No. 43

WAVE TRAP EXPERIMENTS.
Complete in this issue, page 3.

# Radio Builder & Hobbyist

FOR THE EXPERIMENTER.

## COIL WIRE TURNS PER INCH.

| No. | Enam. | S. C. E. | D. C. C. |
|---|---|---|---|
| 10 | 9 | 9 | 8 |
| 12 | 12 | 11 | 10 |
| 14 | 15 | 14 | 13 |
| 16 | 18 | 17 | 16 |
| 18 | 23 | 22 | 19 |
| 20 | 29 | 27 | 23 |
| 22 | 37 | 34 | 30 |
| 24 | 46 | 41 | 35 |
| 26 | 58 | 50 | 41 |
| 28 | 72 | 60 | 48 |
| 30 | 90 | 71 | 55 |
| 32 | 113 | 83 | 62 |
| 34 | 143 | 97 | 70 |
| 36 | 175 | 111 | 77 |
| 38 | 224 | 126 | 83 |
| 40 | 282 | 140 | 89 |

Turns approx. because mfrs. vary. Add ¼-½" at ends for mounting coil.

## CONTENTS.



*Electronics is the study of the motion of Electrons in Fields of Force. - Millman & Seely.*

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## EDITORIAL NOISE LEVEL.

Will look up long enough from my Comic books to castigate an editorial. Brother - I mean castigate, in all 3 dimensions! Old Father Time scoots by here as fast as a Redwood City cop clipping a Jaywalker. But, we keep plugging - and finally out comes an RB&H to you.

Mabel suggested the idea that we make a good, long article for each issue, similar to our Handbooks. Being it takes so much research, we might as well run it all in one issue. When an idea pops - we start out to make it a 5-paragraph deal. But, the more notes we get hold of- the bigger it gets. Then one doesn't know what to leave out. So it goes. Hope you like the idea. And on the cover is a box to bring it to your attention for reference.

The Electrical industry has always been controlled by the prices of Copper and Porcelain. As noted, on page 23, Copper is hitting the ceiling, even though factory men promised us it would not go up much. Like hot air- it all goes up! Well, we fellers putting out Catalogs about got all frazzled up because so many prices had to be jacked up. With MRL policy, we are trying to keep them down until we re-order. But in self-defense, they'll have to go up later. Hope you'll understand. However, albeit MRL will hold prices down longer than the other Monkies. Nothing much costs the big guy - he just passes it along to us. If you want it you pay. An old rule is that it will cost the mfr. 1¢ for material that you pay 5¢ for. But if his metal is jacked up 1¢ - you pay 10¢ for yours. That is the reason the customer pays so heavily for increases, strikes, and other costs at the source.

**Change of Address.** As our cards are filed by States, be sure to give old address as well as new.

Lots of articles are on hand waiting for a spot to put them in. Fellows send in many good reports, for which we are thankful - for what one doesn't think of, another will. Used to think we knew it all - but a H.S. boy wud come along and show us up on something he had studied out. We learn when we get up RB&H.

A point of Testimonials has been brought up. We wouldn't know how our rigs worked if we didn't receive them. Neither would the others. We eliminate the name or the town, so you won't be bothered. Testimonials are given in the spirit of passing the info. on to you.

**Old mags.** On page 22 you will find a good list. Made up some new shelves for mags. and decided to go thru them. Many duplicates were found. In writing to a Bloke, who ran an ad selling Antique mags.- he wanted $1 each for them. But, I think he is still wanting! As you see most are at list prices, plus postage which is quite an item, as most weigh a pound. If included with an order for parts- you may gain some on postage. A few years ago Rider was paying $1 each for a few numbers he needed, but we decided it wasn't worth going thru our stock then.

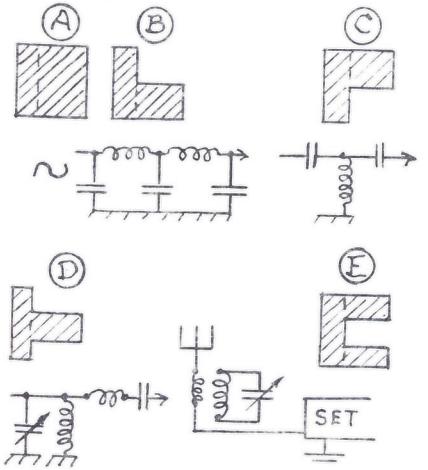
**Making up an Order.** List all items in a column, with or without an Order Blank. Give CAT. #, description & price. We can then get it right - U'll be happy.



## WAVE TRAP EXPERIMENTS.

A very interesting and uncanny field of Radio is the experimenting with Wave traps. Not much equipment is required to carry on a large number of experiments in this field. You may wind your own coils - large or small. Or, you may use plug-in coils, as our Type RF, so the Traps may be operated on various bands. We haven't experimented too much on HF, but suppose they work better on the lower frequencies. Our QRM Coil (CAT. 7-42. 50¢) can be used to cover the Broadcast band for most of your experiments.

To better understand Wave trap circuits we should go back into the study of filters. A filter is a combination of a coil, condenser, or resistor (and may be any two) which blocks, or attenuates the flow of AC at a certain range of freq., but allows other freq. to go un-impeded. Fig. (A) thru (E) will serve to explain the types of filters used mostly in Radios.




(A) represents a great number of different frequencies.

(B) is a low pass filter- that allows the low freq. to pass but apposes the HF. In this class we will find power supply condensers and chokes; 110 v. interference chokes and condensers; detector plate choke and bypass condenser; speaker voice coil chokes and condensers as previously used to control hum; and the tone control condenser and variable resistor.

(C) is a High pass filter that allows HF to pass but opposes the low freq. HF will pass thru the condenser but low freq. will not to any extent. This is one of the main principles of Radio, that DC will not go thru a condenser, but will only charge it. The higher the freq. the more it will "pass thru" a Condenser.

(D) is a Band pass filter that allows certain freq. to pass thru but opposes those below and above. This is the Acceptor type of filter, or Wave trap.

(E) is the Rejector, or suppression type of filter. This allows other freq. to pass thru except the ones not desired.

Therefore, the Traps can be classified into two general groups - Acceptor and Rejector.

The Acceptor, or booster type you tune the condenser to the station desired. This operates as a drain for all other freq. That is, it offers an Impedance to the desired signal, but none for all other freq. above or below. It always seems to "boost" the desired signal a lot.

In the Rejector type you tune the condenser to the station not wanted, and leave it there while tuning the balance of the set on other stations. It is said it has a depreciating effect on volume of other stations, but this is greatly offset by the lack of interference encountered. In this type very low impedance is offered to the undesired signal, but zero to other freq. This is the reason why loud signals may be cut away down in volume but not clear out, due to a certain amount of impedance still left. It is to be understood that when we tune we offer greater impedance to the signal at that freq. The peak of a sharply tuned signal draws more current than the other freq. around it. If there is a "rounded" resonant peak it is said to tune broadly. One may

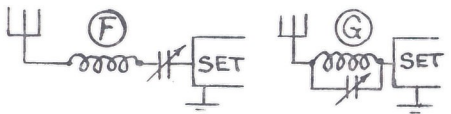
set the Rejector trap, in some locations, so the volume of the loud interfering station about equals each of the others - so it makes nice tuning.

Like in our QRM Coil, close-coupling is necessary to get the best results in Acceptor or Rejector circuits. For this reason we wind 20 turns right over the large coil. Coils for our #4, #9 and #39 sets are wound this way, and give very close coupling. They will work efficiently in a Trap circuit tuned by a .00035.

While Celluloid or Bakelite is OK for large diameter coils - we found, for some reason, that 1" Fibre tubing is better for our QRM coils. As there is a greater dielectric loss in Fibre, it is possible this offered additional reactance that was required for best results. However, they cut signals out like a knife.

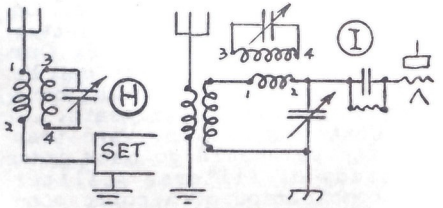
If Wave traps are used on tube sets, they should be shielded. It is said that if your tube set coils pick up local signals - a Trap isn't going to help much. In a Crystal set it doesn't seem to make much difference if they are shielded or not- but we prefer them open. Our experiments placing QRM coils close to tuning coils produced little ill effect. If one does wish to put a shield around them, use Copper or Aluminum sheet or foil, or even Tin is OK. But, it should be placed at least 2" from coil.

A Wave trap may be rigged up as a Wavemeter. Use one of our Logging Dial Scales (CAT. 10-72. $1.00) on your condenser and you may "dot" the readings on it for future reference. Place the coil next to a tuning coil in your set and pull the condenser around. When you hit the station you will know it. Log it down. This is very accurate as a Lab. instrument for checking freq.



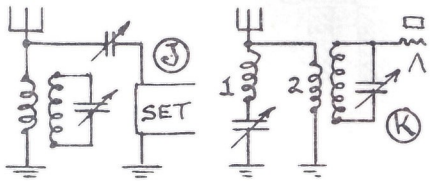

(F) is a coil in series with a condenser. This is like a loading coil in the Antenna, and will increase, or accept the signal. If coil and condenser are placed across Ant. and ground it will cut the signal.

(G) is a Rejector circuit of one coil hooked in series. Cond. is tuned to undesired station. In some cases this will eliminate the undesired station more than (H) because it is closer-coupled to the circuit.



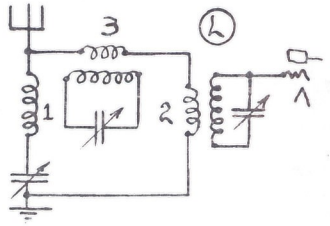

(H) is the type used in our QRM coils. In most cases it works as well as (G) but doesn't affect the efficiency on the other stations being tuned as much.

(I) shows a Rejector type (QRM coil) placed in series with the tuning cond. and coil. It will work in a Crystal or tube set.



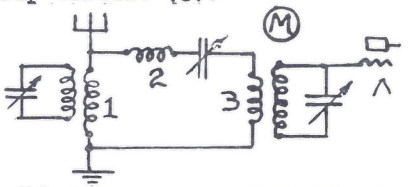

(J) is the Rejector type again - using the QRM coil to push the signal. The coupling cond. tends to tune the Ant. with the set.

(K) This multiple Trap at (1) tends to lessen the path for the interfering station but allows other freq. to pass over thru 2.

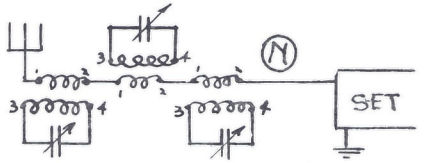





(L) is a modification of (K) where any small amount of QRM signal that may pass thru (2) is prevented from doing so by the Trap circuit (3).

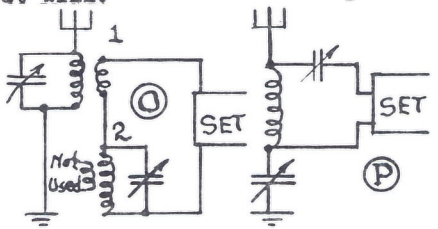



(M) is a very good double Trap booster circuit to try. The QRM coil at (1) is an Acceptor and boosts the signals. (2) is another Acceptor circuit. If hooked from Ant. to ground it would be a Rejector circuit. Therefore, both (1) and (2) are tuned to



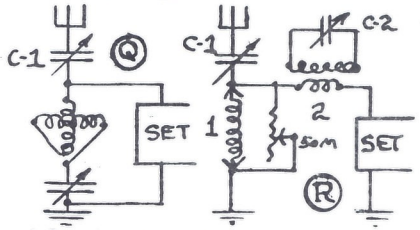

the same desired signal.

(N) shows several Rejector type Traps hooked in series. It is for a congested area where a lot of strong stations operate. Each QRM coil is tuned to one station and left there. Trimmers may be used instead of the 350 mmfd. cond. Then, you go ahead and tune the balance of stations at will.



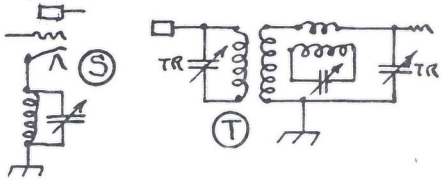

(O) This is a relay booster, or Acceptor circuit using two QRM coils. (1) tunes the Ant. & ground to the desired signal. It is then induced into the smaller coil that feeds the signal into the large coil at (2). The smaller winding is not used. The primary of the set coil completes the tuning circuit. Due to the additional loose-coupling the signal is appreciably made much sharper.

(P) is an Acceptor type and is one of the most efficient methods of tuning a receiver. Each cond. may be .00035. Plug-in coils may be used for different bands or ranges.



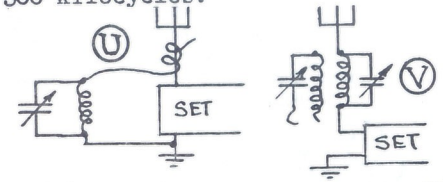

(Q) is the circuit of the old "Filtrola" - once built to cope with interference problems. The makers claimed it not only amplified the signal but tended to sharpen it and cut out unwanted stations. It used a Variometer in series. (C-1) balanced the set to the Ant. (C-2) helped to tune the Variometer to the signal. By careful manipulation this Acceptor circuit will work very well under present conditions.

(R) is a good Acceptor-Rejector Trap circuit. The coil (1) may be a plug-in if desired. The (C-1) is tuned to the desired station. (C-2) is put on the bad station and left alone. The balance of the set is then tuned at will. The variable resistor acts as a "static leak" and has some effect on the tuning and volume. It is a little critical in tuning, but really efficient.



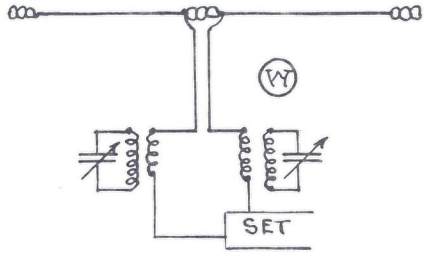

(S) Wave traps may be placed in various parts of a tube circuit. This one shows a Rejector type placed in the Cathode lead of a tube. Refer to (I) for one in the grid circuit.

(T) shows a Rejector placed in the Intermediate Freq. stage of a superhet. to lessen interference from Coastal stations on 500 kilocycles.

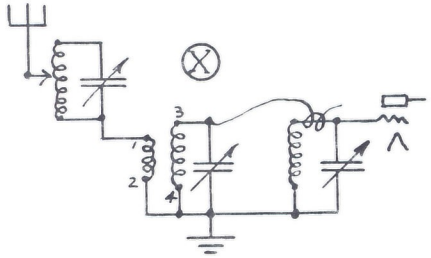



(U) is an Acceptor QRM coil hooked to any receiver. However, just the ground is direct. The top lead just loops around the leadin with insulated wire. The more turns the more coupling effect you get. It will boost the signals a lot - and isn't a bit hard to rig up.

(V) is an I.F.Transformer used as a Rejector Trap in series with Ant. and set to cut out the 500 kc. code stations. Disconnect the other cond. entirely on one side so it won't interfere with operations. In Certain locations this may be used if near a Coastal transmitter.




(W) shows how two QRM coils may be used as Rejectors on a Doublet or Zeppelin Aerial. Tune each one to the unwanted station and leave them.



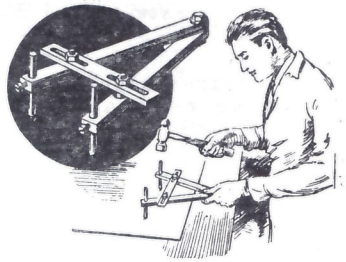

(X) is a tapped Rejector Trap fed into a booster circuit, that is inductively coupled to the RF tuning coil of a receiver. This may be added to any set, but it is a good idea to couple the booster coil over to the tuning coil with a "Hi-gain" jumper as shown. Just wrap a piece of insulated wire around the grid loosely. This is one from Argentina. Plenty of selectivity.

This should keep you busy for some time. Remember, most of the circuits may be used for Crystal sets as well as tube.

## HINTS & KINKS.

**Controlling Drill Depth.** Find a collar with setscrew and fasten it on the drill for proper depth in drilling.

**Adjustable Spacing Punch.**



*With This Device, Equally Spaced Holes Can Be Center-Punched in Work*

**Slots with Hacksaws.** The usual pins on a hacksaw frame will take several blades. A wire around each end will hold the blades steady.

**Glass Cutter** may be made by fastening a phonograph needle in a holder handle.

**Tube Puller** may be made from an old vibrator rubber tube. It sticks to glass. Also prevents a burned finger. -Behncke.

**Mice** will stay out of your shop if you sprinkle Cayenne pepper along their trail. A hot jolt from a transformer will eliminate them altogether!

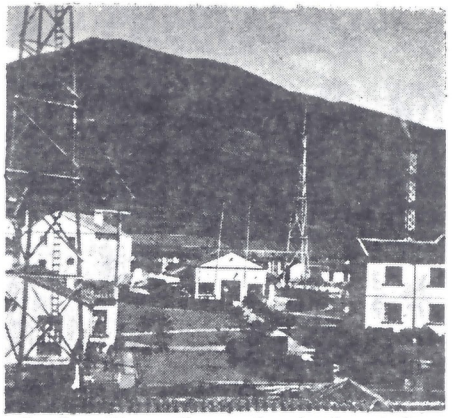



"The DX properties of a set are astounding if one properly tunes the Ant.-ground circuit."

This is the statement by Mr. Osterhoudt, on page 12 of issue #42, RB&H. A truer statement could never be made, and Experimenters as well as Old Timers, should memorize this.Plant it in your mind and you won't have to worry about getting DX.

I have run across many cases involving the improvement of the Ant. circuit, and I will cite 2 here for your benefit.One had to do with an old Truetone set that had the Marine band added to it. Seems like the set wouldn't get the fishing fleet loud enough to satisfy the customer. When the set showed no fault as to parts and tubes, I turned by attention to the Ant. circuit, and here is what I found. The Pri. winding of the SW coil was separated about ½" from the secondary. It seems it could have been a little closer. However, instead of slipping it up, I wound 20 Ts of #32 DCC right over the Sec. and hooked to Ant. and ground. Did this change the situation? I'll say it did. The whole band took on new life.

Another case involved my old Philco 3810. By simply adding a Loopstick in the Ant. lead it has enabled LF-BC stations to come in that have never been heard before. Not much change on the HF end of the dial, or the SW band, but a good 50% increase in sensitivity on the Lo-BC end.



**Ecuador:** The wellknown broadcasting station HCJB, Quito Ecuador. Photo shows the buildings, antennas and the suburb.

Remember, your A-G circuit is the GATE and must be properly opened if the crowd is to come in - otherwise half of them will be shut out. I repeat "the DX properties are astounding if one properly tunes the A-G circuit."

Last issue I listed the Short wave outlets of the Venezuela stations. This issue I am giving the Broadcast band outlets. I'm going to try to have a picture of some announcer or so in every issue if possible. Let me hear your views on this column.

Try to rig a 2-plate trimmer Cond. across your tuning Cond. Make plates ¼" apart. Go slow in tuning for weak DX stations. As you creep along you will snag a lot of new ones. Going over the dial an hour later - you will find some more. Always keep a Log handy so you can find them later. Readings may shift some due to drift of Xmtr. and set.

**Lee St. John, Ohio,** says:"Geo. started me collecting QSL cards by the SW Mailbag.I have received 12 Foreign already.Keep those SW articles coming. Belgium is stopping Goodwill BC's to her friendly countries. I enjoy RB&H very much and owe my starting in the Hobby to MRL."

## VENEZUELA BC STATION LIST.

By Geo. R. Anglado.

| CALL | KC. | KW. | CALL | KC. |
|---|---|---|---|---|
| YVKL | 590 | 3 | YVKE | 1100 |
| YVKA | 630 | 5 | YVME | 1120 |
| YVLH | 660 | | YVQB | 1120 |
| YVLB | 690 | 1 | YVMD | 1150 |
| YVQF | 720 | | YVNA | 1150 |
| YVKY | 710 | 1 | YVKQ | 1160 |
| YVKS | 750 | 3 | YVMK | 1180 |
| YVOD | 780 | | YVMN | 1210 |
| YVKC | 790 | | YVMH | 1250 |
| YV4RE | 850 | | YVMP | 1270 |
| YVKT | 880 | | YVLF | 1290 |
| YVLJ | 930 | | YVMB | 1300 |
| YVKG | 960 | 5 | YVMI | 1400 |
| YVOB | 980 | 3 | YVQD | 1400 |
| YVQM | 1010 | | YVRB | 1420 |
| YVLL | 1020 | | YVOL | 1450 |
| YVQN | 1030 | | YVMR | 1490 |
| YVQJ | 1080 | | | |

## THE EVOLUTION OF CALL LETTERS.

"In the operation of Morse telegraphy it is the usual custom to allot each station a 'call,' consisting of one or 2 letters of the alphabet. For example 'N' 'X' or 'NY' etc. To call that station one signals his letter repeatedly and follows by his own call. To acknowledge this call the receiving station will signal 'I' 3 or more times followed by call of his station. If a call is unknown he sends 'A' (now CQ) and signs off at intervals." Maver's Wireless. 1903.

Little did they realize, in 1903, that in 1956 there would be over 275,000 licensed transmitting stations. Neither did they figure we would exhaust the alphabet and throw in a handful of figures to boot.

**1910.** Referring to Maver again for a partial list of stations, we come up with some interesting ones. QG at Annapolis now we believe is NSS. B was Baltimore. WA was Waldorf-Astoria Hotel in NYC. TA was Cape Blanco, Ore. & now NPF. UC was Honolulu and now NPM, PJ was Los Angeles, and it may be a coincidence, but KPJ was operating during 1914 to the start of World War I by Marconi, and changed to NPJ Navy San Pedro. SF was San Francisco and was later NPG on Goat Island. and later transferred to Mare Island Navy Yard. TD Table Bluff, Cal. is now NPW at Eureka. Some of the known ships were MFA Lusitania; MGA Mauretania; DBR the Bremen; and RY Yale and RH Harvard of the Pacific coast.

**1914.** From Marconi Press of London, in the "Yearbook of Wireless" we find 110 pages of 3-letter Ship calls, and 50 pages of 3-letter World Land stations. Reminiscing - I find 4 of the 8 Ships I was Radio operator on from 1920-23. They were WTT Atlas; WWR Rose City; WTY Standard Oil Barge 93; and WSW Willamette - the other 4 weren't built yet. No telling how old some of the old scows get - they just keep fixing them up!

For Land stations we also find some interesting ones. KPH is still listed as S.F. altho it has been moved here and there - and now at Bolinas. KHK Kahuku, T.H., still operates to my knowledge. KHJ was KOko Head, T.H., now call of BC at Los Angeles.

**1931.** Comparing International prefixes, we find many of them unchanged from present ones.

When World War 1 ended we all rigged up Ford Spark coils. Around Los Angeles some of us got 30 miles. As for tuning there wasn't much trouble as only a handful of us operated, and we were spread all over the dial! My call was "EO." "DS" was Frank Geisel, now holding the much-covetted Chief Op. job at KPH. "RB" Bob Barnhard went to Sea & later vanished. "IT" was another that got lost from us. "BT" Ben Lenz, who went to Sea, ran a Rdo Shop for 25 yrs. and now owns a Real estate chain. "AHS" was Art Spencer, somewhere in Los Angeles. YEP - you guessed it - they stopped us. Too much fun - and too easy. Now we had to get a license or shut up. Mine turned out to be 6NW. in 1919.

In 1920's a Ham in Calif. work-New Zealand. Hams got 3-letter calls. BC stations swiped the 3-letter Ship calls. Coast stations calling Ships now sound like a cypher test. Hams likewise!



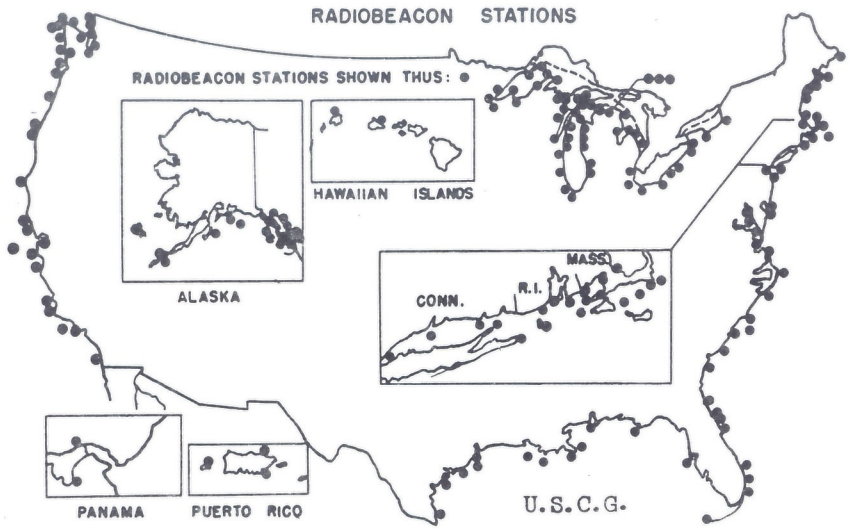
# INTERNATIONAL PREFIXES

Courtesy CQ Magazine

| | |
|---|---|
| AAA-ALZ | U.S.A. |
| AMA-AOZ | Spain |
| APA-ASZ | Pakistan |
| ATA-AWZ | India |
| XA-AZZ | Argentina |
| BAA-BZZ | China |
| CAA-CEZ | Chile |
| CFA-CKZ | Canada |
| CLA-CMZ | Cuba |
| CNA-CNZ | Fr. Morocco |
| COA-COZ | Cuba |
| CPA-CPZ | Bolivia |
| CQA-CRZ | Portuguese Colonies |
| CSA-CUZ | Portugal |
| CVA-CXZ | Uruguay |
| CYA-CZZ | Canada |
| DAA-DMZ | Germany |
| DNA-DQZ | Belgian Congo |
| DRA-DTZ | Bielorussian S.S.R. |
| DUA-DZZ | Philippines |
| EAA-EHZ | Spain |
| EIA-EJZ | Ireland |
| EKA-EKZ | U.S.S.R. |
| ELA-ELZ | Liberia |
| EMA-EOZ | U.S.S.R. |
| EPA-EQZ | Iran |
| ERA-ERZ | U.S.S.R. |
| ESA-ESZ | Estonia |
| ETA-ETZ | Ethiopia |
| EUA-EZZ | U.S.S.R. |
| FAA-FZZ | France and Colonies |
| GAA-GZZ | England |
| HAA-HAZ | Hungary |
| HBA-HBZ | Switzerland |
| HCA-HDZ | Ecuador |
| HEA-HEZ | Switzerland |
| HFA-HFZ | Poland |
| HGA-HGZ | Hungary |
| HHA-HHZ | Haiti |
| HIA-HIZ | Dominican Rep. |
| HJA-HKZ | Colombia |
| HLA-HMZ | Korea |
| HNA-HNZ | Iraq |
| HOA-HPZ | Panama |
| HQA-HRZ | Honduras |
| HSA-HSZ | Thailand |
| HTA-HTZ | Nicaragua |
| HUA-HUZ | San Salvador |
| HVA-HVZ | Vatican City |
| HWA-HYZ | France and Colonies |
| HZA-HZZ | Saudi Arabia |
| IAA-IZZ | Italy and Colonies |
| JAA-JSZ | Japan |
| JTA-JVZ | Mongolia |
| JWA-JXZ | Norway |
| JYA-JYZ | Jordan |
| JZA-JZZ | Dutch New Guinea |
| KAA-KZZ | U.S.A. |
| LAA-LNZ | Norway |
| LOA-LWZ | Argentina |
| LXA-LXZ | Luxembourg |
| LYA-LYZ | Lithuania |
| LZA-LZZ | Bulgaria |
| MAA-MZZ | England |
| NAA-NZZ | U.S.A. |
| OAA-OCZ | Peru |
| ODA-ODZ | Lebanon |
| OEA-OEZ | Austria |
| OFA-OJZ | Finland |
| OKA-OMZ | Czechoslovakia |
| ONA-OTZ | Belgium and Colonies |
| OUA-OZZ | Denmark |
| PAA-PIZ | Holland |
| PJA-PJZ | Curacao |
| PKA-POZ | Dutch Indies |
| PPA-PYZ | Brazil |
| PZA-PZZ | Dutch Guiana |
| QAA-QZZ | (Q signals) |
| RAA-RZZ | U.S.S.R. |
| SAA-SMZ | Sweden |
| SNA-SRZ | Poland |
| SSA-SUZ | Egypt |
| SVA-SZZ | Greece |
| TAA-TCZ | Turkey |
| TEA-TEZ | Costa Rica |
| TFA-TFZ | Iceland |
| TGA-TGZ | Guatemala |
| THA-THZ | France and Colonies |
| TIA-TIZ | Costa Rica |
| TJA-TZZ | France and Colonies |
| UAA-UQZ | U.S.S.R. |
| URA-UTZ | Ukraine S.S.R. |
| UUA-UZZ | U.S.S.R. |
| VAA-VGZ | Canada |
| VHA-VNZ | Australia |
| VOA-VOZ | Newfoundland |
| VPA-VSZ | British Colonies |
| VTA-VWZ | India |
| VXA-VYZ | Canada |
| VZA-VZZ | Australia |
| WAA-WZZ | U.S.A. |
| XAA-XIZ | Mexico |
| XJA-XOZ | Canada |
| XPA-XPZ | Denmark |
| XQA-XRZ | Chile |
| XSA-XSZ | China |
| XUA-XUZ | Cambodia |
| XVA-XYZ | Viet-Nam |
| XWA-XWZ | Laos |
| XXA-XXZ | Portuguese Colonies |
| XYA-XZZ | Burma |
| YAA-YAZ | Afghanistan |
| YBA-YHZ | Indonesia |
| YIA-YIZ | Iraq |
| YJA-YJZ | New Hebrides |
| YKA-YKZ | Syria |
| YLA-YLZ | Latvia |
| YMA-YMZ | Turkey |
| YNA-YNZ | Nicaragua |
| YOA-YRZ | Roumania |
| YSA-YSZ | San Salvador |
| YTA-YUZ | Yugoslavia |
| YVA-YVZ | Venezuela |
| YZA-YZZ | Yugoslavia |
| ZAA-ZAZ | Albania |
| ZBA-ZJZ | British Colonies |
| ZKA-ZMZ | New Zealand |
| ZNA-ZOZ | British Colonies |
| ZPA-ZPZ | Paraguay |
| ZQA-ZQZ | British Colonies |
| ZRA-ZUZ | Union of South Africa |
| ZVA-ZZZ | Brazil |
| 2AA-2ZZ | England |
| 3AA-3AZ | Monaco |
| 3BA-3FZ | Canada |
| 3GA-3GZ | Chile |
| 3HA-3UZ | China |
| 3VA-3VZ | Tunisia |
| 3WA-3WZ | Viet-Nam |
| 3YA-3YZ | Norway |
| 3ZA-3ZZ | Poland |
| 4AA-4CZ | Mexico |
| 4DA-4IZ | Philippines |
| 4JA-4LZ | U.S.S.R. |
| 4MA-4MZ | Venezuela |
| 4NA-4OZ | Yugoslavia |
| 4PA-4SZ | Ceylon |
| 4TA-4TZ | Peru |
| 4UA-4UZ | United Nations |
| 4VA-4VZ | Haiti |
| 4WA-4WZ | Yemen |
| 4XA-4XZ | Israel |
| 4YA-4YZ | Int. Civil Aviation |
| 5AA-5AZ | Libya |
| 6AA-6ZZ | (No allocation) |
| 7AA-7ZZ | (No allocation) |
| 8AA-8ZZ | (No allocation) |
| 9AA-9AZ | San Marino |
| 9NA-9NZ | Nepal |
| 9SA-9SZ | Saar |

Above classifications are for Commercial listings. For a Ham station they take the first one or 2 letters and add a number & letters. For instance DQ1AA is a Ham in Belgian Congo. HF9KAA is one in Poland. 4C6UE in Mexico. AK8SY is U.S.A. W6JWF U.S.A.

As said on page 8, Ham signals are like the Cypher code. In the Radio School they drilled us for hours on 5-letter code. Tune in the Ham CW bands and you can get all the practice you want for nothing, at your leisure.




The Marine Radiobeacon System of the United States,

## RADIO BEACONS FOR ATLANTIC AND GULF COASTS.

Listed north to South, in KC.

..-.

294 Partridge Id., Canada.
314 Block Id., R.I.
302 Georgetown, So.Car.

-..

296 Sambro L.S., Canada.
294 Pt. Judith, R.I.
290 Ship Shoal, La.

-.-.

290 Cross Id., Canada.
308 Cleveland Ledge, Mass.
294 Scotland L.S., N.Jersey.
312 Cape Lookout, N. Car.
300 Mobile Pt., Alabama.

.-

308 Lurcher L.S., Canada

.-..

308 Western Head, Canada.
290 Ponce de Leon, Florida.
296 San Juan, Porto Rico.

....

308 Seal Id., Canada

-.--

288 West Quoddy, Maine
296 Brazos-Santiago, Texas.

-...

288 Mt. Desert,Maine.
306 Sandy Point, Maryland.
286 Fowey Rocks, Florida.

.--.

294 Matinicus Rock, Maine.
310 Stratford Shoal, Conn.
312 Chesapeake, Virginia.
286 Edmont Key, Florida.

----.

308 Manana Id., Maine.
298 Winter Quarter L.S., Md.
286 Dry Tortugas, Florida.

---

312 Half Way Rock, Maine.
286 Barnegat, New Jersey.
296 Mona Id., Porto Rico

-.-

288 Portland L.S., Maine.
310 Execution Rocks, N. York.
290 Cape Henry, Virginia.
306 St. Johns L.S., Georgia.
314 Aransas Pass, Texas.

..-.

292 Eastern Point, Mass.
286 Fire Island, New York.
302 Bald Head, N. Car.

--..

302 Boston L.S., Mass.
290 Wolf Trap, Maryland.
308 Cape Canaveral, Florida.

--.-

302 Cape Cod, Mass.
298 Hillsboro Inlet, Florida.

-..-

314 Pollock Rip L.S., Mass.
290 Smith Point, Maryland.
288 Point Tuna, Florida.
314 Galveston Jetty, Texas.



.--

302 Vineyard Sound L.S., Mass.
306 Cove Point, Maine.
290 Cape San Blas, Alabama.

--.--

308 Handkerchief L.S., Mass.

..-

292 Cape Cod Canal Bkwter., Mass.

-.-.

298 Stone Horse L.S., Mass.
310 Brenton Reef L.S.. R.Is.
------ (dashes in groups)
296 Butler Flats, Mass.
286 Nolska Pt. Float, Mass.
292 Cape May, New Jersey.
288 Brandywine Shoal, N.J.
300 Newport News, Virginia.
296 Sabine Pass E. Jetty, Texas

--.

292 Nolska Point, Mass.
312 Diamond L.S., N. Car.
314 Sabine Pass, Texas.

--.--

288 Hen & Chickens L.S., Mass.

.---

294 Little Gull Id., Conn.
306 Jupiter Inlet, Florida.

-.--

306 Montauk Point, N.York.

-..-

308 Cornfield Point, Conn.

286 Ambrose L.S., New York.
294 Charlestown, So. Car.

..--

298 Five Fathom L.S., N.Jersey.
294 Savannah, Georgia.

.-.

306 Overfalls L.S., Delaware.

--

294 Frying Pan L.S., N. Car.
300 South Pass, Louisiana.
306 Cape Mala, Canal Zone.

----

300 Southwest Pass, Louisiana.

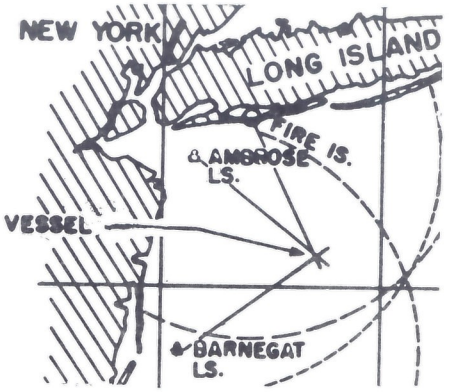
-

306 Cristobal Mole, Canal Zone.

## RADIO BEACON NOTES.

Next issue will wind up the Radio beacons by covering the Great Lakes area. RB&H 42 listed the Pacific Coast area from Alaska to Panama.

There is a variation in some of the signals on this Coast, i.e., Handkerchief Lightship,Mass. which has a variation in tone, but not frequency.As signals are modulated they may be received on a Crystal set if near.




To get these Beacons good use our 1-tube kit and the Long wave coil. Short the series-tuning trimmer and just use the .00035 across the coil. This will give you up to 1200 meters (205 kc). You'll also reach most of the Long wave Aircraft beacons on 200-400 kc. Plenty of tickler turns R on the coil, but if you don't have good oscillation just put another .0001 from CT of the Volume control to chassis.

You will find a lot more info. on Long waves and beacons in the RB&H #41 and 42.

Due to their low frequency the Radio beacons may be used for calibrating an oscillator, wavemeter, etc. Tune set and oscillator to, say 306 kc., and make a check-point. Drop oscillator to 612 for an interfering whistle and make another. See DP-42 for more information on this.

Can sympathize with the Mariners when you see this congested area around Conn. and R.I. However,it is probably well-charted in comparison to Alaskan waters. In the latter - a rock is seldom charted until someone hits it!

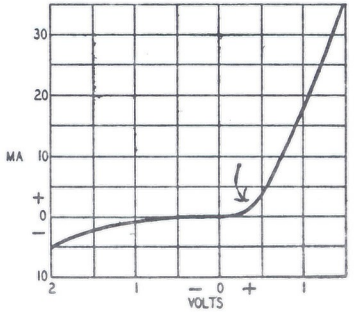
All Radio beacons operate in foggy weather. In clear weather they work 1 or 2 10-min. periods of each hour. Log them down.

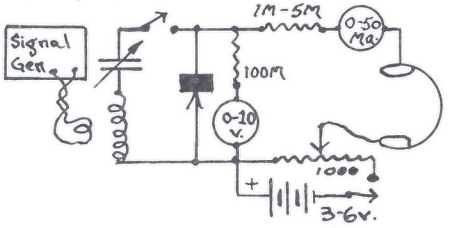
# Crystal Set Notes.

With the last issue we have given 2 pages for this section. Even so, it is impossible to begin to cover all our notes. MRL hopes you find something good.

**Transistor patents released.** No doubt you have read of the long-time litigation in the anti trust suits with G.E., AT&T, WE, etc. As a compromise they released some 8600 patents for use of the public without royalty. Other companies are soon to announce the same. Of special interest to us is the Transistor, which was developed about 4 yrs. ago. Its original price was $30. W.E. will still make phones for AT&T. Other releases were the Solar batt., about 2 yrs. old, and the AT&T color TV system. It should stabilize the prices as many should be building them. Some companies have stopped making Diodes and Transistors as it wasn't possible to squeeze a lot of dollars out of people. Like a company I worked for during the War that got $7 each for Quartz Xtals - that now sell for $1. If they can't "clean up" they quit.

**NEW Alloys.** Early Transistors were made from Germanium, and some now use Silicon. Germanium is sensitive to heat. Silicon has a higher melting pt. but is hard to work in this condition. By combining metals to make various alloys - certain conditions are bettered. One patent is for an alloy made from Gallium, Aluminum and Antimony, which are all good semi-conductors. This is the curve for the alloy. The point (arrow) is the sensitive detecting point, which is about ¼ volt. Gallium melts at 30 deg. C. and is liquid in warm weather. It occurs in ores of Iron, Zinc, Aluminum and Chromium - therefore its attraction to Aluminum. This will give the low melting point.




If you are not familiar with characteristic curves of detectors here is an old-time circuit you may try. C/W is adjusted for sensitivity and clear note with switch on. Sw is opened and a graph is plotted for Amps. and Volts, as above. You can check the sensitive point, where the graph changes abruptly. The idea is that an incoming signal will add a little voltage that will give the most boost. This is the principle of the detector.

**Iron pyrites** from Colorado is exceptionally good. After being abandoned in the early 1900's - Rico, Colo. has staged a comeback to produce 150 tons of Iron pyrites a day. The principle use is making Sulfuric acid. Any of you near there - you might find some FB crystals.

**Likes HB-3.** Bruce Muscolino, Ohio, writes: "I think HB-3 is just the last thing. All info. on the subject of Xtal detectors is included. Just what the Experimenter needs."

**Moscow on #2.** Our good friend, Elmer Burton, Ohio, says: "Just a line. On Dec. 24th, 2:50 pm to 12:30 midnite I played Moscow (4750 miles) very good on your #2. It came in on the 2nd tap fm the left, with dials on 90. It's the same spot for the 40 m. Amateurs. I also heard it in the same spot tonite with 30' of wire about the room. With a 350 mmfd. cond. in series with Ant. it worked better at 6:15 pm."



**"The Radio Mine"** in Spring Valley, not far from Lovelock, Nevada, has a story. Every time a mining man and his son passed a certain point their auto Radio went dead. They found a rich Silver-lead, or Galena vein. A 100' shaft and a 100' level one, were worked for years. When the market went down they let it fill with water. One miner heard organ music from a Radio station at the entrance. you can take it as you wish. It might have been some of that Cactus moonshine, could be!

**2-12 Xtal Set (RB&H 42).** Fred Behncke, Calif., says he got good results on this set. But, he run the coil full of wire, except 1" from the end.

**LOOPstick has Volume.** One fellow reports his Loopstick Xtal set hooked to a 3-tube record player just knocks his ears off if turned on full. Good tone, 2.

**Reversed Transistor Amplifier (DP-14).** Tod Wakefield, Calif., uses MRL #11 Xtal circuit DP-56, with Transistor amplifier DP-14, and gets good volume. But, when he puts the Transistor ahead of the #11 he gets more volume! He didn't say if it was just on loud stations. Being in a Trailer, where he can't erect an Ant. (these Landlords?) he made up a kite-shaped Ant. 7' high and 5' across. Put about 200' of wire on it, and a Loopstick in series for loading. Even the Xtal set is now too loud for phones. May be a good thing for you "sardines" to try out.

**Moscow on 10-A.** Nyal A. McConoughey, Ohio, got Moscow (4750) on his set, but used an amplifier of his tube set. He used a 3" coil instead of the 2" one.

**TV Xmtr. QRM.** Manuel Castro, Calif., (K6AMB), reports he is real close to a TV transmitter. The video picture makes a sound like a 60 to 400 cycle note on his #2 Xtal set. #2 gets cw in form of "puffs of wind." Can't believe how #2 cuts them out and all the QRM around him.

**Likes Fixed Carborundum.** Steve Davis, Va.,: "Works fine. Holds adjustment perfectly and plenty of volume. It's the best Xtal I ever used." They usually get reset in shipping. We set them on a station with a Xtal set here.

**#11 is OK.** J. Gagnier, Ont., Canada: "Been busy experimenting with Xtal sets. #11 works fine-especially on Hams. I disconnect the ground and in they come. Good on local BC and DX. I get 2 stations in W.Va. (500) and Chicago (450) nightly."

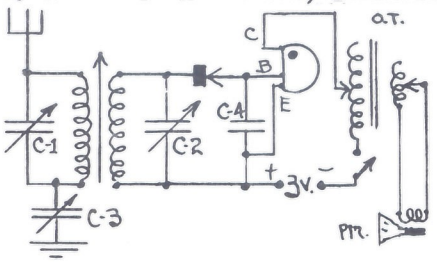
**Mounting Transistors & Batts.** We get along pretty well using 3/4 Fahnstock clips for Transistors. Be sure to mark them as C-B-E. Let's start a plan to draw Transistors like on page 14 and believe it will be less confusing. At least we'll do it. Take a pc. of plywood, or Compo. and make you some brass or phosphor-bronze clips for Batts. Or, even tape several flash-cells together and solder leads. No need to buy expensive batt. holders.

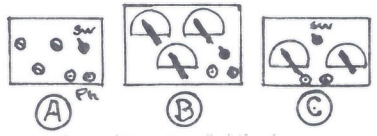
**Raytheon Transistor Book.** We got our copy. While most of it is reprinted from R-TV News and R.E., there are 10 from different sources. However, it is neatly gotten up, and puts them all together in a 116 p. book. Send Ur 50¢ to Raytheon Mfg. Co., 55 Chapel St., Newton 58, Mass.

**Catwhiskers** are most important in getting DX. For most crystals a fine wire with a light touch is most essential. Once you hear a faint station re-adjust the c/w until maximum volume is had. Steel galena is usually better than Diodes as c/w is lighter.

## A TWO-LOOPSTICK TRANSISTOR SET.

By Robert D. Mickelson, Illinois




Parts List:

| | |
|---|---|
| 2 Loopsticks. 7-179..... | .75 |
| 1 Crystal Diode, see CAT. | |
| 3 50-500 Trimmers. 8-96. Ea. | .15 |
| 1 CK-722 Transistor. 9-46. | 1.98 |
| 1 .002 Mica cond. 8-22..... | .20 |
| 1 Universal Output Tr. 24-3 | 1.50 |
| 1 PM speaker, see CAT. | |
| 2 Drycells. 3-1. Each..... | .15 |
| 2 Tip Jacks. 17-26 Each.... | .10 |
| 1 SPST Tog. Switch. 23-1... | .35 |
| 1 4x6 Compo. panel..... | .11 |
| (B) Variation: | |
| 3 .00035 Var. 8-7. Each.... | 1.25 |
| 3 1½" Bar knobs & scales... | .42 |
| 1 5x7 Compo. Panel..... | .14 |
| (C) Variation: | |
| 1 2-gang .00035. 8-10..... | 1.75 |
| 1 .00035 Var. Cond. 8-7.... | 1.25 |
| 2 1½" Bar knobs & scales... | .28 |
| 1 4x7 Compo Panel..... | .12 |
| 1 Fix. Pyrites or Carborund. | .50 |

Recently I built this Radio that will operate a loudspeaker. The unit is quite simple and it will give the volume of a portable set if a good Ant.-ground are used. The set draws but 10 mils and can operate from two flashlite cells.

(A) The original compact model was built on a 4x6 Bak. panel. It was built with 3 mica trimmers instead of var. cond. Tuning can be accomplished by turning the trimmers or cores of the ferrite Loopsticks.

Three panel layouts are shown. (A) is original; (B) is with 3 var. cond. and (C) uses a 2-gang and a single.

C-1, C-2 and C-3, plus the two Loopsticks form the tuning circuit. C-3 can be substituted with a fixed cond. After the correct capacity is figured. It depends on the type and size of the Antenna used.

C-4 is a .002 mica RF bypass condenser and is not critical as to its size.

(C) is another deviation in tuning. This makes C-1 and C-2 a 2-gang variable. When the coupling is set, trim them up so the 2 sections track. C-3 can then be used to balance any discrepancy in the primary circuit.

The coupling between the two Loopsticks must be adjusted for max. selectivity and sensitivity next. Move them alongside each other until best position is located. Fasten down with Cellophane tape. or other means.

Almost any Diode may be used, or even to a fixed Iron pyrites or Carborundum. These will work, with the small current that will feed over. Try crystal both ways to get polarity right. You will notice the crystal is connected directly to the Transistor, but usually a bypass cond. is in between. I wouldn't use an adjustable crystal as it is necessary to have the current steady on the Transistor. If you want to make a change, cut the batt. off first. A CK-722 is used. but any PNP type is OK here.

Correct batt. polarity must be observed or the Transistor may be permanently damaged. A batt. holder may be made from 4 pieces of spring brass or copper.

The output transformer should be a Universal type so the correct impedance can be found. Ur choice of a PM speaker can be made from CATalog.

Skeptics may doubt the capabilities of this little set, but ample volume is had. An example is the complaints from the other members of the family sleeping next door!

There are many possible variations in the circuit and layout, that make it more interesting.

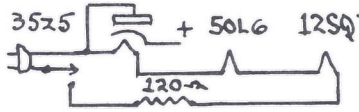


## FUN WITH FIGURES

Continued from RB&H #41 & 42. #41 discussed quick methods of figuring Ohm's Law. #42 covered series circuits in relation to Terminal voltage and drop.

### SERIES RESISTOR CIRCUITS. The tube string.

Cathode types of AC tubes may have their heaters hooked up in series with AC. If DC tubes are hooked in series with AC you get a bad hum. However, you may use DC on AC tubes in series. Following information may help you.




(1) What is the amperage of the tubes? The quickest way is to refer to a tube manual. In the above diagram you'll find each tube draws .15 A. To avoid complications most designers use tubes of the same amps. when put in series. The tube with the lowest Amp. rating regulates the current flow for the balance. If one tube drew but .075 Amps. you'd have to shunt a resistor across it to raise the Amps. If not, it would burn brightly and the balance low. Along this line some AC-DC sets use a pilot lamp in series. Be sure to replace it with the same Amp. and V. as the original, to balance circuit. It seems strange that we can use a dial lamp in series with tube fil. and 110, but it is right. This is the reason dial lamps R now numbered. At one time all we called for was 2.5 or 6.3 v.

(2) How to figure a line cord resistance. List the values of above tubes as follows:

| | |
|---|---|
| Line voltage..... | 115 |
| 35Z5 Rect. .15 A.... | 35 v. |
| 50L6 Amp. .15 A.... | 50 |
| 12SQ7 Diode. 15 A.... | 12 |
| Voltage used | -97 |
| Voltage drop needed | 18 |

so tubes won't burn out. To find the dropping resistance we use

$$\frac{E}{IR} = \frac{18}{.15\ A. \times R} = 120\ Ohms.$$

(3) Let's prove R drops the v. correctly:

$$\frac{E}{IR} = \frac{E}{.15A. \times 120} = 18\ v.\ (OK)$$

(4) What is wattage of each tube?

35Z5 = 35 v. x .15A. = 5.25 W.
50L6 = 50 v. x .15A. = 7.5 W.
12SQ7 = 12 v. x .15A. = 1.8 W.
Total watts drawn 14.55 W.

(5) Proving total is correct: 97 v. (total for tubes) x .15 A. gives 14.55 watts. (OK)

(6) What wattage is R? Watts = E x I = 18 v. (drop) X .15 A. = 2.7 watts. Therefore the line resistor may be a 5 watt Vitreous enamel resistor or an AC-DC line cord. A 2 watt resistor would heat up.

(7) What is total resistance of the string?

$$\frac{E}{IR} = \frac{115}{.15\ A. \times R} = 766\text{-}2/3\ Ohms.$$

(8) What does it cost to run the string?

115 v. X .15 A. = 17.25 Watts.

$$\frac{17.25\ watts \times .05¢}{1000\ (kw)} = .0008625\ ¢$$

per hour. Pretty cheap juice!

To lessen hum from a heater string, it is a good idea to arrange the most sensitive tubes near the ground, or chassis potential. For instance, from the chassis side put Audio detector, 1st AF, converter, RF and IF stages, power amp., rectifier & finally the dropping resistance.

In next RB&H we'll consider the more complicated parallel resistor circuits. They aren't nearly as bad as they sound and we'll give them to you easy!

## MRL 1-Tuber Notes. (HB-4, K-3)

**Shielding panel.** If you'd like to make the 1-tuber using a compo. panel just place a piece of tin on the rear of panel. During the War we had to use this as we couldn't get Aluminum. Tin will solder very easily.

**HF-BC Coil.** We discovered that instead of 20 turns tickler for this coil, we now use 14. Just take off 6 turns from the end of yours and it will work better. Little trouble is had getting BC to oscillate anyway. The HF and LF will then oscillate at about the same position on dial.

**Weather, Beacon and Airlines.** Get weather and Beacon bands (140-425 kc) on Long Wave coil, but short the series trimmer at rear of tuning cond. For Airline com. bands (2500-7000 kc) use 40 80 and 160 m. coils.

**Tube Bases.** One feller laughingly informs us he practiced on tube bases with his .22! Ouch! But now he sends them to us. We are getting a fair supply, but please keep sending them in. Order coils, even if you can't get bases. We'll do our best here.

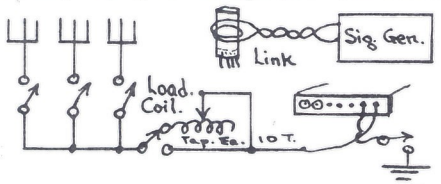
**3Q5 Tube.** C.B., Carlsbad, N. Mex. writes he uses a 3Q5 on the 1-T instead of 1C5. But he can use 45 v. of B. Says it is a wonderful rig. DX from all over!

**Improved Ant. Cond.** Have made several improvements on this 2-plater (8-118. 1.50). Plates are now closer together. Bronze brush extends above insulation to solder onto. Do not hold iron too long. Also, we use clear Plexiglas for insulation and hope it will work as well as the other.

**Series Tuning Cond.** If you've no signal generator just loosen the cond. about a half turn. Our var. cond. are running about 400 mmfd. now, but that is OK. makes them even better for Xtal sets. When using a signal generator make a couple of loops around the coil and twist the leads. It makes a link-coupled deal that cuts down harmonics, QRM, etc.

**1-T as Transmitter.** Elmer Burton, Ohio, advises he puts 90 v. B on his set and brings it to oscillation. He made a sked with a Ham a mile away, who owns a Hallicrafter's SX-71 and got a good signal on 1750 kc. He used no ground but 130' Ant. With a ground on his National SW-54 he can blink the pilot lite with the 1-T. He picks up oscillation down to 30 mc. He thinks it will transmit about 3 miles.

**London easy.** Dorr Tressler, Nebr., gets London an hour at a time, or several nites in a row on the 1-T. Uses 18 v. B on inside Ant. and no ground. He says 1-T depends a lot on Ant. system - and we agree with him. Everyone should have several Aerials, each hooked to a SPST Knife Sw. (12-12. 25¢) and a 100 turn loading coil, as per diagram. Certain




stations work better on a specific Aerial. Besides length, it depends on a lot of other things one cannot fortell. Mr. T. has been a cornetist since 1898, and director of many bands thruout the East. Now he plays on the Short wave bands!

**Long Distance.** F.B., Middleton N.S., Canada, writes: "Still hot after 1-T and Xtal sets, but 11th grade doesn't offer much time. I have picked up Prague (3700); Paris (3200); Madrid (3000); Br. Honduras (2400). I use DP-49 B-supply and cut the B down, like you said. Latin calls me, but am still cheering for you. In my DX Moscow (4000) and London (2800) don't count any more!"

No fooling- it is a big job to sort out the DX reports. If we leave yours out, don't get mad, we may squeeze it in later. Some may not like testimonials but hw R we 2 find out if U don't QSL?.

**SUBSCRIBE NOW!**



## DX Reports.

### MRL #2 or 2-A CRYSTAL SETS. HB-2

Sanford, Fla., R.L.: "I have built your #2 and 2-A sets. I haven't tried 2-A for distance, but on the first night I got Porto Rico (1200 mi.) on #2."

Des Moines, Iowa, R.C.: "On the #2-A I got XERF (1000); WWV and WWL (800); KOMA (450). Ur prices are lower than our local Wholesale houses. Like your Handbooks, DP's and RB&H very much."

Wellston, Ohio, E.B.: "I picked up Switzerland (4400 miles) last night on my #2 on 49 meters."

McLean, Texas, D.S.: "I have built your #2-A and have received stations up to 1100 miles on it with a 75 ft. Aerial."

### MRL #11 CRYSTAL SET. DP-56.

Halifax, N.S., Canada, F.W.: "I built your #11 Xtal and talk about a set! I get locals real loud and separate them all. Some sets cannot do this here. Always have a good word for you people. Still have your books."

### MRL #22 DX MARVEL XTAL. DP-45.

Armonk, N.Y., R.W.: "Your #2 is best I ever worked on BC. Also made your DX Marvel over 20 yrs. ago. I make a few changes now & then. It is very good for Hams & Foreign stations. You can single out a station and hold it from interference."

### MRL 24 XTAL SET. DP-55.

Franklin Mine, Mich., P.J.K.: "Having good success with your #24 Xtal. I hooked a 1-stage Amplifier of 1T4 tube to it one nite and got Australia (9400) on the speaker. Ur books are A-1 in my library."

### MRL #28 PLUG-IN XTAL. DP-28.

Hanford, Calif., D.W.L.: "I finished the #28 Xtal. Amazing little gadget. KSL (500) to KFI. Also the little "guitar" station circuits that don't blow very hard. KCBS (250) is like local."

### MRL #30 XTAL SET. DP-46.

Baltimore, Md., M.M.S.: "Find the #30 particularly good. Here selectivity was improved by running a Xtal return to center tap on coil (7-8). For the Xtal enthusiast, there is nothing like the DP File. The mass of info. compiled therein can keep the Fan absorbed for years."

### MRL 1-TUBE DC SET. DP-29.

Terrace Park, Ohio, G.H.: "Have had excellent results with your 1-tube Triode DC SW set. Have received Australia (9400) and Moscow (4800)."

### YOU NEED A GLOBE.

Mabel, in exchange for the new mink coat she didn't get Xmas - bought me a 10" Replogle Globe. Thanks to her we can now get our distances (in brackets) "approximately accurate."

In reports sent us we find errors in distances as much as 1500 miles. Like us, they had no way of getting correct distances as most of us do not own a late Rand, McNally Atlas. We had to dig into old Ship maps- converting nautical to statute miles by adding 1/6th. Around the Equator a degree is 69 mi. and zero at the Poles.

The only accurate method is on a Globe. Radio waves go in all directions but intensity runs in a straight line. Going from S.F. to London we go thru Montana, Hudson Bay, near Iceland, etc. - not the way ships go from NYC to London. SF to Moscow goes thru Oregon, near N. Pole and Finland as the "great circle" route. Be sure to get one with scale of miles on it or it won't be much help in figuring distances. All Fans should own a Globe.

## Questions & Answers.

What do these wise guys mean by "circular mils?" **ANS.** The guy that wears a slide rule doesn't like anything as simple as a Wire guage. He likes to call off the diameter in thousandths, or mils. For instance,#18 bare wire is .040" - or 40 mils. in dia. If we square this, we get 1600 circular mils, or the surface area. So, throw away that handy wire guage and get a micrometer!

I have a Traveler portable and it uses a 6½" Ferrite rod Ant. I hold a magnet near it and the signal increases. Polarity does not make any difference. **ANS.** A Loopstick is a tricky piece of furniture. Most magnetic lines of force travel thru a coil and back over the outside. They will travel better thru Iron than air - so there is a variation in the lines of force. Consequently, it changes the tuning on a coil. It is possible the magnet exerted a stronger field - and changed the tuning of your Loopstick for the better. There were also some of the local signals picked up on the metal magnet, just like increase of signals when you touch the tuning coil with a finger.

Is Lucite good for coil forms? **ANS.** Should make a good form. We will compare it with our forms & Mica, as follows:

| | Diel. Con. | Puncture |
|---|---|---|
| Lucite..... | 2.5-3..... | 480-500 v. |
| Our forms.. | 3.8 ..... | 300-1000 |
| Mica..... | 2.5-8..... | apr. 1000 |

Lucite is the one they bend the light around corners. Taking air as 1, Lucite & Mica are about the same. However, in our forms we use .015" material, which is extremely efficient (Q). Because Lucite is thick,we feel that for SW coils ours are better. You'll also note the puncture voltage is very low with Lucite. The only good way to test it is on DX stations - then you'll decide.

Does a TV Ant. or telephone wires affect a Crystal set or cause static? **ANS.** They should both aid your set, in getting U a lot more pickup in signals. If we get louder signals, we also get more static. At old KET, that worked an Alexanderson alternator with Hawaii, in 1920, I used to watch the ops. walk back and forth, and cuss. You could hear static with phones on the table. They used about a mile of wire in the Aerial, and it picked up all the static on the continent. They worked long wave. I would suggest your using several lengths of Ant. - each hooked to a SPST Knife switch and set.

What is an Impax coil? **ANS.** If my judgment is right, I believe it is the same as the Loopstick. Possibly an early trade name. We have never met one! hi.

What is Picrofarad? **ANS.** In Australian and British circuits it is used for micro-microfarads - and simpler it is. HT also is Hi-tension, or voltage (B plus). E is for Earth, ground. PV is Power valve. QPP is Quiescent push-pull. TT is tonic train. Catch on, Old Pip?

In HB-3 you say that "distant lightning" will ruin Transistors - how about that? **ANS.** Well the times and opinions change. The Navy and Army required Diodes to be shipped in Lead cases. Well, it may be OK, but think it is carrying things too far. Without a coil, or pickup, you couldn't absorb much RF energy. Besides, Germanium contacts are welded by hi-current when spot is found - so, if lightning is strong enough to wreck the Diode,it will mess up the rest of your set at the same time!

What about HB-5 to 16? **ANS.** OK what about 'em? Not out - have several titles in mind,and still taking notes on them. Wish we had a hundred titles- could sell every one of them. Will let you know as soon as we get going. If you haven't a file of our 6 HB's - be sure and order them.



## What's in the Mags.

### POPULAR ELECTRONICS. Feb., 1956.

"Kill TV Commercials." p. 42. Selenium cell and 2 PNP Transistors in a simple circuit. 722 is OK for this. 5 meg. control may be connected on right end so the Cir. will not be broken.

"Power Supply 4 Transistors." p. 47. Instead of the special diode, why not use Carborundum? Currents won't bother it and is a lot less expensive.

"Preselector." p. 52. A novel split-coil deal, tuning 2 freq. at once.

"Miniature Tuning Cond." p. 57 See Announcement page.

"Emergency Xtal Receiver." 60. I wouldn't build it. Dangerous!

"Transistor Topics." p. 70. A simple Xtal amplifier circuit. A quicker stunt for batts. is to tape them together and solder on jumpers. A good amplifier using a Loopstick. Note that when you use an Audio trans. you step it down instead of up, so reverse positions of pri. and sec. While matching trans. is good, it is't essential to make it work.

"Ohm's Law." p. 88. More along our line of "Fun with Figures."

"Tubeless Audio." p. 92. Again comes the Skindervicken button, yet. Use batt. carbon for contact. Some more fun!

"Compass Galvanometer." p. 94. Easy to make. Least current will deflect compass needle. Use the finest wire, and lots of it.

### POPULAR ELECTRONICS. Jan., 1956.

"Transistor Lite Meter." p. 43 Uses 0-1 m.a. instead of a costly micro-ammeter. Uses crystal photocell and PNP Transistor for amplifier. The amplifier enables you to use the 0-1 m.a.

"Bldg. Regenode Rec'r." p. 51. Our Type A coils will work fine here. Input from V1B half of the tube comes from Cathode, making it a cathode follower cir. Parts are not critical.

"Transistor Topics." p. 58. A good article on Power supplies, using Diodes. Why not use Carborundum? Also voltage doublers, and multipliers. Also amplifier.

### POPULAR ELECTRONICS. Nov., 1955.

"Reflex Receiver." p. 43. The 1N34 is reflexed back to grid of 1st tube. We used to bring them back thru Audio trans.We'd be millionaires now if we had a good 1N34 diode in the 20's as our main trouble was crystal-point-burnout. One contract of 100 sets was cancelled because of this. However, we sold the remainder for $59.50 which was cheap for a 4-tuber then. The reflex field has possibilities.

"Transistor Topics." p. 56. A regenerative cir. looks promising. Believe an N-P-N crystal is preferred for regeneration. Chernof uses 1N34 and PNP direct, instead of coupling cond.

"Crystal Rectifiers." p. 106. Interesting reading.

### RADIO ELECTRONICS. Feb., 1956.

"Transistor Chart." p. 40. A very good compendium - listing 116 types. Incidentally, Radio Receptor no longer makes Diodes or Transistors.Possibly foresaw RCA releases on patents that'll start price competition,we hope!

"Transistor Radio Tester." 51. The modulation control gives you regeneration, see above. Useful.

Other Transistor items pages 44,46,55,112,122,129.

### CQ. December, 1955.

"10 Meter Crystal Rec'r." 89. Not often do the Hams come into our Xtal set game. Altho W8DBF uses it for checking signals, it has possibilities as receiver.

### RADIO & TV NEWS. Feb., 1956.

"Power Transistors." p. 37. A big field coming up. And p. 112.

"Regency Transistor Cir." 56. All the stages to look over!

"Trans. Signal Tracer." p. 64. Output from 1N34 goes into a 2-stage amplifier. Intercom. 108.

## Natural History Oddities.

A Queen Termite lays an average 4000 eggs per day. As it may live 9 yrs. it can lay 13 billion eggs a lifetime. Termite inspectors tap on a sill and listen for a noise caused by all of them hitting on the wood at once - then comes the big bill! One of our friends says in Honolulu, during a TV program, the winged ones come in swarms and spoil the TV programs.

Pocket Gophers can run forward as well as backward, like a shuttle, while storing food.

Muskrats can hardly resist a nice, juicy parsnip. So some of you muskrat trappers might try one for bait.

Man's Eyes do not reflect the light at night. Neither do some animals. Others, e.g., cats have the power of reflection because of a layer of crystalline substance in their eyes.

Apes have the intelligence of a 2-yr. old child. It is possible most of we Radio Fans can go a little higher. Hi. Gorillas make their beds, or nests on the ground and not in trees. A male Chimp's arms are stronger than a man's. A football player pulled 200 lbs. while a Chimp. showed a test of 847 pounds pull.

Plants. Dutch Tulips originally came from Turkey...The Orange peel has the most flavor. A few drops of Orange oil, from the peel, can flavor 50 gal. of water. No wonder the Orange juice business ig good...The Leonas & Wild Fig Trees often kill themselves by sending out shoots that wrap around themselves and are squeezed to death... Spanish Moss, that grows in swampy Louisiana belongs to the Pineapple family...Some kinds of trees are more likely to be struck by the Lightning than others. The Oak is the first, and then come the Elm, Ash, Poplar and Pine. No doubt the density has a lot to do with it. Otherwise, we'd pick out the Evergreens as first... Cow Trees grow in Costa Rica and South America. Natives milk them like rubber trees and drink the sap. After exposure to air this "milk" turns sour and bitter.

Mammals. All land mammals have 2 eyes, 2 ears and 4 limbs...No land mammal is mute...Most can swim except the Flying squirrel, with membranes between its legs, and the Armadillo being two exceptions...The Dolphin, Porpoise and Whale are marine mammals, giving birth and suckling their young...Two mammals lay eggs, e.g., the Platypus and Spiny Anteater...The Shrew is the smallest mammal, scarcely 2" long. The Whale is the largest...The BAT is the only true flying mammal. The Flying squirrel glides. ..The Alligator raises his upper jaw to open his mouth. The Crocodile drops his lower jaw as Man does...The bull Fur Seal weighs 3 to 6 times as much as the female. In no other mammal is there such a great difference in sex. ...The Chihuahua Dog and the Elephant are practically hairless. ...Really long hair 30" or more in length occur only in Man and the tail of a Horse...The fastest Dog is the Saluki, reaching 50 miles per hour.

Birds. A Pigeon sways from side to side because he is flat footed. If he didn't step down flat, he'd go on his beek...Pet Canaries are so domesticated they can not forage for themselves...The Woodpeckers do a lot of damage to poles out here. So much so that they have to be replaced. A way to reduce some of this is by placing a pecked piece of wood on top of the pole...Many small birds are increasing, as Indigo buntings, Sparrows, Robins, Catbirds, Thrashers, Orioles, Cardinals, Mockingbirds, Phoebes, Kingbirds, Waxwings, Warblers, Chats, Goldfinches, Towhees and many other songbirds. The larger birds are becoming scarcer.



## Stamp Collector's Page.


"I'm sick. They sent me home from school, where are my stamps?"

### BE A GENERAL COLLECTOR

Man is a natural accumulator, but Stamps are collected more than anything else except money! It is one of the most educational of Hobbies - teaching about the World, its money, people, history, etc. Every young fellow should own a collection. And you will never make a bad boy from a Stamp Collector. About half of the collectors are over 40. 81% of Stamp Collectors buy by mail because stores do not carry big stocks, or varieties.

Years ago it was possible to collect most of the World stamps but now it is an impossible task - but even so, there is more fun in a general collection. You will find a lot of action at little cost. There are thousands of stamps below 5¢ before one has to buy the scarcer ones. 52% of Collectors go for general.

The best plan is to have two sets of collections. One is a Worldwide and the other is your preferred specialty. Use a loose leaf Album for each, as you may want to add pages later. For a general collection, the Master Global Album (See CAT. S-1) is best, but you can start slow if you wish and transfer later on.

One reason for a Worldwide Album is that after years of specializing one will tire of his Hobby as the stamps become more expensive. At some Stamp clubs members cannot find swappers - because everyone is specializing in one small field. But, general swappers are always there.

Make collecting a Hobby, not an investment, just like movies, football, etc. While hundreds of stamps increase in value, many do not. Some of ours have increased 500%. 75% of U.S. Collectors specialize in U.S. But, many have stored sheets of the U.S. Commemos. Buying this way has been a bad investment for 20 years. One fellow bought $600 in U.S. sheets and disposed of them at a 4% discount - not counting his correspondence, etc. With each new issue, buy a half dozen or a few blocks and let it go at that. Naturally if everyone buys sheets - they cannot possibly be worth much in years to come.

Some worry about fakes, rack- etc. etc. If one sticks to the low-priced stamps one never need worry about any great loss. The faked, or altered stamps are only confined to the high-priced.

Combination mail. Now you can put a letter inside a package if you mark "letter enclosed" on the outside and affix an extra 3¢ stamp to pkg. This keeps letter and package together.

Cancelling machines may run letters thru from 4000 to 40,000 per hour. No wonder some letters are all beat up. If you send us coins, tape them to a card and write "hand cancel" on letter.

Skeptical. a little Old Lady bought a packet of 1000 stamps at a S.F. Stamp store. She refused to pay for them until she sat down and counted them.

TV and Stamps. Some dealers R complaining about TV hurting the stamp biz. No doubt it does. As proof they say that in the last 3 years Comic book titles have dropped from 120 to 75. But after a year many can't "face" TV!

# Announcements.


**New P-N-P Transistors.** Junction type. Each mfr. has different No. as CK-722, 2N34, GT-34, etc. but all work OK with most circuits. Picture slightly enlarged. See our DP's 14 & 43 for more data. At new reduced price. Guaranteed to work OK. 9-45. Each..... 1.98

**New Crystal Diode list.** Here's our complete list to date, with several good reductions in price - same quality:

| | | | |
|---|---|---|---|
| 1N21 | Silicon | 9-38. | .90 |
| 1N22 | " | 9-47. | .90 |
| 1N34 | Germanium | 9-37. | 1.10 |
| 1N51 | " | 9-40. | .90 |
| 1N63 | " | 9-43. | .90 |
| 1N69 | " | 9-44. | .90 |
| CK-706A | " | 9-40. | .90 |

We may raise prices on an order - but likewise, we reduce a price to you when possible, as many of you have observed.

**Used Magazines.** One fellow we wrote wanted $1 each. We'll sell them at following prices, plus postage. Most not obtainable anywhere. Order with parts and part of postage is then absorbed.

Radio. Nov., 1929.....50
Short Wave Craft. Mar. 1932; Apr. 1934; March 1937. Each.....50
Radio Craft. Sept-Oct, 1933; May June-July-Aug-Oct-Nov-Dec, 1936; Jan-Feb-Mar-May, 1937.....35
Radio News. Nov, 1930; Jan-Aprl, 1931; Sept-Dec, 1932.....35
Radio TV News. Nov, 1950; May-June-July-Aug-Sept, 1951; Aug-Sept-Oct-Nov-Dec, 1954; Jan-Apr-May-June-July, 1955.....35
Radio & Hobbies, Australia. June 1945; May-June-Dec, 1946; May-Sept., 1947; Feb-1950.....50
Radio World, Australia. Feb-Dec-1949.....35
Australian Hobby Handbook.....35
Radio Electronics. Feb-May, 1950 July-Sept-Oct-Nov-Dec, 1954; Feb Mar-Apr-May-June-Aug, 1955....35
Radio TV Service Dealer. Mar-Apr Nov, 1955.....25
Popular Electronics. Dec, 1954; Feb-Mar-June-Aug, 1955.....30
CQ. June, 1955.....35
Popular Science. Dec, 1953; June 1955.....35
Science & Mechanics. June, 1952; Apr, 1953; Oct-Dec, 1954; Feb-Apr-June-Aug-Dec, 1955; Feb, 1956.....25
Mechanix Illustrated. July, 1954 Sept-Oct-Nov, 1955.....25
Mechanics Today. Jan, 1954....25

Radio Amateur Call Book. $4.00 Keep getting fatter. See 0-1.

New Radio Handbook. 768 pages. Last word. Radio bible. From new theory to Xmtrs. We postpay it. Buy from us & help RB&H.....7.50

New Detail Prints, RB&H 42. DP File still $1.25.

Large Loopstick for BC. 3/8" x 5¼" long. Efficient. 7-182..1.00

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 the far end of the coil.

Large Coil Forms. Cardboard. 3½" dia. x 21" long. Suitable 4 Tesla, or large loading coil for Long waves. WT. 2 lbs. each...50

.00014 Var. Cond. Same size as .00035 but less plates. Base mtg only. (2) screws incl. 8-4. 1.25

Used 3-gang variable cond. One in stock. .00035. 1¼lbs. 1.00

.05 x 1000 v. Bypass Cond. New stock. 8-83. Each.....20

Arrow knobs. 10-13. Gone.

High Freq. Buzzer for code. Tone adjustable. 12-20.....1.00

Flashlite Batts. Fresh Stock. New price up, sorry. Each .15



Transformers. 3:1 back in stock brand new. 24-16. ½ lb.....1.50
Rauland Lyric Impedance units. See RB&H 42. 24-25. 1½ # 1.50
4:1 Transistor audios. 50 ohm DC and 200 ohm. Step down for use with Transistors. ½# each...1.50
150 v. 35 v. Transf. gone.

Ballasts. ½ A. 4 v. gone.

Volume Controls. Substitute 2 meg. for 3 meg. unobtainable.
Add 25M and 50M with no switch to the list on page R-1.

Knife Switches, CAT. M-1. All prices up a nickel. Sorry.

House Plug fuses. 15-20-30 A. In stock. 11-23. Each.....06

Copper up. Strikes, etc. have jumped it up. NY spot copper is 46-52¢ # with Zinc 13½; Lead 16. Some magnet wires doubled. Will keep prices best we can. Following must be changed:
#18 Str. or solid Hookup wire, in reg. or plastic ins. FOOT. 01½
#10 Busbar. 26-7. Foot.....05
7/26 Tinned Stranded Aerial wire. 1-6. Per 100 ft.....75
Bell wire. No got. The price trebled. Sub. Leadin wire 1-11.
New #14 Black Spaghetti. Fits good. Flexible. 26-22. Ft. .05
Other wires will go up later.

Fahnstock Clips. Both 3/4 & 1" now 15¢ per dozen. Double clips out of stock; use 2 singles and a common screw to make doubles.

Wood Screws. New, hard-to-get size. #2 x 3/4 FH. 13-81. DZ..10

SPDT Toggle Switches back in stock. Up, sorry. 23-1 2 oz...35

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

Transmitting tubes. all we have left. Guaranteed OK condition:
(2) TZ-20. 7½ v. Triode. Ea..1.70
(2) TZ-21. 6.3 Pen-Tet. " ..1.50
(1) HY-31Z. " Triode.....3.00

Please send a 3¢ stamped envelope for reply to questions.

New Tubes. Supplement to T-1 of CAT. All tested on our hi-grade Hickock tester and guaranteed to work OK. Packed OK.

| 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... | ½ wave rectifier. | 1.70 | 1.00 |
| 7C6... | 2nd det. loctal.. | 1.85 | 1.00 |
| 12BA6. | RF amplifier..... | 1.80 | .90 |
| 35W4.. | ½ wave rectifier. | 1.20 | .75 |
| 41.... | Power amplifier.. | 1.90 | 1.00 |
| 78.... | RF amp.; detect.. | 2.15 | 1.00 |

Honeycomb coils. We acquired some used ones, good condition, in following sizes:

| Turns | mhy. | kc. | meters | net |
|---|---|---|---|---|
| 25 | .04 | 834 | 360 | .50 |
| 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 |

Few single mountings for 50¢ each. When coils sold can furnish new unmounted for same prices.

New Detail Prints, or revised. 10¢ each; 3/25¢. Photo-litho'd.
#1. MRL #37 Push-button Xtal.
#2. MRL #38 Selective Xtal.
#4. MRL 15-1 tube DC circuits.
#11. MRL Antenna Coupler.
#13. MRL Vario-coupler.
#14. MRL Transistor Small set Amplifier. Slider xtal set, etc.
#28. Radio Symbols. About 157.
#30. Proper Aerial & Ground Construction. Do it right.
#34. MRL #10-A Xtal Set.
#43. MRL #26 Single Dial Xtal Set. Plug-ins & Transistor.
#47. MRL #28 All-wave Plug-in Xtal Set. Equaled #2 in DX.
More details in RB&H 42.

# MRL Classified Ads.

4¢ pe ord; 3 insertions same ad 8¢ pe ord. Count all words. Circulati over 3500 per issue, plus back/ bers, which continue to sell er a long period. Numerals (3 ) means 3 issues, ending with .

Don't let y ad run out. We won't notify yo when it does. A 3-time ad alwa pulls better than a 1-timer. T more you tell the more you sell. lease do not make ads conflict o much with ours. Thanks - MRL.

EXCHANGE Radio Parts list requirements. Wilburn y, 1803 Childress Drive, S.W., tlanta Georgia. 4-45)

RAYTHEON CK-706 General P ose Germanium diode 70¢. Gu n-teed. Wesley Hamilton, Rou 3 Box 878, Albany, Oregon. (3- )

CRYSTAL Radio Experimenters Write Leslie Hulet, 305 Hope Lakewood, New Jersey. (9-4

EXTRA-loud Crystal, Radio pl , Transistor plans, bargai offers: 35¢. Amorose, Rt. our, Richmond, Virginia. 3-44)

LIMITED quantity new t s- name brands - 60% list p postage and insurance. Oth merchandise. Send for t. George Shaw, 1530 Grov Burlington, Iowa. (3-44)

WANTED - Early reless equipment, books agazines, catalogs. Desc e and give price. V. Philli 1010 Monte, Santa Barbara, lifornia. (6-47)

NEW Revi d Crystal Experimenter's talog free. Robert D. Mick son, 1342 W. Cornelia, Chi go 13, Illinois. (3-45)

PL Auto sets from house current without converters, rectifiers or tubes. Simple foolproof method, Diagram, instructions $1.00. Circuits, 719 Doris, Biloxi, Miss. (1-43)

A SURPRISE awaits a m ion Transistor users. Writ evadium, Box 41, Abita ings, Louisiana. (3-45)

CUSTOM built Xtal se Jak cabinet, sell-trade. ld buy old steam engine, as , any type. No toys. George omas, Rt. 1. Box 28, Perris alif. (3-45)

WANTED - Peor to remail and forward r l from various towns thr U.S.A. and Canada. 25¢ d for every letter you rem .. Send 10¢ for complete tails (refundable). Mail , 719 Doris, Biloxi, Miss ippi. (1-43)

CRY L Diodes: IN34A, IN48, 1, 1N81 - 75¢ each; all 4 .50. Bill Inglis, 135 Bridgeport Road, Waterloo, Ontario, Canada. (1/43)

AVE one 10BP4 Picture tube, used but OK. Any one want it? Write me. Ole H. Tollefsrud, ardner, N. Dakota. (1-43)



EXPERIMENTERS, Build Hobbyists - send for fr booklet of simple plans. Radi upply, Fruitland Park, Florid 1-43)

Display ads $1.50 per in up and down. Can photo any cu or drawings to pull better.