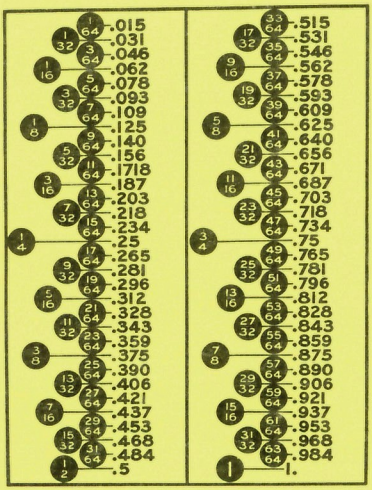
No. 42 25¢

Radio Builder and Hobbyist

FOR THE EXPERIMENTER

DECIMAL EQUIVALENTS



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You cannot work an hour at anything without learning something.

- David Graham Phillips.

MRL "RADIO BUILDER & HOBBYIST"
is published at random by
Modern Radio Laboratories,
328 Fuller Street,
Redwood City, Calif., U.S.A.

SPECIALISTS IN SMALL SET
DEVELOPMENT SINCE 1932

Lithographed in U.S.A. by MRL.

World-wide subscription price: 12 issues $2.50; 6 for $1.30; 3 for 70¢; copy 25¢.
Back numbers 25-40 15¢ each, plus postage. #41-on 25¢ plus postage.

EDITORIAL NOISE LEVEL.

If only we had the space to repeat more of the nice letters received in praise of our last number of RB&H. Thanks, again, fellows - we love 'em.

In our attempt to better interest you, we have made a few more changes in layout. For instance "Manufacturing Processes" was deleted this time - to give more constructional material. "Pacific Coast Notes" has also been replaced for the time being at least. "What's in the Mags." was cut to one page - but concentrating on the best articles.

As usual we can't predict what will be in the next issue, but am sure you'll find plenty of interest.Often, at the last minute we may make a change. We're going to throw in more "hints & kinks" - if possible. Many have sent in contributions.Don't worry if you don't see your article we have to arrange them according to variety and space.

You'll notice, on page 22, our new price of $1.98 on PNP Transistors. One of our suppliers has quit making Diodes and Transistors. Otherwise, the future looks bright on Crystal gadgets. Remember, the other Crystals as Steel galena, pyrites, silicon, etc. are still better for detectors of DX stations. But, use your Transistors for amplifiers only. You'll also need lots of other parts to build all the many Transistor circuits that R floating around. We're getting "Transistor Happy" here at MRL - so we hope to pass on our findings as they pop up.

Re new Detail Prints - we only got around to making up 4 this time.It takes 2 days to make one and time is at a premium.

As before, we're always glad to hear about your experiments & DX reports. If you have any suggestions as to the betterment of RB&H - sing out!

As for our CATalog - it is now mostly a matter of revising one sheet at a time. If you are a subscriber to RB&H you'll get the revisions as they come out. If your CAT. disappears - ask us for another one.

Yep - subscriptions sure have been rolling in. Thanks for the encouragement in getting out a better mag. If you haven't sent your's in - let's have it.

Until next issue - best wishes from the Experimenters' friends,
Mabel & Elmer Osterhoudt.

WHAT SOME SAY ABOUT RB&H.

D. V. Jeung, S. F., Cal.: "Your mag. is swell for Experimenters & beginners. I've never seen a better mag. than the RB&H. Keep up the good work."

W. E. Hatch, Texas: "One of the most interesting mags. I have ever read. Have read and re-read it a half dozen times. Here is another subscription."

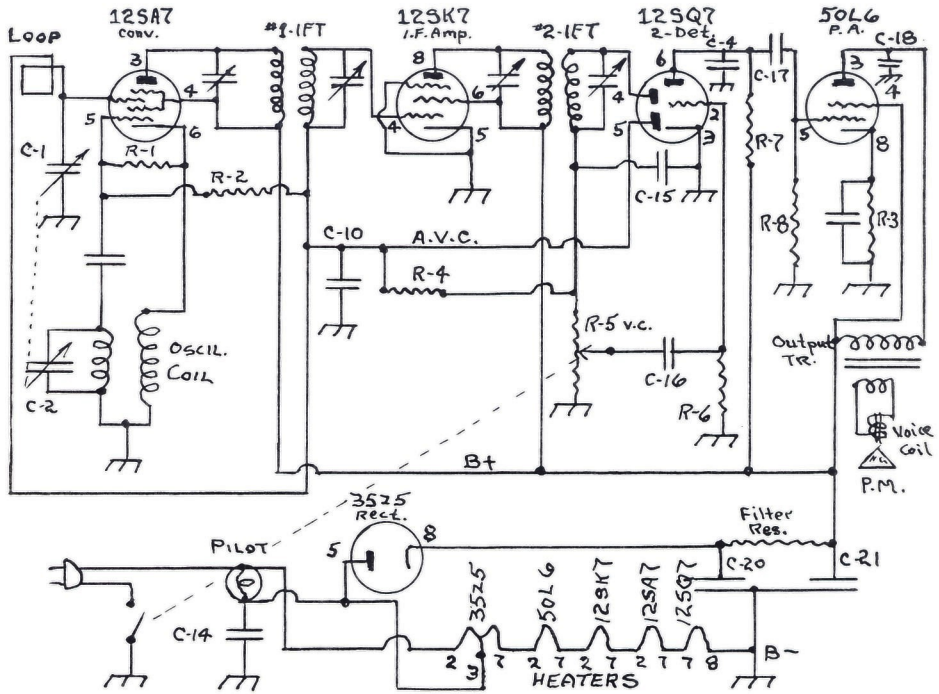
R. Arnold, Kansas: "I think RB&H is the best Radio mag. printed, for the price. I subscribe to a large Radio mag., too."

Geo. S. Haymans, Georgia; "Having built sets since 1922 can say UR mag.offers stimulation not found in larger mags.Fun from building Xtal,and other small sets is far more entertaining to me than today's commercial Radio shows."

A. Domas, Mich.: "You have a wonderful little mag. for a guy starting out, like me. Prices in your CAT. are also cheaper."

It takes 35 million laws to enforce only ten commandments.

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



Continued from RB&H #41

HUM is very often due to filter condensers in AC-DC sets - a high power factor in one or more of the condensers causing the trouble. The old method, and the easiest,of testing condensers is by placing another one across the one in the set.This may work sometimes but not in all cases. You may find that the hum will not stop,or the volume will drop when this is done. So, the best way is to take out the condenser units, one at a time, and replace it, until the hum stops. Of course, if it doesn't stop it is not in the filters. Be careful about connecting a discharged condenser from the Cathode of the Rectifier to B-, because if the line voltage is at its positive peak there may be such a rush of current thru the Rectifier to charge the condenser and damage the Rectifier tube. This can be avoided by first connecting the condenser across the out put filter (assuming you are using the bridging method.) This is shown as C-21 on the diagram. The condenser will then become charged up and safe to bridge across C-20 without danger of shorting the Rectifier output.

As mentioned before, a test of this sort will not always disclose the trouble if leakage exists between the input and output filter condensers. Usually when 2 filter cond. are in the same case a strap will be around the cardboard container to hold them to the chassis. Possibly if you lift the condensers up you may find green corroded spots on the case, showing there is leakage thru the case. If the condensers test OK otherwise a pc.

of fibre may be slipped between condenser and the strap.

Another cause of hum that I've run across in my work, is heater to cathode leakage. If this occurs in the 50L6 type tubes the AC voltage across the 12SK7, 12SA7 and 12SQ7 tubes (which is about 36 volts) will appear across the cathode bias resistor R-3. This is in the control grid circuit and results in a terrific AC hum. By checking the tube in a tester the leakage will be found. If another tube is around substitute it to save time. Be sure to watch the 12SQ7 type tubes as they are frequent offenders and should be checked.

Another cause of hum can be due to an open control grid circuit, making the tube very susceptible to small hum voltages, which may be induced in the lead or may occur due to stray coupling.

An open in the volume control will cause trouble of this sort, because small hum voltages will be applied thru C-16 across R-6. Check the control with Ohmmeter. If C-16 opens the receiver will be dead, and may increase the hum level. R-6 and R-8 should only be checked with the Ohmmeter after the set has been allowed to cool, as warm tube cathodes may still be emitting.

DISTORTION in AC-DC receivers occurs mostly in the output end and may be due to gas in the 50L6 or to leakage in C-17. You may check these with voltmeter, as described in RB&H #41, across R-8. It is customary to replace C-17 in all jobs. Be on the look for leakage in C-18 in the plate circuit. Any leakage here would place a high positive voltage on the Cathode of the tube, tending to cut off the plate current. Distortion would result as the tube would no longer work over a linear portion of the grid voltage-plate current curve.

Defective filter condensers R also a likely cause of distortion and they should be checked first.

Open control grid return circuits will cause distortion. You should check them with an Ohmmeter. Attention should be paid to the loop Antenna. The leads will often break, producing a garbled type of response.

DISTORTION AT HIGH END of Volume control will take place in almost any set due to overloading. If excess distortion occurs there may be leakage of C-16. Considerable DC voltage is developed across the Vol. Control in the process of detecting so if C-16 leaks the grid of the 12SQ7 becomes over-negative. You should check both C-16 and C-17.

ONE STATION OVER WHOLE DIAL is result of Oscillator not working properly. A check should be made by Voltmeter across R-1. A DC vacuum-tube Voltmeter is preferred. Should read between 5 & 15 volts if the Oscillator is working. In case you get voltage and set will not play, check the IF trimmer condensers as they may have been tampered with. Use a Signal generator, if you have one - or tighten the trimmer & back it off about 1/8th turn.

After this, short C-1 with a screw-driver to cause a clicking sound in speaker. While shorting the condenser, adjust each IF trimmer cond. for maximum sound in speaker. This will be aligned fairly close.

If no voltage is found across R-1, you may have a heater-to-cathode leakage in the 12SA7. It would prevent signal current from flowing thru the Oscillator coil primary and no signal would be induced into the tank circuit to C-2. Replace the tube.

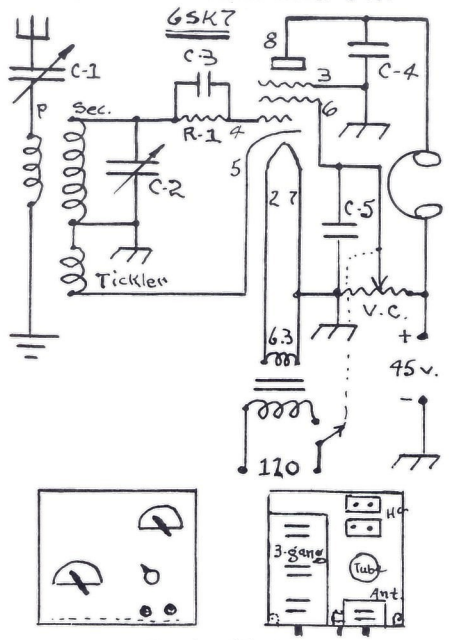
You should also check the Oscillator coil windings for a break. Also C-2 for shorts.

If all these test OK, the only thing left is the Oscillator coil itself which should be replaced. If the set is old an Universal type coil can be installed. Complete instructions usually come with them.

There are other complaints but these are the most common. This will end my discussion of AC-DC.

LONG WAVE RECEIVER EXPERIMENTS.

Continued from RB&H #41.



Parts list.

C-1	.00035 Var. cond.	8-7	1.25
C-2	3-gang .00035 " .	8-11	1.75
C-3	50 mmfd. mica.	8-17	.15
C-4	.005 mica cond.	8-23	.25
C-5	.25 x 600 bypass.	8-45	.20
R-1	10 meg. ½ watt.	19-2	.05
VC	50M vol. control.	19-14	.75
1	Octal wafer sock.	25-11	.10
1	6.3 v. Fil. tr.	24-8	1.50
1	6SK7 tube		.85
	45 v. B-battery (not MRL)		
1	Compo. panel 6 x 7		.16
1	Plywood base 6 x 6		.11
2	½ x ½ brackets		.06
2	1¼" Bar knob.	10-23	Each .09
2	2" dail scale		Each .05
1	Small pointer knob.	10-9	.10
2	Single HC coil mtgs.		Ea. .50
2	Phone tip jacks.	17-26.	.20

Honeycomb coils:

We acquired some used Honeycomb coils, all mounted. Can let you have them at the following prices, which is about half: A few single mountings for 50¢ Ea.

Turns	mhy	kc.	meters.	net
20				.50
25	.04	834	360	.50
35	.072	588	510	.60
50	.150	417	720	.75
75	.325	286	1,050	1.00
100	.62	200	1,500	1.25
150	1.46	132	2,273	1.40
250	3.8	82	3,659	1. 0
300	5.5	68	4,412	1.60
400	9.8	51	5,882	1.85
500	15.	41	7,312	2.05
600	23.	33	9,091	2.20
750	37.	26	11,112	2.35
1250	100.	16	18,750	3.00
1500	150.	13	23,077	3.50

Here is our circuit as finally developed. A lot of it has been described, so will only give a few details here.

Sketches show layout of panel and base. As no shielding problems you can use a compo. panel.

We ended up with about 15 Ts. of bell wire 2" in dia. bunch-wound roughly for each coil. We taped it to the coil with leads running to Fahnstock clips. You can hear it "plop" if polarity of tickler is correct. If not, just reverse the leads. To make all your coils uniform, it may be a good idea to poll them all the same by changing connections on the coils. We got good oscillation clear to the top of the 1500 and down to bottom of HC-20 coil. No doubt the correct tickler turns would be better. Make it oscillate to low-frequency end of each coil and fasten it down to coil.

As for primary, one may use different combinations to suit your Aerial, series condenser, etc. C-1 may be eliminated if U wish, but tuning primary makes set more efficient.

Also ended up with .25 x 600v. bypass from VC to chassis. I believe it helps some stations.

Got NLK with good volume on the HC-1500 coil with good oscillation. Being near to hi-pwr. BC stations, as we are, one may get transmissions from harmonics and guy wires of the stations.

Send 50¢ to Sup. of Documents, Gov't Printing Office, Washington 25, D.C. for "Electronic

Navigational Aids." 73 pages. It takes in Beacons, Loran, etc. A good book to have around.

HC-50 tunes BC as well as the ships around 75 on the dial.

Comparing to a Solenoid (one-layer) coil, the HC has about the same coverage. However, as it is almost impossible to wind and use large coils, the Honeycombs are made. A 1500 turn HC coil 4" in diameter if wound 2" in dia. as a solenoid, would be 25" long. Considering that the correct ratio of length as 2½ times the diameter, this coil would end up as 25" in dia. x 10" long, of 111 turns spread over 10". See how much space you save by using HC coils.

Looking closely at a HC coil U will find the second layer tends to come in between the first and third layers. This keeps down the distributed capacity between the turns, and makes for a more perfect coil.

As most Long wave stations used to operate on 6000 m. or over, this loading coil was sold. They usually figured the Ant. and pri. of the Coupler ran to 3000 m. With this in series, it would bring wavelength to 15,000 m. What a difference in size between this 6" x 28" long tube & a 1500 turn HC coil.

Apparently - there were several coils as the description says "all coils are wound with white, single silk covered wire, on special type tubes. No enamel wire used. No dye, varnish or shellac." Probably several coils were used to keep down dead-end effects. In our loading coils, of the early 20's only one long coil was used - altho there may be several.

For the long waves an Antenna from 30-100 ft. in length and 20 to 40 ft. high were recommended. One fellow used the top wire of a fence for Ant. and lower one for ground (counterpoise) altho he said regular ground was much better. Try it out on your set. See how broadly it tunes.

PACIFIC COAST RADIO BEACONS.

Listed North to South, in Kc.

-.-
314 St. Paul Island, Alaska
298 Sentinel Island, "
314 Patos Island, Wash.

----
290 Cape Sarichef, Alaska.
300 Grays Harbor, Wash.
290 Makapua Point, T.H.

--..
300 Scotch Cape, Alaska.
304 Columbia River L.S., Ore.
296 Pigeon Point, Calif.

.--
292 Cape Hinchinbrook, Alaska.
304 Yaquina Head, Ore.
286 Los Angeles Hbr., Calif.

---
286 Cape St. Elias, Alaska.
308 Triple Island, Canada
310 Cape Disappointment, Wash.
302 Point Arguello, Calif.

.-..
294 Eldred Rock, Alaska.

-
286 Cape Spencer, Alaska.
306 Cristobal Mole, Canal Zone.

--.-
292 Point Retreat, Alaska.
314 Point Wilson, Wash.
302 San Luis Obispo, Calif.

-..
298 Five Finger, Alaska.

.---
294 Guard Island, Alaska.
296 Race Rocks, Canada.
314 Bonita Point, Calif.

..--
286 Cape Decision, Alaska.
310 Willapa Bay, Wash.

--
298 Mary Island, Alaska.
288 Swiftsure Bank, Wash.
314 San Francisco L.S., Calif.
300 Kilauea Point, T.H.
306 Cape Mala, Canal Zone.

.--.
294 Tree Point, Alaska
288 Cape Flattery, Wash.
302 Point Sur. Calif.

--..
308 Dead Tree Point, Canada
308 Ediz Hook, Wash.

286 Anacapa Island, Calif.

-.-.
290 Cape St. James, Canada.
304 West Point, Wash.
286 Point Loma, Calif.

-...
296 Quatsino, Canada.

...-
296 Point Atkinson, Canada.

--.
314 Smith Island, Wash.
292 Point Arena, Calif.

.--.
288 Umatilla Reef, Oreg.
314 Farallons Islands, Calif.

.-.-
300 Destruction Island, Wash.
292 Blunts Reef L.S., Calif.

..-
308 New Dungeness, Wash.

-.--
304 Cape Arago, Ore.

---.
292 Cape Blanco, Ore.

.....
308 Langara Island, Canada

----- (Dashes)
312 Fairway Island, Alaska
304 Point Reyes, Calif.
296 Long Beach, Calif.
312 Newport Bay West Jetty, Cal.

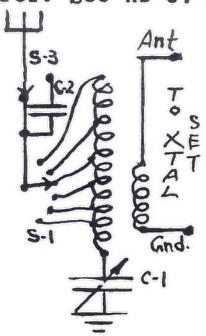
Next issue Atlantic and Gulf Coasts.

Most Radiobeacons send during fog and one or 2 10-min. periods out of each hour during clear weather. They operate on 285-315 kc. (1050-950 m.) Tone 1000 cps. First Radiobeacons in 1921. In 1949 there were 186 stations in U.S. and territories. Usually 3 on same frequency can be checked in a location.

Range is ordinarily 10-200 mi. depending on receiver. Cape Cod, Mass. and Pt. Arguello, Calif. range about 400 miles.

The Coast Guard no longer operates DF stations on 800 meters but ships get their fixes from Beacons, Radio stations or even from vessels giving their locations. Since 1934 any vessel over 500 tons was required to have a Radio compass, or Direction finder (DF). However, most smaller vessels now have one for own protection. Most ship DF bearings may be within 1-2% accuracy. It is near enough when several of the cross-bearings may be had.

Readings on a loop are taken at minimum position, which is at right angles to signal. Signal is weakest because it hits both sides at once, which oppose each other. When loop points toward a signal it is loudest because the signal at the far end doesn't buck the near end, i.e., out of phase. A "sense" bearing is taken at max. position of loop, i.e., N or S, etc. If an antenna is close to a Loop it causes an error. See RB-31 for more data.



EXPERIMENTS WITH MRL #2 CRYSTAL SET.

By Larry Woody, Idaho.

Parts List:

MRL #10 Country Set Coil....1.50
.00035 Var. Cond. 8-7.....1.25
.0001 mica Cond. 8-18..... .15
SPDT Toggle Switch. 23.3.... .45
Switch lever. 9-20..... .15
6 Switch Points. 9-21. Dozen .15
2 " stops. 9-24. 20 for.15
Comp. panel. 4" x 5". ..... .10
1¼" Bar knob & scale..... .14
4 Fahnstock clips. 7-53. Doz .15

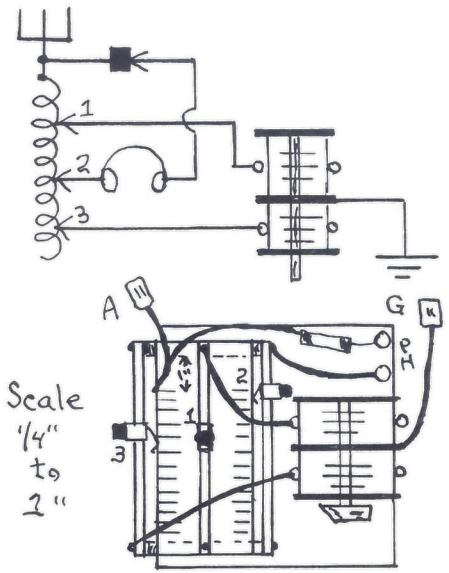
Think the World of MRL #2 and 2-A. Built #2 up from parts on hand and it turned out to be a very remarkable Radio.

I made an MRL #10 Country Set Coil and put it and switches ahead of the #2. Connected secondary to A-G of #2. I get more volume and better reception on Short waves than before. You can mount it in a box and use it on other Crystal sets. Have logged many stations, some 5000 miles away. On the SW band I get WLWO, Voice of America, etc.

Your #10 and #10-A both work fine here. Use .05 across phones for mellow tone. Much useful info. in your Handbooks - read by all Radio Fans at our school.

THE 2-12 DX CRYSTAL SET.

By Francis A. Moran, Penn.



Parts List:

MRL 2XM 2" x 4½" Form. 7-40. .30
35 ft. #22 Enam. 7-75. 100' .30
3 MRL Sliders. 9-25. Each.. .15
3 Slider rods 4½" long. Each .09
6 Fibre bushings. 13-137. DZ .10
6 4-40 x ¾" BH Sc. 13-47. Dz..10
6 4-40 nuts. 13-2. Dozen.... .11
1 2-gang .00035.8-10. 1 lb. 1.75
2 6-32 Binding posts. 4-1. Ea.05
2 3/4 Fahn. Clips. 7-53. Doz .15
1 Diode or Steel galena (CAT.)
1 1¼" Bar knob. 10-23.....09
1 Plywood base, 5" x 5" 09
Wire, screws, solder, etc.

Last night, after the locals had left the air, I was able to tune in WLW, Cincinnati, and CKLW, Windsor, Canada. I used a combination of the MRL #2 and 12 Crystal Sets.The Aerial consisted of one lead of a 50 ft. TV wire, plus an additional 25 ft. of wire within the house. Above is the circuit.

I have purchased all of your booklets and found them to be "tops" from the practical point of view. You can bet I'll be already for any new ones.

EDitor: We laid the set out or a "breadboard" for your convenience. It may be built onto a Compo. panel if desired. We have also changed the coil to make 125 turns #22 Enameled wire. Be sure to start it 1" from one end - at the back, as shown. Paint the wire with MRL Light Coil Cement, except where the sliders are to work, as it's harder to sandpaper them if cemented.Mount the rods up on bushings, after drilling 4-40 holes in them. DP-14 (10¢) gives a little more detail on layout of a slider coil.

A crystal stand (9-17. 25¢) may be mounted on the base and a Steel galena crystal used. Or any type of Diode you wish.

Slider (1) controls the tuning band. (2) regulates the selectivity. (3) controls the Aerial-ground tuning. The latter is a little different than conventional circuits.

The two binding posts may be rigged up to hold phones. Or, a double tip jack may be used.

Why not try it out?

CALL LISTS ARE SCARCE.

A letter from the FCC claims no complete Call lists available because 275,000 stations are always changing. Here are some FB sources of calls:

Radio Amateur Call Book. Hams. $3.50 from MRL, postpaid.

White's Radio Log. Lists TV-FM Radio BC and SW stations. Issued 4 times per year. 25¢ on your newsstands. World-wide SW.

BC-TV Mag., 1735 DeSales St., N.W., Wash. 6, D.C. 2 yearbooks; 1 is AM-FM, other is TV. Also a weekly publication.

TV Factbook. Every 6 mo. by TV Digest, Wyatt Bldg., Wash. 5, D. C. World BC. Kept up-to-date by weekly TV Digest.

Radio TV Daily, 1501 Broadway, NYC 18. Lists BC stations.Annual goes with subscription only.

Bur. Int'l Tele-com. Union, Geneva, Switzerland, issues various lists. Write direct.

MRL RB&H also helps!

Many people have not discovered what the Short waves offer them, - often say their receiver is not good enough. But, in most cases it appears very obvious they have never made a serious attempt to come to terms with the SW band on their own set. Compared with the medium and the long wave bands you cannot find stations all over the SW dial. U will find them grouped close together in the so-called 13,16,19 25,31,41,49 and 60 meter bands. Between these bands are plenty of stations of other kinds as CW code, ships, planes, point-to-point, trans-oceanic,etc. If you take time and search carefully all over the dial you will find that even a small set will do it OK. In fact, I use a small 5-tube Emerson with added hand-wound coils and pick up stations thousands of miles away.

Then again, there is always the old 1938 Philco at my side and sitting on top of it is the little old MRL 1-tuber standby.

On a set without bandspread it becomes more difficult to tune a SW station than a BC.This is because they are closer together & tune sharper down there. As soon as you have the right feeling in your fingers you'll be able to locate small DX stations between the 50,000 and 100,000 watters. One thing about SW listening is that what may appear to be noise may be split into identifiable elements of a station. Soon you will be as familiar with Radio Australia as Rio de Janeiro.

I often hear, thru writing and talking to SW listeners, of a peak period of DX conditions at a particular time of the year. My opinion is that this idea is founded on false principles. Actually one should speak of a continuous peak period of conditions. Reception conditions vary for different parts of the World according to time of year. To speak of a period of conditions (peak DX reception) amounts to saying all continents on all of the bands come over uniformly well, which is incorrect.

The World's smallest standard portable set was recently introduced by Emerson, known as the "Pocket Radio."Measures 6" x 3½" high and 1¼" deep, weighs 1 lb. No trick Ant. or phones needed. Condenser tuned; 2½" flat spkr.; standard wiring. Antenna coil is the Loopstick. Superhet. design. Uses 4 min. tubes. Chassis is easily removed.

As you'll agree #41 was an excellent issue in format and contents - and albeit 3 times the work putting together.

Got a couple of Transistors awhile back and went to experimenting. Sure lively little fellows. Have a 1-transistor Radio with 1 flashlite cell. Getting stations 85 miles away. I use a tapped 456 kc Oscillator coil for Ant. Also use output trans. to couple phones as they are about half the impedance of the Transistor. Pri. of my trans. is 30,000 imp. and sec. around 8. I use low-impedance phones. (MRL: Regular phones couple directly.)

I could go on and on but space is getting short. The country I have chosen this time is Venezuela, but I will list only Short wave outlets, the BC to follow in next issue. All stations are commercial except "R. National" (gov't) and "La Voz de la Fe" (religious.) Language Spanish.

See you next issue.

VENEZUELA S.W. STATION LIST.
By George R. Anglado.

Call megs. KW. Address.

YVOG 3.31 1. R. Trujillo, Truj.
YVQG 3.32 .25 R. Anzoategui, Barcelona.
YVQL 3.33 .85 R. Tigra, El Tigra
YVMU 3.34 1. R. Carora, Carora.
YVKT 3.35 1. R. Libertad, Caracas
YVOC 3.36 1. R. Torbes, San Cristobal.
YVMI 3.37 .5 Maracaibo.
YVQN 3.38 7.5 Puerto La Cruz.
YVKX 3.39 2. Caracas.
YVKP 3.4 2.7 "
YVMK 3.41 2.5 Cabimas.
YVOJ 3.42 1.5 Merida.
YVMC 3.44 .7 Maracaibo.
YVLI 3.45 1.2 Maracay.
YVLC 3.46 1. Valencia.
YVUI 3.47 1. Barcelona.
YVLE 3.48 1. Puerto Cabello.
YVRA 3.49 1. Maturin.
YVLG 3.64 1. Maracay.
YVMA 4.75 .5 Maracaibo.
YVKV 4.76 .25 Guaira.
YVMW 4.77 1. Punto Fijo.
YVLA 4.78 1. Valencia.
YVQC 4.79 1. Bolivia.
YVME 4.8 7.5 Ondas del Lago, Maracaibo.
YVMG 4.81 1. R. Popular, Maraca.
YVNB 4.82 1. Ondas de los Medanos, Coro.
YVOA 4.83 5. Voz del Tachira, Cristobal.
YVOI 4.84 1.5 R. Valera, Calle Bolivar 54, Valera.
YVMS 4.85 3. R. Universo, Barquisimeto.
YVPA 4.86 1. R Yaracay, San Felipe.
YVKF 4.88 7.5 Ondas Populares.
YVKB 4.89 10. Radio di Fusora.
YVQE 4.9 1. R Bolivar.
YVKR 4.92 10. R. Caracas.
YVMQ 4.94 4. R. Barquisimeto.
YVMM 4.95 1. R. Coro.
YVQA 4.96 1. R. Sucre.
YVLK 4.97 7.5 R. Continente, Caracas.
YVMO 4.99 2. R. Occidental.
YVKM 5.03 7.5 R. Continente, Caracas.
YVKD 5.05 5. R. Cultura, la Emisora de los Exitos, Caracas.
YVKO 6.17 5. Nacional, Caracas.
YVXJ 9.51 5. R. Barquisimeto.
YVMZ 9.53 .35-1. Used by YVMA, YVME & YVMG.
YVSE 9.64 5. R Nacional, Carac.

LOOKING INTO THE FUTURE.

Some Engineers' predictions of what we should have by 1975 are given by R.C.A.'s "Radio Age" magazine.

(1) A picture frame TV mounted on the wall, like any other type of picture. Would be controlled from anywhere in the room.

(2) Noiseless portable refrigerators for the living room. To keep you cool, Silly, not for beer!

(3) Two-way units to wear like wrist-watches. They would be made to talk over several miles.

(4) Portable TV sets with a thin screen in the lid.

(5) Various speech-TV recorder outfits for home use.

(6) New electronic heaters, freezers, etc. with electronic exhausts for the bad air from the room.

At the S.F. Radio Show was introduced a TV-telephone. It will show up the guy's picture at the other end - as well as your own. No longer can September Morns answer the telephone!

The other day, at the Dentist's office we had the pleasure of seeing a portable receiver in action. The contact girl, from the Dental supply house, carries it with her. It is about 2" x 4" and the Antenna is a metal hook about 4" long. By pressing a button she listens to the central office for a call. When the office wants her it runs a tape or record with her name on it until she calls in. Saves a lot of time. Didn't see the works of it but suppose it is Transistor operated on high-frequency. It had a miniature speaker opening to the front. RCA claims they have built Transistors to operate up to 10 megs. However, the girl did not know on what megs. she was working - if she knew that she was! hi. It seems most all City taxis are now controlled by HF sets.

Some Worthwhile Literature.

Following literature has been received and checked over by us. Possibly you will be interested in it. Send to the address given - not to us:

"World-wide Time Chart." About 4½" square in 2 colors. Center dial rotates and designates time anywhere in the World. On the reverse side are frequency listings used by Hams, planes, TV, FM, Beacons, novice, etc. Punch a hole in one corner to hang up near bench. Free from Hallicrafters Company, 5th & Kostner Ave. Chicago 24, Illinois.

"The Story of Western Union." 18 large pages. Most interesting chronology of Telegraphy from the beginning up to Facsimile telegraphy. Latter can flash the contents of a 90 page magazine to a distant point within 1 hr., or 3000 words of newsprint per minute. (gosh - we thought 25 wpm was fast!). It is especially interesting to Code Fans. Free from the Western Union Telegraph Co., 60 Hudson St. New York 13.

"The ABC of Hand Tools." 49 p. Exceptionally well done. From screwdrivers to micrometers. Yes even an old "Tool Hand" like me learned a lot from it! Now you will know the right names for a tool, instead of calling it a "gimmick." Explains use and care of some 50 tools. Free from General Motors Corp., Detroit, Mich.

"Careers in Petroleum." 32 large pages. From truck driver to Oil man, geologist, Chemist, selling, foreign service, etc. Free from American Petroleum institute, 50 West 50th St., New York 20, New York. (No school)

"Your Future is what you make it." 30 pages. Well gotten up. Useful to anyone deciding on a career. Simple tests for making a decision; testing your choice; school or not; from Hobby to a career; list of 150 major occupations. Free from National Association of Manufacturers, 14 West 49th St., New York 20.

"Your Opportunities in Science and Engineering." 30 pages. Information on fields of Biology, Physics, Chemistry, research, Engineering, Laboratory, production engineering, writing, patent attorney, teacher. Free from National Association of Manufactures, 2 East 48th St., New York 17, New York.

"List of New Publications." A listing of recent government publications. Write Superintendent of Documents, Government Printing Office, Washington 25.

"Popular Publications for the Farmer & Homemaker. List #5." 22 pages of classified bulletins obtainable free (max. 10 to an order.) From "soup to nuts." The list is free from Office of Information, U.S. Dept. of Agriculture, Washington 25, D.C.

"Pleasure Map of America." A large map listing some 50 tours with Greyhound. Just in case you would like to travel. Free from Greyhound Tour Dept., 71 West Lake St., Chicago 1, Illinois.

"How to Choose and Use your Refrigerator." 15 pages of good information on buying and operating. Many good kinks. Ask for #A1S-56 from Bureau of Home Economics, U.S. Dept. of Agriculture, Washington 25, D.C. Free.

"Today's Art." 16 page magazine. Watercolor, oil, pen, generalizations, supplies. Free from H.G.Daniels Co., 621 South Grand Ave., Los Angeles 17, Cal.

If you have received anything of interest to other Fans, write us about it. Give price, source, etc. and we will pass it along to others. Lots of free literature is floating around but much is of very little help to us.

Crystal Set Notes.

Due to the big interest in Crystal sets, we are enlarging this section. Send in your results of experiments to be passed on to other Fans.

Likes Xtals best. Jos. Smolchak, Ohio, writes;"I have a 21" Admiral TV; 16-tube all-waver; 2 table models, but I still like to work with Xtals the best."

Best for DX. From many reports we find that Steel galenas, Silicon, Iron pyrites, and Diodes are better for DX than Transistors. Many circuits use a Diode (detector) and amplify it with a Transistor later.

Apparently the addition of DC to a crystal, as in a Transistor - affects the DX-getting properties. As signals coming over the Aerial are so minute the addition of current may somehow have its effects in rectification of the weak signal. We'd like to have reports on this.

We know a weak signal may be amplified, but the weakest ones are not to any extent. This is the principle used in present AC DC, and other sets. The Antenna-ground circuit is intentionally detuned by cutting down its efficiency to increase selectivity but the signal is boosted later. The DX properties are astounding if one properly tunes the Ant.-ground circuit.

Signals without Crystal. Vic. Lacken, Sask.,Canada, reports he touches the c/w to cup and gets as good signals. It's being done all the time. Apparently some Xtal, or other dust is left on the cup or c/w. This makes an imperfect-contact detector which will detect signals. If you wipe it off - no signals.

"28 Uses for Junction Transistors." 43 pages; 34 diagrams including amplifiers, hearing aid, push-pull, oscillator, code set, relays, converters, meters, etc. Send 25¢ to Sylvania Electrical Products, Inc., 1740 Broadway, New York City, 19.

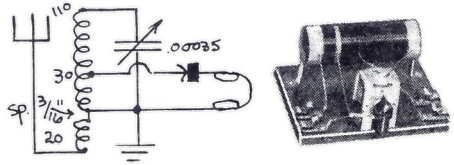
Crystal on Pencil. Jim. Brooks, Oregon, asks what kind of Xtal is best for a pencil set (DP-33. 10¢). We'd suggest any type of fixed Diode as better than the catwhisker type here.

Coal Oil Power Supply. George Shaw, Iowa, tells us that India is perfecting a Radio that uses kerosene and a Thermo-couple for a power supply. It rectifies as your Crystal and catwhisker.

Fixed Carborundum in Superhet. F.R.Lock, Iowa, reports;"I use a Fixed Carborundum as second detector in my Superhet. and it works fine. Your Steel galenas R the best I've used. Crystals are a mystery to visitors.A guy asked me why I use a Xtal set when a big set would get them all. I asked him why he doesn't use a seine instead of a hook!" **Editor** Yep - and they still run trains every day - even to bicycles - just think! No doubt enough current passes to 2nd detector to properly operate the Carborundum - as it requires but 1½ volts.

#10-A on Short waves. Bob Mickelson, Chicago, reports;"This is the first Xtal set I had good luck with Short waves. Received CHLO, Canada and AFRTS, Delano, Calif. (1800 miles) on S.W. Also KSEL, Iowa and WCKY, Ohio, from this congested Chicago Location. I added a couple of taps on the HF end to tune higher in freq. Still using the #2 for making tests from my large mineral collection of detectors." **Editor:** One could add a ½" in diameter coil in series, on the HF end to try SW to better advantage. You may write to Bob for his FB list of items - see page 24.

Prefers Xtals. R.M.Todd, Ohio; "With one of the better National receivers on hand, I still get more kick out of Xtal sets. Your literature is an answer to a Xtal set builder's dream. Your mounted Steel galena, Silicon, Pyrites and Carborundum crystals are tops in performance. I began Radio in 1913."



Knight Xtal Set Circuit. Sold by Allied, and given us by F. Moran, Penn. The windings are shown and apparently #22 Enamel wire on 1½" Bakelite form. This is raised up from a wooden base, with condenser screwed to base. Same price as our MRL 2-A.

Gets Ignition Noises. James Casper, New Jersey, gets static sound on his Xtal set, whenever the car is started. This shows his set is working good.He hooks Xtal set to the same Aerial as the BC battery set. We'd suggest a .00025 mica condenser in series with the battery set and Aerial. Run Aerial directly to Xtal set. They will operate much better. His Xtal set gets many SW stations not possible on the battery set,possibly because the Xtal set has a different range of tuning.

MRL QRM Coil on 2 and 2-A. We have tried the series trap on our sets in various places. But, it seems the best deal is between the Aerial and set or the ground and set. I'd use a .00035 variable condenser to tune it for more flexibility.While these sets are very selective - it may be operated near a station with a strong ground wave - or the station may transmit broadly. The QRM Coil works better when there is a direct path to ground - than in the 2 and 2-A, with a condenser in the ground circuit.

Carborundum in Transistors. Les Hulet, New Jersey,- that Old Timer in the Xtal game - writes the Labs. are experimenting with Carborundum in Transistors. They claim it is more stable in temperature changes and also more selective. Because it is formed in an electric furnace at 3000 deg. C. it can stand temp. We know it is more selective than a Germanium diode.

A couple of years ago a writer for an Australian mag.,in an effort to be funny, flagrantly ran down Xtal sets. From the run of his article he must have gotten hold of some of our literature. Here are a few things he was trying to make them believe:

(1) **Xtal set can't operate a speaker.** What is a magnetic spkr. but a headphone hooked to a horn or box? If you can hear with the phones on the table- you can operate a magnetic speaker.

(2) **Can't get good selectivity on Xtal.** Nobody said it will equal a superhet., but in our locality we separate all the hi-powered babies. That's FB here.

(3) **Won't receive Short waves.** Have gotten hundreds of Police, airports, Hams, etc. on S.W. And hundreds of letters with reception to 7000 miles on S.W.

(4) **Won't receive 3000 miles.** In most conditions - right. But, under good conditions "look at the records."

(5) **Crystals cannot oscillate.** Transistors do. Now Bell Labs. makes Diodes oscillate. Lossev, in the early days, made "unvarying oscillations for a period of 3 days" using Zincite Xtal and a Carbon contact. More later.

(6) **Can't receive over fifteen miles.** Ha!

(7) **Have to be lucky to make them work at all.** (He must be a crap shooter!)

(8) **Can't understand what they are saying.** It's been proven that the clearest reception comes via crystals - or, why a Xtal pickup on a phonograph?

No doubt his summary is due to local conditions. 75% of their land is arid - where poor reception usually exists. Maybe local stations are weak, altho their Overseas' SW stations sure put out. Sydney is 35 deg. S. Lat.; San Francisco is 35 N. Latitude.

DX Reports.

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

MRL #2 DX Crystal (HB-2). W.M. Bradalbane, P.E.I., Canada: "#2 has proved itself. Some of the DX stations are London (3750); N.Y. (1000) on SW; Cleveland (1300). Am looking forward to a better list this winter."

MRL #2-A DX Crystal (HB-2). C. L.R., Isle of Pines, Cuba: "Let me drop you a line about my 2-A. Have picked up and held for a long time, many BC stations in the Southern states, as Del Rio (1100); Nashville (1000); and on SW Canada (1600); Ohio (1200). None in daytime, not even Miami's 50M watter." (ED. lots static.)

MRL #4 Crystal (DP-58). C.E.R. Manning, S.Car.: "Your #4 is the simplest and best set yet."

MRL #9 Crystal (DP-24). M.L., Winnipeg, Man. "Have built three of these and they all work very well. My own set operates a Baldwin magnetic speaker on our five stations. Set is very selective. #4 also works very well."

MRL #10-A Crystal (DP-34). L. E., Litchfield, Minn. "I enjoy RB&H very much, also your Handbooks. Your sets beat anything I have seen. Built #2 and #10-A. Both are good, but get more selectivity from #10-A. Am using a Transistor amplifier on it now. Without the amplifier, my best DX at night is New Orleans, WWL, (1100) and Little Rock (750). I have only been in Radio 2½ years but found it a great Hobby."

MRL #11 Crystal (DP-56). B.C., Canton, Ill.: "Built 26 of your sets and they all operate good. Your #11 brought in all locals & police with excellent volume. With a simple 30 amplifier tube it operated a 4" speaker, on the locals up to 80 miles away. In a DX contest your #28, 2, 15, etc came thru well."

MRL #15 Crystal (DP-27). B.S., Canton, Ill.: "Couple weeks ago I built #15 and logged XERF (1000) KNX (1540) and lots of others. I really like this circuit as pri. can be turned to obtain any degree of selectivity. Using a 137 ft. Antenna 60' high the stations literally "pour in" at night."

MRL #17 Crystal (DP-65). P.J. K., Franklin Mine, Mich.: "I made the Pinole Special and found it to be excellent for DX."

MRL #22 Crystal (DP-45). K.M., Ogilvie, Minn.: "DX Marvel has lived up to its name. Received 23 BC stations on a 135 ft. Ant. 20 ft. high. Use Steel galena. I get New Orleans (1100); Oklahoma City (750); Toronto (690); Detroit (560); St. Louis (530); Ft. Wayne (535) and 9 more between 260 and 400 miles. Also too many Hams for comfort."

MRL #24 Crystal (DP-55). P.J.K. Franklin Mine, Mich.: Hooked up #24 Xtal to a 1T4 tube amplifier and AC-DC supply using a Selenium rectifier. Heard Australia (9000) on it with a speaker, using plug-in coils. Your Literature is tops in my library. Nowhere else can one find so much info. as your Handbooks. RB&H is getting better all the time."

MRL #28 Plug-in Coil Crystal. E.M., Belleisle Creek, BC, Canada "Built the #28 and got stations from all over the U.S. and Canada. Have received about 30 stations - some of which would operate a speaker." (DP-47).

It is too bad we don't have the space for a lot more. Some get so many stations we can make an article out of their letter, which we do. How's your DX?

Questions & Answers.

Should I use AC or DC to test a condenser? ANS. DC only. The idea of the test is to see if it will hold a charge, so it must be charged in but one direction. If AC is used it will charge and discharge 60 times per second on 60 cycle current. Ac will then leak thru it. Electrolytic condensers, which are part chemical - must be tested with DC in the correct position with a high-resistance Ohmmeter.

Have been away from Radio for some time. How can I re-gain interest in it? ANS. Brother, we are with you 100%. If you don't become interested with our 40 p. catalog; 6 Handbooks; 52 Detail prints; subscription to "Radio Builder & Hobbyist"; read our 17 back/numbers; build up our four Radio Kits - then, you might as well forget about it. Hi.

Why do transmitters only a mi. apart vary so much? ANS. May be due to power used, type of Ant., metals in ground, height of the Xmtg Ant., and other things. We have noticed great differences in carrying power of small stations on our trips around here. As most small stations depend on local advertising they do not aim to make DX records. If you get over a good-sized hill they are OUT. In the meantime, the strong chain stations keep coming in with good volume. When BC first started they all wanted to make records. Since then they have found it doesn't pay off in cash received for advertising.

What is cheapest way to measure "Q" of a coil? ANS. A good "Q" meter is expensive to buy or make. The simplest way is to tune in a faint DX station using several types of coils. The one with the loudest signals has the highest "Q" - or measure of efficiency.

Will a 24,000 ohm impedance headset, like Trimm Featherweight phones help in getting more DX? ANS. Yes. On the loud stations you won't find a lot of difference between FWTS. and the Professional 4000 ohm type, but on the weak DX stations it will be very noticeable. As phones may last a lifetime, it is a good idea to get the best set when ordering.

What are Isotopes? ANS. They are radioactively charged chemicals that are usually taken internally. They stop at infected, or disturbed parts of the body and are checked with a Geiger counter. The physician can then locate the trouble without taking you all apart.

What is the best grid leak and grid condenser? ANS. The most widely used are .0001 mica cond. and 2 meg. leak. Years ago we all used .00025. The leak prevents the tube from blocking, or overloading. On the ships, in the early 20's with an Audiotron 6 v. tube, I used a .00025 variable condenser. I also had a variable grid leak. It was made in a Bakelite case by Chelsea mfg. Co. Inside was a piece of paper with an India ink strip ¼" wide under the sw. pts. It cost me $3.25. However, it used to help bring in lots of stations that weren't possible otherwise. Try different leaks and condensers on DX stations and note the difference in volume. The old cartridge leaks had an advantage as one could change them. You may use ½ to 1 watt for a leak. One good idea is to mount 2 ¾" Fahnstock clips on the grid condenser and slip in various resistors until best volume is obtained on DX stations. It wouldn't be too hard a job to run a wooden shaft from a wafer switch out thru the panel for remote control. This is because you can't get near it. The leak can be shunted across the condenser or run from grid to positive or neg. filament. You should try both ways.

A stamped envelope 4 ques. please.

Fun With Figures

Continued from RB&H #41, where we discussed a quick method for figuring Ohm's Law.

Error: Mr. Jack Kiuru, Swastika Ont. observed in last issue 575 watts divided by 110 is 5.23 A. Makes final 21.1 ohms. He also added some more formulas:

$$\frac{E^2}{RW} \qquad \frac{W}{EI} \qquad \frac{W}{I^2R}$$

Work these over and see how they balance.

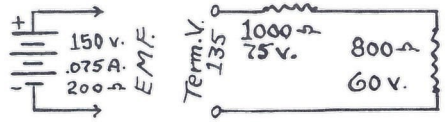
SERIES RESISTOR CIRCUITS.

Electromotive force (e.m.f.), usually called Voltage, is Electric pressure similar to pressure in water pipes, or difference in potential.

Voltage drop, or fall of potential, becomes more as you go from positive to negative. Conversely, to balance, the resistance in Ohms becomes greater. Current, or Amps., is the same thruout the circuit. If several resistors are placed in series the Amperage passed by the smaller determines the current. For instance, if (3) 1 watt resistors are hooked in series with a ½ w. the Amps. allowed will be governed by the half-watter.

E.M.F. or Terminal Voltage. As you've found in experiments, there is a big difference. Suppose you have a source of power supply as battery, or generator, with 150 volts DC output and an internal resistance of 200 ohms. Placing a hi-resistance Voltmeter across it will show 150 v. If you use a low-internal-resistance meter it won't show 150.

Hook this up to a 1000 ohm and 800 ohm resistor in series. Now, if you check the voltage across



the binding posts, you'll find it is but 135, showing a voltage drop of 15. Now, let's see how this happens.

As the Amperage is the same thruout the circuit, we'll add the resistors 1000, 800 plus 200 for source of supply = 2000.

$$\frac{E}{IR} = \frac{150}{1 \times 2000} = .075 \text{ A. for the entire circuit.}$$

$$\frac{E}{IR} = \frac{E}{.075 \times 800} = 60 \text{ v. drop for 800 Ohm Res.}$$

$$\frac{E}{IR} = \frac{E}{.075 \times 1000} = 75 \text{ v. for 1000}$$

$$\frac{E}{IR} = \frac{E}{.075 \times 200} = 15 \text{ v. battery or Gen. drop}$$

(check) Total volts 60 + 75 + 15 gives 150 volts, emf.
(check) or .075 A. x 2000 Ohms gives 150 volts, - the same.

Terminal voltage is the total voltage across all the circuit except the e.m.f. source, as

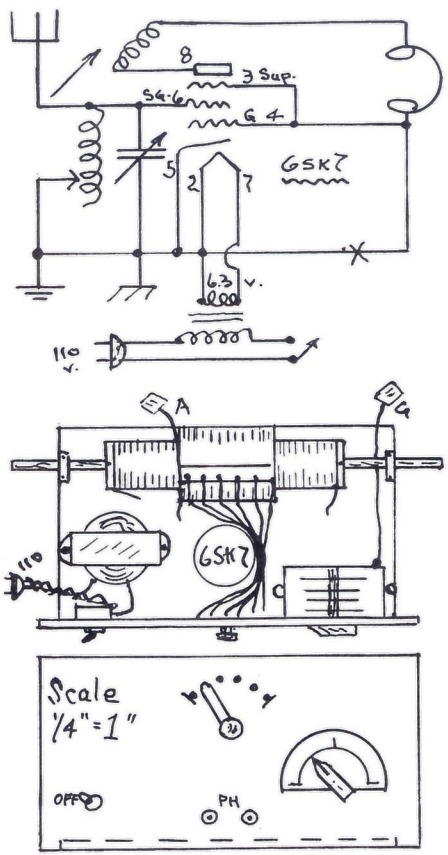
$$\frac{E}{IR} = \frac{E}{.075 \times (1000 + 800)} = 135 \text{ v.}$$

(check) 60 + 75 v. = 135 v. Term.

For example, a filament transformer may test 8 volts AC e.m.f across a hi-resistance voltmeter but drops to 6.3 when a tube is hooked across it.

In next issue we will continue with series circuits. Will discuss some interesting data about tube filament strings and how to figure them. Let us know how you like it so far.

A TRICKY ONE-TUBER.



Parts list:

.00035 Var. Cond. 8-7	1.25
6.3 v. fil. trans. 24-8	1.50
Compo. panel 4" x 8"	.13
Plywood base 4" x 7"	.10
1¼" Bar knob and scale. 10-13.	.14
2 Phone tip jacks. 17-26 Ea.	.10
SPST toggle switch. 23-1	.35
MRL Switch lever. 9-20	.15
6 sw. pts. 9-21. Dozen	.15
2 sw. stops. 9-24. 20 for	.15
Octal wafer socket. 25-11	.10
2 Fibre bushings. 13-137. Dz	.10
6SK7 tube	.85
125 ft. #28 Enam. 7-78	.20
1" Bak. tubing 5" long. 7-166	.45
1½" " " 2" long. 7-69	.22
5 ft- Zip cord. 11-5	.15
Attachment plug. 11-28	.05
1 foot ¼" wood shaft. 8-103.	.12
Hookup wire, screws, etc.	

No B-supply, grid condenser or grid leak - just doesn't look possible - but it works.

The only power furnished is to the heaters of the 6SK7 and the little RF coming from the Aerial-ground circuit. It is a space-charge detector, with the usual grid lead going to the screen grid (6) and the control grid (4) is grounded. In fact, almost everything is grounded on one side - even the phones. Hi.

It is necessary to have a good Aerial and ground. We had a wild scheme to put a 50 mfd. Electro cond. between filament and the phones, to build up some DC for the plate, but it didn't help very much.

The secondary coil is 100 ts. #28 Enamel tapped at 5-10-20-40-75-100 on the 1½" form. Winding space is 4-11/16". Inside this slides the tickler coil 5" long. In about ¼" start winding 300 Ts #28 Enamel. Dope both coils with MRL Light Coil cement. We assume smaller wire may be used. Even an RF choke was used with fair results. Mount the secondary up from base on screws. Then, make 2 wooden bearings for the shaft to move back and forth. You can easily figure this out.

The tuning is first done with the variable and switch lever. Next the inner tickler coil is moved back and forth until the signal is loudest and sharpest. Shaft can stick out the front panel if you wish.

While messing with it we found some funny things that happened. It seems the addition of a grid leak and condenser killed the signals. Also, if the coils are closely coupled the volume is lessened. That is, a 1" inner form works better than a 1½". It seems less wire is needed than with a regular tuner - possibly because no grid condenser used.

Other tubes may be tried, and would probably work OK. We got good volume on locals, even with a poor Aerial and ground.

What's in the Mags.

As you see, we are cutting this section to a page, so only the most outstanding articles in our field are being listed.

POPULAR ELECTRONICS. Oct., 1955.

"Diode, Transistor Set." p.50. You may use phones where meter is. Also use different tuning.

"One Tube Wallop." p. 51. The 1D8gt tube is a triple unit. We suggest substituting our Type A coils for loopstick. Bring tickler from (6) on tube and back to R-3 resistor. Looks like a good rig. We can furnish parts & tube.

POPULAR ELECTRONICS. Sept., 1955.

"Transistorized Phone Pickup." p. 46. You might have some fun with neighbors. Good layout for an audio Transistor amplifier to be added to Xtal or 1-tuber. The PNP Transistor is used most now.

"Hi-Fi Tuner." p. 80. Shows a good diagram of Miller TRF tuner ahead of untuned pri. of RF tube for selectivity. Also layout for Selenium rectifier, using our Isolation trans. (24-23. $2.00) Size of coil L-3 determines the amount of selectivity. Suggest U use a tapped or slider coil. The non-powered, Diode unit also is good. Suggest Type RF coils with tuning condenser across them.

POPULAR ELECTRONICS. Aug., 1955.

"Schematic Lingo." p. 44. Some good beginner data.

"$1.60 Signal Generator." p.64 A simple one using buzzer. May use our bell buzzer (12-16, $1.) and 6.3 v. Fil. Trans. (24-8. $1.50). MRL Type RF coils will work OK and be changed at will. A buzzer puts out enough RF to make it work alright.

POPULAR ELECTRONICS. July, 1955.

"Electroscope." p. 39. Some FB experiments in static, etc. that are easily made by you.

AXIOM: You must begin somewhere!

SCIENCE & MECHANICS. Oct., 1955.

"Power Line Interference." 181 Several ways to cut it down. Use our bypass condensers, see CAT.

"Amateur Xmtg. Station." 185. Can furnish all parts except the Xtal. Our Celluloid coil forms R fine. Also good Ant. data. A very simple rig to build.

SCIENCE & MECHANICS. Aug., 1955.

"Electric Eyes, Timers." 125. Some good data on Transistors.

"Amateur Stn. Receiver." 128. Uses 2 split 6SN7 tubes and 5Z3 rectifier. Note the Antenna goes to cathode of first tube. However a TRF stage is much better. Uses our type C coils. 2 steps of AF by splitting a 6SN7. Will work a speaker OK. Our coils or forms R fine for this job.

"2 sets - 1 TV Antenna." 133. A simple resistor bridge. They don't have to be 800 or 900 ohms but must be the same.

RADIO & TV NEWS. July, 1955.

"Servicing Without Meters." 38 Some practical hints.

"Transistor Dip Oscillator." 51 Now we have regeneration. But if you'll notice, instead of 20 Ts for tickler - they have 42. Anyway, one could try a Type A coil and bypass condensers from (B) to ground. Note usual grid leak and cond. are on ground side.

"Selenium Voltage Doublers." p. 54. Some good data. Also see page 59 for some more.

RADIO & TV NEWS. June, 1955.

"Transistor Light Xmtr." p. 35 Good circuits on push-pull. How fluctuation breaks the light and is received by a Photo-transistor. We saw light beam Xmtrs. at S.F. Fair in 1939, with tubes.

Lucky for us, most of the Rdo. mags. are getting away from Beginner & Experimenter articles. So, keep up-to-date by sending in your subscription to RB&H. NOW!

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

B-Battery. With some "over sensitive" 1-tubers one may get a sudden "br-r-r" when tuning. A fine adjustment of the volume control will eliminate some of this. However, after trying out several volume controls, regen. condensers, leaks, etc. we suddenly found the 22½ v. B-battery was too strong. Many have said their set worked better on 16½. Insertion of a 5M or 10M volume control in series with B-plus will smooth up operation. Whatsmore, it increases volume of the stations to a degree.

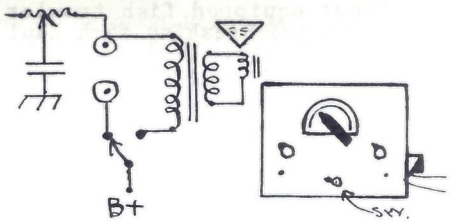
The test for sensitivity of a set may be its "critical point." The more efficient it becomes - the more fussy it gets. In contrast to a hi-strung race horse and a plow-horse with 3 kids on his back. At first we used a .0005 regen. cond. and later we changed to a .00025. Then, less tickler turns now. Now it's gotten to the B-battery. As your B. runs down you can cut out the resistance. It won't drain any more on battery than before.

Reverse Filaments. Don't forget some tubes work better with A-battery reversed, but it seems more noticeable on 1Q5 than 1C5- It is possible some companies hook them differently. Test on a DX station only.

Transistor Amplifier. Get our DP-14 at 10¢ and hook input across phone tips. Then hook up an output trans. to match speaker. Will work the speaker fine - and you'll have swell tone, too.

Longer Antenna. some ask why it may change tuning. It tends to overload the tuning circuit. One could offset this by using mica cond., say .0001 in series with Ant. trimmer and long antenna.

Phones to Speaker. Some would like a quick way to throw from one to the other. Under the dial mount a SPDT toggle switch (23-3. 45¢. Ask for a small one.) Run the B-plus to center of switch & balance as shown. Use tip jacks for phones as before. Run 2 pcs. of stranded hookup wire out to the right to primary of output



transformer for speaker. Now you can switch over with no fuss.

M.R., Philadelphia, Pa. says: "I built HB-4 set and it works swell. I have received Russia (7000); Sweden (6600); Belgium (5000); England (4900); Spain (4500) and Dominican Republic (1350). Also 8 call areas on 20 meter band."

H.D., Canton, Ohio, reports: "Am sure enjoying reception of 1-tube kit. I get England (5700) and South American stations easy (3500). Send RB&H magazine."

Bases for Coils. Previously we were very short of tube bases & possibly many of you didn't order because you couldn't find any bases to mail in. We have been fortunate that several have mailed them to us. Therefore, we can supply a limited amount without bases - if you care to order them. However, if you can still locate bases, we'll still take all you care to send at 2¢ each plus postage. In the meantime, don't hold up orders because you don't have bases.

Wiring notes. We find it much easier to wire if the grid cond. and leak are hooked in last. You don't have to fish under it.

Tube socket connections are plainly marked all over HB-4, so you shouldn't get them mixed up. It is a good idea to completely read HB-4 before building it.

Our Leadin wire (1-11. 1¢ ft.) is very good for flexible leads out the back, and we use it when wiring kits.

SUBSCRIBE TO RB&H NOW!

Natural History Oddities.

A Sonar equipped fish trawler made a record-breaking fish haul of 119,000 lbs. last year. It used the Sea Scanner Fish-locating device. Sonar uses frequencies in Audio and supersonic range. Sound pulses are sent thru the water and time lapse of the return signal is converted into distance. Subs. use code with the same method. Sonar is taken from SOund Navigation And Ranging. Seems a fish is having less chance every day!

A Catfish is kept for a pet in Japan to warn of Earthquakes. For some unknown reason it swims excitedly up and down when an Earthquake is imminent.

The Wildest and least known part of the Globe is said to be in Lower California. Most all water has salt in it so Man has shied away from it. In the 20's I was talking to Mr. Van Duzee, curator of Entomology, Calif. Academy of Sciences in S.F. They had just returned from an exploring trip down there. For a Scientist to find a new species is a big thing. But, they found hundreds of new ones, and became very excited about it. A boat was chartered for the gang of scientists. But the Herpetologists let their Iguana lizards run loose on deck. At night they would attempt to get under the covers - much to the disgust of the other more-timid scientists. I used to go out to the Academy and help mount butterflies during spare moments in port.

Speaking of Snakes - when I was in High School I joined the Lorquin Natural History Club of Los Angeles. We'd have quite an array of Scientists at our meetings. The Herpetologists always had their pockets full of snakes - that came crawling over their shoulders. Of course, the women would scream- so a good time was had by all. Incidentally, we had a Charles Richter as a member - and he used to give lectures. Am sure this is the same well-known authority on Earthquakes at the Calif. College of Technology.

A Rattlesnake rattles to attract a mate - or when scared.

An Oyster is so tiny when It's hatched that a bottle the size of a man's little finger will hold about a million.

Australia has 7000 species of plants not found elsewhere.

The Black Widow spider kills 5 out of every 100 people bitten. Until recently sprays have been ineffective in their control. Now they use Kerosene and Chlordane, similar to toxic action of Ant spray and powder. I used to use gasoline but it might blow up the joint!

Fishing Fleets. Japan has 300,000 ships; U.S.A. 90,000; Spain 38,000 and Italy 33,000. This is number for November, 1954. Many of the larger ships now can fish right on the ship. Years ago the Alaskan packer fleet used to go from S.F. and Seattle. I tried to get a job as Radio operator in the early 30's but things were pretty tough then, so ND. An operator would check fish all day and run the Radio shack at night. Boy, - that's livin'.

Noisy fish. During Naval tests of Sonar they found many noises in the water. Shrimps make a clicking sound by snapping their pincers together. Lobsters make a grinding noise. Groupers make a booming sound. Toadfish growl; Seahorses click; Porcupine fish whine; bottlenosed Porpoises yelp, etc. During submarine detection tests these noises were terrific when amplified.

The Pear tree is the most common tree. It originated East of the Mediterranean and used to be prescribed for "bad temper."

Stamp Collector's Page.

SOAKING STAMPS.

Never attempt to peel a dry stamp off a letter. It leaves thin spots that make it worthless. Tear off the paper and put it into a box.

Now, when you're ready to become a "soaker," -don't dump the mess into a bathtub. You may ruin some of them - besides giving yourself an endless job. One guy uses a washing machine and it may be OK on a large scale.

Due to fading of some Country stamps, it is a good idea not to wet too many at once. Try a few in a small pan of cold, clear water. It may take 20 minutes to loosen some of them. Swish the water around and remove the debris. The less time you soak them, the more sparkle and life they will have.

Sensitive Stamps. Check in the Catalog and see how they are made, if engraved, photogravured or lithographed. Most line engraved stamps will take a lot of soaking. Natural dyes are also quite stable. Photogravure and litho. may run. Aniline, or artificial colors run or bleach out. Some cancellations, especially Latin America, may run, altho they are now using a black "killer." Nederland Indies, Argentina, Trinidad, Tobago are some of the worst offenders.

However, the worst trouble is not from stamps but from paper they are on. Sort them by paper colors and do each batch separately. Trim paper as close to perfs. as possible. In a few minutes you can peel them off. Any small stain on the back is not too bad on used stamps.

Let sensitive stamps float face up on top of the water for about 10 minutes, or until paper has left it. Do only a few at a time so you can watch colors.

Chemicals. Some add small amounts of Vel, Dreft, Salt, etc. to the water as a wetting agent softens gum better. Some claim it brightens the colors. A few drops of Drene shampoo is claimed to be good. Rinso and bleaches ruin them. Hydrogen peroxide has also been used. If any chemicals are used, be sure to rinse after soaking. We prefer to use cold, clear water which is slower.

Mint stamps, if stuck together may be placed on wet blotting paper, face down, until soft. Slowly removing them won't hurt the gum too much.

After softening, lay them face down on newspapers. Do not stack them up as some gum may stick. If some still have the gum on do not attempt to remove it. It is not necessary to use a press if placed in a stock book or storage envelope.

When you're throwing away the common stamps, look for the 1¢ Franklin greens (#594) with a perf. of 11 - it is catalogued at $350. used.

CLEANING STAMPS.

Scotch tape on stamps is hard to remove. Energine, applied with a dropper works good. Attempt to lift it slowly. Another uses denatured (wood) alcohol. Hot water has been used but don't believe it is as effective. Do not use Turpentine as it makes the stamp transparent.

Grease may be removed by Benzine or Carbon tet. Stamps may be shaken in some Fullers Earth, obtainable at the drug store. Leave them in it 48 hrs. A hot iron applied to a stamp between blotters also removes grease.

Non-greasy stains may be removed by a half hour bath in fresh milk. Add a pinch of salt. The colors will be improved. The fugitive colors will become set. Milk may be used as invisible ink - which turns brown when it is heated.

Buttermilk will remove mildew from the back. Lemon juice and salt is OK for rust and some ink stains. Stamps that have become oxidized may be restored by a little Hydrogen peroxide.

See page S-1, in CAT. for list of Stamp supplies.

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. 9-46. 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.

New Magazines for Sale. All are in good condition. Most of them are not obtainable - even from their publishers.
Popular Electronics. Dec., 1954; Feb., Mar., June, Aug. 1955...30
Radio Electronics. March, May, August, 1955.....40
Science & Mechanics. June, 1955; Apr., 1953; Oct., Dec., 1954; Feb., Apr., June, Aug., October, 1955.....25
Popular Science. Dec., 1953...25
Mechanix Illustrated. July, 1954 September, 1955.....25
Mechanics Today, Jan.. 1954...25

Encyclopedia of Pop. Science. New book, paper cover. 247 pages. How things work. 4000 facts. Is very interesting. Special.....65
Auto Mechanics Course. Ignition. 277 p. used but OK.....50
ABC of Television. 210 pages. 1929. Good reading. Shows how TV got going. Used but OK.....1.00
Sylvania Loose-leaf Tube Manual. 1" thick. Used but OK. Have kept it filled with loose sheets pretty well. Special postpaid.75

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

#1. MRL #37 Push-button Crystal Set. Further details than HB-25. More description in RB&H 41.

#2. MRL #33 Selective Crystal Set. Uses variable selectivity control, details, etc. RB&H 41.

#4. MRL 15-1-tube DC Circuits. All tested plans, parts lists, etc. See RB&H 41.

#11. MRL Type D Antenna Coupler shows many uses. Complete construction, etc. See RB&H 41.

#13. MRL All-wave Vario-coupler. Shows construction, use, etc. See RB&H # 41.

#14. MRL Transistor Small Set Amplifier. Just made up. All details for building a slider Xtal set, with excellent selectivity. Also added is the PNP Transistor Amplifier, which works on 1½ to 6 volts of flashlight cells and operates a speaker. Volume control used. May be attached to a 1-tuber, or any Crystal set.

#28. Radio Symbols. Approximately 157 old and new ones. Big job to get it up. Hang it on your wall for quick reference. Looks much better photo'd than mimeo. Many you probably never saw b4.

#30. Proper Aerial & Ground Construction. Was very popular when mimeod before. We sold just hundreds of them. All latest data and the old ideas revised. You are sure to find a good idea.

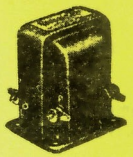
#34. MRL #10-A All-wave Crystal Set. See CAT. K-2.

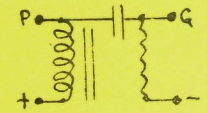
#43. MRL #26 Single Dial All-wave Crystal Set. Gives panel & pictorial layouts, etc. Uses RF plug-in coils for a very efficient SW circuit. A simple Transistor amplifier is shown, that may be used on any 1-tuber or Xtal.

#47. MRL #28 All-wave Plug-in Coil Xtal Set. Completely revised circuit. Has equaled #2 and 2-A in DX reports. See RB&H 41.

DP-file still for sale $1.25.

Fahnstock Clips. Both ¾" & 1" now 15¢ per dozen. Double clips out of stock; use 2 singles and a common screw to make doubles.





Rauland Lyric audio Impedance Units. Just a few on hand. Pri. has hi-impedance choke, and then into a coupling cond. to a grid resistor. Once sold for $6. and gave good tone. 24-25. 1½# 1.50

3:1 Audio Trans. back in stock Really over 4:1 but OK. Brand new stock. 24-16. ½ lb.... 1.50

Carter Rheostat Nuts. Hard to get. Fit old-style rheo. and VC, pots, etc. 5/16" x #32 thread. 13-187. Three nuts for.....10

Wood Screws. New, hard-to-get size. #2 x ¾" Flat. 13-81. DZ. 10

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

Curling Iron. Never used. Red handle. Lite wt. ½ lb..... 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 to the far end of coil.

Large Coil Forms. Cardboard. 3¼" dia. x 21" long. Suitable 4 Tesla, or large loading coil for Long Waves. Wt. 2 lb. Each .50

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

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

(1) Perm. Magnet Dyn. Spkr. (PM)			
2x3 PM	no trans.	21-9..	1 # 1.60
2½	"	21-20.	1 # 1.60
3"	"	21-11.	1 # 1.60
4"	"	21-12.	1½# 1.60
5"	"	21-13.	1½# 2.00
(2) EXT. Field Electro-Dynamics.			
3"	no transf'r.	21-1.	1 # 2.00
4"	"	21-3.	1 # 2.75
5"	"	21-4.	1½# 3.00
5"	with "	21-17.	2 # 3.50
6"	Auto. no tran.	21-5.	3 # 1.75

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

	Types A, S-A, C, S-C, RF, S-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

Also instead of the colored paper strips, we lacquer them with the following colors: 20 m. band lite blue; 40 orange; 80 red; 160 ferrite yellow; HF-BC green gold; BC white; LF-BC brown; LW yellow. Makes a finished job.

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

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

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

MRL CLASSIFIED ADS.

4¢ r word; 3 insertions same ad 8¢ r word. Count all words. Circula on over 3500 per issue, plus bac numbers, which continue to se over a long period. Numerals -44) means 3 issues, ending with '44.

Don't let ur ad run out. We won't notify u when it does. A 3-time ad al. rs pulls better than a 1-timer. e more you tell the more you see Please do not make ads conflic too much with ours. Thanks, - M

EXCHANGE Radio par. List requirements. Wilbur lay, 1803 Childress Drive, S.W. Atlanta Georgia. (4-45)

RADIO Experimenters! Writ for a free list of Radio parts rystals and booklets. Robe D. Mickelson, 1342 West Corn ia Ave., Chicago 13, Ill. (3-)

RAYTHEON CK-706 General purpo. Germanium diode 70¢. Guaranteed. Wesley Hamilton, Route Box 878, Albany, Oregon (3-/

CRYSTAL Radio Experiment s. Write Leslie Hulet, 305 pe, Lakewood, New Jersey. -46)

EXPERIMENTERS, SWL's, B nners, Novices. Build sure re circuits, learn Radio m interesting illustrate adio Science magazine. N 5 issues $1.25. KN2LRS 2 Backman, Westfield, New k. (1-42)

STAMP Collectir and Radio parts for sale. W e Dennis Daluge, North Str t, Springfield, Minnesota (1-42)

PLAY Aut ets from house current nout converters, rectifi or tubes. Simple foolproo ethod. Diagram, instructi 28¢. Circuits, 719 Doris, B xi, Miss. (1-42)

E A-loud Crystal, Radio plans, ransistor plans, bargain offers: 35¢. Amorose, Route four Richmond, Virginia. (3-44)

BUILD Crystal Radios, I-t e receivers, match box R o, Radio transmitter, Short ave adapter, plus others Book gives complete plans, ¢. Catalog 10¢. Don Smith Morgan Electronics, Leesbur Florida (1-42)

LIMITED quantity ne ubes- name brands - 60% lis plus postage and insurance. her merchandise. Send f list. George Shaw, 1530 G e, Burlington, Iowa. (3-44)

NEW Norelco cary action Double header E tric shaver. Unconditiona guaranteed. $24.00. Sorry, COD's. Hovey's, 1509 Alban venue, Modesto, Californ (1-42)

25¢ I list your name and hob- s in my new World-wide oss-Country Hobby Exchange" ecking copy sent. Sample opy 10¢. 719 Doris, Biloxi, Mississippi. (1-42)

'ANTED - Early wireless equipment, books, magazines, catalogs. Describe and give price. Phillips, 1010 Monte, Santa bara, California. (6-47)

L CORRESPONDENCE CLUB.

Begi ng next issue this column wil e placed in classified ad secti If you want to receive lot f letters, run an ad - giving i rests, etc.

P.J. Kavalesk Box 17, Franklin Mine, Mic an. Ham Radio; Crystal set Minerals; Swap Radio magazin letters. (8-42)