Lil' Brown Radios Need Love Too!

The Airline 1939 Midget

A Radio with Unique Tuning…

A presentation by
Bart Lee, K6VK for the
California Historical
Radio Society, © 2017

Cosmetic Restoration of the 1939 Airline AA4

Airline 04BR-420B{?}; RadioMuseum.org ID 47498 with Schematic.
(But this is an All-American Four [!])

Useful Compounds for Bakelite Restoration

Also, Brasso (but beware of abrasives in it), silver polishes, Simichrome polish and toothpaste.

The Cabinet Polished

The bakelite is a burl pattern of brown and black swirls – Understated Elegance!

… with Lots of Elbow-grease and Q-tip Cleaning of Nooks and Crannies …

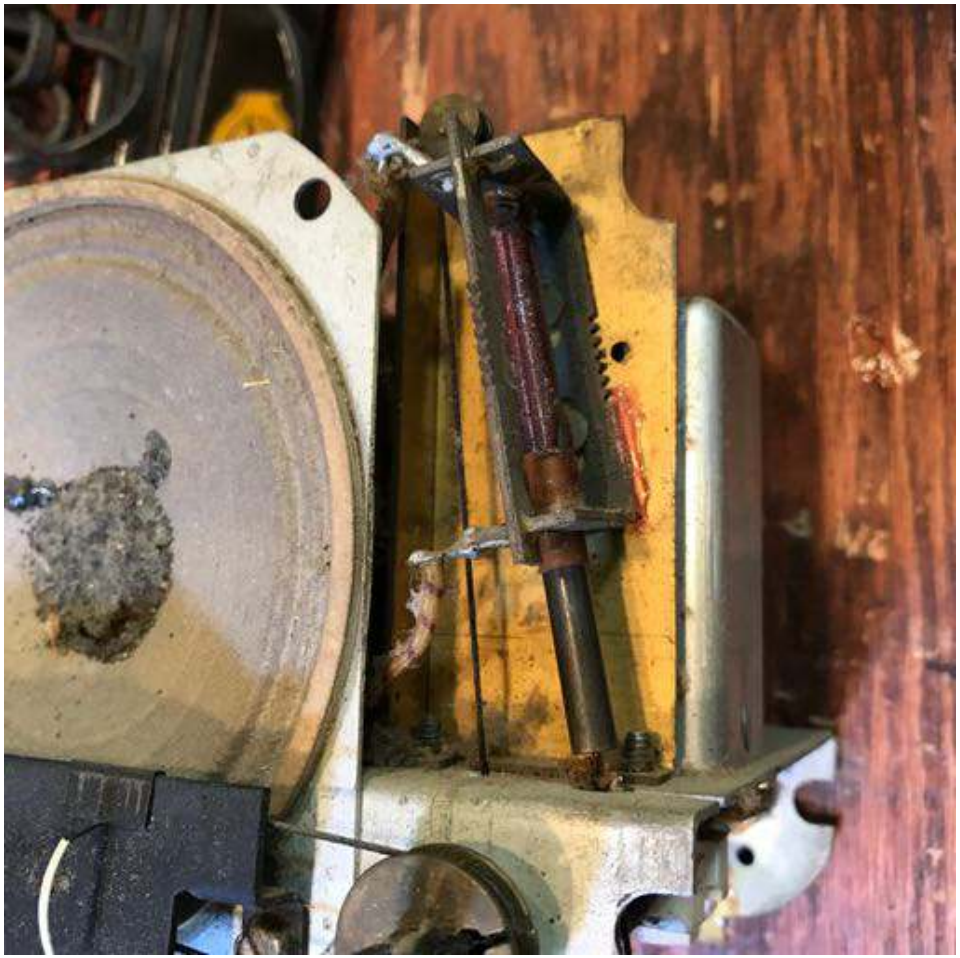
But what's Inside?

This Radio Worked!

No need to re-cap or diagnose 80 year old troubles -- that's impressive engineering!

Where's the Variable Tuning Capacitor?

A Variable Inductance Tunes:

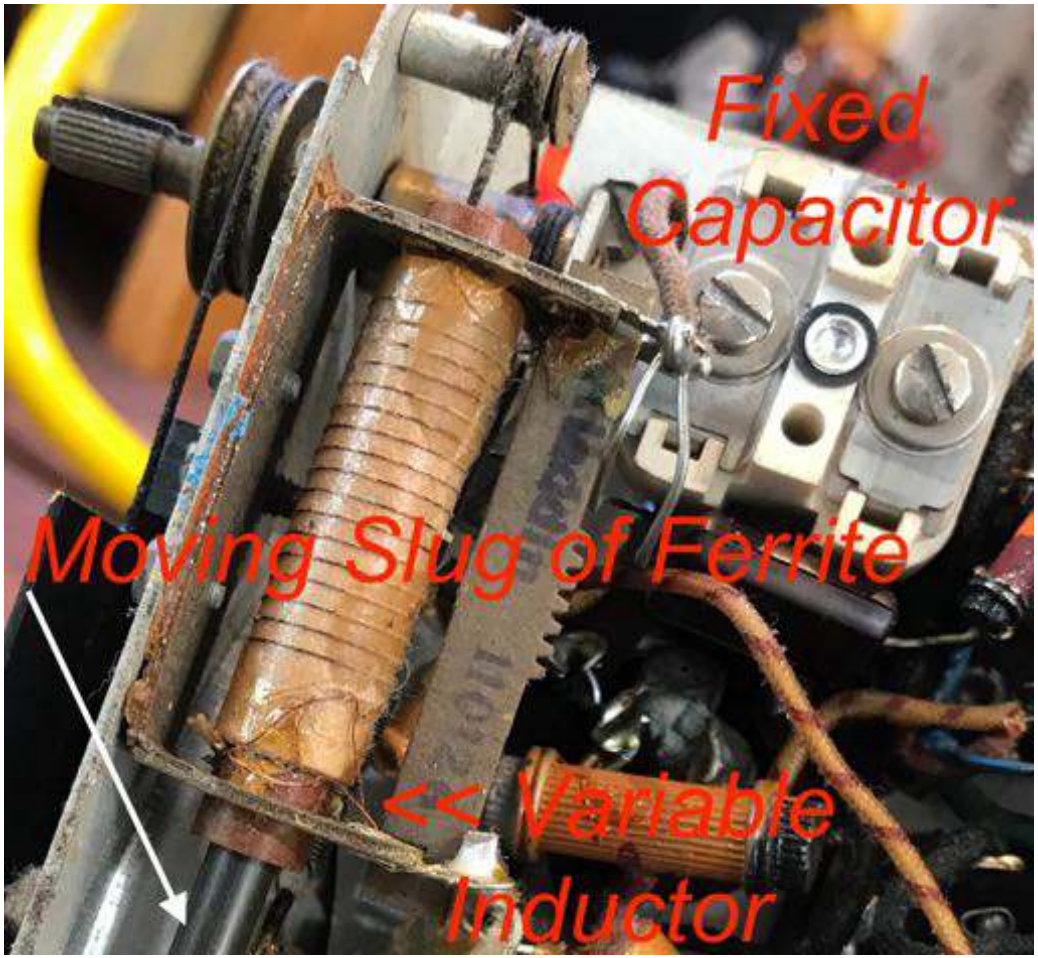


This is “permeability” tuning of the inductance with a ferrite core or slug.

Since it's a Superhet, the Local Oscillator Needs Tuning Too

The Cord-Linked Variable Inductances Tune Together, at the IF Offset.

Moving Ferrites Tune the Coil Against a Fixed Capacitor; Why?



Midget Radios Must Save Space!

- A two-ganged tuning capacitor takes up a lot of room, but this is a very small radio.
- It also runs plenty hot, and heat can warp aluminum capacitor plates…
- And looking to WW II, Aluminum was better put to use to make aircraft ...
- But most likely, this radio had to be cute and small to sell to the lady of the house!

Seven Inches Wide by 5 Inches High by 4 Inches Deep (188x124x102 mm)

From the 1939-’40 Montgomery Ward catalog; courtesy RadioMuseum.org

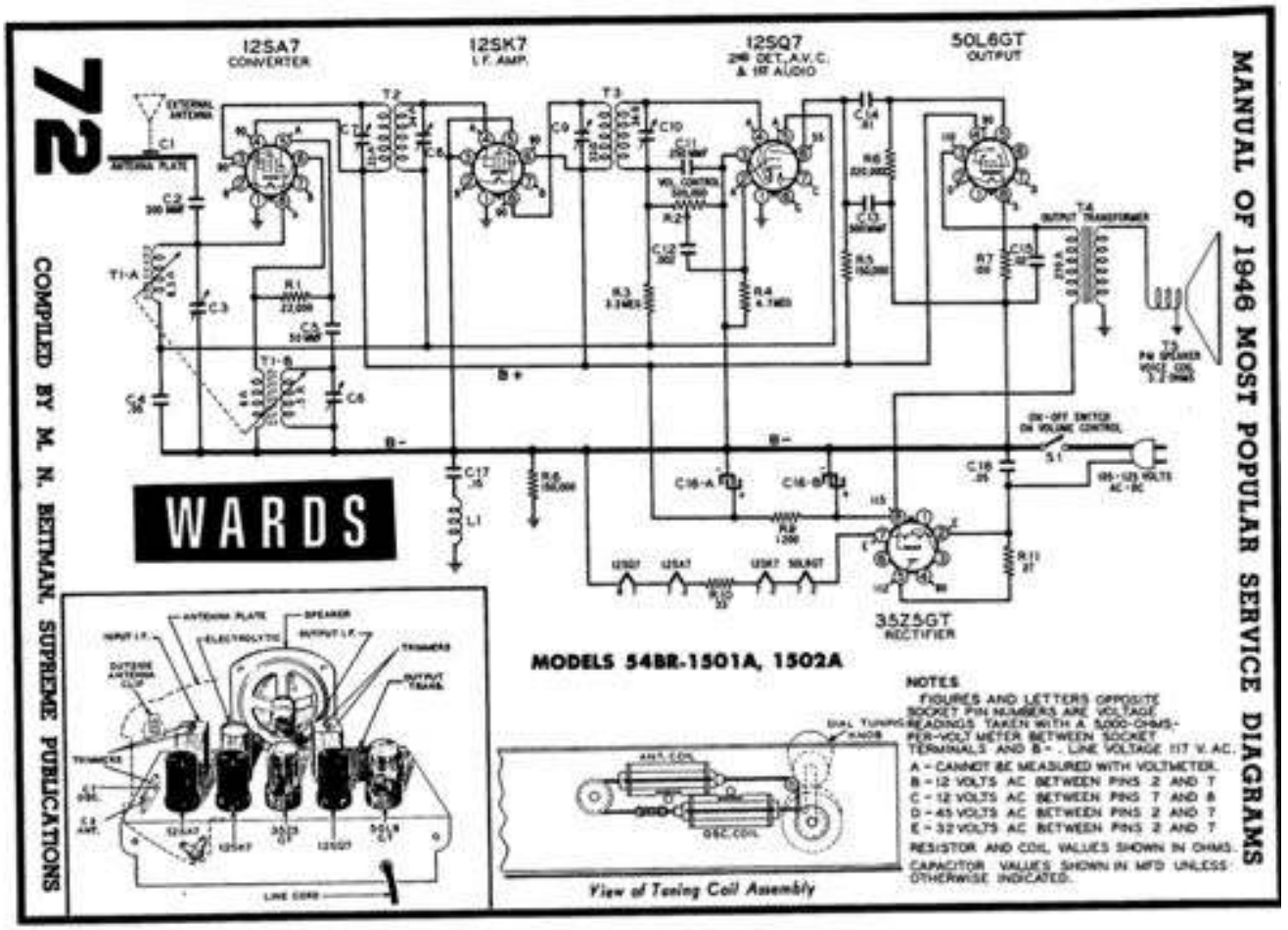
It Fits Everywhere

- This is a perfect little kitchen radio for listening to Arthur Godfrey in the morning.
- This is a perfect bedside radio for one last program in the evening: “Say goodnight, Gracie.”
- This is a perfect kid’s radio for listening to the Lone Ranger and even Jean Shepherd.
- You can’t go wrong for $5.73 [!!] the 1939 –’40 catalog price: Buy three !!

A Similar Post War Radio, AA5

Same First Three Tubes:

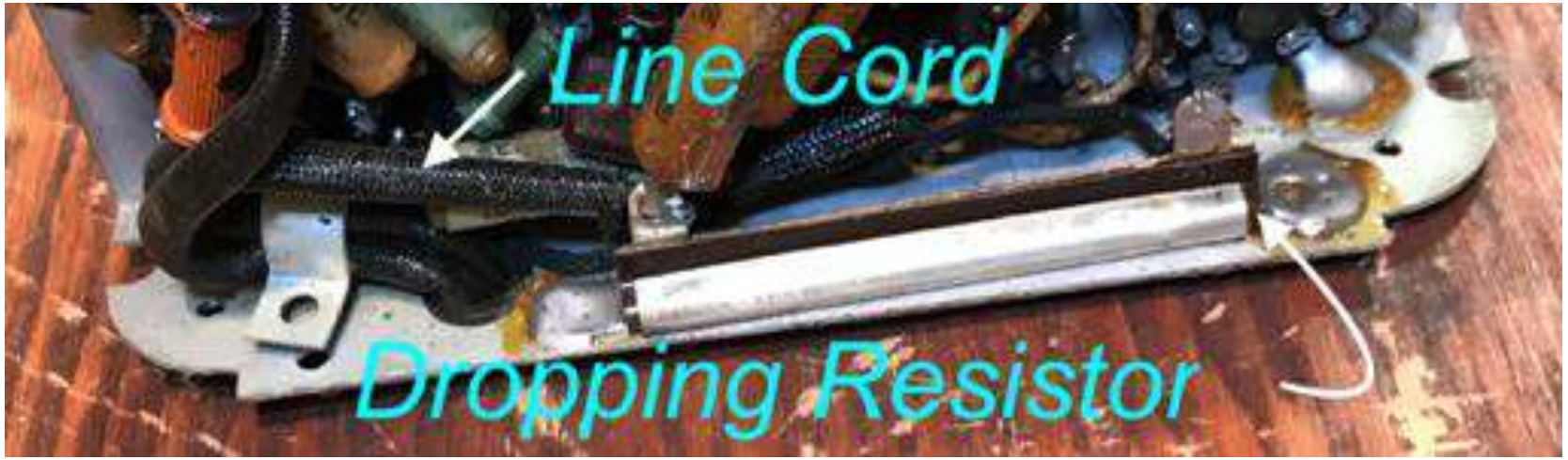
Note Ganged Inductors >>



About One Watt Audio Output.

How Four Tubes?

- In the radio examined, the last audio tube is a 35L7, a pentode amplifier and a diode rectifier
- The three 12 volt tubes provide mixing and IF
- A dropping resistor takes the line voltage for the filaments down to about 70 volts:



Radio Manufacturers' Association

"Approved," so I guess it's OK – just don't drop it in your bathtub!

Permeability Tuning from the 1930s

- A noted physicist worked out tuning by magnetic permeability in inductances in 1933: W. J. Polydoroff, “Ferro-Inductors and Permeability Tuning ” Proceedings of the Institute of Radio Engineers, Issue 5, May 1933; see also *Nature* 133, 956-956 (23 June 1934).
- Commercial adoption such as the Airline midget followed.
- Permeability tuning was especially useful in car radios that could then do without bulky tuning capacitors. This tuning persisted in vehicle radio until the coming of digital tuning.
- Some amateur gear used permeability tuning, *e.g.*, Ten-Tec transceivers such as the Corsair II.
- Collins radio pioneered permeability tuning in World War Two radios. The later R-390 is a classic instance.

Permeability Tuning Goes to War

This midget tactical and covert short wave receiver dates from World War Two (1943); its Navy nomenclature was RBZ.

In this version covering 5 to 13 MHz, it is said to have been made available to anti-Nazi forces in Europe, especially for monitoring the BBC and secret messages.

Emerson manufactured it. See: www.cryptomuseum.com/spy/rbz/index.htm

Please Add More Information!

Corrections, suggestions and amplifications are welcome. Send to: KV6LEE@gmail.com.

See www.californiahistoricalradio.com

73 de Bart, K6VK ##