Radio Builder & Hobbyist

FOR THE EXPERIMENTER

No. 39

By Subscription: 12 issues #1.50; 6 for 80¢; 3 for 40¢. Per Copy 15¢. Only available back/numbers 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38 at 15¢ each.

Litho. in U.S.A. by M R L

Published by
Modern Radio Laboratories
328 Fuller Street
Redwood City, Calif., U.S.A.

Without Praise & Encouragement any one of us can lose Self Confidence - Fulton Oursler.

CONTENTS

EDITORIAL NOISE LEVEL.

We have had many good comments on our last photo'd issue of **RB&H.** We are glad you like it. We really feel the extra cost makes it a more acceptable job.

Our **CATalog** gave us a lot of work this year - and interfered with our getting out more RB&H. Have spent most of our spare (?) Spring and Summer time getting it out. However, we hope changes will only be slight from now on. Prices may even change before we get a plate made up. Price fluctuations have put some m/o concerns out of biz, as it obsoleted their expensive catalogs. Our customers don't object to our making price changes on their orders - as we make them down as well as up!

25¢ Service Charge on all orders under $1. Some of our fellows make up little orders for 10¢, 30¢, etc. It takes as much overhead time to write up, check, pack and mail these as the large ones. We have held off enforcing a $1 minimum order, altho our Shipping Memo. (O-5) has said so for a long time. Most Radio concerns require a min. of $5-$10 - or they send the order back. We know they do it, because they've done it to us several times. On one occasion we mailed $7 and it was returned for $3 more to make the min. A dollar bill doesn't go very far now-a-days - nor buy much overhead. With our hundreds of items it is no hard matter to find a $1 min. for an order. Remember - **25¢ Service Charge on all orders under $1.** Thanks in advance...

Our big job now (and it is!) - is making up new Detail Prints as soon as possible (page 5).

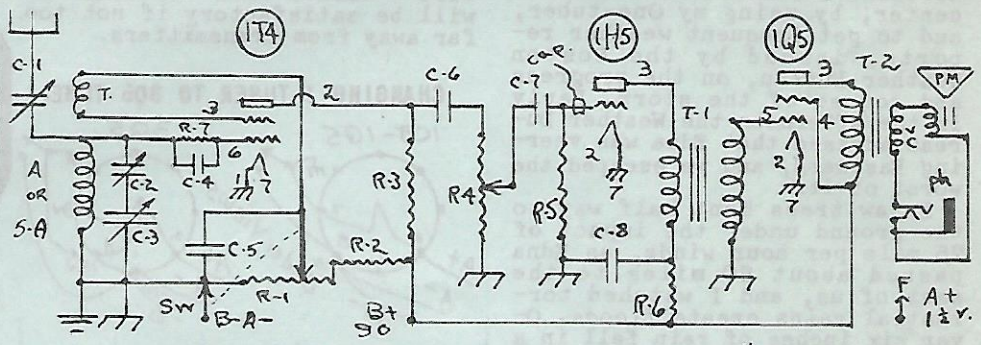
Also, (page 8) note our new **RB&H** Index. It will help you.

When we start the **RB&H** the big question is - how are we going to fill it? When half done - how are we going to get it all in? There may be more DX Reports one issue, but less the next. Likewise, our aim is not to overdo any one classification.

Mabel says if you guys don't send Postage on orders she is going to wring your necks!

Have put "Hints & Kinks" on back page. Maybe you'll like it.

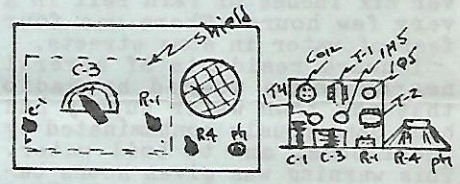
Until next issue - best 73's.



A GOOD 3-TUBE DC DX'ER.

PARTS LIST.

C-1. 2-3 plate Ant. Condenser. Bracket & Ins. Extender.
C-2. 25-280 or other Trimmer.
C-3. .00035 Var. Condenser.
C-4. .0001 Mica Condenser.
C-5. .002 " "
C-6. .05 x 600 Bypass cond.
C-7. .01 "
C-8. .1 "
R-1. 50M Vol. Control & Switch.
R-2. 50M x 1 watt carbon res.
R-3. .1 "
R-4. 500M Vol. control, no sw.
R-5. 10 megs. x ½ watt res.
R-6. 100M x ½ watt. "
R-7. 2 meg. " "
T-1. 3-1 Audio transformer.
T-2. 8000 Imp. Output trans.
1 Set A or 5-A MRL Coils.



1 Double Phone Jack.
1 PM Speaker.
3 Octal wafer sockets.
1 1¾" Bar Knob & Scale.
3 Small Black pointer knobs.
1 Compo. panel 6 x 10 approx.
1 Tin shield behind cond.
1 Plywood base 4 x 6.
2 ½ x ½ Brackets & hardware.
3 Tubes. 1T4, 1H5, 1Q5.
1 Ply back strip ¾" x 6"

This is an interesting little circuit from Australia. It has several novel features. The tickler goes to the screen grid of the 1T4, making a very smooth regeneration control, as the 1T4 is very sensitive.

Also, there is a fixed bias on the 1H5 grid when the volume is regulated. According to our article on Resistance Amplifiers (6) the three resistors work in parallel. The 100M res. keeps the trans. pri. voltage down and eliminates the howls.

The layout is drawn 1/8" scale and not critical in placement. A piece of tin is cut to lay back of panel to shield condensers as the compo. looks better for panel. Then, there is no need to shield jack or baffle speaker.

Switch cuts A & B voltages. U may substitute tubes and parts. Usually when an Engineer figures values, they usually have to be altered in balancing up the set.

Let us know how it works 4 U.

MRL I-TUBER TO THE RESCUE.

By Stanley E. Brown,
Holden, Mass.

Here in Massachusetts we used to read of earthquakes, tornados and hurricanes in far distant places, and we used to think "it can't happen here." But, in 1938 a powerful hurricane did great damage here. Then, during the past 15 months we have had a tornado and two more hurricanes which took many lives and caused millions of dollars damage.

Two days ago hurricane "Edna" was headed straight for this area. When our power failed, due to the high winds preceding the actual hurricane, I was able to get advice and warnings from the Civilian Defense Center in Worcester, by using my One-tuber, and to get frequent weather reports, issued by the Boston Weather Bureau, on the progress and course of the storm. Early in the afternoon the Weather Bureau advised that Edna was veering Eastward, and we escaped the worst of it.

I saw trees bent half way to the ground under the impact of 75 mile per hour winds, as Edna passed about 80 miles to the east of us, and I watched torrential rains create floods. Over six inches of rain fell in a very few hours. There was four feet of water in some streets.

I heard residents of several nearby towns warned by Radio that the town water supply had been dangerously contaminated by the floods, and to boil water. This warning was given hours before the first newspapers would arrive. But most of those towns were without power by then, and the warning surrounded Radios which had gone dead.

People were warned, if they went out, not to cross flooded streets because manhole covers had been blown out and the manholes had become death traps.

In times of disaster it is best to stay home and listen to the Radio. My One-tuber was a friend in need. But, unless one makes it a point to always have a reserve supply of fresh batteries on hand, even a One-tuber may become useless. Therefore, I offer the following advice to all of you.

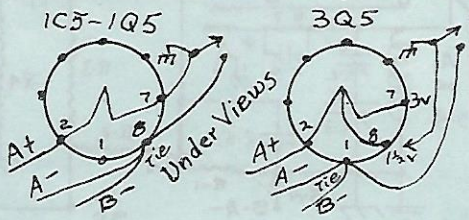
Disaster might strike anywhere at any time. So, get a Crystal set for emergencies. It might be the means of saving your life, so get a reputable one that you can depend on. Get an MRL set for extra safety. Also, get a copy of MRL Handbook #2, and a Detail Print #30, and learn all you can about Aerials. Then, experiment to determine the most efficient Aerial for emergency use in your locality, in case your regular Aerial goes down in a storm. Also get the best headphone you can. You will at least have a lot of fun with such a rig, and it may someday, actually save lives.

Consistent with my advice to others, I am enclosing my order for an MRL Crystal Set #2. I've copies of HB-2 and DP-30, and they are full of solid meat, I use Trimm Featherweight phones, and I recommend them highly.

You may print this in **RB&H** if you desire.

Editor: Mr. Brown has brought up a very good point. We continually hear about Conelrad and stations to listen to during an air raid, or other disaster. Nobody seems to realize the power may suddenly go off. As you well know, it doesn't take much to knock out a sub-station or a hi-line. This may affect thousands of homes. It is doubtful if over 10% of homes have an operating Crystal set, or portable that is working. The quickest Aerial is a 50-100 ft. piece of Leadin wire - thrown over the roof. It will be satisfactory if not too far away from transmitters.

CHANGING I-TUBER TO 3Q5 TUBE.

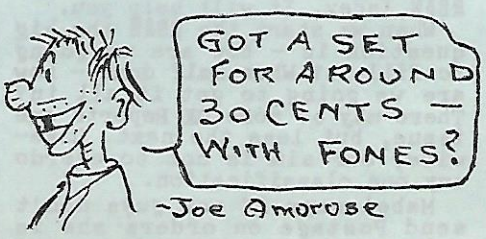


Mr. Stanley E. Brown, above, checks an error in wording, on page 5, **RB&H #37:** "A 3Q5 may be rigged up with 3 volts filament, with same socket connections." What we meant was - it may be rigged up with 1½ volts, with same socket connections. However we failed to mention the tie-point change, which would short out part of the 3Q5 fil. as it's now connected.

However, the above diagram will show the difference in wiring between the 2 tubes. The 1C5 and 1Q5gt are according to **HB-4.** Just change the tiepoint over to (1) instead of (8). Then, if you want to use a 3Q5 with 3 volts, hook the return lead on (7). If only 1½ v. fil. is used, hook it onto (8). Then you can still use the 1C5gt with 1½v. on (7) without changing tiepoint.

He claims that less than 22½ v. of B. works better for regeneration control. One may run a 50,000 volume control in series with B-battery to get best oscillating voltage.

We thank Mr. Brown for his calling our attention to this, and for his desire to help other Fans. Let us hear from others.



Yes, Joe, that guy pops up now and then. While all of us are continually looking for bargains the days of the "sucker" are about gone. In every line the buyer knows how much anything is worth, as well as the seller. So picking up "steal" buys are almost out of the question. Go to a second hand store, and you'll pay almost as much as for new stuff.

You'll find many items in our CAT. that are priced low. But, when we have to replace them, we will have to up our price. Many items will also be discontinued.

START AT THE BEGINNING.

On Aug. 6, 1954, I wrote Mr. Oliver Read, of "Popular Electronics" stressing the fact that one should begin with small sets and work up, when learning Radio. ARRL wants them to start with a Xmtr - which we feel is too much of a jump. Learning Radio slower is much better, and a lot less discouraging.

We also stressed that money put into expensive coated paper, and fancy pictures, etc. be put into more "meaty" data that we can all use. In our review of "Popular Electronics" in this issue, you can see that they really "filled the bill" on both of the above scores.

Mr. Read's nice reply follows:

POPULAR ELECTRONICS

366 MADISON AVENUE,
NEW YORK 17, NEW YORK

Aug. 13, 1954

Mr. E. G. Osterhoudt
Modern Radio Laboratories
328 Fuller St.,
Redwood City, Calif.

Dear Mr. Osterhoudt:

Thank you kindly for your very helpful letter of Aug. 6, and I am inclined to agree with your opinion 100%.

While we are not using a cheap or rough pulp paper, we are going to use a good quality pulp that is capable of providing good, clean reproduction from 100 line screens.

I'll be most happy to hear Ur reactions after you have had an opportunity of examining our 1st issue, which will be available about Sept. 21st.

Again, many thanks for your letter.

73

Read

Editor

RB&H Short Wave Mailbag

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

Being the SW Ed. of **RB&H** is a pleasure. It is also a job that I must keep up, in supplying you the readers, with the latest and better SW info. when possible. You can help, too, by sending me your latest reports direct to my home. Send also, any SW publications you know of, so I can run a short review for the rest of our readers. This,no doubt, will increase circulation of the publication,besides giving the Fans something to look for. On any material sent in by you, your name & address will be printed, along with it. If you want your name left off, advise.

My aim for this column is to please YOU! Tell me what you are in need of, and I'll try to get it. If you want a list of different stations each issue, or a particular country - advise.

Every mag.is built by its Fans and **RB&H** is no exception. So, let's get together and make the **Mailbag** one of the leaders in its field.

Brazil. A new Brazilian station using 4.936 mc. is Radio Poti, in Natal, state of Rio Grande do Norte. QSL is by card or letter with QSA being Avenida Deodoro 245, Natal, Rio Grande do Norte.

Australia. Radio Australia is beamed to Britain on 9.580 and 11.760 at 0145 and 0245. The DX program "Australian DX-ers Calling" is heard on Sundays at 0145 on both above channels.

Holland. Radio Holland operates on 9.59 and 11.73 mc. with their "Letterbox" broadcasts going out on Tues. at 2100.Their English services to North America are at 2030 and 2100.

Switzerland. The International Telecommunication Union. Palais Wilson, Geneva, publishes a Frequency list called the "Berne List." If interested, write to the Union and mention **RB&H.**

Canada. I hope to have the complete story on the Canadian stations in the near future. Meanwhile, here is a brief rundown. The transmitter bldg. of Radio Canada's International Service is located at Sacksville, N.B. The bldg. housing the equipment is a 2½ story structure of reinforced concrete. There are two 50 kw. Xmtrs. used with Antenna arrays of the multi-element curtain type. For normal program operation. the CBS feeds its signals to the Sacksville station by landlines from Montreal. Facilities have been provided at the station so that"on the spot" programs can originate, in case of line failure. The sound-proof room of Radio Canada has 14 recording machines, where any of the 50 programs, passing through the master control can be chosen automatically for recording.Each recorder has its own clock, lite and overhead spkr. The machines can be used to record material simultaneously or separately. More on this Worldwide network & the fine work being done, later on. Watch for it.

Here is a list of stations beginning at 2200 kc. and running up to 21 mc. The complete list will not be given here, but will be continued in the next issue. Clip out this list and have it alongside your set when you are ready to tune DX, and watch them roll in. A complete list of foreign Long Wave stations is also coming up, so be on the lookout, which can be done by sending in your subscription.

kc.	kw.	Call	Station
2200	.2	TGAR	Radio Quetzal, Guatemala.
2260	1.	YDB	Djakarta, Java
2300	1.	YDG2	Surakarta, "
2310	.3	"	" "
2320	.3	YDL2	Padang, Sumat.
2335	.3	YD16	Diember, Java.
2338	100.		Moscow, USSR
2340	.5	ZYV30	Rdo. Difusora, Brazileria, Brazil
2350	.3	YDW	Pontianak, Bor
2350	7.5		Dacca, Pakis.
2370	.3	YDG6	Madiun, Java.
2390	.1	YDN	Kutaradia, Sum
2400	10.		Lahore, Pakis.
2415	.15	YDA2	Bandung, Java.
2420	10.		Karachi, Pakis
2430	1.	YDK2	Palembang,Sum.
2450	.3	YDJ3	Surabaya, Java
2467	.3	YD13	Jogjakarta, "
2480	.5		Radio Culture, Brazil.
2500	.15	YDH	Semarang, Java
2500	.7	WWV	Washington, DC

Reporting on SW Radio transmissions is a most interesting Hobby. Most stations welcome reports on their programs and will verify to listeners. Information on how to make out a correct report was given in **RB&H #36.**

As a keen SW listener I prefer Mexican stations- with Australia as second best. There are many times I spend hours trying to identify weak stations, that are marked in my log book as "un-identified." When conditions are helpful my object is attained.

I find the best way of filling up a log book is to spend each evening on one particular portion of the dial. Spend one evening on 9/11 mc.; next evening on 7-9 mc., and so on. You'll be surprised at the stations you can log this way.

To be really equipped for long distance listening, the SW Fan should have a receiver that covers from 10 to 200 meters. Altho I, myself, haven't a set of this coverage, I do alright with the one I do have. What I have now; how I work it; and how I get out and get stations from around the World will be fully explained in another issue of **RB&H.** I'm sure you Experimenters will be surprised when you see the rig I am now using.

As already stated, I like the Mexican stations best, particularly XEBT, on 9.625 mc. I enjoy the evening music provided by them, particularly Accordion as I am very fond of it.The station is easily identified by the Cuckoo signal between each program. Years ago the station used a motor horn identification. On a verification from XEBT, Dr. Fernando Gonzalez Oviedo Gerente wrote re the Cuckoo signals: "The signals are given with a wind gadget that works on the same principle as an organ. It has a bellows that, as you press it, the wind produces a sound, and a different one when released." (Like a Harmonica)

The station does not carry QSL cards, but verify by letter. Their letters are typed on a Varityper machine (same as **RB&H**).

Recent QSL and info. from TGNA in Guatemala (beautiful Land of the Quetzal) states that they use a dual band-switch Xmtr with 4 Eimac 1000 tubes. They have 3 towers and 2 stacked "quad" rotary beam Antennae. At present they are operating only on four freq. 720 kc., 5.952 mc., 9.668 mc., 11.85 mc. Freq. of 15.1 and 17.87 mcs. are not yet active. The station is non-commercial, cultural, educational and religious. Spanish BC are at 6:30 to 8 a.m. and 4:30-9 pm. CST. The English BC are at 9-9:30 pm CST. Their primary purpose is "Telling the good news abroad."

The QSL card has a beautiful picture of a red and green Quetzal bird. It is the national emblem of Guatemala. As the bird never survives in captivity, it is the symbol of Liberty.

After around 7:30 pm CST, you can look for scads of stations on low freq. My favorite spot is between 6-8 mcs. Moscow comes in better on this end, due to freq. change during Winter. However, during Summer months, the hi-Fr. band will be better searching.

Moscow verifies with a picture postcard of the Lenin & Stalin Mausoleum of Red Square. Their programs are political; Soviet news; music, etc. You may listen to the childish stuff they feed the Russian people.

Will skip call letter list for this trip. More in next issue.

Be sure to write me if you've any dope on verifications, etc.

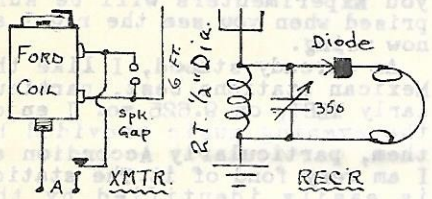
DAFFINITION.

Accumulator - - (1) A storage battery; (2) Collector of junk.

MRL #2 & 1-TUBER; EXPERIMENTS.

By Elmer Burton, Jr.
Wellston, Ohio.

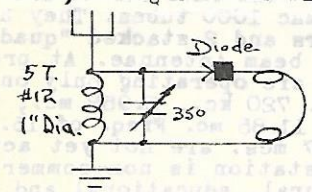
Have been experimenting with high-frequency spark transmitter and Crystal sets. I used a 6 ft. piece of wire for an Aerial, so it would send out a wave of 8 m. I could pick it up on my Crystal set with the condenser half out.



The signal was not too strong at 100 ft. away, but was good at 40 ft. I had to connect the Ford model T. Spark coil as shown. A ground could not be used as it damped out the signal. The Aerial had to be connected to where the ground would have been. Could a spark transmitter use a slider coil? (ANS. Spark would jump between turns. One must use tubing for the coil.)

Going to try to make my MRL 1-tuber a transmitter, by connecting a key in place of the phones and using 90 v. of B instead of 22½. (ED. Leave phones in, and put key in series with phones, & you may listen to the code.)

I get WWV on a Crystal circuit like this, using 5 turns #12 En.



wire wound on a 1" form and a .00035 condenser half out, and a Diode crystal. I prefer a Diode for Short waves but a Steel galena for broadcast band.

Am up on a hill, but there are other hills higher than us, which helps a lot with reception.

How about an MRL QRM Coil on SW stations? (ANS. Use plug-in coils, Type A, so you may change bands, and a .00035 across the secondary. Use the tickler winding for the Ant. side (1) (2) of QRM. It'll knock out SW QRM.)

Where do whistles on the Long waves come from? (If near a BC station, they are harmonics of same. If out away from BC stations you won't hear any, unless there is a regenerative or a superhet. in vicinity.)

MRL #2 Crystal. My results on this set seem impossible to a Crystal set Fan using a slider coil, on sets that are commonly sold. My Philmore has given me only 375 miles at best. The #2 is by far the loudest and best set for DX.

I get Moscow (7200) and London (5400) from time to time on my #2. Get them very plain. Use an Antenna of #12 Enameled wire. They fade, so know I am getting them direct. Also get London on 21 ft. of water spouting on our house, and 15 ft. of housewire. One night I strung 50ft. of your leadin wire about the room and received London on the set, very plain at times. Also got him at 6 pm. local time, on ¼" steel rod 4 ft. long, and about 30 ft. of wire wrapped around a window frame. I get it on the first tap from the left, with dial at 84.

When getting Moscow on #2 I get interference from CHOL, Montreal (1400) and the U.S. Armed forces services.

Have heard Dominician Republic (1500) three times on my #2, as I've checked the theme songs on our Air Castle tube set.

I get lots of BC, aircraft and Hams. Have played Richmond (300) by just ¼" rod 4 ft. long. Can get locals without Ant. when no noise in the room. With the rod it works as well vertically as horizontally.

Had good results using my #2 as long and SW converter, running it into the BC band of our Air Castle tube set.

Some of the important BC stations on #2 are Ft. Worth (950); New Orleans, Minneapolis (750); Boston (700); Dallas, Des Moines (600); Schenectady (550); Phila. (500); St. Louis, Rochester (450) Chicago (350); Richmond (300); tugboats on Ohio, etc.

MRL 1-tuber (HB-4). Received Australia (8800) 3 timee since my last report. Once I got it on my ¼" x 4 ft. steel rod on the 40 m. coil. But, I get it a lot better with my 130 ft. Antenna. Also get it on a 19 ft. inside Antenna.

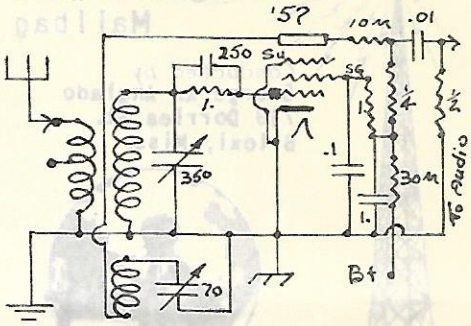
Got Brazzaville, Africa (6200) at 2 pm on the 40 m. coil Also Switzerland (5800); London (5200) Madrid (5000); Moscow (4550); Ecuador (2450); Guatemala & Br. Honduras (2100) – latter on 80 m. coil near top of the dial.

Have also identified 13 Hams on 20 m. coil; many Mexican BC stations (including Mexico City) and on Long wave coil I got 2 Airports and 15 beacon signals from Airports. Works almost as good as our Multi-tube Air Castle Radio set.

(ED. Mr. Burton is one of our most ardent Experimenters. He keeps the mail full of reports, interesting data, etc. Readers of RB&H have read many of his interesting reports. Thanks, again, OM.)

A JAPANESE REGENERATIVE CIRCUIT.

By Alexander J. Werner, W8CMX.
Flint, Michigan.



Nothing radical or original here. The regeneration is characteristic of the Asiatic and Australian circuits, with the variable condenser feeding to ground. The tapped Aerial coil shows they, too, have some interference problems!

The most interesting part is the power supply network. They have really throttled it down for smooth operation. Almost no current gets to the screen grid, so there'd be no spill over at this point.

Any type of audio amplification is OK. Also, any tube may be used, even to a 1T4, when you eliminate the suppressor and the cathode.

SOME NATURAL HISTORY NOTES.

To the Nature Hobbyist some of the following may be welcome.

Dates produce the most money per acre of all fruit trees. Are most cultivated in Arizona.

A spider doesn't become entangled in its own web due to an oily substance from its mouth.

Honey from bees collecting on Rhododendron blossoms is poisonous. Some taken along the Amazon produces vomiting.

Seeds of the Orchid are so tiny that one seed capsule produces 74 million seeds.

A Rattlesnake can rattle 100 rattles a second. It is the fastest movement of any creature on Earth with a backbone.

Balsa wood is so light that a man can carry a tree trunk by himself. Some of the trunks are 15 ft. in dia. Ecuador exceeds in the production of Balsa.

Col. Franklin Braun, 69, of Pasadena died this year. He was the head of the Braun Corpn. and I used to buy insect pins from him in Los Angeles years ago. It was when my interests were divided with Entomology and Radio!

In Arnhemland, a 5000 sq. mile area of northern Australia, the aborigines live in the tropical jungle. They are as hostile to man as they've been forever.

One of the hardest woods, that can be finished mirror smooth has been discovered by a Yale prof. in Central & So. America. It is the Kaneelhart tree. He foresees its use as tool handles and many other hard uses. During our trip to Mexico City, in 1949 we found that railroad ties were made from Mahogany. This was especially so just north of Guadalajara. They were so twisted one wondered how they used them. As it was their local wood it was cheap. The local Pepper tree grows wild on their hills. So, it must have been imported from there centuries ago. If you look close you may see a Vulture or 2 in each Pepper tree. To me there is no more disgusting bird.

Collecting is one of the many hobbies by which psychiatrists claim can relieve your mind.

CRYSTAL RADIOS STILL IN DEMAND.

Reprinted from "Phila. Bulletin"

Back in the early 1920's it was good sport for small boys to make their own Crystal sets.

For almost nothing you could get some wire and wind it around an oatmeal box, ground it, Aerial it, earphone it and have yourself a good Radio set.

But who would think that some 50,000 Crystal sets are now being sold each year? There are a quarter of a million Crystals in use thruout the World now.

To think that there still is a demand for these little sets is remarkable, in these days of TV.

WRC, Washington outlet for NBC has sent out many Crystal sets to mark the end of 30 years on the air.

WRC quotes the Philmore Mfg. Co. as saying the demand for Xtl sets is greater than ever.

Who buys them, and why?

They are much in use in the rural areas of the U.S., which still have no electricity, and where people can't afford a battery set.

The Crystal sets are also used among the workers in the cotton field camps of the South. Many patients in Hospitals find them handy after lights go out. Boy Scouts are among the buyers of the sets, too, and use them on camping trips.

More than 10,000 New Yorkers use them regularly.

The Government is reported to be planning to buy large quantities of the sets and drop behind the Iron Curtain for propaganda purposes.

America is not the only land to find a use for the Crystals. They are found in Mexico, South America, Australia, the Philippines, and even in remote Saipan.

—Submitted by J. Casper,
Atlantic City, N.J.

(Ed. The above only skims the surface. Our lists run up into the thousands, from every walk of life - Engineers, Teachers, Medical, dabblers, - et al. Innumerable MRL Xtal sets were purchased by our Boys during the last War. Daily we got reports of their DX in some foxhole. As transmitters are so much more powerful today - it is logical to believe they have more possibilities now than ever. Years ago I used to carry on Ship biz with the fixed Perikon Crystal detector furnished with the set. We could often work 1000 miles at night. Occasionally reports of 6000 mile reception with a Xtal set were made, even at that time with poor Xmtrs & on long waves)

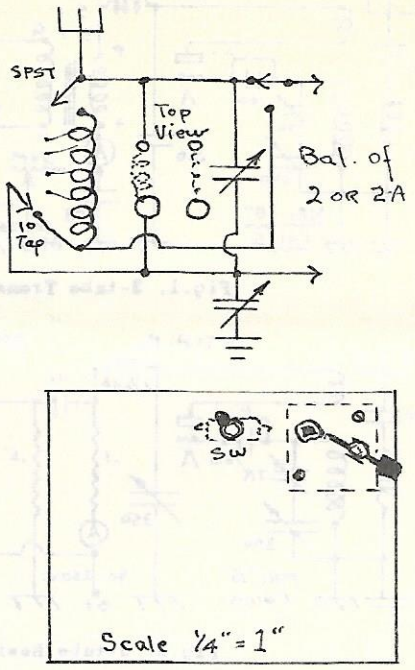
FREE GOV'T PUBLICATION LISTS.

Your name put on "Lists Pubs. of U.S. Gov't." Bi-weekly.

19-B Field & Tech. Manuals.
64 Scientific Tests.
82 Radio & Communication.

Other lists given with these. Address Sup. of Documents, Gov't Printing Office, Wash. 25, D.C.

ADDING PLUG-IN COILS TO #2, 2-A.



Our good friend W.R.Hickmott, Victoria Harbor, Ont., Canada, suggests adding a base socket & SPST toggle switch to an MRL #2 or 2-A Crystal Set. In this way you may cut out the large 2" coil and switch to plug-in coils at will. You will find a big difference in tuning stations, especially results on Shortwave.

As the panel is fairly well filled up, we figured the best place for mounting the base 4 or 5 prong socket is just back of the crystal stand. Set the base socket out about ½" on bushings, to clear the Xtal stand. Diagram shows top view of socket from the rear of panel. Another thing in its favor, is that the plug-in coil works at right angle to the large #2 coil, so there is no coupling between coils. Use 4 or 5 prong, depending on A or 5-A.

As for the SPST toggle switch, maybe it can go at the top of panel as shown. Just clip the coil lead, that goes to the SPDT switch, on the Antenna side, and hook to the SPST.

When operating, throw the tap switch over to #10 tap on right, when using the plug-in coils. The tickler winding, of the plug-in coil is not used. Your SEL-BRD switch will still work the same as with the #2 coil. With this set-up you may still use either coil by throwing the SPST toggle switch in or out. To cut out the plug-in coil, just pull it out.

The advantage may be found in DX when used on Short waves, as the dead-end effect in the large coil is eliminated in the plug-in coils.

Let us hear from you about DX you get with this deal.

Mr. Hickmott is another Old Timer. He started Wireless in 1910, and pounded brass for 41 years. (Beat my time by 5 yrs.!)

MRL NEW or REVISED DETAIL PRINTS

This is the "New Deal" we mentioned in RB&H 38. As time permits, we are making up new MRL Detail Prints #1 thru #15. Also, we are completely making others over, as rapidly as possible, - consistent with our time.

They will be all photographed and Multilithed. It takes about 2 days to re-draw and re-vamp a Detail Print - plus any research necessary. We don't just put out plans - but make sure of each move, that they all work and are as correct as humanly possible. Besides the original plan, we work up numerous variations and kinks into them. MRL delights in giving you facts and experiments to work on. With the new copy we can give you more details in the same space. Our aim is to finish our Detail Print line before more Handbooks are issued.

Our new Detail Prints are to be 10¢ each; 3 for 25¢; or B-1 15 for $1, in a binder, and will be cross-indexed.

For the time being, we are still selling CAT. 5-1. MRL Detail Print File at $1.25, plus postage on 1 lb. As time permits it will be made up into files of 15 for $1. As soon as our first binder (1/15) is finished, we'll start on the second bunch (16-30). At that time you can no longer buy the 46 for $1.25. So, if you want the present DP file, at $1.25, order it NOW. Don't worry about them being obsolete, as they all work fine.

DO NOT ORDER the CAT. B-1 until announced in RB&H. You may order the new revised DP's listed below now, for immediate delivery. Prices for the new ones below R 10¢ each; 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 HB-25. Just throw a lever to a station.

#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 on vertical or "L"; Doublet; Zeppelin; complete mounting instructions; several formulae 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. Well, we just wore out the stencil, and it came out in handfuls! This circuit has equaled #2 & 2-A in DX reports. Uses plug-in coils. All details for making RF coils for the set. Scale drawings show details for making a better layout than our original DP-47. Shows new arrangement for the loading coil. Also using .00035 and a trimmer. Completely new Detail Print worth having.

RESISTANCE vs TRANSFORMER COUPLING.

Each type has its own advantages; give or take. However, the object is the same, e.g., greatest transference of energy, less distortion and hum, and at the least expense. We do not have space to discuss all the variations of impedance, auto, dual-impedance, direct, and all the combinations of these, so we'll talk about the two main systems.

Current in a vacuum tube circuit flows from B plus to minus. Electrons are emitted from a DC filament and flow over to the plate. In an AC tube, the AC filament heats the cathode shield, just like we heat an electric iron. The cathode, in turn, will emit electrons over to the plate element. Without this electron path, the B current would not be completed, as it flows over the electron path to ground, via the filament, and back to B-. When the tube is turned on the Ammeter will show a reading. One may use several double jacks in the B circuit so the Ammeter may be plugged in or out. This shows a direct current reading is going thru the circuit. This pure DC will not cause a discharge of the coupling condenser in resistance coupling, unless we snap the current off, when we hear it in the phones. Neither will any current be induced from the primary to secondary in our transformer coupling. We must have a fluctuation in our DC circuit for this to happen.

However, if we impart a 4 volt AC signal onto the grid of the detector tube we immediately affect a change in the plate current. Half the 4 volt cycle will raise the B voltage 4 volts; the other half will hinder, or lower it - so we have an 8 volt fluctuation of the B supply. As the tube is a rectifier, and passes current in but one direction, we do not have AC in the plate circuit, but only a DC fluctuation up or down. It is this change that affects the coupling condenser and the transformer windings. The fluctuation is then picked up by the grid of the following amplifier tube.

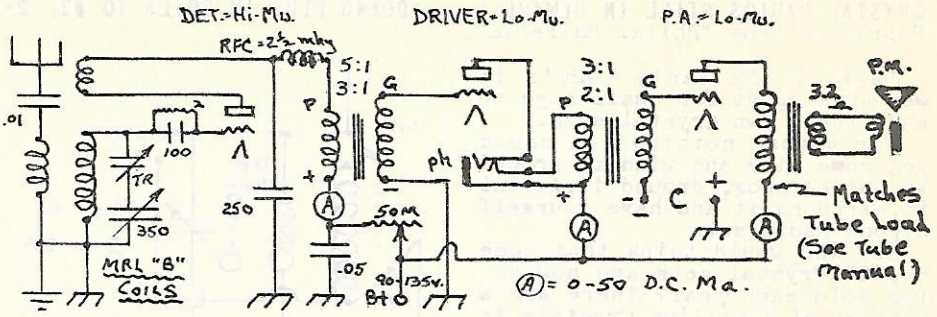


Fig.1. 3-tube Transformer Coupled Receiver.

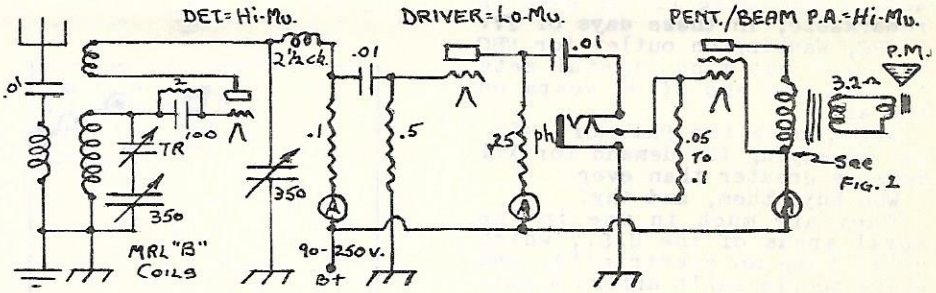


Fig.2. 3-tube Resistance Coupled Receiver.

The voltage developed in this tube will be larger than the incoming signal by a ratio a little less than the Mu (amplification factor) of the tube. For instance, if the tube has an amplification factor of 20, the real amplification will be about 17 times.

In transformer vs. resistance coupling we used to say that 3 resistance stages equaled 2 of the transformer stages in total volume gain.

Transformer, see Fig. 1. Each side can better match its tube with a transformer. For instance, the plate voltage, or impedance, of the first tube may be regulated. Also the grid voltage, or impedance of the second tube may be regulated, independently of each other.

A transformer will step the voltage up or down, which is not possible with resistance coupling. No current is induced from primary to secondary during the DC (no signal) period. When pulsating DC enters the primary it is transferred by induction to the secondary.

The inductance of the wire and the effect of the core, gives a higher impedance to AC, or a DC fluctuation, which are classed as reactance. However, for pure DC, the resistance is low.

Transformer is best for push-pull, or phase-inverted circuits than resistance coupling. It is always used for output transformers to speakers. This is because it is much easier to match the low impedance of a speaker voice coil with a transformer.

An audio transformer uses a laminated iron core. Powdered iron cores, with a binder, may be used for RF tuning, but not laminated cores. This is due to the excessive losses at Hi-Freq. with an iron core. Cores of the audio trans. are made laminated to keep down the excessive eddy currents. The closed core is used because it transfers more energy from primary to secondary. Low-priced audios, with small cores, accent the high notes. Years ago we paid $7.50 for a 7:1 and all we got were the hi-notes, altho they were good for code work. Large iron cores amplify more of the low notes.

There is a greater transference of energy at HF because the direction of the lines of force, (or the intensity in this case) are changed faster. A condenser of .001 to .002 may be shunted across the primary or secondary to further accent the low notes, just like adding a tone control to a rig. This bypasses the HF across the winding.

The ratio of turns of the primary to secondary gives the ratio of the transformer, in stepping up or down. Many thousands of turns of #40-44 enameled wire are used to get lots of turns in a smaller space. #40 will carry about 1.85 amps. The primary is usually wound inside the secondary but it will work the other way around. Start of the primary winding (P) goes to the plate of the first tube. The end of the secondary (G) goes to grid of the next tube. The aim is to keep them apart. Always reverse one winding on an audio to see if it works better. We also contend that often when in the right direction they tend to block the tube, or cause excessive howls. Then, by reversing one winding, we lose volume but gain tone.

Higher ratios produce louder volume on some tones. Usually a low ratio of 1:1 or 2:1 are used for several stages, due to blocking and feedback effects. The average in turn-ratio and cost

must be met, so usually, for general purposes, the 3:1 is preferred. A high ratio of 3:1 or 5:1 is used after the detector, and then come the lower ratios. However, it used to be the opposite, as we were told to place the 5:1 on the back end! Gair can be kept fairly constant over the whole audio range. Several stages are used only with tubes having a Mu of 10 or less, because the primary cannot be made with enough turns to match the plate impedance of the tube.

Resistance, see Fig. 2. This may be used in RF or AF, but usually in the latter. It is simple and inexpensive, and will give the same amount of voltage gain over a wide range of frequencies - so it gives better tone for less money. A resistor has the same resistance for AC as DC. Thus, it permits obtaining high values of load impedance for AC without excessive DC voltage drop that would use more power supply. A resistance amplifier picks up less hum than transformer. The iron core of any audio will pick up the magnetic fluxes from heater wiring, power transformers, AC line, etc. operating at 60 cycle line freq. and be amplified by the following tube. So, place your audios, or output transformers away from your power trans. Resistance is the only coupling desired for Hi-mu triodes or Pentodes.

The load resistance of the first tube is equal to the resistance of the plate resistor plus the following grid resistor in parallel. You can see how the changing of a grid resistor will influence the resistance in the previous plate circuit. The plate resistor must not be too large or not enough voltage will get to the plate. It should be from .1 to .25 meg. If you want to be sure to have enough voltage for detector oscillation, use a .1 meg. (100,000 ohms.)

Leaving off the grid resistor will cause the tube to block. Too large a one will cause distortion. Use the highest resistance possible without trouble. It is a good idea to try an 0-500,000 ohm vol. control instead of the grid resistor. When you find the best value test the resistance with an ohmmeter, and then replace with correct value of carbon resistor. Usually it runs from .25 to 1. meg. but the average is about .5 meg.

A higher power supply voltage is required for resistance than for audio transformer, for the detector supply. It is necessary to use about 45-90 volts on the detector, instead of 16½-22½ v. for a 1-tube receiver.

The coupling condenser is very important. It used to be called a blocking, or stopping condenser, and rightfully named. DC will charge a condenser, but it is the pulsating DC "signal" that's transferred to the opposite end. Use as small coupling cond. as possible, not over .05 mfd is best. The average size is .01 mfd. but down to .001 mfd. is OK if you are getting distortion or overloading. Try for the best. It must be 600 v. test, by all means, as the high surges blow it out. Most Radio men replace it as a matter of routine, as it only costs about a dime.

A 3-stage resistance coupled amplifier uses a little over 3/4 the plate current drawn by two stages of transformer, even tho much higher plate voltage is required for resistance.

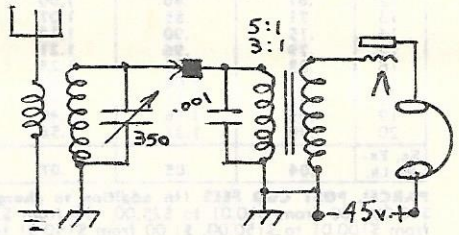


Fig.3. Crystal Set with Transformer Coupling.

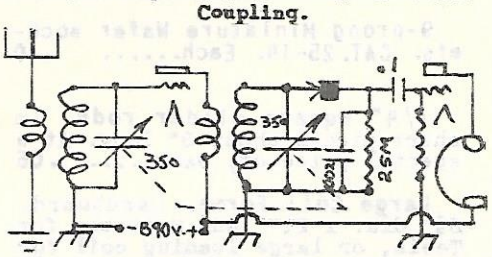


Fig.4. Crystal Set with TRF stage & Resistance Coupling.

A resistance type amplifier cannot be used after a Crystal detector to a power tube, because the small amount of current from the crystal cannot produce sufficient voltage change to operate it. Therefore, use an Audio transformer between Xtal and the following tube, see Fig. 3. If a tuned RF stage is desired ahead of Xtal, then, enough voltage change is had to operate the amplifier tube with resistance coupling, see Fig. 4.

When using a phone jack it is best to connect it in the first amplifier stage, so it will not de-tune the detector. Besides, you'll get better results in the tuning of DX stations. Hooking in the grid circuit will also save the phones. See Fig. 2.

If two stages of transformers are used you should go into a Low-mu tube, after the detector, for smooth operation. We usually call this the driver tube. Look into any tube Manual and you'll find the following Low-mu triode tubes: 1G4, 1H4, 1LE3, 6C5, 6J5, 6L5, 6S4, 26, 27, 30, 37, 56, 76. The gain is low (8-20) so they will give you less trouble.

You may then go into a Low-mu power amplifier tube thru an audio transformer (Fig. 1) with 2A3, 6A3, 6SA7, 6B4, 31, 45, 46, 49, 50, 71-A.

If using resistance coupling (Fig.2) you should use a pentode or a beam power amplifier for the last stage. The tube manual lists a host of them, including 1C5, 1Q5, 1S4, 6V6, 42, 50L6, 7DL7, 89, etc. Use the same type of driver as for transformer coupling, if you want to stay out of trouble. Screen grid drivers get into complications. As said before, the high resistances more match the inputs of pentode and beam power amplifiers.

The tube Manual will give the correct values for resistors, coupling cond., cathode, filament and plate voltages for the highest gain per stage.

Impedance coupling, with an Audio transformer in the plate & a resistor in the following grid may give more gain than resistance. However, it usually peaks, and one must bridge it with resistors and condensers to offset the howls.

To even the experienced Radio man, we hope we have saved him many wasted hours of experimenting. The secret is to keep the Mu-low - as you go up, step by step. Keep the hi-gain tubes in the detector or the last power stage- and you'll end up with an amplifier that will have plenty of gain - and sweet as apple cider in the Fall.

MRL PLUG-IN COIL PRICES UP.

Sorry - but we have had to up our prices on plug-in coils 25¢ per coil. This makes them $1.00 more per set of 4.

For years our plug-in coils have remained the same- and away below the prices of the few manufacturers still making them. Even though we buy materials in larger quantities, the saving has been offset by a general uppage in their list prices. In checking with the few other ones made, we find them selling 4 SW coils at $3.60 net against our $3. Their HF and LF Broadcasts sell at $1.80 each, net, against our price of 75¢ each net.

Another reason - due to our lower prices, and the demand for them - we have coil-winding sessions lasting for days. This has not given us our required profit and has tied us up from our other work.

As far as we can ascertain, the few others only make them similar to our Type A. and, only one of them makes a Long Wave plug-in coil. None of them make a straight Broadcast coil. None of them make types similar to our Types 5-A, B, C, 5-C, O, RF, and 5-RF.

Then there is the problem of bases. Many do not send us 4 or 5-prong tube bases to make our forms, altho we allow 2¢ each plus 3rd or 4th class postage back to them. (See CAT. E-1.) So, this means our scouting around for them, which takes more time. Occasionally some grateful Fan will mail us a box of them. We will take all you send.

However, if you need coils, & can't get bases - shoot in your order, anyway. We'll dig them up some way. If not, we'll let you know.

In our recent coil orders we have billed the customer at the new prices.

Considering that our coils are

very low-loss, and not made from Bakelite or mud material, we really deserve a higher price. We invite you to compare them with any coil made for DX properties. Tests on extreme DX stations is better than any Q-meter test. A test on locals doesn't count.

Mark your **CATalog** with these prices:

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

Standard for our 1-tuber (**HB-4**) are 4-prong coils. If you desire 5-prong, let us know- same cost.

ANNOUNCEMENTS.

OUR NEW INDEX FOR MRL "RB&H" from #25 thru #39.

You may have as much trouble as we do at MRL - trying to find something in a back number of **RB&H**. So - we have made up a new complete index for the last 15 numbers. It isn't cross-indexed, but believe it will help a lot. Continually some Fan asks for a certain circuit or article. We have had to thumb thru them all, which takes considerable time.

So, if you are a subscriber, you'll get the **CAT. pages C-1, 2** with this **RB&H**. If not, you'll find them in future copies of our **CAT.** that you will get.

We have tried to list each article that may be of interest - altho some are short, but meaty. One good idea is worth the price of the number. If limited on the numbers you want - go thru the Index and list the **RB&H** numbers you want. First number is page.

New Magazines for Sale. All R sent postpaid at these prices & in good condition. Most are unobtainable elsewhere.

Radio Electronics for September, Nov., 1954, each copy... .40
Radio & Hobbies Australia, for July, 1954 at..... .50
Science & Mechanics June, 1952; April, 1953; Oct., Dec. 54 .30
Popular Science Dec., 1953. .30
Mechanix Illustr. July, 1954 .30
Mechanics Today. Jan., 1954. .30

New Plug-in prices - see p. 7.

5-Prong Bak. Plug-in forms. CAT. 7-37. Sold out. Substitute our Celluloids - are better.

50 mfd. x 50 v. Electro, Cond. **CAT. 8-39.** sold out. Unobtainable at previous price.

120-1000 Trimmers, CAT. 8-114. Sold out. Unobtainable.

New tubes in stock:

3S4	List at 2.10. MRL at	1.10
7C6	" " 1.85 " "	1.00

Auto fuse Holder. 2-2. .08

PARCEL POST & C.O.D. RATES. Dec., 1954

Weight in Pounds	Zones 1 & 2 Up to 150 Miles	Zone 3 150 to 300 Miles	Zone 4 300 to 600 Miles	Zone 5 600 to 1000 Miles	Zone 6 1000 to 1400 Miles	Zone 7 1400 to 1800 Miles	Zone 8 Over 1800 Miles
1	.23	.23	.24	.26	.28	.30	.32
2	.27	.29	.31	.36	.40	.46	.51
3	.31	.34	.38	.45	.52	.61	.69
4	.35	.39	.45	.54	.64	.76	.87
5	.39	.44	.52	.63	.76	.91	1.05
6	.43	.49	.59	.73	.88	1.06	1.23
7	.47	.54	.66	.82	1.00	1.22	1.41
8	.51	.60	.73	.91	1.12	1.37	1.59
9	.55	.65	.80	1.00	1.24	1.52	1.77
10	.59	.70	.87	1.10	1.36	1.67	1.95
11	.63	.75	.93	1.19	1.48	1.82	2.13
12	.67	.80	1.00	1.28	1.60	1.98	2.31
13	.71	.85	1.07	1.37	1.72	2.13	2.49
14	.75	.90	1.14	1.47	1.84	2.28	2.67
15	.79	.96	1.21	1.56	1.96	2.43	2.85
16	.83	1.01	1.28	1.65	2.08	2.58	3.03
17	.87	1.06	1.35	1.74	2.20	2.74	3.21
18	.91	1.11	1.42	1.84	2.32	2.89	3.39
19	.95	1.16	1.49	1.93	2.44	3.04	3.57
20	.99	1.21	1.56	2.02	2.56	3.19	3.75
Ea. Extra Lb.	.04	.05	.07	.10	.12	.15	.18

PARCEL POST COD FEES (In addition to charges above) .30 from .01 to $5.00, .40 from $5.01 to $10.00, .60 from $10.01 to $25.00, .70 from $25.01 to $50.00, .80 from $50.01 to $100.00, .90 from $100.01 to $150.00, $1.00 from $150.01 to $200.00.

9-prong Miniature Wafer sockets. CAT. 25-14. Each..... .10

1/4" square slider rods. In short pieces about 3" long. At a special price of, each..... .05

Large Coil Forms. Cardboard. 3½" dia. x 21" long. Suitable for Tesla, or large loading coil for Long waves. Wt. 2 lb. each. .50

Forms & CEMENT. New prices on Xtal set forms & cements, as:

2XM	2" dia. x 4½". 7-40.	.30
P2XM	" x 2" . 7-39. (2)	.30
Light Coil Cement.	7-57. oz.	.20
Heavy " "	. 7-58. "	.20
Thinner for each.	7-59. "	.20

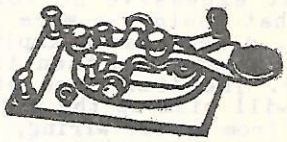
We must continually search for steady prices. Each time mdse. goes up a little. Bottle suppliers are reluctant to furnish us with bottles under 25 gross lots - which would last us too long. Therefore, double prices to us.

SPST Slide Switch. At a good price. May be used in #2 or ~~#2~~-A sets, etc. **23-9. 2 oz.** .25

Drum Dials. 3 left. About 3½" drum works parallel to panel. It has a removable cell. 0-100 scale. Cond. may work to left or right of drum. Illuminated escutcheon plate on front of panel helps tuning. ¼" shaft. In good condition. **10-57. 1 lb.** 1.00

Transformers. Some closeouts. Add postage to each.

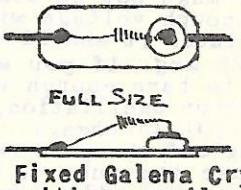
Heavy duty Output Trans. for a 1C5 or 1Q5. **2 lbs. weight..** 1.50
2½ v. Heavy Duty Fil. Trans. with tapped pri. **2 lbs. wt.** 1.75
150 v. and 85 v. secondaries Power Trans. Cased. OK for experiments. **24-19-1. 4 lbs.** .50



New Code Keys. For Radio or Morse. Have shorting key in case you use Morse line. Heavy brass & nickel parts. On Bak. base. A special buy. Made for Signal Corps., U.S.A. Replaces our key shown on page X-1. Very good for practice. **12-17. 1 lb.** 1.50

Double Fahnstock Clips. Temporarily out of stock. Substitute single clips with one common screw for both - same thing.

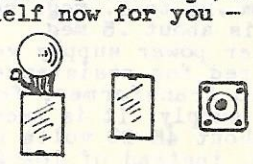
5/16" Brown Compo. Small pcs. only. **16-18. Sq. Inch 1/3¢.**



Tiny Fixed Galena Crystal. A very sensitive, easily adjusted crystal. Smaller than other fixed crystals, outside of the large Lab. Co's Diodes. C/W holds its adjustment. **9-45. Each** .40

Wall Sockets back in stock. R Bakelite now. **11-35. 6 oz.** .20

Nokorode Soldering Paste is on the shelf now for you - .15



2½" Electric Bell. For 10 or 16 v. AC trans. or battery. Grey box. Neat. **12-10. 8 oz.** 1.00

Buzzer. Same operation. May be used for code. 1¾" x 2¾" base. Grey. 2 coil. **12-16. 4 oz.** 1.00

Bakelite Push Button. Only 1¼" square. With screws. Made better than most. **11-47. 2 oz.** .15

WHAT'S IN THE MAGS.

Popular Electronics. Oct., 1954.

"4-tube Bike Radio." p. 17. It uses whip Ant.; Vari-loopstick & our Oscillator coil tuned by a 2 gang .00035. Uses our 456 kc IFT and the 2nd det. is a 1N34. Can furnish all tubes. Looks good. Note how 1N34 connects to v.c.

"Data on Ham Licenses." p. 40. Very good article by Hertzberg, a real Old Timer. Data on novice license requirements.

"Experimenter's Laboratory." p. 65. A very good article on breadboard chassis.

"Fun with Neon Bulbs." p. 69. Interesting data for the Experimenter, in this interesting and inexpensive field. Shows making a tester, nite-lite, stroboscope code oscillator, etc. We can supply the Neons. Hi.

"Code Set." p. 73. An audio oscillator using 1G4 triode tube in an old-time circuit. You may substitute other tubes as 1H5, 30, 27, etc. The other leg of secondary may be used instead, - or windings reversed. C-1 controls tone. A variable 50M tone control may be placed in series with C-1 for variation.

"Crystal BC Receiver." p. 92. Some good ideas. See our DP-1 for a better layout. The twin TV leadin may help to make it more selective. Any Xtal is OK.

Popular Electronics. Nov., 1954.

"Too Old to Learn TV." p. 20. We got oodles of Old Timers over 50. Many are over 80 and still building their share of Radio sets and accessories.

"World at a Twirl." p.24. Lots of data for the DX'er. Also shows a good time conversion chart.

"9 Chassis Bases." p. 34. Many of them work OK. A good place to use your ingenuity. Our layout, (similar to "hardboard") is hard to beat, except we use brackets on the front panel. The phone tip jacks can come out thru the wood at the rear and no other insulation is needed.

"Hints on Reading Schematics." p. 36. Will help the beginner.

"Learning Code." p. 39. Part 2 by Bob Hertzberg.

"Neon Tube Metronome." p. 45. Uses a 1/25 w. Neon (20-18. 15¢) and R-3 varies the number of pulses per minute.

"Time Delay Burglar Alarm." 55 Some various ideas that are OK. We believe it is hard to duplicate the old black carpet thread fastened to a piece of wood. The wood slips between two phosphor-bronze clips, and shorts when the wood is removed. The clip may be concealed, so that if the thread is tripped - nobody can replace it to cut the alarm. Is very good for chicken houses!

"0.4 Watt Xmtr." p. 60. Uses a 1S4 tube for local contacts up to 25 miles or more. Often one is surprised how far they may go under good conditions. About the simplest Xmtr we have seen lately. Be sure to use the crystal to make it legal, as well as your Amateur or Novice license.

"Electric Eye." p. 72. How it works. Good article to read.

"Wavemeter." p.80. You can use our plug-in coils OK for this. The #49 dial lamp is used, but you may try the 1/25 watt Neon.

"Neon Lamps." p. 90. You need this info. on theory, operation, etc. Note that the 3-cond. lay-out on page 91 is identical with Mickelson's Flasher in RB&H 34. Hi. It's funny how circuits may be drawn. Only exception is that it uses different values, which don't seem to be critical.

Popular Electronics. Dec., 1954.

"More License Data." p. 42. A final instalment; and good.

"Pie Case Radio." p. 50. Novel idea, using a Loopstick, 1N34 detector - making it equal to a 2-tube rig. Uses 22½ v. hearing aid batt. If you could find a tiny audio trans. to fit in, it may improve operation. Believe (3) on tube should have been (4) on the diagram.

"Coil Winding Jig." p. 58. May work OK in a hurry, but why not make one like in our HB-2 and it will last forever? We are using one like it that we bought in about 1924, and going strong.

"World at a Whirl." p. 84. A lot of useful skeds & tips.

"Testing Condensers." p. 96. A lot of useful ideas.

"AC Principles." p. 114. Never get enough AC theory.

"Popular Electronics" is just what we need in the small set Hobby field. However, it seems to be getting away from the beginner's angle. You will note we picked 6 articles from the first issue; 11 from the 2nd and 6 out of the third, so we consider #2 the best.

All other beginner and Experimenter Radio mags. started out right, but gradually got into the Engineering class, and away from the Experimenter. We can remember "QST" as being the first to go hi-brow about 1922, and others followed likewise. This included Short Wave Craft, Electrical Experimenter, Radio News, Radio World, Radio Broadcast and many others- now off the market.

Three that have held up pretty good are Science & Mechanics, Popular Mechanics and Popular Science. They always keep on the Novice's level and their Radio articles will always be good.

The Editors may have a good excuse. We believe the "Intellectuals" refuse to write about Xtal and small sets. It does take a certain knack to write it. Many don't have it - or don't want to be bothered. They tell us that the large advertisers like to read only Engineering stuff. But this is a limited market, and we believe more merchandise can be sold to the "common Fans" like us, if more space was given to Experimenter's articles.

Then, many Editors turn down a good lot of stuff- as it doesn't satisfy their whims, etc. One of the RE editors recently told me we couldn't benefit each other mutually - but we have 35,000 Fans that buy and read our stuff - so this is a good practical example of what I mean. Hi.

Nobody can learn Radio in a few weeks - it takes years to learn it good. We'll never learn it all. Every month new ones get started - and become the customers of tomorrow. We must keep the welcome mat out for this newcomer to our field. And, the starter doesn't begin with code!

The field of Radio is large - and we have specialized in small sets. Nobody can cover the entire field. We cater to Experimenters, beginners and Servicemen (don't all the other Mail-order houses?). In his heart the Radio Serviceman will always be an Experimenter - he can't learn it all from books. I serviced Radios for 11 years - and I'm no genius either. I learn every day from some beginner's article.

So, "Popular Electronics" is a fine mag. for you. We only hope it will stay in its present popular field and give us lots of good meaty articles.

Radio Electronics. Dec., 1954.

"Demonstration Transistor Circuits." p. 45. 3 p. of good experiments with CK722 Xtal. Oscillators; amplifiers; Radios.

"Transistor Pocket Radio." 49. Using 4 Transistors & Diode in a novel circuit. Plenty gain. Very interesting. A Superhet. yet!

"Cathode Follower." p.50. Some real good theory. Good tone.

"Hi-Voltage Supply." 52. Puts all of vibrator sec. in series. How would an output trans. work?

"Transistorized VM." 54. Turner knows his stuff. Electronic testing up to 1000 v. with CK722.

"Cond. Tester." 56. Using 6V6 in novel leakage tester.

"Grid-dip Adapter." 58. Using a 1N34 as detector and Ma. meter of tester. Phones may be also used.

"Transistor Overtoner." 59. A simple Transistor cir. for producing harmonics.

Radio & TV News. Dec., 1954.

"Transistor Vibration Amp." 64 Using CK722 for phono. pickup, vibration tester, etc.

"Transistor Meter Amp." 74. Is similar to Voltmeter, above.

"Electronic Memory." 76. Now U can turn the light off and get into bed B-4 it gets dark. Edison was wrong!

"Link-coupled Loop." 96. If anything is selective, this is.

Radio Electronics. Nov., 1954.

"Rate Grown Transistors." 6. method of growing them to produce millions per year. Also 12.

Transistor articles 56-96-120.

"New Diodes Amplify." 94. Now they are placing Diodes in same category as Transistors - amplifiers, oscillators, etc.

More next trip.

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.

EXTRA-LOUD Crystal. sensitive, catwhisker, latest Radio plans and Catalog, circuit list 30¢. Amorose, Route Four, Richmond, Virginia. (3-39)

EXCHANGE Radio Parts and Wire. Write Wilburn Clay, 1803 Childress Dr., Atlanta, Ga. (3-39)

PAEC-GUAR Guaranteed Crystal, instructions, catalog. Only 15¢. Wesley Hamilton, Route #3 Box 878, Albany, Oregon. (3-39)

Peppy-PAL One-tube circuit and photo 30 cents. Bruehl, 38 Oneida St., Lynn, Mass. (3-40)

CRYSTAL Radio Experimenters. Write Leslie Hulet, Route 4. Lakewood, N.Jersey. (3-40)

A COMPLETE 1952 Radio and Television Course, Questions and answers, 11 kit booklets. Cost #180; ask $30. Good shape. Joseph A. Foley, Duncans Mills California. (3-40)

RADIO Crystals, five different minerals, tested and card mounted 50¢. Bruehl, 38 Oneida Street, Lynn, Mass. (3-40)

NEW DEAL: Long Distance Crystal 25¢, or three 50 cents. Address Jiffey, Abita Springs, La. (3-40)

RADIO DIAGRAMS $1.00; Television $2.00. Give make and Model. Diagram Service, Box 672-RH. Hartford 1, Conn. (3-41)

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. (3-41)

100 Names & Addresses of Radio men & Experimenters from Foreign countries who want to exchange books, magazines, diagrams, parts, etc. 50¢. Radio Technical Labs., 719 Dorries, Biloxi, Miss. (1-39)

HINTS & KINKS.

Removing Putty. Run a soldering iron along ahead of your chisel and it will soften up the putty on an old window.

Blow Torch. Easier to start if you place some steel wool in the generating cup before filling it with gas. This raises the gas closer to the burner.

Socket Wrenches. Paint each of the handles a different color, so you can grab them quicker.

Rubber Mallet. Get a 5¢ rubber cane tip in a dime store and fit it over your hammer. This prevents marring up your Aluminum or furniture surfaces.

Oil Dropper. Get a discarded nose-dropper bottle. Clean and fill with oil. Works accurately. We use one with water to add to ink, water colors, etc.

Pliers Clamp. Have some heavy rubber bands handy. When you desire to keep two pieces of metal together, when soldering - place it between pliers and pull bands over the handles. Works good.

Appliance Cords. Keep a short piece of mailing tube handy so you can pull a folded appliance cord into it. Keeps it snug and neat, and out of the way.

Drawing Board. Use Cellophane tape pieces to hold your paper. You can now throw all your thumb tacks away. T-square & triangles glide right over the tape. Tape also works good when using several pieces of paper and carbons in a typewriter.

Screwdriver. A fine one for light work may be made from coat hanger wire. NG for heavy work.

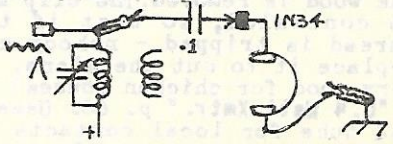
Oil Can. To extend the spout slip a piece of 3/16" spaghetti over it - as long as necessary.

Power Supply Fuse. Use a #40, .15 amp. dial lamp from center-tap of power trans. to ground. If tube or condenser short it'll blow out the dial lamp, which is much less costly.

Nut Starter. Wrap the end of a small screwdriver 1½ times around with cellophane tape. Then, reverse it 1½ times. The tape will hold the nut till started.

Neon Blinker. Place a 2 watt Neon lamp (20-9. 75¢) in a socket, mounted in a pan. Use a key in series with 110 v. Will give you a good signal device so you can "blink" to your neighbor.

Transformer Hum. Loosen screws to open the laminations. Paint latter with shellac or varnish. Screw back when dry. Will stop most of the "buzz."



Signal Tracer. A $50 one will do a lot of things, but the above circuit will point to the ailing stage in a hurry. Replace all resistors & condensers. Check tube.

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. If more bases aren't received we'll have to require them with orders.

Above 2" display ad costs $3 per issue, or $1.50 per inch up and down. Three insertions same ad for price of two. Display ads pull better than classified.

You can make up your own ad. Rule off a space with black ink, same width as above and 1" or more deep. Cut out a line drawing from a mag. and glue on. Then type, or draw in black ink to suit yourself. Copy should be sharp and black; no colors. We photograph it on the plate.

RE gets $28.70 per inch (14 L) or $2.05 per line, of 5 words. The more circulation; the higher the ad. Our ads go to Experimenters and Dabblers, while other's are for general distribution.

MRL CORRESPONDENCE CLUB.

2¢ per word, per insertion. Count name, address & interests as words, the 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. Kavaleski, Box 17, Franklin Mine, Michigan. Ham Radio; Crystal sets; Minerals; Swap Radio magazines; letters. (8-42)

Austin Windsor, Godfrey, Illinois Want to hear from Xtal Xperimenters & Dabblers in Science, Exchange letters, mags, books, courses, for old Radio parts, books, magazines. (3-41)

Roy Koeppe, Route 2 Box 16, Tulare, Calif. Age 14. Radio, code, crystal sets, and future Ham, Swap letters, parts, plans, etc. (1-39)

Ronny Hifner, 225 So. Los Angeles St., Tulare, Calif. Age 14. Radio, Xtal set, Short wave & DX Experimenter, etc. Will swap parts, plans & letters. (1-39)

Larry Whisman, 1102 West Main St., Visalia, Calif. Radio, Stamps. (1-39)

MRL "RADIO BUILDER & HOBBYIST"

INDEX FOR RB&H #25 thru #39.

This is not a cross-index, so please glance thru it all. The first is the page number, and the second is the issue number.

Our RB&H has come a long way from the #1 "MRL Oscillator" in 1938. We originally used an open cylinder duplicator, for a few bucks, which could crank out a few hundred copies per day. (OVER)

MRL RB&H - continued...

Now, at this writing, we are using one of the latest powered Multilith printing machines, at a cost of over $2400, which automatically runs off 6000 sheets per hour. This is in combination with a $700 composing machine, Ultra-violet plate-making equipment, and other vital apparatus necessary to produce good copy. In this way we can better serve our well-deserving Fans.

MRL **RB&H** is the best contact in America between Beginner and the Experimenter and the interesting field of which we know. While Radio and Electricity are the main interests, most of us are also interested in other avenues of Scientific and allied subjects. By deviating a little from the Radio field, we hope to make the **RB&H** more interesting.

Each issue has interesting articles of interest to the Fan; diagrams; where to get helpful literature; what others are doing; summary of late mags.;hints and kinks; allied Hobby interests; as well as items of interest to the Radio Dealer. Any one good kink, or help, will more than pay for the issue.

We always welcome articles and notes from our Readers, to be passed on to the Fans. Any results of experiments, DX reports and helps; notes on interesting Hobbies; freak reception or happenings, in fact, anything that may be interesting to you is also interesting to others. With your permission, we'd be glad to attach your name and address to your contributions. As this will invite correspondence, advise if you want your address printed.

Any notice of a new legitimate Radio Club will be announced if you send details.

Getting out **RB&H** takes a lot of midnight oil. The writing of the material takes the most time - altho the most interesting. A 5000 issue of **RB&H** with 10 pages and all the attached literature, requires 72,500 times thru the machine. This is in addition to addressing, folding and mailing. On a subscription basis **RB&H** is 12½¢ per copy. Consistent with the work involved, we feel this is very reasonable.

Many thanks to the thousands of subscribers, who financially helped to put over the **RB&H**. In view of the cost, we must ask our steady buyers to also subscribe, as **RB&H** is a separate deal from our parts business.

BACK NUMBERS.- 15¢ plus postage.

Above index gives you a good idea of what is covered in past issues of **RB&H**. Many listings, DX Reports, kinks, etc. are left out of the index.

Subscriptions cannot be started with a back/number. They can only begin with the present, or next issue. You see, we want you to stay with us. Hi.

Most Fans prefer the 8½ x 11 size - so it can be filed. Get a loose-leaf binder in the Dime store - and with the above Index in the front - you have a good back/log of Radio material and experiments to work on. Some of the issues are 5½ x 8½, but can still be filed. As back plates are worn out - we'll try to replace them with new ones.

MRL CLASSIFIED ADS.

4¢ per word per insertion. 8¢ per word for 3 times, using same ad. If you have parts, or services to sell, send in an ad. It goes to serious Radio buyers. As back/numbers are sold, your ad runs indefinitely. One advertiser reports 55 replies from one small ad - and "still coming in" when he wrote. In writing an ad, the more you tell; the more you sell, within reason.

MRL DISPLAY ADS.

A display ad always sells more altho it costs little more. Any drawings, line cuts, etc. can be photo'd for correct reproduction by us. Draw with India ink. Or, if you send copy, we'll varitype it in large letters, etc. to make it attractive. Width of the column is 2¼"; 2 col. is 4⅜". Height of the ad price is :

1 column inch, 35 words....1.50
¼ to 1 page, on quotation.
3 times, same price as 2.

Some of the larger Radio mags. charge $28 per inch, and circulate to a Technical field. Ours go to Experimenters.

MRL CORRESPONDENCE CLUB.

2¢ per word, per insertion. Be sure to count all words, including interests, the same as ads. Here is the way to get in touch with other Experimenters. We are aware of many good friendships that have resulted from the use of this column. This includes only name, address & interests. For sale, etc. must go in ads.

SUBSCRIBE TO RB&H.

12 issues $1.50; 6 for 80¢; 3 for 40¢; Per copy, or back numbers 15¢.

RB&H is a random publication at present. That is, it is not a monthly publication, or on a schedule. We hope to make it on schedule in the near future. So, we get out as many issues per year as time and conditions permit.

Over 40 years we have built up quite a library, file of magazines, and Radio notes in our Filing Morgue. Coupled with the current notes from our Fans and our own experiments and experience, we have a good back-log of data for you. At least, most of our material cannot be found in any library but ours.

Because Radio is a large field we specialize in the development of small sets. The scope of this branch of Radio is very extensive - so much so, that one may spend a whole lifetime in it. Since 1932 we have worked along a more or less defined plan. We well remember the early days of Radio when tubes were very poorly made - having a gain of about 8. Now they have gains up to over 100. With poor tubes, the Experimenter, or Laboratory man had nothing to improve but circuits, which he did to the highest efficiency.

Now that tubes are many times more sensitive - we press them into the old circuits. This results in a most efficient set. A look at the present AM circuits will show you that they have not been materially changed in the last 20 years. During this time most of the advances have been with FM, TV and audio circuits.

Crystals have been improved but very little. However, in the Laboratories the Engineers have been busy adding and subtracting impurities to crystal detector material.This has made them more sensitive and also given a control to frequency response, etc.

By using the old and new Xtal circuits,we would not accomplish much, even with the synthetic minerals, if it wasn't for the increased efficiency of transmitters. In 1920 we operated a ship's Wireless with a 2000 watt spark transmitter and crystal receiver. Every night we could work 1000 miles on the water. On certain occasions a distance of 5-6000 miles was received on a crystal receiver, across the Ocean. Now, with transmitters so much more efficient, there is a big field for DX with Crystal sets.To argue oppositely is nonsensical. Land-to-ship stations can now, with exceptions,contact ships around the World at almost any time. In spark days, to get a message to a ship 500 miles in daytime was almost impossible. This shows the difference in the transmitters of today. It also proves the efficiency of crystal sets today.

The Radio Experimenter always has a good chance to make money with his Hobby. Having been in the store business and Radio repairing for 11 years, we can readily see the many possibilities of making money. Unless one has a store, or repair business, he can ply his trade in spare time. Various sets need to be repaired in the neighborhood and he can charge for his labor. One may build small sets and dispose of them thru various channels. A good way is to buy them in kit form- as most kits represent the total price of parts, with the drilling, etc. thrown in free. Word soon gets around if you get a good set that works ideally. A glance at ads will show how many are selling goods by mail.

Along with the above we continually give Dealer hints in the **RB&H** - and most of them are fast to use them. By helping all our Fans - is the real idea behind the **RB&H**.

S U B S C R I B E N O W !