CQ

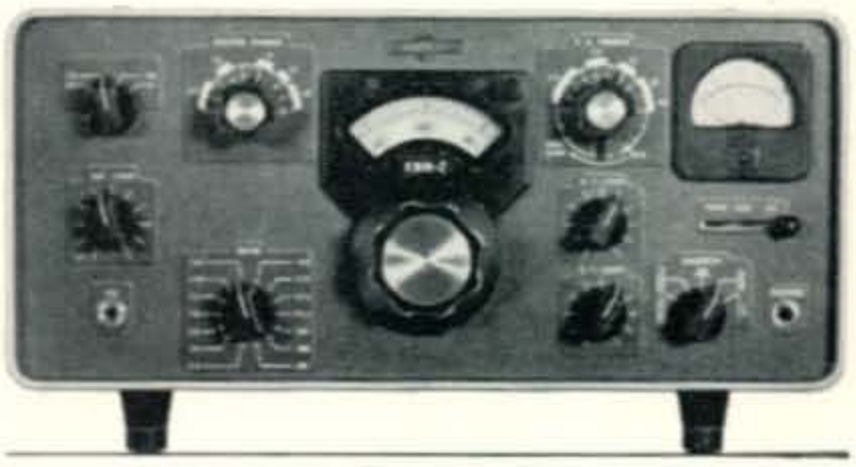
April 1963

50¢

The Radio Amateur's Journal

LOUDMOUTH !

The Collins KWM-2 Transceiver brags on itself every time it's on the air. Performance alone prompts others to look into it and see if they can find an answer to the question, "How do they do it?" It prompts them to try to duplicate it. This is especially true when one of the features is as significant as single sideband, which was first used in mobile amateur equipment by Collins. In developing the KWM-1 and KWM-2, Collins equipment produced at least 19 industry "firsts". Some have since become standard in all amateur equipment, but Collins KWM-2 is still the only transceiver available which features all 19 in one unit. Use the list below to compare Collins KWM-2 with any other transceiver on the market. See for yourself why Collins KWM-2 leads all others. Then ask your distributor to demonstrate the KWM-2. It's still the best way to learn what the KWM-2 can do for you, and how little it costs to own the finest. □ Check these KWM firsts: permeability tuned oscillators, mechanical filters, automatic load control, 1 kc calibration on all bands, crystal controlled front end, Pi network, both sidebands without retuning, lighter unit weight, amateur SSB transceiver, noise blankers, systems engineering, restricted passband on transmit, 0.5 uv for 10 db signal-plus-noise-to-noise ratio, SSB-AVC, transistorized dc power supply, built-in antenna changeover relays, suitcase for portable applications, 100 watts output in a mobile unit and a transceiver which provides for automatic antenna selection. □ See your Collins distributor today.



COLLINS

For further information, check number 3, on page 110

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FUNDAMENTAL, PR TYPE Z-2—Frequency Ranges in Kcs.: 3,500 to 4,000 (80-M); 7,000 to 7,425 (40M); 8,000 to 8,-222 (2M); 8,334 to 9,000 (6M) ± 500 Cycles . . . $2.95 Net

(All Z-2 Crystals calibrated with a load capacity of 32 mmfd.)

Third Overtone, PR Type Z-9A, 24,000 to 24,666 and 25,000 to 27,000 Kc., ± 3 Kc. . . $3.95 Net

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Each step in the making of PR CRYSTALS, from the pre-orientation of the raw quartz to the packing for shipment, is checked by a series of rigid inspections. This assures that EVERY PR CRYSTAL IS THE FINEST PRECISION FREQUENCY CONTROL THAT MONEY CAN BUY.

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Since PR 1934

USE PR AND KNOW WHERE YOU ARE

PETERSEN RADIO COMPANY, INC.
COUNCIL BLUFFS, U.S.A.

For further information, check number 1, on page 110

All this performance for only $650.00!

Full amateur band coverage, 80 through 10 meters • Hallicrafters exclusive new R.I.T. (Receiver Incremental Tuning) for ± 2 kc. adjustment of receiver frequency independent of transmitter, and AALC (Amplified Automatic Level Control) • Receiver AF gain and RF gain controls • SSB operation, VOX or PTT . . . CW operation, manual or break-in • 1650 kc. crystal filter . . .

SPECIFICATIONS

Frequency coverage: Eight-band capability — full coverage provided for 80, 40, 20, 15 meters; 10M crystals furnished for operation on 28.5 — 29.0 Mc. Other crystals may be added for full 10 meter coverage without adjustment. Available for operation on specified non-amateur frequencies by special order.

Front panel controls: Tuning; Band Selector; Final Tuning; RF Level; Mic. Gain; Pre-Selector; R.I.T.; Rec. RF Gain; AF Gain; Operation (Off/Standby/MOX/VOX.); Function (CW/USB/LSB); Cal.

General: Dial cal., 5 kc.; 100 kc. crystal cal.; VFO tunes 500 kc.; 18 tubes plus volt. reg., 10 diodes, one varicap. Rugged, lightweight aluminum construction (only 17½ lb.); size—6½″ x 15″ x 13″.

Transmitter Section: (2) 12DQ6B output tubes. Fixed, 50-ohm Pi network. Power input—150W P.E.P. SSB; 125W CW. Carrier and unwanted sideband suppression 50 db.; distortion prod., 30 db. Audio: 400-2800 c.p.s. @ 3 db.

Receiver Section: Sensitivity less than 1 μv for 20 db. signal-to-noise ratio. Audio output 2W; overall gain, 1 μv for ½ W output. 6.0 — 6.5 1st I.F. (tunes with VFO). 1650 kc. 2nd I.F.

Accessories: P-150AC, AC power supply, $99.50. P-150DC, DC power supply, $109.50. MR-150 mounting rack, $39.95.

Plan now to attend
the 12th annual SSB Dinner
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CQ

The Radio Amateur's Journal

Vol. 19, No. 4 April 1963

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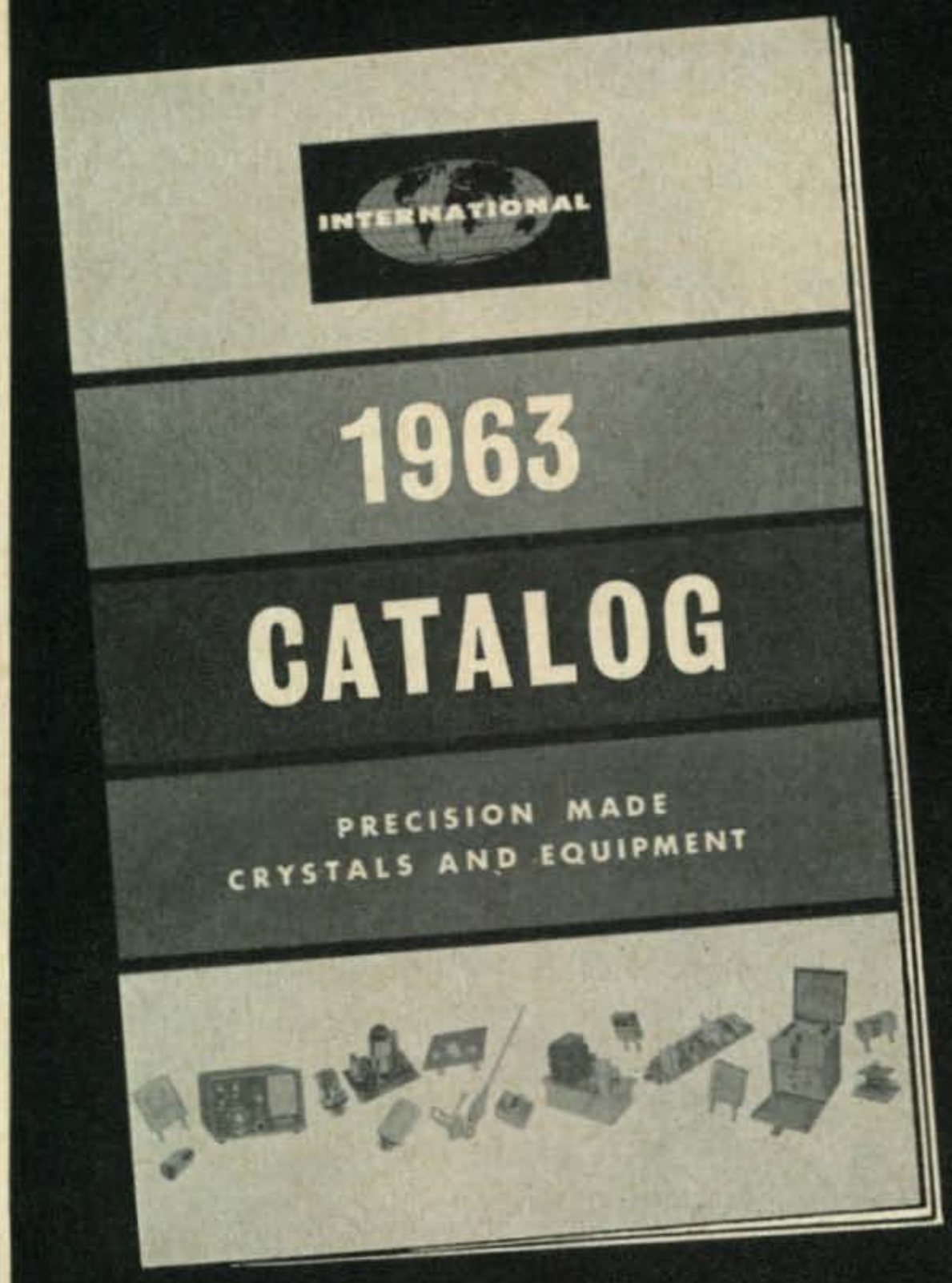

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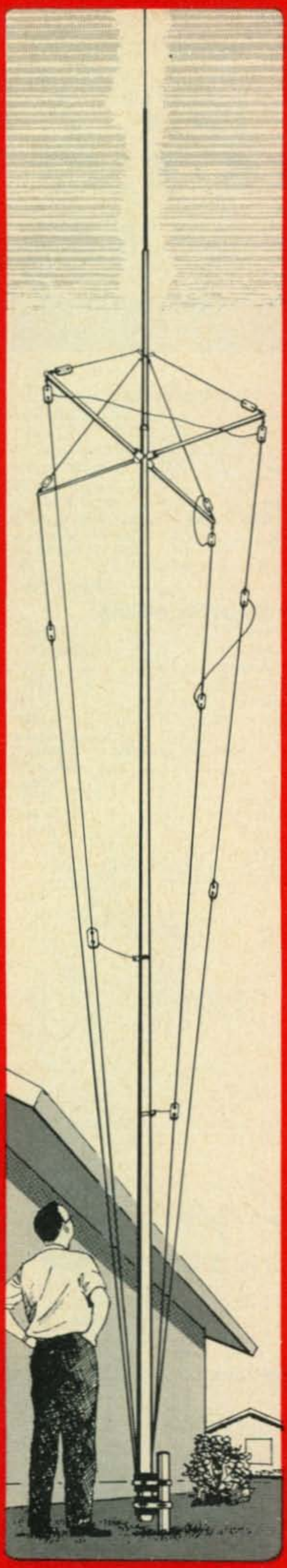

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It all started the day Hy-Gain startled the industry by announcing the incomparable Hy-Tower—still acknowledged by experts as the epitome in vertical antenna systems. Now, today, for those thousands of Hams who requested it...Hy-Gain offers the new low-cost Hy-Tower Junior.

As its name would imply, the Hy-Tower Junior doesn't completely measure up to the Hy-Tower...probably nothing ever will. However, the Hy-Tower Junior is one sensational all band vertical in its own right. It's trapless—It has Hy-Gain's unique stub decoupling system for automatic band switching—It's lightweight (one man can install)—It's broad band (250 KC band pass on 75M) —It ground mounts on 1⅝" steel pipe—Its SWR is less than 2:1 at resonance on all bands—It's fed with 52 ohm coax—Its overall height is 36½ ft. phone; 38 ft. C.W.—It's modestly priced. All in all, the few Hams who have seen it say: It's the greatest advance in all band antennas since the Hy-Tower. See it today.

HY-TOWER JUNIOR MODEL 18JR $79.95

Electrical Specifications:

Frequency Range . . . . . 80 thru 10M (160 with Loading Coil Accessory)
Maximum Power 1kw, AM; 2kw PEP
Polarization . . . . . Vertical
Pattern . . . . . Omni-Directional
Gain . . . . . Unity
Impedance . . . . . 50 ohms nominal
SWR . . Less than 2:1 at resonance
Band Pass . . 10-15-20-40M, below 2:1 SWR; 250kc below 2:1 75/80M
Multi-Band Technique . . . . . Stub Decoupling
Ground Plane Req. . Copper Plated 6' Ground Rod (not supplied)

Mechanical Specifications:

Max. Wind Survival . . 40 MPH Self Supporting (100 MPH Guyed)
Construction . . . . . 2" to 7/16" Aluminum 6063 T832 Alloy
Wire Elements . . . . . 7-24 Copper Clad Steel
Insulators . . . . . Ceramic and Injection Molded Plastic
Overall Height . . . . . 36'6" Phone; 38' CW
Net Weight . . . . . 30 lbs.
Mounting Requirements . . . . 1½ to 2 inch Steel Pipe—Ground Mount (not supplied)

Available now from your favorite HY-GAIN distributor

hy-gain ANTENNA PRODUCTS
8410 N.E. Highway 6, Lincoln, Nebraska

For further information, check number 6, on page 110

ZERO BIAS

THROUGH the extensive efforts of the American Radio Relay League, the 160 meter band has once again been returned to its pre-1956 status, again enabling all states and Territorial possessions operating privileges on amateur radio's lowest frequency band.

In years past, this page, under another title, used the impending loss of amateur frequencies in a reckless, sensational manner, designed to provoke readers into believing that the ARRL was, in fact, not doing all it could to preserve the amateur radio spectrum.

It is therefore, with great humility, that *CQ* bestows upon the League and its General Counsel a generous vote of thanks for a job well done.

It appears that during the past few years serious amateur conversation has revolved about the loss or acquisition of amateur frequencies; and it has literally been years since amateurs have spoken of the latter.

With the amateur population explosion in this country, together with the static frequency spectrum, the problem of "fitting" everyone into place has become a serious issue. We are sure the additional 160 meter privileges will go a long way in alleviating this problem.

Although 160 was quite popular prior to 1941, it has never regained its status in post-war years. If the reader will take a quick look at page 45 he will note that 160 meter DX openings are rather abundant. As the sun-spot cycle continues to deteriorate, the lower bands, especially 160, continue to improve.

While there are a great many traffic networks and RACES programs now underway on 160, two main troubles face the amateur contemplating serious work on this band.

For the most part, the antenna problem seems to be the biggest headache! The "Cliff Dweller" and the home-owner short of adequate real estate finds it difficult to install a sky-hook for 160.

The second problem exists with the transmitter. With the increasing popularity of commercially available transmitters during the past few years, we wonder why manufacturers (with the exception of E. F. Johnson and more recently, Hammarlund) have knowingly refrained from including 160 in their equipment. We hope this will be rectified in the near future.

"One-sixty" rigs need not be elaborate; most tubes are quite stable at 1.8 mc. Power is certainly not important and keying is simple. Crystals are inexpensive and a Command Set conversion will work nicely.[1]

The Commission's Order, RM-298, amending Sec. 12.111 of the amateur regulations is reprinted in its entirety, beginning on page 14. A close examination of this amendment reveals that s.s.b. emission has been excluded! No official statement has yet been made on this matter but it is thought that considerable study is underway to rectify the situation.

One-hundred-sixty meters still remains on a shared basis with the Loran (Long Range Navigation) service and, provided no interference is experienced, there seems to be no reason why this amendment should not continue.

An important point of RM-298 is the fact that the Commission can, without an official hearing, revoke any or all parts of the amendment.

Although power restrictions and frequency limitations appear a bit complex, only *one* portion is designed for you. Common sense and good operating is again the keystone in retaining this band.

CQ would like to think that its Annual 160 Meter Contest had something to do with regaining this band and we would like to publicly thank W1BB, W2EQS, W6ZH, W8PAL, WØNWX and many others for their enthusiastic support in obtaining the return of this band.

[1]Westervelt, E., "Putting Your SCR-274N on 160 Meters," *CQ*, June, 1953, p. 55.

Our Cover

IN case you think our PROPAGATION editor, George Jacobs digs those crazy-mixed-up numbers from a hat each month—you're wrong! W3ASK sweats over charts similar to these in formulating his monthly DX predictions.

This modified cylindrical projection illustrates the F_2 openings for December, 1958, when the Sunspots numbered 180. Ah—for the good ole' days!

No Keys

Editor, *CQ*:

I am writing this letter to you as a ham that can't "ham-it-up" as hams all over the world do every day of the year. For you see I am stationed with the U.S. Army in Saigon, Viet Nam. As you may or may not know, there is no amateur radio operation allowed in Viet Nam. This law was passed two or three years ago when there were very few U.S. personnel here.

There are about 300 amateurs in this Southeast Asian country. I am writing for ten of them, but I feel I can speak for all hams over here. The use of amateur radio for the GIs in South Viet Nam for MARS purposes, or a rig for themselves would make the one year over here go much faster for us. As all hams know, being a ham and not on the air is like having a new car with missing keys.

We would be very grateful if you would print this letter to tell all hams in the U.S.A. that the hams in 3W8-land are just s.w.l.s. for the year.

Sgt. Jackson H. Dobbs, WB6AXW/3W8
560th MP CO, APO 143
San Francisco, California

Aw Gee, Fellers

Editor, *CQ*:

I think the "new" *CQ* is a terrific magazine. I especially like "Reviewing the Radio Classics" and hope it becomes a regular feature. Keep up the good work!

A/2C James Hansen, K3BZP
Box 395, 301st A&EMS
Lockbourne AFB, Ohio

"Radio Classics" will be appearing quite regularly in the months to come.—*Ed.*

Techs on Ten—Again

Editor, *CQ*:

Referring to the Technician-on-ten controversy, will you please include a few additional words in favor?

There are over 4000 hams in the Washington, D.C., and adjacent Maryland and Virginia areas. In my unofficial monitoring of the 10 meter band for the last year, the few that operate here choose the 28.5 to 29.0 mc portion and voice mode of transmission. Their operation is mainly sporadic. C.w. is presently non-existent on 10 meters.

This is certainly a waste of a valuable natural resource —"the radio frequency spectrum." The 10 meter band includes the portion of the spectrum where ionspheric anomalies are frequently and easily observed. High gain h.f. antennas become quite manageable on ten, cosmic,

For further information, check number 8, on page 110

MOSLEY TOWERMASTER

Mosley, *the top name in beam manufacture*, **now has a complete line of quality Built towers designed to fit every need, application and requirement.**

Mosley Towers are designed for 30 pound wind pressure areas in which full engineering calculations and specifications are available with the purchase of a tower to meet and exceed building code requirements in areas requiring special permits for tower installation.

Features

A - Heavy Duty Steel Channel Bracing Members - *Conforms to ASTM standard for structural members.*
B - Low Friction Section Guides.
C - Vertical Guy Attachment Loops.

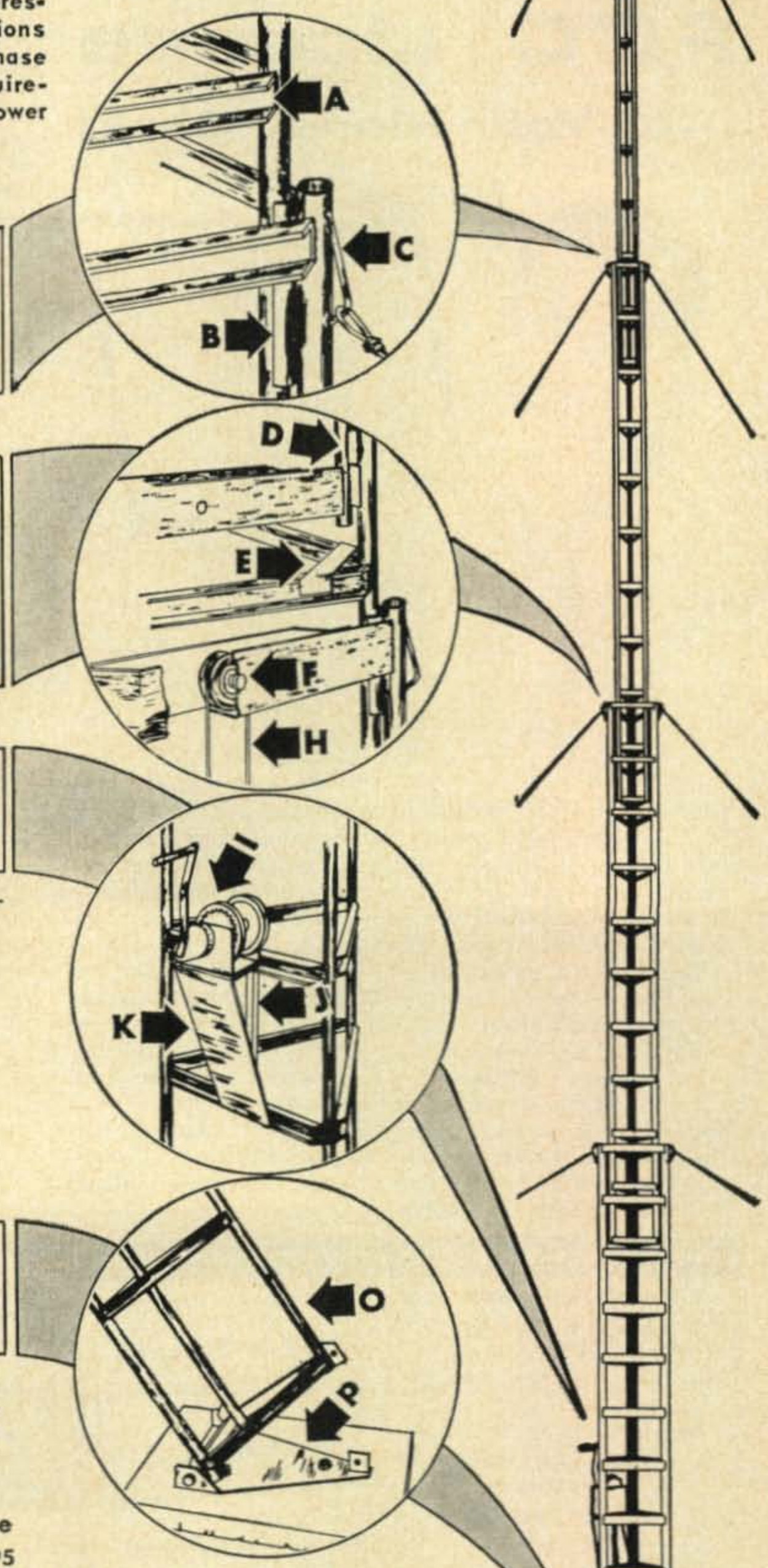
D - Welded Section Stops.
E - Heavy Duty Safety Clips.
F - Metal Ball Bearing Pulley Sheaves.
G - All Welded Construction (*done by certified personnel under strict inspection and manufacturing controls*).
H - Galvanized Aircraft Type Raising Cables.

I - Geared Crank-up Winch and Safety Lock.
J - Extra Reinforcing Spreader.
K - Heavy Steel Winch Frame.

features not illustrated

L - Predrilled Rotor Mounting Plate with series 300 will accept CDR type rotor - series 400, 500, 650, 700, 750 will accept either CDR or Prop-Pitch types.
M - 2 inch I. D. Mast Sleeves.
N - Iron Phosphate Rust-proof Undercoating plus a Tough Triple Coat Epoxy Resin Finish - *Galvanized series are also available at only a slightly higher cost.*

O - All Tubular Leg Members of High Strength Mechanical Steel Tubing - *Conforming to the Formed Steel Institute standards.*
P Heavy Duty Steel Hinged Base Plate.



The Mosley "*Towermaster*" design is available in a complete tower package unit which includes all Guy Cables and Cable Clips, Guy Plates, Thimbles, Guy Anchors and Extension Mast.

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CTL-50237	37	210	179.95
CTL-50354	54	320	245.95
CTL-50471	71	460	346.95
CTL-50588	88	620	476.95
CTL-506105	105	890	784.95
CTL-30237	37	145	99.95
CTL-30354	54	220	159.95
CTL-30471	71	290	229.95
CTL-30588	88	390	319.95

Mosley also has a complete line of SELF SUPPORTING TOWERS

MOSLEY Electronics, Inc
4610 North Lindbergh Blvd.
Bridgeton, Missouri

For further information, check number 9, on page 110

receiver, and atmospheric noise are low; QRM will remain low because of the relatively large band size, narrower beam antennas and a smaller ground illumination for a given ionospheric path.

The years of the "quiet sun" (sunspot minimum about 1964) are important for ionospheric study. They will exist, like it or not, for several years more and again every 11 years staggered with the years of sunspot maxima.

We cannot afford to waste the 10 meter band during the years of sunspot minimum. The amateur Technician would be more than happy to keep even a small fraction of this band in regular use for ionospheric study and radio communication during these times.

Note that it is of primary importance in the study of anomalous radio propagation that transmitters be "on the air" at all times of day and under all apparent ionospheric conditions. The population of Technicians even if restricted to a small portion of the 10 meter band would adequately fulfill this criterion.

P.S.—It may be of some significance to mention that I hold a General Class license.

Peter Nicholson, K3SSG
353 Irvington Street, S.E.
Washington 21, D.C.

ACARN

Editor, *CQ*:

I have recently been the disgusted recipient of several journalistic "masterpieces" published by the Anti-Communist Amateur Radio Network headed by W6RNC. This fanatic organization has taken upon itself the righteous duty of witch hunting, already characteristic of a more well-known group.

The ACARN has accused *CQ* and *QST* of being pink, red and all colors between these. It seems that these journals, in good taste, refused to print advertisements for the organization. The ACARN has waged a war of revenge on these magazines. The ACARN also accuses the International Ham Hop Club of being a "pinkish outfit."

For the information of those amateurs who are unfamiliar with this group, I will list some of the policies of the ACARN:

1. The shelving of the reciprocal licensing bill.
2. Playing the *Star Spangled Banner* by amateurs over the air twice daily.
3. Banning QSOs between the US and Iron Curtain countries.
4. Banning the exchange of QSLs by US hams and hams in Communist countries, etc.

I am sure that most amateurs will agree with me that keeping politics, especially this type of mudslinging fanaticism, out of our hobby is in the interest of amateur radio and in good taste.

Keep up the fine work.

Roger L. Warren, K9UHH
8715 Guilford Ave.
Indianapolis 40, Ind.

Roger, we agree with you 100 Percent that politics, international or otherwise, have no place in our hobby. Unfortunately, there are always those radicals in any group who insist on calling attention to their shouts for social rebellion, and refusal to cooperate with them leaves the refuser open to accusations of all sorts.

Both *CQ* and *QST* have chosen to ignore ACARN. We feel—and we suspect that the League does also—that this organization isn't worthy of our attention, since most people recognize them as rabble rousers and nothing more.

Incidentally, the various military servires, in indoctrinating their personnel with the many techniques of the subversive groups in existence, make it quite clear that one of the techniques most widely used to create mistrust by the communists is to scream publicly that communists are evil, vicious, *etc*. This enables them to bring communism in the public eye. Whether ACARN fits in this category or whether they're merely a sadly misinformed group, we don't know and care less.

We expect that the next step will be a demand that both *CQ* and *QST* stop using the color red on our front covers. Oh, well!—*Ed*.

1st Choice Among Nation's Amateurs!

Matched Pair

Outstanding performance on SSB, AM and CW with absolutely no compromise on any mode!

"SSB ADAPTER"—The new filter-type SSB generator—with bandswitching 80 through 10 meters . . . more than 50 db sideband suppression . . . more than 45 db carrier suppression! When used with the Viking "Valiant" or "Valiant II" it places 275 watts P.E.P. at your command. Two compact units and interconnecting cables . . . RF unit is only 8" wide—may be placed on your operating desk. Power supply unit may be placed in any convenient location. Features built-in multiplier requiring VFO input only—band-pass interstage couplers require no tuning—design and front panel make operating practically foolproof. Superb audio fidelity and balanced audio response; excellent sideband, spurious and carrier suppression. Other features: positive VOX and anti-trip circuits with built-in anti-trip matching transformer and adjustable VOX time delay. With remote power supply, tubes and crystal filter, less microphone.

Cat. No. 240-305-2—Wired, tested.....Net $369.50

"VALIANT II"—Outstanding flexibility and performance—bandswitching 160 through 10 meters—delivers 275 watts input CW or SSB (with auxiliary SSB exciter or Viking SSB adapter) and 200 watts AM! Low level audio clipping—differentially temperature compensated VFO provides stability necessary for SSB operation! High efficiency pi-network tank circuit—final tank coil silver-plated. Other features: TVI suppression; time sequence (grid block) keying; high gain push-to-talk audio built-in low pass audio filter; self-contained power supply; and single control mode switching. As an exciter drives any popular kilowatt level tubes and provides quality speech driver system for high power modulators. Provision for plug-in SSB operation with no internal modification. With tubes, less crystals.

Cat. No. 240-105-1—Kit.....Net $375.00
Cat. No. 240-105-2—Wired, tested.....Net $495.00

INVADER—More exclusive features than any other Transmitter/Exciter on the market today! Specially developed high frequency, symmetrical, multi-section band-pass crystal filter for more than 60 db sideband suppression—more than 55 db carrier suppression! Instant bandswitching 80 through 10 meters—no extra crystals to buy—no realigning necessary. Delivers a solid 200 watts CW input: 200 watts P.E.P. SSB input; 90 watts input on AM! (25-30 watts output—upper sideband and carrier). Built-in VFO—exclusive RF controlled audio AGC and ALC (limiter type) provide greater average speech VOX and anti-trip circuits. Fully TVI suppressed. Self-contained heavy-duty power supply. With tubes and crystals.

Cat. No. 240-302-2 Wired, tested.....Net $619.50

INVADER 2000—Here are all of the fine features of the "Invader", plus the added power and flexibility of an Integral linear amplifier and remote controlled power supply. Rated at a solid 2000 watts P.E.P. SSB, 1000 watts CW, and 800 watts AM! (250 to 300 watts output—upper sideband and carrier.) Wide range output circuit (40 to 600 ohms adjustable). Final amplifier provides exceptionally uniform "Q". Exclusive "push-pull" cooling system. Heavy-duty multi-section power supply. With power supply, tubes and crystals.

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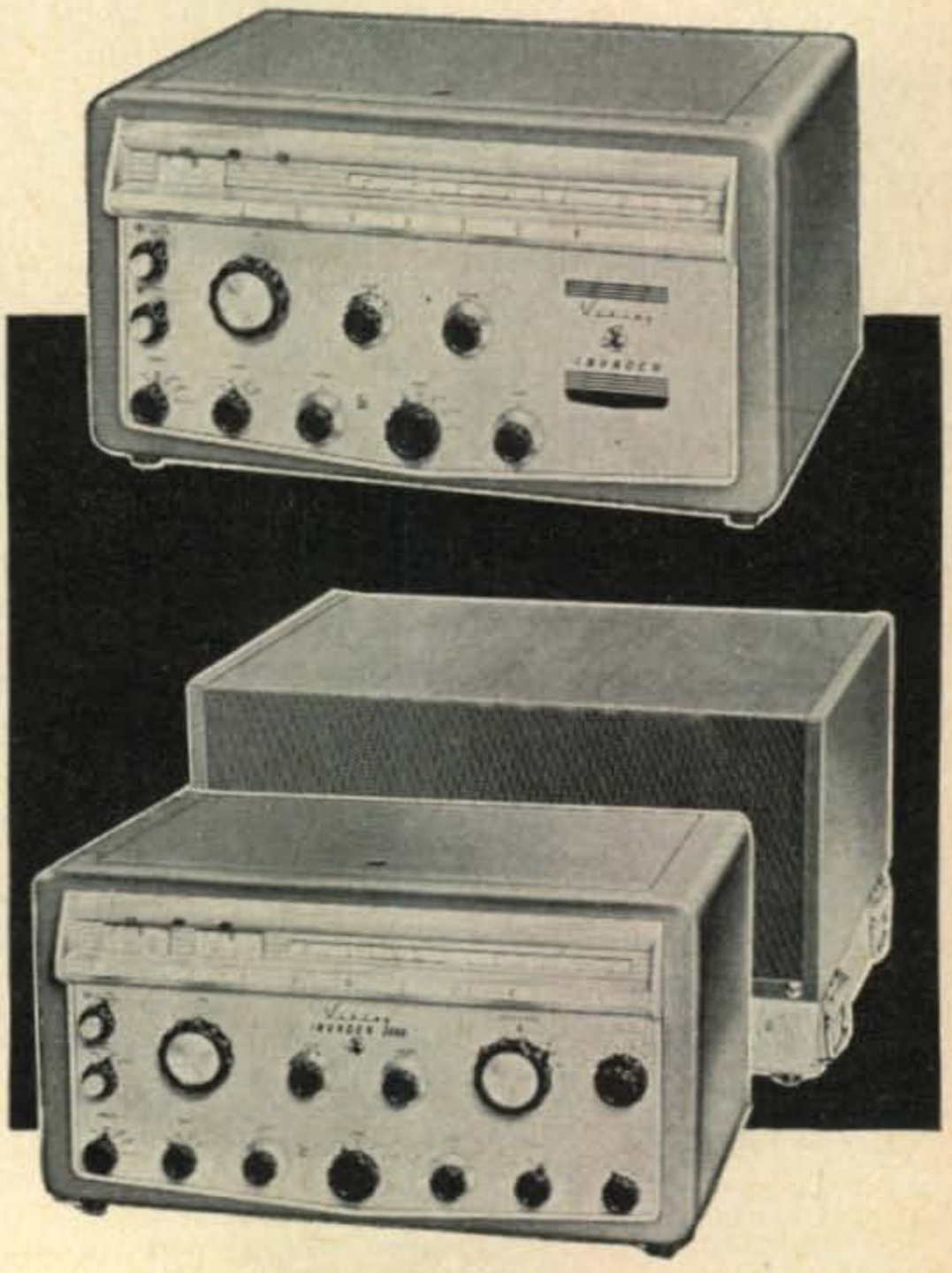
HIGH POWER CONVERSION—Take the features and performance of your "Invader" . . . add the power and flexibility of this unique Viking "Hi-Power Conversion" system . . . and you're "on the air" with the "Invader 2000". Wired, tested, includes everything you need—no soldering necessary—complete conversion in one evening.

Cat. No. 240-303-2.....Net $619.50



E. F. JOHNSON COMPANY
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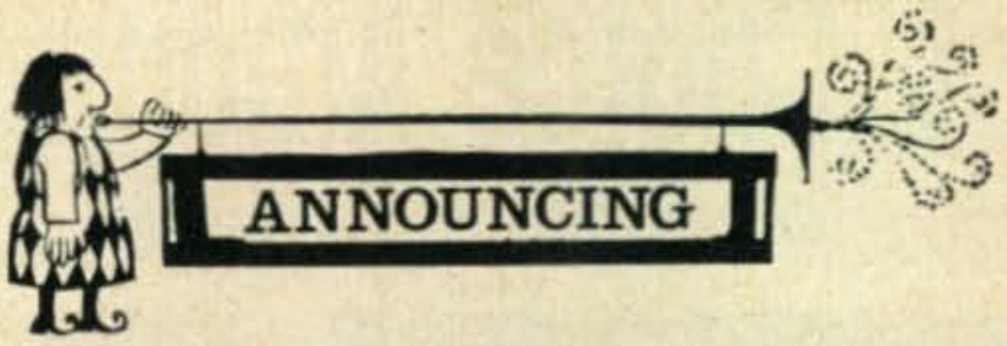


Montgomery, Alabama

The Montgomery A.R.C. will sponsor their "Hamfair" at the State Coliseum on Sunday, April 21st in Montgomery. A banquet will precede the Fair Saturday evening to be held at the Holiday Inn Motel. Reservations for the Banquet and other information can be obtained through the club at P. O. Box 6187, Montgomery 6.

Erie, Pennsylvania

The annual "Hamfest" sponsored by the Radio Association of Erie, Inc. (W3GV) will be held at the Cesare Battisi Club on April 27. Address all correspondence to the Chairman, 1806 Water Street, Wesleyville, Penna.

Greenville, S. C.

The annual Hamfest of the Blue Ridge Society, Inc. will be held at Paris Mountain State Park, Greenville, South Carolina, Sunday, May 5th. Tickets are $3.00 for adults and half-price for the kids. W4VWW at 111 Coleman Court, Greenville is the man to contact.

Fargo, N. D.

The North Dakota State University A.R.S. will hold its hamfest on Sunday, April 28. KØPEO is Public Relations Director and will fill you in if you write to the N.D.S.U. A.R.S., E.E. Dept., State University Station, Fargo, N. D. (Whew!)

Birminghamfest (Ala.)

P. O. Box 603, Birmingham, Alabama is the QTH of the Birmingham A.R.C., Inc., who will hold its 10th Annual affair this coming May 4 and 5. The State Fairgrounds is the location. K4AAU will direct you.

Florida

The Orlando Amateur Radio Club, Inc. will be holding its annual hamfest at the Cherry Plaza Hotel on April 19-21. Admission: $1.00. Sunday luncheon $4.25. Tickets may be purchased in advance from K4JSS, 308 Castle St., Orlando, Florida.

Dayton

The Dayton Hamvention will once again be held at the Dayton Biltmore Hotel on Friday-Saturday, April 27-28. Technical sessions as well as just plain get-togethers are planned. John Pratt, W8RJH is publicity Chairman and he'll fill you in on details.

One of the special Highlights at the Dayton show will be a breakfast, Saturday morning, sponsored by the club which boosts as its members amateurs who once held G-calls. Host will be Roy, W8LUZ (ex-G3HLP). Call Roy at TU 5-7811 (Dayton) or write 8981 Clyo Rd., Dayton 59, Ohio.

Oklahoma

The North Fork Amateur Radio Club of Carter, Oklahoma tells us that their annual shindig called the "Quartz Mountain Hamfest" will be held April 27-28 near Lone Wolf, Mangam and Altus, Oklahoma in the southwest part of the state. K5JCH is club sec'y and will be pleased to reserve a $3.00 ticket for you. Write to Earl Street, P. O. Box 321, Carter, Okla.

Corrections

"A Six Meter Double Conversion Converter," Jan. 1963, p. 28, L3 and L4 should be reversed in fig. 1. The parts list is OK.

On page 33 of the same issue, in fig. 2, the variable capacitors tuning L10 and L11 should be 140 mmf.

In the February issue, p. 46, Column C at 21.2 mc, the dimension should be 5'9.75" *not* 5'8.75".

In "Independent KWM-2 Receiver Control," March, 1963, p. 40, fig. 1 indicates that the relay should go to J17 pin 4; the rest is right, it *should* go to pin 5. Sorry!

A 4-track 2-channel Recorder expressly designed to become an integral part of a complete Amateur Station. 4-track stereo and monaural Record/Play...

AMPLIFIERS — Two: Channel I and Channel II, Output 3 watts each channel at 4 ohms.

EACH CHANNEL

INPUTS:

- ★ Mike: Channel I — Hi/Lo impedance
  Channel II — Hi impedance only
- ★ Preamp (Line)
- ★ Lo impedance from Receiver (Channel I or II, not both)

OUTPUTS:

- ★ Mike Preamp
- ★ Preamp (Line)
- ★ Monitor Speaker Jack (4 ohm)

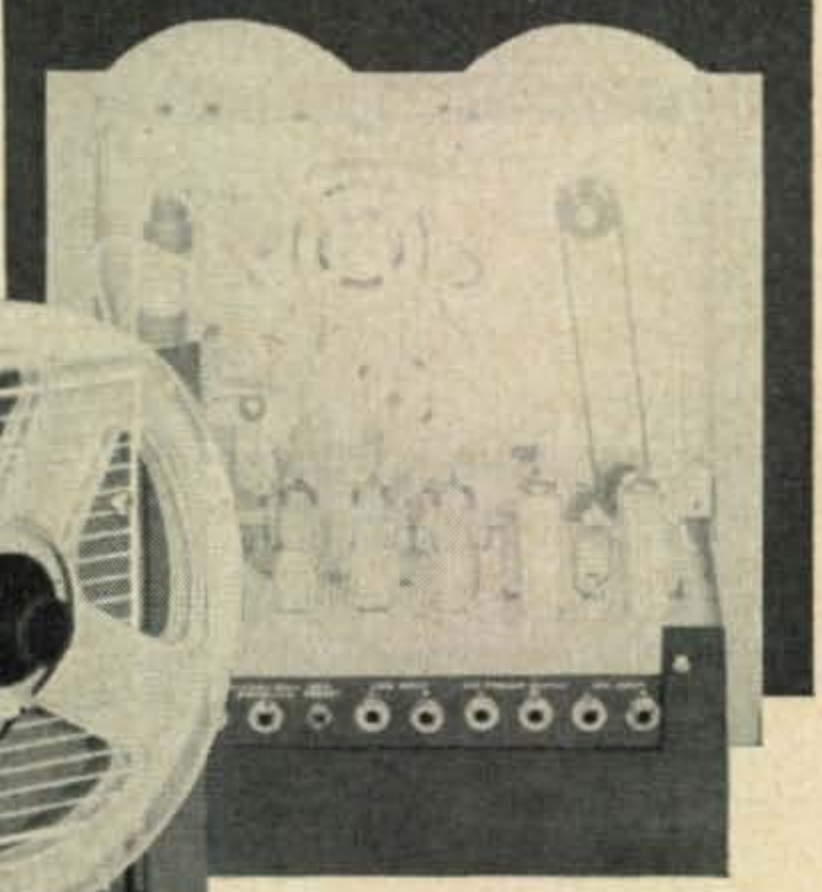
CONTROLS:

- ★ Gain
- ★ Tone (Equalizing)
- ★ VU Meter

COMMON CONTROLS:

- ★ Lo impedance from Receiver for Recording Channel I or II
- ★ Hi/Lo Mike Impedance Selector (Channel I only)
- ★ Record Preset for Record from Receiver
- ★ Record Indicator ★ Motor Indicator
- ★ Motor Switch ★ Power Switch

model AR-300 TAPE RECORDER for the AMATEUR



Rheem

AMATEUR NET:
$259.50

Reel Size: 7" maximum
Wow & Flutter: 0.2% or better
Bias Frequency: 95 KC
Response: 70 to 15,000 cycles ± 3 db.
Tape Speeds: 7½ or 3¾ IPS
Signal/Noise: 45 db.
Power: 110-125 Volts, 60 cycles, 80 watts
Weight: 27 pounds

WRITE DEPT. CQ-4

RHEEM CALIFONE CORPORATION ★ 5922 BOWCROFT ST. LOS ANGELES 16, CALIF.

For further information, check number 13, on page 110

One-Sixty Returns

The petition for inquiry into the problem of completely returning 160 meters to the amateur service made by the ARRL in December, 1961 has resulted in the following FCC order, RM-298, which completely goes into effect on April 15, 1963.

Breakdown of frequencies, power during day and night operation, and geography are rather complex so we therefore reprint the entire amendment to Sec. 12.111 below.

Single-sideband emission is prohibited; however, we understand that the subject is not closed and more about that point will follow.

Amateurs are cautioned that this Order is of a temporary nature and should interference be experienced with the Loran service, the Commission may, without hearing, revoke any or all parts of RM-298.

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

In the Matter of Amendment of Parts 2 and 12 of the Commission's Rules to modify the availability of frequencies in the band 1800-2000 kc for use by the Amateur Service on a share basis with LORAN stations.	RM-298

ORDER

At a session of the Federal Communications Commission, held at its offices in Washington, D.C. on the 13th day of February, 1963;

The Commission having under consideration the above-entitled matter; and

IT APPEARING, That footnote NG15 to the Table of Frequency Allocations contained in Section 2.106 of the Commission's Rules and that Sections 12.111(*b*) and 12.231(*a*) of the Commission's Rules stipulate that the Amateur Service may use certain portions of the band 1800-2000 kc in accordance with the following conditions (among others):

(1) The use of these frequencies by the amateur service shall not be a bar to the expansion of the radionavigation (LORAN) service;

(2) The amateur service shall not cause harmful interference to the radionavigation (LORAN) service; and

(3) The provisions of this footnote and section shall be considered as temporary in the sense that they shall remain subject to cancellation or revision, in whole or in part, by order of the Commission without hearing whenever the Commission shall deem such cancellation or revision to be necessary or desirable in the light of the priority within this band of the LORAN system of radionavigation; and

IT FURTHER APPEARING, That the Commission has before it for consideration a petition, RM-298, filed by the American Radio Relay, Inc., requesting the institution of proceedings looking toward removing or relaxing the present restrictions upon the operation of amateur stations in the band 1800-2000 kc; and

IT FURTHER APPEARING, That interference considerations indicate that the existing sharing arrangement may be modified in a manner which represents an increase in amateur operating privileges in a majority of the areas concerned but which requires elimination of the use of single side band emission throughout the band and a reduction of power in a few areas where the degree

[*Continued on page 93*]

Since its introduction in 1956, the PL-172 beam pentode (now identified as the PL-8295/172) has become widely accepted by both amateurs and manufacturers of military and commercial communications equipment as the tube to use as a 1000 to 1500 watt-output linear amplifier of single-sideband signals. Now, in keeping with Penta Laboratories' policy of continuing product improvement, we announce the *ceramic* PL-8295A, which promises to become the new standard of excellence.

Like the PL-8295/172, with which it is directly interchangeable, the 1000-watt plate dissipation PL-8295A beam pentode uses the exclusive Penta vane-type suppressor grid, which provides high efficiency and output, excellent linearity and low distortion. The new ceramic design adds to these features improved reliability, decreased cooling air requirements, and tolerance of high temperatures and severe shock and vibration.

Design your new linear amplifier around the Penta ceramic PL-8295A, or use it as a replacement for the PL-8295/172, and enjoy all the advantages of this rugged, high-performance, low-distortion beam pentode. Write today for your free copy of the complete, factual PL-8295A data sheet.

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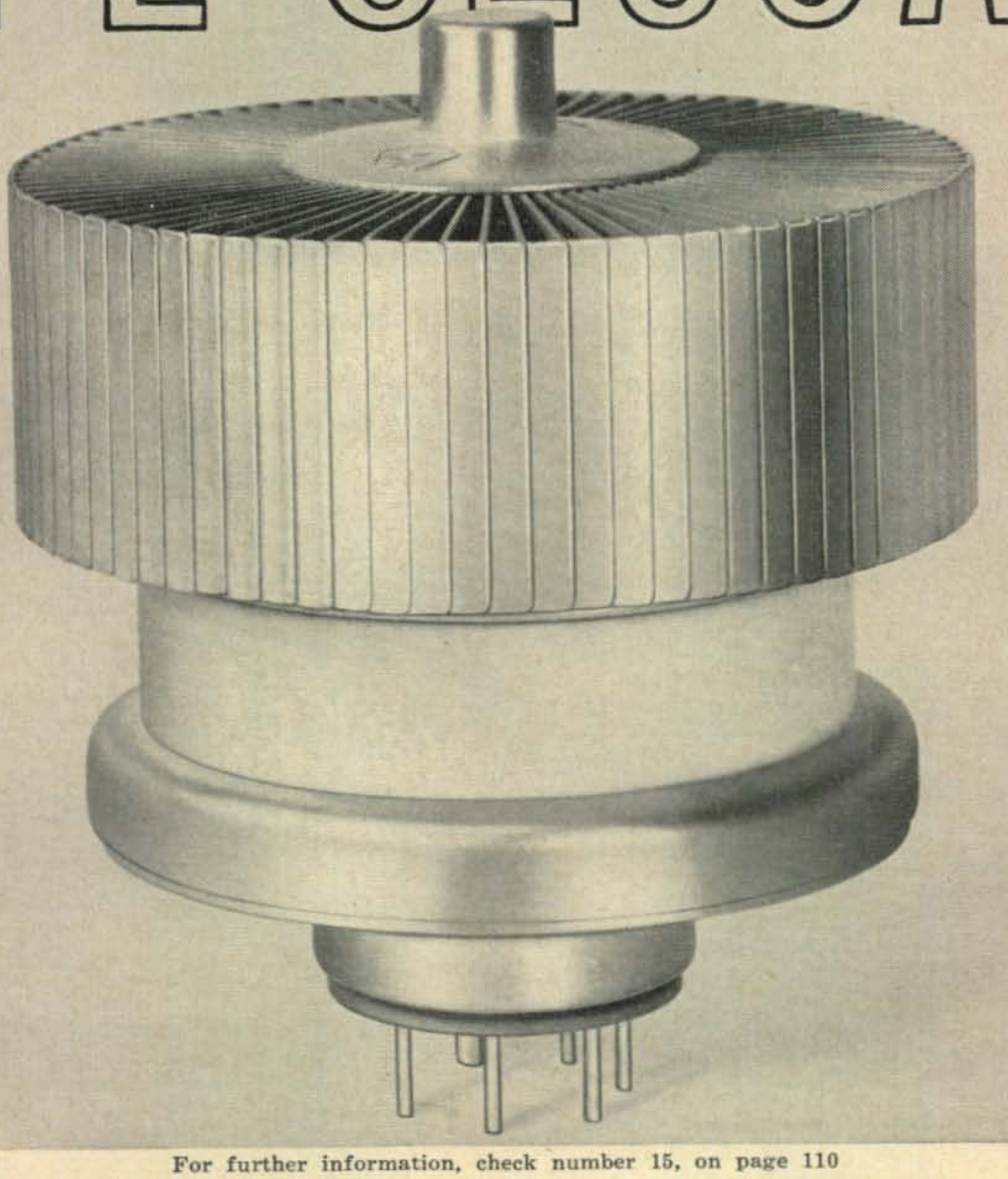
NEW CERAMIC PL-8295A



For further information, check number 15, on page 110

QSL contest

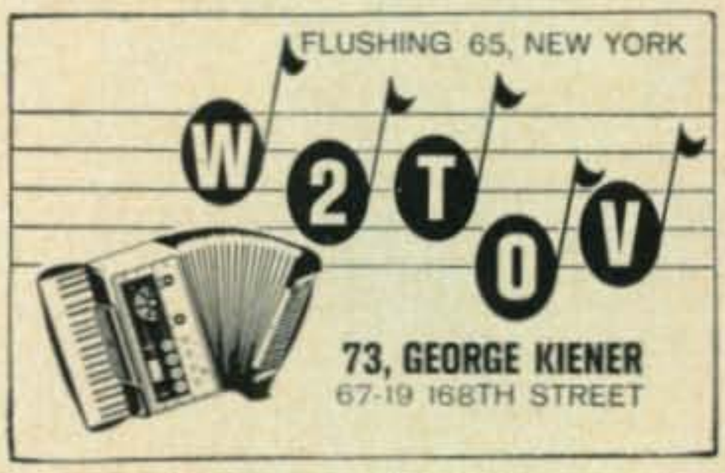
KARL Strobel, DJ6EO, was too bashful to send his own card so DJ5AA (runner up for January) had to do it for him. Mainly in green, the special quality of this card is the liquid laminate surface.

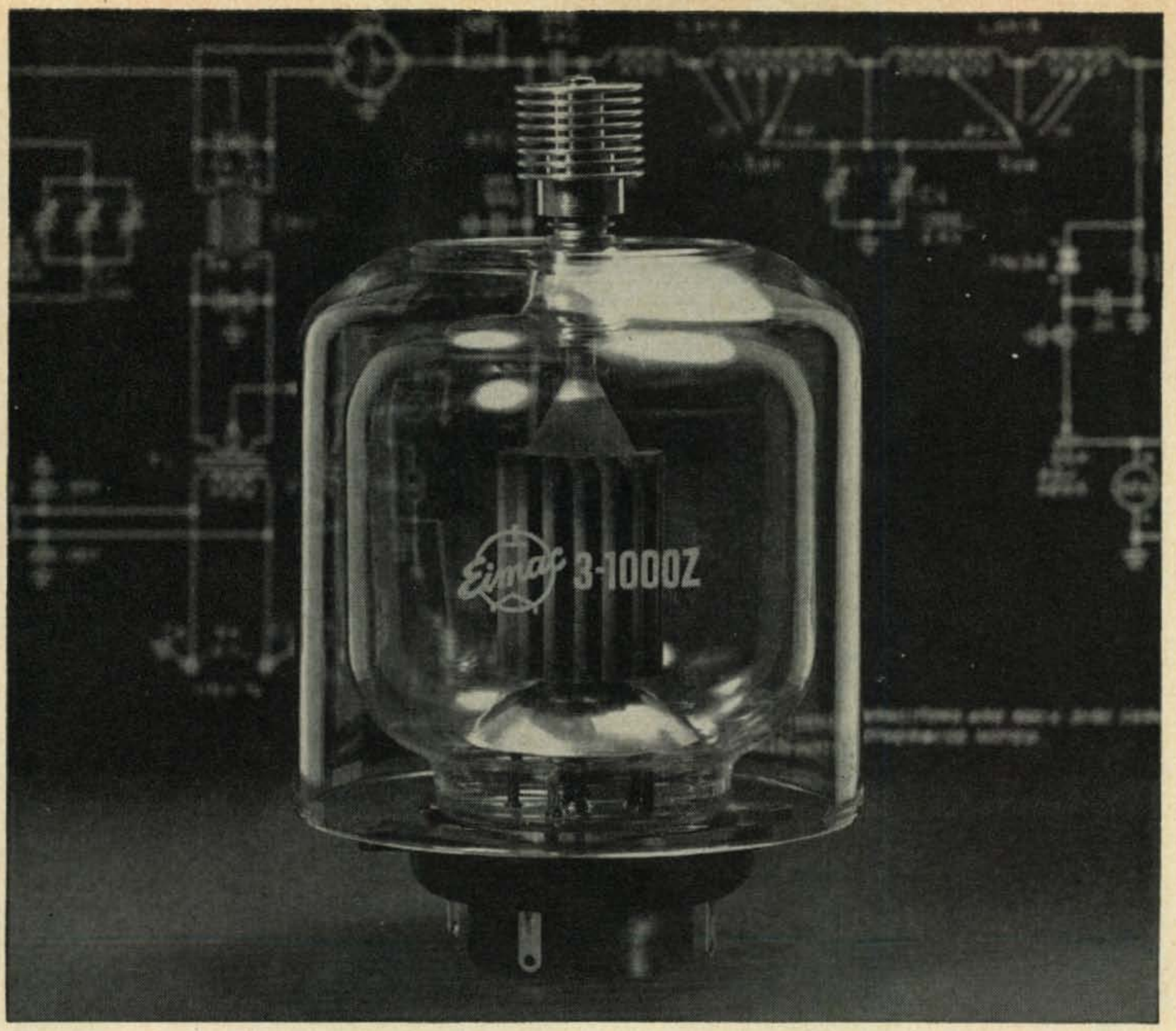
Runners up include: W2TOV, who makes it clear that he's an Orchestra Leader "on the side"; KP4TL who uses a Japanese and English motif to illustrate "Tokyo-London" and WN5-FEF who lives in the Texas oil fields.

Honorable mentions include: WA2EIY, PWI, RAU, RRK; K3LWY, OOU, SCH; K6JSS; K8TUT; K8ZQV (WOW!) and VE4XJ.

Contest entries topped all previous months, with 177 cards received. *Please*, no hand made one-of-a-kind cards accepted.

Runners Up





Eimac cuts the price of the 3-1000Z power triode.

Today the 3-1000Z, high-Mu, 1 kw power triode is the most economical tube you can buy. With its new low price, the compact 3-1000Z gives you more work per dollar than any tube suitable for amateur operation. Since there's no screen grid, it requires only simple associated circuitry. It offers longer life. It gives you adequate power margins, provides reliable, trouble-free performance. **$119.00** amateur net.

Here are typical operational characteristics (single-tone conditions):

D-C Plate Voltage	3000 volts	Resonant Load Impedance	2650 ohms
Zero-Sig D-C Plate Current*	240 ma	Max-Sig Driving Power	65 watts
Max-Sig D-C Plate Current	670 ma	Peak Envelope Plate Output Power	1360 watts
Max-Sig D-C Grid Current	300 ma	Max. Plate Dissipation	1000 watts
Driving Impedance	55 ohms		

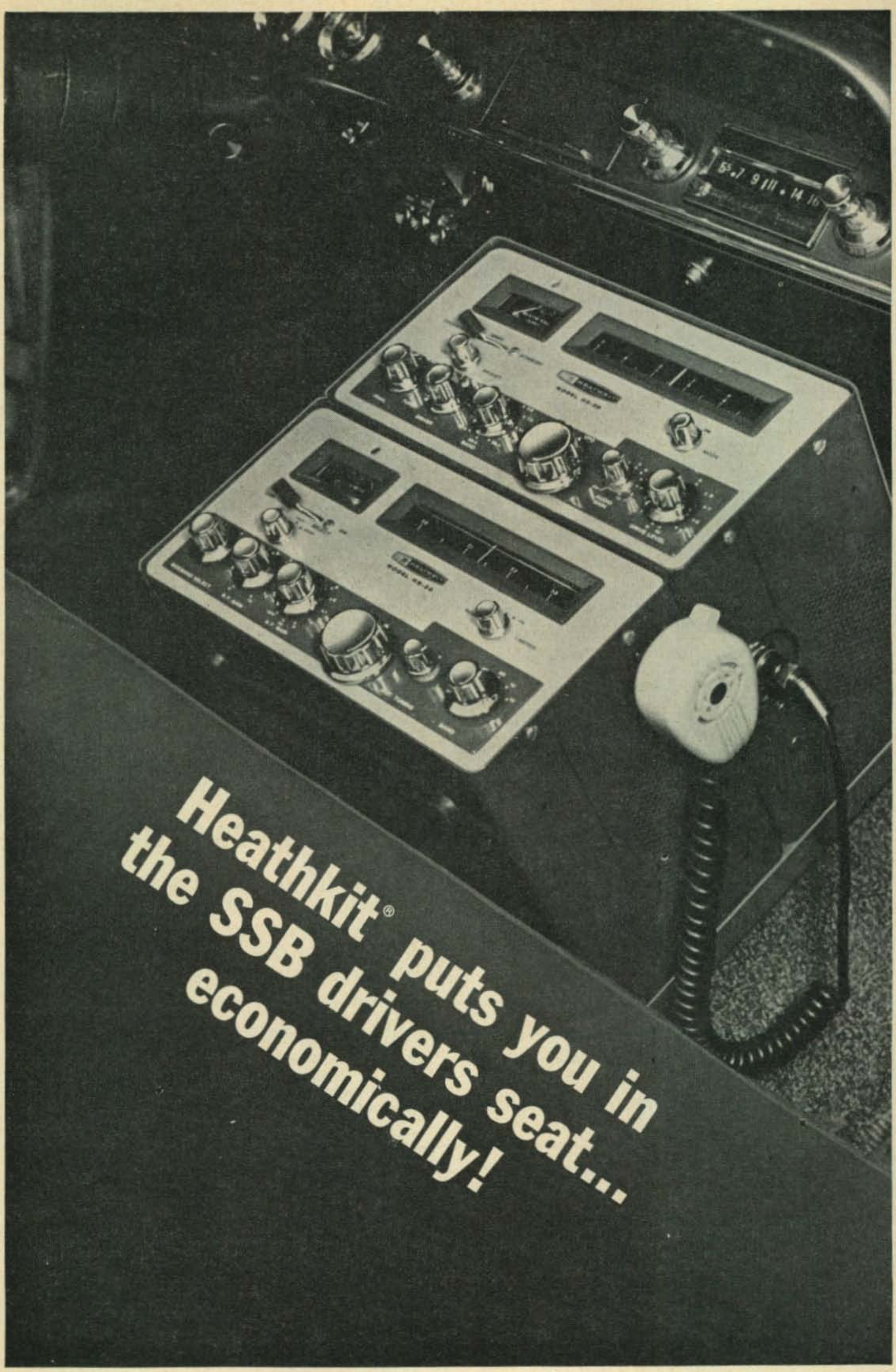
*approximate value

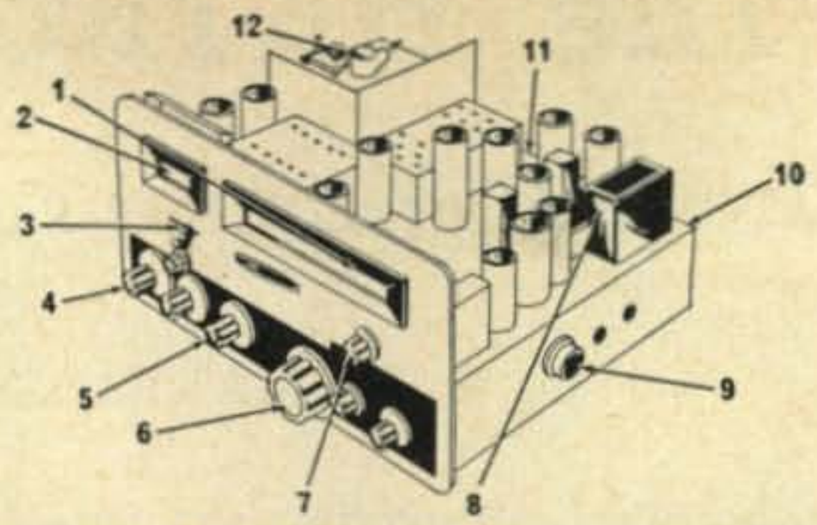
Recommended Heat-Dissipating Plate Connector	Eimac HR-8
Sole Recommended Socket (at new low price!)	Eimac SK-510
Recommended Chimney	Eimac SK-516

For additional material on the 3-1000Z and a reprint of the article, "A two-Kilowatt P.E.P. Amplifier Using the 3-1000Z," from QST magazine, write Bill Orr, W6SAI, Amateur Service Dept., Eitel-McCullough, Inc., San Carlos, Calif. Subsidiaries: Eitel-McCullough, S.A., Geneva, Switzerland; National Electronics, Geneva, Illinois.

Eimac

For further information, check number 17, on page 110


Heathkit® puts you in
the SSB drivers seat...
economically!



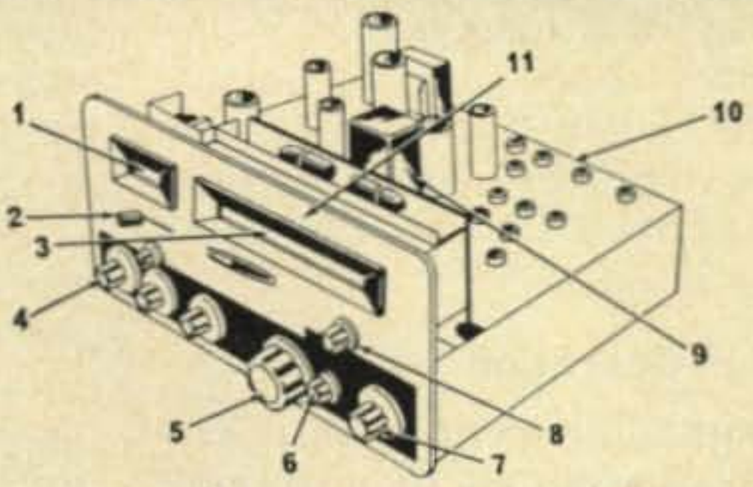
HEATHKIT HX-20 SSB MOBILE TRANSMITTER... A SENSATIONAL VALUE AT ONLY $199.95

1. Easy-to-read, edge-lighted, slide-rule dial **2.** Relative power output indicator for ease of tuning **3.** Spot function for zero-beat or talk-on frequency setting **4.** Fixed 50 ohm loading for easy tuneup **5.** Bandswitching 80 through 10 meters—all crystals furnished **6.** Full gear drive vernier VFO tuning **7.** Mode switch for LSB, USB or CW **8.** Hermetically sealed crystal bandpass filter **9.** VOX or push-to-talk operation **10.** External linear amplifier cutoff bias **11.** Built-in antenna relay plus external antenna relay control **12.** 6146 for 90 watts P.E.P. input. Automatic level control for maximum talk power, low distortion Crystal control, dual conversion, heterodyne circuitry. Frequency stability 100 cps overall, after warm-up. 50 db carrier suppression, 55 db unwanted sideband suppression.

SSB Portable, fixed station or mobile

less than $395.00 with power

All the features you want and need for top mobile performance. Handsomely styled with die-cast panel, chrome-plated knobs. Units require only 1 cubic foot of space for easy installation in auto. Rack mounting allows easy removal for fixed or portable use. Operates with Heathkit HP-10 or HP-20 power supplies. Here's quality, economy and versatility that can't be beat anywhere!



HEATHKIT HR-20 SSB MOBILE RECEIVER . . . MANY EXTRAS FOR TOP PERFORMANCE $134.50

1. Built-in calibrated "S" meter **2.** Fast or slow AVC selection **3.** Rotating slide rule dial **4.** Crystal controlled BFO for selectable sideband reception **5.** 30-1 gear drive vernier tuning **6.** Antenna tuning control, 1 uv sensitivity on all bands **7.** Full coverage 80 through 10 meters **8.** Series noise limiter for AM reception **9.** Crystal bandpass I.F. filter **10.** Additional 500 ohm output for anti-trip circuit or headset **11.** Die-cast control panel & knobs. Product detector for SSB & CW, diode detector for AM. Fully compatible for use with HX-20. Excellent mechanical and electrical stability.

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For further information, check number 19, on page 110

The "HETROCITER"

A Transmitter/Exciter For The C.W. Man

By E. H. MARRINER*, W6BLZ

This c.w. heterodyne exciter has variable power output, on the 80, 40 and 20 meter bands. It also has semi-break in vacuum tube keying.

A HETERODYNE exciter has certain advantages not easily obtained by the use of multiplier stages. Assuming both types of transmitters employ v.f.o.s, the heterodyne unit will provide uniform dial coverage for each band while in the multiplier type the usable portion of the dial becomes more crowded as the frequency is multiplied. Insofar as drift is concerned, it will remain constant for all bands in a heterodyne exciter while it will increase by the multiplying factor in the multiplier type of transmitter.

Of course, as with most things, there is the debit side. The heterodyne exciter is prone to spurious radiations. Careful choice of the frequencies to be heterodyned and the use of class A amplifiers have reduced spurious signals to the point where they are no problem at all.

Along with the heterodyne features, the "Hetrociter" also has vacuum tube keying. During the experimental phase I tried blocked grid and sequential keying but found vacuum tube keying superior in key click reduction.

The relay sequence has been timed so that no r.f. appears at the output before the coaxial antenna relay closes. This, of course, prevents contact burning and presents a load to the output stage whenever it is keyed.

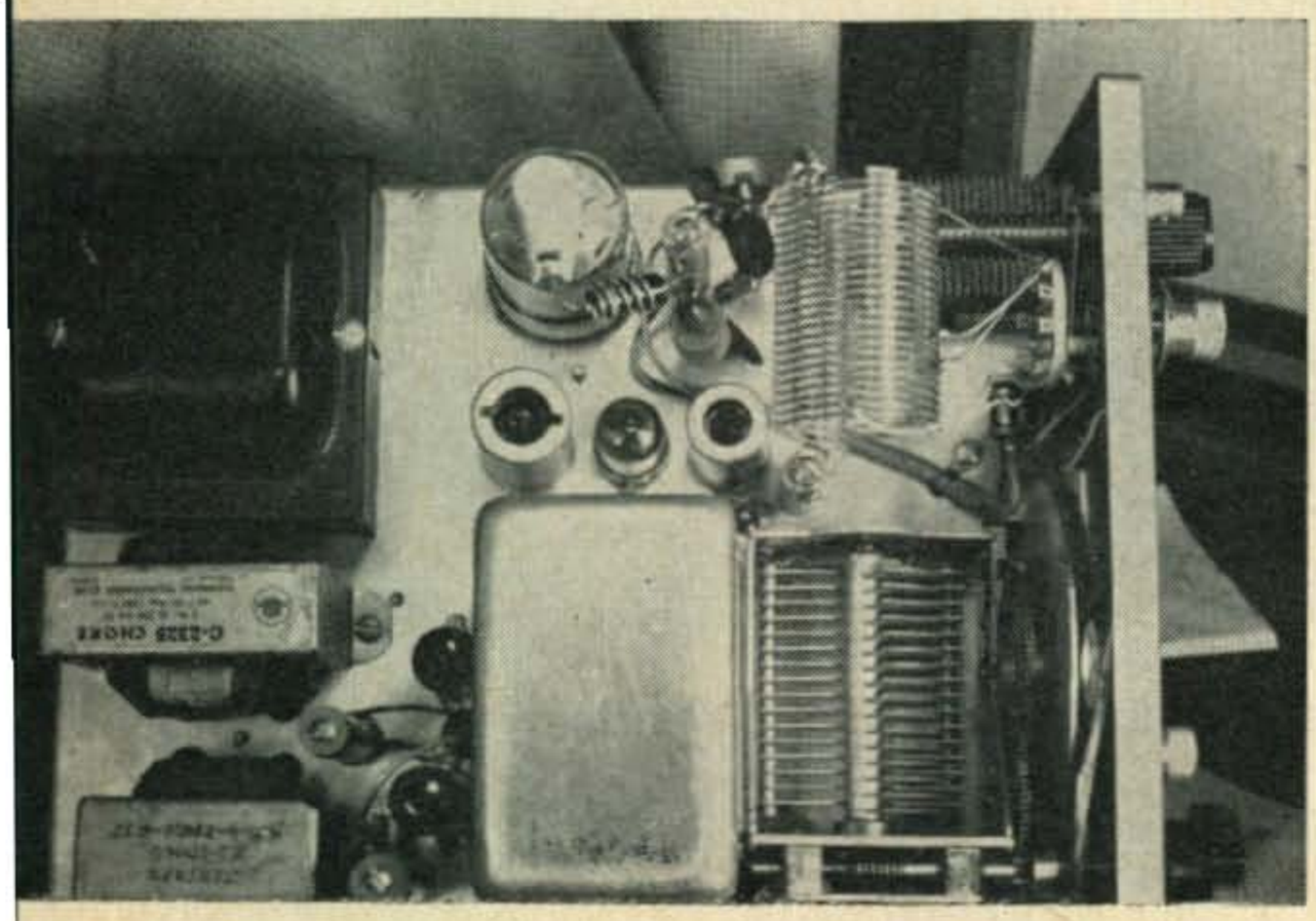
Circuit Operation

A signal, in the desired amateur band, is generated by combining the output of a variable oscillator which tunes from 5.0 to 5.3 mc, with a crystal oscillator of the proper frequency and feeding them both into a 6BE6 mixer tube. The output of the mixer tube is sufficient to drive a 6CL6 class A amplifier, which in turn drives a 6146 power output stage. Keying is accomplished by breaking the cathode return of the 6CL6 driver with a 6AQ5 keyer tube. Output is controlled by a potentiometer in the screen lead of the 6CL6.

The keying sequence begins by pressing the key; this removes the blocking bias on the 6C4 relay control tube. When the bias is removed, the plate relay of the 6C4, K_1, closes. It will stay closed for a few seconds between words or longer if desired. Relay K_1 energizes a coaxial antenna relay (K_2) that connects the antenna to the transmitter. At this time there is no r.f. output from the transmitter because the variable oscillator, the 6BE6 and the screen of the 6146 have no voltage applied. This assures no spurious signal generation during reception. The antenna relay has auxiliary contacts on the outside which operate and close when K_2 is actuated. These contacts are used to mute the receiver and energize a 5 volt a.c. relay, K_3. This applies power to the variable oscillator, mixer and 6146 screen.

Note the low pass filter on the output of the variable oscillator. This is used to prevent harmonics from entering the mixer and causing spurious output signals. Because the variable oscillator signal and the crystal oscillator frequency are at closest, 3 mc apart, the tuned circuits in the following stage prevents all but the desired signals from appearing in the output of the transmitter. The tuning range of the small variables is also not great enough to tune to undesired frequencies.

*528 Colima St., La Jolla, California



Top view of the heterodyne c.w. exciter shows the 6146 upper center. Beneath it are the 6CL6, 6BH6 and 6BE6 (from l to r). The v.f.o. tuning capacitor, with its gear train, is from an ARC-5 transmitter. To the left of this capacitor is the coil shield and to the left of the coil shield is the 6AQ5 and 0B2. The 6C4 keyer and relay may be seen alongside the v.f.o. tuning capacitor.

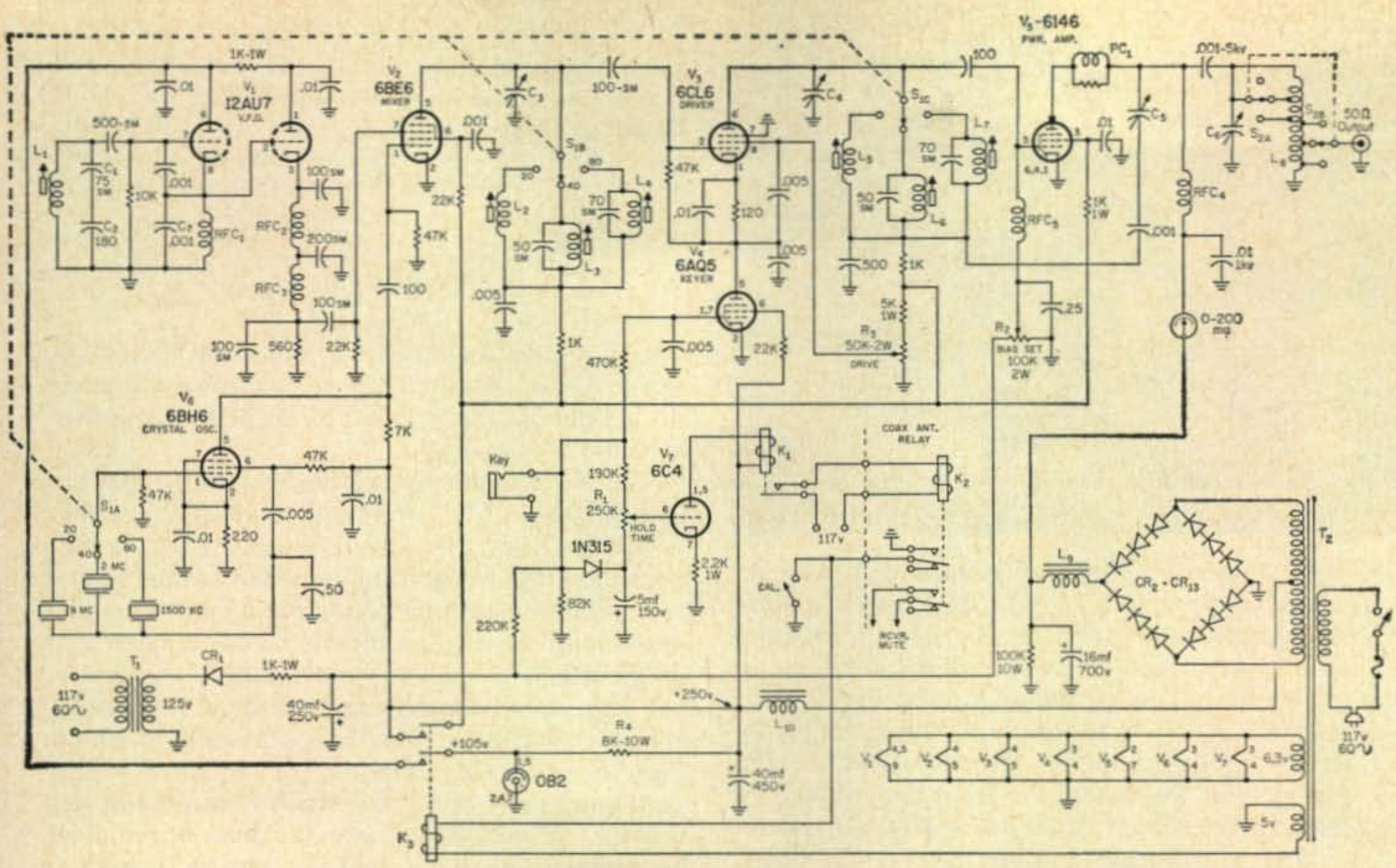


Fig. 1—Circuit of the "Hetrociter," a 3 band heterodyne exciter for 80, 40 and 20 meters. All resistors are ½ watt unless otherwise noted; all capacitors greater than one are in mmf and less than one in mf unless otherwise noted. Capacitors should be of the disc ceramic type except for those marked S.M. which are silver mica.

C_1—75 mmf disc ceramic.
C_2—180 mmf variable from ARC-5 transmitter, 16 rotor and 16 stator plates.
C_3—75 mmf, Hammarlund APC-75.
C_4—3-35 mmf, Johnson 160-130.
C_5—3-12 mmf ceramic trimmer.
C_6—12-250 mmf variable, 16 stator and 17 rotor plates.
CR_1—600 ma, 300 p.i.v., G.E. 1N1694.
CR_2 to CR_{13}—600 ma, 500 p.i.v., G.E. 1N1695.
K_1—S.p.s.t. relay, 10K coil. Potter Brumfield 5M5LS.
K_2—Coaxial relay, Dow DK-60-2C with d.p.d.t. auxiliary contacts. Coaxial contacts not shown.
K_3—D.p.s.t. relay, 5 v.a.c. coil. Advance A-C type.
L_1—10t of #1016 Air-Dux slipped over a National XR-62 ceramic slug tuned form.
L_2, L_5—1.35 to 2.75 μhy slug tuned, Miller #21A226RBI.
L_3, L_6—3.6 to 8.5 μhy slug tuned, Miller #21A686RBI.
L_4, L_7—9.4 to 18.7 μhy slug tuned, Miller #21A155RBI.
L_8—24t #1210 Air-Dux.
80 M—Full coil. Antenna tap 4t up from ground.
40 M—11t of the bottom portion of the coil. Antenna tap 1½t up from ground.
20 M—7t of the bottom portion of the coil. Antenna tap ½t up from ground.
L_9—2h at 200 ma, Stancor C2325.
L_{10}—8h at 100 ma.
PC_1—4t #20 on a 47 ohm 2 w. resistor.
RFC_1—2.5 mh 100 ma.
RFC_2, RFC_3—12 mh, Miller #72F125AP.
RFC_4—2.5 mh National R-300.
T_1—125 v.a.c., 15 ma., 6.3 v.a.c., 0.6 a. Stancor PS-8415.
T_2—530 v.c.t., 210 ma. 6.3 v., 9 amps, 5 v., 2 amps. Stancor PS-8172.

To prevent any interaction, shields are placed over the 6BE6 mixer and 6CL6 driver. Stability of the 6146 is increased by neutralization. The output tank circuit is a simple shunt fed arrangement with the output tap at the proper impedance point to match another amplifier or an antenna. In this manner the output is properly terminated at all times.

Construction

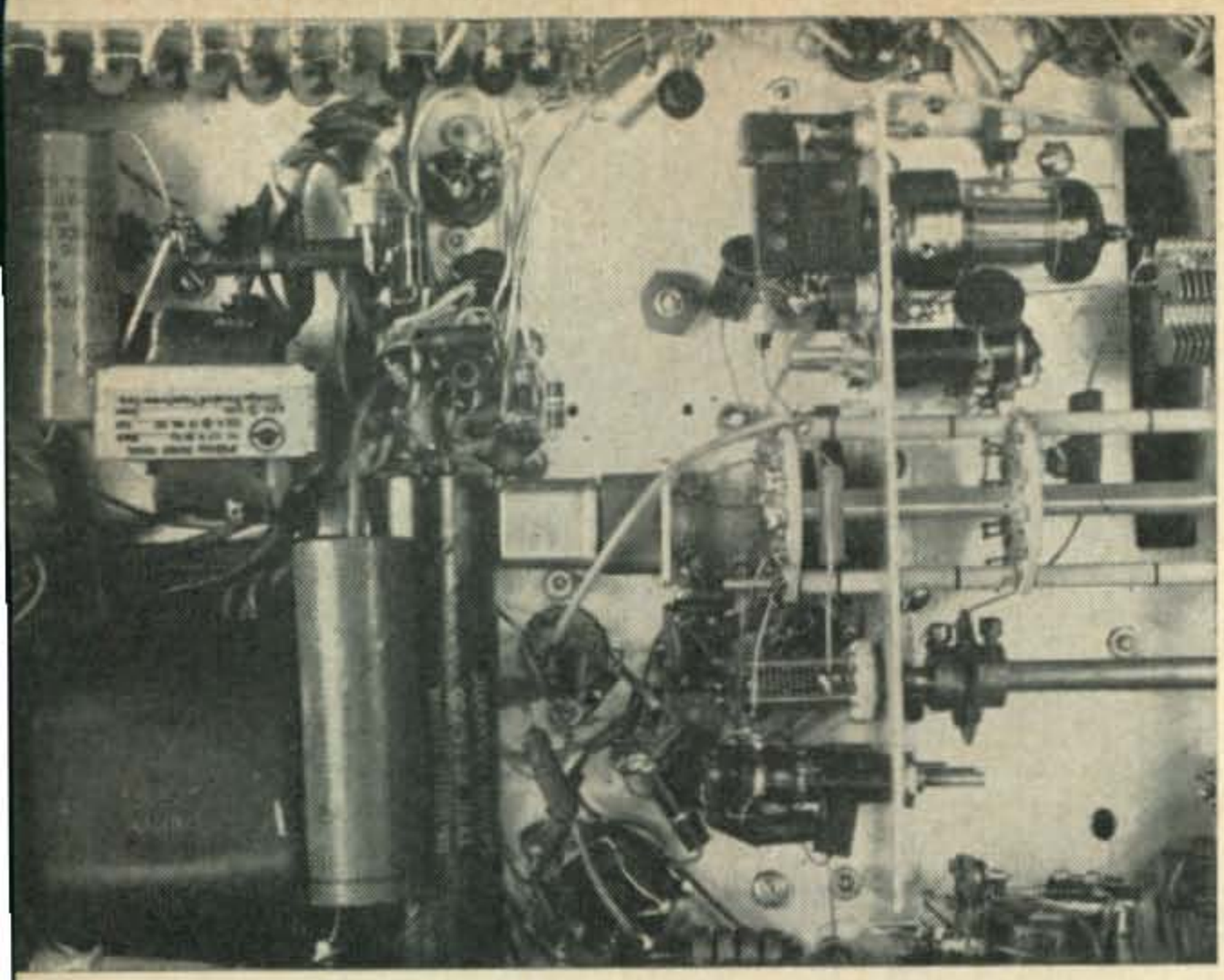
The Hetrociter is constructed on an 11 × 8½ × 2" aluminum chassis (California chassis, LTC-469) and enclosed in a perforated aluminum cabinet 11¼ × 8¾ × 5½". The ARC-5 transmitter tuning capacitor and gear train were modified by extending the tuning shaft and adding a calibrated aluminum-disc dial. By cutting a small circular window in the front panel and fitting it with a piece of plexiglass, (scribed with a hairline) easy and accurate frequency readout is obtained.

Although construction is quite compact, the Hetrociter is not overly crowded and no difficulty should be encountered in duplicating it. The use of an L-shaped bracket beneath the chassis provides support for the v.f.o. tube and components.

In the prototype, separate transformers were used for the high-voltage and bias supplies. Many surplus transformers, however, combine these windings and using one would save chassis space. Substituting 200 ohm resistors of suitable wattage for the filter chokes will save still more chassis space but will necessitate much larger filter capacitors (125 mf).

Adjustments

First, the variable oscillator must be set to 5 mc by adjusting L_1 with the shield in place.



Bottom view of the heterodyne exciter shows the power supply components in the lower left with the silicon rectifiers on a terminal board in the upper left corner. The bracket acts as the support for the v.f.o. components and driver coils.

Later if more band spread is desired, C_1, can be reduced in size but L_1 will have to be padded accordingly. The output of the v.f.o. must be at least 2 volts r.f. as measured with an r.f. probe and v.t.v.m. The crystal oscillator should next be checked on a receiver or some frequency measuring device to assure that it is on frequency. For 80 meters the frequency should be 1500 kc, 40 meters 2000 kc and for 20 meters 9000 kc. Using these crystals, the dial will always be in calibration with all bands tuning in the same direction.

The crystal oscillator should feed three to four volts into injection grid #1 of the 6BE6 mixer, while the v.f.o. feeds injection grid #2. With these two voltages, the output of the mixer should be 2 volts of r.f. which is sufficient to drive the 6CL6 operating class A.

The 80, 40 and 20 meter slug tuned coils may have to be pruned, using a grid dip meter, if they fail to resonate properly with the tuning capacitors. This applies both to the mixer and driver stages. Please note that the bottom of the coils in the 6CL6 driver stage, L_5, L_6, L_7 are bypassed with a 500 mmf capacitor. The reason for this is to leave enough r.f. on the cold end to be used for neutralizing the 6146. Note that this r.f. voltage is coupled to C_5, the neutralizing capacitor.

When the transmitter has been tuned, neutralization can be accomplished by unsoldering the plate and screen voltage leads to the 6146. Couple a field strength meter (or grid-dip meter in the diode position) close to L_8 to pick up the small output voltage feeding through the 6146. Next, slowly tune C_5 with an insulated screwdriver until this feedthrough is reduced to a minimum. The plate and screen voltages may now be reconnected.

Operation

The keying hold-time can be set by adjusting R_1. Bias for the 6146 should be set to about 50 volts by adjusting R_2 so that under conditions of no excitation, the plate current of the 6146 is resting at 35 to 40 ma. Under loaded conditions the plate current can be excited to read about 100 to 150 ma. The drive control, R_3, should not be advanced more than needed or the output will flatten out. If the output of the 6BE6 mixer is too low to obtain proper drive, increase the crystal oscillator signal to the 6BE6 to assure at least 2 volts output.

The loading current of the 6146 will also be determined by the proper matching tap on the bottom of the tank coil. This spot will depend upon how the exciter is to be used by the operator. Theoretically, a non-inductive 50 ohm resistor could be used on the output for adjustment of the tap, and the wire moved back and forth for maximum output and soldered in place. However, when coupling into a 50 ohm antenna there is some reactance, and the tap point might not be the same as for the 50 ohm non-inductive resistor. It will be necessary to perform this operation using the actual antenna or coupling it into the device to be driven. The point will vary, for example, on 20 meters from half a turn driving a grounded grid amplifier, up to 2½ turns from the ground end coupling into an antenna. Once these points are found, the tap can be soldered in place and forgotten.

Another suggestion to the constructor would be to put a ¼ amp fuse in series with the plate meter for protection against meter burn out. The regulator tube, an 0B2, should never have more than 25 ma flowing through it to ground under key up conditions or less than 5 ma under key down conditions. This value of current flow can be adjusted by varying R_4. ■

Front view of the "Hetrociter" showing control locations. The V.F.O TUNING is in the upper left corner with the HOLD TIME and EXCITATION controls below it. The antenna connector is located in the upper right corner with the OUTPUT BANDSWITCH alongside it and the P.A. PLATE TUNING underneath. Along the bottom row, from l. to r., we have the KEY JACK, MIXER OUTPUT TUNING, CALIBRATE SWITCH and POWER.

After being snowed in at Dikson Island for two weeks a five-hour flight brought the glaciers of Franz Joseph Land into view.

Flight To The Arctic

First S.S.B. Operations From Franz Joseph Land and Dikson Island In Rare Zone 18.

BY LEO LABUTIN*, UA3CR with ANATOLE KRYZHANSKI†

When an amateur gives up a whole weekend for a contest brawl, well—we don't think too much of it these days; and when he gives up a whole month's vacation for a DXpedition—well, that's not too uncommon either; but when he packs a bag, a portable s.s.b. rig and heads for Franz Joseph Land—man, that's enthusiasm! The author relates some of his experiences as UA3CR/UAØ and later /UA1 at one of the Soviet Union's northern most group of islands.

It seems that the transportation of a portable s.s.b. rig around the Soviet Union during 1961 had taken care of all the blank spots on our map.[1] Zone 23 and the missing Union republics were now represented on sideband. There was, however, one other place the portable rig should have gone but never had the opportunity of making it. That area was Franz Joseph Land and an expedition to that Arctic territory seemed a very tough proposition indeed.

In spite of its formidable climatic conditions, Franz Joseph Land being one of the northernmost group of Russian islands (only a short distance from the pole) I was extremely interested in making the trip. If only the Central Radio Club would support the venture we could begin preparations. Once such a wish was aired, word began spreading that UA3CR was soon starting on a DXpedition to Franz Joseph Land (FJL). It was some time, though, before things took shape and once the Central Radio Club promised financial backing I arranged for a four-week vacation.

By early 1962 everything was all set and a plane reservation was made for March 15th.

Shortly before departure, Ben, UC2AA, a leading sidebander in Minsk, Byelorussia called long distance. He was already on his vacation and wondered if he, too, could spend what was left of it at FJL, even if he had to "sell his shirt to raise the necessary funds."

The air route from Moscow to Franz Joseph Land lay via Dikson Island in rare Zone 18; that is, Dikson Island was as far as the airline went, and there I would have to wait for an occasional flight to FJL. Ben and I agreed that we would try to meet each other at Dikson Island.

It was planned to reach FJL by the time of the 1962 *CQ* S.S.B. Contest. The s.s.b. rig being taken had three crystal frequencies: 14,289; 14,303 and 14,310 kc. After a great deal of traveling, the rig was still in good condition and only needed some minor tuneup.

*Central Radio Club of the U.S.S.R., Post Office Box 88, Moscow, U.S.S.R.
†DX Editor, North American Service of Radio Moscow, Moscow, U.S.S.R.
[1]DX, "The Rig Goes Round," *CQ*, Jan., 1963, p. 58.

A log-cabin type structure was the shack at Franz Joseph Land.

At FJL two methods of transportation are available; the new and the old. Leo preferred the old.

At —40° an orphaned Polar bear cub was in his element.

An electric razor gave the author a chance to take a pile-up break.

Operators at UA1KED from left to right Nick, Alex, Leo and Vic.

After 2000 contacts UA3CR/UA1 bids farewell to his newly acquired friends at FJL.

Dikson Island

The plane landed on Dikson Island at one in the morning, local time, March 16th or 1 P.M. EST March 15th. A bus was waiting to pick up the passengers and it took me and the rig to the home of Val, UAØAZ who knew I was coming and was expecting me.

I was indeed surprised to find my host drinking his evening tea—it was getting on to two in the morning! Val explained that he lived by Moscow time, and as far as he was concerned it was only 10 P.M.

Val, or Valentine Ignatchenko, is the leading amateur operator on Dikson Island and the only one who has his own personal station; the others, some thirty-odd members operate the club station, UAØKAR and are *all* c.w. men.

The radio shack of UAØKAR is housed in the same two-story log structure in which Val has an apartment and which, incidentally, has running water, electricity and central heating. UAØKAR consists of two first-class communication receivers and one transmitter. On close inspection it turned out that the latter was out of commission as somebody was making some minor modifications. Val was kind enough to lend me his own transmitter to use as an amplifier for the s.s.b. exciter. As soon as the gear was hooked up, UA3CR/UAØ was on the air.

Band conditions were much better than they had been in Moscow. W/K, KL, VE and all of Oceania were especially loud. Conditions to Europe were much worse, and as for Africa and South America, they came through only once a day for only about an hour or so.

I didn't expect it but I made quite a hit on sideband. Dikson Island is located in Zone 18 and at the time of the trip was represented by only five other calls—UA9HG, UA9OI, UAØBP, UAØVQ and UAØWC. It turned out, however, that a lot of the gang did not have this Zone and, ending the QSO, thanked me for completing their WAZ.

Propagation conditions continued good throughout the stay at Dikson Island and QSOs were made almost every day with friends at home and in North America. At 0400 GMT skeds with Soviet hams were made, among them: Nina, UA3CG; Leo, UA3DR in Moscow and Vlad, UB5WF in Lvov, Western Ukraine. At 0445 GMT a sked with the two Bills—VE7ZM

Dikson Island, March, 1962. The club station, UAØKAR (right) Val, UAØAZ (center) and the author were all lodged in the comfortable house (left). Weather conditions forced a much longer stay than was anticipated.

and W7PHO was made. Later on, at 1300 it was QSO time for W1YDD.

Everything at Dikson Island was running just fine, except it was not where I was hoping to spend my entire vacation. A number of blizzards paralyzed air travel and leaving the island was out of the question due to the weather.

The *CQ* S.S.B. Contest came and still found me stranded on Dikson. A few days before, Ben, UC2AA arrived on the island so there were three operators to man UAØKAR during the contest; Val, Ben and myself. Hollering into two mikes, we scored 541 contacts with 145 different prefixes, which turned out to be the best results from Dikson Island to date.

Leaving Dikson

By the time the weather improved, half of the four-week vacation was over. As for Ben, he was hurriedly packing since his vacation was practically at an end. We departed Dikson Island almost at the same time—but in opposite directions—Ben going south and I going north.

Val saw me off to the plane and helped me with the baggage. Besides the s.s.b. gear I took Val's transmitter, just in case, and one of the receivers. The only station on Franz Joseph Land, UA1KED was not equipped for s.s.b. reception.

Two hours before take-off I spoke to Bill, VE7ZM and asked him to tell everyone that I would be on the plane in two hours and in another five would be at FJL. I promised to be on the air that very evening, March 28th. At 1100 we touched down and at 1600 UA3CR/UA1 pumped out the first CQ.

Band Conditions At FJL

I could hear Ws almost round the clock, but after 2000 GMT, probably due to short skip, they ceased to respond. Early next morning they were back in again as loud as ever.

Three levels of stations were usually distinguishable from North America. The top level consisted of stations running S-9 plus, beneath them were S-6 to 7 stations and deeper underneath were 3 and 4s. The last group were greatest in number and merged in an almost continuous buzz. Once I asked a W6 if there were only kilowatts in California. He paused before answering and said that there must be weaker stations, but he personally didn't know of any. Running a check, I called "CQ low-power W6" and rather quickly the upper crust disappeared, leaving the second level quite audible. Besides a signal report the operators were asked to give me their power. Most of them were using from 75 to 150 watts and one was running 40 watts. That was the first and only truly low-powered contact made and I promised him a special QSL card.

The score after the first evening of operations at FJL was 170 contacts but the next day it shot up to 500. Excitement continued to grow and soon reached fever pitch. Seventy to eighty contacts were being worked per-hour and the pileups on frequency refused to subside. When working American stations, listening was accomplished 5 to 10 kc above or below the transmitting frequency. After each contact the frequency for the next contact was announced. Operating was greatly faciliated by friendly DXers such as VE7ZM, W1LLF, W1YDD and W3AYD who shooed intruders off the working frequency.

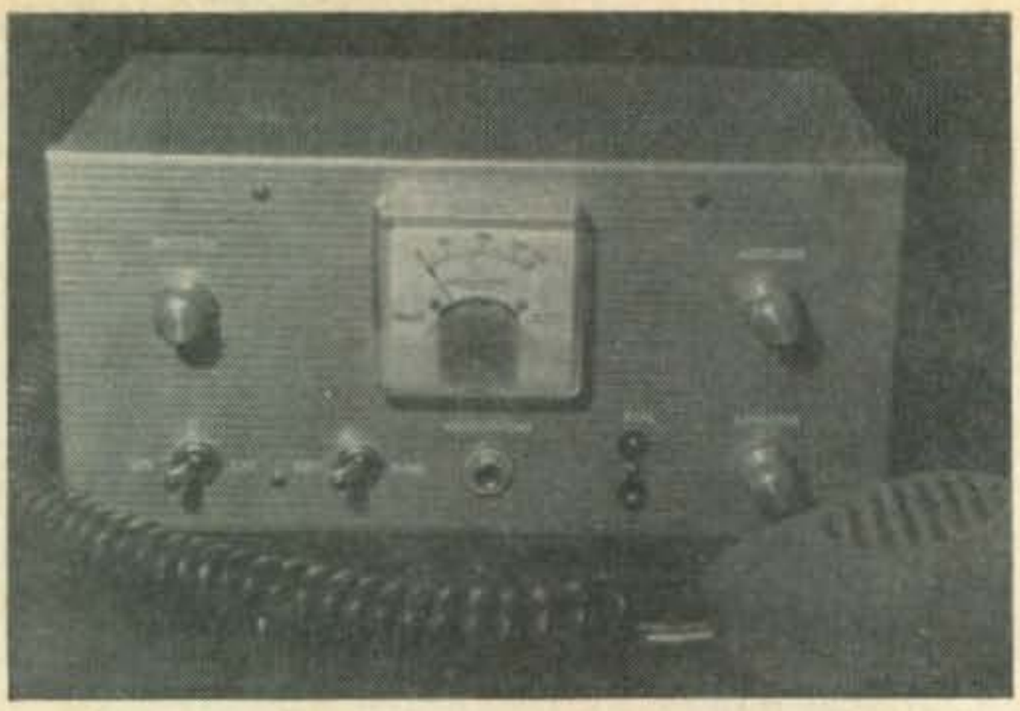
The DXpedition to FJL was going into its second week, the last week of my vacation. Propagation continued to get worse and QSOs began to repeat. A look through the log later revealed three, four and even seven repeats!

Between operating periods, some lectures were given to the small group at FJL, mainly on s.s.sb.

Chief operator at UA1KED, Nick Tyurkin even tried his hand at sideband. I preceded him by announcing that UA1KED could be worked on s.s.b. in Russian. Believe it or not there were quite a few DXers trying to make themselves understood in Russian with the aid of textbooks and dictionaries.

I left Franz Joseph Land for Dikson Island on April 6th and again had to stop there longer than I cared. The weather kept us marking time for another five days and finally I made it home on April 12th.

Together with my QSL manager, Nina (UA3CG) we reckoned the total haul from FJL to be 2,300 contacts in 37 Zones. The next step was to estimate postal expenses including the purchase of a roomy satchel to carry incoming and outgoing QSL cards. In other words, the "pleasure trip" was over, we now had real work to do. ■



Front view of the transceiver shows a neat uncluttered appearance. The converter controls are on the left side and the transmitter controls are on the right side. The size of the unit can be seen by comparison to the microphone.

A COMPACT MOBILE TRANSCIEVER

BY T. W. GWIN*, K5BNS

This is an economy model package of a small mobile transmitter and converter (to feed the BC radio) for use on 80 or 40 meters. The output stage is a screen modulated 6146.

Most amateurs, at one time or another, have been bitten by the mobile bug. Those that have been bitten will quickly tell you that there is nothing more enjoyable than to carry on a good solid QSO from your family limousine when you are on a cross-country trip or even just out for a Sunday drive.

Usually there are two major factors that arise when you decide to go mobile. These are the financial investment and the space limitations involved when installing the equipment in the automobile. With these problems in mind the author has designed the "Week-Ender".

Circuit Design

The circuit employed is simple and straightforward. The oscillator and final amplifier circuits are old standbys that can be found in most any handbook. The main deviation from the standard mobile transmitter is in the modulation section. In order to hold down the cost as much as possible, it was decided to use screen grid modulation. This eliminates the driver and modulation transformers which can run the parts bill up considerably.

The basic modulator design was taken from the DX-40. The speech amplifier circuit was modified to facilitate the use of a carbon mike. The switching arrangement for the TUNE-OPERATE function was changed slightly to make it simplier for the operator to adjust the transmitter while in motion. (This is not considered good practice if the operator is also driving.)

In order to further eliminate unnecessary extra pieces of equipment taking up space in the car (at the suggestion of a very patient XYL) a converter was also included in the same compact 10½" wide × 4¾" high × 6" deep package. The converter is one which the author has used for quite some time with excellent results.[1] Do not be misled by its simplicity. Solid contacts have been made on 75 meters on numerous occasions for distances of two hundred miles and better. All things considered, you will find the results you get from this transceiver very rewarding.

Construction

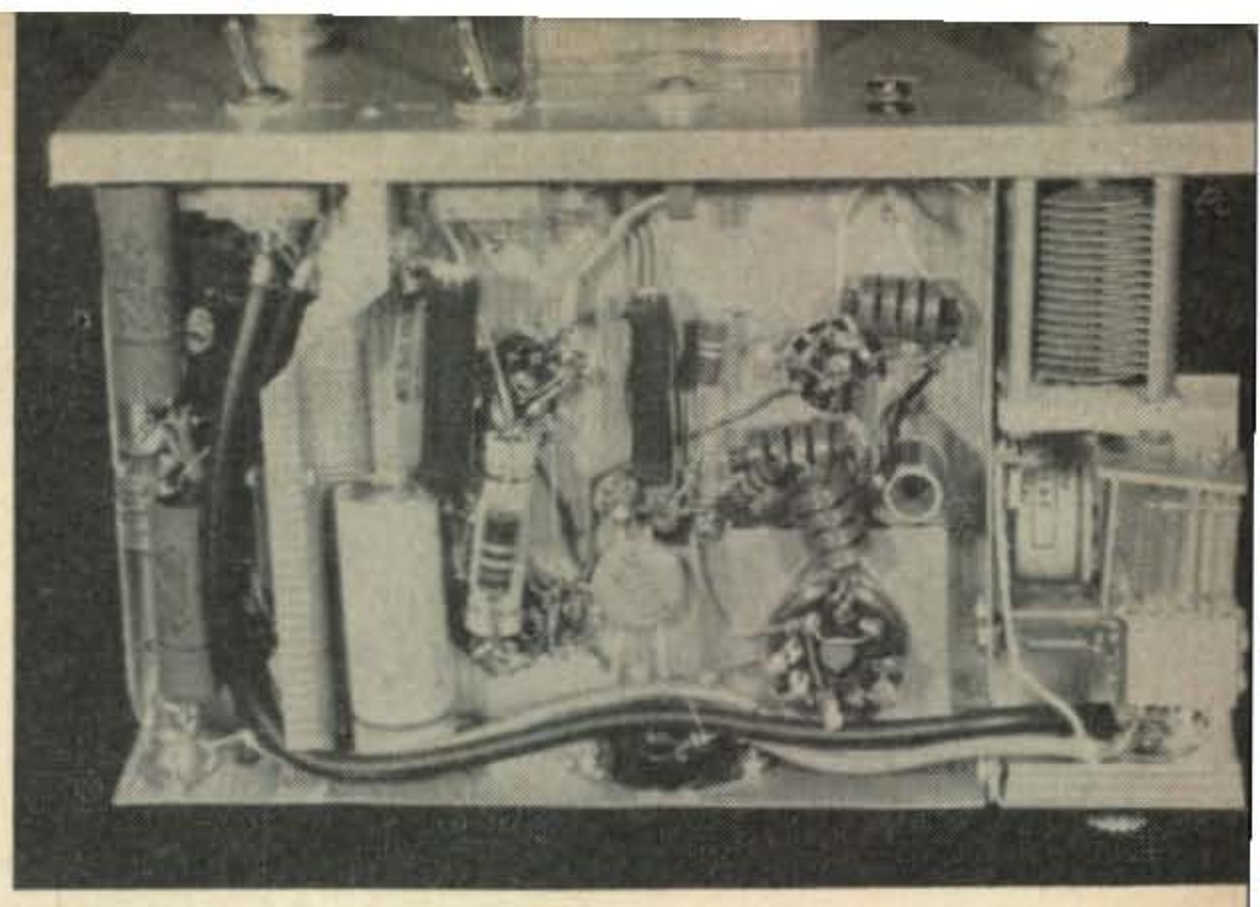
The chassis, partitions and front panel are made of medium weight aluminum sheet. The outside cover is made of perforated aluminum to allow for adequate ventilation of tubes, etc. The main chassis section is 7⅞" × 6" with a 1½" lip turned down on three sides. A ½" lip is turned down on the remaining side.

By referring to the accompanying photographs, placement of tube sockets and related components can readily be established. The aluminum shielding partitions should be placed into position after the tube sockets have been installed. As can be seen, some of the components are mounted on these partitions.

*2819 Copeland Road, Tyler, Texas.

[1]Gwin, T. W., "An Inexpensive Mobile Converter," *CQ*, May 1962, page 40.

Rear view of the 80 or 40 meter transciever. The converter tube and converter tank circuit are on the right hand section of the chassis. The final r.f. section is located on the left side of the chassis.



Bottom view of the transceiver shows the compact arrangement. The "A" line filter choke and capacitors may be seen in the converter compartment on the left. Note the jog in the sidewall so that the shield falls between S_1 and S_2. The 6146 socket is sub-mounted to conserve space. The panel, shields, chassis and sub-chassis are all formed from a suitable gauge of aluminum.

In following good construction practice, you should first complete your tube filament wiring. Then comes the control circuit, high voltage and r.f. wiring with the filament and control wiring laid next to the chassis. Needless to say, all wiring should be kept as short as possible.

The National XR-50 coil form used in the oscillator plate circuit will have to be modified. The bottom end of the form will have to be cut ⅜" so that it will not protrude below the chassis. This can be done with a hack saw if you are careful and do not apply too much pressure.

In order to eliminate the necessity of removing the auto receiver from the car to obtain a filtered 12 volt connection for the converter, a filter is included. A filter choke from a discarded auto receiver was used. This item is available from almost any radio supply house as a replacement part.

Care should be used when wiring the converter section. The placement of parts is not at all critical but you will find that the filter coil and capacitors take up a great deal of the room in the area allotted to the converter. Be sure and mount all parts as rigidly as possible. In mobile operation you will encounter a great deal of vibration and components crowded into a compact area can very easily move about and short.

Tuning

The initial tune-up should be done on the bench. A power supply delivering 500 to 600 volts at 200 ma, 250 volts at 75 ma and 12 volts d.c. is required.

A 0-10 ma meter should be inserted temporarily at the point marked X in the grid circuit of the final amplifier. A 75 or 40 meter crystal should be placed in the crystal socket (the crystal used should be near the center of the frequency range you intend to operate). Next, connect 12 volts to the tube filaments and allow ample time for the tubes to reach operating temperature. Apply 250 volts to the plate of the oscillator but do not apply high voltage to the final at this time. Tune the slug in coil L_1 until you get a grid current of 2.6 ma. This should give you ample drive from crystals 25 kilocycles either side of this frequency without further adjustment. Remove the 250 volts from the circuit.

[*Continued on page 96*]

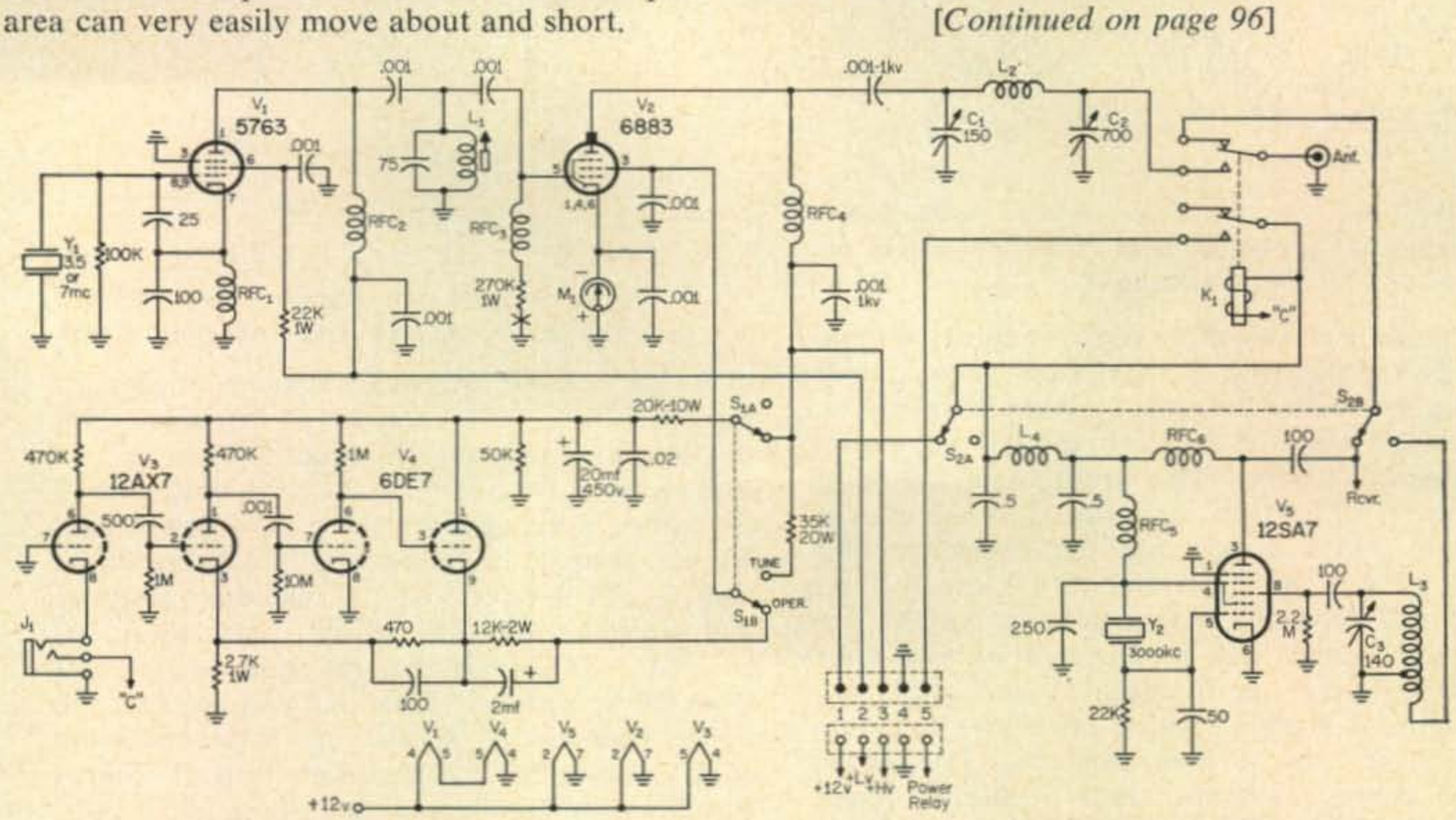


Fig. 1—Circuit of a 80 or 40 meter transceiver. The converter tunes to 80 or 40 as described in the text and the windings of L_1 and L_2 are halved for 40 meter operation of the transmitter. The 700 mmf loading capacitor is a 2-gang broadcast variable. The output tube may be a 6883 as shown or a 6146 with a 5 ohm 10 watt resistor in series with the filament.

L_1—35t #26 E wire on modified XR-50 form.
L_2—80t #18 E 1" dia. close wound.
L_3—B&W #3008 grounded 18 turns from the antenna end.
K_1—d.p.d.t. 12 volt relay.
$RFC_{1,2,3,5,6}$—2.5 mh, 125 ma.
RFC_4—2.5 mh, 200 ma.

More QSOs, Less QRM

BY SIMON RAND*, W2QZJ

The author presents some thoughts and techniques that will permit maximum utilization of the phone spectrum.

ONE of the most perplexing problems of amateur radio is how to utilize the available phone spectrum with the greatest efficiency. One has only to listen on the bands to realize that by proper distribution of signals a greater number of amateurs could operate more efficiently. Watching the Spectroscan[1] and simultaneously listening on the receiver reveals adjacent channel interference due to improper spacing of signals. Also evident is the unnecessary QRM caused by splatter resulting from overmodulation.

This article will cover a.m. and s.s.b. signal distribution along the r.f. spectrum. The signals will be presented along the frequency axis.[2] For a better understanding of this discussion it is recommended that the reader refer to "Basic Spectrum Analysis" that appeared in *CQ*, August and September 1961. This article will also show how receivers with different i.f. curves and filters respond to a given situation. A 20 kc segment of the phone band will be chosen, and this segment will be representative of any phone band segment.

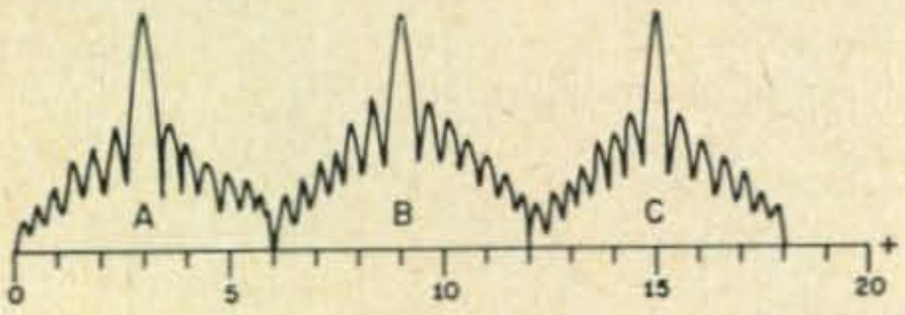


Fig. 1—Three a.m. signals, each 6 kc wide, spaced for maximum utilization of a 20 kc segment of any phone band.

Figure 1 shows three a.m. signals with sidebands representing a maximum audio modulating frequency of 3 kc, giving a maximum spectrum width of 6 kc. Note the 6 kc spacing between carriers. This represents optimum spectrum utilization. It is the ideal set of a.m. signals and assumes that the respective contacts of stations A, B and C are exactly zero beat and have the same spectrum width. Any of these signals can be received without interference on a properly designed receiver.

Figure 2 shows a set of i.f. curves that may be inherent in various receivers. Try tracing these curves on transparent plastic or paper, utilizing this tracing as an overlay for fig. 1. Place the overlay on fig. 1 with the base lines superimposed and position the center of the curve represented by the vertical line Y on 9

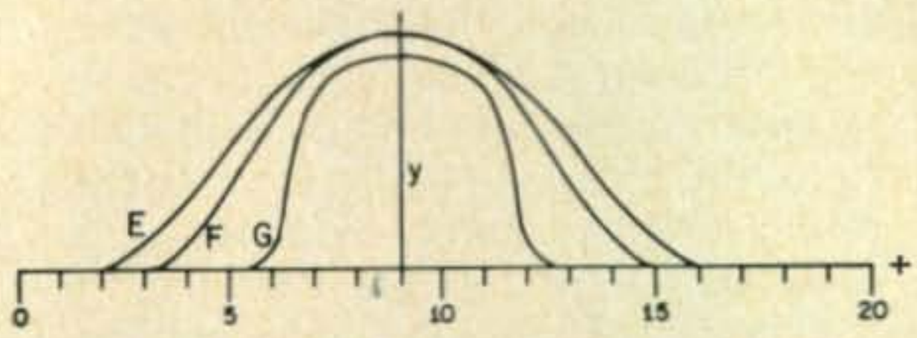


Fig. 2—Some typical receiver selectivity curves. Trace these curves on transparent paper or plastic and use the overlay as directed in the text.

kc which is the carrier frequency of signal B. Note that the curve of receiver E not only passes signal B but also allows portions of signals A and C to be heard. This is an example of poor receiver selectivity. The owner of such a receiver will always complain of interference even though none exists.

Curve F represents a receiver which also passes A and C but to a lesser degree. This represents improved selectivity but still leaves something to be desired. Receiver G shows the curve of a well designed receiver. With this receiver, signal B can be received without adjacent channel interference. Now slide the overlay to 3 kc and then 15 kc and note the different results.

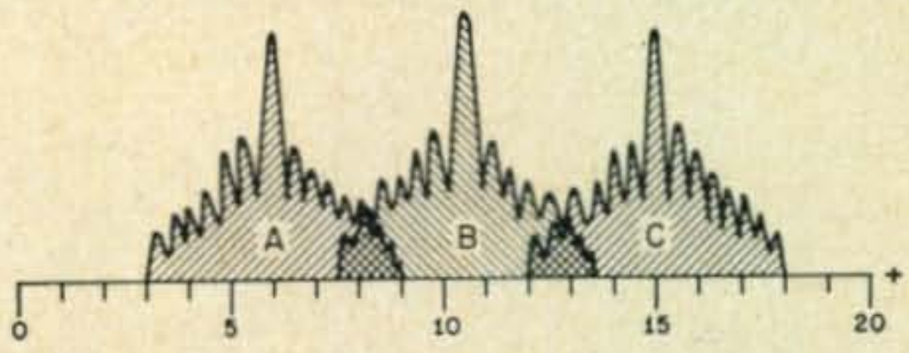


Fig. 3—The same three a.m. signals shown in fig. 1 are now improperly spaced and will cause QRM.

Figure 3 shows improper spacing of signals. Signal A leaves a 3 kc space at the lower end; this space is unusable by another a.m. signal that requires 6 kc. Signal C could have placed his carrier 6 kc up from A or 3 kc down from 20 kc. Instead he chose the 15 kc position. This forced B to choose the indicated position. An alternate position would have been between C and signals that are assumed to exist from 20 kc upward. Thus one can see that the upper sideband of A and the lower sideband of C now suffer interference from B. Signal B suffers on both upper and lower sidebands. Signal B experiences such severe interference anyone would have extreme difficulty trying to copy it. Signals A and C, on the other hand, could be copied with some annoyance. If those listening to A and C had selectable sideband receivers, they could copy A and C with the exalted carrier method, that is, as one would copy single sideband.

*27 Forest Avenue, Ossining, New York

[1]Rand & Whitmore, "Basic Spectrum Analysis, Part III," *CQ*, Oct. 1961, p. 24.

[2]Rand & Whitmore, "Basic Spectrum Analysis, Part I, II," *CQ*, Aug., p. 34, Sept., p. 32.

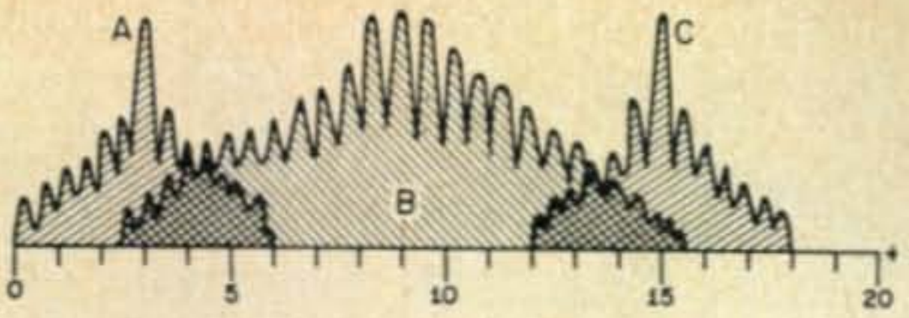


Fig. 4—This is the result of overmodulation by signal B. The degree of splatter is determined by the severity of overmodulation.

The lower sideband would be selected for A and upper sideband for C resulting in little or no interference being heard. There are many other undesirable frequency combinations. I will leave these up to the reader's imagination.

Let us look at fig. 1 again and then at fig. 4. Figure 4 shows B overmodulating and causing adjacent channel interference. Note the splattering on A and C. The degree of splatter depends on the severity of overmodulation. The shaded area indicates area of interference. The Hi-Fi enthusiasts with up to 6 kc or more audio modulation, take up 12 kc or more of spectrum space. Those operating with unrestricted modulation represent the most selfish individuals and should be told that they are denying operating space to others. There may be some that don't realize that they are quite broad. Approaching these operators with a friendly and helpful attitude, avoiding belligerent remarks, frequently gets results.

Whenever more efficient use of the available spectrum arises in any conversation, we have the a.m. versus s.s.b. argument and, of course, s.s.b. wins without challenge. Simple arithmetic will indicate that for each a.m. signal almost three s.s.b. signals could occupy the same portion of the r.f. spectrum.

Before our good brothers and sisters on s.s.b. get swell heads as spectrum conservationists, let's take a look at some of the faults and virtues. One of the virtues of s.s.b. is that with the same maximum modulating frequency as used on a.m. we now can have 6 s.s.b. signals in a 20 kc band segment (fig. 5).

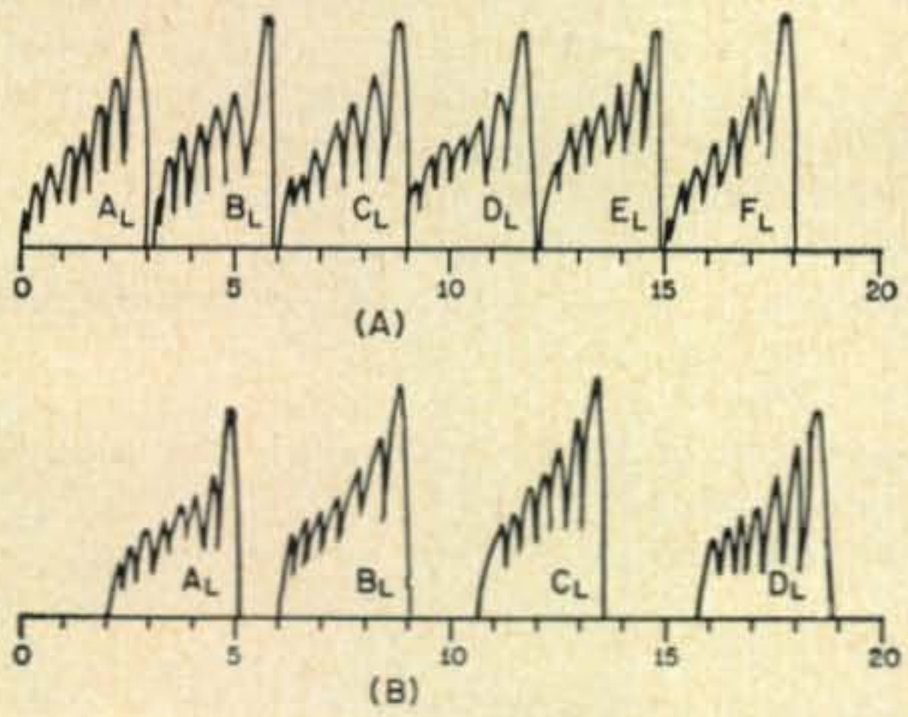


Fig. 5—Drawing (A) shows the ideal distribution of six s.s.b. signals each with a bandwidth of 3 kc. A poor usage of the same space is shown in (B).

Figure 5B shows one of many combinations possible with improper signal spacing. Signal A_L is at 5 leaving 0 to 2 unusable for most s.s.b. signals. Signal B_L at 9 wastes the space between 5 and 6. Signal C_L at 13.5 wastes 1.5 kc. Signal D_L at 18.5 wastes 2 kc. It should be very evident that signals E_L and F_L have been denied clear channels by thoughtless choice of frequencies. Stations E_L and F_L could squeeze in between the broader waste areas but not without some QRM.

One can readily see that on a relatively quiet band, during certain hours, unnecessary QRM is often caused by stations calling 1½ kc or so above or below a station already operating. This type of senseless QRM might occur because the operator did not tune his transmitter to the listening frequency; that is, he is trasmitting on one frequency and listening on another. A preferred method of operation is to tune in a sideband of a station near the frequency on which you desire to operate. If your dial is calibrated in kc, tune the receiver either 3 kc up or 3 kc down in frequency from the receiver signal. If the dial is not directly calibrated in kc the receiver is carefully tuned up or down until a minimum of "chatter" is received. A combination of listening and dial interpolation will usually do the job.

As in a.m. reception, receiver selectivity is an important factor. Unlike receivers designed for a.m., s.s.b. receivers depend on filters instead of transformers to provide the necessary selectivity.

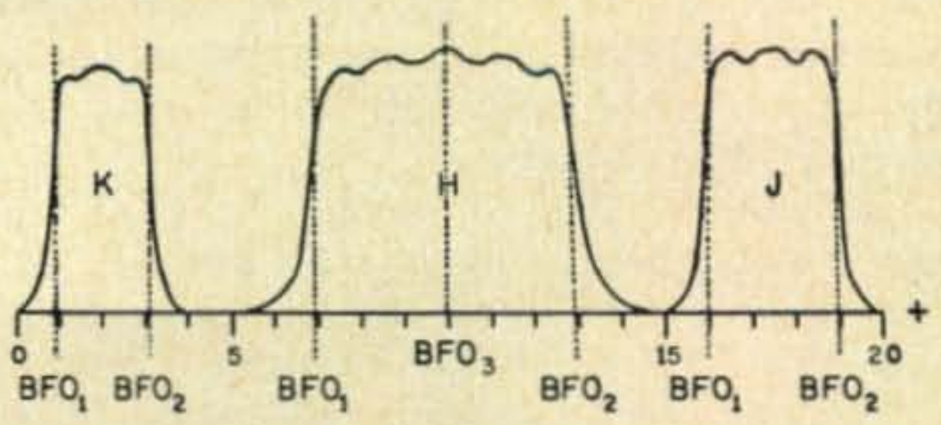


Fig. 6—Drawings of i.f. and filter curves encountered in various receivers. Draw an overlay of these curves and use as directed in the text.

Figure 6 shows i.f. and filter curves found in different receivers. Figure 6H represents the i.f. selectivity curve of an excellent a.m. receiver. Its bandwidth is about 6 kc at 6 db down.

Many a.m. operators try to copy s.s.b. with conventional receivers without too much success. For these operators, the following information should be helpful: With such a receiver the b.f.o. should not be placed in the center of the pass band. Let's see why. Suppose we were to place the overlay of curve H over fig. 7. Slide the overlay so that the dotted line representing b.f.o.$_3$ is at 3. Signal A_L could then be copied if signal B_L were not present. But signal B_L is detected and the resulting audio of signal B_L will be inverted. Speech inversion means that the audio frequencies that were high are now low and the low frequencies are now high. Move overlay H so that b.f.o.$_3$ is at 9. You can copy C_L and D_U simultaneously.

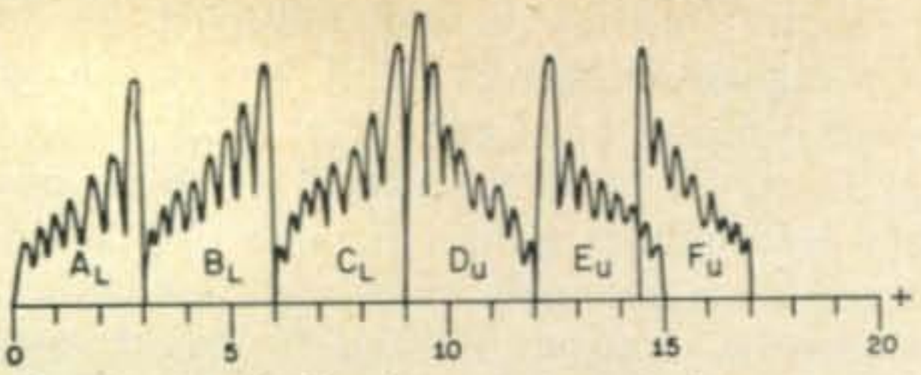


Fig. 7—The signal distribution shown above contains several typical situations. The text explains the effects when the various curves of fig. 6 are used.

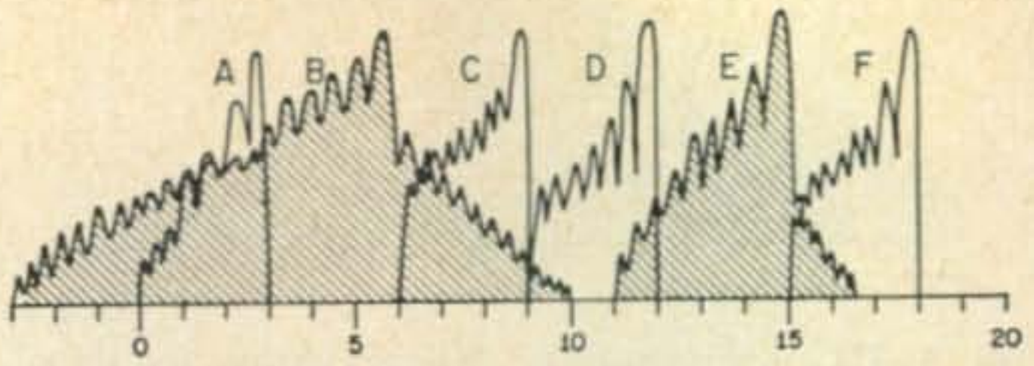


Fig. 8—A graphic indication of splatter by signal B and its effect on signals A, C and D. Signal E is also splattering but not too severely.

The upper and lower sideband QSOs would appear to be on the same side. If the conversation of one QSO could be fitted into the other, it would be a masterpiece of incoherency. In practice, both would be speaking simultaneously and severe interference would result, making copy impossible.

If the B.F.O.$_1$ or B.F.O.$_2$ position were used and the receiver has a sharp cut-off 3 kc audio filter, it might be assumed that the net response would resemble that of fig. 6J. Let us arbitrarily choose B.F.O.$_2$ and place your curve H on 6 of fig. 7 so that B will be the received signal. It can now be seen that signal A also falls within the pass band of the curve and will arrive at the detector. The presence of signal A with its own major frequency components acts as a pulsed reference signal producing products that will fall in the audio pass band. If signal A were the upper sideband of an a.m. signal, including carrier, it also will fall within the audio pass band and act as if both signals were superimposed. It is important to prevent any signal other than the desired one from reaching the detector.

The curve of fig. 6J is the one most commonly used. Figure 6J is representative of a 3 kc filter. B.F.O.$_1$ and B.F.O.$_2$ represent the b.f.o. injection signal on alternate slopes for upper and lower sideband. It doesn't matter whether adjacent channels are upper or lower sideband, you will only hear one signal.

A 2.1 kc curve further reduces the received bandwidth, thus reducing effects of small overlaps between signals. Figure 6K represents a 2.1 kc filter and is desired by most operators. The 2.1 kc pass-band of filter K seems to be the optimum for general usage and frequently permits copy under adverse conditions. Transmitters with a filter bandwidth of 2.1 kc would allow the best utilization of the alloted spectrum. When the generator frequency is properly placed on the slope of the 2.1 kc filter, it yields an audio bandwith of 300 cycles to 2.4 kc. When the bands are heavily occupied, small overlaps are tolerable and successful QSOs may be carried on.

Poor sideband suppression and overdriving of linear amplifiers often contribute to unnecessary QRM. A signal with a poorly suppresed sideband denies operating space to an adjacent channel. Suppression of 35 to 40 db would improve conditions on the bands. Splatter caused by overdriven linears or not-so-linear linears result in the same effects as overmodulation from a.m. transmitters. In rather severe cases this splatter could be heard and seen on the spectrum 20 to 30 kc from the operating frequency. Most offenders do not realize that they are splattering and would certainly resent any remarks inferring that they purposely caused this condition. Usually a proper approach will result in cooperation in correcting the condition.

Figure 8 shows results due to overdriven linear amplifiers. Signal B is represented by the shaded display and is a classic example of splatter. Notice that signal A is swamped and so is signal C. If O were the lower phone band edge, signal B would be violating the band edge by 3 kc and inviting a citation. Signal B is not the worst seen to date; there are many that are positively horrifying. Signal E is representative of a mild condition and is a result of an operator trying to squeeze out the last watt. You will notice that although D and F are being interfered with, copy is possible, although not without annoyance.

Unnecessary testing on the air, when a test into a nonreactive dummy load would yield the same or even better information, is another cause of QRM. Tuning up and testing in the midst of a QSO is the ultimate of rudeness. This type of unnecessary interference usually provokes a hostile response, and rightly so. It is indeed a rare occasion when operators in an existing QSO refuse to cooperate with a station requesting a test when asked to do so.

Most of us have occassionally heard QRM that was deliberately caused by certain stations. These stations sometimes use multiple tones or low frequency multivibrators. If caught, such operators are subject to severe penalties.

In summing up, we have found that:

1—Three a.m. stations occupy about 18 kc.

2—Six s.s.b. signals with the same audio response limit occupy 18 kc.

3—Almost nine s.s.b. signals with a spectrum width of 2.1 kc can operate in a spectrum space of 18 kc.

4—We also found that, with moderate overlap, many more s.s.b. stations could successfully operate.

Up to this point we have considered a 20 kc segment of the r.f. spectrum. Let us now see, arithmetically, how many QSOs are possible in a 100 kc segment using a.m., s.s.b. with a 3 kc filter and s.s.b. with a 2.1 kc filter:

a.m.—3 kc modulation = 16 QSOs plus a

[*Continued on page 96*]

Reviewing The Radio Classics

Assymetric Speech

BY DAVID T. GEISER*, WA2ANU

The fact that the positive and negative halves of the male speech cycle differ in amplitude may be the reason some a.m. stations appear to have more modulation than others. The following discussion explains how this condition may be put to good use.

Number 4 of a Series

SMITH and Dawley ("Comes the Revolution," *Radio,* December 1939) first took official "ham" note that male speech differs in peak output on positive and negative halves of the speech cycle.

Speech assymetry (or unbalance, if you wish) had been known for some time, but this article was significant for two reasons; it showed how objectionable types of overmodulation could be avoided and proposed a method of making constructive use of the phenonoma.

While assymetry exists on all speech because of the way a human voice is created, it seems to predominate on male voices. To make most effective use of it, it is necessary to be using a fairly high-fidelity microphone, speak closely to avoid room reverberation, and have little amplifier response in the extreme bass register.

Amplitude modulation is the process of varying the output voltage of a transmitter linearly with the speech wave amplitude. In conventional amplitude modulation, a carrier provides a reference voltage to which the speech signal is added or from which it is subtracted. As the peaks in one direction may, for male speech, be twice the voltage of the other direction, it becomes twice as easy to overmodulate in one direction as the other. If the big peak is in the negative direction, negative clipping and splatter will occur before 50% positive modulation is significantly exceeded. If the polarity is reversed, the audio voltage may be doubled without clipping on negative peaks. (This effect has been noted by many workers, and has been constructively used on the Viking I and Collins 32V series.)

The effect starts at the microphone, and the phase reversal, if desirable, may be performed any place between the microphone and the secondary of the modulation transformer. (Of course, it is not effective when both halves of the audio have speech clipping.) Common present practice is to switch the plate leads of a push-pull modulator.

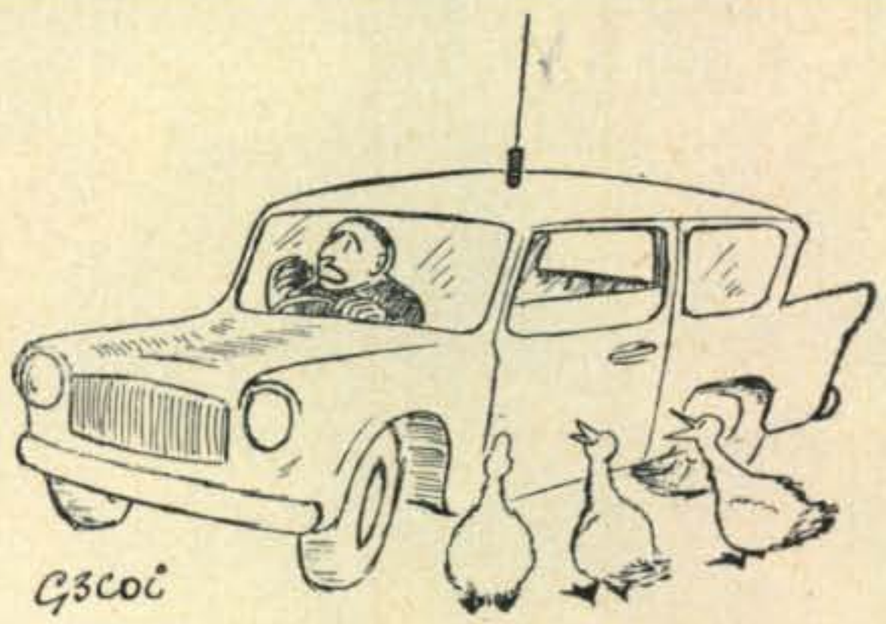
Assuming the condition where the positive audio peak is twice the voltage of the negative peak and that 100% negative modulation is desired, the modulated amplifier must have a "modulation capability" of nine times the carrier power, instead of just 4 times, as in conventional practice. Actually, present-day finals approach this capability under some conditions of adjustment, and you may find it worthwhile to perform the experiment if you have a way to observe instantaneous modulation with the oscilloscope trapzoidal pattern.

The added peak power of 200% modulation is not free, for it represents power that is supplied by a low-distortion modulator, and the modulator must deliver. If excess power is available from the modulator at low distortion you *may* be able to obtain the higher positive modulation, but it is illegal to do it if accompanied by spurious sidebands caused by abrupt saturation of either the modulator or modulated amplifier. Incidentally, grid bias for the modulated stage should be about 1.5 times normal with normal grid current. Peak tank voltage developed will be about 50% higher than with "normal" 100% modulation.

Perhaps the least complicated way to use this effect is in the avoidance of negative peak clipping wherein the reversal is made to permit less critical gain control settings without particularly trying to increase the positive modulation above 100%. Certainly, if you are not familiar in detail with modulation theory or do not have continuous scope monitoring, this use will avoid the possibility of justifiable criticism from the neighboring hams and the FCC.

(*Author's note:* this review presents just one aspect of speech processing in the amateur transmitter. Messrs. Smith and Dawley as editors of the old *Radio* magazine gave good presentation to other techniques, some of which may be the subjects of future reviews.) ■

*Light Military Electronics Dept., General Electronic Co., Utica, N.Y.



". . . QRX a minute, I think a sidebander wants to break in."

A Transistorized Mobile Converter

BY T. L. THOMAS*

This crystal controlled transistorized converter covers 40, 20, 15 and 10 meters when fed into a broadcast receiver. The use of printed circuit boards provides a high degree of reliability under mobile conditions.

SINCE none of the mobile converter circuits seen had all the features desired by the author, it was decided to design one. The resulting converter is crystal controlled, band-switched, and transistorized. It utilizes printed circuitry and is contained in a 4" by 5" by 6" box. There is no b.f.o. included due to lack of space; an outboard b.f.o. is being used with the associated receiver and has proven to be quite satisfactory for single side band. The converter covers the 10, 15, 20, and 40 meter bands.

Circuit Details

There is nothing particularly unusual about the actual circuitry. The three coils were optimized for the 15 and 20 meter bands, but work quite satisfactorily on 10 and 40 meters. An antenna trimmer is provided, but has little effect on any but the 40 meter band, and so could probably be replaced by a fixed capacitor of the appropriate value.

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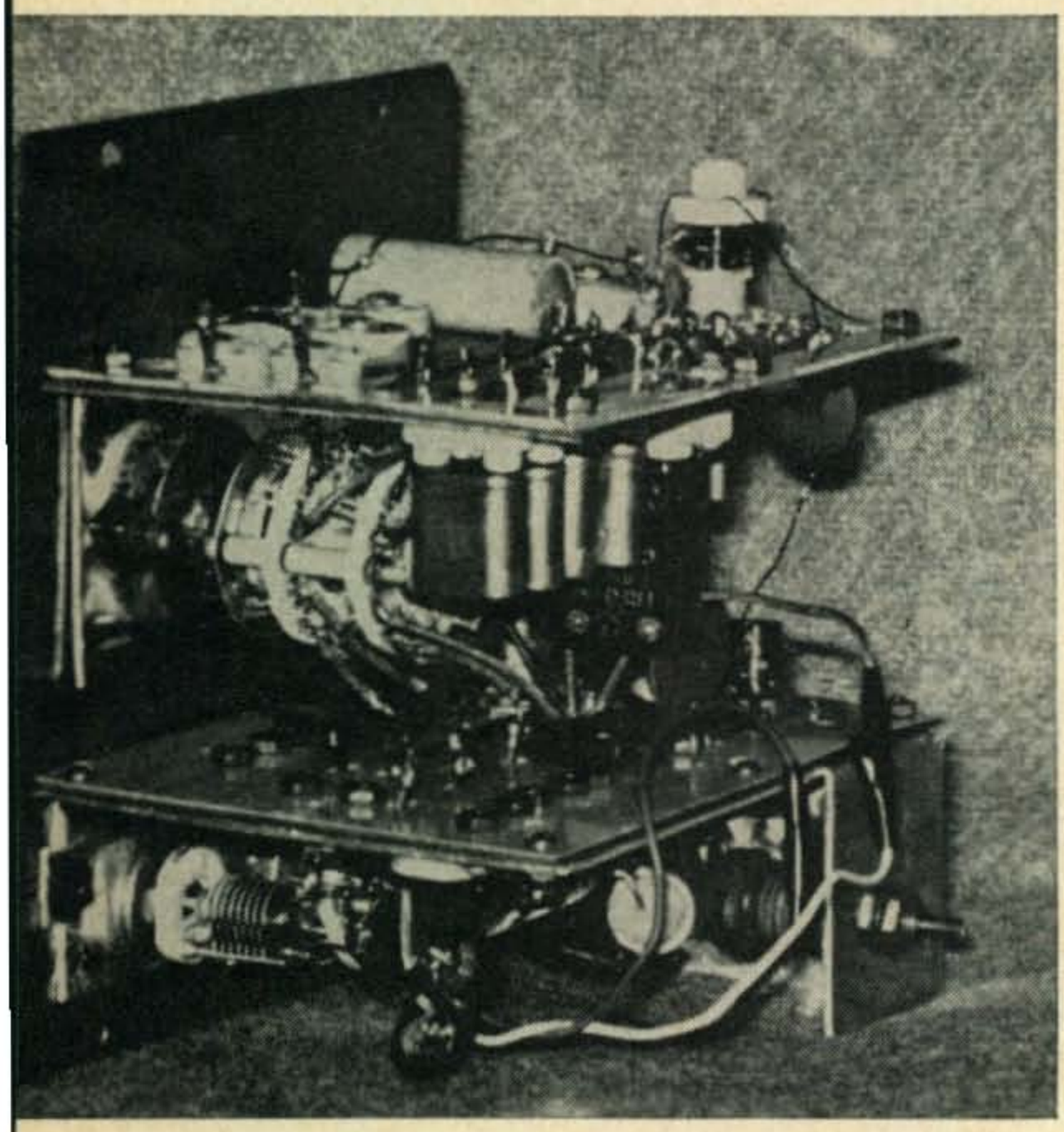


A three quarter view of the converter interior shows the general construction method. The oscillator stage is mounted on the upper deck and the r.f. and mixer stage on the lower. The adjustable antenna output coil may be seen on the rear of the lower chassis.

The coils are tapped to match the transistor impedances at about 20 megacycles. The oscillator coil is tapped for both the input and output of the transistor, which increases the Q of the circuit and also its output. However the oscillator will also function satisfactorily when the collector is connected to the top of the coil. The output coil is a standard broadcast antenna coil connected backwards to match the impedance of the broadcast receiver input.

The oscillator is a transistorized version of the Pierce circuit.

The 2N370 series transistors were used in the converter, but a somewhat better noise figure could probably be obtained on 10 meters with a 2N384 r.f. transistor.

If a milliammeter is available the transistors should be biased for 1 to 1.5 ma emitter current for the oscillator and r.f. stages, and 0.25 to 0.5 ma for the mixer. If no milliammeter is available the component values provided should be satisfactory.

Printed Circuit Boards

Printed circuits were used for several reasons. They are very stable, which is a major factor in mobile converters, especially in some European cars. They are also easier to work with than standard circuits. The printed circuits were made with Lafayette MS-510 series copper clad formica sheets. The wiring was drawn in with acid resistant paint (Lafayette MS-728, which comes in a ball point dispensing tube) for small areas and plastic electrical tape for larger areas. The exposed copper was then etched away with dilute nitric acid (about 40%). Be extremely careful as this acid is very corrosive; rubber gloves and eyeshields should be used when handling this material. Concentrated nitric acid (about 60%)

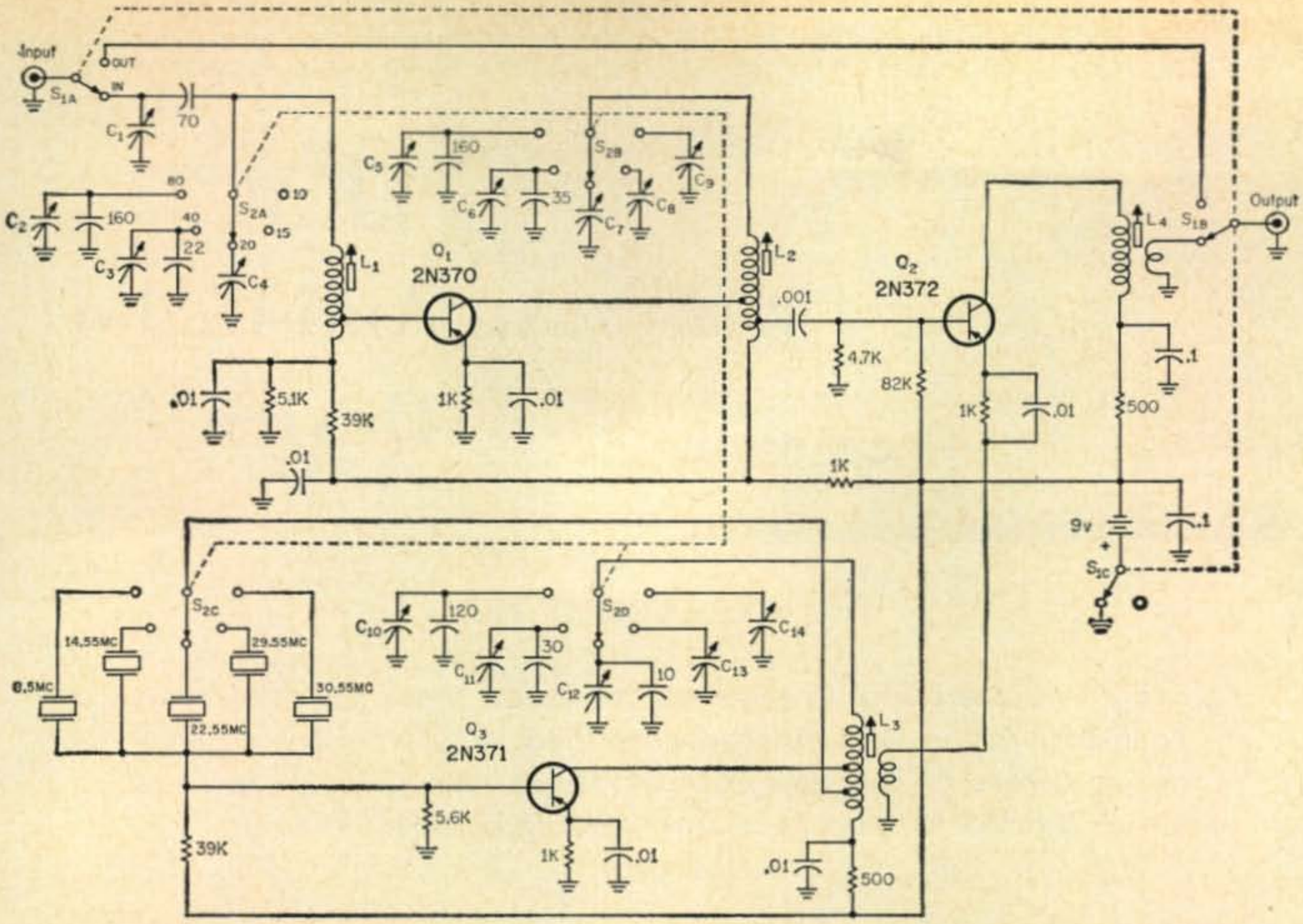


Fig. 1—Circuit of a four band transistorized converter using the automobile broadcast receiver as a tunable i.f. All capacitors less than one are in mmf, greater than one in mf. Capacitors 200 mmf or less are silver micas and all resistors are ½ watt.

C_1—2.5—15 mmf variable.

C_2, C_5, C_{10}—7-45 mmf ceramic trimmers.

C_3, C_4, C_6, C_7, C_8, C_9, C_{11}, C_{12}, C_{13}, C_{14},—3-13 mmf ceramic trimmers.

L_1-16t #26 e. closewound on ⅜" dia slugtuned form, tap at 3½t.

L_2-22t #26 e. closewound on ¼" dia slugtuned form, tap at 4 and 11 turns.

L_3—primary—14t #26 e. closewound on ⅜" dia slugtuned form, tap at 3½ and 7 turns. Secondary—1¾ t on cold end of primary.

L_4—Broadcast receiver antenna coil, slugtuned.

may be purchased either through a chemical supply house, or, at a much higher price, from a drug store, and diluted appropriately with water. The circuit board layouts are not shown for space reasons, but copies may be obtained for one s.a.s.e. from *CQ*.

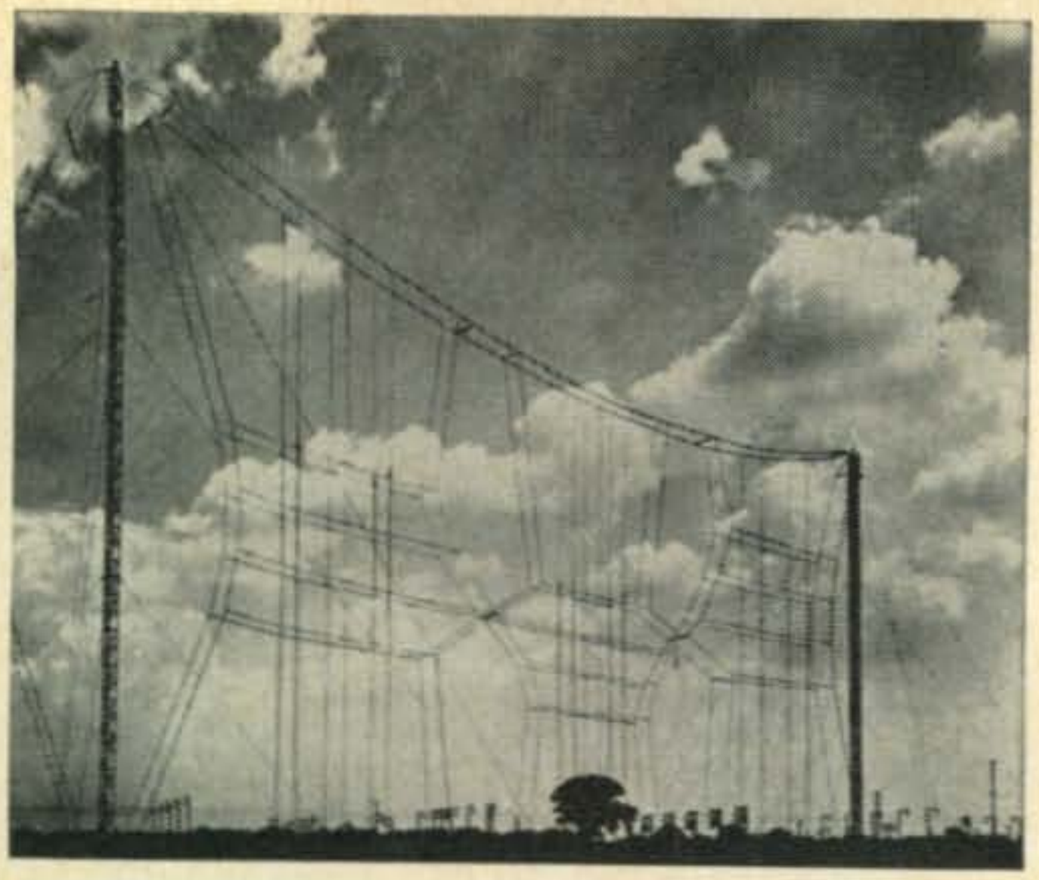
Alignment

Initial alignment of the converter was done with a grid-dip meter. Final alignment was made by connecting the converter to a broadcast receiver with the a.v.c. turned off, and feeding in a signal from an r.f. generator. The oscillator coil and capacitors were tuned to give maximum output. The r.f. and mixer coils and capacitors were adjusted in the same manner.

Performance

The converter has been in use for several years now and has been found to work very well on all the bands. A fair amount of DX has been picked up at one time or another.

The only trouble that has been encountered with the converter has been a periodic temporary failure of the oscillator on 40 meters due to cold weather. This oscillator lock-up probably could be prevented by replacing the 5600 ohm resistor with an appropriate thermistor and the mixer capacitors with temperature compensating capacitors. As the trouble was never present when the car was warm it has not been particularly bothersome, and so has not been investigater further. ■



This classified photo shows for the first time, one of the seven magnetized curtains designed for I.E.M.

"I.E.M." An Anti-Radio Device

BY HOWARD U. NOE*

What you are about to read will no doubt shock you; however, each fact in the story has been verified. As Amateurs we must all be aware of this new radical device. We ask you to read about "I.E.M." with an open mind, setting aside the guidelines of the past.

SINCE last December most of eastern Europe has been quietly acclaiming the work of Dr. Victor Vasilescu; *quietly*, lest the remarkable details of his electronic experiments be learned by the Western governments, and thence the United Nations.

It was while on a trip to Bucharest, Rumania, within the past few months that I first heard of Dr. Vasilescu. During this trip I actually met the amazing man and had a chance to see his so-called "*Intrerprinderea Electròreveris Magnitik*" device.

Location

The town of Borsa, Rumania, is a quiet village nestled in the Carpathian Mountains. Not far from Borsa is Mt. Pietrosu, a 7,560 foot peak which now wears—as a crown of eight 400-foot steel radio towers—the antennas of I.E.M.

In Borsa there is a building, fenced off from the public, where Dr. Vasilescu and his staff of young men and women have worked on I.E.M. day and night since June 16th, 1956. The highly secret laboratory had been continually on 24-hour duty until April 4th, 1962, when the unit was completed and the 8 towers had been erected. Strung between these towers are 7 Sterba Curtain antennas made of special "permalloy" (iron-nickel alloy) which has been magnetized—the largest artificially magnetized mass on earth!

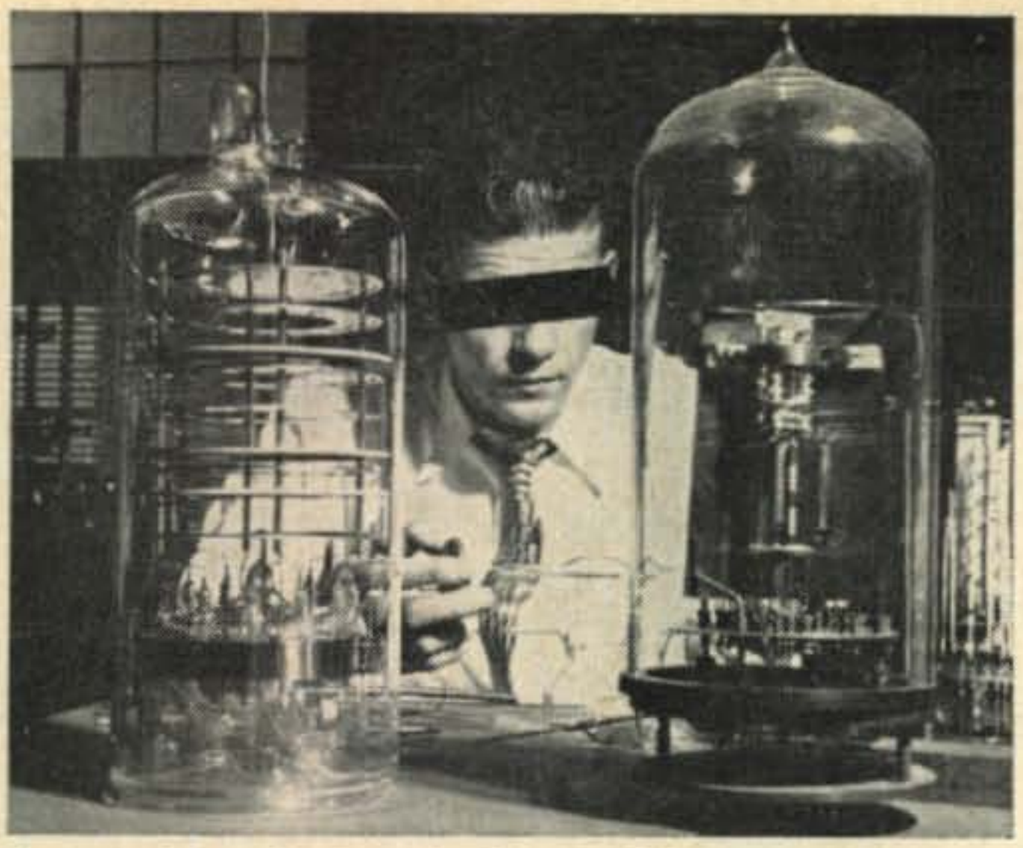
Before we discuss the principle of how the device works, you should know that on May 1, 1962 (Communist holiday) I.E.M. was tested, and hams and commercial radio operators will recall that on that particular day there was a prolonged "ionospheric disturbance" which took out all international transmission for a period of 19 hours. During the 19 "lost" hours, the village of Borsa was completely supplied with electricity drawn directly from active radio transmitters located throughout the world. Three days later the I.E.M. furnished Borsa with 18 minutes of electricity from storage batteries which were charged during the May 1 experiment. The unit was again tested during the entire month of December, 1962 and if you will check the station logs of any commercial or amateur station you will note that DX operation was almost non-existent; far below NBS predictions.

It was after this prolonged test (the unit was out of operation several times during this period for minor repairs) that Dr. Vasilescu was heralded by the Communist world as being the greatest contributor to electronics in the past decade. This coming May Day, Nikita Khrushchev will personally award Dr. Vasilescu the Michael Lomonosov Science Medal. We were told that it will be stated at that time that Dr. Vasilescu has made "significant contributions to the world of electronic science," without any further explanation.

Theory of Operation

The operation of Dr. Vasilescu's device is amazingly simple. It has been known for quite some time that energy from radio transmitters can be used to operate small circuits and devices and many people have demonstrated this with only the aid of inexpensive and simple experiments. The only trouble with the process is that, even with ultra-high amplification, the amount of power obtained is nevertheless not sufficient to light much more than one or two

*Ball Research Laboratories, Los Angeles, Calif.



A technician in Dr. Vasilescu's laboratory examines the VAA-7 and VAA-41. These devices are the key to the success of I.E.M.

homes or a very small factory.

It was found that this principle and the benefit of wide-range frequency sweeping circuits would prove adequate for the Borsa tests.

Repolarized energy allows the signals to be completely absorbed and negatized, thereby obtaining maximum power. To use an analogy, it would be as if a radio receiver was no longer a passive piece of equipment. The receiver would now generate a power which would force all signals to actually be absorbed into its antenna to the extent that they no longer existed.

The signals enter the antenna and are passed by special 600 ohm transmission line to the I.E.M. through the two 3-foot-high hand-constructed amplification tubes, the VAA-7 and VAA-41. It is in these tubes that the repolarized energy is applied which forces the antennae to absorb and negatize electromagnetic energy.

It is interesting to note that the VAA-7 and VAA-41 tubes operate with 25.2 *negavolts* (Dr. Vasilescu's term for negative voltage) on the filaments and 75,000 negavolts on the plates.[1,2] A 5-foot-high tube designated the XVAA-52 is under construction but details of its specifications or intended use were not revealed.

Frequency sweeping circuits determine the band which will be scanned during the operation of the device. In previous tests the device operated in the range of 5.95 mc to 27.0 mc although it is understood that the use of these frequencies will be discontinued due to the low sunspot activity. Recent spectrum analysis conducted (with American equipment) at the Borsa monitoring station indicated that better results might be obtained in the range of 150 kc to 2.000 mc, although Dr. Vasilescu hesitates using these frequencies because of the disruption it will cause in the service of the important 20 kilowatt broadcasting station in nearby Cluj which operates on 1151 kc.

In any case, the highly amplified signals are then passed into a Varnak Integrator[3] which rectifies the r.f. signal and builds up a d.c. voltage across filter capacitors. The positive and negative d.c. voltages are then combined with super-amplified electromagnetic induced current to produce currents in the frequency range of 0 to 100 cycles. This can be tuned to the requirements of any geographic area. Pure d.c. cannot be obtained because the modulating and base currents cannot integrate in steady-state fashion.

The power is then fed directly into power lines or into storage batteries.

The Future of I.E.M.

Mild mannered Dr. Vasilescu declined to comment on his future plans, or even speculate on all the possible uses for his equipment. He did admit, however, that there are certain problems which are to be expected when the exact nature of his experiments were learned officially by the Western powers. It can be assumed that the International Telecommunication Union would be aroused by this deliberate negatizing of international radio transmissions.

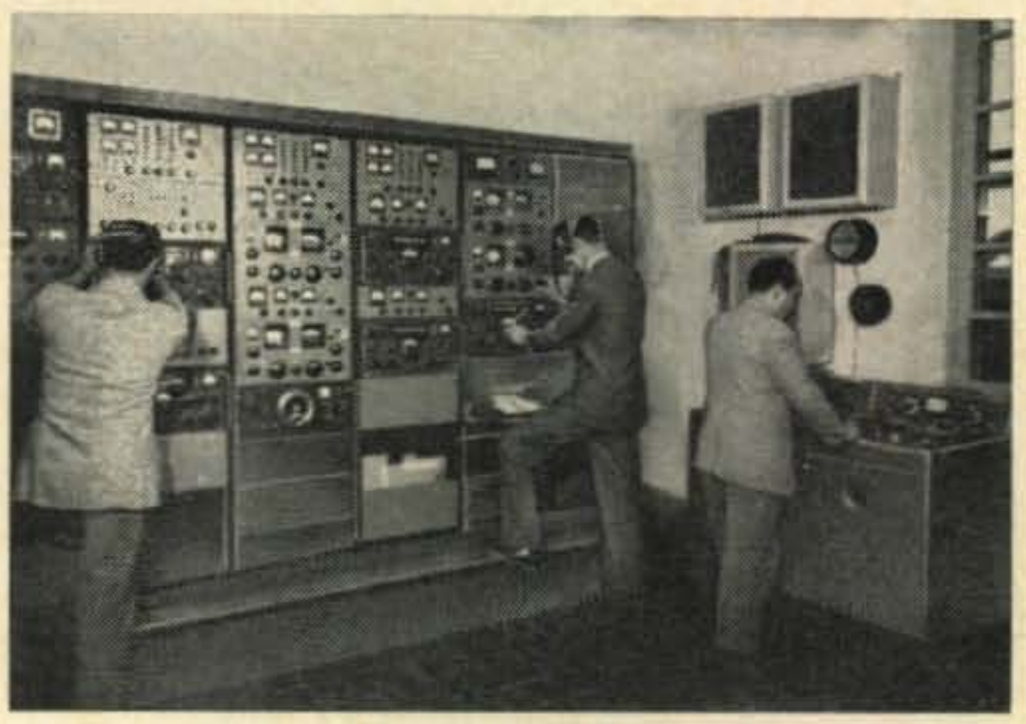
It is our opinion that should these experiments be continued on a long-term or large-scale basis, the very foundations of all international communications could be destroyed. Time will, of course, provide us with an answer.

NOTE: Although the experiments, as mentioned previously, are still being conducted under a cloak of apparent secrecy, Dr. Vasilescu was nevertheless able to persuade The Directia Reglâtiilor Internationale of the Ministerùl Postelor si Telecommunicatiilòr to permit the accompanying photographs to be taken out of the country on the condition that the faces of the scientists and technicians not be identifiable. This action on their part, and the fact that the information on "I.E.M." was given to me, a foreigner, indicates that the Rumanians may be trying to let the news of I.E.M. "leak" out unofficially to get a sampling of world reaction. ■

[1]Hull, W. A., "A Vacuum Tube Possessing Negative Electrical Resistance," *Proceedings of the IRE*, Vol. 6, 1918, p. 5.

[2]Herold, E. W., "Negative Resistance and Devices for Obtaining It," *Proceedings of the IRE*, Vol. 23, 1935, p. 1201.

[3]Varnak, O. "Integrating With R.F. Energy," *Transactions of the Repolarized Energy Commission*, Vol. 45, 1949, pp. 1324-1346.



Spectrum analysis made at the Borsa station uses some "familiar" equipment. Recordings are made on the right.

A Product Detector for the HQ-129X

BY J. M. STUEBER*, W5UOZ

This article describes the installation of a product detector that requires no outboard equipment. Also included is a new a.v.c. circuit whose performance is compatible with s.s.b. operation.

It has been over three years since the last improvements were made to the HQ-129X[1] and the receiver has been in constant use since. About a year ago, sideband operation was engaged in and it became apparent that a product detector would be very advantageous, along with a compatible a.v.c. system. A few shortcomings were also noted in the original modifications, as evidenced by reader's letters, due to differences in individual receiver characteristics, and these will be covered for the benefit of those who need to further improve receiver performance.

Product Detector For S.S.B.-C.W.

It was considered desirable to utilize existing circuitry and space as much as possible, and not add any outboard units to the receiver[2]. With this in mind, the 6SA7 pentagrid converter tube was chosen as this would fit into the same socket that the 6SJ7 tube, V_7, occupied.

The b.f.o. transformer shield can must be removed so that the MAN-A.V.C.-B.F.O. function switch may be modified. A schematic showing the wiring changes to the function switch S_5 are shown in fig. 1. A pictorial view of the switch and wiring additions and deletions are shown in fig. 2. Only one new green wire is fed through the chassis grommet for connection underneath. All other wiring changes are on the switch itself. The manufacturer cut off the unused contact lugs on the switch of the receiver that was modified, but there was enough metal protruding, to which the necessary wires and jumpers were soldered, although there was not the usual lug hole to pass the wires through.

After the indicated wiring changes are made, the shield can may be reassembled to the chassis. A little juggling is necessary in order to feed the beat oscillator capacitor and function switches back through the holes in the shield can and this is done before assembling the can to the chassis. Reinstall the mounting nuts and knobs.

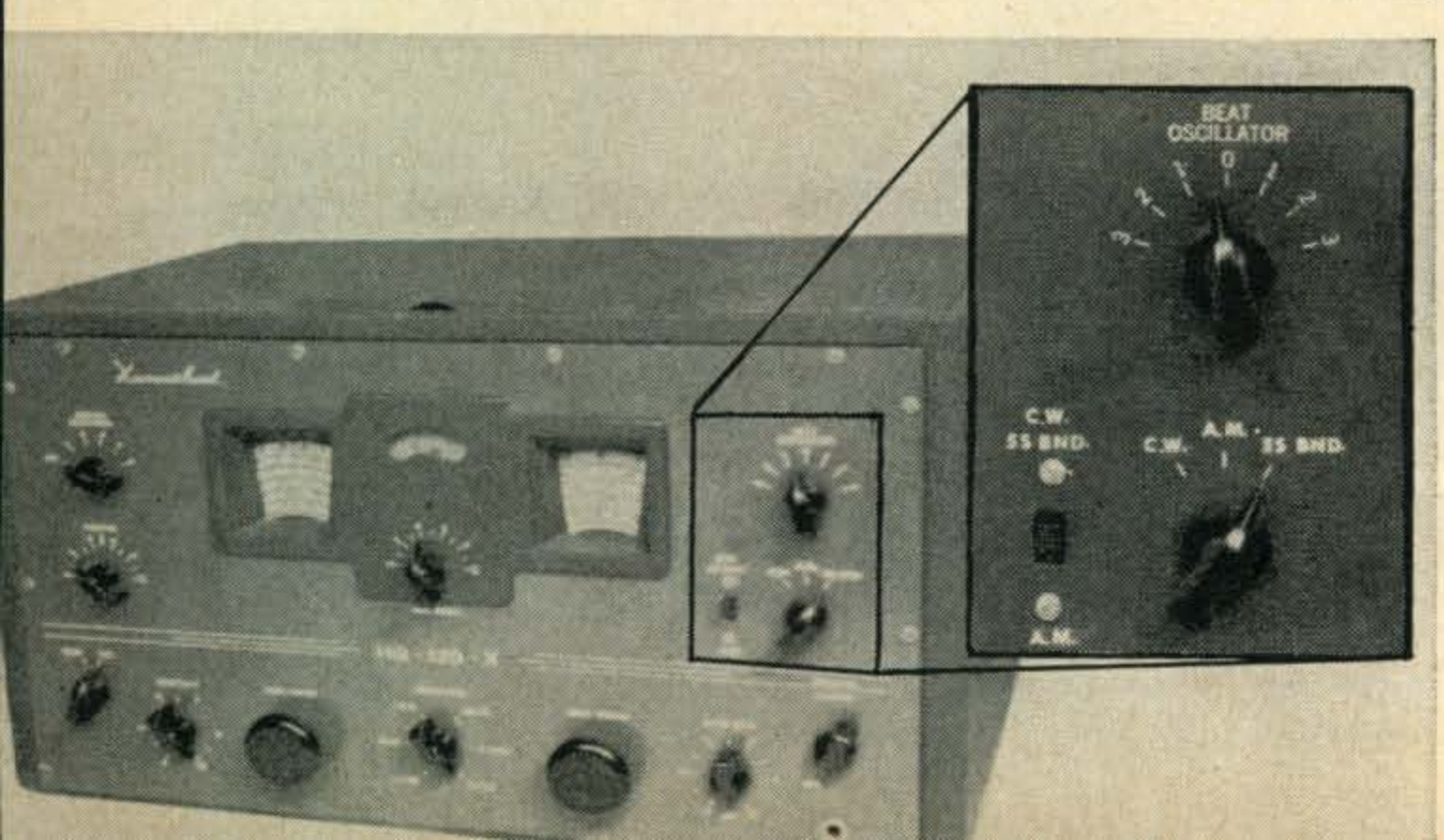
Now the wiring inside the shield can switch covers the b.f.o. tube socket is modified. This is not to be attempted by beginners because of the crowded component layout. Care and patience are required for satisfactory completion. A step by step procedure follows. (S) means solder. (N.S.) means do not solder.

1. Remove the shield can covering the 6SJ7 (V9) tube socket.
2. Remove the 100K (R_{48}) resistor from pin 8 to the terminal strip and discard. Call this terminal No. 1 for later reference.
3. Disconnect the 5 mmf (C_{40}) capacitor from pin 8 but leave the other end connected to the terminal strip.
4. Clip out the wire running from pin 2 to pin. 3.
5. Remove the 100K (R_{47}) resistor from pin 6 to terminal strip contact No. 1 and discard.
6. Remove one end of the .05 mf (C_{42}) capacitor from pin 6.
7. Remove the wire from pin 5 and run it to pin 6 (S).
8. Remove the wire from pin 4 and connect it to pin 5 (NS).
9. Connect a 27K ½ watt resistor from pin 5 to the ground lug near pin 8 (S).
10. Connect the end of the 0.05 mf (C_{42}) capacitor disconnected in step 6 to pin 4 (NS).
11. Connect a 22K ½ watt resistor from pin 4 (S) to terminal No. 1 of terminal strip (NS).
12. Connect a 220K ½ watt resistor from pin 3 (NS) to terminal No. 1 of terminal strip (S).
13. Connect a 22K ½ watt resistor from pin 8 (NS) to a ground lug of socket (S).
14. Connect the end of the 5 mmf (C_{40}) capacitor disconnected in step 3 to pin 8 (S).
15. Connect a 500 mmf mica or ceramic capacitor from pin 3 (NS) to ground lug near pin 4 (NS).

*8410 Flower Pl., N. E., Albuquerque, N. M.

[1]Stueber, J. M., Noe, J. B. "HQ-129X Receiver Improvements," *CQ*, May 1959, page 38.

[2]Lee, P. H., "The Single Tube Product Detector," *CQ*, April 1961, page 50.



The modified HQ-129X, incorporating a built-in product detector and compatible a.v.c. system. Exploded view at right reveals the b.f.o. controls. Slide switch on the left selects audio from the product detector or diode detector, while the three-position switch at the right now includes s.s.b.

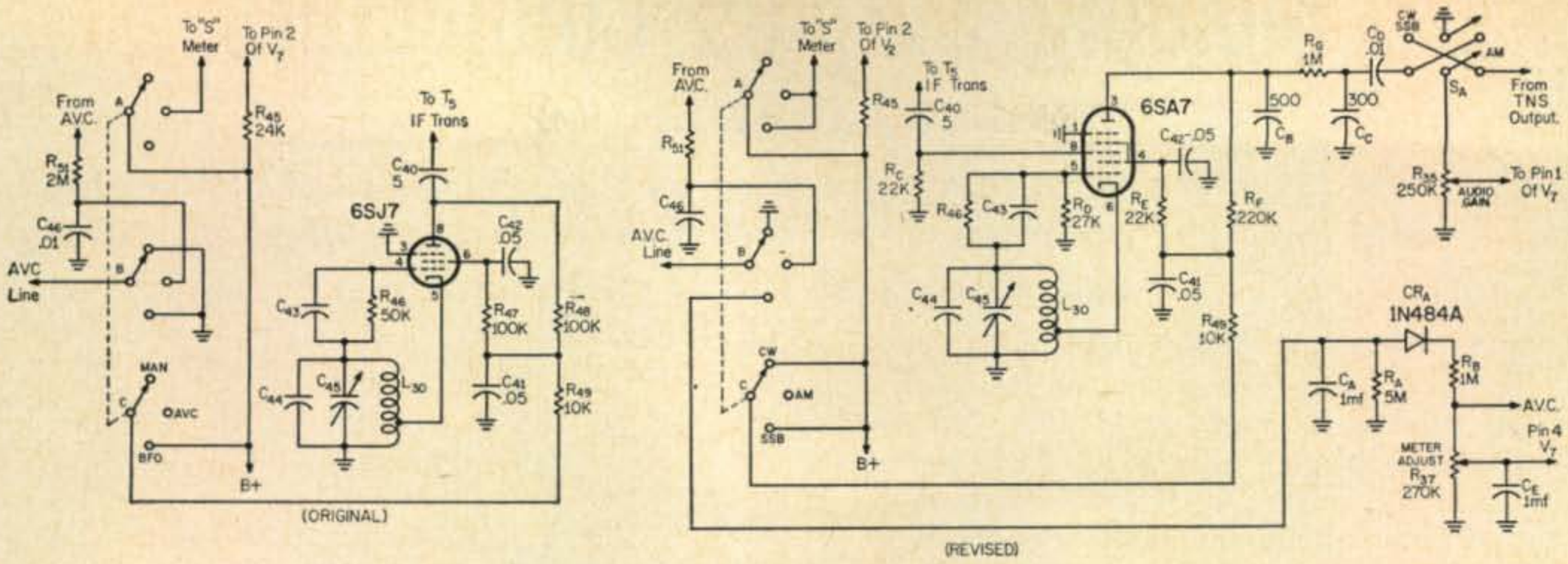


Fig. 1—Original and revised circuit of the b.f.o. The new circuit includes the b.f.o., a product detector and the a.v.c. Only the additional parts needed are listed below. All resistors are ½ watt and all capacitances are in mf unless otherwise noted.

16. Connect one end of a 1 megohm ½ watt resistor to pin 3 (S) leaving the other end sticking up (NS).

17. Connect a 300 mmf mica or ceramic capacitor from lug ground near pin 4 (S) to the free end of the 1 megohm resistor (NS). Capacitor and resistor should stand on end so shield cover will fit.

18. Install one end of a 0.01 mf disc capacitor to the junction of the 300 mmf capacitor and 1 megohm resistor (S).

19. Connect an 8 inch piece of covered hookup wire to the other end of the 0.01 mf disc capacitor (S), cover with sleeving and feed through hole of shield near socket. This is the audio output lead from the product detector.

20. Install a 6SA7 tube in the 6SJ7 socket. This completes all work that must be done inside the shield cover and it may be replaced, being careful that all leads will clear after the cover is replaced.

A.V.C. Network

Next, the long time constant a.v.c. network is fabricated on a 3 lug terminal strip so it may be conveniently mounted under the chassis.

This network features a fast attack, slow decay which is extremely good for sideband operation. Components needed are a 1N484A diode, 5 megohm ½ watt resistor and 1 mf 50 to 200 volt capacitor.

21. Solder the component connection at the ground lug only. Then install the completed terminal strip near the socket of the 6SN7 tube (V_7) so it may be conveniently wired.

22. Route the new green wire which comes through the grommet from the function switch the diode with pliers so it won't get hot during soldering.

23. Connect a 1 megohm ½ watt resistor from the cathode end of the 1N484A diode (S) to the high side of the METER ADJ. potentiometer, R_{37}, located near the 6SN7 tube socket V_7. (S)

24. Connect a 1 mf 50 to 200 volt paper capacitor from the center lug of the METER ADJ. potentiometer (S) to any convenient ground lug. (S) This is an "S" meter damping capacitor.

A.M.—S.S.B. Switch

A new double pole double throw slide switch is now installed, to switch audio from the product detector or AM detector to the gain control. The switch is mounted to the left of the MAN-AVC-BFO function switch. The new switch must fairly shallow so as to clear the bandspread tuning dial in back of the panel, and care in positioning and wiring should be taken. After installation, the panel is labeled CW-SSB above the switch and AM underneath with white "Technicals" decals.

A 3/16-inch hole must be drilled directly under the switch in the chassis for the leads to feed through. Prewiring of the crossed leads of the switch per fig. 1 is recommended because of the tight quarters in which to work. Four additional lead wires must be attached to this switch, as viewed from the rear.

25. Attach a lead from the center contact of the right pole (S) to any convenient ground under the chassis. (S)

26. Connect the audio output lead from the product detector (8 inch lead installed in step 19) to the top of contact of the left pole of the switch. (S)

27. Disconnect the lead wire connected to the high side of AUDIO GAIN control R_{35}, add a piece of hookup wire to it, insulate, and connect to the bottom contact of the left pole.

28. Connect a new piece of hookup wire from the center contact of the left pole (S) to the top of AUDIO GAIN control R_{35}. (S)

29. Carefully scrape off the MAN-AVC-BFO markings on the front panel near the function switch and relabel with "Technicals" to read CW-AM-SSB.

[*Continued on page 98*]

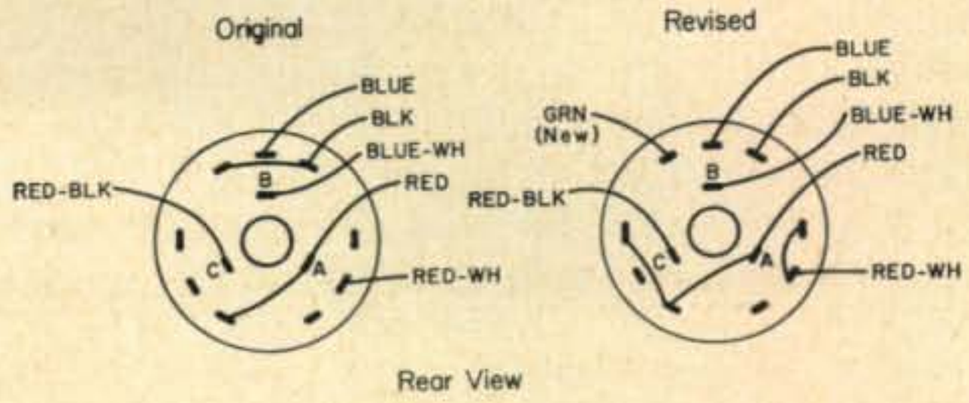


Fig. 2—Modified wiring of the switch S_5 is shown above.

Molding Surplus Connectors

BY DICK BALDWIN*, K4ZQR

Need connectors for that piece of surplus gear? Instead of hunting high and low, why not make your own? Here is a neat method of making custom connectors to fit nearly any plug.

THE lure of surplus equipment is fascinating, and many fine pieces of equipment are offered in "Radio Row" and other surplus emporiums around the country. They can be put to good use on the amateur bands by a bit of conversion and the exercise of some local ingenuity.

One problem which always seems to plague the user of surplus equipment, however, is the fact that many of the receivers and transmitters available used special plugs and cables to interconnect equipment and various control boxes. Probably this is a result of the equipment having been designed primarily for a remote location.

The writer recently acquired an R77AN/ARC3 receiver and a T67AN/ARC3 transmitter, fairly new items of two meter surplus equipment, the conversion of which was so clearly covered in a previous article.[1]

On the face of the transmitter you are confronted with P_{102}—a 16 pin plug which is used for channel selection, as well as power and mike connections. The receiver plug P_{202} is even worse —an 18 pin affair that resembles one of those spiked beds the Indian fakirs are supposed to use for sleeping. As is the usual case with most surplus equipment, the sockets, interconnecting cables, and control equipment for the ARC3 seem to be unavailable. The problem boils down to some sort of a home brew solution.

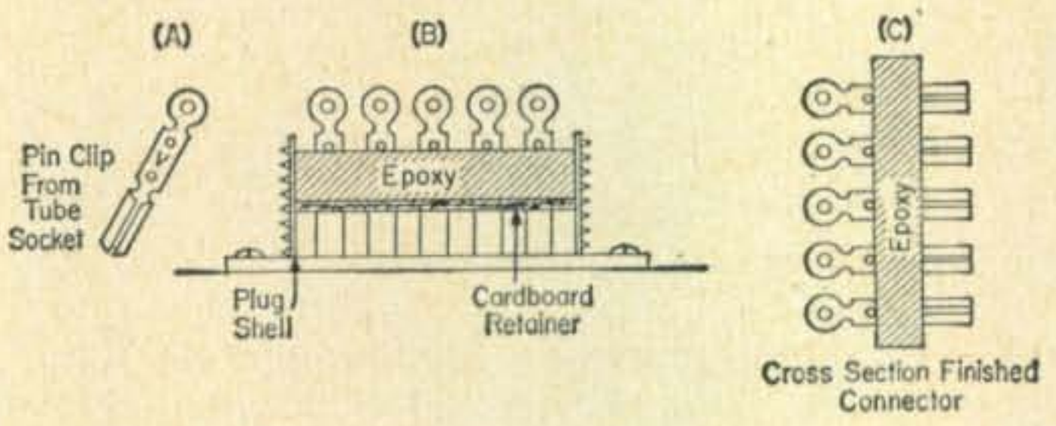
All you need to make acceptable home brew sockets is a couple of tubes of Epoxy Resin Adhesive, an old shirt board or any other type of *soft* cardboard, plus some octal sockets with the round pin clips you can remove, and last but not least, a tube of Lubriplate grease or vaseline.

Procedure

Start by removing enough pin clips from the octal sockets to fit over all of the pins in the plug. Do this by straightening up the tails of the clips with pliers and pushing them through and out of the top of the socket.

Next, cut a circle of the soft cardboard to make a snug fit inside the rim of the plug. Push it down level with the tops of the pins, and, with your fingertips, press down on each pin to make an impression in the soft cardboard. Remove the cardboard and with the point of a sharp knife make a small slit, orienting the slits the way you will later line up the tails of the pin clips you removed from the octal sockets.

Next put a pin clip on each pin of the socket. Line up the tails as planned, and slowly work the cardboard down inside the plug rim so that the tails of the clips come through the slits you made. Seat the cardboard as far down as possible, but it will still be above the tops of the pins, and the connector which you make will be formed around the tails of the pin clips only. The round part of the clip that fits on the plug pins will protrude from the front. Be sure that the cardboard makes a good fit around each clip and the inside of the rim.



Construction of a control connector for surplus gear. Tube socket pin clips (A) are fitted over male surplus connector and held in place by cardboard and epoxy cement (B). After drying we have a new female connector ready for use (C).

Apply a thin coating of grease to the inside rim of the plug. Do *not* get any on the tails of the pin clips—all you want to be sure of is that the plug you form will come out and the grease on the inside of the plug rim is the thing that does the trick.

Mix the resin—equal parts of tube #1 and#2. One is the epoxy, and the other the hardener. Work it in around the pins with a small wooden stick or a small knife. It will level itself out eventually, but it isn't of a pouring consistency, so you want to "poke" it in around the tail of each pin-clip to be sure that it grips it properly when the whole thing hardens. Leave only one hole in the tail of each clip protruding, and don't worry if you get some adhesive on it. You can scrape it off later with a sharp knife. Finally, apply epoxy around the outside edge up to the level of the rim of the plug. Be sure the equipment is propped up so that the plug is horizontal.

Let it harden overnight. Test the epoxy with the point of a knife. It never will get rock hard but it should be tough and leathery. Work the knife blade all around the rim to loosen up the socket. It won't stick to the grease, but having been molded in the plug it's a tight fit. Now take a pair of pliers and pull gently on the tails of the pin clips that are protruding—first on one side, then the other until you get your socket out.

Finish by sanding the edge all around for a looser fit, and you have a good home brew socket that will give good service if not abused. ■

*409 Kaelin Drive, Louisville, Kentucky.

[1]Kincaid, W.B., "Converting the AN/ARC-3," Feb., 1962, *CQ*, p. 48.

The Cool Communicators

BY WESLEY L. CHESNUT*, W5ODO

ROGER HAMM groaned wearily as he waited. This evening the transmitter filaments were taking an unusually long time to warm up.

He sighed and glanced around the interior of his backyard ham shack. The room was rather small—still, it was the only place where he could relax after a nerve-shattering day at the shop.

Working a little code might ease some of the tension, he thought, and pulled the handkey over to a comfortable spot on his desk.

At that instant the outside door burst open behind him. Indignant at the sudden interruption, he whirled around and stared . . . and felt the blood drain from his face.

From the open doorway five haggard creatures scrutinized him—four bearded men, and one sweater-clad female. Beatniks!

For what seemed an eternity Hamm gaped at his uninvited guests, unable to utter a word. Then, at last, one of the Beatniks, a tall bright-eyed, rather intelligent looking member of the crew stepped forward.

"Daddio, I don't dig this scene. What kind of crazy outhouse is this?"

Hamm frowned. His ham shack wasn't that small! "Isn't an outhouse," he protested. "It's a *ham shack*."

"Man, you bug me . . . a what?" the Beatnik grunted.

"A ham shack. You know, an amateur radio station."

In reply to that all five Beatniks proceeded to give the station a thoroughly inquisitive investigation. Hamm stood by in a state of near shock, too stunned to protest. But after a short time they finished their inquiry and once again the leader Beatnik turned to Hamm.

"Looks real cool, daddio. Like, man, a cool pad to cut-out after a beat day."

Hamm mulled that over before he was able to digest it. Then, he said, "Oh, sure. I come out here every afternoon and work a little code."

"Code, daddio? I don't dig you."

"All right then," Hamm sighed, "I communicate with other amateurs.

All five faces lit up instantly. "You *communicate?*"

Hamm nodded. "Sure, I communicate."

"But how, daddio, how?" they demanded eagerly.

Hamm was beginning to understand. These Beatniks didn't have the slightest concept of modern science. Still, he recalled that the members of the Beat Generation seemed to have an odd way of talking about wanting to communicate. Maybe if he tried he could explain his hobby to them.

"I use the Morse code. A is dit-dah . . . B is dah-dit-dit-dit, and so on."

"Man, that's real cool," the female Beatnik chimed in. "I've heard of it. I thought it was all square talk . . . dots and dashes, like birds, daddio."

Hamm grinned a bit. "It is dots and dashes, but vocalizing it in dits and dahs sounds more like the real thing . . . makes it easier to understand."

"And you *communicate?*" That seemed very important to them, to be able to communicate.

"Sure, I communicate. All over the world," Hamm explained, beginning to feel more at ease with his strange guests. At least they seemed highly impressed with the idea of ham communications.

And when they begged him to teach them the code they did it with such feverence and passion that Hamm couldn't bring himself to refuse.

So, in the days that followed, he labored to teach them code and theory that they might obtain amateur licenses. He taught them the code with vocal dits and dahs because they insisted he do it that way. The idea of learning radio theory set them back a little; still, they seemed to be possessed with a boundless enthusiasm to communicate.

And, as for Hamm, it wasn't all unselfish effort. In his mind he could see the newspaper headlines, "RADIO AMATEUR MAKES USEFUL CITIZENS OF BEATNIKS!"

And so he devoted weeks and months to the little group of Beatniks, hoping he was up to the task.

He was—they learned surprisingly fast. No one had ever questioned the intelligence of Beatniks, he realized. Society simply questioned their thoughts, their social activities.

They learned under his tutoring and the day of the test finally came. Hamm accompanied them to the examiner, mentally patting himself on the back. They passed the code test with ease despite the unorthodox vocal method by which they had learned. The written examination seemed to give them more difficulty.

Then it was over and the days of waiting for licenses passed slowly. For many long weeks Hamm did not see his pupils. He feared that

[*Continued on page 98*]

*P. O. Box 252W, Oklahoma City 12, Oklahoma

The Care and Feeding of Husbands

BY KAY H. BLOOM*, KH6CKO

THERE are tomes of literature on the subject of How to Get a Man; all of which, at some point or other, state firmly that you must learn to love his interests. If he likes baseball, learn all you can about baseball. If he is an avid golfer, take lessons. They all carefully point out, however, that you must never excel him in these pastimes.

Years ago, when I was single, I read all these with interest. When I finally met *the* man, I discovered to my chagrin that he was a lover of Bridge. I had never played anything but Poker and an occasional game of Hearts before, but I bought a book and plunged right in. I was soon bidding five hearts over my partner's four heart bid, but the OM was very tolerant and later told me four hearts was game. Being moderately bright, I learned the game and married the guy in question. I too became an avid lover of bridge.

Feeling that a woman should continue to please her man after marriage, I also found that he loved baseball. Here, I had a head start. I had grown up in Cleveland, Ohio where I spent my summers cheering the Cleveland Indians. I must admit it was a little difficult to *Company.)*
forsake the Indians and learn to love the Boston Red Sox, but with the supreme effort, I became a Red Sox Fan. I cheered when they won, cried when they lost, and Heaven help the person who dared to call me on the fone when a game was on. My children were neglected between the hours of 1:30 and 4:00 P.M. every day during the season.

Next it was golf. After playing for about five years, I was still trying to break 100 and not succeeding. This keeping up with your man's interests was beginning to pall. By now we lived in Hawaii and had taken up skin diving, hiking etc.

Then came the day he roared into the house claiming he was going to be a ham. I was sure he had lost whatever mind he had left. He went on to explain and said, "Honey, it's a great hobby, one which we can share and enjoy together." Again I was hooked! Here, he was ahead, having been a radio operator in AACS during WW II. Poor me! I studied and worked and finally after four months of eating and sleeping code and theory, I passed the General. "No wife of mine is going to be a novice," were his words. I pitched in and gave it my all.

What am I leading up to? After 15 years with "my man", he can't tolerate bridge; golf is a waste of time; there are no major leagues in Hawaii so who can keep up with baseball; and ham radio is fun but I'm too busy with other things.

Me? I'm dying for a good bridge game; wishing he hadn't sold our golf clubs 'cause I could use the exercise; still crying over the poor Boston Red Sox; and ham radio is absolutely the greatest!

I followed the books on "How to Get a Man" to the letter. I can't, however forget the part about "never excel him in these pastimes". So, I have learned to do without bridge and golf, and I cry quietly over the Red Sox so he won't notice, but what's a gal going to do when she has 98 countries for DXCC (he has 99); 38 zones for WAZ (he has 39); and both have WAS (but he won't submit his QSLs) and he won't get on the air to complete them?

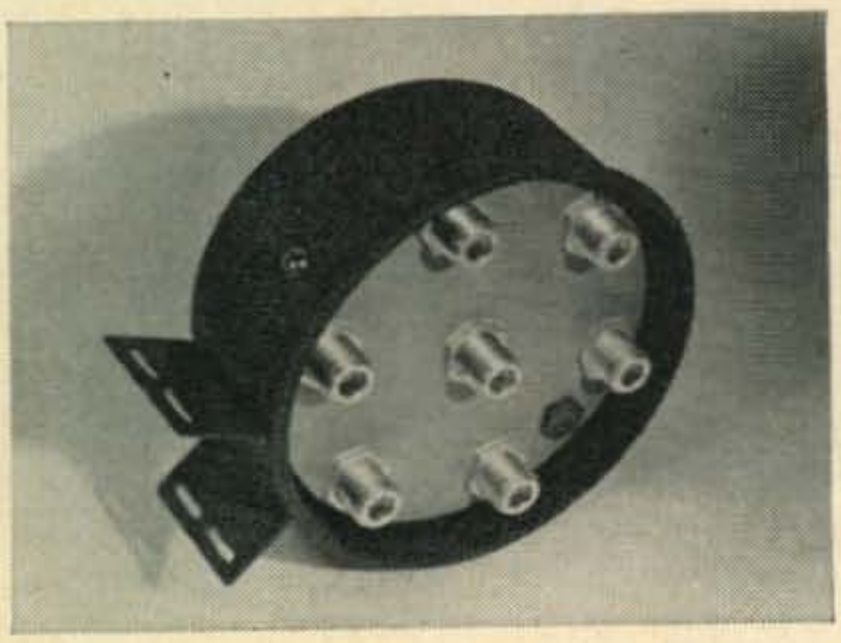
I ask you! ■

*316 Ilimalia Loop, Kailua, Hawaii.

NEW AMATEUR PRODUCTS

Dow-Key Coaxial Switch

THE Dow-Key Company has recently come out with a new, low cost, single pole six throw, weatherproof coaxial switch for the amateur radio field called the DK71.



Designed for mast mounting and for remote switching of up to six antennas, the switch will simplify antenna installation since only one coaxial cable is necessary to run from the antenna to the station.

The DK71 can also be used to select any one of six transmitters, exciters, receivers or other equipment. The unit is not a rotary switch, but every position is activated by a separate coil, whereby positions can be selected in any sequence and more than one at a time.

The DK71 is supplied with a mounting strap to fascilitate mounting to the antenna mast, and a seven pin connector for connecting to the control wire. For further information circle A on page 110.

CQ Reviews:

The Knight-Kit T-150 Transmitter

BY WILFRED M. SCHERER*, W2AEF

PROBABLY the best introduction to the Knight-Kit T-150 is to simply say that it is a lot of transmitter for the money.

Take a look at some of its features: A pair of 6146's in the final amplifier with pi-network for working into 40 to 600-ohm loads; input power 150 watts c.w., 150 watts peak a.m., on all bands 3.5 to 28 mc; 100 watts in both modes on 50 mc; stable v.f.o. with illuminated dial nicely calibrated for each band; provision for crystal control; shock-proof key terminals; band-switching; frequency-spotting position; TVI-suppression measures; full meter switching; regulated potential for v.f.o.; rear power plugs for separate accessories, auxiliary controls and use of external high-level modulator; rugged construction with high-quality components used throughout; built-in power supply using solid-state rectifiers; all housed in a cabinet measuring only 8½" × 17" × 10½".

In addition, the whole unit is so attractively designed, that it is a piece of equipment well suited for table-top operation in almost any type of home environment. Its wrap-around cabinet is gray hammertone, the panel is a two-tone combination of light gray and charcoal with mirror-finish trim and the knobs are black with polished aluminum inserts. Both the meter and the v.f.o. dial scales are black with white numerals.

Front view of the Knight-Kit T-150 transmitter. Two 6146s are in the final, covering 80 through 6 meters.

Circuit Description

A 12BY7 is used for the v.f.o. in a series-tuned oscillator circuit. The v.f.o. operates on 3.5 mc for 3.5 mc band use, on 7 mc for 7, 14, 21 and 28 mc band use, and on 8.3 mc for the 50 mc band. The v.f.o. is followed by a 6CL6 which is used either as a buffer amplifier, frequency multiplier or Pierce crystal oscillator. When it is used for the latter, the v.f.o. is disabled. The next stage utilizes a 7189 as an amplifier or multiplier. This tube is a newcomer to amateur transmitters and it packs a good punch as is evidenced by the more than ample grid drive which is available to the final in the T-150. The final amplifier consists of a pair of 6146s connected in parallel and using the familiar pi-net output circuit.

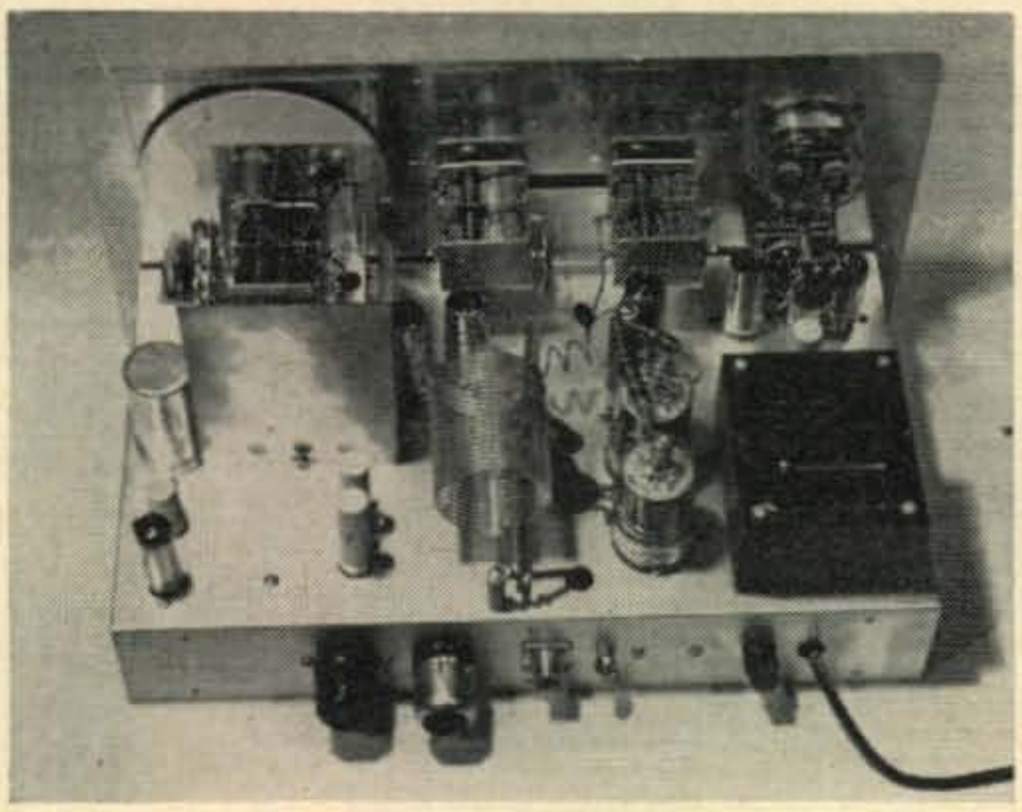
C.W.: The cathodes of all r.f. stages are keyed along with the v.f.o. for c.w. making break-in operation possible. A 2200 ohm resistor is shunted across the key jack to prevent excessive voltage at the key. It also provides a bias to cut off the v.f.o.

A.M.: On a.m., cascaded halves of a 12AX7 are used for the speech amplifier with high impedance input for crystal, ceramic or Hi-Z dynamic microphones. An r.f. filter at the input reduces the possibility of r.f. feedback. Two sections of a 6DR7 dissimilar triode are then combined to modulate the final-amplifier screens and to provide a controlled carrier during the modulation process.

POWER SUPPLY: A saving of space and the reduction of heat generation within the cabinet is made possible by the use of silicon rectifiers in the power supply. Costs are also held down by the utilization of a voltage-doubling circuit. Six-hundred and forty volts (at full load) is available for the 6146s, while a tap at the midpoint of the voltage-doubling scheme furnishes 320 volts for the low-power stages. An 0A2 tube provides 150 volts of regulated potential for the v.f.o. and the screen of the 6CL6. A power plug at the rear of the chassis makes available, for accessory use, 640 or 320 volts d.c. at 50 ma and 6.3 v.a.c. at 1 a. A second plug at the rear makes

[*Continued on page 77*]

*100 E. Palisades Ave., Englewood, New Jersey.



Rear chassis view of the T-150. V.f.o. components are mounted forward of the shield partition and the power resistors are mounted behind for ventilation. Auxiliary power plug, antenna connector, heavy ground terminal with wingnut and fuse are mounted on the rear apron.

DX DX DX DX DX

URBAN LE JEUNE, JR.*, W2DEC

The following certificates were issued between the period from January 16th, 1963 to and including February 6th, 1963:

CW/PHONE WAZ

1775	OZ4H	Paul Heinemann
1776	W4RBZ	Robert E. Fitz
1777	W7QY	Ralph L. Norgard
1778	K2YXY	Fred Burst
1779	WA6DUG	D. A. Dantes, Jr.
1780	VR2BZ	B. J. Hogg
1781	K8KAE	Edward J. Chopko, Sr.
1782	VK3XB	Ivor Stafford
1783	W8JXY	Chester W. Bolg

ALL-PHONE WAZ

190	WA2IZS	John M. Heisey
191	VE6TP	Gene Krehbiel

TWO-WAY SSB

148	W7AQB	Philip True
149	SM5LL	Hilding Andersson
150	WA2IZS	John M. Heisey
151	K8GLH	P. J. Priore, Jr
152	JA1DM	M. Ebisawa
153	DL1AU	Helmut Hoschke

CW WPX

413	DJ5VQ	Karl Kaul
414	WA2HXC	Albert W. Vitt
415	SP4JF	Tadeusz Nietupski
416	I1IZ	Cherici Armando
417	W4HOS	Tracy Levy, Sr.
418	VQ2W	P. R. Golledge
419	WØLBB	Harris A. Fromhold

PHONE WPX

84	ZS6IW	M. Sherman

SSB WPX

124	CN8AW	H. L. (Tommy) Hall

MIXED WPX

58	DL3RK	Walter Geyrhalter
59	W9IRH	John Gohndrone
60	G2FFO	Richard Johnson
61	ZS6IW	M. Sherman
62	K9AGB	Steven L. Tuma
63	WØLBB	Harris A. Fromhold
64	HK3LX	Edmundo Quinones P.

WPX ENDORSEMENTS

	Mode	*Continent*	*Band*
W1UOP	SSB		14
W2EMW	CW	E	14
K2ZKU	CW	F	
K4TEA	CW		14
K9AGB	Mixed		14
W9UZS	CW	E	
DJ3OJ	Phone	E	
DL1QT	CW		21
DL1YA	CW		3.5
DL3RK	Mixed	E/F	
DL9KP	CW	E	
DL9OH	Phone	E	
G2FFO	CW	E	
SP9ADU	CW	E	
ST2AR	CW	E	
ZS4MG	CW	E	14
	Mixed	E	14

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

REP. E. A. Cederberg (R-Mich.) has introduced H. R. 750 to amend the Communications Act to allow aliens to obtain a three-year license to operate an amateur radio station providing the National security would not be endangered. LET'S GET BEHIND THIS BILL!

Here and There

AC3 Sikkim: Prince Namgyal, AC3PT, is scheduled to start operating with a new transmitter about the time you read this. He was recently married so let's hope for the best. *(Tnx W3LE).* Gus, W4BPD, has permission to operate from Sikkim and hopes to be there shortly. HL9KH also has his sights on this spot.

AP Pakistan: Bing, ex-5A3BC, is now in Pakistan and hopes to be active as AP2BC. *(Tnx K2ZRO).*

AP5 East Pakistan: Gus, W4BPD, has been assigned the call AP5JB and will operate from East Pakistan. He has also been issued VK3SI which should permit him operating privileges from the VK outer islands.

CN8 French Morocco: Jerry, KR6BQ, operated CN8IF during the period of 14 Nov. 1958 to 6 Nov. 1959 and can furnish a QSL to anyone who didn't receive one. Jerry would also like to receive cards from those stations who did not QSL while he was in CN8 land.

EP Iran: Art Monsees, W4EXM, is on another field engineering assignment and is signing EP2AM in Teheran, Iran. Art is advising members of the Imperial Iranian Army on communications and electronic matters. He is using a new Collins KWM-2 transceiver and hits into the States on 20 meters c.w. and s.s.b.

GD Isle of Man: A DXpedition to the Isle of Man is scheduled for the period of 5 to 15 April.

*Box 35, Hazlet, New Jersey.

WPX HONOR ROLL

C.W. WPX

W2HMJ	668	W5LGG	502	DL1YA	450	W4DKP	410	W8WT	565	W5ERY	358	K4PUS	305	W8WT	588
W8KPL	632	W6YY	502	DL9KP	450	K4IEX	408	G3DO	565	W8JIN	356	W6YMV	304	K9EAB	578
W5KC	629	IT1AGA	502	W8JIN	448	W1CKU	408	W9YSQ	471	PY2CK	354	DJ3CP	304	W6YY	570
W2AIW	617	K2CPR	501	W9UZS	447	K4JVE	407	MP4BBW	454	5A5TO	353	K1IXG	303	W4BYU	557
W6KG	574	W9SFR	501	W8RQ	445	W5AFX	407	PAØHBO	453	W1ORV	351	K2TDI	300	W3AYD	552
W2EQS	572	W2EMW	500	W3AYD	443	W7HDL	405	W6YY	448	LA5HE	351	KØRDP	300	HB9EU	551
W4OPM	571	K2ZKU	500	OE1FF	442	W4YWX	404	G8KS	430	ZS6IW	350	WA2SFP	300	YU1AG	533
K6CQM	565	G2GM	499	W3BQA	437	GI3OQR	404	VK6RU	421			W3VSU	300	W2GT	528
W5OLG	564	K9EAB	497	LA5HE	437	ZS4MG	404	W3AYD	420	**S.S.B. WPX**		WØCVU	291	G8KS	520
W2NUT	550	W2MUM	495	W8UMR	429	K2ZRO	403	W9UZC	418			W4RLS	278	K9AGB	510
W9YSX	544	W1WLW	494	WØAUB	429	W9DYG	403	F8PI	418	MP4BBW	462	K2JFV	266	W5LGG	509
W9UXO	542	SM5CCE	488	K5LIA	428	W9IHN	403	PZ1AX	413	W4OPM	451	K2MGE	263	K2ZKU	508
K2UKQ	535	W4BYU	487	W2RA	428	VE6VK	403	K9EAB	412	G3AWZ	428	W3AYD	262	W9DWQ	508
W1EQ	528	ON4QX	486	OK1MB	428	K4TEA	402	K2CJN	409	HB9TL	423	W4EEU	262	W4BQY	505
W2HO	526	W8PQQ	481	W3CGS	426	WØVBQ	401	DL3TJ	404	W3NKM	402	W4NJF	260	W3KDP	501
DL1QT	518	W4HYW	478	W1EIO	425	IT1TAI	401	W1UOP	402	K9EAB	401	VE3BKL	259	W8UMR	500
K9AGB	515	W3OCU	466	SM5WI	424	VE3JZ	401	G3NUG	400	G8KS	400	XE1CV	256	LA5HE	500
W1TJB	513	K6SXA	464	WØPGI	420	OE3WB	400	OE1FF	382	G3DO	373	G3FKM	255	DL3RK	493
W6WO	511	W2KIR	463	HB9TT	419	SP4JF	400	SP7HX	381	G3NUG	356	UR2AR	255	JA2JW	480
W2GT	510	DJ2KS	462	G3HIW	418	SP6FZ	400	TG9AD	381	TI2HP	356	W6USG	252	WØMCX	476
SM7MS	510	PY4OD	462	W8IBX	416	VE1AE	400	DL6VM	376	W3MAC	354	TG9AD	252	W3CGS	475
W8LY	506	JA2JW	461	WØMCX	416	VE4OX	400	DJ3CP	375	PZ1AX	345			W9FVU	474
W9DWQ	506	W9WCE	458	K2PFC	415	VK3KB	400	PAØSNG	369	W2HXG	324	**Mixed WPX**		G3FKM	463
W9GFF	503	W3BCY	457	W5AWT	412			G3FKM	366	W2VCZ	320			DL1YA	456
G3EYN	503	OK3EA	456	W5DA	412	**Phone WPX**		W8UMR	363	W1UOP	318	W4OPM	629	WØVBQ	452
YU1AG	503	DL3RK	454	K5LZO	411			SM3AZI	362	W2YBO	318	W8JIN	605	PAØLOU	452
		PAØLOU	451	WA2DIG	411	CT1PK	599	SM3EP	361	W8PQQ	315	G3DO	597	GI6TK	450
		W3PGB	450	W2PTD	411	W9WHM	570			W1ORV	307	W3OCU	588	HK3LX	450

Operators will be G2BUL, G3FTQ, and G5GH. Operation will be primarily c.w. and QSL's go to the home call of the individual operator. *(Tnx VERON).*

HS Siam: A new station has been reported active. He is HS3PD. Although HS is presently on the "ban list," new activity officially licensed might be the cause to lift the ban. *(Tnx VERON).*

JT1 Mongolia: Dambi, JT1AG, and Tuul, at JT1KAA, have been keeping Zone 23 very active on 14 mc c.w. of late. UA3CR will operate from Mongolia on s.s.b. shortly.

JY Jordan: IT1TAI and IT1ZGY have applied for a JY license for the second time. Their current passport visa is valid thru May 5th and they have requested a ten-day operating permit be validated during this period. *(Tnx WGDXC).*

KG6 Marcus Island: Ray, KH6PD/KG6, shows up! He is on Monday thru Friday on 14295 kc s.s.b. Operation starts at 2000 GMT and ends at 2030 GMT. A 20 meter beam has been erected with considerable improvement in state-side signal strength. Ray also plans construction of a Rhombic which will be directed at Japan and will be unterminated so that the back end will favor the States. There will be no activity weekends, as this is used in working Japan. This is the only time his duty permits operating. WA6MAZ, Marsha, has been acting as MC. Ray will pull the big switch sometime in September. *(Tnx LIDXA).*

KH6 Hawaii: Was sorry to hear that KH6IJ's new position at the University of Hawaii leaves him no time for hamming. Nose's machine gun fist will sure be missed. This reminds me of a saying popular in DX circles. "The fastest thing in the world is a contest QSO between KH6IJ and TI2PZ."

Good luck in your new position Nose.

OK Czechoslovakia: Mila, OK1KX, ex-JT1YL, and Ludvik, OK1KW, ex-JT1AA, have returned to Czechoslovakia from a foreign assignment. They are presently active on 20 meter s.s.b. using their new KW Viceroy. They can help with any overdue JT1AA or JT1YL QSLs sent via Box 69, Prague. *(Tnx W3LE).*

WAZ and WPX

THE WAZ and WPX certificates are awarded by the *CQ* DX department. WAZ is issued for proof of contact with the 40 Zones of the world as shown on the official WAZ Zone Map. WAZ is issued in three classes, *i.e.* Any mode, all phone and all s.s.b. For complete rules, see the January, 1962 *CQ*, page 50.

WPX is issued in four classes, *i.e.*, all c.w., all phone, all s.s.b. and Mixed. The number of prefixes required are: C.w.-300: Phone-300; s.s.b.-200; Mixed-400. For complete rules, see January, 1962 *CQ*, page 52. WAZ applications, Zone Maps and WPX applications may be obtained from the DX Editor at the address shown at the head of this column. Please send a self-addressed, stamped envelope or a self-addressed envelope and an IRC. All applications should be sent directly to the DX Editor.

The usually persistent and successful 160 meter DXer Ern, G3PU, who has worked 41 countries, with WAC for good measure, on 160 meters. The trophy was won in a 1930 listening contest! The transmitter runs only 8½ watts. *(Tnx W1BB)*

The Virginia Century Club (Norfolk, Va.) announced that Gus Browning, W4BPD, has been selected as the winner of its first annual DX Award. The award, a beautifully inscribed certificate, was presented by Haywood, N. Perry, W4DHZ, Chairman of Awards and vice-president of the club, to P. Lanier Anderson, W4MWH, ARRL Director for Roanoke Division, as proxy for Gus who is still overseas embarked on the longest DXpedition on record. The DX Award will be made annually by the Club to the amateur who, in the estimation of the Club, has accomplished the most to further the DX phase of amateur radio during the preceding year.

In making this decision the Club also considered the nominations of UA3CR for his work in putting the rare countries of the USSR on s.s.b.; WØMLY for his historic African trek; KV4AA for his untiring work with the *Yasme* Foundation and QSL managering for WØMLY; and W2CTN who has donated unselfishly of his time and effort in acting as QSL manager for an unlimited list of DX stations. *(Tnx W4NJF)*

PK Indonesia: Bob, ex-EP2BK/WØGTA, is presently working in Indonesia and he mentioned the following in a letter recently received. "President Sukarno has announced that he intends to lift the National State of Emergency in Indonesia on May 1, 1963." If he does, so, it will clear the way for getting the PK's back on the air. Some of the boys in Djakarta are cautiously optimistic about getting the long-awaited word late this year. Bob is now VS1LP in Singapore. See VS1 below.

PYØ Trinidad: The PYØNG DXpedition to Trinidad has been postponed until June or July. The reason for the postponement was that the new dates will give PY4's AS, GA, and OD a full 30 days to operate. *(Tnx WGDXA)*

TA Turkey: A station signing TA4JV has been active on 14280 kc s.s.b. Operating time has been around 1300 GMT. He gives his name as Don and QTH as Trebizonde, Turkey. *(Tnx WGDXC).*

VK4 Willis Island: The following news on Willis Island was supplied by VK4SS:

"As regards the DXpedition of Brian, VK5AB, to Willis Is., I have no final dates of his departure for this remote, sandy, windswept strip, which has only a few palm trees in the form of vegetation. It is but a few feet above sea level at high tide and the three only inhabitants (two weather men and one radio operator) have as their only companions, thousands of sea birds, which do a good job on their water tanks. There is a protective reef, and fishing is good but sharks are dangerous. It lies right in the path of the cyclone route which is dangerous along our Coast from December to June. To such a place VK5AB, using the call VK4WE, hopes to journey some 200 miles from the mainland next June. He had originally intended to go by private charter at the rate of approximately 200 dollars per day. The whole trip taking about six days. He intended to take a gang along to share expenses, but this has fallen through. He will most probably now make the journey alone on the once-a-year supply boat with a stopover of no longer than 48 hours, maybe less. So, everyone will have to be on the ball to make out. From Willis Is. Brian intends to get out to several other places including Portugese Timor."

VK9 Papua: VK9AT is now QRV from Papua on s.s.b. *(Tnx VERON).*

VK9 Cocos Keeling Islands: Aside from VK9LA, who is currently active on c.w. and s.s.b., VK9ZS is workable occasionally on s.s.b. VK9ZS is Peter, ZS6IM, a pilot, who flies a South Africa-Australia route with stops on Cocos Keeling. As his flying schedule is irregular, as are his stays on Cocos Keeling, his operation cannot be announced in advance. *(Tnx VERON).*

VQ8 Agalega: Harvey, VQ9HB, plans to go to Agalega in April. He has a beam and other low power equipment.

VS1 Singapore: Bob, ex EP2BK/WØGTA, is now working in Sumatra, Indonesia. Bob and his wife, Lorna, maintain an apartment in Singapore. Bob spends three weeks in Indonesia, then one week in Singapore with his family. He has been assigned the call VS1LP and has been active on 40 and 80 meters. 40 has been good to the States from 1300 to 1600 GMT. *(Tnx VS1LP).*

VS9 Maldive Islands: There are four operators at VS9MB. Bryan, Colin, Dave and Jim. Each keeps his own log so when QSLing, please mention the name of the operator on your card.

YA Afghanistan: Howard, YA1AW, is in Kabul, Afghanistan and is active from 1200 to 1400 GMT, 14266, 14268 and 14310 seem to be preferred. *(Tnx LIDXA).*

ZD8 Ascension Island: Two operators, Chuck and John are currently making Ascension Island quite workable. Active as ZD8DW on 14340 s.s.b., their activity seems to be most intense between 1930 and 2030 GMT. Their method of handling the pack seems to vary, but in all cases, they make their wishes quite clear and are doing a fine job in removing this spot from its hitherto rare status. QSLs go via W5SWX. *(Tnx WGDXC).*

ZL1 Kermadecs: Ian, ZL1ABZ, has been active on 14034 kc c.w. between 0800 and 1000 GMT. He continues his s.s.b. activity as well on 14293 kc. Ian has no rotator and must climb an 80 foot tower every time he wants to change his beam direction.

4W1 Yemen: Krim, 4W1AA, remains active

on 14 mc c.w. but it is very doubtful if the station is actually located in Yemen. He is not heard in the Netherlands when other stations in that part of the world are received with good signals. He now requests QSLs via the SU Bureau (Box 2928 Cairo, Egypt) when previously he had requested W3CXX to act as his QSL Manager. To my knowledge, no one has received his QSL.

5T5 Mauritania: Alban, 5T5AD, returned to Mauritania on March 15th. He will be active on s.s.b. with a 20A, Drake 2B and a TH4 beam. Alban mentioned to Cliff, K9EAB, that cost prohibits his answering QSLs not accompanied by IRCs or appropriate postage. He has 2000 QSLs from W stations that fall into this category. He also has a great many first-day covers from Mauritania, Senegal, and Malagasy Republics which he would like to sell to philatelists. His QTH is Alban Duffau, 5T5AD, Box 100, Nouakchot, Mauritania. *(Tnx K9EAB).*

9U5 Burundi: Received a letter from WØMOU, and I quote part of same:

"We have had a request from a missionary amateur radio operator in Burundi, Central Africa for help in getting on the air. He has been trying for the past two years to get the rig all set up. He now has a power plant and a transmitter but is still in need of a good receiver.

If anyone has a good receiver he would like to part with for a small fee or better yet donate it, we would be happy to arrange shipment to 9U5DP.

Please address any reply to, "Home and Latin American Missions, 508 South 14th Street, Sabetha, Kansas."

It sure would be a nice gesture if we could help 9U5DP get on the air.

160 Meters

Band conditions now excellent! Now meeting low Sunspot prediction . . . conditions best in years . . . *CQ* WW. 160m Contest at peak conditions . . . scores very high . . . W1BU worked 15 countries 28 foreign contacts in two days from Rhododendron Swamp . . . Long skip is VFB also GI6TK heard K7ICW . . .

Third Transatlantic 160 DX Test January 6th, unqualified success . . . Conditions best this season . . . Many QSOs by 42 W/VE and 45 DX stations . . . Outstanding: W1TX Roy's 13 QSOs. The Runners-up 1PPN/8, 1WY/7, 1BB/6, 3GQF/4 . . . DL1FF/Armin QSO'd 14 W/VE, heard four others . . . ZL3OX heard W6KIP, K7GCO . . . K7GCO w/new Vertical Phased array boomed in all over . . .

Fourth Annual Transatlantic DX Test-22 W/VE and 28 DX Participants. Quite a few East Coast/Europe QSOs . . . HC1DC, HR3HH, VP5XG, XE1OK put on splendid show . . . ZL station (Per ZL3OX) authorized 1875-1900 kc . . . when working W/VE 1975-2000 they operate 1898.5-1899.5, when working W/VE 1800-1825, operate 1875.5-1876.5.

Important DX Now On-HC1DC, VP5GX, VP8GQ, HR3HH, LU3EX, DL1FF, UO5AA, OH3NY, GI6TK, ZL3RB, HK7ZT, OK1AFC, PAØPN, HB9CM, VO1DX, ZE8JJ, EI9J and others.

Roland, 5R8CO, and his family decorate their Christmas Tree in their home in Tananarive, in the new Malagasy Republic. *(Tnx W9WHM)*

Goose Bay ARC Annual QSO Party 1963

In celebration of their tenth annual QSO party this year, the party will run for the whole month of April, commencing 0000 GMT 1st April and ending 2400 31st April, 1963.

All amateurs are invited to take part. Any amateur in Canada or United States submitting a list showing they have worked four members of the GBARC during the party will receive a WAG (Worked All Goose). All others submitting list showing they have worked three members will also receive a WAG award.

Submit list to Awards Manager, Jack Willis, VO2NA, P. O. Box 255, Goose Bay, Labrador. No QSL cards required but GBARC member must have received your card. Your QSL may be sent along with your application to VO2NA.

K6CQM

I was very sorry to learn that Bob Murphy, K6CQM, will no longer be at the reins of the *Northern California DX Club Bulletin.* Bob has done a superlative job on the editing of this bulletin and it has become one of the finest in its field. He had rare insight into the problems which beset the DXer and even more important, had the ability to express these editorially. Bob is leaving on a new job assignment in Houston. I would like to wish Bob the best of luck in his new endeavor.

An old friend of mine, Joe, WA6TGY, ex-W2HQL, will be stepping into Bob's big shoes. Joe will be remembered for his W2HQL/KC4 Navassa Island expedition. Best of luck Joe.

Russian OOs

What appears to be a kind of Official Observer

[*Continued on page 84*]

PROPAGATION

GEORGE JACOBS*, W3ASK

LAST MINUTE FORECAST

The following is a forecast of day-to-day propagation conditions expected during April, 1963. This forecast attempts to predict *specific* days upon which openings shown in the Propagation Charts in this column are most likely to occur, and the expected quality of the openings. For example, the following forecast shows that circuits rated (2) in the Propagation Charts are most likely to open with "good-to-fair" quality (B-C) when conditions are above normal (April 4 and 15), and with "fair-to-poor" quality (C-D) when conditions are expected to be normal. Circuits rated (2) are not expected to open on those days forecast to be "disturbed", etc.

PREDICTED PROPAGATION CONDITIONS & CIRCUIT QUALITY

Prop. Chart Forecast Rating	*Above Normal Days (WWV rating 6 or higher)*	*Normal Days (WWV rating 5)*	*Below Normal Days (WWV rating 4)*	*Disturbed Days (WWV rating 3 or less)*
	April 4, 15	April 1-3, 5, 8, 11-12, 14, 16-20, 26-30	April 6, 9-10, 13, 21, 24-25	April 7, 22-23
(1)	C	D-E	E	E
(2)	B-C	C-D	D	E
(3)	A-B	B-C	C-D	D-E
(4)	A	A-B	C	D

Where:

A—An excellent opening with strong steady signals.

B—A good opening, moderately strong signals, with little fading and noise.

C—A fair opening, signals fluctuating between moderately strong and weak, with moderate fading and noise.

D—A poor opening, signals generally weak, with considerable fading and high noise level.

E—A very poor opening, or none at all.

DURING April, 20 meters is expected to be the optimum band for DX propagation conditions during the daylight and early evening hours. Some fairly good 15 meter openings are also expected to occur during the daylight hours when propagation conditions are normal or better. Few 10 meter openings are forecast for April, but some may occur to southern or tropical areas during the hours of daylight.

Forty meters is expected to continue to be the best band for DX propagation during the hours of darkness. Fairly good 80 meter openings are also predicted to some areas of the world during the hours of darkness, and some 160 meter DX openings may also occur during this period. Ionospheric absorption continues to increase during April in the northern hemisphere as the sun rises higher in northern skies. Atmospheric noise (static) also increases as thunderstorms become more numerous. This is expected to result in somewhat weaker signals, and higher noise levels in the 40, 80 and 160 meter bands.

*11307 Clara St., Silver Spring, Md.

VHF Ionospheric Openings

The occurrence of sporadic-*E* ionization begins to increase during April. This is expected to result in numerous short-skip openings, up to distances of approximately 1300 miles, on 15, 10 and possibly 6 meters. V.h.f. ionospheric openings may also be possible as a result of the *Lyrids* meteor shower which should occur between April 19-23, and the *Aquarids* shower which is predicted for May 1-6.

V.h.f. openings resulting from auroral displays are often possible during periods of ionospheric storminess. Check the "Last Minute Forecast" at the beginning of this column for the dates during April which are likely to be "below normal" or "disturbed".

Sunspot Cycle

The Zurich Solar Observatory reports a monthly sunspot number of 19 for January 1963. This results in a 12-month running smoothed sunspot number of 36 centered on July 1962. A smoothed sunspot number of 26 is predicted for April 1963 as the solar cycle continues to decline slowly.

Weekly CRPL Forecasts

In reference to the discussion of weekly CRPL propagation forecasts which appeared in February's column, notice has been received from the Central Radio Propagation Laboratory that the CRPL Jb-series reports are *no longer* available for general distribution. Unfortunately, these reports can only be distributed to those who can demonstrate a professional need-to-know (*e.g.* universities, other government agencies, research institutions and certain individuals who have professional need-to-know). CRPL

states that they are indeed sorry that this decision was necessary, however, they had no alternative since budgetary limitations precluded further general distribution of the CRPL Jb-series reports.

This month's *Propagation Charts* contain predictions for major DX paths for April and May. For a short-skip propagation forecast for April, see the Charts appearing in last month's column.

73, George, W3ASK

APRIL & MAY, 1963

Time Zone: EST (24-Hour Time)
EASTERN USA To:

	10/15 Meters	*20 Meters*	*40 Meters*	*80/160 Meters*
Western & Central Europe	09-13 (1) 13-15 (2) 15-18 (1)	05-07 (1) 07-12 (2) 12-14 (3) 14-16 (4) 16-17 (3) 17-18 (2) 18-20 (1)	17-19 (1) 19-20 (2) 20-23 (3) 23-00 (2) 00-02 (1)	19-21 (1) 21-23 (2) 23-00 (1) 20-21 (1)† 21-22 (2)† 22-00 (1)†
Eastern Europe & European USSR	12-16 (1)	14-19 (1)	19-00 (1)	20-23 (1)
Southern Europe & North Africa	09-13 (1) 13-16 (2) 16-18 (1)	04-05 (1) 05-08 (2) 08-12 (1) 12-14 (2) 14-17 (4) 17-18 (3) 18-19 (2) 19-21 (1)	17-19 (1) 19-20 (2) 20-23 (3) 23-01 (1)	19-20 (1) 20-23 (2) 23-00 (1) 20-21 (1)† 21-22 (2)† 22-23 (1)†
South Africa	11-14 (1)* 07-11 (1) 11-14 (2) 14-16 (1)	01-06 (1) 14-16 (1) 16-18 (2) 18-20 (1)	19-21 (1) 21-23 (2) 23-00 (1)	21-23 (1) 21-23 (1)†
Eastern Mediterranean	13-17 (1)	04-06 (1) 13-15 (1) 15-17 (2) 17-19 (1)	18-22 (1)	20-22 (1)
Central Asia	*NIL*	16-20 (1) 06-08 (1)	18-20 (1) 04-06 (1)	*NIL*
Southeast Asia	*NIL*	13-17 (1) 07-09 (1)	*NIL*	*NIL*
Far East	16-19 (1)	18-23 (1) 07-09 (1)	04-06 (1)	*NIL*
Samoa, Pacific Area & New Zealand	15-19 (1)* 14-17 (1) 17-19 (2) 19-21 (1)	20-23 (1) 23-06 (2) 06-08 (3) 08-10 (2) 10-14 (1)	01-02 (1) 02-05 (2) 05-07 (1)	02-06 (1) 02-05 (1)†
Australia	18-20 (1)* 16-18 (1) 18-20 (2) 20-21 (1)	22-07 (1) 07-08 (2) 08-10 (1)	03-04 (1) 04-06 (2) 06-07 (1)	04-06 (1) 04-06 (1)†
South America	10-17 (1)* 06-07 (1) 07-10 (3) 10-14 (2) 14-16 (4) 16-18 (3) 18-20 (2) 20-23 (1)	05-08 (3) 08-10 (2) 10-15 (1) 15-18 (2) 18-22 (4) 22-00 (2) 00-05 (1)	19-21 (1) 21-03 (3) 03-05 (2) 05-06 (1)	21-01 (1) 01-03 (2) 03-05 (1) 00-03 (1)†
Mc-Murdo Sound, Antarctica	13-14 (1) 14-16 (2) 16-18 (1)	16-17 (1) 17-18 (2) 18-20 (1)	00-06 (1)	*NIL*

Time Zones: CST & MST (24-Hour Time)
CENTRAL USA To:

	10/15 Meters	*20 Meters*	*40 Meters*	*80/160 Meters*
Western & Central Europe	12-18 (1)	05-07 (1) 12-14 (1) 14-17 (2) 17-19 (1)	19-20 (1) 20-22 (2) 22-00 (1)	21-23 (1) 21-23 (1)†
Eastern Europe & European USSR	11-16 (1)	05-07 (1) 15-19 (1)	19-23 (1)	*NIL*
Southern Europe & North Africa	13-18 (1)	05-07 (1) 12-14 (1) 14-15 (2) 15-17 (3) 17-19 (2) 19-21 (1)	19-20 (1) 20-23 (2) 23-00 (1)	20-21 (1) 21-23 (2) 23-00 (1) 21-23 (1)†
Central Africa	14-18 (1)* 13-15 (1) 15-17 (2) 17-19 (1)	12-15 (1) 15-17 (2) 17-19 (3) 19-20 (2) 20-21 (1)	20-23 (1)	21-23 (1)
Eastern Mediterranean	14-17 (1)	16-22 (1)	19-21	*NIL*
Central Asia	*NIL*	05-08 (1) 14-19 (1)	06-08 (1) 19-21 (1)	*NIL*
Southeast Asia	18-21 (1)	04-06 (1) 06-08 (2) 08-11 (1) 19-21 (1)	05-08 (1)	*NIL*
Far East	18-21 (1)	06-07 (1) 07-09 (2) 09-12 (1) 23-03 (1)	02-07 (1)	03-06 (1)
Samoa, Pacific Area & New Zealand	15-19 (1)* 10-12 (1) 12-16 (2) 16-18 (3) 18-21 (1)	18-20 (1) 20-22 (2) 22-00 (4) 00-02 (3) 02-04 (2) 04-07 (1) 07-09 (2) 09-14 (1)	23-03 (1) 03-05 (2) 05-07 (1)	02-06 (1) 03-05 (1)†
Australia	17-19 (1)* 15-16 (1) 16-18 (2) 18-21 (1)	21-23 (1) 23-03 (2) 03-07 (1) 07-10 (2) 10-15 (1)	03-04 (1) 04-06 (2) 06-08 (1)	04-05 (1) 05-06 (2) 06-07 (1) 04-06 (1)†
Northern & Central South America	10-17 (1)* 06-08 (1) 08-10 (2) 10-14 (3) 14-18 (2) 18-22 (1)	10-14 (1) 14-16 (2) 16-18 (3) 18-20 (4) 20-23 (3) 23-04 (2) 04-06 (3) 06-10 (2)	19-21 (1) 21-02 (3) 02-04 (2) 04-06 (1)	21-22 (1) 22-02 (2) 02-05 (1) 22-03 (1)†
Argentina, Chile & Uruguay	13-16 (1)* 06-08 (1) 08-12 (2) 12-14 (3) 14-16 (4) 16-17 (3) 17-18 (2) 18-22 (1)	14-16 (1) 16-18 (2) 18-21 (4) 21-00 (2) 00-05 (1) 05-07 (2) 07-09 (1)	20-22 (1) 22-01 (2) 01-05 (1)	22-03 (1) 22-02 (1)†
Mc-Murdo Sound, Antarctica	12-13 (1) 13-16 (2) 16-18 (1)	10-12 (1) 17-18 (1) 18-19 (2) 19-21 (1)	00-07 (1)	*NIL*

Time Zone: PST (24-Hour Time)
WESTERN USA To:

	10/15 Meters	*20 Meters*	*40 Meters*	*80/160 Meters*
Western & Central Europe	*NIL*	05-08 (1) 11-13 (1) 13-14 (2) 14-16 (1)	19-22 (1)	*NIL*
Eastern Europe & European USSR	*NIL*	05-08 (1) 11-15 (1)	19-22 (1)	*NIL*
Southern Europe & North Africa	12-16 (1)	06-08 (1) 12-14 (1) 14-16 (2) 16-19 (1)	19-22 (1)	19-21 (1)
South Africa	11-14 (1)	06-08 (1) 12-14 (1) 14-16 (2) 16-18 (1) 21-23 (1)	19-21 (1)	20-21 (1)

*Predicted 10 meter openings.
†Predicted 160 meter openings.

[*Continued on page 84*]

CONTEST CALENDAR

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

CALENDAR OF EVENTS

April	6-7	Helvetia 22
April	6-7	PZK DX C.W.
April	10-11	YL v.h.f.
April	20-21	REF Phone
April	20-21	PZK DX Phone
April	27-28	PACC C.W.
May	4-5	*CQ* Spring V.H.F.
May	4-5	PACC Phone
May	4-5	USSR DX
May	11-12	Georgia Party
May	11-12	OZ CCA C.W.
May	18-19	OZ CCA Phone
May	31-June 3	CHC/HTH Party

Helvetia 22

Starts: 1500 GMT Saturday, April 6
Ends: 1700 GMT Sunday, April 7

The HB boys are going to have a little competition this year, with the PZK going on the same weekend, but it will probably be more noticeable over in Europe than on this side of the pond. You will note that they are now allowed to use 1.8 mc, not that its going to do us much good. The boys promised to activate some of the rarer Cantons.

A full run-down of the rules and a list of the Cantons will be found in last month's CALENDAR.

Be sure to get your logs off before April 30th to: HB9ZY, USKA Traffic Manager, Meggen—LU, Switzerland.

P.Z.K. DX

C.W.

Starts: 2000 GMT Saturday, April 6
Ends: 2000 GMT Sunday, April 7

Phone

Starts: 2000 GMT Saturday, April 20
Ends: 2000 GMT Sunday, April 21

Try to see how many SP stations you can work in this one. You will have to dig through the Helvetia 22 activity but the SP boys usually stir up quite a bit of participation as they are contest minded. It is hoped that next year these two organizations will get together before announcing their contest dates.

The rules were covered in last month's CALENDAR.

Your logs should reach the committee no later than June 30th. They go to: The P.Z.K. Contest Committee, P.O. Box 320, Warsaw 1, Poland.

*14 Sherwood Road, Stamford, Conn.

YL V.H.F.

Since this is strictly a YL activity its a middle of the week affair. Louisa covered it on page 66 of her March Column.

R.E.F.

C.W.

Starts: 1400 GMT Saturday, March 30
Ends: 2200 GMT Sunday, March 31

Phone

Starts: 1400 GMT Saturday, April 20
Ends: 2200 GMT Sunday, April 21

The c.w. section will be underway just about the time you will read this column. Besides awards for contest credit this also affords an excellent opportunity for you to build up your credits for one of the many attractive French awards: DUF, DPF, DDFM & DTA.

Contest rules were in the March CALENDAR.

Both your contest logs and awards applications go to: The REF, BP 42-01, Paris RP, France.

P A C C

C.W.

Starts: 1200 GMT Saturday, April 27
Ends: 1800 GMT Sunday, April 28

Phone

Starts: 1200 GMT Saturday, May 4
Ends: 1800 GMT Sunday, May 5

It's the world working the Netherlands in this one. Besides certificates to the winners, there is also an added incentive; contest contacts can be applied toward the 100 PACC Award, providing of course that you submit your contest log.

1. Use all bands, 1.8 through 30 mc. (PA stations operate between 1.825 and 1.835 *only*.)

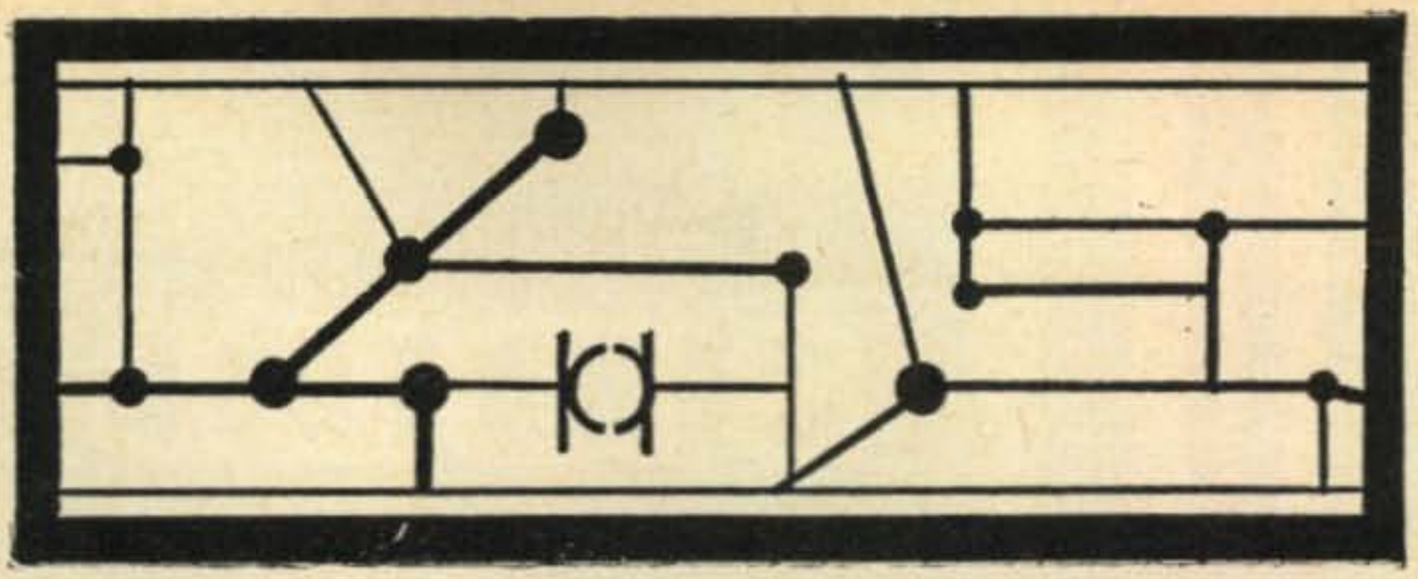
2. The usual 5 and 6-digit serial number, RS or RST report plus a progressive QSO number starting with 001.

3. Each completed QSO counts 3 points and the same station can be worked once on each band.

4. The multiplier for stations outside the Netherlands is determined by the number of provinces worked; 11 on each band and a possible maximum multiplier of 66. PA/PI stations will use the DXCC country list for their multiplier. In addition, the call areas in the following countries will also be considered a multiplier. W/K, VE/VO, PY, VK, ZL, ZS, CE & JA.

[*Continued on page 81*]

NOVICE



WALTER G. BURDINE*, W8ZCV

My good friend, L. Jackson Landers, K3IJ, ex-W8IF and W4IA, is one of our good Dayton hams whose job was moved to Middletown, Pennsylvania. He wrote the following for the editorial page of the *Middletown Press*. "Bridges of friendship lie with the world's amateur radio operators. Friendship among men brings friendship and peace among nations. The doors open wide to both the world over."

In another letter he says, "I believe that service to others gives the truest happiness and that that service is a measure of greatness." If everyone lived and believed those ideas the world over we wouldn't have so many troubles with our foreign neighbors. You can help by sharing your ideas, time and knowledge with some one. Give some mother a piece of traffic from her son on foreign shores, help some youngster get his rig in shape or help some one get his (or her) amateur license. You'll reap rich rewards for your efforts.

Novice Nets

The SIGS Amateur Radio Club meets on Saturday at 13:00 CST on 3730 kc. To join, listen to the Net for awhile to get the traffic procedure. Then, when the NCS, WN4HPD, Lee Buchanan, asks for new members to call, call near the frequency if you don't have a crystal on frequency. More information may be obtained from the secretary, David Ballew, WN4HZQ, 6404 Harding Road, Nashville 5, Tennessee. David says all classes of amateurs are invited to join the Net. He also says look for a lot of WA's from around Nashville soon as a result of their on the air practice in the Net.

Harmonic Radiation

A large number of letters are received concerning harmonics and harmonic radiations and their prevention. This is always a problem with any station, amateur or commercial and the problem can be reduced by carefully following the rules of good construction and operating practices. Harmonics from amateur stations often cause interference to State Police, Civil Air Patrol and airline communications services as well as TV. It is unnecessary and *must be stopped*. The FCC issues notices of violation for harmonic radiation.

By definition a harmonic is an integral multiple of a fundamental frequency. A sine wave which has the same frequency as that which was originally generated is called the fundamental. Frequencies which are a whole number multiple of the fundamental are called harmonics. For example, the frequency twice as high as the fundamental is called the second harmonic.

Harmonics in tube plate circuits are generally due to distortion in the power amplifier of a transmitter. This is primarily due to the fact that, when an amplifier receives high grid-excitation the plate current is driven into the upper curved portion of its characteristic curve. Therefore, if it is adjusted to the point where the grid voltage does not allow the plate current to rise into the upper curved area, the harmonic generation may be practically eliminated. But, in order to increase the efficiency of the amplifier, the grid bias is often increased nearly to the point of plate-current cut-off.

Suppressing Harmonics

Proper design and careful attendance to constructional details are two of the best ways to

[*Continued on page 78*]

Col. John W. Riggs, K8WRT, 5683 Mad River Road, Dayton, Ohio was presented the Air Force Commendation Medal by General William W. Veal upon his retirement after nearly 32 years of military service. Col. Riggs was our MARS director and the first serviceman to receive an amateur license while stationed at the Defense Electronics Supply Center (DESC). Col. Charles W. Flint was the second, receiving the call, WA8GHY and Gen. Veal may well be the third licensee at DESC.

*R.F.D. 3, Waynesville, Ohio.

sideband sideband sideband

SIDEBAND

IRV & DOROTHY STRAUBER*, K2HEA/K2MGE

SSB DX HONOR ROLL

TI2HP	280	G8KS	250	I1AMU	237
VQ4ERR	278	K2MGE	250	G2BVN	237
W8EAP	275	VK3AHO	249	K6MLS	235
W8PQQ	274	W5IYU	248	W6WNE	232
W2ZX	274	DL1IN	245	K6ZXW	231
PY4TK	270	W6PXH	244	WØCVU	230
W2FXN	267	W3MAC	243	W1AOL	227
HB9TL	267	WØUUV	243	WA2IZS	226
K8RTW	265	W1LLF	242	W2YBO	225
WØQVZ	262	G3NUG	242	W2NUT	225
W6UOU	262	W3KT	241	K4AJ	220
MP4BBW	261	W2VCZ	241	K6LGF	220
W3NKM	259	W6BAF	241	W2VZV	219
K4TJL	257	K1IXG	240	UA3CR	217
K9EAB	256	W6RKP	240	UR2AR	215
PZ1AX	254	W8YBZ	240	WA6EYP	214
W3LMA	251			W1UOP	211

SSB DX ENDORSEMENTS

VQ4ERR	275	OZ7FG	150	G2FNS	100
K2MGE	250	ZL2GX	150	G3MVV	100
PZ1AX	250	KP4CL	150	G3PEU	75
G8KS	250	W2GT	125	W3BVL	75
G2PL	200	DJ1KM	125	KØHUU	75
OZ7FG	200	ZL2GX	125	ZL2GX	75
KP4CL	200	KP4CL	125	K9WJU	75
OZ7FG	175	W2GT	100	WØALA	50
KP4CL	175	DJ1KM	100	K5FLY	50
K8LSG	150	ZL1AAS	100	W3BVL	50
		ZL2GX	100		

HAM radio is the sum of a great many parts; s.s.b., a.m., c.w., *etc*. Within each of these there are further subdivisions of operating interests. All of us have some special niche we have found for ourselves; but we all have one thing in common and that is the advancement of ham radio. On this point we have a great many different views and we have heard and read some of these. One thing we can all agree on, and that is that good operating is of prime importance.

You may not feel that, as an individual, you can do much to improve the conditions of the ham bands and that what you do or say is of little consequence. Nothing could be further from the truth! The manner in which you conduct yourself on the air will have a direct bearing on the path amateur radio will take in the coming years. You are an important member of the team; an important part of the whole and what you do and say is of more importance than you realize! So next time you put your rig on the air remember that you are on a team and it is your cooperation with the other members that will make the ball game!

*12 Elm St., Lynbrook, New York.

G8KS DXpedition to Isle of Jersey

Les Hill, G8KS, one of Europe's outstanding operators, has made arrangements for intensive sideband and c.w. operation from the Isle of Jersey in the Channel Islands from April 13th to April 15. Accompanied by G3IFB and using the call GC8KS, Les lost no time in following up the ruling that the Isle of Jersey would be considered as a "separate country" from the other Channel Islands, and quickly completed plans to satisfy the needs of many DXers for this new country.

With both Les and Frank being such superior operators, we have no doubt that all of you will add another country to your list by April 15.

DARC Welcomes DL4/5 Members

Johnny Barrows, DL4HU, who is noted throughout the world for his efforts to unify native and American hams living abroad in local radio clubs, is again to be commended for his efforts in Germany.

In a recent letter, Johnny revealed that: "My proposal to the Deutsche Amateur Radio Club (the ARRL of Germany) at the DARC Convention in early November, 1962, that American Amateurs in Germany be offered membership in that body at a reduced rate has been approved.

Peter, ZS6BBB, left, toasts Ian, MP4BBW, during a party given in Ian's honor during his visit to Johannesburg. Ian made his holiday tour of South Africa shortly before leaving Bahrein Island for six months in England. *(Photo by ZS6BHT, courtesy ZS6BBB).*

"What has happened to Joe, 9G1BF?" is a question often heard on sideband recently. Thanks to Reg, W3HQO, left, we are pleased to bring you a photo of Joe during his visit to Reg's shack in November. Joe is now back in Ghana but expects to be a VP2 before the end of this year.

The approval was returned to me within three weeks, indicating that they want us in their League. This will permit thousands of American hams here to benefit from their Station-Antenna Insurance and the excellent QSL service. The present rate is 30 Deutsche Marks for full membership (4 marks equals $1.00). Effective 1 January 1963, all American hams, holding an FCC and DARC license, will be able to become members of the DARC for the sum of 16 Deutsche Marks ($4.00) per year, or 4 DM's ($1.00) per quarter.

"We also hope that this membership will encourage the American hams to participate more closely and more often with their German counterparts in socials, Field Day events, meetings, and all other activities that are conducted regularly.

Johnny was similarly successful in Spain during his years there and was one of the prime movers behind the Spanish-American radio societies which gave both groups the opportunity to work in closer harmony. He has also been in the forefront of the movement for reciprocal licensing and is continuing his efforts for the eventual amendment to the Communications Act which would permit the licensing of foreign ham visitors, to be followed by similar privileges to Americans living, working, or visiting abroad. We salute Johnny Barrows, DL4HU, as one of our best ambassadors of good will!

Sideband Around The World

Not a day passes but that we don't hear of increased sideband activity not only here in the States but in many remote areas of the world. Latest news has it that 4S7IW is now operating with a KWM-1 and dipole from Ceylon while Andre, 5T5AD, is expected to be active shortly with a very fine sideband station. . . . Joe, PY4AS, is planning a DXpedition to PYØ, Trindade, in July; and, if all goes well, Ye Olde Master Operator, Gus Browning, should be operating from Tromelin right now. . . . Speaking of Gus, did you ever in your life hear just a pileup as greeted his opening day operation from Juan de Nova? It is a source of never-ending amazement as to how Gus manages to maintain his calmness and serenity in the face of such a riot. Guess it just goes to prove "once a gentleman, always a gentleman!" We'd like to remind you that Gus is on this mammoth DXpedition as *your* representative. While it is true that he is obviously enjoying himself, nevertheless the effort, time and expense that he has expended to make these new countries available to so many should not be taken for granted. The best way you can thank Gus is to enclose a contribution with your QSL request so that he can continue to operate from many more rare spots. Just saying "Thanks for the new one, Gus" is not enough; make your "thank you" really count!

It's very nice indeed to see one of our own receive the recognition he deserves so it's with great pride that we announce that Stu Meyer W2GHK, was elected President of the Hammarlund Manufacturing Co. We hope that his new responsibilities won't interfere with his usual sideband operations. Congratulations, Stu!. . . . Have you worked Harold, KØOJV, of St. Louis, Mo. recently? Harold built his own copy of the KWM-2 and you know 'that ain't easy'! What a signal he puts out . . . but more important, what quality! According to our checks, he actually had 60-70 db of suppression on unwanted sideband—almost unbelievable! . . . We inadvertantly stumbled upon a new net which should be of interest to many people associated with the Adventist Church. Called the Adventist Amateur Radio Network or AARN, it seeks to reunite those who have attended 7th Day Adventist Schools, Colleges and other institutions run by the Church. The net meets every Thursday at 1900 GMT on 14.270 and Ed Peterson, K3LJP, is usually net control station. However, the day we checked in for further information, Barney, W4STU, of Memphis, Tennessee was in the driver's seat and doing a very fine job.

Congratulations are in order to another net—the YL Fins, organized by V. Mayree, K4ICA, of Miami, Fla., ably assisted by Alicia, KP4CL. These two outstanding YLs, plus the Floradoras, have been instrumental in uniting the YL Sidebanders of the world every Thursday, starting at 1900 GMT around 14.332 and in giving many OM's some wonderful contacts with YLs. . . .

Congratulations and best wishes to *CQ*'S DX Editor, Urb LeJeune, and his charming wife, Helen, who have welcomed a baby boy to their home; and the same to Dottie, WA2RPN, and

[*Continued on page 90*]

SSB CONTEST CORRECTION!

Referring to section "V. Points," page 71, Jan. *CQ*, the paragraphs were reversed by the printer. Sub-heading "For Stations Outside The USA" should read "For USA Stations" and vice versa. Please pass the word along.

VHF

DONALD L. STONER*, W6TNS

DON'T FORGET!

The Spring *CQ* VHF Contest (complete with brand-new rules designed for the ultimate in fairness and convenience to the operator) will take place May 4 and 5. You won't want to miss this great new v.h.f. brawl. See page 32 of March *CQ* for complete rules. Logs, cover sheets and rule sheets are available from *CQ* for one s.a.s.e.

LET's go a little further with the modulation discussion started last month. No one can dispute the fact that we need all the modulation available to punch through a readable signal in the presence of receiver noise. The problem is how to increase modulation without excessive distortion.

Did you know for example, that the polarity of your microphone is important? The human voice, particularly the male, has a lop-sided characteristic, that is, the peaks are greater in the negative than in the positive direction. You can prove this by observing your voice on an oscilloscope connected to the modulator. If you wire the mike cartridge so that the negative peaks generated by the microphone are amplified and applied to the final in the positive direction, your modulation will increase. This is known as microphone *phasing*.

Many rigs do not have sufficient audio to 100% modulate the final. This may be the result of improper design or marginal design which reduces efficiency due to aging of components.

*Alta Loma, California.

LU3DCA and XYL during a recent visit to California.

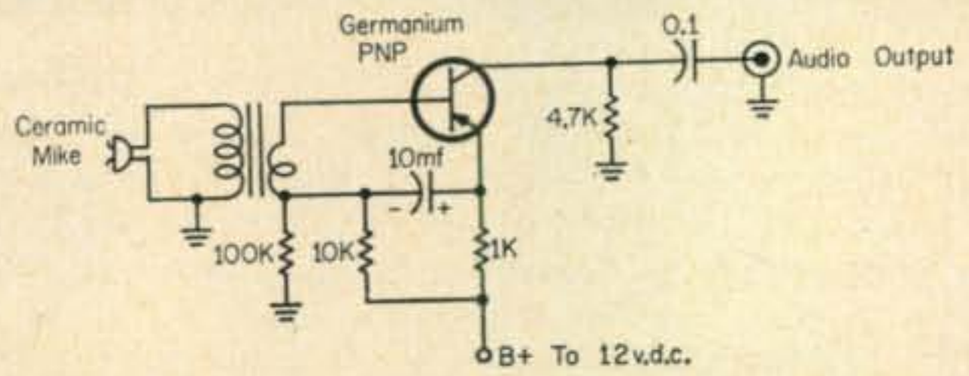


Fig. 1—A transistorized mike preamp delivery about 20 db gain.

Figure 1 shows a conventional microphone preamplifier which will add approximately 20 db to your audio system gain. A 100K to 1K transformer is used to match the high impedance ceramic microphone to the transistor base. This could be replaced by an emitter follower circuit, but the transformer (Lafayette TR-97) is less expensive than the transistor, electrolytics, and bias components. The transformer can be eliminated if a low-impedance dynamic mike is used. No transistor type is specified. It can be any low cost germanium p.n.p. since the values are selected for non-critical characteristics.

Another popular trick to increase modulation is speech clipping. The human voice is not smooth and steady. Rather it has many high peaks and these determine the maximum modulation percentage. However, if these peaks are clipped-off or compressed, the lower-value peaks can be increased in amplitude (by turning up the microphone gain) without over-modulating.

There is one last trick which should be mentioned when discussing modulation techniques with the v.h.f. addict. Some time ago, the technique called negative cycle loading was described in the west coast publication, *Western Radio Amateur*. Subsequent technical correspondence appeared in *QST* proving conclusively with the assistance of equations that negative cycle loading could not work. However, experimentation by the writer has convinced me that negative cycle loading does work. It works so well in fact that every avid v.h.f. DXer should have it in his rig. Basically, here's how it works. If you apply a signal wave to your modulator and slowly increase the gain, a point will be reached where the modulation wave-form negative peak will equal the supply voltage and as a result, the power output to the final will be zero. We can broadly call this point 100% modulation. If the modulation is increased further we effectively run the supply voltage below ground or in a

minus direction and of course the tube puts out no power during this interval. This is the condition of the over modulation and the attended problems are well known to amateurs.

Let's assume for a moment that we can suppress, limit, or in some manner distort the negative half-cycle of the modulation so that it can never go below zero. Then upon increasing the audio gain the negative peaks are limited but the positive peaks continue to increase in amplitude. It will take a considerable "over-drive" of modulation before severe distortion results, and the peaks will add tremendous amounts of talk power to the signal.

One way of limiting the negative peaks is negative peak clipping. However this generates distortion due to the sharp corners and more rapid rise time of the waveform. Whenever negative peak clipping is used, a fairly complex audio low pass filter should be used to eliminate the harmonics generated and the splatter they cause. A much simpler system is the trick of negative cycle loading. A circuit for accomplishing this is shown in figure 2. The theory of operation is almost as simple as the circuit. Near the peak of the negative half-cycle the waveform tries to go negative with respect to the supply voltage. Whenever this occurs, the diode conducts and places a very low resistance (R) across the modulation transformer secondary. The modulator cannot supply enough power to drive this heavy load and the resultant is a gradual rounding of the peaks. Although this system is wasteful in that considerable power can be dissipated in the resistor during these peak intervals, there are very few harmonics created and no audio filtering is required. The resistor should be 1/10 the value o fthe modulator transformer secondary. For example, if you were modulating 3000 ohms, the resistor should be 300 ohms. The wattage of the resistor should be 1/10 the audio power capability of the modulator. If your rig has say, a 6146, running 60 watts input, the modulator must deliver at least 30 watts. One-tenth this value is 3 watts of dissipation required for the resistor.

On the Subject of Meteors

Al Roloff,W4SHL, 4 Hedrick Dr., Melbourne, Florida sent in some very interesting conclusions on the best time for meteor schedules, after reading the article in the February issue of *Sky and Telescope* on page 97 by Richard Defouw. He concludes that 6:00 A.M. is the best time for meteor pings. He says, "The frequency of meteors in the earth's upper atmosphere is significantly higher in the pre-dawn hours than it is after

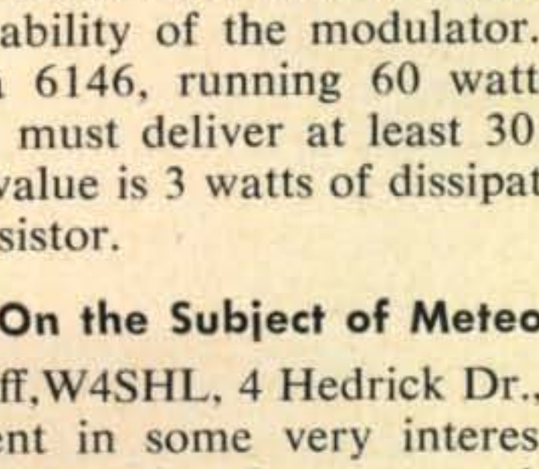


Fig. 2—Negative cycle loading. See text for explanation.

W4WDR/4 operating MARS station AG4BN.

sunset. If you are listening intently to your two-meter receiver and waiting for a 'meteor to happen' to support propagation, you will be most interested to know that you'll have a three times better chance of hearing your scheduled station at 6:00 A.M. than at 6:00 P.M. This is because meteors burn up in the atmosphere three times as frequently at dawn as at sunset."

Local Time	1800 Sunset	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600 Dawn
Average Meteor Count	6	8	9	10	12	13	14	15	17	18	17	18	19

Fig. 3—Chart showing number of meteor observations in relation to nighttime hours.

The *Sky and Telescope* article lists the average number of meteors that could be counted in one hour by a good observer enjoying excellent "seeing" conditions. The table, figure 3, summarizes this average meteor count with local standard time (L.S.T.). The average count of meteors is based on Dr. Oliver's catalog of observations. This data was compiled from 294,000 visual sightings made over a span of 58 years. Incidentally, this observational evidence corroborates Schiaparelli's theory (made in 1866) that explained the earth's orbital motion around the sun caused meteors to strike earth more often at dawn. See illustration, figure 4.

A similar effect can be noticed when you are riding down the highway in your car when it's raining without wind. You can readily notice

[*Continued on page 82*]

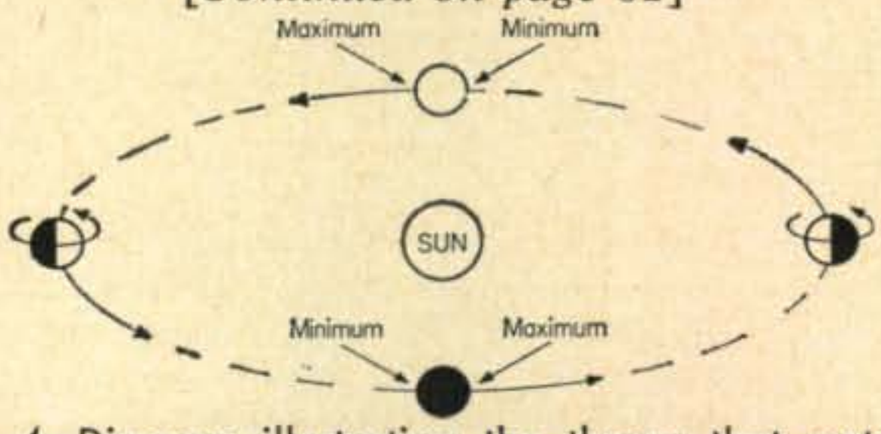


Fig. 4—Diagram illustrating the theory that meteors strike the earth more often at dawn. See Text.

SPACE COMMUNICATIONS

GEORGE JACOBS*, W3ASK

ACCORDING to information made available by the National Aeronautics and Space Administration (NASA), transmitters on the following seventeen satellites were still in operation during early March, 1963.

Satellite Name	*Date Launched*	*Inclination to Equator (Degrees)*	*Time Between Passes (Minutes)*	*Frequency (Mc)*
VANGUARD I	17 Mar 58	34	134	108.024†
TRANSIT 4-B	29 Jun 61	67	104	54†, 150† 324†, 400†
INJUN-SR-3	29 Jun 61	67	104	136.5†
TIROS 4	8 Feb 62	48	100	136.23 & 136.92
OSO 1	7 Mar 62	33	96	136.744†
ARIEL 1	26 Apr 62	54	101	136.408
TIROS 5	19 Jun 62	58	101	136.235 & 136.922
TELSTAR 1	10 Jul 62	45	158	136.05
No Name	17 Sep 62	82	90	108.09
TIROS 6	18 Sep 62	58	99	136.235 & 136.922
ALOUETTE	29 Sep 62	80.5	106	136.979
EXPLORER 14	2 Oct 62	36	2185	136.44
EXPLORER 15	27 Oct 62	18	315	136.101
ANNA 1-B	31 Oct 62	50	108	136.975† & 54†, 162†, 216†, 324†
RELAY 1	13 Dec 62	47	185	136.140 & 136.620
EXPLORER 16	16 Dec 62	52	104	136.858
TRANSIT 5-A	19 Dec 62	91	99	150† & 400†

Space Television

For the first time home television viewers in America may be able to watch an American astronaut as he soars through space. Officials at NASA announced recently that they plan to install live television cameras aboard the Mercury capsule which soon will carry Leroy Cooper around the earth for 22 orbits in 34 hours.

The television cameras will send back live pictures of astronaut Cooper as well as the instrument panel of his spacecraft to television receiving equipment which has been installed at Cape Canaveral and aboard the *Coastal Sentry*, a tracking ship that will be stationed in the South Pacific. A third television receiving station is planned for the Mercury tracking station located on Canary Island, in the Atlantic.

The lightweight space-borne television cameras will operate on a slow-scan basis, sending a complete picture frame every two seconds. Conventional television cameras send 30 frames per second. As Cooper's Mercury capsule passes within line of sight of the television receiving stations, pictures will be transmitted from the capsule to ground. In addition to giving scientists and medical officers on the ground a look as Cooper and the inside of the capsule, NASA plans to make some of the live pictures received at Cape Canaveral available to the networks for relay to home viewers.

Although the quality of the slow-scan pictures will be poor compared to conventional television pictures, they should be clear enough to give the American public their first view of an astronaut in space. The Russians have used a similar television system in the past for televising their cosmonauts as they orbit the earth. NASA is particularly interested in developing this technique for use in the much longer two-man Gemini and three-man Apollo flights which will follow the Mercury program.

OSCAR III Progress Report

Progress continues on the preparation of the OSCAR III amateur radio satellite for what is hoped will be a late 1963 launch date. After working successfully on the ground for the past few months, the breadboard version of the

[*Continued on page 92*]

*11307 Clara Street, Silver Spring, Md.
†Unmodulated or tone modulated carrier. All others are pulse modulated telemetry circuits.

Seen gazing skyward at a model of the OSCAR beacon satellite are (left-to-right) Igor Dolozel, OK1KKA; Herbert Wahlberg, SM5ANV; George Jacobs, W3ASK and Werner Wolter, DL1YJ. The picture was taken in the lobby of the new International Telecommunication Building in Geneva, Switzerland where OSCAR went on display February 9 for a two week period.

RTTY

BYRON H. KRETZMAN*, W2JTP

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	52.60mc

ADAPTING an s.s.b. transmitter for radioteletype is a project which occasionally must be faced, since most s.s.b. transmitter manufacturers don't bother to build-in this feature. (*Notable exception*: Hammarlund.) There are two paths which can be taken. One is to modify the v.f.o. of the s.s.b. transmitter, and the other is to feed an a.f.s.k. oscillator into the audio. Which path you take depends upon several considerations, not all technical. First of all, do you have the courage to dig into the v.f.o.? Secondly, have you written the Customer Service Department of your transmitter manufacturer? (*When you do, you might ask them why they didn't build-in RTTY in the first place.*) We suggest that you confer with a local active and experienced RTTYer when you get an answer.

*431 Woodbury Road, Huntington, N. Y.

Technical Considerations

The choice of shifting the v.f.o. or feeding in a.f.s.k. primarily depends upon whether your s.s.b. transmitter is of the phasing type or of the filter type. If it is of the phasing type it is recommended that you shift the v.f.o. Spurious responses in a phasing type s.s.b. transmitter are just not far enough down to allow the production of F-1 by feeding in an a.f.s.k. oscillator. To shift the v.f.o. you could build an external shifter and use a tube socket adapter to get at the tube connections. See Chapter 4.2 in the *New RTTY Handbook* for several different frequency shift circuits.

If you have a filter-type of transmitter you can feed in an a.f.s.k. oscillator with reasonable assurance that the spurious frequencies are far enough down. Now, you may not be able to use the standard tones of 2125 and 2975 cycles because the audio response curve, limited by the particular filter, falls down on the high end. This applies especially to the Collins KWM and S-Line. The solution here is to use two other tones 850 cycles apart, namely 1275 for *mark* and 2125 for *space*. Fig. 1 shows a typical station arrangement, such as used at WØPEV in St. Paul, Minnesota. Note that the station TU, or receiving converter, must also be set up for 1275 and 2125 instead of the standard 2125 and 2975. This is ok if you only intend to operate on the h.f. bands;

[*Continued on page 86*]

RTTY The Hard Way...No. 18

"Hank claims he hasn't had so much fun since he received his last Erector set."

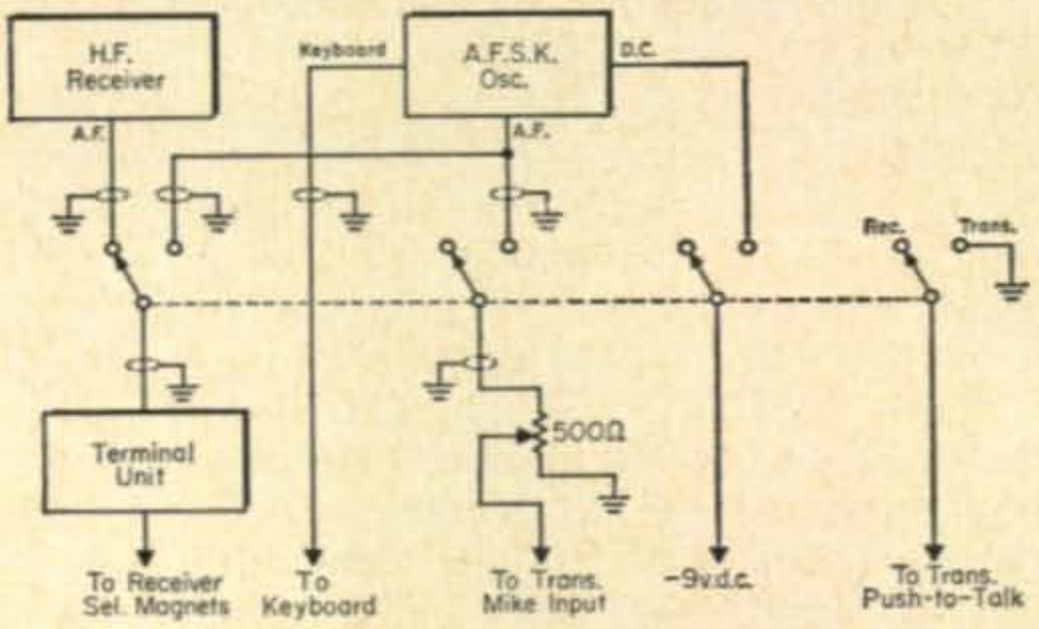
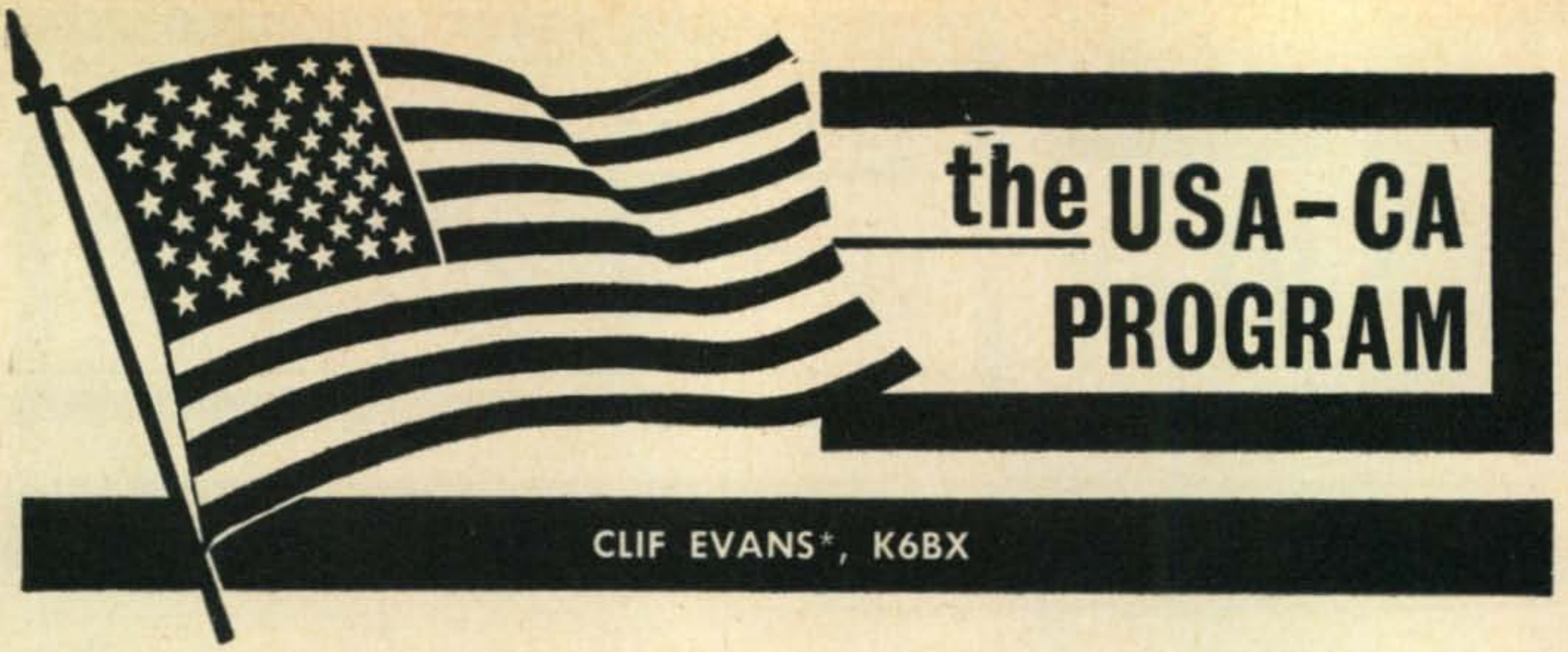


Fig. 1—WØPEV station control circuit for KWM and S-Line.



the USA-CA PROGRAM

CLIF EVANS*, K6BX

SEVENTEEN happy 'hunters' bagged USA-CA-500 during month of January thus swelling to 187 the ranks of those winning the coveted and most beautiful of all hamdom's awards.

USA-CA HONOR ROLL

W2SNI ...162	K1MBM ..168	K5BQS ...174
K1QZV ...163	K8CIR 169	K8VSL ...175
K6HOR ...164	CR6CA ...170	VE6ABP ..176
W4KZF ...165	W4JUJ ...171	K2CPR ...177
WØHSC ...166	K7KPM ...172	W1UOP ...178
K9GOE ...167	W9ACU ..173	

Endorsements on the above USA-CA's included four for all phone, three for all cw, one all 7 mc, and fourteen for mixed operation. WØHSC is North Dakota State University Amateur Radio Society base station. As reported in January issue, the NDSU-ARS sponsors the new North Dakota State Counties Award. See March issue for complete Honor Roll listing which includes nine USA-CA-1000 winners. In correction W6KG was erroneously listed as K6KG.

We Get Letters and Questions

Walt, WA4AQV, "Clif Old Man, I and many of my friends have switched to *CQ* for two major reasons; first, unlike others, *CQ* publishes many more articles of a practical nature which are within the technical competence and financial resources of a majority of readers. Secondly, your column gives manifested policy that *CQ*, even with an awards program of its own, transcends the usual commercial competition practice by also supporting awards programs sponsored by others. *CQ*'s recognition of the s.w.l. plight is a healthy revelation. *CQ* rates and will get my support. Put me down on the USA-CA Good Will Club rolls as willing to help any DXer identify U.S. counties. On QSLing, I started back as a Novice naming my county and QSLing 100% . . . keep plugging your many worthy hamdom causes and know you have strong support . . . 73 and God Bless you."

John, K8TNE, "Clif, the USA-CA Program has brought new meaning to ham radio for me. I was an addict for DX but now work about 90% W/Ks. Have 439 counties confirmed toward USA-CA-500. Not only have I learned much about these great United States, but I have made a host of new friends who never fail to call and say hello when they hear me on."

Hudson, K7LAY, "Clif, I want to get in on some of USA-CA's 'fun unlimited'. Operate mobile out of Great Falls, Montana and will be glad to help others get contacts with nearby 'rare' Montana counties."

Jo, CR6CA, "Clif, Old Man, words cannot express my pride in being first CR6, and first Portuguese station, and as you say, first Africa station to achieve the beautiful USA-CA-500. We are also highly proud of being CHCer and will soon be applying for the 100 awards gold seal. Our beam is constantly turned toward the USA where we have made so many friends. Naturally, USA-CA-1000 is my next goal . . . say 'hello' to all from me." OLD MAN's note: Even with dead bands we hear CR6CA several times weekly near CHC hangout frequency, 14075, and especially Sundays, 2100-2300 GMT. K4ICA is Jo's QSL manager.

Gerry, G3PEU, "Clif . . . from all the corners of the Earth, we know you are being told how tremendously successful is the USA-CA Pro-

Pictured here is "Doc", SM5BPJ, second SMer to achieve over 200 amateur radio awards and join CHC's select CHC-200 Fraternity and win the Arne Trossman Top Honors Plaque. "Doc" a flying Dentist (FHCer), is married; XYL Babs and two harmonics, Joe and Cil. "Doc", a DX-Pert of note has visited lands of OZ, DL, HB, OE, HE, I, 3A2, F, ON4, PAØ, LX, LA, OH, OHØ, UN, UA1, and 9S4. Next scheduled is trip to CT1 and EA8. "Doc", a member of the Flying Hams' Club, reports FHCers in Sweden will form a FHC Squadron in 1963, and other factors permitting, hopes to make the FHC and CHC Conventions in Cleveland, Oct. 4, 5, & 6, 1963.

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

gram. Twelve short months ago one could witness DX operators reject an American's answer to a CQ in hope some-one else would answer. Today, because of USA-CA, there are few more interesting groups to chat with than the American ham, so why did this happen. Your USA-CA answers it simply. The DX operator in most cases wanted a contact which had value to him toward some sought after award, and, in the case of the U.S., except possibly a 'rare' state, the average W/K could not contribute any contact credits. However the USA-CA has changed all this as more and more DXers get infected with the thrill of USA-CAitis. What you have done is to elevate, on the competitive side of our hobby, the USA QSL card from an otherwise meaningless piece of paper, to a treasured contribution to the one USA award the DXer now earnestly seeks. To this end Clif, keep telling U.S. hams that DXers value their cards and especially appreciate them when counties are named." Old Man's comment: Gerry, a F/O with the RAF, expresses what many DXers are writing to us today. Because of USA-CA, every U.S. ham's QSL card now has meaningful value to others, both to W/Ks and DXers. If you are not already doing so, name your county on every QSL card sent out.

Dick, G2FFO, ". . . saw the USA-CA displayed at the RSGB Exhibition and I won't be happy until I have mine. Have over 470 U.S. counties confirmed . . . you have really come up with something wonderful in the USA-CA . . . my knowledge of U.S. Geography is increasing by leaps and bounds . . . researching QSLs


Codfish Certificate

Issued by the

Argentia Amateur Radio Club

U S Naval Station, Argentia, Newfoundland

to

K6BX

For successfully completing contact with the ... listed American Radio Stations in the Argentia area.

The remote location of the duty station allows few chances for communication, and each Amateur contact holds a little deeper sentiment than just another QSO and QSL. More often than not, the phone patch facilities of "States side" Amateurs provide the only direct contact between service personnel and the folks back home.

_____ President

_____ Secretary

AA NG

Awarded for a ten point score, seven point for each Amateur contacted, two points when phone patch is included. CW contacts score two points.

Pictured here is the reactivated Codfish Certificate sponsored by the Argentia Amateur Radio Club, Argentia. Newfoundland, Canada, composed of U.S. hams operating under stateside calls/VO1. The award is given for achieving a total of 10 points; 2 pts for each AARC c.w. Stn QSOed; 1 pt for each AARC a.m./s.s.b. Stn QSOed; 2 bonus points for each Phone-Patch run by a stateside, mainland VE or any DX Stn where 3rd party traffic is legal. To get award, send QSLs to Business Secretary AARC, Navy #103, Box 12, FPO, New York, N. Y. The AARC will pay return postage. AARC has Stns active 10 thru 80, c.w., A.M. & s.s.b., and all they need to go RTTY is a FS keyer (who can help them).


Pictured above is Ken, XE2DS/XE2PDS, whose XE/W/K goal is to see to it that every W/K Stn that needs an XE QSL card gets one. Ken, a CHCer, 54, has been in XE land nearly 6 years and is now approaching his 10,000th QSO. He QSLs 100% upon receipt of a QSL. Ken is Chief Eng'r. of a large Coal & Zinc Refinery near Rosita which is about 75 miles South of Eagle Pass, Texas. Pictured below is a "For Fun & Goodwill" special XE2DS eye-ball certificate which Ken issues to those who visit him as they head down Hwy 57 into his "Beautiful Mexico" as he calls it. The Old Man has watched CHCer Ken at work . . . he truly is a goodwill 'American' Ambassador, and if you know your 'history' all residents of both North and South America are Americans.


ROSITA, COAHUILA, MEXICO

K6BX CLIF

171 4-9-63 Ken

SPECIAL TNX OM

is a real pleasure . . . I have copy P.O.D. #26 and only too glad to help others identify U.S. counties until eventually, we DXers hope, all U.S. hams will name counties on the QSLs."

The Goose is in the Bag

For the tenth consecutive year the Goose Bay ARC will hold their annual QSO Party in April —the whole month of April—and no April Fooling. Party starts 0000 GMT April 1 and runs through 2400 April 30. Prime purpose of the Party is to help others win the Worked All Goose Award, WAG.

All that is necessary to win the WAG during the Party is U.S. and Canda stations work 4 members GBARC and all others work three. Submit lists only, and during Party, the WAG is no charge.

Letter from CHCer Jack, VO2NA, said there would be five trophies this year; two club trophies for prefixes on all bands; VO2DP trophy for consecutive letters of the alphabet; W5HCZ/VO2 trophy for countries and VO2NA trophy for states. Jack stated high activity can be expected by GBARC stations on c.w., a.m., and s.s.b. and bands 3.5 through 28.0 mc. Actives will be VO2AH, BA, NA, RN, UA, VO2DP/VE2, VO1FG/VO2, VE1MW/VO2, K5DYR/VO2,

K5HOJ/VO2, W5HCZ/VO2, K7TIH/VO2, W8UPV/VO2, and KØSZE/VO2. Submit lists to Awards Manager, Jack Willis, VO2NA, P.O. Box 255, Goose Bay, Labrador, Canada. No QSLs but your card must have been received by member and be sure to name your county.

Idaho Centennial Flash

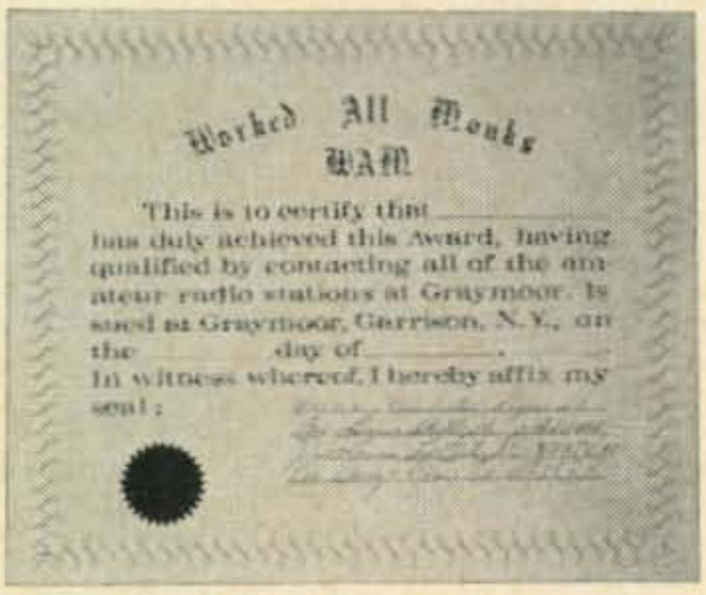
Idaho announces 1963 Centennial Award by the State of Idaho for working 10 different stations with at least 5 different counties represented, during year of 1963. Idaho stations must work 22 different counties in Idaho. Send QSLs with s.a.s.e. for return to Mahlon England, W7ZLO, P.O. Box 103, Shelly, Idaho. Award will bear Governor of Idaho's signature.

Florida Fins (Mermaids) Bask in Sun

Been swapping Florida 'cracker' quibs with CHCer/FHCer V. Mayree, K4ICA, and out of it all, and no April Fooling, came a brand spanking new YL Club out of what already was international high interest in the YL FIN's net.

Name for new organization is YL Florida International S.S.B.'ers, or for short title, their original "YL FINS". And if you don't know what a Florida gal means when she says FIN . . . tis a Mermaid for sure. The officers for 1963 which reads like a Who's Who in Mermaids are: President, Ellie, K4RHL; 1st V.P. Margaret, K4GKL; 2nd V.P. Marge, K4RNS; Publicity Ruth, W4BWR; Public Relations Alicia, KP4CL, and permanent Secretary-Treasurer and YL FINS Awards Custodian V. Mayree, K4ICA, 428 S.W. 28th Road, Miami 36, Florida.

The Old Man, long with sand between his toes with memories of calls 4CY, W4DJ, and W4GZA, in the land/waters of the Mermaids, recognizes that here is a group of folks that really are generating hamdom fun in good humor and creating world-wide good fellowship. The YL CHC Hunters have their Royal Queen of the Hunt, Princesses, Royal Huntress and even



Have you ever worked a Monk? The Directory of Certificates lists a Protestant Ministers' Award and a Padre Award, but here for the first time is a Monks' Award. To get the Worked All Monks, WAM, award, work three individually licensed Brother Monks residing at what they affectionately call "At the Mount" and submit list to Brother Lawrence, S.A., WA2PCM, Graymoor Friars, Garrison, N. Y. If you're curious, the S.A. stands for "Society of the Atonement". Brother Lawrence reported Brother Hams now limited to himself, WA2RRK, WA2UMG and WA2TCA, but four others were preparing for "Hamnology", and others scheduled. The "76" used on their and other's QSL cards means "God Bless You".

Pictured here is one of two new Wisconsin county awards sponsored by the Waupaca Amateur Radio Club Waupaca, Wisconsin. In recognition of the fact that it is more difficult for DXers to work Wisconsin counties, the club, rather than just modifying one basic award for DXers, came up with a completely new counties award just for DXers. The club is to be commended for such realistic approach in awards design seeking greatest goodwill returns. Read text for full rules of both awards.

a Royal Wolf and a Royal Skonk . . . we wonder when these daughters of Nereus will find a Neptunian counterpart?

The YL FINS sponsor an award (now being designed) for working members; Stateside stations work 10 DX plus 5 stateside members; DX stations work 10 stateside and 5 DX members (total 15). Seal endorsements for each additional 10. No charge; send GCR certified list to K4ICA as above. The YL FINS have club news letter free to members who pay only $1 annual dues. They meet regularly, world-wide, each Thursday, 1800 GMT, on 14.333. On fourth Thursday each month stateside OM's are invited to check in. Let's see how many OMs have a weakness for catching Mermaids!

Ohio Convention Nuggets

Available effective April 1st, and no fooling, is a new award for working past or present committeemen of the Cleveland Amateuradio Convention. If you are not already aware, this live-wire Ohio group will be hosts for the ARRL 1963 National Convention, and the Certificate Hunters' Club National Convention, and the Flying Hams' Club National Convention, plus other national groups, all concurrently at the new convention facilities, Sheraton-Cleveland Hotel, Cleveland, Ohio, running three days, October 4, 5 and 6, 1963.

To get the Ohio CAC Convention certificate, stations in Cuyahoga County work 15; 10 for balance of Ohio; 8 for rest of U.S. (except KH and KL), and Canada; KH, KL and others work 6. Second award for working additional committeemen in steps as above of 22/18/15/8. No band/mode endorsements. Send full log data only and 10¢ or 1 IRC to Custodian, Jack Siringer, W8AJW, 2972 Clague Rd., North Olmsted, Ohio. Presently eligible calls are: K6BX, *W8*AEU, AJW, BF, CTZ, CWL, EPM, FAT, ICS, IJP, LHX, LY, MDL, NGW, OIS, POR, SZF, USP, UWJ, VAJ, YPT, *WA8*AAV, *K8*AAG, DBJ, IPS, JSM, MHG, MVA, VVB. Award is available to s.w.ls.

[*Continued on page 80*]

HAM CLINIC

CHARLES J. SCHAUERS*, W4VZO

THROUGHOUT our travels in Europe, the Middle East and Africa we will attempt to visit as many hams as we possibly can and to give talks before various ham clubs. If you are a ham residing in one of the areas mentioned and/or are a Secretary or President of a radio club and would like to see us personally, please drop a card to me at 4 Lutzelmatt Strasse, Luzern, Switzerland.

As *CQ*'s main overseas correspondent, I shall be pleased to meet with and assist you in solving some of your technical problems.

Although our file on European equipment is not yet complete, our American and British files are. We also have accumulated a great deal of information on various American surplus radio items which are now available in most large European cities.

Although we are not outstanding linguists we can handle French, German, Spanish and Italian without too much difficulty.

Wherever we go, we shall generally be available *after* an area's regular working hours and sometimes on week-ends.

Questions

We cannot accept any more questions for publication, inasmuch as our files are already loaded and our column space has been reduced due to the expansion of *CQ*. We will continue however to accept questions (one to a letter) from readers to be answered on a personal basis. If you wish an *airmail* reply direct from this writer's QTH, please enclose the required number of International response coupons, and direct your communication to my home address given in the paragraph heading this column. Thank you!

Microwave Radiometer—"What is a microwave radiometer, what does it do, and where may I obtain more information on it?"

The microwave radiometer is a receiver of electro-magnetic energy used to measure thermal radiation in the rf spectrum. Typical sensitivities of the order of —140 dbm are made possible by comparatively long post detector integration time and provision for cancellation of receiver gain variation in the period of one observation. It is principally used in radio telescopes for measuring extra-terrestrial radiation and for passively detecting and identifying military targets (both ground and airbourne).

For more information, write: White Electromagnetics Inc., 4903 Auburn Ave., Bethesda 14, Md. and ask for Vol. 2 #1 Technical bulletin.

Eico G.D.O.—"Any practical way to extend the coverage of my Eico g.d.o. from its top limit of 250 mcs to 420 mc without tearing it up?"

No. Even if you could make the modification you would have calibration difficulty. The Eico g.d.o. is a fine instrument.

HX-50—"I plan to buy a Hammarlund HX-50 s.s.b. transmitter. Do you think it is worth having the 160 meter coverage (offered as an optional feature) done at the factory, or do you think the job is simple enough to do myself with limited ham shop facilities?"

I'd take the factory job. However, the addition of the 160 meter band is not complicated and any good ham with a soldering iron and a few other tools can do the job easily.

Commercial S.S.B. Adapter—"I have just completed my conversion of my old faithful kw final to linear operation and would like for you to recommend a good commercial filter type s.s.b. adapter. How about it?"

Sure. I suggest the E. F. Johnson Co.'s s.s.b. adapter catalog number 240-305-2. This adapter covers 10 through 80 meters, has more than 50

RTV-201 silicon rubber adhesive facilitates waterproof sealing of rotators, antennas, *etc.*

*c/o *CQ*, 300 W. 43 St., New York 36, N. Y.

db sideband suppression and is highly recommended for use with the new Valiant II. It has its own power supply and only needs a good stable v.f.o. input. A reliable vox circuit and all interconnecting cables are included. I think it is well worth the price.

Antenna Rotator Moisture—"I own a rotator that refuses to function properly during wet weather. When dry, it is okeh. I've taken it apart but cannot find where the moisture is coming through. What do you suggest?"

First check all exterior connections for corrosion. If these are okeh, then obtain some General Electric RTV-102. This is a new silicone rubber adhesive sealant that really, really works! Use the stuff as directed on the tube and apply it to all "open" surfaces (as shown in the photo). Goodbye leakage!

PL-175A Linear—"Recommend a good tube to me that has a plate dissipation of around 400 watts or so, and which will give me about 400 watts output with 2000 volts on the plate in Class AB-1 for s.s.b. service."

Try Penta's PL-175A for about 450 watts output. With 3000 volts on the plate you can get nearly 700 watts output.

Pre-Amplifier DB-68—"I need a pre-selector (pre-amplifier) which covers 6 to 80 meters. This is to be used with an older set for which I have a 6 meter converter. I don't wan't to spend more than $45.00. Can you help me?"

Sure. Why not buy the wired DB-68 preselector made by WRL, Inc., 3415 West Broadway, Council Bluffs, Iowa. It sells for only $39.95 and worth every penny. Even when used with an older receiver it gives an average gain of 24 db.

Collins 32V2—"I recently got my general license and my dad has given me $200 with which to buy a good transmitter. I have my eye on a 32V-2 Collins which is in excellent condition, but the seller wants $240 for it. What say?"

Before you buy, try Amateur Electronic Supply, 3832 West Lisbon Ave., Milwaukee 8, Wisconsin. They did (and still may have) a 32V-2 (reconditioned) for around $210.00. If the set you have your eye on is clean however, unmodified and the calibration has not been affected, it is worth $240.00.

Remember, the 32V-2 makes an excellent s.s.b. transmitter when "married" to the Heath s.s.b. adapter properly.

TVI Tangent—"I own a popular 60 watt transmitter made in the United States which I am using here in South America. I do not give the name for fear of offending the manufacturer because I have TVI trouble. Can you assist me please?"

We can try. But in order to *really* help you we need more information. What channels are affected? Does the sound come through too? What kind of antenna are you using? Do you have a good ground? How close is your transmitting antenna to the TV installation? And finally, what transmitter are you using?

Suggest as the first try, that you obtain a B&W low pass filter, Model 424 for installation at your transmitter. This filter sells for only $8.65 and reduces all ham frequencies (r.f.) within the TV bands by 60 db. It is good for transmitters up to 100 watts.

Any transmitter made can develop TVI. Never fear offending an American manufacturer, they expect to be told when their products are at fault so they can correct any deficiencies.

Another Transistor Q-Multiplier – HAM CLINIC receives more questions relative to *Q*-multipliers than nearly any other "outboard" receiving accessory. The question most often asked is: "Please come up with a transistorized *Q*-multiplier for operation with an i.f. of around 1400 kc." Our effort is in figure 1. It is based on a design by H. J. Adami as it originally appeared in the ham mag, *OM*.

Although the original used an Amperex OC-170 transistor an RCA 2N544 was used with success as were a half dozen others.

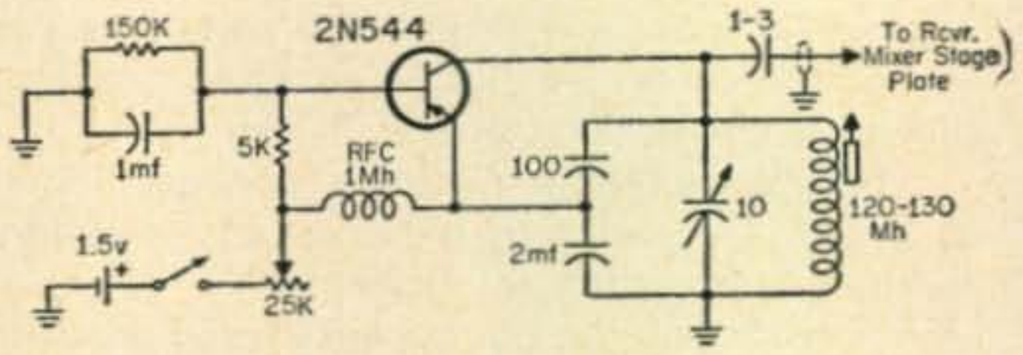


Fig. 1—Transistorized Q-multiplier for i.f.s. in the 1400 kc region.

The lead to the plate of the mixer stage in the receiver should be shielded. The coil used should have a high *Q* and for 1400 to 1450 kc should be an iron core unit having a value of 120 to 130 microhenries. The resistor tied to the 25k Pot will have a resistance of from 3k to 40k ohms depending on the transistor used, and the value must be obtained experimentally. Try a 5k unit with the RCA 2N544 transistor. You can also try 3 instead of 1.5 volts before changing resistors. If you are fortunate enough to have a Philco 2N1742 transistor on hand it will work extremely well in this circuit.

Thirty

I wish to thank all of the readers of HAM CLINIC who have written in, for their patience and understanding. Making a 3000 mile move across the sea and keeping up with a deluge of mail has not been easy. We will do our level best to get replies out as fast as we can. In the meantime, if your reply seems to be slow coming, please consider the circumstances and continue to bear with us.

HAM CLINIC offers no certificates, operating awards or medals. It does however, attempt to give you the technical and other general information which will assist you to keep your station operating and to get more fun out of the hobby.

So until next month then, 72, 73 and 75. By the way, listen for the call 4U1ITU, the ITU station in Geneva, we may be operating it as we did in January along with W3ASK, *CQ* PROPAGATION and SPACE editor. Chuck

YL

LOUISA B. SANDO*, W5RZJ

THANKS to ZS6GH, Diana, we have news of some of the ZS YLs. During the SARL convention at Johannesburg last spring the YLs held a luncheon to celebrate the 10th anniversary of SAWRC (see photo). Special guest at the convention was Mary Rosen, VQ1YL (WA2QDL). Mary's OM, VQ1DR (W2GLM) was First Radio Officer aboard the USNS *General R. M. Blatchford,* and while the ship was traveling between African ports and India, Mary lived in S. Africa (including a 2-month honeymoon in Cape Town and DX-peditions to Zanzibar—lucky gal!).

Officers for 1963 for the S.A. Women's club are: Pres., ZS6GH, Diana; V.P., ZS6YL, Toni; secy, ZS6BDB, Dot.

Congratulations to Iris, ZS2AA, and Vi, ZS2BR, who celebrated their silver anniversaries as radio hams in 1962!

YLRL

Additional officers appointed for 1963: Advertising Chm., WA6BNS, Meta Brazzell, and Publicity Chm., KØEPE, Marte Wessell. Marte has been written up here before, most recently in July '61 as a high scorer in the YL-OM Contest. Marte's OM is WØJYQ. She has been licensed since '57, is active in the Colorado YLs, on the Tangle and LCL nets, and in contests.

Here and There

The Colorado YLs 6-meter net meets on Sat. 1900 MST on 50.5 mc.

New officers for WRONE: Pres., K1IJV, Jean; V.P., K1EKO, Edie; S-T, K1ICW, Mary; hospitality, W1RLQ, Chata; net & membership, K1LCI, Ginny.

Officers for '63 for YL CHC Chap. 4: Pres., K4ZNK; V.P., K1OYM; Sec./P.C., K6UHI; Treas., W1YPH; Royal Huntress, KØRGU. From a charter membership of 40, by Jan. '63 the club had grown to 70 members. The CHC YL net

[*Continued on page 90*]

*4417 Eleventh St. N.W., Albuquerque, New Mexico

W7QYA, Flo Majerus, visiting SM4KM, George, at Ludvika while on a world trip with another teacher from Lewistown, Mont. W7QYA is a member of the International Ham Hop Club, as is SM4KZ, and Flo has met many other IHHC members.

Pictured at the 1962 SARL convention dinner-dance, l. to r., VQ1YL-WA2QDL, Mary; ZS1TZ, Anita, and ZS6GH, Diana. *(Photo by ZS6AYI)*

YLs attending the 10th anniversary luncheon of the So. African Women's Radio Club at Johannesburg Easter Saturday '62. L. to r., front row: ZS's 6AJR, 6GH, 2LM, 6AXM, 6YL, 6AEU, 6KK. Center row: ZS2-031, 6BAW, 6ACT. Back row: ZS6BDB, 6AOX, 6APG, 6AZQ. Photo by ZS6AYI.

OUT THIS MONTH!

ANTENNA ROUNDUP

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Every ham will want a copy of this information-packed book. Builders will find complete information for building antennas and accessories that will be "just perfect" for their stations. Operators will find many ways to improve the efficiency of their equipment. This book will soon become the most worn out one in your shack!

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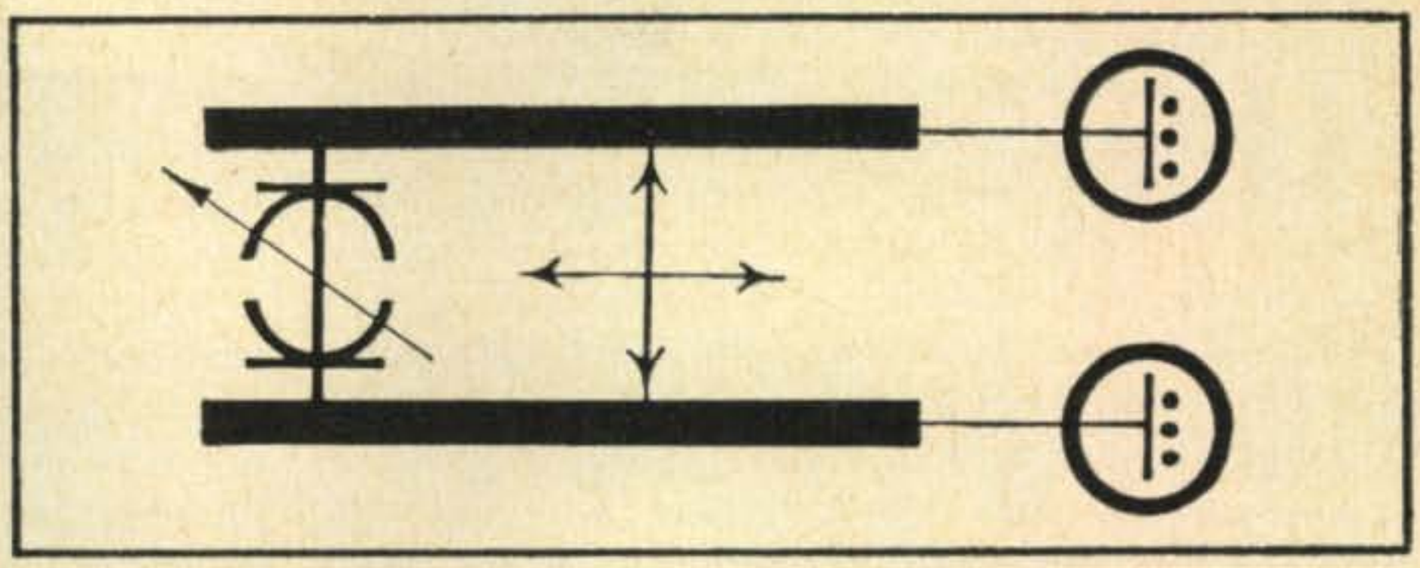
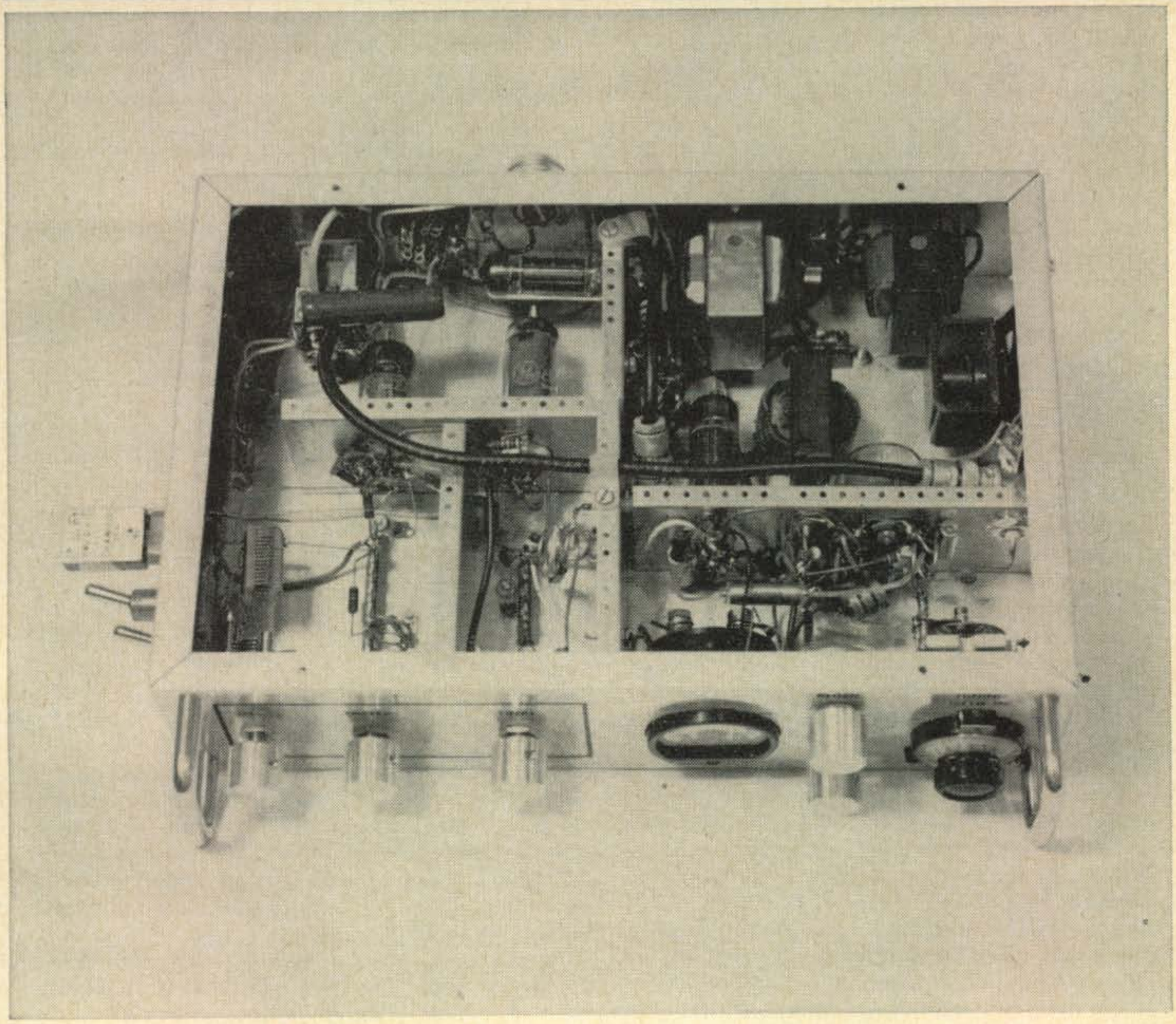
Vol. 5, No. 4—April 1963

VHF AMATEUR





In This Issue

Departments

Features

Address correspondence to: Bob Brown, K2ZSQ, Editor, *The VHF Amateur*, 300 W. 43rd St., New York 36, N. Y.

Editorial...

By now it is no secret that we are contest-minded. There is hardly a month that goes by when we don't wonder to ourselves if maybe we shouldn't drop a hint somewhere in the magazine that we're looking for ideas and comments so that the next VHF contest will become the most successful yet in participation. We feel that our March 16 contest was a step in the right direction. It is still too early to get an accurate indication of the final results, but a substantial number of contesters wrote in to request logs and rulesheets. It is reassuring, at least, that there are others among us who are also struck with this contest mania. What causes otherwise normal amateurs to suddenly turn out en masse to gather a sheet of statistics surpassing the next fellow's? What is this strange aura that surrounds these frequent competitions?

In my opinion these embroilments are a vital part of amateur radio as we know it today. Since time eternal, hams have rallied at specific times on specific frequencies to put forth the best they have to offer. Truly these are days of reckoning. Countless numbers of VHF enthusiasts spend a great deal of time experimenting, creating, building—all in an attempt at improving their stations. All the long hours with the hot soldering gun in hand, the planning involved in constructing that antenna, the building of that super low-noise converter, in short all the relentless effort exerted toward making the station 100% effective is put forward for final verification. Perhaps VHF contests are just that: a test, to determine the performance of a station under maximum stress conditions, a period of time when the utmost is required of each and every component that together make up a station.

For every ham on the air today, there is another definition of what it takes to come out on top of a contest. But most will admit that overall there is something inherently human that makes a winner. For each contest there are at least two stations identically equipped, located much the same as to amateur populace, and situated at more or less symmetrical heights above sea level. Why, then, does one station rise above the other in achievement at contest time? Why does one station find himself with a rather limited working radius while the other is working stations hundreds of miles away?

Yes, there is much more to a contest than just a mere test of equipment. If that were the sole objective of the event, the low power stations and hams who have little time to build their own gear would have long since vacated the airwaves, allowing the better equipped stations the full run of the house during the contest period. But VHF competitions contain another essential ingredient: the operator. We are all too familiar with cases of the big-signal boys who lack certain basic operating techniques, both in common courtesy and in the general knowledge of the band he is using. Fortunately for us, however, a big signal alone is not sufficient to work DX, or for that matter, winning contests. It takes a real operator; someone who knows the band, is adaptable to conditions he faces, and one who practices good manners while skillfully laboring to make the contest work for him. It is these things which ofttimes makes the difference between a mediocre score and a winner. And it is these qualities that make us sit back and take notice when a few months after the contest we read about the high-scorers all over the country. The natural inclination is to look up your own score to see how well you did. And sometimes this final tabulation is both surprising and revealing. But the winners alone don't constitute a contest; it is made up of great numbers of hams, some who enter to win, others who enter just to join the fun.

We are anxious to see the results of our most recent VHF competition, curious to see who will rise to the forefront to claim area awards, but, more than anything else, to see how many amateurs took the time and initiative to become a part of that mysterious phenomena known as a VHF contest . . .

Apotheosis with Yen

The paramount objective of *The VHF Amateur* is to serve that select group of amateur radio operators inhabiting the frequencies above 50 mc, for these compose our readership. We believe that while our columns should reflect what VHF'ers are doing, our articles should present ideas and stimulate interest in construction projects. Unfortunately, this cannot be accomplished by one person alone. This is where you come in. We need your help in this area. If you have designed and built a 220 mc transmitter, for example, we want to know about it. Any equipment you have constructed to enhance your station will, most likely, have the same effect on other VHF'ers. And they'll want to know how to build it. We would like to present your equipment on these pages. You don't need a professional writing background; few of our present contributors do.

We enjoy reading the mail that comes to this office and appreciate that you have taken the time to write. Although space doesn't permit our running a LETTERS column in this section, rest assured that all mail is read and answered personally. Please feel free to drop a line. We'd enjoy hearing your viewpoints on contests, articles, and *The VHF Amateur* in general. Your opinions help guide us in the right direction, so that the magazine can truly reflect VHF amateur radio.

BOB BROWN, K2ZSQ, EDITOR

A Compact 2 Meter Transceiver

RANDALL J. MARTIN, WA6ZFJ
1813 Third Street
Manhattan Beach, California

Cover Story: Here is a simple 144 mc transceiver using the new G.E. Compactron as the superregen detector and a.f. amplifier, and a straightforward transmitter delivering three watts output. This neat unit is ideal for mobile use.

THE transceiver described in this article is capable of delivering approximately 3 watts of fully modulated carrier on the 144 mc band. The receiver section utilizes the 6D10 "compactron" tube which is readily available at most supply houses. Total filament drain is only 3 amps. Total drain from the plate supply at 100% modulation is under 110 ma with a 300 v. supply.

Special attention was paid to shielding in the r.f. assemblies insuring a clean parasitic-free carrier. The grid circuit of the final amplifier is metered, which is especially helpful when changing crystals. Provision is made for switching the meter to read plate and modulator current; it was found, however, to be unnecessary as the dip in final plate current at resonance is very difficult to distinguish at this frequency. Final amplifier and antenna loading is accomplished with the aid of a field strength meter which is stored in the glove compartment of the car.

Completed unit after construction. Toggle switches on left are B+ and filaments. Front panel controls, left to right, oscillator, tripler, final loading, final grid meter, regen control, volume and tuning, 144-148 mc.

The Transmitter

The transmitter uses ½ of a 6U8 as a triode osc., which is tuned to 24 mc. The second half of the 6U8 is the tripler stage which is capacitively coupled to the grid of the 5763, which in turn doubles to 144 mc. All r.f. circuits are conventional and no difficulty was encountered during construction or tuning.

The Modulator

Since a transceiver of small physical dimensions was the ultimate objective, the modulator consists of a single 6AQ5 driven by a carbon mike. This tube is capable of an output of approximately 4.5 watts and delivers sufficient audio for 100% modulation quite easily. Although the plate and screen are run at slightly higher potentials than recommended, no ill effects have been observed. With the transmitter fully loaded, the audio quality is clean and sharp. Although by no means could it be called "broadcast quality", it provides plenty of punch for those days when the QRM level is high.

The Receiver: What to use?

At this stage in the initial design of the unit I must confess that activity seemed to bog down substantially. What to use? A converter? A superregen or both? Although the design of converters working into b.c. radios at this frequency has reached the stage where selectivity, sensitivity and s/n ratio are very good, it was decided that since the unit was to be a complete station with a minimum number of connecting cables, a receiver of the superregenerative type would be used. The heart of the circuit revolves around the 6D10 "compactron" tube. It is a triple triode with moderate gain, thus providing a stage of r.f. amplification, a superregenerative detector and an audio amplifier stage. The r.f. stage serves a twofold purpose. It isolates the detector from the antenna and provides a fair amount of gain. The audio output of the 6D10 is coupled to a 6AQ5 power amplifier which in turn drives a small standby speaker and a telephone type handset simultaneously. Strong signals are readily heard even while the car is traveling at high speed, although for weaker ones the handset must be used.

The inherent disadvantage of the superregen, namely its poor selectivity, was not so apparent in this unit. Separation of strong and weak signals very close to each other has astounded the author time and again. Although another stage of audio amplification could readily be added, the unit in its present state serves the purpose for which it was intended.

Construction

The complete unit is constructed upon a 12 × 3 × 8" chassis. All control locations are readily apparent from the photographs. The tube sockets are mounted on the divider strips, thus providing effective shielding of r.f. components. Almost all components may be mounted on the sub-assemblies while they are out of the chassis, making construction simple. Feed-thrus are provided for

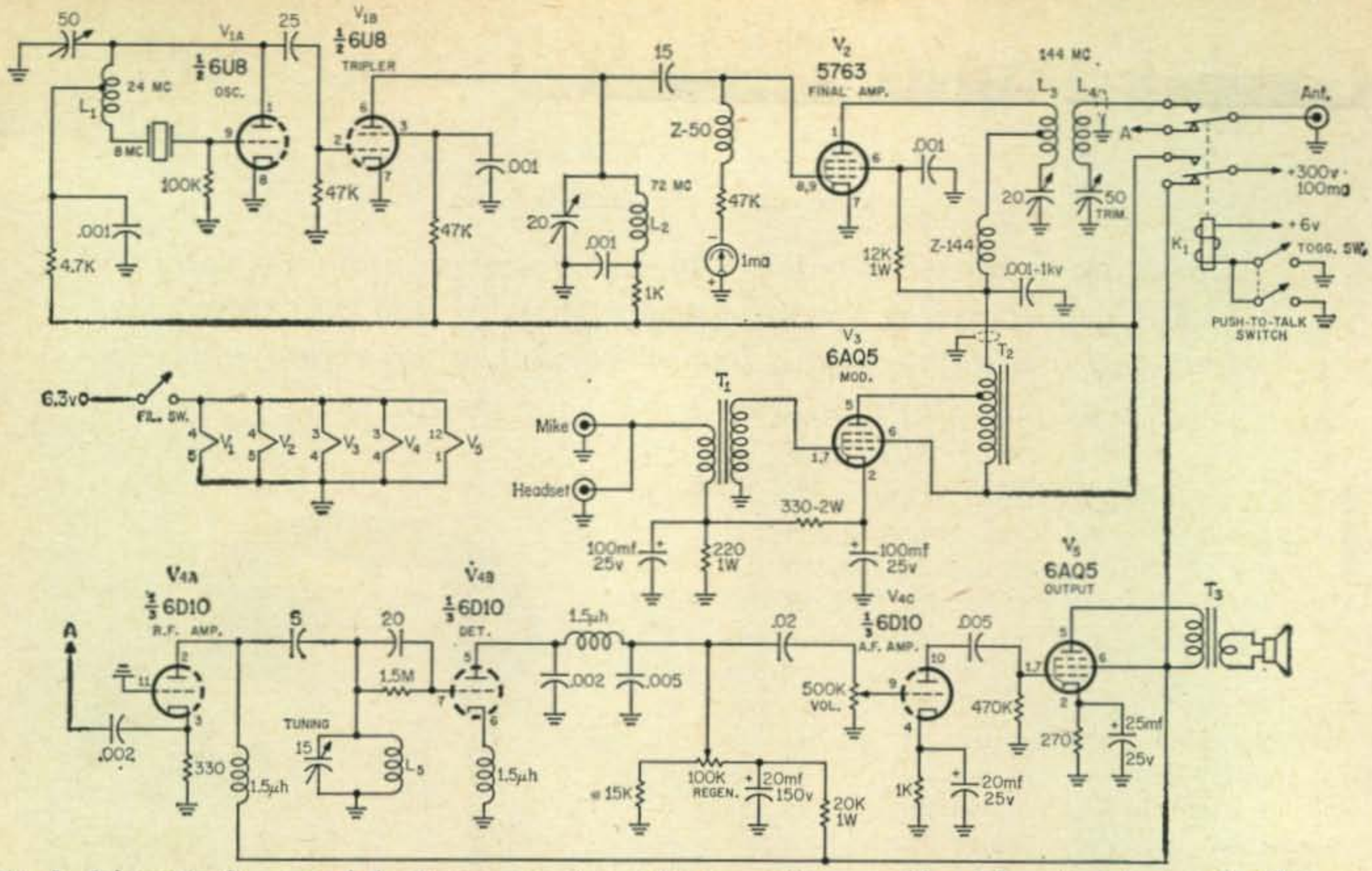


Fig. 1—Schematic diagram of the "compactron" to meter transceiver capable of 3 watts output and utilizing a superregenerative receiver. Standard 8 mc crystals are used.

L_1—15t. #20 tinned ½" dia. ⅞" long tapped 4t from crystal end. B&W 3003.
L_2—5¾t. #16 tinned 7/16" dia. ⅝" long.
L_3—4t. #16 tinned ½" dia. center tapped.
L_4—1t. hook-up wire 1" dia. link on center of L_3.
L_5—2t. #16 tinned ½" dia.

T_1—Input transformer, single button, carbon hi-gain. Triad A-5X.
T_2—Modulation transformer, 5K-6.75K. Triad M4Z.
T_3—Output transformer. 5K to voice coil.
K_1—D.p.d.t. relay, v.d.c. coil. Potter & Brumfield KL11D.

final r.f. grid drive and modulation input. The r.f. output coil is terminated in a b.n.c. connector which in turn goes to the TRANSMIT-RECEIVE relay. Receiver construction is not critical, although all leads should be kept as short as possible. Due to stray capacitance and construction techniques, the values of inductance and capacitance for the receiver may not be identical to those noted in the schematic. However, with the aid of a grid dip meter a bandwidth of approximately 140-150 mc, should be easily attained.

Adjustment

Tuning of the r.f. section is quite straightforward. Disconnect B+ and screen voltages from the 5763 and insert an 8 mc crystal in the socket. Adjust the osc. plate tuning capacitor for resonance at approximately 24 mc, which is evident by a very pronounced dip in plate curent. Plate current runs about 20 ma at resonance. Now adjust the tripler plate circuit for maximum grid current to the 5763 stage. Grid current with the transmitter fully loaded should run about 1 ma. Check with a grid dip meter to insure that the tripler is operating at approximately 72 mc. Now apply plate and screen voltages to the 5763. With the aid of a grid dip of field strength meter, tune the final for maximum output at 144 mc with a dummy load consisting of a No. 47 pilot lamp across the antenna terminal. Adjust final plate and the antenna loading condenser for maximum brightness of the lamp. Now with a meter in the + circuit, *very quickly* pull the crystal and see if the dummy load goes out indicating the circuit is crystal controlled. If it does not go out, the 5763 stage needs neutralizing, which is usually not the case. However, if this situation exists, a small value of capacitance in the screen grid of the 5763 will cure the problem. A value of 312-mmf should do the trick. Now plug in the headset or mike and speak at a normal level. The lamp should increase in brightness and the plate meter should "kick" upward about 20 ma on voice peaks. Total transmitter plate current should run about 50 ma with the final fully loaded. With the modulator in the circuit, the plate current will be approximately 100 ma.

Adjustment of the receiver is very simple. The detector circuit should be adjusted so the bandwidth is approximately 140-150 mc. Spreading or compressing the tank coil should bring the circuit into the two meter band. Maximum sensitivity seems to be obtained when the REGEN pot is set at the point where the receiver just breaks into oscillation. However, on strong signals, advancing the pot will allow more volume while still retaining the inherent a.v.c. action of the superregen detector. It was also found that c.w. signals were received very well with the REGEN control turned all the way counter-clockwise. With a 19-inch whip mounted on the raingutter of the car, no apparent change in the oscillating point of the detector was noticed, due to the antenna whipping back and forth. ■

The Sixer—On DSB!

BOB HEIL, K9EID
402 Border Street
Marissa, Illinois

KEN MEACHUM, KØKYZ
26 Magnolia Drive
St. Louis 24, Missouri

Here is a unique article: putting the Heathkit Sixer on double sideband. The cost is low and the system can be in working order in just a few evening's time.

ALMOST everyone operating 50 mc today has a Heathkit Sixer around, either in the car or on the air as a fixed station. Many 6 meter operators have one of them as a spare rig sitting around collecting dust, and have little use for them until the big rig "goes South." If you have been keeping up with the many conversion articles that have appeared in magazines since the introduction of the Sixer and Twoer, your attention may have been aroused by the many duplication of the modifications. This we will guarantee: Here is one "modification" that you won't find duplicated anywhere.

Sideband seems to be the coming thing. Everyone's doing it. If you've got a Heathkit Sixer, why not try this system? All you need is a decent communications receiver so's you can listen to 6 meter sideband, and you're all set.

How It Works

Actually there are no real "modifications" to the Sixer in order to use it on d.s.b. The little system is built on two chassis: one is the modulator, using a 12AX7 and a 6V6, while the other chassis contains the balanced modulator (sideband converter-final) that is connected to the Sixer via a short run of 52 ohm coaxial cable. The modulator (first chassis) is hooked up through just a short power cable.

The d.s.b. transmitter is exactly like any a.m. rig as far as the r.f. section is concerned. The difference is that the 6AQ5's that make up the balanced modulator would have been used as a push-pull final in an a.m. transmitter. Here their purpose is to null the carrier while transmitting the two sidebands (upper and lower). Now, if you were to go the *single* sideband route, some means of suppressing the other sideband would have to be used here. This is where the trouble comes in (and the expense!). The d.s.b. will be almost as effective and will serve as a useful and inexpensive way to get on sideband. Six meter sideband operation is by no means of the proportions that it is on the lower frequencies (20 meters, for example) and the space occupied by d.s.b. as compared to s.s.b. is not such a critical factor. *Editor's Note: I've been running 20 watts on 6 meter d.s.b. for four years now. All kinds of DX!—K2ZSQ.*

Chassis Work

The balanced modulator (sideband converter-final) is built on a 5 × 7 × 2" Bud chassis. Begin by wiring and bypassing all the filaments and connecting them to the power plug on the back wall of the chassis. Mount a five pin tube socket on the chassis and connect the plate circuit up to this. The matching plug can then be wired to the plate coil. Within an hour this part should be ready to fire up.

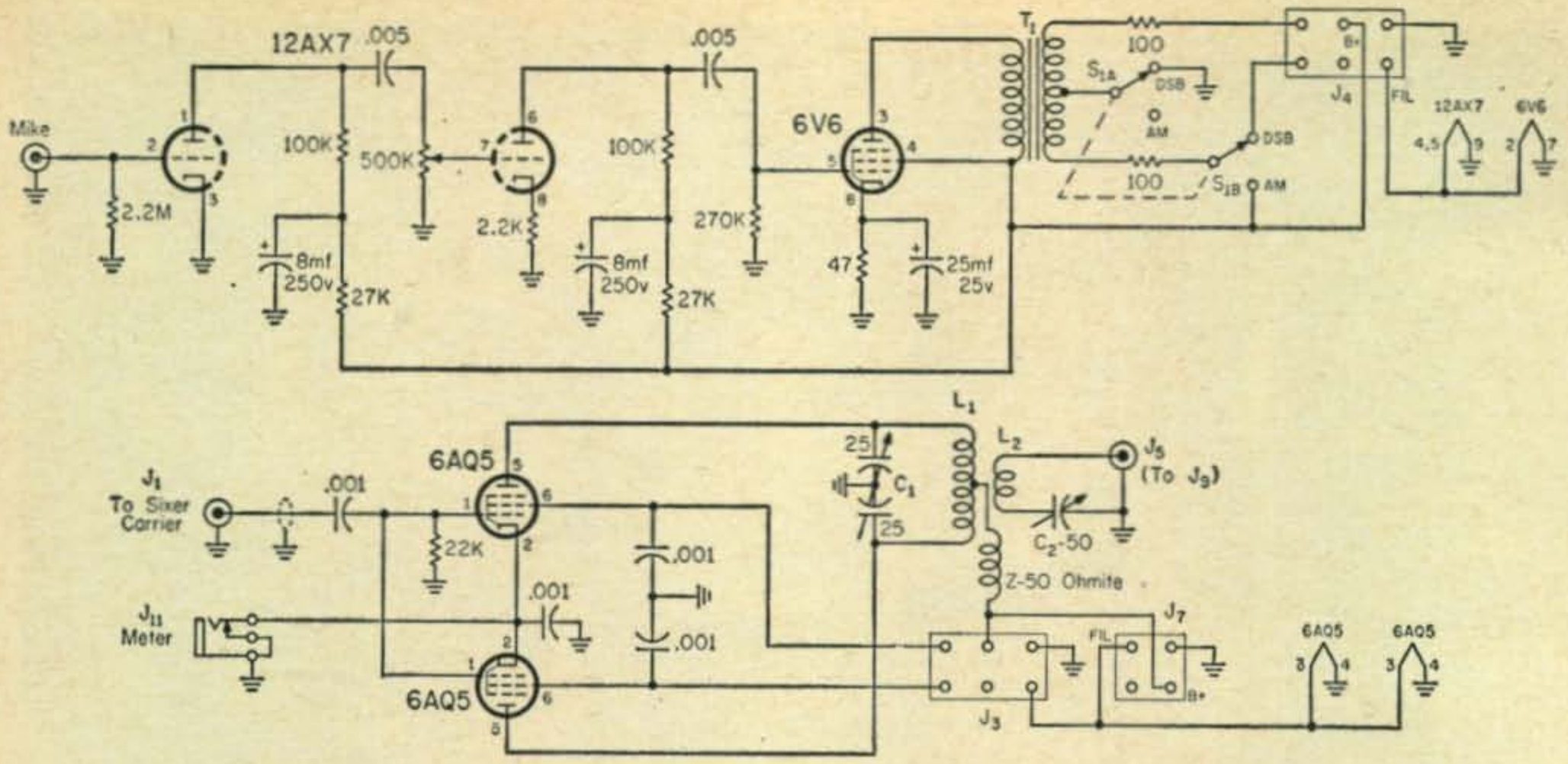


Fig. 1—Schematic diagram of the speech modulator and balanced modulators (sideband converter-final) for the Heathkit Sixer.

C_1—Dual 50 mmf. Bud #LC-1662.

L_1—6 t. enamel, #10, ⅞" dia., 1" long.

L_2—3 t., enamel, #18, ⅝" dia., placed in center of L_1.

T_1—Triad A31X or Thordorson 20D76.

Next, get the second 5 × 7 × 2" chassis prepared by punching the holes for the 12AX7 and the 6V6 tubes. The modulation transformer, T_1, is mounted on the left end of the chassis beside the 6V6. An octal socket is mounted on the back of each chassis for the power.

Fiber epoxy circuit boards with all hardware are available from the authors at $6.00 each.

Wiring

Now that we all understand how this thing is set up, and the chassis work started, the remaining job is to get the small chassis wired and tested. Since we do not have to worry about a carrier on six meters (as the Sixer provides us with a very nice 50 mc signal) work can begin on the 6AQ5 finals. This unit is extremely simple, having only 11 parts. *Yes, eleven!* The largest and most expensive component here is the plate capacitor, C_1. This can be gotten from the junkbox, if you have one of any size.

The wiring of both chassis takes very little time and the layout is not critical. No particular attention need be given toward shielding, *etc.* The wiring is most straightforward and simple.

Switching and Connectors

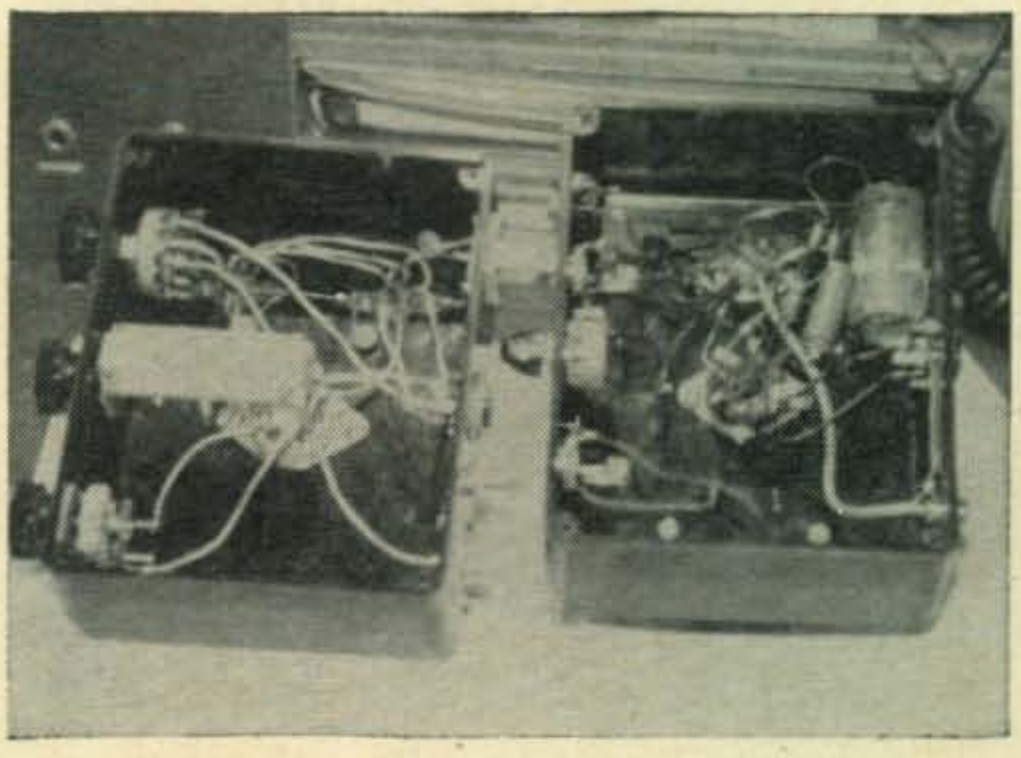
How to key-in the d.s.b. modulator? Since it is apparent that a receiver capable of copying sideband must be used, this problem of controlling the antenna switching and the keying-in of the Sixer becomes most simple.

A Cinch-Jones two-conductor plug is installed on the back of the Sixer and is wired in series with the B-plus lead that feeds the transmit-receive switch. The matching plug is wired to an extra pair of contacts on the relay (coaxial) that switches the antenna. This will then control the Sixer transmitter as soon as the coax switch is keyed. The coax switch can be keyed by any SPST toggle switch on the power supply chassis. It could also be keyed by a relay that could be actuated by a vox circuit if you so desired. A look at the diagram for keying will quickly show how this is done.

When the Sixer is operated as a normal a.m. transmitter-receiver combination, a second mate to the Jones plug on the back of the Sixer will have to be used. Just connect these two terminals together so that the B-plus is fed to the switch on the front panel. With this modification, the Sixer can then be used as it came from the factory or on the d.s.b. mode. Easy?

Power Supply

After this is finished, all that remains is to get a source of power. Here the Sixer could be used as a power supply, but, to eliminate any possibility of frequency modulation of the carrier and r.f. feedback, a separate power supply was built on a small chassis using a TV replacement transformer that had been taken from a discarded television receiver. The filter choke and



Underside view of the d.s.b. units. The balanced modulator is on the left, speech modulator is on the right. Chassis layout for these projects is not critical. Construction is straightforward and simple.

Closeup view of the d.s.b. units. The balanced modulator (sideband converter-final) is on the left and the speech modulator is on the right. Controls on the speech modulator, l. to r., OUTPUT jack, GAIN CONTROL, MIKE jack, and ON/OFF switch.

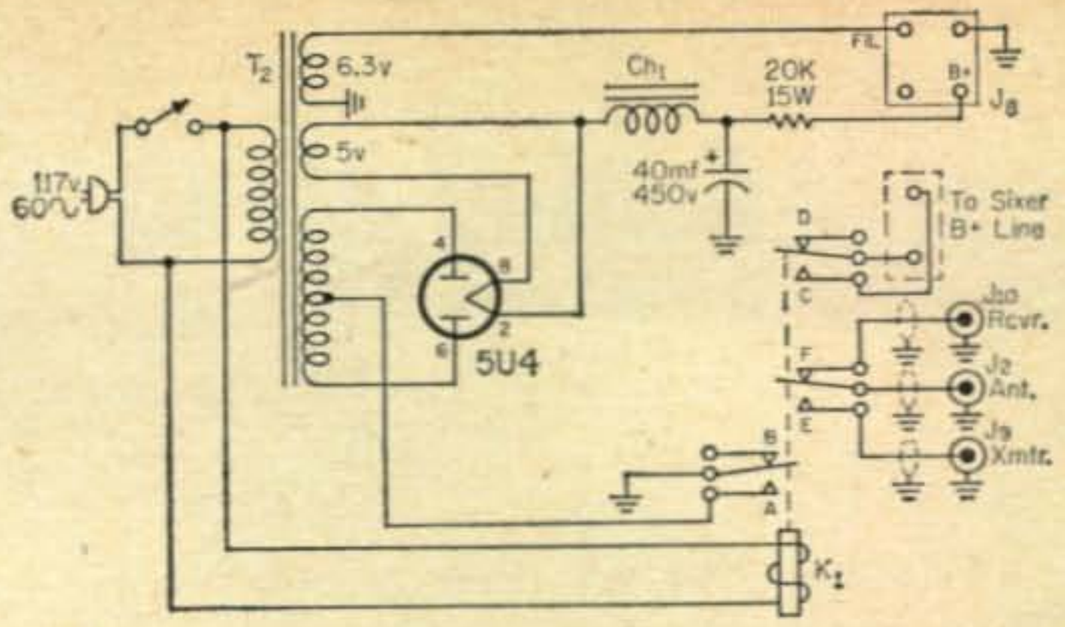


Fig. 2—Schematic diagram of power supply, showing also the relay control system.

CH_1—8 hy., 200 ma. choke.
K_1—DPDT coaxial antenna relay.
T_2—TV type replacement transformer.

some large bleeder resistors were also available from this same source. The filter capacitor was purchased new, to eliminate any possibility of getting a leaky or shorted one from the used TV. This is always good practice to follow when salvaging parts from these old chassis. The schematic for the power supply is shown in figure 2. This gives us plenty of high voltage for both the speech modulator and the balanced modulator, as well as for the filament supply.

Tuning Up

Testing this rig is the easiest job to do. Begin by connecting up the Sixer to the balanced modulator (sideband converter-final) and hooking the speech amplifier and modulator to the power supply and balanced modulator. Connect a dummy load to J_2. Turn S_1 to the AM position.

While listening on the station receiver and turning the d.a.b. rig to TRANSMIT, the signal should be heard on the frequency the Sixer is on. Adjust C_1 and C_2 for maximum output on the dummy load. An adjustment of the final tank capacitor on the Sixer might give a little more output to the dummy load. Turn S_1 to the D.S.B. position and advance the AUDIO GAIN to approximately the twelve o'clock position. As modulation is applied, the dummy load should light with voice peaks. A quick listen on the receiver will prove that this little rig does work.

In Case You Don't Have A Sixer . . .

If any other 50 mc carrier is used to drive the balanced modulators and is over 2 or 3 watts, output should be controlled through a pad at J_1 The Sixer is most adaptable, as it provides just the correct output without any swamping to drive this d.s.b. rig.

Windup

Little time, money, or trouble went into the construction of this system. Here is one sure way to put your existing a.m. transceiver on d.s.b. and really have a ball with the rest of the sidebanders. *Get with it and good luck!*

Protect Those Finals

IRWIN MATH, WA2NDM
126B Taylor Avenue
East Brunswick, New Jersey

OFTEN in amateur transmitters, blowers are incorporated to prevent final tubes from overheating. In some cases, loss of the forced column of air from the blower will result in complete destruction of the final tube (4X150's etc.). A very simple and inexpensive way to protect these tubes is to install a thermistor in the air stream near the tube. When wired in the circuit of fig. 1, the relay will close ringing the bell, lighting a light, shutting off the rig, or whatever you desire, as soon as the temperature exceeds the predetermined value. R_1 is the calibrating resistor.

The values of resistors used will vary with the relay and thermistor used. The ones given in the schematic should be used only as a guide. As the temperature increases, the resistance of the thermistor will drop and the current through the relay increase. At the preset temperature, enough current will flow through the relay to close it.

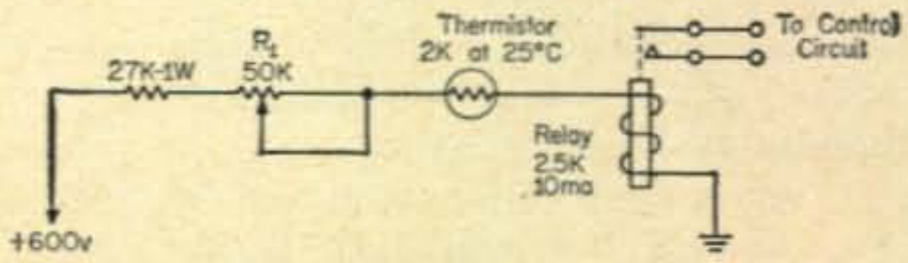


Fig. 1—Schematic diagram of the air stream thermistor installation near the final amplifier tube. The thermistor can then control a relay which could light a warning lamp, or simply shut off the rig. Excessive heat near the final can destroy the tube.

Although this idea is not new, availability of the thermistor in recent months prompted this application. Many medium powered VHF transmitters, such as the popular 829B's, the new crop of s.s.b. heterodyne units and the 50 and 144 mc hundred-watt-plus amplifiers are ideally suitable. ■

Fourth of a Series

Getting Along with the Indians

DAVID L. HELLER, K3HNP
14 Darkleaf Lane
Levittown, Pennsylvania

Six meter TVI has been discussed in the previous installments of this series, bringing out many problems and various solutions. It has been found, however, that the single most effective answer for 6 meter TVI is a good high-pass filter, preferably a Drake TV-300-HP, at the TV receiver. In most cases the installation of this device almost completely cures the problem, if the six meter transmitter is clean and there is a good TV antenna hooked to the set.

Many manufacturers have agreed to furnish filters to customers demonstrating a real need. In past years *The VHF Amateur* has widely circulated a list of addresses for obtaining free high-pass filters. I've attempted to update this list with fair success by sending a questionnaire to the major manufacturers. The following data is derived from the information supplied by these companies on that form.

General Electric and Hotpoint: Supplies the Drake TV-300-HP for set of any age. Requires model, serial number and "customer indication of need." Write to the General Electric distributor in the nearest large city; check your telephone book. The list is far too lengthy to reproduce here.

Magnavox: Supplies filter for any age set. Drake supplied if 6 meter interference is specified, otherwise Regency. Requires serial, model numbers, and if possible, FCC endorsement of need. Write: The Magnavox Company, 2131 Bueter Road, Fort Wayne, Indiana. Attention: Service Department.

Philco, Crosley, Bendix: Supplies part no. 420-0018 (a Drake) for any age set. Requires serial, model numbers, and TVI Committee endorsement of need, if possible. Write: Philco Corp., C and Westmoreland Avenues, Philadelphia 34, Pennsylvania. Attn: C. H. Godshall, Jr.

Westinghouse: Supplies Drake high-pass filter. Requires only model and serial numbers. Installation free during TV warranty period. Write: Westinghouse, TV-Radio Division, P.O. Box 71, Metuchen, New Jersey. Attn: Service Department.

Zenith: Supplies filter, their own manufacture, part no. S58500, for any age set. Although this filter is not a Drake, it may well be effective at the lower frequencies. Write: Zenith Radio Corp., 6001 W. Dickens Avenue, Chicago 39, Illinois. Attn: Brian J. Marohnic.

The following sources were not obtained through the questionnaire, although they have proved adequate in the past.

Admiral: Supplies Drake filter for sets up to two years old. A $1.00 charge is made for older sets. TV serial and model numbers are required. Write: Admiral Sales Corporation, 903 Morrissey Drive, Bloomington, Illinois.

RCA: Supplies Drake filter for sets of any age. Write: RCA Sales Corporation, 600 N. Sherman Drive, Indianapolis 1, Indiana. Attn: Consumer Relations 6-206. Local RCA Service facilities will usually provide filters; free installation is normal for sets up to one year old. Occasionally free installation is available for older sets at the discretion of RCA Service. Note that most RCA sets require a special plug-in Drake filter, and that grounding of this filter is essential.

Sears and Roebuck, Montgomery Ward: Contact your local retail store, attention of Service Department Manager, or write the nearest mail-order house, attention of Appliance Service.

Emerson-Dumont: Limited information at hand on requirements and filter type. Give as much information as possible. Write: Emerson Radio Co., 524 West 23rd Street, New York, N. Y. Attn: Mr. Raftery.

Motorola: Limited information at hand on requirements and filter type. Write: Motorola Communications and Electronics, 540 Bergen Blvd., Ridgefield, New Jersey. Give as much information as possible.

Private-Name Sets: Contact the Service Department of the store. Satisfactory results unlikely. Give as much information as possible.

Procedure

A standard letter has been used by many TVI committees for requesting high-pass filters. The recommended text is:

"This is to notify you that I have been receiving the 50 megacycle transmissions of amateur radio station W3XXX on my ..... (brand) television receiver.

"Please forward a high-pass filter capable of attenuating signals up to 52 mc. (R. L. Drake TV-300-HP or equivalent).

"The serial number of my set is ..... and the model number is ....."

The Bucks TVI Committee, of which I am chairman, has had very good success with a three part form originated by Mike Fekete, K2QOS. The first part is a report form for individual interference complaints, to be filled out at the complainant's home, and forwarded to the FCC for their records. The second part is the high-pass filter request letter; the last part is the list of manufacturers supplying free high-pass filters. I will honor requests for sample sets of this form when accompanied by 10¢ to cover my mailing.

Next month: All about TVI Committees.

UHF

ALLEN KATZ*, K2UYH

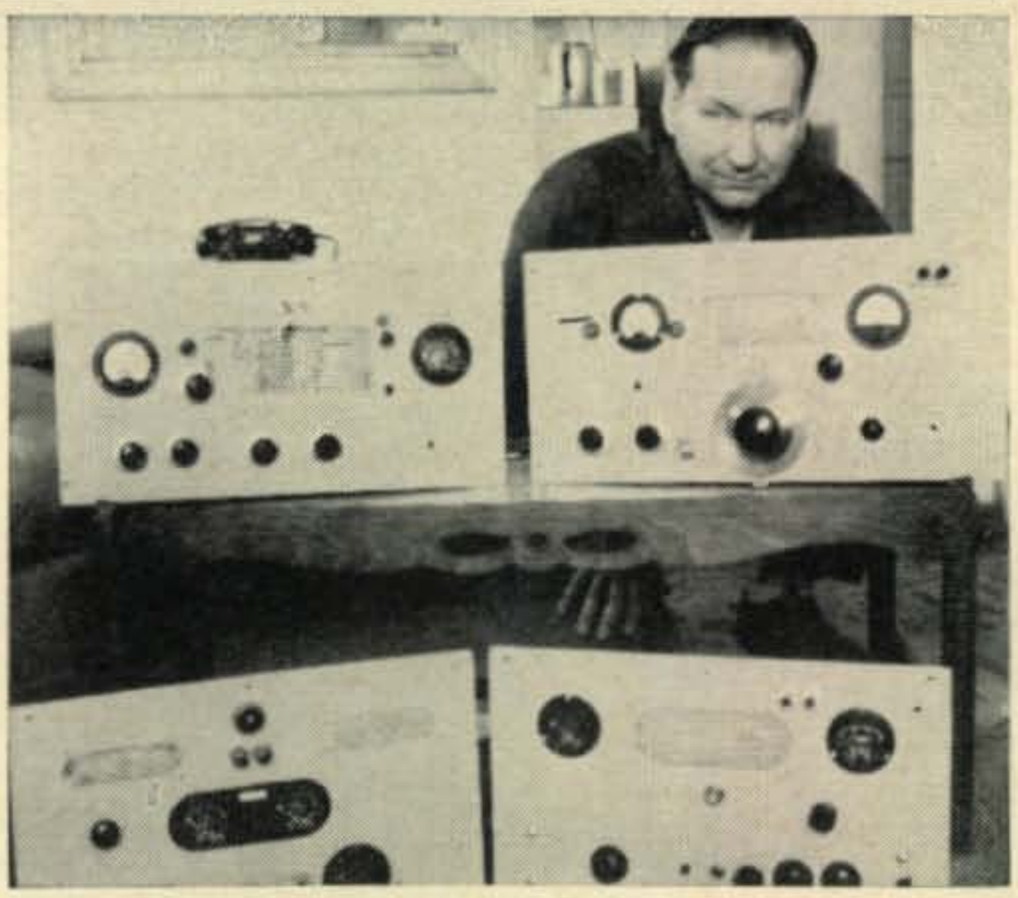
How many times have you read articles with titles like "High Power Confidential" or "The Truth about the DB?" Most of these articles end up trying to show that more gain can be obtained by putting up a bigger antenna than by going to higher power. They are telling only half the truth. Radio gains like many other things in life are subject to the Law of Diminishing Returns. This law is not enforced by the FCC, yet it is just as effective.

Consider the OM down the road with a two watt output transmitter. All he must do to get a 3 db gain is increase his power by two watts. This transmitter modification is probably easier for him to carry out than climbing up on the roof and stacking a second dipole. However if you are a lucky enough fellow to be getting 800 watts output from your rig, to get the same measly 3 db gain obtained by your friend down the road with a two watt power increase, you have to increase your power 800 watts. At this point the articles would tell you to get the 3 db gain from your antenna. But, most u.h.f. stations have a pretty large antenna to start with, and the "law" applies to antennas as well as transmitters. You can only get a gain of 3 db by increasing the size of a 100 element array to 200 elements. As you see, a gain of 3 db can pose a real problem for the all around well equipped station.

This is why the development of the parametric amplifier and other really low noise receiving techniques caused such a stir in v.h.f. circles not long ago. Here was a part of the v.h.f. amateur communications system not yet completely subject to the Law of Diminishing Returns. The full effect of the parametric amplifier will probably not be felt on the u.h.f. bands for several years. Yet, already many advanced u.h.f. operators are asking, "Where can I get still another db gain?" And amateur radio is about to enter another epic making period with the present development of methods to detect signals under the noise.

Analysis of noise is not new; radio astronomers have been using the idea for years. But amateur radio is the first instance where the idea has been applied to communication. There are several different methods of detecting signals under the noise being worked on by amateurs. The system which we are most familiar is that of integration. The principle behind integration is the idea that noise is made up of a series of completely random pulses. A signal is considered to be undetectable when it drops below the level

*48 Cumberland Avenue, Verona, New Jersey.



Ted Fabian, W3RUE, of Belle Vernon, Pennsylvania, with some of his final amplifiers. Top row, l. to r., 220 mc rig, 144 mc unit. Bottom units are for 432 mc.

of the noise pulses. Repetitive integration of the rectified noise should produce an approximately stable voltage. When noise plus signal are repetitively integrated, the voltage output should be greater despite the fact that the signal may be below the noise pulses. The operation of an integrator can be explained by considering it an area summing device and the noise as a wavy graph. The weak signal fills in part of the space between the noise pulses, therefore creating a larger total area and a higher voltage. Another system is that of synchronous detection. This system is being worked on by K2TKN, W2AZL, K2LNG, and many others. It promises a gain of 30 db—more than increasing your antenna 1,000 times! A combination of synchronous detection and integration promises even more gain. I am sure amateur radio will be hearing more about detection of signals under the noise in the near future.

220 Up

Walt, K1RTS, from Waterbury, Conn., should be on 220 and 432 mc by the time this is printed. On 220 Walt will run a B-19 Mark II transmitter and an ARR-2 receiver into a 5 element beam. On 432 mc the transmitter will be ANP-1. Vic, W9JFP, is ready to go on 432 mc from Milo, Wisc., with a pair of 4CX250B's running 800 watts, 416B coax tank pre-amp into trough line converter, and a 54 element Yagi on a 40 foot boom 130 feet up. Look for Vic on 432.025 mc

[*Continued on page 75*]

DX report

DANIEL L. PARNES*, WA2DMQ ROBERT M. BROWN*, K2ZSQ

THE young blood in our midst has a sometimes annoying way of striking back—where it hurts the most. Case in point: East Coast two meter men may be familiar with the call of WN2AOG, Rahway, New Jersey, a relative newcomer to the VHF bands. Ron's station is nothing exceptionally elaborate, a twenty watt transmitter and a three tube converter into a modest communications receiver. What is unusual, however, is his antenna. Ron's array consists of four eleven element Yagis arranged in a quad fashion, with each antenna equadistant from the other. This effective 44 element rooftop horror provides approximately 21 db forward gain to his twenty watt transmitter. Needless to say, Ron works his fair share of DX. As a matter of fact, WN2AOG and K2ZSQ are continually comparing logs, his 2 meter record against my 6 meter contacts, and, quite frankly, it is oftimes embarrassing . . . for me. What really terrifies me, though, is the thought of what Ron might be able to do when he earns General Class privileges and tries his hand at c.w. at 144.01. Alas . . .

Aside from just being an interesting story, however, this case somewhat typifies the new crop of VHF men sprouting up around the country. They're antenna minded and ambitious. And they work DX. Large arrays are becoming more and more commonplace, making it increasingly difficult for some of the older generation of frowning dyed-in-the-wool enthusiasts to keep up with the times. Personally, I think Ron has the right idea.

50 Mc News

. . . *VE8BY*—in Yellowknife, Northwest Territory, Canada, worked VE6IP, VE4MA, VE4JX, and VE6MO, on Jan. 31. He reports hearing WØEUG, N.D., but no QSO . . . *K1WZS*—reports Sporadic-*E* to the Midwest on Dec. 14-15 . . . *WA2CWF*—in Buffalo, N.Y., is looking for technical assistance . . . *WA2GSO*—in N.J. worked W3OMY, 15 miles n. of Pittsburgh on Jan. 20 . . . *WA4EDR*—is looking North for six meter contacts. Write for skeds . . . *WA4JYN*—in The Land of Sunshine enjoys working Puerto Rico with his groundplane when those with the beams are having trouble . . . *W4HHY*—contacted many active DX'ers in East: WA2OLB, WA2FMC, WA2CVF, K1ONJ, and W1DEI . . . *WA4IMX* in Memphis would appreciate skeds. He reports that WA4FGB and K4HOZ are also keeping a watchful eye out for DX . . .

. . . *WA5ACF*—in Orange, Texas, talked to K8UQA in Cleveland on Dec. 20th, for a real solid QSO . . . *K5JII/5*—from Marshall, Texas, wants to make sure that the fifth call area is heard from here. K5JII reports hearing stations from Little Rock on Dec. 20th.

. . . *K7OCG*—of Phoenix reports that down his way the only DX that came in was on Jan. 29-31. Stations heard and worked were WA5EQG (Okla.), K5RGD (Tex.), WA6LHS (San Mateo) . . . *K8REG*—caught openings recently

SKED BOX

Policy: Although the Sked Box will appear every month, your listing must be re-submitted to be repeated. No listings are held over. *Deadline for Sked Box listings is the 20th of the month.* All data received after that date will be run the following month. Listings must be submitted on a postcard or the Reader's Reporting Form. Give as complete information as possible. Listings are compiled first by frequency, then by call area. Address all requests to: "Sked Box," *The VHF Amateur,* 300 West 43rd Street, New York 36, New York.

Schedules Wanted—50 Mc

K4YDG to Md. and W. Va. Write: 942 Crescent St., Roanoke, Va.
W4IMX to Ga., Miss., Ark. Write: 2406 Sterling Road, Nashville, Tenn.
WA5APU to S.C. Write: Box 588, Trinity, Tex.
W6BUR to Seattle. Write: 1357 Washington St., San Francisco 9, Cal.
K8BQJ to Minn., N.D., and S.D. Write: 2300 Plainview Dr., Saginaw, Mich.
W8PT scatter to Maine, N.H., N.M., Ariz., Nev., and Idaho. Write: R.R. #3 – Box 157, Benton Harbor, Mich.
W9BLZ to Wis., Ind., Tenn., and Kas. Write: 4751 Vincent, Granite City, Ill.
K9DTB to Nev. Write: 531 S. Illinois, Villa Park, Ill.
WØGXJ to Mo., Kas., Neb., Ark., Minn., and Wis. Write: 3534 1st Ave., Cedar Rapids, Iowa.

Schedules Wanted—144 Mc

K1VUE to R.I., Conn., Ve., and N.Y. Write 37 Allen St., Wilton, Maine.
WA2VBX to R.I. Write: Box 85, Rocky Point, N. Y.
WN2EIE to New England. Write: 40 Franklin St., Verona, N.J.
K9RVG to Pa., and W. Va. Write: 11114 So. E. Brooke Ave., Chicago, Ill.
K9DTB to W. Va. Write: 531 So. Illinois Ave., Villa Park, Ill.

**The VHF Amateur,* 300 West 43rd St., New York 36, N. Y.

to Alabama and Texas and succeeded in snagging K1PLJ, Mass. . . . *K8YGZ*—who operates mostly c.w., worked W9DGX on Dec. 17, and in the same aurora worked Pa. and Wisc. . . . Active in the Detroit area are K8TCL, K8SSZ, and K8YVI. All are well equipped to work DX with no real difficulty. For example, ten states and one foreign country were worked during December alone by their combined efforts . . . *K9UYK*—worked via ground wave Peoria, Ill., from Moline, on Dec. 22nd.

. . . *K9DTB*—worked WØZBL, Ames, Iowa, on the aurora of Jan. 30. Also heard were WØPFP, W8's and W3's . . . *K9UUR*—of Villa Park, Ill., worked W8ESZ in Grand Haven, Mich.

Odds "n" Ends

Manitoba VHF Society: Murray Ronald, VE4RE, tells us about this new group. "The Manitoba VHF Society was formed with the aim of furthering VHF and UHF activity in the VE4 district. Beginning with approximately a dozen members, the group intends to devote most of its energy to technical projects and programs." *Don't forget contests, Murray!* "For those interested, the net and calling frequencies in this area are 50.280 mc and 144.200 mc. We'll keep you posted from time to time on further happenings from VE4 land." *Good luck with the society, Murray. If there's anything we can do, don't hesitate to drop a line.*

New Two Meter Net: Lynwood Hosaflook, W4YAP, writes, "By the way, Bob, we have a 2 meter net in the Harrisonburg, Va., area which meets each night at 8:00 P.M. EST. Frequency is 145.8 mc. Net control is Tom, W4JG. If you're

[*Continued on page 76*]

Here's that license plate collector again, Dave Heller, K3HNP, at the South Jersey Radio Assn.'s Hamfest. If you'd like to add your plate to Dave's group, drop a line to: 14 Darkleaf Lane, Levittown, Pa. He'll pay postage on plates.

Reader Reporting Form

Fill Out Now! **March-April, 1963**

This form serves as the basis for our DX REPORT column in *The VHF Amateur*. Your participation in this program is of utmost importance, for without news-activities reports from you, we cannot provide a truly comprehensive column. *Deadline:* April 20, 1963. Return this form to: DX REPORT, *The VHF Amateur*, 300 West 43rd Street, New York 36, N.Y.

Your name ..... Call .....

Address ..... City ..... State .....

This report covers my 6 2 220 432 (circle one) activities for the period. Enter only one band's activities on this form. Extra forms free upon request. (S.A.S.E. please.) Check here ☐

Antenna (number of elements and type) .....

Best DX Recently

Date	Time	Call	Location	Sig. Rpt.

Sked Box Listing: Do you desire schedules to a particular area? (Give state.) .....

.....

Do you presently hold skeds? (List calls, times, days and frequencies) .....

.....

Approximate distance of longest contact made this month (give details: call, number of miles, day, *etc.*) .....

daily at 2200 CST. His beam will probably be pointed either East or South. K9DOE will also have similar setup on 432 mc from Forest Lake, Ill.

Activities

Ted, W3RUE, writes on 432 mc in Western Penn:

"Since I haven't been too active during the last couple of months (only skeds with W8EDS, 85 miles), W3BQG, K3LUW, and a crossband QSO with W8TYY in Columbus, Ohio), I have been doing some building and designing of equipment." *We all should be so inactive.* "The line up now on 432 mc is an 832 (144 mc) to a 5894 tripler to a 5894 final running 75 watts in." *Doesn't that 75 sound good?*

Vic, W5HPT, reports on 432 in Texas:

"Not much to report on activity down this way during the last month. Got on the air on 432 with 200 watts input, but so far no new contacts. In running regular checks with W5AJG; I found I wasn't copying him. Check at his end revealed that he had an open line. Repairs were made at his end, but still I couldn't copy him until he turned his antenna on me. Subsequent check at my end revealed I had an open line in the shack also! At any rate during the period I found I could copy his 432 mc signals with no antenna on the converter in my shack also."

Ben, W9OVL:

"The rig here is a forced air cooled 5894 running 125 watts in with a 416B pre-amp and Canadian type radar unit for receiver. The antenna is a 10 over 10, 40 feet up, fed with high efficiency line and an antenna tuner. Stations worked this month on 220 mc include K9's DNG, OOK, JIJ, ZWU, WSZ, and ZWV; W9's RPF, BIY, and ROS; and WA9FLV. We are interested in skeds with stations west of Chicago, and will be looking on Monday, Wednesday, and Friday nights between 8 and 9 CST." *What do you say fellows?*

Don't Forget

Yes, don't forget to be at K2RGF's QTH April 8, if you have an APX-6. It is the date of the first *APX-6 Operators Meeting* sponsored by the Central Jersey UHF Net. The time is eleven P.M. The place: 17 Baldwin Road, Edison, New Jersey. Contact Bob for exact directions, if you have not done so already. And don't forget your APX-6!

73, Allen, K2UYH

Contributors Note:

Specially printed UHF Reporting Forms are available in any quantity for contributing to this column. Send a self-addressed stamped-envelope for your supply to Allen Katz, K2UYH, 48 Cumberland Avenue, Verona, New Jersey. Let's hear from you!

Correction

"Sideband on Six" (p. 71, March). In fig. 1, r.f.c. at L_3 should be .5 mh. L_5's bypass should be .01 mfd. V_3's plate bypass is 1 mfd. V_5's screen resistor to 15K. Add position on S_1 so pole B will connect with 1 mf cap. on pin 8 of V_3. On fig. 2 VR dropping resistor should be changed to 7.5K. Change R_6 to 50K pot. Our apologies for these errors.

DX Report [*from page 73*]

ever in this area, give us a shout. We'll be glad to have you aboard." *I'll do that, Lynwood. Keep us posted!*

Two Meter News

. . . *K8IFL*—On Jan. 5-6, Bob worked W9DLY, W9LEE, WØBBN, WØIFS, W9OVU, and WØGKP . . . *WN2CWG*—Kerry Hauptli of Westfield, N.J., reports contacts with K3IHA, K3IUZ, K3IPM, WA2EMB, and W3VWX recently. *Heard you on the other night, Kerry.—K2ZSQ*. . . . *K1PLR*—Jan. 6 brought forth W3BDK, in Md. Nice haul, eh? . . . *W4UXV/KL7*—"I am located on top of 4300' Mt. Susitna, 30 miles west of Anchorage at a microwave site. 6 meter facilities on their way." . . . *W8PT*—Running daily skeds with K4IXC, Melbourne, Fl., for an 1180 mile path. "We never miss." . . . *K3QAX*—Columbia, Pa., works W2CBB regularly . . . *WB2CCO*—Heard K8HEG, W1JRA, W2NCF, K1CRQ during the Jan. 31 aurora . . . *W8RBW/2*—In December worked W1JSM, W1MEH, K1JNH, W3BS . . . *K8TCL*—Is busy racking up new DX from Detroit. Tom worked a slew of juicy ones last fall . . . *K9UUR*—Snagged K8ZQE for a nice 190 miler on Jan. 5 . . . *K9DTB*—Phil QSO'd WØRWC in Clinton, Iowa, on Jan. 5 for a 240 mile path. "Good tropo" comments Phil.

. . . *K6LRN*—Dick Watson, of Concord, California, desires skeds to San Joaquin Valley on 144.27 or 144.90 mc. Dick has an impressive station with a 10 over 10 array . . . *WA6QVI*—is a newcomer on 144 mc, and anxious to make skeds. WA6NFI comments that Jim has a 6360 final (designed by W6QED). *Let's hear more from the West Coast!*

Canadian Observations at WB2CCO

VE2HS north of Montreal, Quebec, works two nights a week to K2ISA (Q5 sigs) in Albany, N.Y. VE2IM in Montreal tells WB2CCO via 2 meters that the boys up that way are going all out for amateur TV on 432 mc. VE2ADA in Granby, Quebec, has a new 100 watt 2 meter rig on the air.

"The VHF boys up Montreal way and that area turn their beams toward the U.S.A. almost every night," reports Bernie, of Plattsburgh, New York. "Most of them work between 144.010 and 145.000 mc. VE2ANF in Cowansville, Quebec, has an 80 ft. tower with a 10 element 2 meter beam on top. Note: to date I have worked over fifty Canadian stations on 2 meters from this QTH." *You're making us green with envy, Bernie! Keep us posted!*

QRT

Well, that about wraps it up for another month. Reminder: Reporting Forms are available from *The VHF Amateur*, 300 West 43rd Street, New York 36, N.Y. Just enclose a self-addressed stamped envelope for your supply.

73, Bob, K2ZSQ
Dan, WA2DMQ

it possible to connect an external high-level plate modulator without necessitating any rewiring in the transmitter.

METERING: The panel meter may be switched to read BUFFER-GRID, AMPLIFIER-GRID and PLATE currents. A position is also provided to read relative r.f. output power. This is an especially nice feature which facilitates tuning for the most output, serves as an output monitor or may be used as a neutralizing indicator.

FUNCTION SWITCH: The following modes are controlled by the Function Switch: POWER OFF; V.F.O. SPOT; A.M.; STANDBY and C.W.

Assembly

Parts identification is readily made by Knight-Kit's usual method of packaging the resistors mounted on cards together with individual identification. This is a feature which saves a great deal of sorting and time. In addition, a photographic parts-identification sheet aids in the selection of not only the correct electronic component, but also in the various pieces of hardware. Pre-cut and trimmed hook-up wire, which is color-coded for different lengths, also is an added convenience.

A 36-page Assembly Manual provides complete instructions which are concisely given, and if the instructions for each step are carefully and completely read, no special problems will arise and the unit may be assembled in 18 to 20 hours.

The schematic diagram should be corrected to read: FUNCTION switch in OFF position.

Alignment and Tuneup

Three easy methods of v.f.o. alignment are set forth in the Manual.

Tune-up first involves adjusting for grid drive to the final. Desired meter readings are not given in the manual, but our experience indicates that about 3 ma is about right. As a protective measure, the final then is initially tuned for maximum output using the A.M. position. After this, it is again tuned for the best output, but this time in the C.W. *position*. This is the procedure for *both c.w.* and a.m., since the peak a.m. output depends on that obtainable on C.W.

Tuning up is a simple procedure which relies on the maximum obtainable power output (indicated on the relative power meter) from the final amplifier rather than depending on the resonant dip at rated plate current, as generally is done. This may seem a bit unusual; nevertheless, it is a good procedure, since coincidence of plate-current dip and maximum output does not always occur with tetrodes and should cause no undue concern as long as the amplifier otherwise exhibits stability. The lack of coincidence will especially be noticed when the T-150 is used on 3.5 and 7 mc.

The plate current for c.w. operation will be approximately 250 ma except on 50 mc, it will be 175 to 200 ma. With a.m. the resting current will be about 100 ma which, during modulation will kick up 60 to 70-percent of the c.w. current. The output-power meter reading also will similarly rise.

Performance

The first delivered T-150s exhibited a number of faults; however, these may be overcome with a modification kit [1]which provides several shields and a number of component and circuit changes. Application of these to the unit under test eliminated most of the early difficulties.

With c.w. on 3.5 and 7 mc a tendency toward some chirp and roughness of the signal was experienced, the extent of which depends on the tuning of the low-power stages. Some frequency modulation also was found with a.m. This is mainly due to the fact that the v.f.o. functions on the same frequency as one or more following multiplier stages. The only sure-fire cure is to operate the v.f.o. on a lower frequency. Fortunately, the T-150 has a separate v.f.o. range switch, so that when 7 mc operation is conducted, the v.f.o. may be switched to its 3.5 mc range, in which case the output frequency will be a multiple of the dial calibrations on the 3.5 mc scale. This will cure the problem. (Such operation may be used for the higher bands also).

This cannot be done, without modifications, for 3.5 mc band use, so the next best bet is to adjust the tuning of the low-power stages for the best sounding signal.

V.f.o. stability was found to be excellent both electrically and mechanically. Required warm-up up time for 3.5 mc was 15 minutes; for 7 mc, 30 minutes.

The final tank capacitance for 21 and 28 mc was found to be a bit high. This was corrected by moving the coil taps to *add* an additional turn for each of these bands. This resulted in increased output and less tank heating. Difficulties were encountered in properly matching to loads below 100 ohms on the 3.5 and 7 mc bands. This was corrected with a more favorable L/C ratio for 7 mc by moving the coil tap *down* two turns (*less* inductance).

The 3.5 mc inductance can likewise be cut down, but this requires switching in a capacitive padder across the plate-tuning capacitor. It is interesting to note that when these steps were taken in the unit under test, that full loading with low-impedance was readily obtained together with coincidence of plate-current dip and maximum output.

POWER OUTPUT: The output ratings specified in the manual are: 90 watts on 3.5 through 21 mc, 55 watts on 28 mc and 40 watts on 50 mc. After the tank changes, just given above, were made, and with the final plate loaded to 250 ma, at which point the measured plate potential was 640 volts for an input of 160 watts, the measured output in a 50-ohm load

[1]Available free of charge to owners of original kit. Request for modification kit #040159 should be made to Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill., giving date of purchase of original kit.

was: 110 watts on 3.5, 7 and 14 mc, 105 watts on 21 mc and 90 watts on 28 mc. Output on 50 mc was a little under 40 watts.

MODULATION: As is common with modulation systems of the type used, the r.f. envelope is never quite fully modulated, however, due to controlled-carrier action modulated power is favored in the positive direction which results in both a high average and peak power.

Excellent quality is obtained with the T-150 and the measured tone-modulated peak power was found equal to the c.w. power, while during noise modulation the short instantaneous peaks actually exceeded this value slightly due to the regulating action of the power supply filter.

In order to avoid flat-topping with distortion and splatter a good procedure for adjusting the modulating level (if a scope is not available) is to set the output power meter reading to full scale during c.w. tune-up, then using the a.m. position, talk into the microphone and adjust the mike gain so the highest voice peaks kick the meter no more than to between 4 and 7.

TVI: Measurements indicated some harmonic radiation along the edges of the panel, in the vicinity of the meter and at the v.f.o. dial window. Most of this is due to the fact that the panel is not bonded to the cabinet, the only contact between transmitter and cabinet being made at the rear where the two are secured together with screws. Nevertheless, in the strong signal area in which tests were conducted, little difficulty was experienced; but in weak signal areas, good bonding between the panel and cabinet would be required and, of course, a low-pass filter in the transmission line should be used.

All-in-all, one cannot help but be well pleased with the T-150. No doubt, it will set a pattern for a move towards higher-powered units of a similar nature. Priced at only $119.50, the Knight-Kit T-150 will be found a wise investment. Incidentally, the Knight-Kit R100-A receiver is also available with styling to match the T-150. ■

Novice [*from page 54*]

suppress harmonics. All components should be laid out to keep r.f. lead lengths to a minimum. This is important, not only for the purposes of keeping the resonances of the grid-to-cathode and the plate-to-cathode paths above the TV bands, but also because it helps discourage v.h.f. parasitic oscillations. Link coupling should preferably be used throughout the transmitter. Link coupling discriminates against the passing of harmonics from one stage to another, and helps to keep all leads short.

Complete electrical shielding of the whole transmitter prevents radiation of harmonics. Be sure to connect the metal cabinet of the transmitter to an earth ground, keeping in mind that the ground lead should not be a multiple of a quarter wave at the frequency of operation. A good ground is also a safety measure.

Keeping all frequency multiplier output as low

For further information, check number 55, on page 110

as possible, amplifying it to its power level in as small a number of stages possible will keep the harmonic content low. Be sure you pick the right multiple of your fundamental frequency. Check the setting of all controls with a grid-dipper and record all settings for future use.

Keep grid drive as low as possible, being sure that the grid has enough drive to allow upward modulation on a.m. If your dummy load, (used during initial tune-up) shows downward modulation increase the grid drive until upward modulation is obtained. Variable grid drive can be obtained with variable link coupling or by adjusting the driver screen voltage.

Help Wanted

Last week I received the following note. It was dated 5:30 A.M., March 20, 1962. The envelope was correctly addressed (many are not) but the letter bore no stamp. Where was this letter all the time? In it, Lee K. and Jeff Geiger, 505 Wellner Road, Naperville, Illinois requested help in code and theory. Sorry the letter arrived late. Hope you have your licenses, Lee and Jeff.

David R. Bosley, KØMZK, 716 Bradish Ave., La Junta, Colorado needs some local help to get going. Help this fellow amateur.

Robert Simon, 87-77 169th Street, Jamaica 32, New York needs advice and help. Francis Hixon, R 2, Jackson, Ohio, needs a local ham to advise him. A regular NOVICE reader, he has code records and ambition to become a ham. Norman Woram (15), 998 Armoury Street, Niagara Falls, Ontario, would like to meet a local ham and needs help for the license. Leslie D. Molnar, 211 Hillcrest Avenue, Ellwood City, Pennsylvania needs help with code.

Letters

From Wildwood Station, Alaska, Fred Fraley, W4CHK/KL7 comes the next letter:

"Dear Walt: Although it has been several years since I dropped the "N" from my call letters, I still enjoy reading about and working the Novices. I had worked 49 states from my home QTH in Virginia before entering the Army and coming to Alaska. Nevada was the hold-out.

"I thought some of the gang in the South 48 might like to know who was being heard up here near Anchorage on 80 meters. I logged the following stations during the period 18-20 December: WN5CQB, EHY, ESV; WN6BQR, BUN, CQI; WV6WHZ, ZLX; KN7SDM/Ø, SIH, SLI, SSJ, TGU, TWC, TWL, UKO, UOB, URD, UUB, VCY, VED, VKX; KN8BZV; WNØBLP, BWI, CPF, DGO, DOU, DXF, EFH, EJU and EOA. I was able to work some of these Novices from our club station KL7WAF. KN8BZV, Tiffen, Ohio was 579X up here.

"Well, that's the news from up this way, Walt. Keep up the good work. 73, Fred."

The Letters section is not short of letters this month, but short of space. So, only one letter this month. I would like to hear from some of the Novices over 70 years of age. Thanks for all the letters and good wishes, fellows. Keep the key and mike busy. 73, Walt, W8ZCV

USA-CA [*from page 58*]

Ohio Forest City Award

The Cleveland CHC Chapter #5 announces an award in two classes for working members, full or associate, as follows: Cuyahoga County stations work 15; 12 for balance of Ohio; 10 for rest of U.S. (except KH & KL) and Canada; all others work 7. Second award for working members in steps of 25/20/15/10 as above. No band/mode endorsements. The year member became CHC or after counts; for associate members contacts must be after January 1, 1963. Send certified (GCR) list signed by two other licensed hams or an officer of a radio club, stating QSLs sighted, plus 50¢ or 5 IRC to Custodian, Jack Siringer, W8AJW. 2972 Clague Rd., North Olmsted, Ohio. Award available to SWLs. Present Chapter members are: K6BX, *W8*AJF, BF, FKU, GMK, LY, YPT, *K8*AAG, EUX, GHG, IPS, WOT, ZPK. Associate members are: *W8*EPM, OIS, QOV, SZF, USP, WUO, *K8*DXR, UNP.

Wisconsin Joins USA-CA Fun Unlimited

We are indeed pleased to report that not one but two new "Work All Wisconsin Counties, WAWC, awards; one for continental USA stations and one for DX stations; sponsored by the Waupaca Amateur Radio Club, Waupaca, Wisconsin.

Rules for the DX Class: To get basic award, stations outside the continental USA, work 10 of Wisconsin's 72 counties. Additional stickers are available when 20-30-40-50-60 and 72 counties have been confirmed. All contacts must have been after January 1, 1958. For basic award, send certified list signed by one other amateur stating QSLs listed on check list have been sighted together with 7 IRC or $1 U.S., to the club at P.O. Box 161. The additional stickers may be obtained by same process but with fee of only 1 1RC for handling.

Rules for the USA Class: To get basic award, stations within the continental USA, work 40 of Wisconsin's 72 counties after January 1, 1958. Additional stickers for confirmed contacts with 60 and 72 counties. For basic award send certified list signed by two amateurs confirming QSOs and QSLs plus $1 fee. For 60 and 72 county stickers which are free, send certified list only.

What's Cooking Department

Golly, or files getting loaded with high interest things cooking and even happening. Problem here is not that we aren't both cooking up 'stuff', or getting 'stuff', it is a case of lambasting that New York Editor swab into more and more space in his technical rag. So far, because you good folks been breathing down his journalistic 'blue pencil' neck, we've been okay. All we can tell the swab is that your letters are barometer of strong support both the column and *CQ* so, don't let me down. Such is a basic law of magazine survival and growth . . . so, without a doubt you can help me continue to help you. Keep that 'rare stuff' coming.

OLD MAN, K6BX

Contest Calendar [*from page 48*]

5. The final score therefore will be the sum of QSO points from all bands, multiplied by the sum of the multiplier on each band.

6. Certificates will be awarded to the highest scorer in each country and call districts in the above indicated countries.

7. Your logs should show in this order: A) Date and time in GMT; B) Station worked; C) Province worked; D) Multiplier for each band; E) Serial number sent; F) Received; G) QSO points.

8. The PA stations will identify their province by two letters after their serial number. The Provinces, 11 in all are:

GR	Groningen	DR	Drente
GD	Gelderland	NH	Noord-Holland
ZH	Zuid-Holland	NB	Noord-Brabant
FR	Friesland	OV	Overijssel
UT	Utrecht	LB	Limburg
ZL	Zeeland		

Include a summary sheet with your log and a signed statement that all rules and regulations have been observed.

Logs must be postmarked no later than June 15th and go to: Mr. P. v. d. Berg, PAØVB, Contest Manager VERON, Keizerstraat 54, Gouda, Netherlands.

CQ Spring v.h.f.

This is a new version of the old *CQ* V.h.f. Contest with completely new rules and was fully covered on page 32 of last month's issue.

Georgia Party

Starts: 1800 EST Saturday, May 11
Ends: 2400 EST Sunday, May 12

This is the second annual QSO Party sponsored by the Columbus Amateur Radio Club. This is another one for the CHCers and Clif Evans covered it on page 63 of his March column. There is a bad conflict here with the OZ CCA but you ought to be able to dig out some of the Georgians.

Your logs go to: The CARC, c/o John Laney, K4BAI, 3500 14th Avenue, Columbus, Georgia, and should be sent no later than May 31st.

OZ CCA

C.W.

Starts: 1200 GMT Saturday, May 11
Ends: 2400 GMT Sunday, May 12

Phone

Starts: 1200 GMT Saturday, May 18
Ends: 2400 GMT Sunday, May 19

This is the 12th running of this OZ world wide contest. Operation is not confined to working OZ stations only but contacts with OX, OY and OZ stations are worth double value. C.w. and phone are two separate contests, cross-band contacts are *not* permitted and participation is limited to single operator stations.

1. Use all bands 3.5 through 28 mc.

2. Serial numbers will be of the usual five and six figure variety, RS or RST report plus a progressive 3 digit number starting with 001.

Results: 1962 VE/W Contest

Only Section winners are shown

USA Winners

W4CKD	125,411	WA6BBJ	50,901	W1JYH	27,616
W9FSP	109,744	K7CTI	47,652	K7KHA	23,880
K4BAI	97,957	KØBPO	46,786	W7IEU	23,500
K6JIC	84,312	K2KFP	46,135	W5FTD	23,393
W8RQ	80,413	W4MLE	45,486	W7ENA	22,959
K4HPR	77,974	WA2OJD	45,323	WAØBHL	19,928
W5FTD	77,488	K6SDR	44,186	K4GXK	18,844
W9NLQ	74,944	W6ISQ	43,320	W7POU	14,729
K3JCT	74,510	W8CQN	42,453	W1GKJ	13,321
K9LIO	73,102	W5KC	42,237	K6RTK	12,563
W1WY	70,660	W5AMZ	40,937	WAØAAD	12,509
KØSLD	69,853	KP4BEA	37,526	WA6PHZ	12,455
W2EXB	67,254	KØBHM	37,255	KØVEJ	11,913
KØVSH	62,380	WA2BEX	34,494	WA2GLU	10,234
W4PLL	61,731	WA5CBL	34,115	W8HZA	9314
K5OCX	61,406	W6MSM	33,789	W3LOS	8375
K3KHK	60,070	W7JLU	31,840	KH6EVT	8122
W1SWX/1	54,583	W1TQS	30,703	WØWUU	1227
K1LPL	52,562	W4BWX	27,670	KL7MF	145

Canadian Winners

VE7AAF	105,138	VE4AK	80,640	VE5KY	37,506
VE3DUS	91,080	VE2NI	78,400	VE8PC	20,458
VE6BR	82,128	VE1ON	52,800	VO1DZ	1408

This makes W4CKD the top man and winner of the traveling MARC Trophy which has been held for the past year by W4SVJ.

3. Each completed contact is good for 3 points; however, contacts with OX, OY and OZ stations are worth 6 points.

4. The multiplier is determined by the number of countries (ARRL DXCC list) worked on each band. In addition, each call area in the following countries, W/K, VE, PY, LU, VK and ZL, will also be considered a multiplier for all contestants.

5. The final score therefore will be the total QSO points from all bands multiplied by the sum of the multiplier on each band.

6. Certificates will be awarded to the highest scorer in each country and call area as indicated in rule #4.

7. Your log should show in this order: A) Date and time in GMT. B) Station worked. C) Country/country district. D) Progressive multiplier for each band. (5 separate columns) E) Serial number sent. F) Received. G) QSO points.

8. Include a summary sheet showing your scoring, name and address in BLOCK letters and sign the usual declaration.

Mail your logs not later than June 15th to: The E.D.R. Contest Committee, P.O. Box 335, Aalborg, Denmark.

CHC/HTH Party

Starts: 2300 GMT Friday, May 31
Ends: 0600 GMT Monday, June 3

This party is a world-wide affair and open to all amateurs whether you are a CHCer, HTHer or not, and offers an excellent opportunity to become acquainted with K6BX's program.

There will be certificates and Trophies galore. Clif will cover the details in his Column next month.

Ed. Note

An increase in domestic (state parties) contests has added more confusion to an already

[*Continued on page 82*]

VHF [*from page 53*]

that many more raindrops strike the front windshield than strike the rear window. So it is with meteors—many more strike the earth's front windshield (the upper atmosphere directly above the dawn line) than strike the earth's rear window (directly over the sunset line).

So if you need that rare county: schedule your station before breakfast instead of after supper and you'll have a much better chance of working him!

Who's News

Michael Czysch, LU3DCA, of Buenos Aires is news! This writer had the pleasure of meeting Michael and his lovely wife during a recent vacation in the United States, which included a stop off in Los Angeles. All of Michael's amateur equipment is home brew and DXers around the world can vouch for its effectiveness. He is certainly to be congratulated, particularly when you know the exorbitant prices and duties he must pay for electronic parts. LU3DCA and his wife attended the February meeting of the Long Beach Microwave Society and had the opportunity to discuss future plans with Chuck Towns, K6LFH, spearhead of the Project OSCAR Association. Michael now has a pair of 4CX300s and plans to work through the OSCAR Repeater coming along later this year. If six meters ever opens up, you can also expect to hear him on the low end of that band.

Chet Lambert, W4WDR/5, operating MARS station K5FGI/AG4BN Amarillo AFB, Texas sent in the photograph shown hereabouts with a verified list to prove his 150 stations for VHF C.C. During an operating period of approximately six months, the MARS station has worked around 600 contacts with 275 confirmed. Best DX to date is Canada, Puerto Rico, and Mexico. The equipment is self-explanatory, being the Clegg "power house" and matching Interceptor receiver. Not shown however, is a Poly-Comm 62-B for mobile work and home brew 4 element beam built by Bert Jones, K5FVH. It is up about 47 feet with a halo mounted 8 feet above that. Thanks for a fine business photograph Chet, see you on 6.

That drains our grid leak for another 30, see you then.

73, DE Don, W6TNS

Contest Calendar [*from page 81*]

overcrowded Calendar of Events. Since these are usually of local interest only, we are strongly considering adding a separate section to our CALENDAR, which will cover these activities only.

It would be greatly appreciated therefore if U.S.A. Clubs would make their contest planning known to us so that we can plan on such a department.

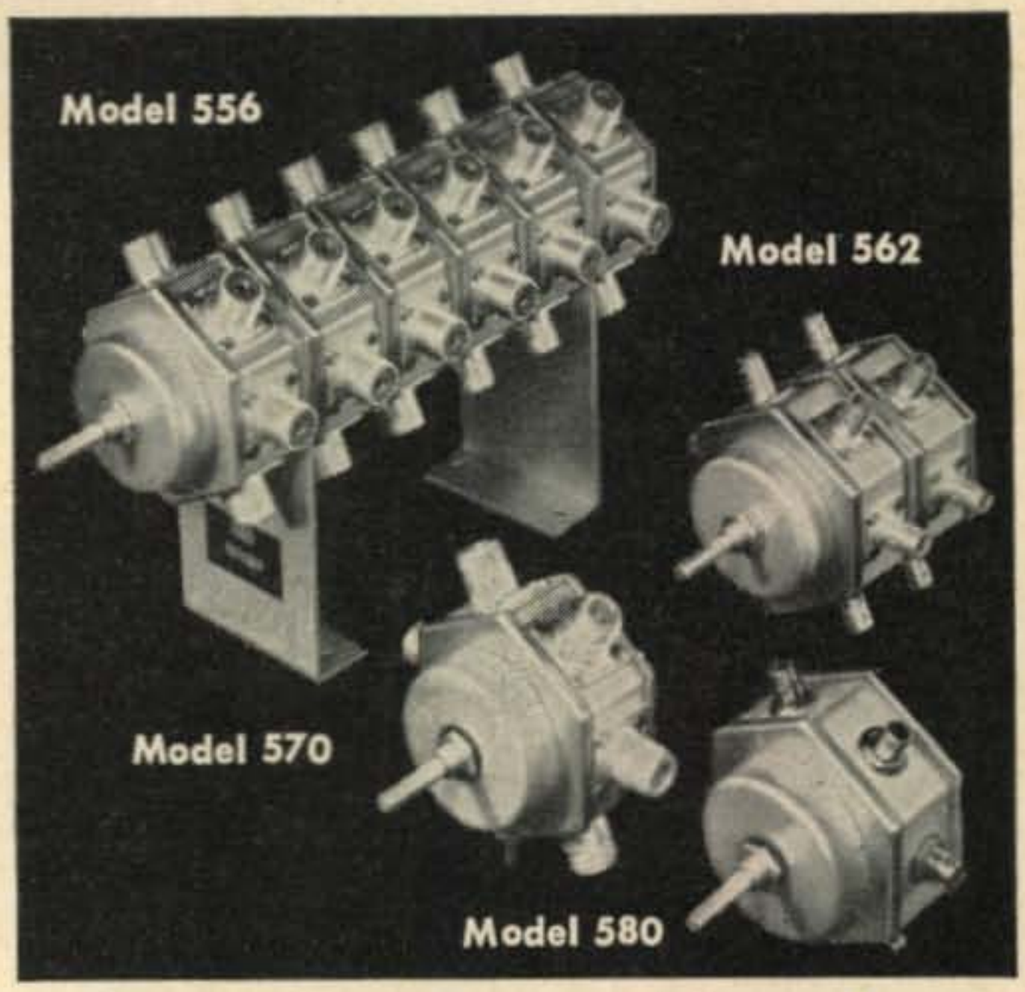
Results of the Phone Section of our World Wide Contest will appear in next month's issue.

73 for now, Frank, W1WY

COAXIAL TYPE SWITCHES

. . . multi-position, single or multiple gang

Now you can switch coaxial line circuits quickly and without error. These handy, inexpensive units are available with "UHF", "BNC", "N" and Phono type connectors for use with either 52 or 75 ohm lines. Phono connector types are specific for Hi-Fi applications. Other types are designed to handle RF Power up to 30 MC, 1 KW input.



Stock items ready for shipment are:

Model 550A—Single gang, single pole, 5 position switch with UHF connectors. Price: **$8.25** each.

Model 551A—Single gang, 2 pole, 2 position special purpose switch with UHF connectors. Ideal for switching any device in or out of series connection in coax line circuits. Price: **$7.95** each.

Model 560—Single gang, single pole, 5 position switch, same as Model 550A except with BNC type connectors. Price: **$11.95** each.

Model 561—Single gang, 2 pole, 2 position special purpose switch, same as Model 551A except with BNC type connectors. Price: **$9.95** each.

Model 570—Single gang, single pole, 5 position switch, same as Model 550A except with N type connectors. Price: **$13.35** each.

Model 580—Single gang, single pole, 5 position switch, same as Model 550A except with Phono type connectors. Price: **$7.35** each.

Multiple gang types, up to 6 gang for single pole—5 position switches, and as required for 2 pole—2 position switches, are made to order with any connector types listed above. Prices on request.

Barker & Williamson, Inc.
Canal Street & Beaver • Bristol, Penna.

Foreign Sales—Royal National Corp., 250 West 57th St., New York 19, N.Y.

OTHER B&W EQUIPMENT: Transmitters AM-CW-SSB • Transistorized Power Converters and inverters • Dip Meters • Matchmasters • Frequency Multipliers • Low Pass Filters • T-R Switches • R. F. Filament Chokes • Transmitting R. F. Plate Chokes • Band-Switching Pi-Network Inductors • Cyclometers • Antenna Coaxial Connectors • Baluns • Variable Capacitors • Toroidal Transformers • Fixed and Rotary edgewound Inductors • Plug-in Coils with fixed and variable links • Straight type air wound coils in a variety of dimensions.

For further information, check number 27, on page 110

KH6AR

Wahiawa, Oahu, Hawaii reports:

"most natural sounding SSB mike yet"

We'll let Ken Bryan's (KH6AR) letter to us speak for itself:

"I've been using my Shure 440SL on regular skeds with people who know my voice from eyeball QSO. That includes my daughter who doesn't ordinarily like the tone of sideband. Everybody tells me that it's the most natural sounding SSB mike yet . . . especially my daughter.

"The pick-up is great. The tendency of local splatter and unwanted sideband is *considerably* reduced over three other mikes I compared it with. Humidity doesn't affect it at all. All in all, I feel it's the best SSB mike I've ever had, including one that cost me over $50.00!"

ONLY **$28.50** net

(complete with stand, grip-to-talk switch, 7 ft. highest quality 2 conductor shielded cable.)

A87K Modification Kit. *Instant switching from VOX (with muted microphone position) to push-to-talk. $3.25 net.*

SHURE 440SL

CONTROLLED MAGNETIC SSB, AM, FM MICROPHONE

Literature: Shure Brothers, Inc., 222 Hartrey Ave., Evanston, Illinois

For further information, check number 28, on page 110

Prop. [*from page 47*]

Eastern Mediterranean	*NIL*	06-08 (1) 14-19 (1)	*NIL*	*NIL*
Central Asia	18-21 (1)	09-14 (1) 20-00 (1)	04-06 (1)	*NIL*
Southeast Asia	16-21 (1)	06-07 (1) 07-10 (2) 10-13 (1) 23-03 (1)	03-06 (1)	03-05 (1)
Far East	19-22 (1)	06-07 (1) 07-09 (3) 09-12 (2) 12-19 (1) 19-21 (2) 21-00 (1)	01-02 (1) 02-05 (2) 05-07 (1)	02-03 (1) 03-05 (2) 05-06 (1) 02-05 (1)†
Samoa & Pacific Islands	11-19 (1)* 09-11 (1) 11-13 (3) 13-16 (2) 16-18 (3) 18-20 (2) 20-21 (1)	03-07 (1) 07-09 (3) 09-11 (2) 11-18 (1) 18-20 (2) 20-22 (4) 22-01 (3) 01-03 (2)	23-01 (1) 01-05 (3) 05-07 (1)	00-02 (1) 02-05 (2) 05-06 (1) 02-05 (1)†
New Zealand	13-14 (1)* 14-16 (2)* 16-18 (1)* 10-15 (1) 15-17 (2) 17-19 (4) 19-21 (2) 21-22 (1)	18-20 (1) 20-22 (2) 22-00 (4) 00-02 (3) 02-04 (2) 04-11 (1)	22-23 (1) 23-00 (2) 00-04 (3) 04-06 (2) 06-07 (1)	00-02 (1) 02-04 (2) 04-06 (1) 02-04 (1)†
Australia	14-19 (1)* 12-18 (1) 18-20 (2) 20-22 (1)	20-22 (1) 22-00 (3) 00-02 (2) 02-07 (1) 07-09 (2) 09-13 (1)	00-01 (1) 01-05 (2) 05-06 (1)	00-02 (1) 02-04 (2) 04-05 (1) 02-04 (1)†
South America	12-18 (1)* 06-07 (1) 07-13 (2) 13-16 (4) 16-18 (2) 18-21 (1)	12-15 (1) 15-17 (2) 17-20 (4) 20-22 (3) 22-00 (2) 00-03 (1) 03-05 (2) 05-08 (1)	18-20 (1) 20-01 (3) 01-02 (2) 02-04 (1)	19-20 (1) 20-01 (2) 01-03 (1) 20-01 (1)†
McMurdo Sound, Antarctica	11-14 (1) 14-16 (2) 16-18 (1)	10-12 (1) 16-17 (1) 17-18 (2) 18-20 (1)	03-06 (1)	*NIL*

Explanation Of Forecast Ratings

The numerical rating appearing in parenthesis following each predicted time of band opening indicates 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

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 conditions (signal quality, noise and fading levels), see the "Last Minute Forecast" which appears at the beginning of this column.

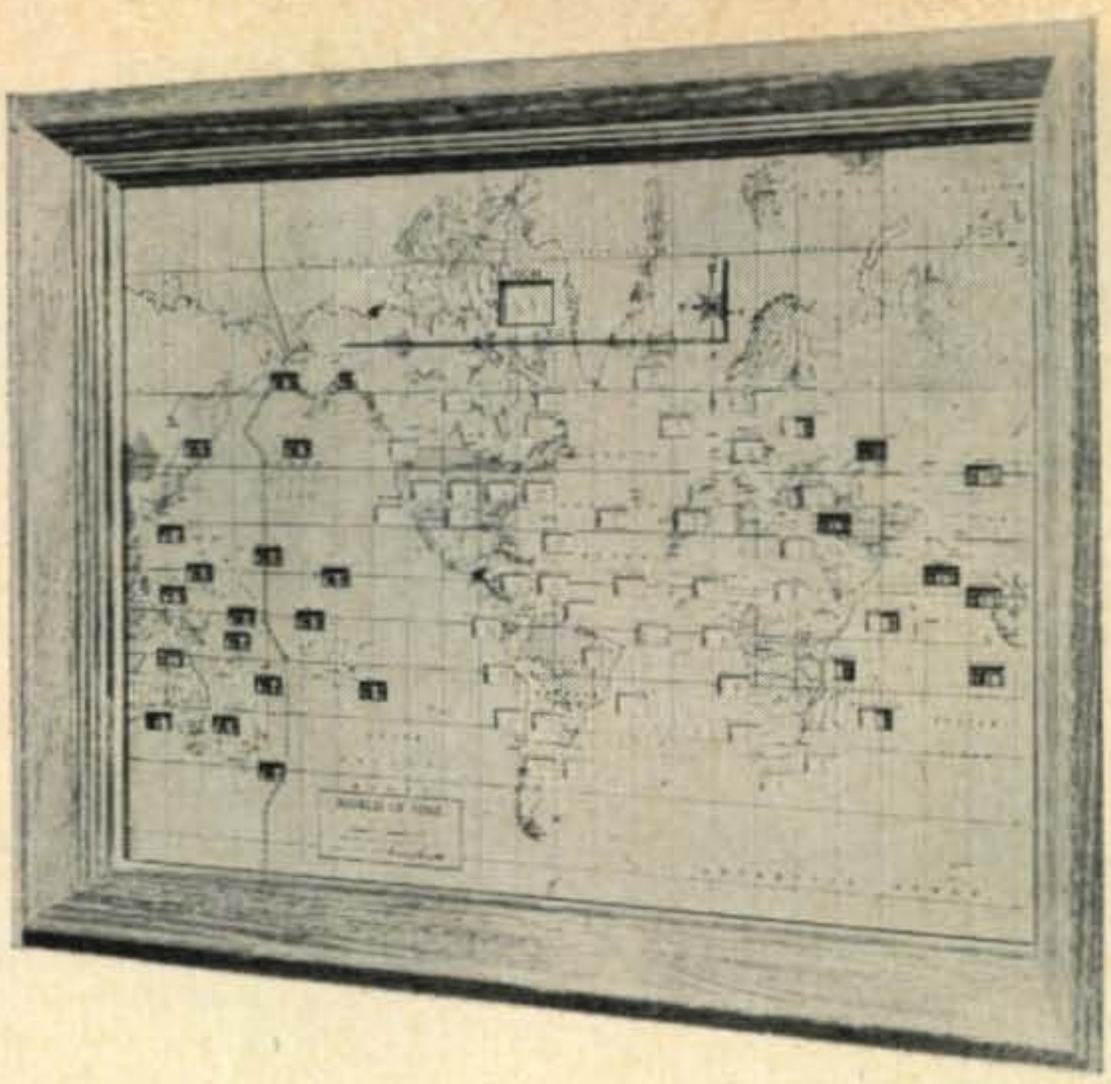
The *CQ* DX Propagation Charts are based upon a double-sideband a.m. effective radiated power of 600 watts, a single-sideband e.r.p. of 300 watts, and a c.w. e.r.p. of 150 watts, at antenna radiation angles less than thirty degrees. The Eastern USA Chart can be used in the 1, 2, 3, 4 and 8 amateur call areas; the Central USA Chart in the 5, 9 and Ø areas, and the Western USA Chart in the 6 and 7 areas. The Charts are valid through May 31, 1963. Propagation information contained in these Charts is derived from basic ionospheric data published by the Central Radio Propagation Laboratory of the National Bureau of Standards, Boulder, Colorado.

DX [*from page 45*]

station has appeared in Russian ham radio. These stations, identified by a "K" added to the call (UA3AN/K, UA1MU/K) evidently issue instructions regarding operating practices, and, according to *Radio* magazine, these instructions are to be "strictly adhered to." *(Tnx K3CUI).*

QTH's and QSL Managers

AP5DC John J. Geil, Technical Training Centre,



If it's 10 O'Clock in your shack

WHAT TIME IS IT IN ZANZIBAR?

With a World of Time electric wall clock, you'll know the answer is 6:00 O'Clock — same as for Moscow. Set the World of Time clock for the correct hour in your zone (with daylight saving time adjustment) and you know the correct Standard Time in 70 different cities and in every time zone. See at a glance the location of your contact, his time zone, and the present hour there . . . whether he is on the hourly, half-hourly, or even the 20-minute system, as in Monrovia! Height 15", width 19", depth 4¾". Amateur Net $49.95

OTHER HARVEY VALUES OF THE MONTH

Toroid Low Pass Filter — Handles up to 25 to 30 watts of audio; needs no maintenance; is better than a speech clipper. Contains five toroidal coils in an L/C network . . . pass band 300 to 2,500 cps ± 3 db . . . extremely sharp cutoff at 3,200 cycles . . . impedance 500-ohm in and out . . . weighs 3.6 lb. . . . dimensions, 3⅜x3⅜" x 5". Use in single side band applications, in 500-ohm line from speech driver to modulator, in 500-ohm receiver output, and as a telephone line filter for broadcast stations. Amateur Net $9.95.

Rotron Whisper Fan—
The fan that moves 60 cu. ft. of air per minute . . . while running so silently you have to look to see if it's running! Removes heat to save your rig, yet uses only 7 watts. Measures 4½" square by 1½" deep. Has run for years in computers and other commercial equipment without attention—lifetime lubricated. Amateur Net $14.85

Extra-Sensitive Head Phones by Superex—
600-ohm impedance; extra-high sensitivity for weak signals and hard-to-read stations . . . reproduction is crisp, free of distortion . . . unequalled wearing comfort over long use. Amateur Headphone Model AP-S. Amateur Net $24.95

Include postage with your order . . . any overages will be refunded.

Uni-card

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103 West 43rd Street, New York 36, N. Y. 1 Block from Times Square / **JUdson 2-1500**

Visit our new subsidiary, FEDERAL ELECTRONICS, INC., Vestal, N.Y. for all your industrial needs.

For further information, check number 35, on page 110

	Mizpur Rd., Dacca 7, East Pakistan.
CP5EQ	Box 940, Cochabamba, Bolivia.
CP5IZ	via W2CTN.
ex-CR5AE	J. I. L. Garcia, Rua Serpa Pinto 130, Santarem, Portugal.
EP2AM	Art Monsees, Signal Advisory Unit, ARMISH-MAAG, APO 205, New York, N. Y.
ET3LM	via W7KMF.
ET3PP	via K4QDC.
FW8DW	via W8EWS.
HK1QQ	via W4DQS.
HL5X	via W6ZY.
KB6CA	J. S. Burris, Box 87, USPO 06-5000, Canton Island via Honolulu.
KH6PD/KG6	(Marcus Is.) via W2VCZ.
KP4BCL	via W9AQW.
KR6BQ	Gerry Hale, U S NAV SEC GRU ACTY, Torii Station, APO 331, Box 1027, San Francisco, Calif. or via OARC.
LA5FI/P	Isfjord Radio, Spitzbergen, Norway or via LA5AD.
LX3QX	via ON4QX.
SVØWI	Will be leaving Greece early in June, 1963 for stateside duty. Anyone needing a QSL for either Greece or Rhodes contacts with A1 can get same by contacting him at APO 223, N. Y., N. Y.
VE2ALV/VO2	via GM3LYS.
VP2MZ	via W2ZMT.
VP2SH	Box 142, St. Vincent, BWI.
VP8HD	via G3PEK.
VS1LP	(ex-EP2BK) Bob Synder, Mount Elizabeth Flats, 55 E. Nutmeg Road, Singapore 9, Malaya.
VS6EQ	Peter Cheung, Box 541, Hong Kong.
VQ4 Kenya	PO Box 30077 Nairobi, Kenya.
5X5 (VQ5)	PO Box 3433 Kampala, Uganda.
5H3 (VQ3)	PO Box 2387 Dar Es Salaam, Tanganyika.
VQ1 Zanzibar	
W3KVQ	2308 Branch Pike, Riverton, N. J.
YN3KM	via K1KDP.
ex-YN9CIL	Lewis M. Lucas, Hilltop Road, Bridgeport, Conn.
ex-ZB1BW	Gerry Smillie, G3PEU, Button End, Church Dr. Linby, Notts, England.
ZD6HK	W2ELW has the W/VE logs from 29 September 1962 up to and including the present. Bill will furnish a card upon receipt of QSO information and s.a.s.e. Cards for other than W/VE go direct to ZD6HK.
ZD8DW	via W5SWX.
ZM6AW	via W8EWS.
5H3HV	via W2CTN.
5X5IG	via W2CTN.
9L1GM	via W3BYX.

73, Urb, W2DEC

RTTY [*from page 55*]

to operate a.f.s.k. on v.h.f. the standard 2125 and 2975 tones are required as the tones themselves are fed to the modulator and received directly.

The transistorized W2JAV a.f.s.k. oscillator described in the RTTY COLUMN in the March 1962 issue of *CQ* may be readily modified to produce the 1275 and 2125 cycle tones to feed an s.s.b. transmitter. First of all, *two* 88 mh telephone loading coils are used in series for L_1. As previously corrected, the capacitor between the base and the collector of Q_1 should be 0.01 mf, and the capacitor between the emitter of Q_1 and the cathode of diode CR_1 is 0.1 mf. The 3.3k resistor between CR_2 and the *keyboard* terminal should be reduced in value to about 47 or 100 ohms to get the oscillator to key to 1275 c.p.s.

LAFAYETTE RADIO

QUALITY AMATEUR GEAR SINCE 1923

INVITATION: Stop in at any of our locations and visit our fully stocked **HAM SHACKS — FREE DEMONSTRATIONS** without obligation. Lafayette carries a complete line of famous brand amateur equipment and accessories.

New!

HE-80WX

149.50

NO MONEY DOWN

1. **NEW LAFAYETTE HE-80 Professional Quality 14-Tube Amateur Communications Receiver**

● 5 Bands: 550KC to 54MC ● Extra RF Stage, Mixer/OSC For Dual Conversion on 6-Meters ● 1 RF Plus IF Stages for High Gain Reception on all other Bands ● Product Detector Circuit for Improved SSB Reception ● Separate BFO and Q-Multiplier Circuits (can be used simultaneously) ● Crystal Calibrator for Checking Receiver Calibration Markings ● Improved Automatic Noise Limiter ● Voltage Regulated Power Supply

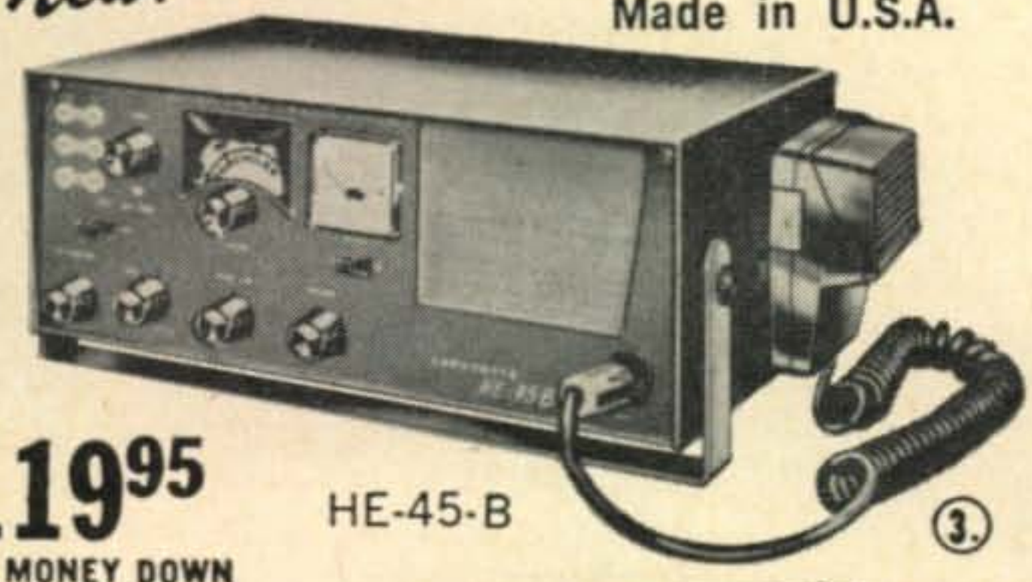
Designed for Today's Congested Amateur Bands

79.50 KT-390

NO MONEY DOWN **Made in U.S.A.**

New!

Made in U.S.A.



119.95 HE-45-B

NO MONEY DOWN

2. **STARFLITE™ 90 WATT PHONE and CW TRANSMITTER KIT**

● 90 Watts Phone or CW on 80 Thru 10 Meters ● Built-in 3-Section Low-Pass Filter ● Clear, Chirpless, Grid Block Keying

Dollar for dollar you can't beat this new Lafayette Starflite transmitter. Easy to build and operate, it glistens with quality and performance all-over.

3. **LAFAYETTE HE-45-B DELUXE 6-METER TRANSCEIVER**

● High Efficiency—Up To 100% Modulation ● New Modulation and Power Transformers plus 7868 Power Pentode ● New Heavy-Duty Communications Vibrator ● Front Panel Antenna Loading Controls ● New Standby Switch; VFO Power Jack ● Sensitive Superheterodyne Receiver ● Built-in 117 VAC and 12 VDC Power Supplies ● Rugged Push-to-Talk Ceramic Microphone

LAFAYETTE HE-50A 10-METER TRANSCEIVER

Similar to above except for 10-meter operation ... **119.95**

99.95 HE-30

NO MONEY DOWN

4. **THE LAFAYETTE HE-30 Professional Quality Communications Receiver**

● Tunes 550 KCS to 30 MCS in Four Bands ● Built-in Q-Multiplier for Crowded Phone Operation ● Calibrated Electrical Bandspread on Amateur Bands 80 Thru 10 Meters ● Stable Oscillator and BFO for Clear CW and SSB Reception ● Built-in Edgewise S-Meter

Sensitivity is 1.0 microvolt for 10 db. Signal to Noise ratio. Selectivity is ± 0.8 KCS at —6db with Q-MULTIPLIER.

LAFAYETTE RADIO ELECTRONICS

FREE!

CUT OUT PASTE ON CARD

SYOSSET	JAMAICA	NEW YORK	BRONX	NEWARK
PARAMUS	PLAINFIELD	SCARSDALE	NATICK	BOSTON

LAFAYETTE RADIO DEPT. CD-3
P.O. BOX 10, SYOSSET, N.Y.

Send me the FREE 388 Page 1963 Catalog 630

Name .....

Address .....

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

For further information, check number 44, on page 110

Another technical point you should consider before operating any s.s.b. transmitter on RTTY is, can it take it? Remember that with F-1 emission, as far as the final is concerned, the duty cycle is *continuous*. It is quite likely that you cannot load the final to the usual value for c.w.; and, perhaps like the S-Line, extra ventilation may be required. This is another reason for contacting the Customer Service Department of your transmitter manufacturer. Find out what precautions may be necessary.

On the Bands

WA2DEX of Plainview, Long Island, N. Y., has a Model 15, an SP-600 and a "large chest of spare parts for Models 14, 15, and 28." *(QTH is in the* CALL BOOK.*)* WB2BDT of Neptune and WB2CVN of Bayville, N. J., are on 80. WA2AUQ of Garden City and WA2VNR of Manhasset, Long Island, N. Y., are new stations on 52.60 mc f.m. W3IJF/3 of Yellow Springs and K3EWU of Emmitsburg, Md., are on 80. K4DKC of Hampton, Va., has a Model 19 on a.f.s.k. and f.s.k. and is transistorizing a la W2JAV. K4AAB of Waynesboro, Va., reports that he and W4BLD have been active on 6 meter f.m. and will switch to 52.60 f.m. for RTTY. W5DWB of Los Alamos, N. M., is on 20 with a Model 19 and an ART-13. W5APM of San Marcos, Texas is solid at W2JTP on 20.

K6YCX of Pomona, Calif., is modifying his Collins PTO to bring out the cathode connection through a hermetic seal. Frank also now has a 14 TD and a 14 Typing Reperf. WØUMG/6 in North Highlands, Calif., has a Northern Radio f.s.k. exciter driving a 500 watt Marconi transmitter into a 50 foot vertical. W6NTK, who took over W6CQK Filters, has quite a backlog due to serious illness. *(Get well, first, Grant.)* W7WWG reports that the January 24th meeting of the Portland F-1 Group was held at K7CTC in Portland, Oregon. K8LYK of Cambridge, Ohio, is building the W2JAV transistor a.f.s.k. oscillator to get his S-Line on RTTY. Rick would like to know where to get a set of Teletype tools such as the surplus TL-50. *(So would I, Rick!)* W8OMY is on 80 with a DX-40 and Models 14 and 15, from Columbus, Ohio, working K8YEK in Troy, Mich., who is using a W2JAV tube TU. W8CJ of Muskegon, Mich., is on 80 with a 4-1000A final and a Model 15. W8LBJ of Wheeling, Va., is using a Twin City TU on 80.

7040 KC vs. 7140 KC

We are still getting questions and comments about RTTY operation on 7040 kc. "How did the change come about?" is the usual question. (We were in the process of relocation back to W2-land and not on the air at the time.) A pretty good run-down on the situation, as viewed from the west coast, is given by W6CG on page 14 of the January 1963 issue of *RTTY*, the monthly bulletin of the RTTY Society of Southern California. ($3 per year via W6AEE, 372 West Warren Way, Arcadia, Calif.) We hope to have space enough next month to give you the view from the east coast. 73, Byron, W2JTP

Here's your chance to STEP UP to greater operating pleasure with a better receiver AT A PROFIT!!

That's right. I will allow you a lot more for your present receiver than it is worth — in most cases even **more than you paid for it!**
But, you will have to act quickly. Our supply of these brand new, latest improved production, Hallicrafters receivers is limited. Each one is in its factory-sealed carton, and includes full Warranty. Don't miss this buy of a lifetime! Send your order today. 73, *Bil Harrison*, W2AVA

Here's How

1. Look at the mouth-watering **guaranteed** allowance for your old receiver.
2. Rush the low, low balance to us. (Or, a $10 deposit can reserve your new receiver for you.)
3. Send or bring in your old set.
4. We can immediately ship or give you your brand new, exciting performance, world-famous Hallicrafters receiver.

Act Now!

ENJOY THESE OUTSTANDING FEATURES!

Both the SX-111 and the SX-101A bring you:

- Full width, direct calibration of 80, 40, 20, 15 and 10 meter bands, plus 10 Mc for WWV.
- Selectable selectivity, 500 cycles to 5 Kc.
- Tee-Notch filter, lets you suppress heterodyne QRM, sharpens selectivity.
- Crystal controlled upper–lower sideband selection.
- Separate product detector for SSB/CW.
- Dual conversion, with crystal controlled second oscillator.
- Improved noise limiter.
- Lab type precision 100 Kc crystal calibrator.

With Harrison's long trades, either receiver is a good investment in top performance and value!

hallicrafters

SX-101A

70 pounds of solid stability! Cold rolled .089 steel chassis — heaviest in the industry. • Better than 1 microvolt sensitivity on all bands. • Amplified S-meter • Fast-slow AVC. • 30.5-34.5 band (for UHF converters) with full direct dial calibration for 6 and 2. • 13 tubes plus rectifier and regulator. Plus many more features that make this SX-101A the new standard of comparison. **$445.00**

LOOK AT THESE GUARANTEED ALLOWANCES*
Toward a new SX-101A, I will give you for your:

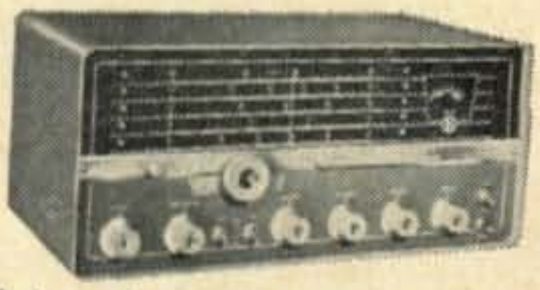
ins
A3 ..... $355.
A4 ..... 440.
S1 ..... 425.

ke
..... $285.

icrafters
28 ..... $208.
43 ..... 201.
71 ..... 225.
96 ..... 250.
100 .... 278.
SX 101 .... $285.
Mark III .. 305.
SX 110 .... 225.
SX 111 .... 278.
SX 140 .... 205.

Hammarlund
HQ 110 .... $270.
HQ 129 .... 215.
HQ 140 .... 260.
HQ 145 .... 285.
HQ 150 .... 270.
HQ 160 .... 300.
HQ 170 .... $327.
HQ 180 .... 360.

National
HRO 5 ..... $210.
HRO 7 ..... 232.
HRO 50 .... 270.
HRO 60 .... 355.
NC 183 .... 250.
NC 183D .. 285.
NC 270 .... 270.
NC 300 .... 285.
NC 303 .... 355.



SX-111

Sensitivity of 1 microvolt on all bands • 12 tubes plus rectifier and regulator • The nearest thing to SX-101A performance, for a lot less money! **$279.50**

LOOK AT THESE GUARANTEED ALLOWANCES*
Toward a new SX-111, I will give you for your:

Collins
75A1 ....$220.
75A2 .... 255.

Drake
1A .....$205.

Hammarlund
HQ100 $170.

Hallicrafters
S 40 ....$115.
S 53A .. 122.
S 76 .... 145.
S 85 .... 136.
S 107 .. 130.
S 108 .. 143.
SX 24 .. 115.
SX 25 .. 120.
SX 99 .. 150.

National
NC 88 ..$130.
NC 98 .. 145.
NC 109 155.
NC 125 140.
NC 173 155.
NC 188 135.

Do you want to CHARGE the balance, or SPREAD IT OVER MANY MONTHS?

When reserving your new receiver, tell me what you would like to do. I'll be happy to send you the credit form and give you a deal that will delight you!

HARRISON

"HAM HEADQUARTERS U.S.A."
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NEW YORK 7, N. Y.
BArclay 7-7922
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*Allowance for original factory wired equipment, delivered here in good operating condition.

FOR OTHERS, REGARDLESS OF MAKE, MODEL AND CONDITION, I WILL STILL ALLOW YOU MORE THAN IT IS WORTH. Bring it in, or write me a full description.

YL [*from page 61*]

meets Tues. at 1800 GMT on 14240 with W1OYM & W6YZV as NCS.

New officers of the Camellia Capital Chirps: Pres., K6HHD, Jan; V.P., WB6AOG, Trish; S-T, WA6DGH, Vel; P.C., K6ENK, Wanda.

Congratulations to WØUA, Loretta Ensor, on becoming an OOT—as of 1963 Loretta will have held her Ham license for 40 years!

ZS5RI, Kay Munro, also of Margate, served SAWRC twice as V.P. Kay operates all bands, mainly phone. She and OM ZS5MS are grandparents; Kay is active in Boy Scout work.

Silent Keys

We are sorry to have to record the passing of W7PUV, Inez Morton, of Scottsdale, Ariz. on Dec. 29. Our condolences to her son W7LBN. . . . Belatedly, our sympathy to W3UUG, Miriam, on the passing of her OM, W3MPO, in Oct. . . . Also belated condolences to K7TWP-KN7TWQ whose daughter Carolyn Murray, K7TWR, has joined the Silent Keys. 33-W5RZJ

Sideband [*from page 51*]

Lee, WA2RPC, who became the parents of their fourth boy in February. . . . Keep an eye on the Long Island DX Association which has big plans for the future. Enthusiastically led by Joe, W2MES, and Marv, W2FGD, this small but mighty active group includes, Art, W2EXH; Dave, W2GKZ; Virgil, WA2WUV; Ed, W2LJF; Bill, WA2ISQ; Bill, K2UYG; Dorothy, K2MGE; Mac, W2BO; and other well-known L.I. DXers.

Congratulations to Alicia, KP4CL, who is not only the first station in Puerto Rico to earn the "Worked 200" Certificate but is also the first XYL in the world outside of the USA to do so. Considering that Alicia has been DXing on s.s.b. only since August, 1961, this is a remarkable accomplishment. . . . We are looking forward to receiving the slides and tape description of the FW8BH DXpedition, kindly forwarded to us by Charlie, W1BAN. If time permits, we hope to show this to the group at the DX Luncheon of the N.Y. Sideband Hamfest and know they will be most interesting.

We hope that Spring has sprung wherever you might be and that all those plans you had to replace or repair your tower or antennas were followed through. 73, Irv and Dorothy

Ellen, W9YHE, Our Credit Manager Sez—

"Only My Boss, Terry, W9DIA Gives You Such a Terrific Deal on Collins 62S-1."

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Only 10%

Take 1 - 2 - 3 years
TO PAY THE BALANCE
MONTHLY PAYMENTS
Only $32.13 (three years)

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COLLINS 62S-1

More than doubles your ham band coverage. The 62S-1 provides for additional coverage from 49.6 to 54.2 mc. plus 143.6 to 148.2 mc. Offers xmit and receive functions with 32S, 75S and KWM series. No cable changing. We're trading extra high . . . get Terry's deal to **save!**

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Extra Fantastic Trade-In Allowance!

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

☐ Send latest reconditioned gear bulletin

For further information, check number 57, on page 110

Space [*from page 54*]

OSCAR III relay equipment, designed by Ed Hilton, W6VKP, and Don Norgaard, W6VMH, is now being packaged into what may be its final form. The linear amplifier has been changed from a tube version to transistor circuitry designed by Bayman McWahn, W2GAX. The newly designed amplifier is capable of 800 milliwatts output, with a bandwidth of 50 kc. Using transistors in the final amplifier has eased the power supply problem, and it now appears possible to use solar cells as the primary source of power for OSCAR III.

As it stands now, OSCAR III will be capable of receiving a number of signals simultaneously from radio amateur stations on the ground, over a passband of 50 kc centered on approximately 144.100 mc. The entire 50 kc spectrum will be passed through the receiving circuits, be translated and converted by mixing techniques, and then relayed by OSCAR III's transmitter over a 50 kc passband centered on approximately 145.900 mc. In practical terms, this means that radio amateurs separated by hundreds or thousands of miles could communicate with each other by transmitting to the OSCAR III satellite on a frequency between 144.075-144.125 mc, and by listening to the respective satellite-translated signals between 145.875-145.925 mc. The transmitting and receiving spectrums have been chosen to permit world-wide participation in the OSCAR III project, since they are confined to that part of the 2 meter band allocated to the amateur radio service on a world-wide basis (144-146 mc). The choice of 144.100 mc as the center of the receiving spectrum and 145.900 mc as the center of the transmitting spectrum will help keep the weight of the satellite to a minimum. For example, had the frequencies been interchanged, considerably heavier inductances would have been required in the rejection and isolation filter circuits.

The OSCAR III satellite had been designed so that the equipment required on the ground for communication through the satellite will be within the capability of many existing v.h.f. amateur radio stations. Tests conducted with the breadboard repeater version indicate that at an altitude of 600 miles the satellite's 800 milliwatt relay transmitter should be able to put a solid signal (at least 26 db above the noise level) into a receiver on the ground having a noise figure of 0 db, 10 kc bandwidth, and using a receiving antenna with 13 db gain. On the ground transmitting side, for example, a 500 watt a.m. phone transmitter, using a transmitting antenna with a gain of 13 db, should be able to put a signal into the OSCAR III receiver of at least 20 db above the noise level. Equipment required at ground stations wishing to communicate through the OSCAR III relay satellite will be discussed in greater detail in subsequent articles planned for publication in *CQ*.

73, George, W3ASK

of protection from interference required by LORAN stations in the immediate future cannot otherwise be provided; and

IT FURTHER APPEARING, That, in view of the conditions applicable to the use of the band 1800-2000 kc by the Amateur Service, and because of the nature of Government requirements and the national defense considerations involved herein, the Commission finds that it is impracticable, unnecessary and contrary to the public interest to comply with the public notice requirements of Section 4 of the Administrative Procedure Act; and

IT FURTHER APPEARING, That, with the exception of the required reduction in operating power and the prohibition of the use of single side band emission, the changes ordered herein relieve existing restrictions on amateur operation in this band and, therefore, compliance with the effective date requirements of Section 4(*c*) of the Administrative Procedure Act is not necessary;

IT IS ORDERED, That, pursuant to the authority contained in Sections 1, 4(*i*), 4(*j*), 303(*c*), (*f*), (*g*) and (*r*) of the Communications Act of 1934, as amended, Parts 2 and 12 of the Commission's Rules are amended as set forth in the Appendix hereto, effective on February 21, 1963, except that the prohibition of the use of single side band emission, and the reduction in operating power required in the band 1800-1825 kc in certain areas, shall be effective on April 15, 1963;

IT IS FURTHER ORDERED, That, to the extent that the amendments ordered herein are consistent with the request of the American Radio Relay League, its petition IS GRANTED and, to the extent that the petition requests action beyond that taken in this order, it IS DENIED.

FEDERAL COMMUNICATIONS COMMISSION
BEN F. WAPLE
Acting Secretary

APPENDIX

1. §2.106 [amendment]

* * * * *

2. Section 12.111(*b*)(1) through (4) is amended to read as follows:

§12.111 Frequencies and types of emissions for use of amateur stations.

* * * * *

(*b*) * * *

(1) Use of this band is on a shared basis with the Loran-A system of radionavigation. The amateur service may use, in any area, whichever bands, 1800-1825, 1875-1900 or 1900-1925, 1975-2000 kc, are not required for Loran-A in that area. The use of these frequencies by the amateur service shall not be a bar to the expansion of the radionavigation (Loran-A) service;

(2) The use of these frequencies by stations in the amateur service shall not cause harmful interference to the Loran-A system of radionavigation. If an amateur station causes such intereference, the station licensee shall, as directed by the Commission, immediately cease operation on the frequencies involved.

(3) Amateur operation with single side band emission is prohibited in this band and shall otherwise be limited as follows:

Area	Maximum D.C. Plate input power in watts			
	1800 to 1825 kc *and* 1875 to 1900 kc		1900 to 1925 kc *and* 1975 to 2000 kc	
	Day	*Night*	*Day*	*Night*
Alabama, Louisiana, Mississippi, Puerto Rico, Virgin Islands, and other U.S. possessions in the Caribbean sea area	No operation		100	25
Alaska	200	50	No operation	
Arkansas, Illinois, Kansas, Missouri, Oklahoma	100	25	200	50
Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming	200	50	500	200
California, Hawaii, Oregon, Washington, and Baker, Canton, Enderbury, Guam, Howland, Jarvis, Johnston, Midway and Palmyra Islands	No operation		500	200
Connecticut, District of Columbia, Delaware, Massachusetts, Maine, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Wake Island	500	200	No operation	
Indiana, Kentucky, Ohio, Tennessee	100	25	100	25
Iowa, Minnesota, Wisconsin	500	200	200	50
Nebraska, North Dakota, South Dakota, American Samoa	500	200	500	200
North Carolina, South Carolina, West Virginia	100	25	No operation	
Michigan: Northern peninsula	500	200	200	50
Michigan: Southern peninsula	500	200	100	25
Texas: East of 105 degrees W	100	25	200	50
Texas: West of 105 degrees W	200	50	500	200
Virginia: Arlington and Fairfax counties and city of Alexandria	500	200	No operation	
Virginia: All other than above	100	25	No operation	
Florida: The counties Columbia, Union, Bradford, Putnam, Lake, Osceola, Okeechobee, Martin, Palm Beach, Broward, Dade and counties to the east of these	25	25	No operation	
Florida: The counties Hamilton, Suwanee, Gilchrist, Alachua, Marion, Sumter, Polk, Highlands, Glades, Hendry, Collier, Monroe, and counties to the west of these	No operation		25	25
Georgia: The counties Union, Lumpkin, Hall, Jackson, Barrow, Walton, Morgan, Putnam, Baldwin, Wilkinson, Laurens, Wheeler, Telfair, Coffee, Atkinson, Clinch, Echols and counties to the east of these	25	25	No operation	
Georgia: The counties Fannin, Gilmer, Dawson, Forsyth, Gwinnett, Rockdale, Newton, Jasper, Jones, Twiggs, Bleckley, Dodge, Wilcox, Ben Hill, Irwin, Berrien, Lanier, Lowndes and counties to the west of these	No operation		25	25

(4) Subparagraphs (1), (2), and (3) of this paragraph shall be considered as temporary in the sense that they shall remain subject to cancellation or to revision, in whole or in part, by order of the Commission without hearing whenever the Commission shall deem such cancellation or revision to be necessary or desirable in the light of the priority within this band of the Loran-A system of radionavigation. ■

Surplus Specials At SELECTRONICS

TDN XMITTERS

CF 53349—2.0 to 5.16 MCS
CF 52350—5.16 to 13.3 MCS
CF 52350—13 to 20 MCS

Plate input Power 4 K.W. Output power 3 K.W. Nominal Power required. 220V 50-60 Cycle 1 Ø, 4250 VDC @ 1 amp, 2125 VDC @ 500 Ma., 600 VDC @ 500 Ma., 300 VDC bias. Output impedance 400-700 Ohms balanced, 60-250 Ohms grounded. Tubes: 3-807's, 1-813, 2-450th's, 1 573. Freq. control crystal or V.F.O. (Not built in). Any one unit can be made to operate on all bands with proper coil modification. **C-7079** **$99.50**

RCA WO78-A OSCILLOSCOPE

Vert. amp. freq. response wide band. 3 cps to 4.5 mc within—1 db. narrow band 3 cps to 500 KC within—3 db.

Horiz. amp. freq. response 3 cps to 1.0. mc within—6 db.

Deflection sensitivity: Vert. amp. wide band 100 MV pp/inch narrow band 10 MV/inch Horiz. amp. 200 MC pp/inch

Sweep freq. Variable 10 cps to 100 KC fixed 60 cps & 15750 cps.

Built-in calibrators & freq. compensated attenuators. **Cat. No. C-6663** **$89.95**

MULTIPLE OUTPUT VOLTAGE REGULATED POWER SUPPLY

Here is a very fine little power supply for Receivers, Converters, Test Equipment, etc. Outputs are all well filtered. VR tube regulated. 250V @ 30 ma., 240V @ 30 ma., 150V @ 30 ma. 400V @ 60 ma not regulated. 6.3V AC @ 4.5 amps or remove regulators and get 400V at 140 ma with 5 U4G or 125 ma with 5Y3, uses 1-5Y3, 2-OD3/VR 150, 1-OC3/V105, OB3/VR 90 contains a 750 VCT @ 150 ma power Xfmr. and a 7 hy @ 140 ma filter choke plus filter capacitors and 4-25W adjustable resistors and a 25 W pot plus a Mallory 4W pot. All in a nice grey crackle cabinet with top lid measures 8" H x 16" W x 8" D. Used-Good Conditioned with tubes. Shpg. Wt., 40 lbs. Cat. No. **C-6345** **$11.50**

FM TRANSMITTER

T-14/TRC-1 FM Transmitter, 70-100 MC-crystal controlled. 40 Watts- one channel operates from 115/230 Volts 60 cycle **$19.95**

Receiver for above transmitter. R19/TRC-1 **$19.95**

VOLTAGE REGULATOR

Mfg. CBC, Model 300. Input: 85-120V Output: 115V @ 300 VA. Shpg. Wt. 15 lbs. **Cat. No. C-6491** **$6.95**

Model 201-50 or model 200. Input: 85-120V. Output: 115V @ 130 to 200VA. Shpg. Wt. 15 lbs. Cat No. **C-6493** **$4.95**

REGULATED POWER SUPPLY

Input: 120V 60 cycle—1Ø
Output: 350V @ 350 Ma. **$49.50**
Input: 120V 60 cycle 1 Ø
Output: 150V @ 350 Ma. **$39.50**

MODULATOR MONITOR SCOPE

Excellent little 2" basic scope unit for modulation monitor. Has self contained 1152 60 cycle Power Supply. Front panel intensity and focus control, and, on and off switch, centering control on side panel. Front Panel 8⅝" by 5⅜" by 16½" behind panel. Plenty of room to build sweep circuit if desired. Good cond. **$12.95**

REMOTE CONTROL AMPLIFIER

Brand new. Type CAY-23304A. Power req'd 117 VAC-DC 37 Watts
Audio power output 1.3 Watts 600 Ohms 250-350 cycles + 2 DVB
Excellent for use as intercom master station or small paging system.
Contains telephone type mike & earphone.
New, with spare parts **$12.95**
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SUPER DELUXE RELAY RACK CABINET

A beautiful item for your shack.

Std 19" panel, 63" panel space 17½" behind panel (for recessed mtg). 2 doors, dust proof-recessed handle.

Excellent condition **$44.95**

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Comprised of the following RF sections: 6AG7 — Crystal Oscillator; 6AG7 — Crystal Amplifier; 6V6 — First tripler; 807 — Doubler; 829-B Second tripler. Frequency range of crystal circuit: 4.16 to 7.40 mc. Output frequency range: 75.24 to 133.20 mc. Very easy to modify to operate on the 2 meter band, or use as exciter for a higher band. Size: 21¾" L x 10" H x 5¼" W. Shpg. Wt., 25 lbs. Cat. No. **S-6316** ... **$12.95**

TELETYPE CONVERSION KIT NO. 105382

For conversion of type 15 printer to provide automatic carriage return and line feed at end of line and to provide combined carriage return and line feed upon reception of carriage return selection Mfg. by Teletype Corp. Chicago. BRAND NEW including instructions. Shpg. Wt., 2 lbs.

Cat. No. **S-6326** **$19.95**

SMALL INSTRUMENT CABINETS

These are a grey crackel cabinet measuring 16¼" W x 8" H x 8" D. with a top lid. They also contain a U.H.F. TV tuner with few other components. Excellent for instruments, small receivers, transmitters, etc. Shpg. Wt., 40 lbs. Cat. No. **S-6403** ... **$2.00**

TK 207 PRESS WIRELESS TONE KEYER

Keys 1000 cys. can be easily converted for A.F.S.K. mounted on a standard 19" x 5¼" grey relay rack panel includes power supply and spare tubes. BRAND NEW—limited quantity. Shpg. Wt., 28 lbs. Cat. No. **S-6327** **$19.95**

ART-13 TRANSMITTER

Clean & like new with all tubes. Power output is a very conservative 100 watts. Power required is 28 v DC @ 100 a, 400VDC @ 225 Ma & 1250 VDC 2 250 Ma. See power supply below.

Weight 70 lbs. Price with tubes **$39.95**

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803	—$2.50 ea.	
5763	— 1.00 ea.	
12AU7—	.60 ea.	2/$1.00
6AH6 —	.60 ea.	2/$1.00
PL6549—	6.50 ea.	2/$12.00

SILICON — DIODES

500 P.I.V.—10 Amp DC
Special **CQ** price **$2.95**

BC-221 POWER SUPPLY

Input: 115 V 60 cycle 1 Ø
Output: 150 VDC @ 25 ma
6.3 V AC @ 2 amps.
Shpg Wt., 20 lbs. Cat. No. **C-6682** ... **$12.95**

RDZ POWER SUPPLY

D.C. Power supply. Mfg. for the Mars for RDZ receiver.

Input 115 VAC 50/60 CY. Output 300 VDC at 200 Ma. well filtered thru two 8 HY 200 ma. chokes and two 10 mfd 600 oil caps. Also has a 150 VDC supply thru a VR 150. 6.3 VCT at 10 amps and 12 vac at 3 amps. Meas. 5½ x 9 x 17. Complete with tubes. Shpg. Wt., 64 lbs. Cat No. **C-6262** **$14.95**

SUPER PRO POWER SUPPLY

In either rack or cabinet mounting type—excellent condition. Shpg. Wt. 60 lbs. Cat. No. **C-6609** **$12.95**

NEW WESTON METERS

0-2 amps RF model 1523 2½" round.... **$9.95**
0-5 k.v. (range 0-1 mil) 3" sq. **$9.95**
0-2 amps dc 3" sq. **$8.95**
0-150 vac 3" sq. **$9.95**

FIELD TELEPHONE SETS

Type EE8 Complete in carrying case. Shpg. Wt., 18 lbs. ..... **$7.95** **2 for $15.00**
EX-COND. C-6443, same as above, NEW **$9.95**

COAXCABLE & CONNECTORS

Type N Connectors each end 22½" overall length length RG 9/U cable. Shpg. Wt., Cat. No. **S-6636** **$1.50**

Type N Coax Connectors, UG-21 D/U new in poly bags. Shpg. Wt., Cat. No. **S-6546** **$1.00 ea.** ..... **6 for $5.00**

RBS RECEIVER

2 to 20 mc. 14 tube super het mfg. by Stromberg Carlson. Low-pass filters cut off above 3500 cy. which is ideal for voice and cw. Schematic included, less cables.

Price including power supply **$54.95**
Price less power supply **$40.00**
C-6337

RECEIVERS—R58A/ARQ-8 30 to 100 mcs. NEW **C-7065** **$9.95**

19" BLANK RACK PANELS

8¾" high, blank, grey steel. Shpg. Wt., 6 lbs. Cat. No. **S-6395** ..... **65¢** **3 for $1.50**

SPARE PARTS KIT

This repair kit was originally issued for servicing Wilcox Electric Co. Type **CS390** Control Equipment which was designed for the remote control of 10 transmitters, 8 receivers, 2 modulators and 2 rectifiers.
The kit includes books with photos and diagrams for a dual channel audio-amplifier, microphone pre-amp-limiter and a 1000 cycle sine wave generator.
Contains enough parts to build 2 complete P/S Contains over 100 brand new parts:
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For further information, check number 25, on page 110

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W9DIA

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$5.00 DOWN

TAKE 1, 2 or 3 Years to Pay

Terry's out to move a mountain of National ham gear and the sky's the limit on trades! Drop a $5 bill in the mail with the coupon below . . . and you'll be operating National in your shack in no time flat! Yes, Terry has the fabulous new NCX-3 200 watt Transceiver in stock for immediate delivery. Order today!

LOOK AT OUR LOW MONTHLY PAYMENTS ON NEW NATIONAL EQUIPMENT

Model	Type	Price	Monthly Payments after $5.00 down (3 years)
NC-60	Receiver	$ 59.95	$ 1.98
NC-105	Receiver	119.95	4.15
NC-140	Receiver	189.95	6.67
NC-155	Receiver	199.95	7.04
NC-190	Receiver	219.95	7.76
NC-270	Receiver	279.95	9.92
NC-303	Receiver	449.00	12.70
NC-400	Receiver	895.00	25.46
HRO-60T	Receiver	975.00	27.75
NCX-3	Transceiver	369.95	10.44
NCXA	AC supply	110.00	3.79

Model	Type	Price	Monthly Payments after $5.00 down (3 years)
NCXD	DC supply	$119.95	$4.15
VFO-62	6 & 2 meter VFO	49.95	1.62
NTS-2	Speaker for NC-303, NC-400	21.95	.61
NTS-3	Speaker for NC-270	19.95	.54
NTS-3B	Speaker for NC-109, NC-155	19.95	.54
XCU-109	Calibrator for NC-109, NC-155	20.95	.57
XCU-300	Calibrator for NC-303	23.95	.68

NATIONAL RECEIVERS RECONDITIONED AND TESTED IN OUR OWN SHOPS

Model	Price	Model	Price
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SW-54	29.00	NC-173	94.00
NC-57	49.00	NC-183	124.00
HRO-60	299.00	NC-183D	179.00
NC-66	49.00	NC-240	99.00
NC-88	69.00	NC-300	189.00
NC-98	89.00	NC-303	309.00
NC-109	99.00		

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Only $5.00 down is required for any New Equipment. 10% is required for reconditioned equipment. Payments shown on new equipment are for a 36 month plan. A $60 order for either new or used equipment, may be financed up to one year, two years on a $120 order, or three years on $180 order. Persons purchasing on our time payment plan must be of 21 years of age and regularly employed. Service men with APO addresses with good credit ratings, accepted. APO Shipments our specialty.

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To expedite order give full information

Terry: I have a .....

to trade. What's your deal? .....

.....

Ship me a .....

I enclose $..... and will pay balance:

☐ COD ☐ 1 Year ☐ 2 Years ☐ 3 Years

If ordering C.O.D., please enclose 10% deposit.

If ordering on terms, please list following information on separate sheet and enclose with this order.

Three credit references, (furniture and car preferred). Rent or own home? How long at present address? Employed by? Type of job? How long employed here? Married or single?

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ADDRESS .....

CITY..... ZONE..... STATE.....

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6450 Milwaukee Ave., PHONE RO 3-1030

ORLANDO, FLORIDA
23 Azalea Park Shopping Center, Phone 277-8231

For further information, check number 26, on page 110

The Weekender [*from page 27*]

Place a dummy load (a 60 watt light bulb will do fine) across the antenna connector. Set capacitors C_2 and C_3 to full capacity. Place switch S_1 in TUNE position and apply all voltages. Quickly adjust C_2 until meter M_1 reaches a minimum reading. Now adjust C_3 until M_1 reads 140 ma. Again adjust C_2 for minimum reading. Repeat this process until minimum reading that can be obtained by adjusting C_2 is 140 ma. The 60 watt bulb should now be lit to almost full brilliance.

Remove all voltages and place S_2 in OPERATE position. Plug a carbon microphone into J_1. Apply voltage and speak into mike. The meter, M_1, should read around 50 ma with no modulation and should swing close to the 140 ma mark on peaks. Remove all voltages and disconnect the 0-10 ma meter from the circuit. You are now ready to make the installation.

Connect a tuned whip antenna to the antenna connector. Plug the output of the converter into the auto receiver antenna and you are in business.

With the 3000 kc crystal in the converter you can tune the 75 meter phone band on your receiver from 800 to 1000 on the dial and tune 40 meters from 1200 to 1300. Tune capacitor C_3 for loudest signal. It will be near maximum for 75 meters and near minimum for 40 meters.

Here's wishing you many hours of happy mobiling. ■

More QSO's [*from page 30*]

4 kc waste area.

S.s.b.—3 kc filter = 33 QSOs plus a 1 kc waste area.

S.s.b.—2.1 kc filter = 47 QSOs plus a 1.3 kc waste.

Using the 2.1 kc filter on the following bands:

80M = 95 QSOs
40M = 47 QSOs
20M = 71 QSOs
15M = 95 QSOs
10M = 571 QSOs

Let us project this idea into the future.

We shall see a minimum of 50 db sideband suppression for all.

Spectrum width signals of 2.1 kc will be the vogue.

Splatterers, classified as social outcasts, and a.m. on the lower frequency bands being only a topic pertaining to the pioneer days.

V.f.o. drift of not more than one part in ten million per hour will be an absolute necessity.

The latest rumor on the bands will sound something like this;

Joe: "Did you hear that Central Halicollins is coming out with the new Single Sideconserband Rig?"

Jack: "Do you mean with the new audio spectrum compressor and 300 cycles bandwidth?"

Joe: "Yaright Jack, they're going to include Single Sideband so that we can still talk to some of our friends."

Jack: "The bell just went off, let's identify." ■

For further information, check number 41, on page 110

For further information, check number 42, on page 110

Cool Communicators [*from page 39*]

perhaps they should drop into their old ways and lose interest. All he could do was to wait —and hope.

Then, a week later the Beatniks came. It was afternoon and he was in the shack trying to warm up the transmitter. The door burst open and Hamm spun around.

The glow in their faces told of the new licenses they displayed, and Hamm felt a swelling sense of pride. In a little while he could call the newspapers.

He slapped the leader Beatnik on the shoulder. "Well, old man, what kind of rig are you going to use?"

"Rig, daddio?"

"Sure, rig . . . transmitter."

"But, daddio, we just *communicate*. Who needs a transmitter?" And turning to his four fellow Beatniks, he asked, "Dah-dit-dah-dit?"

In chorus they replied, "Dit-dah-dit!" The vocal code round-table that followed left Hamm in a complete daze.

And like, man, you can't win everytime. ■

Product Detector [*from page 37*]

After the receiver is turned on and warmed up, the b.f.o. adjustment screw on the side of the shield can will have to be reset for zero beat, with the BEAT OSCILLATOR knob on zero and the set accurately tuned in to a local broadcast station. Function selector switch must be on CW or SSB and slide switch on CW-SSB for this adjustment.

The function switch now operates as follows; In the CW position, the product detector is switched on, the a.v.c. is turned off and the "S" meter does not operate.

In the AM position, the diode detector, a short time constant a.v.c. circuit and "S" meter circuit operates. In the SSB position, the product detector, a long time constant a.v.c. circuit, and "S" meter circuit operates.

Supplementary Conversion Notes

The following notes supplement the last conversion article by the author.

Converter Stage—For those receivers lacking adequate oscillator action and injection on the three low frequency bands, as evidenced by poor signal to noise ratio, and in some cases no oscillator output at all, remove capacitors C_6 (0.05 mf) and C_7 (4700 mmf) connected from pin 6 of the 6X8 tube to ground, and discard them. Change R_{10} (47K) resistor from pin 2 to ground to 18K ½ watt. Change the 180 ohm resistor from pin 6 to ground to 270 ohm ½ watt. Slight readjustment of the oscillator trimmer capacitors and coil slugs for each band may be necessary after these changes are made, to correct dial calibration and tracking. Adjust oscillator coil slugs on the low frequency end of each band and trimmer capacitors on the high end of each band. A signal generator or crystal calibrator is desirable when making these adjustments. ■

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For further information, check number 37, on page 110

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For further information, check number 36, on page 110

For further information, check number 24, on page 110

Ham Shop

Rates for the Ham Shop are 5¢ per word for advertising which in our opinion, is non-commercial in nature. A charge of 25¢ per word is made to all commercial advertisers or organizations. Since we do not bill for Ham Shop advertising, full remittance **must** accompany all orders.

Closing date is the 15th of the 2nd month preceding date of publication. Your copy should be typewritten, double spaced on one side of the page only.

Because the advertisers and equipment contained in Ham Shop have not been investigated, the publishers of CQ cannot vouch for the merchandise listed therein. We reserve the right to reject advertising which we feel is not of an amateur radio nature.

QSL's? CB's? WPE's? Regular samples 25¢, De-Luxe samples 50¢. (refunded). Sackers, W8DED, Holland, Michigan.

QSLs Samples 25¢ Rubber stamps; name, call, address $1.55. Harry Sims, 3227 Missouri Ave., St. Louis 18, Mo.

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QSLs Large selection styles including photos. Fast service. Samples Dime. Ray, K7HLR, 679 Borah, Twin Falls, Idaho.

QSLs—$2.00 per 100 postpaid U.S. only. Glossy, red and green. Free sample. Hobby Print Shop, Umatilla, Fla.

QSL's SWL's, CB samples 15¢, Nicholas & Son, Printery. P.O. Box 11184, Phoenix 17, Arizona.

QSLs SWLs that are different, colored, embossed card stock and "Kromekote." Samples 10¢. Home Print, 2416 Elmo, Hamilton, Ohio.

QSL Kromekote 3-color . . . order 200 get 25 each of 8 different styles . . . many styles. Samples 10¢. Progress Printing. Box 1154, Biloxi, Miss.

QSLs four colors glossy stock, forty designs—send $5 for 200 and get surprise of your life. 48 hour service. Satisfaction guaranteed. Constantine Press, Blandensburg, Md.

GLOSSY 3-color QSL cards 100—$4.50. Free sampler. Rutgers Vari-Typing Service 7 Fairfield Rd., Somerset, N. J.

QSLs—SWLs samples 10¢. Malgo Press. Box 375 M.O., Toledo 1, Ohio.

COLOR QSL's . . Free Samples, Filmcrafters . . Martins Ferry, Ohio.

QSL Cards in 3 colors $2.50 per 100. Free samples and catalogue. Garth Printing, Box 51Q, Jutland, New Jersey.

QSL cards: 2 color, glossy; 100 for $2.50. Samples, Dime, Ramsbottom Printing, Box 237F, Kirksville, Missouri.

QSLs Samples, dime. Print Shop, Corwith, Iowa.

QSLs CBL's—Finest quality—extra fast service on stock or custom designed multicolor cards. Samples and catalogue 25¢ (refundable). Dunnahoo, 516 Prospect, Fairview, Mass.

RUSPRINT QSLs—SWLs 100 2-color glossy $3 postpaid. QSO file cards $1 per 100. Rusprint Box 7507 Kansas City 16, Mo.

QSLs SWLs XYL-OMs (Sample assortment approximately 9¾¢) covering designing, planning, printing, arranging, mailing, eye-catching comic, sedate, fantabulous. DX-attracting. Protopay, snazzy, unparagoned cards. (Wow!) Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minn.

HUNDRED QSL's: $1.00. Samples, dime, Meininger, Jesup, Iowa.

QSL's—100—$2.50. Samples. Dime. AMEE's Printery—W9FXQ—Box 138, Oak Lawn Illinois.

QSL cards low prices free samples. Debbeler Printing 1390-X North 38th Street, Milwaukee 8, Wis.

QSL Cards Brownie, W3CJI—3110 Lehigh, Allentown, Pa., Catalog with samples 25¢.

SELL 75A-4, serial 5446, speaker, 2 filters, $575, absolutely like new; stereo Fisher am-fm 101-R tuner, $100; stereo amp-preamp, Bell 3030, $95 and TEC transistorized stereo amp, $95; 2-6550 tubes each $4; 2E26 tube RCA never used, $2; E-V 600 D mike, as is, working, $5; mobile, power supply with relays, etc. ready to go, 6 volts in, about 400 volts, 350 ma. out, $25; Johnson 275 watt matchbox, $30; VFO-matic for transceive operation with 74A receivers, $90. All in excellent or like new condition. F.O.B. Lamb, 1219 Yardley Rd., Morrisville, Pa.

CLEGG 99er with National 6N2 vfo $125. Drake 2A and HT-37 $515. Ameco Nuvistor 6m converter $30. LW-51 DeLuxe 6m 50 Watt Transmitter $40. Prop pitch motor with 2 selsyns and indicating compass rose $35. WA2FSD 11 Burbury Lane, Great Neck, N. Y. 516 HU 2-7857.

From the Boys in the Back Room

This page is what we in the publishing industry refer to as a house ad. It's not an editorial, and it's not intended to reflect the opinions of *CQ's* editor. Rather it's a page which we use to convey to our readers the thoughts of the business staff in order to let you in on what's behind our planning from a practical business point of view.

In the past it's been a difficult task to make our messages as effective as we might like, and yet be tactful as well. We naturally believe that *CQ* is the best amateur radio magazine and we do everything in our power to keep it that way. We like to sell *CQ* on its own merits at all times, both to the reader and the advertiser. That's not easy to do in print when you have to be subtle and beat around the bush by referring to the other publication as Brand X.

So, we'd like to set a precedent in the amateur radio magazine business, and call a spade a spade. We must admit that *CQ* is Number 2 in its field. That is, *CQ* is a very close second to *QST* in total distribution, and has almost four or five times as must distribution as any other HAM RADIO magazine in the world. Now then, is being a close second worth bragging about? Consider these facts. *CQ* is published as a commercial venture and hasn't the benefits of a tax-free association as does *QST*. *CQ* pays for all its editorial material whereas *QST* exists on freely contributed articles donated by readers. *CQ* doesn't have the benefit of more than 1,000 league officers, SCMs, OOs, and other officials as a *free* public relations team. Nor does *CQ* have the advantage that *QST* has of selling subscriptions under the label of an association membership. We don't have elaborate testing labs and we don't have a set of manuals for the beginner ham in which to presell him on our magazine before he even obtains his license. There are lots of things we don't have.

We *do* have, however, almost as much total distribution as *QST* has despite their head start. In fact, we frankly believe that when the non-active, non-operating amateurs are deducted from *QSTs* distribution total that *CQ* is read by many thousands more *active* hams than read *QST*. Inactive old-timers renew their league membership as a token of support—but they don't represent a buying market for the advertiser. Then, we maintain, *CQ* is not really the Number 2 magazine. Statistically it's hard to prove. Realistically, we're certain in our own minds that it's True.

If we're right—and the far superior content and broader editorial scope of *CQ* over QST convince us that we are—then *CQ* is really Number 1. Our aim is to keep *CQ* Number 1.

For further information, check number 58, on page 110

For further information, check number 23, on page 110

MICHIGAN State Convention, Grand Rapids, 16th Annual, April 6, 1963. Pandlind Hotel, Michigan's Best. Write Post Office Box 1333, Grand Rapids, Michigan.

220mc. Information Frequency, Equipment, Schedules. Postage Returned W9DJ.

FOR SALE Collins 30L-1 and 31SB-5 Station Control in original cartons used less than year. W5SZB, Box 330 Edinburg, Texas.

TEFLON sheets, up to ⅛" thick, mill ends. $1.00 lb. postpaid S. Diamond, Etiwanda, California.

STILL LOOKING for old wireless gear before 1925. Will pay good money or trade and particularly want certain spark equipment, a C.R.L. Paragon with amplifigon or matching tube panel, De-Forest Type O radiotelephone with tubes, catalogs, government call books and other books. File of QST's is almost complete but need a few issues of 1916, 1917, 1919 and 1923. If you are lucky, enough to own any copies I need, I will pay real money for them. I want them that badly. Also need quenched sections number SE1001 for SE1075 ship transmitter. In writing please give complete information plus price or specify what you need. W5VA/W5AI, T. Frank Smith, P.O. Box 840, Corpus Christi, Texas.

WANTED Test equipment TS- or AN/URM, -UPM, -ARM, etc. Teletype TG-7, models 15, 19, 28 printers & reperfs. Rcvrs & Xmtrs -GRC, -PRC, -FRR, -URR, -TCC, RT-66, -67, -68, -70, etc; Collins 51J, 17L-3, -4; 18S-2, R-388, -390, -391; ARN-14-21, -30, etc; APR-9 & -10; ARC-21, -33; -34, -55; APS-42, etc. We pay freight. Amber Industrial Corp. 75 Varick St., New York 13, N. Y.

WANTED 20A Central Electronics Exciter BC-458 v.f.o. Final amp. for same, SP44-Panadaptor, Electronic Key—50mc Linear Amplifier, Collins Speaker Console—Collins nbfm Product Detector for 75A-3 (Universal) Johnson 6 & 2 v.f.o. & p.s., Xformer 3000-3000 vct 500ma. WA2GHB, 2786 Miles Ave., Bronx 65, New York, SY 2-5697.

TV CAMERA Low cost-easily built—complete schematics, instructions 50¢. Denson Electronics, Rockville, Conn.

FOR SALE: Complete instructions including 28 page booklet and 22" x 36" schematic for converting the ART-13 transmitter to a.m. and s.s.b. Satisfaction guaranteed. $2.50 Sam Appleton, 501 N. Maxwell St., Tulia, Texas.

COMMUNICATION Teletype unusual surplus bargains, Free flyer. MDC-923 W. Schiller, Phila. 40, Pa.

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.

READY CASH for your AN/GRC, PRC, TRC, TCC, ARC, all Military communications Equip't. Also test gear: TS-; AN/UPM, URM, etc. We Pay Freight. Call K2BBC collect at TR 8-5222 or Write Space Electronics Co., 218 W. Tremont Ave., Bronx 53, New York.

TOROID RTTY Kit: Mark-Space Discriminator and Bandpass filters. Includes 4-88 mh and 1-44 mh uncased, like new toroids; Information sheet, mounting hardware and six mylar capacitors. $5.00 Postpaid. Toroids: Specify 88 or 44, less capacitors, $1.00 ea., 5/$4.00 Postpaid. KCM Products, Box 88, Milwaukee 13, Wis.

WANTED Army Sets or Parts. GRC, PRC, FRR/URR, TCC, SB, SCR Send Listings. Quick Cash. Anker Electronics, 1617 So. Main St., Box 26, Wilkes Barre, Pa.

TOROIDS Uncased 88 mh like new. Dollar each. Five $4.00 p.p. DePaul, 309 South Ashton, Millbrae, Calif.

WANTED: Military and commercial laboratory test equipment, Electronicraft, Box 399, Mt. Kisco, N. Y.

ONE THIN dime brings 50 page eye-popping war surplus electronics catalog. Fabulous bargains. Meshna, Lynn, Mass.

FOR SALE complete Elmac mobile or base station AF-67, PMR-7, M1070 with controls, cables, antenna relay, S-meter—works off 110 vac or 12 vdc with racks perfect—$250; Motorola receiver FMR13V, transmitter FMT30D, both 30 mc and 5 kc width; converter 12 vdc to 6 vdc at 50 amp; two voltage regulator transformers (250 watts—120 watts); Hallicrafters S-39 receiver; Gonset superceiver and super 6 converter, 12 vdc; M. G. Bullock 7475 Rupert, St. Louis 17, Mo.

BARGAIN Like new, less than 6 mos old. HT-37, HQ-170A w/spkr, Viking matchbox w/cplr. and ind, (new) Heath HO-10 Ham-scope assembled & tested Eico gdo, Amphenol 40m fld, dipole w/75 ft. 300 ohm line, Hy-Gain 10-15-20 m trap doublet w/75 ft RG-8A/U, Dow-Key DK60-G2C Ant.Relay, D-104 Mike w/G-stand plus bug and all connecting cables. Price $600. E. Bosinski, WA2SHW, 11 Elizabeth Ct., Secaucus, N. J.

WANT CU-286/FRR Antenna Coupler. N. K. Thompson Millinocket, Maine.

WILL Swap for ham equipment. 50 Short Wave Craft 1931-37, 24 Radio 1935-41, 64 QST 1931-39. 30 Radio News, Craft, etc., same dates. Will answer all offers. Chuck Hohl, WN8EYH, RD Box 221, Huron, Ohio.

ATTENTION! Swap equipment, components with other hams! Many interesting offers in Equipment Exchange. Sample copy free! Write: Brand, Sycamore, Ill.

RTTY WE255A relays $3.50. Sockets for same $1.00 postpaid. Jerry Copeland K80QI, 8423 Newells Lane, Kalamazoo, Mich.

For further information, check number 7, on page 110

LOOKING? Shopping? Trading? Trying to save money? Write Bob Graham for Special Deals on new and guaranteed reconditioned used gear. Cash or Budget. See us at the Swampscott Hamfest. Graham Radio, Dept. B., Reading, Mass. Tel: 944-4000.

HAM BUERGERS Used equipment, Money Back Guarantee. Collins 75A-4 mint with vernier dial, Serial #5364 $595.00. Other items equally as good. Trades. Write for free list. Ham Buergers, Wyncote, Pa., CA 4-1740.

TRADE-ins accepted on purchases of demos and brand new Ham, CB, Marine and Hi-Fi equipment. We are one of the largest retailers in the country and carry complete lines of new equipment of almost all manufacturers in stock. Time payments—up to 24 months—arranged. We will also buy your used equipment for high cash prices. Many specials available. Call Bob at Crown Electronics, 64 Cortland Street, N. Y. 7, N. Y. Worth 4-0790 for real money saving deals, whether you have something to trade-in or not.

SWAN owners We will convert your present Swan Monobander or Tribander to 450 Watts p.e.p. input, using two 6DQ5 in final amp. parts, labor and one 6DQ5 $39.95, your present Adcom or Topaz supply will handle extra power Outercom of California, 10550 Burbank Blvd., North Hollywood, California.

NOW 3 New Do-It-Yourself crystal grinding and etching kits. Literature available for 5¢ stamp. Quaker Electronics, P.O. Box 215, Hunlock Creek, Pa.

PREMIUM quality reconditioned equipment! Terms! Trials! Trades! World's largest stock! Elmac AF-67 $99.95; Globe HG-303 $79.95; Heath DX-40 $49.95; MT-1 Cheyenne w/mic. $109.95; Johnson Adventurer $34.50; Viking II $175.00; Geloso G-209 $169.00; Hammarlund HQ-140X $159.00; Heath MR-1 Comanche $99.95; National NC-188 $99.95; NC-300 $209.00. Leo, WØGFQ, Box 919, Council Bluffs, Iowa.

ELECTRONIC Tie Clip, Lucite embedded 3.9 meg 1/10 watt resistor mounted on high quality clip $4.95, sterling silver $6.95, cuff links $2.50, sterling silver $3.50. Key chains—embedded resistor, tubular/disk capacitor, transistor, diode, or vaco terminal, choice clear, white or black background $1.00. Desk-Set—your QSL card or assortment of electronic components in 7/16" Lucite. Card $6.95, components $8.95 choice of backgrounds. Amateur License—embedded in 0.020" Vinylite $1.00. All items carry money back guarantee. Gift Town, P.O. Box 1125, Minneapolis, Minn.

THE Ham Trader-Magazine devoted to sale of amateur radio equipment. Advertise free, pay when you sell, subscription 6 issues $1.50. 25¢ copy. Information—The Ham Trader, Box 153 Dept. C, Franklin Square, N. Y.

SEE you at the Dayton Hamvention April 26 and 27.

SELL xmtr 250w cw 8°—20 m. 170w 15°cw Half pwr a.m. Going ssb. $250. Dave Roberts, WA2TWO, Box 232, Sewell, N. J.

USED G-76—ac & dc Supplies with mike $450. New Johnson 500 Kit $550. New SX-101A $450.00. Larry W6RNR, 749 Estates Drive, Sacramento, Cal.

VIKING 1-TVI Kit, Lo Pass Filter installed; Viking vfo, Spare 4D32; Good operating condition. First $100 FOV K.C. E.M. Wesick, WØLCB, 8830 Horton, Overland Park, Kansas.

WANTED Radio correspondence course, also back issues of Electronic World and Popular Electronics. Thomas Condon, 321 Moreland St., S.I. 6, New York City.

FOR SALE Hallicrafter SX-100 receiver. Excellent condition. Belonged to my late husband. Best offer over $175. Must pick up. Mrs. Johnny Linker, 1322-28 St., Lubbock, Texas.

SELL or trade—Miscellaneous copies R-9 and Radio 1935 to 1940. Want audion detector, rotary spark gap. W3BX, 1012 Wilde Ave., Drexel Hill, Pa.

FOR SALE Paco r.f. signal generator & TV/FM marker generator, Model G30 $20.00; National Radio & TV Home Study Course $10.00; Ameco Code Course, 7½ wpm $4.00; D.C. Milliamperes Meter (Triplett), new, 0-300 $5.00; John Neugent, 129 Beaupre Ave., Green Bay, Wis.

75A-2 w/spkr-$280, xcint all band phasing ssb xctr w/vfo, vox, 60w. $130, w/p.s. $150. All for $415. K8PSV, Route 3, Lowell, Michigan.

PHASING sidebander—well built from Nov. 59 QST—$150. K8PSV, Rt. 3, Lowell, Mich.

ACHTUNG 40ft. steel tower, $40. 3 el. Hy-Gain ten meter beam, $25. AR-22 rotor $25. All—$80. K8PSV, Route 3, Lowell, Michigan

FOR SALE Kleinschmidt Model 100A Page Printer with keyboard and synchronous motor. Including line current supply, typing table, repair manual and spare motor. Like new. You pick up for $150. W9OLD, 120 N. Ashland, Palatine, Illinois.

WANTED Kw final amplifier 80-40-20-15-10; also B&W HDVL BCL coils links mounts. W1BB.

FOR SALE Meissner Signal shifter, plug in coils $10; Heath VF-1 vfo $10; Heath WA-P2 hi-fi preamp $10; B&W 52-A low pass filter $7; VOM-battery powered—$5; Collins TCS transmitter & pwr supply $35 Hammarlund HQ-129X rcvr with speaker $125; Heath O-6 scope 5" $35; 2 mtr rcvr Abbott TR4-Regen $5.00; Power Supply 250v-100 ma, 6 v-3 a $5; Heath DX-35 xmtr $25; Heath sixer—$30; 6 mtr Wald—1 element $5; B&W Bolun coils (2) boxed $5; Hand keys (2) $1 ea.; Bug $5; Argonne AR-54 mike (new) $5; Heath 12v vibrator supply $7; Carbon mikes (2) $1 ea. 10 mtr mobil xmtr-xtal controlled—30 watts built in 6v dyno $25; Antenna coupler $2; 0.4 mfd @ 7500 vdc—dual (2) $2.00 ea.; BVI electric jigsaw & sander $5. Call Tilden 5-9352, Woodbury, N.J. K2GMY.

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See your favorite dealer today for your latest issue or order direct from the publisher (add 25c for mailing).

VALIANT, factory wired, like new $285; Johnson s.w.r. bridge $22. Millen 6m Conv. $19. J. Bright, 131 Nugent St., New Hyde Park, L.I., N. Y. FI 2-0088.

MODEL 19 teletype machine for sale. This machine is complete and is in very good condition. Sorry, will not ship but will crate. Contact Larry, K9BJM, Hoopeston, Ill.

WANTED From anyone, information on effective means of eliminating radio interference (static) caused by fluorescent lighting. Ron Eoilling, 900 S. 5 Ave., W. Newton, Iowa.

TRYING to complete BC-611 Handie-talkie need following parts: case bottom, antenna cover, latching bolt, hinge for bottom. State condition and price. Charles King, 36 Linsley Ave., Meriden, Connecticut.

WANTED Speaker console for KWM-1 Also crank up tower W20BH, 200-27 46 Ave., Bayside 61, N.Y.

FOR SALE Bandmaster Deluxe Model TBS-50D transmitter with power supply. Also Hallicrafter Skybuddy & converter. $125. Dr. Ralph Racicot, 8 Elm St., Southbridge, Mass.

WANTED Mutual conductance tube tester; vtvm; signal generator; tracer. 21YP4 TV picture tube. Sell Knight tube tester; bug; vom; 2 Meter fm transceivers, constant voltage transformer 500w @117v; Heath O-11 oscilloscope; 100 watt transmitter am, cw, vfo; electro voice 915 mike; mobile mike; nearly completed HBR 16 with all parts including Eddystone dial and cabinet; picture tubes—17HP4, 9JPI; Heath balun coils, TU-26B. K7JUR 210 No. 24 Ave. Yakima, Washington.

SHAWNEE HW-10 perfect condx make offer Jeff W9FWK, 1549 Atchison Ave. Whiting, Inc.

KWS-1 For Sale New condition—less than 20 hours use. Recently calibrated. $1000.00 firm. D. J. Bridgeman 7007 So. 116 Pl. Seattle 78, Wash.

HAMMARLUND Pro 310 receiver A1 condition. Will ship express pre-paid. First $275 gets it. J. L. Lowrey, 4019 Tyndale Dr. Jacksonville 10, Fla.

SELL Hammarlund super pro BC-779 and supply, $50; Another Super Pro supply $10; P.A. 813 kw final (no supply) $20; Millen 50 watt driver and supply $25; You pay shipping, K4LXT, Bridgeton, North Carolina.

FOR SALE Globe King 500-C. Low hours, good condition, $350; Hammarlund SP-400X, speaker and power supply, good condition, $100. Montgomery Amateur Radio Club, P.O. Box 6187, Montgomery 6, Alabama.

FOR SALE Gonset G-76 a.c. supply model 3349, d.c. supply model 3350, $145 pr. or sell separate. WA2IRO, Cloverdale 9-4217.

MOBILE Station Gonset G66B and G77A (80-10 meters with power supplies that operate on 6, 12 and 110 volts) with all cabling, manuals and factory cartons—$199. Antenna, all-brand center loading coil, bumper mount and Micro-Z Match $20. Shure 505C mike—$9. All excellent condition. K3JHX, 109 Spring Valley Rd., Wilmington 7, Delaware.

ART-13 Manuals—copy of original TM less catalog and pages not needed for amateur use. $4.25pp—John Barviaux W3NGL, 2537 Leslie Dr., New Kensington, Pa.

SELL G-76 factory modified to C model, perfect condx, Ac supply home built with Gonset transformer, 12vdc supply home brew. $400.00 FOB. Bob WA6ICT, 6521 No. Golden West, Arcadia, Cal. HI 7-5201

LAFAYETTE HE-30 Factory wired, in like-new condition, best offer over $80. Write Fred Duncan, K3TTN RD #1, Schellsburg, Pa.

WANTED 2 meter linear with power supply. State price and condition in first letter. Box S9, CQ Magazine, 300 West 43rd St., New York 36, N.Y.

NIKON F Camera, fl.4 lens, Photomic system, case. Absolutely brand new with factory guarantee, never used, $295, or will consider deal on ssb gear. W1RGX, Leonard Hart, 88 Marshall St., Medford, Mass.

JOHNSON Thunderbolt. Kilowatt amplifier with power supply, factory wired excellent condition. Will ship. $275. Ron White, 210 Alden Road, Hayward, Cal.

SELL KWM-2 purchased Dec. 62, Ser. 13642 $940; A.c. pwr. supply $90; VFO-matic for 75 A receivers, $80; Johnson Matchbox-275 watts, $30; all guaranteed perfect, F.O.B. Lamb, 1219 Yardley Road, Morrisville, Pa.

NEED money for further work with radio? Sell your old toy trains. Send description including make and numbers, also price desired to Edward H. Wichmann, New Lennox Station, Lenox, Mass.

WANTED Central Electronics Model 10A or 10B transmitter. W2ELW, 71 Southampton Drive, Levittown, N.J.

$750 Priced for immediate sale KWM-2 Collins single sideband in excellent condition complete with 110 volt power supply and all crystals needed to operate on any frequency, set capable of operating, Contact: Robert E. Lee, Jr., 315 Holly Drive, Coleman, Texas.

4-1000A GG linear, completely shielded, lowpass filter, vacuum variable, B&W coil, Eimac socket, blower, 19" high panel, spare tube, no power supply $360. For direct pickup have 5000v 3KVA supply components; poleig, four 872A, swinging choke, filters, variac panel etc., You need lots of room for this one. $75. W2CFT.

Doc, W9HJS, our Chicago Store Manager is punching S.S.B. holes in the band with the 150 PEP of his new Hallicrafters SR 150 mobile rig. Listen for him on 80 and 40! He uses it fixed at his home QTH, too!

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CRX-2 151-174MC Receiver	109.95	3.79	S-118 General Coverage Receiver	99.95	3.42
CRX- 3108-135MC Receiver	94.95	3.24	S-119 General Coverage Receiver	49.95	1.62
FPM-200 Transistorized Transceiver	2,650.00	95.51	S-119K Kit form of above	39.95	1.26
HA-1 "To" Keyer	79.95	2.70	S-120 General Coverage Receiver	69.95	2.35
Ha-2 2 Meter Transvertor	349.50	12.44	SR-150 Fixed/Mobile Transceiver	650.00	23.29
HA-5 80-2 Meter VFO	79.95	2.70	P-150AC Supply for SR-150	99.50	3.41
HA-6 6 Meter Transvertor	349.50	12.44	P-150DC Supply for SR-150	109.50	3.77
HA-10 Tuner	24.95	.76	MR-150 Mobile Mount for SR-150	39.95	1.26
HTHT-32B SSB Transmitter	725.00	26.00	SX-62A FM & Short Wave Receiver	430.00	14.08
HT-33B Linear Amplifier	995.00	35.75	SX-100 General Coverage Receiver	325.00	11.56
HT-37 SSB Transmitter	495.00	17.69	SX-101A Ham Band Receiver	445.00	15.89
HT-40 AM-CW Transmitter	109.95	3.79	SX-110 General Coverage Receiver	169.95	5.86
HT-40K Kit form of above	89.95	3.07	SX-111 Ham Band Receiver	279.50	9.91
HT-41 Linear Amplifier	395.00	14.08	SX-115 Ham Band Receiver	599.95	21.48
P-26 Supply for Transvertors	99.50	3.41	SX-117 Ham Band Receiver	379.95	13.54
R-47 Speaker	12.95	.29	SX-140 Ham Band Receiver (80-6)	139.95	4.87
R-48 Speaker	19.95	.54	SX-140K Kit form of above	114.95	3.97

HALLICRAFTERS RECONDITIONED EQUIPMENT

HA-1 Keyer	$ 49.00	HT-40 Xmtr.	$ 64.00	S-108 Revr.	$ 99.00
HA-4 Keyer	39.00	S-40A Revr.	59.00	SX-110 Revr.	119.00
HA-10 Tuner	14.00	HT-41 Linear	295.00	SX-111 Revr.	189.00
HT-18 VFO	39.00	SX-43 Revr.	89.00	SX-115 Revr.	449.00
HT-20 AS-IS	45.00	SX-71 Revr.	119.00	S-118	
SX-25 Revr.	69.00	S-85 Revr.	79.00	SX-117 Revr.	229.00
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HT-32 Xmtr.	369.00	SX-96 Revr.	139.00	S-119 Revr.	29.00
HT-32A Xmtr.	419.00	SX-100 Revr.	199.00	S-120 Revr.	44.00
HT-33 Linear	299.00	SX-101 Mk III	249.00	SX-140 Revr.	89.00
HT-37 Xmtr.	349.00	SX-101A Revr.	289.00		
S-38D Revr.	34.00	S-106 Revr.	39.00		

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THE CQ HAM MART

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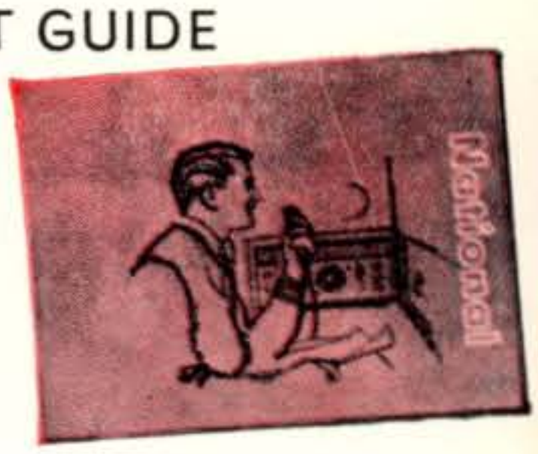

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Actual Size

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