



# RADIO BUILDER AND HOBBYIST No.35

For the Experimenter

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By Research Today we can Insure Prosperity Tomorrow. - Karl Compton

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## Litho. in U.S.A. by MRL.

### EDITORIAL NOISE LEVEL. (QRN)

Well, bust my bust buttons and call me Buster, if RB isn't here again - and this same year, too! This new 6000 per hour Printer sure slaps 'em out. and "EO" is getting slap-happy trying to handle both ends of the contraption at the same time. (If I'd just learned to roller skate when I was a Kid!) As soon as we collect all the pieces, we'll whip up an article on how it works (when it does!) hi.

HB-4 and our 1-tube Kit have been put into shape, as you can see on pages A-4 and K-3, without any casualties around the place. After fighting the Spring fever; filling orders; making up Stamp packets; mailing out to

our Stamp list; getting up this RB; keeping down the wasteline; re-modeling; seeing all the Movies; taking care of Real estate; reading 2 newspapers and 8 magazines; mailing out literature; completely re-writing BP-2 into HB-4 of 24 pages; and answering 8" of correspondence - and then, our friends ask "why don't you folks drop in on us, you are retired, and have nothing to do!"

Many subscriptions have come in; several good reports on Ads in RB; plenty of good DX reports have shown up; orders have held up good in comparison to most businesses; and when we get all tired out - here comes a nice letter from some Fan, who claims he has received exceptionally good treatment - well, what more could one ask?

We still must push for more subscriptions to RB before we can make it pay, and come out with any regularity. (Even large mags. with millions of readers, keep asking for subscriptions, so we aren't alone.) Even if one of 3 for 40¢, or 6 for 80¢, we still appreciate them and they help to pay postage, which has advanced 50% this year.

Thanks again to the many contributors for their time and interest, in sending in material and helping generally in making this RB more interesting.

We are now working on HB-3 - so you fellows with a back/order won't have too long to wait.

We have had plenty of trouble getting our new \$2400 machine & new plate set-up to working OK. We have changed processes on the plates, partly because the mfrs. decided to stop making the direct Aluminum plates. We either had to go to Zinc Photo'd plates at \$3.80 each page, or to Remington plastic direct plates, or to Aluminum photo'd plates. We decided on the 2 latter. Naturally, we ran into a lot of new difficulties in solutions, and certain procedures we had not used before. This has helped slow us up until we could get going right. Believe we have them fairly well licked, at least, we got our fingers and toes crossed! In-

stead of buying a \$350 printer, we rigged up one from a GE Sun lamp for \$15 - and the results are what you see on CAT. pages A-4 and K-3, and all of HANDBOOK 4. They may not be perfect, but you'll have to admit MRL is getting some of the birdies out. These were done on the photo'd Aluminum plates.

As to the Remington-Rand plastic, direct plates, this RB is done on them. It wasn't understandable to us, why many office girls who aren't too mechanically-minded, could get good results every time, and us with 7 years' experience in Lithography couldn't cut the buck. Well, all we were doing was wiping off the copy with a strong etch, put out by another company for Aluminum and Zinc plates. When we stopped doing this, we were in clover, and they all turned out OK. (Now, Mabel says I can be reading up on data for next RB, while the press is running!)

Even with our small output of literature, we use over a ton of paper a year. Some companies use a carload a week, but look at their output, in comparison to ours. And our chemical shelf is getting to be a regular Laboratory in itself, with all kinds of 'goop' being used on the new machines. So, if you feel your house settle a little, some day, just figure it might be MRL taking a trip thru the Air, with the Nuclear Scientists, that has caused the earthquake! hi.

Mabel has made up several hundred address plates for 12-time subscribers. Even this takes a lot of time, but we are rewarded when they are run off. It is about 6 times as fast as addressing on a typewriter and we both do touch-typing. Besides, it is much more accurate than typing up each time.

Over 1000 cards have been removed from our active files this trip, and placed in the inactive file. For years, we have been hoping to send an occasional pc. of literature to this file, but always lack the time. So - let's have your subscription NOW and we'll keep them coming. Thanks.

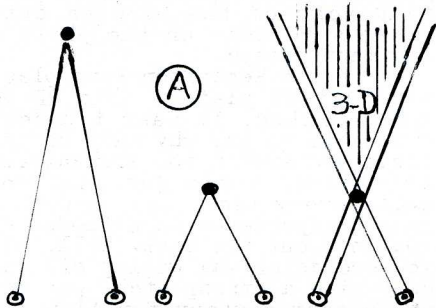


## THE NEW 3-DIMENSION MOVIES.

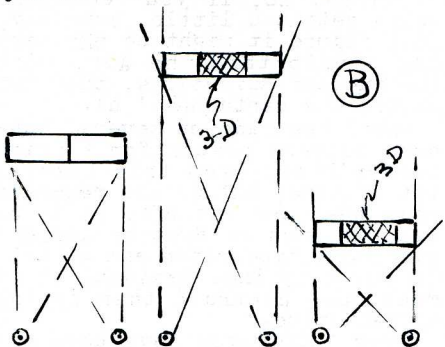
We feel this little article on Movies may be of interest to our Radio Fans. Besides attending Movies - we have amplifiers, optics, electric eyes, CR tubes & photography with which to contend and interest us.

There are two general systems used in the production of depth pictures. Various editors classify them differently, but we feel they should be classified as Stereo and Wide screen types. In the latter some say they are not depth pictures, but only produce an illusion of depth. Really, the Stereo pictures are also the result of an illusion, so why give this as the determining factor? We think the difference is in the way they are produced and shown.

**Stereo.** There is nothing new about 3-D (3-dimension) pictures as experiments have been carried on since Edison's days. Some of you may remember the old-fashioned Stereoscope we used to look thru when we came to visit Grandma, or waiting for our girl to dress??



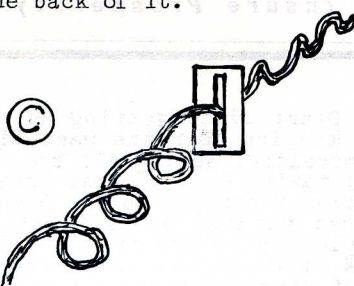
Eyes focused at a distant object are almost parallel. Bringing the object closer to the eyes causes them to converge, or cross - thereby giving the realization of distance. One cannot judge distance with only one eye in use. You may make an experiment with a pencil in Fig. A. Hold it away from the eyes - and steadily bring it closer. Your eyes will become crossed.



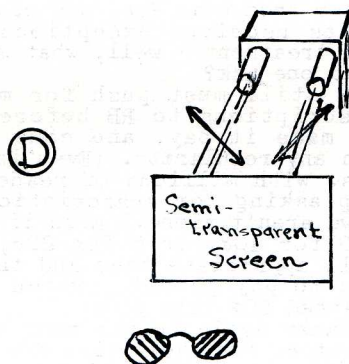
Another experiment, Fig. B, is to take a Stereo, or double picture. Relax the eyes, and hold it at a distance from your face, and look over it. Then, gradual-

ly bring your eyes back to the picture, but leave them focused on the distance. You will now see three pictures - one in the center will have 3-D and one on each side will look flat. The farther the Stereo is pulled away, the smaller the center one becomes, and the larger the outside ones. In viewing a Stereo each eye sees only the picture intended for it, and your brain fuses them together into one.

When we view an object with both eyes, each gets a different picture. One may check this by looking at an object and first closing one eye and then the other. From Fig. A you will note how we see an object, and how the lines converge and form 3-D at the back of it.



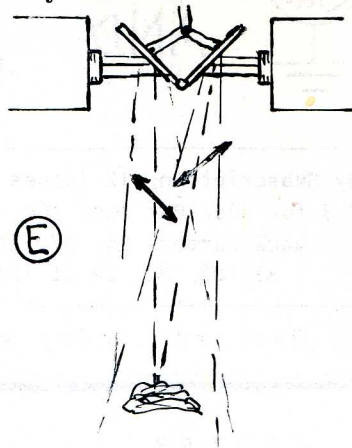
If a rope is put thru a vertical slot in a piece of cardboard and rotated, as in Fig. C, only the vertical rotations will be carried along the rope. This is polarization. Also, when light is reflected, it may lose some of its glare and become more polarized.



Each camera lens is polarized, to direct its picture to the eye intended for it by matching the polarized glasses of the viewer. Therefore, one obtains the separation of the two camera pictures by looking thru the polarized glasses furnished free by the theatre. Some theatres furnish heavy plastic glasses, and are much better than the thin ones furnished by some. Without the glasses, the pictures look blurred, similar to the colors failing to meet, or register, in the Sunday comics.

We've seen two shows now, in Stereo vision, the "Bwana Devil" - and a series of English shorts on Natural History, optics, etc. We especially enjoyed the African adventure picture, where a native apparently threw a spear to within 6 ft. of us, and lions

were running all over. Evidently the effect is obtained by varying the distance between the camera lenses. Landscapes and animals in Technicolor all seemed very lifelike.



Writer-producer Arch Oboler upset the Movie World by his production of the "Bwana Devil." His camera, Fig. E, is composed of (2) 35 mm. Mitchell Motion picture cameras. The lenses face each other, and are focused on an adjustable mirror of about 45 deg. Mirrors are adjusted by hand to swing like a pair of eyes. This solves the parallax correction and permits the recording of scenes as actually seen. Cameras are focused individually, and sharply on the object, as the Star. But, objects in the background and foreground are out of focus, and appear as double images without glasses. Cameras are spaced 2½" apart, like our eyes. The combination of the two shots give the third dimension illusion.

Depth movies will throw a lot of actors, with poor figures, out of work, as 3-D doesn't go for falsies. This is because it accents slimmness and stoutness. It also seems to us that distant objects are not true size, but possibly future camera adjustments will take care of this. I also note that when they change from one scene to another, it takes a fraction of a second for the eyes to get adjusted to the new shot, due to different camera adjustments.

Three top movie executives got up and walked out of the original showing of "Bwana Devil." The press also gave it a dig. However, this picture is expected to draw 8 million dollars at the box office. Experts and banks were all against the idea. Oboler is now working with 3-dimensional sound from speakers placed about the theatre.

Stereophotography has now become a Hobby, and many camera Fans are changing over from the flat pictures. One can make his own Stereo pictures by snapping a picture and carefully moving the camera 2½" to one side for the other snap. Mount the pictures with the nearest center



object  $2\frac{1}{2}$ " from the same in the other picture. Distant points in the picture will be different than  $2\frac{1}{2}$ " apart, therefore, the 3-dimensional.

**Wide-screen.** It is claimed Cinerama, or Wide-screen pictures are not depth, but we feel the final outcome is the same.

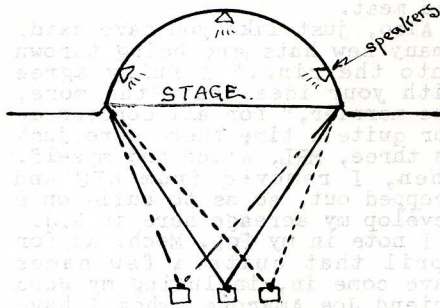


Fig. F. Cinerama method of projection, with 3-D sound from each machine.

The Cinerama method above uses natural vision, that is, no glasses are required. It is viewed on a large semi-circular screen setting around the stage, Fig. F. Three cameras are used and three projectors to show it. One is much larger and placed in the center to cover the whole screen - while the two smaller ones are focused from the sides. Fred Waller developed the Cinerama, but it was Michelangelo who invented it, when he painted a curved mural in the Sistine Chapel. When you get close to it, you are part of the whole picture.

There are really three images shot onto the screen, but the curve gives the illusion of 3-D depth. Depth sound is accomplished by moving sound from one of the speakers to another as the objects move about the stage. The screen may be 25 ft. high & 65 ft. long. It really multiplies the Movie expanse three times.

Cinerama seems to be awe-inspiring for outdoor scenes, big buildings, etc. Roller coaster rides shown in New York caused the audience to scream, they were so realistic. However, the love scenes shown on the large screens do not seem just right. So, the Fan mail may go to the scenery instead.

Cinemascope, developed by 20th Century Fox uses a special lens on the center camera and projector to broaden the picture to fit the giant screen.

The Wide-screen method is more costly in screens and more operators. The three projectors cost about \$50,000 to install over a period of 4 weeks. However, when shows in New York pull \$35,000 per week with a 16-day sellout, it soon pays off. However, future popularity cannot stand up to this figure.

In Vienna a special grooved Aluminum screen is used. No different projection equipment is required, and ordinary films are used. It gives an illusion of depth.

Anso also announces we will soon have News reels in color,

by use of their new 3-color film to be shot by regular cameras & developed by usual equipment.

We remember the first Talkies which used large platters for sound. Often the picture proceeded, or followed the voice, causing the audience to complain in no uncertain terms. Later it put the picture of a sound vibration on the film, along with the picture we use today.

Times and conditions change. At first, the Movies, or Flickers, with big attendance. We used to stand in line an hour to get ANY seat. Then, the Radio with Amos & Andy, and others came along, to the detriment of Movies. Latter were prevented from hooking up to Radio programs due to Copyright restrictions of the Radio programs. The Movies then turned to dishes, drawing for prizes, etc. to draw them in. Then Talkies came along and put the people back into the theatres again. Next came the TV which really knocked the props out. Shows played to empty seats except on week-ends and Preview nights with a third picture for free. In a recent RB article we mentioned lower prices might do some good. Contrarily, we have found out differently, as low-prices also bring empties, so I guess it is old TV after all.

Now, for a shot in the arm, Hollywood is up to its elbows in 3-D projects. In December, 1952, Warner Bros. announced they were first major film company to enter the 3-D field. Warners also pioneered the talkies in 1928.

Warner Bros., Columbia and RKO Paravision are going for Stereo.

Fox and MGM are betting the people won't go to Stereo movies the second time, if they have to wear glasses, so are going in for Cinerama.

Paramount and Universal-International are experimenting with both Stereo and Wide-screen, & are trying to get present films shown on Wide-screen.

Due to selfishness of the various studios, the public is now rather confused. This isn't near as bad as the effect on the poor theatre owner, who is waiting to see which system is going over best, before he makes an expensive switch. Each system has its own advantages.

At least, the Movies will have to hunt new faces, stories but probably the same old plots.

**NOW!** After that, we'll expect Marilyn Monroe to come out with the 4-D - who knows?

#### PACIFIC COAST NOTES.

##### Ampex.

Ampex, of Redwood City, is one of the leading magnetic tape recording organizations. It is now working on 3-D sound. It uses 3-microphones, 3 recorders and 3 speakers in its system. Results of these 3 recorders are placed on one tape, to make them synchronous, and able to play at once. Ampex says the secret is in the mixing of the tapes, that

produces lifelike sound. Their sales for 6 mo., ending October, were 1.6 million dollars. We may run a story on them later.

##### Varian Associates.

If you have a scheme for a new tube, and \$75,000, Varian will develop it for you. Their demands for the Klystron tubes doubles their ability to produce them. One of their latest output developments is a large 200 pound, 6 ft. high Klystron tube to supply power for the UHF station WHUM-TV in Reading, Pa., which is expected to be the World's largest, with 260,000 watts. Maybe you've driven by their new Palo Alto building to be occupied by May 1st, for experimental and development work. It is made in the form of a cross, and sure is a Honey. They intend building another addition to this later, on their 16 acres, leased from Stanford. Plans are to acquire 34 more acres in the future.

##### Lenkurt Electric.

This San Carlos' concern has been operating in their 40,000 sq. ft. addition completed this year. Now they have another one, costing \$60,000, making a total of 130,000 sq. ft. The latter is to shorten supply lines, etc. A  $2\frac{1}{2}$  million dollar Naval contract for Aircraft electronic equipment has just been landed. Sales last year were 4.9 million dollars. A dinner was just given to 60 employees with 5 years service. 1000 are employed in San Carlos. Another plant is operating in Vancouver, B.C.

##### Dalmo Victor.

This San Carlos firm reports a backlog of 30 million dollars in orders, mostly for Military contracts for Radar Antennae. Sales ending Sept., 1952, were 23 million dollars for the year. Firm is celebrating its 30th anniversary. It employs 1170 in its 4 San Carlos and Belmont plants. We saw the new #4 plant, in Belmont the other day, sure a pip. Now they intend building a 7500 sq. ft. addition to their San Carlos plant for laboratory work and experimental. Their rights & equipment for inter-coms were just sold to Paul Beale, Electronics Engineer, who is starting up in San Carlos, to build 6 basic models, mostly for room-to-room service. Will employ 10.

##### Eimac.

Eitel-McCullough, Inc., of San Bruno, with another plant in Salt Lake, started by two Amateurs in a butcher shop in the 30's. Their specialty is tubes - mostly for the Services.

##### Sylvania.

We have no new info. on their new Lab. at Mountain View, Cal. Picture tubes are its best seller, of which it makes 25% of



those in use. A representative was in S.F. in January, selling 20 million dollars worth of common stock. Their sales for 1952 ran about 230 million dollars. The Company operates 4 plants & 2 laboratories.

#### Packard-Bell.

This Los Angeles firm did 22½ million dollars worth of business for the year ending Sept., 1952, to break each previous record. Net profits from this is 3 million dollars.

#### Mare Island Naval Yard.

Work just started on a new 4.8 million dollar 5-story Electronic shop at the Naval shipyard, at Vallejo. Will consolidate all the electronics work. To be finished by 1955. This year's production of Military electronic equipment sold to the Armed Forces by other concerns, will exceed the 1952 figure of 4 billion dollars worth.

#### General Electric.

Oakland's lamp factory produces thousands of light bulbs per day, or enough to supply demands over to Salt Lake. Plant was set up in 1912. KGO used to be near it, before it was moved to the mud flats in south S.F. Bay. KGO used to drown out everything in Oakland, due to strong ground wave. GE produces about 10,000 kind of lights, including mercury, fluorescent, photo, sealed beam, etc. Lamp biz is better on the Coast because about 100% of the farms are electrified. One woman spends the whole day busting up lamp bulbs - or 1½ of the output that are defective. What fun!

#### UHF in Portland.

In Sept., 1952, KPTV opened up the first UHF station, doing experimental telecasting. New UHF cannot be received by most HF sets, unless they use converters - but newer models provide for both. GE, and other mfrs. are building UHF equipment rapidly.

#### Local School Transmitters.

Sequoia High School, of Redwood City, now operates station KSEQ on 1030 KC, on 24 watts, from 4-5 p.m. Thursdays. It gives sport announcements, etc. put out by the Students...KCSM (FM), San Mateo Junior College, operates during College year 1-5 p.m., 5 days per week. Educational and entertainment programs. It will serve as a laboratory for Radio Engineers, Technicians & Actors. School now has several branches, and many adult courses are included in its curriculum...KEAR, San Mateo, 1550 KC, now has been boosted to 10,000 watts. How well we know - he splatters all over the HF end of the dial. Station will continue classical music.

**DX Location-** He who gets it - gets it!

#### KGEI, San Carlos.

Cutting government expenses a half million dollars per year has eliminated 6 International SW BC transmitters. Two are at KGEI, GE station in San Carlos. Others are Associated Broadcasters S.F.; Crosley in Mason, O.; Westinghouse, Hull, Mass.; and the World-Wide Broadcasters in Scituate, Mass.

#### Eastman Kodak.

In the new Stanford University development, Eastman Kodak is building a new 2 million dollar processing plant. Stanford has held onto a lot of land for yrs, and it is now in the center of development. Eastman's primary operation will be the processing of 35 mm. color films, which are now done in Los Angeles. 300 are to be employed at first, with 900 at the peak.

#### Self-lighting Cigarettes.

A new building on the Bayshore Highway, Redwood City, has been completed for manufacturing a self-lighting cigarette. They will be lighted by striking the emulsion-coated end on the side of the package. Four more plants are planned, but the owner may still keep his barber shop in SF - just in case!

#### Radio Parts Firms Fined.

Fines totaling \$40,000 were meted out to the following Bay firms - Associated Radio Dist., S.F.; Frank Quement, San Jose; Kaemper & Barrett, S.F.; Pacific Wholesale, S.F.; Zack Radio, SF & Palo Alto; Miller Radio & TV, Oakland. Thru their association, they prevented other firms from engaging in wholesaling Radio supplies. They were accused of violation of the Sherman Antitrust Act, to freeze out dealers - who weren't members, to the extent of 8 million dollars per year. Penalties could have been much worse.

We may add that we continually run into this sort of thing. We cannot get many items direct, but have to buy thru "squeeze" channels and pay a higher price, because we aren't a favored Distributor for that line. Now-a-days it's impossible to tell a Dealer from a Distributor - at least in the Radio business, so who is Mighty enough to judge? There will always be a fight in this business, as long as there is a dollar to be made by someone - and another to try to prevent him from getting it.

While above information may be more of Success Stories than experimental Radio, we believe the info. can be used by local talent. Usually they are in need of help, so if you are looking for a good job, contact them.

This area is fast becoming the World's Electronic center, from the large number of concerns we see starting up. Especially with a fat government contract, anyone can really "be in!"

#### A NICE LETTER FROM LES HULET.

Friend Osterhoudt:

After having read and re-read your RB and HB-17 many times, I still learn a lot whenever I go thru them again. It sounds funny for an Old-timer in Radio, like myself, to admit the truth, but you sure do cram them full of red meat.

Also, just like you have said: "many new hats are being thrown into the ring." I fully agree with your idea that "the more, the merrier," for all concerned. For quite a time there were just us three, MRL, Allen and myself. Then, I removed from NYC and dropped out, so as to build on & develop my acreage here in N.J.

I note in my Pop. Mech. ad for April that quite a few names have come in, including my good friend Joe Amarose, whom I have known for years.

Your RB brings me back to the good old days when Mr. Gernsbach published that great Radio News. Your RB should absolutely be a must for every Radio Experimenter.

It takes a subscriber at least a month to carefully read and digest the mass of valuable information that you crowd into each issue. And, just like the famous "Radio News" they will be treasured and kept for many yrs. My little classified ad in last RB has already pulled good, and be sure and notify me in time so I won't miss an issue.

Yes, Friend Osterhoudt, your Mag. is good value for only \$1.50 for 12 issues. I prove my point by enclosing my check for \$1.50, and mailing this letter via Air.

Cordially,

Les Hulet, Rt. 4, Lakewood,  
New Jersey.

**Editor:** Thanks, Mr. Hulet, for "them koind woids." Here's a little secret - we learn a lot each time we write it up! hi. It seems no end to the amount of info. one may get if one just keeps searching. I remember, in 1930, when I got a feeling I'd like to go back to Sea again, as Radio Operator. When I used to sit in on a beginner's class of Radio theory, etc. during a 30-day brush up course, I found I got untold value for my time, & I was classed as a veteran Opr. at the time.

As for fellows working together - we sure go in for that aplenty. The large successful concerns work together - so why shouldn't we? And, above all, it helps the Hobby immeasurably.

We welcome all the subscriptions we can get, as this will make it come out more often, and we'll try to make the RB as interesting as possible.

#### FREQUENCY and WAVELENGTH.

Light, heat and Radio waves R called Ethereal waves. Water waves are carried along by water - which is its medium. Ethereal waves are carried along in their medium of Ether. The name Ether is a theoretical term applied to



our space, and is not really Ether.

The Velocity, or speed of all Etheral waves is the same and never changes. It is 186,000 miles (or 300,000,000 meters) or 7 times around the World in one second.

To keep away from large figures, we use Kilocycles (KC) or Megacycles (Mc) instead of Cycles (cps) per second. Instead of 300,000,000 cps we use 300,000 KC, or 300 Mc, which are just the same, by counting off 3 decimal points for each.

For the Velocity formula, we use

$$V (300,000) = \text{Freq. (KC)} \times \text{meters}$$

or, substituting, we have 300M divided by 300 meters equals 1M KC, or 1 Mc.

In other words, the shorter the Wavelength (WL) the higher the Frequency. Wavelength is the distance the wave travels, and the Frequency is the number of oscillations back and forth per second.

Therefore, in the following quick-reference table you may substitute on either side. If U want a figure for points in between, you may divide the Freq., or WL into 300,000.

Wavelength in Meters	Frequency in KC.	Mega- cycles
1.....	300,000.....	300.
2.....	150,000.....	150.
3.....	100,000.....	100.
4.....	75,000.....	75.
5.....	60,000.....	60.
6.....	50,000.....	50.
7.....	42,900.....	42.9
8.....	37,500.....	37.5
9.....	33,333.....	33.33
10.....	30,000.....	30.
20.....	15,000.....	15.
30.....	10,000.....	10.
40.....	7,500.....	7.5
50.....	6,000.....	6.



"Drinkin' again, eh? Can you prove it?"

Experiment submitted by G.F.  
(Hand Cleaner) Corey, 4767 N.  
Durfee, El Monte, Calif.

Wavelength in Meters	Frequency in KC.	Mega- cycles
60.....	5,000.....	5.
80.....	3,750.....	3.75
100.....	3,000.....	3.
120.....	2,500.....	2.5
150.....	2,000.....	2.
160.....	1,875.....	1.87
200.....	1,500.....	1.5
250.....	1,200.....	1.2
300.....	1,000.....	1.
400.....	750.....	.75
450.....	667.....	.66
500.....	600.....	.6
550.....	546.....	.54
650.....	462.....	.46
700.....	429.....	.42
800.....	375.....	.37
850.....	353.....	.35
900.....	333.....	.33
950.....	316.....	.31

In the above table, you may substitute wavelength or meters. For instance, 200 meters would be 1,500 KC. Or, reversing, 1,500 meters would be 200 KC. We have eliminated duplication as much as possible. Again, 10,000 meters would be 30 KC. Doggone it, we don't like to figure, either!

#### NOTES ON GERMANIUM; NEONS; etc.

By Dr. Wm. H. Grace, Jr.  
Bronxville, New York.

Sorry I don't know where you could procure some Germanium metal, suitable for Xtal use at the moment. The metal is not used in the pure form, as far as I know, for rectifying purposes, but has certain substances added to it. The most common are Antimony and Phosphorus, in small amounts, to produce the N type Germanium Xtals. Much of the original work on this subject was done by the Purdue University group, as you may know. Others, like the Bell Labs and Sylvania and the G.E.Co. have also done lots of research since.

Germanium is not a recent discovery, but has been known for some time now. If memory serves me right, I think it was first reduced by a chap named Winkler, in 1886, from a rare mineral "Argyrodite." It was reduced from the dioxide by Carbon, I believe. The first Germanium was obtained over here by the Purdue people from the Eagle Pincher Co. in Joplin, Missouri.

There are 2 methods employed. The first was by the reduction of Germanium oxide by Hydrogen & the second from Germanium tetrachloride, by Zinc vapor reduction. Both gave pure Germanium metal.

I am under the impression that Germanium used to be known as Ekasilicon, but it could have been Ekaboron, later it became known as Germanium. If you are interested, the Atomic weight is 72.6 and Atomic number is 32.

The work with the newer type Germanium rectifiers for use on the Broadcast frequencies, has not been successful, in my hands - but were not intended for this purpose, anyway. It was just a brainstorm of mine, to try them out for this purpose. They are known as large area rectifiers, and do work fine at 50 KC., or

near this frequency range. Are no good for us, am sorry to report. You will see them on the market in the very near future. Will be used as power rectifiers and even still newer ones are under development at the present time by the G.E.Co. I haven't seen this type yet, myself.

It is very difficult to secure information on some of the research work, that is going on right now, regarding Xtals. I hear some gossip, on the grapevine from time to time, about a new type of synthetic Xtal supposedly made from a Boron compound. This sounds entirely plausible, but I have no definite dope on the subject. Will keep both ears cocked, and perhaps learn a little more about it in the future. There is a strict security check on this research work.

Received RB-33, and want to say, it is a pleasure to watch the continued advancement of Ur publication. Keep up the good work.

Your suggestion on using a small neon tube across the Antenna to ground circuit, is an excellent one. In fact, I have employed this scheme for some time in the past, and it provides an easy escape for static discharges to ground, thereby saving a good Diode from possible harm. Such a precaution will not be of any appreciable help if an actual lightning bolt strikes the Aerial directly. I have had my Antenna struck directly, on two occasions, so know from experience "wha happens!"

Many of your Readers, who are familiar with the push-pull Xtal circuit described by Mr. Rufus P. Turner, and referred to in RB #33 in a letter from Mr. Milton. M. Schuman, may have also been skeptical as was Mr. Stephen Souse, concerning the 2.5 m.a. output. Must admit, I was dubious on this, until I succeeded in obtaining a meter reading of 3.65 m.a., using full-wave rectification in a very similar circuit. Yes, it can be done! The bridge-type full-wave 4-diode circuit, suggested by Mr. Vern Yeich (RB-32) should do as well, provided the circuit components are well designed. Get the boys busy on this, we all may learn something.

Keep your eyes peeled for much more detailed information in the Transistor line. Certain security restrictions will soon be lifted on this subject, and articles will appear in the Mags. by the score. These Xtal Triodes are definitely the coming thing. Bell Labs. have, in connection with Western Electric Co., produced at least 8 different types for special purposes. One of the earlier models, made for pulse-switching work, has recently been released for public sale at the modest charge of \$6.45 - minimum order of 5. This model Transistor is useful as an oscillator and as an amplifier, for experimental circuits. It may also be used as a rectifier, and the gate is



wide open for Amateur research along such lines.

Have had good success with a 12" PM speaker, with an impedance matching transformer, here as a replacement for a magnetic speaker. There seems to be no trick to using such a speaker with a Xtal rig if you get a transformer with a very high IN-PUT impedance. The higher, the better, of course the output should match, or be somewhere near the voice coil impedance.

You may quote me, if you wish.

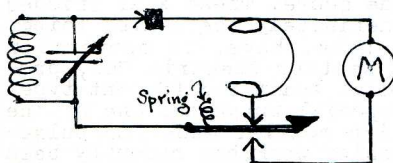
**Editor:** If it were possible to obtain absolutely pure Germanium or Silicon ores, their use as Xtal rectifiers would be very poor. Germanium is an "n" type semi-conductor; Silicon a "p" type. This is according to the "Band theory" which we'll hope to simplify in RB-36.

However, when small amounts of impurities are added to the above Xtals, they become good semi-conductors, or Xtal rectifiers. Other impurities that may be added to Germanium are Nitrogen and Arsenic. Impurities added to Silicon are Boron, Aluminum, Gallium and Oxygen.

Most Diodes, now sold, are for Hi-Freq. use in TV, etc. as wide band detectors. On the Broadcast band they tune broadly, in comparison to Steel galena, Carborundum and battery, Iron pyrites and commercial Silicon, but often exceed them in volume. If you will put a 1N34 Diode across the Xtal stand in our #10 Kit, you will at once notice a difference in selectivity when you switch back to Carborundum and battery.

When using the small Neon (CAT 20-18. 15¢) we prefer that a Lightning arrester (CAT. 1-34. 30¢) be shunted across the Neon. This protects the set and Neon against Lightning, but will still give the static discharge display described in RB-33. Some users of Diodes short them when not in use, to protect them from heavy surges, like we used to protect Xtals when we opened up the Spark transmitter!

In Dr. Grace's next paragraph, we highly recommend each Experimenter obtain a Micro-ammeter (Not Milliammeter) for testing Xtal circuit output. We obtained a Sangamo O-500 for about \$4.50, from a surplus sale. (We don't have them for sale.) One can judge the strength of a signal much better with a meter than by ear. We suggest a micro-ammeter be connected as shown, with two contacts. Make it from Phosphor-



bronze, so pushing it down puts the meter on; releasing it throws in the phones. Then, you can let her up in case a strong current gets in, as meters burn out very easily.

There is no limit to the new field of Transistor development. Bell Telephone now use them in relay booster stations, as amplifiers, oscillators, and many other uses, to replace the bulky and costly tube set-ups. They R fairly foolproof and have no warm-up period, so their action is instantaneous.

### NORTHERN LIGHTS and CANADIAN RECEPTION.

By Dick Klassen, Morris, Man.

I read your article in RB about Radio reception being affected by the magnetic lines of force between the poles. By a strange co-incidence I heard a commentary along that line, on the Radio recently.

An organization, known as Radio Physics Lab. is doing research in the Canadian north regarding Radio reception.

Across the North there is a communication network which plays an important role in regards to police, weather and rescue operations. Radio reception has been greatly affected by the Northern lights and the magnetic pole. At times transmitters had been blocked out for days. The increasing necessity of defending the North, from a surprise attack prompted this research.

By sending Radio waves at different frequencies into the Ionosphere they are attempting to discover which frequency works best under certain conditions. They discovered that low-frequencies are least affected by the Northern lights and magnetic pole.

They have also advanced to the point where Radio reception conditions may be predicted for many weeks ahead. They feel the time is not far off when trouble free Radio reception may be achieved in the North.

I, personally, have never encountered any Radio interference by Northern lights, altho they quite frequently pass overhead. I suppose the QRN must be much more pronounced farther North.

I've also noticed stations do come in much better from the South, than West or North. And, that reception here, is almost as good from the East as from the South. The best reception I get is South to Texas and Mexico and East of Long. 102. West of that Long. I have so far received only 8 or 10 stations, while East of that line I've received approximately 70. That is, of course, with a tube set. On the MRL #2 Xtal Set I've received stations as far South as Oklahoma, without half trying. If I sat up nights, after locals were off, I could beat that easily.

I've noticed quite a few DX reports in RB call the Del Rio station XERA - isn't it XERF?

In RB-33 I noticed U only got 80¢ for a Canadian dollar, altho it is 1.05 U.S. here.

**Editor:** Snow and hail are very bad for static. I used to draw sparks off the Aerial, which we

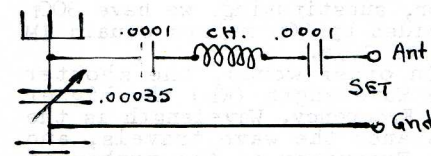
found would jolt you good, when Rdo. Opr. on the Tankers.

As for reception, I believe it is the big, flat Mississippi valley that is so effective with Mr. Klassen's reception. When we get mixed up with mountains, the reception is very erratic. We cannot say why reception is not as good to the North. His reception from the East should also be good.

Not sure about XERF, as they change letters frequently. If anyone has a good complete list of Mexican BC stations, we'd like to publish it in RB.

Yes, we still only get 80¢ on the Canadian dollar at the bank.

### A GOOD WAVE TRAP FOR 80 METERS.



Dick Mills, Cincinnati, Ohio, comes up with a good wave trap 4 80 meter band receiver. Best he has seen for TV and Fluorescent lights. The drawing shows his circuit, which appears to be very good. Choke is 57 turns #20 En. on 1/2" Bakelite form. Proportionate turns may be used for other bands. Let us know how it works out for you.

### OBTAINING MERCURY.

John Conjurske, Rhinelander, Wisc., says to contact a Neon sign man, if you want a supply of Mercury for any purpose. He is a sign painter, and wonders if we got more on the list. He also changed our spelling of "Hobbyist" - our mistake!

### OUR 1-TUBE KIT AND NEW HB-4.

See CAT sheets A-4 and K-3.

From along the grapevine, we get comments that HB-4 is our best yet. Every time we hope to improve on the previous one. Even so, we are confident any one of them is well worth the price paid for it. Many send orders for all 5 of them. You will notice that HB-4 is 30¢. This will soon be the price of all the other 4, as paper, postage, etc. keep going up.

Well - the laff's on us! After all our diligence, midnight oil, check and double-check, we pulled a "funny." We went and left out the tube type, 1C5gt or 1Q5gt. Our regular customers know this, but new ones may not. We are very sorry. With 1000 copies printed, it had us flabbergasted when we found out, from a couple of observing Fans. Only thing left was to rubber stamp the tube number on page 4, above the tube. You may put it down in Urs if it was left out. On our next run we can doctor up the plate so it will be OK. We didn't want to list anything in the Parts list that wasn't included in the Kit, as it usually causes much



trouble later on. (One guy even threatened to put sand in our oatmeal, because he expected a tube with the kit.)

If you hesitate on buying the 1-tube Kit, you may obtain the HB-4 at 30¢, and look it over, first, but it is included with this Kit. We have sold hundreds of these Kits, but with the additional revision and data, our sales should step up. We cannot offer these Kits to Dealers, at a discount, as our profit is too close. We can offer them Hand-books in dozen lots, tho.

For a quick check, here are the CAtalog numbers and prices on the parts, if bought separately. Note that Hardware, etc. are sold only in dozen lots. Also, don't forget **postage is extra:**

2-plate Ant. cond. assembly, including Extender 8-118....	1.50
25-280 Trimmer Cond. 8-117..	.15
.00035 Var. 8-7. 1/2 lb.....	1.25
.0001 mica Cond. 8-18.....	.15
.00025 " 8-19.....	.15
2 meg x 1/2 watt resistor....	.05
50,000 VC & Sw. 19-14. 4 oz.	.75
4 1/2 x 6 Alum. panel. No holes.	.15
4 x 5 1/2 Compo. base. "	.10
1/2 x 5 1/2 Ply strip. "	.05
1 1/2 Bar Knob & Scale. 10-30..	.12
B.P. cardboard strip. 10-33.	.05
Small pointer knob 10-10. Ea.	.10
Tip Jack. 17-26. Each.....	.08
Octal wafer socket. 25-11.....	.10
4-prong " 25-6.....	.10
A-HF-BC coil. 7-3. 4 oz.....	.50
A-LF-BC " 7-4. ".....	.50
1/2 x 1/2 x 1/2 bracket. 13-178. EA.	.03
2 x 1/2" FH wood sc. 13-80. doz.	.07
6 x 3/8 BH mach. 13-95. doz.	.10
6 x 3/8 RH " sc. 13-16. doz.	.06
6 x 1/2 hex nuts. 13-3. dozen.	.06
#6 type P lugs. 20 lugs for	.12
#6 lockwashers. 13-118. 20..	.05
#18 solid Hookup. 26-1. ft..	.01 1/4
#22 str. Hookup. 26-6 Foot..	.01
Rosin solder. 26-17. 3 feet	.10

Other accessory prices shown on K-3 CAtalog sheet.

Here is another good report on HB-4 set from Billy Rush, Boone, N. Car., that was too late to get in. Some good DX'n here:

Station	Coil	Distance
Switzerland....	40.....	6500
Tangier, Africa	40.....	6000
S.F., KRCA....	40.....	2250
Jamaica. ....	80.....	1000
Montreal. CKLO, KHOL.	80, 160	800

Some Broadcast stations are as follows: Dallas (950); Montreal CKCS (800); Toronto CBL, CJBC (600); Tulsa KRMG (800); Des Moines (750); plus 35 more.

**MOSCOW on R.E. Xtal. Oct., 1952.**  
By Joe Amorose, R4, Richmond, Va.

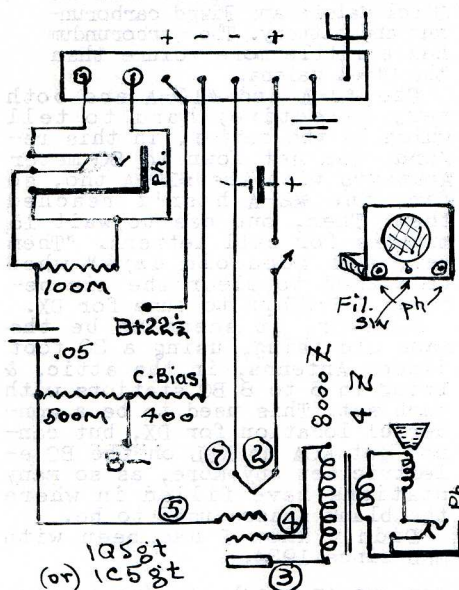
One Richmond man, R.A. Rogers, built up the Radio Electronics Mag. Xtal Set, shown in October number, set of mine, and got Moscow, Canada, Mexico, Cuba and all over on Short waves. He sure did a professional job of wiring as he brought it over for me to see. (MRL Coil \$1.58 postpaid).

I find I can get some very loud locals for volume on speaker, by just using several good grounds hooked together.

Your last RB-34 was top-notch.

It gets better all the time. I wish you could print it monthly, as there is a big place in this Radio field for a publication like you put out. It is ideal for Experimenters and beginners.

#### AN AMPLIFIER FOR THE 1-TUBER.



#### Parts list:

2 Double jacks. 17-32. Each	.25
1 100M x 1/2 w. resistor....	.05
1 500M x " ".....	.05
1 400 x " ".....	.05
1 .05 x 600 v. cond. 8-43.	.12
1 SPST Tog. Switch. 23-1....	.30
1 Octal wafer socket. 25-11..	.10
1 8000 Impedance Output Transformer. 24-13. 6 oz....	.90
1 PM Speaker, see CAtalog.	
10' 20 solid Hookup. 26-2.ft..	.01
1 1C5gt Tube.....	1.25
(or) 1Q5gt.....	1.50

Add postage to all above.

We are repeating, from a previous RB, a simple amplifier for the 1-tuber. Drawing has been somewhat revised for the better. You may mount it on a Compo. panel, attached to a metal base. Or, if you wish, it may be attached to a wooden baseboard. Be sure to use some soft material, like Celotex or Insulite between the speaker frame and panel, to keep down vibration and improve the tone.

As the diagram shown is fairly simple little explanation is required. The two jacks are shown on the front, for first and second stages. Note the 400 ohm C-bias, may give a little more pep to the outfit, instead of using a C-battery. The SPST switch, on the front panel, cuts off the A from the tube. As for the output transformer a 7000 to 9000 ohm impedance is desired. The 8000 ones we have in stock, are O.K. A Universal output transformer (CAT. 24-3. 1.50) may be even better as you match the input & output circuits exactly, giving little more volume and better tone. Note that pushing in the phones in the voice coil circuit

increases the resistance so much the voice coil doesn't work the speaker.

#### REPAIR JOBS.

**PLEASE!** do not ship us sets to be repaired, without our permission. We are too busy doing our regular work to experiment with sets, and build up Specials. It may lay around for a long time before you get it. Rather than be disappointed, please write us first and see if we can handle it. When we first started, in 1932, all jobs were taken in to be gone over. As a result, our plans, kits, orders, etc. all had to be put aside with much bad feeling here and there. 24 hours per day, still isn't sufficient time, but we'll have to make it do! Hi.

#### TRY A VERTICAL AERIAL.

Mr. R.J. Peterson, Escondido, Calif. reports: "Yesterday I put up a 35 ft. vertical Antenna and installed a good ground. I hooked up our table model Radio to the Antenna, and the BC band was overflowing with signals. The selectivity and sensitivity was so great I couldn't tune even one station in clearly. If the Radio had a bandspread, I probably would have picked up BBC! This Antenna should be perfect for a Crystal. I think I'll get lots of DX."

#### DX REPORTS.

##### MRL #2 Xtal Set. (HB-2. 30¢).

John Hughes, Dallas, Texas reports: "Just built your #2 and I logged XERF (400 miles), using a Steel galena, when 5 locals were on. Also got Los Angeles (1250); Chicago (850); Denver (700); Albuquerque (600); Kansas City (500); New Orleans (500) as well as XELO, XEXO, XEG. Like the way you pack merchandise. I got an Antenna coil from another firm and they packed it in a box 4" x 7" x 5" (too true!)"

##### MRL #2-A Xtal Set. (HB-2. 30¢)

Arthur W. Carlson, Chicago, says: "Have been using my 2-A for about 5 years now, and have induced a lot of my friends to buy it. All Chicago stations come in with a blast, plus Police, Amateurs and even WNBQ-TV. Getting FM was quite surprising, especially since I just use the bed-springs for an Aerial. It is just every so often that I get this freak reception. I also wrap insulated leadin wire around my lamp cord for more pickup."

##### MRL #10-A (DP-34. 7¢) #2-A Xtals

E.J. Rolle, Brinsmade, N. Dak.: "Can say you operate the best business, and that your service is good. I appreciate this. Built your #2-A and 10-A last night & logged these stations: Clint, Texas (1400); Detroit (950); St. Louis (900); Salt Lake (800);



Denver (700); Omaha (550); St. Paul (450); Manitoba (150). On the #2-A Xtal I heard for the first time, Hams talking. I'm with Joe Amorose, who thinks Ur King Pin of the Xtal Sets." (hi)

### MRL #12 Slider Xtal. (HB-17..30)

**Jack Ryburn, Parsons, Kansas:** "Received parts several months ago and put the #12 together. It is tops. It is the only Crystal set I have had that cuts out a local 3 miles away and gets two other stations 30 miles away. Then, after the locals go off it is possible to get stations many miles away. RB is swell. It has the information in which I am interested."

### MRL I-tuber. (DP-29. 7¢)

**Harry R. Cook, Oklahoma City, Okla.** reports: "U may put this in RB. I'm using a 27 tube and about 25 volts of a shot B-batt. I've logged about 137 stations, on 75 meters alone. I use filament trans. on the 27 tube. Some of my best BC are S.F. (1400); KMJ, Fresno, Cal. (1275); Los Angeles (1200); CBK, Saskatchewan (1200); Detroit (950); KOY, Phoenix (850); Cincinnati (800); Atlanta (800); Minneapolis (750); Denver (550). I logged 23 stations between 500 and 850 KC. My address is 709 SE 30th St."

### MOSCOW (7000 miles) on #2 XTAL.

**Elmer Burton Jr., Rt. 2 Box 296, Wellston, Ohio,** says: "Just a few lines to let you know that on the #2 you wired for me, I have just received **Radio Moscow (7000 miles)** and several other Foreign broadcasting stations at 10:00 pm tonight. Moscow came in very good. Also a Short wave station in Los Angeles (2000).

I received Moscow on the #1 tap, at the left, and the dial on 40. I feel a greater distance could be made with this set. The other Foreign BC stations were a little weaker than Moscow. I can receive WHKC, a 5000 watt station in Columbus, which is 80 miles away, in the daytime fairly well, but the local station cuts in on it.

My Aerial is not very good; it has several splices. Length is 100 ft. I get WHO (590) as well as WLWO, a Cincinnati Short wave station."

**Editor:** Sure is DX'n, kiddo! The tap is correct for Moscow. Mr. Burton is remote from Cincinnati, and other Hi-powered stations that might cause a signal to ride in. Well, in the Old days, USN at Yerba Buena Island, in S.F. Bay used to hear Australia, 7200 miles, **ON A CRYSTAL SET.**

### REPORT ON MRL #2-A, #10-A and MRL VARIO-COUPLER.

By H.H. Parker, Los Gatos, Calif.

Have the #2-A, #10-A and the Xtal set built around your Vari-o-coupler. (CAT. 7-172. \$2.50). I built the #10-A the same as the

instructions, except I used another tap on the Crystal switch - making 3. Now I can select the adjustable stand with Steel galena; Fixed carborundum and battery; or the 1N34 Xtal diode. The Diode is by far the loudest, tho a little less selective than the Steel galena and Fixed carborundum and battery. The carborundum has a little more volume than the Steel galena.

The #2-A and #10-A are both very selective; hard to tell which is the better, in this regard. Can get down to 80 meter Amateurs with the #10-A tho, so far, the #2-A hasn't reached them. Then, one has to wait 15 minutes for call letters. "They were the good old days" when they used to clear the air between 7-7:30 pm to tune for DX.

However, it seems to be the same old thing, using a 30 foot indoor Antenna, in the attic, & bring in 6 to 8 BC stations with each set. This used to be a wonderful location for DX, but cannot get KOA or KSL on the BC electric set any more, as so many stations have filled in where the blank spaces used to be.

Didn't know I had been with MRL since 1934.

### #39 (HB-17. 30¢); #2 (HB-2. 30¢)

**James Dahlman, Rt. 1, Dassel, Minn.,** reports: "Sending a note telling you about my Radios. I have made 6 of your Xtal sets & they sure work swell, especially the #39 and #2.

On your #2 I have received stations from Mexico (1100); Del Rio Texas (1000); Cincinnati (600); Omaha (300) and 8 locals. Find about the best time to dial for DX stations is 2 a.m.

On the #39 I have received the following stations many times: Del Rio (1100); Pittsburg (800); Toronto (700); Okla. City (692); Cleveland (685); Detroit (600); Ft. Wayne (580); many others. On many stations I can hear them on a speaker across the room. It's the best set I've built. I am 60 miles away from the nearest BC station. On the secondary I wound 30 turns of #26 Enameled instead of 40 turns 20 DCC. It sure is interesting to build Xtl sets during my spare time. I am 14 years old."

### DIALING THE MRL #2-A CRYSTAL.

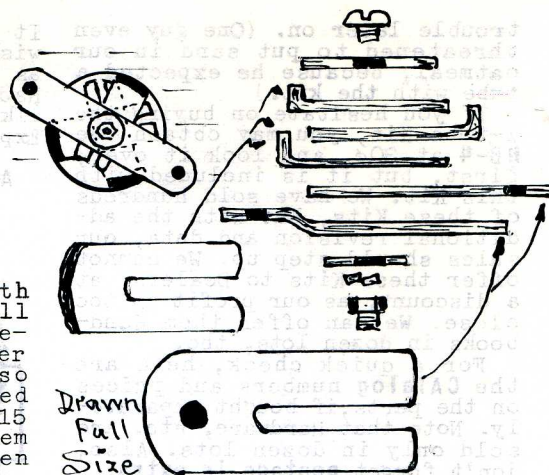
By Jimmy Munson, Layton, Utah.

Enclosed is a list of stations I have logged on my #2-A. In addition to the BC, I have received Aircraft and Police calls. In my opinion the 2-A is better on DX, and more selective than the #2. I get KNBC (SF) almost every night and sometimes Denver, with high volume. I have about 100 ft. Aerial. Thanks for the fast and courteous service. Keep up the good work. Here is copy of my log on the 2-A:

### FRESH!

Waiter: "Why don't you eat your fish? Isn't it alright?"

Customer: "Long time; no SEA!"



Station-Miles	Dial	SEL	Pt.	Vol.
Tulsa, 900.....	—	B..8...	Low	
XELO, Mex., 750.....		B..8...	Fair	
KNBC, S.F., 625.....	68...	B..8...	Fair	
KNX, L.A., 575.....	32...	B..8...	Fair	
KFI, " " ".....		B..8...	Low	
KNVD, " " ".....	36...	B..8...	Low	
Albuquerque, 500.....	56...	B..8...	Fair	
KOA, 400.....	60...	B..7...	Good	
KMUR, 35.....	23...	B..8...	Low	

### A SOCKET HOLE TEMPLATE

See diagram above.

This is a "must" for every Shop, that is doing any amount of drilling for mounting wafer sockets. For a few sockets it wouldn't pay to make it up. Usually, when one gets the socket right from the top, then it slips sideways when you turn it over. For years we threatened to make one up, and finally did.

Parts are shown full size made from galvanized iron. Drill the larger socket hole first, making it small as possible, to clear the tube prongs, because one has very little material to work around a socket hole.

The three small guides are drilled with a #6 hole, and then slotted with tin snips. These guides fit in three directions inside the large socket hole.

Then, the two larger markers are made and slotted. Drill the holes in the end as shown.

A 6-32 x 1/2" RH machine screw goes thru the 5 pieces, as shown with a washer, split lockwasher, and 6 x 1/2" nut on top.

First, set the 3 inside guides to fit the hole snugly, and adjust the marker holes by guess. Tighten the nut just a little. Then, measure the distance between the socket holes, and readjust the marker holes, and then tighten her up. When adjusted, try on a base and check with the socket. You may now drill hundreds of socket holes in a short time.

### HE WAS A TOTAL LOSS!

COLLEGIAN: "What did you do with my shirt?"

ROOMMATE: "I sent it to the laundry, why?"

COLLEGIAN: "Gosh, the whole history of England was written on the cuff."



## ANNOUNCEMENTS.

**Subscribe to "Radio Builder & Hobbyist"** now, if you haven't already done so. Some have paid for their subscriptions away ahead. Our continual aim is to get out more copies per year, and we are now 1 ahead of last year. "RB & Hobbyist" is a separate deal from parts and literature, so we must have your subscription if you are to get it. The only sample sent is when one answers our original ads in the mechanical magazines. If you send in an order for 12 issues, we now make you an address plate which automatically assures you of receiving future issues. More details about "RB & Hobbyist" are given in CAT. sheet C-1.

**Air Parcel Post Rates.** Many R requesting us to send their mdse by Air Parcel Post. They evidently don't know the rates, for example:

Lb.	2nd Zone	5th Zone	8th Zone
wt.	Air	pp	Air
1	.60	.17	.70
2	1.08	.20	1.26
3	1.56	.22	1.82
4	2.04	.25	2.38
5	2.52	.27	2.94

While we will ship mdse by Air if you enclose enough postage, but we don't encourage it. Many airmail shipments are delayed on docks for pickup, and in lots of cases, ordinary Parcel post will reach you as quickly.

**.00014 mfd. Variable Condenser** out of stock, but we substitute (1) .00035 (CAT. 8-7. 1.25) plus 25-280 mmfd. Trimmer (CAT. 8-117. .15) in its place. Hook them in series; tune .00035 clear in; bring up regeneration; back out 25-280 Trimmer until oscillation stops, and you got a O-.00014, & you may adjust it at will. See HB-4 how it is done, and it does really work slick.

**HB-4 Antenna Condenser Assembly**, with Extender can now be supplied as a complete unit. It includes bracket, screws, etc. all ready to go. CAT. 8-118. 1.50

**1-Tube Binding Post Strip** for back of base strip in HB-4 set. Made of cardboard. Will soon be ready to go, as we have to make up plates for it soon. Fits over holes for leads. CAT. 10-33. .05

**Used .00025 Var. Cond.** of 5 large plates 1/16" thick. Gives straight-line wavelength; OK for Xmtr. or Lab.; plates adjustable. In good condition. 1 lb. wt. .50

**50-500 mmfd. Trimmers** out of stock temporarily. Substitute a CAT. 8-117. 25-280 mmfd. .15

**CRYSTAL DIODES** in stock;  
1N21 Silicon....CAT. 9-38. 1.25  
1N34 Germanium....CAT. 9-37. 1.50  
1N51 " ....CAT. 9-41. 1.00  
CK706. " tiny..CAT. 9-40. 1.00

**Rheostats.** Can still supply a few of the following ohmages: 2 1/2, 6, 10, 15, 20, 30, 60, each .15

## New Phones in stock:

Trimm Featherweights, 24M impd.  
5M DC. List \$11. 17-1.....6.47  
Trimm Professionals. 28M impd.,  
4M DC. List \$5.60. 17-3....3.41  
Trimm Rex 10M impd., 2000 ohms  
DC. List \$4.10. 17-51.....2.41  
Trimm Acme 4000 ohms DC. resist.  
List \$3.65. CAT. 17-52.....2.41  
Trimm Acme 2000 ohms DC. resist.  
List \$3.25. CAT. 17-9.....1.97  
Trimm Acme 1000 ohms DC. Single  
Phone & Band. \$2. 17-10...1.18

## Phone Cushions. (2). 17-12. .90

## Phone cords in stock:

Double. Lugs/tips. 17-35.....45  
" Tips/tips. 17-36.....45  
Single. Lugs/tips. 17-37.....35  
" Tips/tips. 17-38.....35  
" Lugs/lugs. 17-39.....25

**Electric Juicer.** We purchased a complete mixer, so have a Sun-kist, Jr. juicer on hand in good condition. 10" high. OK for a fruit stand, etc. Parts may be removed for cleaning. Motor is worth price asked. Wt. 8 lb. 5.00

**Emery Wheel Grinder.** Will mount on bench for sharpening tools, etc. Emery wheel furnished. The crank furnished hi-ratio, so may be used for coil winder. 7# 1.00

**8" Knap Auto Electric Fan.** All overhauled & tested. Adjustable base. Works on 6 v. Storage battery in car. 3 lbs. wt. 1.75

**Soldering lugs.** Due to raises in prices, when we re-ordered, lug prices as follows:  
Types C-F-N-R .....20 for .05  
" D-H-K-M ..... " .06  
" A-E-G-I-P ..... " .12

**Audio Transformers.** Hard to get unless around \$2.50. Are 3-1 ratio, plenty in stock. Very essential. CAT. 24-18. 1 lb....1.50

**Filament Transformers** now back in stock. 6.3 v. 2 amps. Needed by all Fans. 24-8. 10 oz. 1.50

**Audio, or Filter Chokes.** Here is complete list on hand. Tested by inductance meter:  
4 HY; 50 ma; 170 Ohm. 6-8. 1# .90  
8 " 50 " 200 " 6-6. 1# 1.00  
10 " 100 " 150 " 6-4. 1# 1.25  
12 " 80 " 300 " 6-9. 1# 1.50

**Rider's Manuals**, in fine condition. You save half. Shipping charges extra.

#10. List \$19.80. 12 lbs. 10.00  
#11. " \$19.80. " 10.00  
#12. " \$19.80. " 10.00  
Rider's Auto Manual #2, in good condition. 3 lbs. wt. 1.50

**G.E. TV Service Guide.** 84 large pages of late circuits. Regular \$1. Good cond. Postpaid.... .75

**Radio Operator's Code Manual.** Best manual we have seen. Teaches code and touch typing at the same time. One left. 150 p. 2.00

**Practical Delta Projects.** For the Woodworker Fan. 31 p. .10

S-U-B-S-C-R-I-B-E T-O "R-B"

**How to Find the Job You Want.** Also "Write Ur own Ads" of 29 p. included. 36 pages of good data. Originally \$2. Both for 1.00

**New Magazines** for sale, post-paid. Radio-Electronics for May, March, 1953. Each..... .30  
Jan., 1953. TV Annual issue. .50  
Science-Mechanics. April, 1951  
June, 1952; Apr. 1953 Each .20

**MRL Handbooks.** HB-1, 2, 4, 17, 25 all ready for delivery at new price of 30¢ each, as paper and postage have advanced. Don't pass up a one, as they are a "must" for the Fan. HB-3 is now being worked on, and will be out before RB-36 is mailed. Will also be 30¢. No more Handbooks will be announced in advance, but you will never know when one will appear, as we have several on the fire now. So, whether you buy or not, if you have a subscription on the hook, you'll know about anything that happens! hi.

**Editor's and Engineer's books** priced postpaid, to meet Eastern competition. Postage comes out of our pocket. Latest list:  
Radio Handbook, 13th Ed. ....6.00  
" " 12th " .....3.00  
Radiophone License Manual. .3.75  
Surplus Conversion Man. 1. 2.50  
" " 2. 2.50  
World's Radio Tubes, rev... 5.00  
Better TV Reception..... 2.50

**Crystal Set Coils** not previously listed, from HB-17:  
#39. (1-2-3-4) 7-175. 8 oz. 1.50  
#40. IFT 7-116 or 117. Each .90  
#41. L-1 or L-2. 7-176. " 1.00  
L-3 on Bak. 7-177. oz. 1.00  
#42. AC-DC set. 7-44, 45 (2) .80  
#43. Bucking coil. 7-178. 1.50  
RE, Oct., 52. Amaroze Coil.. 1.50

**Litz Coils.** Some taken out of Grebe DX sets. Tune with .00035. 1-5/8" dia. x 3" long. Also 2" dia. x 3 1/2" long. Either at .75

**Magnet Wire.** Back in stock for immediate shipment. Per 100 ft.:  
#20 DCC. Cat. 7-88. 100 ft. .50  
#22 " CAT. 7-89. " .40  
#24 " CAT. 7-90. " .30  
#26 " CAT. 7-91. " .20  
#28 " CAT. 7-92. " .20  
other sizes, see CAT.  
#12 Enameled. CAT. 7-70. 2#... 1.60  
#14 " CAT. 7-71. 1 1/2#... 1.25  
#18 " CAT. 7-73. 1#... .45  
other sizes see CAT.

**Complete Tube List** see RB-34.

WHAT'S IN THE MAGS.

Radio Electronics. May, 1953.

**"Hi-Fi VOLTAGE Doubling BC Tuner."** p. 80. The author claims an increase in voltage output when using this pre-selector. He uses 2 1N34 diodes, connected so they have a doubling effect, like a Selenium rectifier may be used (See RB-30. 15¢). It may use a 2 gang .00035 Var. cond. (CAT. 8-10. 1.75). Also, the coil L-3

Turn to next page...



## MRL CLASSIFIED ADS.

4¢ per word; 3 insertions same ad 8¢ per word. Count all words. Circulation above 3500 per issue, plus back/numbers, which continue selling over a long period of time. Numerals (3-36) mean 3 issues, ending with #36. In preparing an ad, always consider the Reader's point of view and not your own. A 3-time ad always pulls better than one.

**Crystal Radio Experimenters.**

Write Leslie Hulet, Route 4, Lakewood, New Jersey. (3-36)

**Exchange Radio parts and wire.**

Write Wilburn Clay, 1803 Childress Drive, Atlanta, Ga. (3-36)

**Wanted: Volume 1 of "Radio TV**

Experimenter" by Science and Mechanics. Write L. H. Peldo, Frederick, South Dakota. (1-35)

**"Crystal Radio Fans!" Send 3¢**

stamp for Crystal Radio catalog. Amorose, Route four, Richmond, Virginia. (1-35)

**Attention! New JIFFEY detector.**

Write for details. Address Jiffey, Box 30, Abita Springs, Louisiana (3-37)

**Best Crystal Yet, only 20¢ post-**

paid. Eugene J. Rolle, Route 2 Brinsmade, No. Dakota. (1-35)

**Wanted - Old time speaker horn**

of the type using a single headphone unit. State price and condition. Write Ole H. Tollefsrud, Gardner, North Dakota. (1-35)

**Tube bases wanted by MRL. See**

CAT. page E-2 for details. Modern Radio Labs., 1131 Valota Rd., Redwood City, Cal. (1-35)

**WHAT'S IN THE MAGS., Cont.**

may be varied - one fellow has used a slider coil - to control the amount of coupling and selectivity between the 2 circuits.

"NBS Transistor Oscillator." p. 118. This is an interesting cir. using a 100 kc quartz Xtal, and a Transistor. It looks very simple, after someone else got it up!

"Harmonic Generators." p. 140. Some cir. using 1N34 Diodes. We used to say you could never make a Crystal oscillate or amplify. We have to retract a lot of data now-a-days!

"Pilots in Portables." p. 141. If a pilot is used, it usually connects in series with the filament leads and the line cord. In this case it uses the current built up by the condensers to light the pilot.

"Crystal Still Alive." 156. Tks to Mr. Paola, of Baltimore, for getting our name in, and we can say "amen" to what he says. It is hard to keep a Hobby like this going unless everyone adds his little bit - and it DOES include the Magazines! Articles on Diodes are helping a lot.

## MRL CORRESPONDENCE CLUB.

2¢ per word, per insertion.

Count name, address and interests as words, same as for ads. MR. Kavaleski says: "Feel I am of a great Family of Xtal Fans and Experimenters, an interesting hobby. Have made a lot of new friends thru this Cory Club ad. Want to thank you very much for this opportunity U have given we Radio Fans to correspond with each other. Will always be a booster for MRL." Many use this column to trade parts. Numerals figured same as for ads.

**P. J. Kavaleski, Box 17, Franklin**

Mine, Mich. Ham Radio; Crystal Sets; Minerals; Swap Radio magazines; letters. (4-38)

**Den Nichols, 5486 Nichols Road,**

Mason, Mich. Interested in receiving news and information on TV-DX. Would like to know more about it by person who has received it. (2-35)

**Murray Cohen, 2078 Wallace Ave.,**

New York 60, N.Y. I would like to hear from anybody interested in Xtal sets, Radio, what not. Please drop me a postal. (1-35)

**Radio Electronics. April, 1953.**

"The Versatile Neon Tube." p. 50. A real good article on glow tubes. When using 110 volts, or near, use the 2 watt (CAT. 20-9. 65¢). We can also furnish the 1/4 watt (CAT. 20-7. 1/4 W. screw. 50¢) and (CAT. 20-8. 1/4 W. Bayonet 50¢) as shown in diagrams. On page 52 you will find a wonderful chart showing most all types.

"Voltage Amplifiers in Control Circuits." p. 57. Some good ideas in dial light controls by use of simple 1N34 circuits, or doublers to increase voltages. His idea is to take some load off the filament transformer windings.

"2-tube Pocket Set." p. 94. It uses 2 2E31 1 1/2 v. Pentode tubes. Note regeneration is obtained by varying the tickler rotor, same as the old time Couplers.

**Radio Electrics. March, 1953.**

"Test Techniques for Transistors." p. 78. By Rufus Turner. A real good article on these new double Xtals. Will pay you to read it over.

**"Det.-Ampl. with Germaniums."**

p. 86. More voltage doublers in Xtals. Seems they won't be satisfied with the normal output, - they have to increase it!

**"Transistor Receiver Operates**

Speaker." p. 99. Our friend, Dr. Wm. Grace has come up with a simple circuit, using a tuned Ant. and Gnd. circuit. Note that the input current comes from the Ant., but is amplified by the Transistor with 45v. in the output. You may use phones where the speaker is. Also, it could

be rigged up to a #2, or any other Xtal rig OK.

"CRYSTAL Diode Tester." p. 117 This tester gives other tests than the Ohmmeter test, we usually use.

"Personal Headphones." p. 124. Just a kink to us favoring use of one ear more than the other.

**Radio & TV News. May, 1953.****"Advanced Regenerative Cir."**

p. 48. Note the tickler runs from plate of a Cathode follower tube instead of the regular. Haven't tried it out, but it looks very encouraging. We are sure he can greatly improve his set by using MRL Celluloid coils. C-1 Antenna Cond. should be a 3 plate run to panel by Insulated extender. Note R-2 regen. control comes from P of 1st tube, and may be any size.

**"Transistor Sine-wave Clipper"**

p. 50. Similar cir. to Dr. Grace in RE, above. Article describes its use with Scope for sq. waves.

**"Transistor PE Cell Relay." p.**

64. Another cir. similar to one used by Dr. Grace. Seems there is no end to this business.

**Radio & TV News. April, 1953.****"Push-pull Amplifier." p. 78. A**

circuit showing use of 1N34 diode in split output so it may be hooked to a push-pull amplifier.

**Radio & TV News. February, 1953.****"Build This Transistor Rec'r." p.**

35. A storehouse of data on Transistor sets. Be sure to dig it up.

**"Care of Transistors." p. 40.**

Another article you shouldn't let go by you. Yep, they're still Xtal sets! Such fun!

**"Code Practice." p. 123. List**

of stations that send 20 wpm. He records it on tape, or records, and plays it back slowly. FB.

**Science & Mechanics. June, 1953.****"Crystal Set Bed Lamp." p. 166**

A good idea, using pick up from the light cir. A #2 circuit may work a lot better.

**"Pocket Signal Tracer." p. 171**

A good probe using a plastic salt shaker and 1N34, or other Diode. Before Rider figured out signal tracing, we used to beat our brains out trying to locate troubles. Funny, but the simple things are the hardest to find.

**Science & Mechanics. April, 1953****"Jobs for Neon Tubes." p. 161.**

A real good Blanchard article on Neons (CAT. 20-18. 15¢). All sorts of rigs. Also a simple Selenium (CAT. 3-19. \$1.) power supply.

**"AC Amplifier." p. 165. Cir.**

looks OK, altho layout looks a little complicated. The input is in lower right of diagram, and apparently it shorts itself to chassis. You can re-arrange it.

**GUESS THIS WILL KEEP YOU BUSY** until the Next "Radio Builder & Hobbyist" appears on the Horizon - and in the meantime, "best 73".



another MRL Handbook...

MRL

HB-4

30¢

by Elmer G. Osterhoudt.



Uses  
1C5gt or  
1Q5gt Tube  
1 Flashlight Cell  
1 22½ v. B-Batt.

5½ x 8½

24 pages

18 full size drawings

# 1-TUBE D.C. ALL-WAVE RECEIVER

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## SOME OF THE QUESTIONS ANSWERED IN HANDBOOK #4. Pages given.

What is the logical method for learning Radio? Ans. on page 3.

How is this set good for the learning of code? p. 3.

How does the small set field work into a large Hobby? p. 3.

Why is this set called the single circuit tuner? p. 3.

What are the advantages? p. 3.

How do we substitute a standard variable for .00014? p. 4.

How does this combination select the range of coils? p. 4.

Why is the Antenna condenser the most important part? p. 9.

What is the purpose of the insulated extender to panel? p. 9.

How does distance between the plates of the Antenna condenser affect the set? p. 10.

Why is heavy wire used for RF circuits in this set? p. 10.

On what bands is it most important to be careful? p. 10.

What is our new method of systematic wiring? p. 12.

What special care should be used around sockets? p. 12.

Why do we make the grid leads short as possible? p. 12.

What does size of regeneration condenser tell you? p. 13.

Why are celluloid coils preferred? p. 13.

What are two methods of finding range of condensers? p. 15.

Why is tickler of 20 m. coil interwound with secondary? p. 15.

What band works best? p. 15.

Why does it take 2 coils to cover the broadcast band? p. 15.

How does splitting the BC help the Hi-Frequency end? p. 15.

What lengths of Aerial are to be used in City? Country? p. 15.

What is life of batteries? p. 16.

What effect does reversing the A polarity have on SW? p. 16.

How far should one get on this set? 7½ pages of reports.

This is one of our best MRL Handbooks. It was issued to replace our original **Big Plan (BP) 2**, of the same name. Much care has been given to its preparation, and every effort made to give all necessary details.

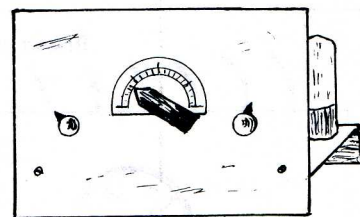
The Handbook is our standard size 5½" x 8½" - or pocket size. It is printed in easy-to-read type, in an easy-to-read manner.

The One-tube set, it describes weights but 12 ounces. Literally hundreds of them have been sold to satisfied customers, so the rig is not an experiment on the market.

The circuit is simple, and is easy to assemble and wire. The DX ability is due to the layout of the proper parts, Antenna condenser, and little kinks we have learned during its sale the last 13 years.

Complete parts lists are given in detail. While we prefer certain parts, the whole list may be purchased at any good Radio Parts store.

On its 24 pages we have attempted to show all drawings in full size, so measurements may be made directly. It is easy to lay out the panel, base, etc. by just removing the staple from the Handbook, and placing sheet directly on the flat surface. A



center punch is then used to mark the hole centers, for easy layout.

Our new system of systematic wiring, showing starting points, etc. will help the novice. One may use the schematic or pictorial diagrams as he wishes. Details are given, as we progress, why certain methods are used.

Complete data for winding all the coils from 20 meters up thru the Long Wave band of 830 meters are shown.

While the majority of the 1-tube kits have been sold to Experimenters, many have been sold to Engineers, and other professional men, as a diversion from TV sets. This Handbook should also be in the hands of every School instructor, when he reaches the part of his course devoted to the study of Radio.

Small set building is again becoming a big Hobby, as attested to by thousands on our mailing list. For over 20 years, several of us have stayed with this field and kept it going, so now the interest is increasing.

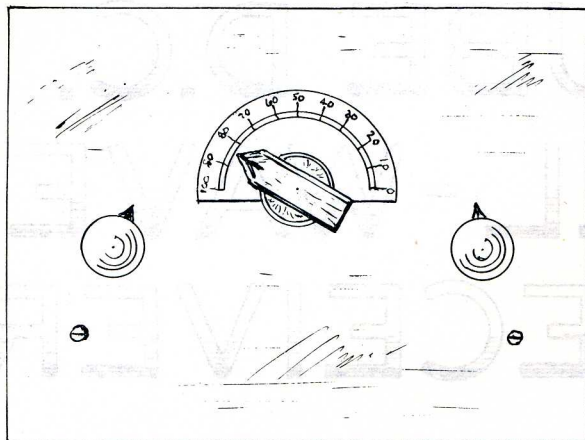
7½ pages of "Performance Reports" are given. These show, in condensed form, and alphabetically by Countries, States and Cities, some of the best results we have heard about. Besides the station call letters, we have figured the approximate airline miles, which run up to 12,000. Now and then a Fan reports some special kink, or change he has made and found useful.

MRL Handbook #4..... 30

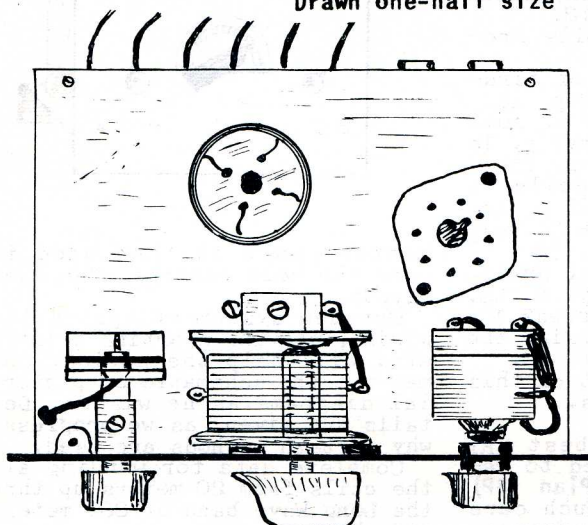


# MRL 1-TUBE D.C.

Best distance  
reported 12,000 miles



Drawn one-half size



## ALL-WAVE RECEIVER KIT

\$6.50

Plus 2 lbs.

Parcel Post



ohm DC resistance. Set is not hard on phones.

Handbook 4 (see A-4) may be referred to for more details. This is furnished with the Kit, so you get all information.

Instead of the BC coil, previously furnished in BP-2 kits, we now furnish a Hi-Frequency BC & a Lo-Frequency BC coils to more than cover the BC band. The Hi-F goes down to Police and spreads the 'peanut' stations all over the dial, so many will be found you never knew existed before. The Lo-F BC coil goes up to the Ships, and puts the Lo-F BC stations at the bottom of the dial. This system has many advantages.

The Kit was designed for the 1C5gt power output pentode, that gives the set lots of gain. Some may prefer the 1Q5gt, beam power amplifier, with a little more gain. Both tubes fit the same socket.

5-prong coils (Type 5-A) may be specified for the kit and accessories, if desired, at the same price. We may use the 5-prong forms in case we run out of the 4-prong. We still allow 2¢, plus postage, on any 4-prong tube bases of 1-3/8" diameter U could send in to us.

While this should out-perform any similar set, we cannot guarantee any specific distance, or station, due to varying conditions under which it may be operated.

MRL 1-tube DC All-wave kit; all parts; Hi-F and Lo-F Broadcast coils; HB-4. CAT. 14-3. 2# 6.50  
Same, assembled, wired and tested. CAT. 14-3-W. 2 lbs. 8.50

### FOLLOWING ACCESSORIES ARE EXTRA:

Set of 4 MRL Type A Hi-Q Celluloid Short Wave plug-in coils, 20, 40, 80, 160 meters, with DP-68. CAT. 7-1. 8 oz. wt. .... 2.00  
MRL Type A HI-Q Long Wave band plug-in coil. CAT. 7-5. 1# .75  
1C5gt new tested tube. 1/4#... 1.25  
(or) 1Q5gt tube. 4 oz. wt. .... 1.50  
HB-4, if bought separately... .30  
#2 1 1/2 v. Flashlight batteries. CAT. 3-1. 2 cells for..... 25  
22 1/2 v. B-Batt. buy elsewhere.  
Headphones, see CAT. P-1.  
Aerial supplies, see CATALOG.

DON'T FORGET POSTAGE.

Hundreds of these little 1-Tube Kits have been sold to satisfied customers. If one compares the advantages found in this Kit, there is nothing on the market at near the price. The utmost care has been taken to produce an efficient 1-tube Kit, and still make it easy to build.

It uses a 4 1/2" x 6" Aluminum panel, which, besides making a neat appearance, tends to offset any body capacity effects.

A composition base is used, so grounding troubles are mostly eliminated. A wooden back-strip is used to hold phone tip jacks and battery wires.

The usual set of this nature has but two controls, while we use 3. The third one operates the Antenna condenser from the front of the panel. This is the most important part of the set, and the reason for most DX. Most companies use a cheap hard-to-tune trimmer condenser at the rear, instead.

The best parts are used, to make the set operate more efficiently. Some of the parts are made by us.

The Kit is easy to wire if you follow directions given by HB-4, furnished with the kit.

Set is lightweight - only 12 ounces, but shipping makes it run over 1 lb. It may be taken on camping trips or carried in a suitcase. It has been used on boats, bikes, etc.

It has low drain on batteries, - some Fans say batts. seem to "never wear out." The B-battery should last at least a year, and flashlight cells R easy to buy.

Oscillation is good on Short wave bands. The 40 meter band is the best - where most of the DX is obtained.

Any Aerial or ground is used, altho in the City, we prefer a short one, if a nearby station has a strong ground wave.

The set will run a speaker on loud stations, under certain operating conditions.

The Kit gives you an all-wave set for little more money than a good Crystal set kit. It just takes a few seconds to change from one band to the other.

Any kind of phones may be used but we prefer about 2000 to 5000