

OVRC Meeting

April 8, 2020

1-Tube Radios

Gord Rabjohn

April 2020 OVRC Meeting Overview

- Lets start like this: I'll ask everyone to mute their mics. If you want to talk, unmute them and talk, but be aware that others might be talking at the same time. Share the floor!
(If this doesn't work, I will take control of all mics, but I'd rather not!)
- I have a few announcements
- I will open the floor to announcements
- I have a presentation on 1-tube radios
- I will open the floor to 1 tube radio discussions

Notes

- Jim Stephen (Henry James “Jim” Stephen) died February 23. Was an authority on radios, and was very active in the early years of the club.
- May 2 live auction has been cancelled.
- June 10 face-to-face meeting cancelled.
- If this “Zoom” seems useful, I propose another on-line meeting May 13, also the June 10 meeting about “Stewart-Warner”
- I have not been to the mailbox lately; it’s not an essential activity.
- Anything else???

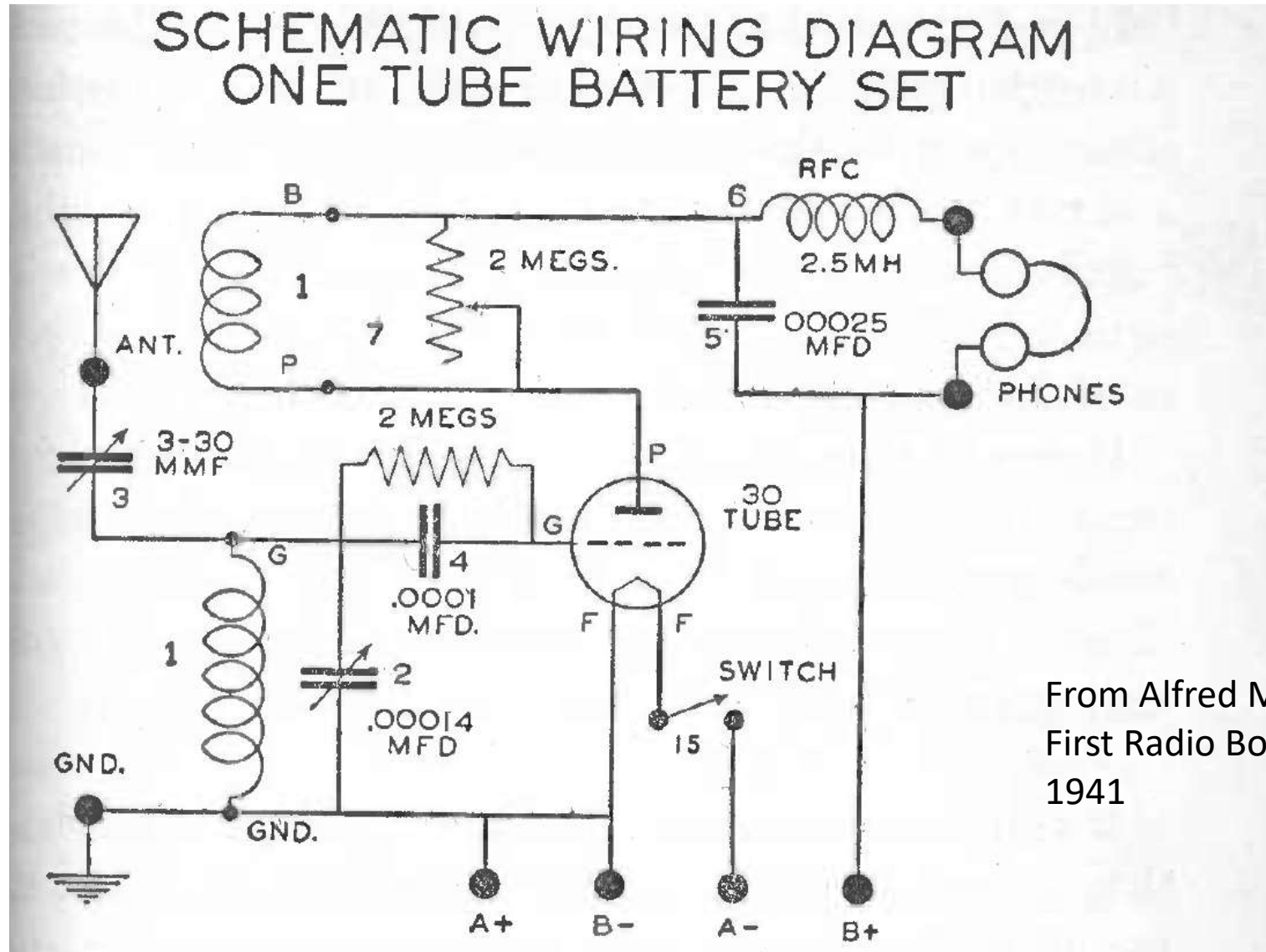


One-Tube Radios

- How do you get enough performance from a single tube?
 - Just use a tube as a detector: essentially a crystal radio.
 - Regenerative: Get almost infinite gain.
 - Superregenerative: Often used at higher frequencies. Also gives lots of gain.
 - Reflex: Put the signal thru the tube twice: once at RF, once at audio.
 - Multi-section tubes.
 - Combinations of the above.
- The most interesting to us are probably the one-tube regens popular in the '20's
 - Cheap, easy on batteries.
 - Licenses for single tube radios were sometimes cheaper.

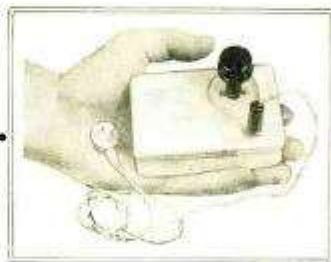
1-tube construction plans

1-Tube Regenerative



From Alfred Morgan:
First Radio Book for Boys
1941

Pocket FM Receiver



By HERB COHEN*

HERE'S a miniature FM receiver that requires no external antenna, uses only one miniature tube and has good fidelity. The entire FM broadcast band is covered with enough selectivity to separate weak from strong signals even in metropolitan areas.

And it's possible to complete this "under \$10.00" project in just one evening. Component placement is not critical even though the radio is constructed within a plastic case that is no larger than a cigarette pack.

Construction. The subminiature 1AG4 tube socket should be pre-wired before installation. Follow detail view, soldering plate and screen lugs together and then connecting 2½" lengths of hookup wire as shown. Connect C2, C3 and R1 directly to the grid lug. The tube socket can be glued directly to the case with a drop of Duco cement.

Antenna coil L1 is made by winding four turns of #14 gauge solid wire around a form ¾" in diameter. The turns should be spaced as close together as possible without actually touching each other. Remove L1 from the form and solder its two ends directly across tuning capacitor C1. All leads should be as short as possible.

Quench coil L2 is a four-section 2.5-mh. choke. Tap into L2 between the first and second section as shown. Then carefully scrape the connecting wire clean and solder a thin flexible 3" lead to the tap.

All components can now be screwed or glued into place. In order to eliminate hand capacitance effect, an insulated shaft extension is used with C1. A dynamic ear-

phone of 2000-3000 ohms impedance should be plugged into J1.

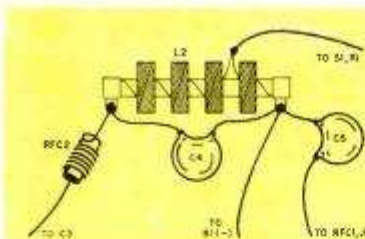
Trouble-Shooting. Before turning the unit on, check for shorts in the wiring. Turn C1 to full mesh and S1 to the "on" position. If the unit is functioning, a loud hiss will be heard. Tune C1 across the band until the hiss subsides and a station appears. A large dead area may appear at the high end of the FM band. If this happens, shorten the leads in the tuning circuit.

If a hiss is not heard, touch C1 with an insulated screwdriver. A click should be heard indicating that the ultra-audio section is oscillating but the quench circuitry is not functioning. Check all components, particularly the tap on L2, for a short, break or wiring error. Check battery voltage—if B2 drops below 1.3 volts, oscillation will be difficult to obtain.

One method of calibrating your set to cover the entire FM band is to place the pocket receiver near a commercial FM set. Tune the commercial FM receiver to 88 mc. Then tune C1 until a rushing noise is heard. Mark this spot on the pocket receiver's case. Repeat this procedure for the upper end of the FM band at 108 mc. If the high

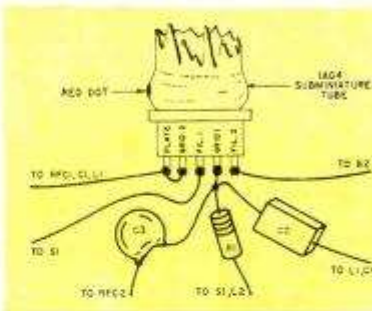
(Continued on page 112)

*General Transistor Corp., Applications Engineering Dept.
POPULAR ELECTRONICS

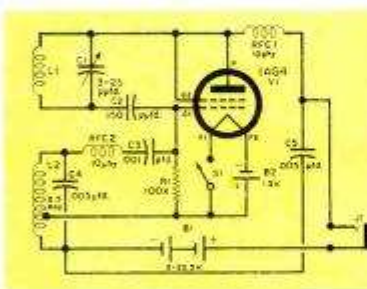


Wiring details of quench oscillator coil L2. Note added coil tap.

Detail view of wiring of subminiature tube socket. Red dot on tube is guide for proper installation.



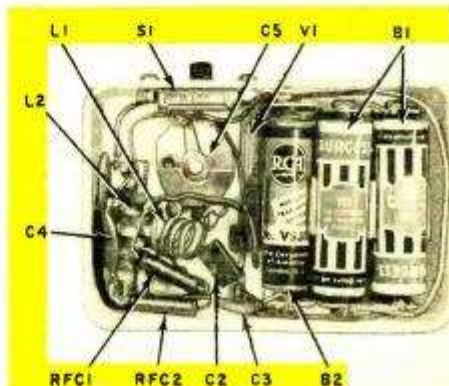
Sensitive superregen circuit pulls in FM band—without an antenna



Antenna coil L1 is the only one requiring special winding. All others are commercially available. For longer battery life, a mercury cell can be used as B2 instead of standard penlight cell.

PARTS LIST

- B1—2.25-volt battery (Burgess Y15)
- B2—1.5-volt penlight cell
- C1—0.001-µd. variable capacitor (Hammarlund APC-35)
- C2—150-µd. mica capacitor
- C3—0.001-µd. disc ceramic capacitor
- C4, C5—0.001-µd. disc ceramic capacitor
- J1—Miniature open-circuit phone jack
- L1—Four turns of #14 solid wire (see text)
- L2—2.5-mh. choke (Miller 4537)
- R1—100,000-ohm, ½-watt resistor
- RFC1, RFC2—10-µh. choke (Miller 4512)
- V1—1AG4 electron tube
- S1—5 p.p.t. slide switch
- 1—Plastic cabinet extension
- 2—Battery holders (Acme 3 and Acme 45)
- 3—Subminiature tube socket



Parts placement shown should be followed carefully for best results. Consult the two detail views above for exact positions. All leads should be as short as possible.

FM in Your Pocket

(Continued from page 36)

end of the band does not come through, spread the turns of the tuning coil L1 slightly. Compress to obtain the low end of the band.

In order to increase sensitivity in very weak signal areas, place the receiver near any metal surface. This method of loose coupling utilizes the metal object as an antenna.

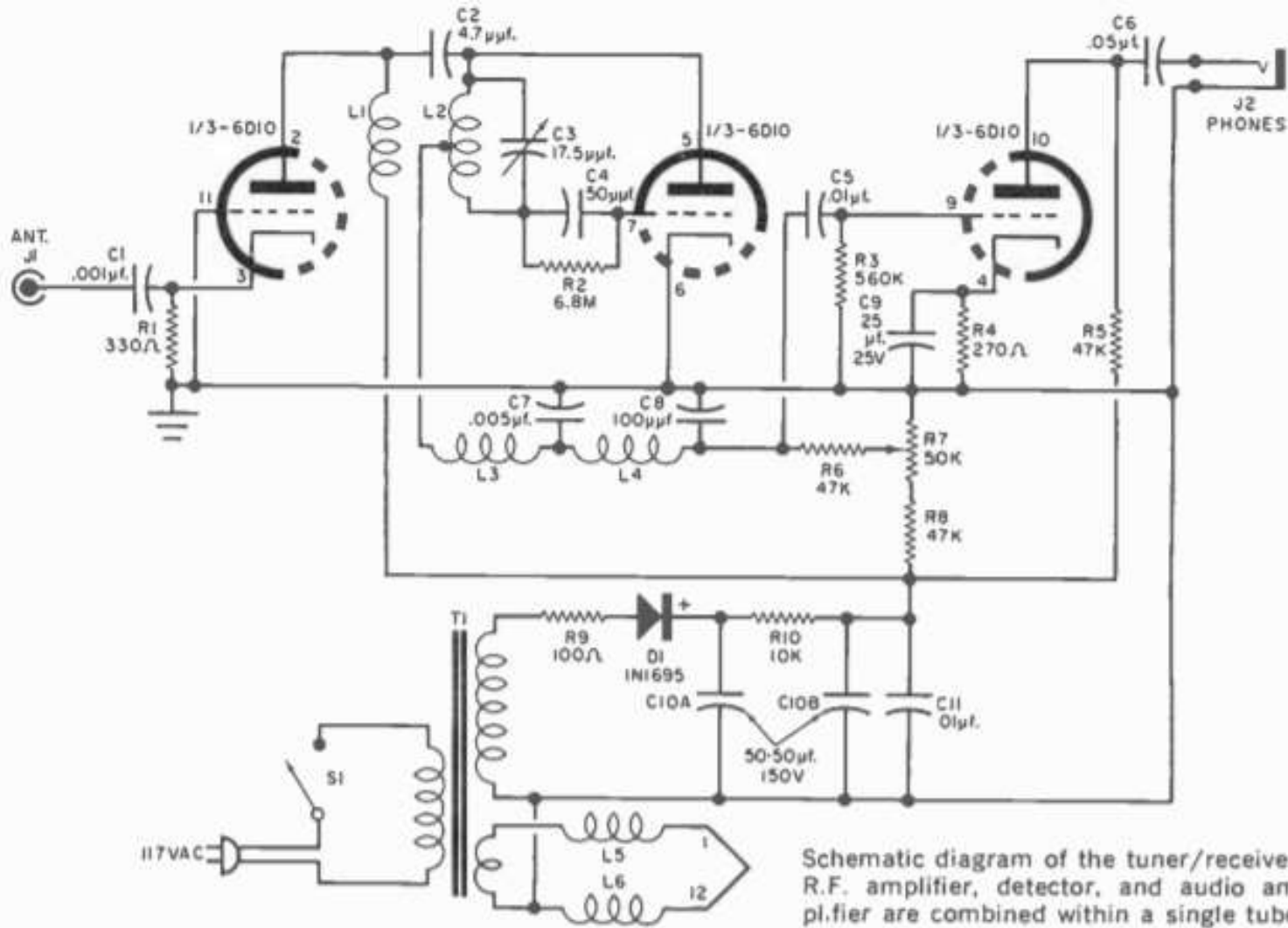
HOW IT WORKS

Through the use of a superregenerative type detector, gain comparable to a full superheterodyne receiver has been obtained. The circuit utilizes two separate oscillators. The first, an r.f. ultra-audio (200), is tuned by L1 and C1 in the tuning r.f. signal. The interelectrode capacitance of V1 is used to provide the feedback to sustain the oscillation. A quench oscillator of the Hartley type, whose tank circuit is L2 and C4, supplies the grid current at V1 on and off at a 30-40 cps. Its only purpose is to interrupt the high-frequency oscillation.

An r.f. signal appearing in the tank circuit triggers the ultra-audio oscillation on before its natural period and keeps it on slightly after the quench frequency would naturally kill it. The "extra" period of oscillation by the ultra-audio section results in a large phase current change. This current appears as the audio signal to the earphone. Since the incoming r.f. signal is used only as a trigger to fire the high-frequency oscillation, the overall gain of the circuit is not dependent either on the strength of the incoming signal or the gain of the tube.

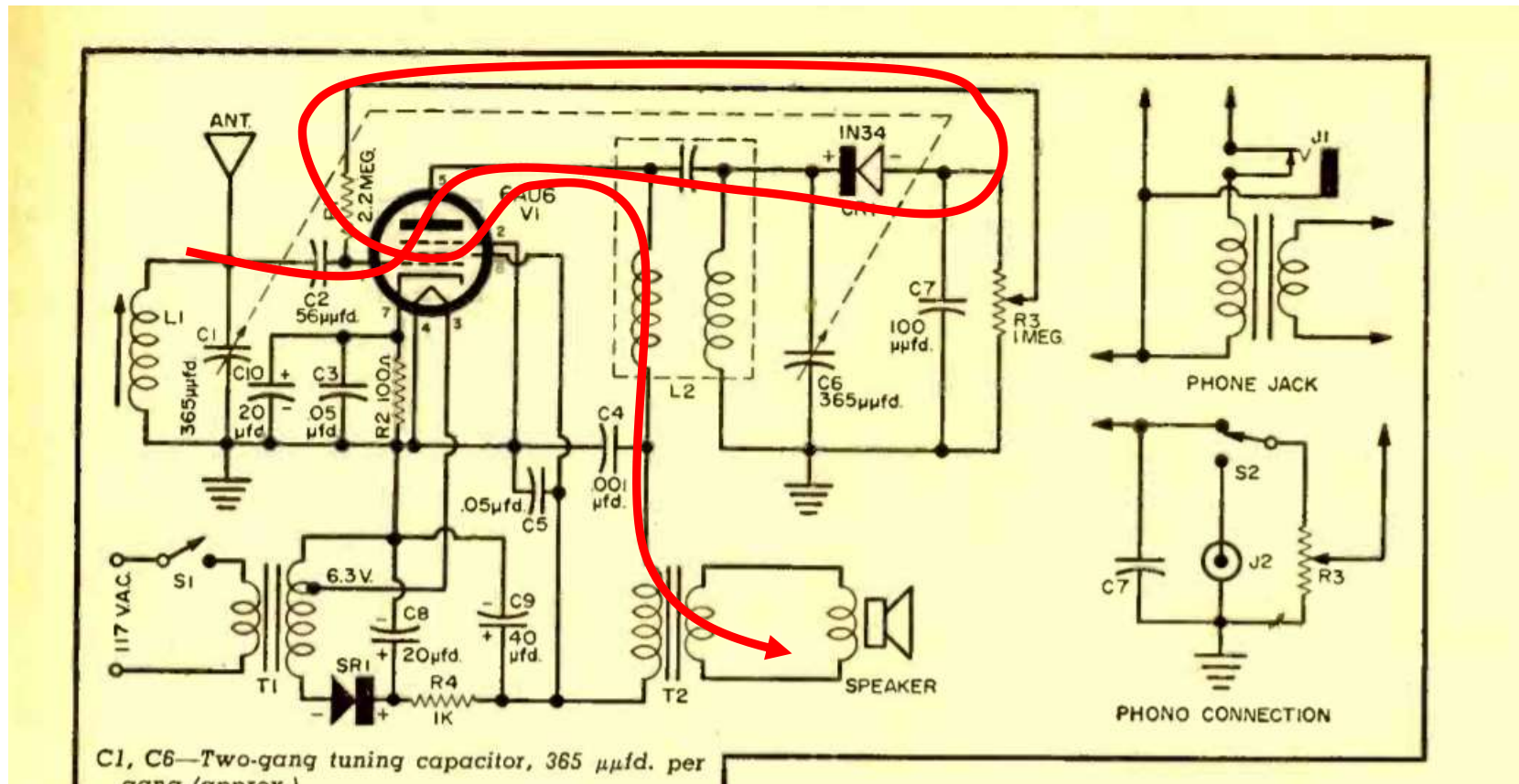
ways say you saw it in—POPULAR ELECTRONICS

Superregenerative FM Receiver



August 1961
Popular Electronics

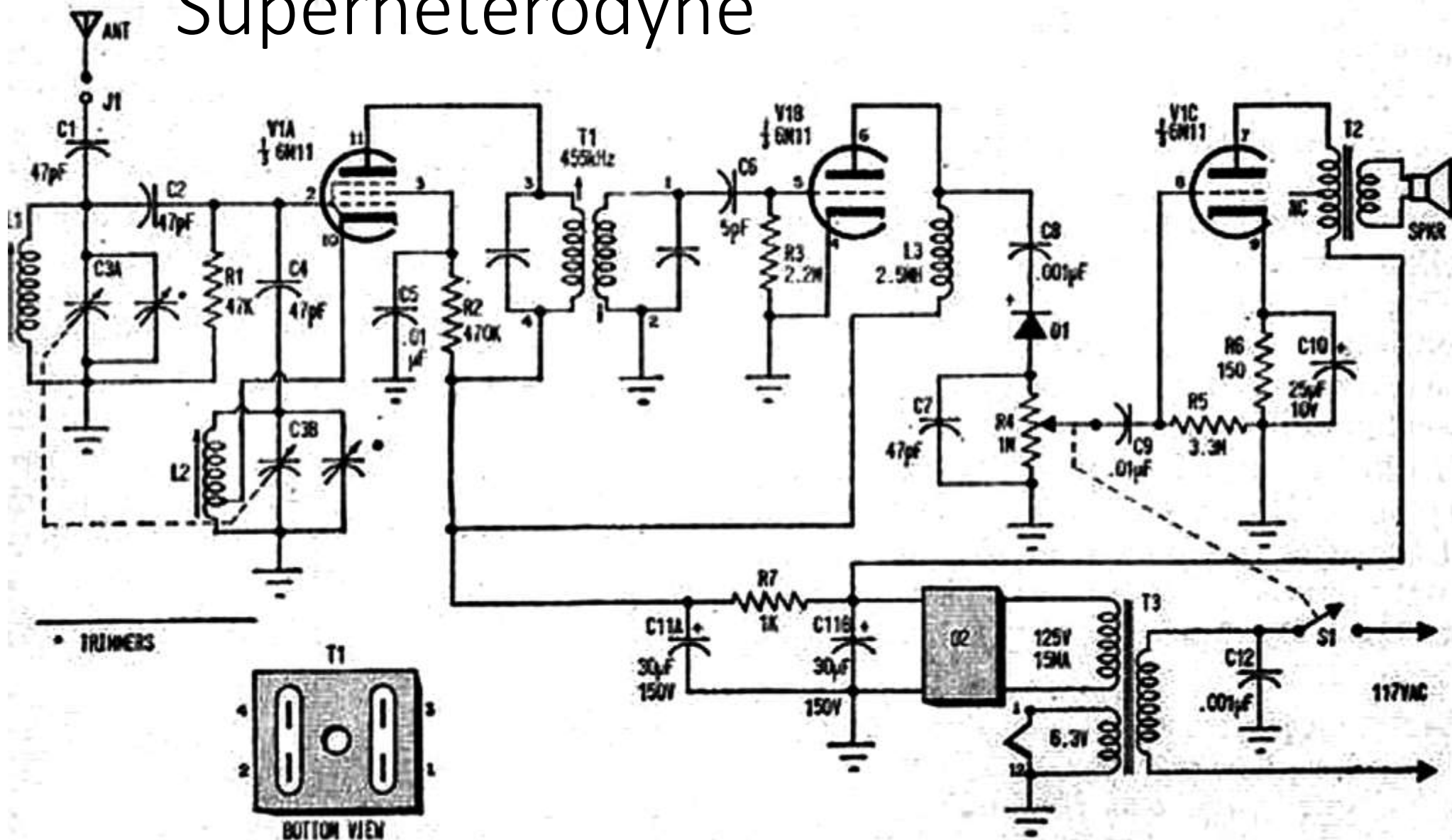
1-Tube Reflex TRF Radio



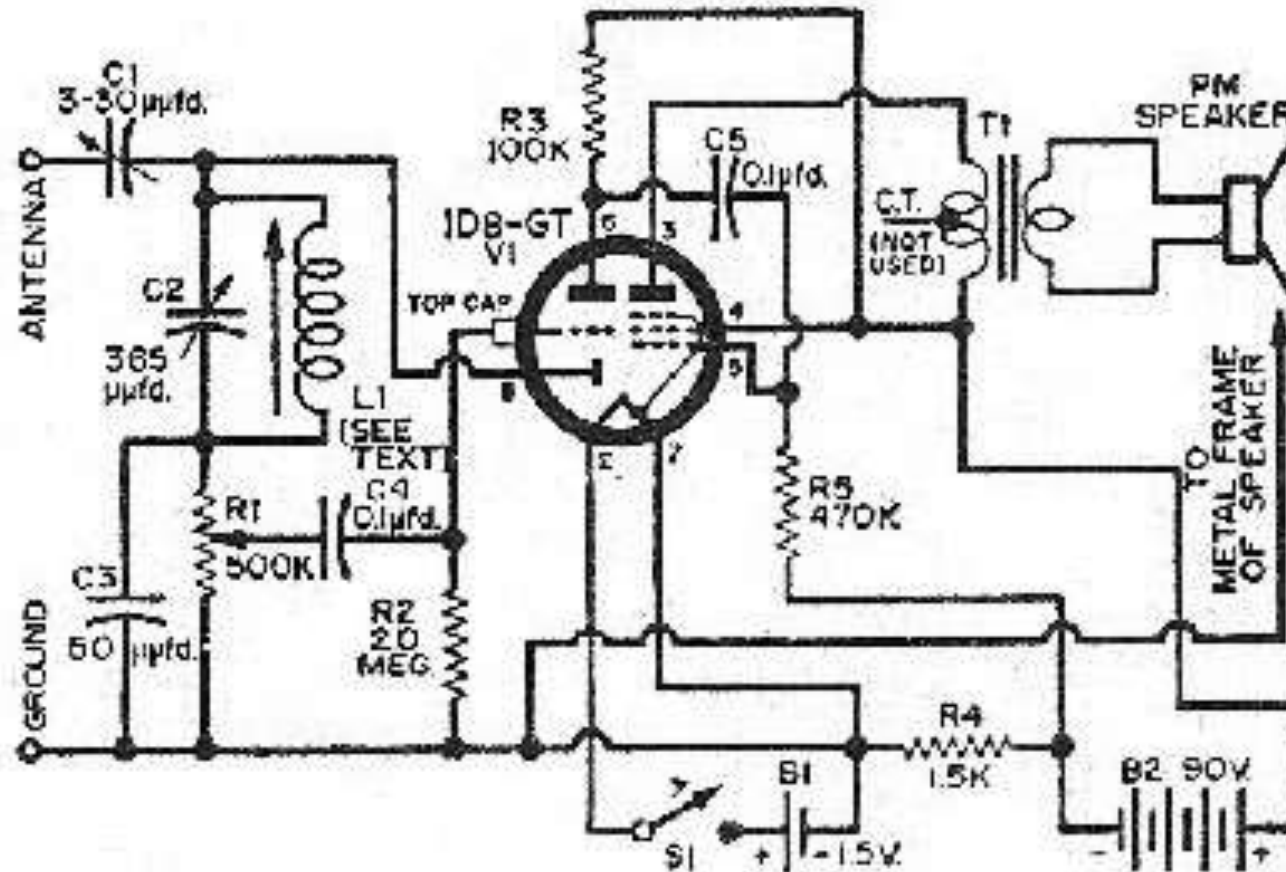
Nov 1955
Popular Electronics

- RF amplifier,
- diode detector,
- reflexed audio amplifier.

Superheterodyne



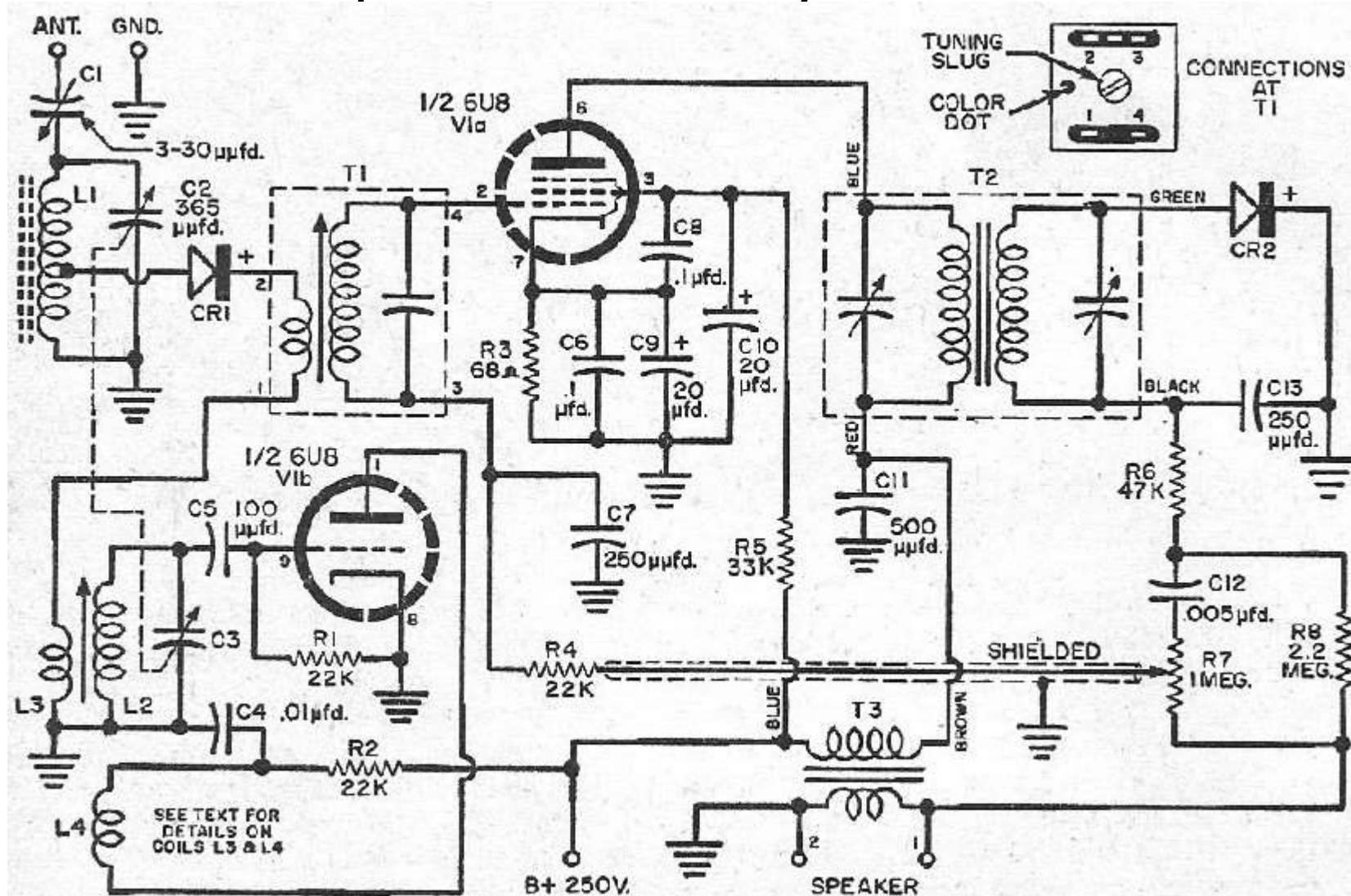
1-tube with 3 functions



October 1955
Popular Electronics

- Diode det
- Audio 1
- Audio 2

Reflex Superheterodyne



Sept 1956
Pop Electronics

- Diode mixer
- Triode local osc.
- Pentode IF amp
- Diode detector
- Pentode (reflexed) audio amp

Commercial 1-tube Receivers

Loewe



Loewe

Three triodes plus
resistors and capacitors
all in one envelope!



Northern R11



Radiola 1

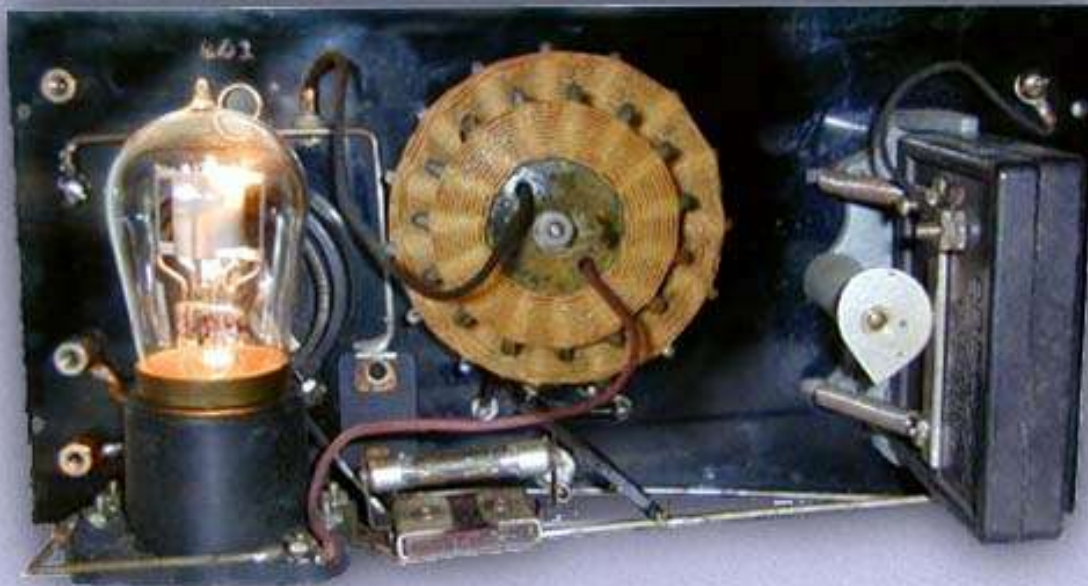




Ace "V"

Ace = "Precision Engineering Association"
Was bought by Powell Crosley in 1922

Tuned circuit + detector



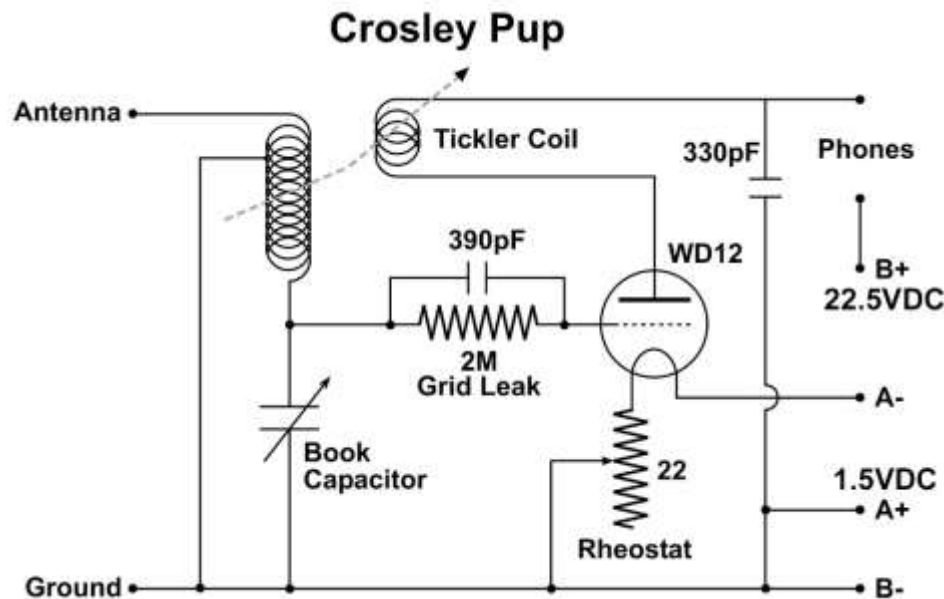
Crosley V = Ace =Harko Sr. Not regen: just an Audion detector.



Early 1922 Crosley Harko Senior

Crosley "Pup"

AKA Sky Terrior



From Radio Magazine, September, 1925

**\$1000
Grand Prize!**

*Pedigreed Puppies and
Larger Crosley Radios as
Monthly Awards.*

Who will send Crosley the first
verified report of reception with
a Crosley radio between Sep-
tember 1st and March 1st of
next year?

Who will send the best report
each month?

\$1000 prize for the best report
for the entire period. A real
live pedigreed puppy each month
as first monthly prize and larger
Crosley radio sets as other prizes.
Contest open to all, except Cros-
ley employees, on station where
you are or what set you own or
use, factory or home built. Re-
ports of reception must be veri-
fied. Judges may ask for all
details.

Full details of the contest and
entry cards are packed with each
Crosley Pup as may be obtained
from any Crosley dealer or upon
application to The Crosley Radio
Corporation, Cincinnati, Ohio.
Try for the prize as many
times and as often as you like.
Remember! The Crosley "Pup"
is offered as a real selective,
long range receiving set. It re-
quires one dry cell, one B bat-
tery block, one WD 12 tube, a
pair of head phones and an-
tenna. Other similar one-tube
Crosley receivers bring in sta-
tions from coast to coast, with
frequent reports of trans-Atlantic
reception in the United States.



Crosley is the world's largest
builder of radio sets and has
built up a tremendous vol-
ume by offering the highest
quality receiving sets at the
lowest prices. More than a
million satisfied users is the
strongest testimonial of Cros-
ley quality, simplicity, dura-
bility and value.



*A Genuine Armstrong Regenerative
double circuit receiver*

Radio, with all its romance, knows no more
magic name than Crosley.

From the time that Power Crosley, Jr., first
enabled millions to build their own sets by
offering parts at a fraction of existing
prices—down to the present day, radio
progress and Crosley achievements have
gone hand in hand. Now Crosley announ-
ces not only vital improvements in radio
performance—but in the Crosley "PUP"
offers this finer performance at the lowest
price in radio history.

This compact, efficient receiver is a devel-
opment of the famous Crosley one tube
set, with which Leonard Weeks, of Minot,
N. D., heard the MacMillan Polar expedi-
tion while the rest of America listened in
vain.

The employment of the double circuit not
only reduces radiation to a minimum, but
radically improves selectivity. It can be
tuned through local stations more readily.

Under average conditions, its radius, with
head phones, is 1500 miles or more.

You can use the "PUP" to check the per-
formance of your larger set; to entertain
the youngster whose curious fingers can-
not resist the lure of dials and switches;
to install in the maid's room, or even in
your office—for the air is full each day.
You can take it on canoe trips, picnics,
outings, and on your business journeys—
for it's only half the size of a shoe box.
Engineered and built to the strictest stand-
ards of Crosley Quality, this genuine long
distance set can be offered at the
phenomenal price of \$9.75
only because of its simplicity and
Crosley's tremendous manu-
facturing facilities.

\$9.75
WITHOUT
ACCESSORIES

ADD 10% TO ALL PRICES WEST OF ROCKY MOUNTAINS

Crosley manufactures receiving sets which are licensed under Armstrong U. S.
Patent No. 1,515,188 and priced from \$9.75 to \$69.00 without accessories.

Crosley owns and operates WLF, first remote
control super-power broadcasting station.

CROSLLEY
THE CROSLLEY RADIO CORPORATION
CINCINNATI

Tell them that you saw it in RADIO

Pup



Globe



1922 Globe 610 Regenerative Receiver



1922 Globe 610 Regenerative Receiver

Home Brew



- Show us yours!