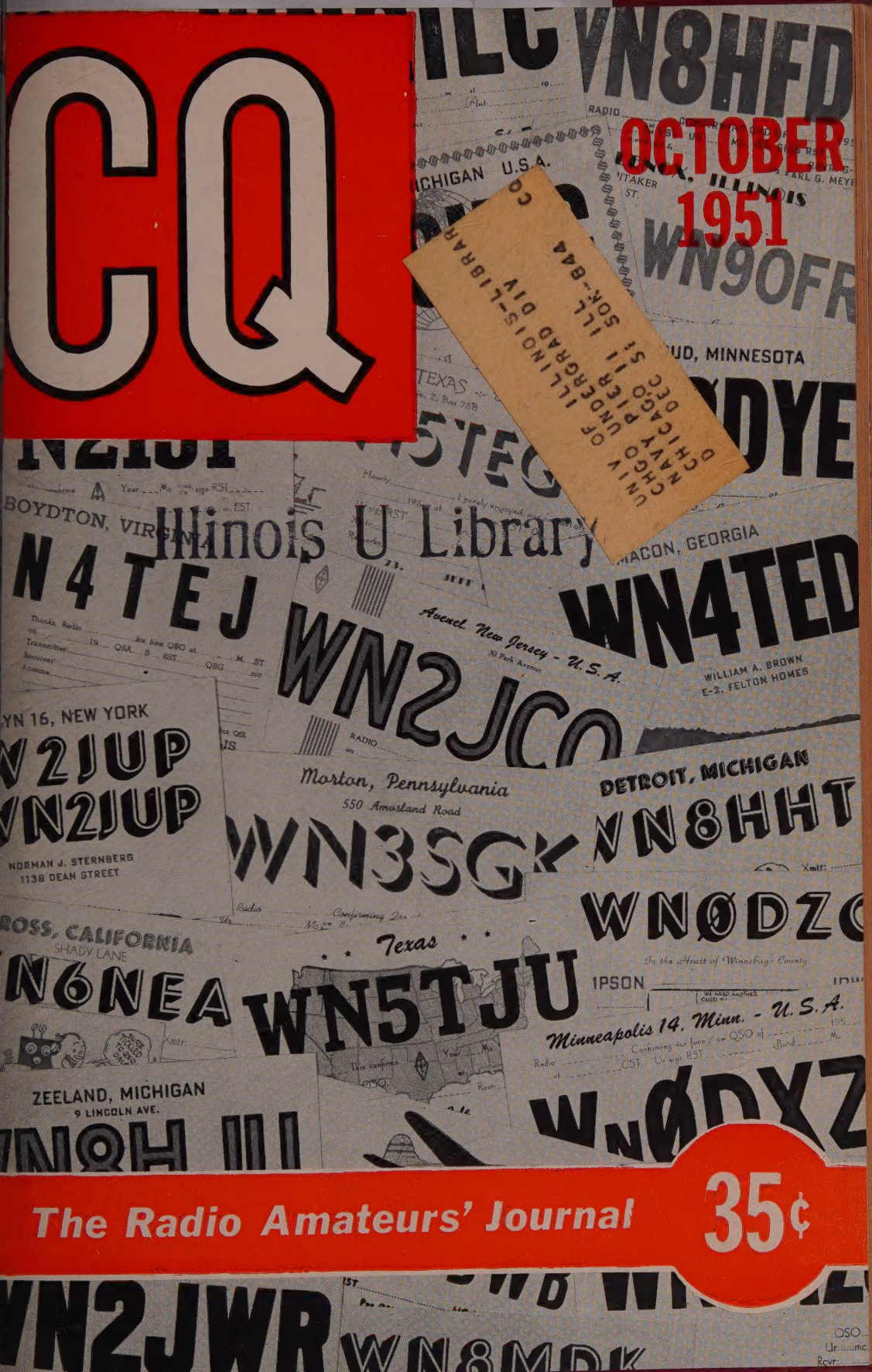
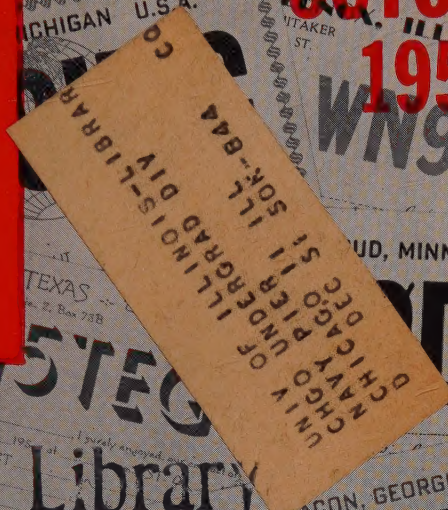


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OCTOBER
1951

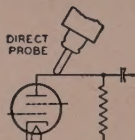


The Radio Amateurs' Journal

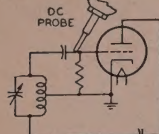
35¢

Now ...a NEW Junior VoltOhmyst* ...the WV-77A

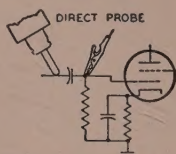
For all regular measurements and specialized measurements as illustrated.



MEASURES AC VOLTS . . . such as signal voltage on plate of af tube.



MEASURES DC VOLTS . . . such as oscillator grid bias. One-megohm resistor in probe prevents circuit loading.



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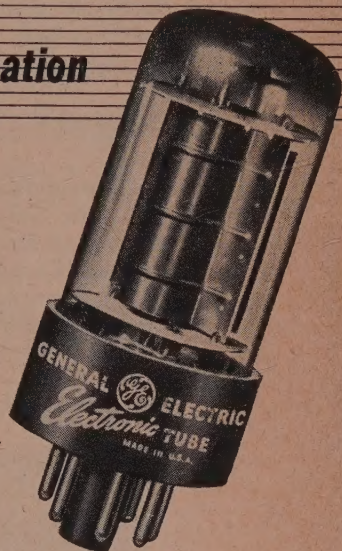
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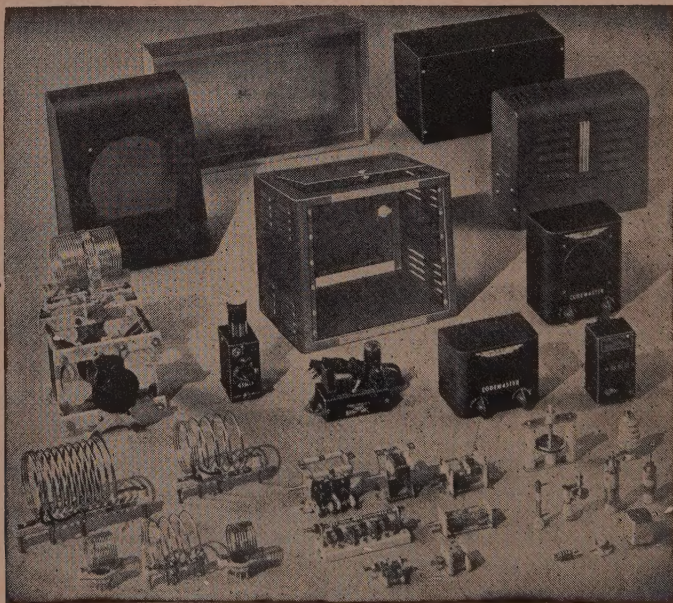
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Cleveland 3, Ohio

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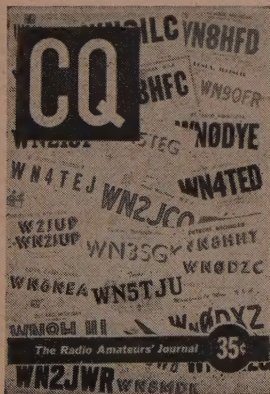
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OUR COVER

Something new is being added to shack walls around the country—the Novice QSL. Every one that you have is a step towards some fellow getting his regular license. (QSL cards supplied by *Rus Sakers, W8DED, Holland, Michigan; C. Fritz, Joliet, Ill.; M. Mead, WØKXL, Kansas City, Kansas; and Glenn Print, W3FSW, Baltimore, Md.*)

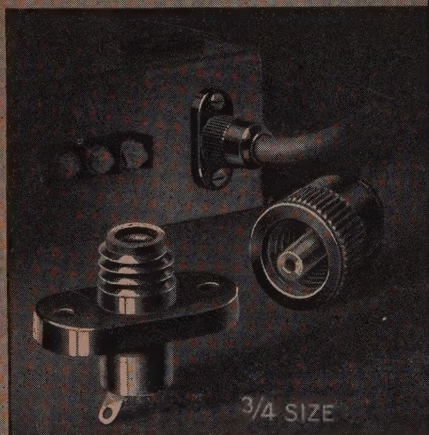
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Feenix, Ariz

Deer Hon. Ed:

Scratchi is having bad case of trubble again and he post-hastily writing to give you the low down. If you are guessing for a hundred years howsomever, you would never guess what happen to me. I are having a stupendous case of B.I. No, not B.O., but B.I. And what, no doubtless you are saying, is B.I.? Well, it isn't Broadcast Interference, no indeedy, but Bird Interference—or maybe I better call it Buzzard Interference. Before you thinking that Scratchi's brain has suddenly developed parasitics, I better go back and start at the beginning.

As you knowing, I have been away on nice vacation to west coast, swimming, playing tennis, watching the movie stars, etc., and are just recently returning. The first thing I do when I get home to the ranch is to rush into the shack, as I been off air for so long I reel anxious to get back on the air. However, I barely get to door of shack when Brother Itchi telling me not to get on air until he show me sumthing. So, he take me over to the transmitter, and point to the top of it, where I have my antenna tuning network. Hokensakidokey! What are I seeing but a big bird in a nest, smack-dabby in the middle of my tuning network. It sure are a mess of nest. And what a bird. Scratchi are a 1/c bird watcher, but I are never watching anything like this.

I certainly not able to describing this beast. It are definitely a bird, but you wouldn't call it a feathered friend. It are more like a feathered fiend. At this point Scratchi are all for cranking up the rig and pouring all five kilowatts into the antenna, but Brother Itchi having soft heart, and he say that I can't do that, especially on account the SPCA not liking it. Furthermore, he pointing out that if I turn on the transmitter, I liable to have feathers, bones and bits of bird all over the shack.

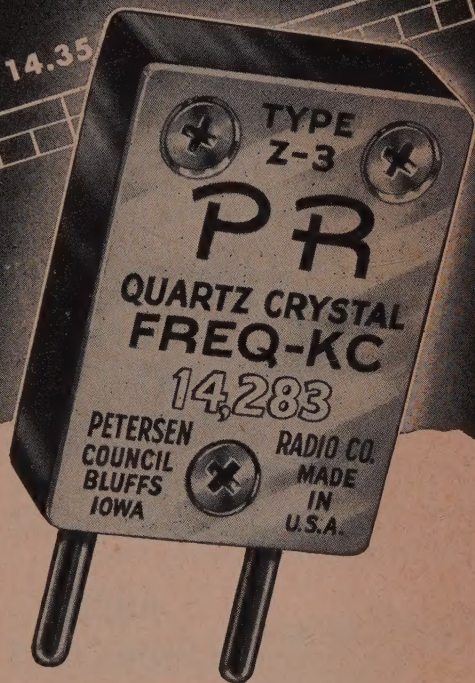
Wasn't that a pretty pickle? I finally talk Itchi into letting me try to take the bird out of its nest even though Itchi want me to let bird alone. So I walk over, and try to pick it up. WHAM! Scratchi almost lose a hand on that one. My that bird certainly have a big beak. I look at bird and he look right back at me with bairful eye. I yell at him. He blink his eyes. I go get several pots and pans, and hammer them together. Brother

(Continued on page 59)

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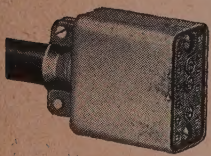
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★ ★ Letters ★ ★

15 Ullet Road
 Liverpool 17

Editor, CQ:

A colleague and I are engaged in compiling a register of USSR calls and QTHs (towns only, of course) and in testing a hypothesis that the exact location of a UA call (not UB, UC, etc.) may be determined from the letter following the numeral, or the letter following the K, in the case of a club station. This hypothesis works well in practice, but more data are required before any results can be published—we are not counting on Box 88 for help!

Knowing that you fellows over there are always on the hunt for UAs, we would like their cooperation. We would be most grateful if you would insert a notice asking your hams and SWLs to send us the following details:

1. QTHs of any UA stations, especially those not in Leningrad or Moscow, indicating those copied from QSL cards. Town is the only thing required.
2. Wherever possible, QTHs of UB, UC, etc. Also indicating those taken from QSL cards.

As you will realize, if we can successfully pinpoint a UA call inside the call area, we are in a position to state which zone a particular station is in. Zone maps in this country indicate that UA9 stations may be in any one of zones 16, 17, or 18. UAØ stations may be in zone 23, as well as, 17 or 18.

As an example of the application of the hypothesis, we reckon that all calls in the series UA4HA-UA4HZ, UA4KHA-KHZ are in the province of Kuibyshev. Calls in the series UA9WA-
 (Continued on page 54)

W2GJV

It is with deep regret that we record the passing of J. Carl Drumm. Carl was only too recently associated with CQ in the capacity of Novice Editor. We of CQ felt extremely fortunate to have "discovered" his latent ability to express the problems of the novice licensee. The many letters received as a result of his very first—and only—column, more than justified this statement.

W2GJV passed away shortly after the notice of his illness appeared in the September issue of CQ. He was only 42.

W2GJV, ex-W8IET, ex-W9RJQ, and ex-W3MXF—amateur radio will not soon forget your steps toward the betterment of the hobby.

THESE ACTIVE AMATEURS WILL TELL YOU ...



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Prove to yourself, the VIKING 1 is everything you have wanted in a transmitter. Own a "commercial in appearance," "commercial in performance" JOHNSON VIKING 1.

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VALUE? Yes! Says Mr. Larry Pyle, WØAGE, Chappell, Neb., "... probably the best buy on the market ..."

PERFORMANCE? Yes! Says Mr. Paul Magnusson, W7MYA, Portland, Ore., "... It sure is performing like a charm for me ..."

DEPENDABILITY? Yes! Says Mr. B. R. Fowler, W4RRH, Morgantown, N. C., "... on 160 ... I get Q5 S9 plus reports up in W2, W3, W4, W5, W8 and W9 ... antenna about 7 feet in the air ..."

FLEXIBILITY? Yes! Says Mr. Roy T. Morris, W4PXW, Somerville, Tenn., "... reason I bought a Viking 1 is it has more power and flexibility than any other set ... for same amount of money ..."

EASY ASSEMBLY? Yes! Says Mr. F. J. Flynn, W6DRZ, Palos Verdes, Calif., "... my wife (was) capable of completely assembling the transmitter from ... information contained in the kit. (She) has NO experience in such assembly work ..."

EASILY de-TVI'd? Yes! Says Mr. Rudolph Bartz, W9QHH, Peoria, Ill., "... Congratulations on the Viking 1 ... de-TVI'd with a simple antenna coupler and low pass filter ..."

TOP ENGINEERING? Yes! Says Mr. D. K. Ruth, W3SWX, Pittsburgh, Pa., "... My congratulations for a most excellently engineered job ..."

ALL AROUND SATISFACTION? Yes! Says Wm. I. Neely, W5NEN/4, 1st Lt., Inf., Ft. Jackson, S. C., "... the VIKING 1 ... is everything you say it is ..."

AND

Yes! Says Mr. T. M. Thorson, WØGGR, Bismark, N. D., "... I get very good reports and results with the rig ..."

Above are excerpts from a few of many unsolicited letters from pleased VIKING 1 owners. These letters are on file at E. F. JOHNSON CO. and are reprinted by permission.

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COWAN PUBLISHING CORP.
67 West 44th Street, New York 18, N. Y.

Murray Hill 7-2080

September 14, 1951

Dear Reader:

No one was more surprised than yours truly to find upon returning from a two and a half year leave of absence from the editorial staff of CQ, that I had been chosen to assume the role of Managing Editor.

As many of you were aware, for the past 30 months I had been acting as Project Supervisor for the Radio Amateur Scientific Observations (RASO) Six Meter Project. This project utilized the services of well over 500 active radio amateurs in the Western Hemisphere. All of the observational work was performed in the 50-54 mc band. During that period, this group of amateurs supplied the Atmospheric Ionization Laboratory, Air Force Cambridge Research Center, U.S. Air Force with over 100,000 observations of skip DX. As a result of this work, considerable knowledge in the field of VHF propagation has been gained.

In returning to CQ, it is with high hopes that we may re-establish many of our old friendships and make many new ones. Editorialwise, it is difficult to forecast at this writing any particular changes which may be of import to the readers. Undoubtedly, some will be made, not only with regard to the staff and their functions, but in the content of the magazine as a whole.

Until next month.

73,

CQ

Oliver P. Ferrell
Managing Editor

OPF/cjs

YOUR KW-1 IS ON ITS WAY

Shipments of this new Collins kilowatt transmitter to distributors have begun.

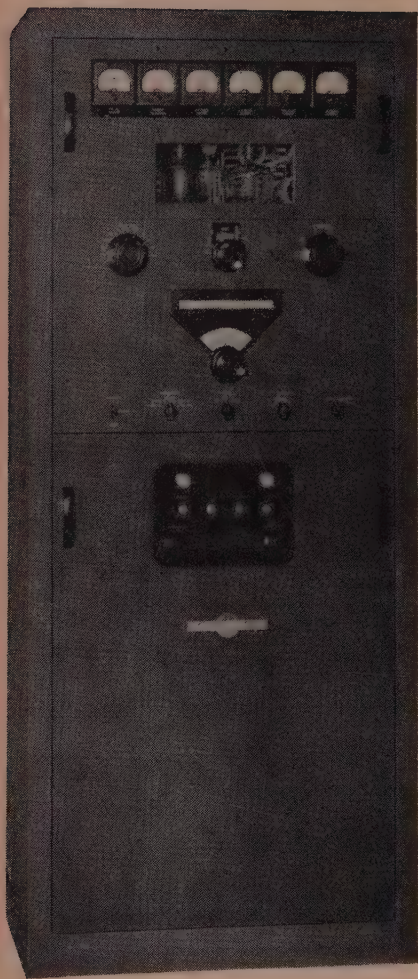
The performance of the KW-1 will richly reward the patience of those who have ordered it during the months since it was announced. It is as easy to operate as a Collins 32V.

Complete bandswitching of the exciter, driver and power amplifier is accomplished by a single control. Complete tuning control requires only four functions: band-switch selection, frequency setting, PA tuning, and PA loading. Over any narrow frequency range, only frequency setting adjustment is necessary.

Using two 810 modulator tubes and two 4-250A's in the power output stage, the KW-1 provides full kilowatt input on both CW and phone. This transmitter really has authority. The speech amplifier has a peak clipper and a low level filter. In addition, a high level filter is incorporated, permitting high percentage modulation without splatter and adding greatly to intelligibility.

From the time the KW-1 was a mere gleam in the eye, its engineering has given major consideration to the amateur's TVI problem.

End to end electrically, top to bottom mechanically, here is a transmitter that will enable you to enjoy your amateur operation to the full.



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

COLLINS RADIO COMPANY, Cedar Rapids, Iowa

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2700 W. Olive Ave.
BURBANK



Radio Control of your Garage Door

HARRY D. HELFRICH, JR., W4DWF*

Every once in awhile a cute little gadget comes along that can still be considered within the realm of amateur radio. This is just one of those things—we could not resist using it.

—Editor



W4DWF opening garage door from the car dash by radio remote control.

ALTHOUGH THERE ARE a number of manufactured devices for operating a garage door from your car, their cost is such as to make them a luxury item beyond the means of most of us. Their desirability becomes obvious, however, in a driving rain storm when you arrive home and want to put the car away. If you like to stray occasionally from the field of straightforward amateur operation (as does the author) here is an excellent opportunity to make use of your amateur license in a very different field and to provide yourself with an automatic door opener and closer for approximately \$30.

The author does not have a mobile rig in his car, so this article describes the construction of a very simple two meter transmitter for the car as well as door mechanism, receiver, and control circuits. Obviously you can use any mobile rig already installed in the car with that much less equipment to construct. The receiver operates on carrier alone so any type of modulation (including none at all) is satisfactory to trigger the control mechanism. The receiver sensitivity is such that only a very strong signal will operate the door, *but*—be sure to set it up on a frequency not normally used in the home station. Other signals in the band are not strong enough to cause operation of the door.

Drive Mechanism

The basic operating mechanism shown in Fig. 1 is one suitable for a common type sectional overhead door. It is described in detail even though its features may not apply to another type door, since the description may suggest ideas applicable to other types. The author's door had two wire cables attached to the bottom corners of the door and to two heavy springs overhead. One of these cables and a pulley was replaced by a section of chain and sprocket. The sprocket shaft is driven through a 50 to 1 worm reduction from a 1/6 hp split phase a.c. motor. This speed reduction of the 1725 rpm motor speed turns the

sprocket at about 0.6 revolution per second and raises the door at a speed of 9 or 10 inches per second. This raises a seven foot door in about 9 seconds. This speed is adequate and puts a very light load on the motor. All components of the drive mechanism including shafts, shaft support, coupling, worm, worm gear, sprocket, and chain were purchased from the local representative of the Boston Gear Works. Whatever your needs for your particular installation, you will find it in their catalog. The motor itself was a surplus one picked up for only six bucks.

It will be noted that the drive as installed can only drive the door up. Reversing the motor will drive slack into the chain below the sprocket and since the upper track for the door is on a slope, the door will move down of its own weight. The action is smooth since the spring on the other side is supporting approximately half the weight of the door. This is a valuable safety feature, since an object or pet caught under the door cannot be seriously hurt. No force other than half the weight of the door can possibly be exerted on anything under the door. The spring on the drive side assists in raising the door since it is driven into tension as the door goes down.

Other types of doors should be equally capable of being operated automatically. Each type will present its own problems, requiring solutions dependent upon the particular mechanism.

Motor Control

The motor control circuit (Fig. 2) was arrived at from the desire to use the same type of impulse to initiate either opening or closing of the door, the direction of motion changing in sequence. To do this, Ry₁ is used to reverse the a.c. power to the running winding of the motor. Since the starting winding cannot be left across the line when the door is at rest, Ry₂ is used to interrupt the power to the starting winding except when the running winding is energized. S₁ and S₂ are the "up" and "down" limit switches respectively, and stop the door when motion is sufficient in either direction. These switches are leaf actuated "micro-

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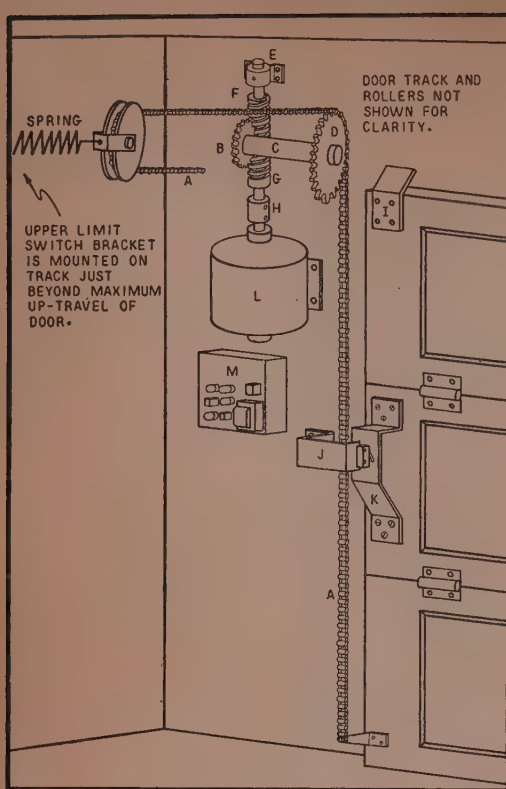


Fig. 1. Sketch of the drive mechanism and layout.

Bill of Materials

A—11 ft. $\frac{1}{2}$ " x $\frac{1}{2}$ " chain
 B—4" diam. 50 tooth worm gear
 C—6" length $\frac{5}{8}$ " steel shaft
 D—Sprocket 5" diam. approx.
 E—Shaft support, adjustable, $\frac{1}{2}$ " base
 F—1 ft. $\frac{1}{2}$ " steel shaft

G—Worm, single pitch, $\frac{1}{2}$ " bore
 H— $\frac{1}{2}$ " shaft coupler
 I—Upper limit switch slide
 J—Lower limit switch bracket
 K—Lower limit switch slide
 L— $\frac{1}{6}$ HP a.c. motor
 M—Control-receiver unit

switches" and use the normally closed set of contacts. As the door moves to the end of its travel, a metal slide (Fig. 3) engages the switch leaf and opens the circuit. Each metal slide must be about 8" to 12" long to provide for the overrun of the door and motor when the power is interrupted.

From the circuit it can be seen that S_1 will interrupt the power to the motor only when Ry_1 is energized, and S_2 when Ry_1 is unenergized. Therefore, each switch will stop the door in its direction but does not prevent the motor from starting when Ry_1 is reversed. Reversal of Ry_1 is accomplished by Ry_3 , which is a ratchet type sequence relay or a stepping relay with every other position wired together. The one the author obtained was a surplus stepping relay used originally designed at a station in an automobile

selector broadcast receiver. The only modification was to remove one switch wafer. Operation with the 6 volt d.c. coil on a.c. was not positive until approximately 11 volts a.c. was applied. This was obtained from two windings of T_1 connected in series. If a non-surplus relay is to be used, a 110 volt or 110 volt a.c. coil is suggested, as this will permit using a smaller and less expensive transformer at T_1 . S_5 and S_3 are spring loaded normally-open toggle switches used to step Ry_3 . The need not be held closed, since Ry_3 will hold Ry_2 closed or allow it to stay open depending upon the step in effect. Once an impulse is received by Ry_2 the door will continue in motion until stopped by S_1 or S_2 .

Since an a.c. motor, while running, will continue in the same direction if the power is rapidly reversed to the running winding, it is important that a second impulse not be received to reverse Ry_3 while the door is in motion. If this should happen the incorrect limit switch would be in the circuit and the motor would drive the door against the stops, stall, reverse, and drive to the other limit. The second set of contacts on Ry_2 , which are in series with the coil of Ry_3 , prevent this accidental reversal. These contacts are normally closed, allowing Ry_3 to accept an impulse, but open whenever the motor running winding (and Ry_2) are energized, thus preventing further operation of Ry_3 and Ry_1 .

Fig. 3. Detail of the "slide" attached to the garage door to engage the microswitches and which act as "limit" controls.



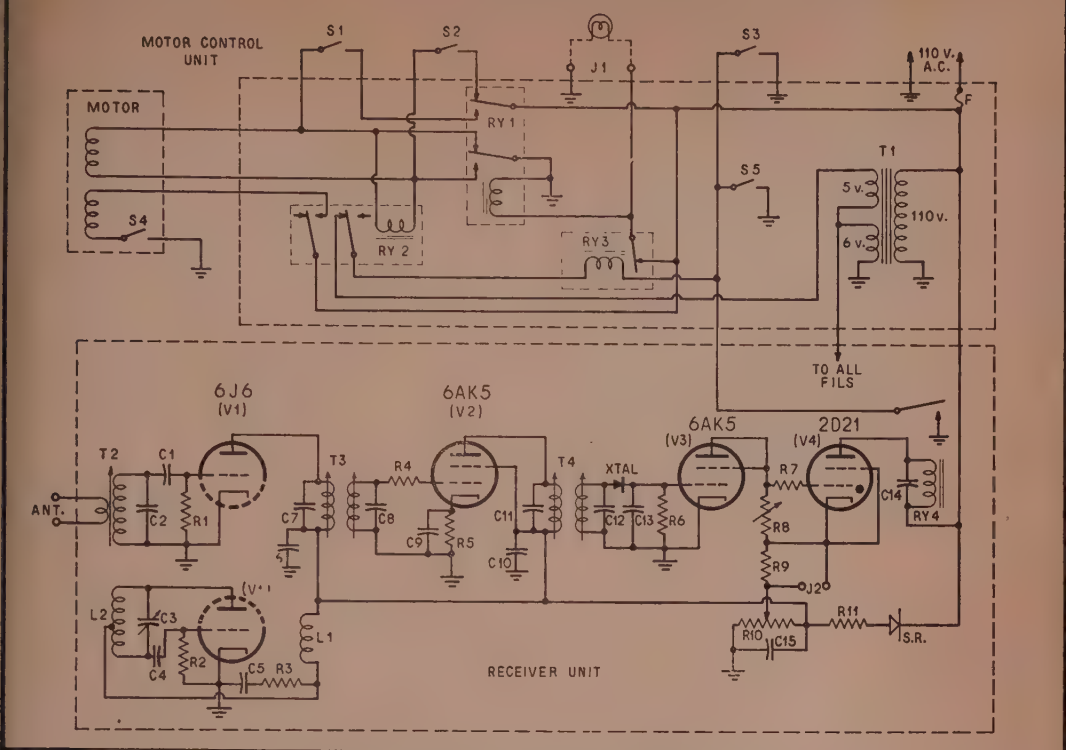


Fig. 2. Wiring schematic of the Control-Receiver Unit.

CONTROL UNIT

- S1, S2—Micro-switch leaf actuated
 S3, S5—s.p.s.t. momentary toggle switch, normally open
 S4—Starting winding switch in motor
 Motor—1/6 HP, 110 v a.c. motor split phase, 60 cycle
 F—15 amp circuit breaker or fuse
 Ry1, Ry2—dpdt relay 110 v a.c. coil
 Ry3—Ratchet type sequence or stepping relay—Struthers Dunn type 11 or

- modified Philco No. 77-0257
 T1—Filament transformer 5 v 3 a and 6.3 v 3 a
 J1—Octal plug
RECEIVER UNIT
 R1—3 meg., 1/2 w
 R2—8,000 ohms, 1/2 w
 R3—390 ohms, 1/2 w
 R4—15,000 ohms, 1/2 w
 R5—180 ohms, 1/2 w
 R6—200,000 ohms, 1/2 w
 R7—1 meg., 1/2 w
 R8—10,000 ohms variable
 R9—39 ohms, 1/2 w
 R10—5,000 ohms, 25 w
 R11—100 ohms, 1/2 w
 C1, C4—75 μ f mica

- C2—10 μ f ceramicon
 C3—25 μ f APC trimmer
 C5—.001 μ f mica
 C6—.005 μ f mica
 C7, C8—In T3
 C9—.002 μ f mica
 C10—.001 μ f mica
 C11, C12—In T4
 C13—500 μ f mica
 C14—20 μ f 150 v elect.
 C15—40 μ f 150 v. elect.
 Xtal—IN34 crystal
 L1—100 μ h r.f. choke National R-33 or similar
 L2—2 T #14 bare wire 1/2" x 1/2" mounted on terminals of C3

- SR—75 ma selenia rectifier
 Ry4—s.p.s.t. normally open sensitive relay 2000-5000 ohm coil
 T2—r.f. transformer
 Sec: 2 T #28 3/8" diam. with adjustable slug
 Pri: 1/2 T #28 on same form with secondary spaced 1/8" away
 T3, T4—10.7 mc i.f. transformer variable slug tuning
 Ant.—Folded dipole antenna made of 300 ohm twin lead 38" long

J1 is a socket to provide power for a light in the garage that comes on automatically. Since the coil of the Ry1 is energized whenever the door is opening, or is at rest in the open position, the light is merely wired in parallel with the Ry1 coil and will be on whenever needed. Two other switches, S3 and S5, permit local operation of the door. S5 is conveniently mounted on the control chassis while S3 is mounted just outside the door, well protected from the weather, concealed, and out of reach of the neighborhood children. Any

number of other switches may be wired in parallel, including the sensitive relay of the receiver unit, to permit operation of the door from wherever desired.

It should be noted that one side of the a.c. line is connected to the chassis, and for this reason, extreme care must be taken to tie the grounded side of the line of chassis. Use of the other side could make a dangerous shock possible. If a plug and socket are used to supply power, only one prong of the plug should be wired in, and a

resistance biases V_4 , 2D control tube, to cut-off. Upon receiving a signal the 1N34 crystal detector biases the control grid of V_3 negatively, reducing its plate current. V_4 now conducts, tripping sensitive relay Ry_4 . (The plate of V_4 is returned to the a.c. line to permit the tube to cut off after the signal is removed. As with all thyatron tubes, V_4 cannot be cut off by a negative grid once conduction has started. It is necessary to cause the plate voltage to go to zero to stop plate current flow, after which a negative grid can prevent conduction again starting. This lack of control by the grid during conduction is due to the ionization of the gas in the tube and the resulting sheath of positive ions formed around the negative grid and cathode. These ions neutralize the electrostatic effect of the grid and the normal space charge.) The use of a thyatron as the control tube is desirable since it permits a very large and abrupt increase in current from a zero value, giving positive action of Ry_4 . C_{14} prevents chattering of Ry_4 from the pulsating current through it.

Adjustment of the receiver should proceed as follows:

1. Discount the lead from Ry_4 to the motor control unit, remove V_1 and V_2 and connect a low range milliammeter across J_2 .
2. Adjust the slide on R_{10} to give approximately 0.5 ma V_3 plate current. (Meter indication will be somewhat low, depending on meter resistance.)
3. Now adjust R_8 until V_4 is just cut off.
4. Remove V_4 and insert V_1 and V_2 .
5. Feed a 10.7 mc (approx.) signal to the grid of V_1 from any convenient signal generator such as the GDO and tune T_3 and T_4 for minimum current in the meter.
6. If oscillation occurs in V_2 it will be indicated by a sudden drop in V_3 plate current as T_3 and T_4 are resonated. Insert R_4 in the grid of V_2 , increasing its value until oscillation ceases.
7. Now shift the signal generator to 147 mc and tune C_3 and T_2 for minimum V_3 current.
8. Reinsert V_4 , connect the antenna and Ry_4 , and the receiver is ready to operate.

Transmitter

The transmitter unit employs a 2E30 instant-heating beam pentode, connected as a triode. The tank circuit is a section of transmission line tuned with a small variable ceramic condenser. The oscillator is conventional and should take off quite readily if leads are kept as short as possible. This is additionally necessary to prevent vibration detuning the oscillator after mounting in the car.

The power supply is entirely conventional, using a synchronous vibrator. This type is desirable to avoid the time that would be required to heat a rectifier tube cathode. The transformer is a small 110-Volt power transformer with 5 and 6.3 volt windings series connected for low voltage winding. The 110 volt winding is unused. If a transformer of this type is not available in the junk box it may be preferable to buy a transformer built for vibrator operation. However, output from the 110-volt type of transformer is adequate and its performance has been completely satisfactory.



The transmitter is small enough to be mounted in almost any convenient spot under the hood. Note the use of three rubber shock mounts.

Any small chassis which can hold all the components is suitable for the transmitter. The one used by the author was 2"x3"x5" and is supported on three small rubber shock mounts. The 2E30 tube is mounted in a socket with attached shield so it will stay in place with no trouble. Two soldering lugs are mounted under the heads of the screws supporting the vibrator socket. These are bent up and soldered to the sides of the vibrator can after it is inserted in the socket. With these precautions the transmitter has withstood several months of use with no apparent ill effects from shock or vibration.

The antenna coupler unit serves two functions: L_5 and C_9 are resonated at 147 mc with the GDO. They offer a very high impedance to the transmitter output, preventing its dissipation in the broadcast receiver input coil. C_8 assists in tuning the antenna for maximum output from the transmitter and prevents L_3 from short circuiting an incoming broadcast signal. The entire unit is mounted in a Bud "Minibox" 1½" x 2½" x 2¾", screwed to the auto frame near the antenna mount. Coaxial plugs and jacks are used to provide connections for the leads to the antenna and to the broadcast receiver. These leads are simply the regular receiver antenna cut at the proper point. The antenna trimmer on the broadcast receiver should be reset after installing the coupler, to take care of the added capacitance introduced by the new installation.

Transmitter and broadcast receiver may be operated simultaneously with no apparent interaction. If it is not desired to use the broadcast receiver antenna, an additional antenna can be mounted on the other fender of the car and the entire coupler

(Continued on page 56)

The Utility VFO

50 Watts of Solid VFO Signal on All Bands
10 through 80

LAURENCE B. PEIRCE, W4KIX*

THE DESIGN of an exciter, particularly one that will find favor with a large number of other amateurs, is a problem containing many variables. Chief among these, of course, is the nature of what is to be excited; following this are the personal preferences, habits, and modes of operation of the individual amateur, as well as his technical skill and mechanical resources for construction. The 80-meter traffic man desires v.f.o. and break-in operation; bandswitching is secondary to him and quality oft-times assumes something of tertiary importance! For the DX-man band switching is more important and a stable signal of outstanding quality often pays off. The phone man is more concerned with frequency drift than keying characteristic, while the beginner, exciter-wise, may ask for nothing more than sure-fire operation of a crystal oscillator. Furthermore, any of these amateurs may change the scope of his operation at any time as his field of interests narrows or broadens, thus necessitating a complete reappraisal of his excitation problem.

There is apparently no single solution to the problem of exciter design outside of the so called "universal exciter"—that is, an exciter designed to meet any demand its user is likely to make of it, now or in the foreseeable future. This approach is possible for commercial designers, but hardly practicable for amateurs as a class. It is true

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As the author rightly remarks, the "universal exciter" is often beyond the means and ability of the average amateur. Definitely, this one is not. Some might say that it is ordinary and uninspired, but what it lacks in that direction, it more than returns in utility and ease of operation. See if you don't think so. —Editor.

that a few exciters of the truly universal type, designed and built by amateurs, have been described in radio literature from time to time. We suspect, however, that the majority of these super exciters serve only as monuments to the ingenuity and mechanical resources of their builders; they are difficult to duplicate because the average amateur has neither the self-assurance nor the materials, special parts, and machine tools necessary to undertake the job.

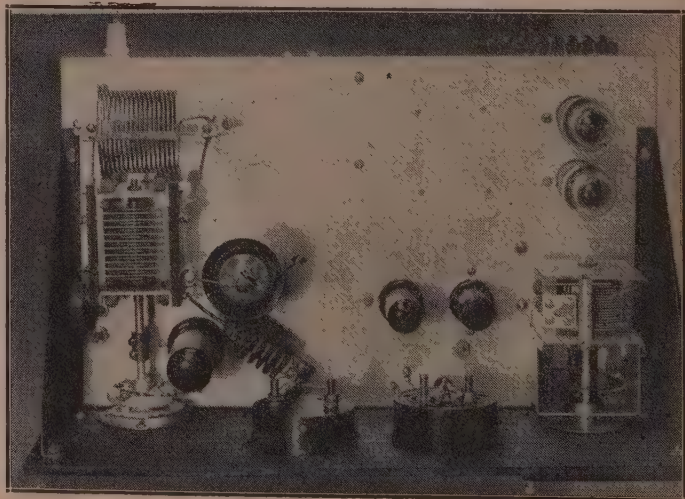
Clearly, therefore, in presenting an exciter not in the universal class, its designer should at the very beginning carefully describe its capabilities, so that prospective builders of the gadget can see at a glance whether or not it will fulfill their specific needs. This article describes an exciter having the following features:

1. Sufficient power output to drive directly a 500-watt triode amplifier or a kilowatt tetrode amplifier on the 10,15,20,40, and 80-meter bands.
2. Either crystal control or v.f.o. control of comparable stability and quality.
3. A high degree of operating convenience without the usual complicated switching arrangements for band changing.
4. A keyed signal of excellent characteristics, amenable to wave shaping for click elimination without the production of chirp.
5. Simplicity of electrical circuit plus mechanical construction easily duplicated with ordinary hand tools.

◆

Top view of the exciter. The 807 plate tank is at the extreme left. The tubes from left to right are the 6L6 doubler-tripler, 807 driver, 6AG7 buffer doubler-crystal oscillator, 6SS7 VFO, and in the upper right corner of the chassis, the two VR tubes. The VFO main tuning condenser and dial mechanism are at the extreme right.

◆



The Circuit of the Exciter

The schematic diagram of the exciter circuit appears in Figure 1.

A 6SS7 is used as an electron coupled oscillator with the grid circuit operating in the 1,750-2,000 kc region, while the plate circuit is tuned to about 3600 kc by the broadly resonant slug-tuned coil L2.

The second stage, a 6AG7, functions as a straight amplifier on 80 meters, a doubler on 40 meters, or as a crystal oscillator on either 80 or 40 meters. The plate tank of this stage tunes to either 80 or 40 meters with the same coil, thus providing effective band change with no switching whatever.

The third stage is a 6L6 which functions as a doubler on 20 meters or as a tripler on 15 meters. It is not used for 80 and 40 meter operation and

may be cut out off the circuit by switches S4, S5, and S6, which are ganged. Again, band changing is simplified by designing the plate tank of the 6L6 to tune both 20 and 15 meters with the same coil. If operation on 10 and 15 meters is not contemplated this stage may be eliminated entirely as the 807 output stage performs quite well as a doubler to 20 meters.

The 807 final stage operates straight through on all bands except 10 meters, where it functions as a doubler with nearly as much output though with somewhat lower efficiency than on other bands.

At W4KIX this exciter is used to drive push-pull 805's running at 500 watts input and more than enough excitation is available on all bands. As an interesting sidelight on the capabilities of

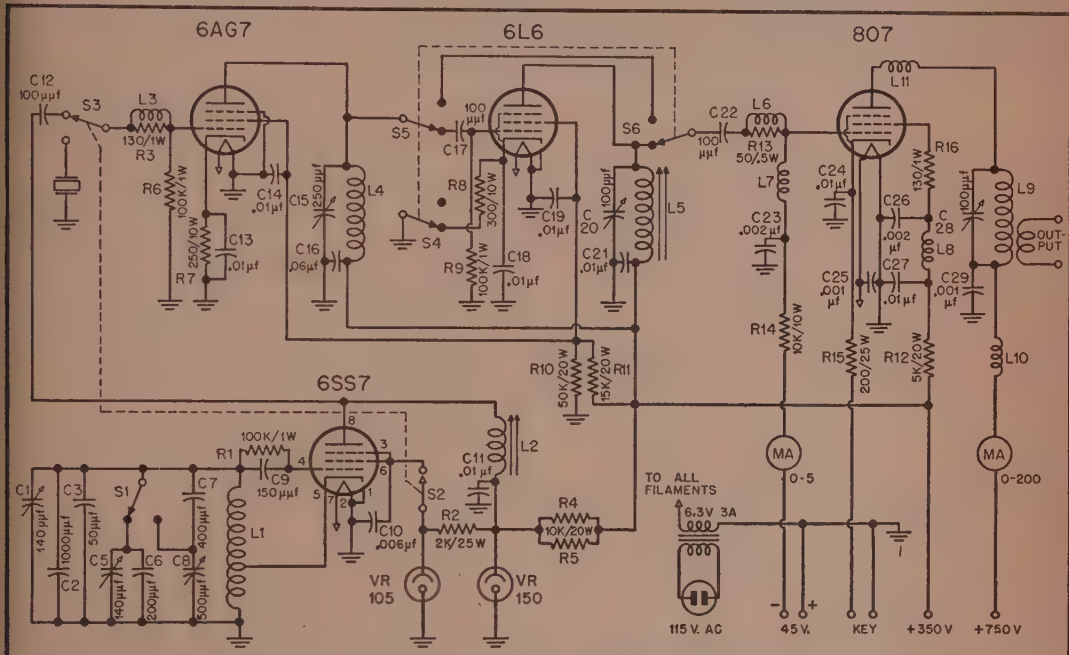


Fig. 1. Wiring schematic of the all-band utility VFO.

C1, C5—140 μ f variable air trimmer
C2—.001 μ f, 3,000 v mica (see text)
C3—50 μ f, negative temperature coefficient
C6—200 μ f, silver mica
C7—400 μ f, silver mica
C8—500 μ f, variable main tuning (see text)
C9—150 μ f, silver mica
C10—0.006 μ f, 500 v mica
C11, C13, C14, C18, C19, C21, C24, C27—.01 μ f, 600 v moulded paper

C12, C17, C22—100 μ f 250M)
C15—250 μ f, variable (Hammarlund MC-16)—0.06 μ f, 600 v moulded paper
C20—100 μ f, variable (Hammarlund MC-100M)
C23, C26—0.002 μ f, 1000 v mica
C25—0.001 μ f, 400 v mica
C28—100 μ f, variable, 1,000 v spacing
C29—0.001 μ f, 2,500 v mica
R1, R6, R9—0.1 meq., 1 w

R2—2,000 ohms, 25 w
R3, R16—130 ohms, 1 w
R4, R5—10,000 ohms, 20 w
R7—250 ohms, 10 w
R8—300 ohms, 10 w
R10—50,000 ohms, 20 w
R11—15,000 ohms, 20 w
R12—5,000 ohms, 20 w
R13—50 ohms, 1/2 w
R14—10,000 ohms, 10 w
R15—200 ohms, 25 w
L1—19 T No. 18 enam. spaced to 1" on 1/8" dia. form, tapped 5 T from ground
L2—1-1/3 layer No. 28 enam. close wound on National XR-50 form
L3—8 T No. 20 tinned

1/4" dia. spaced 3/4" air wound
L4—16 T No. 18 enam. spaced to 1" on 1/4" dia. form
L5—10 T No. 18 enam. spaced to fill National XR-50 form
L6—10 T No. 20 tinned 1/4" dia. spaced to 1" air wound
L7, L8—2.5 mh r.f. choke
L9—100 v plug-in coils (B&W BEL)
L10—1mh, 500 ma r.f. choke
L11—6 T No. 12 tinned 1/2" dia. spaced 3/4" air wound



Panel view of the exciter. A crystal socket is located just above the "Xtal-VFO" switch. The VFO tuning dial described in the text is at the extreme right. Band-set trimmers can be seen just underneath the VFO dial.

the 807 tube, we unwittingly ran this stage with a plate voltage of 900 for several months without the slightest complaint from the 807. As a matter of fact we will go even further and admit that we are still running it at that voltage, simply because we now know that the tube can take it and it is convenient with our particular setup to run the 807 and the modulator tubes from the same power supply. To be conservative, however, it is best to stick to the tube manuals and 750 volts or less: even at rated voltages, an output of 50 watts should be readily obtainable on all bands.

The general mechanical layout and construction are pretty well covered by the photographs. It may be mentioned that the chassis is aluminum, 17" x 10" x 3", and that the panel is $\frac{1}{4}$ " masonite. We could pretend that these materials were selected because of some subtle electrical reason such as the superior grounding qualities of the aluminum, but few constructors who have sweated over a steel chassis with a dull handdrill would be taken in by that story.

Details of Design, Construction and Operation

The VFO.—Frequency drift in an oscillator circuit is primarily a function of the effect of heat on the component parts. Since the source of heat in low-power oscillators can be confined almost entirely to the oscillator tube itself, it seems fundamental to select for the v.f.o. a tube having very nominal current demands, especially for cathode heating, for by doing so we minimize the effect of heat at its very source. The 6SS7, requiring only 150 ma for cathode heating seemed to be, and apparently is, an excellent choice. To reduce the effect of some unavoidable heating, the frequency determining circuit is made quite high-C. About 1600 $\mu\text{f.}$ of capacity are shunted across the oscillator grid coil, L1. Most of this capacity is concentrated in C2 which is a .001 $\mu\text{f.}$ mica capacitor rated at 1.2 A at 3 mc. It is important that these specifications for C2 be adhered to; fortunately these capacitors are presently plentiful and cheap on the surplus market. The combination of the 6SS7 oscillator tube,

high-C tank, amply rated main padder, and the 50 $\mu\text{f.}$ negative-coefficient capacitor C3 effectively handle the problem of frequency drift.

The plate circuit of the v.f.o. is tuned by the slug-tuned coil L2 which is peaked about 3600 kc and forgotten.

The v.f.o. tuning dial was salvaged from a surplus long-wave receiver. It is a sort of bifocal affair having two dials geared together. One dial, having 100 divisions around its entire circumference, makes one revolution while the other, having 100 divisions in 180 degrees, rotates through 10 divisions. Thus 1,000 readable dial divisions are afforded. We used this dial simply because it appealed to us. Any slow motion dial could be used and one of the type that can be directly calibrated might be preferred.

In the experimental stages, the v.f.o. tuned from 3500 to 4000 kc in 450 dial divisions which felt about right on 80 but was a little touchy on the higher frequency bands, especially 20. To reduce the tuning rate on these bands switch S1, and capacitors C5, C6, and C7, were added to the v.f.o. grid circuit. With these capacitors switched into the circuit, the 20-meter band occupies 360 dial divisions and the 40-meter band about 500 divisions, which restored the proper feel. On 80, the bandspread position of S1 provides 900 dial divisions for the range 3500-3750 kc which is really elegant for settling down on a net frequency.

The main tuning condenser, C8, should be rigid and sturdy with bearings at each end of the rotor and of generous plate spacing. Ours was salvaged from the same surplus receiver that provided the dial, but again, any quality condenser of the proper capacity will do.

It is recommended that the band-set trimmers C1 and C5 be adjusted to bring 3,500 kc to the same dial reading with the bandswitch, S1, in either position. We used a dial reading of 100 as a purely arbitrary choice.

No bugs were encountered in the v.f.o. except a slight instability with S1 in the bandspread position. This was finally traced to poor grounding

of the trimmer C5 and disappeared when a flexible lead was used to connect the rotor to the ground bus. The chassis should not be used alone to complete any part of the tuned grid circuit; use heavy bare wire.

The 6AG7 buffer-doubler.— There is little need for comment in this stage except the plate tank and the crystal switching circuit. The plate tank L4-C15 tunes to both 80 and 40 meters with the same coil. For satisfactory crystal operation on 40 meters it is desirable to have plenty of leeway on the high side of the 40-meter band because this tank circuit must be tuned to a higher frequency than that of the crystal in order to offer an inductive reactance at the crystal frequency—a necessary requirement for oscillation. Coil L4 should therefore be adjusted so that it tunes to 3500 kc with C15 nearly at maximum capacity. This may require a little individual “tailoring” of L4.

When the ganged switches S2 and S3 are in “Xtal” position, the crystal is connected into the grid circuit of the 6AG7 while the v.f.o. is silenced by opening the screen lead. We generally keep a 7,000 kc crystal in the holder and use the 6AG7 as a crystal oscillator merely to check v.f.o. dial calibration, although the 6AG7 will function satisfactorily as a crystal oscillator throughout the 80 and 40-meter bands.

When first tested, this stage operated satisfactorily except in the 75 meter phone region where output dropped to zero. At first we interpreted this as a warning to stay off 75 phone, but later decided that the plate blocking condenser, C16, and L4 were forming some kind of series resonant circuit at that frequency. Whether this theory was correct we do not know; at least changing C16 from the original value of .01 μ f to .06 μ f, as shown, corrected the trouble.

The 6L6 doubler-tripler.— Another 6AG7 could have been used here, but this stage when in use always serves as a frequency multiplier so that the superior screening afforded by the 6AG7 is not needed to prevent self-oscillation. Here again the plate tank is a dual-frequency affair, tuning

to 20 and 15 meters with the same coil, L5. We realize now that we slipped up in the design of this tank circuit by not extending its frequency range a bit below 14 mc so that the exciter could also be used on 11 meters, using the output stage as a doubler. This possibility is called to the attention of those who desire 11-meter operation.

The 807 output stage.— The plate circuit of the 807 stage is all above the chassis to shield it from the input circuit underneath. Plug-in coils were used for this stage because of their superior efficiency and because, like most hams who have built a rig or two, we happened to have them. To maintain a reasonable Q in the output tank the particular coils specified were tailored a bit: 8 turns were removed from the 80-meter coil, 3 turns from the 40-meter, and 2 turns from the 10-meter coil; a “10-meter” coil, as is, was found just right for 15-meter operation, and the 20-meter coil required no modification.

Screen voltage for the 807 is obtained through a 5000 ohm resistor from the 350-volt supply for the preceding stages. Separate meters for grid and plate current are used in the 807 stage—the only stage it was thought necessary to meter. Maximum output from the 807 is obtained with a grid current of 2 ma; plate current should be kept under 100 ma.

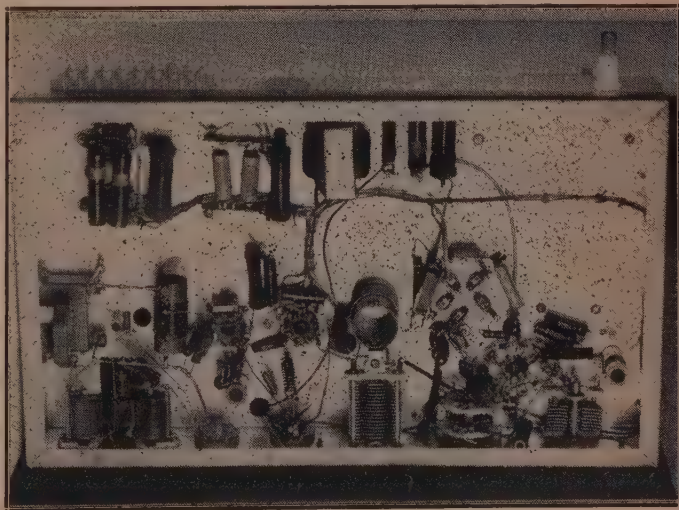
It might be deduced from the parasitic suppressors in grid, screen, and plate leads that some difficulty was had from this source—and indeed it was, but the suppressors indicated in the circuit diagram eliminated them. One of the new “stabilized” 807 tubes might have fitted in nicely here, but even with the old-fashioned 807 there are no spurious oscillations in any stage of the exciter.

Keying.— We conclude with a few choice remarks on the subject of keying. It is a well known though apparently little recognized fact that an oscillator which will key without either click or chirp is a rara avis indeed. The remedy for click is unfortunately the exact cause of chirp and vice-versa.

Prior to about 1930 the v.f.o. was in general

(Continued on page 63)

Bottom view of the exciter. VFO grid circuit components appear in the lower left hand corner. Major parts are arranged generally as they appear in the circuit diagram. Although grid and plate leads are kept short, the large chassis prevents crowding and simplifies servicing.





The "Compact Milliwatt"

JAMES N. WHITAKER, W2BFB/6

This is an extremely compact low powered transmitter. It is suitable for local contacts and features simplicity of circuitry and stability. Especially designed for the Novice, it can be built in a few hours. —Editor

IT IS A RELATIVELY SIMPLE matter to build an extremely low-powered transmitter for use in local communication work. The tube developments in recent years do make it possible to build a "compact kilowatt", but they also make it possible to build a still more "compact milliwatt." It is questionable which type will give the owner the greatest satisfaction. Probably the most satisfactory arrangement is to have both, since the "milliwatt" is so simple and inexpensive to build.

Almost any type of good stable oscillator may be used for local work providing the antenna does not influence the frequency, and providing the oscillator is capable of being keyed. Crystal control is probably the most desirable since crystals are so readily available. Local nets may be established for "round tables" with all participants operating on a common frequency. VFO operation is not necessary as the signals will usually be sufficiently strong locally to preclude the possibility of interference from stronger stations in other localities.

One very satisfactory and simple circuit is shown schematically in Fig. 1. A 6AG7 is used in a modified Pierce oscillator circuit with electron-coupled output. This arrangement employs no tuned circuits. The frequency-determining element is the crystal. The frequency is relatively unaffected by variations in load or power supply voltage. It keys clean and snappy, with a clear crystal note. A crystal of any

fundamental frequency may be used. "Harmonic" crystals will not usually oscillate at their specified frequency, but will oscillate at their true fundamental frequency usually somewhere near, although not exactly one-third of their specified frequency.

The values of resistance shown are the optimum values although none are at all critical. The value of R_3 should not be reduced much below 100 ohms, as this resistor limits the current drawn by the tube by providing a protective cathode bias. The output will not be appreciably increased by the use of a lower value, but the screen and plate dissipation will be increased. R_1 may be varied considerably, but should not be made less than 25,000 ohms. A slight gain in output will be obtained by lowering the value of this resistor. The output will be reduced if this value is increased, although the reduction in power is not too great with any value lower than 100,000 ohms. R_2 is probably the least critical of all. This resistor may be increased to .5 megohm, but should not be reduced to a value lower than 25,000 ohms. If the crystal used is sluggish in starting, it may be necessary to use a resistor of a value higher than that specified.

The power supply is a conventional voltage-doubler system using selenium rectifiers. T_2 is used to provide isolation for the power supply. This transformer may be eliminated if the entire system is ungrounded after the fashion of a.c.-d.c. receiver techniques. However, the price of the transformer is very cheap insurance against accident grounding of the chassis and the resultant "fireworks."

The keying relay may be omitted and the key connected directly in the circuit between R_3 and ground if desired. If this is done, the body of the key must be connected to ground, and the contact

of the key connected to the low end of R_3 . If T_2 is eliminated, the keying relay can not be safely omitted.

The power supply as shown provides 190 volts under full load. The no-load voltage is approximately 205 volts.

The plate input is 1.98 watts. The efficiency is rather low as no tuned circuit is used in the output system. The output can be materially increased by the use of a tuned antenna system such as is shown in Fig. 2.

Since no tuned circuits are incorporated in this arrangement, the harmonic radiation will be relatively high. However, total radiated power is only a few hundred milliwatts at most, so the actual power radiated at the harmonic frequencies is of little or no consequence. The tuned antenna system shown in Fig. 2 will appreciably reduce the harmonic radiation.

The keying wave form is very good, having no click, thump, chirp, or tailing. The keying wave front has a slope of approximately 1.5 milliseconds, which precludes the possibility of clicks and produces a clean sounding character.

This oscillator has sufficient output to drive an 807 or similar amplifier tube either as a straight amplifier, or as a frequency doubler or tripler. It can serve the dual purpose of a low-powered transmitter for local communication and code practice, or as a driver for a higher-powered transmitter for the long distance work. It is complete in itself, containing its own power supply system, and yet it is small enough to be included in almost any transmitter as the exciter unit.

The mechanical arrangement of parts is not at all critical. The crystal socket should be mounted near the tube, and R_1 and R_2 connected to the prongs of whichever socket proves most convenient. Rf.

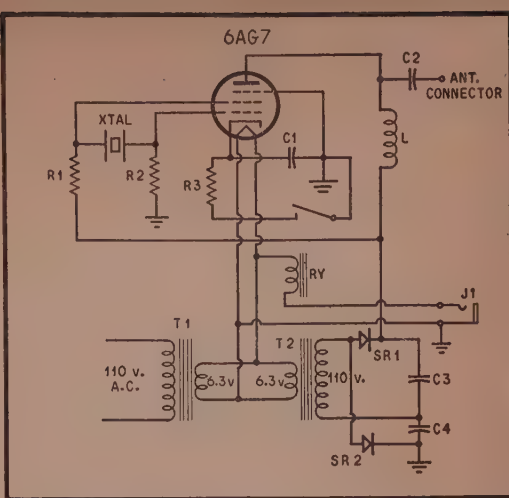
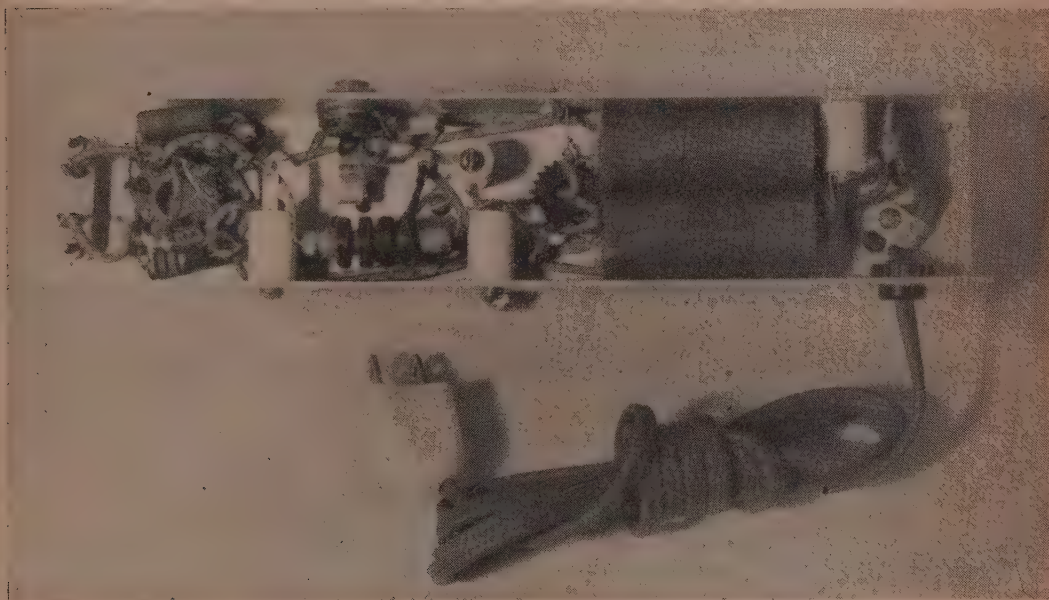


Fig. 1. Wiring schematic of the transmitter. Note the use of an isolating transformer to prevent accidental electrical shock from the a.c. line.

- R_1 , R_2 —47,000 ohms,
1 w comp. resis.
 R_3 —100 ohm, 1 w
comp. resis.
 C_1 —.0001 μ f mica
capacitor
 C_2 —.001 μ f mica
capacitor
 C_3 , C_4 —20 μ f 450 v
dry electrolytic

- J1—Open circuit jack
(for tel. key)
RY—Sigma type 41FZ
keying relay
L—2.5 mh r.f. choke—
Millen #34103
SR1, SR2—"Selectron"
Type 5M1 selenium
rectifier
T1, T2—Thordarson 21-
F10 fil. transformers

choke L_1 , bypassing capacitor C_1 , and coupling capacitor C_2 should also be located near the tube
(Continued on page 56)



Bottom view of the "Milliwatt" showing the location of parts.

Double Coax Matching Section

G. FRANKLIN MONTGOMERY, W3FQB*

In this article the author discusses and shows some definite results obtained from a mathematical treatment on matching antennas to feedlines. Although there is a popular disdain for the importance of feeding a balanced array with balanced feeders, in the long run such a system is highly desirable.—Ed.

THERE SEEM TO BE almost as many ways of matching a transmission line to a beam antenna as there are beams antenna designs. The most popular methods for Yagi arrays are the Gamma-match, the T-match, and the folded dipole. All three are used with a continuous one-piece driven element, and each has its own disadvantages. The Gamma-match and T-match have unpredictable adjustments, unless one can make use of previous experience with the same antenna. Folded dipole construction may add considerable weight to the driven element assembly. In contrast to these, the "quarter-wave" matching section can provide a very good match between the feed line and a simple split-in-the-center driven element. It has not been frequently employed, apparently because of design difficulties, or because there was no convenient way to accommodate an open-wire or twin-lead matching section on a rotary structure.

This article assumes the use of double coaxial line as the matching section. The advantage here is that coax can be strapped directly along the Yagi boom or the supporting mast without disturbing its electrical operation. Such an arrangement makes a neat mechanical job and distributes the weight added by the matching system along the parts of the structure that are best able to support it.

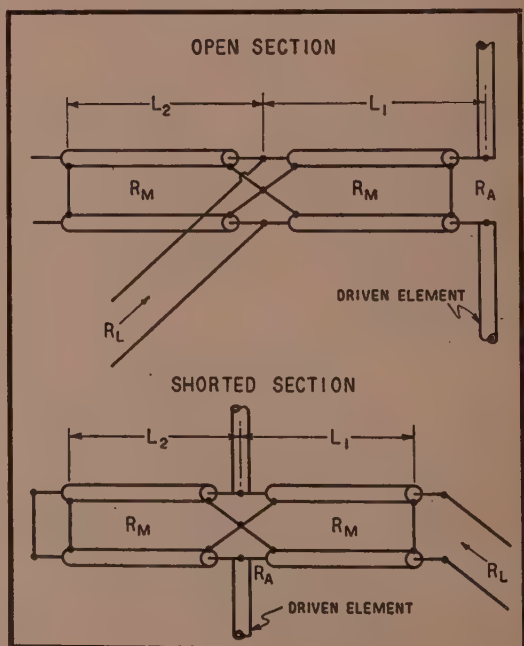
If the feed line itself is double coax, the problem of cutting the coax matching section to length is easily solved; for the case where feed line and matching section have the same characteristic impedance, the *Antenna Book*¹ contains curves for calculating the matching section lengths. But suppose one wishes to use twin-lead feed line and, say, double RG-8/U coax for the matching section.

The required information on matching section lengths is not readily available in this instance, and it becomes necessary to calculate them directly from the transmission-line equations².

Calculations have been made for the common twin-lead impedances of 75 and 300 ohms, and for matching section impedances of 104 and 150 ohms, corresponding to double lengths of RG-8/U and RG-58/U, or RG-11/U and RG-59/U. (150-ohm twin-lead can be matched with double RG-11/U, using the regular *Antenna Book* curves.) The results are plotted in Figs. 2 to 6. In the figures, R_L is the characteristic impedance of the feed line in ohms, R_M is the characteristic impedance of the matching section in ohms, and λ is the electrical wavelength in feet.

The independent variable for each of the curves is the antenna resistance, R_A . This is the resistance that appears at the center of the driven element of the completed beam. Antenna resistances for two commonly used beams are discussed in the *Antenna Book*³. Alternatively, the resistance can be measured with an antennascope⁴ or by measuring the standing-wave ratio on a short length of

Fig. 1. The two alternative methods of using the double coax method of matching.



¹ The A.R.R.L. *Antenna Book*, 1949, pp. 102-106

² F. E. Terman, *Radio Engineer's Handbook*, McGraw-Hill, 1943, p. 186

³ loc. cit., p. 161

⁴ W. M. Seherer, "Building and Using the Antennascope," *CQ*, September, 1950, p. 13.

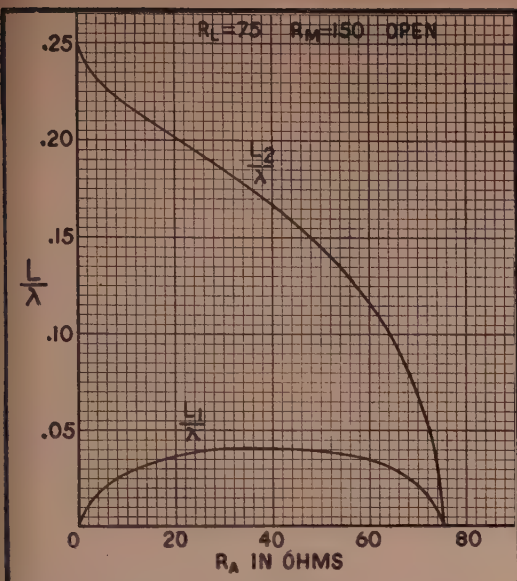


Figure 2

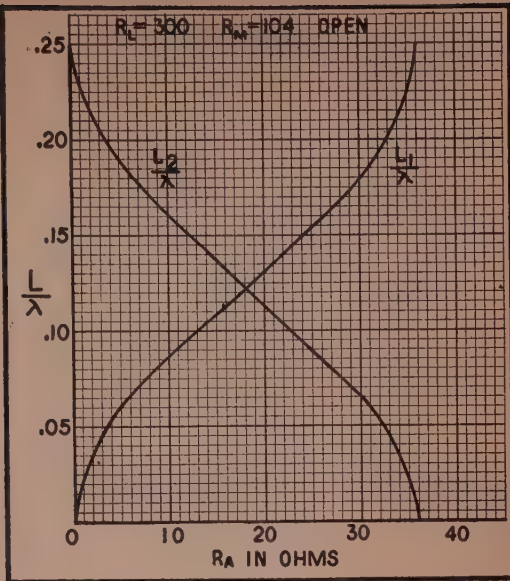


Figure 3

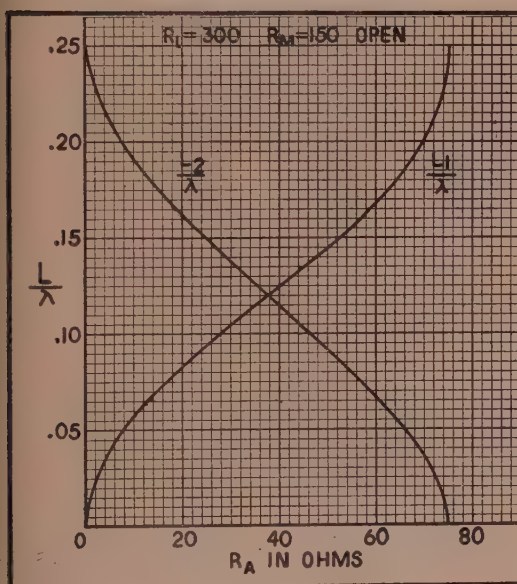


Figure 4

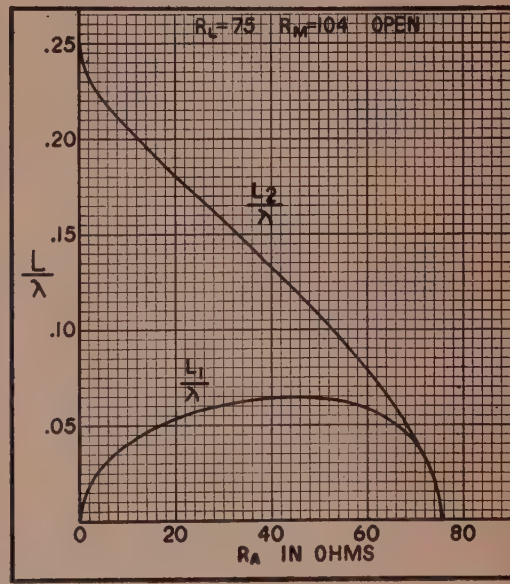


Figure 5

Figures 2-5: Graphical data using the open section with various feedline and matching impedances.

line connected directly to the driven element without the matching section.

It will be noted that the antenna resistance is always less than the 72-ohm resistance of a single half-wave dipole. There are, then, two possible arrangements for the matching section, as shown in Fig. 1. The "open" section is used with the driven element of the antenna connected at one

end of length I_1 and with the feed line connected at the junction of I_1 and I_2 . The "shorted" section is used with the driven element and feed line positions reversed. It turns out that for the range of antenna resistances considered, the shorted section is useful with only one combination of twin-lead and coax impedances, but the open section can be used with all four combinations.

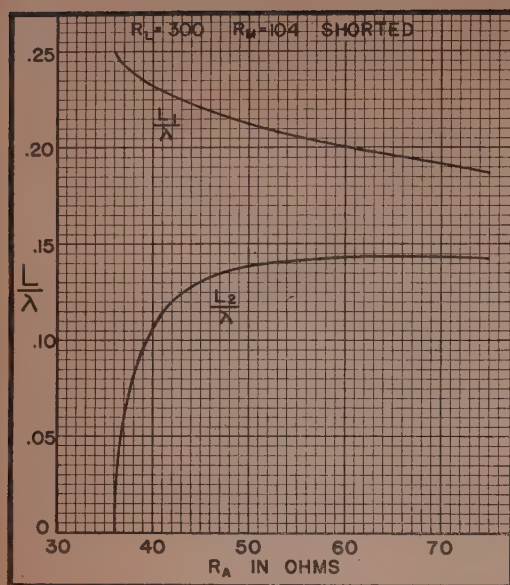


Fig. 6. Design data using the shorted section with a feedline of 300 ohms.

In each curve, L_1 and L_2 are plotted in electrical wavelengths at the operating frequency. As has been pointed out before, the term "quarter-wave" section is really a misnomer, because it is only at limiting antenna resistances that the sum of L_1 and L_2 is exactly a quarter wavelength. In addition, the matching section will always be physically shorter than a free-space quarter wavelength, because the free-space wavelength must be multiplied by the proper velocity factor to obtain the actual wavelength in the coax. For the coaxial cables whose type numbers are given above, the velocity factor is 0.66.

To illustrate the use of the curves, the following example is representative:

A three-element parasitic array with 0.1-wave-length director spacing and 0.15-wave-length reflector spacing is to be matched at 14.250 mc using 300-ohm twin-lead as the feed line and double RG-8/U as the matching section. Then $R_L = 300$, $R_M = 104$, and the appropriate curve is Fig. 4. After adjusting the beam for maximum gain, its resistance, R_A , is measured with an anten nascope and found to be 10 ohms. From Fig. 4, we find

$$L_1/\lambda = .087, \quad L_2/\lambda = .160$$

The free-space wavelength is

$$984/f(\text{mc}) = 984/14.25 = 69.0 \text{ feet}$$

and an electrical wavelength in RG-8/U is

$$\lambda = 69.0 \times .66 = 45.5 \text{ feet}$$

so that

$$L_1 = .087 \times 45.5 = 3.96 \text{ feet} = 3 \text{ ft, } 11\text{-}1/2 \text{ in.}$$

$$L_2 = .160 \times 45.5 = 7.28 \text{ feet} = 7 \text{ ft, } 3\text{-}1/2 \text{ in.}$$

In mounting the matching section on the antenna structure, the two outer shields of the coax may be grounded to the boom and mast if the constructor desires. In the use of the shorted section, the inner conductor of the shorted end of L_2 may be either grounded or left free. In any case, the outer shields should be bonded together at both ends of the section and at the junction of L_1 and L_2 .

Appendix

The following equations, derived from the transmission-line equations² for the particular case of the matching section, were used to calculate the curves.

OPEN SECTION:

$$\tan X_1 = \frac{\sqrt{1 - R_A/R_L}}{\sqrt{R_M^2/R_A R_L - 1}}$$

$$\tan X_2 = \sqrt{1 - R_A/R_L} \sqrt{R_M^2/R_A R_L - 1}$$

SHORTED SECTION:

$$\tan X_1 = \frac{\sqrt{R_L/R_A - 1}}{\sqrt{1 - R_M/R_A R_L}}$$

$$\tan X_2 = \frac{1}{\sqrt{R_L/R_A - 1} \sqrt{1 - R_M^2/R_A R_L}}$$

WHERE:

$$X_1 = \frac{2\pi l_1}{\lambda}$$

$$X_2 = \frac{2\pi l_2}{\lambda}$$

Technical Editor's Note: It might be worthy to mention that the above systems will work as long as the load being matched to the feedline is a pure resistance. If the antenna has a reactive load at the frequency in question, the formulas will not apply. As a result, the array must be resonated with the help of the grid dipper, or anten nascope. The assumption that the feedpoint impedance of a close-spaced array is even close to the "Handbook" value is often dangerous. Element lengths and/or spacing must be varied until the feedpoint is resistive.

There is some danger of exceeding the voltage ratings of the coax cables used in this system. If R_A is very low, and the feedline impedance is moderately low, it is possible to develop fairly high voltage across the open matching section. The danger of flashover exists where very high power is being used.

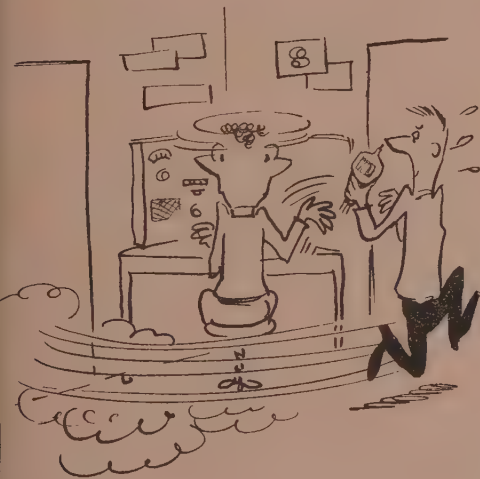
UNFAMILIAR PROVERBS—by Mel



SOMETHING OLD



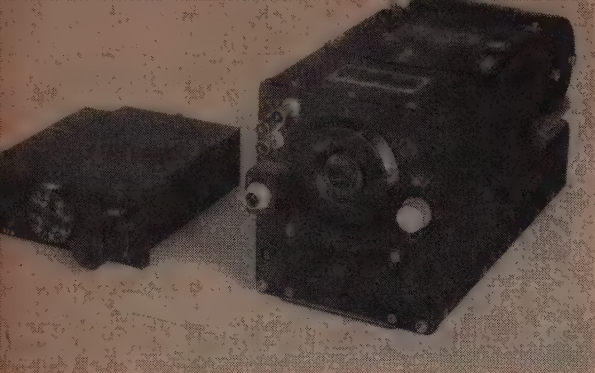
SOMETHING NEW!



SOMETHING "BORROWED"



SOMETHING BLEW?



(Courtesy National Bureau of Standards)

Fig. 1. The new subminiature low-frequency radio receiver (left), developed at the National Bureau of Standards, is the functional equivalent of the World War II BC-453 unit on the right.

ALTHOUGH NOT MANY of us have ever had the occasion to use the popular BC-453 for its intended purpose as an aircraft radio range receiver, nearly everyone is familiar with its use as an outboard i.f. amplifier and detector to supplement the selectivity of the usual communications receiver on the amateur bands. Amateurs will be interested, therefore, in the job done by Gustave Shapiro and his associates at the National Bureau of Standards in developing a miniature version of the 453 for the Navy Department's Bureau of Aeronautics.

The striking feature of the new receiver, readily appreciated from the comparison of Fig. 1, is its greatly reduced size. The volume occupied by the miniature version is little more than one-fifth that of the BC-453, and this reduction has been made possible by applying a number of new techniques developed in large part since the war. In fact, the new model is not simply a scaled-down 453 but is an entirely new receiver except for basic circuit similarities and an identical tuning range (190 to 550 kilocycles). To understand the differences, one must remember that the original 453 used conventional, prewar design with standard tubes, resistors, and condensers. The new receiver is made of parts that were almost unheard of until recently, including ferrite cores for the tuned circuits, printed-circuit resistor assemblies, glass-dielectric by-pass condensers, and tantalum high-capacity electrolytics.

In addition to its small size, the new receiver has a number of other advantages for military purposes. The unit is built up in subassembly form which makes for easier servicing, and the entire receiver is hermetically sealed, being filled with dry nitrogen when completed to eliminate oxidation of the components and the necessity for using protective coatings on the components themselves. To make the tuning controls air tight, special "wobbling-bellows" rotary seals were used, and since these seals were too large to be included inside the housing, they are enclosed in the tuning knobs. The front panel is sealed to the housing with a

The Miniaturized Q5er

soldered copper strip that can be removed for servicing with a coffee-can type of key.

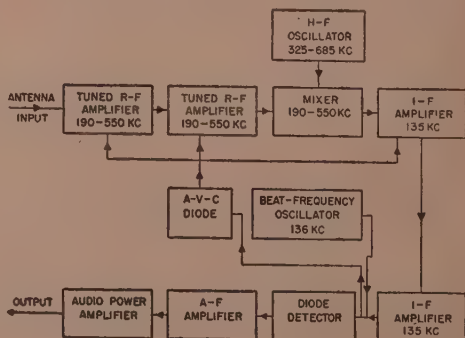
A block diagram of the receiver is shown in Fig. 2. Twelve subminiature tubes, of the type having flexible leads that are soldered directly into the circuit, perform all of the superheterodyne circuit functions. The radio-frequency circuits are slug tuned with ferrite cores driven by variable-pitch screws to give a linear dial calibration. The 135-kc i.f. transformers are also slug tuned and have an overall size of $\frac{1}{4}$ by $\frac{1}{2}$ by $1\frac{3}{8}$ inches; the receiver is about 2 kilocycles.

Where is the dynamotor? The interesting answer to this is that there isn't any. The entire receiver operates with 26 volts d.c. applied to heaters, screens, and plates. It may be news to some amateurs that sufficient receiver gain can be achieved with such low plate voltage, but the fact remains that a large percentage of the maximum transconductance of modern tubes can be obtained with supply voltages as low as 26 volts when the usual screen dropping resistors are eliminated and control

(Continued on page 54)

Fig. 2. Block diagram of the new subminiature low-frequency receiver. Although notable compactness is achieved through the use of subminiature components and techniques, the superheterodyne circuit is conventional. Twelve subminiature tubes are used, four of which are required for the audio output stage to secure adequate output with the 26-volt high-voltage supply.

(Courtesy National Bureau of Standards)



Monthly DX Predictions

GEORGE JACOBS, W2PAJ*

THE WEEKENDS of October 27th and November 3rd mark the CQ World Wide DX Contest. This month, we present a special "contest" edition of the DX Predictions. The contest periods have been specifically analyzed from best available data, and we hope that the information appearing on the following pages can be put to good use.

Since scores are based on the greatest number of different countries and zones, as well as stations worked, this contest is truly a world-wide competition. For this reason, we are including propagation data centered on other continents. It is hoped that this information will be of use to our overseas readers. This special foreign section was prepared by Mr. Roger C. Legge.

Last year's contest was plagued by a severe disturbed period. A long range study of ionosphere conditions for the next few months indicates that this winter season will have poorer radio conditions than any since 1944-45. A specific study of the contest period indicates that the phone period (October 27-29) falls between two disturbed periods. DX conditions are expected to be normal for that portion of the contest. The picture is unfavorable for the C.W. contest weekend (November 3-5). Indications are that this will be a disturbed period.

Other below-normal periods expected during the month of October are as follows: 2-5, 7-9, 11-13, 15-23, 25-27, 29-30 and November 3-5.

General Propagation Conditions for October, 1951

Increased activity should be noticed on 10 meters, with circuits from the United States possible to all continents towards the end of the month. Twenty meters will still be the best DX band, although the hours that it will be useable will be somewhat less than during the summer months. Nighttime noise and daytime absorption levels are expected to decrease considerably, permitting 40, and to a less extent 80 meters, to become quite active.

All predictions are based on an effective radiated power (power into the antenna multiplied by the gain of the antenna) of 100 watts c.w. The predictions are valid throughout the entire month of October. By referring to the predictions during the contest period it should be possible to arrange your operating schedule to your best advantage.

The following is an example of an operating plan suggested for an East Coast ham, during the C.W. contest. This operating schedule indicates which band has the best possibilities of providing contacts with the most continents and zones for any hour of the day. Similar operating plans can be easily devised for other areas.

*3620 Bedford Ave., Brooklyn 10, N. Y.

(Continued on page 52)

TYPICAL CQ DX CONTEST WORK PLAN FOR EAST COAST QTH

TIME PERIOD GMT	RECOMMENDED BAND	CONTINENTS	POSSIBLE ZONES
0200-0300	20	So. America, Oceania, Asia	1, 6-13, 19, 25, 27-32
0300-0800	40 or 80	Europe, So. America, Oceania, Africa, Asia	1, 2, 6-13, 14, 15, 20, 25, 27, 29-38, 40
0800-1000	40	So. America, Oceania, Asia	1, 2, 6-13, 19, 25, 27-32
1000-1400	20	Europe, Asia, Africa, Oceania, So. America	6-13, 14-20, 23, 32-38, 40
1400-1800	10	Europe, So. America, Africa	6-13, 14, 15, 20, 31, 33-39
1800-2100	20	Europe, So. America, Asia, Oceania	6-13, 14, 15, 20, 21, 25, 33-35, 40
2100-2200	10	So. America, Oceania, Asia	6-13, 25, 27-32
2200-0200	20	Europe, Africa, So. America, Oceania Asia	6-13, 14, 22-33, 35, 36, 38

OCTOBER 1951

EAST COAST TO: (Centered on Washington, D.C.)	10 Meters	20 Meters	40 Meters	80 Meters
	ALL TIMES IN GMT			
Scandinavia	Nil	1030-1200 (2) 1200-1830 (1) 1830-2030 (3)	2200-0800 (1-2)	Nil
Great Britain & Western Europe	1400-1800 (0-1)	1000-1200 (3) 1200-1800 (2) 1800-2100 (3-4)	2300-0800 (2-3)	0000-0700 (2)
Balkans	1430-1730 (1-2)	1000-1130 (2) 1130-1800 (1) 1800-2100 (3)	2300-0700 (2)	2300-0600 (1)
Southern Europe & North Africa	1500-1900 (2)	1000-1200 (3) 1200-1830 (2) 1830-2300 (3-4)	2200-0630 (3)	2300-0630 (2)
Near East	1400-1500 (1)	0930-1030 (1) 1030-1700 (0-1) 1700-1930 (2-3)	0000-0400 (1)	0000-0400 (0-1)
South America, East Coast Section	1230-2130 (3)	1030-1200 (2-3) 1200-2100 (1) 2100-0100 (3-4) 0100-0600 (2)	2300-0900 (3)	2300-0900 (1-2)
Hawaii	1730-0000 (3)	1500-1800 (2-3) 1800-0000 (1) 0000-0400 (2-3)	0300-1400 (3)	0300-1400 (1-2)
Oceania	2030-2330 (2-3)	1200-1400 (2) 1400-0000 (0-1) 0000-0230 (2)	0700-1400 (2-3)	0700-1400 (0-1)
South Africa	1230-1830 (2-3)	1100-1300 (2) 1300-2200 (0-1) 2200-0000 (2)	0100-0400 (2)	Nil
Guam	2100-2300 (1)	1400-1600 (2) 1900-0000 (0-1) 0000-0300 (2-3)	0600-1400 (1)	Nil
Far East (Japan)	2200 (0-1)	1200-1400 (1-2) 2030-2200 (2-3) 2200-0000 (1) 0000-0230 (2-3)	0500-1400 (1)	Nil
Asia (India)	Nil	1100-1200 (2) 1200-1530 (0-1) 1530-1730 (2) 0100-0200 (0-1)	Nil	Nil
CENTRAL USA TO: (Centered on St. Louis, Mo.)				
Great Britain & West Europe	1430-1730 (0-1)	1100-1300 (2) 1300-1830 (1) 1830-2200 (3)	0000-0800 (2)	0000-0700 (1-2)
Southern Europe & North Africa	1600-1900 (2-3)	1100-1300 (3) 1300-2000 (1) 2000-2300 (3-4)	2330-0700 (2-3)	2330-0700 (1-2)
South America, East Coast Section	1300-2200 (3)	1000-1200 (2-3) 1200-2100 (1) 2100-0200 (3-4) 0200-0600 (2)	0000-0930 (3)	0000-0930 (1)
Hawaii	1800-0130 (3)	1530-1900 (2-3) 1900-0100 (1) 0100-0500 (2-3)	0330-1330 (3-4)	0330-1330 (2)
Oceania	2100-0000 (2-3)	1300-1500 (2)	0800-1500 (2)	

OCTOBER 1951

CENTRAL USA TO: (Centered on St. Louis, Mo.)	10 Meters	20 Meters	40 Meters	80 Meters
ALL TIMES IN GMT				
Oceania	2100-0000 (2-3)	1300-1500 (2) 1500-1700 (1-2) 1700-0000 (0-1) 0000-0300 (2-3)	0800-1400 (2-3)	0800-1400 (0-1)
South Africa	1300-1900 (3)	1100-1300 (2) 1300-2200 (0-1) 2200-0000 (2-3)	0100-0400 (2)	Nil
Far East (Japan)	2200-0000 (1-2)	1300-1500 (2) 2100-0200 (1) 0200-0400 (2-3)	0700-1200 (1-2)	Nil
Asia (India)	1600 (1)	1300-1400 (2) 1400-1600 (0-1) 1600-1700 (2) 0200-0300 (1-2)	Nil	Nil
WEST COAST TO: (Centered on Sacramento, Calif.)				
Europe	Nil	1330-1500 (1-2) 1500-1900 (1) 1900-2030 (1-2)	0200-0700 (2)	0200-0700 (0-1)
South America, East Coast Section	1500-0000 (3-4)	1300-0100 (1) 0100-0400 (3-4) 0700-0900 (2)	0200-1000 (2)	0200-1000 (0-1)
Oceania	2000-0300 (2-3)	1530-1800 (2) 1800-0300 (0-1) 0300-1000 (3)	0800-1300 (2)	0800-1200 (0-1)
Japan & Far East	2200-0230 (3)	1800-2000 (2-3) 2000-0200 (1-2) 0200-0630 (3)	0800-1300 (1-2)	0800-1300 (0-1)
Philippines & East Indies	2200-0300 (2-3)	1500-1800 (2) 2100-0500 (0-1) 0500-0630 (2-3)	1200-1400 (0-1)	Nil
Asia (India)	Nil	1530-1730 (2) 2300-0300 (1) 0300-0500 (1-2)	1200-1400 (1)	Nil
SOUTH AMERICA TO:				
Europe & North Africa	1200-1800 (2-3)	1800-2200 (2-3)	0000-0700 (2)	0100-0700 (1-2)
South Africa	1100-1900 (3-4)	0600-0900 (1-2) 1800-0300 (2-3)	2300-0600 (2)	0000-0600 (1-2)
Middle East	1100-1600 (2-3)	1900-2200 (2-3)	0000-0400 (1-2)	0000-0400 (0-1)
India	1000-1600 (2)	1900-2300 (1-2)	2300-0100 (0-1)	Nil
Northeast Asia	2200-0400 (2-3)	0600-0800 (1-2)	0800-1000 (1-2)	Nil
Australia	Nil	0700-1100 (1-2)	0800-1000 (0-1)	Nil
WESTERN EUROPE TO:				
Central America	1230-1800 (2-3)	1000-1200 (2) 1900-2200 (2-3)	0000-0700 (2)	0100-0700 (1-2)
South America	1200-1800 (2-3)	1800-2200 (2-3)	0000-0700 (2)	0100-0700 (- 2)
South Africa	1000-1700 (3)	1700-2000 (2-3)	2100-0400 (2)	2200-0400 (1-2)
India & Southeast Asia	0900-1500 (1-2)	1500-1900 (2-3)	2100-0000 (0-1)	Nil
Northeast Asia	Nil	1200-1400 (0-1)	2000-2300 (0-1)	Nil
Australia	0900-1500 (1-2)	1600-1900 (1-2)	2100-2300 (0-1)	Nil

Conducted by E. M. BROWN, W2PAU*

THE DAYS ARE GETTING SHORTER and the nights are longer—more hours should be available each evening for the pursuit of elusive DX. This is the season to be especially alert for good band conditions. Remember the big “weather openings” of years past? W2BAV’s many near-record two-meter contacts during September, 1950; the big break along the northeast coast between VE1QY to W4CVQ and the near-record 420 mc work done by W4CLY, W2QED and K2AH on October 2nd and 3rd, 1950; the opening on October 17-18, 1950 during which so many of the east coast gang got their first crack at West Virginia, Kentucky and Ohio. And in 1949 the existing two-meter record was broken by W4JFU and WØEMS during late September. Nor is the weather the only favorable sign—the Northern Lights have provided many “firsts” on both two and six meters, and the peak of auroral activity seems to come during the months of September and October. The six-meter band is certain to feel the beneficial effects of the Fall auroral season during the next few weeks. In short—let’s make the most of our opportunities. May 1951 be a year to remember!

New 420-mc DX Record

It was bound to happen sooner or later. During the past two years a fairly small group of serious-minded experimenters have been steadily improving their equipment for the 420-mc band. You may have noticed that nearly every month there has been a story of another “near miss” on 420. K2AH works W4CLY cross-band over 295-mile path (July, 1951). W1HDQ works W2QED cross-band during July and August, 1951. K2AH hears W4ODG—300 mile hop (October, 1950). W3OWW heard by W1HDQ—and so it went.

The big break that everyone was waiting for came on August 31st. Early in the evening it was apparent that we were in for something a bit special in the line of band openings. VE1QY on 144.67 mc was pounding in with an S9 signal all the way down the coast to Virginia (and possibly further!). The fellows with the 522 transmitters and dipole antennas were making plenty of noise over distances of 300 miles or better. W3AIR, of Germont, Md. (near Washington, D. C.) and W2TP of Leonia, N. J. put on a show which advertised very effectively that the 420 mc band was

open for business. The signals which they broadcast via two meters sounded as good, if a better, than the two-meter signals received directly from the weaker station!

There followed a great flurry of activity to get all the available 420-mc stations in the area on the air, in an effort to break the record. W1HDQ and W1PBB, (who have been running regular schedules over the 40-mile path that separates their stations), were both alerted. W3OWW and W3BSV were on. W2QED made it a little later in the evening.

After the dust died down it became apparent that W3AIR had worked W1PBB of Monroe, Connecticut, two-way on 420 mc. This seems to be the former record for this band by a small margin. Calculations based on the locations of the centers of the cities involved indicate that the distance is approximately 265 miles, sufficient to top the 260-mile contact of W6VIX and W6VRN who were both operating portable from mountain-top locations. In any event, the W3AIR to W1PBB contact sets a new record for fixed station work!*

During this same opening W3AIR heard W1HDQ and reported him as Q5. Although E thought that he was able to detect Frank’s signal on 420, it was not scored as a QSO and a possible 300-mile record was missed.

Meanwhile, W2TP was taking advantage of the opening. Musty worked W3OWW, of Stewartstown, Pa., and heard W3BSV of Salisbury, Md. W2QED was relieved of his baby-sitting chore and got over to the radio shack pronto, and worked W1HDQ (approx. 200 miles), W1PBB (160 miles), W2TP, W3AIR and W3OWW.

Full facts on this story—equipment details, etc.—must wait until next month, as our deadline is at hand!

There is sure to be more and bigger news on 420 mc activity in the near future. W2QED is putting the finishing touches on a 96 element array. W3BSV has his 64-element job about ready to go. W3RE has a 4-x-150 on the band, crystal controlled. W4JFU has a 32-element array also set. W3AED is open for business at Berlin, Md.

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

* This episode points out the reason why we have often requested that active v.h.f. stations determine their exact geographic location in terms of latitude and longitude and submit these data to those agencies who might be interested in determining the exact mileage of a near-record hop. Calculations of distance are simple, but it is often difficult to obtain the exact locations of the stations involved on short notice.

W1HDK is demonstrating that selectivity, via an HRO as an i-f strip, pays off.

Expeditions

The Island of St. Pierre was the target for many a high-gain two-meter array during the last two weeks of August, 1951. Official Bulletins to all OES stations had announced the fact that FP8AG and FP8AH would be active on 144.12 and 146.03 from this rocky outpost off the southern coast of Newfoundland. The full story of this expedition is not available as we go to press. It is reported that the stations were set up and ready to go only a few days behind the original schedule. There seems to be some question as to when they shut down. Were they on during the big opening of the 31st? Or did poor weather north of Nova Scotia spoil their chances? In any event, the two-meter gang owes a big vote of thanks to the operators of FP8AG and FP8AH for providing the incentive necessary to coax some of the old-time DX artists out of hiding. The stations on this end were doing their best—if the expedition was a failure from a v.h.f. point of view we'll just have to blame it on an act of Nature.

WØINI of Pleasant Hill, Missouri, is a proud candidate for 50-mc WAS honors, thanks to an expedition station manned by WØHVW and WØQXT. These boys loaded HVW's transmitter and converter and QXT's HRO receiver into a car and drove over to Rulo, Nebraska. They left at 2:00 p.m. The gear was set up, a duly witnessed QSO was accomplished between WØINI and WØHVW/Ø with S9 signals both ways over the 100-mile path, and the expedition arrived safely back in town at 11:30 P.M.! Congratulations on the WAS, Harry, even if it took a little "arranging" to complete the deal!

W4KKZ/VP7 has been on the air from the Bahamas since early August. Equipped for both six and two meters, this station has been producing plenty of excitement on both bands. On the 6th of August came the first reports of contacts between the mainland and the Bahamas. On the 14th, the Florida six-meter gang reported that a new call had been assigned to W4KKZ, namely, VP7NQ. He was reported under this call on the 15th by W4MS and others. On the 16th, a good sporadic E opening up and down the east coast gave W2BYM, W3MQU and several others their first crack at a VP7 contact. Another opening on the 1st of September during the late afternoon and early evening gave the northeastern gang another good chance to add the new prefix to their laurels. Full details on the 144-mc operations of VP7NQ are not available at this time. It is, however, rumored that cross-band contacts to the mainland over the 80-mile (approximately) path have been made. Latest word is that W4LIP plans to ship a two-meter array and another converter to the island—let's hope that it pays off! Operations are expected to continue for at least another month, and if all goes well, this Bahama expedition may become an annual affair.

CO2JF is now active in Havana, Cuba. Although



The 30-element 435 mc array used by G5BY for reception during his record-breaking contacts of July, 1951. The design is based on the 30-element W2NLY antenna described in "CQ" for November, 1950. The framework is made of wood. Driven elements are made of $\frac{1}{2}$ " o. d. copper, all other elements of $\frac{3}{8}$ " o. d. Soldered connections are used throughout. The array is matched to the open-wire feed line by means of a half-wave shorted section made up of $\frac{1}{2}$ " o. d. copper tubing spaced 2". Part of the "4-over-4-over-4-over-4" 144-mc array can also be seen in this picture. The center elements of the 435 mc array are approximately 40 feet above the ground. A separate 24-element beam was used for transmitting.

this station should probably not be classed as an "expedition station", until full details are released (we hope in an early issue) this classification is perhaps the best one. CO2JF wishes us to make the following announcement: *Please Omit QSLs!* The chief op at this station was able to renew old friendships during the six-meter opening of the 1st of September when he contacted W1HDK, W2BYM, W2BCR; W3s BGT, MQU, KKN, OJU; W8CMS, W8NQD; W9ZHL.

On Saturday, October 6th, W5VWU is heading up an expedition to Sandia Crest, 10,600 feet above sea level. This spot is about 9 miles northeast of Albuquerque, N. M. Equipment will consist of a 100-watt transmitter in 144.14 mc, c.w. only; a multi-element array on horizontal polarization; and a converter with a pair of 6J4 grounded-grid r-f amplifier stages. Another transmitter on 7155 kc will be used to coordinate two-meter schedules. Operation is slated to begin at 4:00 p.m. MST

October 6th, 1951, and will continue for 24 hours. Write to W5VWU, J. R. Johnson, Sandia Park, New Mexico, for details. Assistant operators will be W5CA, W5LFH and W5LZD. Watch 144.14 during the weekend of October 6!

G3DA organized an expedition to the Isle of Man operating under the call GD3DA/P during the period from July 11 to August 16; and despite everything that the weather could throw at him came up with the following fine results: 66 different stations worked on two meters, in 31 counties and 5 countries! Credit him also with the first: GD to EI QSO with EI2W; GD to G with G3GMX; GD to GI with GI2FHN; GD to GM with GM3DAP; GD to GW with GW5MQ and also the first GD to GW 430 mc QSO with GW5MQ! Equipment used at GD3DA/P included a much-modified BC624 with a 6J6-832-832 tube line-up, with only about 8 watts input on two meters. The receiver was a 6J6 converter into a home-brew i-f strip, and the aerials were a 3 element Yagi on 144 mc and a 5-element job for 435 mc. This was at least one expedition that really paid off!

VFO Operations on the VHF Bands?

In a recent issue of Short Wave Magazine (London) G2XC, Editor of the v.h.f. column, took an editorial poke at the stations who were using VFOs or VFO operating techniques on the two-meter band. We were amazed at the sudden and practically unanimous reaction in favor of his stand.

Could it be that a similar sentiment exists on this side of the pond? Ye Ed has always been of the opinion that a VFO in the hands of a good operator, (one who is thoroughly schooled in the practical applications of the Golden Rule!), is a great asset to any ham station, v.h.f. or otherwise. But perhaps that opinion is prejudiced by the fact that W2PAU has always been VFO-controlled!

We'd like to hear from our reader(s) on this matter. Should an effort be made to keep VFOs off the band, or to discriminate against the few who employ conventional low-frequency practices with their "swishers"? And what about contest work? The QRM caused by VFOs during a contest may be hard to take, but how about all the extra calling and tuning that would be involved if everyone stuck strictly to one frequency? And, as every low-power operator knows, when a big gun decides to stake out a claim on your frequency, you might as well move! Let's hear your ideas.

Miscellany

W6PJA, formerly W2PJA/6—some guys must have pull with the FCC—writes that he has been unsuccessful to date in his efforts to contact W7FGG in Tucson on their schedule at 2200 PST, but he hopes that things will be better in the Fall. There are quite a few more fellows listening on the California end of this path than there were formerly, and several pairs of ears are better than one. Bud would like to try operating a Beacon transmitter on 144.11, at a power input of about 30 watts. Any comments on the idea of two-meter beacons, gang?

W3TF of Temple, Pa., has done more than his

share toward keeping activity alive on two meters during the "dull periods". We learned with a great deal of pleasure that his XYL, Verna, finally made the grade and was issued a genuine General Class ticket—W3RVU. Quite by coincidence, the 17-year old son of Jean, W3INL and Fritz, W3G, received his general class ticket at about the same time. His call—W3RVU! Needless to say, we these two hooked up for the first time on two meters, there was great consternation! Latest reports have it that Mrs. W3TF is the rightful owner of the call. We print this story not so much to ridicule the FCC for a perfectly understandable secretarial error as to point out that just this of the hams caught the FCC making a mistake. M. bites Dog!

KP4NX passes along the news that he switched from VFO to crystal control on 50.6 mc as of 1 August 1951. His receiver is of interest; it uses a Wallman cascode r-f amplifier into a converter which is fed by an overtone crystal oscillator to produce an i-f signal of 16 to 20 mc. The converter feeds into an HRO7. Westy has another Wallman r-f amplifier outboard for six-meter work. A similar receiving set-up is used for two-meter coverage, but as yet no good antenna is available for this band.

W3BLF of York, Pa., is looking for two-meter schedules in any direction. Russell puts out a full signal on 144.1 (approx.) and is equipped for either polarization.

Two new "super gain" 144 mc antennas which should do a great job of band-opening may be in action by the time this column appears in print. First to take the air was the 48-element array, W2NLY. Using two 24-element arrays spaced 1/2 full-wavelength, with the top element approximately 87 feet above the ground, horizontally polarized Jim claims a significant improvement over the old 30-element beam. (See "CQ," November, 1950). Hard on his heels comes W2BV, whose 48-element *flip-flop* array is due for erection on the 75-foot tower any day now. Burrill's array consists of a conventional 32-element 4-by-4 backed up by a curtain of parasitic reflectors, to which has been added a 16-element array, giving a total of 48 stacked bays each four wide on vertical polarization. And he's the one who said that those so'n's in the Mid-West would have to go vertical to work him—Haw!

From VE7FJ comes the latest dope on doings in the Vancouver, B. C. section. VE7JG got his new beam up, and was rewarded by being the first to work into Seattle for a two-way contact with W7MQM. He also heard W7EVO and W7ML in QSO. This work was on vertical polarization; however, all the Vancouver gang are now using horizontal. VE7AIW has a new "Twin Five" up, but to date it doesn't quite come up to the performance of his old 16-element job. VE7AIM has a new 32-element beam in action, but it still doesn't seem to be giving the expected results on transmitting. AIM is also trying to get some of the gang interested in 420 mc operation. VE7AIA has a new final, running about 80 watts to an 829J

and it sounds even better (if possible) than the old 832 amplifier. VE7DU is so busy working six meters that he probably won't find his way back to two meters until winter comes. VE7ABG is another new-comer to two meters and is heard quite regularly. And our correspondent, VE7FJ, has a new 16-element beam but he doesn't know whether it works or not. Seems that the landlady saw it on the roof and raised H—1! Austin may get around to testing that beam when he finds that new QTH out in the country!

Activity on the two-meter band is picking up as a result of the issuance of Novice tickets. Typical of the Novice licensees is our friend WN3SAO of Philadelphia. Frank uses only two watts input to a single 6J6 in the final, a 3-element collinear antenna, and a home-brew converter into a surplus 3-5 mc ARC receiver. During one month's operation on the band, Frank has contacted over 50 different stations, at distances up to 100 miles. He seems to be satisfied with the type of QSOs available on two—in fact, too much so! We're afraid that the year may pass without the code practice necessary to insure continuation of this sort of operating. As a result, several of the old timers have laid down the law—at least 50% of each future QSO with WN3SAO must be on CW or MCW—or no QSO! Maybe this trick could be used beneficially on those of the Novices who seem unwilling to venture into the maze of QRM, QRN, and ITV on the lower frequency bands. Try MCW on your next Novice contact—it may not be much fun, but it's for a good cause.

W2YXE of Troy *Eastern* New York, passes along a wealth of information on two-meter activity in his neck of the woods. He lists W2ACY, Schenectady, on 144.5—W2OPQ, West Galloway, (5 miles north of New Amsterdam) on 144.25—W2VCB, Latham, (3 miles west of Troy) on 144.2—W2KLZ at East Berne or at his home in Troy on 144.3—W2ERX at Lake George on 144.75—W2SFK, Glens Falls, (40 miles north of Troy)—W1MEP in Bennington, Vt. (only 15 miles northeast of Troy) runs 100 watts input and has a 16-element beam on either horizontal or vertical. And Paul adds "If we can only get him on the air I'm sure you can work him . . . Watch for him on 144.14...." We'll be watching! W2PV of East Greenbush (5 miles south of Albany) is on 144.9—W2DIF, Albany, is on 144.20. W2s ACY, OPQ, ERX, PX and YXE are using "Twin Five" beams. ERX has 20 watts, the others, 100. W2KLZ has 100 watts and a 4-element beam at the East Berne location, and a 16-element array at his Troy QTH. W2SFK has 60 watts input and an 8-element beam. W2DIF is building a "Twin Five" to replace his 4-element indoor array. Thanks a lot for all the information, Paul, and we'll be looking for you on 144.2 every Tuesday at 10:30 P.M. See what W1MEP wants to induce him to get on the air some Tuesday!

W3LZD, near Scranton, Pa., has 700 watts input to a pair of 4-125s on 144.9 mc and has a 16-element array on horizontal. During the early evening hours he confines his operations to straight c.w. because of the "Indians"! He has been holding

schedules with W2YXE on a daily basis morning and night, in an attempt to determine which times are optimum for DX.

W3RUE of Pittsburg, has a new 12-element "Twin-Six" up on the old mast. Horizontal only, at this time. Ted is laying a FB signal out on 144.32. He has been worked by the east coast stations more than once during the past month.

W7QLZ (and several others) reports that nothing was heard from the balloon on two meters. (We don't know whether they had troubles or not. When the official story is released by the New Mexico group, we'll pass it along.) Clyde also notes that W7FGG put up a new tower and a new set of antennas on August 12. Clyde should have his new tower up by the time, too. He has built seven versions of the "Twin Five" array during that past year, and his tests seem to indicate that those spaced $5/8$ wavelength worked better than those spaced a full wavelength. He says that he can hear W7FGG 9 out of 10 tries on his present beam, where it was only 5 out of 10 on the original antenna.

W3MQU announces a program to stimulate routine local activity on the six-meter band. On every night, at 10 p.m. local standard time, the gang have agreed to have at least one representative in the W1, W2, W3 and W4 call areas on the air—either calling CQ or in QSO. Frequent stand-bys to permit listeners to call in will be made in either event. In addition, Saturday evenings are scheduled as special round-table nights. At 10 p.m. the gang will convene for one of those good ol' time sessions. Anyone is welcome—even DX!

Art Bates, W5ML, writes to tell us that he and W5DXB are now active on 420 mc, with 3C22s as high-powered modulated oscillators. W5DXB has a 6J6 mixer-6J6 oscillator converting into a 522 receiver on 50 mc, and is using a 16-element collinear about 45' high. W5ML uses a modified BC645 with butterfly tuners for the oscillator and mixer, with a 40 mc i-f system. Although they were over 9 miles apart S9-double-plus signals are the

(Continued on page 61)

EXTRA

It has been reported that on August 30, 1951 at 2045 CST, W9EHX of McLean, Illinois, heard W7JRG of Sheridan, Wyoming, using CW on 144.3 mc. This hop is close to 950 miles, and is especially interesting in view of the extremely rugged terrain on the western end of the path.

At the time this reception was reported, ground-wave conditions were excellent between Central Illinois and the Kansas City area, according to W9ALU.

VE1QZ reports excellent ground wave conditions during the two meter opening on August 31. Oscar was testing his 16 element array. He heard W2SLX, W1IZY and W3OWW(?) Neither VE1QZ nor VE1BC, who was also active, made any DX contacts.

DX

AND OVERSEAS NEWS

Conducted by HERB BECKER, W6QD*

Our sincere congratulations to the following well known DX men for achieving WAZ.

266	G5GK	George E. Webster	40 - 163
267	W6NGA	R. J. Grill	40 - 162

By the time you read this is will be old stuff, but I can't help giving a few words about the National Convention at Seattle. There were about 1500 in attendance and a great deal of credit should go to W7RT and his entire Gang for putting on the show. Naturally, from a personal angle, the DX portion was of great interest. A surprisingly large showing from the PVRC surprised everyone. Such DXers as W4KFC, W4ESK, W3GRF, W3GA, W4NTZ, W4ABY, W3LQK, W3LIR, W4IQR, W4YCV, W4KJT, W3RAQ, W4CC, W4IA, W4EMJ, W4SLD, and W3GD really represents quite a contingent from that neck of the woods. Of course, we can't overlook W9ERU/4. Naturally, there were many others from around the country but this was a

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

highly gratifying showing from the East Coast. ZK2AA and XE1BT were very much in evidence. The VE7 Gang was a fine group, and once again it was swell having so many bull sessions with all of the above characters—er, ah, that is, mean gentlemen. One of the biggest characters to show up was W2IOP—in fact, I had to live with him for two weeks. Oh, brother! His XYI was along and is she patient! W7DL had a very fine DX breakfast-meeting which was attended by about 200. W6ENV and XYL went along with us and I guess the gals had some sort of "anything but" DX meeting themselves. WØELA was there, and don't be surprised if by the time you read this, you hear strange signals coming from Brunei, Sarawak, and British North Borneo. WØELA was in the midst of arranging for this trip and let's all hope it comes off.

Speaking of DX meetings, W2IOP is supposed to show up and conduct the DX shindig at the Central Division ARRL Convention, October 20th and 21st. It will be held at French Lick Spring Hotel, French Lick, Indiana. If at all possible, better take in this little deal because LeKashmar has a little book called the "DX Man's Zoo." As a matter of fact, we initiated this book at the Seattle Convention and apparently this is a repeat performance. The book will give you more than a snicker, and you can really see what various types of DX men look like.

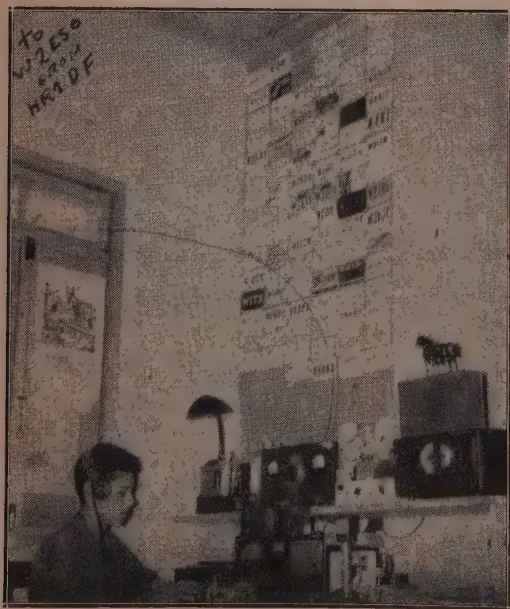
G6TT tells us that he is going to operate VP9TT from October 6 to November 5. He will be using a 32V2 and a 75A1 with a rotary beam for 10 and 20, up in the air about 300 feet. He said he will QSL everybody he works, and this should be a good one for the Contest.

I think we mentioned before about VS9AC being in Aden. As a matter of fact, he is on a little island in the Red Sea called Kamaran. Butcher who is also ex-MT2E, says the island is 80 square miles of sand, no trees, one other white man, no fresh water, hot, and very humid. What, no women?

W1ZL says LZ1DX should be getting enough radio gear to go in the radio business. . . W2WZ shouldn't complain too much, and here's why:



One of your best bets for an HR QSO and QSL. HR1DF is currently active on 40 and 20 with a 6L6-807 combination.



◆
 INU/Trieste works 'phone and c.w. on all bands, and has a number of "firsts" to his credit. The rig runs about 100 watts to an 813 final.



◆
 FR7ZA, 7B4QF, ZD1SS, and JA01J, who is supposed to be on Iwo Jima. . . . W6MEK is now in a new QTH, but at present is using only a 2-element rotary, 16 feet high. He now has a good shot at Europe, which, naturally, makes the guy happy after doing it the hard way around the Oakland hills for years. . .

W0ANF is getting all set for the next "CQ" Contest. . . . It is also good to hear from W0RBA, who took time and brought his country standing up to date. Maybe here is as good a spot as any to needle a lot of you fellows to take a look at your country totals in the Honor Roll. Then plow into your log book, copy down the countries and zones you haven't sent in, and shoot them in to us. This, of course, adds up to more work for our Gang, but a lot of those totals in the Honor Roll haven't been revised for months. After a few more needles on this subject, I think I might begin cleaning out a little dead wood, which will make way for some of the more up and coming DX men. . .

CR9AG tells me he has just finished installing a commercial broadcast station in Macao, and he is remaining there to be Chief Engineer. John's ham equipment is still in Hong Kong, and due to an embargo, he doesn't know when he will be able to get his stuff to CR9. The only card CR9AG needs for WAZ is one from Zone 9. He has worked HK2AZ, but as yet, no card. There is a new station on the air, CR9AF, whose QTH you will find in the usual place.

VK—ZL DX Contest

This Contest is in the nature of Australia's Jubilee Celebration. This is always a popular Contest, and the following is a condensation of the rules:

"The Contest is divided into three sections: c.w., phone, and receiving. The c.w. section will commence at 0001 G.M.T. Saturday, 13th October, and will conclude at 1200 G.M.T. Sunday, 14th October. The phone section will commence 0001 G.M.T. Saturday, 20th October and conclude at 1200 G.M.T. Sunday, 21st October. The receive-

1951 "CQ" World Wide DX Contest

**Contest Period: Phone Sections: 0200 GMT, Oct. 27 to 0200 GMT, Oct. 29.
 C.W. Sections: 0200 GMT, Nov. 3 to 0200 GMT, Nov. 5.**

Remember, this year we have added the 80 meter band in addition to the 40, 20, and 10 meter bands. Multiple operator stations—both phone and c.w.—receive due credit, and each of the operators assisting gets a certificate of award, as well as the station owner. We have a brand new type Contest Log Sheet, which will simplify your bookkeeping as well as ours, and these can be had by sending a self-addressed, stamped envelope to "CQ", 67 West 44th Street, New York 18. Overseas stations may send unattached postage stamps. Reprints of the complete Contest Rules may also be had for the asking.

Attention, Foreign Amateurs! It is recommended that you give the call letters of the station you are working at the end of a transmission, instead of just "BK," as this would prevent much QRM of stations piling on and calling you.

We suggest that overseas phone operators indicate which end of the band they are tuning, or which portions of the phone band (American or foreign) they intend to tune. On 28 mc., where the band is 1700 kc. wide, it is extremely important that overseas phone stations specify the approximate frequency they intend to tune. C.W. stations likewise could greatly assist by indicating where they intend to tune. We think if the above principles are used by all, it will result in fewer useless calls and far less QRM.

Foreign amateurs, remember: scores are based on the greatest number of different countries and zones as well as stations worked. Do not concentrate on working only U. S. stations; this is a world-wide competition!

W. A. Z. HONOR ROLL

CW & PHONE	CW & PHONE	CW & PHONE	CW & PHONE	CW & PHONE	PHONE ONLY
WAZ					39 Zones
W1FH 242	GZFSR 196	ZS6FN 157	KP4KD 185	CL3AB 143	XE1AC 205
W6VFR 240	W5GEL 196	W7BE 156	W7PGS 185	W0RBA 140	VQ4ERR 203
W0YXO 237	VK4HR 196	KH6LG 156	W8RDZ 184	W9PKH 135	W6DI 192
W3BES 236	W6UCX 195	W6BAX 155	W9TQL 184	VE3ACS 134	W6VFR 175
W6ENV 236	W5KRE 193	VK5KO 155	4X4RE 184	MP4BAD 133	PK4DA 175
W6ADP 234	G6QB 195	G3AAM 154	W3DRD 183	W6ETJ 132	G8IG 169
W3GHD 232	OK1FF 194	G2IO 154	W4INL 183	W4FPK 131	W7HTB 161
W2EXA 231	W6GAL 193	W6ATO 154	W2BJ 183	W2PQJ 130	W8HUD 160
W6GRL 231	W6RLN 193	W6KEV 153	W1DQH 181	W4LQN 130	F9BO 150
W6SN 231	W0SQO 192	OK1RW 153	W2CPL 181	W3ZN 129	VE7ZM 145
G6ZO 231	VK2NS 191	W6NTR 153	W2RDK 180	W9MZP 126	DL1FK 125
W6MEK 231	W6RWV 190	G3YF 152	VE3IJ 180	FE3AB 126	38 Zones
G6RH 229	W6SRU 190	KP6AA 152	VO6EP 179	W9TB 123	W2BXA 189
W8JIN 229	W6EPZ 190	W2QL 151	W9HUZ 175	GW4CX 120	W9RBI 188
W8NBK 229	CE3DZ 190	W6LEE 150	W4RBQ 174	EATAB 119	W6KQY 161
W6EBG 227	VK3JE 189	W6FHE 150	W8CVU 172	W0FET 118	W4CYU 160
W3EVW 227	ON4JW 189	W6EYR 150	W4DKA 172	KL7PJ 117	ZL1HY 157
W6M 227	W6EHV 189	W6LER 150	W4LVV 171	VE7VC 116	W6AM 156
W6PFD 226	W0NTA 188	W6LER 150	W2RGV 171	W6CAE 113	W1HKK 153
W3KT 225	W70Y 187	OK1CX 147	VE3AAZ 171	W7EYS 107	W9NDA 149
W6SYG 225	W8SR 186	W6LS 147	W6L 170	VK6DX 103	37 Zones
W3JTC 224	VK6RU 186	KH6PY 147	W6CTL 169	W6FKL 92	W1JCX 189
W8BRA 223	W6DFY 186	W7DZX 146	W1NMP 169	C1CH 84	W3BES 182
W3LOE 222	DL7AA 186	W6AYZ 146	W3JTK 169	37 Zones	W8REU 176
W6FSJ 222	W2CZO 185	VE6GD 146	OZ7UE 169	W1KFW 171	W3LTU 170
W6AMA 222	W1AB 185	W9NRB 145	W4VE 169	W2ZA 170	W3WU 157
W8BHW 221	W6BUD 185	W6MUC 145	HC2OT 169	W4IWO 149	CE3AB 163
CE3AQ 220	W6SA 184	OK2SO 145	W2CYS 167	W2WC 149	W9HB 161
W3ITA 219	KH6VP 184	ON44TA 145	W44Z 167	1IUU 149	W7MBX 158
W6DZZ 219	W3GAU 183	G3BI 144	W8LEC 166	F9AH 146	VK3EZ 158
W6MX 219	W2JVV 183	W7LYL 143	W9ABA 163	OZ7BG 144	W6WNH 157
W6TT 218	ILKN 182	W3IXN 141	W4BRB 162	GM2UU 142	G3DO 157
W0NUC 218	LA7Y 182	ILXK 140	W8VLK 160	G6GX 141	W6PXX 153
W0PNQ 217	W0ELA 182	W6AOD 140	W4OM 158	W4ML 140	W3GHD 152
W6MVQ 217	G3DO 182	W6ONZ 139	W5FFW 158	W9WCE 140	W3JNN 150
W9UDV 217	W6IFW 179	W6ID 138	W0AIW 157	OE1FF 136	W8BE 146
LU6DJX 217	OE1D 179	OK1WX 137	ILAY 157	W2AAT 130	W6TT 150
VE4RO 217	PY1BG 178	OK14TA 135	VK4DO 156	W7HKT 130	F8VC 124
G2PL 216	W6LN 178	W6TEU 133	W9YNB 155	W4DIA 129	W7MBW 107
W2PED 215	W7DL 177	W6RDR 133	DL1FK 155	W1APA 128	C1CH 83
W7AMX 215	W6UOX 177	W6AOT 133	W8WUU 155	VE5JV 126	36 Zones
W3JNN 215	VK6KW 177	W6ORB 131	ILAI 154	W9LNH 122	W1NWO 183
ZL2GX 215	W6UZX 177	ZS2AT 131	ZS2AT 152	VE1EA 116	W1MCW 176
W3IYE 214	CK1FY 176	W6IDZ 130	G3AKU 150	G3BPP 112	W1BEQ 164
PY1DH 214	W6IBD 176	W6BIL 130	DL1AT 150	W6AX 110	W4ESP 154
Z3ZX 214	KH6CD 176	W7ASG 129	W6LGD 149	W0FWW 108	W2DR 140
W6OEG 213	VK4EL 176	W7GBW 127	SM5WI 148	OH3OE 108	W9BZB 139
W2AGW 213	PK4DA 175	G8IP 146	W2GR 146	W7CK 104	GM2UU 135
W4AIT 213	W6WGU 174	G5BJ 126	W2MEL 145	W8HSW 104	W9HP 131
VK3BZ 213	W6CIS 174	PK6HA 124	OKIAV 144	W2BLS 99	W6PDB 130
KH6CT 213	W7FZA 174	G5VU 124	W6KYV 143	W6WWW 99	W4INL 129
G4CP 213	W6PCS 174	W6NRQ 123	VK4FY 143	KL7KW 88	W1FJN 128
W6HX 212	W6KUT 174	W6MLY 123	TF3EA 142	36 Zones	W8AUP 128
VE7HC 212	W8HUD 174	ZL1GX 122	VSTNX 140	W4HA 166	G6BW 127
W6NNV 211	W6TSD 173	VK5MF 121	W9NZT 136	W1BET 156	VE3BNQ 126
VK2ACX 211	G5VY 172	ZS2EC 116	W6KYZ 135	W5KJG 154	VE7HC 123
W6SAC 211	OK1LM 172	ZS6CT 113	VE7KC 133	W3MZE 151	W8CYL 112
W6BPD 210	W6WUQ 172	VK6GL 103	W7EJK 132	ILIT 140	W3DHM 96
W6MJB 210	W6SRF 171	VK6SA 103	W6TE 131	W0CU 139	W6SA 92
W6FE 210	PY1AH 171	W7KWA 98	W6WJX 131	W9LI 131	F8DC 87
W6PQT 209	OK1HI 171	W6DUB 89	W7BTH 131	OE4AK 128	35 Zones
KH6BA 209	VK2HZ 171	W7IYA 59	W5CPI 130	VE1PQ 128	HC2JR 171
W6VW 209	W6BAM 170	39 Zones	W6NZ 129	ILIZ 128	W4HA 159
W2AQW 208	W6PZ 169	W2NSZ 222	OE3CC 128	W3AYS 124	ZS6Q 156
W8HGW 208	W5AFX 169	W3DPA 220	DL1DA 127	F8TM 127	W9RNX 149
W9NDA 208	G2VD 169	F8BS 218	W7HXG 127	W2BF 115	W6PCK 148
ZL1HY 208	W6JZP 168	W9ANT 217	W6EYC 126	4X4BX 112	W9ETW 146
W6TS 208	W6ANN 167	W9RBI 216	W6MUF 124	W5CD 108	W2GHV 137
W5GDI 208	VK3CN 167	W1ENE 216	VRSPL 124	W2JA 102	W2RGV 135
KH6IJ 208	W6LDD 167	W3EPV 214	KG6BD 121	W5BK 99	W6CHV 135
W6SC 207	W6BVM 167	W5ASG 212	DL3DU 118	35 Zones	W0PUE 135
VE7VM 206	W6DUC 166	W2WZ 214	W6NRZ 117	W1DEP 159	HC2OT 134
W4BPD 206	KH6MI 166	XE1AC 211	KL7UM 117	W5JUF 152	W0EYR 131
W6DLY 206	W6CEM 166	W3OCU 210	W6JWL 114	W2OST 146	W9BVX 130
W6KRI 205	W6JK 165	W1BIH 209	KL7GG 114	W4DZH 132	W0FNF 130
DL1FF 205	VE7GI 165	W2HHF 208	W6FCB 114	W9CKP 132	W0PRZ 124
W6ZCY 204	W6LRY 165	W1JYH 208	W6VAT 110	W1MRP 130	W9CKP 124
W6DI 204	W6BZE 165	VK6JY 206	DL3AB 107	W5FXN 123	G8GX 123
W6PKO 204	W6PH 164	W5LVD 206	W7GXA 105	ZL1QW 129	W8ZMC 108
VK2DI 204	W6EAK 163	W9IU 201	W6LE 103	OESLY 122	W5LWV 103
W6AVM 204	W6YZU 163	W1GKK 201	W7LEE 91	W6ZZ 121	W4OM 106
W4CYU 203	G5GK 163	W8HFE 201	38 Zones	W9RQM 119	W3PA 105
W7GVI 203	VE7VO 162	W2HZY 200	W2HMJ 194	CO6AJ 119	34 Zones
W6EFM 203	ZS6DD 162	W3DKT 200	W2PUD 181	W9DAJ 115	W5ASG 152
W6VE 203	W7ENW 162	W4GG 197	CM2SD 174	W9FNR 113	W3KT 145
ZL1BY 203	ILIR 162	W9MXX 197	W8KPL 173	W8AVB 113	ILAXD 130
W6RM 202	W6NKA 162	W8SYC 197	W2SHV 169	W0GBJ 113	V55AB 129
W6OMC 202	W6PDB 161	W1HX 193	W2GVZ 162	W2HAZ 111	IJUSCB 129
W6AQA 202	W4CYV 161	F9BO 192	SMTMS 159	KZ5PI 108	W2ZVS 128
W9KOK 200	OK1SV 160	W2CWE 195	ZL3CC 159	KL7CZ 80	W5KC 125
VK5JS 200	VK3EK 160	W9LNM 192	W8EYE 158	34 Zones	W4LZM 124
W8BRQ 200	W6PUY 160	W3KDP 192	W2UEI 156	W8NS 133	W6UZX 123
G8IG 200	JAZKG 160	W2AGO 191	W3FYS 156	W1NLM 130	W8BIQ 122
PY1GJ 199	W6MHB 160	W1AWX 191	LU7CD 155	W4IYT 127	W5JUF 117
W6DU 199	W6CYI 157	OK1VW 189	VE2BV 153	W1RAN 122	W1BPH 105
W6TI 199	W7BD 157	W9FKC 180	W3LVJ 151	W5NTT 107	W4IWO 100
W2IOP 197	W0DUH 157	W1ZL 187	W5MET 150	W8JM 100	W8UIG 100
KH6QH 196	G3TK 157	W2EMW 188	W8ZMC 143	G2BVN 91	W8QBF 92
PY1AJ 196	W6BUV 157	W3JKO 186	W0AZT 143		
W6WH 196	W6QD 157	W0EYR 186			

ing section covers both c.w. and telephone. You may enter the "open" section, viz: all bands in either phone or c.w. or any one band in either section. A separate log must be forwarded for all sections entered. Additional log sheets may be obtained from your divisional secretary.

Serial numbers must be exchanged during the Contest as follows: The first three numbers will be the RST in the c.w. section followed by serial number of the contact, commencing with any number between 001 and 100 for the first contact and increasing in value by 1 for each successive contact. In the phone section the first two figures will be the RS report and then as in the c.w. section.

The method of scoring is quite simple. One point is scored for each contact and the final score is obtained by multiplying the number of contacts by the number of countries or VK-ZL districts worked on all bands.

Logs must show in this order: Date, Time (G.M.T.) Band, Call of Station Worked, Serial Number Sent and Received, and New Country or VK-ZL District Worked.

Overseas logs should be received by the Contest Manager, Box 1734, G.P.O., Sydney, Australia, not later than 31st January, 1952."

W8SYC has a few new ones to report: ZD6JL, 3A2AC, FG7XA, MP4BBD and IIAHR/M1. Clint recently completed a new rig using a couple of 4-125A's with these being driven by a 2E26. The whole job is TVI-proof, which is darn near a must these days. . . .

W5GEL has finally got his beams back up after having moved to a new QTH a year ago. His best and latest include FG7XA and FP8BX on 20 c.w. and CS3AB on 20 phone. . . ZL1BY took the hint and sent in about a dozen countries to bring his total up to where it should be. Bill has been on for years, but still continues to plow along. . . .

W6LGD is just about ready to start printing up some cards since he can't seem to get one out of SU1CR. W6MX is worrying about the airmail postage he spent, sending his card to Sikkim, when up pops a card from AC3SQ mailed from Rockford, Illinois. Walt is also worrying about Newfoundland, I understand. He will worry about anything, that guy. . . .

WINWO picked up VR5GA on 20 phone. . . GACP took time to bring his books into balance and sent in a whole mess of countries to add to his official list. . . . W6VE grabbed onto this trio: FG7XA, IIAHR/M1, and EA9BA. . .

According to our friend, XE1AC, Andorra was really on the air with PX1A. It was operated by Mario Flaue, EA3HE and EA3FL, from Hotel Meritxell, and used 20 and 40 meter c.w. and phone. Power input was 100 watts with an NC-57 receiver. As was the case when ON4QF, W6SAI, and W8PQQ went to Andorra, PX1A had an equally hard time working W's due to the surrounding ore bearing mountains; only six W's were QSO'd. Now then, if any of you boys would like to work Ifni, and who wouldn't, keep your good



"Los Tres Mosquiteros;" you've heard 'em all.

ear open for another expedition, also planned by an EA. . . .

CE3AG surely doesn't miss much. Witness VT1AC, 7B4QF, and KC6WD in the Carolines. . . Rumor has it that VR4AB is aboard ship, and the various C9's you hear on are probably Japanese Nationals. While I think of it, it might be of interest to some of you that MD4BBD is Roy Fleming, and before the War he was W6DQD, located not too far away from QD's joint. In fact, Roy went over to Bahrein before the War and signed VS8AA. He worked a number of W's at that time, but his DXing was short-lived on account of the Shah, or whatever it is, not getting enthused over Ham radio. . . .

I1ER is having a dickens of a time trying to figure out why he can't get a QSL card out of XE. It surely seems as though I have heard this story before, somewhere. . . . W1GKK says he would like to state (why so formal, George) that he is still handling the cards for FP8BX and thus far, he has sent out 1000 in the requested stamped envelopes. He also has sent out many having paid for the postage himself, because the boys, I guess, just forget to send him an envelope with a stamp on it. Now then, you fellows, George has done a good job, and if you want to get your card from FP8BX through him, for the love of Mike, shoot him a stamped envelope and save him all this messing around. It is a thankless job at the best, and in addition to this, George has sent him enough equipment to get on NBFM phone. . . .

W7HXG has been doing a lot of 40 meter work lately, and hooking some pretty good stuff too. He is getting set for the Contest, and figures on putting up a 40 meter ground plane antenna to replace the present folded dipole. Lee runs a kilowatt into a pair of 250TH's while the receiver is 75A1. . . .

W6AM recently logged VQ8CB on Chagos, and on phone hooked OE13RL. . . G6ZO was one of the lucky ones to work 7B4QF. W6DLY raised LZ1KAB on a CQ while another new one for Guy's log was HB1JJ/HE. . . W4HA adds a few nice ones on phone: KH6QL/KC6 in the Carolines, KH6KY/KM6, YO3RI, and VQ5AU. . .

One or two of the boys have wondered if FO8AG, located on Makatea Island, is a separate country from Tahiti. The answer is "nope,

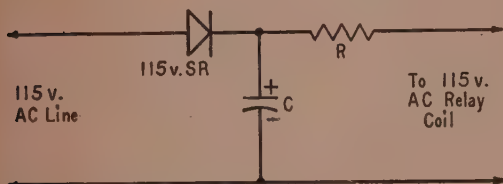
(Continued on page 58)

S & W is back again, after an absence of over a year. Your S & W editor promises to keep this department rolling, but he needs your ideas. Send them in, rough sketches and all. Each published idea will put \$2.50 in your pocket. All S & W contributions should be addressed to Shack & Workshop Editor, % CQ, 67 W. 44 St., N. Y. C. 18.

Quieting A-C Relays

If you have ever said, "QRX a second, my relays are buzzing", then here is an idea made to order for you. The schematic diagram is almost self-explanatory. The trick is to apply d-c instead of a-c to the relay coil. The result: a dead quiet relay. It's not quite this simple, however, because 110 volts d-c applied to an a-c relay would cause excessive current in the relay coil. This means you must select the value of R so that the relay draws enough current for proper pull-in, but not enough current to overheat. Start with a 1000 ohm, 20-watt resistor and work from there. The selenium rectifier should be rated to handle the current used. The condenser can be small—8 μ f at 150 volts is adequate.

—R. Lightner, W6OUI



Plug-in Miniductors

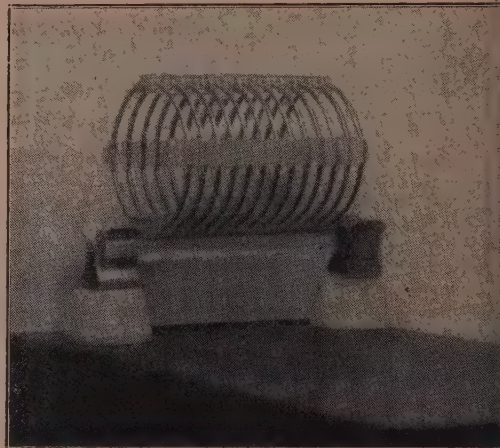
The Barker & Williamson Miniductor coils are known to most amateurs who construct their own equipment. These coils have hundreds of uses, they are economical, and few amateurs have the talent or patience required to duplicate these neat air-wound coils—in short, they are ideal for experimenters. The one weakness of the Miniductor is that it is not a plug-in coil. After a bit of thought, I discovered this simple way to make plug-ins of Miniductors.

Cut the coil to the desired length. Obtain a 3/16 inch diameter Polystyrene rod and cut it so that it is about 3/4 inch longer than the coil. Obtain a small automobile-type glass fuse and remove the metal end pieces from it. Ream all the glass and cement from the inside of these end pieces. Solder each end of the coil to the outside of one of the cleaned fuse end pieces. Slide them on the Polystyrene rod and secure them with Polystyrene cement. Position the rod so that it is running lengthwise to the coil, and secure it to the coil with

cement. You now have the plug-in unit, as shown in the photograph.

The receptacle is easily made with two fuse clips. Mount the clips on insulators as shown, and you have a sturdy receptacle for the plug-in coils.

L. A. Wortman, W2LJ



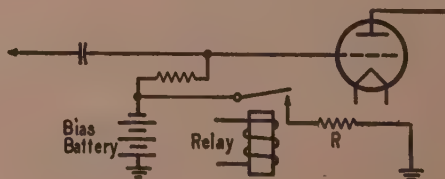
Longer Bias Battery Life

There seems to be very little information available regarding the life expectancy of bias batteries. However, in my experience the charging current (grid current) drawn through the battery is at least as detrimental as the same value of current drawn from the battery in the normal manner. This means that shelf-life cannot be realized.

In transmitters which use bias batteries for protective purposes only, the addition of a resistor and a relay will help to insure full shelf-life. In the circuit shown, resistor R is connected across the bias battery by the relay contact when the plate supply is energized (or when the key is pressed in a c-w rig). The value of R, in ohms, is the bias battery voltage divided by the normal grid current (in amperes).

When the rig is off, the resistor is disconnected and no current flows through the battery. When the relay is energized, grid current flows through R and develops a voltage across R exactly equal to the battery voltage, so that no current is drawn from the battery—however, if excitation fails, the battery will furnish protective bias.

—Ben W. Roberts, WØIEU



The Newcomer's Buyway

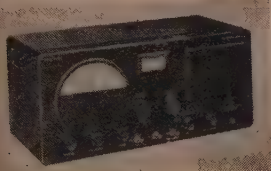
Advertising

"The Hercules"



In amateur radio, just like lots of other hobbies, there are all kinds of gadgets and accessories which one acquires in time as a matter of course. However, probably the first item a radio amateur requires, after obtaining his basic receiver and transmitter, is a dependable microphone, so voice "contacts" can be made. Regardless of whether you are a new-comer or an old-timer in amateur radio, the new Controlled Reluctance mike, the "Hercules" (manufactured by Shure Brothers, Inc., 225 W. Huron St., Chicago, Ill.) warrants your consideration. It is a hand-held magnetic unit that provides clear reproduction, high speech intelligibility, high output and ruggedness at an amazingly low price. Being magnetic, this mike is practically immune to varying conditions of heat or humidity. The "Hercules" can be used indoors or outdoors, fits snugly in the hand, sits firmly on a desk or can be placed on a stand. There are two models with an output level of 52.5 db below 1 volt per microbar. Model 510C "Hercules" lists at \$15.00 while the Model 510S, which has a built-in switch, lists for only \$17.00. The "Hercules" has a die-cast case, with a Metallic Green finish. See the "Hercules" at your Distributor or write Shure Brothers for further details.

The S-40B Receiver



As any experienced old timer will tell you — the Novice should attempt to look ahead and, obtain equipment that will still be usable when his "regular" license comes through. Of particular importance is the station receiver. The policy the OM will advocate is to invest in a moderately priced receiver. A very good example is the Hallicrafters Model S-40B (or S-77 for AC/DC lines). This receiver has long been a favorite of the amateur since it incorporates many of the features of the larger communication receivers at an exceptionally reasonable cost.

The S-40B is a seven tube receiver that covers all of the ham bands from 10 meters through 160 meters. The main tuning dial is accurately calibrated in megacycles. Full electrical bandspreading is provided over the amateur bands. In addition, this receiver has such features as audio and r.f. sensitivity controls, noise limiter, tone control, BFO pitch, standby/receive switching, etc. The S-40B is self-contained with a built-in PM speaker. The S-40B receiver is manufactured by the Hallicrafters Company of Chicago and will always remain a highly prized piece of equipment as the Novice progresses through the amateur ranks.

Allied Catalog

In amateur radio, a new youngster is affectionately called a "Young Squirt." We'd like to say a few words to the Young Squirts, (and OM's), reading this. In ham radio there are all kinds of gadgets, accessories and essential parts to be bought. You'll acquire some of these items as soon as you start to build your equipment. Others you'll only "look at" for years. However — before you buy anything — think of Allied's complete, free catalog.



Here is the new, complete Buying Guide to *everything* in Amateur Radio. It's ALLIED's 212-page 1952 catalog—packed with full selections of quality receivers, transmitters and station gear of every description — everything you need to operate an efficient Ham station at lowest money-saving cost. Here, too, are the widest selections of parts, tubes, kits, tools, books and diagrams,

ready for fast, dependable shipment from ALLIED's huge stocks. You can count on ALLIED for expert service, the most generous time payment terms and down-to-earth practical help from our large staff of old-time Hams. Have the complete, dependable service enjoyed by thousands of Amateurs over the past 30 years. Send today for your FREE copy of the new ALLIED Catalog, finest Buying Guide in Amateur Radio. ALLIED RADIO CORP., 833 W. Jackson Blvd., Dept. 16-KK-1, Chicago 7.

"The Competitor"



Operating your own two-way station is now quite simple. With equipment smaller in size than most TV receivers you will be able to talk to fellow hobbyists across town, in other states, and occasionally, when conditions are good, thousands of miles away. If you always thought it took all kinds of high-priced special equipment to do this, stand

corrected. Take, for example, the microphone you will use with your transmitter, the "sending" part of your station. An ideal mike, low in cost but high in audio quality, equally suited for hand, desk or stand use, is the Turner Company Model 60X, a moisture-sealed crystal mike popularly known as "The Competitor". This mike has — Response: 70 to 7,000 c.p.s.; Level: 52 db below 1 volt/dyne/sq. cm. The model 60X has a list price of \$10.85 while model S60X, which has an "on-off" slide switch, lists at \$12.85. For more information see your Distributor or write The Turner Co., 929 17th St. N.E., Cedar Rapids, Iowa.



Conducted by LOUISA B. SANDO, W5RZJ*

THE BEST CONVENTION ever held," promised W7LCS, and for the YL turnout the National Convention at Seattle in July did prove to be the "biggest and best." Toddy reports 40 YLs registered for the convention, with 35 attending the special YLRL breakfast. Here are most of those who joined in the fun: W3CDQ, Liz Zandonini; 3LSX, Kay Barclay; 3MSU, Ethel Smith; W6CEE, Vada Letcher; 6EHA, Genevieve Malette; 6FEA, Gertie Cassady; 6YXI, Neva Fredenburg; 6ZYD, Jean Baptie; 6ZTJ, Kay Brown; W7COX, Fran Viers; 7ENU, Mary Davis; 7FTX, Clarice Goodman; 7FWR, Mary Ann Tatro; 7GLK, Dot Dickey; 7GPO, Mary Roden; 7GSR, Frances Morgan; 7GXI, Marjorie Frazier; 7HHH, Bea Austin; 7IHK, Jessie Crook; 7JFB, Miriam Brown; 7JFM, Doris Munkries; 7JWC, Manila Beebe; 7KEU, Laura Stegner; 7NJS, Beth McKay; 7NOB, Gwen Jackman; 7NWT, Lenore Hopkins; 7OLY, Helen Morrison; 7OVW, Irma Aufang; 7OYY, Lucille Spargo; W9MMO, Lillian Uribe; WØCMV, Opal Sisk; TI2TG, Marge Gabbert; VE7AYL, Nita Wood; Mary Lewis, waiting for call; novice licenses WN7PQW, Jane Honey, and Betty Wilson and Ethel Tatro, both awaiting WN calls.

W7LCS was chairman for the YL activities, and sends along these notes of the festivities. At the YLRL breakfast Sunday morning at the Olympic

Hotel W3MSU won the radio quiz and got the beautiful cup donated by the West Seattle Radio Club. She gave a little speech. W3LSX won the clock and also gave a speech. W3CDQ won the code contest for YLs at 32 wpm. She received the cup donated by the North Seattle Club, and gave a speech. W7OYY told about operating "dog-mobile" when in Alaska. W7FTX, 7th D/C, said a few words. W6FEA brought W9LRT's quilt. W7FWR brought her whole QSO Bureau and had it set up in a booth. Her daughter-in-law surprised her by getting her novice license—with help from Toddy and in secret from her OM. W7JFB had earrings that lit up and she went around sending code. Cutest thing you ever saw. W7IHK had charge of the long cruise, which everyone thought was wonderful. W7KEU won a portable sewing machine. She had W3CDQ and sister as house guests.

Toddy took all the gals that could make Friday to tea at W7JWC's. Wonderful hostess she kept open house for the gals all during the convention. W7NJS took the radio quiz orally and did a wonderful job. W7GXI had a nice blouse on and all the gals autographed it. W7JFM won a portable sewing machine and an automatic toaster, lucky gal! First time she ever won anything. W6ZTJ and OM were guests of W7LCS at dinner Friday night. W9MMO brought her four kiddies. They had an accident and Lillian's arm was sore and also her head, for she broke the windshield. They took one boy to the emergency

**Address all correspondence to 959C-24th St., Los Alamos, New Mexico.*



YLs who participated in the radio quiz at the National Convention in Seattle. L. to r., back row: W7GLK, 7COX, 3LSX, 6CEE, 7NJS, 7LCS, 7OVW, and 7OLY. Seated: W3CDQ, 7KEU, WN7PQW, 7JFB, 7FTX, 9MMO, and 3MSU. W6EHA was in this picture but got cut off when the print was made. Note W7JFB's "lit up" earrings! The large group of YLs at the YLRL breakfast scattered in different directions before a photo could be taken.

Announcing



Because of a deep-rooted interest in Amateur Radio, and because Hallicrafters makes more short-wave receivers than all other U.S. manufacturers combined, we are offering a Merit Award to Novice-Class Amateurs who make outstanding progress during the coming year.

Award Given to Everyone Who Qualifies

Hallicrafters Merit Award will be given to every Novice who, during the period beginning 12:01 A.M. September 8, 1951, and ending 12:00 P.M., September 7, 1952, local time, works all states and has obtained by September 7, 1952, a General or Conditional Class Amateur License. Both Novice-Class and "regular" QSOs can be used to make up the total of 48 contacts.

Rules governing contacts and verifications thereof are the same as for ARRL W. A. S. Certificates (see p. 6, "Operating an Amateur Station"). Your package of verifications must be postmarked not later October 7, 1952.

First Ten Win S-76 Receivers, All Others \$25 Cash

The first ten Novices who complete the above will receive, absolutely FREE, a Hallicrafters S-76 Receiver. All of the other Novices who complete the above will receive \$25 in cash, each. Remember this is not a contest in which only *some* contestants win; *everyone* who completes the course will win either an S-76 receiver or \$25 in cash. No entry blank is required, but we will be glad to have you drop us a line (Attention: WN90EP, Bill Halligan, Jr.) telling us you're going to try for the Award. Best of luck with your QSOs.



S-76. Double
Conv., 50 kc 2nd i-f.
9 tubes, Rect., Reg. \$169.50

hallicrafters

"The Radio Man's Radio"

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

agency hospital but everything was okay. T12TG was the guest of W7JWC. VE7AYL, 14 years old, won a Call Book for being the youngest op.

"It was a huge success," says Toddy, "the cruise, luncheon, fashion show, YL breakfast, broadcasts both Rainier Ranch and 'Scandia Hour', tours, banquets, and all—something going on all the time. My West Seattle Hamettes in the Kilowat Kapers was a sensation and highlight of the convention—hi! I won an airplane ticket. Scared me. The OM didn't want to go up either so we gave it away. Without the help of the XYLs don't know what I would have done, so most of the credit should go to them."

Down East Hamfest

Time rolled around for another hamfest at Portland (Me.), and each year seems to bring together more YLs. This time it was an even dozen with W1MCW, Lou Littlefield; 1RTB, Nell Waterman; 1QON, Eleanor Wilson; 1SCS, Ruthe Ferguson; 1RYJ, Esther Routhier; 1SRQ, Doris MacGown; 1HIH, Veronica Landry; 1MDV, Louise Bruya; 1NUO, Tisha Young; 1TRE; 1FTJ, Dot Evans, and VE2HI, Ethel Pick.

W1FTJ reports an FB time, and also another YL get-together later at her QTH at Bow. W1MCW returned to N.H. with 1FTJ and they found 1BCU, Peg, and her OM awaiting. Then along came 1QJX, Charlotte, followed by W4HWR, Hilda, and her three jr. ops. At times W1FTJ's QTH gets to be like Broadway at 42nd Street!

Los Angeles YL Club

It's good to have news again of what one, at least, YL club is doing. Newly elected publicity chairman for the Los Angeles YL Club is W6WSV, Carol Witte, and here is her report of recent activities:

Six guests showed up at the June L.A. club meeting. Gertie Cassady, W6FEA, and her OM, W6WJF, and another YL, W6ZKD, all from Fresno. The other guests were W2JZJ/6, W6LMQ (a new licensee from Long Beach), and an XYL from Long Beach who is on the verge of getting a ticket. Gertie and W2JZJ/6 joined the club. Gertie was so impressed with our program for the coming year that she is going to try to attend some of the meetings, which is a nice tribute to our live-wire new president, Vada Letcher, W6CEE. Mary Klein, W6AVF, is secretary, and May England, ex-VE3QL, is treasurer. At the club raffle at that meeting Gertie's OM won the prize—a bottle of perfume!

Plans for the coming year include: 1) Activity contest to run from Sept. through May. 2) Contest to run for one month. 3) Donation auction for November. 4) Possible special club award to stations having worked a certain number of L.A. YL Club members. 5) Other contests and special activities. 6) Possible entrance as a separate group on the next Field Day.

Other chairmen appointed for the coming year: Raffle—Gilda, W6KER; L.A. Council delegates—Evelyn, W6NZP, and Naomi, W6YZU; Off-

cial hostess—Maxine, W6UHA; Contest and special activities—Helene, W6QOG.

We have received permission from the FCC to go through their files for calls of YLs. Also we are reading the requirements to find out what is necessary to apply for Helen Cook's call W6MWO, as a club call. We'd like to perpetuate her memory.

FB, Carol! And let's hear from some more of the clubs.

YLRL Officers

In the August column we reported new YLRL officers for the coming year. Here are some highlights on their ham backgrounds. President W9JTX, Louise Baker, was much too QRL to supply many details. Seems she's in the process of moving her ham shack and is in the middle of "spring" housecleaning, it having been left by the wayside due to so much activity on the air. Now while her sked for overseas traffic W9ILH, is on a much needed vacation, Louise is trying to clear a "path" through the place. But she does add this note: "Feel very proud of my five BPL cards since first of the year, also my Armed Forces Day certificate, plus QSLs from AIR WAR and NSS!"

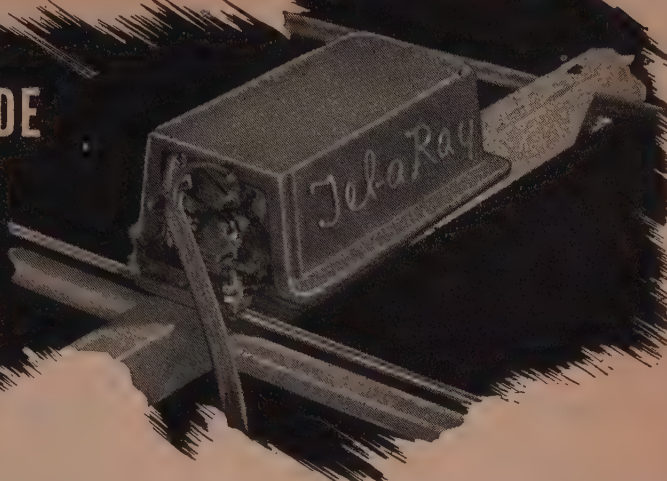
Vice president W3LSX, Kay Barclay, has been licensed since the summer of '46. She got her Class A in '49 and also holds a commercial ticket radiotelephone second class. "Still operating 40 and 20 c.w., mostly 40," Kay writes. "The present rig is a BC-459 driving push-pull 812s, running about 150 watts. Rebuilt some of it myself—do enjoy wielding that soldering iron! Have OR appointment—member RCC and Royal Order of Wouff Hong. Have been reelected treasurer of the Washington Radio Club (again!), and am supervisor at W3PZA, the amateur station associated with the American Red Cross. Otherwise—am still with Quartz Research at the National Bureau of Standards. Nearly 9 years now. Might mention I'm co-author of a Bureau circular 'Fundamental Techniques in the Frequency Adjustment of Quartz Crystals.' One of the main jobs of the V.P. is organizing YLRL contests and Kay says if you have any suggestions to please send 'em along.

Secretary-treasurer W1BCU, Peg Wells, used to be W6BCU in San Diego. She got her ticket in '47 and prefers ten meters—"strictly phone," she adds, "no bird chatter for me—hi!" OM is W1WUW, ex-W6WUW. "Like most girls I became interested in ham radio through the OM," Peg explains. "He got his ticket before the last war but of course couldn't get on. In California all our friends were hams and rather than be on the outside I decided to jump in and enjoy it too. And I really love it. Did quite a bit of traffic work on the West Coast but there is very little of that here and I miss it." Their rig is torn down and in the process of rebuilding—all-band kilowatt with 813s in the final, 304TLs in modulator and VFO. They hope to be on again by fall. Receiver is an NC173 and they have beams on

(Continued on page 60)

are peaked at the factory to a single channel. This Pre-Amp is primarily designed for antenna mounting with the Tel-A-Ray "Reception Master" antenna. But when weaker constructed antennas are in use it may be mast mounted.

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gives clear, sharp reception beyond the fringe areas!

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Use With Model T or TD Antenna for the best results

Installation of these famous long distance Tel-A-Ray antennas is the first step in getting clear, snow-free reception. With the Pre-Amplifier, they give up to 300 times gain over dipole.



- Gives maximum gain in signal.
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- Provides for vastly improved signal - to - noise ratio.
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- An essential complement to the booster at the set in many locations, and can be used without a booster in numerous cases.
- Made of Dural and weather-sealed . . . completely guaranteed against weather damage.
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MOBILE CORNER

Conducted by RALPH V. ANDERSON, W3NL*

GENERATOR REGULATORS seem to be somewhat of a mystery to most hams, yet they are one of the most simple of electrical components in the manner in which they operate. Most automobile mechanics consider them strictly a "hands-off" proposition and it is almost impossible to find someone who will set a regulator to your specification. Standard settings are generally not good enough for mobile use. Yet these generator regulators can easily be adjusted to give the maximum capacity of the electrical system without the use of complicated equipment.

The only equipment required is an ammeter which will give one current reading with fair accuracy—the rating of the generator. This ammeter is not needed if the car ammeter is fairly accurate or if you know where the car ammeter reads at the specific current. Most car ammeters are fairly accurate when first installed although eventually they are supposed to be used only to indicate a change or discharge. A good ammeter can be temporarily inserted in the line and the car ammeter checked. Those few cars having no indicating ammeter will require the temporary meter.

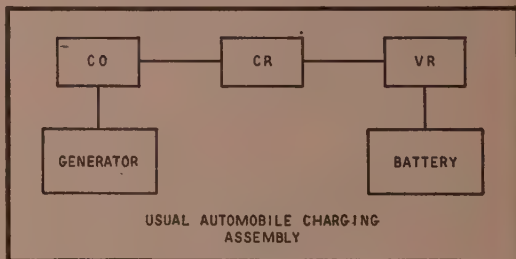
There are three relays in the assembly, usually arranged as follows: With the terminals of the assembly towards you, the cut out (CO on the diagram) is on the left, the current regulator is in the center, and the voltage regulator is on the right. We are not concerned with the cut out—its sole function is to connect the generator to the battery when the generator output is sufficient to charge the battery.

It is easier to explain the functioning of the regulators if they are looked upon as protective devices—the current regulator (CR on the diagram) protects the generator in that it limits the amount of current it can produce and the voltage regulator (VR on the diagram) protects the battery since it prevents further charging once the battery is up. The names come from the fact that the generator protector works on current and the battery protector works on voltage.

The nameplate on the generator will give its capacity. 35 amp ratings will normally stand 40 amps without burning out the armature. Many late model cars charge 40 amps normally with a 35 amp rated generator. Let it be assumed that the adjustment will be made for 40 amps. Temporarily

insert the ammeter. Hold the armatures of both the CR and VR regulators so they cannot be operated by their magnets and speed the engine until 40 amps is indicated. Note the car ammeter reading. Now release the armature of CR, still holding VR from operating. Speed the engine, and note when the ammeter levels off with increased speed. If below the 40 amp reading, increase the spring tension on the armature of CR. Some regulators have adjustment screws, others require bending of the tab to which the spring is fastened. Bend this very carefully and very little at a time. When you have this adjustment correct, the generator will charge its maximum capacity without exceeding its safe operating limits.

For adjusting VR the battery protector or voltage regulator, a fully charged battery is required. Hold the armature of CR so it cannot operate and speed the engine, noting the point on the ammeter where the current levels off. Adjust the spring on VR so that this point is about 15 amps.



You may wonder at the 15 amp charge with a fully charged battery. The trouble here is that CR tapers off the charge and does not act like an off-on switch. It is normally set at the factory to reduce the charge nearly to zero when the battery is fully charged. This results in a condition where the generator will not charge full capacity unless the battery is *half down*; the battery will seldom test more than half charged. By increasing the spring tension on the voltage regulator VR this point is raised and in order to keep the battery at three-fourths full, VR must be adjusted so that an overcharge will occur with a fully charged battery. With the 15 amp setting, use of the transmitter will prevent overcharge. The only difficulty you may have with the overcharge is on a long trip where the transmitter is not used. Lights, car radio, etc., can be used to prevent overcharge.

*Send contributions to R.V. Anderson, 2509 32nd St., S. E., Washington 20, D. C.

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For further information and reservations,
write

Harry N. Reizes, Fair Manager, Room 920, 342 Madison Ave., N. Y. 17, N. Y.

I am personally acquainted with several hams who have consistently had "battery trouble" which completely disappeared with the proper adjustment of the regulators. Average power used was about 40 watts and no long trips were taken.

Mobile Harmonics

There have been a number of cases of mobile harmonics interfering with other radio services—we've heard of many cases here in Washington. W2PAU, the VHF editor, calls our attention to the many cases of reception on the 2 meter band of 10 meter mobile signals. He says, "This is not merely a matter of being able to detect and identify the signals, some of them have S9 strength over a radius of miles. . . If the 5th harmonics are going out that far, what about the TVI ones? In some cases operation of our two-meter mobile nets have been broken up by overloading signals from the ten meter gang. Though we might be at fault for using non-selective receivers on two meters in some of these cases, the basic fault is in the mobile ten meter units. The mobiles can't always dodge TVI or FMI or Aircraft I or what have you! Often CD assignments require extended operations from a fixed location where the trouble may be objectionable."

Call Letter License Plates

From W8ZQC, Ohio, comes a request that should be axiomatic for all of those fellows that live in states providing Call Letter License Plates. Get them fast! In Ohio, the issue is particularly important to the hams because stickers will be issued instead of plates in 1952 so the fellows that don't get them this year will have a long wait. It seems only right that, once authorized, everyone eligible should immediately apply. It might further be asked if each of you has helped pay the expense of obtaining the legislation for the plates.

Advertise Your Call!

In a paragraph from a sheet circulated by W5CA, Dave says he is "constantly amazed at the lack of Call Letters on cars bearing mobile rigs." We certainly agree. How often have you wondered who was the owner of a particularly good installation, yet there were no call letters visible. With decals costing only a few cents a letter and the aluminum die cast plates selling very reasonably, there should be no reason why the Call Letters cannot be posted. Dave further suggests that your call letters be posted out in front of your home, you just might be called upon by someone who has worked you.

Northeast Iowa Radio Amateur Association

In the belief that some good ideas may be presented to groups organized for mobile operation, we'd like to tell you of Waterloo, Iowa. The communications center, housed in a re-enforced brick two-story building, contains 3 transmitters and 12 receivers, powered with a 2.5KVA gasoline generator. The many receivers are required for liaison work with commercial radio services such as utilities, taxi, police, etc. Women will be called upon to operate the receivers. To work with this center

the boys have in operation, twelve mobile units on a fixed frequency of 29.600 plus the regular mobile around town. In addition 6 standby transmitters and receivers are kept on hand that can be transported to a disaster area and operated entirely from 6 volts. One noteworthy item is the installation of ground plane antennas in each of the outlying towns so that a pack-set will have a good antenna and a mobile will not be tied-up. Emergency drills are held frequently in order to maintain efficiency.

Maritime Mobile Amateur Radio Club

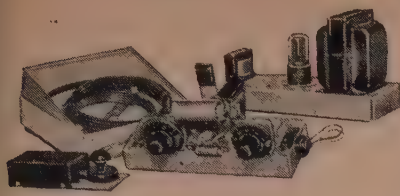
W5ITG on the Natalie O. Warren was tied up at the dock in Newark, N. J., on July 7th when the Warren Petroleum Terminal exploded. A few hundred feet away were tanks holding 1,500,000 gallons of high octane gasoline. For a while it looked like they would not get away but quick action and good thinking on the part of all concerned got the ship away without damage or loss of personnel. Bill says he saw tanks hurled over a thousand feet into the air. The tanks he is talking about are 70 feet long and 10 feet high W4IUT back on the American Banker after a vacation is busy building a new receiver which he claims will be the receiver to end all receivers. He is including an automatic beer-cooler along with all other less important gadgets W4RW is now on the Gulfvictor after bringing the new super-tanker Magwa to Philadelphia. Van has a TBS50 aboard till he gets his new Globe Champ. Says he sure missed ham radio while on the Magwa and used to go to the shack and listen on twenty when the bug bit him real bad.

W4AYE on the Pioneer Wave had himself quite a time over in Manila with W1SSI. Did up the town in first-class shape. George's hobby (at least one of them) is keeping up with changes in names of ships so he is keeping the M/M Secretary pretty well up-to-date on corrections for the M/M list W5AXI is on a triangular run from the East Coast to South America and the Gulf. Lately, with the band conditions being so lousy he has been heating the filaments in the rig just to dry it out waiting for the band to open up W8FML formerly on the Gulfkey now has a shore job with Gulf Oil and will no longer be active as an M/M. The gang all wish Ed good luck on his new job W6IUL on the Charles S. Jones is running coastwise along the West Coast with an occasional trip to Central America. Bob would like to know how some of the gang solve the ship 110 D.C. problem and what is the best antenna W4KEJ on the Mormac dove spent part of his vacation in Washington and found out what a swell gang of fellows hold forth around the marble city. Ray says other places he is just another one out of 80,000 hams, but not so in Washington W6HBO on the Gulf Banker expects to drop into Washington soon on her vacation. Seems that Billie used to work for the Weather Bureau at the Oakland, Calif. Airport back in '42, Ken may remember.

(Continued on page 57)

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ALL PARTS, CHASSES, XTAL, KEY ANTENNA,
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1/2" spe. 54th or 72nd harm. channels. Listed by fund.	1/2" pins 1/2" spe.		
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374 403 431 503	440 482	6370	2105 2545
375 404 433 504	441 465	6407.9	2125 2557
376 405 434 506	442 468	6450	2145 3202
377 408 435 507	443 472	6470	2155 3215
379 409 436 509	446 474	6522.9	2280 3237
380 411 438 511	447 477	6547.9	2258 3250
381 412 481 516	448 479	7480	2260 3322
383 413 483 518	450	7580	2282 3510
384 414 484 519		7810	2300 3520
386 415 485 526			2305 3550
387 416 485 530			2320 3570
388 418 490 531			2360 3580
390 419 491 533			2390 3945
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395 425			
396 426			
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HAM XTALS-FT-243	HOLDERS-1/2" pin spe.
4190 6773 7806	5735 5840 6450 6740 7573
5030 6873 7840	5305 5850 6473 6806 7640
5485 6906 7873	5677 5873 6475 7340 7673
6006 6973 7973	5706 5906 6506 7440 7706
6040 7740 8273	5740 5940 6540 7473 7806
6073 7773 8306	5750 5973 6573 7506 8340
6106	5760 6273 6806 7540
6140	5773 6373 6640
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1 hour 1/2 hour 3/4 hour
\$3.50 \$2.10 \$1.40

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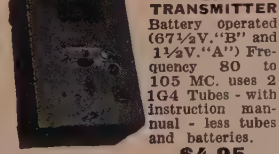
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NAVY VHF BRAND NEW CW



TRANSMITTER
Battery operated (87 1/2 V. "B" and 1 1/2 V. "A") Frequency 80 to 105 MC. uses 2 1G4 Tubes - with instruction manual - less tubes and batteries.

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FAMOUS MAKE BUTTERFLY CONDENSERS ALL NEW — 1/4 OFF!

.500 GAP. .375 GAP. .250 GAP.
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Max. Cap.	Gap	Price
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230	.171	5.57
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100-100	.344	15.64
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Modulation Trans. 20 w. Universal Model No. M-4081Q. List \$9.95. Only\$3.70

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With 2 crystals \$.99
With 2 crystals, one in 80 meter band. \$1.29

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Volts	2" Price	3" Price
600	\$2.95	\$3.95
1000	3.49	4.49
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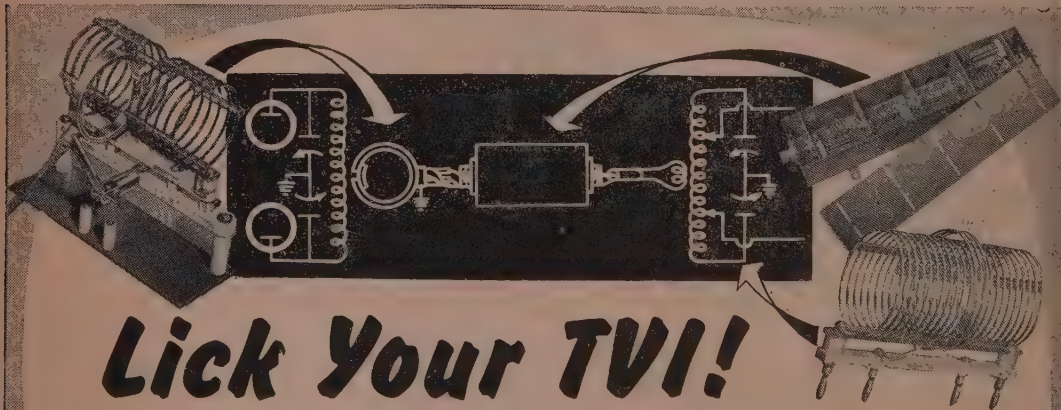
\$49⁹⁵



HAMFEST CALENDAR

Kingsport, Tenn., Saturday and Sunday, November 3rd and 4th, 1951. The theme of this Hamfest will be "The Role of the Radio Amateur in Civil Defense." To be held in the Kingsport Civil Auditorium. Movies Saturday night concerning atomic warfare. Program will also consist of talk by Gen. M. C. Adams, Director of Civil Defense, State of Tennessee. Substantial prize for the best mobile rig present at the Hamfest. Grand prize will be a NC-125 receiver.

French Lick, Ind., Saturday and Sunday, October 20th and 21st, 1951. This is the ARRL Central Division Convention sponsored by the Indiana Radio Club Council. Will be held at the famous French Lick Springs Hotel. The Convention this year offers a very well-rounded program including numerous exhibits and technical talks. Special meetings will also be held for the VHF gang, MARS, SSB, and "Mobileers." Advance registrations are \$4.00 per person. Further information from P.O. Box 7506 Indianapolis, Ind.



Most cases of TVI caused by harmonics and spurious radiations can be reduced to a negligible minimum.

In planning a new rig, the best bet, of course, is to use precision-made B&W components—from oscillator to final including antenna coupler. Filtering and shielding recommendations in our "Filter Facts" booklet show what to do, how to do it.

Should your present rig be

of fairly good design, a few minor changes as outlined in "Filter Facts" plus installation of B&W low-pass filters and Faraday shielded links will effectively throttle TVI. Many hams have proved it!

Send 15c today for a copy of "Filter Facts" giving details on how to lick your TVI and get silent rigs back on the air!

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SUPERIOR POWERSTATS

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Type 20, 3 amp.....\$12.50
116, 7.5 amps, table mtg..... 23.00
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1126, 15 amps.....46.00
1156, 45 amps.....118.00

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

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Model M-101 covers 152 mc to 162 mc Band\$72.50
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Model PR-31 for 30 to 50 mc band... \$44.95 complete.
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NEW GONSET TWO - METER CONVERTER; superheterodyne... same size and appearance as Tri-Band Converter and FM Tuner.\$44.50



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Deluxe Model (separate squelch tube, pilot light switch).....\$69.50 net

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

It's Dependability!



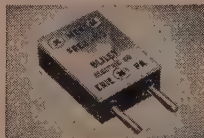
TYPE BH6A
 RANGE: 1.4 - 75.0 mc
 Supplied per Mil
 type CR-18; CR-19;
 CR-23; CR-27; CR-19;
 CR-28; CR-32; CR-33;
 CR-35; CR-36 when
 specified.

Dependability is a composite virtue that Bliley builds into all crystals. From raw quartz to finished crystal, exacting inspection assures *dependable* performance. That's why Bliley methods and techniques are a "natural" for military as well as civilian applications.

★ TYPE MC9

RANGE:
 1.0 - 10.0 mc

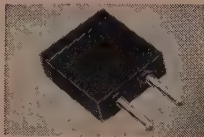
Supplied per Mil
 type CR-5; CR-6;
 CR-8; CR-10 when
 specified.



★ TYPE SR5A

RANGE:
 2.0 - 15.0 mc

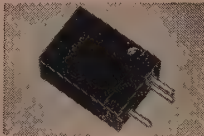
Supplied per Mil
 type CR-1A when
 specified.



★ TYPE AR23W

RANGE: 0.080 -
 0.19999 mc

Supplied per Mil
 type CR-15; CR-16;
 CR-29; CR-30 when
 specified.



★ TYPE BH7A

RANGE:
 15.0 - 50.0 mc

Supplied per Mil
 type CR-24 when
 specified.



Bliley

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 UNION STATION BUILDING
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Third Annual AUDIO FAIR

Many amateurs will want to attend the third Audio Fair—due to be held in New York City in the Hotel New Yorker on November 1, 2, and 3. Audio facilities and equipment has now become a three-quarter billion dollar business. Many pieces of equipment have direct, or indirect, applications in the ham field. In addition, many amateurs have become hi-fi enthusiasts. The Audio Fair is their opportunity to see the latest this growing industry has to offer. Registration is free.

The Audio Fair is held in conjunction with the Annual Convention of the Audio Engineering Society. Many exhibitors have arranged novel and interesting displays. One New York distributor of high quality audio equipment is planning a "Golden Ear" contest. Each visitor will be invited to take a hearing quality test with a Bell Laboratories "Audio Meter." The results will be recorded on a "Golden Ear" tag presented each participant and in a scoring book retained by the exhibitor. At the close of the Fair those 20 persons whose hearing is closest to the ideal will be given valuable prizes—including a Fischer pre-amp, Audax Poly-phase head, etc.

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

Docket No. 20040

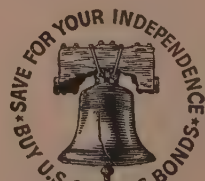
Docket No. 10040

NOTICE OF PROPOSED RULE MAKING

1. Notice is hereby given of proposed rule-making in the above-entitled matter.

2. Present rules relating to call signs of amateur radio stations provide that the call signs of such stations will be assigned systematically with five exceptions which are stated in the rule. In the administration of this rule the Commission has found that considerable research and other clerical time is required to process requests, made under the exceptions, for assignments of specific call signs. In view of the mounting backlog of pending applications for other types of amateur authorizations, it appears that public interest, convenience, and necessity would be served by diverting clerical time now used in processing requests for specific call signs to the processing of requests for new, modified, or renewed licenses. Accordingly, it is proposed to amend Section 12.81 of Part 12, "Rules Governing Amateur Radio Service" by deleting so much of that rule as provides any exception to the systematic assignment of call signs to amateur stations. The amended rule would read, in part, as follows:

Section 12.81. Call signs. The call signs of amateur stations will be assigned systematically, without exception, and they will consist of a sequence of one or two letters, a numeral designating the call sign area, and two or three letters. In the continental United States no new call sign having only two letters following the numeral will be issued. The call sign areas are as follows: (No change in listing of call sign areas.)



SEE LEO FIRST FOR... *National* RECEIVERS

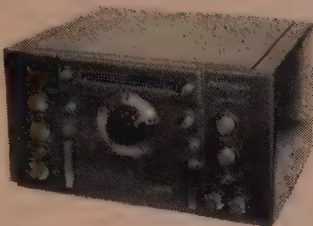
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HRO-50-1 RECEIVER

Additional I.F. Stage and 12 permeability tuned I.F. circuits result in the ultimate in selectivity! Built-in power supply on separate chassis. Front panel oscillator compensation control. 20 to 1 precision gear drive. Provisions for NBFM adapter. Push-pull audio output. Speaker matching transformer built into receiver with 8 and 500/600 ohm output terminals.

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(less speaker)
LOW DOWN PAYMENT



10" PM Speaker
matching cabinet

\$1600

NC-183 RECEIVER

Sixteen tubes (including rectifier and voltage regulator) are employed in a modern high-gain super-heterodyne circuit. MF oscillator temperature-compensated on all bands; phonograph pick-up jack; accessory connector socket; illuminated signal strength meter with adjustable sensitivity; self-contained output transformer with 500 ohm and 8 ohm terminals; operates from 115 or 230 volts 50/60 cycles or, in emergency, from batteries or vibrator power supply; narrow band FM adaptor available. Frequency coverage: 540kc. to 31mc. and 48 to 56 mc.

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10" PM Speaker in
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NATIONAL RECEIVERS

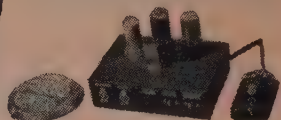
NC-125	\$149.50	Matching Speaker.....	\$11.00
SELECT-O-JET (#2 or #3)			\$24.95
SW-54			\$49.95

Leo I. Meyerson

WØGFG



**GOOD NEWS
for the NOVICE...**



NEW NOVICE CW 7 KIT \$19.95

Here is a complete novice 80 meter AC-DC 7 watt transmitting kit—complete with tubes, power supply, tuning indicator, antenna, pi-network, key and crystal. Nothing left to buy—simply wire (complete instructions included) plug into AC socket and go on the air. Will operate on either 110 volts AC or DC.

NEW LOG BOOK

25¢

Full column log listing all FCC required info... accommodates 1,525 stations. "Q" signals, phonetic alphabet, amateur international prefixes.



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NOW YOU CAN AFFORD TO OWN A BEAM TO METER BEAM



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

Narrow spaced **\$15.95**

Wide spaced **\$17.95**

GUARANTEED CRYSTALS IN HOLDERS Type FT-243 160 METER

1.8 to 1.825 1.875 to 1.9
1.9 to 1.925 1.925 to 2.0

\$1.25 ea.

80-40 METER

3.5 to 4.0 7.0 to 7.4

98¢ ea.

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

Our Famous REFERENCE MAP 25¢



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☐ NC-57 Info.
☐ NC-183 Info.
☐ NC-125

Name _____

Address _____

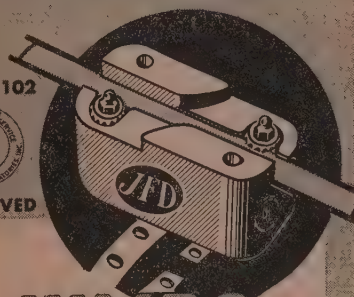
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CQ Magazine

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NEW YORK 18, N. Y.

The Foreign Scene . . .

From time to time our contemporaries overseas print various articles which we feel would be of interest to the readers of CQ. Whenever this occasion arises we will attempt to abstract these important articles and present some of the highlights. The material below is a good example. It gives the essential details on the effective system of modulation popularly referred to as "controlled carrier." The summarization was particularly good, and we reprint it below. If you feel this Department is worthwhile and should be expanded, please write us. —Ed.

"Constant Modulation Controlled Carrier Working"

By A. J. R. Pegler, G3ENI

(Short Wave Magazine, Vol. IX, Aug. 1951, p. 336)

The constant modulation controlled carrier system has not been very popular in Amateur Radio circles in spite of the fact that it has a lot to recommend it, and is a well established system of speech communication. Its chief advantages may be listed as follows:

- A predetermined level of modulation can be maintained over wide ranges of audio power.
- Only sufficient radio frequency energy is generated to accommodate the audio frequency component at the given level of modulation.
- Greater intelligibility at weak signal strengths, and under conditions of high background noise.
- Reduction of heterodyne interference between adjacent stations.
- Efficiency systems of modulation can be used, thus economizing in audio equipment.
- Such systems of modulation as in (c) can be worked at their maximum efficiency at all times.

The disadvantages are mainly of a design nature:

- Good regulation of power supply and bias supply is required.
- Weak signals may be difficult to locate owing to absence of steady carrier.

PREDICTIONS

(from page 27)

In the event of a severe ionospheric disturbance during the contest periods it should be worthwhile to tune for the special broadcasts from WWV. The latest information on radio conditions is broadcast every half hour at 19 and 49 minutes after the hour by the National Bureau of Standards over WWV. If the Morse Code letter "N" is transmitted during the ionospheric information period it may be taken to mean that conditions are good over the North Atlantic paths. The code letter "U" indicates

HARRISON HAS IT!

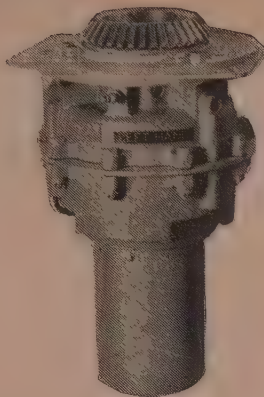
NEW SMALL PROP PITCH ROTATORS!

HARRISON DOES IT AGAIN!

The boys were yelling for those FB, SMALL prop pitch units — and we managed to ferret out a few more.

Makes a husky ham beam rotator equal to anything selling for hundreds of \$\$\$! (See Handbooks and magazine articles.) Rugged enough to support and turn even the heaviest stacked arrays.

They're brand new, clean spares. Never used in any way. Cost the U.S. several hundred dollars.



- Operates on low voltages—20 to 30 volts, AC or DC.
 - Continuous rotation in either direction, reverses instantly. Single pole switching.
 - Approximately 1 RPM (with 30 Volts)
 - 9000 to 1 gear reduction gives tremendous power. No windmilling.
 - Light weight! — Only 44 pounds.
- Fully converted! Brake and rotation stop removed—leads pulled—etc. With complete mounting and operating instructions. (RO-10)**\$29.95**

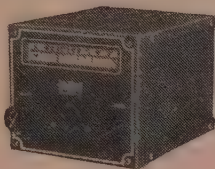
Rush your order now! Today—
While they last!

Special step-down transformer, to run rotator from 115 Volt AC.
(TF-80)**\$7.95**

SONAR'S NEW SR-9 9 TUBE SUPERHET 2 METER RECEIVER IS "HOTTER" THAN A JET PLANE!

See our September CQ ad
—and rush your order in.
\$72.45

(Or ask for literature describing it and its companion transmitter).



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The Eagle X-30 transmitter kit is just the thing for the beginner! Two tube crystal controlled xmtr with up to 30 watts input on any band, 20 through 160 meters. Punched chassis and famous Pict-O-Graph instructions make building a cinch! Built-in resonance indicator. Pi-network loads any length antenna. Uses 6V6GT oscillator and 6L6G PA.

PS-30 Power Supply Kit (with 80 rectifier)**\$9.75**
X-30 KIT, less coils, tubes & xtal**\$8.95**
Plug-in coils (20, 40, 80, 160) each**\$.99**
Set of tubes—1-6V6GT and 1-6L6G**\$2.85**
Professional type key (HSS J-38)**\$.95**

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Here's America's most versatile xmtr! Ideal for old timer or novice operator. (Covers Novice Frequencies: 80 CW, 11 CW, and 2-Meter Phone) 40-50 watts to 807 final—Phone or CW. Completely bandswitching—just turn to work 80, 40, 20, 15, 11, 10, 6 or 2 meters. 100% break-in operation. All controls and xtal sockets located on front panel for quick QSY—provision for VFO input.

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APS-50 Power Supply for 110V AC Operation**\$39.50**

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JOHNSON VFO**\$57.75**
Wired - Tested - Complete only

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With tubes**\$45.20**

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that conditions are unstable or that an ionospheric storm is anticipated. Quite often during the periods when the "U" symbol is being transmitted, 10 and 20 meter DX may be quite outstanding. The code letter "W" indicates that a disturbed period is in progress or is anticipated within 12 hours. During a disturbance look to work the North-South paths on 20, 40 and 80 meters and the East-West paths on 40 and 80 meters only.

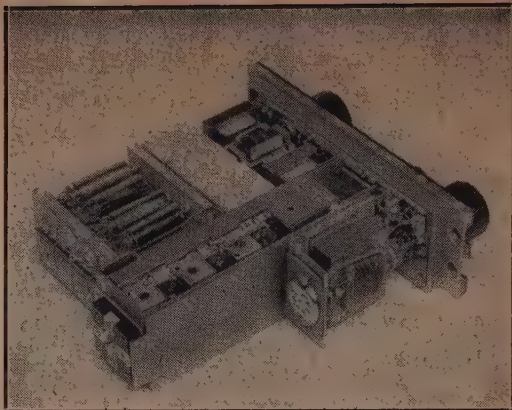
LETTERS

(from page 6)

WZ, UA9KWA-KWZ are in Bashkir, A.S.S.R. (zone 16 according to the local WAZ maps).

In cases where the QSL card is printed in Russian characters, a copy of the call and QTH (in Russian) will be good enough for us.

C. Stewart S. Lyon, G3EIZ



The receiver ready for encasement and hermetic sealing in nitrogen. To simplify heat and replacement problems, the audio output tube assembly plugs into a set-back outside the main case.

MINIATURIZED Q5ER

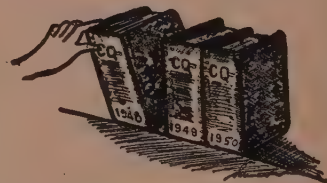
(from page 26)

grid biases are appropriately reduced. One drawback to low plate voltage, however, is the difficulty of obtaining large power output, and in the miniature receiver it was necessary to use an output stage of four tubes in push-pull-parallel to give the required 100 milliwatts of audio. Another advantage

of the low-voltage supply is the decreased power input necessary to run the unit. One of the problems of miniaturization is adequate radiation of heat. If a circuit that formerly occupied 300 cubic inches is squeezed into a 55-cubic-inch space without corresponding reduction of supply power, interior temperatures are going to go up, to the detriment of component life.

Besides the receiver itself, the development work

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General William Dean knew in his heart that it's every man's duty to defend America. You know it, too. The General's job was in Korea and he did it superbly well. Your defense job is here at home. And one of the best ways to do that job is to start right now buying your full share of United States Defense* Bonds. For remember, your Defense Bonds help keep America *strong*, just as soldiers like General Dean keep America safe. And only through America's strength can your nation . . . and your family . . . and you . . . have a life of security.

Defense is your job, too. For the sake of all our servicemen, for your own sake, help make this land so powerful that no American again may have to die in war. Buy United States Defense* Bonds now—for *peace*!

Remember when you're buying bonds for defense, you're also building personal cash savings. Remember, too, if you don't save *regularly*, you generally don't save at all. So sign up in

the Payroll Savings Plan where you work, or the Bond-A-Month Plan where you bank. For your country's security, and your own, buy United States Defense Bonds!

****U.S. Savings Bonds are Defense Bonds - Buy them regularly!***

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at the National Bureau of Standards has produced a number of new components and fabrication techniques. Amateurs, especially those planning new portable equipment, should be able to put several of the ideas incorporated in the receiver to excellent use.

RADIO CONTROL

(from page 15)

unit dispensed with. In this case the antenna should be cut down to 19 inches, making it a quarter wave stub working against the car as a ground plane. S₁ is mounted where ever convenient on or under the dash and the 6 volt lead tied to the amateur, fuse panel, or other convenient point.

Tuning Up

The two meter transmitter and receiver described are tuned to 147 mc. Of course use of an already installed mobile transmitter on another band will necessitate modification of the receiver. An i.f. frequency of 1600 or 456 kc would be more appropriate for any band below 30 mc and would provide a considerable narrower pass band for the receiver. The superhet circuit is simple and is recommended in any case to provide best stability and selectivity.

When tuning remove V₄ from the receiver, plug a milliammeter into J₂ and tune either C₄ (transmitter) or C₃ (receiver) for minimum V₃ plate current. Be sure that the unit which is not being tuned is set up on a proper frequency (within the

ham band!) by use of an appropriate frequency meter. The transmitter described is line stabilized and shows very little drift. Occasionally, about as often as you check the battery water, you should remove V₄ when tuning to prevent actual operation of the door.

Tube life is good despite the 24 hour-per-day operation. The author's receiver has been running about six months with no replacements needed to date. It is, after all, the heating and cooling of vacuum tube cathodes with normal off and on operation that is most destructive to the cathodes. Power drain of the unit is negligible and will never be noticed on the light bill.

In the circuits described, component values are for the most part not critical. Most tubes and many components were selected because of availability from surplus or from the author's spare parts. Do not stray too far, however, as much experimenting was done to work out a few bugs. The result is a stable circuit having easy straightforward adjustment and reliable operation.

COMPACT MILLIWATT

(from page 21)

socket. The remaining component parts may be located wherever convenient. The chassis shown is a bent-over aluminum sheet, forming a chassis 1½-inches wide and 1-inch high, and 10-inches long. The selenium rectifiers are mounted on an angle support by means of a long 6-32 stud, with

Every radio technician should keep abreast of all the latest developments and all phases of Radio-TV service techniques. "SERVICE DEALER" is a magazine designed to bring you up-to-the-minute facts on the use and applications of new instruments, new short-cuts in trouble-shooting—substitution methods, etc. In recent copies of "SERVICE DEALER" we've had such articles as, "The CBS Field Sequential Color System," "UHF Television Converters," "Antenna Rotators," "Build Your Own Instruments," "Filters For Amateur TVI" and many, many other useful articles.

Although your hobby is Amateur Radio, we know you will enjoy reading this magazine. Its contents are written for men engaged in AM-FM, home radio and TV service work and has proved invaluable to many people interested in technical radio and television.

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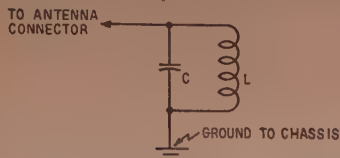
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C = HAMMARLUND HF-100 VARIABLE. 100 MMF.

Fig. 2. Antenna tuning system that may be attached between the antenna connector and ground to increase the output.

the vertical portion of the angle support between the two rectifier units. The transformers, rectifiers, keying relay, tube and crystal are mounted above the chassis. The remainder of the parts are located below the chassis.

There are no tuning adjustments unless the antenna tuner shown in Fig. 2 is used. If the antenna tuner is used, the tuning is accomplished by closing the key and adjusting the tuning capacitor for the strongest signal in a nearby receiver.

The range of the "compact milliwatt" will depend upon several factors. It is intended for local contacts only, and is capable of producing a signal of sufficient strength to be readable within a two- or three-mile radius even with a very short indoor antenna. A wire around a picture moulding, or a connection to a bedspring will produce surprisingly good results. The apartment house dweller will find this little transmitter a means for enjoying the hobby of amateur radio, even though the landlord will not permit the erection of an outside antenna, and it is inconceivable that the radiated power will interfere with standard broadcasts or other radio services.

MOBILE CORNER

(from page 46)

Odds and Ends

FCC Commissioner George Sterling, W3DF is operating mobile and is a member of the Washington Mobile Radio Club WØPZT has a ground-plane antenna 285 high for the station used with the Minneapolis mobile group. A squelch receiver is operated constantly on 29.640, the national emergency and calling frequency Remember the use of 29.640 for ordinary contacts completely blocks squelch receivers and Auto Calls when the band opens Seven Auto-Call receivers are now operating in Washington and Baltimore. St. Paul is also equipped We'd like to know what happens to the ignition noise if an audio filter passing only from about 750 to 2500 cycles is used. These frequencies give about 90% articulation with only about 50% of the energy It is expected a new commercial mobile transmitter will make its appearance shortly, a new product of an old firm W2BFD has transmitted mobile radio teletype



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Designed primarily to simplify and increase the efficiency of cooling the most popular Eimac tetrodes. Sockets are supplied with necessary mounting screws, clips, and a pyrex glass chimney. The 4X150 socket, in addition, incorporates a built-in screen to cathode by-pass capacitor.

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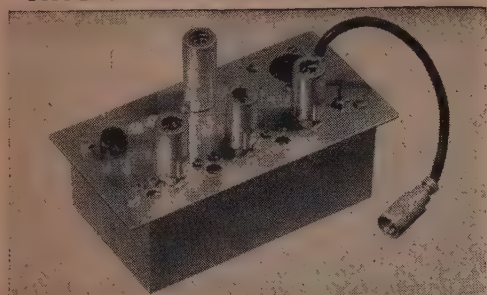
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Back issues of CQ

Year	Issues
1945	July, August, September, November
1946	December
1947	February, May, June, September
1948	March, June, August, September, October, November, December
1949	June, August, October, December
1950	January, February, March, April, May, June, July, August, September, October, November, December
1951	January, February, March, April, May, June, July, August, September

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while underway . . . Western Union receive telegrams via facsimile while under way mobile . . . Watch the height of your antenna in cities using overhead trolley wires . . . Some fellows believe that some of the bus engines radiate more r.f. energy in QRN than some mobile rigs. Some ignition cables use resistance the full length of the cable for spark suppression. It is rumored that many new cars will have fully shielded ignition systems.

DX & OVERSEAS

(from page 37)

it ain't", and as a matter of fact, Tahiti isn't a separate country. French Oceania includes the whole works. . . .

Well, it looks like we no sooner get W6EHV out here from W2 and he makes WAZ, when bingo, he is off again—this time to KG4 for at least a couple of years. Burt Fisher is going to try and get on by DX Contest time and then he too can take a whack at being one of these popular DX stations. Good luck, Burt.

Every once in a while someone wants to know about the Phoenix Island situation. For example KB6AC is on Canton, as is VR1G. Since this group is under United States and Great Britain we took care of this little situation some years back by grouping together under KB6, Baker, Howland, and American Phoenix Islands, which includes Canton. Then, under another listing you will find "Phoenix Islands (British)", VR1. . .

Some of the boys are questioning XU6F because he gives a Hong Kong QTH. All we know is that he claims to be in China but apparently gets his QSL cards some way from Hong Kong. The full QTH is elsewhere. . . .

A real new one by W2NSZ is SV9RP, or Crete. Good? Dunno! . . . If you have worked 3A2AG sometime in September, it was F7AT and before that, DL4FA. Read on for the QTH.

This month DX activities seem to hit the usual summer slump, but by the time you wade through the above mess of drivel, conditions should be on the upgrade. Last year I said I had arranged for good conditions during our Contest, and look what happened, they were lousy. This year I am not saying anything! But I am going to crank up my brand new 807 and I'll see you on the low end. 73.

QTH COLUMN

CR9AF	Oficinas Navais, Macao, Asia.
CR9AW	Box 541, Hong Kong
XU6F	c/o 13 Yik Yam Street, Gr. Fl. Hong Kong, China.
3A2AG (F7AT)	Warren Snyder, Hq. Sig. Sect., Hq. Eucom, Com Z, APO 58, c/o PM New York.
KJ6AI	M/Sgt. B. P. Moran, 1959th AACSG Sqn, APO 105, c/o PM, San Francisco.
VK1BS	Nurse J. Mills, Prince Henry Hospital, Sydney, Australia

SCRATCHI

(from page 4)

Itchi didn't like the noise, but the bird—he seemed to enjoy it. I get another brilliant idea, so rush into basement and come back with automobile horn I have. I get as close as I dare, then let go with the horn. No response. Try again. Bird just raise up a little in its nest, then make noise right back at me that sound exactly like auto horn. Gracious to goodness, better not trying that again. I think horn maybe sound like mating call, and not anxious to play Romeo to this Juliet.

Next I just sit down and think. What would I want if I were a bird in a transmitter? Food? Maybe. It's worth a try. So, I go to refrigerator and start hauling food to the thing. Lettuce, bananas, meat, carrots, beans, bread, even some left-over caviar (Itchi had party while I gone). Doesn't this bird like ANYTHING? Finally I try everything we have, and the poor transmitter is covered with food, and Scratchi is knee-deep in wilted food, and nothing seems to interest the bird. Maybe it's on a diet.

I sit again and think. What would I want if I were a bird in a transmitter? Not food. How about NATURALLY!! Cactus juice. I quickly rush out and get some of my new stock, and pour it in a big bowl. I put the bowl on the rig, and

walk away. First thing I know the bird cocks his head, looks at the bowl, then stretches his neck over and over until he can just get his bill in the bowl. He likes it! He was thirsty! I walk away, and bird gets up, walks over to bowl, and Hon. Ed., you wouldn't believe it, but he sits down in it! Wow! Now Itchi and I can see in the nest. It's full of eggs!

After bird finishes bath in bowl of cactus juice, he starts to drink it. First he sips some, then relaxes, then sips some more. This keeps up for an hour or so, and I can see that it is starting to take effect. After while the bird stands up, weaves around a little, then staggers back to the nest. What a constitution! He drank most of the cactus juice, and he can still walk.

Now what to do? I had hoped that bird would leave nest for good if it take good drink of Cactus juice, but no luck. At this point Brother Itchi are suggesting that maybe the bird will leave when the eggs are hatched, and that the eggs might hatch faster if I turn the filaments on in the rig. So, it being late at night, I decide to try it and go to bed.

Next morning Itchi and I go in to see how the bird is doing. He is still there, but things seem to be happening. I are all for turning on the plate voltage and getting things over in a hurry, but Itchi convincing me it be easier to wait. Sure enough, we hear slite noise, and little bird pops out from under big bird. Few minutes later, same thing happens. Pretty soon the whole top of my

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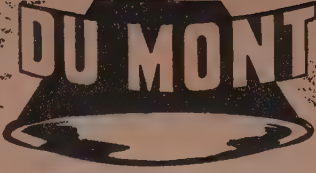
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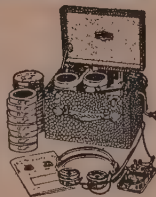
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transmitter is full of birds, all making funny noises. Next thing we know the big bird gets off nest and starts flying around the room. Bang! into one wall! bang! into next wall. My shack are becoming reel mess, so I open window and bird flies out. Itchi go over to transmitter and get little birds, putting them in cardboard box he had handy, and carry them outside.

So, everything now about back to normal, except for one small thing. In the excitement one egg didn't get hatched, and I didn't know it till I cleaned out the nest a couple days later. I accidentally broke egg on transmitter, and well the only reason I'm telling you this, Hon. Ed. is on acct. if you work me soon, and my signal smells, you'll know why.

Respectfully yours,
Hashafisti Scratch

YL'S FREQUENCY

(from page 42)

both ten and twenty. As a final note Peg adds: "I have four children who help to keep me really busy—three girls, 5, 7 and 14, and a boy 9. Am also a den mother for cub scouts." (!!!)

Another Young YL

From Paducah, Ky., W4TAV, Susan "Marty" Martin, writes: "I have been reading your column with interest, especially about the young YLs. I am now 13 years old, and took my Class B when 12. I run 200 watts to PP VT-127As on 40 and 80 c.w., and 200 watts to PP 812As on 10 phone. The receiver is a Super Pro. Antennas are a rotary beam and a Zepp. On 10 mobile it's 25 watts to a Motorola T69-20A. Use the call W4NEP (my Dad) on c.w., and my call, W4TAV, on phone." FB, Marty!

YL Novice Licensees

Welcome to the new Novice licensees. It was FB hearing about those at the National Convention, and we hope to be hearing from many more of you.

One of the first YLs we heard of to get her Novice license is June Gurke of Bethesda, Md. From W3LSX we received a clipping from the Washington *Evening Star* which was an FB write-up about June. The news was still so "hot" she hadn't even received her call, but by now she no doubt has it and is already on the air.

June is only 12. She learned the code from her brother, W3PQF, who got his ticket two years ago when 14. "My brother needed somebody to practice with and I was handy," June explained. Now she plans to take her General Class exam when her year is up.

Hamming will be only one of June's hobbies. An active Girl Scout, she's won merit badges in folk dancing, hostess, cooking, sewing and community work.

YL Booster

One strong supporter for the YLs is W1SAS. Recently Dick wrote: "Back in November of '48, in a letter to Ed Handy at ARRL, I referred to the fact that ARRL was overlooking a vast po-

entual among the YLs and XLs who could do a great deal of good for ham radio. I felt that many of them had the feeling they were being partly shut out and I could vouch for the fact that women make as good and in most cases better operators than men. This experience I found to be true as I had a contingent of WACs under my supervision at Fort Monmouth while an instructor there, and they were not only grand to work with but turned out to be the best students I could have had." (Take heart, you gals who find the going tough!)

"Now under bulletin 292 I see that ARRL has voted to introduce a column for YLs and XLs in QST. Up till now they have left it to girls like yourself to do the job, but I think you need all the support you can get, and I surely hope that the YLs will be able to expand rapidly from here on." Tnx, Dick!

33 CUL—W5RZJ.

VHF-UHF

(from page 33)

rule! They are now looking for W5LAN 15 miles west of Texarkana or W5OMG of Shreveport, 25 miles to the south. Art says that he'll let us know when he makes his first 1,000-mile QSO on 420.

Slips that Snuck in Somehow

G2XC calls attention to the fact that in the August issue of "CQ" we had the new European two-meter record listed as 60 miles! He adds, "We're not *that* bad!" Sorry, Ted. It should, of course, have been 600 miles.

Also in the August column we had W3IMC listed instead of W3LMC as being in the custom-built antenna business. Wonder how many orders W3IMC got on account of this error?

We'll have to blame these two, and a few others not quite so important, on a rush job of printing that didn't leave us time for a complete proof-check.

One that we can't blame the printer for was the frequency we listed for K2USA. Those guys must have a flock of crystals! When last heard, they were on 145.1, working the DX in the best W8WXXV tradition.

We Mourn

Carl Drumm, W2GJV—who was to have taken over the job of Novice Editor for CQ—passed away on August 28, 1951. Carl was active on the two-meter band, and will be long remembered by the many friends he made through his contacts in person and over the air. Carl spent his last conscious hours at a meeting of the South Jersey Radio Association, where, as usual, he was the center of a round-table discussion on the problems of newcomers to our hobby.

Our New Boss

As announced in "Zero Bias" last month, Gene Black, W2ESO, has found it necessary to relinquish his spot at the top of the "CQ" masthead. The new Editor is one who will need no introduction to most of you—especially the six-meter

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COPY of January 1945 "CQ" wanted! What's your price? W0JIN.

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specialists. He is none other than Perry Ferrell, who has headed up the six-meter Radio Observation program so successfully during the past few years. We're glad to see one who is so well-acquainted with the v.h.f. and u.h.f. phases of our hobby stepping into the front office. CQ should grow and prosper under his supervision. Good luck, Perry!

And that's about it for now. Keep us posted—we'll try to pass along all the news we hear! 73.

Brownie, W2PAU

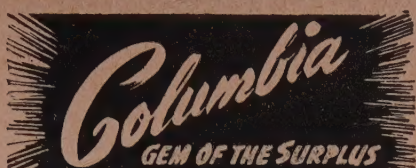
UTILITY VFO

(from page 19)

use—through necessity and not by choice, for crystals were expensive in those days. From 1930 to 1940 crystal control became the fashion and the bell-like notes of that era still ring in our ears, for even then, oscillators were not generally keyed. Now the v.f.o.—keyed this time—is back, and the bands swarm with signals that sound like someone cracking rocks under water—or worse.

Why everyone with a v.f.o. thinks he must key it is beyond us. It certainly is not for the sake of break-in operation—if you think so, try to break in on some of them and see how far you get with it. Except for very low power, break-in operation requires a great deal more than just a keyed oscillator. Apparently a great many amateurs use keyed oscillators simply because it allows them to come back fast to the other fellow without throwing any switches. The ability to reply instantly is a great advantage, particularly in net operation, and perhaps overshadows even the ability to hear the other fellow break, but there is a better way to achieve it than keying the v.f.o. Use a foot switch! The foot switch applies all plate voltages to the rig. When it is pressed the v.f.o. and all stages preceding the keyed stage go into operation; when the key is closed, the keyed stage and all following stages come in. If the key is left closed, as on phone, closing the foot switch places the entire transmitter on the air. And that's all there is to it. After you get used to the foot switch you will be able to tramp on it, reduce the receiver r.f. gain, and begin keying simultaneously. Now you have the better part of break-in operation, the immediate response, plus what is even more important—a decent signal. A foot switch is easily made from two boards, a hinge, and a compression spring to hold the contacts normally open.

To return to our original story—as you may have guessed, this little build-up is to prepare you for the fact that the v.f.o. in this exciter is not keyed. It probably would key as well as the next v.f.o. and sound no better. Keying in the cathode of the 807 is indicated although screen keying of this stage could be used as well. Regardless of the keying method used, if you want a signal you can be proud of, key the 807 stage. We key the cathode return using a conventional click filter to reduce clicks and there is absolutely no chirp nor variation in oscillator frequency. Reports are almost invariably T9X.



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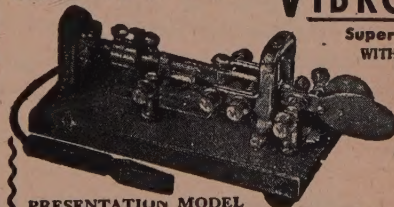
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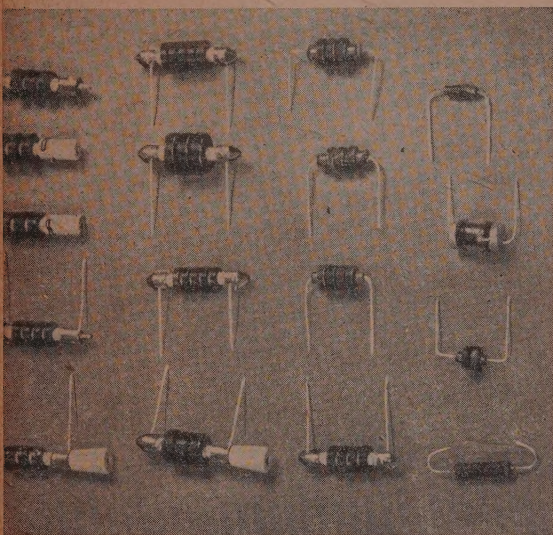
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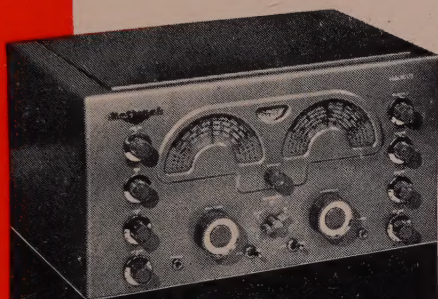
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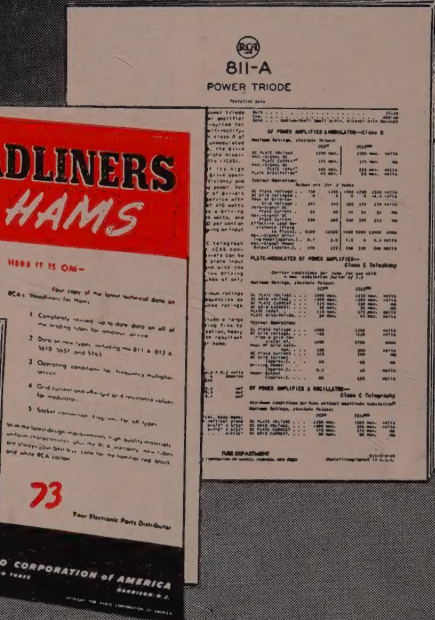
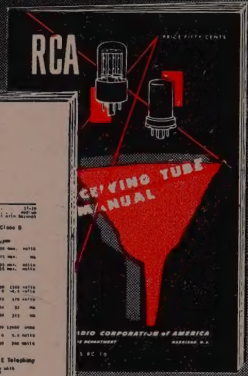
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