naturally, as you speak into the mike, your voice level will rise and fall, causing the output power of the modulator to vary. Because of this, the percentage of modulation in a phone transmitter is constantly varying anywhere between zero and 100%. If the modulator is designed so that the loudest tone into the mike produces exactly 100% modulation, then the most readable a.m. signal is being produced without resorting to gimmicks such as clipping and compression.

Plate modulation is about the easiest and most efficient method of impressing an audio signal on an r.f. signal in a transmitter. Other methods of modulations, while cheaper, usually eat up some of the r.f. output of a transmitter while giving less modulation and poorer quality than plate modulation.

Clipping

That gimmick called compression that we referred to a while ago is a rather neat and clever way of increasing the average modulation percentage. If we can make the weaker audio tones louder and the louder audio tones weaker, we will have an audio signal of nearly constant level. Modulating a transmitter with this "redesigned" audio will result in a higher average modulation percentage. The loud peaks that formerly limited us to 100% modulation are no longer as loud, and the weaker tones, in which most of the intelligence is carried, are relatively stronger.

It has been found that the most voice intelligence is contained in the 300-3000 cycles per second range. Most voices, however, contain frequencies far above and below this range and they contribute little to the readibility and clarity of the voice. In the modulator, through the use of clipping, it is possible to eliminate the audio frequencies above 3000 and below 300 cycles. By doing this, we accomplish two things. First it allows our phone signal to occupy less space in the ham bands and second, it enables us to use our transmitter most efficiently by modulating only with the useful part of the voice signal. More about this at a later date. Information on these topics can be found in the modulation section of the *Radio Amateurs' Handbook*.

News and Nets

In going over some of my old columns I noted the fact that at that time we had announcements of nets and novice awards for getting the guys and gals together on the air for ragchews and code practice. I haven't heard of this for a while, why? Here in Dayton there was a net formed just for the fellowship and to help the fellows come up with the answers to problems that come up in every day operation. Listening to this net for ten minutes, you would think the fellows were all a bunch of nuts, but they help one another put up the antenna, tune up of the final, they are always there to answer the question, "how's my modulation?" Form a net and let me hear about it for this column. You'll enjoy your station more.

Letters

"Dear Walt, The handle here is Al Pruskowski and the call is WV2TKK. I read the NOVICE COLUMN every chance I get and I think it will help me get my general, which I am going for on Feb. 23.

"I was very much interested in your explanation of power supplies and components last month.

"My trouble is the theory, my code speed is no trouble, I copy 18 w.p.m. I've tried for the big one twice and failed the theory both times.

"I've been licensed since June, 1961 and have a low WAS of 18/16, I still need QSLs from Iowa and Maryland. I've worked a few VE's besides the 18 states.

"I would like a sked with you or anyone else reading this or who needs New Jersey. I work the 40 meter Novice band and think it is great.

"The rig is an Eico 720, an SX-43 and a folded-dipole antenna.

"If I pass my general this time I'll let you know so that all Novices and would-be Novices will see what help the NOVICE COLUMN can be to them. Good luck, Al."

Thanks for the nice letter Al and I wish you the best on passing your test and don't forget, it's worth all of the trouble that you're going through to get the general.

This letter from John Oakey, WN5AXI, 1218 Austin Avenue, Denton, Texas, was the first letter sent to me as NOVICE Editor. Thank you, John.

"Dear Walt, I got my Novice license November 3, 1961. Because of my very limited budget I thought I would not be able to buy a rig until this summer, but I saved enough

money from my paper route to buy an Ameco AC-1 transmitter kit in December. The 15 watt transmitter was originally built for my 9th grade science project; then I bought a S-120 Hallicrafters receiver in January and I am now on the air.

"Since January 11, I have worked 10 states: Texas, Colorado, Kansas, Oklahoma, Illiniois, Michigan, Louisiana, Tennessee, Arkansas and Virginia, all are confirmed except Tennessee and Kansas. The reason all of these contacts are East of me (except Colorado) is that my long-wire antenna is running East-West with the lead-in from the West. It acts like a beam.

"I have been nominated for the RCC and I plan to buy a Heathkit *Q*-multiplier for the S-120.

"I wish to thank Eddie and Robert Ferguson, WN5AHN and WN5AHK and Vincent Richardson, K5JJN for helping me set up my station and get my license.

"I am 14 years old and I'm having a ball! Yours truly, John."

Thank you, John and I'm sure glad you are enjoying that little gem, the AMECO AC-1. I have one and I might say that a great number of local Novices have used my AC-1 to make their first QSO and have gone on to make good hams. By the way, John, you might send for a copy of *CQ* for February 1957 and see how I built an all-band final for use with the AC-1, that raised the power to a rockcrushing 150 watts. I used some cheap surplus 1625 tubes for the job and included a real cool c.w. monitor that didn't have to be keyed. I used that combination for a lot of contacts. I will try to work out a cheap 100 watt final for those small rigs and get it in the column before too long. You new amateurs might send me some ideas of the type tubes that could be used and the amount of power that you would like to get out of this new final. I personally think that we should use a single tube for this final as this would make it more simple, and possibly use a pi-net output circuit. Let me hear from you on this subject.

Another reason I'm glad to print this letter is to show some of the fellows that you don't have to have the full Novice gallon to make a QSO on the Novice bands. John has shown that you can work them with low power and that the operator is the most important part of the successful ham station. Keep up the good work, John.

A card from Rolf Rasp, Rua Antonio Parreiras, 67, Niteroi, R.J., Brazil says: Perhaps it might be of interest for the WN's es KN's.

"I am listening very often on 80 meters for DX and I send a QSL card to EVERY Novice station on this band via the bureau. So far more than 30 stations have been heard. I am trying for all states confirmed on 80 meters. Best of luck and 73, Rolf."

There you are fellows and gals. We have had letters and cards from a number of countries that state they are listening to us in our conversations. It behooves us to watch that everything we say or do is the right thing at all times. Don't be caught acting like a heel and try to be careful that everything you say is right and not offensive to anyone that might be listening. It might be well to remember that, due to the translation what we say in our language may be interpreted to mean some thing entirely different than what was intended. We never know just who is listening, we have no private conversations on the air. Personally, I spend 95 percent of my time listening and really I am ashamed to admit that some of the conversations that I hear would be the worst kind of publicity for amateur radio. Like everyone, we are judged by our deeds and actions. I must say that the majority of our operators are to be congratulated for the way they handle themselves on the air.

Michael S. Sealfon, WA2OCG, Pennsylvania State University, Nittany 26, P.O. Box 1398, State College, Pennsylvania writes in part:

"Dear Walt: I have been an amateur for about a year and a half, and the bug is worse than ever. My shack includes an Eico 720, HG-10, v.f.o., Hammarlund HQ-145XC, TH-2 triband beam and dipoles for 40 and 80 meters. In a years time I have received WAS, WRK (Worked all Royal Kings), RCC, CP20, 1961 Novice Roundup Award for Northern New Jersey, 100 DX Award, EI-50 DX award and my ARRL membership. My DX stands at 38/30 with such goodies as TF2, UR2, CX2, UB5, OZ8, FP8, YU and many others. I am also trying for the United States Counties Award and now stand at 343/275. I think this award will give U.S. amateurs more prestige when dealing with DX stations.

"I attend Penn State for seven months of the year and only work the ham station for five months of the year and can then be reached at 107 Stony Ridge Drive, Hillsdale, New Jersey. I am free for skeds during the time I am at home for anyone needing New Jersey."

If you need help in getting your amateur license or if you are willing to share some of your time to help some one needing help in getting their license, please send the letter to me and I will print it in this column. I get as much enjoyment out of helping others get their license as I do out of operating and I make a large number of friends this way, let me tell you about that facet of amateur radio some time. I have helped about 79 people obtain their license and only three have defaulted so far, that's a pretty good record, and by golly look at all of the joy I've given to these good folks.

Let's have some letters, offers of help, notices of net operations and formations and some general ham news from you new Novices and Technicians. Just mail the material to Walter G. Burdine, W8ZCV, R.F.D. #3, Waynesville, Ohio. Thank you.

73, Walt

YL

BY LOUISA B. SANDO, W5RZJ
4417 ELEVENTH ST., N.W.,
ALBUQUERQUE, N. M.

CONGRATULATIONS to the recipient of WAC/YL award No. 500! Especially nice is that it went to a YL—Betty Collier, K4ZNK. To celebrate this event WAC/YL custodian, K5YIB, Barbie, and her OM Dick, K5YIC, presented Betty with a world globe on a stand complete with flags spotting the YL contacts on the six continents, and showing call and handle of each (see photo). Betty was invited to appear on "The Guest Room" over WSFA-TV (Montgomery, Ala.) and during the program displayed her WAC/YL certificate and world globe. She added this made a grand conversation piece, and she was glad to get in a plug for YLRL and amateur radio generally. (WAC/YL certificates issued now number close to 550.)

LYL

K9CCO, Lota, requests help in promoting the abbreviation "LYL" for *licensed YL*. This in preference to just YL, or XYL, OW, etc. We're all for it, Lota; in fact, we tried hard a few years back to bring LYL into general use. At that time W8INQ added his 2¢ worth and suggested "UW"—for understanding Wife—and commented, "after all, who would understand the situation of the OM and his hobby better—be it radio, photography, rocks or bugs?"

Did you know that back in the early 1930's *QST* published a department known as "Reserved for YL's and YF's?" We like that term "YF" (instead of XYL) and wonder why it lost popularity.

Now with some eight thousand or more licensed feminine amateur radio operators, why can't we exercise our YL wiles a little more artfully and persuade the OMs we'd appreciate a more complimentary handle like LYL, YF or UW!

K4ZNK, Betty Collier, displays WAC/YL certificate No. 500 and the world globe she received in recognition of this event. Betty has been on the air since 1958; her OM is K4DOL.

Congratulations . . .

To Bill Welsh, W1SAD/6, who is the winner of the 1961 Edison Amateur Award. Bill was selected on the basis of his work in conducting code and theory classes from 1951 through 1961 which resulted in over 2800 interested persons becoming licensed amateurs. Of particular satisfaction to Bill must have been the fact that his classes were appreciated at home for his UW (understanding wife) Marie, became W1COL with a General ticket in '56 and one of their five harmonics, Richard, is KN1SAR. Best wishes to all the Welsh family, especially in their new QTH at Burbank, Calif.

Congratulations also to W4VCB/KL7, Evelyn Wikoff, for earning SSB WAZ award #29! Ev is again a W4 in Virginia. . . . And congrats to W9RTH, Adah, and K9IVG, Roberta, for their BPL medallions.

With the Clubs

A tradition established between two YL radio clubs had its inception 15 years ago when the San Diego Young Ladies Radio Club, headed by W6YYM, Ellen, invited the Los Angeles Young Ladies Radio Club to attend their meeting Oct. 18, 1947. The L.A. YLRC accepted and were entertained with a luncheon and fashion show. The L.A. club that year was headed by W6TDL, Clara, founder of the L.A. YLRC. The following June the L.A. club reciprocated with a luncheon for the San Diego YLs.

W6QVK, Gene, P.C. for the L.A. YLRC, comments that the two clubs have continued their friendliness throughout the years and the joint meetings have been fairly regular. This year the L.A. group decided to entertain their sister club early. On Jan. 13 nine members of the San Diego club were met at Union Station and taken to New Chinatown, where a delicious Chinese luncheon was served to 62 members and guests at Grandview Gardens.

In response to the welcome by L.A. president WA6AOE, Maxine, WA6EVU, Debbie, president of the San Diego club, spoke on the closeness of all California YLs. Special guest was Shirley Lyons, W6OTT, whom most of the YLs recognized as a fellow ham who had been of great comfort to them when they went for their ham examination. Shirley is license examiner for the FCC at Los Angeles.

Since their joint meeting with the S.D. YLs, the L. A. girls have held their 10th annual Valentine Party, on Feb. 3, to honor their OMs. Nearly 100 attended the dinner party.

Buckeye Belles' Certificate

The Buckeye Belles' certificate is now off the press (see cut) and available to all who work their members (20 for Ohio hams, 10 for other W/K stations, 5 for DX). In addition to usual log information, you need each Belle's membership number. Send, with 25¢ to cover mailing costs, to W8MBI, Marie Helminski, 3943 Concord St., Toledo 12, Ohio.

Buckeye Belles certificate awarded by the Ohio YLRC. See text for award requirements.

Look for these Buckeye Belles for contacts: W8's: AVN, TNR, WRG, UOJ, VLF, WRH, NAL, TBT, TIL, QEF, ADI, FMW, LGY, VWL, TDB, EFB, OIS, SSF, GSH, SPU, RZN, HUX, HWX, OTK, MBI; K8's: PSZ, BXO, BNM, BJZ, WZD, ZAW, YVQ, VBO, CEN, PSZ, GWF, WUO, VMV, KKP, SQO, YLU, WHX, OVF, HKU, VDN, AUX, YMB, TCG, RLS, IYW, ZKW, MAK, RZH, WMV, VYW, ZHP, PXX, LGA, RBM, QBU, RZI, OMC, TFL, PRT, RVI, YLM, WSW, RGL, NQD, VMY, IGD, TCI, KEW, DAW, PXH, RGY, TFG, HDO, ISL, QPT, SMV, NQJ, TAY, UZI, WDZ, NQK, LEV, WIC, PSE, RMH, ITF, HGD, MZT; KN8's: AGW, DHF, WDL, YLX, YMS, BVG, QVU, USP, WIB, VHO, UIS; WN8's: AOT, ADS, AOK, APV; W9LAS/8.

S.A.W.R.C.

The South African Women's Radio Club is entering its tenth year with these officers: President, ZS5OB, Edna Herbert; vice president, ZS5RI, Kay Munro; secretary, ZS5-111, Alice Hall. Subscription to *YL Beam*, published by SAWRC, is $1.04 in the U.S.A.

Coming Conventions

May 18-19: 12th Annual Mid-west YL Convention. At Flint, Mich., Howard Johnson Motor Lodge; registration $2; chairman W8ATB, Esther. Full details in April *CQ*.

June 1-2-3: Southwestern Div. Convention. Fun for all the family at famous Disneyland, Calif. Full details in March *CQ*. YLs and YFs will especially appreciate the luncheon fashion show by Georgia Bullock at which several gowns will be given as prizes; the LYL operators session to be conducted by W6CEE; SWOOP initiation to be MC'd by W6DXI; plus the banquet, family night at Disneyland Park and all the other convention activities. Address registration ($2 after Apr. 15) and inquiries to S.W. Div. Convention, P.O. Box 1685, Newport Beach, Calif.

WV6RXU, Marilyn Meyer, Queen of the Southwestern Division Convention

"Miss Amateur Radio," selected to reign as queen over this convention, is WV6RXU, Marilyn Meyer. Lynn is quite a new ham. She started attending club meetings with her father, S.W. Div. Director W6MLZ, to "meet some boys," became interested in transmitter hunts and after being chosen club secretary in Nov. '60 she started studying code and theory with help of club members and at night school, all unknown to her Dad (he thought she was studying shorthand!). Lynn surprised him at the '61 S.W. Div. Convention in Phoenix when it was announced her call was WV6RXU. Since then Lynn has taken over his Gonset 2 meter gear for her car to take part in transmitter hunts. She also has an HT-40 xmtr. and S-38 rcvr.

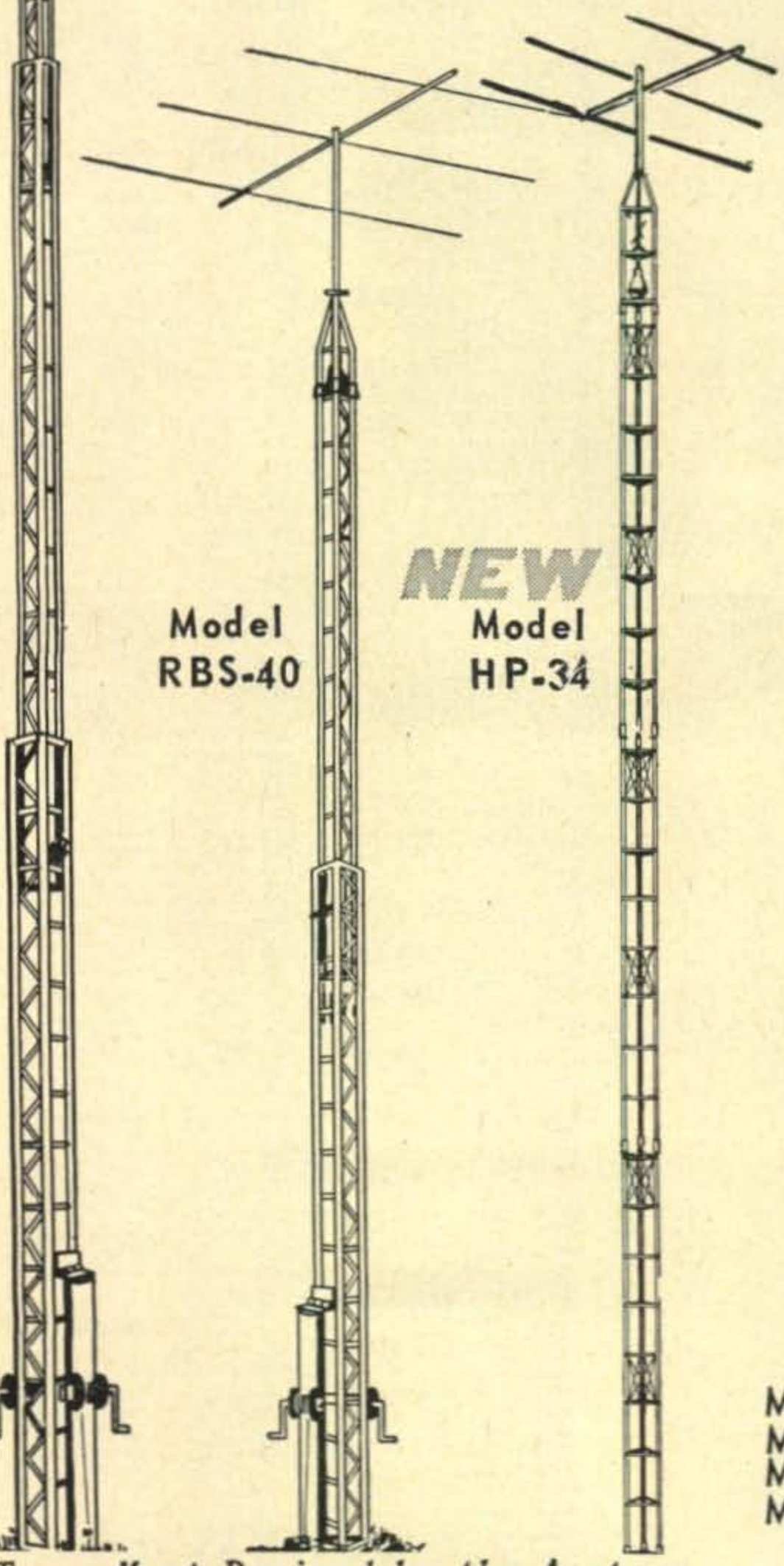
Sept. 1-3: ARRL National Convention, Portland, Ore. ARRL's 12th national. It will be held in Portland's brand new Memorial Coliseum, only five minutes from downtown Portland and close to Lloyd Center, called the world's largest shopping center. Another at-

[*Continued on page 102*]

NOW ALL E-Z WAY TOWERS ARE BETTER THAN EVER!

STRONGER • LIGHTER

Through The Use Of 55,000 PSI Steel!



Model RBX 60-3

Model RBS-40

NEW

Model HP-34

Available At HARVEY

Our deluxe line of Crank-up and Tilt-over Towers are now built with 55,000 PSI steel rod and tubing! Now. . . 40% STRONGER and 20% LIGHTER.

More Value - No Increase In Price!

NEW "HP" Economy Series

Here is a low-cost, light-weight, super strong tower made with 55,000 PSI steel. Top quality features include: Hot dipped galvanizing after fabrication, Diagonal bracing, Electric arc welding, and the famous E-Z Way Rotor Head.

Fast, easy erection . . . 10 ft. sections weigh only 29 lbs. Self supporting or building attached models are available in three most desired heights.

Model HP-34	$84.95
Model HP-44	$101.90
Model HP-54	$118.85

Complete with Rotor Head and Mounting Kit for self supporter or building attached.

Model RBS-40P	$169.50
Model RBS-40G	$209.50
Model RBX-60-3P	$335.00
Model RBX-60-3G	$410.00

MOUNTING KITS

Model GPK-S40 Ground Post	$75.00
Model BAK-S40 Wall Bracket	$10.50
Model GPK-X60-3 Ground Post	$125.00
Model BAK-X60-3 Wall Bracket	$17.00

"The Tower Most Desired by the Amateur . . . He Either Owns One Or Wants One!"

hrc HARVEY ESTABLISHED 1927 **RADIO CO., INC.**

103 West 43rd Street, New York 36, N. Y./JUdson 2-1500

For further information, check number 35, on page 110

Phone Results

[*from page 52*]

Africa

Ethiopia

ET3RS **137,768 353 39 97** (ET3RS, OD5CT, YN1EP)

Kenya

VQ4RF **542,244 676 84 208** (VQ4RF, VQ4DT)

Libya

5A3CAD **338,100 670 47 128** (5A3CAD, 5A3CAE)

Asia

Cyprus

ZC4AK **97,439 258 47 92** (ZC4AK, ZC4AB, ZC4AT)

Japan

KA7DX **11,395 94 24 29** (K1TXA, K2BTK, WA6QDA)

Ryukyu Islands

KR6AF **102,221 368 43 76** (K1GFS, K8LEZ)

Taiwan

BV1US ..... **62,532 323 29 52** (W5OUT, KØYXU, WØDRO)

U.S.S.R.

Azerbaijan

UD6KAB ..... **35,880 157 27 65** (Club Station)

Armenia

UG6KAA ..... **10,976 82 13 36** (Club Station)

Uzbek

UI8KAD ..... **5754 76 16 26** (Club Station)

Tadzhik

UJ8KAA ..... **16,188 105 32 44** (Club Station)

Europe

Bulgaria

LZ1KSZ ..... **97,152 388 39 145** (Club Station)

Crete

SVØWT ..... **44,390 322 30 85** (SVØWY, W5GMS)

Czechoslovakia

OK2KAU ..... **17,834 142 29 69** (Club Station)

England

G3NGZ **46,200 260 33 107** (G2FZK, G3KTC)

G3OHM ..... 22,236 169 28 74 (Radio Society)

Finland

OH5SM **254,664 675 66 196** (OH5SM, OH5NQ, OH5NW)

OH2A 3723 74 14 37 (OH2CM, OH2XK)

Germany

DJ3VM **233,412 484 60 152** (DJ3VM, DJ1BP, DL1CR, DL3AO, DJ3JZ, DJ4LI)

DLØOS 69,078 260 48 126 (DL2BL, DJ2HH, DJ4OZ, DJ4PE)

DL5BR ..... **67,320 268 37 99** (Club Station)

DL4FX 66,444 246 44 103 (DL4FX, DL4FC)

Hungary

HA1KSA ..... **33,170 230 24 83** (Club Station)

Northern Ireland

GI3CDF **133,450 434 46 111** (GI3CVH, GI3FJA, GI3GSB, GI3ILV, GI3JGZ, GI3ONF)

Norway

LA1K **25,256 287 16 72** (LA2OH, LA3EG, LA5UF, LA7WG, LA9TG)

LA1H 4002 83 11 35 (LA3SH, LA3RH, LA3PH, LA5AD, LA5FG, LA6ME)

Poland

SP5KAB **5248 85 11 30** (SP5GM, SP5ZM)

SP5ZHP 1316 44 6 22 (SP5AHZ, SP5ZK)

Portugal

CT1EY **200,169 588 57 150** (CT1EY, CT1YE)

Sweden

SM5AZU **19,012 145 24 74** (SM5AZU, SM5ATN, SM5BGM, SM5MC)

SL6BF 3640 76 11 29 (SM6CKV, SM6CRX)

Vatican City

HV1CN **169,708 646 40 93** (I1CNS, W2BBV, W2BIB)

U.S.S.R.

European

UA3KND ..... **8515 93 18 47** (Club Station)

UA3KFB ..... 7750 103 18 44 (Club Station)

UA3KOB ..... 6 640 71 12 34 (Club Station)

UA1KBW ..... 4982 66 15 38 (Club Station)

UA1KIA ..... 1066 36 7 19 (Club Station)

Ukraine

UB5KEP ..... 181 15 6 9 (Club Station)

Lithuania

UP2KBU ..... **31,096 265 23 81** (Club Station)

UP2KNP ..... 29,998 208 24 82 (Club Station)

Estonia

UR2KAN **4316 107 12 33**

Oceania

Australia

VK2AHM **43,976 184 40 52** (VK2AHM, VK5NO)

MULTI-OPERATOR

Multi-Transmitter

North America

K2GL **319,144 444 91 196** (K2GL, W2IWC, W2SKE)

K6EVR **103,170 260 69 112** (K6EVR, W6GFE)

Europe

DJ3OU **220,818 480 61 186** (DJ3OU, DL1HC, DJ3YV, DJ4OT, DL6NK, DJ6WI, DL9GU)

DL4FKT **58,286 303 33 118** (DL1TA, DL4UC, DL4IU, DL5AC, DL5BM)

I1KQ **40,608 182 36 105** (I1KQ, I1DH, I1SF)

OH2AA **31,868 200 28 96** (OH2SB, OH2KK, OH2KH, OH2LP)

Our thanks to the following stations who sent in their logs for checking purposes: W1PLJ, K2GME, W2GRA, W2PEO, W3UHN, W4GF, W4HVU, K5OGP, WA6IVM, WA6MWG, WA6OET, W6SUD, W7FCY, K8NMG, K8BTL/6, GI4RY, JA1DRC, LU9DAH, OH2VO, OK2KJU, OZ7DX, PAØNIR, PAØTV, SM4AWC, SM7TQ, VE3AO, VE4DQ, YO2CJ, YO9WL, YV5AKU, ZS6ZC and EL1C.

Announces

[*from page 18*]

munication between amateur stations and transmission of third party traffic by amateurs is published for the information and guidance of amateurs in the United States:

Article 41, Section 1. "Radiocommunications between amateur stations of different countries shall be forbidden if the administration of one of the countries concerned has notified that it objects to such radiocommunications." Cambodia (FI8, XU), Indonesia (PK, YB-YH), Thailand (HS), and Viet Nam (FI8, XV, 3W) have so notified.

The amateur service has not yet been organized in Jordan.

Article 41, Section 2. "(1) When transmissions between amateur stations of different countries are permitted, they shall be made in plain language and shall be limited to messages of a technical nature relating to tests and to remarks of a personal character for which, by reason of their unimportance, recourse to the public telecommunications service is not justified, It is absolutely forbidden for amateur stations to be used for transmitting international communications on behalf of third parties. (2) The preceding provisions may be modified by special arrangements between the administrations of the countries concerned." Such arrangements permitting third party communications have been effected between the United States and the following countries only: *Bolivia, Canada, Chile, Costa Rica, Cuba, Ecuador, Haiti, Honduras, Liberia, Mexico, Nicaragua, Panama, Paraguay, Peru* and *Venezuela.* Only amateur stations identified by properly authorized call signs having a one or two-letter prefix beginning with "W", or "K", are authorized by the United States, and third party communication is presently permissible with all such stations except those identified by prefixes KA2-KA9, inclusive. ■

Cranium Query—Here we go again! Remember, don't cheat! In case you started here, the "Round-Word Puzzle" can be found on page 41.

I	O	N	O	S	P	H	E	R	E	N	D
G	C	O	D	E	X	T	R	A	F	C	L
A	L	T	I	C	K	E	T	M	W	H	D
Y	Y	D	N	B	F	M	U	F	I	I	R
A	X	P	I	M	I	K	E	I	N	R	I
D	D	D	K	F	T	G	S	E	D	P	F
Y	N	N	S	M	T	M	G	L	O	O	T
A	U	A	M	E	D	O	I	D	M	W	F
M	O	B	R	E	P	P	I	L	C	E	C
A	R	C	N	I	A	R	D	E	E	R	P
E	G	A	R	E	W	O	T	N	U	H	S
B	U	T	S	N	O	R	T	C	E	L	E

See Terry (W9DIA) for Your Best Deal on

COLLINS!

Big Inventory Sale! TERRIFIC TRADES!

$5.00 DOWN ...UP TO 3 YEARS TO PAY

WATCH FOR TERRY'S A. E. S. PLANE AT YOUR NEXT HOME CONVENTION! It's Collins Equipped all the way!

Bargains in Collins Reconditioned Gear!

75A-1 Receiver	$239.00	32V-3 Transmitter	299.00
75A-2 Receiver	299.00	32S-1 Transmitter	479.00
75A-3 Receiver	399.00	KWM-1 Transceiver	449.00
75S-1 Receiver	379.00	AC Supply for above	99.00
75A-4 Receiver	495.00	KWM-2 Transceiver	849.00
32V-1 Transmitter	199.00	30S-1 Linear Amplifier	995.00
32V-2 Transmitter	249.00		

WRITE FOR LATEST LISTING: 10% DOWN!

Up to one year to pay on $60 order, two years to pay on $120 order, three years on $180 sale. $5 deposit holds your selection.

TRADES ACCEPTED ON ALL NEW OR RECONDITIONED GEAR — USE COUPON

Now Making Delivery on New Collins 75S 3

Look at these low monthly payments after low $5 Down Payment . . .

	Ham Net Price	Monthly Payments
30L-1 Linear Amplifier	$520.00	$18.59
30S-1 Linear Amplifier	1556.00	56.00
32S-1 Transmitter	666.00	24.42
75S-1 Receiver	520.00	18.59
75S-3 Receiver	680.00	24.35
51J-4 Receiver	1464.00	52.69
51S-1 Receiver	1828.00	65.83
KWM-2 Transceiver	1150.00	41.35
DL-1 Dummy Load	58.00	1.91
351D-2 Mobile Mount (KWM-2)	120.00	4.15
CC-2 Carrying Case	85.00	2.88
MP-1 15V DC Power Supply	198.00	7.10
PM-2 Portable Power Supply	150.00	5.24
516F-2 AC Power Supply (32S/KWM-2)	115.00	3.97
321B-3 Speaker (S-Line)	32.00	.97
312B-4 Speaker Console (S-Line, KWM-2)	195.00	7.00
312B-5 PTO Console (KWM-2)	350.00	12.45
399C-1 PTO Speaker	164.00	1.99
F455Q-5 Mechanical Filter (75S)	52.00	1.70
302C-3 Directional Wattmeter	130.00	4.51
189A-2 Phone Patch	67.00	2.10
440E-1 Cable (516E-1 to KWM-2)	17.00	.43
136B-2 Noise Blanker (KWM-2)	124.00	4.30

Above are shown for a 3 year contract. Minimum order that can be financed for one year is $60, two years $120, three years $180. Persons signing time pay contracts must be 21 or over and employed.

AMATEUR ELECTRONIC SUPPLY

Two Stores to Serve You

PLEASE SEND MAIL ORDERS TO MILWAUKEE STORE

MANAGER, STEVE, W9EAN

MILWAUKEE, WISCONSIN
3832 Lisbon Avenue
Phone: WEst 3-3262

MANAGER, "DOC", W9HJS

CHICAGO, ILLINOIS
6430 Milwaukee Avenue
Phone: ROdney 3-1030

Amateur Electronic Supply—Mail Order Dept. C-54
3832 W. Lisbon Ave., Milwaukee 8, Wisc.

Ship me .....
I enclose .....: I will pay the balance in

☐ 1 year ☐ 2 years ☐ 3 years

I want to buy ..... and want to trade
..... What's your deal?

Name .....

Address .....

City ..... State .....

☐ Send reconditioned equipment bulletin

For further information, check number 36, on page 110

Heath GC-1A [*from page 46*]

until the greatest selectivity is obtained. The capacity value may not be the same for both filters.

Conclusion

If you are inclined to write and ask, I'll tell you the same thing "off the cuff." Priced at $109.95 the Heath GC-1A is an excellent buy and I like it! ■

DX [*from page 58*]

HS1X	via WA2WCB.
I1SVZ/M1	G. Rustichelli, I1SVZ, Via F. Dall Ongaro 81, Rome, Italy.
JA3BEU	1-775 Kurehacho Ikeda, Osaka, Japan.
JA3CUK	21-2 Kikawa higashinocho, Higashiyodogawaku, Osaka, Japan.
JA3DDG	439 Hiranonodocho, Higashisumiyoshika, Osaka, Japan.
JA3TC	Box 48, Toyonaka, Japan.
KA7DR	CMR #3, Box 8056, APO 929, San Franciso, Calif.
KC4AAC	via KØYKJ.
KC4AAD	via WØBAT.
KG4CY	Box 12, Navy 115, c/o FOP, N.Y.
KJ6CA	Det. 1, 1957 Communications Group, Johnson, Is., APO 105, c/o PM, San Francisco, Calif.
KV4CM	via WØGEK.
ex-KX6CO	CWO James D. Jardine, SAC Test and Evaluation Unit, IT&T Corp. Box 285, Paramus, N.J.
MP4TAC	10 Ave Rd., Gosport, Hants, England.
OK3EA	Harry Cincura, MD., Drotarska 383, Bratislava, Czechoslavakia.
ex PK2AA	F. Heyer, Hilversum, Holland.
SM5ZS/ZC6	Wo/2 Bo Engren, Swed BN, UNEF, BPO, Beirut, Lebanon.
SVØWO (Crete)	Gordon E. Nelson, Box 564, Athen, Greece or via ISWL or 6930th RGM Box 507, APO 291, c/o PM, N.Y., N.Y.
SVØWT	Box 808, Irakilon Air Stn., Irakilon, Crete.
TA2BK (ex TA5EE)	via DJ2PJ, Hadi, Teichmann, Moltkestrasse 16, Nienburg/Weser, Germany
TT8AG	via W3KVQ.
TU2AK	Andrea, Box 1813, Abidjan, Ivory Coast.
UA2AB	A. E. Lakir, Box 78, Kalininggradsk Oblast, USSR.
UA2BD	S. Buratevich, Box 136, Kalininggradsk Oblast USSR.
UC2CS	Eduard Khomenko, R. Luxemburg 128, Apt. 26, Minsk 36, USSR.
UG6AB	Ul Aeriana 73, Erevan, Armenia, USSR.
UT5LL	Viktor Kharchenko, Lenin Blvd. 22 Apt. 3, Simferopol, 6, Crimea, USSR.
VE3BQL/SU	E. C. Veal, UNEF Base Post Office, Beirut, Lebanon.
VP2AF	William Martin, Market St., St. John, Antigua.
VP2AR	via W3KVQ.
VP2DG/VP2	Dean, c/o Cable and Wireless, Montserrat.
VP2GAC	via W4OPM.
VP2LD	via W4CKB.
VP2SH	R. L. Nelson, c/o Dept. Arigo, St. Vincent Island, BWI.
VP2SY	via K2MRB.
VP3YG	via G2BVN.
VP4BY	via VE6BY.
VP5BP	via VE3CJ.
VP5LG	Richard Gleason, CEW-2, U.S. Naval Facility, Navy No. 104. c/o FPO, N.Y., N.Y.
VP5MJ	via KØTYO.
VP8BP	via G8FC.
VP8DW	Box 185, Fort Stanley, Falkland Is.
VQ1DR	via W2TSD.
VQ2JN	P. O. Box 203, Lusaka, Northern Rhodesia.
VR4CV	via K6EC.
VU2RM	via W3KVQ.
VU2NR	via WØZSZ.
W6QMN/KB6	via K6HAU.
WA4FPK/KL7	via KL7DVB.
XE2RCC	via XE2OK.
XWØGZW	via K5GZW.
XW8AL	via K4KTR.
YN1AW	via P. O. Box 2113, Managua, Nicauragua.
YVØAA	Radio Club of Venezuela, P. O. Box 2284, Caracas, Venezuela.
ZD6HK	Box, 24, Blantyre.
ZD6PR	P. Rackham, Box 16, Mzuzu, Nyasaland.
ZA2BAK	Box 28, Tirana, Albania.
4S7WP	via W3KVQ.
5A1TW	Box 372, Tripoli, Libya.
5A3CAD	I. Trays, c/o Mr. Burnett, 56 Albany St., Edinburgh 1, Scotland.
5H3HH	via W2CTN.
5N2EBL	E. B. Lloyd, Box 114, Ibadan, Nigeria.
5N2NFS	via K9QIZ.
5N2RSB	via K3MNJ.
5T5AB	as listed in call book under FF7AB.
5T5AD	via B. P. 100, Nouakchott, Mauretania (*Nouakchott*).
6O1ND	c/o American Embassy, Mogadiscio, Somali Rep.
6W8BQ	via W9RKP.
6W8DE	Saint Hilaire, Box 3033, Dakar, Senegal.
9N1MM	via W3KVQ.
9Q5PW	via HB9GX.
9U5KU	Jim, Box 76, Kitega.

Propagation [*from page 60*]

are expected to be similar to conditions that existed during the spring of 1952.

VHF Ionospheric Openings

A considerable increase in sporadic-E propagation is expected to result in occasional 6 meter openings during May. Openings are most likely to occur between 9 A.M. and 1 P.M., and between 5 P.M. and 9 P.M., Local Standard Time, between distances of approximately 1000 and 1400 miles. DX openings between stations in the southern part of the United States and Central America may be possible on 6 meters as a result of sporadic-E propagation.

A fairly large meteor shower, the *Aquarids*, is expected to occur during the first week of May. This should result in some meteor-reflection type openings on 10, 6 and 2 meters.

May is usually a month of very little auroral activity. If auroras do occur, however, there is the likelihood that 6 and 2 meter propagation may be possible for distances up to approximately 1200 miles as a result of auroral reflection or scatter. Auroral activity is most likely to occur during below normal or disturbed propagation periods (see "Last Minute Forecast").

This month's Propagation Charts contain data for short-skip openings between distances of 50 and 2300 miles, and special forecasts for Hawaii and Alaska for May & June. DX Propagation Charts for May appeared in last month's column. 73, George

NOW . . . PROOF OF DX PERFORMANCE

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a $16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida
Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am
Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-TI2TG)

V-80 VERTICAL ANTENNA FACTS

- If K6INI can do it, so can you
- Absolutely no guying needed.
- Radials not required.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- Uses one 52 ohm coax line.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Four metal mounting straps furnished.
- Special B & W loading coil
- Non-corrosive aluminum used exclusively.
- Omnidirectional radiation.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.

DO YOU KNOW

1. YOU WILL HAVE NO DIFFICULTY INSTALLING YOUR GOTHAM VERTICAL ANTENNA IN JUST A FEW MOMENTS, REGARDLESS OF YOUR PARTICULAR PROBLEM, SO ORDER WITH CONFIDENCE EVEN IF YOU HAVE RESTRICTED SPACE OR A DIFFICULT SITUATION.
2. LOADING COIL NOT REQUIRED ON 6, 10, 15 AND 20 METERS. FOR 40, 80, AND 160 METERS, LOADING COIL TAPS ARE CHANGED MANUALLY EXCEPT IF A WIDE-RANGE PI-NETWORK OUTPUT OR AN ANTENNA TUNER IS USED; IN THIS CASE BAND CHANGING CAN BE DONE FROM THE SHACK.
3. EVERY GOTHAM ANTENNA IS SOLD ON A TEN DAY TRIAL BASIS. IF YOU ARE NOT FULLY SATISFIED, YOU MAY RETURN THE ANTENNA PREPAID FOR FULL REFUND OF THE PURCHASE PRICE. THIS IS YOUR GUARANTEE OF FULL SATISFACTION.

FILL IN AND SEND TODAY!

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. CQ
1805-A PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

☐ V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS. ESPECIALLY SUITED FOR THE NOVICE WSO OPERATES 40 AND 15 ..... $14.95

☐ V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS $16.95

☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO $18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name_____

Address_____

City_____ Zone _____ State_____

For further information, check number 37, on page 110

Contest Calendar [*from page 61*]

win QSO Party awards and the regular Hunt the Hunters' awards for working 25, 50, 100, 200, 300 or 400 club members. QSO-Party awards for first, second, and third place will be given to Continent, Country and U.S. State high scorers. CHCers and HTHers will be scored separately.

Frequencies: (Plus or minus 10 kc) Primary frequency is 14075. *C.W.:* 3575, 7030, 14075, 21090, 28090 *AM:* 3810, 7235, 14250, 21330, 28800 *SSB:* 3990, 7205, 14340, 21440, 28690.

Procedures: CHCers: Call CQ CHC. CHC; give Report, Name, State, County and CHC number. HTHers: Call CQ HTH. HTH; give QSO Nr., Name, State and County.

Scoring System:

CONTACT POINTS: CHCers: each contact with HTHer counts *two;* each contact with CHCer counts *one*. HTHers: each contact with a CHCer counts *three*. (Note: Same station may be contacted on different bands or modes for additional points.)

MULTIPLIER POINTS: 1. Multiply total of "Contact Points" by the number of different Continents worked to establish a total of continent points.

2. Multiply total of "Contact Points" by the number of different Countries (ARRL list) worked to establish a total of country points.

3. Multiply total of "Contact Points" by the number of different U.S. States worked to establish a total of state points.

Final Score: Final Score is the sum obtained by adding total "Contact Points" *plus* total "Continent Points" *plus* total "Country Points" *plus* total of "State Points" for grand total. (Note: Own Continent, Country, State Counts. KL7 and KH6 count for Continent. Country and State represented.)

Contest Logs: Submit contest logs within 30 days to K6BX, Box 385, Bonita, Calif. Logs must show numerical listing of QSOs, GMT time/Date, Calls, Bands/Modes, Reports, CHC numbers when applicable, States, Counties, and be tabulated by sub totals for the grand total claimed.

Special Note: CHC/HTH QSO-Party Logs will, if submitted within 30 days of Party, be accepted in part or in full or for later credit claim toward regular HTH awards whenever HTH applications so properly refer to such Party Logs, and without any requirement for certification of possession of QSL cards. This action is taken to obviate the need for exchanging QSLs for the purpose of the Party or other HTH awards.

That just about does it for this contest season. All except the ARRL Field Day the last week-end in June. And that one is a humdinger if you're a nature boy and like the wide open spaces. As for me I'm taking it easy, after we put the results of our C.W. Contest to bed, that is.

73 for now, Frank, W1WY

Sideband [*from page 73*]

permanent QTH in Rockville Centre, L.I., (sob) one town removed from us. . . . Her many friends will be delighted to learn that Harriet, K9WUR, has shown decided improvement after the most recent of many operations. . . . Wonder if Ted, W9OOL, ever found a station in Buffalo, N.Y.? For several days during March, Ted kept popping up on frequency hoping to get a patch into his daughter and learn further details about the new grandchild! . . . Note this new call in your book—Bob, K8BTL/6 is now K7UDV/6. . . . As this column is being finished on a Spring-like day in early March, we are looking forward to our first personal meeting with Lou, WØCGE, who is in New York for a few days and have no doubt that our dinner with him will be most enjoyable. Wish you all could join us!

73, Irv and Dorothy

Out of the Darkness [*from page 39*]

ter, this was apart from the Ocean City operation. Distant points went through K2RXB, New Jersey Phone Net, on 75. Calls were relayed round the clock, to points as distant as California.

One keynote which certainly must be cited is the modesty displayed by the radio amateurs, the reluctance of individuals to accept recognition for their vital assistance. The unification of all forces ran smoothly, without friction in any quarter. SCARA, RACES, AREC, MARS, and every individual operator banded together to handle the flux of storm traffic. Bob Rosenberg, Captain Lon Benson, and Maryan Bouchard each pointed out that it is impossible to single out one individual and call him responsible for the vital operation.

Yet, it was they, the people behind the scenes, who provided the precious link . . . from small attic rooms housing home brew rigs or Heath Sixers; from the Net Control Center's Senacas and Gonset Communicators; from the mobiles, some equipped with Heath Twoers, running deep into the desolute ruins, describing the grim remnants of ravaged communities . . . Traffic, a lot of traffic.

Perhaps this behind-the-scene drama of New Jersey's storm disaster was not flashed across the nation's television screens. This part was not headlined in the bold black and white newspaper copy that told of Red Cross Shelters, the Air Force Trucks, the National Guardsmen, that moved in to transport evacuees. The amateur radio operator's part will best be told by the pages in the log books dated March 5, 1962 . . .

"QRZ 6 for traffic . . .

Standing by and tuning . . .

Traffic . . . a lot of traffic, long into the night. Some QSO's, merely conversation of the storm's damage. Some urgent, distress calls. To the anxious, to homeless families, to sick children, to concerned relatives out of touch, and, to a little girl tearfully greeting a wet and frightened Collie . . . Out of the darkness came the voice, the reassurance, *the "light through* darkness . . .

QRZ 6 for traffic. ■

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SX-101A Rcvr	445.00	15.89
S-107 Rcvr	94.95	3.25
S-108 Rcvr	139.95	4.87
SX-110 Rcvr	169.95	5.96
SX-111 Rcvr	279.50	9.91
*SX-115 Rcvr	599.95	21.48
S-120 Rcvr	69.95	2.35
SX-140 Rcvr	124.95	4.33
SX-140K Rcvr	104.95	3.61
SR-34AC Transcvr	395.00	14.08
R-47 Spkr	12.95	.29
R-48 Spkr	19.95	.54
HT-32B Xmtr	725.00	26.00
HT-33B Xmtr	995.00	35.75
*HT-37 Xmtr	495.00	17.69
HT-40 Xmtr	109.95	3.79
HT-40K Xmtr	89.95	3.07
HA-4 Keyer	59.95	1.98
HA-2 2-Meter Transvtr	349.50	12.44
HA-6 6-Meter Transvtr	349.50	12.44
P-26 Sup for above	99.50	3.41
FPM-200 Mob. Transcvr	1995.00	71.86
HT-41 KW Lin	395.00	14.08
S-119 SWL Rcvr	49.95	1.62
S-119K Kit	39.95	1.26
CB-3 C.B. Transcvr	149.95	5.23
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SX-40 Rcvr	49	S-102 Rcvr	39
SX-40B Rcvr	69	SX-111 Rcvr	199
SX-43 Rcvr	99	HT-18 VFO	39
SX-62A Rcvr	299	HT-30 SSB Exciter	199
S-85 Rcvr	79	HT-31 Lin Amp	179
SX-95 Rcvr	49	HT-32 Exciter	399
SX-99 Rcvr	99	HT-32A Exciter	449
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For further information, check number 38, on page 110

RTTY [*from page 81*]

W3QLC of West Chester, Pa., needs keyboards for his Models 14 and 15. *(Contact W3CRO, Joe.)* W5TKI is /4 at St. Petersburg, Florida, with a BC-610E and a Model 26. K4KIN is building a W2JAV transistorized TU on board the carrier, U.S.S. *Saratoga*. K5WUP of Dallas, Texas, has a TT-160(A)/FG Synchronous Teletypewriter Mixer. (*Can anybody tell us what this is??)*

W6AEE of Arcadia, California, reports better copy on narrow shift (less than 200 cycles) on 3620 kc, working W7CGA and W6NRM. W7PRG of Klawith Falls, Oregon, wants to f.s.k. a Command Set without modifying it. *(?!)* W7ELB of Tacoma, Washington, is trying his Twin City TU on 170 cycle narrow shift. W8ADZ of Cincinnati, Ohio, has for sale several Model 15's with tables. W9GRW of Skokie, Illinois, donated a *NEW RTTY Handbook* to the Lawndale branch of the Chicago Boys Club for use in their station. K9OFG of Indianapolis, Indiana, needs some local assistance. K9ZQT of Rantoul, Illinois, has a Model 19 ready at the gate. K9MOT of KCM, Box 88, Milwaukee 13, Wisconsin, has 88 mh and 44 mh toroids for sale for $1 each or 5 for $4. WØTWG of Bemidji, Minnesota, has a Model 19 and a Twin City TU.

KL7CK of Juneau, Alaska, was caught with his antenna down. KP4BCA, now of Puerto Rico, put KØWBD on RTTY at Ft. Leonard Wood, Mo. Billy will trade other parts for needed machine motors. Contact B. L. Nielsen, USAG & Tech Svc, Antilles, APO 851, New York, N.Y. KG6GF, the Camp Sukiran Amateur Radio Station, Okinawa, is on RTTY for 3rd Marine Division traffic with a KW-1 and a TM-30 antenna. XZ2AD of Rangoon was shipped a Model 15, with a 240 volt 50 cycle motor, by Merrill Swan, W6AEE. A TU is still apparently the problem, though. PY1KU and PY2BCD are going strong on 15 and 20, according to W6CG.

Transistorized Corrections

In the February '62 RTTY COLUMN, page 87, fig. 2 the resistor in the emitter circuit of Q_2 should be 8.2K instead of 2.2K.

In the March '62 RTTY COLUMN, page 92, Fig. 1, the capacitor between the base and the collector of Q_1 should be 0.01 instead of 0.1; and, it didn't print too clearly but the capacitor between the emitter of Q_1 and the bottom of coil L_1 is 0.1 mf.

Comments

Last month we asked for post cards commenting on operation on 7040 instead of on 7140 kc. So far everyone seems to be happy with the change, especially the DXers. Any remarks from the balcony? *Keep the cards coming!*

73, Byron, W2JTP

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For further information, check number 40, on page 110

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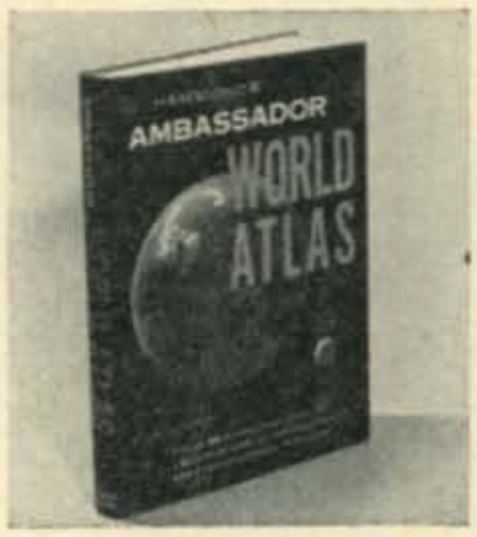

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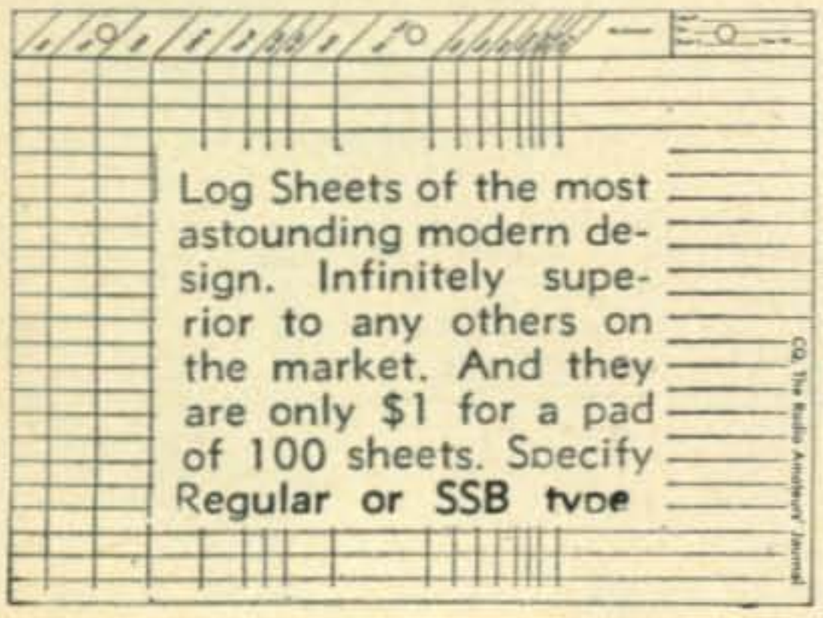

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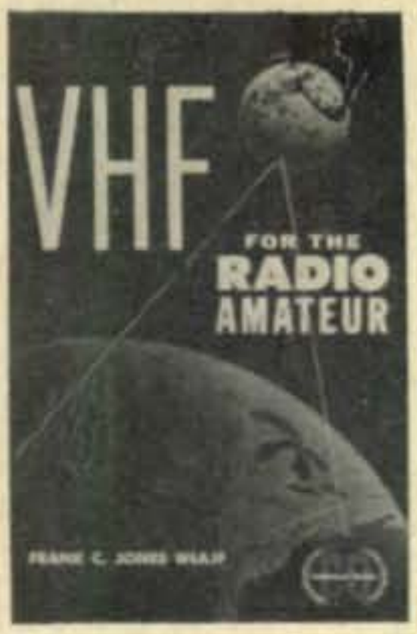

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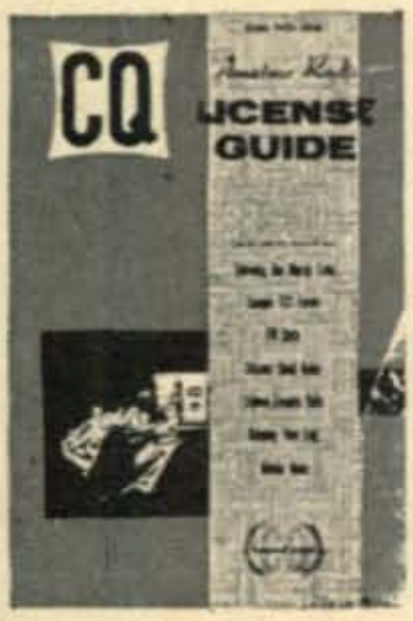

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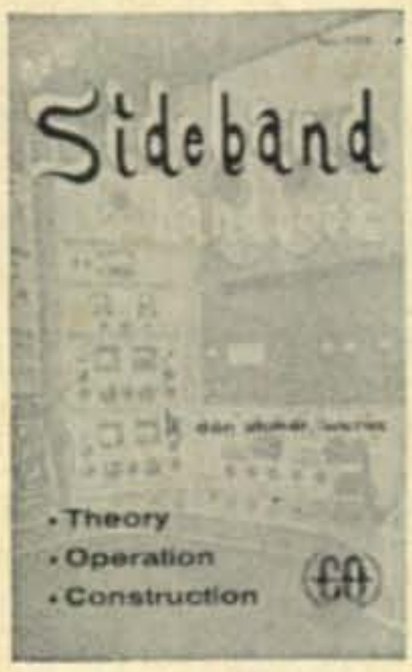

SIDEBAND HANDBOOK

Written by Don Stoner, W6TNS, was almost one full year in the preparation of this terrific volume. This is not a technical book. It explains sideband showing you how to get along with it . . . how to keep your rig working right . . . how to know when it isn't . . . and lots if how to build-it stuff, gadgets, receiving adaptors, exciters, ampliers Price, only $3.00.

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L.F. and V.L.F. [*from page 28*]

axial feed lines. Also, it is doubtful that element spacing for an underwater beam would equal that of a conventional above water beam. Spacing would probably have to be much closer, possibly closer than called for in the usual formulas based upon effective wavelength.

Once the problems of antenna design, antenna feed, etc, are ironed out, assuming, of course, that this method of transmission is shown to be practical, it is expected that with suitable equipment and techniques and with moderate power, submarines may be able to transmit a sharp beam of electromagnetic energy upward, from a beam antenna riding just below the surface, so that it is refracted to a horizontal plane upon leaving the water and conducted in the normal way to receivers aboard ships and at ground stations. Additionally, using single sideband suppressed carrier or other high efficiency transmission techniques or, even with conventional c.w., it may be possible someday for submerged submarines to transmit to other submerged submarines, ships and land stations. It would certainly be to amateur radio's credit if it contributed significantly to such developments after the noticeable lack of progress on the part of American industry. So, take your amateur radio gear to the beach next summer and, if you feel up to personally exploring inner space, enjoy skin diving as a second hobby. Besides having fun you may do your government a valuable service.

I would like to express my appreciation to Mr. Leon Arnell, a business associate who contributed much analytical data for this article. ■

VHF [*from page 79*]

and should be satisfactory for general purpose v.h.f. work.

Gil Desvernine, 30 Byron Lane, Larchmont, N. Y., would like to see a s.s.b. adapter conversion for the Heath Seneca and wonders if any of the fellows have any ideas along these lines?

Wm. C. Parsons, 329 Molokai Hema St., Kahului, Maui, Hawaii, would like to see some material on simple general purpose two meters antennas in the v.h.f. column. He says "Not the ultra fancy ones, but just the type that are consistently good in their average overall performance". What say, fellows have you any designs we can use in the column?

Seems this is a month for problems. John L. Kuempel, W8IXF, wants to convert the $15.00 u.h.f. beacon transmitter to six meters. This is the one that Barry Electronics sells and uses a 6360 in the final. I have one of these rigs and am going to give it a whirl on six. A 220 mc conversion will appear in this column shortly.

Danny Held, WA2IHY, 370 Central Park West, New York 25, N. Y., has the lunar fever and would like to contact others interested in

moon-bounce work. His biggest problem is (you guessed it) antennas. Get in touch with him if you have similar interests.

That's it for another month. Keep those letters and pictures coming and don't forget to pass along your latest circuits.

'Til next month, 73, de Don, W6TNS

Ham Clinic [*from page 76*]

It can be done but I feel the change is not worth the effort. If you are contemplating using the transmitter for s.s.b., you might look into the Amperex 8117 described above. You'd only need one socket instead of two.

Receiver Dial—"I like to build all of my own equipment including receivers. Can you suggest the best dial (in your opinion) that I can use for an all-band receiver I have in mind?"

Yes. The Eddystone made in England. It is distributed in this country by British Radio Electronics Ltd., 1833 Jefferson Place, N. W. Wash. 6, D.C. It is a mite expensive at $16.50, but I guess that includes import tax, etc. This dial has a loaded drive with a reduction ratio of 110:1. It can be zeroed, is of the slide rule type and easy to mount. I wish some of our American manufacturers would come up with one as good; but I do not believe the demand (at this time anyway) warrants the special effort.

Transistor Tape Recorder Trouble—"I, like many other hams, have purchased one of the inexpensive transistorized tape recorders made in Japan which we used to record OSCAR as it spun over the earth. However, as the batteries wear down the motor changes speed. Anything practical I can do about this?"

These little recorders work fine as long as the batteries are good but there is no electronic speed compensation nor mechanical governor (as such) on them. The Grundig and Phillips are the only recorders I know of using transistorized motor speed control circuitry, that are imported into the U.S.A. Only thing I can suggest is to make up an a.c. operated power supply or parallel a good number of batteries (for the correct voltage) for long operation. I hope the Japanese manufacturers will look into the speed situation.

***Q* Mult and BFO**—"How about a diagram for a *Q* multiplier and b.f.o. using one tube?"

See next month's column. This little rig can be adapted to nearly any i.f.

Mobile Antenna Resonance—"Being a newcomer to the mobile arena, I'd like to know how you adjust a loaded antenna for an exact frequency so that I am certain that the thing will load up properly. Help me out?"

Sure. Make sure that you have the correct loading coil installed (or tapped for the band on which you want to operate). Next, at the end of the coaxial cable feeding the antenna install a pickup coil (2½ turns #18 bellwire, 1½ inches in diameter). Connect one end of the coil to the coax inner conductor and the other end to the shield. Now with a grid dip

meter (with the proper coil plugged in for the frequency range) place the g.d.o. coil close to the pickup coil, rotate the g.d.o. dial until resonance is indicated on the meter (by a dip). Merely read off your frequency from the dial. To go up in frequency reduce the whip length; to go down, increase the length (a ¼ inch at a time) or adjust the loading coil taps. Merely adding a small length of wire to the whip end (perpendicular to the whip) will decrease the resonant frequency a number of kc. The wire will act as a top loading device.

Thirty

Next month, our good editor, Arne Trossman has turned over to HAM CLINIC over twice the space normally used. We can promise you some very interesting and worthwhile ideas, and none will duplicate any which have appeared during the last 4 years! The June column has been in the making for 3 months, so you can expect to see the results of a lot of work, culminating in a wide range of subject matter of interest to nearly every ham.

We again remind our readers that we do not claim technical infallability, we do make mistakes as any ham does, but we do try very hard to bring you useful and practical information.

We sincerely thank those of you who have taken out the time to drop us a card to encourage our efforts these kind communications give us the impetus it takes to answer hundreds of letters from hams all over the world each month.

So until the *big* column next month then, our sincere 73 and 75 to you, and we add a big 72 to our many DX friends.

Chuck, W4VZO

YL [*from page 86*]

traction is the "Century 21" World's Fair in Seattle, only 180 miles north of Portland. YLs of the Portland Roses are planning program, prizes and favors for the LYLs and YFs attending.

The Roses have put out an appeal for shank-type buttons no larger than ¾" in diameter, the prettier the better. They also need colorful stones from the 50 states. They should be reasonably hard and need not be larger than thumbnail size. Mail both items to Beverly Welker, W7HPT, 4816 S.E. 75th Ave., Portland 6, Ore. As you could see in the photo in April *CQ*, these gals are working on some interesting surprises for the convention.

Correction

In Feb. *CQ*, p. 91, the photo and caption for YLRL's 1,000th member, Thelma Bomyea, listed her call as WA2RLW. This was in error —please correct your copy to read WA2RLU. Tnx to WA2GCH for calling this to our attention.

33, W5RZJ

For further information, check number 48, on page 110

Ham Shop

Rates for the HAM SHOP are 5¢ per word for advertising which, in our opinion is obviously of a non-commercial nature. A charge of 25¢ per word is made to all commercial advertisers or business organizations.

Your copy should be preferably typewritten, double spaced on one side of the page only.

We do not bill for advertising in the HAM SHOP Full remittance *must* accompany all orders.

Closing date is the 15th of the 2nd month preceding date of publication.

We reserve the right to reject advertising which we feel is not of an amateur radio nature.

Because the advertisers and equipment contained in the HAM SHOP have not been investigated, the publishers of *CQ* cannot vouch for the merchandise listed therein.

TOROIDS: 88 mhy with mounting hardware. Uncased like; new. Information sheet included. $1 ea., 5/$4.00 Postpaid. KCM, Box 88, Milwaukee 13, Wisconsin.

"The VHF Amateur" At last a magazine for VHF'ers! Don't miss a single issue! Send $2.00 for year or $1.00 for six big issues . . . 67 Russell, Rahway, N. J.

CITIZENS Band Gear! I have two CB-1 tranceivers, one with 12 volt power supply also one GW-10 for 110 volts. All are Heathkits; assembled, used very little; and in excellent condition. Make me an offer for part or all. Trades possible. Frank Dahm, Jr., 86 Garfield St. Natrona, Penn.

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp system $50; 12 volt amp system $50; 12 volt 60 amp system $60; 12 volt 100 amp system $100. Guaranteed no ex-police car units. Herbert A. Zimmermann, Jr. K2PAT, 1907 Coney Island Ave., Brooklyn 30, N. Y. Tel. DEwey 6-7388.

ONE THIN DIME brings 50 page eye-popping war surplus electronics catalog. Fabulous bargains. Meshna, Lynn, Mass.

TOROIDS: Uncased 88 mhy like new. Dollar each. Five $4.00 P.P. DePaul, 309 South Ashton, Millbrae, Calif.

WANTED: Teletype printers, perforators, reperforators transmitter-distributors test equipment: Model #14, #15, #19, #26, #28, etc. All types Collins receivers, 51J, R-388, R-390, 75A, etc. Cash, or trade for NEW amateur equipment. Write Tom, W1AFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. (RIchmond 2-0048).

A-1 reconditioned equipment. On approval. Trades. Terms. Hallicrafters S-85 $79; SX-100 $199; SX-111 $179; SX-101A, HT-32, HT-37; Hammarlund HQ-100 $129; HQ-110 $179; HO-160 $229; HO-170 $289; HRO-60 $345; Gonset G-50 $229; Central 20A $149; Viking II $159; Valiant $279; Collins 75S-1, 32S-1, 32V-3, 32V-1, 75A-4, KWM-2; Elmac, Globe, Gonset, Heath, Johnson, RME, other items. List free. Henry Radio Company, Butler, Mo.

WANTED: TEST EQP'T TS or AN/URM, UPM, ARM, etc. TELETYPE TG-7, Models 14, 15, 19, 26, 28, printers & reperforators: Revrs & xmtrs: BC 610E, I; AN/GRC-3 & higher, RT-66, -67, -68, Collins 51J 17L3, -4, 18S-2, R-388 -390, -391; ARN-14 and 30; APR-9, -10, ARC-21, -34; APS-10, -31, -33, -42 etc. We pay freight Amber Industrial Corp, 75 Varick St., New York 13, N. Y.

FREE—RCA, GE, etc., tubes catalog. Discounts to 75% from list. Picture tubes at $75¢ inch and up. Parts,(Parts kits at 1/10 original cost. Needles, tube testers, silicons, seleniums, 7" TV test tube $6.99 and more. Arcturus Electronics Corp. CQ 502-22nd St., Union City, New Jersey.

PRESERVE YOUR HAM TICKET, Social Security Card, small photo, passes and anything else of value that is wallet-size. We will laminate it in clear plastic, guaranteed for life. Lamination will prevent it from getting torn, soiled or frayed. Send your ticket or anything of value with $1 in stamps or cash for each item that you want preserved. 24-hour service. Send to CQ Magazine, Dept H.W., 300 W. 43rd St., N.Y. 36, N.Y.

QSLs. Samples, Dime. Print Shop, Corwith, Iowa.

QSL—Kromkote 3 color . . . order 200 get 25 each of 8 different styles—many styles. Samples 10¢—Progress Printing, Box 1154, Biloxi, Miss.

QSL's four colors glossy stock forty design send $5 for 200 and get surprise of your life. 48 hour service satisfaction guaranteed. Constantine Press, Bladensburg, Md.

GLOSSY 3-color QSL cards 100—$4.50. Free sampler. Rutgers Vari-Typing Service, 7 Fairfield Road, Somerset, N.J.

QSL's SWL's. That are different, colored, embossed card stock and "Kromekote." Samples 10¢. Home Print, 2416 Elmo, Hamilton, Ohio.

QSL's Samples 15¢. Rubber stamps: Name, Call Address $1.35. Harry Sims, 3227 Missouri Avenue, St. Louis 18, Missouri.

SELL: 178 issues QST 1939 thru 1960. From Sept. '46 thru Dec. '60 complete.

QSL's, SWL's, WPE, CB. Samples 5¢ Nicholas & Son Printery P.O. Box 11184, Phoenix 17, Arizona.

CREATIVE QSL CARDS—New catalog and designs being completed. Free samples and catalog. Personal attention given. Wilkins Creative Printing, P.O. Box 1064-2, Atascadero, California.

GOODIES: Engraved Shack Plaques—badges—desk plates. Printed Call Card Mailing Envelopes—etc. Illustrated list 10¢ (refundable) K1VRO, Shirley Decker, 36 Hampden Street, Westfield, Mass.

QSL's . . . Dime . . . Filmcrafters . . . Martins Ferry, Ohio.

HUNDRED QSLs: 80¢. Samples, dime. Meininger, Jesup, Iowa.

QSL's-SWL's samples 10¢. Malgo Press, Box 375 M.O., Toledo 1, Ohio.

QSL's. SWL's XYL-OM's (Sample assortment approximately 9¾¢). Covering designing, planning, printing, arranging, mailing, eye-catching, comic, sedate, fantabulous, DX-attracting, protoypay, snazzy, unparalloned cards. (Wow!) Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minnesota.

WANTED: A few 304TL tubes needed urgently. J. Callanan, W9AU P.O. Box 155 Barrington, Illinois.

Convert any television to sensitive, big-screen oscilloscope. Only minor changes required. Plan $1.95. Relco Industries, Box 10563, Houston 18, Texas.

Multiplex Adapter—Circuit board, set of 5 coils, sockets and complete instructions $15.00. D. L. Stoner, Box 7388Q Alta Loma, California.

CUP—Core Inductances, excellent for sharp or band-pass 50 to 100 kc i.f. or b.f.o. Very high *Q*. Unused cased; adjustable; solder terminals. Type 1, 2.9 mh. Type 17, 3.7 mh. Dollar each postpaid U.S. proper. Circuit suggestions included. Woods, 2346 Clover Lane, Northfield, Illinois.

FOR SALE—Heath MR-1, MT-1, MP-1, Two mobile antenna's, mount, coax, and base power supply $220. W2UGM, 66 Columbus Ave., Closter, N.J.

COMMUNICATION. Teletype. Unusual surplus bargains. Free flyer. MDC 923 W. Schiller. Phila 40.

SSB exciter described in February CQ, $250. F.O.B. Dallas, W5VU.

HAMMARLUND HQ-100 receiver. Like New. Used 2 Months $170. Leo Soulek, 418 Riverview, Springfield, Oregon.

WANTED: BC639 receivers, advise price, condition. We pay freight. Amber Industrial Corp. 75 Varick Street, New York 13, N.Y.

TRAILERITE HAMS—information desired on ham operation in mobile homes/trailer parks. W5CAX, Tijeras, New Mexico.

HRO-50 T 1—A,B,C,D Coils. 3 extra surplus coils, speaker calibrator-$225. RME HF-10-20 converter—$45. Eldico Antenna Tuner with 4 coils—$15. Heath Q Multiplier—$6. Ted Kasper, Route 1, Grapevine, Texas.

For further information, check number 49, on page 110

For furtner information, check number 50, on page 110

FOR SALE—Heath Seneca, excellent condition and modulation reports. Hallicrafters S-76, converters, All for $200. Prefer local deal. K2EKP, So. Farmingdale, N.Y., CH9-6594.

SSB: HQ 170C, spkr, $285; HT32A, $450. McRae, 82 Holder, Princeton, N.J. WA4-0355.

WANTED—RADIO OPERATOR/TECHNICIANS. The U.S. Government has a continuing requirement for single and married men between the ages of 20 and 30 with radio operator/technician experience. Individuals with less than minimum required experience can qualify for training. Persons with past applicable experience who for some time have been out of touch with this type of activity will be retrained. Assignments are overseas as interesting foreign posts. Starting annual salaries, which will be determined by the applicant's experience and ability, range from $4830 to $5885. Normal promotional progress within this salary range may be expected when quality of performance dictates. Beyond this latter level advancement possibilities exist on a selective and competitive basis. Standard government allowances are paid in addition to the salary. A variety of foreign posts is available. Rotation of the employee and his family from post to post is accomplished in accordance with standard government regulations and usually involves tours of 24 months duration at each post followed by Stateside leave between assignments. Work is challenging and varies from post to post. If you are in good health, not subject to military draft, and are interested in the above openings, please write, giving us the following information: (1) name, address, telephone number, and hours when you can be reached; (2) date of birth; (3) military history, including dates, schools, experience, grade or rank, and mos (primary and others); (4) Civilian training and experience; (5) FCC license, if any; (6) CW speed; (7) typing speed; (8) marital status and dependents. If your letter indicates that you have the required qualifications, a formal interview will be arranged in the near future. Address letter to Mr. Carlton H. Broadnax, P.O. Box 8254, Southwest Station, Washington 24, D.C.

SELL: Heath mobil rig; RX-1, TX-1, transistor power supply and Mosley whip for $210. AC power supply for $22, K5MUR, Curtis May, Katy, Texas.

USED RADIO RACK CABINETS: Panel size 12¼ x 19. Cabinet size 13 x 20 x 13. Gray wrinkle finish, $7.50 each, FOB Marietta, Pa. U.S. Aluminum Corp., Marietta, Pa.

FOR SALE: One Eim 4-1000-A tube with filament transformer $40. Will ship postpaid within 25 miles. K1HLE, 30 Robinson Street, Webster, Mass.

WANTED: Commercial or Surplus Airborne Ground Transmitters, Receivers, Testsets, 18S, 17L, 51R, 618S, BC611, BC1000, GRC, PRC, Arn 14, RT77GRC, Bendix, Collins others. Ritco, Box 156, Annandale, Va.

Signal Generator 2—to 2000 kc, Model OAN, $15; BC-221 frequency meter with calibration book and crystal $45; Triumph oscilloscope model 841, $12; precision meter unit, contains Simpson VTVM, 4" DB meter, control networks with 110 volt supply, model MK56, $15; Frequency meter and oscillator model OAP, 146 to 206 mc. 110 volt supply, $13.50; Model LW signal generator and wavemeter, 680 to 720 MC. micrometer adjustments, $20; Echo box with meter, model CUO14A, 2900 to 3100 MC, new with spare crystals, $8.00; Standing wave meter model 1M89/UR $4.50; Model OAA-2 tester with meter and 110 volt supply, $5.00; Weston VOM-capacity meter in hardwood case model 664-665, $8.00; five GE pyranol condensers, 10 mfd @ 600 volts, net. 85¢ each all for $4.00. T. Rutherford, W6NUI, 1947 Turrell St., Lomita, California.

FOR SALE CX-100 with push to talk $150; Elmac AF-67 $100; Pentron NL-3 tape recorder $90. All perfect condition. R. O. Smith, 1817 McJenkin Dr., N.E., Atlanta, Ga.

FOR SALE—"SSB Junior" 5 watt exciter with vox. Good Shape. $30. Hugh Smyser, RFD #4, Bethlehem, Pa.

SALE: Hallicrafters S-85, $70, Heath DX-20 $20. Excellent condition. Write: Bob Taylor, Crescent Rd., Millbrook, N.Y.

Receiver, Pierson KE-93, with speaker, mobile power supply and home brew AC power supply. $170. Carbon Microphone, Astatic 11 M 5. Unused. $5. Ron White, 210 Alden Rd., Hayward, Calif.

SELL Collins 51J-4 like new to the highest bidder, New pair 4CX300 and sockets $45 *each* 4X250B *and sockets* $30 each; 304TL $18; 500 cps and 2/1 mech. filter for the 75A-4 $40 each, M500 silicon rectifiers 10 for $8; CRL 858S xmit. cap. 4 for $5; 50 mmfd. vacuum cap. $3.50, used 250th (less than 10 hrs.) $10. Box 120, CQ.

QSL's 100 $1.25 Free Samples. L. Keller 3036 Ridgeview, Normandy, Mo.

QSL Cards $1.00 Per 100. Lewalski, 1367 Perk Ave., Reading, Penna.

QSLs? WPE? CB? Outstanding samples 25¢ (refundable). Sackers, W8DED Holland, Michigan.

QSLs—U.S. only. Glossy, red and green. All orders mailed within 10 days. Free sample. Hobby Print Shop, Umatilla, Florida.

QSL's . . . Outstanding . . . DIME . . . Filmcrafters. Martins Ferry, Ohio.

EMBOSSED LABELS: Label your instrument panel and equipment with I-DENT-TAG vinyl labels. 3/16" white lettering on color background; black, red, blue, green or brown. Adheres to any surface or shape. 4 for $1.00. I-DENT TAGS, Box 3827, Oak Park, Michigan.

RUSPRINT QSLs—SWLs. 100 2-color glossy $3 postpaid; QSO file cards $1 per 100; Rusprint, Box 7507, Kansas City 16 Minnesota.

WANTED: Link FM Transmitter—Receiver type 2365 in any condition. Will trade Bendix MRT-3B Communicator, suitable for 2 meters. Herbert Ailing, 209 Euclid Ave., Byesville, Ohio.

FREE—R.C.A., GE, etc., tubes catalog. Discount to 75% from list. Picture tubes at 75¢ inch up. Parts, parts kits at 1/10 original cost. Needles, tube testers, silicones, seleniums, 7" TV bench test tube—$6.99—and more. Arcturus Electronics Corp. CQ 502 22nd St., Union City, New Jersey.

LAMPKIN 205—A Modulation Meter $185. Also 103-B Frequency Meter $145. Both units $300. W4KUV J. L. Best Jr. 610 N. Madison Ave., Goldsboro, N.C.

APACHE OWNERS: Increase power by 50%. Run 240 Watts AM—300 Watts CW or SSB. Complete kit and instructions for adding another 6146 to final. Only $19.95. Similar kit for DX-100. Order or write. W4KUV-W4NZS, Best Radio Service, 610 N. Madison Ave., Goldsboro, N.C.

WANTED—Catholic priest would like some equipment to get back into ham radio. Fr. Benedict MS.SS.T. W8CUU, Box 1097, Lorain, Ohio.

British Commonwealth Areas including VE's VK's and ZL's needed for 15 meter Two Way SSB with WØCVU. Will listen each week-end 21,425 KC. Larke colored QSL sent airmail for QSO.

ATTENTION Hams . . . Answer your phone from across the room or in the next room. No rush, no fuss. Phone rings, IT LIFTS AUTOMATICALLY, incoming call is amplified. You talk back from across the room and will be heard perfectly on the other end. Guaranteed . . . $39.95. BOGIN ELECTRONICS, 2775 East 12th Street, Brooklyn 35, N.Y.

WILL PAY CASH for 75A4 Late serial No. Please state condition. Must be reasonably priced. W. C. Brooks, K4CDB, Box 159, Route 2, High Point, N.C.

WEST COAST. BC-221, calibration book, crystal, modulation. $75. WA6OQP, 151 Estates Drive, Santa Cruz, Calif.

SELL—Johnson Valiant $249, HQ170C $249. John Conners, 207 Spring, Fox Lake, Wis.

Trade for good received new German Nimifon wire recorder P55 pocket size 2 pounds cost $300. W5YMX 1311 Kabel, New Orleans.

We wire and align any kind and make of kits. Postage stamp brings you full information and price list. KØULX, Walter I. Funk, 1102 12th Ave. No., St. Cloud, Minn.

FOR SALE: Collins KW-1 in excellent condition $2400. Elmer Ford WØMPF, 5422 Bermuda, Normandy, Mo. EV 2-2077.

COLLINS 75S-1 receiver, like new, with manual, in original packing $319. R. Giesen, Estelline, So. Dak.

FOR SALE: Eimac 4-400A's; these tubes are new and in original cartons. Only $25 each or will trade for kilowatt power supply and/or amplifier components. B. H. Gould, K6UUS, Unit 17, Box 4531, Grand Forks A.F.B., North Dakota.

SWAP: Pr of new 4-400A's. Need mobile gear. Reply Marty Graybeal K4THP, 1649 Romain Dr., Columbia, S.C.

FOR SALE: BC221P with modulation, 115VAC powered original calibration book $50. Heath Q-Multiplier $7.50, BC348H, built-in 115VAC, silencer, S meter, Extra audio, speaker $50. BC779 Sup. Pro. modernized with power supply and speaker $50. New BC645 15 tube Xmtr/Recr $20. RCA TX-818 H.F. Sweep Generator $15. 1933 Supreme AAA-1 Diagnometer, instruction book, make offer. W5EDX, 645 East Woodlawn, San Antonio, Texas.

Pick up only. Beautiful 6 ft. cabinet 29½" wide, 24½" deep, with blower; $20. 220v 3 phase trans. 2000 3000 4000v. 3 Amp. $35. K9RZD Robert Kubow, 3435 N. University, Decatur, Ill.

HRO-60T. ABCD coils $255; Bell RT-75 tape recorder $45; BC-SW table radio $6.50; 33&1/3 rpm turntable $5.50; 2-speed record player radio comb. $13; 30A circuit breakers, manual push-reset .20: Solonoids 24-28v; SPST .30, 3PDT .40, 4PDT .30, latching SPDT .35. All above good or better working condition. Offers considered; other items, list; all inquiries answered; all FOB KINNC, Unionville, Conn.

RANGER: factory wired, exceptional physical and elect. condition. $150 f.o.b. K6EJY/1, J. M. Kootsey, Physics Dept., Brown University, Providence 12, R.I.

Sprague ferrule type resistors 50W109K, box of 14, $1. Webster capacitor, 600 v 4X4MFD, $1. Ostermeier, 1060 Cedar, Pittsburgh 28, Pa.

RENT-A-RIG. Low monthly rates 6M communicator $25; Collins 75A-4 $25; w/panadapter $35; Pacemaker $25; test gear, SCUBA, Guns, Camera gear. Free list. Tom Perera K2DCY, 20 East 80th Street, New York City 21, N.Y.

WANTED: All types Military Electronic Equipment, GRc-PRc, Bc-UPM, also teletype of all types. Phil Rickson, K2HJC, Morrisonville, New York.

SELL—Quantity 700 receiving tubes. Best offer. List for stamped envelope. W2PQG, 188 Concord Drive, Paramus, N.J.

TRADE: Professional wired QF-1 Fer bug power meter, or other accessories. WV2VHY.

Souvenir of Broadcast Radio for your shack: Western Electric condenser microphone, studio table model with preamplifier, cost $300 in 1928. Still works. Sell or swap for photo or radio equipment. Write to Douglas Galbreath, 124 Columbia Hts., Brooklyn 1, N.Y.

HAMFEST—Starved Rock Radio Club, June 3rd. For details write—SRRC/W9MKS, G. E. Keith, Secretary, RFD #1, Box 171, Oglesby, Illinois.

FOR SALE: Viking Valiant Xmtr. $325. SX-99 rcvr. with Heathkit Q Multiplier $90. 3 element 15 meter beam $15. Complete rig—$410. All in like new condition. K4IQI 9540 Byron Avenue, Miami Beach 54, Fla.

FOR SALE: SX-100 $200. Apache $200, SB-10 $85, also Cheyenne and Comanche $200 good condition collage. K3CDA, 313 Jefferson St., Brookville, Pa.

WANTED: Crystals marked 163.95 KC. Also need indicator unit 1P-173/U. Operative or inoperative. Need for spare parts. Also need TS-175/U. Have polar relays marked 206-A, etc., need loading coils. W7TYR, Deane E. Kidd, 12235 S.W. James St., Tigard 23, Oregon.

Like new, one owner, Collins 75A3 with Jensen Housed Speaker. Packed for shipment, F.O.B. $325. W4EBM, Fayetteville, N.C.

FOR QUICK SALE: Factory wired Valiant, not a scratch or blemish, mint condition $250. RME preselector DB-23 in original carton $30. Brand new Heathkit Sixer $50. All with manuals. W4TAI, 12 Golden Isle Drive, Mount Dora, Fla.

Wanted: BC-1031 Panadapter. Please state condition and price. Charles Norfleet, K5DNS, Box 694, Hale Center, Texas.

TECHNICIANS, Hams, new Twirl-con good for rapid, easy condenser, resistor replacement. Nothing like it for printed and conventional wired circuits. Saves hours of valuable time. Hundreds of uses. Guaranteed satisfaction. $2. postpaid. Texans include tax. Twirl-Con, 1101 North East, Edna, Texas.

Johnson 500 $550 and SX101 Mark III $200 good condition; 20A and VFO $200 excellent condition. Prefer to sell as complete station accessories included. Can ship if necessary. Welcome to inspect station. Contact KØGVO, VI 3-5684, Lawrence, Kansas.

Brand New Johnson Rotomatic Antenna rotator, cost $354, sell $175. 12 volt continuous duty ball bearing dynamoter $18; HQ 129X $110; 28V 1200 watt gasoline generator $50; Fonadek telephone amplifier $18; Heathkit AT-1 xmtr & ant. coupler $30; Elmac A54H Trans. $50; TS-175/U $145; new Viking II $175; Miscel. command emtrs, rcurs, Back issues CQ & Electronic Technician Magazine. R. Wolfe, W3HDT, 19 Virginia Ave, Baltimore 36, Md.

12VDC transistor mobile PS, 125W 500-250VDC, new, $35. New RCS tubes 7094—$12.00; 614—$2.50; Mini-Products Coax Antenna 6-10-15-20—$20. Other items, cleaning house. Send for list. W2WZT, Box 571, Hewitt, New Jersey.

SWAP: Tenshodo, United model RR equpiment for 6 and/or 2 meter gear, GDO, or what-have-you. My list for yours. BC-224 (similar BC-348) w/ps $25 FOB. KØGYZ, Austin Wade, 406 Avery Rd., Omaha 47, Nebraska.

SELL several remote antenna switches as described by W5BGP in March 62 CQ. K5AXL. COLLINS 51J-4 serial #1380 used under 100 hours, $895; 75A-4 serial #5835, $600; 75A4 serial #3814 $525; KWS-1 serial #475 $825; 75S-1 with noise blanker $435; New 30L-1 linear, unopened, $475; KWM-1 $450; 516E-1 12 volt DC supply (brand new), $165; 75A-1, $215; GSB-100 $255; Drake Model 2-AQ Speaker-Q multiplier $25; All equipment with manuals. Want late 32S-1. W8WGA Phone: 513-2770409.

Buy my KWM2-A & PM2 supply for only $1100. Guaranteed tip-top condition. No time to operate. Certified check or money order. Robert D. Corbett, 46 Prospect St., Torrington, Conn.

FOR SALE—Eico 720 Xmtr $55; Eico 730 Modulator $40.00 Knight R-100 RCVR with S-meter $60.00. Regency ATC-1 converter $35.00. Home brew 75 watt plate modulated mobile with built in lysco VFO, Mike & 12v dynamotor. All for $40.00. All equipment in Excellent Condition. Will ship. LaVern Earnest, 2001 So. 19th, Lincoln, Nebr.

FOR SALE: Collins 30S1 linear amplifier, new condition, with cables and instruction book. In original packing case. Very reasonable. Will ship. All inquiries answered. WØLIL, 1863 DeSoto, St. Paul 17, Minn.

SELL COLLINS 51J-4 like new to the highest bidder, New pair 4CX300 and sockets $45 each 4X250B and sockets $30 each 304TL, M500 silicon rectifiers 10 for $8, CRL 8588 xmit. cap. 4 for $5 50 mmfd. vacuum cap. $3.50, used 250th (less than 10 hrs.) $10. Box 120 CQ.

HEATH MOBILE SYSTEM—Cheyenne transmitter, Comanche receiver, 110VAC and 12VDC Power supplies, cables and microphone—$250. Dick Johnston K1QJD, Box AR-51, Stonington, Connecticut.

Station for sale. Going Mobile. Ranger F/W $190. Dow TR-switch $5. TA 33 Jr. $50. Cables, fittings, filters, etc. $15. SX-99 $99. Q Multiplies $5. Complete station one lump $340. Viking 500 Kit Factory Boxes, sacrifice $500. K1MLK, Paul Bray, Jr., Winding Lane, Norwalk, Conn.

SALE—National receiver NC-HR 60, instruction manual, speaker, coils A.B.C.D. $350. K2GWO, Joe Albino, 221 Hillbrook Road, Syracuse 9, N.Y.

For Sale—Multi-Elmac fixed or mobile station, AF-68 Trans-citer, PMR-8 receiver, M-1070, 12v DC and 115v AC power supply, Shur mike, model 505C, Dow-Key 12v antenna relay, all for $329. Lysco model 600 transmitter, 40 watts, crystal-vfo, $47. Eldico AM-40 modulator $32. Kuhn police convertr. 5th overtone crystals, 50.4 and 50.1 megs. Bob Hartman, W9RQY, McConnell, Illinois.

AN/FGC TERMINAL UNIT never out of crate. New complete with spares, extra set tubes, tools and manual. Price $135.00 FOB W8NLT, Mel Swillinger, 209-55th St., S.E. Charleston, West Virginia, Phone WA5-3447 or DI6-6483.

Industrial tubes type 5555 $95.00 ea. frequency shift converters An-7 Ura-6 frequency shift converters $295.00 or will swap for other gear. Spera Electronics, 37-10 33 St., L.I.C., N.Y.

FOR SALE: Complete instructions including 28 page booklet and 22" x 36" schematic for converting the ART/13 transmitter to AM and SSB. Satisfaction guaranteed. $2.50. Sam Appleton, 501 N. Maxwell St., Tulio, Texas.

HAMS-EXPERIMENTERS. Free list of our interesting "surplus" surplus items sent on request. Bargains. Ariel Electronics, Box 725 Sag Harbor, New York.

For further information, check number 56, on page 110

For further information, check number 57, on page 110

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Please send me more information on your ads in the May 1962 *CQ* keyed as follows:

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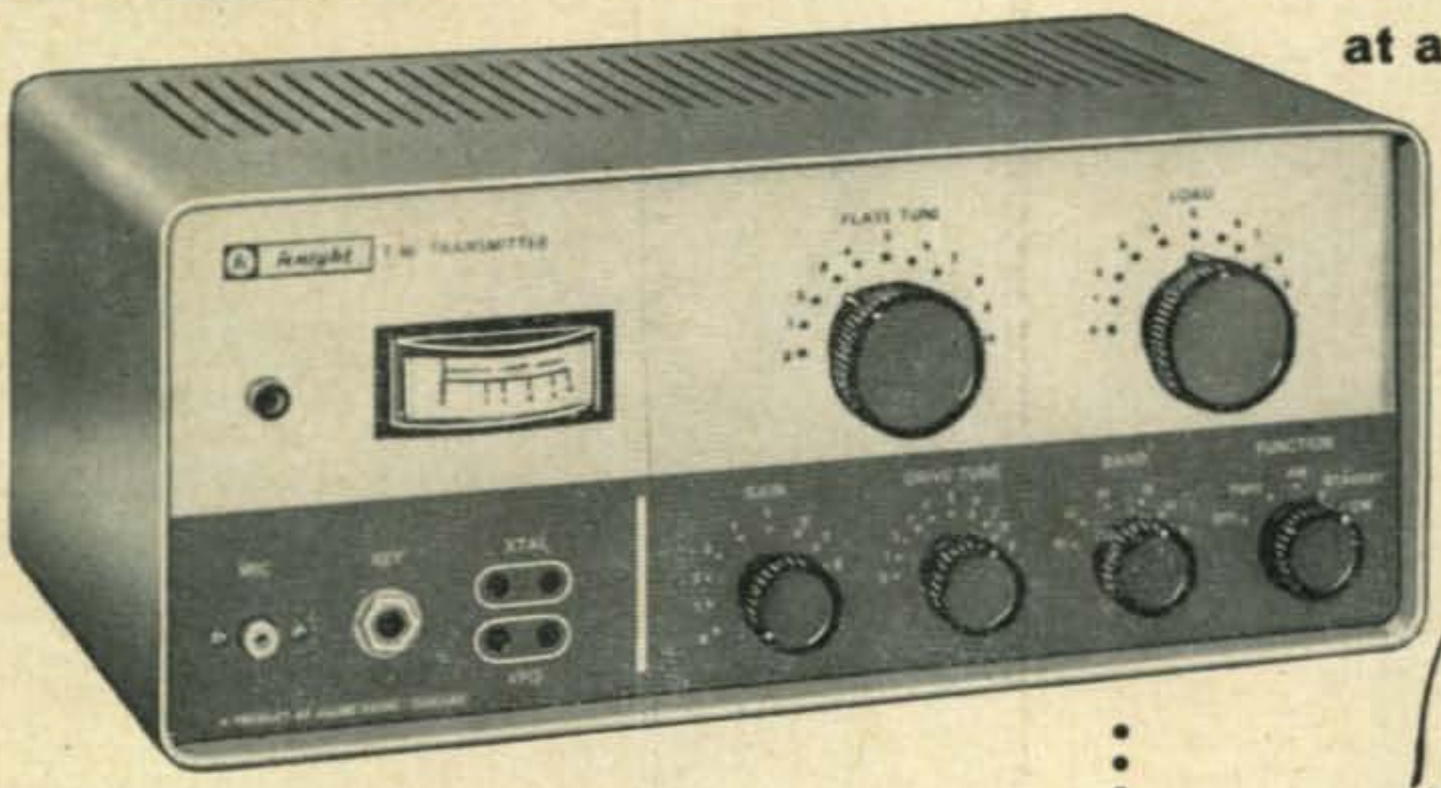

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