



Radio Builder and Hobbyist

FOR THE EXPERIMENTER

Ohm's Law for D.C.:

$$\frac{E}{IR}$$

Where E = Volts
I = Amperes
R = Ohms

Watts = Volts X Amperes

See page 5.

Some Radio Abbreviations

Ant. Aerial, Antenna
AF. Audio frequency
cw. Continuous waves
cps. Cycles per second
db. Decibels
emf. Voltage
f. Frequency
Gnd. Ground
hy. Henry
HF. High frequency
IF. Intermediate Freq.
kc. Kilocycles
kv. Kilovolt
kw. Kilowatt
Mc. Megacycles
mfd. Microfarad
mmfd. Micro-microfarad
ma. Milliampere
pf. Power factor
RF. Radio frequency

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All that is yet completed, or begun,
Is but the dawning that precedes the Sun.
- Charles Mackay.

MRL "RADIO BUILDER & HOBBYIST"

is published at random by
Modern Radio Laboratories,
SPECIALISTS IN SMALL SET
DEVELOPMENT SINCE 1932

Lithographed in U.S.A. by MRL.

Quotations are permissible if
credit is given RB&H.

World-wide subscription price:
12 issues \$2.50; 6 for \$1.30; 3
for 70¢; copy 25¢.

Back numbers 25-40 15¢ each,
plus postage. #41-on 25¢ plus
postage.

Scope. Since 1932 Modern Radio
Labs. have been foremost in re-
cognizing a definite and perman-
ent class of Radio Fans devoted
to small set experimentation as
a Hobby. This class has always
existed- tho so many have failed
to realize it. Not only the Neo-
phyte - but into the Profession-
al ranks and business - we find
these Dabblers by the thousands.
Our own lists attest to this.

(1) Crystal Sets. No longer is
the Crystal set a kid's toy - it
now has its own field of devel-
opment. The large laboratories
are now spending millions on the
Diode, Transistor and other Xtal
(set) experiments. This has re-
sulted in countless developments
and literature to revive the old
lowly Crystal Set.

(2) 1 to 3 Tube Sets are also
included in our field. We com-
bine old, sensitive circuits
with various new Hi-gain tubes
to result in more DX.

(3) Electronics in general -
from the Experimenter's angle is
also included in our interests.

(4) Sciences - because a Radio
Fan is a Scientist - are touched
lightly on any branch that may
attract our fancy.

Well, - our subscribers renew
and renew- so that is enough for
us. Against heavy odds and ridi-
cule - while others have come &
gone - we have continued to push

this Small Set Hobby. After 23
years we are stronger than ever
- so apparently we guessed right
after all!

But, we at MRL don't know it
all - so any suggestions will
always be welcome. And all those
subscriptions coming in are sure
to help RB&H to grow.

EDITORIAL NOISE LEVEL.

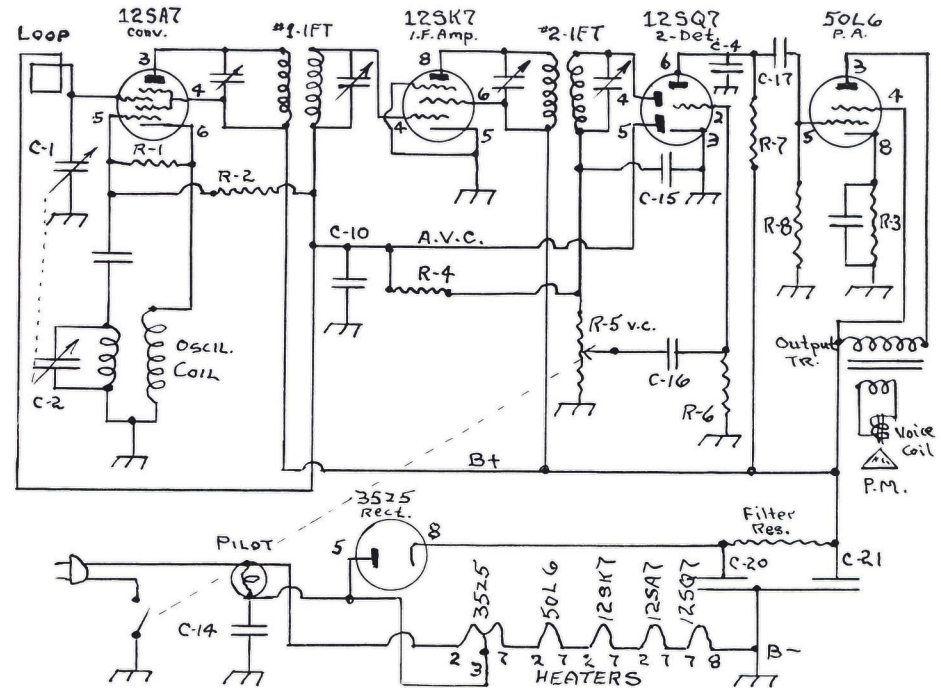
Well, here you have it. We hope
you like the new layout. We have
tried to make it as interesting
as time and space permitted. No
count of the man and woman hours
that went into it has been taken
- but it's been plenty. Of course
there is an old axiom "it can
always be done better." If you
will write in your opinions and
criticisms we'll appreciate it.
It is made for you to read - not
us. Our notes have been gone over
and an attempt has been made to
interest as many Experimenters
as possible. We can't predict
what will be in the next issue
of RB&H as our plans are often
changed during the makeup.

Lithography has a multitude of
potentialities. This is our first
experience in color- but it does
dress it up. We've seen some FB
work done on a #1250 Multilith.

As Transistors are now in our
stock we'll have some of their
workings in the next issue. As
the opportunities for develop-
ment of this new gadget are so
great- it is a good idea for you
to get started with it. In the
past we have deliberately stayed
away from them due to their
price, newness, etc. However, at
\$2.75 each (see page 22) they R
getting down to an Experimenter
level. Whatever you do, be sure
to connect them up in the right
position. Some of the 3-stage
hearing-aid Transistor amplifi-
ers require but 1½ volts. In the
meantime, send 25¢ to Sylvania
Products, Inc. 1740 Broadway,
New York 19, for "28 Uses for
Junction Transistors." Will be
described in next RB&H.

Until next issue, keep the DX
rolling in. Best 73'S from
Mabel and Elmer Osterhoudt.

SERVICING AC-DC RECEIVERS. By Geo. R. Anglado, Radio Technical Labs.



This article is written for
the Experimenters and beginners
who would like to know a little
more about repairing of the com-
mon AC-DC type of receiver. By
carefully digesting the informa-
tion the beginner will soon be
repairing his own set along with
the sets of his neighbors. Read
with care and you will be well
rewarded for your time.

The article presented here
deals with the usual symptoms
encountered in most AC-DC types.
While most anything can happen
to a receiver, the following
symptoms are those most fre-
quently encountered. It has been
said that in a 5-tube set there
may be 93 faults plus a combina-
tion of all of them!

- (1) No light in tube filaments.
- (2) Pilot lamp burns out repeat-
edly when set warms up.

- (3) Lights in the tube filaments
go off and on intermittently.
- (4) Hum.
- (5) Distortion.
- (6) Distortion at high volume.
- (7) Only one station received.

Pilot light burns out re-
peatedly when set is turned on,
or the set is dead. This is a
sign of excess current flowing
thru the lamp. Make sure the cor-
rect type of lamp is used, with
correct voltage and amperage. The
figure shows a standard type of
circuit to which we will refer.

You will notice that the pilot
light is connected across the
tap of the 35Z5 rectifier fila-
ment. A portion of the fil. cur-
rent flows thru the lamp and al-
so a portion of the rectifier
plate current. When the light
burns out as soon as the plug is
inserted in the 110 socket it

means that the plate current of the rectifier cannot be the difficulty, since it takes a little more time for the rectifier cathode to heat up and start emitting electrons.

In practically all cases you will find the trouble due to an open in the tapped portion of the rectifier filament, which is between pins (2-3). When this occurs all the current drawn by the other tube filaments flows thru the pilot light. Since the current is excessive, the pilot light burns out. The tube may sometimes test OK in a tester, since the tester may test the whole filament, regardless of the tap. The best, and easiest way to check the tube is by an Ohmmeter between pins (2-3) and (2-7). Sometimes the tap burns off.

Before you try a new tube be sure to check the filter condenser to see if it is shorted.

Also check to see if there is a condenser (C-14) between fil. & ground, and if it is shorted. If so, it will burn tube and the lamp both out. Turn the set on & see if pilot lamp glows brightly at first and settles down. If it happens the light keeps getting brighter, turn it off quickly. A little later you will be shown what portions of the cir. besides the filters that should be given a test for current drain.

An interesting fact should be noted that when you tune from 1 station to another the pilot may flicker. Also, if volume is turned up with changes in volume of speech and music. This condition is natural because the current drain on the 35Z5 changes.

The 50L6 output tube does not operate strictly as a class A amplifier and will undergo average plate current variations on a strong signal. This may cause the light to flicker, also.

If you ever find a dead set & the pilot flickers on a station, it may be an open voice coil in the speaker.

Above defects are concerned mostly with the rectifier. In most cases the P.A. tube is the culprit, since it is capable of

drawing considerable current.

Filter condensers (C-20, 21) may be tested by disconnecting 1 side of each. Test their leakage by a hi-resistance Ohmmeter with a reading of 100M or more on the scale. For a best condenser it will charge up to around 10,000 ohms and drop slowly back to 2 megs or less and stay there. A good cond. may run about 100M, & be perfectly OK. Others increase in efficiency with age and use.

Check heater to cathode leakage of P.A. tube as this will partly short (R-3) resistor and cause excessive drain. Also a gassy tube may cause drain.

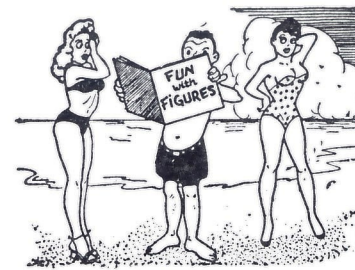
Check (C-17) coupling condenser with a DC voltmeter by placing it between grid and across (R-8) to ground. If no reading is obtained, with the set on, the cond. is OK. If (C-17) is replaced and you still get a reading, then it is a gassy tube.

No light in tube filaments may mean an open somewhere in the fil. string. Test each tube fil. with an Ohmmeter as it is quicker than a tube tester. Check the power plug to see if it got pulled loose. Also the switch.

Tubes go on and off. Place the tubes in a checker and tap them while being tested. Watch the emission meter to see if it drops during test. Or, you may apply AC across a fil. shunted with an AC meter. If meter jumps up the fil. is open; if down, - shorted.

When one or more tubes don't light in a power trans. set, you suspect the filament. In an AC-DC the single tube may be shorted in the fil. Wiring may be shorting to chassis. Or, if the fil. and cathode of a tube are shorted it will ground the fil. By elimination one can find the bad one. A glance at the schematic will help to locate it.

Will continue with more problems in next RB&H. I hope this much has helped to solve some of your problems in servicing.



OHM'S LAW

As our friend Les Hulet puts it "Math. is hated by all Experimenters." We'll agree. I must admit my grades weren't any too good in Geometry. Hi. But, here we have concocted a little plan to make you like some of it. And am sure you'll benefit, too.

Ohm's Law has no connection with Oliver Wendell Olmes, doncha know, old Pip. It is in 3 forms. Definite relationships exist between them. If we know two of the quantities of Amps (I), volts (E), or Ohms (R) we can find the missing one.

Usually to find the current in Amps. (I), we say

$$I = \frac{E}{R} \text{ or Amps} = \frac{\text{Volts}}{\text{Ohms}}$$

To find the pressure in Volts: $E = IR$, or Volts = Amps. x Ohms.

To find the resistance (Ohms):

$$R = \frac{E}{I} \text{ or Ohms} = \frac{\text{Volts}}{\text{Amps.}}$$

But some Quick Wit has figured on combining the three formulae, as

$$\frac{E}{IR}$$

In other words, if you have the Volts and Ohms, divide Volts (E) by Ohms (R), to get the missing quantity. Likewise, multiply the Amps x Ohms to get Volts. Divide Volts by Amps to get Ohms. Write this down in a handy place on a Landlord's wall.

Ohm's Law applies only to pure DC circuits, thru solid materials because thru a gas it varies as gas is not constant. It applies to AC where no inductance (coil) is involved. In the latter case the Ohms are changed to Impedance (Z). Now our formula becomes

$$\frac{E}{IZ}$$

As figuring problems involving AC are more complicated we will skip it for now.

Volt is the unit of EMF (Electro-motive force) (Potential) to drive 1 A. of current thru 1 ohm.

Ampere is the unit of current that will flow thru 1 ohm at 1v.

Ohm is the unit of resistance that will allow 1 A. of current to flow at 1 volt.

In laying out your formula be sure you figure current in Amps. and not milliamps. For instance, 6 m.a. would read .006 A.

Ohm's Law applies to any part of your series circuit as well as the whole.

Just for fun, let's take a 1C5 tube, and substitute the correct values in our formula:

$$\frac{E}{IR} = \frac{1.4 \text{ v.}}{.1 \text{ A.} \times 14 \text{ Ohms}}$$

1.4 v. divided by 14 ohms gives .1 Amp. Also, .1 A. x 14 Ohms is 1.4 v. Likewise, 1.4 v. divided by .1 A. is 14 Ohms. Catch on?

So - what's Watts? Watt is the unit of Power where we have 1 v. and 1 A. Therefore, all Volts times Amps. gives Watts. What?

Now, let's sneak into the kitchen and steal the Electric iron. Looking on it we may see 110 v., 575 Watts. Latter divided by 110 v. gives 5.75 Amps. To go back to Mr. Ohm, we find

$$\frac{110}{5.75 \text{ A} \times R} = 19.13 \text{ Ohms.}$$

Now, let's take a sensitive Ohmmeter and check - 20 ohms, on the button. Ah - ha - Hotpoint's been cheatin' again! Underrated! Now you know why a Hotpoint will last for years - especially with youse guys that leave them on all day! Then, these fluctuating power lines, now usually rated at 115 volts. Lord knows what the mfr. will be up against. We have seen fluctuations up to 123 on a 110 volt line. Put a good A.C. meter across your line and watch it bob up and down as some Jerk switches on some Watts.

This will be continued in next issue. We hope to see you then.

EXPLOITING THE MRL #10-A CRYSTAL SET.

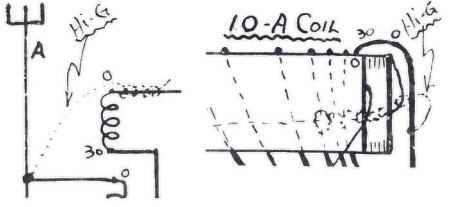
Anyone designing a Radio kit is up against the problem of location, varying conditions of reception possibilities, long and short Aerials, grounds, etc. One can only design a set for better than average conditions. However, one may suggest various changes in order to make the set work better under certain new conditions.

In the City one requires a selective set above everything else. Distance reception depends on strength of locals, ground waves, buildings, etc. Most sets can get good DX in the City after midnite when loud locals are off the air.

In the Country one requires a set for DX more than selectivity and a larger Aerial. It's a sure thing, you can't have tops in both on the same set. The set can tune broadly because the DX stations will be sharp anyway. However, from past experiences and reports, we can offer some of these changes you can easily make on the #10-A set.

To offset above conditions one may wind a secondary coil of his own - say about 1 1/2" in dia. and some 50 turns #20 DCC wire. Slip this inside the main coil. It may be Bakelite or cardboard. It isn't necessary to remove the present secondary winding - just disconnect it at both ends. Then slide it in and out until you get the best signal and selectivity for your location. It may be fastened with Cellophane tape once it is in place. You may also try reversing the leads for better reception on DX stations.

Another method is to use the hi-gain coupling method as used



in Midget sets to eke out the last iota of energy from the Aerial. As shown in drawings, you solder a piece of insulated hook up wire to the Aerial connection as shown. Wrap it around the lead to the crystal stand, but keep it insulated from the latter. The more turns, the more energy goes over to the secondary. It will also affect selectivity.

Another way is to fish about 30 turns #22 DCC around the primary coil and use this for the secondary. Divide this evenly over the entire length. However, we prefer the separate secondary coil as being more flexible in its adjustment.

If in the Country you may remove your present coil and send for our #10 Country Coil. Same number of leads, etc. so everything works OK. Cost of coil and postage is \$1.58. This has 160 turns of fine wire and gives a closer coupling. In the City it will tune broadly, but is more beneficial in the Country for DX reception.

A Fan from Del Paso Heights, Calif., suggests hooking ground to the Antenna post of the set. Then he hooks his Aerial to the catwhisker side of the secondary coil. In this manner he claims better reception of Police stations and lots of Short waves. This tends to raise the set "above the ground" for better SW tuning of the set.

Be sure to mount the coil after everything else is wired up, as it will be much easier.

Two 3/4" Fahnstock clips may be mounted behind the panel under the stand screws for a Diode crystal mounting. It may be easily removed in this way. When we furnish a Diode, at \$1 extra, we keep the Steel galena. Try reversing the Diode for best results on DX stations.

Use the busbar, furnished with kit, to mount the Fixed carborundum crystal in a slanting position for easy adjustment. The busbar tends to keep it rigid. Don't heat it too much or Xtal may fall out. If so, lay it face down on a bench and re-run the

solder over Xtal. The Fixed carborundum is adjusted here on a station, for good response, before it is packed. Often they get moved in shipping. If you desire to re-adjust it, tune in a weak station on a Diode, or Steel galena, and throw switch over to Carborundum. Re-adjust it by sliding sidewise "just a hair" with your finger. It will stay on a hot spot, as that is one of its advantages.

When not in use, be sure to throw switch over to the stand or Diode to preserve your battery. Drycell may also be removed to make sure.

One Fan suggested using one or more points for additional Xtals as a Diode, Fixed silicon, galena, pyrites, etc. to make it a lot more interesting and comparing crystals for DX, Short waves and other properties.

Here is a chart showing the average operating characteristics of our fixed crystals:

| Xtal | Vol. | Select. | S. W. |
|-----------------|----------|----------|-------|
| Diode..... | Best.... | broad... | good |
| Carborundum.... | next.... | sharp... | fair |
| St. Galena.... | next.... | " | good |
| Silicon.... | next.... | " | " |
| Ir. pyrites.... | next.... | " | " |

Many sets have DX possibilities but we haven't pushed them as much as the #2 and #2-A in the past. They, too have possibilities in this line.

One fellow hooks A-G leads of his BC receiver into the phone tip jacks of the #10-A and gets Short waves on his set.

Cliff Brown, Kingston, Ont. gets Moscow (7000) for 1 hr.; London (5200) every pm for 1 hr.; others 800 miles down. Also Hams, ships on Lakes, planes, etc.

Brinsmade, N. Dak. got 1400 mi. the first night.

Lewisburg, Tenn. gets 950 mi.

Spring Valley, Calif. got 46 stations first nite, including 13 Mexican, 6 Police, 2 planes, even with loud Ham down the St. and pillow speaker. 130' Ant.

Phoenix, Ariz. gets 700 miles on Short waves.

Alhambra, Calif. gets the best

selectivity of any Xtal he ever heard.

Oakland, Calif. near strong BC station separates them all.

If you'd like some fun, order your #10-A Kit now. Prices as follows:

- #10-A kit with DP-34. 2 lbs. wt. CAT. 14-7..... 5.00
 - Same, but with Diode Xtal instead of St. Gal. 14-7-D 6.00
 - DP-34 by itself..... .10
 - Assembling, wiring and testing each kit, additional..... 2.00
 - Country Coil for #10 1.58
- See CAT. K-2 and HB-17 for more data.

NOTES ON MRL 1-TUBER & #2 XTAL. By Elmer Burton, Ohio.

I found that a very small coil of 4 turns #22 Enam. 3/8" in dia. will work good in my 1-tuber. I make the secondary closewound & to fit inside a tube base. Ticker is the same and held close to it. Also use a .0005 mica for regeneration, instead of the .00025. Also, I open up the 25-280 trimmer to get a lower minimum capacity for tuning. Also use a .00035 Var. in series with the Ant. to make it oscillate over the whole scale.

I heard a station with a KQ call, but couldn't make out the last letters or numbers because it was distorted. It might have been a telephone relay by the sound of the conversation and because they operate on the 30-50 mc band. This station tuned very sharply and it faded. Came in with bar knob between 4-6 on the dial and the screw of the 25-280 trimmer turned 7 times back from closed. When the dial is set on 30 and the 25-280 trimmer all the way out it will interfere with channel 3 on TV (60-66 mc.) A Ham said the station I heard was probably FM because it was distorted.

Still get Hams from all over on 20 m. coil. Portland, Utah, Cuba, etc.

Also get Hams in W. Va., Ky., and all over on my #2 - besides MOSCOW!

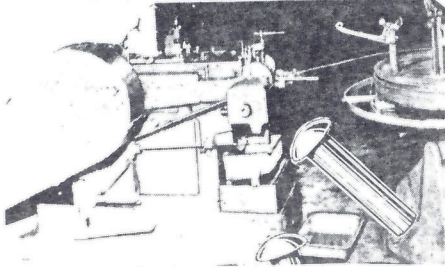
Manufacturing Processes.

MAKING MACHINE SCREWS.

The old method of making machine screws on a turret lathe, using bar stock, has been mostly replaced by automatic machines shown here.

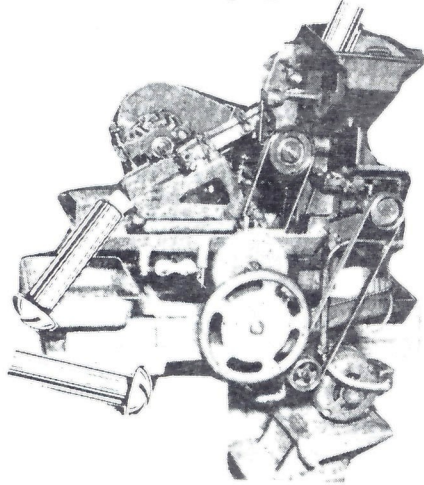
Cuts were furnished by the Hercules Fastener Corp., of Chicago, one of our suppliers and manufacturers.

Heavy wire is fed into the heading machine, which can put a

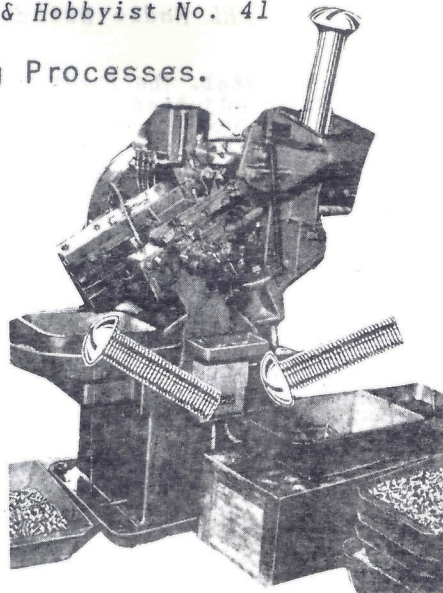


variety of shaped heads on them, as flat, round, oval, binding, etc. It also cuts them to the proper length. Here you get your sizes as #2, 4, 6, 8, 10, etc.

Now it goes into the slotting machine for the proper slot.

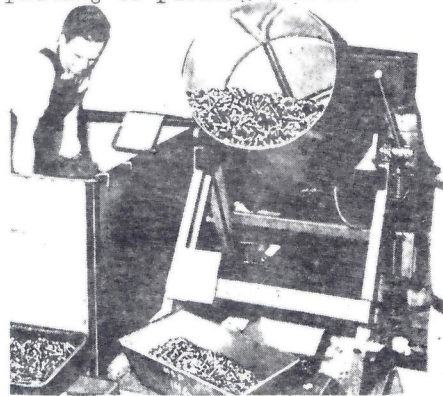


Next to the threading machine. We understand a lot of lubricant is used to make good threads. So



now you get your threads per in. as 32, 36, 40, etc. A 6-32 screw will mean size #6 and 32 per in.

Next comes the cleaning and tumbling process, where grease, dirt, etc. is removed before the plating or packing process.



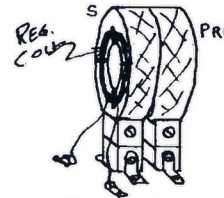
Plated screws are then covered with any number of finishes, as nickel, cadmium, chromium, zinc, copper, etc. They are then dried and given to the packing dept.

They are then weighed in gross or 1000 lots and packaged. Some supply only in 1000 lots. Certain sizes we buy in 15M lots to get a good price to pass on to you. We sell in dozen lots to you.

LONG WAVE RECEIVER EXPERIMENTS.

We had planned on rigging up a Long wave receiver for you this issue. However, after much experimenting, we found that our DP-36 (10¢) was still much in order. We will attempt to do as much work as possible on our experimental model so more data can be passed on to you later.

The set is rigged so you may use two Honeycomb coils, standing upright with mountings on the Compo. base, and up close to each other.



Instead of tapping the coils for the Electron-coupling regeneration, we prefer to tape on a bunched winding and extend leads to base, for each coil. On the base mount 2 Fahnstock clips for this coil. As the coils are often poled differently, and will not oscillate if in the wrong direction, they must be placed right. You may mark one lead and matching Fahnstock clip with some wax from a Crayola applied with hot soldering iron. Then, it will always be in right direction. In the experiments we arbitrarily took 25 turns of bell wire and mounted it between pri. and sec. coils. It was used on all coils from 1500 down to 20 with good oscillation. However, finally each coil will have its proportioned regeneration winding taped to it with Cellophane tape.

The primary Honeycomb coil stands upright against the sec. It is tuned in series or parallel by a .001 variable. We don't know which is best. DP-36 shows a series-parallel switch so you may have either, which is a good idea for flexible operation.

Using a 6SK7 tube, as it works very good. As they are used in IF circuits (Lo-freq.) they are

good for Long waves. Lit it up with a 6.3 v. fil. transformer. (24-8. 1.50), with one side to the ground for grid return circuit. Suppressor (3) to ground.

For tuning condenser one of our 3-gang .00035 var. condensers (8-11. 1.75) was hooked with all 3-gangs parallel - total .00105 mfd. This gives a wide range. On the HC-100 coil it ranged from 195-525 kc, so this will give you an idea of its coverage.

For regeneration condenser from plate to ground we used a .005 mfd. mica instead of the .00025 as shown in DP-36, but it may be changed later.

Regeneration/volume control is a 50,000 ohm, but we hooked it clear across B- and plus. This will be changed as it is hard on volume controls. Hi. We also eliminated the .5 mfd. from center tap to ground, as apparently no difference. May be returned later to the circuit.

For a B-supply we tried it out with a 250 v. B-eliminator as well as 45 v. of batteries. Believe the batts are better maybe because of lower voltage.

Got good results with 10 meg. grid leak and a 50 mmfd (.00005) grid condenser.

No trouble was had with body capacity or shielding so Compo. may be used for panel and base.

Has a terrible wallop on BC band. On the Long waves we got lots of BC harmonics. In the far Country you won't get these. It is possible an MRL QRM Coil (7-42. 50¢) placed between the sec. coil and condenser will cut out the worst of these.

The Radio Spectrum, that may be used for transmission of messages, runs from 10 kc to a million kc. (30,000 to .3 meters). Above 200 mc. it is in the experimental stages.

We tuned a number of Beacons on various coils. Some of them operate all the time; others part time. Usually 1 to 3 letters and you may easily de-cypher them. The Marine beacons run from 260-320 kc. The Radio Range, or aircraft Beacons run from 200-400 kc. (We got "OAK" on 361) How-

ever, there must be variations as we got "PES" (190) and "SRP" (525). Will try to furnish list of Beacons and Ship coastal stations in forthcoming issues. For a long time it was impossible to get a list of them. We have an old copy (1931) but many have been changed as we heard many new to our experience.

The Intermediate Ship band is from 355-500 kc, the latter being the calling wave, SOS, etc. Low frequency range is 100-160 kc. on a Ship set.

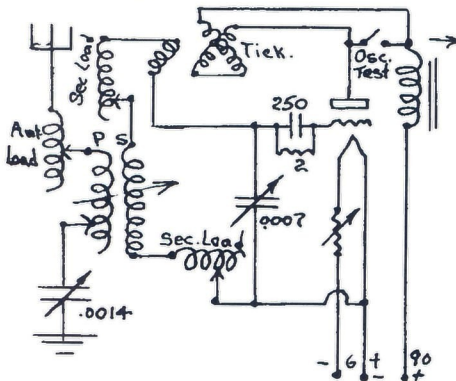
Marine receivers are simply & ruggedly built for Sea use. Before Broadcast started in 1921 the Ship sets had reached a high degree of perfection. With large coils, 300 ft. multi-wire Aerials and perfect grounds lots of DX was easily gotten.

The average Ship set uses one TRF stage; 1 regenerative detector; and 2 steps of Audio; 6 v. A supply and 90 volts B-battery. Some sets are Superhets. - and may tune sharper, but albeit a few harmonics drop in. Possibly the TRF stage corrects this.

Some Ship sets use plug-in coils to 20,000 meters.

One U.S.C.G. and RMCA set uses variable B-voltage to the first audio trans. to control amount of regeneration.

RMCA IP-501-A receiver uses a peculiar vario-tickler regeneration setup, as follows:



Usually they peak their audios at 500-1000 cycles for better

amplification at these readable frequencies. Salt air raises havoc with audios - mostly around the terminals. You can clean the brass every day out there - so you always have a job. A good operator usually cleans his brass when entering port to make a FB impression on the Inspector!

We acquired some used Honeycomb coils, all mounted. Can let you have them at the following prices, which is about half:

| Turns | mhy | kc. | meters. | net |
|-------|------|-----|---------|------|
| 20 | | | | .50 |
| 25 | .04 | 834 | 360 | .50 |
| 35 | .072 | 588 | 510 | .60 |
| 50 | .150 | 417 | 720 | .75 |
| 75 | .325 | 286 | 1,050 | 1.00 |
| 100 | .62 | 200 | 1,500 | 1.25 |
| 150 | 1.46 | 132 | 2,273 | 1.40 |
| 250 | 3.8 | 82 | 3,659 | 1.0 |
| 300 | 5.5 | 68 | 4,412 | 1.60 |
| 400 | 9.8 | 51 | 5,882 | 1.85 |
| 500 | 15. | 41 | 7,312 | 2.05 |
| 600 | 23. | 33 | 9,091 | 2.20 |
| 750 | 37. | 26 | 11,112 | 2.35 |
| 1250 | 100. | 16 | 18,750 | 3.00 |
| 1500 | 150. | 13 | 23,077 | 3.50 |

Above readings depend on coils and condensers, air conditions, and other variables. All in good workable condition. (.001 mfd.)

Also a 3-coil gear mounting for \$3.00. 2-coil for \$2.00. A few single mountings for 50¢ Ea. No more mountings obtainable. If coils sold out, can furnish new, unmounted for about same price.

CRYSTAL DX NOTES

Looking over some old files of MRL RB (#9) we found where MRL had indirectly helped in winning all three prizes in an Eastern DX contest in 1937. First prize for DX was a cir. similar to our #2. 2nd to a #2 built by us and 3rd prize was our #8, which was originated by us. How's that for copping the prizes? No #9 RB's for sale - only our shop copy.

C. Williams, Venice, Calif. reports he used to copy press from KPH in Australia on a Marconi #301 Xtal receiver in the olden days - 8000 miles.

Some Worthwhile Literature.

This is a new heading with us. We have selected the most interesting for you. Send to the address given, not to us:

"Electrical Demonstrations you can Make." 32 p. Storehouse of knowledge on wiring, fans, wire sizes, toasters, cords, vacuum cleaners, sewing machines, mixers, waffle irons, irons, washers, ventilation, motors, shades, lights, brooders, fences, clipping & milking machines, dehorning, soldering. Free from Youth Activities Info. Svc., Westinghouse Elec. Corp. 491 Liberty Ave., Pittsburgh 30, Penn.

"Soldering Simplified." 12 p. of good, interesting data on the art of soldering. Explains solder, flux, care of irons, proper heat, operation, etc. Free from Kester Solder Co., 4201 Wrightwood Ave., Chicago 39, Illinois.

"A Simple Electric Motor." 4 p. of plans for making the simplest machine. Made from simple things easily obtainable. Doesn't look like a motor, but it sure works. Free from National Electrical Contractor's Assn., 1200 18th St. N.W., Washington, D.C.

"Thunderbolts in Harness." 7 large pages, but very interesting. 15 million volt tests; many lightning facts worth knowing; some history; \$2 million Lab. of G.E. Free from General Electric Co., Schenectady, New York.

"Building a Power Shop Workbench." Plan DW-102. Complete details and parts list for this swell workbench. Free from DeWalt Power Tools, Lancaster, Penn.

"Handy Man's Guide" or Ball Point Pen, whichever they have in stock. Also data on gloves, mits, shoes, etc. Free from the Wolverine Shoe & Tanning Corp., Rockford, Michigan.

"Auger Bits." 29 p. Very useful. Types of bits; selecting;

proper use; sharpening; storing; straightning, etc. Free from the Irwin Auger Bit Co., Wilmington, Ohio.

"What's New with the Electron" Interested in revolutionary, large Eimac Xmtg tubes, as Klystrons, etc.? How to get down to 7500 mc. (1/25 m.) About micro-waves; hi-gain to 20,000 times; rectifiers to tetrodes. 14 large pages. Free from Eitel-McCullough Inc., San Bruno, California.

"101 Money-saving Ideas." Many new ways to use boiled Linseed oil around the home. (Note: be sure to burn all rags to prevent spontaneous combustion.) Free from Archer-Daniels-Midland Co., Minneapolis, 2, Minnesota.

"Your Career in Textile Engineering." 24 p. Enlightens you on a good future. One large cotton mill lists 675 types of jobs. The first time I knew some 10 colleges gave 4-yr. courses leading to B.S. in Textile Engineering. Courses run from Chemistry; cotton; synthetics; wool; machinery; knitting; weaving; etc. Free from Textile Info. Svc., Suite 1901, 551 5th Ave., New York 17.

"Engineering Opportunities." 120 p. Numerous courses in Engineering by correspondence. Well gotten up. Fine for the fellow still undecided what to do for his future. Besides all the interesting courses, there are Electrical engineering in many branches; telephony; general Radio, servicing, Television; and sound-film projection, etc. Each course lists subjects covered so you know what you're getting. It is a good idea to look into it. Free from Canadian Inst. of Sc. & Tech., 576 Century Bldg., 412 5th St., N.W., Washington, D.C., or 263 Adelaide St., W., Toronto.

If you have received anything of interest to other Fans, let us know. If it costs money, also advise, so we can pass it on.

Pacific Coast Notes.

To describe all the Electronic activities around S.F. Bay would require a book. Population increases by 4300 per mo. in the newcomer list. Hardly a week goes by that some new mfr. doesn't start a new factory near here.

Varian. San Carlos & Palo Alto have invented the Magnetometer. When flown in a plane it detects minerals, oil, etc. This would be especially handy in a rugged mountainous country. Dr. Varian was the inventor of the Klystron tube. The largest UHF TV tube in the World has been mfd. by them for G.E.

General Electric. Redwood City new bldg. to be in operation by July 1st. Will build 2-way communication equipment for Police, taxis, etc.

Gudeman Co. Sunnyvale have been building 10M sq. ft. addition 4 making Electronic equipment. 125 employees.

RS Electronic Corp. Palo Alto. Radar scanners, miniature and printed circuits, etc. New bldg.

Ampex. Redwood City. Opened a branch in Los Angeles, called Ampex Loud Speaker Co. They make tape recorders, etc. here.

Packard-Bell. Los Angeles may announce a color TV next fall to sell for \$800.

National Motor Bearing Co. of Redwood City are installing a Remington Rand computer. This can solve 40 consecutive math. operations in 1 sec. They are now installing their new sealed type bearings on train cars to stop hot boxes. Started in S.F. a no. of yrs. ago in a small garage. Now they have 2 plants. One here occupies several blocks.

Folgers. S.F. also installed a R.R. Univac - no doubt for keeping a score on coffee beans! At these high prices, yet.

Davis Electronics. Burbank. To have new plant with 5 times the floor space as before.

Aerovox. Burbank. Have acquired Cinema Engr. Co. Also an additional Burbank plant, plus a new plant under construction in Monrovia.

Mechanics' Library. 57 Post St. S.F. 100th year. Collection has 155,000 books, etc. If near it U may take out books.

Pacific Gas & Electric. Pittsburg, Calif. \$75 million steam plant is the largest of its kind W. of the Miss. river. Can produce 600M kw by using a million gal. of fuel oil per day at full load. 1000 deg. boilers are 12-stories high. A steam plant helps keep the power up during a hi-line failure or overload.

Stanford Univ. Palo Alto, is foremost in research and development in this section. The West coast supplied 1% of Electronic equipment after WW 2, but now it accounts for 10%. Hewlett-Packard leased 20 A. of Stanford land 4 future development in Elec. testing equipment. Other occupants are G.E. Microwave Lab., Varian Associates plus a Varian Lab. 4 the Airforce, Eastman Kodak Co., Preformed Line Prod. mfr. of power transmission line equip., a museum and U.S. Geological Survey library, The G.E. Lab. will work on microwave tubes to give better fringe reception of TV, permit longer detection ranges and Radar uses and be a Scientists' Heaven!

Du Pont. Antioch, Cal. is now building a \$10 million plant for making tetraethyl lead and freon fluorinated hydrocarbons for use in refrigerators. Another Neoprene plant is being built at E. Chicago, Ind. Du Pont says that chemical additives to gas are only starting. Maybe they can put something in to help smog.

Natural History Oddities.

Most Useful Tree is the Car-nauba palm of Brazil. Produces a fruit to be eaten, seeds for a coffee substitute, sap to make a wine or vinegar, furniture polish oil, cattle fodder, and lumber resistant to salt water and insects. 1500 species of palms are in existence. The Palmyra palm has over 800 uses.

Meadowlarks in the Sacramento valley consume 193 tons of insects daily to feed their young. Nebraska estimates consumption of insects by birds at 170 car-loads daily. One figure disclosed a pair of wrens brought insects to their young 1217 times in 15 hours. (It sez here!)

Crab's eyes are larger than bees. Like bees, they navigate by detecting polarized light as reflected sunlight from the sky. Yale professors are studying the eyes in development of a new type of compass to navigate the north pole. Here magnetic compasses are useless and twilight hinders celestial navigation. White light vibrates in all directions, while polarized light is uni-directional, the same as used in stereo-movies.

Life of a parrot may be up to 200 years; a goose 80; a dog to 14. How much better to have a dog live longer - as a better friend to man. A parrot can only mimic sounds - which it doesn't understand.

Rabbits, in the Arctic circle region can stand on their hind legs and run like a man. (No wonder some people throw away their whiskey bottles up there!)

Wild burros will be protected in Calif. and elsewhere. During our trip to Mexico City, in 1949 we saw them loaded with firewood and given a slap on the rump and sent home. They would jog along the side of the road alone with a big load tied on. He will remain almost motionless all day

when his rein is dropped to the ground. We'd stop and pet them - with no motion from the animal except an occasional whisk of his tail toward a fly. The burro is the rancher's best man.

Worms have no eyes but have light cells over the surface of their bodies. If a worm is placed in a dark room and a light is flashed on him - he wriggles.

Jaguars are the biggest cats of the Americas. May sometimes grow as large as a Tiger, and is strong enough to break the neck of a mule, or horse with one blow. During our Mexican trip we met an American grower of 200 A. of tomatoes, near Mazatlan. He invited us to hunt Jaguars, but we had to decline. No license is needed there. In 1948 they had a big flood there - and he watched his "tomato catsup" go down the river.

Fish exceed in number and variety all other backboneed creatures. An Ichthyologist is one who studies fish. Sunshine vitamin D comes from codliver oil - from Codfish not exposed to the sun. But, they get it from tiny marine plants - that get it from the sun. The Sailfish has been clocked at 70 mph. The mouth of the large blue Whale can accommodate 10 men upright but its throat is only 9" in dia. (Did the Whale swallow Jonah?) Sharks seldom attack Man unless there's blood in the water. Often the heavy scales will draw blood as it brushes a body. A Barracuda will attack at once.

Six Rabbits started the rabbit horde in Australia. In no time their ability to reproduce along with a favorable climate has produced millions. Farmers have never found a good way to deal with this problem of having much of their crops chewed up. Reminds me of a note in a paper "Father of 10 children shot - mistaken for a rabbit."

Stamp Collector's Page.

Many Collectors are leaving TV to get back to Stamps again. You can't keep your mind on both at once. Nobody knows how many Stamp collectors are in the U.S. but some estimate 10 million. 50 yrs. ago one stamp paper had a circulation of 6000. Now about six papers circulate 150,000.

Doctors say people live longer with a Hobby. It keeps people busy and out of mischief. It is a safety valve - lets off energy thru something you like. There are 22,000 Hobby clubs in U.S.

First in order of numbers is the Stamp collector. Gathering, sorting and cataloging a collection creates relaxation and a stabilizing effect on your mind. It is said not a Stamp collector is found in any mental institution in the U.S.

Collecting is not juvenile. 90% of the members of the Austrian Phil. Soc. are between 34 and 55. The average U.S. collector is about 40.

Stamps create greater knowledge of geography, history, religion, biography, nature, etc. Due to my meagre knowledge of Stamps on hundreds of occasions it has helped me understand the news, movies, etc.

Collect for pleasure - not for profit - same as attending a ball game, movies, trip, etc. Many firms stress the money angle - altho your collection does increase in value like bank interest, it'll never make you rich.

Begin with a general Worldwide collection. After a few years you'll become interested in some certain Country, group or class. Then you can specialize. However don't throw away your general collection as you'll need it.

Obtain a loose-leaf binder with quadrilled paper and you can build your own Album. Start with one Country to a page - and use one side only so stamps will not catch. We can furnish you an album if interested. Collecting singles is more fun to me.

A stamp Catalog is a necessity if you are going to do it right.

However, thousands collect without owning one. Since Britain's Penny Black of 1840, more than 100,000 varieties have been issued. Catalog prices are comparative - you can't use them for final value. Figure your collection is roughly worth about half catalog retail. A Stamp may CAT. for 50¢ and sell for 10¢. Another at 2¢ may cost that much or more depending on scarcity. Every successful dealer marks up from his cost, not CAT. Some unused (mint) stamps are worth less than used, but usually the reverse.

Be sure to use good Hinges. Our Dennison's are best we have been able to find. Easily peelable, - won't harm stamps. 1000 .20

Stamp Tongs are necessities for handling stamps. Each .25

Watermark Detector. You may lay a stamp face down on a black tile and put a drop of Carbon tet. on it. This will bring out the watermark. Made by impression in soft pulp before rolling that leaves a thin mark. Some watermarked stamps are more valuable.

Perforation gauge given free to all Stamp buyers. Number of holes per 2 cm. make the gauge.

A Color chart is also good because some colors are better.

Join a Stamp club to swap duplicates; subscribe to a couple of Stamp mags. Beware of ads with "valuable material" for nothing. Good stamps are worth money. Also disregard scares about faked stamps, etc. which are rare and not worth mentioning here.

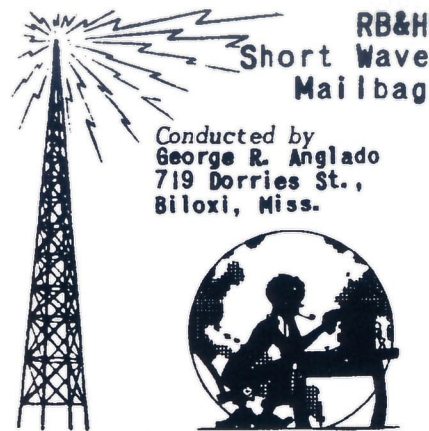
Do not buy up mint sheets of U.S. - buy only what you need. Companies buy them back at 5-10% discount and you lose. It is impossible for the little fellow to gain this way.

If in a Foreign Country (except Canada) ask as about taking your stamps, etc.

Approvals. If you'd like some on a Country, or group let us know. We have millions.

Note our new Packet List. Use Commemos. on letters.

Subscribe to "RB&H" N-O-W



RB&H
Short Wave
Mailbag

Conducted by
George R. Anglado
719 Dorries St.,
Biloxi, Miss.

By the time you read this you will be ready for tuning in on the HF Bands. I will give a few LF stations that you may be able to hear, plus the best ones to tune for in the HF Bands during the summer months.

Calcutta. Radio AIR has FB sigs on 4.88 mc.

Indonesia. Unknown station operating on 5.59 mc. heard since early this Spring. Good signal level of about S-6.

Courier. This is a seaborne relay base VOA. Has English.

Japan. Since July 7th of last year FEN-Tokyo has begun regular SW service on new freqs. with a new Xmtr. The old Xmtr was known as JKI and JKL. The new stn. has no call letters and is called FEN-Tokyo Shortwave. Listen on 11.75, 6.16 and 11.76 mc.

Sarawak. This is a new stn. and a new country. Radio Sarawak, Kuching, operates on .84 & 4.87.

U. S. A. KCBR has moved from 9.53 to 9.55 mc. since July 4th. Have heard that the Hq of this stn. has moved to Wash. New address is 330 Independence Ave., Washington, D.C.

A letter from Jim Brooks, Hays, Kans. has been received, with the following list heard: (C.S.T.) Spain 9.363 mc. 5-5:35 pm. Brazzaville 11.97 mc 4:45-5 pm. Guatemala, TGNA 9.668 to 10:35pm Holland, Hilversum, Radio Netherland 11.73 mc 3:45-4:25 pm.

Norway, Oslo 9.61 mc 10:45 pm. Denmark, OZF 9.52 mc 7:30-8:30 and 9-10 pm. He has received QSL cards from these stations. England 11.8 mc from 4:30 pm. Sweden 11.47 mc at 11 pm. Switzerland 9.535 mc fm 9:34 pm. Ecuador, HCJB, Quito 11.915 at 9:30 pm.

Jim uses a Hallicrafter's S-38C, says he finds it to be very dependable. (Have you tried the MRL 1-tuber, Jim?) Also states that he thinks the reason for his reception is good is because he lives in one of the highest spots in Hays - the town itself being 2000 ft. high. His Antenna is an Aluminum wire running NE to SW about 70' long x 20' high.

Many thanks for the fine report, Jim. Keep'em coming.

WWV & WWVH U. S. Bur. of Standards

They broadcast day and night freq. time signals, time announcements, in voice and code. Interval sig. for WWV is 600 cy. tone for 4 min. (first 4 min.) & 1 min. of announcements. 440 cy. tone next 4 min. with 1 min. of announcements, repeated every 10 minutes. Radio propagation warnings at 19½ min. and 49½ min. after the hr. on 2.5 mc (.7 kw); 5 mc (8 kw); 10 mc (9 kw); 15 mc (9 kw); 20 mc (8.5 kw); 25 mc (.1 kw). WWVH broadcasts in code continuous except for interruptions of 4 min. after the hour & half hour and off. WWV answers reports by QSL card or letter. WWVH by letter. WWV National Bureau of Standards, Wash. 25 D.C. WWVH Puenene, Maui, Hawaii.

National Scientific Labs., 2010 Mass. Ave., Wash. 6, D.C. publishes a bi-monthly bulletin called "Transistor Research Bulletin." Covers all developments in Transistors, Diodes and other devices. Price is \$5 per year.

First commercial Transistor set for public sale has been put out by Transi-Mite Labs. of No. Car. About size small match box; runs 500 hrs. on a tiny 3 volt cell. Priced at \$16.95. Earset.

BOLIVIA STATION LIST.

Call mags. KW. Address.

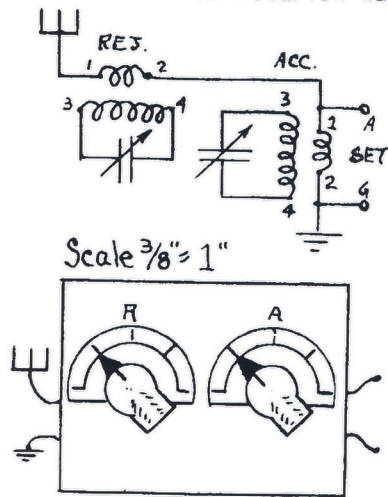
CP5 5.97 1. R. Illimani, Emis-
sora del Estado, La Paz.
CP44 6.06 .1 R. Popular, Cocha-
bamba.
CP18 6.07 .3 R. El condor, Oruro
CP15 6.12 1. Same as CP18.
CP30 6.136 .5 R. Electra, S. Cruz
CP12 6.15 .3 R. Fides, La Paz.
CP9 6.185 .5 R. Amauta, "
CP37 6.19 .3 R. Oruro, Oruro.
CP22 6.25 .25 R. Internacional,

Potosi.
CP6 9.5 1. Same as CP5.
CP38 9.505 .7 R. La Cruz del
Sur, Cajon 8, La Paz.
CP21 9.57 .4 R. La Plata, Sucre

Medium Waves.
CP27 .73 .7 As CP38.
CP20 .9 .3 As CP15.
CP4 1.02 10 As CP5.
CP47 1.16 .1 As CP44.
CP29 1.35 .08 As CP12.

All language Spanish. All Sta-
tions commercial except CP5, 6,
4, 38, 27.

AN ACCEPTOR-REJECTOR ANTENNA UNIT.



Parts List.

- 1 3" x 4" Compo. panel. .10
2 MRL QRM Coils. 7-42. .50 Each.
2 .00035 Var. Cond. 8-7.1. 25 Ea.
2 1 1/2" Bar knobs. 10-23. 9¢ Each.
2 0/100 Scale. 10-31. 5¢ Each.
5' #20 Stranded Hookup. 26-5. 5¢

Especially in the City, near strong BC stations, we often require a simple interference unit to help with tuning. This one will fill the bill and still not take up much room. As variable condensers, etc. are made so much smaller now-a-days, we can miniaturize most units.

Construction is very simple &

the layout shown will do alright for most purposes. The two QRM Coils may be mounted on a condenser lug, - say #3 on the coils to the stator connections of the variable condensers. Then, connect #4 on coils to the frames.

If you wish to use it on Short waves or Long waves, we suggest using our MRL Type A or 5-A plug in coils, with a socket for each set. In this case a baseboard is better. The advantage is that it is all-wave and not just BC.

It should be put into a box. It may be shielded with Aluminum foil, but not necessary.

The unit may be placed alongside or on top of your receiver. Rejector condenser is tuned to the un-wanted station and left on it. Next, tune the Acceptor condenser to the desired station being tuned on set. It will boost this station's signals and lessen the strength of stations around it. Operating a rig like this in San Francisco, with lots of interfering stations nearby, has given good results.

Here is the principle of the series wavetrap, or Rejector. If you tune your receiver coil and condenser to 1000 kc it offers a hi-impedance path for signals of this frequency. Therefore, if you tune the trap to 1000 kc, signals won't enter the receiver.

In the booster trap and receiver in parallel, a hi-impedance path is offered other freq. so they won't enter the set.

DX Reports.

Due to so many DX reports coming in - we can only grab a few at random. All our circuits are tested and worked over before we put them on the market. Failure to list many of them does not decrease their popularity.

MRL 1-tuber (HB-4), E. D. T., Oxford, Neb.: "Ur set works fine. I get Australia (8790); Brazzaville, Africa (5870); Moscow (5246); Guatemala (2082); Mexico (1562), etc. Your parts are below other catalogs in price."

J. S., Warren, Ohio: "1-tuber as good as b4. Got Bulgaria (8500); Quito, Ecuador (3000) daytime. RB&H is tops - helps my DX."

MRL #2 Crystal (HB-2), Dr. J. W. W., Wall Lake, Iowa: "Get 600-1200 miles every pm on #2 with a 30' attic Aerial. Here is an order for another. Lots of fun."

G. E. H., Fairfax, Cal.: "Logged 16 stations with a chimney Ant. Best DX was XERB, Mexico (600). Here is order for (2) 1-tubers."

MRL #2-A Crystal (HB-2), E. A. H., New Gloucester, Me.: "Get a long list of stations including Moscow (6880); London (4600) and 37 Hams besides."

L. M., East Bernard, Tex.: "First nite on 2-A I caught AFRS (1300); Chicago (1100); Denver (880); Nashville (780). The best Crystal set I've ever made."

D. M., Olympia, Wash.: "Got S. F. (700) and Boise (400) on a 2-A Crystal set I built from HB-2."

MRL #4 Xtal (DP-58), G. H. T., Seattle, Wash.: "Use your #4 to knock out KVI here. I hook a variometer in series with ground and have never done this with any other Crystal set. 30' Ant."

T. M., Milwaukee, Wisc.: "Built #4 but use a QRM Coil in series with a 40' Ant.-ground. Local 1 mile away almost melts off my c/w, but I still cut him out."

MRL #10-A Xtal (DP-34), R. K., Tulare, Calif.: "Your sets work

fine here. I get 15 BC stations, L. A. is 175 miles away."

R. S., Lewisburg, Tenn.: "Get Del Rio (950); Omaha (700); Dallas (650); Ft. Worth (650); etc."

MRL #11 Xtal (DP-56), R. T., Leith, N. D.: "Built this set and it works wonderful. First night, I received stations 750 miles. I use Aluminum Ant. 300' long."

MRL #22 Xtal (DP-45), R. K. B., Eureka, Cal.: "First nite I got Los Angeles (600); Portland (400) S. F. (250), etc."

MRL #29 Xtal (DP-44), D. Z., Phila. Pa.: "It works swell. Received many local Hams, as well as Cincinnati (550)."

MRL #35 Xtal (DP-48), D. K., Tuluca, Ill.: "Got excellent results. Live 100 mi. from Chicago and stations usually run together, but this set cuts them all."

MRL 1-tube Amplifier (DP-37), E. R., Brinsmade, N. D.: "Must tell you about my amplifier, However, I use a 30 driver in front and I get speaker operation on a 5000 watt station 150 miles away."

Philmore Xtal Set (see CAT.) J. C., Atlantic City, N. J.: "Some of stations received are Badaxe, Mich. (650); Cincinnati (550); Windsor (400); Boston (300) etc."

Flextal (RB-33), A. P., Modesto, Cal.: "At 10 every night I get 9 outside stations including KSL (550) with 3 locals a mile away. I use an MRL QRM Coil tuned to each local. It's now the most selective set I've seen. Your #2 pulls in DX better at 2 a.m. than the Flextal."

MRL RB&H, R. M., Brooklyn: "Your mag. is an Experimenter's dream. I've never heard of another devoting full time to small sets."

M. B., New York: "Ur publications are best I've seen for the small sets. Keep it up."

Crystal Set Notes.

MRL Fixed Iron Pyrites. We have made quite a change in construction of our Fixed pyrites Xtals. After quite a bit of experimenting a different type of Catwhisker was the result. We'll tell U how to make it as so many have purchased them in the past.

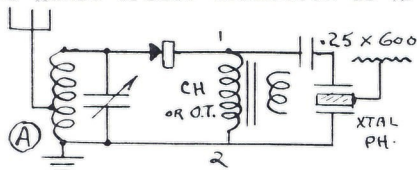
Place a 1" brad horizontally in a vise. Get a piece of #36 spring brass wire and coil it around the nail 2 $\frac{1}{2}$ times. Cut off the short end FLAT with a pair



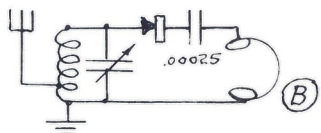
of scissors. Do not use a pair of pliers as it leaves a "v" shape, which isn't good. Now secure the Xtal base in the vise. Push the long end thru the lug & cut off. Bend a hook on the end and hold in position until soldered. The hook will make the joint more substantial. It's now easy to adjust it to the strongest signal - and it will stay. Some Iron pyrites work better in some circuits if reversed. Try it. Our Fixed carborundums use an entirely different c/w.

The British are trying to recover Selenium from flash-roasting of Iron pyrites during making of Sulfuric acid. It sounds logical as they both belong to the Sulfur family.

Crystal Phones. Many find that using Xtal phones on a Xtal set is not at all efficient. You may get a very tinny sound. Mfrs. of Xtal phones recommend an Output, or Audio trans. connected as A.



You get the same sound when using a .00025 mica in series, as in B. In other words, you must have a good return path as a



coil, choke or phones connected at (1-2). However, a large electrolytic condenser, say 10 mfd. by 25 volts may be substituted for the mica, with some improvement in clarity. When a 100 mfd. x 25 v. is used there is very little difference between it and the direct short. Shows the 100 mfd. is almost a complete short for hi-frequency.

Alloys. The Univ. of Calif. Scientists have been trying to find why alloys hold together. It is a tremendous field in its scope. Of 99 chemical elements - 72 are metals. Using 6 metals in one Alloy, or mixture, there will be more than 156 million Alloys possible to make.

Some form of precision is necessary in mixing. Bronze, brass, duralumin, etc. were first produced by trial and error. Various new compounds have been made in pressures and heat equal to 6 m. down, that can be obtained in their lab. Occasionally, along the line we hope they can develop some new types of Crystals. We hear of numerous ones being used for detection, amplification, etc. that have never been used before.

We hear, thru Les Hulet, that GE. has found Silicon to be more efficient than Germanium in mfr. of Transistors. Price of Silicon made pure in a Silver bath, has risen to \$460 per pound. For our purposes, tho, the present material is OK as we do not have to have precision.

R. Mickelson, Chicago, says in his experiments with Silicon Diodes he gets readings to 470 microamps on a strong signal with a poor ground. He uses our #2 for his testing circuits.

Questions & Answers.

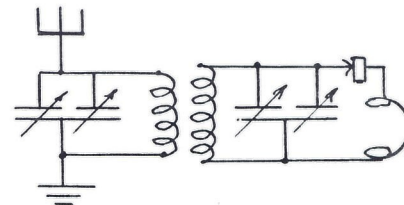
Does SOS mean "save our ship?"
ANS. No, nor does it mean "sink or swim!" It was arbitrarily chosen as 3 dots, 3 dashes, 3 dots, as the simplest combination of the code. "May day" is the distress signal for planes.

Why do some BC stations fail to carry over short distances?
ANS. May depend on a lot of different conditions. Comparing two locals, as follows:
KLX Oakland, 910 kc, 5000 watts
KSFO S.F. 560

On our superhet Auto radio, when 50 mi. East, over a range of hills, KSFO comes in very loud. KLX fades out. Latter is on top of a large building but nearer the hills. The longer ground may be a hindrance. KSFO is across the Bay and has a clear sweep of the Bay before it hits the hills to bounce over.

On our midget TRF set, with a short Ant. and 25 miles away, KSFO is weak, while KLX is loud. Possibly due to short Ant, and set oscillates better at 910 than at 560 kc. A longer Aerial or a loading coil in series with Ant. may help bring in KSFO. In the same location both are loud with the Auto radio, but it seems a Superhet does not vary in sensitivity on the different bands as much as a TRF set. Being adjacent to hills or metal bldgs. raises havoc with a Xmtr as the signal is absorbed. This is the reason why you get much better DX in the Miss. valley where the land is flat for miles before it hits a mountain.

How could I design a Crystal set to pull in the long waves?
ANS. It is hard to do and get good volume. You must use large coils, at least 2" in dia. Use about 100 Ts #24 DCC on a 2XM form. Then, make a 3" Bak. form to fit over this, and to be wound with 75 turns #20 DCC. Use a big Aerial and good ground. Then use (2) 2-gang .00035 var. condensers with stators in parallel. Any



crystal is OK. You should hit the ship, compass, etc. stations if near the coast. Test it at night as this is your best bet.

I use a 200' Ant. 30 ft. away from a telephone line, and a good ground. Why do I get 'phone conversations on the set, even when the Xtal is not used? ANS. This is one of those freaks. Possibly because your Ant. is large it picks up the conversations by induction. It can't be by detection, as the Xtal is not used. If received only when the Xtal was used, it might show a loose connection in the phone line, that was arcing over, being modulated by the voice and acting as a transmitter.

When using the QRM Coil as a wave trap, and tuned to 1160 kc, why does it decrease volume on a 570 kc station? ANS. Nature is in balance - take a little and U must give a little. To deaden the 1160 kc station you will also deaden the others a little. This is offset by the advantage in less interference on 570. In reverse, it would not be as noticeable if the QRM was set on 570 kc and you tuned in the 1160, due to greater amplification on this band.

Where can I get a UX-200? ANS. Probably in the museum. The original had 4 short prongs, and with brass base and glass drawn out to a tip. They drew 5 volts at 1 amp. and lit up like a head lite. They'd run a storage batt. down in no time. Later replaced by UX-200-A with Bak. base, no tips and long prongs at .25 amp. A Mu of 20 against 100 for 6SQ7.

What's in the Mags.

POPULAR ELECTRONICS. May, 1955.

"Headphone Adapters." p. 58. A good article. However, see our drawing under Output Trans. on p. N-1 of CAT. This is far superior, altho using the same principle. Doubt if a volume control is necessary as not much current comes from the O. Trans.

"Dual Voltage Power Supply." p. 65. Getting 2 supplies from one power trans. We can supply all the parts and tubes.

"Oscillating on a Dime." p. 66. Using Transistor for an Audio oscillator. May be made into a code practice rig. By using vinegar, or lemon juice, you should increase the power output. Other combinations may be used.

POPULAR ELECTRONICS. April, 1955

"Microphones." p. 40. A good article for the Experimenter who likes to mess with mikes.

"Push-pull Transistor Oscillator." p. 48. It is not necessary to always use a 722 - just so it is a p-n-p type.

"How to Solder." p. 76. We used many of these ideas, including the copper wire extension 4 fine work. Prefer can lid filled with steel wool for cleaning the iron. Hold it down with screw & washer thru lid into bench. Smear some soldering paste over wool.

"Prin. of DC Circuits." p. 82. Some more Ohm's Law.

"Transistor Code Oscillator." Another deal, but using condensers instead of audios. p. 86.

"QRD? Snohomish." p. 96. Well I remember this old tugboat in the N.W. around Seattle and Grays Harbor. It was 7-8 yrs. old when I used to work it as "Sparks," on the Standard Oil Tankers. hi.

"Deluxe Neon Oscillator." 122. Simple rig using Selenium rect. and neon lamp (20-18. 15¢). We have all other parts, too.

RADIO ELECTRONICS. May, 1955.

"Super-reg. Amplifier and Detector." p. 130. Note how L-1, 2

are tapped to give selectivity. A principle you may use in Xtal sets. Note that detector stage is tuned while Amplifier is untuned and with tickler feedback. The inventor claims min. radiation.

RADIO ELECTRONICS. April, 1955.

"Transistor Mfr." p. 6. Shows n-p-n type, with layers and Gold wire contact that is welded to the "p" layer.

"Vibration Chart." p. 37. Draw this off on a card - it shows U the vibration spectrum to be used for reference.

"Jr. Record Amplifier." p. 42. A good amplifier for that portable phonograph. Sel. rect. may be 100 ma. OK. We have the tubes and parts shown here. May also

be used as audio amplifier, plugging into the A.C. Lines.

"Transistor Xtal Set." p. 96. By our friend Dr. Grace, when he isn't vacationing in Bermuda! hi. Uses 1N34, or any xtal, into a CK-722, or other p-n-p Transistor for audio amplifier. The only power used is what comes from the transmitter thru the Xtal. U may add a little power if you desire more volume.

"Emergency Receiver." p. 98. A good little portable DC set for use when power goes off. May use our A or 5-A coils (see CAT.)

"2-Way Transistor Amplifier." p. 126. Uses 4 diodes and a p-n-p Transistor. May be used for intercom. use, etc.

RADIO ELECTRONICS. March, 1955.

"Transistor Metal Locators." p. 54. One uses 2 Transistors giving a beat frequency. Other is about the same but with 2 audio stages for more wallop.

"Transistor-Varistor Modulator." p. 62. Uses a loopstick with 2 secondaries coupled to it. Do you see a similarity between it and our #5 Double Xtal set? A Varistor is 2 balanced Diodes but is not necessary to have them

accurately balanced in this cir.

"Probes for Profit." p. 96. We see lots of data on probes. Most we Fans come into contact with R Signal Tracer Probes, where a pair of phones may be used instead of the Audio grid Fig. 7.

"Transistorized Bridge." 106. Shows an oscillator with an amplifier. Also dial calibration chart. A bridge is hard to beat for an accurate measurement.

"Hearing Aid Transistors." 112. Size of match head by Hytron.

"Hi-pwr Transistor." p. 143. Large Transistors, yet. New invention to withstand 500 volts for a rectifier. Shows ingenious method of slotting Germanium.

RADIO & TV NEWS. MAY, 1955.

"A Practical Transistor Pre-Amplifier." p. 39. Uses 2 stages in a simple circuit. If used on a Xtal set, I'd use a hi-impedance Audio choke or 1 side of an Audio trans. instead of R-1, 2 and C-1 to ground. This won't affect operation of the Transistor circuit very much.

"Germanium Diode Oscillator." p. 55. If Germanium can do it, why can't Iron pyrites, Steel galena, etc.? Let's hear about your results along this line. A Carborundum should be much better as it will stand voltage. Be sure to connect latter in right direction. The C-4 may even be a little higher to pass more hi-surges around the Xtal. At least, burning out one of these isn't as expensive as a Diode.

RADIO & TV NEWS. April, 1955.

"Transistorized Portable." 39. Whoopee! 8 of them in one cir. There seems to be no letup to their possibilities. Superhet. cir., IF's, pushpull audio.

"420 mc Unit." p. 64. Good for Experimenters, with many uses. You have to take up "plumbing" with it.

"Conelrad." p. 69. Using a 2N34 or 722 Transistor in an a-periodic sec. with tuned primary - easy to build.

"Improving 10-m. Signal." 132. By our friend Anglado. Overcomes a lot of trouble on this band.

POPULAR SCIENCE. May, 1955.

"Building Geiger Counter." 218. Good deal, if interested in Uranium hunting.

POPULAR SCIENCE. March, 1955.

"Transistors." p. 215. Shows how they oscillate, detect light and other uses.

POPULAR SCIENCE. February, 1955.

"Transistors." p. 217. Shows many uses for them, in a simple form.

SCIENCE & MECHANICS. June, 1955.

"Transistor Amplifier." p. 179. Blanchard rigs up a 2-stage amplifier using a PM speaker as an input microphone. Can be rigged into an inter-com. outfit.

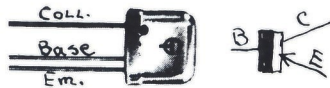
"AM Superhet. Tuner." 182. Can run into Audio circuit, or possibly into Antenna of midget.

"Small Fry Xtal." 185. Using a loopstick and Diode, more or less conventional.

MOUNTS 4 SLIDERS ON 2XM FORM.

Francis A Moran, Penn. writes that we should take advantage of the superiority of our 2XM coil forms. To be on the safe side we had always recommended 2" Bak. forms for slider use, mostly because the Fan winds his wire too tight. Mr. Moran uses as many as 4 sliders at once on a Celluloid 2XM form. The main thing is not to make tension on springs too strong, but enough to make a good contact. We usually paint MRL Light Coil Cement close to where the sliders run, which also helps to keep it rigid. He also puts taps on his coils so they may be used in various circuits without winding a new one. Some use both a slider and variable condenser on the coil - which often gives an advantage in tuning effects.

Announcements.



New p-n-p Transistors. Type GT-34. Made by General Transistor Corp. Same characteristics as CK-722 and 2N34. Picture is slightly enlarged. Now you can buy them from us and start making your amplifiers. Individually packed. 9-46. Each 2.75

New Magazines for Sale. All are in good condition. Most of them are not obtainable - even from the publishers.

Radio Electronics for Nov., 1954 Jan., March 1955.....40
Science & Mechanics June, 1952; April 1953; Oct., Dec., 1954; Feb., Apr., June, 1955.....30
Popular Science Dec., 1953....30
Mechanix Illust. July, 1954....30
Mechanics Today. Jan., 1954...30

Encyclopedia of Pop. Science. New book, paper cover. 247 pages. How things work. 4000 facts. Is very interesting. Special.....65

Auto Mechanics Course. Ignition. 277 p. used but OK.....50
ABC of Television. 210 pages. 1929. Good reading. Shows how TV got going. Used but OK.....1.00
G. E. TV Svc. Manual. Sold out.

Double Fahnestock Clips temporarily out of stock. Substitute 2 single clips with common screw - equals the same thing.

5/16" Compo. Panel. Small pcs. only. CAT. 16-18. 3 sq. in. .01

New Plug-in Coil prices. Shown in RB-39. We repeat them:

Types A, 5-A, C, Types
5-C, RF, 5-RF. B, O

4 SW Coils.....3.00.....3.50
HF-Broadcast... .75.....1.00
Broadcast..... .75.....1.00
LF-Broadcast... .75.....1.00
Long Wave.....1.00.....1.25

Also instead of the colored paper strips, we lacquer them with the following colors: 20 m. band

lite blue; 40 orange; 80 red; 160 ferrite yellow; HF-BC green gold; BC white; LF-BC brown; LW yellow. Makes a finished job.

Speakers. Complete list. Paste this in your catalog on page P-1

(1) Perm. Magnet Dyn. Spkr. (PM)
2x3 PM no trans. 21-9.. 1 * 1.60
2 1/2 " " 21-20. 1 * 1.60
3" " 21-11. 1 * 1.60
4" " 21-12. 1 1/2 * 1.60
5" " 21-13. 1 1/2 * 2.00
(2) EXT. Field Electro-Dynamics.
3" no trans'f'r. 21-1. 1 * 2.00
4" " 21-3. 1 * 2.75
5" " 21-4. 1 1/2 * 3.00
5" with " 21-17. 2 * 3.50
6" Auto. no tran. 21-5. 3 * 1.75

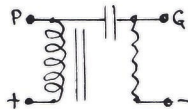
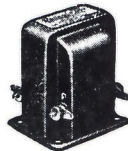
Large Coil Forms. Cardboard.
3 1/2" dia. x 21" long. Suitable 4 Tesla, or large loading coil for Long Waves. Wt. 2 lb. Each .50

Untuned RF Trans. sold out.

Fahnstock Clips, both 3/4" and 1" now 15¢ per dozen. Price has been advancing to us for a long time. Hope it stops soon!

Loopstick. Some of our shipments don't have the loose wire attached. Solder about a foot of #22 or 24 Enameled wire on the Ant. post and wrap it around. It is the lead that goes over to the far end of coil.

Sylvania Loose-leaf Tube Manual. 1" thick. Used but OK. Have kept it filled with loose sheets pretty well. Special postpaid.75



Rauland Lyric audio Impedance Units. Just a few on hand. Pri. has hi-impedance choke, and then into a coupling cond. to a grid resistor. Once sold for \$6. and gave good tone. 24-25. 1 1/2 # 1.50

New Tubes. Supplement to T-1 of CAT. All our tubes are tested on a hi-grade Hickock tester before shipping to you. All guaranteed to work OK. We also pack them well when shipping.

| Type | Use | List | MRL |
|--------|--|------|------|
| 1U5... | Second detector.. | 2.00 | 1.00 |
| 3S4... | Power Amplifier.. | 2.10 | 1.10 |
| 5Y4g.. | Full wave Rect... | 2.55 | 1.00 |
| 6BC5.. | 400 mc. detector. | 1.95 | 1.10 |
| 6C4... | HF Oscillator.... | 1.65 | 1.00 |
| 6D6... | RF amp.; detect.. | 2.50 | 1.10 |
| 6L6g.. | Power Amplifier.. | 3.10 | 1.00 |
| 6SN7.. | Duo triode..... | 2.35 | 1.00 |
| 6W4... | 1/2 wave rectifier. | 1.70 | 1.00 |
| 7C6... | 2nd det. loctal.. | 1.85 | 1.00 |
| 12BA6. | RF Amplifier.... | 1.80 | .90 |
| 35W4.. | 1/2 wave rectifier. | 1.20 | .75 |
| 41.... | Power Amplifier.. | 1.90 | 1.00 |
| 78.... | RF Amp.; detect.. | 2.15 | 1.00 |
| 117L7. | 1/2 wave rectifier & Power Amplifier.. | 6.60 | 2.50 |

New Detail Prints not shown on CAT. D-1, 2 or revised to date. All photo-lithographed. 10¢ each or 3 for 25¢ plus postage:

#1 MRL #37 Push-button Crystal Set. Plan shows schematic; pictorial front & rear panel views; how to mount trimmers; coil data etc. We have also added a SPST switch to increase the range, as different from circuit in RB-25. Just throw a lever to a station.

#2. MRL #33 Selective Crystal Set. Shows simplest layout and all is mounted on the panel. It gives detailed drawing of all connections in pictorial. Also shows hi-gain connections. You have a variable selectivity control and other features.

#4. MRL 15 1-tube DC Circuits. A plan sold usually thru our ads that shows 15 good tested plans on a page. Also complete parts list. Shows Lo-B cir.; variable screen grid; reversed Electron-coupled; space charge with 6 v. B.; super-regenerative; reflex; long wave; etc.

#11. MRL Type D Antenna Coupler shows full-sized drawing of the unit. Also under-base view for

condenser mounting; use a vertical or "L", Doublet; Zeppelin; complete mounting instructions; several formulas for building Aerials; theory. (See CAT. E-4)

#13. MRL All-wave Vario-coupler. Shows complete constructional layout in simple drawings of all details; use in Crystal set; in Australian regen. cir.; in BC band set; a good Shortwave circuit; theory. (See CAT. E-4).

#34. MRL #10-A All-wave Crystal Set. Has been furnished in DP-file, but listing it as it is one of our revised plans from the mimeo'd ones. (See CAT. K-2).

#47. MRL #28 All-wave Plug-in Coil Crystal Set. This is a complete revision of our mimeo'd plan of which so many have been sold. It has equaled #2 and #2-A in DX reports. Uses plug-in coils with all details for making RF. Scale drawings, etc. much improved over other plan. A new arrangement for loading coil and tuning condensers. Worth having.

Our Catalog. When 2 present sheets are run in we should have 40 pages in our Catalog. We will be able to sail along better now as only a few revisions need be made from time to time. We may have a "get acquainted" page to go on back of Index sheet - and we may have our 'mugs' there??? From now on we will be deleting more stock than we add and hope our efforts can be swung over to RB&H and literature. As it costs too much to circularize our entire list with Catalogs we prefer your asking for them when U send in an order. Anyone getting RB&H for several issues is up-to-date, anyway. If you give Urs away - ask for another.

DAFFINITIONS.

DX - one of the most fervent of Amateur religions.

Experience - is what you have left after everything else is gone.

Baby sitter - someone who is paid \$1 per hour to watch TV.

MRL CLASSIFIED ADS.

4¢ per word; 3 insertions same ad 8¢ per word. Count all words. Circulation over 3500 per issue, plus back numbers, which continue to sell over a long period of time. Numerals (3-40) means 3 issues, ending with #40.

Don't let your ad run out. We won't notify you when it does. A 3-time ad always pulls better than a single ad. Always consider the Reader's point of view, not your own, when writing an ad. The more you tell; the more you sell, within reason. First word of text is Caps, etc. Do bring out your ad. Please do not make ads conflict too much with our services. Thanks - MRL.

RADIO DIAGRAMS \$1.00; Television \$2.00. Give make and Model. Diagram Service, Box 672-Hartford 1, Conn. (3-4)

QSL and SWL Cards - 3 colors with cuts. 120 cards for \$3 ppd. Prompt acknowledgment and service. Hall Printshop, 150 E. 5th, Jacksonville 6, Fla. (3-)

EXCHANGE Radio Parts. List requirements. Wilburn Clay, 1003 Childress Dr., S.W. Atlanta, Georgia. (3-42)

RADIO Experimenters! Write for a free list of Radio parts, Crystals and booklets. Robert D. Mickelson, 1342 W. Cornelia Ave., Chicago 13, Ill. (3-42)

USED 6-tube, 3rd and Superhet. Reasonable. Van Bekken, 5425 Lovers Lane, Hamazoo, Mich. (1-41)

I pay \$1 for hobbyist names. 25¢ (refundable) brings "Homework Income Plan." Geo. Anglado, 719 Dorsey, Biloxi, Miss. (1-41)

POLICE Radios, Marine band, Short wave in your present Radio using only one simple hand-wound coil. Drawings & instructions free. Extra loud - no Antenna. Radio Plans, 808 Crawford, Biloxi, Mississippi. (1-41)

RAYTHEON CK-706 General purpose Germanium diode 70¢. Guaranteed. Wesley Hamilton, Route 3 box 878, Albany, Oregon (3-43)

CRYSTAL Radio Experimenters. Write Leslie Hulet, 5 Hope, Lakewood, New Jersey (6-46)


NATIONAL SW-54 Communications Receiver, like new. Excellent condition. \$30. Gordon Owen, Route 3 Box 877 Albany, Oregon (1-41)

MRL CORRESPONDENCE CLUB.

2¢ per word, per insertion. Count name, address & interests as words. Use same as for ads. Numerals same as ads. Many good friendships have resulted from the use of this column. You may also benefit financially.

P.J. Gwaleski, Box 17, Franklin, Mich., Michigan. Ham Radio; Crystal sets; Minerals; Swap radio magazines; letters. (8-42)

in Windsor, Godfrey, Illinois want to hear from Xtal Experimenters & Dabblers in Science, exchange letters, mags, books, coupons, for old Radio parts, books, magazines. (3-41)



TUBE BASES WANTED

See CAT. E-2 about sending us 1-3/8" dia. tube bases. Because 4, 5, 6 pr. are hard to get, we are allowing 2¢ for 5's also. Be sure to mail them 3rd or 4th class; that's all we allow.

Above 2" display ad costs per issue, or \$1.50 per inch, and down. Three insertions same ad for price of two. Display ads pull better than classified.