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The Radio Amateur's Journal

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For further information, check number 1 on page 124.



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DICK K9BMJ/8



DOUG K8GNA



AL W8HTX



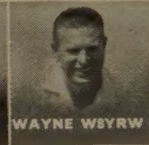
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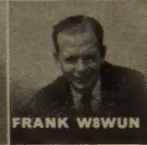
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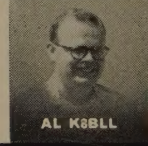
ERNIE W8VFN



WAYNE W8YRW



FRANK W8WUN



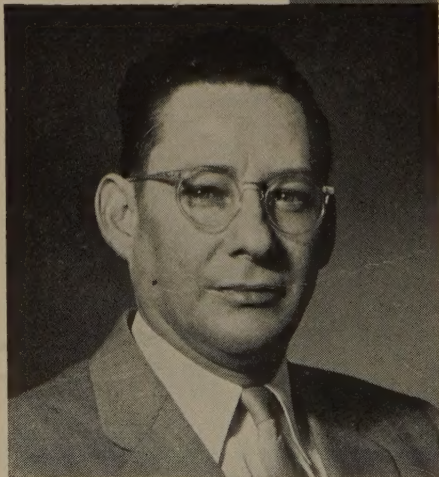
AL K8BLL

All of these licensed radio amateurs make important contributions to the Heath line of fine ham kits. In a sense, they are your personal representatives within the company, because their design ideas and performance preferences reflect not only their own "on-the-air" experiences, but those of the amateur fraternity with which they are in constant contact. With this kind of representation in Benton Harbor, you can continue to rely on high-performance Heathkit amateur radio equipment designed by hams, for hams!

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CHUCK K8CJI



ROGER MACE (W8MWZ)
SENIOR HAM ENGINEER
HEATH COMPANY

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MODEL DX-20

\$35⁹⁵



If high efficiency at low cost in a CW transmitter interests you, you should be using a DX-20! It employs a single 6DQ in the final Amplifier stage for plate power input of 50 watts. The oscillator stage is a 6CL6, and the rectifier is a 5U4GB. Knob band-switching is featured to cover 80, 40, 20, 15, 10 meters, and a pi network output circuit matches impedances between 50 and 1000 ohms to reduce harmonic output. Designed for the novice as well as the advanced CW operator. The transmitter is actually fun to build, even for a beginner, with complete step-by-step instructions and diagrams. All the parts are top-quality and well rated for application. "Potted" transformers, copper-plated chassis, ceramic switch insulation are typical. Mechanical and electrical construction is such that TVI problems are minimized. If you desire a good clean CW signal, this is the transmitter. Shpg. Wt. 19 lbs.

Letters to the Editor

CG Rebuttal

Dear Wayne:

I have been in the U. S. Coast Guard since 1939 having joined as an apprentice seaman with no delusions of grandeur. At the time of entering into the U. S. Coast Guard I held: 1st Class Broadcast License; 2nd Class Telegraph License; Class "A" Radio Amateur License and I must confess in all sincerity that I never enjoined the anticipated ecstasy of having the recruiting officer present me with a Collins KW, an HRO-60 and a three band multielement Telrex rotary at the door of the recruiting office or at the gate of Boot camp. The U. S. Coast Guard is not a big outfit, either personnel-wise or money-wise and it is not the intent of our outfit to unwisely empty its till. The U. S. Coast Guard is perhaps just a little bit different in that it expects and tries to instill a little initiative on the part of its personnel. I believe that RM3 Haake would not be in his present mental outlook on ham radio if he had engendered a wee bit of that sometimes elusive substance.

I have operated as an amateur throughout my Coast Guard career with the exception of the War years: Loran Station, Cape Bonavista, Nfld., 1946-47-48-49; U. S. Coast Guard Training Station, Groton, Conn., 1949-50-51-52, WICGS; Loran Station, Cape Christian, Baffin Island, WIKGH, 1954-55. In all locations and cases we installed, operated, and repaired our equipment which was U. S. Coast Guard furnished. If our antennas were in need of repair or maintenance we did it. If our equipment needed fixing we did it. I can't see where that is any too much to ask of a radio amateur. But who knows—this is the year 1958—the year of the free lunch. I must also point out to RM3 Haake that wherever I was stationed I had very little or no trouble getting on the air and that fact was regardless of whether I was RM3 or higher. The U. S. Coast Guard does recognize all too well the importance or merit of amateur radio. At Cape Christian Baffin Island in the arctic we had a B&W rig, HRO-60 X, Telrex beam—all installed and operated and maintained by amateur operators. This U. S. Coast Guard furnished equipment was the only means by which we were able to contact our folks back home during the 10 month ice-in period. (This incidentally thru fine services of W9NZZ.) Since its commissioning in 1954 Cape Christian has had many men in its crew who would undoubtedly have words of opposition to RM3 Haake's letter with bitter tea context.

It is indeed unfortunate that the CGC Bramble incident developed but any ham with service years behind him can attest to long scale red tape procedures that must be completed in cases of this sort. Three weeks to process such a request is altogether too short a time. This request should have gone in well in advance—at least two months prior to sailing date.

With reference to the non-operating status of the USN amateur station at Argentina, Newfoundland, all I can say in response is "Get to it Boy and get it operating!" It is peculiar concerning the capabilities of a station and its equipment. It won't operate without an operator. There does have to be an amateur present with the required license, necessary capabilities and initiative to get it going. A Non-operating station means just one thing to me—no amateur present!

Having been in the U. S. Coast Guard these past 19 years I can only add that to me amateur radio has been more than a memory. If RM3 Haake had ever had the true amateur spirit he would never have to question his ability to lose it or hold it.

Randall H. Spooner, CHRELE-USCG
U. S. Coast Guard Base (ERS)
Woods Hole, Mass.

Hams in Service

W2NSD:

A few comments on hams in the service: Speaking only from personal knowledge of the AF point of view, I must say that ham radio in the service has the highest level of support anyone could want. Most air bases have a MARS radio station to one degree or another. Many are not the best equipped, but what they have is available for all properly licensed personnel. I for one feel we can't look a gift horse in the mouth, be it an old BC-610, 32V, or a KWS-1, it's a free for the using rig and should provide an enterprising ham with a basis to start on.

MARS stations, both the military base stations and civilian affiliates operate continuously passing personal messages and phone patches for military personnel, their friends and families.

Upon arrival at this base, I applied for permission to set up my personal station in the barracks. I was required only to comply with a few points, like having safe wiring and emergency fire extinguisher handy, and permission to operate was granted.

Previously I served at a base in Japan where the base MARS station was furnished with a Viking KW, Viking Ranger and Hallicrafters SX-100. Actually the equipment available generally depends upon the wealth of the base Special Services Office and the degree of ham activity available on the base. Also, remote sites would get more support due to the lack of other communications facilities for troops.

So, all in all, I would say that ham radio in the USAF at least has a fine present and a bright future.

T/SGT Bob Smith
KØHLW/9

Announcement

CQ was sorry to hear that James Clemens, KØEWC of Easton, Minnesota is in the University Hospital after having his leg amputated. He has received many cards and wishes to thank all the hams who thought of him. An antenna has been erected on the hospital and Jim has his receiver and transmitter by his bed. If you can, drop him a line at the following address:

Jim Clemens
Section 47-408
University Hospital
Minneapolis, Minnesota

Taste

Dear Sirs:

I bought the last three issues of CQ (what a waste of money) and I'd like to go on record as being the first to say, "You sure print a rotten rag of a magazine."

Thanks for Nothing
Gene Graham WA6BRI
San Bernardino, California

Maybe CQ is an acquired taste.

Free Filters

Dear Wayne:

I have obtained a list of TV manufacturers, and their addresses, of whom will supply good high pass filters FREE.

I'd like to remind your readers that according to the FCC, all television receivers made after January 1, 1958, must have a high pass filter built into them. Also, as of January 1, 1958, the TV distributors must supply high pass filters to those who need them, free of charge.

I have had a chance to use these filters, and have found most of them to be very good. About 80% of these are

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HERE'S PROOF:

Name and Address	City, Okla.	License	Time
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Prentice Harrison, Lewes	Pa.	1st	27 weeks
J. A. Niedeck, Bethlehem		2nd	8 weeks

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Lewis M. Owens, Columbia, Ky.



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Carl E. Smith, Consulting Engineer, President
Desk CQ-47, 4900 Euclid Ave., Cleveland 3, Ohio
Please send Free Booklets prepared to help me get ahead in Electronics. I have had training or experience in Electronics as indicated below:

- | | |
|---|---|
| ☐ Military | ☐ Broadcasting |
| ☐ Radio-TV Servicing | ☐ Home experimenting |
| ☐ Manufacturing | ☐ Telephone Company |
| ☐ Amateur Radio | ☐ Others |

In what kind of work are you now engaged?.....

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

Name Age.....

Address

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

the R. L. Drake 300 HP or equivalent. These have cut-off frequency of 52 mc., thereby also reducing meter TVI.

I am willing to supply the addresses and requirements for the free filters to anyone who writes to me on the conditions. . .

1. That only one TV manufacturer is requested at one time (such as RCA, Admiral, etc.)
2. That a 4¢ stamp is enclosed with the request for return postage.

I'll answer all letters immediately in order that they are received. Please address the request to: K2ZSQ, Russel Avenue, Rahway, New Jersey.

I'd also like to call to your reader's attention the fact that a new group has been organized on six meters called "Channel A." This is a group that can be found on 50.25 mc at any time. It is, simply, a frequency monitored by several local boys, so that a contact may be made without difficulty by just coming in on the frequency and saying, "Anyone around?" (This channel has also been established as the calling frequency Rahway, N. J.)

W2QFV and I originated Channel A from an idea taken from the famous 2 meter "Channel A" of approximately 147.25 mc.

To date active stations that can be found on Channel A are . . . W2QFV, WA2BIP, WA2BZV, WA2BZ, K2QNI, K2UGH, K2LEO, W2RMU, K2PJG, K2ZSQ, K2ZSQ. Anyone interested, contact K2ZSQ either by mail or on the air. Crystals are available for Channel A for 30¢ from K2ZSQ.

73,
Bob Brown, K2ZSQ

Calling All Flying Chess Playing Organists

Editor:

Please include me in the following interest categories:

- 1) Flying (ATR #199575). Interested in hams who have flown in foreign service . . . Arabia . . . South America . . . West Indies . . . etc.
- 2) Music, especially organ . . . like to know hams who have worked at it professionally.
- 3) Chess
- 4) Astronomy
- 5) Missile instrumentation and guidance

Carl Springer W4 VK
38 S. Atlantic Ave.
Cocoa Beach, Florida

A Fam Family

To CQ:

Sure got tired of running to news stand so here's my check to save my feet.

I believe "our" family has more on the air than any other—how about running the "fact" in CQ to see that's right.

W6YFT, Dale—Brother, W6YFF, Elie—Brother's wife, K6DQA, Hillis, Brother, K6EXQ, Connie—Brother's wife, K6QPE, Ray—that's me.

On our regular sked nite last week there were members of our family on the air talking etc.

Take it easy now—Best 73's

Ray Hauck, K6Q
13280 E. Calif.
Sanger, Calif.





Once again it is our privilege to express the best wishes of the entire Hallicrafters family through the words of "*A Christmas Bonus*." It was written in 1956 by the late Cyrus T. Read, W9AA—a loyal friend of amateur radio whose entire life reflected the spirit of "... good will toward men."

Buel Halligan Jr. W. J. Halligan W9AC

A Christmas Bonus

IN THE DAY BY DAY PURSUIT of our hobby we radio amateurs have a wonderful time. The fascination of experimenting with new circuits and equipment—the thrill of DX—the organized teamwork of net operation—the excitement of Field Day, Sweepstakes, the DX Contest—all combine to make ours an incomparable avocation. In the midst of such absorbing interests it may be that we fail to remember the one enduring reward which comes to all of us through our amateur activity.

THAT REWARD is the many lifelong friendships which we all establish directly or indirectly through amateur radio. From the day we start to work toward an amateur license we begin to

make new friends. Some may live near enough to help in learning the code, building equipment, or putting up an antenna. Others are so far away that we never hope to see them in person. Nonetheless, near or far, they are all close friends. Most of us have had the heartwarming experience of visiting some distant place, calling on an amateur whom we knew only through contacts over the air, and being welcomed like one of the family.

WE AT HALLICRAFTERS like to feel that those interested in amateur radio are our friends. And, at this particular season, we want to extend to all amateur enthusiasts, everywhere, our sincere best wishes for a Very Merry Christmas and a Happy New Year.

Vy 73,
—CY READ, W9AA



hallicrafters

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Our 25th year of service

For further information, check number 6 on page 124.

December, 1958 • CQ • 11

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AMATEUR NET \$459.00

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P-400 GG

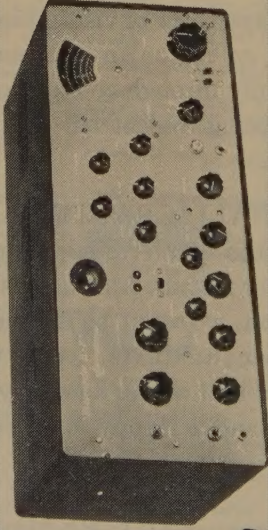
AMATEUR NET \$269.50

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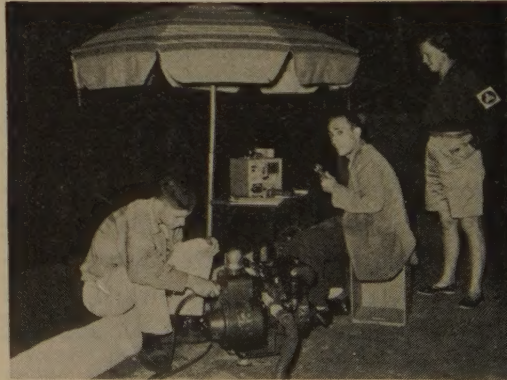
MANUFACTURERS OF PRECISION ELECTRONIC EQUIPMENT

Hams Help

Up Winthrop (Mass.) way a bunch of the boys got together and helped the State Police to watch for accidents and traffic jams over the holidays. Operators were K1AIQ, W1WLP, WIDLY, W1EAJ, K1ECD, KN1GY, W1DQF, and W1BB. Stuart Perry. Good work, fellows every bit of public service helps.



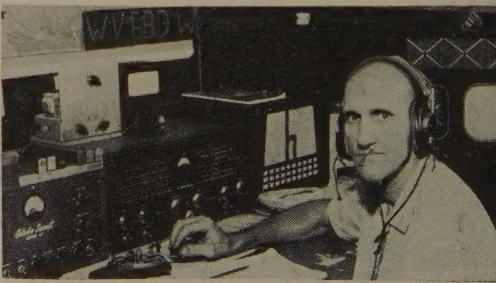
Eddie Adams, WIDLY operating a Gonset Communicator battery powered during "Operation Roadwatch."



Norm Richards, K1AIQ plugs in generator for Ralph Greenberg, W1WLP. Audrey Richards watches.

More Names

Here's one for W2BOH to add to his collection of names: WV6BDW is A. D. Bible. Just to cinch it, and incidentally make the Ripley Column, Bible is the Chairman of the San Diego Postal Clerks Union.



[Continued on page 100]

Among those Hams interested in beam antennas, many are concerned with the feed systems employed. It is for these Hams that we shall attempt to explain the wonderfully simple—yet highly efficient—feed system used in both the *Trap Master* and the *Power Master* series of MOSLEY beam antennas.

The beliefs that a balanced radiator element cannot be fed with an unbalanced line and that the impedance at the center of the element is not of a suitable value to permit direct connection of a 52 ohm coax line are not always correct. We will show, with authoritative references, that antennas can be designed to take advantage of the simplicity of such a system and still provide low VSWR over a broad bandwidth and a symmetrical radiation pattern. Page numbers will refer to the ARRL Antenna Book, seventh edition.



Fig. A

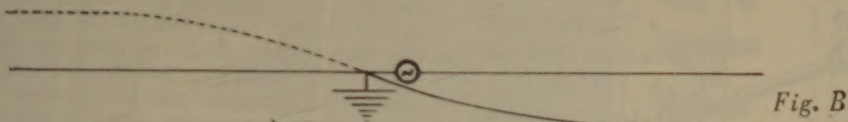


Fig. B

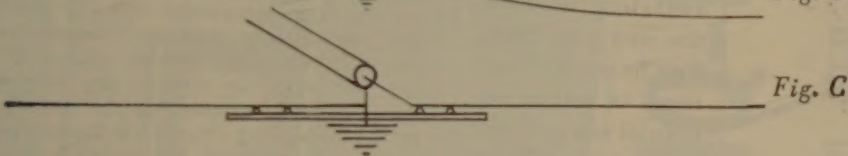


Fig. C

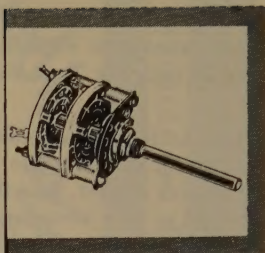
The voltage distribution over a half-wave radiator is shown in Fig. A. Since voltage is zero at the center, a ground may be placed at this point. (Page 26)

There are a variety of methods for introducing energy into the antenna. A balanced line may be connected directly to suitable points at each side of the grounded element center—a method commonly called the *delta* match or, with slight modification, *T* match. To connect an unbalanced line to a grounded un-split element, the *gamma* match from grounded center to a suitable point at one side of center may be used.

However, the element may be split at the center and fed with either a balanced line without a ground at the center or an unbalanced line with or without a ground at the center. With an unbalanced line and ground on both the outer conductor (coax braid) and antenna center, a voltage introduced just off center in the position of the power source (Fig. B.) will introduce a voltage in this excited side, as shown. With the other half of the antenna element an integral part of the circuit, voltage will appear as indicated by the dotted line. Since the end of the feed line is fundamentally the same as a power source it may be replaced in the circuit, (Fig. C.), resulting in a balanced antenna fed with an unbalanced line. The ground at the center helps to minimize stray feed line currents to achieve the balanced pattern. (Pages 98–100) (See, also, page 224, Fig. 10-10).

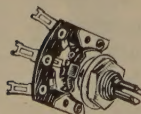
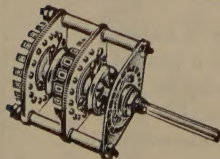
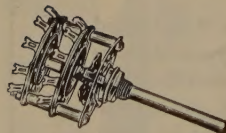
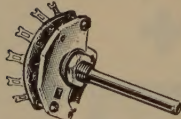
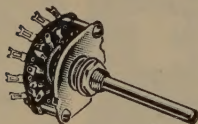
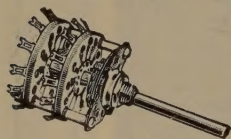
Curves on page 169, Fig. 4-51, show how a three element beam, by correct tuning and element spacing, may present a feed point impedance of from 10 to 70 ohms. Of course, MOSLEY beams are tuned and spaced to present 52 ohms at suitable tuning points with low VSWR over the entire bands of operation and to achieve proper voltage distribution for a balanced radiation pattern.

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For further information, check number 9 on page 124.

CLUB BULLETINS

Marvin D. Lipton, VE3DQX

311 Rosemary Road, Toronto 10, Ontario, Canada

Bill Parker, W8DMR, reported in CARR SCOPE, published by the Columbus A.R.C., that he and Richard, W8TYY, were in the process of establishing a 2 way Amateur T net. The net will be known as the "Snow Net" and it is hoped that it will include many of the Hams now experimenting with video in the Dayton, Columbus, Detroit, and Toledo areas.

"Radio Club To Help Firemen," was the headline of a story of Amateur Radio reported in the Chester Times August 28, last. The Mobile Sixers Radio Club reprinted the excerpt from their club monthly, MOBILE SIXERS. It seems that the club provides communication for the Fire Department and CD group during practice sessions held in conjunction with the new CD personnel training school. By rendering this valuable service, the Mobile Sixers Radio Club is reinforcing the Amateur cause in the prevailing "battle of frequencies."

As I have stated on various occasions in the past, the uses that a radio club paper might be put to are manifold. There are relatively few "off the air" activities that are as effective as a club journal for keeping inactive members together. In recognition of this fact, and to promote more club papers, Waldo Townley, W5FEK, editor of HARC NEWS, is endeavoring to set up a series of annual awards to be presented to the editors of outstanding amateur papers. Since this is a very recent undertaking there are no peremptory details to report at this time. However, if you are willing to join us in our support of Waldo's idea, write him at 4331 Alba Drive, Houston 18, Texas. When additional details are available they will be passed on to you in this column.

Needless to say, space in CQ is at a premium. If new members continue to join us at the present rate, we may be compelled to resort to a smaller type when announcing their new status. We derive great pleasure in informing you that the publications listed hereunder have augmented our News Service to our present standing of 140 members. Welcome, HUGH A.R.C., assoc. member, TRYLON RADIO CLUB BULLETIN, Trylon R.C., SCOTT West Philadelphia Radio A'ssn., and MURLARD LTD., England, assoc. member.

Look for the first winner of a free CQ subscription in next month's CQ. Get full information about this new feature from the October 1958 issue if you missed it.

73, Marv. VE3DQX.

- General coverage—540 KCS to 30.0 MCS in four bands. Electrical bandspread on all ham bands within frequency range of receiver.
- Dual conversion from 10.0 to 30.0 MCS.
- Unique combination of adjustable 60 db slot filter and six-position selective crystal filter for endless tuning techniques.
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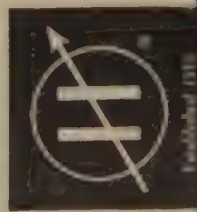
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Take a good long look at the features offered in this newest Hammarlund receiver. Never before has so much been offered in a general-coverage receiver at such a low price. The all-new HQ-145 is another winner in the ever-growing line of quality Hammarlund receivers—whatever your needs and budget, you'll find your best buy is a Hammarlund!



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you can improve
speech intelligibility
and cut through QRM
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MODEL NO. 505T

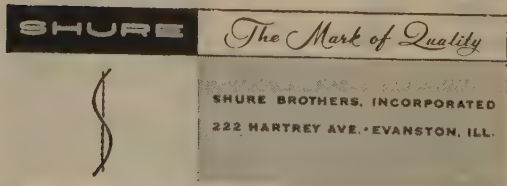
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MICROPHONE
WITH
TRANSISTOR
AMPLIFIER



All the advantages of controlled magnetic microphone construction—ability to withstand hard usage and extremes of climate and weather conditions—are yours in this sturdy, reliable microphone. The Ranger 505T has a flat frequency response characteristic (200 to 4000 cps), controlled to provide maximum speech efficiency.

It is ideally suited for SSB-AM transmission. Fits naturally and comfortably in the palm of the hand . . . takes up minimum space in mobile or fixed-station equipment. Equipped with heavy-duty push-to-talk switch.

LIST PRICE \$48.50



MICROPHONES, HIGH FIDELITY
AND ELECTRONIC COMPONENTS

For further information, check number 11 on page 126.

16 • CQ • December, 1958



Feenix, A

Deer Hon. Ed:

I begging most honorably pardon for bring up this subject, but Scratchi are havin' just about all he can taking on said subj. Like old saying, don't hiding your rose in a bushel by any other name, or somethin' like that.

Last nite are coming home from meeting one of local amchoor clubs. Not even sure you could calling it a meeting, on acct. only to, peeples there, good old Scratchi the Hon. Gest Speaker. We didn't ackchew hold a meeting, on acct. Hon. Gest Speaker and I retiring to local emporium where custing things over glass cactus jooce. A waiting one hour for peeples to showing our throats kinda dry.

Where being Hon. Prexy of club? He has sked on air that more important. Hon. Secretary? Who you thinking Hon. Prexy has skedyule with!! Hon. Keeper of Exckecker missing also, but nobuddies worried, on a who'd run away with three bux and eleven cents we having in Treasury. How's about members, you saying? Hon. Ed., that's me.

Members—we used to have nice group members around. But taking meeting I attin'ing cupple few months ago. I showing up meeting place five minutes before meeting start and door are locked. Scurrying around and getting Hon. Janitor to getting place open up and by then cupple other amchoors there.

Half hour later more guys there and Hon. Prexy showing up with Gest Speaker. Prexy starting things and saying we having a busyness meeting then heering G.S. To be honest, according to former meeting, it's a short busyness meeting—only to hours long.

Spending first three minutes reeding Hon. Secretary report, and seventeen minutes arguing over how to spelling word finenchewall not getting in argewment even tho Scratchi 1/c speller.

Next to minutes spending on Hon. Treasurer report, and next twenty-ate minutes custing how to razing more money for Treasury. What bringing this up are not that spending \$3.95 for new xtal for club tr

[Continued on page 105]

DO YOUR SHOPPING HERE!... CHRISTMAS GIFTS for "HAMS"

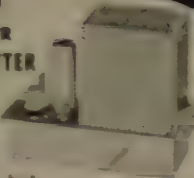
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STP-50

6 METER TRANSMITTER

Kit, less tubes
& crystal \$21.50
Kit, with tubes
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Wired, with tubes but
less crystal 32.50
Crystal, FA-5 12MC 4.00
Shipping Weight 5 lbs.



FCV-2 CONVERTER

Model 50, 6 Meters
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and tubes 17.95
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FCV-1 6 METER CONVERTER

Kit with crystal
less tubes \$10.95
Wire with tubes
and crystal 15.95
Shipping
Weight 2 lbs.

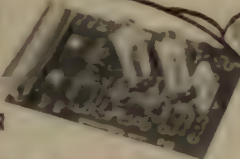


VFA-1 CASCODE PRE-AMPLIFIER

Kit, less
tubes \$4.75
Wired with
tubes 6.95
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Weight 2 lbs.
For 6 or 2 meters



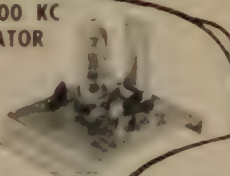
MODEL T-12 12-WATT CRYSTAL CONTROLLED TRANSMITTER



T-12 kit less tube and crystal \$ 8.95
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FO-1L 100 KC OSCILLATOR

Kit with tube
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Wired and
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100 KC
crystal only 8.50
for use with FMV.



1 10 KC multivibrator
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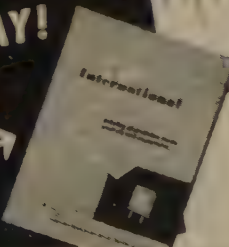


FMV-1 MULTIVIBRATOR

for use with FO-1L 100 KC
oscillator
Kit,
less tube \$5.95
Wired,
with tube 8.95
Shipping
Weight 2 lbs.



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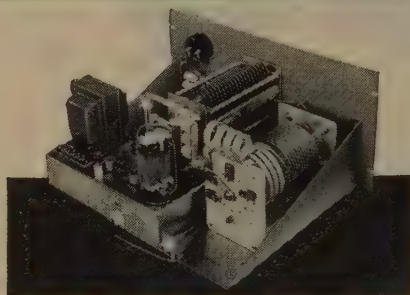
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For further information, check number 14 on page 124.



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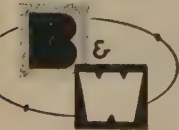
NOW IT'S HERE—the L-1001-A

Ever since B&W first came out with their grounded grid linear amplifier, amateurs from all over the country have been clamouring for just the RF section of the unit.

Now it's here! At last, you can buy only this RF section and have all the advantages of the complete B&W L-1000-A. Use of your own power supply will save many dollars.

Two tetrodes in the RF section are connected as high-Mu grounded grid triodes. Intermodulation distortion products of a grounded grid amplifier are far less than those generated in a conventional grounded cathode circuit because of the inherent negative feed-back. Increased driving power requirements are offset by recovery of most of the driving power in the output circuit.

This RF section will boost your signal to the maximum allowable. Quality of materials and workmanship is unsurpassed. Tuning and loading are precise over the 80, 40, 20, 15, 11 and 10 meter bands. Why not drop in at your favorite dealer and take a look at either the Model L-1000-A or just the RF section, Model L-1001-A. If he doesn't have them in stock write the factory for details.



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B&W AMATEUR EQUIPMENT: Transmitters • AM—CW—SSB • Single Sideband Generators • Grounded Grid Linear Amplifiers • Single Sideband Receiving Adapters • Dip Meters • Match Masters • Frequency Multipliers • Low-Pass Filters • T-R Switches • R-F Filament Chokes • Transmitting R-F Plate Chokes • Audio Phase Shift Networks • Band Switching Pi-Networks • Cyclometer-type Counters • Antenna Co-axial Connectors • Baluns • Variable Capacitors • Fixed and Rotary Type Coils • Band Switching Turrets • Standard Inductor Materials •

For further information, check number 14 on page 126.

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MARS BROADCASTS



Brigadier General Earle Cook, W4FZ, presents an award to Ed Piller, W2KPQ for his work in establishing the Single Sideband Technical Net which broadcasts every Wednesday at 9 pm. (Eastern Time) on 4030 kc. Looking on are Lt. Col. Lloyd Colvin, W6KG, winner of the first CQ WPT Award, and Laddie Smash, W9CYD.

Air Force MARS Eastern Technical Net

Sundays 2-4 PM EST—3295, 7540, 15,715 kc

Dec. 7—"Navigation by Electronics" by Mr. Ernest N. Storrs, Chief, Navigation Laboratory Directorate of Control & Guidance, Rome Air Development Center.

Dec. 14—"New Concepts in Communication Systems" by Mr. Allan A. Kunze, Senior Scientist, Directorate of Communications, Rome Air Development Center.

Dec. 21—"Uni-Directional Antennas" by Alfred J. Beauchamp and Mr. Moses A. Diab, Electronic Scientists, Directorate of Control & Guidance, Rome Air Development Center.

Dec. 28—"Impact of Solid State Physics in Electronics" by Mr. Joseph J. Naresky, Chief, Applied Physics Branch, Directorate of Technical Services, Rome Air Development Center.

Jan. 4—Vacation Day.

Army MARS

Wednesday evening at 9 PM, EST, on 4030 kc upper sideband:

Dec. 3—"International Radio Communication Systems" by E. D. Becken, Asst. Vice President and Chief Operations Engineers, RCA Communications Company.

Dec. 10—"FM Multiplex Stereo System" by Murray G. Crosby, President, Crosby Laboratories.

Dec. 17—"VHF Radio Propagation" by Edward P. Tilton, VHF Editor, American Radio Relay League.

On December 24th and December 31st, the net will not operate due to Christmas and New Years Eve holidays.

The Down-spout Vertical Antenna

B. J. Kunkel, K5AXY

Box 351
College Station, Texas

Tried making the beer can vertical antenna and run out of patience before getting all the joints soldered together? Or did it collapse during the raising process?

Dick Worthey, K5HHI, experienced difficulties such as these while trying to erect a 10 meter vertical. So Dick replaced the beer cans with 3-inch down-spout and made himself a neat little antenna.

Probably the most unique thing about Dick's antenna is his insulator between the down-spout and ground. Dick used a family size Coca-Cola bottle for the insulator. Three-inch down-spout seats itself nicely on the shoulder of the bottle.

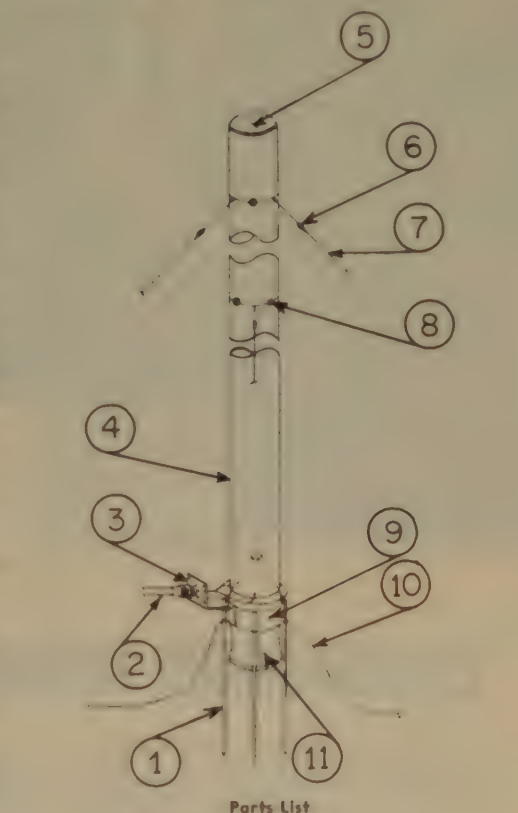
To keep the bottle from slipping, Dick had a welding shop make him an anchoring assembly. He had the shop braze a 1-inch wide .080 copper strap into a circular band. The diameter of this band is slightly larger than the outside diameter of the bottle. Four 1/4-inch brazing rods 15 inches long were used as legs and ground rods. The legs are spaced 90 degrees apart and are on the outside diameter of the band. The tops of the legs were brazed flush with the top of the circular band.

Some of the same 1-inch wide .080 copper strap was used to make a mount for mounting the female section of a coaxial plug. The overall length of this copper strap is 3 1/2 inches. It was bent into a 'Z' shape with 1-inch flanges on each leg. The coax plug was mounted on one of the flanges and the other flange was brazed to the 1-inch wide circular band of the anchoring assembly.

Number 12 copper wire feeds from the center of the coax plug to four points 90 degrees apart on the bottom of the down-spout. The ground system consists of four #10 copper rods, each 33-feet in length, spaced equally around the base. These radials were attached to the brazing rods to complete the ground system.

The radiator is 33 1/2-feet of down-spout. The down-spout comes in ten-foot sections. Dick soldered each of the sections together to insure positive conductivity. To plug the top of the down-spout, Dick cut a circular disk three inches in diameter from a thin sheet of flat metal and soldered this disk to the top.

At the 20- and 30-foot levels, Dick made provisions for guying. He made two circular rings of #6 aluminum wire. These rings were



Parts List

1. Legs made from 1/4-inch brazing rods (Four required).
2. RG 58-U coaxial feed line.
3. 'Z' shaped mount with female coaxial plug attached.
4. Radiator made from 33 1/2 feet of down-spout.
5. Tin cap soldered to top of radiator.
6. Small egg-shaped insulators.
7. Guy ropes made from plastic covered nylon clothesline.
8. Small metal screws and flat head washers.
9. Circular band made from 1-inch wide .080 copper strap.
10. 33-foot copper radials (Four minimum).
11. Family size Coca-Cola bottle.

about eight inches in diameter. He slipped the rings over the down-spout and slid one ring to the 20-foot level and the other to the 30-foot level. Then he began to twist the wire to form "eyes" for attaching the guy ropes. These "eyes" are 120 degrees apart. He twisted the "eyes" until the rings closed down on the down-spout. To anchor the rings, he used small metal screws and flat head washers.

[Continued on page 115]



Honor is paid to all radio amateurs. In this spirit James E. Harrington, K5BQT, accepts his 1957 Edison trophy from L. Berkley Davis, general manager of the General Electric electronic components division. Left to right: Raymond L. Hufft, adjutant general and civil-defense director of Louisiana; Mr. Davis; Mr. Harrington; Lieutenant General Francis H. Griswold, vice-commander, U.S. Strategic Air Command.

EDISON AWARD NOMINATION DEADLINE JAN. 5

The final postmark date for letters naming candidates for the 1958 Edison Award is January 5, 1959. Only a short time remains to send in your nomination of an amateur who has rendered an important public service.

The judges for the Award will consider only those persons who are named in letters from you and others. Accordingly, you will be serving the entire amateur group by

choosing a candidate and writing to the Edison Award Committee about him.

Below are some of the many selfless activities that can make an OM or YL eligible for consideration. For terms and rules of the Edison Award, see the October issue of this magazine, or write to *Edison Award Committee, General Electric Company, Electronic Components Division, Owensboro, Kentucky.*

HERE ARE TYPICAL ACTIVITIES THAT CAN QUALIFY FOR THE AWARD:

Emergency communications work in a disaster, such as a flood, hurricane, tornado, or an explosion.
Helping amateurs and others with their specialized problems, through professional knowledge and experience.

Publishing a book or other literature that contributes to general scientific knowledge or procedure.

Helping disabled or physically handicapped persons.

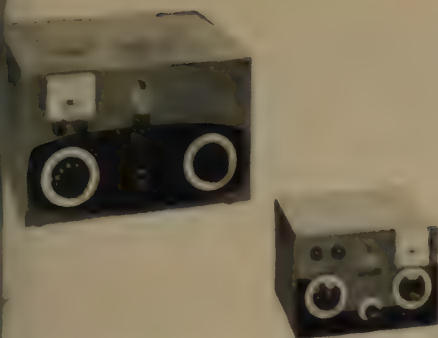
Relaying messages from remote points for the benefit of isolated servicemen and civilians.

Designing and constructing radio equipment for use by persons in remote parts of the world, who do not have access to regular commercial communication channels.

Civil-defense organization work; weather reporting; radio assistance to state or local traffic and police authorities; cooperation in forest-fire prevention and control.

Teaching young people the elements of electronics. For further information, check number 21 on page

GENERAL  ELECTRIC



VIKING "PACEMAKER" TRANSMITTER EXCITER

An outstanding power bargain when used as a transmitter or exciter! 90 watts SSB P.E.P. and CW input . . . 35 watts AM. Unique circuitry uses only 1 mixer for improved spurious signal rejection greater than 50 db. balanced range audio. Highly stable built-in VFO gives complete coverage of bands without manual switching or re-tuning. Instant bandswitching 80, 40, 20, 15 and 10 meters. VOX and anti-trip circuits. Wide range pi-network output. Effectively TVI suppressed. With tubes and crystals.

Cat. No. 240-301-2. Wired Amateur Net \$495.00

VIKING "THUNDERBOLT" AMPLIFIER

Rated at 2000 watts P.E.P. input SSB; 1000 watts CW; 800 watts AM linear! Continuous coverage 3.5 to 30 mcs. —instant bandswitching. May be driven by the Viking "Ranger", "Pacemaker" or other unit of comparable output. Unique design features a 20 watts Class AB₁ linear, 20 watts Class C continuous wave. Employs two 4-400A tetrodes in parallel, bridge neutralized—wide range pi-network output. With tubes.

Cat. No. 240-333-1. Kit Amateur Net \$524.50

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NEW VIKING "MATCHBOXES"

Provides completely integrated antenna matching and switching systems for kilowatt or 275-watt transmitters. Units complete with built-in directional coupler and indicator. Bandswitching 80, 40, 20, 15, and 10 meters. Quickly and easily match transmitter to balanced or unbalanced lines over a wide range of antenna impedances will tune out large amounts of capacitive or inductive reactance. No "plug-in" coils or "load-tapping" necessary.

275 WATT "MATCHBOX"

Cat. No. Amateur Net

250-23-3 With built-in Directional Coupler & Indicator \$86.50

250-23 Less built-in Directional Coupler & Indicator \$54.95

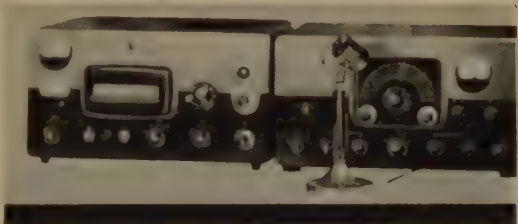
KILOWATT "MATCHBOX"

Cat. No. Amateur Net

250-30-3 With built-in Directional Coupler & Indicator . . . \$149.50

250-30 Less built-in Directional Coupler & Indicator \$124.50

1st Choice Among the Nation's Amateurs . . . Viking Equipment!



For the strongest signal on the band!



**Unequaled 100% broadcast-type
high level amplitude modulation!
Full 2000 watts SSB
input—1000 watts CW and AM!**

VIKING "KILOWATT"

Brilliantly designed, and engineered specifically for high power operation, the Viking "Kilowatt" is the only power amplifier available which will deliver a signal with the authority of maximum legal power in all modes!

Class C final amplifier operation provides plate circuit efficiencies in excess of 70%. Final amplifier utilizes two 4-400A tetrodes in parallel, bridge neutralized—wide range pi-network output. Continuous coverage 3.5 to 30 megacycles.

For unsurpassed enjoyment with every contact an unforgettable experience . . . step up to the very finest . . . the thrilling Viking "Kilowatt"!

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Wired and tested with tubes Amateur Net \$1595.00

Matching accessory desk top, back and three drawer pedestal

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†The F.C.C. permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of 2000 watts or more depending upon individual voice characteristics.

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For further information, check number 23 on page 124.

December, 1958 • CQ • 31

THE PATCHMASTER

Many articles on phone patches and phone patch theory have been written in the various periodicals, but all of these articles have described compromises in one form or another. As yet, no phone patch has been described or put on the market which does not put either the station operator, the telephone party or the radio party at an audio level disadvantage.

It is the intention of this article to describe a phone patch, which in the opinion of those who have used it, possesses all the qualities of the "ultimate" phone patch with none of the disadvantages present in other types of phone patches. The "Patchmaster" is a phone patch which:

1. Permits voice-control operation of the transmitter by either the telephone party or the station operator,
2. Modulates the transmitter with audio of equal amplitude from either the telephone party or the station operator,
3. Transmits the received radio signal and or the station operator's voice at equal and proper audio level to the telephone party,
4. Permits the station operator to monitor the phone patch operation with either the station loudspeaker or earphones, with both the radio party and the telephone party at the same listening level,
5. Provides for adjustment of the level received from the telephone party, as is necessary for compensation for loud or soft talkers and long telephone lines,
6. Monitors the audio level impressed on the telephone line,
7. Provides means for "Holding" either the radio party or the telephone party while the station operator is talking to the other,
8. Provides for "three way" operation with both parties and the station operator in contact like a three way voice operated break-in contact.

The Patchmaster uses the "Hybrid Coil" principle to permit voice-control operation. A simplified schematic of the circuit* used in the Patchmaster is shown in figure 1. The circuit used is the simplest arrangement of a hybrid and standard, available, transformers are used.

The hybrid circuit can be described as a circuit with three external connections, two of which have a high loss between them. The loss to or from the third connection is small in comparison.

The hybrid is used in the telephone line circuit of the Patchmaster, as shown in fig. 1, to isolate the Patchmaster input and output circuits. Referring to fig. 1, assume an audio voltage impressed across terminals 1 and 2 of T1. The secondary voltage across terminals 3 and 5 is distributed across the telephone line and the balancing network. The balancing network, when properly adjusted, is the electrical duplicate of the telephone line. As the balancing network and the telephone line are equivalent electrical circuits, half of the voltage from terminals 3 and 5 of T1 will be impressed on each. The input transformer, T2, which is connected from the midpoint of the source to the midpoint of the load, has no voltage drop across it. Since there is no voltage drop across T2 when a voltage is impressed across T1,

*Hybrid Husbandry, CQ, November, 1957

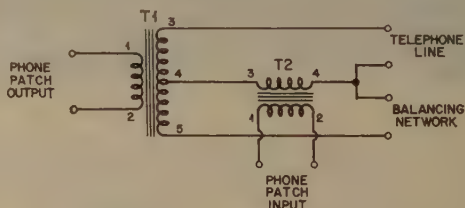


Fig. 1—Simplified version of the hybrid circuit used to isolate the input and output circuits.

There is a high loss from the output transformer, T1, to the input transformer, T2.

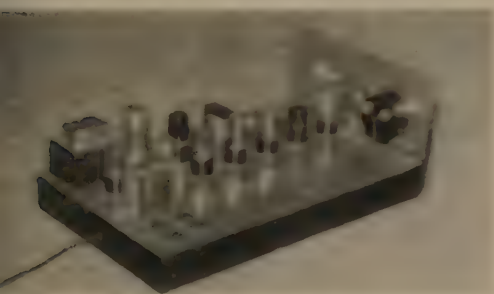
Again referring to fig. 1, assume an audio voltage from the telephone line. This is distributed across T2 and half of T1. The voltage induced in the other half of T1 is impressed across T2 and the balancing network, reinforcing the voltage from the line.

The network used should be as close as possible to the electrical equivalent of the telephone line. It may take any combination of resistive, capacitive and or inductive components and must be determined by trial and error.

The Patchmaster is merely a multi-stage audio amplifier with a number of inputs and outputs. In order to properly analyze the operation of the various circuits, each signal path must be considered separately.

Receiver Signal

The audio output from the station receiver is fed to the anti-trip circuit in the transmitter and thru the transmit-receive relay to the Patchmaster. In the Patchmaster, (fig. 2) the



output is fed thru S3b (TALK-RADIO) to R5 (Receiver to Speaker) and R7 (Receiver to Phone). R5 and R7 are screwdriver adjustment potentiometers located on the chassis of the Patchmaster.

V3a and V5 amplify the signal from R5 and feed the station loudspeaker or earphones for monitoring the incoming radio signal. V3b amplifies the signal from R7 when S2b (Talk Line) is operated and feeds the telephone line thru T1 and the hybrid coil circuit. R5 is adjusted for comfortable loudspeaker volume with R10 (SPEAKER VOLUME) half open, and R7 is adjusted for comfortable listening volume at the other end of the telephone circuit. R10 is used to control the speaker or earphone volume whenever a change in level is desired by the station operator.

Telephone Line Signal

When the party on the telephone line speaks, his voice comes in thru S1 (Line), the dial, the hybrid coil circuit, and from T2 to R1 (Receive Phone Level). From R1, the audio



passes thru S2a (Talk Line) to R3 (Phone to Transmitter) and R4 (Phone to Speaker). R3 and R4 are screwdriver adjustment potentiometers on the Patchmaster chassis. V2a and V5 amplify the signal from R4 and feed the station loudspeaker or earphones for monitoring the incoming telephone signal. V1b amplifies the signal from R3 and feeds the transmitter thru R9 (Transmitter Input Level) and S3a (Talk Radio). R4 is adjusted for comfortable loudspeaker volume with R10 half open, and R3 is adjusted to properly modulate the transmitter with R9 open about ten percent.

Station Microphone Signal

The audio from the station microphone is fed thru V6, a preamplifier stage, to R6 (Mike to Phone) and R2 (Mike to Transmitter). R2 and R6 are screwdriver adjustment potentiometers on the Patchmaster chassis. V4a amplifies the signal from R6 when S2b (Talk Line) is operated and feeds the telephone line thru T2 in the same manner as V3b. V1a amplifies the signal from R2 and feeds it to the transmitter in the same manner as does V1b. R6 is adjusted for comfortable listening at the other end of the telephone line, and R2 is adjusted for proper modulation of the transmitter.

Level Monitoring Meter

A portion of the audio signal which is fed to the telephone line is impressed on the grid of V4b thru R8 (Meter). V4b amplifies the audio and operates the audio level meter, M1. M1 can be any ac meter with a reasonably fast time constant or a dc milliammeter with a rectifier.

Anti-Sidetone Circuit

As a perfect balance is impossible to maintain with the hybrid coil circuit used in the Patchmaster, a certain amount of the audio sent out on the telephone line will return to the phone patch, perhaps causing feedback from the loudspeaker to the microphone or false operation of the transmitter voice control circuits. In order to cut down this effect a circuit to reduce the gains of V1b and V2a

during transmission toward the telephone line has been incorporated in the Patchmaster.

A portion of the output of V3b and V4a, the amplifiers which feed the telephone line, is fed from their common cathode connection to the grid of V2b, an audio amplifier. The output signal from V2b is rectified by CR1 and presented across R11 (AGC). Any portion of this negative voltage may be added to the grid bias of V1b and V2a to reduce their gain.

The amount of gain reduction is dependent on the setting of the slider of R11, the pot that the grid returns of V1b and V2a are tied to. R11 is adjusted for a comfortable level sidetone (talkback) from the loudspeaker when talking into the station microphone.

The .1 mfd capacitor connected across R11 has been found to give about the right amount of delay to the operation of this circuit, but could be varied to change the time required

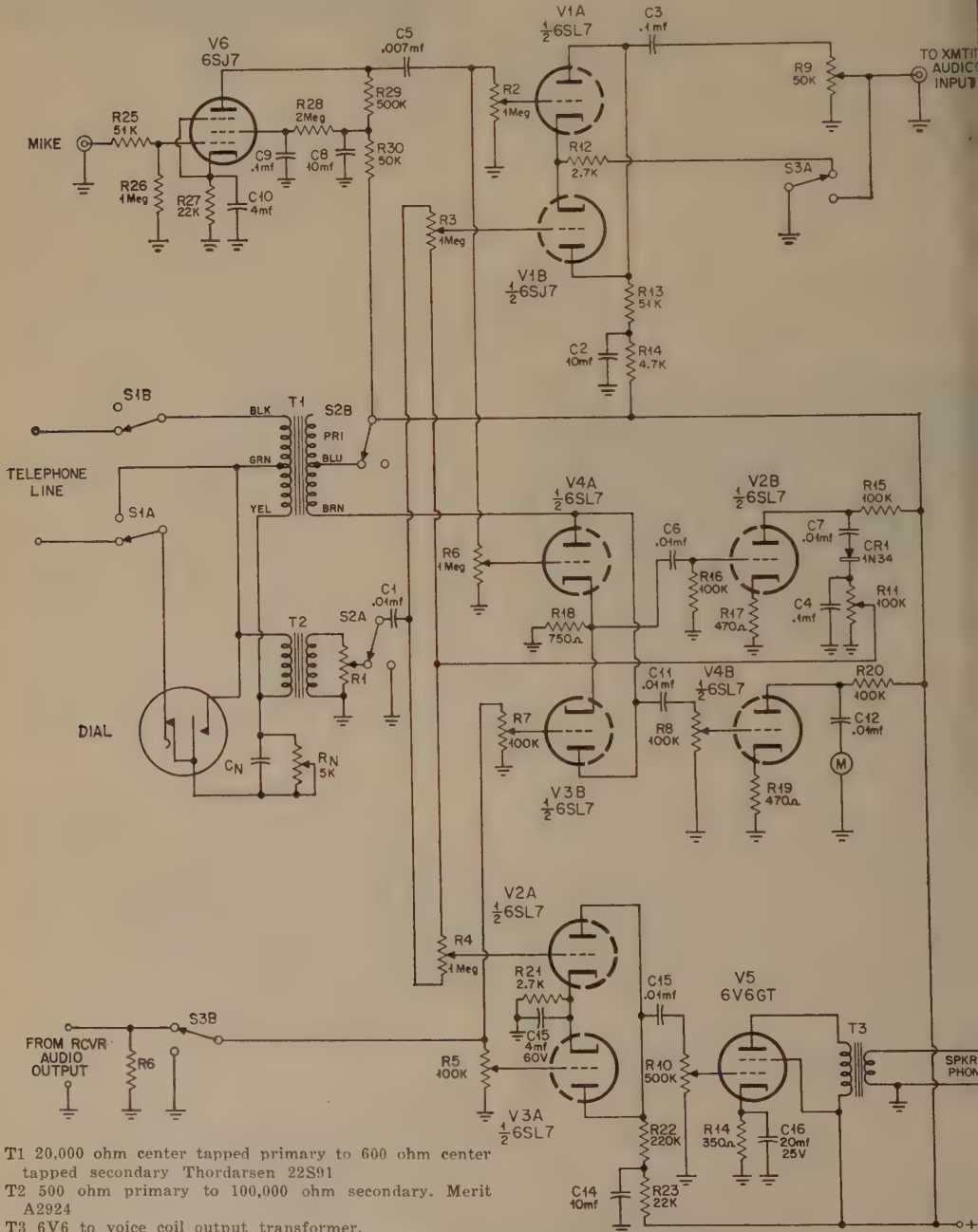


Fig. 2—The complete circuit of the Patchmaster

for this circuit to take effect

Switching and Dialing Circuits

With the exception of the level adjusting potentiometers, there are four main operating controls on the front panel of the Patchmaster. These four controls are the "LINE" switch, the "Talk Line" switch, the "Talk Radio" switch, and the telephone dial.

The Line switch in the Patchmaster performs the same electrical operation as picking up the handset on your telephone that is, answering incoming calls or getting the dial tone before making an outgoing call. Throwing the Line switch to the off position is the same as hanging up your telephone handset. C continuity for the telephone line is provided thru S1a, the dial, T1, T2, and S1b.

Dial Circuit

After the Line switch is closed and dial tone heard, a number may be called using the dial. As the dial is rotated clockwise, the bottom contacts close, shorting the hybrid coil circuit, and remain closed until the conclusion of the dialed digit. When the dial is released and permitted to spin in the counterclockwise direction, the upper contacts break once for each number in the dialed digit, interrupting the line current and operating the dialing equipment in the Telephone Company Central Office. If a dial is not desired, it may be omitted by connecting directly from S1a to T2.

Talk Line Switch

With the Talk Line switch in the Talk position, the receive and transmit amplifiers and from the telephone line are in operation. When this switch is placed in the off position, plate voltage is removed from V3b and V4a, preventing transmission of audio to the telephone line, and the input to V1b and 2a is grounded. This prevents reception of audio from the telephone line. The switch permits the station operator to switch the telephone party in and out of the circuit as desired, and to "Hold" the telephone party while he is talking over the radio connection.

Talk Radio Switch

With the Talk Radio switch in the Talk position, the receive and transmit amplifiers and from the transmitter and receiver are in operation. When this switch is switched to the off position, the cathode circuits, of V1a and V1b are opened and the input to the transmitter is grounded, preventing transmission of any audio to the transmitter. Also the input to V3a and V3b is grounded, preventing reception of any audio from the receiver. This

switch permits the station operator to switch the radio party in and out of the circuit as desired, and to "Hold" the radio party while he is talking over the telephone connection. If both the Talk Line and the Talk Radio switches are operated in the TALK position, the phone patch connection is complete, permitting the radio party and the telephone party to converse with each other and with the station operator.

Adjustment of the Hybrid Coil Circuit

As the adjustment of the hybrid coil network circuit is a trial and error affair, a capacitor decade box is very handy to use for Cn in determining its optimum value. There are many ways to adjust this network, but probably the easiest is to call a friend across town and have him lay his telephone handset on a pillow to reduce any possible acoustical coupling at his end, and to adjust the network with the line terminated in this manner.

Operate the Line switch to On, establishing the line circuit thru the Patchmaster, and hang up the telephone used to establish the connection. Operate Talk Line to Talk, and Talk Radio to off. Open R4, R6, and R10 about half way and adjust R1 until feedback is obtained with the microphone directly in front of the speaker. It should be easy to create feedback in this manner, but, if necessary, advance R4, R6, and R10. With R1 adjusted to just start feedback, adjust Rn and Cn until feedback stops. Advance R1 to cause feedback and again adjust Rn and Cn. Continue this process until no better balance can be obtained. Increasing or decreasing either Rn or Cn should increase the tendency to feedback. A good starting point is 500 ohms for Rn and .1 mfd for Cn.

Final Adjustment

After the balancing network has been adjusted, set R1 and R10, the front panel controls, to mid-position. With your friend across town talking, the Line switch on, Talk Line to Talk and Talk Radio off, adjust R4 for comfortable loudspeaker volume. Then adjust R6 to give a comfortable listening volume to the telephone party when you are talking into the station microphone. Adjust R11 to cut down the speaker sidetone to a comfortable volume. While talking into the microphone at a level which approximates the level from an ordinary telephone to your friend on the phone, adjust R8 so that the Audio Level Meter kicks to about half scale. This meter may be used to indicate that the proper audio level is being fed into the telephone line.

Throw the Talk Line switch to the off position.
[Continued on page 115]

Teletype Without Tears

J. D. Wells, W4TJU

657 Oakwood Drive
Dunedin, Florida

There must be a fortune in teletype machines tucked away in various corners throughout the country which were put there soon after the first "Boy-I-am-sure-gonna-get-on-RTTY-right-away!" enthusiasm wore off. From then on the RTTY activity reduces to remarks about how some day he will really get on RTTY but right now isn't really the best time. Most often, he is just "waiting for a simple converter circuit to come out" or something like that. Well, here is the dope on a receiving converter and a simple FSK circuit, both of which work and both of which have no moving parts.

The converter, or TU (short for terminal unit), uses only four tubes and plain ordinary slug-tuned TV coils so you don't have to mess around with toroids or tear up any filters or things like that. It is not the ultimate in converters, but it works very well and you can do a lot of very satisfactory operating with it before you will feel like you need something better. The FSK circuit is for use with the Clapp circuit VFO (you mean people use something else?) but will work ok with any other oscillator circuit with the right value in the shift circuit.

The TU circuit is shown in Fig. 1. A tv

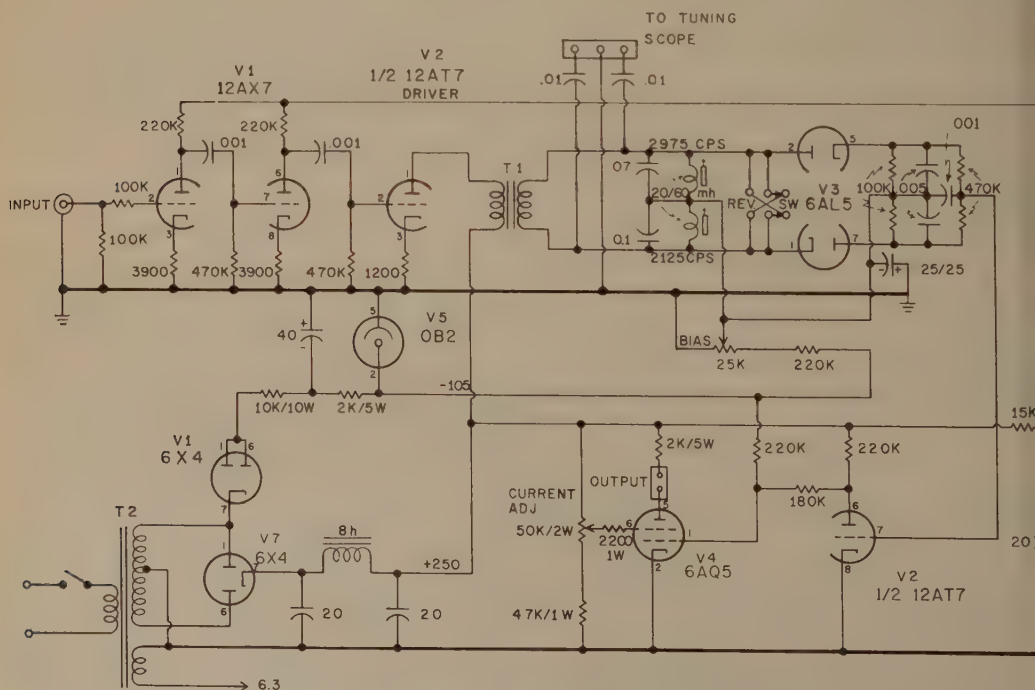


Fig. 1—Terminal unit. T1 is a Merit A-2190, T2 a Merit P-3148 and the 20-60 mh coils Merit MWC-3.

age limiter is first, followed by a driver stage for the audio discriminator. Following the discriminator is a dc amplifier followed by a RTTY keyer stage. The frequency response of the limiter stages is limited somewhat in the low frequency end by the coupling circuits to reduce spurious responses to signals below 2125 cps. The operating signal frequencies are 2125 cps and 2975 cps (for an 850 cps shift) with a center frequency of 2550 cps but the unit will operate OK with shifts down to 250 cps or so. Most everybody uses the 850 cycle shift so you can start with that and go from there if you feel adventurous. For marks on using this TU on narrow shift, see the March 1956 issue of "RTTY."

Meanwhile, back at the circuit, the reversing switch lets you switch from right-side-up shift (mark tone at the high frequency, or 2975 cps) to upside-down shift (mark tone at the low frequency, or 2125 cps). This and the **Current Adjust** pot are front panel controls although the loop current is set, you don't need to change it and the adjusting pot can be tucked in the back somewhere. The output current of the TU is adjustable from about 0-60 ma so that series or parallel coil connections can be used on the printer magnet coils. Not all printers have the series-parallel feature, but most do. The output loop is a "neutral loop" which means that when current flows it only goes in one direction. In a "polar loop" the current flows first in one direction and then in the opposite direction. The only machine generally in amateur circles requiring polar keying is the model 12, so if you are stuck with one of them and want to use this TU you will have to add a relay or modify the keyer stage.

Tuning

For best results and simplest to start with, a scope should be used for tuning. Tuning indicators may be rigged which use magic-eye tubes or other things but the connection shown is the easiest at first.

There are no critical parts in the circuit. As any high-gain cascade circuit, don't get the

output part of the limiter circuit too close to the input or it will oscillate, but other than that there should be no problems. If the specified transformer is not available for T1, a 3:1 interstage may be used backwards for a step-down driver. Almost anything will work but a 2.5:1 driver works best. If the specified transformer is not on hand for T2, use something else, but don't try to make it work with a B supply voltage much different from 250 volts. The dc amplifier has certain limits where it operates and outside that it just doesn't. The *Merit* parts listed are inexpensive, but other companies make units just like them.

Fig. 2 shows the FSK circuit, with values shown for a 160 M oscillator. A diode switch is used to turn an inductance "on and off" in such a way that the RTTY shift comes out with the mark frequency high. The 30 microhenry coil can be slug-tuned, air wound or pie-wound. In fact, it doesn't really have to be 30 μ h, but if you have it too small it won't give you enough shift. If it is too large you may have trouble getting a stable coil or it may make the shift adjustment touchy. I find that 30 μ h is a nice value. The RFC can be almost anything—a National R-50 2.5 mh choke works fine. The 50K pot should be a pretty good one. An ordinary replacement type control is all right but don't use one that is dirty or of flimsy construction or your shift will jump in width. Mount the .01 condenser, the coil, the diode and the RFC right in close to the oscillator tank or at the tube socket and after you get past the RFC you can make the leads as long as you want without affecting the shift. The pot can be mounted right on the machine for convenient adjustment if you want to. The attachment should not have much effect on your normal VFO operation except to shift the calibration a little. With the circuit to the keyboard open, the shift will be small and with it closed your frequency will shift up about 850 cps depending on the setting of the pot. If anything different from this happens, the 1N34 is probably not what it is cracked up to be. Try another. Or use a different type diode. Or use a 6AL5 if you want to.

Adjustments

After you have the TU built and have determined that it doesn't smoke when turned on, you are ready to begin the few adjustments required. Connect the vertical input of a scope to one of the tuning scope terminals and the horizontal input to the other terminal. The middle one is ground. Set the **Bias** pot for minimum bias voltage and the **Current Adjust** pot for minimum screen voltage on the output tube. Connect the printer magnet loop to the **Output** terminals in series with a 0-100 ma meter. Be sure the printer loop is not grounded anywhere. This is a good time to separate the keyboard circuit from the selector magnet circuit if they happen to be connected together.

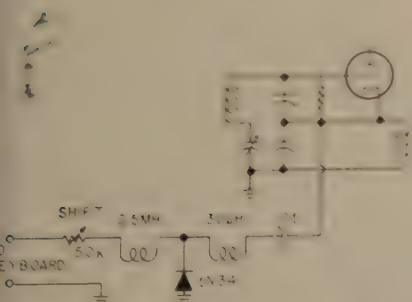


Fig. 2—FSK shift circuit.

In most machines they are separated already but in some of the model 26's there is a jumper in there somewhere that has to be removed.

Turn on the TU and apply 2975 cps from an audio oscillator or wherever you get your audio from at the **Input** jack. You should see an ellipse on the scope in either the vertical or horizontal direction. Adjust the slug of the coil with the .07 mfd condenser across it for maximum indication on the scope. Now set the input frequency at 2125 cps and adjust the other slug for maximum indication in the direction at right angles to the first ellipse. They will be pretty hairy looking ellipses, but definitely vertical or horizontal as the case may be. Go back and forth on the adjustments a few times since they interact somewhat.

To adjust the output current set the audio signal to 2975 cps and throw the reversing switch to whichever position gives an indication on the meter (this position is the right-side-up position of the switch and the other is the reverse). Set the **Current Adjust** pot for a reading of 20-25 ma if your printer coils are in series and 50-60 ma if they are in parallel. Now remove the audio input and the current should fall to zero. If it doesn't and the **Bias** pot is still at zero, something is wrong. The dc amplifier stage should be conducting and the keyer stage should be well cut off. If they are not, something may be oscillating.

With no audio input and no loop current, turn on the machine. It will run "open" which means it will sit there and jiggle up and down like it didn't know which way to the fire exit. Turn up the **Bias** pot slowly until the printer magnets **just** pull in and the chattering stops. The loop current may not read up to what you adjusted but don't worry about it because when the mark signal comes in it will pile right on up to where it should. This is the most sensitive setting of the **Bias** pot. You are now ready to copy.

Installation

Installation of the TU consists of just hooking the audio output of the receiver into the **INPUT** jack of the TU. Leave things so you can use your headphones for monitoring because in operation you will want to hear what's going on.

After the TU is installed, you are ready to adjust the FSK circuit in the VFO. Connect the keyboard circuit of the machine to the input terminals of the FSK circuit, with the shift pot set to maximum. Turn on the VFO and tune in the signal with the receiver in the CW position. Remember that the BFO in the receiver should be set 2550 cps on the low side of the center frequency to make things come out right and have the signal fall in the passband of the receiver. As you tune across the signal, the scope will show a vertical indication for one frequency and horizontal

for another one. Tune in the highest sounding frequency that gives a definite vertical or horizontal ellipse. This is the "mark" and should be 2975 cps. It should give you maximum printer loop current. If it is zero, throw the reversing switch and you should get full current. Let's say the ellipse is vertical for the "mark" with the scope connections you have. Now break the keyboard circuit by pushing the "Break" button on the 26 or pushing the lever on the 15 or somehow opening the keyboard circuit. When the machine is sitting on mark, the keyboard circuit is closed and when you push a key, it opens it according to the code for that key. With the keyboard circuit broken, tune the receiver for a horizontal ellipse and the loop current should fall to zero with the machine running open. Close the keyboard circuit and adjust the **Shift** pot for a vertical ellipse. You are now on the air. This shift adjustment will vary a little with changes in operating frequency but can easily be adjusted during a transmission.

In normal operation, your machine will be on "mark" with the magnets pulled in. Tune in a signal for the crossed ellipses and the machine should print. If it doesn't, throw the reversing switch. If it still doesn't, and the TU is operating properly, the signal is probably coded, multiplexed or not RTTY in the first place. There are a lot of signals in the bands that sound like RTTY but aren't. After you have a signal tuned in (look around 3620 kc or 7140 kc) push the "break" button in your keyboard circuit and set the VFO for the "space" ellipse. The machine will run "open." When you close the keyboard circuit the "mark" ellipse should be seen and the machine will go to "mark." Touch up the **Shift** pot if you need to. When receiving, keep the crossed ellipses tuned in and when transmitting, turn on the transmitter and copy your own signal for monitoring. Remember that you have to identify on CW as well as RTTY.

You will improve performance of the TU a little with a good bandpass filter ahead of the TU input. It should pass 2000-3000 cps and cut off sharply on each side of the passband. Refer to the many articles on filters of this type if you want to use one. You can do a lot of copying without the filter and things have to be pretty rough before you can tell the difference with it in or out.

So there you are. I used this TU and shift for some time with 300 watts on 80 and 40 with FB results to the East and Midwest before a series of QTH changes left me temporarily without room for the machine. This TU gave perfect copy on two transmissions from military stations on one Armed Forces Day RTTY receiving competition and compares very well with performance of the military CV-31 TU.

So dust off your machine and get out the soldering iron. This is one kind of "talking with-the-fingers" that *anybody* can read.

Rectifier Power Supply for Small Size Transmitters

E. H. Marriner, W6BLZ

528 Colima Street
La Jolla, Calif.

Something different! The new look in transmitters of the future will use small dry rectifiers in a bridge circuit. With this circuit, space is saved by eliminating three tubes in the economy power supply, transformer size is reduced and some power is saved by not using rectifier filament winding.

Because the only new thing in the transmitter is the power supply section, the photo is inserted to show how small a transmitter could be constructed if you use dry rectifiers. Other miniature parts now on the market are the Grayhill series 5000 switches, Air Dux relays, indicator lamps, and LTC slug coils.

Power vs. Size

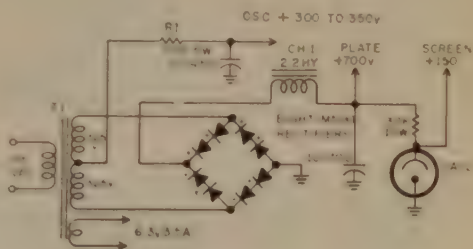
Building small transmitters can be a lot of creative fun. This fun can also be dampened very quickly if the transmitter power is too small to work any DX. Thus this rectifier power supply comes in very handy as it will put out 700 volts for the plate of the 6146 at 100 ma and the center tap of the transformer can be used for the oscillator with very little additional filtering. If R1 is 700 ohms the output will be about 300 vdc. For 350 vdc, remove R1 completely.

Power supply requirements for CW operation require a minimum ripple of 5%. A 2 mry choke and a 10 mf condenser at 600 vts, oil filled, will fill the requirements if size is a consideration. The transformer (T-1) is a 70 ma job overloaded for CW operation running as high as 120 ma without heating up. The little rig with this power supply will light a 75 watt bulb about full brilliancy.

Sarkes-Tarzan M500 rectifiers used in this transmitter mount on fuse clips. It is also possible to obtain rectifiers with pigtailed which can be mounted on terminal boards. Type 40K will function about the same as the M500. Full information on all types can be obtained by writing Sarkes-Tarzan, Rectifier Div., 415 N. College Ave., Bloomington, Ind., and requesting Catalog #669A1.

Another advantage in using these small rectifiers, the output voltage drop under load seems to be less than a vacuum tube, possibly because of the higher internal resistance of tubes.

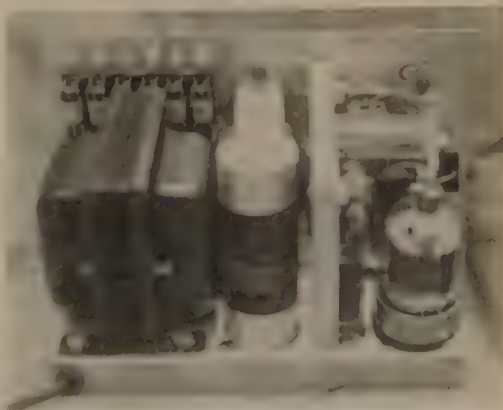
I have been very happy with my first transmitter built using these rectifiers and it has opened a whole new field of ideas for small transmitters. Why don't you try it and see how small a rig you can build? ■



Parts List

- T1—Merit Transformer P3151 325-0-325 at 70 ma, 6.3 v at 3.5 Amps.
Ch-1—Merit Choke C-2991, 2.25 hys at 200 ma.

Fig. 1—



A complete transmitter using the power supply described. Note the rectifiers mounted on the panel as a space saving step.



How to Acquire an OM Painlessly

This article is being written to supplement the one KH6CMM wrote in the August, 1958, "CQ," How to Acquire An XYL Painlessly. So for the lonely, incomplete, pining (I wonder) YL, here are some very easy to follow ideas on how to eliminate the state of bachelorhood for these "poor, unfortunate" (it's a fact) hams.

YLs, if your desire is a genuine OM to empty your ash trays during SS, bring you breakfast during the VHF contests, and—in due time—tend the children during the DX shindigs, then swing your beams due east, fire up the rig, and stand by.

First of all, look around on the 40 meter cw band—there the OMs are patient, friendly, and ready for a ragchew. (My OM is a fone lad—Hi.) Now as you dahdidahdit dahdahdidah, sit back, relax, and then concentrate on 5-9-9 signals close to home.

After exchanging the amenities, coyly mention the fact that you'd love to get into a radio club somewhere close to your QTH. If I know the gallant cw-er, he'll enthusiastically suggest that you go along with him next time he goes to the LRK, (Local Radio Klub). Never mind telling him that you're quite active in YLRL, secretary of the daytime net, a complimentary member of the Tri-State Club, and conduct

cw classes for the local XYLs. These things are better left unsaid.

Of course you'll have to ask him to come over to help you iron out a few "bugs" in the transmitter, which just hasn't worked properly since the time you spilled the nail polish remover over it on that last fone QSO while doing your nails.

It's always a good idea to let him know you was sheer luck, and maybe a very nice FCC official, that let you pass your exam in the first place; thus, you are all thumbs when it comes to checking out that home brew that the brother-in-law built for you—a fact you fail to mention to him, however.

Now if you don't have a mobile rig already, equip the car—perhaps a 10 meter whip plus a 6 meter halo will impress him, 'cause you insist upon using your car to go to that LRK. As he enters your auto, it might be good to let him see you have installed a Kw job—even though he has to sit in the extra seat you've fixed on top of the car, beside the 20 meter beam. (This gives him the idea you might be sold on hamming.)

Of course all this is assuming the initial QSO is eligible. If he's not, he'll be more than glad to interest one of his pals in an honest-to-good

avid YL ham. He'll realize the value of having an XYL who can share his hobby, and all, therefore, think that since you're unmarried and a ham—he's got some F B friends who would like to have an XYL—one who is in the fraternity. In any event, since you are on your way to meeting the eligible bachelors—and since you also have the advantage of being female, I don't have to give you pointers on that angle of the game; we all know and use them.

After you get him over to the freshly cleaned shack (you've already taken down the bills around the certificate frames, duster curtains from the transmitter and receiver, and substituted conventional color fone and key or the decorator color ones) you go all watery and limp, blink your eyes helplessly, appear nervous, and say that somehow you "just never remember how to turn on the 'little ole' rig." He'll be more than glad to give you some pointers while thinking to himself that you really need a man around the house.

It might be advisable now to excuse yourself—mumbling about "Whipping up some grub"—the meal that has lost you a check-in at the daily net to prepare. What he doesn't know, won't hurt him.

While you are in the kitchen, and the OM

is waiting for the rig to heat up, he has looked around and decided that it would be nice to have his shack cleaned up like this. "Why, even the ash trays are clean!" He might decide, though, that the log book should be standard, instead of green with white print and purple ink. "But," he muses, "that won't be any problem to change." Hi.

Well, Lassies, your dinner has clinched it! By now you should have him eating off your dinner plate, so to speak. Now you don't have to worry about getting a hydraulic lift to take that rig down to the local ham shop to repair the next time one of the 813s blows—the OM is right there to fix it for you. (Besides it might even give him a thrill, since that's the only time he ever gets near the shack—except when you give him another QSL or certificate to mount on the wall for you.)

Incidentally, if you've had your heart set on a new rig, and that antenna farm just like the one down the street, don't fret any more. Now you've got a hard working OM of your own, who would just love to buy you anything your little heart desires!

By the way, I hope this works. My OM thought it would be fun to have a hobby we could share—so he nagged and nagged. Does anyone hear K2OZK on the air any more? ■

A Simultaneous RF Bridge Indicator

Bob Forman, W9RJH

Marmouth, Illinois

The writer was given a dual scale aircraft temperature gauge by a generous friend (V9LTI) some time ago and like any red-blooded ham, refused to throw it away.

Months later, in search of a lower standing wave ratio, a Micro-Match coupler was purchased with the idea of using it with an existing multi-meter, as an indicator. After changing the test leads back and forth a few times, the light came on and the dual scale meter was carefully removed from the junk box.

After removal of unnecessary parts the movements were connected to a two contact slide jack (Amphenol 80PC2F) on the rear and the coupler unit was fitted with a mating connector.

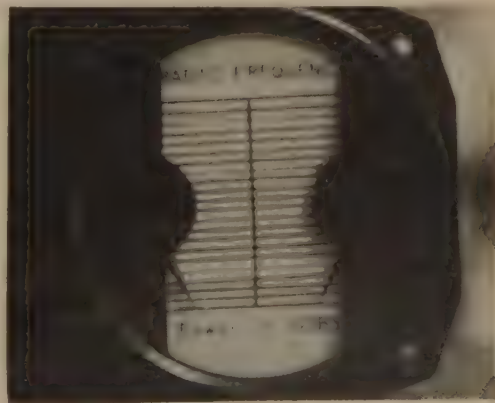
Since the interest here is in low power, it was unnecessary to add a scale multiplying arrangement of any kind. Above this figure it will be necessary to provide attenuation for higher power readings.

A new scale was constructed and calibrated to the standard unit of amateur power measurement, the Gob. Since the meter originally contained quite a number of correcting chokes, presumably made up to match the sensing elements in the original installation it was found that the meter movements were neither linear

nor logarithmic so no attempt was made to calibrate the scale accurately.

The indicating needles were originally painted with luminous paint. In the conversion, the pointer indicating reflected power was painted red and the other black. Every fifth line was inscribed in red to aid in counting and to avoid the necessity of numbering or worry about figure placement, on the small scale. Photo fans could, of course, have a field day in scale design with such a unit.

The convenience of being able to read both powers at the same time repays the efforts of construction many times over. ■



Pink Ticket Protector

M. J. Westrem, WØHOB

Garner, Iowa

The number of complaints received by the FCC concerning amateur radio signals being radiated outside of the amateur bands, has prompted them to send out warning slips concerning harmonic radiation with every new Novice ticket. The chief cause of this trouble seems to be that the final is unintentionally tuned to the second harmonic of the desired frequency. In many transmitters this is impossible, but in others, both home brew and some commercial types, the final tank will tune not only the desired frequency, but it will also tune its second harmonic. This seems to be especially true of transmitters with Pi-Net output tank circuits.

Operation

The unit described here samples a portion of the rf current from the final tank circuit and lights an indicating lamp on the band that the transmitter is tuned up on. If the lamp fails to light on the desired band, it is an indication that the transmitter is not properly tuned.

This unit was designed to cover the three Novice bands. If it is desired to add additional bands, it can be done by simply adding another resonant circuit and its indicating lamp tuned to the desired band. If you do not operate on all the bands included in this unit the circuits associated with the unused bands may be omitted.

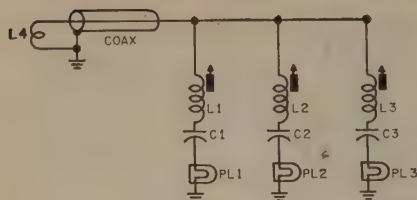
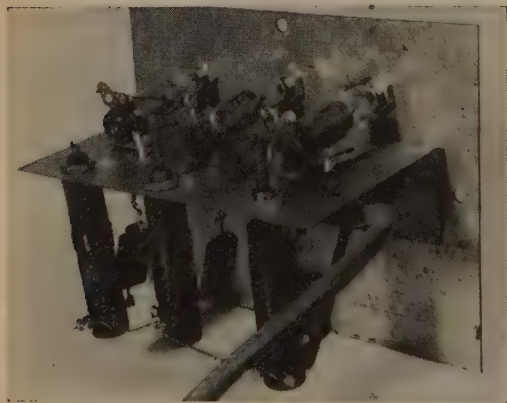
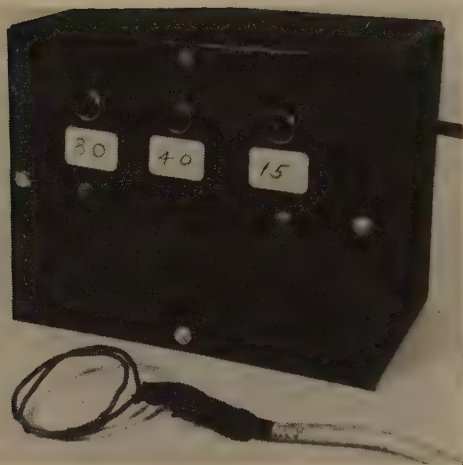
Construction

The complete unit is housed in an 4"x5"x3" cabinet. The layout of the parts are not critical and are clearly shown in the photos. A short length of coax cable is used to couple the link to the unit. The link is made of two turns of wire. The coils are wound on slug-tuned coil forms and the coil winding data should be closely followed unless you have a grid-dip meter or some other means to check the resonant frequency.

Adjustment

After you have completed the unit it will have to be adjusted. First, place the link about one inch from the cold end of the final tank coil. This distance will depend upon the amount of power that you are running and will require further adjustment. You will have to devise some method to hold this link in position. Next, tune up your transmitter, making sure that it

[Continued on page 109]



Parts List

- | | |
|-----------------------|---------------------------|
| C1—100 mmf mica | L2—35 turns Number 26 |
| C2—50 mmf mica | wire close wound |
| C3—15 mmf mica | L3—12 turns Number 26 |
| 3 pilot light jewels | wire close wound |
| PL1-2-3 No. 47 bulb | L4—Two turn link |
| L1—55 turns Number 26 | All coils except L4 wound |
| wire close wound | on 3/8 inch dia. slug |
| | tuned coil forms. |

"CQ Cross-band Six Meters"

Al Slater, G3FXB

86, Cross Rd.
Southwick, Sussex, England

Other than a few very limited openings, late February and March, reception of North American 50 mc amateur transmissions in Europe finished in mid-February. This more or less followed the pattern of the previous season. This article comprises a review of the six-meter scene on this side of the pond, and of the 1957-58 DX season.

During November and December of 1957 reception of W and VE stations on 50 mc was almost daily occurrence here in England. It is fantastic to compare this with the state of affairs four years ago, when 14 mc was infrequent and a W QSO on 21 mc quite a rarity! Much is the influence of the sun-spot cycle.

Not being licensed until 1949, and then only using QRP, the writer, G3FXB, barely tasted 50 mc working on 28 mc during the last cycle. And so, with increasing sun-spot counts and rising MUF's, operation during 1954, 1955 and 1956 was centered on 21 mc and 28 mc.

Reading about the F2 openings on 50 mc that occurred in 1947 prompted interest in that band and in December of 1956 the writer's first cross-band QSO was effected with W1FOS, W1GKE, W1HOY, W8CMS and others followed. The band seemed good in 1956 but pressure of business precluded any serious work and it was disappointing to note the collapse of the band in January, 1957. The last 50 mc signals actually heard being on January 14, 1957, when W4's and a Channel 2 video carrier were audible. However, openings commenced again on October 27, 1957, and it was obvious that the winter of 1957/58 was going to see 50 mc hotter than a fire-cracker. Getting equipped for listening on 50 mc in England is no problem. A very nice item of surplus known as the RF26 Unit is already made six-meter converter. It may not have the most wonderful of noise factors but it fills brand new for the equivalent of about 100 USA dollars. For the record, it tunes from 10 mc to 65 mc and employs the output frequency of 7.5 mc. The rf and mixer tubes are somewhat similar to the 6AK5 and the unit uses a separate triode oscillator.

In England, 50 mc is slap bang in our TV, Channel 2—so, if a fellow is in a Channel 2 area, the domestic receiver antenna can be turned W-wise and put to good use! This of

course providing the QRM from video is not too bad. TV in England is vertically polarized and whilst the writer used the domestic 2 element TV antenna in 1956 it was decided to use a horizontal antenna for 1957 with a view to reducing the video QRM. The local TV Channel 2 station is but four miles away and unfortunately openings on six meters invariably coincide with test patterns which spread a generous 2.5 mc of video all over the band.

During November 1957 a crude 3 element wire beam was used at G3FXB but tests indicated that the driven element of the G4ZU tri-band beam was giving one s-unit better—saying a lot for the efficiency of the wire beam. The driven element of the G4ZU beam is 24 feet long and at a height of 35 feet is center fed with a 450 ohm open wire line. Time did not permit the erection of anything better and the incentive of transmission in G-land has been largely non-existent.

In early November, 1957, my local collaborator in the world of DX began to show an interest in six meters, Stan G2DPY. In fact, his XYL bought him an RF26 unit for a birthday present. If ever an XYL regretted a birthday present—this was it! Stan became an ardent six-meter man and being a shiftworker was in a position to give the band a fair bit of attention. Acknowledgements are due to Stan for much of the information in this write-up, also to short-wave listener John Whittington of Worthing who also procured an RF 26 unit and promptly started to log the six-meter boys. John used just one leg of a 21 mc dipole whilst Stan started with a three element indoor wire beam and later increased this to a six element wire beam similarly situated.

On the whole, the east coast boys were the most co-operative in listening on ten meters but plenty of the lads down south and out west could have made any number of contacts. Cross-band six to ten meters, had they listened on ten. For our part, a mid-west or west coast QSO was for obvious reasons, of greater interest and to hear fellows such as W5PDE, W7ACD and W7JRG at S9 calling "CQ Six" was a most frustrating experience. One knew that no matter how hard one called, there was not a hope of raising them! There were days

[Continued on page 109]

Mac Maurer, W1QMS ex W2CKE

International Division
Raytheon Manufacturing Company

Like many other Certificate chasers I discovered that two QSL cards were still missing for the WAVE certificate: Prince Edward Island had never been worked! Subsequent QSO's revealed that many other stations needed PEI.

I decided to conduct a vacation-type DXpedition in July 1958 to Prince Edward Island, the garden island of the Canadian maritime provinces. DX conditions and band activity would not be optimum in the summer, but at least the certificate seekers would be on hand to work PEI and be assured of a QSL.

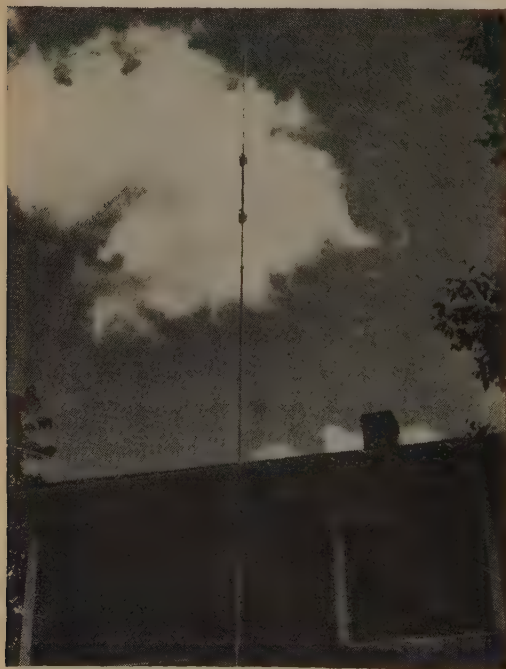
Since the island is a vacation paradise, it was necessary to secure accommodations early in the year. A tourist booklet suggested various cottages and cabins throughout the island. The desired QTH had to have electricity, trees, and no TV. I felt that the last requirement would promote good public relations and permit operation at all times. Correspondence brought color photos of an ideal site that had a 40-foot

tower. A later letter revealed that the source of "electricity" was one of the last 32-vdc wind-driven generators on the island.

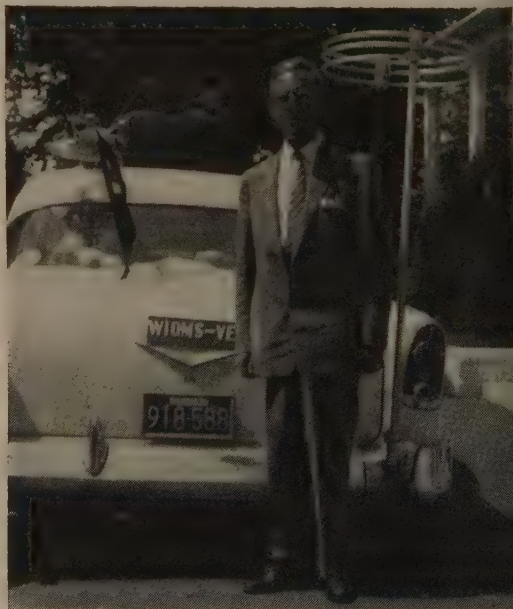
A cottage was selected at Montague on the eastern end of the island. I had assurance of access, power, trees, no TV, and permission to operate. The Department of Transport issued the operating permit in less than two weeks. All preliminaries were thus hurdled and the serious operational planning was tackled.

PEI plans were aired and the "Be sure to look for me" remarks were commonplace. DX editors, W4KVV and W9BRD, were notified so that they could further the cause of WAVE through CQ and QST.

Plans to take a DX-100 and HRO-50 were changed when Roger Mace, W8MWZ, of the Heath Company, made the new Heath Apache TX-1 transmitter and Mohawk RX-1 receiver available. Les Cushman, W1AWZ, provided one of his latest 10-15-20 meter ground planes, the Cushcraft ATGP-3. The Heath Apache-Mohawk combination was checked out with the Cushcraft ATGP-3 and the reports indicated a



Antenna VE1



VE1BZ Governor of PEI

successful PEI adventure.

Forty and eighty meter center-fed dipoles were also checked out and then rolled up. The dipole of my 10-meter beam was selected along with a 5-element Hi-Par beam for 6 meters. Mobile and fixed 6-meter operation was planned with a Gonset III.

A mockup of the car trunk and the gear was worked out and each cubic inch was allotted for some accessory. The tire space and it well allowed the Apache and Mohawk to occupy the center of the trunk. The VE1's could not see how I packed the trunk of a heavy sedan to hold all the gear plus provisions for two adults and three harmonics.

The Customs check took only five minutes. The entire trip from Massachusetts to PEI took 1½ days including a one-hour ferry ride across Northumberland Strait. After the rough trip over the torn-up roads of Maine and New Brunswick, we unpacked and inspected the equipment. Surprisingly it still worked.

The main antenna, the Cushcraft vertical designed for 10-15 and 20, was supported on a 10-foot pipe and its radials drooped at random angles to the nearest supports.

I called a CQ on 14.190 kc and stood by on the frequency. VE3EHR came right back. Jack confirmed that the Apache and ground plane were putting out. WINDX was the first W contacted. The skip was good to the entire eastern half of the U. S. As it lengthened all U. S. call letter areas were worked and all Canadians as well, except VE8. W3's and W8's were always in on the first hop and openings to W6 and W7 land were few. The following stations were the first to be contacted in their respective call areas: WINDX, W2GRS, K3COW, W4BOY, W5URU, K6CCY, W7FND, W8IUA, W9WHM, and KOMOC. Canadian firsts were: VE1ACL, VE2BA, VE3EHR, VE4FS, VE5DU, VE6TF, and VE7JB. W8WUB was the first YL to be contacted and KN5PSS the first Novice on 15 cw. YV2AM was the first DX station worked.

Operation on phone was slowed down because of the pile-ups created by the PEI label.



W1QMS / VE1

It was amazing to note the number of stations calling blindly. Twenty, nevertheless, proved to be the best band in spite of the QRM.

Later the 40 and 80 dipoles were strung between birch trees approximately 15 feet above the ground. A 20-meter dipole was supported between the cottage chimney and a low birch and the 6-meter 5-element beam was propped on the roof and aimed at the states.

The operating position was in the cottage living room until peace with the family moved me out on the porch. It rained occasionally and whenever the fog was thick it seemed that signals were down in strength. All exposed antenna connections were heavily sprayed and no shorting or moisture ill-effects were present.

Forty and 80 provided some nearby states and provinces in spite of the severe QRN. I made some Novices happy by going to cw. The strongest signal was from W2BDS. Mike pinned the meter on the Mohawk at 60 db over 9. This occurred at midnight and Mike wished me the best as he went to bed.

Many small craft traversed the waterways about the island and their radiated ignition was evident up to a mile away. I could even tell certain craft and identify them by their radiation. The noise limiter on the Mohawk was pressed into service and effectively eliminated this interference along with power line leaks and a neighbor's razor.

Operation was conducted as domestic duties allowed. I also had to chop wood, pump water, keep the youngsters from tripping over the coax, go shopping, check the BC band and get some sleep. As a one-operator station you hate to be asleep for even one segment of the 24-hour period. It is also tough to QRT when stations are still calling.

VE3GC and VE1IA surprised me when they visited the Montague QTH. A 75-phone contact with VE1ACL resulted in an invitation to attend a club meeting at the VE1HI Memorial Station in Charlottetown. The VE1's were eager to see the gear and I brought it along. They looked it over and took turns getting familiar with the features. I learned that they are not on the air as much as the DX world wants them to be because of TVI and a preference of rag chewing to "quickies."

No DXpedition is ever problem-free. My operation resulted in only a blown fuse and an overheated RF choke. These breakdowns were not serious considering that the shack was located near the water and the gear subjected to salt air. It also rained quite a bit and the humidity was extremely high at times.

VE1ZM had waited for years for someone to help him check out his six meter gear. I worked him from the mobile for 14 miles and several fixed contacts followed. Unfortunately no openings occurred to the States. Ten phone provided a good short skip opening following a radio blackout. A later long skip path snagged

[Continued on page 109]

VOICE OF AMERICA BROADCASTS

CQ, CQ, CQ to all radio amateurs and shortwave listeners from the Voice of America. Beginning Sunday October 5th, and every week thereafter, the Voice of America will broadcast the VOA Amateur Radio Program to all areas of the world at five different times throughout the day. The program will consist of 15 minutes devoted to the latest gossip on the ham bands, interviews with radio amateurs around the world, propagation forecasts, and discussions of the latest technical news of interest to radio amateurs and shortwave listeners.

The broadcasts, in the *English* language,

are written and voiced by Bill Leonard, W2SKE, one of America's leading news commentators, and a very active radio amateur operator. Gene Kern, W2BAK, produces the program, and propagation forecasts are by George Jacobs, W3ASK, with radio amateurs everywhere invited to participate.

The VOA has prepared a distinctive QSL card for exchange with listeners of the Ham Show, and W2SKE and the gang are looking forward to receiving QSL cards from radio amateurs and shortwave listeners everywhere. QSL's should be sent to: Amateur Radio, Box 922, Washington 4, D. C.

WEEKLY VOA AMATEUR RADIO PROGRAM SCHEDULE EFFECTIVE SUNDAY October 5, 1958

TIME (GMT) TIME (EST)
0600-0630 1:00-1:30 AM

KCS	METERS	STATION	BEAM	7160	41.90	Okinawa	East Asia
15330	19.57	WLWO, USA	West Africa	9650	31.09	Honolulu	East Asia
11810	25.40	WLWO, USA	West Africa				
15165	19.78	WLWO, USA	North Africa				
11970	25.06	WLWO, USA	North Africa				
9530	31.48	Greece	Middle East				
7125	42.11	Greece	Middle East				
1259	238.28	Greece	Middle East				
15210	19.72	Munich, Germany	Middle East				
11960	25.08	Munich, Germany	E. Africa/Mid East				
6140	48.86	Munich, Germany	Europe				
1196	250.84	Munich, Germany	Europe				
15295	19.61	Tangier, Morocco	Middle East				
11790	25.45	Tangier, Morocco	Middle East				
11865	25.28	Tangier, Morocco	Europe				
9505	31.56	Tangier, Morocco	Europe				

TIME (GMT) TIME (EST)
0700-0730 2:00-2:30 AM

KCS	METERS	STATION	BEAM
15330	19.57	WLWO, USA	West Africa
11810	25.40	WLWO, USA	West Africa
15210	19.72	Munich, Germany	Middle East
15295	19.61	Tangier, Morocco	Middle East
17780	16.87	Tangier, Morocco	Europe
15330	19.51	Tangier, Morocco	Europe

TIME (GMT) TIME (EST)
1200-1230 7:00-7:30 AM

KCS	METERS	STATION	BEAM
25950	11.56	WBOU, USA	Europe
21730	13.81	WLWO, USA	North Africa
17795	16.86	WLWO, USA	North Africa
11875	25.26	Colombo, Ceylon	South Asia
7110	42.19	Colombo, Ceylon	South Asia
25880	11.59	Tangier, Morocco	Mid East/South Asia
21455	13.98	Tangier, Morocco	Mid East/South Asia
11900	25.21	KNBH, USA	East Asia
9515	31.53	KNBH, USA	East Asia
6145	48.82	KNBH, USA	East Asia
6020	49.83	KNBH, USA	Hawaii/Australia
11775	25.48	Honolulu	East Asia
11790	25.45	Manila	East Asia
920	326.00	Manila	China
15330	19.57	Philippines	South East Asia
9745	30.79	Okinawa	East Asia

TIME (GMT) TIME (EST)
1700-1730 12:00-12:30 PM

KCS	METERS	STATION	BEAM
21610	13.88	WLWO, USA	West Africa
17795	16.86	WLWO, USA	West Africa
21500	13.95	WDSI, USA	Europe
15210	19.72	WDSI, USA	Europe
11875	25.26	Colombo, Ceylon	South Asia
7110	42.19	Colombo, Ceylon	South Asia
15340	19.56	Munich, Germany	Europe
6140	48.86	Munich, Germany	Europe
1196	250.84	Munich, Germany	Europe
173	1734.10	Munich, Germany	Europe
15200	19.74	Munich, Germany	Middle East
11760	25.51	Munich, Germany	E. Africa/Mid East
9520	31.51	Salonika, Greece	Europe
21455	13.98	Tangier, Morocco	Mid East/South Asia
9615	31.20	Tangier, Morocco	Europe

TIME (GMT) TIME (EST)
2300-2330 6:00-6:30 PM

KCS	METERS	STATION	BEAM
21730	13.81	WLWO, USA	North Africa
17880	16.78	WLWO, USA	North Africa
15150	19.80	WBOU, USA	North Africa
21540	13.98	WBOU, USA	Europe
17830	16.88	WDSI, USA	Europe
173	1734.10	Munich, Germany	Europe
11870	25.27	Tangier, Morocco	Europe
9615	31.20	Tangier, Morocco	Europe
15330	19.57	WBOU, USA	Brazil
15210	19.72	WDSI, USA	W. Indies/E. S. Am
21740	13.80	KCBR, USA	East Asia
17770	16.88	KCBR, USA	East Asia
15275	19.64	Philippines	East Asia
15200	19.74	Philippines	South East Asia
11895	25.22	Philippines	South East Asia
11790	25.45	Philippines	South East Asia
7160	41.90	Okinawa	East Asia

Note: The VOA Amateur Radio Program is a 15 minute feature of the Sunday Report From America broadcast a half hour program devoted to late world-wide news and Americana feature items.

CQ Tests the Johnson Courier

Wayne Green, W2NSD

The Johnson Courier is an all-band *rf* amplifier, running a pair of 811A's, with inputs of 100 watts on CW and sideband (PEP), and 100 watts AM phone. Both the bias and high voltage power supplies are built right into the unit, making it a completely self-contained power amplifier.

The Courier can be driven with the Johnson Ranger, Navigator, Adventurer and Pacemaker. The Central 20A, Lakeshore Phasemaster II, Globe DSB-100 and Hallicrafters HT-32 also will work well with the Courier. The 20A and Phasemaster II are a little low on *rf* output in the ten meter band for the Courier and you will have to settle for reduced input on this band.

In our tests the Courier was connected to the Phasemaster II and operated on 75, 20, 15 and 10 meters. Full output was easily obtained on all but 10 meters. Signal reports were universally excellent. It was very easy to use since all we had to do was disconnect the exciter from the antenna and put the Courier in between. From then on we left it turned on all the time and it just sat there quietly waiting for drive to come along. Tuning was accomplished by following the chart in the instruction booklet, which brought us very close to the final adjustment.

One really big advantage to the Johnson equipment is that they take so many precautions to prevent TVI. All connections entering or leaving the amplifier are thoroughly filtered and bypassed. Even the meter is completely shielded and its leads filtered. No wonder my TV set sits there minding its own business while I gas with Peru.

Let's see now, what else have they put in here that you might like to know about? Well, there's a blower to keep the 811A's cool. You can shift the bias from class C to class B by means of a switch on the front panel . . . the "B" being for linear operations, like SSB, DSB, and AM phone where the signal is already



modulated by the time you feed it into the grid of the final. Class C is used for CW to provide maximum plate efficiency.

The output is a regular pi-net arrangement which allows you to feed a coaxial antenna feedline directly. Since I am one of the old fashioned types and use folded dipoles I found it prudent to put in one of the Johnson Matchboxes to take care of the transition from unbalanced line to balanced line as well as remove any possible reactance that might be lurking around.

So, for \$244.50 (\$289.50 wired and tested) you get the Courier in kit form and should get the same results that I did. Where before, when I called a station, he would come back and say that I was pretty weak . . . now he comes back and says that I am loud and clear. On SSB they usually come back. Having power just makes it a lot easier in case someone tries to muscle you off your channel.

Provisions are made for remote operation of the high voltage supply as well as remote application of cutoff bias to help the 811A's run a bit cooler and have a happier longer life. This also is quite important if you are using a T-R switch for you get lots of QRM from the amplifier if it is just sitting there mumbling to itself amplifying random noises that find their way to the grid. Hook the bias to an extra pair of contacts on the relay in your exciter and all will quiet down. ■

CQ Tests the Globe DSB-100

Wayne Green, W2NSD



As you may remember, CQ was the first to bring you good practical dope on double sideband. Well, we've been expecting some manufacturer to take advantage of all the benefits of this mode of transmission . . . and sure enough Globe Electronics made the plunge with their DSB-100 transmitter.

The setup, if you don't have anything to start with at all, runs about like this. \$119.95 for the transmitter in kit form (\$20 more wired and tested), \$19.95 for the voice operated control unit (\$5 more wired and tested), and \$49.95 for the vfo unit in kit form (add \$10 for factory wiring). Of course you may well have one of the other VOX units already around the shack, ditto the vfo. But if you don't the bill only runs to about \$190 for everything, which is a really amazing figure for a complete operating sideband rig.

The rig is rated at 100 watts PEP on DSB, 35 watts on AM peaking to 50 watts with controlled carrier modulation and 50 watts on CW. The circuit runs a 6CL6 oscillator or buffer, a broadbanded stage which requires no tuning, followed by a second 6CL6 buffer or doubler or tripler. The final consists of a pair of 6DQ6's in a push-push circuit. The grids are run in push-pull and the plates in push-push, the idea being to cancel the carrier output. Screen modulation of the tubes results in rf output.

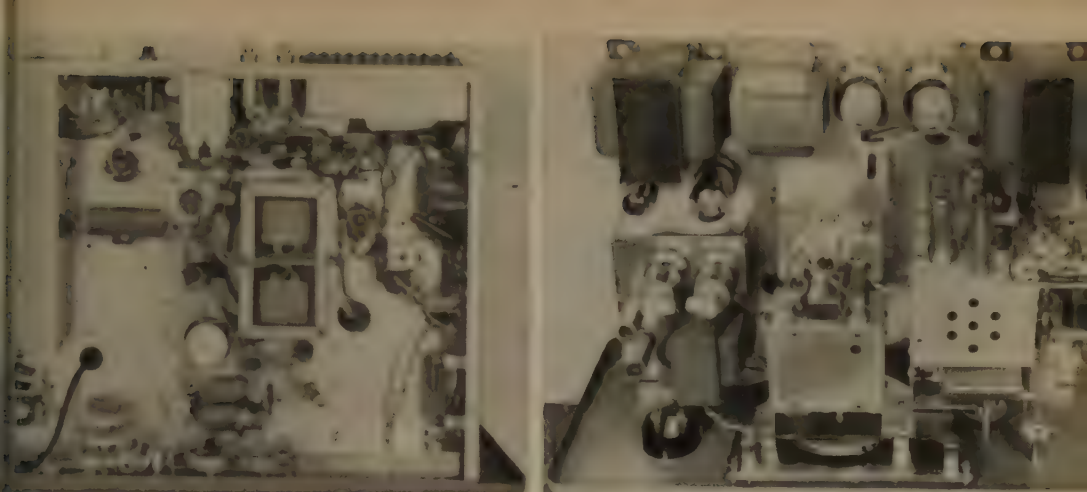
In addition to the microphone and speech amplifier there is a separate tone generator

which is used for tuning up the rig. Further for more speech power the rig has a clipper filter arrangement, which of course cannot be used on a regular single-sideband transmitter.

The power supply is built in so you have nothing else to buy or jury-rig up. The DSB-100, VOX and vfo can be connected together quickly since they are designed to plug into one another. There is even a terminal supply for 110 v ac for your antenna relay when the rig is operating.

But of particular interest will be the actual tests. The rig was set up at W2NSD, feeding a folded dipole through the usual antenna tuner. It loaded fine on 15 meters and gave an indicated 100 watts output with the tone oscillator. The first station called was DL1JV in Cologne. Helmuth came right back and reported that the signal sounded excellent to him, just like single sideband. Next I called G5KL and Ken gave the same report. Neither had heard a commercial DSB rig before and both were surprised and pleased to note how nice a signal it put out.

So there you have it. You can get in there and talk with sideband stations now for mighty little money. There may be a few bleats now and then from fellows who have spent several times as much money as you have for the gear, but for the most part you will find that few stations notice that you are not running single sideband.



CQ Tests the B&W 5100-B

Frank Anzalone, W1WY

The personal satisfaction of working DX with only 25 watts is hardly worth the effort. I came to this conclusion after bucking the KWs for the past four years. Something had to be done but economy dictated that it must be done in slow stages. A medium powered rig now, that could be used later to drive a KW linear would be a practical way of solving the problem.

The Barker & Williamson people had recently sent one of their new 5100-B transmitters to the office. We asked Wayne to let us try it out. "Sure," said our Hon. Ed., "take it home and put it on the air."

My first impression after I had unpacked the carton was one of admiration for the handsomely styled cabinet and the symmetrical layout of the front panel. No small transmitter this; measuring 22 in. across, 11½ in. high by 14¾ in. deep and weighing 88 lbs. left no doubt in my mind that here was a real job.

Opening the top cover revealed five basic units. The VFO and dial assembly, the crystal osc. and buffer unit, the multiplier and final amplifier unit, the speech amplifier and modulator unit and the main chassis which contained all the power supplies and other accessories.

The 5100-B is a completely self-contained transmitter designed to cover all amateur bands, 10 thru 80 meters, CW and AM phone and SSB when used with the 51SB-B.

A study of the manufacturer's instruction manual revealed that the VFO employs a 6BH6 in a modified Hartley circuit that operates in the 160 meter band, which makes for unusual stability. The dial assembly is a gear driven unit that provides a drive ratio of 64 to 1 on a slide rule type indicator.

The buffer unit consists of two 6BJ6s, the second of which doubles as a crystal oscillator. These tubes also serve as part of the keying circuit, giving complete isolation under key up conditions.

The multiplier section, a four stage affair, is part of the multiplier-power amplifier unit. Selection of the proper output is accomplished by means of the band selector switch on the front panel.

The final power amplifier utilizes a pair of the popular 6146s connected in parallel in a pi-network tank circuit. The output feeds a low pass filter which is an integral part of the transmitter. Input on CW is 180 watts and 140 watts on AM phone.

The speech amplifier and modulator are one unit on a separate sub-chassis. The tube line-up, 6U8, 6AQ5 and a pair of 6146s. The push-pull modulators are operated class AB² and deliver adequate power to modulate the final 100 percent. The modulator transformer also has a 500 ohm tap to drive a separate high power modulator if desired.

Two power supplies, low and high voltage, are mounted on the main chassis. The low voltage supply is a conventional full wave circuit using a 5U4-GB rectifier. The multipliers, the speech amplifier, the final screen grids and the 51SB-B when used, all derive their power from this supply. A regulated 150 v dc for the VFO, crystal oscillator and buffer unit is also obtained from this supply thru a VR150. Negative bias voltage for the modulator, final amplifier and keying circuit is obtained from an additional tap on this transformer and a selenium rectifier.

The high voltage for the power amplifier
[Continued on page 80]

CQ Tests the National NC-303



Wayne Green, W2NSU

At least one manufacturer seems to believe that I'm a "National" man. This review of the new NC-303 won't do much to discourage the belief. I'm not anybody's man . . . when I set up a receiver or transmitter for testing it has to darn well impress me as being a good deal or you won't hear about it in these pages . . . and there have been a lot of things that you haven't heard about for this reason.

Those of you who have followed the review and editorials in CQ closely will remember that I've been using an NC-300 for the last two years. After I'd lived with it for about a year Wes Schum came along with his Sideband Slicer mit Q-Multiplier and convinced me to try it with the 300. Good as the 300 was, this was quite an improvement for SSB reception and the Slicer never left the circuit again.

Essentially what National has done with the 303 is to take the tried and proven 300 and add a slicer plus Q-Multiplier to it, plus a few other goodies. (Don't get ideas! You cannot modify your 300 to produce a 303.) Obviously the National boys have their ear to the ground for they put in just about every improvement that I had hankered after. The sidebanders will certainly appreciate the lower-upper sideband switch which shifts the *if*, thus making it unnecessary to retune when you shift from one to the other.

The calibrated main tuning knob serves two functions for me. When tuning from one sideband station to another, like when you are working a DX station outside the band as well as someone on your own frequency, you can note the dial readings and flip back and forth, arriving at the exact zero beat every time. When those aurora signals come through on VHF you want to be able to make note of the spot on your dial in order to separate them so you know who is where. As a matter of fact I had

added some calibration to the knob on my 300 for this purpose. The 303 also has a fine tuning vernier which is very handy for both SSB and VHF tuning.

Another need filled is for some way to tune in WWV. You have to get a small converter which plugs into the 303 and then you are all set to check your watch or your 100 kc calibrator against the Bureau of Standards.

The noise limiter on the 300 was excellent but it was cut out of the circuit on SSB and CW. The 303 has dual noise limiters so you have full action on all three modes.

For those of you that have not used the NC-300 I should explain that it is a most satisfactory receiver. Within minutes it settles down to extremely low drift, a boon to SSB and RTTY operators. The dial calibration is well spread out . . . on twenty meters you have a mark every 2 kc so that you can set your dial to 1 kc with ease. Even with all this bandspread you can flip from one end to the other quickly because the tuning knob is well balanced and counterweighted.

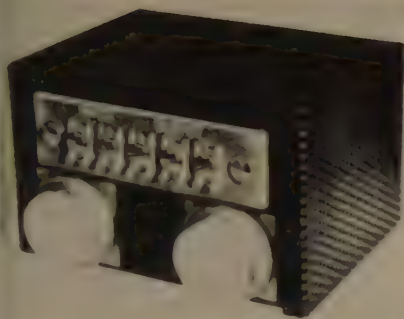
The sensitivity and selectivity are really all that you could ask. The Q-Multiplier gives you a handy tool for removing any interfering heterodyne. Very flexible.

Those of you who like to go up on the VHF's will find the receiver all calibrated for you. You have a choice of converters, too. National, Tapetone, and Tecraft are all selling good converters which are compatible with the 303. It is very nice to be able to flip the band switch and check two and six for activity every now and then.

The tab on the NC-303 is \$449, which seems like a lot to an old timer like me who remembers that the SX-28 only cost half of that when it came out 18 years ago. I guess it is OK though for I notice that NC-300's are selling for \$320 used, which isn't much of a drop from their original price of \$350 some two years ago. Pretty good when you can get to use a receiver for two years and only take a \$30 loss on the deal. The 303 will no doubt hold its price well too.

CQ Tests a Transistor Power Supply

Wayne Green, W2NSD



We've been reading a lot about these new-fangled transistorized power supplies, but this is the first unit that we actually got our hands on. One of the major difficulties was that we had to wait until some company managed to design a unit which would work from a six volt input. Heretofore all of the supplies were designed to operate from twelve volts and several companies said that they had been unable to make a satisfactory six volt unit.

Then came a small package from Kupfrian Manufacturing Corp., Binghamton, N.Y. I was amazed. It is one thing to read the physical size specs of such a thing and another to hold one in your hand. This little $1\frac{1}{2}$ pound $3\frac{1}{4} \times 4 \times 2\frac{1}{2}$ box would turn six volts into 300 volts at 165 ma or 150 volts at 330 ma, or any combination of the two. You may dissipate approximately 50 watts from either output but not both. The two loads may total 50 watts and any division of power may be made as long as you do not exceed the rated 50 watts. This was ideal for my car rig which required 150 volts for the oscillator, speech and converter and 300 volts for the final and modulator. And it would replace that vibrator power unit which had already taken out two vibrators. The small space available in a sports car makes the Kupfrian unit even more

desirable, it being less than one fourth the size of the unit it replaced.

The lack of moving parts is another advantage for mobile use since the transistorized unit is unaffected by moisture and vibration, both of which are available in quantity in my car. Full load efficiencies of over 80% apparently are attained by careful matching of parts, and the use of grain-oriented core construction.

Kupfrian also has two 12.6 volt units which deliver 100 watts from the same midget package. The first delivers 300/150 vdc at 330 ma and 400 ma respectively, and the second delivers 500/250 vdc at 200 ma and 400 ma respectively, in any combination not exceeding 100 watts. All outputs are filtered, the ripple measuring under 0.5 volts, and regulation is good. Included in the line also is a 12.6 volt inverter delivering 100 watts at 60 cycles, essentially square wave. Net prices are low and start at \$39.75. Separate kits are available at slight reduction in price.

One other benefit of these gadgets is that if by chance you should happen to short out the output or if something should go pffft in the rig all that will happen is that the transistors will stop oscillating and there will be no output. Better than fuses, eh? ■

Filter King VHF-50

Six Meter Converter

Richard C. Weinberger, K2ALM

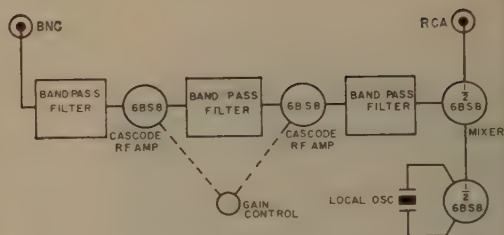
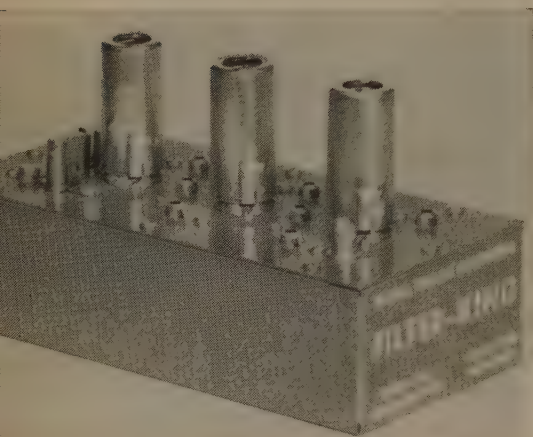


Figure 1

The **Filter King VHF-50** made by Santa Rosa Electronics, Santa Rosa, California, is a low-noise, high-gain six-meter converter. The local oscillator is crystal controlled, and models are available with output frequencies ranging from 550 kc to 30 mc. The converter is shown in block diagram form in fig. 1. Each bandpass filter is a triple-tuned circuit designed to pass 50 mc to 54 mc without attenuation but to give high attenuation outside the band. The power requirement is 6 to 6.3 volts at 1.2 amperes and approximately 120 volts *dc* at 20 *ma*. This can usually be supplied by the receiver without strain.

One unit with an output range of 28 mc to 30 mc was tested in operation by K2ALM and W2EGK. The receiver used was a Hammarlund HQ-100 of proven performance (CQ Feb. '58). The HQ-100 does not have an accessory power socket, so a hole was punched in the rear apron and wires connected to B plus, A, and ground were brought through and connected to the power plug which is supplied with the converter.

Before the power was applied, the following items were noted:

1. The unit, which measures about 8 by 4 by 4¼ inches over the tubes, is too big to be mounted inside an ordinary communications receiver.

2. All tubes have military type tube shields.

3. The box is clean and completely shielded.

Screwdriver controls are on top of the chassis.

The converter has been in operation for two months and has given a good account of itself. It has been found to be sensitive, and the low noise figure claimed for it (4 *db* maximum) seems reasonable. The only difficulty found in operation was the sensitivity to antenna impedance. With the dipole (vswr-1.5) the converter was run with the gain wide open. This seemed to produce the best signal-to-noise ratio. No crossmodulation was noticed.

However, when the ground plane antenna (vswr-2.5) was used, the converter was found to "overload" and produce "birdies" in the band, apparently as a result of oscillation in the first *rf* stage, until the gain control was turned down about halfway. Realignment of the first bandpass filter did not help the situation, but the performance of the converter was very good even with lowered gain.

Our experience in handling this unit has shown that it is a very high-performance piece of equipment and give a good account of itself even under adverse conditions of noise and signal.

The specifications of this unit are:

1. Gain—20 *db* minimum.
2. Noise Figure—4 *db* maximum.
3. Power requirement—6.3 volts at 1.2 amperes and 120 volts *dc* at 20 *ma*.
4. Output Frequency—28 mc.
5. Crossmodulation—negligible

The Built-in Q Multiplier

Jack Najork, Ex-W2HNN, K9?

926 Cedar Lane
Northbrook, Ill.

Soon after going DSB mobile, it became painfully apparent that my faithful old Elmac PMR6A receiver just didn't have the selectivity required to pull the sidebanders away from the AM phone boys. A project was therefore initiated to improve this department—in as cheap and easy manner as possible.

The first thought was to improve the *if* skirt selectivity by the addition of more *if* transformers. These were available in the junk box but a quick look inside the well-packed receiver chassis showed that any additional transformers would have to be out-boarded. Since this meant nasty chassis construction, this idea was temporarily abandoned.

The next idea was to build in a simple Q multiplier but here again it was found that the necessary components wouldn't fit inside the case . . . there must be an easier way . . .

The inspiration came after the second bottle of beer. Why not use the existing receiver BFO as a Q multiplier? CW was never used in the car and carrier injection for SB reception was handled by an external source (the xmtr VFO) so the BFO was sitting idle. Hmmm . . . let's take a look at that schematic. By forgetting about the NULL feature and making the Q multiplier fixed-tuned about all that would be required would be a control potentiometer and a few simple wiring changes.

Right about here some theory-steeped character is going to step up and ask about the Q of that miserably small BFO coil. The original Q multiplier article stressed the need for a high Q coil and went on to point out that with a circuit Q of 200, positive feedback would result in an over-all Q of around 4000—which was capable of narrowing the *if* passband down to roughly 500 cycles. This degree of selectivity is not needed for SB and AM phone work so let's back off a bit. Let's assume our portable BFO coil has a Q of 50 and this is multiplied by feedback to a total Q of 1500. Would it be enough to make a worthwhile improvement? Only one way to find out . . . where's that soldering iron?

Ten minutes after the iron heated up the PMR6A was splitting signals apart that formerly were a garbled mess. Gadzooks! Let's write this up for CO!

If you are strictly an AM phone man and never use the BFO, this is for you. If, however, you operate CW or use the BFO for sideband copying read no further.

In exchange for a BFO you will buy greatly improved phone selectivity. If you want to get fancy you can probably add your own modifications so that the BFO can be used either as originally intended or as a Q multiplier. As modified here, the BFO cannot be used as such because in the oscillating condition it feeds too much signal into the *if* stages and blocks up the works to the point where only an extremely strong signal can be heard.

Since this is an "idea" yarn rather than a point-by-point construction article, the reader will have to devise his own modifications on his particular receiver with the aid of the following suggestions. The changes are so simple, however, that you just can't go wrong. (Famous last words)

Procedure

Here is how the operation was performed on the PMR6A: The BFO B plus line was disconnected from the mode switch and reconnected to a midget potentiometer wired into a voltage divider on the regulated B plus line as shown in fig. 1. The voltage divider resistors were selected to bring the Q multiplier into oscillation at half-rotation of the potentiometer. The potentiometer was secured to a small bracket on one side of the receiver case and the two leads were run down through vent holes in the side of the case.

Next, the "gimmick" coupling capacitor (a piece of insulated wire looped around the rear wafer of the bandswitch) was removed and the .005 mfd coupling capacitor was added to couple the Q multiplier to the first *if* transformer tuned circuit. The slug on this side of the transformer was reaped to compensate for the added capacity introduced by this

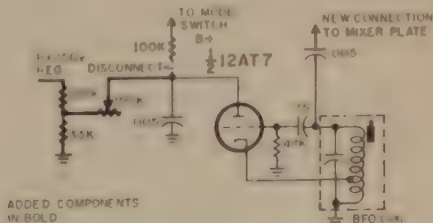


Fig. 1—Existing bfo modified as a Q multiplier.
(Note—The .005 to the mixer plate must also be added.)

change. This peaking can be done on a steady signal such as a BC station, with a VTVM connected to read maximum AVC voltage. Lacking a VTVM, you can peak while listening to a weak signal with AVC off.

The final step is to tune the Q multiplier exactly to the *if*. This is done by throwing the Q multiplier into oscillation and then adjusting the BFO coil slug to zero-beat with a strong, incoming signal. Because of the blocking effect mentioned earlier this signal has to be

pretty husky, otherwise you won't hear a beat-note. That is it. You should now be in business.

The degree of selectivity improvement on the PMR6A is indeed amazing. Bringing the control pot up to the critical point sharpens the pass-band to a degree where the audio quality of a phone signal takes on the typically boomy response of a highly selective receiver and adjacent channel hash and crud drop way down. Best of all, the price is right!

Hidden Transmitter Hunt

Something different in hidden transmitter hunts was pulled on the mobileers at the Montreal Amateur Radio Club Hamfest in September. Bill Still, VE2AZT (W2GJR) and the gang rigged up Eric Lloyd (SWL) as a good looking blonde. The 75m rig and batteries were in the handbag, the loading coil was hidden in some of the towels used to put curves on Eric. The antenna was nine feet of wire sewed into the hem of the skirt and protected from body capacity by a heavy crinoline slip. The mike was a carbon switchboard type taped to a bracelet with two fine wires passing through the blouse, down under the arm and into the bag carrying the transmitter.

Everyone except the hunters were clued in on the stunt and all hands turned out en masse to watch the "girls" stroll along the street.

Accompanying Lloyd was Mary Reidy, VE2NR, who carried a midget portable two meter receiver so she could listen to the mobiles talking to one another as they searched.

As the mobiles arrived in the vicinity the hunters jumped out of their cars and started looking, in full view of the whole gang, in the

bushes, houses, up trees, etc., while the "girls" walked past them. This went on for almost an hour before VE2ABU and VE3UY set to tracking them down on foot with portable field strength meters. VE3UY was the winner.

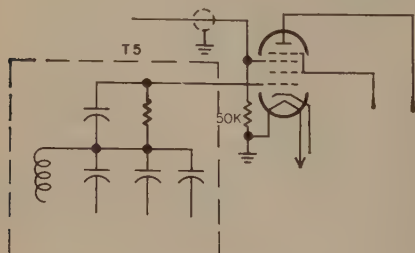


Oops We Goofed

Save Your Super Pro

Sept., 1957—fig. 1, page 52: A 50,000 ohm resistor from the third grid to ground was omitted.

Also in fig. 1, the grid leak was shown to be shorted out. The correct diagram is shown.



In fig. 2, page 53, there should be a fixed condenser, 1000 mmf, between the two cathode ends of the 1,500 ohm cathode resistors. The direct connection shown should be removed.

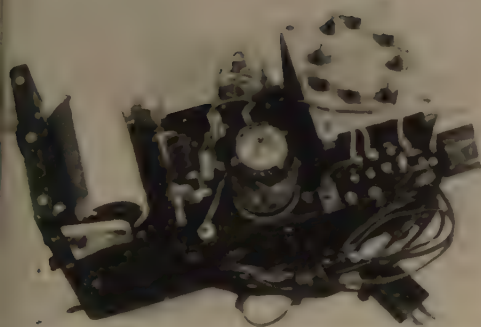
Semiconductors

Oct., 1957—fig. 1, page 60: The oscillator tank condenser marked 330 mf should be marked 330 mmf.

THE 200 L/ARC 5

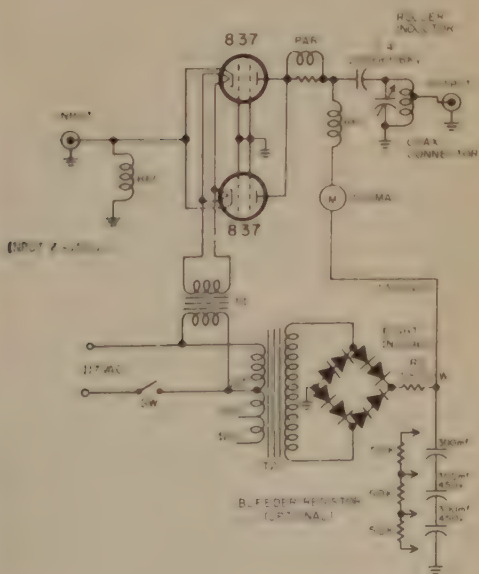
W. R. Booher, W9NTI

Electronics Engineer P. R. Mallory Co.



Although the Central Electronics Model 20A single sideband exciter will make a good account of itself by merely hooking up the skywire to the appropriate terminal on the rear, it isn't long until the operator desires to try his hand at QRM'ing the higher power fellow with a boost in signal strength. The little linear amplifier described here will boost the receiver's meter several notches with a minimum of outlay on your part and the complete assembly, including a power supply with excellent dynamic stability, puts out a signal as strong as horseradish yet occupies a space no larger than the VFO!

The actual cash outlay for this amplifier will be in inverse proportion to the junk box inventory. Most of the parts used in the final described were already tucked away in various corners of this old endeared place and just naturally fell into place when the design passed



through the drawing board stage. Fortunately, the power supply was through the drawing board stage when CQ for Feb. '58 arrived at the QTH. However, Mr. Romnel's article on the power supply for short duty cycles* confirmed my thinking on the subject and aided in speeding up considerably the actual try-out of the completed amplifier.

837 AMP

Pie itself couldn't be easier. About all that is needed for a start is an old command transmitter chassis which has nothing left but the two 1625 sockets and the roller inductor and, in case it is a Navy version, the plate *rf* choke. In the conversion shown here, I was not so fortunate as to have only the above mentioned parts available, so—out came everything except the above, which makes a brand new T-17 look somewhat naked. In addition it goes against the instinct to "leave it alone because its new."

Examination of the schematic diagram will show the usual grounded grid circuit using two 837's in parallel. The tubes readily fit the vacant 1625 sockets left in the chassis and the remaining components required are hooked up to form an output tank circuit and a means to drive the cathodes of the two 837's. Ground all unwired pins of the 837's except the cathode and filament, keeping the ground connection short as possible. A lug mounted between the two sockets serves admirably and also holds one end of the *rf* choke connected from cathode to ground.

In the unit pictured here, a pi-network was originally installed using two capacitors in conjunction with the variable roller inductor. Although this arrangement worked very well, it was decided that the amplifier always worked into a 50 ohm load (the antenna tuner) and, therefore, the versatility of the pi network was abandoned in favor of the space saving arrangement shown.

The only component that wouldn't fit inside the chassis was the filament transformer. No doubt if a smaller transformer had been available, this feat might have been accomplished, but the Central Electronics Company's 458 VFO uses a filament transformer mounted on the rear of the chassis, so this is where it went.

POWER SUPPLY

The heart of this little amplifier is, of course, the novel power supply. As can be seen in the photos, eight "top hat" silicon rectifiers are mounted above the power transformer on a piece of insulating phenolic board. The little rectifiers are real space savers. If you can image using tubes with the associated filament transformers in the full-wave bridge circuit

shown, you will soon see what I mean.

The power transformer was pulled out of the junk box, and, if my memory serves me, it was purchased war-surplus several years ago. The rating is 350 volts each side of center at 200 *ma* and with the full-wave bridge and capacitor filter puts a measured 1120 *vdc* on the plates of the 837's with 115 volts poured into the 105 volt primary tap. In this circuit the capacitor will charge to peak secondary voltage of the transformer which runs about 800 volts *rms*.

The electrolytic capacitors are rated 300 *mfd*/450 *vdc* each and are hooked in series making a total of 100 *mfd* at anything up to 1350 *vdc*. Contrary to popular opinion, this supply uses no equalizing resistors across each capacitor. I have used up to six electrolytic capacitors, series-connected, without resistors for continuous life tests beyond 5,000 hrs. many times, without a single failure. However, if a bleeder is desired for this supply, these resistors could be added thus serving both purposes. The 837's do a good job of keeping the supply bled after turn-off, but it is still advisable to short the capacitor bank when making adjustments inside the transmitter. With 100 *mfd* available, even relatively low voltages can be lethal and it certainly isn't worth the risk!

The 100 ohm 20 watt resistor serves to limit the surge current applied to both the capacitors and the rectifiers when voltage is turned on. This resistor in combination with the capacitors form an "L" section filter to provide *dc* for the transmitter's plates.

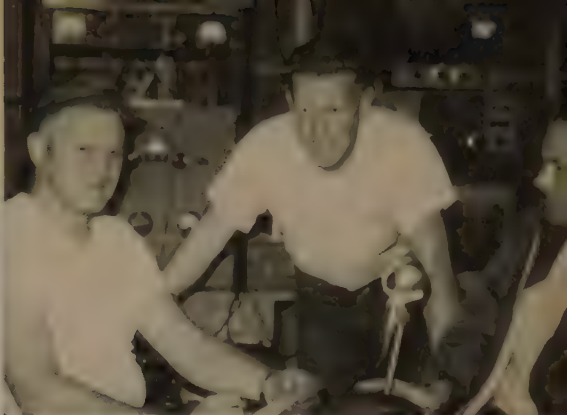
TUNE-UP

Tune-up and operation are just as simple as the construction. All that is necessary to get on the air is a small amount of carrier from the exciter. First start with the load tap at the bottom of the tank coil and tune the tank condenser for maximum current dip as usual. Then turn the coil until the tap is moved upward a few turns. Now check the plate current dip. If the load is non-reactive, the setting of the tank condenser will not change. Continue moving the tap toward the "Plate" end of the coil until the plate current at dip is about 10 *ma* less than when off resonance. Now remove the inserted carrier and talk while advancing the speech level. You are now on the air!

Since little operation is done on frequencies other than 75 meters at present, no attempt has been made as yet to make the amplifier tune to other bands. This should be very easy to accomplish. The simple task of moving the ground connection "up" on the tank coil leaving the turns open at the lower end should bring satisfactory results to those who wish to operate several bands. No doubt you can visualize another roller on the inductor to do the job from the front panel.



Larry (W3MSR/4). Larry took the Virginia section on two meters in the fall "CQ" contest.



Left to right: Babe (W6GCG), Ed (W6TZR), and Loren (K6DTR). Contest worked and won to order.

by **SAM HARRIS, W1FZJ**
P.O. Box 2502, Medfield, Mass.

VHF

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

If you have been building Parametric Amplifiers for the lower frequencies, you have a new thrill coming when you get your 432 mc Mavar going. On this band the performance of a Mavar preamp is startlingly better than anything you can do with tubes or crystals. Signals which are buried in the noise become good readable phone signals when the preamp is used. In fact the performance of your 432 mc receiver can now be *better* than your six or two meter receiver. Even with the ridiculous power restrictions imposed on 432, the use of a parametric amplifier makes it a useable band. Unfortunately it makes it a useable band for every other kind of service and we will probably lose it unless we can show some activity to support our squatters' rights.

Mavar, Varactor, Parametric Amplifier

Lest you become confused by the various names for this device, let it be known that they all imply the same thing. Mavar is a trade name for a diode which, when properly excited, will amplify. A varactor is exactly the same thing and comes from a contraction of variable reactance. Mavar is also used as a contraction of "Microwave amplification by variable reactors." Not necessarily the same thing, as the variable reactance would not have to be a diode. A parametric amplifier is a device which uses varactors or Mavars or some such. An up converter is also a type of parametric amplifier which uses Mavars. It is generally not called a parametric amplifier and its method of operation is considerably different and much more complicated.

As a result of the construction article in last month's issue we have received a passal of questions which we will attempt to answer.

"Where do you get four inch brass tubing?" My only source is the surplus frequency meter mentioned. I hasten to point out that there is no magic in the four inch tubing. Any size will work. I would recommend going to a plumber supply house and buying a piece of copper water pipe. The only reason for using large diameters is that it is easier to work with. The deterioration in "Q" with diameters as small as two inches will not be significant. The pipe could be for instance bent up from flat stock and will work as well if it is square. Any material is suitable. Remember that the bottom joints are operating at high currents and should make good electrical contact.

"What is the significance of the pump frequency?" In the circuit shown in the construction article, the pump frequency should be near some multiple of the signal frequency. This device works as a negative resistance amplifier. In order for this to happen the tuned circuit must be resonant not only at the signal frequency but also at the idler frequency and at the pump frequency. If your signal frequency is 50 mc, your tank wants to look like a quarter-wave line at 50 mc. Now if you pump at 200 mc the tank looks like a wavelength and presents a low impedance at the Mavar end to the pump frequency. The idler frequency in this case would be 150 mc and the tank looks like a high impedance (three quarter wavelength line slotted at one end). If you had no capacity loading, these resonances would occur

[Continued on page 82]



ham clinic

by **CHARLES J. SCHAUERS, W6QLV**

CQ Magazine, 300 West 43rd St., New York 36, N. Y.

The choice of an antenna by the serious minded amateur is often fraught with some uncertainty. No matter which one he finally chooses, there seems to be some doubt as to whether or not he could have done better. For example, nearly every ham has had the experience of working some distant station (say a ZL) and find that his 20 over 9 signal is being "pushed" into America from New Zealand with only 20 watts input! While at the same time his own signal report is a mere R5-S6 . . . and this with 150 watts behind it! The first suspect? The antenna!

Of course, the ZL may be using a fairly insensitive receiver and have no S meter; and the subject of antennas comes up. So what does the average amateur do? You guessed it! He immediately begins to plan on a new antenna installation—perhaps the same type used by the ZL. Does he have any luck, or is the new installation better than the old? Sometimes.

Before any radio wave arrives at its "destination" it can be bent, distorted attenuated and sometimes not "arrive" at all. Sometimes transmission is better in one direction than it is another. No one can predict with 100% certainty how a radio wave will actually behave after it leaves any antenna! Sure, each antenna has its own peculiar radiation pattern and if given the proper "environment" will probably operate as it is designed to do. But how many antennas have just exactly the ideal location? Not many amateur antennas! Nearly every location is a technical compromise.

It has been very aptly demonstrated that two stations located on opposite sides of a city for example, using identical equipment (including antennas), are not always capable of making the same on-frequency contacts with identical reports. Now why is this?

For one thing, it is a good bet that both antennas are not exactly at the same height,

nor do both stations have identically situated man-made and natural obstacles, such as power lines, buildings, trees, etc. to cope with. Too, one must remember that the paths of both incoming and outgoing signals are not exactly the same.

What every ham wants to do is to make himself heard as well as he can and to be able to hear what he wants to hear. However, too many amateurs are fooled into believing that an antenna that works for one will work for all in any location. This is not completely true!!

Antenna selection must not only be predicated on specific antenna efficiency but *location* as well. For example, it would be foolish to buy an expensive four element beam and only be able to raise it 20 feet in the air and at the same time be surrounded with steel water towers, tall buildings, hills etc. However, there are some hams who have just such installations and do manage to make themselves heard. But how efficiently?

Taking all influencing technical factors into consideration the best way to select an antenna for your particular location and purpose is by "cut and try," after settling the question of expected efficiency. It is true that this method takes time and money, but the only way one can really find out what is best (according to his own desires) is to try out various antennas until he finds one that suits.

Experience has demonstrated the need for a beam antenna for high frequency DX operation. From the mighty rhombic with its gain of from 12 to 15 db to the lowly dipole, a wide choice of beam antennas is available. With three and four element beam prices at a new time low, it is more economical to purchase one from a reputable manufacturer than to try to put one together yourself. One must not forget that more time than you have available (unless you are a millionaire) has been

[Continued on page 89]

YL

by LOUISA B. SANDO, W5RZJ

212 Sombrio Drive, Santa Fe, N. M.

JLRS

Congratulations to the JA YLs on organizing their own YL club. JA1AEQ. Fumi Abe, sent news of JLRS and the information that it came into being in August, 1958, with all seventeen YLs in Japan as members and headed by the longest licensed, JA0EC. Administration will be carried out by JA1YL and JA1AEQ, and JA1AEQ also is NCS of the club net which meets at 2400 each Monday at 7 mc. Fumi and her OM, JA1PK, are currently operating from JA0. They run 100 watts on the lower frequencies and also VHF.

Sightless YL

Two months after graduating from the Missouri School for the Blind in 1957, Ruth Vollrath heard of Ham radio for the first time while listening to a local bc station newscaster commenting on Field Day. His statement that in case of an emergency the only means of communication with the outside world would be via amateur operators inspired real interest. Soon she was referred to W0ZSL who not only helped her obtain her Novice license but worked with Ruth constantly for the next four months after she got on the air and helped her receive her General ticket.

K0ONK operates both phone and cw on 40 and 40 meters using a DX-40 and an all-band vertical antenna, the latter put together by K0AWU. Her rig uses both crystals and vfo, the vfo built for her by W0MAO who calibrated it to within 5 kc of each band. Ruth pads up the rig with a battery operated relaxation oscillator which W0ZSL built. She tunes the final slowly, listening for the change in pitch. After finding the highest note she knows that the rig is dipped so close to resonance that overloading the transmitter would be impossible. As a double check the meter num-

[Continued on page 94]



K0ONK, Ruth Vollrath, another sightless YL who is finding Ham radio a fascinating hobby.



K5GMI, Ruth (standing), president of WHOOT, and W5BDB, Rose, operating on 2 meters during Dallas Women's golf tournament relayed up-to-the-minute scores to various parts of the course.

PROPAGATION

by **GEORGE JACOBS, W3ASK**

607 Beacon Road, Silver Spring, Md.

December's Highlights

- 6 Meters:** World-wide DX is again forecast for *six-meters* throughout the daylight hours, with openings as numerous as during November.
- 10 Meters:** Excellent world-wide DX propagation conditions are forecast for this band from early morning through the early evening hours. Almost daily openings to many areas of the world can be expected, with strong signals and little fading.
- 15 Meters:** Excellent world-wide DX conditions are also forecast for *fifteen-meters*. The band should open shortly after dawn and remain open through the evening hours on most days of the month.
- 20 Meters:** Signals are expected to be stronger during December with the band forecast to open to most areas of the world shortly after sunrise, peak during the late afternoon and early evening hours, and remain open to many areas of the world around-the-clock.
- 40 Meters:** Fairly good propagation conditions are forecast for *forty-meters* to many areas of the world from a few hours before sunset until shortly after sunrise. Static levels should be lower than during the summer and fall months, and on many nights signal-to-noise levels are expected to be exceptionally high.
- 80 Meters:** Propagation conditions on this band peak during the winter months. Static levels are low and signal strengths generally stronger than during any other season of the year. DX openings to some areas of the world are forecast during the night time hours fairly often during the month.
- 160 Meters:** Observations made last year on this band seem to indicate that the sunspot cycle has little, if any, effect upon *160-meter* propagation conditions. Intense solar absorption prevents any skip during the daylight hours, but beginning in the late afternoon, as the absorption decreases, skip will take place. During the night hours the range should extend to about 1500 miles, and at times may reach several thousand miles.

Book Review

Recently this column has received a considerable amount of mail asking if there are any

good books available for beginners on the subject of radio wave propagation. While there are dozens of excellent advanced texts available on the subject, unfortunately not many good semi-technical basic texts have been written about radio propagation. Of the few that have been written, one is outstanding—"Short-wave Radio and the Ionosphere" by T. W. Bennington. Mr. Bennington is a member of the Research Department of the British Broadcasting Corporation. The main purpose of his book is to present information about short wave propagation and reception in an essentially simple form so that it can be of use to those with only a limited technical knowledge of the subject. In this way it is intended to meet the needs of all those "users" of the ionosphere, whether amateur or professional. The use of mathematics is avoided, but the physical processes involved are explained in clear descriptive language.

The *practical* side of shortwave propagation is emphasized, and the text explains how scientific ionospheric data may be applied to everyday problems of shortwave transmission and reception. The subject is introduced in such a way as to make it comprehensible to the beginner. The formation and structure of the ionosphere are first discussed, and its effects upon a radio wave are briefly, but accurately, explained. The techniques of ionospheric measurements are explained, and the nature of the continual variations that occur.

[Continued on page 98]



At right, W3ASK, CQ's Propagation Editor, checking some of his West Coast predictions during a recent visit with Don, K6BMA, at San Francisco. Photo by KN6TQB.

LAST MINUTE FORECAST FOR DECEMBER

Radio storms are forecast for Dec 4-5 and 15-17. A period of exceptionally good short wave conditions is expected between Dec 6-14.

CONTEST CALENDAR

November 29-30 CQ WW DX CW
December 7 only CC RC DX CW
January 9-11 DARC WAEDC CW

CQ WW DX

It's all over but the shouting in the Phone Contest. If you haven't completed your preparations for the CW Contest it will have to be "wait until next year" for you. We have spared no time or effort in publicizing this year's affair and will be very disappointed if all previous records are not broken. So make us happy by sending in your report regardless of the size of your log. Check W3ASK's Propagation Column for last minute report on conditions. Make them good, George.

CCRC DX CW

This is a world wide contest, same as our CQ DX contest, now in its second year. Therefore do not concentrate on OK stations only.

Contest Period:

December 7th—0000 GMT to 1200 GMT, only 12 hours.

Rules:

1. All bands may be used, 3.5 thru 28 mc, CW only.
2. The usual 6 digit serial numbers, RST plus a progressive 3 digit QSO number starting with 001.
3. Three points for each completed QSO. However contacts with OK stations will count double or six points.
4. The multiplier is determined by the number of continents worked on each band. The maximum multiplier therefore will be 30.
5. Use a separate log sheet for each band and enter continent multiplier only first time it is worked.

Classifications:

1. Single operator and multi-operator.
2. Single band and all bands. If more than one band is used, state which band is to be judged if single band credit is desired.

Awards:

1. Certificates will be awarded to the top scorer in each country.

2. Another certificate will also be given to stations working all continents on one band with stickers for each additional band.

3. OK stations worked during the contest can be credited toward the 100 OK Worked certificate.

Sign the usual declaration and send your log to the Czechoslovakian Central Radio Club, Box 69, Praha, Czechoslovakia, before Jan. 15, 1959.

DARC WAEDC

This is the 4th annual WAE contest by the DARC. This year's version has been limited to CW only. The object of the contest is for non-European stations to work as many stations on the European continent as possible. The WAE country list will be used as a guide.

Contest Period:

January 9th 2100 GMT to January 11th 2100 GMT. A 48 hour period.

Rules:

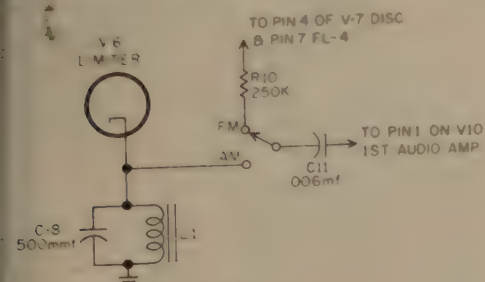
1. All bands 3.5 thru 28 mc on CW only.
 2. The usual 6 digit serial numbers, RST report plus a progressive 3 digit QSO number starting with 001.
 3. Each completed QSO counts ONE point,
- [Continued on page 97]



L. to R.—Vice Pres. Erb LeJeune, W2DEC, an outsider, W1WY, Pres. Ben Stevenson, W2BXA, and Sec. Treas. Howie Wolf, W2AGW.

My face is a little red this month . . . all due to the conversion we did on the BC-603 receiver in October. The conversion, as we did it, was a good one and worked very well on AM. When we got a letter from Gary Bangart, QK1, who had such a simple conversion I have to blush. Gary worked out a scheme to make it an AM-FM (narrow band type) receiver with the least amount of work. He merely added a SPDT toggle switch, which selects AM or FM at will. To quote from his letter, "By looking at the limiter circuit you will see a choke and a capacitor in the cathode of V-6. (L-1 and C-8) which is an audio filter. Therefore, a large portion of the audio is developed across this filter. By removing the other end of C-11 connected to R-10, and connecting it to the cathode of V-6, the limiter, the set is ready for AM reception. C-11 is the audio coupling capacitor." This seems to me a good idea worth passing along before you get into the set as I did. Figure 1 shows the schematic of this portion of the set and how the switch is connected.

Last December we ran our first column under the byline, and covered the BC-1335, which is a great mobile rig. As you remember it covers



by KENNETH B. GRAYSON, W2HDM
110-20 71st Ave., Forest Hills 75, N. Y.

ten and eleven-meters as it stands, and operates from six or twelve volts, depending upon the setting of one switch. All tuning and operating instructions are located in the cover. The set is FM, with about five watts input to the final.

Since that column we have literally been hounded for a modification to six-meters. Well we finally got one that works, and here it is. All part numbers refer to the original schematic, figure 2.

The original crystal oscillator is made to triple in the plate, rather than double, by removing C-63, which is a 10 mmf ceramic capacitor. The crystal oscillator amplifier V-14 is also changed, by removing C-57, also a 10 mmf ceramic capacitor. This now makes the crystal range 7.617 to 8.283 mc for the six-meter band. An exact frequency output can be determined merely by subtracting the intermediate frequency of 4.300 mc from the desired frequency and then dividing by six. Remember that the receiver and the transmitter use the same crystal and transmit and receive on the same frequency.

The *r/f* stages have to be tuned from 50 to 54 *mc*, and this requires removing C26, which is a 10 mmf ceramic capacitor in some models and an 8 mmf ceramic in others. Capacitor C26 is across L17 or L18 depending upon the channel in use. Capacitor C30 is an 8 mmf capacitor connected across the coil L20 or L21 depending upon the channel selected, and must be removed.

Tuning is accomplished by the knob and counters on the top of each coil. You should be able to tune from about 43 to 60 mc on the *rf* coils and it will be necessary to log the settings for all coils for future tune-ups. Just in case you experience difficulty bringing the *rf* coil frequency down to six-meters (although we can't see how you will have any difficulty) replace C26 and C30 each with a 1 to 7 mmf ceramic trimmer, and add a little capacity as is

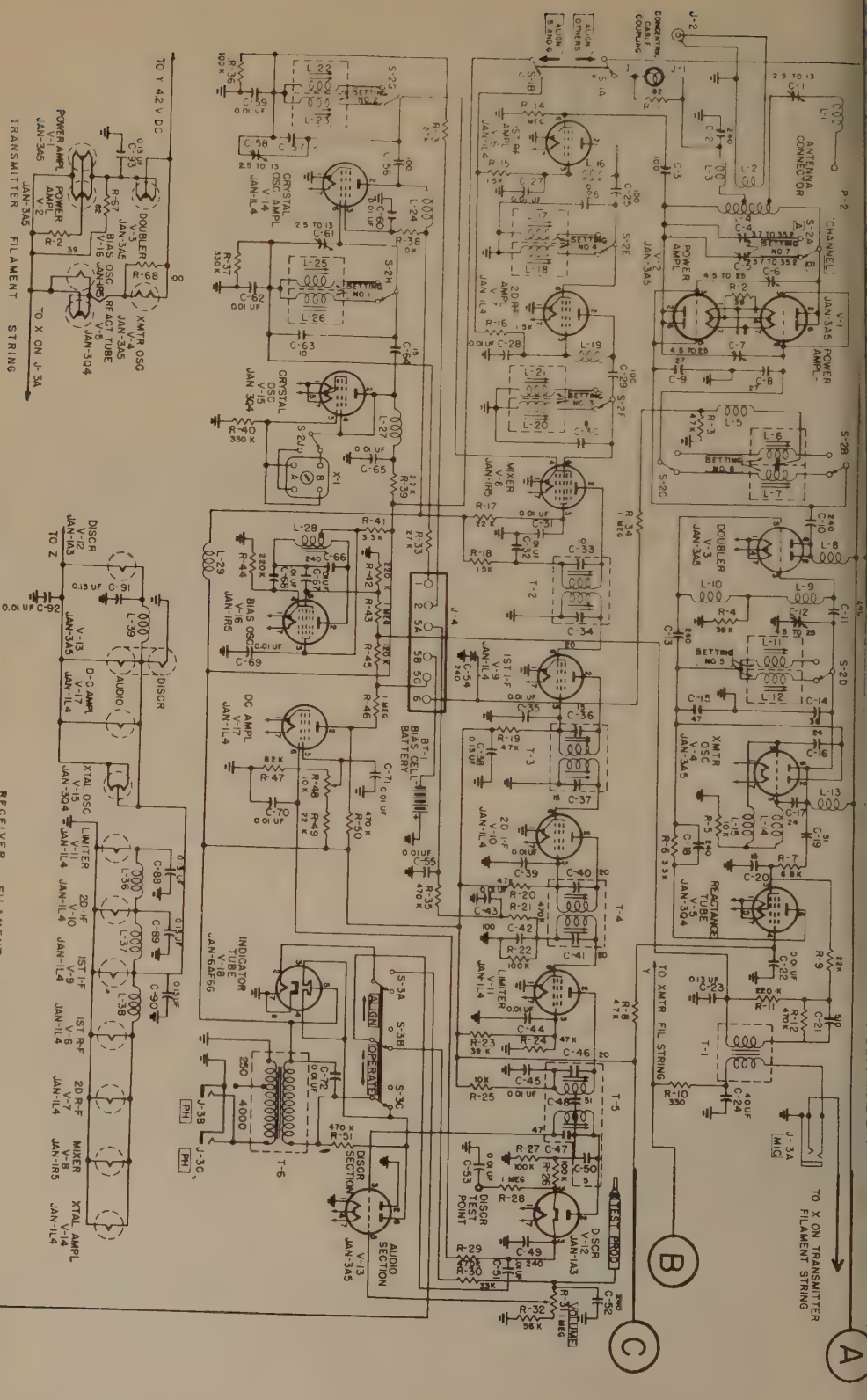


Fig. 2A—Schematic of the BC-1335. Diagram is completed on next page in Fig. 2B.

NOTE: CHANNEL SWITCH S-2A, S-2B, S-2C, S-2D, S-2E, S-2F, S-2G, S-2H, S-2I SHOWN IN B POSITION

ALL RESISTOR VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.

ALL CAPACITOR VALUES IN UUF UNLESS OTHERWISE SPECIFIED.

RECEIVER FILAMENT STRING

ed to make the coils tune to about 52 mc in the middle of the slug range, as determined by the counters on the knob.

The transmitter portion is simple enough to convert. Change the value of C8, and C9, presently located in the grid circuit of the power amplifier, from 27 mmf to 12 mmf.

These can be found connected from pin 6 of each 3A5 (V1 and V2). The output tank was reduced in the number of turns it had from one half to one turn. The C1 trimmer and H1 loading coil was removed entirely and replaced by the antenna was made by link L2. By checking the output circuit, with an antenna connected, to see if it tunes to 54 mc on a grid dipper, you can determine if you have removed the right amount of turns of the H tank. Note too, that the appropriate plate tuning capacitor C4 or C5 should be used to check the tuning, being not quite fully open for the high end of the band.

Well that is the conversion, and it shouldn't be too long to do it. The original frequency range was 27.0 to 38.9 mc, with a little bit of overlap. Full tuning instructions are in the users of the unit, but briefly we'll repeat a few of what was given in December 57's original article. Figure 3 is the table of settings for test prod positions for the BC-1335. First insert a crystal and connect power to the set.

Turn the set on by turning the volume control. Make sure first, however, that the voltage switch is set for 6 or 12 volts as appropriate for what you are feeding in. Connect an antenna to the coax output connector. Make sure that the four L25 bias cells (made by Mallory) are good. These cells are used to calibrate the VTVM magic-eye tube. With the set on and the test probe connected in test jack 5B, the eye should just close using the volume control to close it. Without touching the volume control knob, put the probe in jack 5C and then adjust setting 5 to close the eye. Several settings may be found which close the eye, but you'll have to determine from the overall results just which one is correct. Next go through the adjustments as listed in figure 3 and check the output as shown under the adjustment column.

Just one more thing. By relocating the capacitors we removed from the switch arm to across one set of coils (say on the B-channel), and by adding a 6 mmf capacitor across L-7, it would be possible to tune six-meters on channel A and ten-meters on channel B.

Handbook Department

We've got to thank N. McLeod, VE1UE, who brings to our attention two publications full of schematics of surplus equipment, and

[Continued on page 99]

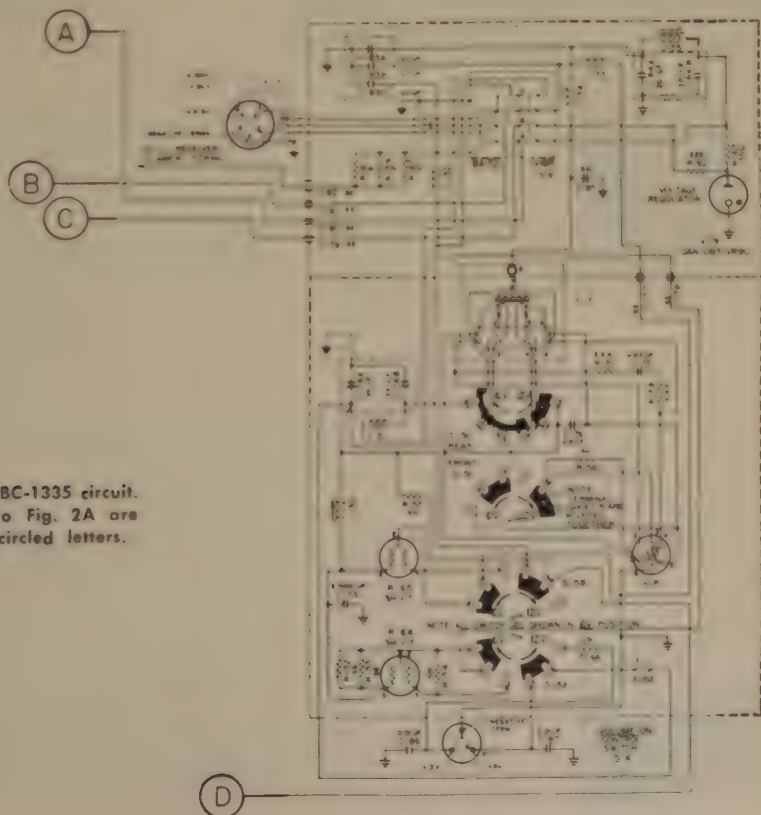
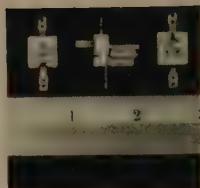


Fig. 2B—Balance of BC-1335 circuit. Connection points to Fig. 2A are identified by the circled letters.

New Amateur Equipment

Sub-Miniature Variable

E. F. Johnson Company has a remarkably tiny variable condenser available for building miniaturized equipment. This unit takes up less than $\frac{1}{2}$ " of panel or chassis space. Both the rotor and stator are really solid because they are machined from a piece of solid brass and then silver plated. The end rotor plate is extra solid with a screw driver slot for tuning the condenser. The terminals come out in wide terminals designed to be used with printed circuits or wire. Condenser spacing is for 1300 vdc, and 850 vdc. Designed for real easy mounting too by means of two small tabs, you just drill two small holes for the tabs and that is it. Prices run from 50¢ to 95¢, capacities from 3.5 to 13 mmfd. Circle A on page 124 for more info.



Need A Tower?

All Products Company (APC) has a new type cross brace on their tower which, they claim, gives more strength per pound than any other known design. The twelve inch wide ten foot long triangular galvanized steel sections are on 30 pounds, yet will go to a guyed height of 150 feet (with a $\frac{1}{2}$ " ice load). It is self-supporting up to 50 feet with an antenna of up to two square feet. They also have 18" and 24" wide models. Tell you what, you circle B on page 124 and APC will send you info.

Soldering Iron

The Tube Wholesalers Co is marketing a small soldering iron (25 watts) for \$2.98. Good for printed circuit work. For more info circle C on page 124.

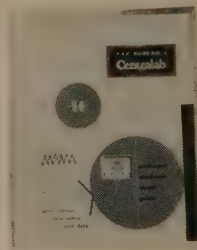


New Improved Type of T-R Switch

Barker & Williamson figured out a way to get away from the major difficulty of many of the presently available T-R Switches: intermodulation with local broadcast and TV stations. They put in a tuned circuit in the amplifier which passes the desired band and attenuates everything else. The T-R Switch, in case you're not sure, replaces the usual antenna switching relay and does the switching job electronically. It is safe in that, even should it fail, the transmitter will be connected to the antenna, not the receiver, and both will be protected. It provides a substantial gain through all of the amateur bands. Break-in is really simple when you have one of these. Circle D on page 124 for additional information.

FREE Booklet

Centralab has a new edition of their Packaged Electronic Circuit Guide available. This describes in detail the nine new packaged circuits (PEC's) as well as the previous 97 types, complete with circuit diagrams and component values. The booklet also lists equipments which use PEC's and has a cross-reference chart showing replacements for units of other manufacturers. PEC Guide #5 from Centralab is available at electronics parts distributors free of charge or may be had by circling number E on the CQ Reader's Service Coupon on page 124.



Operating Table

Electro-Voice has a new table kit available for \$57.50. The table is designed particularly for amateurs, with a flat top for mike, key and log and a sloped part of the top for the receiver, transmitter or transmitter control unit, etc. Only a screwdriver and hammer are necessary for construction of the kit. For full details on this beautiful operating table just circle F on page 124.



RTTY

Byron H. Kretzman, W2JTP

16 Ridge Road, Apt. 4
Huntington Station, N. Y.

NCARTS Dinner for W2JTP in May, 1958 (Story on page 63, July '58 CQ). Facing the camera, left to right: Tommy Lett, VE2AGF/W6, Jack Pitts, W6CQK, W2JTP, Bob Weitbrecht, W6NRM, Roger Wixen, W6FDJ, Howard Hale, W6FYM, and Elliot Buchanan, W6VPC



Chicago—On October 12, 1958, your RTTY Editor attended the fourth annual "CHITTY" meeting, actually the charter meeting of the CATS, the Chicago Area Teleprinter Society, Inc.

Although October 12th, Sunday, was the day of the meeting, many of us got to Chicago Saturday afternoon, gathering as usual at the "Gray-Mare." Right after I checked in, I ran into Tom, WØBKV, and Bob, WØYKZ, the early birds. We decided to have dinner where we could keep an eye on the front door for ole BeeP, WØBP, who was expected to roll in with somebody else. Sure enough, just as we were finishing, along comes BeeP—but we would never have recognized him if we hadn't heard his familiar booming voice. BeeP was sporting a neatly trimmed "Van Dyke," or coatee! (That's what I get for calling him an old Goat," he says!) The bull session that night ran into the wee hours of the morning and consisted of WØBP, VE7KX, WØBKV, WØYKZ, WØITX, WØFQW, WØLFI, KØAKG, and yours truly.

The meeting place Sunday was at Hallcrafters, arranged by that good friend of all RTTYers, Fritz Franke. The doors opened at 10 am and soon the place was buzzing with

70 registered RTTYers and a Model 28-ASR assembled by Ray Morrison, W9GRW. This is the "Cloud-9" Teletype machine that replaces the Model 19. "Tape galore," somebody said, and it sure was.

The technical session got under way in the afternoon, with 'ole BeeP as MC. Your RTTY Editor spoke briefly of his recent trip to Israel and of things to come in the RTTY column in CQ. BeeP then played a tape (audio) made by Phil, W2JAV, since he couldn't make it this year. Phil demonstrated, on the tape, how bad keying could be corrected by regenerating the signal with a polar relay.

The highlight of the technical session was the very enlightening chalk-talk by Don Wiggins, W4EHU, on "Optimum Receiving Techniques for FSK Signals in the Presence of Interference." Compared were the discriminator-type and the channel filter-type of converters. Don also discussed in detail the design and construction of channel filters and low-pass keying filters.

Bob Springer, WØYKZ, explained and displayed his application of automatic frequency control to his 75-A4 receiver as derived from his terminal unit, using a "Bill Gates" AFC

[Continued on page 100]



by DONALD L. STONER, W6TNR
P.O. Box 137, Ontario, Calif.

semiconductors

There are so many things to tell you about this month that I hardly know where to start. Maybe it wouldn't be too improper to do a little horn tooting to start with.

Those of you who read *Popular Electronics* magazine may remember "The Semiconductor Space Spanner," the little transistor cw transmitter that I designed. I have been experimenting with the little bomb, since the article appeared, and finally have something to brag about. On Sept. 20, at 1410 GMT, I contacted "Empty" Wessels, ZS6KD, on 20 cw. The contact was over the long path and as close as can be figured, the distance is approximately 16,606 miles to Johannesburg. Power input at the time was 90 milliwatts (.09 watts), and the antenna was a Gonset three element, tri-bander! The following weekend, "Empty" made a tape recording of my RST 548 signals.

This initial contact with a DX station was followed by an attempt at WAC, and I made that also, although I nearly had a nervous breakdown trying to get into Europe. On Sept. 22, I snagged KL7BDK, in Kodiak, for the North Am. contact. Signals were RST 559. The next evening, CE1AGI, near Santiago, Chile (S.A.), gave me an RST 449. Asia was "duck soup" from here, and a call to KA2YA, near Tokyo, produced the best RST of all; 589 (where's my QSL? @\$%&*) on Sept. 24. Later that evening, at 0800 GMT, my good friend Mick, ZL3PJ, listened for the germanium giant, and gave me an RST of 549 from Oceania. Then, I tackled Europe. Many tests with David, G2MA, produced negative results, until the 4th of October. David's report was RST 529. In all cases the stations were first contacted on SSB, then I shifted to cw for a CW/SSB QSO, and at no time did the power input exceed 90 mw. I want to thank the fellows mentioned, for they spent quite a bit of time dregging around in the QRM for me.

Speaking of accomplishments (?), congratulations are in order for my friend, Major Gilbert, K6LMW, who has come up with another semiconductor first. Major contacted W9KZX and W9RLY on Sept. 13, on 10 meter phone, using the sun as the only power source. The

transmitter runs between 60 and 75 mw output depending on the intensity of the sun. The power supply consisted of a bank of 72 Hornman silicon solar cells. Nice going, Major—keep me posted—please.

The hit of the 1958 Wescon Show, as far as I was concerned, was Texas Instruments little 27 mc handie-talkie units. These devices are completely transistorized, and yet provided extremely good communication around the Pacific Auditorium.

The transceivers are designed to hit the 10 meter band and will meet the FCC specs for the new citizen's radio band service. However, they can be retuned to cover the 10 meter ham band. It should be pointed out that these units are not being built for sale, but merely to point out one of the many applications for TI transistors.

The circuit for the handie-talkie is shown in fig. 1. The receiver is a one transistor superregenerative detector, using a TI-2N309. The transmitter consists of a crystal oscillator driving a power amplifier. Texas Instruments type 2N623 (the new MESA 90 mc fab type) are used for both applications. A very novel switching circuit requires only a DPDT component. The audio amplifier/modulator consists of 2N185 driving a 2N291. All components are stock items, except T1 which must be modified by adding a speaker winding.

I would suggest that anyone duplicating this unit should not try to construct it in such small space, or at least breadboard the components first.

Miscellaneous Items

The Triad TY-68S transistor power converter transformer can be used on 6 volts d.c. to provide 125 volts output. This is just about the right voltage for the model airplane radio control transmitters and the supply can be driven by the surplus wet cells, or the car battery.

Does anyone have information on using the Philco T-1324 as an *rf* amplifier on 28-50 mc frequencies?

RCA has developed a transistorized close-

circuit color television system that employs some 300 transistors, including several that are still in the developmental stage. The only vacuum tubes in the system are the three half-inch Vidicon camera tubes and the black and white tube for monitoring. The experimental system, like the conventional closed circuit equipment, includes a synchronizing generator and a color plexer circuit to produce an NTSC color signal.

Good grief! The circuit shown on page 60, fig. 1, of the Oct. '58 issue of CQ contains a misprint. The capacitor marked 330 mfd, is actually 330 mmfd. Thanks K2TGK.

David A. Williams, K4MQF, 2431 Allen Way, Macon, Ga., has built a transistor transmitter for 40 and 80 meters that produces a 100 mw output. If anyone is interested in duplicating the unit, drop David a line and he will send the schematic and parts list.

Radar Speed Meter—Nathan Gold, K2AXF, 1822 D Patton Drive, Ft. Meade, Md., sends along the following improvements for the Radar Speed Meter. The receiver sensitivity can be increased by about 6 db by putting some forward bias on the diode detector. This can be accomplished either by placing a positive voltage on the anode or a negative voltage on the cathode. Nathan suggests a source of plus 1.5 volts, through a 50K resistor to the anode. In addition he advises that the rf choke can be eliminated without affecting the performance. Ignition noise pickup comes from the folded dipole and line acting as a loop for the pulses. Pickup may be minimized by using the smallest practical spacing between the two conductors of the dipole and the transmission line, thereby keeping down the area of the loop. Nathan also worked out a clever four-stage transistor amplifier. The circuit will be reproduced next month.

New Literature

Allied Radio, 100 North Western Avenue, Chicago 80, Illinois, has a free semiconductor directory available for the asking. It includes more than 700 transistor types and over 1500

diode types.

CBS-Hytron, Danvers, Massachusetts, ways a good source of informative literature currently has two very good publications of interest to experimenters. "Tube Tips" this month is entitled "Are You Destroying Transistors" and describes in detail some of the do's and don'ts for handling transistors. Also of interest is Bulletin E-285, Transformer Design Notes for Transistor Power Supplies. Both of these interesting publications were written by Bud Tomer.

The General Electric Company has published a 17-page booklet, entitled "Application Notes for ZJ-39A Silicon Controlled Rectifier". It may be obtained by writing GE, Semiconductor Products Dept., Syracuse, N. Y., asking for publication #ECG-327.

Speaking of General Electric, have you seen the third edition of their transistor manual? It has really been expanded and is bound in ring type book, now. The new handbook is available at General Electric distributors for \$1.00, or by sending that amount to the above address. You can also obtain a complete catalog of General Electric semiconductor products by asking for publication ECG-280.

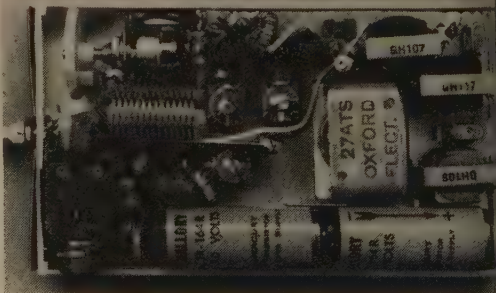
Transistor News

A new French development in the semiconductor field is described in the March '58 issue of Wireless World. The Tecnetron is a new transistor and is similar to the field effect type of transistors. It differs in two ways, however. It does not have an alloyed junction between the center electrode and the germanium, but uses a surface barrier. In addition, it uses a cylindrical center electrode instead of two planar electrodes. Experimental results show that a gain of 22 db is obtainable at 110 mc, or 16 db at 200 mc. As for the power output, it is stated that 30 mw can be obtained in class A operation at 500 mc.

CBS-Hytron is manufacturing an individual



Introducing the boys from TI and the miniature citizens band handie-talkie.



The audio section is grouped around the right side of the speaker. The transmitter section is at the top of the chassis, near the volume control. The T-R switch and the batteries occupy the lower portion of the case, along with the detector circuit.

ded diode, the 1N699, for computer applications which features high resistance and a low failure rate.

BS-Hytron also manufactures a comprehensive line of computer-type NPN transistors for matching applications.

The General Electric Company has announced a new line of 30 volt, one-half amp. P germanium transistors for use in industrial and data processing equipment. The 2N524, 525, 526, and 527 have a triangular lead arrangement and are housed in the JEDEC TO-18 package. In the computer line, prices have been reduced, and ratings have been stepped up, for the 2N395, 396, and 397 PNP high frequency switching units.

General Transistor Corp. is manufacturing a new line of drift transistors. JEDEC numbers 2N602 through 2N608, for both computer and industrial applications. For more information write to General Transistor Corp., 27 138th Pl., Jamaica 35, N. Y., and ask for transistor brochure G-180.

Hughes Products, division of the famous aircraft company, have really jumped on the semiconductor band wagon. Hughes Semiconductors include diodes, power rectifiers, silicon capacitors, and a line of extremely good transistors. Now they have expanded to include special assemblies of diode packages, including diode arrays in assemblies.

International Rectifier Corp., 1521 Grand, Torrance, California, famous for their rectifiers, have added a new Zener voltage regulator to their line. The silicon Zener's will replace gas tubes as the 0A2, 0A3, 0B2, 0C3, 1B46, and the 991. The series is rated at 5 watts, without a heat sink. Also new from International Rectifier is a 600 mw double anode silicon zener diode. The device consists of two matched zener units connected with a common cathode. Bulletin SR-254 describes the device.

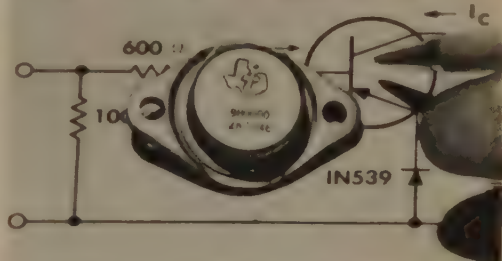
Motorola Semiconductors, 5005 E. McDowell Road, Phoenix, Arizona, are going

[Continued on page 102]



Although it looks like a "bath-tub" capacitor, it is actually the new International Rectifier high voltage silicon zener voltage regulator, and will replace the gas discharge OC3 shown in the picture.

TYPICAL SWITCHING CHARACTERISTICS



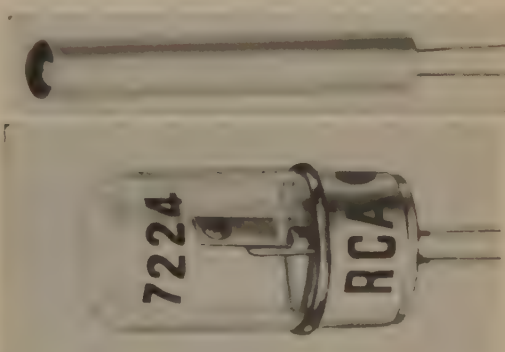
TYPICAL SWITCHING TIMES

T_d	DELAY TIME	0.3 μ sec
T_r	RISE TIME	0.7 μ sec

Although primarily designed for switching applications, the Texas Instruments 2N1046 has a 12 mc alpha cutoff frequency, and will dissipate 15 watts.



Major Gilbert, K6LMW, scores another first for Amateur radio. Major contacted several stations in W9 land using a 10 meter transistorized phone transmitter that operated from solar power. The company he works for (Hoffman), manufactures the silicon solar cells.



RCA is now manufacturing junction photodiodes. The 7223 is designed for tape and card "reading," while the 7224 will find wide application in movie projectors.



by DONALD L. STONER, W6TM
P.O. Box 137, Ontario, Cal

Novice

I must say I had a very nice vacation last month, but the letters and news for the column certainly piled up in the meantime. The file marked "Novice" is bursting its seams with circuits, news, DX info, and photographs.

No doubt you will be thinking about "under the Christmas tree items" by the time you read this column. Like me, you are probably wishing for a new Apache and Mohawk combination. Or maybe it's a "Thunderbolt" you want to go along with that general class ticket that just arrived.

Service Bulletins—A few months ago I told you that World Radio Labs was changing their name. Seems as though I goofed! WRL remains the same, it is their subsidiary (manufacturers of such items as the Chief and Scout, etc.) that is changing its name to Globe Electronics. This was done to eliminate just such confusion as occurred in this column.

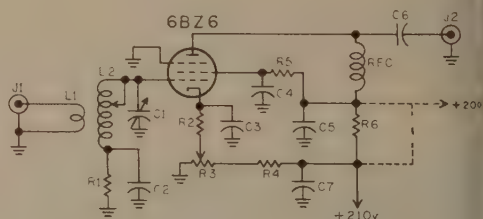
If you are having problems with your DX-35, drop a line to Heath Co. They are issuing a service and maintenance bulletin for this popular rig. My thanks to 1/Lt. R. A. Dodds, for sending a copy along.

Preselector—A preselector, when connected between your antenna and receiver, will increase the strength of signals by approximately 20 db. Of course it will increase interference by the same amount, too, and so it is most useful connected to receivers that are not very sensitive. If you have an old timer, or a receiver with only a few tubes, a preselector will really give it a "shot in the arm."

A circuit for a "jim-dandy" preselector was sent to the Novice column by W. H. Fisher, W4EHY/4, Box 5706, Duke Station, Duke University, Durham, North Carolina. Several of these units (shown in fig. 1) have been constructed and all perform very satisfactorily. OM Fisher says "Bandswitching is accomplished by shorting out sections of the coil, with an alligator clip. This is faster, more convenient, and less expensive than having separate coils for each band. R1 prevents rf from destroying the 6BZ6's grid. A 40 watt Globe

Scout burned up two tubes in less than 10 hours of operation, before R1 was installed. The voltage applied to the preselector, measured between the bottom of the rf choke and ground, should not exceed 205 volts, as the 6BZ6 seems to be most unhappy when excessive voltages are applied. A copper shield 1½" x 2½" passes between pins 1 and 2 against the sockets center pin, and against pins 4 and 7. It is soldered to the socket mounting screw, pins 4 and 7, and the socket's center pin. This isolates the grid from the plate circuit, and the grounds are returned to it. The shield is absolutely necessary to keep the preselector stable at the upper end of the frequency range."

Confusion Department—The chart of call letters that appeared in the September column



Parts List

- RFC—2.5 mh—National R-100
- J1—2-pin terminal strip—ICA 2420
- J2—RCA-type phonojack
- L1—2 turns #22 solid rubber-covered wire, wound immediately below L2
- L2—27 turns #22 solid rubber-covered wire, tapped 2, 4, 7, 10, 14, 18, 22 turns; wound on 1¼ inch diameter (Amphenol 24-4P), with alligator clip with 1 inch lead attached to top of coil
- C1—140 µmf, Bud MC-1876
- C2, 3, 4, 5, 7—.01 µf disc ceramic
- C6—100 µmf mica
- R1—100 k, ½ watt
- R2—180 Ω, 1 watt
- R3—4000 Ω pot.
- R4—40 K, 2 watt
- R5—18,000 Ω, ½ watt in series with 1200, ½ watt
- R6—750 Ω, 5 watt

Really confused folks, including Bea Clousing, W7CZQ, 112 So. 3rd, Livingston, Montana. Bea thought she had done something wrong! The call letters are stations that have been heard by KG1CK, up in Thule, Greenland. It's a mass of typo's because the typesetter thought my I's were L's. Also the last column should be "Time of QSO" of course (good grief).

New Equipment—I see the General Electronics Company, Inc., 4200 Mobile Road, Montgomery, Alabama, is manufacturing a 75 watt Novice transmitter for \$49.95. If in the market, drop them a line—looks interesting.

Net News

A New Jersey traffic net meets every week day on 3748 at 1830 EDST (or 1830 EST by the time you read this) and Novices are invited to check in. For more information, write to Joe Blasi, K2PSX, 47 Cleveland Avenue, Highland Park, N. J., or to the net manager, John Sorrentino, 900 Orange Avenue, Cranford, N. J.

The Channel "A" net meets at 50.25 and the frequency is monitored most of the time. Thus, there are no set times. Anyone desiring a QSO in New Jersey can usually obtain one simply by calling on this spot. For more info, write to Bob Brown, K2ZSO, 67 Russell Avenue, Rahway, New Jersey. Bob also has "rocks" for the frequency at 30 cents each.

Who's DX?

Australia is certainly well represented this month, three letters with reports. Bill Stevenson, VK3AWS, 11a Maud St., Ormond S. I. 34, Victoria, Australia, has been picking them all regularly on the 15 meter band. He reports QSO's with the following stations: July 5, 1958 — KN3DHE, KN5LKU, MLS, PGM, PTG, KN6ORE, WN6VAK. July 10, 1958 — KN4VSL, KN5PKA, RFJ. Bill assures the stations that he works, that he will QSL 100%. See the note at the end of this section.

Don Grantley, W1AL 2022, Mt. Raven, Holbrook, NSW, Australia, reports reception of the following stations: 7 mc—KN6OBA, WH6COK, CTM, KN7CWK, 21 mc—KN1PDD, KN3XC, DOG/6, KN4SBL, SWC, KN5LKU, MHF, MVP, KN6KDV, KYD, RUH, RVJ, WH6CNK, WN6OUD, WV6AJV, BDA, KN7CLP, KN8LGG, KN9FKL, LUQ, KN0PFF. Don's list was very complete and included dates, times, conditions, and RST but I have had to cut corners to get everything in this month. If interested, drop me a self addressed postcard and I will forward the additional data. Many thanks for the fine report, Don, sorry that I had to nip it short.

Ivor Stafford, VK3XB, 16 Byron St., Box Hill So. Ell, Victoria, Australia, informs us that he will be active on 7150 every nite in November at the usual time of 3 AM to 6 AM EST. Ivor reports working the following sta-



Ron Van Diver, K8KHE, Sacred Heart Seminary, 8108 Beechmont Avenue, Cincinnati 30, Ohio, sends along this picture of the station at the seminary, which he printed himself. As a Novice, Ron worked 35 states as HC2, WP4, KL7, and G2 in about two months of operating. Look for them on 40, 20, or 10 meters.



"OOPS—The RI," says Nick, KN3DWD, 503 Belaire Avenue, Pittsburgh 26, Pa. A man of few words, Nick says he has worked 14 states and the picture speaks for itself as to the gear.



Gene Brown, KN6RGA, 4062 Globe Avenue, Culver City, California, has worked 39 states WH6, WL6, and JA1 since June on 40 meters with a single 616 homebrew rig, and an S-38E receiver. Asked how he did it, Gene replies "constant listening and less CQ's."

tions between May 1 and July 23, on the 40 meter band: KN1CCN, DIW, KN2ICO, OSC, PNO, WN2HCR, KN3BSY, DAK, KN5MHF, MQA, OKY, RCG, KN6ABD, AUQ, KFR, KLC, QCB, WH6CTA, CTZ, WV6AEQ, WL7CRJ (heard only), KN7BKV, BXT, CAD, CVH, DBV, DFI, DWT, KN8HVC, HZK, IPH, IWC, Kfv, KN9MRH, KNØODF, OJC. On Sept. 15, the following stations were heard in Victoria: KN4GUU, TDT, ZXR, KN5POM, DIU, RKW, KN8KKD, KN9LJC, KNØOCI. On Sept. 16 worked KN4VPB and heard WH6CTZ, KN8JUG. On Sept. 18 these stations were coming through: KN1HQS, KN2LJL, PNY, RIL, KN4VIK, KN6STO, UMB, KN7CSM, KN8LKC, LRK. On Sept. 19, Ivor heard: WV6AQQ, BMI, KN9LQY. My thanks for the fine report, Ivor, we'll all be looking for you next month.

And last, but by no means least, is a report from our old friend Tima Popovic, YU1-RS-357. Tima always has his ears tuned for Novices that punch their signals into Yugoslavia. He reports the following Novice stations heard on the 15 meter band: July 18, 1630 to 1705 GMT: KN1CXA, EUH, KN2MHK, KN4UWF, KN8HBI. July 29, 1720 to 2000 GMT: KN1DPB, DXB, HTP, KN2CME, GTJ, OGN, RRW, SDT, TQJ, KN3CXC, EGH, KN4SKX, YNI, YNO, YXC, YXK, ZEF, KN8HBF, KN9JOO, LQK, MBD, MFI, MDX. July 31, 1920 to 2000 GMT: KN1EIX, GIX, KN2REG, KN3DHD, WP4AOK, KN4FTU, RJA, SKX, TRV, UTF,

YSK, KN9LHU. Aug. 1, at 1949: KN2MMJ. Aug. 4, 1900 to 2200 GMT: KN1DIR, DXA, EFI, EGI, EIJ, GBI/1, GSX, GVI, GVM, KN2BGB, CLY/1, CPC, IHQ, JWD, QKM, LBL, LNS, MEK, OIF/2, UVU, KN3BUZ, DWW, ERE, EXM, WP4AHR, KN4TAU, UQS, UWH, UWJ, VGB, VHC, VJD, YNO, YXC, YXK, ZEF, KN5PHB, QEM, KN8HLH, HZN, IOQ, IRU, IWC, KN9LJM, LJW, LQK, OZZ. August 6, 1915 to 2200 GMT: KN1DXA, DYV, EDW, EGD, EJC, HGB, HZE, KN2ADY/2, CME, EMQ, HPL, IUT, JXY, KXT, KYH, LBL, LEG, OEL, KN3CWC, CXM, DHV, DRD, EAF, KN4CYC, RSO, RWO, SWC, SWO, TQJ, UTX, VJD, VNS, VRT, VUR, YMR, YZF, KN5PGW, RHZ, KN6TQO, KN8ICZ, KBI, KTZ, LJD, LDS, KN9LQK, LRW, OUF. On August 6, Tima heard DX stations calling the following Novices. Read it and weep if you missed 'em, fellows! KN9LQK (SM5AJU), KN8LDS (G3LKN), KN4SWC (LA1MF), KN6TQO (YU1AG). Our thanks for a fine business report, Tima, we hope to see you next month.

I should point out, when you work a DX station, don't expect the confirming QSL card to arrive in a week or two. Few DX stations can afford individual postage for each card, and so they are sent to the various QSL bureaus in bundles. In addition, they are sent by surface mail which takes two to three months. Additionally, the card may be delayed until the DX station has enough cards to warrant a shipment to the bureau in question. The solution? If you want a QSL direct, send at least two international reply coupons for surface mail. If you are really "hot" for the QSL, send four coupons for an airmail reply. Airmail from most DX locations takes between one and two weeks to arrive.

Help

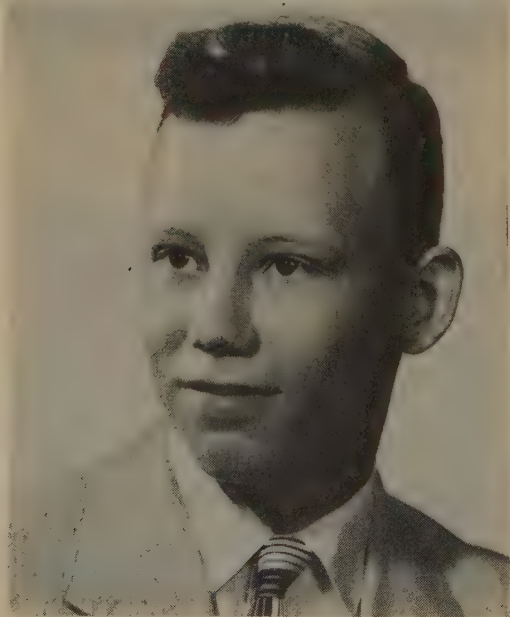
Some unusual situations have arisen that warrant a little more space than is usually given in the Help Wanted or Offered section.

I have been advised by Jan R. Slupe, of a young lady who is paralyzed from the waist down, due to polio. She has never seen the operation of an Amateur station but would very much like to obtain a Novice license. It would really be appreciated if someone would help her. Amateur radio would certainly make her life more interesting. Her address: Miss Betty Jones, P. O. Box 32, Beallsville, Md.

Another "problem" is experienced by Gene West, 7 Manor Road, Auburn, Mass. Gene's Novice ticket and a coronary arrived on the same day! Gene is all set to go with the gear, but can't set it up or put up an antenna. How about a helping hand from someone in the Auburn area? Many thanks.

The following persons can be contacted to assist prospective Amateurs:

Bob Brown, K2ZSQ, 67 Russell Avenue,



Scott Baudhuin, 825 37th Avenue, Minnonsota, operates ARS KNØQPG and has had 160 contacts with 28 states, in the 40 meter Novice band. Scott has a home-brew 75 watt rig and will sked anyone.

Rahway, New Jersey.

Dean Thompson, 2038 S. W. 2 St., Miami, Florida.

E. B. Allen, K6OHL, Rte 21, Box 448, Winton, California.

A helping hand is requested by the following fellows:

W2—Mr. James Earle, 72 E. Washington St., Hornell, New York

W3—J. C. Collins, 74 West Ross St., Wilkes-Barre, Pa. Rene H. Reixach, Jr., 5618 Lamar Rd., Washington 16, D. C.—Phone OLiver 27217.

W7—Dick Powell, 9004 Shorewood Drive, Mercer Island, Washington (Gen. Theory).

W8—Richard Mondro, 6827 Greenview, Detroit 28, Michigan.

Letters

Leading off the letters section, this month, is Don, KN8LPV, 3319 W. Nelson St., Midland, Michigan. Don plans to issue bulletins of interest to Novices at 2000 on 3738 and at 2030 on 2111 *kc*. He requests letters advising him of nets, activities, conventions, new equipment and DX. In fact, any information of interest to Novices is requested. This could be a good deal, if Don gets enough help.

Heiko Ganzer, KN2REH, 814 Nicholas Pl., Rahway, N. J., is 15½ and picks 'em off with BC-348P and a Hammarlund Four-20 transmitter. He works 80 and 40 and would like skeds with anyone.

K4JGD, Charles E. Smith, Jr., 2632 Berkeley Dr., Red Bank 5, Tenn., would like skeds with Wyoming for his WAS, and also would like to work Alaska.

An XYL puts in an appearance as Juanita Hatcher, KN8KSO, Mullens, W. Va. She is trying for WAS and uses a Globe Scout and NC-98. Fourteen states are confirmed so far.

From the land of tall tales, writes John, KN6RNM, 601 N. W. 5th Avenue, Mineral Wells, Texas. John puts Texas on the map with an NC-109 and a DX-35. He will be listening for a call from anyone on 7173 or 3705 *kc* after 1900 CST and 0600.

John Mazur, WV2ARF, 149 Kirby Avenue, Lackawana 18, N. Y., would like information on a long wire antenna for all bands. Anyone help him?

From one of the most beautiful spots in Calif., Leonard Tralger, WV6BMQ, Morro Bay, writes to advise us that he just received his Novice and Tech. Leonard is a student at Cal Poly and will be running a BC-654A transmitter/receiver.

Joan Bishop, KN4YBO, 2137 Mountain View Dr., Birmingham 9, Ala., is handing out Alabama contacts with a DX-20 and an S-40 on the 80 and 40 meter bands. She would like skeds, particularly with anyone in W6 land. Joan would like a schematic for a DX-20 modulator. How about page 60, June, 1958, CQ Mag., Joan?

Bob Bell, 2620 W. Sharp, Spokane 11, Wash. is an almost Novice and would like information on a limited space 80 meter antenna.

E. St. John, 122 Queens Ave., Elmont, L. I., N. Y., is in the same boat and would like information on what surplus gear to use. How about the Novice Q5'er, OM? See Jan. '56, CQ Mag.

Wayne Thomas, 38 Westminster St., Wilkes-Barre, Penna., KN3CSL, weighs 297 lbs., and claims to be the biggest Novice in the world. Wayne's gear includes a Globe Scout 680, S-85, WRL converter for 6, and a new Gonset Communicator III.

Want a sked with Montana? Gordon Ziesing, K2OUK/7 is going to the Residence Hall, Montana School of Mines, Butte, Montana, and will be happy to accommodate anyone needing this state.

Joe Hauptly, KN3CNN, 2205 W. Market St., Pottsville, Pa., says, I QSL 100%, try me! He dishes it out with a Globe Scout 680A, and sucks 'em in with an NC-88, and has worked 32 states, plus VE3, KL7, and WH6.

Doug Sjolund, KNØQVB, 1223 Rosewood, Brainerd, Minn., has five states to his credit with a Knight 50 watter, and an S-38. He would like skeds from all over and will QSL 100%.

Sanford Hutson, KN5QHS, Box 27, Stuttgart, Ark., finally passed his General, but will sked Novices who need the state of Arkansas.

Stuart Clark, 1064 Seward Way, Stockton 4, California, just received the call WV6 BTK and is pumping out the watts with a homebrew 6AG7-807 rig. The catcher is an HQ-110, powered by dipoles for every band. Stu is also on 6 meters.

Melvyn Jeffcoat, WV6BUT, 2781 "H" St., San Bernardino, California, is a newcomer and wonders why stations come back to him at 15 WPM on a 8 WPM call? Sorry Mel, I don't know either.

This looks like Calif. month! Haney Pack, WV6BXF, 690 Newcomb Drive, Porterville, writes to let every one know that he just received his call and will be looking for QSO's on the 80 meter band, using a DX-40 and an HQ-129X.

KN7CHO/5, 506 North 18th, Killeen, Texas, is starting a radio club at the high school and would like to hear from other HSRC's.

Dick Boyer, KN3DHE, R.D. #1, Box 50, Beaver Falls, Pa., "bombs" 'em with a Globe Scout 680A and a HQ-110 and has worked 39 states on the 15 meter band. Dick would like skeds with S. Dakota, Maine, and Vermont.

Will Routsong, KNØPPX, 3107 Cherokee, St. Louis, Mo., added a crystal controlled BFO to his HQ-100 and then added a Heath Q Multiplier. He says the combination is very selective, but he can't null out interference now. Anyone having a solution, or wanting Mo. for

[Continued on page 103]

sideband
sideband
sideband

SIDEBAND

Our first Worked All States Contest was a huge success and every one who participated seems to have had a good time. Considering that the event was limited to one twenty-four hour period, there were some terrific scores reported. No one reported working all forty-eight states but W2SKE and W1HKK worked forty-seven and K3BQB hooked forty-six.

Before the Contest started, Bill, W2SKE said he was going all out to win it and it appears that he did just that. W2SKE's score of 20,680 points was accomplished by making 440 contacts with 47 states. W1HKK was not very far behind with a total of 16,544 by working 47 states and 352 QSO's. W7IAA took third honors with 337 contacts in 44 states for a 14,828 total.

Here are the first twenty-five high scorers:

W2SKE	440	47	20,680
W1HKK	352	47	16,544
W7IAA	337	44	14,828
W8EGB	298	45	13,410
W5KFT	273	45	12,285
K4LPW	250	44	11,000
W6ONP	245	41	10,045
K0ITF	236	42	9,912
K9EAB	219	44	9,636
K3BQB	202	46	9,292
K4HXF	197	44	8,668
K2LOC	190	44	8,360
W3CJI	170	45	7,820
K4QBJ	163	44	7,172
K5EJC	165	43	7,095
W4TWW	164	41	6,724
W8USP	159	42	6,678
W3OEF	156	38	5,928
W1GR	147	40	5,880
W0DBN/5	136	43	5,848
W0FUH	124	40	4,960
W9LRH	129	38	4,902
K2HEA	123	39	4,797
VE3MR	120	36	4,320
W8YIN	126	32	4,032

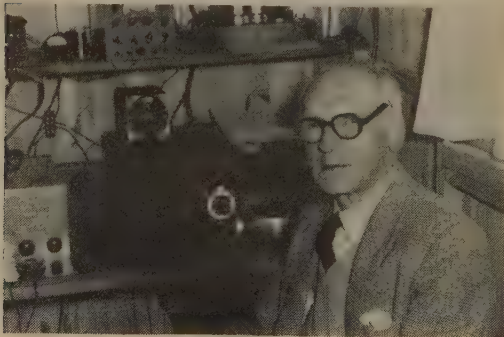
Bill Leonard, W2SKE will award W.A.S. albums with gold call letters to the various winners in each of the call areas, even though no one worked all states as was originally required.

Tom at 5A3TH worked W2PZS and W2AXU on September 24th. Both of these stations were in Trenton, New Jersey, and each had the same first and last names: John Power. To further add to the strange coincidence, both W2PZS and W2AXU knew each other and were using identical transmitters, an HT-32 exciter driving 813's in grounded grid. Can you top this one?

John. PY2JU describes his shack as shown as follows: "My QTH is an unusual place, hectare on which I have a 30 seat cinema, hand shack, guest house, swimming pool, riding horses, six German shepherd dogs, two Dachsunds, two radio towers, an XYL, a dozen chickens, two ducks, one goose twenty years old." (I get in trouble at home by putting my shack ahead of the XYL in importance. How do you survive John in listing yours tenth? hi.

That 'other' Bob Adams, OD5BZ was compelled to QRT because of the troubles in Lebanon, and is now in Columbus, Ohio with the call W8BKO. If anyone has not received an OD5BZ card you can write to Bob at 1625 Doone Road. Bob just missed his 100 countries on SSB and now he has to start all over again. We will sure miss OD5BZ's big signal and Bob's precision operating, especially during Contests.

[Continued on page 88]



Pony-G800 Courtesy W1BDF.



Harry, JA1ANG

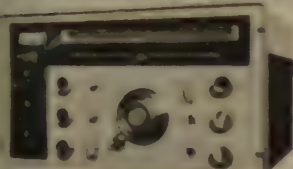
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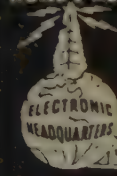
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For further information, check number 35 on page 124.

December, 1958 • CQ • 77

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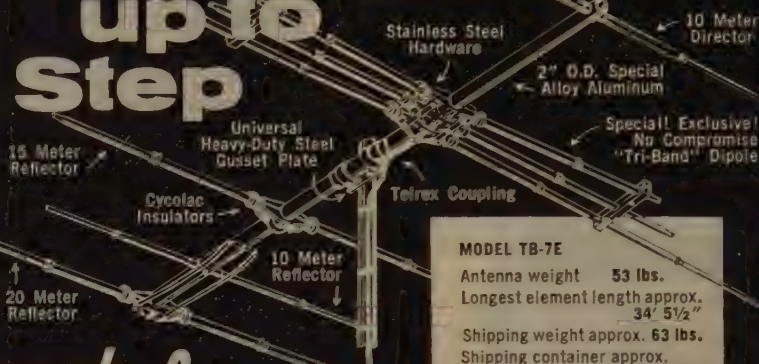
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3 Element, 7 db on 10 Meters; 2 Element, 5.5 db on 15 Meters;
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For further information, check number 25 on page 124.

and modulator comes from a separate supply utilizing a pair of 5R4s.

All ac and dc circuits terminating at the resistor are bypassed for TVI suppression.

So much for the technical description. Now how does the 5100-B stack up under actual operating conditions.

We found that it loads up to its rated power on all bands, with plenty of drive to spare. Mosley TA-33 Tri-band beam was used on the three top bands, a dipole on 40 and an elevated long wire with a coupler on 80. Some difficulty was experienced on 80 due to the length of the wire, but this was overcome when it was cut down to size.

Keying is clean and absolutely free of clicks. A local DXer, W1GYE, only a few hundred yards away, can still snag some choice DX within 10 or 15 kc from my operating frequency.

Changing bands can be accomplished in less than a minute. This of course after the desired settings have been recorded. Five control adjustments are necessary for each band change. Tested during actual contest conditions I found that this operation could be simplified. Speed in changing bands is a very desirable feature during contest competition.

Not being a Phone Man the rig was only operated on AM to test the manufacturer's ratings. At 140 watts input, 100 percent modulation was achieved with negligible carrier shift. And voice quality was reported as very good. The microphone jack is wired for push-to-talk if desired.

A desirable feature is a VFO switch which closes the keying circuit with no high voltage on the final, permitting zeroing to any desired frequency without putting the carrier on to the air.

Another desirable feature is a TUNE switch which places a resistor in series with the primary of the plate transformer and reduces the high voltage when tuning up the final. This position can also be used for local QRP contacts.

We liked the construction and assembly of the separate units. If servicing is ever necessary the task is made easier by the fact that each unit can be removed from the cabinet for inspection.

In the short time I have operated the 5100-B, I have acquired a feeling of confidence when I call DX. Such calls as VR2DG, HV1C, CR9AH, VU2BK, VS9AS, DU7SV, ST2A, XW8AH, HS1C, ZD7SA, ZA1MA and FK8A have never appeared in the worked column of my log before I had the new 5100-B. The KW beam are still giving me a hard time, but now at least I have a fighting chance.

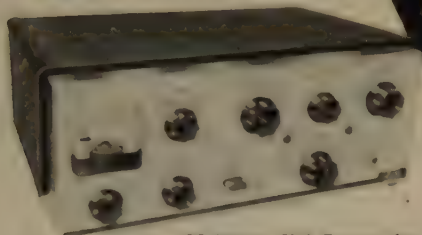
Yes, the new 5100-B is a nice piece of gear to have on your operating desk. I hope to have it in my shack for a long time.

HARVEY HAS THE HAM GEAR OF THE YEAR

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NEW!

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EICO Ham Kits



90-Watt CW Transmitter Model 720

The new EICO Model 720 is a very "clean" 90 watt CW, 80 through 10 meters bandswitching amateur transmitter. Some important design features are: automatic band switching, tune and operate switch, final amplifier grid drive control without detuning, a keying switch for break-in operation, a 15" wide x 5" high x 9" deep, 15 watts (25 watts) on the meter.

KIT \$79.95 WIRED \$119.95

SPECIFICATIONS — Power input: 90 watts CW (invoice limit calibration on meter); 65 watts AM-Phone with EX1 plate modulation. Output impedance: 50-1000 ohms. Band Coverage: 80, 40, 20, 15, 11, 10 meters. Operation: XTAL, EXT. VFO. Cabinet Size: 15" wide x 5" high x 9" deep. Shipping Weight: 27 lbs.

GRID DIP

METER MODEL 710 — An exceptionally versatile, stable, rugged, compact design. Basically a VFO with a microammeter in its grid circuit, it determines frequency of other oscillators or tuned circuits; has a sensitivity control and phone jack to facilitate "zero beat" listening. Also excellent as an absorption wave meter. Ham uses: retuning and neutralizing transmitters, power indication, locating antenna adjustment, correcting TVI, general de-bugging with transmitter power off, determining C, L, Q, etc. KIT \$29.95 WIRED \$49.95

NEW! SHAKESPEARE — WONDEROD NORMAL MODE HELICAL ANTENNAS. Now — an efficient distributed-load antenna built into a Shakespeare Wonderod! You can mount this shortened antenna on trunk or boom and use a spring mount. Glass fibers run the entire length of the whip, with the antenna inside the lower half fiberglass. The result is superior mechanical characteristics and the appearance of a standard whip.

STYLE	62-3	62-4	62-5	62-6	62-7
BAND	10 meters	15 meters	20 meters	40 meters	80 meters
APPROX LENGTH	4'	4'	6'	6'	6'
PRICE	15.90	15.90	18.75	18.75	18.75

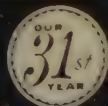
Special 40 and 80 meter bumper mount antennas in 8' lengths — \$21.00

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CUSHCRAFT BLITZ BUG — A Coaxial Cable Lightning Arrester

Thin all new Lightning Arrester for standard coaxial cable. Designed to eliminate heavy static charge buildup — protecting valuable radio equipment. There is no insertion loss from Blitz Bug. It will not affect performance or S.W.R. to 150 MC. ONLY \$3.95



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For further information, check number 26 on page 124.

December, 1958 • CQ • 81

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AIRCRAFT SHEET METAL MAINTENANCE, AF Manual 52-11, 214 pages written especially for Aircraft Sheet Metal Workers and includes: Elements of Aircraft Structure, Properties of Aircraft Metals, Introduction to Sheet Metal Tools, Principles of Forming Processes, Applied Tin Shop Practices, Fundamentals of Aircraft Riveting, Application of Sheet Metal Fasteners, Fundamentals of Structural Repair, Fundamentals of Common Soldering, Elements of Aircraft Plumbing, Maintenance of Transparent Plastics and Fundamentals of Cable Mechanics. Govt List Price \$1.50—ALL for Only \$1.25 per copy.

LEARNER'S GUIDE—ADVANCED CIRCUITS, AF Manual 52-18, 234 pages of Laboratory Material covering the most frequently used Oscillators, Multivibrator and other Generator Circuits, as well as the Test Equipment necessary for Troubleshooting. Govt. List Price \$2.00—ALL for Only \$1.75 per manual.

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VHF [from page 57]

automatically. This is not the case however and as a result one must search about with the pump frequency until the point at which these resonances occur simultaneously is found. For any given tuning adjustment and pump amplitude, there will be one pump frequency which works better than any other multiples. In general the higher order pump frequencies give the most stable results with less trouble and an attempt should be made to get your amplifier working with the highest pump frequency you can generate.

"Will a parametric amplifier work on UHF T.V.?" The answer is Yes. We tuned up an amplifier on Channel 19 and ended up with 20 db gain and sufficient bandwidth to pass the TV signal with no deterioration in picture quality. Channel 19 is 130 miles away and with the preamp it comes in as well as the local VHF TV stations. The pump frequency used was 1520 mc. (About 5 mw)

"Where can we get a Mavav?" If you have something going and really feel you are ready for one, you might try writing to D. W. Atchley (W1HKK), Microwave Associates, Burlington, Mass. If your letter is convincing enough, who knows?

1296 mc

Hank Cross (W1OOP) managed an out of state contact on 1296 mc during the last VHF contest. Not a new DX record (80 miles) but evidence that the east coast boys are at least in there trying. The other end of the contact was provided by W1PZA/1 in New Hampshire. Wayne Taft (W1WID) ably assisted at the portable end. (Things like supplying the transmitter and receiver, etc.) Rumor has it that the boys are readying an assault on the California DX record. (Parametric amplifier and all that jazz.) Equipment used in the contest contact included the crystal controlled converter written up in "CQ" by Hank Cross and Wayne Taft, and the 2C39 tripler (driven by the 432 exciter) which they haven't written up yet.

432 mc.

Activity on 432 got a real boost during the October coastal band opening. W1UHE (Tiverton, Rhode Island) and W4VVE (Richmond, Virginia) had the longest distance contact. The band however, was open from Maine to South Carolina and the only thing preventing dozens of DX contacts was simply *nobody there*.

220 mc

The same coastal openings that worked on 432 mc were doing their stuff on 220 as well. No new records were set but there are few east coasters without ten to fifteen states under their belts. Activity in this neck of the wood is simulated by a few high power, big beam boys

from **CARTON** to **CONTACT** in **47** minutes!

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MODEL 14-AV The Model 14-AV is only 31 feet high and weighs just 15 pounds. It incorporates the exclusive Hy-Gain capacity hat assembly which increases the electrical length of the maintaining high efficiency on 40 meters.

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Combination mast and radial roof mounting kit complete with hardware, \$3.35 Ham Net.

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Completely factory pre-tuned with no further adjustments necessary these Hy-Gain Multiband Trap Verticals maintain an SWR of 2 to 1 or less across the entirety of each band for which they are designed. 152 ohm coaxial feed line. True 1/2 wave marconi resonance on each band makes possible low angle DX radiation pattern.



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Acting as an insulator at resonant frequencies but allowing radio energies of other frequencies to pass freely the Hy-Gain Insu-Trap becomes an automatic electronic switch which isolates various sections of the vertical to make it the proper length for each band. Hy-Gain Traps use exclusive adjustable capacitor plates and are individually factory resonated maintaining a high degree of efficiency. Each trap is completely weatherproof and air tight. No water or condensation can ever enter. Enclosed in carbon activated polyethylene cover and cap assembly the Hy-Gain Insu-Trap is rated to take the full maximum legal input power. Traps are only 2x3", weighing just 6 oz. each.

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14-AV

\$27⁹⁵



for 6*, 10, 15, 20 & 40 M

NYLON BASE MOUNT



Fiber Glass impregnated nylon base assembly makes possible self support. Heavy cast aluminum mounting brackets is adjustable for various sizes of mast. Weatherproof internal coaxial fitting supplied.

*Available as an accessory, the specially designed decoupling stub adds 6 meter operation with low SWR to Models 12 or 14-AV.

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MODEL 12-AV

The Model 12-AV is only 12.5 feet high and weighs just 12 pounds.

Combination mast and radial roof mounting kit complete with hardware, \$3.35 Ham Net.



for 6*, 10, 15 & 20 M

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For further information, check number 27 on page 124

December, 1958 • CQ • 83

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For further information, check number 28 on page 124.

like W1FOS who sports a cw kw to a pair of 4CS300's and has at least 44 elements or more. Your "QST" conductor (W1HDQ) has been giving the band a good going over with a sixty-six element beam which according to reports is really shaking them out of the bushes in Flat-bush and environs. Haven't heard of anyone using a parametric amplifier on 220 mc yet. (W1FZJ excluded.)

If you're looking for Georgia on 220, you might try W4UML in Athens, Georgia. He is on 220 now and K4KLD in Hoschtown, Georgia is building. Jay is also on six but gee—I thought everybody in Georgia was on six. Anyway a good way to arrange a sked with Jay is to work him on six first.

2 Meters

There have been so many openings on two meters that I was beginning to think conditions were always that way. At least two coastal openings. One from VE1QY in Yarmouth to W4MDA in North Carolina. South Carolina (W4AIB) was getting into Massachusetts. Another one gave Alabama (W4EQM) to W1AZK. (New Hampshire), W1JDF and W1JSM (Mass.), W1KCS and W1AJR (R.I.) and so on down the coast. The next night the same opening got signals from W4UMF in Florida as far north as W1AZK (New Hamp.), and everything in between. I think that the farthest northern station worked was W1REZ in Connecticut.

These good openings followed a couple of doozies to the west from the New York, New Jersey area out to Wisconsin, Illinois and Iowa area. One real popular guy was K8AXU/8 in West Virginia. Seems like old Al worked everything in sight (4000' elevation).

Moonbounce transmissions are continuing as per schedule. If you don't know when the moon is up you might get a copy of "The National Almanac". Available in book stores, libraries or the U.S. Government printing office. (\$2.00) This little gem is complete with examples of how to, etc., and will allow anyone anywhere to locate the sun on a rainy day.

6 Meters

Shades of things to come! The MUF has been coming up, higher, and higher, and higher, and finally rose above 50 mc. On October 19th, we finally heard Harry (EI2W) for the first time this season. We'd been looking for him for the previous week when the band was very definitely open to Europe, but we heard no amateur signals from Europe until the 19th.

Unfortunately when Helen (W1HOY) called "CQ DX" (which she occasionally does) she could not copy Harry when he came back to her because of heavy local QRM. As soon as the QRmer was alerted to the fact that he was sharing the frequency with EI2W, he very kindly changed frequency, but by that time Harry was gone, for the W1's at least.

Another familiar signal from Europe,

take your choice!

\$189⁰⁰



HQ-100

True Hammarlund quality at low cost! General coverage, 540 KCS to 30.0 MCS. 10-tube superheterodyne with automatic noise limiter. Electrical bandspread. Q-multiplier.

Optional Telechron clock-timer \$10

EVERYONE A WINNER!



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HQ-110

A true amateur receiver at a low price! Dual conversion 6, 10, 15, 20, 40, 80 and 160 meter ham bands. Crystal calibrator. Q-multiplier. Separate linear detector for SSB and CW. Separate BFO.

Optional Telechron clock-timer \$10



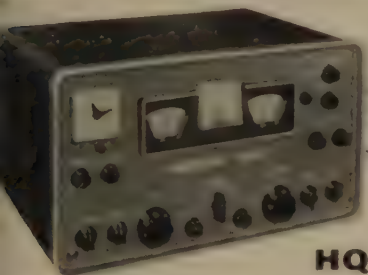
\$269⁰⁰

HQ-145

Brand-new general-coverage receiver! 540 KCS to 30.0 MCS. Dual conversion. Adjustable 60 db slot filter. Crystal filter. 11-tube superheterodyne with automatic noise limiter.

Optional Telechron clock-timer \$10

Optional plug-in 100 KCS calibrator \$15.95



\$359⁰⁰

HQ-170

Best for the amateur at any price! Dual and triple conversion 17-tube superheterodyne with automatic noise limiter. 60 db slot filter. Separate vernier tuning. Selectable sideband. Tuned IF amplifier. Crystal calibrator.

**BUDGET
TERMS
AVAILABLE**



\$379⁰⁰

HQ-160

Everything you could wish for in general-coverage! 13-tube superheterodyne with automatic noise limiter. Dual conversion. 540 KCS to 31.0 MCS. Crystal calibrator. Electrical bandspread. Slot filter. Q-multiplier.

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For further information, check number 29 on page 124.

December, 1958 • CQ • 85

BC 603 FM RECEIVER



20-27 mc. Equipped with 16 push buttons for selecting channels. Cont. variable tuning over the entire range. Unit complete with tubes, built-in loud speaker, squelch circuit, head phone jacks, schematic diagram on bottom of case. Approx. weight 34 lbs. For conversion to 6 meters AM or FM see Sept. and Oct. issues of "C Q". **\$12.95**
Unused.....

Original 12 Volt Dynamotor for above DM 34. Unused **\$4.95**

BC 604—Companion Transmitter for above 20 to 27 MC FM. Unused **\$7.95**

Original 12 Volt input Dynamotor for above—625 VDC C 225MA output. Unused. **\$10.95**

FT 237—Mounting rack for above Rec. & Trans-mitter. Unused **\$4.95**

BC 659—FM RECEIVER-TRANSMITTER, xtal controlled, two channels, freq. range 27-38.9, 9 mc. 13 tubes, built-in speaker, dual meter for testing filament and plate circuits. EXC. **\$6.95**

PE-117—6 or 12 Volt vibrator type Power Supply for BC 659. NEW **\$5.95**

I-177—TUBE CHECKER. A portable dynamic or mutual trans ductance type. 3" circular meter indicates condition of tube for normal operation. Presence of gas, short circuits between elements and noise, also measures the dynamic mutual conductance. 110 V. AC — 60 Cycle. USED **\$16.95**

ARB/RCA—SIX TUBE RECEIVER. All purpose super het receiver covering 195 KC to 9000 KC including weather, lighthouse, aircraft, radio range, broadcast, marine and amateur 160 meter, 80 meter, 75 meter and 40 meter, with tubes, 24 volt dyno. and schematic. EXC. **\$17.95**

Accessories for remote tuning per set. **\$5.00**
See June 1958 "C Q" for conversion.

\$45.00—HI-FI HEADSET. Uses annular grooved plastic fibre comes with voice coils as in speakers and brand new rubber ear pads to obtain spacing for correct acoustical load. GIVES FINEST MUSIC REPRODUCTIONS! Imp.: 300 Ohms per unit or 600 Ohms when wired series. BRAND NEW **\$7.95**

HS-23—2000. Ohm Headphones. BRAND NEW

CD-307—Extension Cord for above. **\$.97**

ARC-1—100-156 MC Transceiver EXC **\$59.50**

BC 669—Six Channel Crystal Controlled, 50 Watt Radio Telephone, 1600 to 4500 KC. Ideal for boats or land station, less power supply. Used **\$59.50**

LM-20—FREQ. METER with original Calibration Book and Crystal. BRAND NEW **\$79.50**

LM-13—FREQ. METER with original Crystal and Calib. Book. Used—EXC. **\$49.50**

T-19—3-4 MC XMTR. EXC. **\$ 5.95**

BC-45B—5.37 MC EXC. **\$ 5.95**

T-23—100-156 MC XMTR. NEW **\$13.95**

R-28—100-156 MC RECEIVER. EXC. **\$15.95**

TA-12 XMTR, 100 Watt. EXC. **\$19.95**

MP-28 MODULATOR and 28 V. DC Power Supply for above. EXC. **\$14.95**

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Phone CALumet 5-1281

CT1CO is also back on his early morning tape transmissions again.

As soon as the British TV signals and Harry faded out, beams swung toward the west from New England for the first W6-W1 contacts of this season. The opening to the west coast lasted about an hour and a half with only 6's coming through. However, on the 20th of October (next day) there was another opening to the west coast (for us) and this time several W7's in Oregon were heard and worked. On the 21st, the opening to the west lasted only about five minutes. None of these might be called "good openings" but it does show "Shades of things to come".

The band had been open to Europe for a week or more before Harry (EI2W) and CT1CO came through. Don't know if they were on or not but we didn't hear them until the 19th of the month.

Clubs, Nets, Etc.

P.O.O.S.

Finally a group of YLs and XYLs who are VHF minded enough to form a club of their own. The club is the "Petticoat Operators of Six," and they are located in the Pittsburgh area. Their net meets every Tuesday evening at 9:00 P.M. and they issue a Certificate to any Amateur working and QSLing seven (7) members.

Objective of the club is in case of emergency during the daytime, efficient operators will be able to handle the situation.

Officers of the P.O.O.S. are President — K3AZZ, Treasurer — K3DYW, Secretary — W3UTU, Manager — W3ERK.

"Hen-Net"

Another one! They come in pairs, seems like.

The "Hen-Net of Ohio"—all XYL's—meet at 1330 on Thursdays on 50.185. Net Control is Kay, K8IYW.

"Worked All Skokie"

The "Skokie Six Meter Indian" award is issued to anyone who has worked ten of the Skokie six meter men, if he is within a radius of 50 miles of Chicago. Beyond that point a ham has to work only six of the group to earn the WAS award (certificate).

The SSMI net meets every Monday at 2100 CDST on 50.298 mc, and at that time all members tune carefully to see if anyone wants to check into the net or is working for the award.

"Meat-Ball Net"

A net for the two-meter gang; the "Meat-Ball Net" meets every Sunday at 2100 at 146.7 mc. 84 members of the net, all on the same frequency. On the third Sunday of the month they meet in Tarrytown, New York, at K2YVC.

73, Sam, W1FZJ



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For further information, check number 31 on page 124.

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10 to 30 Meg. tol. .005% ea. \$3.75
30 to 54 Meg. tol. .005% ea. 4.10
Overtones: 54 to 75 Meg. tol. .005% ea. 4.25
75 to 90 Meg. tol. .005% ea. 5.40

Special! FT-243 Prec. Calib. to 1st Decimal

2 Meters { Exom: *8010.6 x 18=144.190
Exom: *8010 x 18=144.180

Note—10 KC difference between the above

6 Meters { Exom: *8340.6 x 6=50043.6
Exom: *8340 x 6=50040

Note—3.6 KC difference between the above

Calibrated FT-243 as exam. above* spec. ea. \$1.19

Thin-Line FT-243—6 Meters, 50 meg. to 52.44 meg. ea. \$1.79

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NOVICE BAND FT-243 Fund. or DC-34 Freq. \$1.29

80 Met. 3701-3748—Steps of 1 KC. FT-243 or DC-34

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4045	5030	5982	6473	6925	7426	7868	8320	8783	9233	9685
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4110	5127	6095	6480	6940	7440	7880	8340	8805	9255	9710
4135	5165	6140	6495	6960	7460	7900	8360	8825	9275	9730
4165	5205	6180	6525	6990	7490	7930	8390	8855	9305	9760
4195	5245	6220	6565	7030	7530	7970	8430	8895	9345	9800
4230	5285	6260	6605	7070	7570	8010	8470	8935	9385	9840
4260	5325	6300	6645	7110	7610	8050	8510	8975	9425	9880
4290	5365	6340	6685	7150	7650	8090	8550	9015	9465	9920
4325	5405	6380	6725	7190	7690	8130	8590	9055	9505	9960
4355	5445	6420	6765	7230	7730	8170	8630	9095	9545	10000
4390	5485	6460	6805	7270	7770	8210	8670	9135	9585	10040
4420	5525	6500	6845	7310	7810	8250	8710	9175	9625	10080
4455	5565	6540	6885	7350	7850	8290	8750	9215	9665	10120
4485	5605	6580	6925	7390	7890	8330	8790	9255	9705	10160
4520	5645	6620	6965	7430	7930	8370	8830	9295	9745	10200
4550	5685	6660	7005	7470	7970	8410	8870	9335	9785	10240
4585	5725	6700	7045	7510	8010	8450	8910	9375	9825	10280
4615	5765	6740	7085	7550	8050	8490	8950	9415	9865	10320
4650	5805	6780	7125	7590	8090	8530	8990	9455	9905	10360
4680	5845	6820	7165	7630	8130	8570	9030	9495	9945	10400
4715	5885	6860	7205	7670	8170	8610	9070	9535	9985	10440
4745	5925	6900	7245	7710	8210	8650	9110	9575	10025	10480
4780	5965	6940	7285	7750	8250	8690	9150	9615	10065	10520
4810	6005	6980	7325	7790	8290	8730	9190	9655	10105	10560
4845	6045	7020	7365	7830	8330	8770	9230	9695	10145	10600
4875	6085	7060	7405	7870	8370	8810	9270	9735	10185	10640
4910	6125	7100	7445	7910	8410	8850	9310	9775	10225	10680
4940	6165	7140	7485	7950	8450	8890	9350	9815	10265	10720
4975	6205	7180	7525	7990	8490	8930	9390	9855	10305	10760
5005	6245	7220	7565	8030	8530	8970	9430	9895	10345	10800
5040	6285	7260	7605	8070	8570	9010	9470	9935	10385	10840
5070	6325	7300	7645	8110	8610	9050	9510	9975	10425	10880
5105	6365	7340	7685	8150	8650	9090	9550	10015	10465	10920
5135	6405	7380	7725	8190	8690	9130	9590	10055	10505	10960
5170	6445	7420	7765	8230	8730	9170	9630	10095	10545	11000
5200	6485	7460	7805	8270	8770	9210	9670	10135	10585	11040
5235	6525	7500	7845	8310	8810	9250	9710	10175	10625	11080
5265	6565	7540	7885	8350	8850	9290	9750	10215	10665	11120
5300	6605	7580	7925	8390	8890	9330	9790	10255	10705	11160
5330	6645	7620	7965	8430	8930	9370	9830	10295	10745	11200
5365	6685	7660	8005	8470	8970	9410	9870	10335	10785	11240
5400	6725	7700	8045	8510	9010	9450	9910	10375	10825	11280
5430	6765	7740	8085	8550	9050	9490	9950	10415	10865	11320
5465	6805	7780	8125	8590	9090	9530	9990	10455	10905	11360
5500	6845	7820	8165	8630	9130	9570	10030	10495	10945	11400
5530	6885	7860	8205	8670	9170	9610	10070	10535	10985	11440
5565	6925	7900	8245	8710	9210	9650	10110	10575	11025	11480
5600	6965	7940	8285	8750	9250	9690	10150	10615	11065	11520
5630	7005	7980	8325	8790	9290	9730	10190	10655	11105	11560
5665	7045	8020	8365	8830	9330	9770	10230	10695	11145	11600
5700	7085	8060	8405	8870	9370	9810	10270	10735	11185	11640
5730	7125	8100	8445	8910	9410	9850	10310	10775	11225	11680
5765	7165	8140	8485	8950	9450	9890	10350	10815	11265	11720
5800	7205	8180	8525	8990	9490	9930	10390	10855	11305	11760
5830	7245	8220	8565	9030	9530	9970	10430	10895	11345	11800
5865	7285	8260	8605	9070	9570	10010	10470	10935	11385	11840
5900	7325	8300	8645	9110	9610	10050	10510	10975	11425	11880
5930	7365	8340	8685	9150	9650	10090	10550	11015	11465	11920
5965	7405	8380	8725	9190	9690	10130	10590	11055	11505	11960
6000	7445	8420	8765	9230	9730	10170	10630	11095	11545	12000
6030	7485	8460	8805	9270	9770	10210	10670	11135	11585	12040
6065	7525	8500	8845	9310	9810	10250	10710	11175	11625	12080
6100	7565	8540	8885	9350	9850	10290	10750	11215	11665	12120
6130	7605	8580	8925	9390	9890	10330	10790	11255	11705	12160
6165	7645	8620	8965	9430	9930	10370	10830	11295	11745	12200
6200	7685	8660	9005	9470	9970	10410	10870	11335	11785	12240
6230	7725	8700	9045	9510	10010	10450	10910	11375	11825	12280
6265	7765	8740	9085	9550	10050	10490	10950	11415	11865	12320
6300	7805	8780	9125	9590	10090	10530	10990	11455	11905	12360
6330	7845	8820	9165	9630	10130	10570	11030	11495	11945	12400
6365	7885	8860	9205	9670	10170	10610	11070	11535	11985	12440
6400	7925	8900	9245	9710	10210	10650	11110	11575	12025	12480
6430	7965	8940	9285	9750	10250	10690	11150	11615	12065	12520
6465	8005	8980	9325	9790	10290	10730	11190	11655	12105	12560
6500	8045	9020	9365	9830	10330	10770	11230	11695	12145	12600
6530	8085	9060	9405	9870	10370	10810	11270	11735	12185	12640
6565	8125	9100	9445	9910	10410	10850	11310	11775	12225	12680
6600	8165	9140	9485	9950	10450	10890	11350	11815	12265	12720
6630	8205	9180	9525	9990	10490	10930	11390	11855	12305	12760
6665	8245	9220	9565	10030	10530	10970	11430	11895	12345	12800
6700	8285	9260	9605	10070	10570	11010	11470	11935	12385	12840
6730	8325	9300	9645	10110	10610	11050	11510	11975	12425	12880
6765	8365	9340	9685	10150	10650	11090	11550	12015	12465	12920
6800	8405	9380	9725	10190	10690	11130	11590	12055	12505	12960
6830	8445	9420	9765	10230	10730	11170	11630	12095	12545	13000
6865	8485	9460	9805	10270	10770	11210	11670	12135	12585	13040
6900	8525	9500	9845	10310	10810	11250	11710	12175	12625	13080
6930	8565	9540	9885	10350	10850	11290	11750	12215	12665	13120
6965	8605	9580	9925	10390	10890	11330	11790	12255	12705	13160
7000	8645	9620	9965	10430	10930	11370	11830	12295	12745	13200
7030	8685	9660	10005	10470	10970	11410	11870	12335	12785	13240
7065	8725	9700	10045	10510	11010	11450	11910	12375	12825	13280
7100	8765	9740	10085	10550	11050	11490	11950	12415	12865	13320
7130	8805	9780	10125	10590	11090	11530	11990	12455	12905	13360
7165	8845	9820	10165	10630	11130	11570	12030	12495	12945	13400
7200	8885	9860	10205	10670	11170	11610	12070	12535	12985	13440
7230	8925	9900	10245	10710	11210	11650	12110	12575	13025	13480
7265	8965	9940	10285	10750	11250	11690	12150	12615	13065	13520
7300	9005	9980	10325	10790	11290	11730	12190	12655	13105	13560
7330	9045	10020	10365	10830	11330	11770	12230	12695	13145	13600
7365	9085	10060	10405	10870	11370	11810	12270	12735	13185	

spent designing and perfecting commercially produced beam antennas. Proper installation of a commercially made beam antenna will save the average amateur many headaches.

Tuning beams properly is still a major complicated task for many hams, but it need not be. One thing for sure, no matter how well a beam is tuned it will **not** have maximum gain on every frequency within a band. So-called broadband beams are at best a compromise when overall gain is considered.

Antennas for high frequency operation are frequency sensitive and to obtain maximum output must be designed on a "narrow band basis."

For work in the 40 and 80 meter bands most amateurs use doublets, but some cater to the vertical. Long wire antennas are good too but they take space which seems to be a very big factor in most localities.

A word about multiple band antennas: trap antennas seem to be occupying the limelight now and there are many amateurs who are very happy with the results, but don't get the idea that they are more efficient than the antenna designed for one band only.

Well, how does one know when he has finally got the antenna? To realize this, the average ham must take into consideration the "law" of average operation. He must ask himself how he is doing in comparison with his contemporaries; usually, he will find that he isn't doing too badly.

Power has its points but the guy who concentrates on his antenna will not be left too far behind even though he operates in the 50 to 150 watt class. Location, proper transmission line matching, propagation conditions and operator know-how are a few of the things that must be considered and which enter into the communications picture. But in the final analyses, what antenna you choose depends upon what **YOU** want—personally.

Satellite Tracking

One of the most interesting and instructive booklets received recently is the one received from *Tapetone Inc.*, 10 Ardlock Place, Webster, Mass. For those interested in satellite tracking and the equipment to do it with, this booklet is recommended without reservation. Copies can be obtained from *Tapetone* at the address given above.

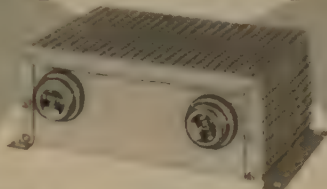
Observation

Do you know what a *krytron* is? Well, it is a new and very interesting cold-cathode trigger tube. Capable of replacing relays and thyatrons, this little "wonder" can control up to 500 amperes with as little as 20 microamperes of signal current. Various types are available and can be used in many amateur radio control applications. Those interested may obtain Bul-

Dramatic Announcement from **TRANSCON**

Sensational New **TRANSISTORIZED POWER SUPPLIES** KIT FORM OR FACTORY-WIRED

Choose from a line-up of models supplying from 16½ to 120 Watts continuous duty output. All units are designed for 12-14 VDC BUT can be changed in moments to 6-7 VDC* by substituting two resistors which are supplied with each unit. Complete with mounting brackets.

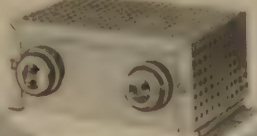


MODEL H600 — CONTINUOUS DUTY OUTPUT: 120 Watts

Single Output	600 VDC @ 200MA
Dual Output	600 VDC @ 100MA
(Simultaneous)	300 VDC @ 200MA

Kit, \$59.95 Factory-wired, \$68.95

Size 2 5/16" High x 5" Wide x 6 1/2" Long (Over Brackets)



MODEL H-250 — CONTINUOUS DUTY OUTPUT: 16½ Watts

Single Output	250VDC @ 65 MA
Dual Output	250VDC @ 32½ MA
(Simultaneous)	125VDC @ 65 MA

Kit, \$33.95 Factory-wired, \$39.95

MODEL H311 — CONTINUOUS DUTY OUTPUT: 30 Watts

Single Output	300VDC @ 100MA
Dual Output	300VDC @ 50MA
(Simultaneous)	150VDC @ 100MA

Kit, \$42.95 Factory-wired, \$49.95

MODEL H325 — CONTINUOUS DUTY OUTPUT: 48½ Watts

Single Output	325 VDC @ 150MA
Dual Output	325 VDC @ 75MA
(Simultaneous)	162½ VDC @ 150MA

Kit, \$47.95 Factory-wired \$55.95

MODEL H375 — CONTINUOUS DUTY OUTPUT: 75 Watts

Single Output	375 VDC @ 200MA
Dual Output	375 VDC @ 100MA
(Simultaneous)	187½ VDC @ 200MA

Kit, \$53.95 Factory-wired, \$62.95

All or above models 2 15/16" High x 5" Wide x 6 1/2" Long (Over Brackets)

WRITE TODAY FOR FURTHER INFORMATION:

ARROW ELECTRONICS, INC.
65 Cortlandt St., New York 7, N. Y.

Gentlemen:
Please send me information about the complete Transcon Line

Name _____

Address _____

City _____ Zone _____ State _____

ARROW ELECTRONICS, INC.

65 Cortlandt St., New York 7, N. Y. Digby 9-3790
525 Jericho Turnpike, Mineola, N. Y. Pioneer 6-8686

For further information, check number 42 on page 124.

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CQ Magazine

300 West 43rd St., New York 36, N. Y.

letin E-287 from *CBS-Hytron*, Danvers, Mass. Look forward to seeing a few novel circuits using the krytron in this column. (Hint to CBS)

Observed: applications of electronic components designed for industrial use to amateur radio circuitry are numerous and should be investigated. The *UHF* and *SHF* spectrums have been barely "cracked" by the amateur. The key to the expanded use of amateur microwave bands is partially in the hands of the industrial electronic designer. He has many "tricks" up his sleeve that are awaiting exploitation by the amateur.

Questions

Beam

"Please recommend a three element beam to me that is commercially available for around \$35.00 and covers 10 meters."

Try *Moseley's Model A-310* at \$37.50. I like it. When they are available in England I plan to obtain one and give it a good "whirl" here in France.

No Audio

"I have checked all the voltages in my Heath DX-40 and replaced the tubes in the audio section but I still do not seem to be able to find the trouble—no audio. My mike seems to be okeh too. When I switch to phone I also get a hum. Any good troubleshooting info?"

Yes. If you say voltages check okeh, then I'll bet you either have a poor mike input connection (tighten connections and solder center connection), or maybe an open 4.7K resistor or .001 mfd. condenser which are in series with the mike to the rid of the first section of the 12AX7 amplifier. If your pre-amp is not at fault, check the wafer switch connections paying special attention to numbers 10 and 2. Make sure connection 3 is properly soldered.

Collins 32V

"I have an old 32V2 transmitter and I have 'popped' a number of loading capacitors. What causes this anyway?"

How's the standing wave ratio in your antenna system; high? Are you sure you are loading properly (especially on 10 meters)? I'll bet your parasitic choke on that plate cap connection of your 4D32 final is cooked too. Make certain you are feeding your antenna properly, that you have a good ground and are tuning that pi final properly.

Question of the Month

"I'd like to be able to obtain a gadget that would operate from my tape recorder to operate my color slide projector automatically, have any ideas?" (DS San Francisco).

Yes. You can prepare a tape to "synchronize" with your color slide projector relay if you use a low frequency (20-25 cycles) tone

[Continued on page 92]



I can give you personal service on helping you select better gear per dollar for your operating pleasure. Over 30 years experience. Big trades, easy terms, used bargains. **GENE VAN SICKLE**, W9KJF, Owner.

VAN SICKLE RADIO SUPPLY COMPANY

Permanent location
4131 N. Keystone Ave.

One acre parking space on NE side. Indianapolis 5, Ind.

UNUSED SURPLUS

Globar Non-Ind. Res. 600 ohms 118 W.....	\$ 1.25
Use 12 paralleled for 50 ohm 1.4 KW Dummy Load (see Sept. ad)	12.00
Soldering Iron 6/12 VDC, 10 ft. Cable, Battery Clips and Switch, for Mobile or Field use.....	4.90
Plug-In Trigger Amp. contains 3, 6X502AX tubes and Precision Parts	.99
UTC #A-10 Transf. Line to Grid. 30-20,000 cys	2.90
931A Tubes	3.90
Special 1N28 Diode	

ARKAY ELECTRONICS

Ft. George Sta. P.O. Box 23 New York 40, N. Y.

**YOU SAW IT
IN CQ**



TRADING POST

Again in this issue a new section appears in CQ where distributors may advertise trade-in and reconditioned equipment. This section, called the TRADING POST will be confined only to legitimate ham distributors as a means of announcing the many excellent used items available. \$15 per column inch.

RECONDITIONED OR LIKE-NEW EQUIPMENT

GRP-60, GSB-1, Speaker	\$ 425.00
Hammarlund 55400X	\$ 165.00
MRO-60, Cal. Sckt. Collis: A. B. C. D. E. F. AA.	
AC, AD	\$ 365.00
Johnson FIVE HUNDRED Transmitter	\$ 509.00
Johnson Courier Linear Amplifier 500 watt	\$ 210.00
Collins 32V-1 Transmitter	\$ 260.00
Collins KWS-1 & Power supply	\$1154.00
Gonset Communicator, 2 meters, 6 volts	\$ 129.00

ALLTRONICS-HOWARD CO.

Box 19, Boston 1, Mass. (Richmond 2-0048)

BARGAINS in RECEIVING AND TRANSMITTING EQUIPMENT: DX-100 \$195.00; B&W 5100 \$250.00; 10B \$160.00; DX-35 \$50.00; Viking II \$265.00; Navigator \$175.00; Globe Chief 90 \$50.00; HT 30 \$375.00; NC 109 \$175.00; HQ 129X \$125.00; NC 125 \$140.00; NC 98 \$99.00; SX 42 \$145.00; SX 71 \$145.00; Demonstrators HT 32 \$525.00; HT 33 \$595.00; Frequent changes, write for list.

KEY ELECTRONICS

122-126 South Wayne St., Arlington 4, Va.

VALUES IN RECONDITIONED GEAR

Johnson Viking Kilowatt	\$995.00
Collins 32V2/3	\$399.50
Johnson Ranger	\$199.50
Johnson Viking II, VFO	\$209.50

We buy ham gear for CASH!

H & H ELECTRONIC SUPPLY, INC.

506-510 Kishwaukee St., Rockford, Illinois

BARGAINS IN RECONDITIONED EQUIPMENT

National HR600 with ABCDEF coils — \$370.00
Collins 32V2 converted to 32V3 — \$350.00
Collins 75A4 — \$495.00 — Eldico SSR-100F — \$595.00

VALLEY RADIO DISTRIBUTORS

518 N. Appleton St., Box 975, Appleton, Wis. • REgent 3-6012

SENSATIONAL OFFERING: National NC-300 like new \$315.00, NC-188 \$125.00, NC-109 \$155.00, Hallcrafters R-38E \$43.00, SX-105 \$85.00, RX-101 \$299.00, S-40A \$50.00, S-27 \$40.00, Hammarlund HQ 100 with clock \$139.00, HQ-110 with clock \$195.00, HQ-150 with speaker like new \$229.00, Super-Pro RP-400-X with speaker and power supply \$135.00, RCA AT 88 \$200.00, Morrow CM-1 \$28.00, 5BR-1 \$39.00, RME Mc-55 Mobile Conv. like new \$40.00, Gonset Tri-Band Conv. \$29.00, Elmic AF 67 \$125.00, Lyco 600 \$49.00, Temco 75GA \$100.00, WRL Globe Beant \$45.00, Johnson Pacemaker \$395.00, Meisner 130-B with VFO \$115.00, Central Electronics AP-1 \$6.50. For your best deal write.

CHESTER ELECTRONIC SUPPLY CO.

2012 52nd Street, Kenosha, Wisconsin

Reconditioned and guaranteed.

Special low priced items featured by us. Hallcrafters R-38E, R-38F, R-38G, R-38H, R-38I, R-38J, R-38K, R-38L, R-38M, R-38N, R-38O, R-38P, R-38Q, R-38R, R-38S, R-38T, R-38U, R-38V, R-38W, R-38X, R-38Y, R-38Z, R-38AA, R-38AB, R-38AC, R-38AD, R-38AE, R-38AF, R-38AG, R-38AH, R-38AI, R-38AJ, R-38AK, R-38AL, R-38AM, R-38AN, R-38AO, R-38AP, R-38AQ, R-38AR, R-38AS, R-38AT, R-38AU, R-38AV, R-38AW, R-38AX, R-38AY, R-38AZ, R-38BA, R-38BB, R-38BC, R-38BD, R-38BE, R-38BF, R-38BG, R-38BH, R-38BI, R-38BJ, R-38BK, R-38BL, R-38BM, R-38BN, R-38BO, R-38BP, R-38BQ, R-38BR, R-38BS, R-38BT, R-38BU, R-38BV, R-38BW, R-38BX, R-38BY, R-38BZ, R-38CA, R-38CB, R-38CC, R-38CD, R-38CE, R-38CF, R-38CG, R-38CH, R-38CI, R-38CJ, R-38CK, R-38CL, R-38CM, R-38CN, R-38CO, R-38CP, R-38CQ, R-38CR, R-38CS, R-38CT, R-38CU, R-38CV, R-38CW, R-38CX, R-38CY, R-38CZ, R-38DA, R-38DB, R-38DC, R-38DD, R-38DE, R-38DF, R-38DG, R-38DH, R-38DI, R-38DJ, R-38DK, R-38DL, R-38DM, R-38DN, R-38DO, R-38DP, R-38DQ, R-38DR, R-38DS, R-38DT, R-38DU, R-38DV, R-38DW, R-38DX, R-38DY, R-38DZ, 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HAM CLINIC [from page 90]

signal and dc amplifier which will trip the relay after each slide has been shown. That is, you will for example, talk about a certain color slide, then push a button modulating the tape with the low frequency tone. On play back (no hands!), this tone will trip the projector relay (switch) automatically so that all you have to do is to sit back, look at your slides and listen to the tape. Your tape recorder may need an additional head and an amplifier because most recorder amplifiers usually do not cover such low frequencies. Incidentally, this is roughly the system *Ampex* uses to make unattended broadcast programming possible. Let me know how you make out. In the meantime we'll try some of the circuits we have in mind. If we come up with something not too complicated we will send you and any others intrested, the info.

TV Birdies

Sometime ago, D. H. Queeney of Hinsdale, Ill. had some trouble with "TV birdies" (on the 10 and 15 meter bands) fouling up reception. He advises us that he obtained a surplus A-98 Phantom Antenna for 15¢ which cured the trouble to the extent that the set is now "listenable." He merely connected the little device across the 110AC line at the receiver plug! This little PA consists of a 700mmfd condenser and a 31 ohm resistor in series. Maybe it will work on your receiver too. Thanks Don for the tip!

G4ZU Beam Information

G4ZU, Dick Bird, the designer of the beam bearing his call has asked me to pass on some information to the many readers who wrote to him and to HAM CLINIC relative to this antenna. Most of the information however, has been supplied by W6EGL (Norm Rose) and is re-printed herewith.

He says: "I recently built a G4ZU beam in accordance with your article (Dick's) in the March 1957 CQ. Everything went together in fine shape and I was most enthusiastic. However, when I checked the SWR readings on the three bands I was in for a big surprise. Careful adjustments of feeder length, coil turns and the series condenser in the coax were of no avail. I virtually spent days trying to find the correct combination and still the SWR was, at best, 2.25 to 1 on 20, 3.8 to one on 15 and somewhere in between on 10.

"As a last resort, before giving up and building a different type of driven element, I substituted a different coil in the matching unit. Suddenly the results were entirely different. Tuning was no longer critical. SWR readings are in the order of 1.25 to 1 on all bands and I believe with a little juggling could be brought to lower readings.

[Continued on page 94]

For further information, check number 34 on page 124.

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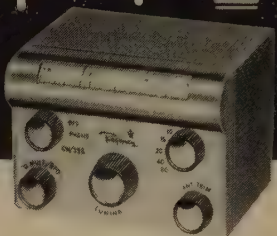
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HAM CLINIC [from page 92]

"The secret? Hard to believe, but a coil with the same number of turns but much shorter length is the 'ticket'! The length was in the order of 3 inches. The matching link was turns (2 turns would not work). The new coil is $1\frac{1}{2}$ " coil stock (Miniductor type), about 1 turns to the inch. I use 2 turns of the same material as the link and with this coil 2 turns is correct for the best SWR. The number of turns on the coil does not appear to be too critical and a good match can be made with anywhere from 4 to 6 turns on each side of center.

"This may not be the best tuning procedure but it works for me: use recommended feeder length as a starter (about 39 feet for 450 ohm line). Start with 5 turns on a side. Using a grid dip meter and with the coax line disconnected, tune the antenna's tuning condenser for a dip on 14 mcs. Now drop down to 21 mc. 21 mc should also dip properly without juggling. Next go to 10. If the dip on 10 is too high in frequency, adjust your feeder length a few inches longer or try to bring it in line by changing the turns on the coil. A little juggling of coil turns and feeder length should establish a point where all three bands show proper resonance with the GDO.

"Leaving the antenna portion of the matching section alone, connect the coax and check the SWR on 20. You will find it necessary to adjust the series condenser for lowest SWR and make the tuning fairly sharp. Follow through with similar checks on 15 and 10. You should be able to find a single setting of the coax condenser that will give you a low reading on all three bands. The antenna works fine on all three bands."

Thanks very much Norm.

G4ZU adds: "the important point that emerges from Norm's info is that the coils in the auto-match must be closely wound and tightly coupled."

Thanks to you too Dick.

[Continued on page 96]

YL [from page 59]

bers for the grid drive and plate current are marked in Braille and glued to the rig. The 100 kc crystal callibrator on her HQ-110 makes it easy for her to know what part of the band she's in.

Ruth feels the most interesting thing about amateur radio is the fact that no matter where you are or where you may live, there is always someone with an outstretched hand waiting to be of assistance. She is grateful for the many helping hands along her way.

Ruth, who lives at Marshall, Mo., is 23 years old. Other interests include playing the piano and organ. She has a collection of popu-

ar, classical and religious choral music consisting of about 500 records ranging from the Messiah to rock and roll. She also collects autographs of friends, rocks, shoes and seashells.

Our thanks to WDOUD, Letha, herself nearly sightless, for introducing us to Ruth. May her experience inspire others to take up this rewarding hobby.

WHOOTs Assist Golfers

Members of WHOOT took on an unusual assignment Sept. 5-9, on the occasion of the annual Dallas Women's Open Professional golf tournament, sponsored by the Civitan Club for the benefit of mentally retarded and deaf children in the area. WHOOT members were stationed at three locations on the Glen Lakes Country Club golf course with 2-meter Communicators, scoreboards and portable telephones to nearby greens. Thus golfers and spectators were able to keep an up-to-the-minute score on all competitors as they traveled around the 18-hole course.

WHOOT members participating: W5's BDB, KFC, SPV, SYL, YKE; K5's KDY, GBX, PE, GMI; KN5's, MTF, PSK.

With the Clubs

New officers for PARKA, installed at the July meeting, are: Pres., KL7BVQ, Marjorie; P, and friendship chairman, KL7BLL, Margie; secy, WL7CFJ, Bonnie; treas., KL7CCP, Pat; P/C, KL7ANG, Nancy; membership chairman, KL7ALZ, Geri. The PARKAs now have their own club station, KL7CUD. The club also is publishing a monthly bulletin, PARKA HI-LITES, edited by KL7's CP and ALZ.

WAYLARK has elected these new officers to take over in Nov.: Pres., W3CDQ, Liz; VP, W3RXJ, Irene; secy, W3UTR, Meg; treas., W3UXU, Betty; exec. committee rep., K4LMB, thel.

The Los Angeles YLRC held their first meeting of the season in Sept. at which W6QYL, Martha, and OM Noel, W6RDQ, showed color slides and gave a talk on their stay in Lebanon. W6Q5CH, Martha worked about 30 states and 25 countries. The Edwards' will be operating portable four from Washington, D.C.

The Grandmothers Club is offering a certificate to anyone who works ten grandmother exams since March 17, 1958. No list will be published—just find out during your QSO if you are a grandmother. Send a list of your contacts (no QSLs), together with band and date worked to the custodian, W9RUJ, Mary Meyer. The Camellia Capital Chirps have organized a net on 75 meters which meets Thursdays, 8 p.m. PST, with K6HHD as NCS.

Here and There

Congratulations to K3CYH, Chris, and OM

KEN-ELS RADIO SUPPLY

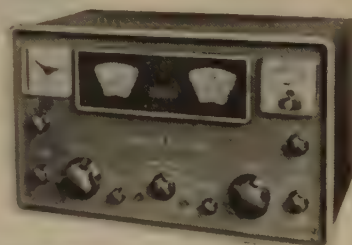


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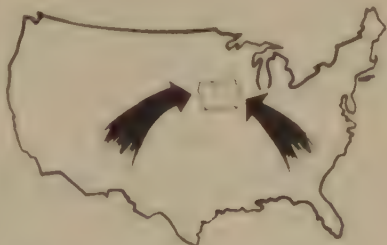


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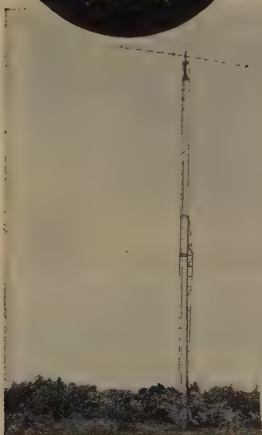
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KØABO—Rog {

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For further information, check number 39 on page 124.

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116 Limestone, Bellevue, Peoria, Ill.

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TV-Communications Towers"

For further information, check number 68 on page 124.

HAM CLINIC [from page 94]

Thirty

Not so long ago, the electronic industry was talking about miniaturization of electronic circuitry. But today it is *sub-miniaturization*. Everything seems to be getting smaller and smaller—except CQ magazine! One of these days it may be possible to have a powerful transmitter and receiver in a container half the size of the well known cigar box. When that day comes we hope that we have the diagrams on hand so that we can help you trouble-shoot it! Keep your letters coming!

A very merry Xmas to you all. 73, Chuck W6QLV/f



Several Johannesburg YLs entertained W6NZP, Evelyn, during the Scotts' visit to the "Golden City" on their latest world tour. L. to r., W6NZP; ZS6VC, Pat; ZS6YL, Toni; ZS6AEU, Anitra. Photo by ZS6GH, Diana. Evelyn also met ZS6's APG, Doreen; KK, Marie; MN, Maggie, and APF, Mona, in Johannesburg.



J1A1AEQ, Fumi Abe, at the rig she shares with her OM, J1P1K. J1A1AEQ is NCS for the net conducted by the newly formed YL club, J1RS.

K3CND on the arrival of jr. op Craig Lincoln on Sept. 28. . . . To W6CBA, Violet, and OM on the birth of jr. YL Gayle Ruth.

PY4APA, Bina, featured in this column in March CQ, has returned to her home in Brazil. Completely paralyzed when she entered the Polio Ward of the Hillcrest Hospital in Tulsa less than a year ago, Bina left the hospital able to walk with the aid of crutches and braces. She hopes for a future in *bc* radio as a musician and arts commentator.

The YLs are Saying . . .

"I was so happy to get an autographed copy of 'CQ YL' at the convention in Washington. I stayed up until 4:30 a.m. Sunday reading every single word! Congratulations for such an interesting, exciting and detailed account of YLs in Amateur Radio."—W1CEV Mary

"Congratulations on the fine job you did on 'CQ YL'. Have just seen W3CDQ's copy and am very much impressed. Here is my check for four copies."—K4LM Ethel

"You are truly to be complimented for your herculean efforts and the ultimate results in 'CQ YL'. You have produced a book which is most interesting and encyclopedic."—W4JCR, Nita

"My wonderful copy of 'CQ YL' received! Golly, the amount of interesting material and hundreds of good

photos in it left me amazed. It's like a family album, too, seeing how each other looks, and changes over the years."—W6WSV, Carol

"Bravo! You did a first rate job on 'CQ YL.' So much fun to see some of those old photos! I wonder what has happened to some of those gals. Why don't you put a request in your column urging the 'long lost souls' to write and tell us where and what they are now?"
—W6NAZ, Lenore

How about it, gals—you early members of YLRL? Let's hear from you and see what's happened in nearly 20 years!

"CQ YL" contains 18 chapters covering every facet of the YLs' participation in Ham radio. Order from your column editor: W5RZL, 212 Sombrio Dr., Santa Fe, N.M., \$3.50 post-paid and autographed if you wish.

33, Louisa W5RZL

CONTEST [from page 62]

except on 3.5 mc where it will count TWO points. (Same as in the WAE certificate rules.) A station can be worked only once on each band of course and a tone report less than T7 will not be credited.

4. For non-European stations the multiplier is determined by the number of European countries worked on each band, using the WAE country list as a guide.

European stations will use the ARRL country list. Multiplier of ONE per country on each band. In addition, each call area of the following countries will also count ONE point in the multiplier. CE, JA, PY, VE/VO, VK, W K, ZL and ZS.

6. Final score will be the QSO points, plus the QTC points, multiplied by the sum of the country points on all bands.

QTC Traffic:

A QTC can be transmitted only from a non-European station to a European station. The general idea is, that after a number of European stations have been worked, a list of these stations can be sent during a later QSO with another station. A credit of ONE point can be claimed for each station reported.

1. A QTC contains the time, call and QSO number. For example — 1200 DL7AA/113. Which means you worked DL7AA at 1200 GMT and received his number 113

2. A QSO can only be reported once, and not back to the same station, even tho the contact was made on another band.

3. No more than a maximum of 10 QTC's can be sent to the same station.

4. Keep a uniform list of QTC's sent. Example: QTC 3/5. This means that this is the third series of QTC's sent, and that 5 QSO's are now being reported.

It is strongly recommended that contestants write to the DARC for official log forms and rules sheets. Include 1 IRC for regular mail or 5 IRCs for air mail. Indicate the number of sheets needed.

For further information, check number 41 on page 124.

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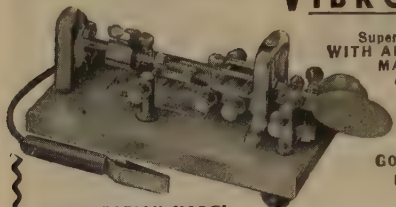
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Classifications:

This year two classifications are allowed; single operator and multi-operator. Awards will be made for all band operation only.

Awards:

Certificates will be awarded to the highest scorer in each country or country/district. There will be an additional award to the top man in each continental area. In case of sufficient participation second and third place awards will also be awarded.

Logs must be mailed not later than March 15, 1959, to the DARC DX Bureau, Fuchsiengeweg 51, Berlin-Rudow, Germany.

Ed. Comments:

The North Jersey DX Association, winners of last year's Club award, held their September meeting at Buzz Reeves' spacious layout. The formal presentation of the CQ Plaque was made at that time.

Flash:

We have two more trophies to be awarded in this year's contest. For the Single Band, Single Operator world high scorer in each section. Don Wallace, W6AW is donating the Phone award and John Ryan, W7KVU is the CW sponsor. Thanks, fellows, that's six trophies, plus the CQ plaque we can now offer. That should be just about tops for any DX contest.

Good luck and 73, Frank, W1WY

PROPAGATION [from page 60]

cur within the ionosphere are also discussed in a very interesting manner. The methods of applying ionospheric information to the solution of shortwave transmission and reception problems are reviewed at length, and some of the phenomena which particularly influence amateur radio transmission are specifically mentioned. Finally the cause and nature of ionospheric disturbances and of certain other phenomena, such as sporadic-E and aurora, are also discussed.

Mr. Bennington has that rare literary talent for very simply explaining the very difficult. All in all, his book is highly recommended for everyone having an interest in the subject of radio propagation—beginner and professional alike.

"Shortwave Radio and the Ionosphere" is published by Iliffe and Sons Ltd., London, England, but can be obtained by ordering through your local bookdealer, or from the *Radio Bookshop*, 1379 East 15th Street, Brooklyn 30, N. Y. The price is approximately \$3.50.

Next month this column will review "Wave Propagation and Antennas" by George B. Welch. This new text bridges the gap between

The practical approach taken by Mr. Bennington, and the more advanced theoretical approach to the subject of radio wave propagation.

Merry Christmas and best wishes for 1959.
73, George.

SURPLUS [from page 65]

Setting	Function	Test Point	Adjustment	Note
1	Crystal Oscillator Plate	1	Max. Eye Closure	
2	Doubler Plate	2	Max. Eye Closure	
3	Receiver Mixer Grid		Max. Head-set Noise	
4	Receiver i-f		Max. Head-set Noise	
5	Oscillator Tank	5C	Max. Eye Closure	1
6	Doubler Plate	6	Max. Eye Closure	2
7	P. A. Plate		Max. Head-set Noise	

Note:

1. Several closure will be noted, but only the one nearest the pre-set setting will be correct. This should also be the maximum closure of the eye.
2. Adjust volume control so as to obtain sensitivity.

Fig. 3. Table of settings and test prod positions for adjustment of the BC-1335

at only a buck apiece. Available from the Office of Technical Services, Department of Commerce, Washington 25, D.C., they are "Schematic Manual for Surplus Electrical Equipment" Vol. I (No. PB-98487) and Vol. II (No. PB-99539).

KN6EEQ is looking for a TBS-8 transmitter conversion to go with the one that we did on the receiver in May '58 CQ. W2EEJ needs the BC-1136 manual, while James O'Mara of 449 W. 24th St., S. Boston 27, Mass. is looking for and RDZ conversion and handbook. Bob DeMattei, 918 Altos Oaks Drive, Los Altos, California wants a book on the RAL-7. Anyone who has figured out how to bring the I-177 tube esfer up to date should get in touch with W4BJC. Alan York, 35 Main Street, East Hampton, N.Y. needs the BC-620H and LM-7 books. Hugh Richards, Box 631, Ft Myers, Florida needs the BC-348-O data. K2OMQ is still looking for the T-91/VRC-4, R-114/VRC-4 and BC-609D books. W7GYO has an LM-13 frequency meter without any operating data, or even a schematic.

W3HK wrote in looking for the RTA-1B schematic or book. K5OFR wants the ARR-7 handbook. W9KLR is looking for a conversion of the BC-923A. W2YBT needs the TCS manual. W2BXE also needs an RDZ conversion. W3VAA has a Bendix MN-26C radio compass and would like to get in touch with anyone who has a book or a conversion on it. Any help on a BC-1306 would be appreciated by K2DG.

73, Ken, W2HDM

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BC-1335 TRANSCIVER

Two channel, crystal controlled, FM, 18 tubes! Output: 1.8 W. For fixed or mobile installation. Range: 5-10 miles. Built-in bracket type power supply operates from 6 or 12 **\$29.95**
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Same as above except freq. is 20.27.0 MC Excellent **\$6.95**

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110 VAC POWER SUPPLY: for above. Just plug in. No conversion needed. Brand New ... **\$11.95 In Kit Form ... \$7.95**

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T-19 TRANSMITTER: 3-4 MC. Excel. cond. **\$5.95**
T-20 TRANSMITTER: 4-5 MC. Excel. cond. **3.95**
T-21 TRANSMITTER: 5-6 MC. Excel. cond. **8.95**
R-25 MARINE RECEIVER: 1.5-3 MC. Excel. cond. **5.95**
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MD-7 MODULATOR: Excel. **8.95**

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For further information, check number 83 on page 124.



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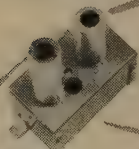
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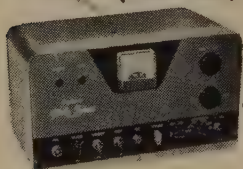
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W/T:

\$2195

Globe Scout 680A

**6-80M Xmtr.
65w CW, 50w AM, Plate Modulated**



Kit:

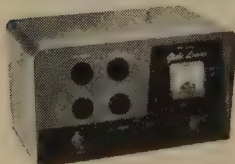
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W/T:

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The Scout Xmtr., housed in the Forward Look cabinet, TVI-shielded, is bandswitching 6-80M, with built-in power supply. High level modulation maintained. Pi-Net output on 10-80M; Link-Coupled on 6M, matching into low impedance beams. New type, wide view shielded meter. Kit completed with all parts, tubes, pre-punched chassis & detailed instructions.

Grounded Grid Linear Amplifier



**Complete with
Well-Filtered
Power Supply**

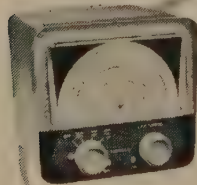
Kit:

\$9950

W/T:

\$12450

Capable of 200w input operated AM Class B linear. 300w DC input, or 420w P.E.P. input Class B SSB or DSB. 300w Class C for CW. Pi-Net output, 80-10M, matches loads 30-150 ohms. 52 Pi-Link coupled on 6M. Meter for monitoring final plate current also indicates approx. RF voltage. Extensively bypassed, shielded and filtered for TVI. New Forward Look.



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**Highest Output ...
Sideband Stability!**

W/T:

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Kit:

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Covers 10-160M, with output on 40 and 160M. Improved vernier dial drive with shock absorption; 13:1 tuning ratio. Voltage regulation. Approx. 50W RF output; will drive oscillator stage of any Xmtr. on market; plugs into Xtal. socket. Temperature compensated for stability for SSB or DSB. Calibrate switch for zero beating. New Forward Look.

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LETTERS [from page 12]

Prowlers

Dear sirs:

Yesterday morning at five AM we had a prowler in our neighborhood who, because there was a light on, chose my QTH as a likely spot to entertain himself. He tapped on the windows and when he awoke my mother, she went to the phone to call the police. Unfortunately he had cut the two telephone lines and we had no way of reaching the police. However, I thought of my rig downstairs and tuned the 40 meter band where I heard W2CDJ in QSO with a W8. I broke in and asked him to call the Staten Island police and to give them my QTH. He gladly phoned from Long Branch, N. J. Ten minutes later they were there and picked up a likely looking suspect. I never thought ham radio would ever be my only means of contact with the City of New York!

Matthew S. Gregoff, W2AOJ
Staten Island, N. Y.

Fibre-glass Grounds?

Dear Wayne:

Being a typical ham, I have the usual additional hobbies, i.e., photography, hi-fi, flying . . . and sport cars. The latter has recently posed a problem. How to mount a six-meter antenna on my fibre-glass Corvette body? (Look Ma, no ground-plane.) Any Suggestions?

Kent Mitchell, W3WTO/4
1374th M & C Squadron
Palm Beach AFB, Florida



W2SLA and K2VB1

RTTY [from page 67]

discriminator, and the circuit from the *RTTY Handbook*. (Page 68)

Dozens of polar relays and 1-A tape heads were distributed in a drawing. Also, K9ODR won a box of ten rolls of tape, W9HTV won a Model 10 reperforator, and WØBKV won one of Ben Woodruff's famous *Auto-Mate 26* automatic carriage return and line feed attachments for a Model 26 machine.

The dinner was a mob scene, but the food was excellent, and the door prize was a Model 15 donated by Ray Morrison, W9GRW. This was won by Dan Goldstein, K9IES, from Skokie, Illinois, of all places!

The program committee, George W9SPT, Ray W9GRW, Chuck W9THE, and Bob W9JBT, deserves a great big vote of thanks for putting on a real fine affair.

For further information, check number 43 on page 124.

100 • CQ • December, 1958

Things to Come

This month I had hoped to continue the story on autostart that I had started last month. Unfortunately, a business trip prevented the preparation of those details necessary in time to meet the deadline, so please tune in next month.

Also to be prepared are the stories on the W2JTP heterodyne exciter that uses silicon diodes for remote VFO as well as for fsk, and, of course, that long promised story on the W2JAV transistorized converter for polar relay operation.

Amateur Radioteletype Channels

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Seattle, Wash.	147.00	Mc.	AFSK on AM
Spokane, Wash.	147.15	Mc.	AFSK on AM
Minneapolis, Minn.	144.90	Mc.	AFSK on AM



Bart, W6OWP, adjusting his 40-meter mobile loading coil at the Provi antenna farm at Belmont, California

Comments

A recent trip to Israel brought your RTTY Editor in personal contact with Ely, 4X4AO, and Si, 4X4CL, the treasurer of the Israel Amateur Radio Club. Needless to say, a couple of RTTY Handbooks were left in their capable hands. Ham radio is not easy in Israel. There is almost no surplus, and what is imported is taxed, even if it is a gift. Some Model 15's were available on a "borrowed" basis, but these are set up for the European speed. So, as you can imagine, RTTY will not come easy, but remember—these 4x4's are real hams: they build.

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For further information, check number 44 on page 124.

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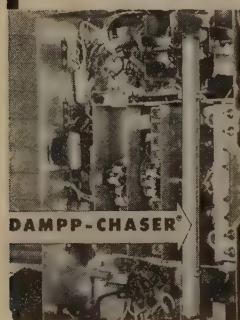
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If you would like to do a real favor to the next 4x4 you work, buy him a foreign subscription to *CQ*. (They can't send money out of the country for magazine subscriptions.) It will be really appreciated.

73, Byron, W2JTP

SEMICONDUCTORS [from page 71]

great guns with their UHF MESA transistors. The type 2N700 is a lo-noise high frequency amplifier with an f_{max} of 600 *mc* and a power gain of 12 *db* at 200 *mc*, with a 9 *db* noise figure. Maximum power is 50 *mw*. Another MESA, the 2N695, is an ultra high speed switch (sw. time in the order of 10 milli-microseconds) and has a similar frequency rating.

Technical literature is available from Motorola on their new line of Zener diodes which come in a 10 and 50 watt package, and are available for regulation points up to 200 volts. Types 10M10Z to 10M200Z are stud mounted types while the 50 watt package (50M10Z to 50M200Z) looks like a regular power transistor.

Philco and Montgomery Ward have jointly announced a unique hearing aid, containing the world's smallest transistors and weighing only one ounce! Featured in the Fall/Winter catalog, the hearing aid uses the Philco M-1 transistors, said to be the world's smallest. A dime size mercury battery will last about one week when used at a rate of 12 hours a day.

Dr. Alan M. Glover of RCA Semiconductor Division announced that RCA will manufacture silicon rectifiers. Developmental type TA-142 has a maximum forward current rating of 500 *ma* and a *piv* rating of 400 volts. Developmental type TA-143 handles the same amount of current but has a 500 volt peak inverse rating.

A photojunction cell, the 7224, is being marketed by RCA for use in movie projectors and computers. The cell employs a germanium *p-n* alloy junction and features fast rise and fall characteristics. The illumination sensitivity is 0.7 microampere per footcandle, and has a power dissipation of thirty *mw*. An additional type, the RCA-7223 is a head-on type designed for card and tape reading service.

Also new from RCA is the 2N591 for use in large signal class A *af* driver applications. The 2N591 can provide a power output of 5 *mw* with a total harmonic distortion of 3 per cent. At this power output, it has a power gain of 41 *db*. For more data on any of these RCA devices, write: RCA, Semiconductor Div., Somerville, N. J.

Sylvania Electric has added the 2N557 (med. I Sw.), 2N576 (high I Sw.), 2N556 (25 volt, NPN sw.), 2N587 (40 volt, NPN sw.), 2N544 (18 volt *rf* drift), 2N515 (18 volt NPN, 455 kc.), and 2N516 transistors to their renewal line.

Texas Instruments is manufacturing the in-

dustry's highest voltage germanium power transistor. The 2N1022 has a maximum of 120 volt operating voltage and 80 watts dissipation at 25° C.

Another TI device of note is the 2N1046. This unit is a diffused base germanium transistor providing 15 watts of dissipation and a typical 12 mc alpha cutoff frequency.

73, Don, W61NS

NOVICE [from page 77]

WAS is invited to look for him on 40, after 1:00 AM.

Richard W. Randall, KN1GCX, 43A University Hgts., Burlington, Vermont, represents one of the rarer states. He is dishing out 40 and 15 meter contacts with a Heath AT-1 and an SX-42. By the way, Dick brewed up his own QSL cards. Nice job, OM.

Joe Hester, 142 Blossom Drive, San Antonio, Texas, is on the air with 10 watts and an S-40 receiver. He has worked 31 states and WH6, but would like skeds with Ark., S. Carolina, Md., and Del. Joe likes to write and wants lots of letters.

Cliff McCreery, K6TUZ, 9523 Longden, Temple City, California, would like to hear from other hams interested in playing chess. No such invitations will go unanswered so please contact him by mail.

Dick, KN0MOL, Green Island, Iowa, needs Nevada, Idaho, Wyoming, and Vermont to complete his WAS, he will sked anyone needing Iowa. Dick works 40 and 15 meters with a Knight rig and a Hallicrafters S-85.

Robert F. Koch, KN8KFK, Kincaid, W. Va., has been a ham for four months, and has racked up 36 states and 4 countries. Bob would like to have the Novices in Nevada, Mont., N. and S. Dakota keep an ear peeled for him. Because time is limited, Bob cannot keep skeds very well.

Dick Milligan, KN5RCG, 315 Axtell, Clovis, N. M., has worked "Ivor," in addition to HL9KT (Pete) in Korea with a Knight 50 watter. Dick would like to locate a converter for the 30-50 mc range to feed into his HQ-150.

Kathy Ladd, KN0OWS, 111 N. 41st St., Omaha 31, Nebr., wonders why there aren't more YL's represented in the column. Maybe they don't operate much, for Kathy has never contacted any on the air either. Her rig is a Viking Ranger and an HQ-129X. She works both 40 and 15 meters and will make skeds with anyone if they write.

John Truebenbach, KN9JMQ, Gillett, Wisconsin, sure gets out to the N.E. He has picked off G3, GM2, CM2 and WL7 using an SX-24 and a Globe Chief loaded to 75 watts.

Kenneth Wright, WV2CAX, 165 Sherwood Place, Englewood, New Jersey, would like to get into a net. He runs a Globe Scout 65-B and an S-38C to a folded dipole about 30 feet above the ground. Look for him on 40 and

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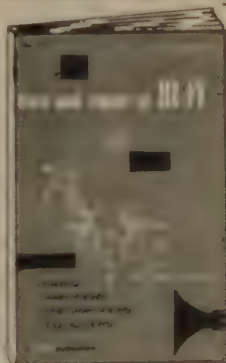
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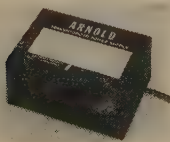
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15 meters.

Can you beat this? By mistake, the FCC sent Dick, KN5QKK, 813 Mulberry Avenue, Ardmore, Oklahoma, a conditional ticket. Dick sent it back and finally received the Novice license that he had been expecting. Now he is operating on the 40 and 15 meter bands, and has totaled up 30 states in 102 contacts. By the way, Dick, I believe it is ok to use RC-59 U on the WoSAL "Demi Quad".

Jim Simmons, W7EZN, Box 7, Gabbs, Nevada, is providing this elusive state for the Novices. He says that 30% of his contacts provide the first Nevada or 48th State. When writing for skeds, make it a week in advance for the mail delivery is slow.

Paul Sandels, KN7EMO, 1415 Sheridan St., Laramie, Wyoming, is a railroader and finds it difficult to make definite skeds. But whenever he is home he operates 15 meters with a DX-40 and SX-99 to a 3 el. beam. Paul needs Vt., Nev., and N. Dak. for WAS.

Bill Dobbs, Jr., 2410 East 13th Street, Chattanooga 4, Tenn., sends along a picture of his Novice "Dream Beam." What's the chances of an article for CQ, Bill?

Fritz Mulhauser, WV WA6AYC, 424 West 11th St., Claremont, California, has no use for the lower frequencies and thinks the Novice on two meters is vastly superior technically. Fritz whacks away at the DX with a homebrew rig using an 829B, with 75 watts input. The hearing aid is an SX-71 and crystal controlled converter to a ground plane antenna, 40 feet in the air. By the way, Fritz, your letter is the first ever received from a Novice who had brewed his two meter station.

That brings us down to the back of the file this month men (and ladies). I sure ran way over on pages, but maybe the editor will go light with the scissors since this is two months in one. Oh, yes, let me be the first to wish you a very Merry Christmas and a happy New Year.

73, Don, W6TNS

SCRATCHI [from page 16]

mitter. No. What starting discushun are fifty cent contribution club are making to local community chess.

That are reel harev sesshun. Having moshuns to not donating to anything, moshuns to ampingdun constitushun—even having moshun to not having any more moshuns. No moshun getting seconded, on acct. not enuf members there to doing any seconding. When things settling down are seven moshuns standing, and three others flat on there back on Hon. Floor.

Next item old busyness. One amchoor jumping up and saying we still not voting to changing brand of coffee we having for refreshments after meeting, and he feeling should buying brand made locally. Then having moshun we serving tee and not coffee, then moshun to

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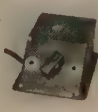
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BC-1312-342 Receiver — 15 to 18 MC	Used: 79.50
BC-733 Rec — 108-110 MC — Used	\$9.95 — No tubes: 4.95
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For further information, check number 52 on page 124.

serving tee and coffee, then moshun to having tee only, then finely moshun to tabling hole subject until next meeting. Never did finding out why local coffee so much better, but Scratchi thinking amchoor having part intrust in local coffee company.

After old busyness comes new busyness. Only one item being brought up. Amchoor wanting club to riting to FCC to inasking that amchoor getting raw deel when moving in Hon. State, on aect. he having to-letter call before and now he not getting to-letter call after moving. A never finding out how or what happening, on aect. this when Scratchi are going home.

So, Hon. Ed., here are my problem. I knowing that these kind meetings are reel eggsepshun and that most amchoor clubs doing reel good, peechy l c job. So, howcomes our club having trouble? I thinking maybes something rong with our Hon. Constitushun, and are going to sending copy, only Hon. Historian only man having copies and we not having Hon. Historian for cupple yeers now, so can't sending you copy.

Please sending air-male post-hasty and telling us how we can curing club problems. Maybe better sending speshul delivery to, on aect. next meeting are eieckshun of officers and wanting to have peeplees in club enuf to filling all posts and if not getting help soon I being only man left and are not having time to being Prexy, Secretary, Treasurer, and Historian rolling into one.

Respectively yours
Hashafisti Scratchi

PEI [from page 45]

CE3CU. His fleapower 2.8 watts was S9. I vainly hoped for a summer surprise on 15 and settled for a raft of Europeans. QSB was always severe on this band and the added speech clipping on the Apache lifted the signal right through and thus provided 100% QSO's.

Fifteen and 20 were fairly good and vigil was kept for a good 10-meter opening along for a break on 6. Short skip on 20 resulted in contacts with fellow DXpeditioners FP8AO and FP8AV on St. Pierre 300 miles to the east. They listened for my 6-meter transmission but did not hear me.

When I worked WIFFO on 20 he asked if I might be on 15 later on. He needed PEI on a band other than 20 and a quick check of 15 showed that it was open to New England. A quick QSY resulted in Ted's WAVE and this called for a QSL dispatched on the spot. Within seconds I was back on 20 to unscramble those who patiently waited.

Visitors and guest operators at Tea Hill were VE1ACL, VE1PE and VE1ZM. On the last evening VE1BZ, the governor of Prince Edward Island, paid a surprise visit and tuned the Mohawk on SSB. He is an avid SSB fan and

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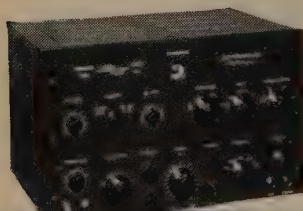
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CHRISTMAS PRESENTS

When are you actually going to start learning something about radio? We've left out all the unnecessary stuff and concentrated on those books that are really top notch for hams. Beginners should have #11-13-23-24. The next step is #21-22-28-32. #16 will help make QSO's a lot more interesting. #1-2-5-25 are important for developing your technical education and giving you a good reference library. #9 will help you get a commercial license.

- 13 **Reference Data, 4th Edition**
The IT&T handbook, 1152 pages. Data, data. \$6.00
- 16 **Ham Register by W3VKD**
Inside scoop on over 10,000 hams. These are the fellows you hear on the air every day.\$5.00
- 20 **RTTY Handbook by W2JTP**
A-Z of ham teletype, supply low, very popular. \$3.00
- 21 **VHF Handbook by W6QKI**
Covers just about every aspect of VHF.\$2.95
- 22 **Beam Antenna Handbook by W6SAI**
Practical, includes both theory and construction. \$2.70
- 23 **Novice Handbook by W6TNS**
Receiver, transmitter and antenna theory and construction for the Novice and Technician. Terrific.\$2.85
- 24 **Better Shortwave Reception by W6SAI**
Fine handbook for SWL'ing, long needed.\$2.85
- 25 **Mathematics for Electricians & Radiomen by Cooke**
The standard text book in this field \$5.50
- 26 **Surplus Radio Conversion Manual I**
BC-221, 342, 312, 348, 412, 645, 946, 1068A. SCR-274, 522. TBY, PE-103, etc.\$2.50
- 27 **Surplus Radio Conversion Manual II**
BC-454-459 Xmtr-Rcvrs; APS-13; ARC-5 VHF Xmtr-Rcvrs. BC-357, 946B, 375; TA-12B; ART-13; AVT-112A; GO-9; LM; etc.\$2.50
- 28 **Television Interference by Rand**
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- 29 **QSL Album for WAS by Hanover Products**
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- 30 **Miniature Call Letter License Plate**
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- 32 **RCA Radiotron Designers Handbook**
1500 pages—fabulous\$7.50
- 33 **Wave Propagation & Antennas**
As described and recommended by George Jacobs in the Propagation Column of CQ.\$5.75
- 34 **CQ's New Mobile Handbook by W6SAI**
Contains information not available elsewhere that is invaluable to mobile operators . . . adjustment of the regulators, etc. Dozens of rigs, converters, etc. \$2.95
- 35 **Command Sets by CQ**
Reprints of all of the conversions of the popular command sets out of the past years in CQ. Want to get real value out of your BC-454-2-6-7-8-9? . . . \$1.50
- 36 **Call Letter Cast Aluminum Auto Plates**
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- 38 **25 Reply Paid QSL's**
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- 39 **CQ's New Sideband Handbook by W6TNS**
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OK fellas, send me postpaid the items circled, and get a move on. See Nov. Issue for complete list.

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suggested an SSB DXpedition next time.

The final tally of 5½ days of actual operation totals 492 contacts excluding about 20 repeats. These include 45 states and 38 countries.

Power input was usually 140 watts on phone and 160 watts on CW.

The governor's invitation to visit Government House was accepted and a tour of his mansion and up-to-date SSB station was a high point for the WIQMS clan. The photo shows the governor almost under the Saturn 6 Halo. This antenna caused quite a sensation whenever I drove anywhere on the island.

The aftermath is always the huge job of QSLing and as I read each card I realized that the final touch of a QSO is the return QSL. The added comments TNX FR PEI, LAST CRD FR WAVE, PSE QSL FR WAVE etc. all show how much PEI is still needed and appreciated. (If I slipped on a QSL . . . or you didn't get it . . . let me know and I'll send another.)

I also learned from W1's that W6's and W7's called me frantically on 15. One way skip? I needed Idaho and Montana so badly! Of course I'll go back and complete my WAS from PEI.

A hearty thanks to all who helped make PEI-1958 possible. To W4KVV and W9BRD for the publicity, to W8MWZ of Heath, to WIAWZ of Cushcraft who supplied the station and antenna respectively. Thanks also to W1MIJ for technical assistance and to W1USL and K2IRD for phone patches. ■

PINK TICKET [from page 42]

is properly adjusted and adjust the slug-tuned coil in the indicating unit. Be sure to adjust the coil in the band that corresponds to the one the transmitter is tuned up on. Adjust this coil until the indicating lamp lights the brightest. This same procedure is followed for every band. If the lamp lights too bright, move the link further away from the final tank coil. If it does not light or is too dim, the link will have to be moved closer. The resonant circuits are broad and will cover the entire band once they are tuned up. It is therefore best to align these coils close to the middle of the band.

Once this unit is tuned up and operating, it is left coupled to the transmitter at all times. The next time that you go on the air and tune up in a hurry, one glance at the indicator will tell you if you are tuned up on the right band. ■

CROSS SIX [from page 43]

when west coast and mid-west signals were the only ones audible on six meters—no east coast at all! When these western gentlemen came in they came in with a bang. The strongest signals I have heard on six has been from stations like W5PDE, 5SFW, 5VY, 7ACD, 7JRG

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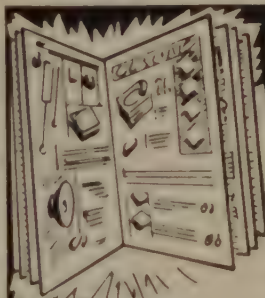
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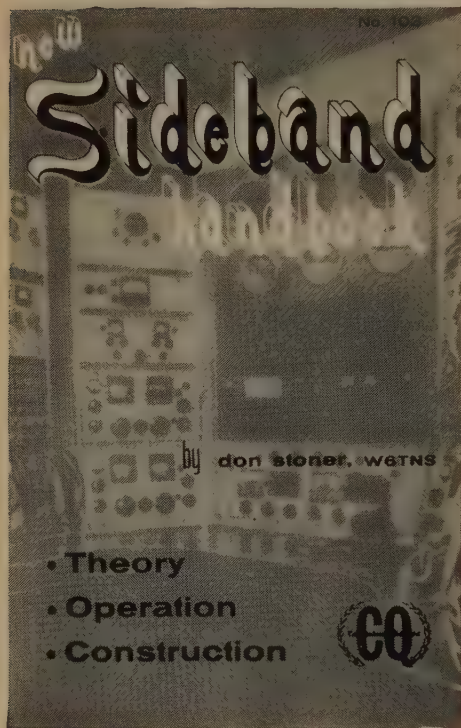
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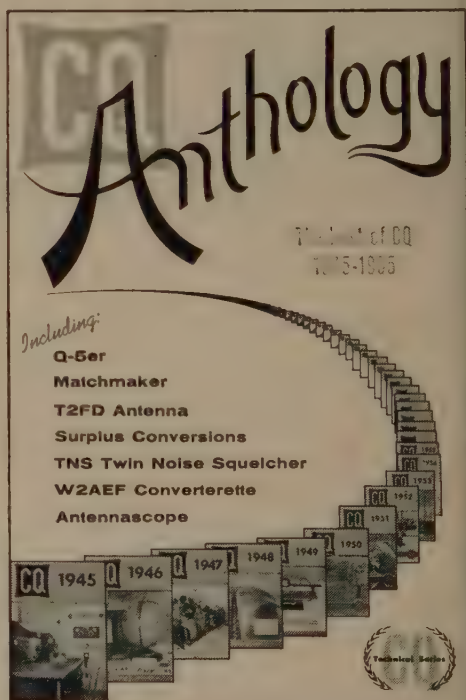
SIDEBAND HANDBOOK

Well, we've done it again. We've got a brand new Sideband Handbook on the presses. Everything in this book is new. All of the dozens of construction articles were written specially for this book. There are absolutely NO reprints of any information that has appeared in CQ or anywhere else. This book is new from cover to cover. Written by Don Stoner, W6TNS, Novice and Semiconductor Editor of CQ, as well as author of the best selling Novice & Technician Handbook was almost one full year in the preparation of this terrific volume. This is *not* a technical book. It explains sideband briefly and then spends most of the time on showing you how to get along with it . . . how to keep your rig working right . . . how to know when it isn't . . . and lots of how to build-it stuff, gadgets, receiving adaptors, excitors, amplifiers . . .

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Down through the years CQ has had the honor of being there first with just about every major discovery in the amateur radio field. Unfortunately most amateurs do not have a good file of back issues of CQ to fall back on when they are interested in building up something or in improving their equipment. So we've looked back through the years 1945-1955 and assembled all in one place the articles that have made a lasting stir. The issues containing most of these articles have long ago been sold out and are unavailable. The price is a paltry \$2.00.



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C-12

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and 9DSP. Some days the band shut at dusk, other days it did not open until dusk whilst often it stayed open a couple of hours after nightfall. Earliest reception of six meters was recorded at 1215 GMT-WIGKE and the latest at 1800 GMT-W8CMS.

Just before Christmas the GPO (British licensing authority) announced the granting of special limited permits for transmission on 52.5 mc. Unfortunately in all but a few remote areas, operation was restricted to non TV hours—0001-0930 GMT. With 50 mc slap in the TV band such restrictions were hardly surprising. It was immediately suggested to the authorities that another normally non-TV period 1300-1400 GMT might be made available as trans-Atlantic contacts seemed completely ruled out during the 0001-0930 period. Permission was not granted and thus no operation on the 52.5 mc band was entertained—the return for the effort involved seemed rather negligible. MP4BBL (Bahrein) and ZC41P (Cyprus) might well have provided cross-band QSO's but that seemed about the only possibility in the 0001-0930 period. Incidentally, both these fellows were fully prepared for six to ten cross-band with W and VE but they did not hear any signals. They have both made regular cross-band contacts with VQ2, ZE and ZS via trans-equatorial scatter.

The tabulation gives an idea of what was worked and heard day by day at G2DPY, G3FXB and SWL Whittington. To those who claim in vain—our apologies. 28mc was invariably open but such was not the case with six meters. When six was open things were hectic and it must not be forgotten that quite often the problem was TV video QRM. Unfortunately the beam bearing for the USA coincided with that for the local TV channel!

"CQ Cross Band Six-meters" has been good fun. Let us hope that by the time this appears in print we shall have enjoyed some Fall openings on six meters.

- Worked and Heard Six to Ten Meters Cross-band
- 27 Oct. 57. G3FXB worked K2ISP K2IZV K2MYQ K2TYG W4HVV.
 - 1 Nov. 57. G3FXB worked VE1ZR K1AHH W1FCP WIGKE W1HOY K2CBA W2RGV W8CMS W4HNT
 - 2 Nov. 57. G3FXB worked W1JAT W1QIG W1UAR K2MNB W2ALL W3HPY.
 - 1 Nov. 57. G3FXB worked W1GKE W1QXX K2LTW W4UCH W5VY W8SSD.
 - 5 Nov. 57. G2DPY worked K1BIL W1DEI W1FGY W1GKE W1GKJ W1HOY K2CEH W3PMG. G2DPY heard W1HDQ K2PHN W3CAU W3IUU W3PMG W5FXN W5PMG. G3FXB worked W1IGP W1UVB K2CEH K2PPC W2ADA W5SEW.
 - 6 Nov. 57. G2DPY worked VE1HT VE3AGU K1AAA K1BWX W1DYQ W1GKE W1HO W1UVB K2PPC W3IUU W4UCH K8ACC.
 - 7-10 Nov. 57. No openings.
 - 11 Nov. 57. G2DPY heard VE1PQ W3QOF.
 - 12 Nov. 57. G2DPY heard W1HOY.
 - 13 Nov. 57. G2DPY heard W1QCC/VE1. G3FXB worked W1QCC/VE1 W1HOY W1LGE.
 - 17 Nov. 57. G3FXB worked W1QCC/VE1 W1ZGW. Heard W5PDE.
 - 19 Nov. 57. G2DPY worked W1ITP W1WHI K2MGN

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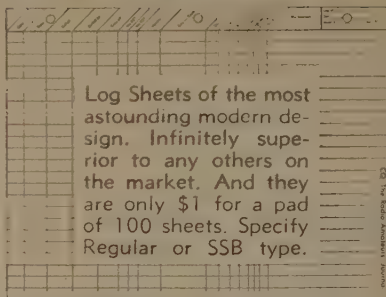
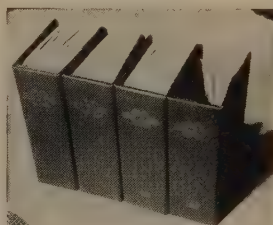


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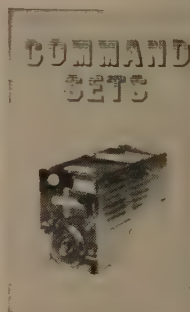
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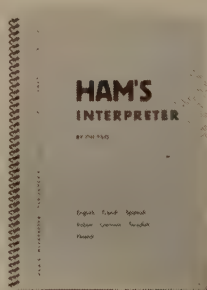
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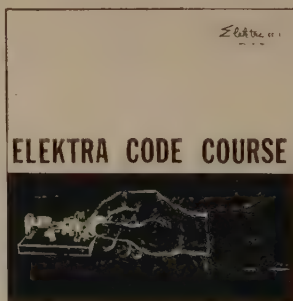
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20 Nov. 57. G2DPY worked WIHOY W4UCH W8CMS W8HXT. G3FEB heard K5DXJ W5AJG W8HXA W5JXU K6HMK W6HAZ W6UOV K8RGW W8IC.
21 Nov. 57. G3FEB worked K0HLD W0HIL W0IC W0ZJB.
22 Nov. 57. G3FEB worked W9DSP.
29 Nov. 57. G2DPY worked W1HLJ W1CSG K2LXI K2LXI 3 W5VY K8ACK K8HDK. Heard W1GRT W1HDQ W1ZOB K2LOY K4CYZ W4HHV.
30 Nov. 57. G2DPY worked K1HWX W1ZOB. Heard K5ABW W5CVW K7ANW K8HDK.
1 Dec. 57. G2DPY worked K1HFK W1GKJ W1LUN W1RJA W2BYN W4UCH W8CMS.
3 Dec. 57. G2DPY worked K1HFK K1HIL W1MB. Heard W1QCC VE1 W4HHK W5AJG.
4 Dec. 57. G3FEB heard W1QCC VE1 K4ILL K4JGO W4HHK W5FDB W5PHS.
5 Dec. 57. G2DPY worked W1QCC VE1.
7 Dec. 57. G2DPY worked W1QCC VE1. Heard VE1PQ W6NLZ. G3FEB worked W8CMS W8HXT. Heard XE1WL W1QCC VE1 K1HWX W1CLH W1DEI W1GKE WIHOY W1ZAW K2CEH K2TYG W2LOY W2UTH W2YYI W3EGR W3GLL W3SQU.
8 Dec. 57. G2DPY worked K1HWX W1GKE W1ZAW W3GXL W4UCH W5SQU. Heard W1QCC VE1 W2JTE W2RGV W2UTH W3VMY W7JLV. G3FEB worked K1HFK K1DBJ W1GKJ W1FCF WIHOY K2MYQ W1JQY W4UCH Heard VE1EF W1QCC VE1 W8HXT.
9 Dec. 57. G2DPY worked K1HIL W1GKJ WIHOY K2LW W4UCH W8HXT.
10 Dec. 57. G2DPY heard VE1ZR W8CMS.
11 Dec. 57. G2DPY worked VE1HB W9QUV W0DNW W0YNP. Heard W0QWT K0HND K0KAO W0CKQ G3FEB worked K0KAO W0GOW.
21 Dec. 57. G2DPY worked W4AYV.
25 Dec. 57. G2DPY worked W8CMS.
26 Dec. 57. G2DPY heard W1QCC VE1.
27 Dec. 57. G2DPY worked K2CBA W4UCH W8CMS W8HXT W9DSP W9QUV. Heard W1LUN W2YO W4AYV W4LAP W8HIL K8NGI W9HGE Q0DNW G3FEB worked W1FCF K2ITQ K2YCB W4UCH W8CMS W8ESZ W8HAT W8HGE. Heard K9KGI.
28 Dec. 57. G2DPY worked W1KHL W1LUN W8VIR W8CMS W8RLT W8AZT W0DNW W0RQK. Heard W1QCC VE1 W5SPW W6NLZ W1JRG W8HJS W0SMJ G3FEB K1BWV W1GEP K2CEH K2ITQ K2XP W2LCB W2UTH W3VAM W8RLT W8SAH K0GQG W0DNW.
29 Dec. 57. G2DPY worked W1HXT K2YWO W2LOY W3GXL. Heard W6NLZ. G3FEB worked K1AFT W1FOS W1GKE K2DZM W2LOY W2ZKE W8EGR W5VY W8CMS W8HRV. Heard W1JRG.
30/31 Dec. 57. No opening.
1 Jan. 58. G2DPY worked W1CLS W1GKE W2YYI W4UCH.
2 Jan. 58. G2DPY worked W1FCF WIHOY K2ITP K2ITQ W3CCC. Heard W0NW. G3FEB worked W1PX K2ITP W2LCB W4KK. Heard K2JKA.
3 Jan. 58. G2DPY heard W4TRE. G3FEB heard K4PIY W4TRE W5AJG W5KPZ.
4 Jan. 58. G2DPY worked W4IUI W4LNB W6MJD W5VY W7RUX W8PJ W0GMM. Heard W6NLZ W8TMI W7EGG W1JRG K0GQG W0HND W0YZV. G3FEB worked W6VY W7RUX W9DSP W0CNM W0DMW W0TJF. Heard K6PVH W6NLZ.
5 Jan. 58. G3FEB worked W1UVB.
6/12 Jan 58. No openings.
13 Jan 58. G3FEB worked W5VY.
14 Jan. 58. G3FEB worked W8CMS W9DSP.
15 Jan. 58. G3FEB worked K2VIX K2ZOB/2 K2ZXH. Heard by SWL John Whittington between 14 November and 19 December, 1957.
VE1HT VE1OD VE1QY VE1WL VE1ZR W1QCC/VE1 VE3CRA/3 K1BWV W1AZK W1CLS W1DEI W1FOS W1GKE WIHOY W1GP W1LFB W1TQZ W1ZAW K2ITP K2ITQ K2PPC W2JTE W2LCB W2YYI W3KMW W3TNP K4IVD K4JMF K4MBM K4PIY W4HHK W4KK W4TDW W4UCH W4ZXI K5DXJ K5EPR K5GHK W5AJG W5EMT W5SFW W5VY W8CMS W8HXT K0EJZ W0PPP/0 W0ZJB.

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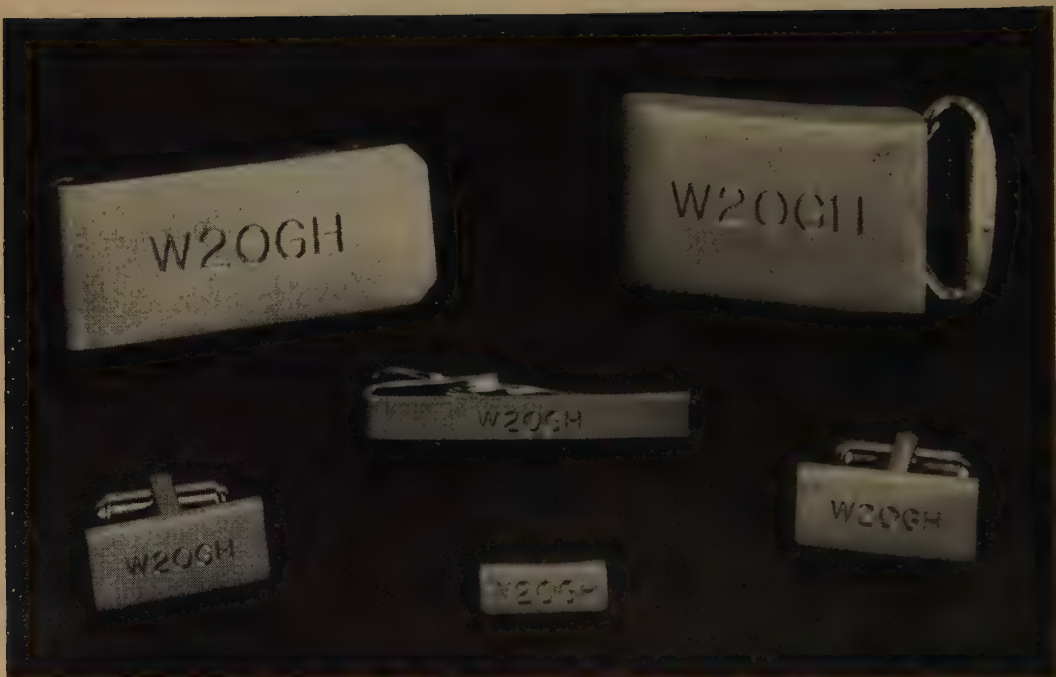
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CQ-12

DOWN-SPOUT [from page 27]

Since these rings were placed at the 20- and 30-foot levels, and anchored by the metal screws, the previously soldered joints at these levels were further strengthened.

In guying, Dick used plastic covered nylon clothesline. Small egg-shaped insulators were used at the top and at the bottom of each of the guy ropes. ■

PATCHMASTER [from page 35]

tion, the LINE switch off, the TALK RADIO switch to Talk and tune in a signal on your receiver, preferably WWV or a broadcast station. Temporarily connect a speaker to the output terminals of the receiver and adjust the receiver for normal listening volume. Connect the receiver to the Patchmaster and adjust R5 for normal listening volume with the speaker connected to the Patchmaster. This adjustment should be made with R10 set at mid-position. Turn R9 clockwise about ten percent, speak into the microphone at a normal speaking volume and adjust R2 for proper modulation of the transmitter.

Call your friend across town again, and with the Talk Line and the Talk Radio switches to Talk and the Line switch to On, adjust R7 until the audio from the receiver causes the audio level meter to swing to half scale. This should provide your friend with comfortable listening volume from your receiver. Turn the receiver's audio gain control down for the next adjustment. With your friend talking at normal level, adjust R3 for proper modulation of the transmitter. This completes the rough adjustment of the patchmaster and final touch-ups can be made as you familiarize yourself with it's operation.

Operation of the Patchmaster

For normal operation of the station transmitter and receiver without connection to the telephone line, the Talk Radio switch should be thrown to Talk, the Talk Line switch off, and the Line switch off. R10, the front panel Speaker Volume control should be set to mid-position. Normal operation is obtained thru the amplifiers in the Patchmaster. Adjustment of loudspeaker or earphone level from the established normal may be accomplished by varying R-10.

To complete a phone patch for a party on the radio, throw the Talk Radio switch to off after requesting the radio party to stand by, and throw the Talk Line switch to Talk and the Line switch to On. After receiving dial tone, dial the number of the desired party. When you have ascertained that the right party is on the line, throw the Talk Radio switch to Talk and allow the radio party to talk to the telephone party.

[Continued on page 117]

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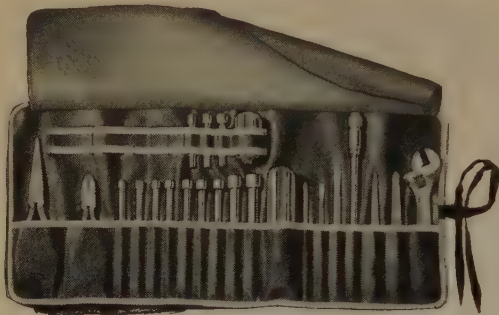
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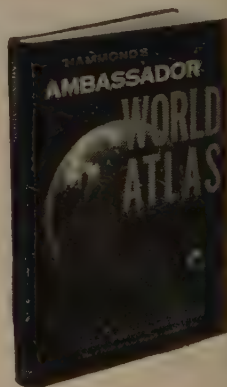
full size long nose pliers and diagonal cutters; a full set of nut drivers (size 6 thru 12-14-16) in the regular size and 8-10-12 in the stubby size; small and medium screwdrivers; Phillips screwdriver; two sizes of reamers, a 6" extension blade for any of the screwdrivers or nutdrivers; a 6" Crescent wrench; a regular and stubby handle and a roll kit with a compartment for each tool. All tools are of the finest grade highly polished Nickel Chrome finish.

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PATCH [from page 115]

It is a good idea to have a switch on the station microphone so that room noises in the operating room may be cut off and not transmitted to either the radio party or the telephone party. Adjust the receiver gain control so that the audio level meter swings to half scale when the radio party is talking, and adjust the Receive Level control to properly modulate the transmitter when the telephone party is talking.

The Speaker Volume control can be adjusted to provide a comfortable monitoring level from the station loudspeaker. If the various controls in the Patchmaster are adjusted correctly, very little adjustment will be needed from the front panel controls.

Whenever the patchmaster is being used or adjusted, it is very important that no telephone receiver be "off hook" on your line, as this will upset the hybrid balance.

Conclusion

The patchmaster is really more of a "station master control" than a phone patch, and the more it is used, the more it will be liked. This has proved to be the case with the Patchmaster which has been in constant use on 15 and 20 meter SSB with an HT-32 and 75A-4 at W6HSB W6HTS.

There are many modifications and simplifications that can be made to this basic circuit. The audio power amplifier V5 and associated components may be excluded if the receiver audio circuit is broken immediately following the audio gain control, output being taken from the receiver at this point. Audio output from the Patchmaster is then taken from the center connection of R10 and fed directly to the receiver audio amplifier input. The AGC circuit may be left out if loudspeaker operation is not desired during a phone patch. The dial may be left out if all outgoing calls are first made with a regular telephone.

It is felt, however, that the circuit as shown is applicable to any SSB installation, and for that reason was presented this way. ■

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160 M Mobile Rig, W8HAW	May	38
Removable Mobile Rack, K6ELE	May	40
AF-67 Meter Light, W4AWN	May	40
Transistor Pwr. Sup. W1MCA	May	42
KW Amp in Antenna, W6EI	May	44
CQ Staff Goes Mobile, W2NSD	May	114
Converterettes—Transistorized, W6TNS	May	57
Voice Break-in, W5SUC	June	38
Squelch for 92s, W3HTF	June	51
10W Modulator, W6QLV/F	July	79
Vox-Box Report, W2NSD	Aug.	43
12V Xmtr-Converter, W8HJN/6	Aug.	56
Converterettes—Printed CKT, W4UHN	Aug.	52
Mobile Speech Compressor, W5SUC	Sept.	28
G.G. Mike Preamps, W5SUC	Sept.	30
Modernizing T-17 Mike, W6QLV/F	Sept.	35
Converterettes—Transistorized, W6TNS	Sept.	71
Mobiling, W0WET	Oct.	31
Quick Noise Limiter, W2UQB	Oct.	39
All Band Mobile, W5THI	Oct.	45
VOX-Break, K2ECY	Oct.	47
Vox for Mobile, K6ESZ	Oct.	56
500 V Mobile Supply, W3LMC	Nov.	104
G.G. Mike Preamps, W5SUC	Nov.	105

Phone Patches

Applied Hybrid Husbandry, W5KMH	Sept.	36
Macy's Special, W6QID	Oct.	42
Patchmaster, W6GDO	Dec.	32

Power Supply

Simple Portable Supply, W6RIJ/7	Jan.	57
Short Duty Cycle Supply, W6EHY	Feb.	38
New Look in DC—DC Conversion, W2UQB	Mar.	36
Xstr Mobile Supplies, W6TNS	Mar.	75
Xstr Mobile Supplies, W1MCA	May	42
30 & 120 W Xstr Supplies, W6TNS	June	65
Mercury Rect. Tests, W6JAT	Oct.	54
DC—DC Xstr, W6TNS	Oct.	61
500 Volt Mobile Supply, W3LMC	Nov.	104
Rect. P.S. For Small Xmtrs., W6BLZ	Dec.	39

Radar

Radar Speed Meter Receiver, W6TNS	Jan.	27
More Info on Receiver, W6TNS	May	104

Receiver

Radar Speed Meter Receiver, W6TNS	Jan.	27
Noise Clipper-Filter, W6AJF	Jan.	30
Folded Line Cavity (6M), W1LIU	Jan.	32
HQ-100 Tested, W2HDM	Jan.	46
Front End for 1215 mc, W10OP-W1WID	Jan.	48
Command Twins 455/453, DL3AO	Feb.	46
Better Audio for 10c, W2WLR	Feb.	115
Easy Squelch, K4GOM	Apr.	33
Converterettes: Transistorized, W6TNS	May.	57
Squelch for 92c, W3HTF	June.	51
Four Tube Regen, W5DF	July.	56
Simple Tuning Indicator, W6QLV/F	July.	80
Cave Drift for 15c, W5DF	Aug.	40
Auto Call from BC-357, W8YVD	Aug.	49
Printed CKT Converterette, W4UHN	Aug.	52
Super Pro for SSB, W3JHR	Sept.	52
Converterettes: Transistorized, W6TNS	Sept.	71
Tunable Audio Filter, W9AEL	Oct.	40
B-C & Sputnik on NC-300, K2IKZ	Oct.	94
Four Tube Regen, W5DF	Nov.	38
10 Tube Super, W0EXC	Nov.	84
"AC" Call for HRO 50T1, V6AWT	Nov.	128
Self-Monitoring, W2WLR	Nov.	73
Adjusting Mixer Trimmers, W0EXC	Nov.	83

RTTY

Tone Generator, W2JAY	Feb.	80
Reversal Generator, K2DHE	Mar.	41
Diode Shifter, W2JTP	Mar.	85
RTTY Converter, W2JTP	Apr.	42
Polar Relay Tester, W2JTP	Apr.	75
I.F. Converter, W2JTP	May.	61
Transistorized Converter, W2JAY	June.	74
Tuning Indicator, W2JTP	July.	62
Zero Bias or Distortion Gen., W2JTP	Aug.	86
T-D Keyer, W2JAY	Oct.	62
Teletype Without Tears, W4TJU	Dec.	36

Sideband

Short Duty Cycle P.S., W6EHY	Feb.	30
Half Gallon Linear, W6COU	Mar.	28
VHF SSB, W3YHI	Mar.	30
Modulating DSB Xmr, K2GZT	Mar.	32
Class C to AB-1, W6BL	Mar.	42
Visual Monitoring, W8QNW	Mar.	44
SSB Exciter, W6BLZ	Mar.	46
Old Timer Regeneration, W2WK	Aug.	47
4CX1000A Linear Amp., W6HHN	Nov.	92

Six Meters

Black Widow Xmr-Recvr., W6TNS	Jan.	28
Folded Line Cavity, W1LIU	Jan.	32
Band-opper, Xmr-Rec. W0EXN	Feb.	52
Bandhopper Correction, W0EXN	May.	96
Collins 32V on 6M, W8FA	Apr.	28
6M KW Amp., W1FZJ	Apr.	66
Ground Plane, K8BYQ	July.	40
Transistor Receiver, W6TNS	July.	64
(Correction), W6TNS	Sept.	71
BC-603 on 6M, W2HDM	Sept.	76
Sixing the AF-67, K4ELB	Oct.	38
6A8 Driver, W2IHW	Oct.	49
CQ Crossband, G3FXB	Dec.	43

Sport Cars

Shell Economy Run, K2VBI	May.	116
CQ Staff Goes Mobile, W2NSD	May.	114
"Ohio 24" Report, W8FEM	Aug.	26

Surplus

Equipment Designation code, W2HDM	Jan.	65
Command Twins 455/453, DL3AO	Feb.	46
What's Available, W2HDM	Feb.	86
15W & 120 W Modulator, W2HDM	Mar.	58
AN/CRC-7 Conversion, W2HDM	Apr.	83
TBS, W2HDM	May.	53
ARC-5 to SSB Linear Amp., W2HDM	May.	54
ARB, W2HDM	June.	68
AS-89 Antenna Can-6M Vert., K8BYQ	July.	40
TBX-8 Conversion, W2HDM	July.	85
TBX-8 Xmr-Rec. Diag., W2HDM	Sept.	78
BC-357 into Ham Alarm, W8YVD	Aug.	49
ID-60/APG-15, W2HDM	Aug.	70
T-17 Modernized, W6QLV/F	Sept.	35
Super Pro for SSB, W3JHR	Sept.	52
BC-603, W2HDM	Sept.	74
BC-603, W2HDM	Oct.	87

Transistors

Mobile Modulator, W6TNS	Jan.	61
Audio Freq. Meter, W1JAV	Jan.	72
Flea Powered Xmr, VE3TA	Feb.	59

10M Pocket-Talkie, W6TNS	Feb.	59
100:1 Freq. Divider, W6TNS	Feb.	59
Tone Generator (RTTY), W2JAY	Feb.	85
DC-DC Power Conversion, W2UQB	Mar.	36
150 W. Portable, W6EI	Mar.	38
Mobile Supplies, W6TNS	Mar.	75
Keying Monitor, K6TIZ	Apr.	41
Mike Preamp., W6TNS	Apr.	78
Power Supplies, W1MCA	May.	42
Converterette, W6TNS	May.	57
30 W Power Supply, W6TNS	June.	65
120 W Power Supply, W6TNS	June.	65
6M Receivers, W6TNS	July.	64 & Sept.
Audio Osc., W6TNS	Aug.	66
Crystal Osc., W6TNS	Aug.	66
VFO, W6TNS	Aug.	67
Der Nipper, W0QFZ	Sept.	56
Using BC-453 IF Xfms, W6TNS	Sept.	71
Monomonic, W8YVD	Oct.	48
Calibrator, W6AHO	Oct.	60
80M Xmr., W1SPU	Oct.	60
DC-DC Power Supply, W6TNS	Oct.	61
Anodized Heat Sinks, W5IXV	Nov.	36

Test Equipment

Probe for RF Scoping	Jan.	42
Audio Freq Meter, W2JAY	Jan.	72
Transmitter Tuning Meter, K6EUS	Feb.	32
100:1 Freq. Divider, W6TNS	Feb.	59
Tone Generator, W2JAY	Feb.	80
Visual Mon. of SSB, W8QNW	Mar.	44
Peak Mod. Indicator, W7ESM/6	Apr.	38
SWR Indicator, W1FZJ	Apr.	67
True Match, W2WLR	July.	36
Using the RF Ammeter, W7OE	July.	41
Audio Osc., VK2AC	July.	51
Using Antennascope, W3RYX	July.	55
Dummy Load for Coax Line, K6NKZ	July.	61
Der Nipper, W0QFZ	Sept.	56 & Nov.
Monomonic, W8YVD	Oct.	48
Xstr Calibrator, W6AHO	Oct.	60
Calibrator, K6EAW	Nov.	32
Variable Mod. for Heath SG-8-Ives	Nov.	48
RF Bridge Ind., W9RJH	Dec.	41
Pink Ticket Protector, W0HOB	Dec.	42

Transmitters & Modulators

Neut. of Pi Tetrodes, W5OSL	Jan., 52 & Feb.	124
Transmitter Tuning Meter, K6EUS	Feb.	32
Xtal Exciter, W6QJJ	Feb.	50
Picket Talkie—10 in Xstr, W6TNS	Feb.	59
Flea Powered Xstr Xmr, VE3TA	Feb.	59
Half Gallon Linear, W6COU	Mar.	28
Class C to AB for SSB, W6BLZ	Mar.	42
SSB Exciter, W6BLZ	Mar.	46
450th KW Final, W6SAI	Mar.	52
15W & 120W Modulators, W2HDM	Mar.	58
4CX1000A Final, W6EI	Apr.	34
125W Modulator, W4TEF	Apr.	37
Crystal Switching Unit, W7OE	Apr.	50
Mike Preamp, W6TNS	Apr.	78
Remote Controlled VFO, W6CZA	Apr.	81
All Band Mobile, W4ELZ	May.	30
160 M Mobile Rig, W8HAW	May.	38
KW Amp in Mobile, Ant. W6EI	May.	44
Remote, VFO Tuning, W6TNS	May.	60
Voice Break-In, W5SUC	June.	38
Voice Control for CW, W3RYX	June.	52
75W Universal Modulator, W6TNS	June.	58
10 W Mobile Modulator, W6QLV/F	July.	79
Protecting Tetrodes, K6PGB	Aug.	44
G.G. KW-4-65A's, W7HWR	Sept., 38 & Nov.	105
Conversion Exciter, W7ATV	Oct.	28
Stop Harmonics, W6BLZ	Oct.	46
Vax-Break, K2ECY	Oct.	46
Water Cooled Rigs, W6JAT	Oct.	50
80M Xstr Xmr, W1SPU	Oct.	60
4CX1000A Linear Amp, W6HHN	Nov.	92
One Tube Walkie-Talkie, W8WLM	Nov.	98
Screen-Grid Modulation, W7EPM/6	Nov.	52
Screen Grid Protection, W5EHC	Nov.	45
Complete Remote Control, W0DKC/2	Nov.	56
Pink Ticket Protector, W0HOB	Dec.	42

UHF-VHF

Front End for 1215 mc, W10OP-W1WID	Jan.	48
VHF SSB, W3YHI	Mar.	30
Dilemma—144 mc Style, W2CXY	Apr.	32
Channel 2 Trap, W1FZJ	May.	71
Printed Circuit Ants., W4UHN	July.	28
Antenna De-Icer, K2TKN	Sept.	39
3800 mc Xtal Osc., W1FZJ	Sept.	102
Parametric Amplifier, W1FZJ	Nov.	74

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For further information, check number 70 on page 124.

