



NATIONAL RADIO INSTITUTE

 *Washington D. C.* 

Radio-Trician Service Manual

REG. U. S. PAT. OFF.

Compiled solely for  Students & Graduates

on

**Zenith Models 52, 53, 54, 522, 532, 542, 33, 34,
35, 35A, 342, 352, 352A, 362, 33X, and 362X.**

The Zenith 50 series circuit incorporates three stages of audio frequency amplification. The first stage is resistance coupled, the second, push-pull using two 227 tubes and the third, also push-pull using two 245 tubes. Only two push-pull transformers are shown in the diagram, the third being in the speaker. The plate circuit from the output or third transformer is completed through the cable provided with the 5-prong plug.

The grid bias for all tubes excepting the UX-245 or C-345 tubes is obtained by usual voltage drop through resistances connected between cathode and ground. .2 condensers are connected across the resistors.

Instead of the usual grid leak and condenser in the detector grid circuit, the linear detection method is used. This consists of a 50,000 ohm resistance paralleled with a .2 condenser between detector cathode and ground. This method allows a greater amount of volume input to the detector tube without blocking or distorting as is the case with the other methods of detection.

The circuit diagram of Models 52, 53, 522, 532 is shown in the Figure 2. Models 54 and 542 use exactly the same diagram with the exception that there is a two-point switch in the grid circuit of the first tube which disconnects the inductance coil from the circuit and connects one side of the loop aerial to the grid of the first tube. The other side of this loop is grounded to the chassis.

The power pact used in these models is shown in Figure 1.

Hints on Servicing

MERSHON FILTER CONDENSER.
The Mershon filter condenser is used instead of the conventional tin foil and paper type.

This condenser is as near trouble proof as can be made. In the event that a portion of the electrolytic contents of the condenser is spilled or allowed to leak from the condenser, no harm will result with respect to fabrics, metals or wood finishes. However, a white spot will appear where the solution has been but this can be removed with a damp cloth.

If, during the operation of the set, a frying sound emanates from the condenser, the cause is high line voltage and the fuse should be placed in the 120-volt position. A line resistance should be used to reduce the A.C. supply if the fuse is already in the 120-volt position.

When testing the voltage divider (63-105) for continuity, the Radio-Trician should remember that unless the test leads are touched on the proper terminals of the voltage divider a false reading will result. The reason for this is: The Mershon condenser will pass current in one direction. If a voltmeter with a battery in series is used for testing the voltage divider or Mershon condenser and the test lead running from the positive terminal of the voltmeter is touched to a point that connects with

ZENITH MODELS 33, 34, 35, 35A, 342, 352, 352A, 362, 33X AND 362X

The easiest method of locating defects in the tubes, power units, or chassis is to test at the tube sockets with any high grade set analyzer. The voltage tables will enable the Radio-Trician to readily determine the condition of the set. Allowance should be made for the variation in line voltage in tubes. At least 10% variation from the readings given is allowed. Any wide variation of voltages given in these tables will indicate some defect in that portion of the circuit.

When testing in the R.F. sockets, the volume control of the receiver should be turned completely to the right or the position of full volume. This places maximum voltage on the plates of these tubes.

tions in the circuit a deflection of the meter will occur if the circuit is complete.

For example: Applying the test leads to the primary terminals of a audio transformer. No deflection of the meter indicates an open primary winding or in other words, a defective transformer.

Excessive Oscillations

Excessive oscillation is generally due to the following:

1. High line voltage.
2. Poor tube in the radio-frequency stage.
3. An open by-pass condenser.

The tendency of the receiver to oscillate is greater on a short antenna than on a long one.

APPROXIMATE VOLTAGE READINGS

Models 33, 34, 35, 35A, 342, 352, 352A, 362

	1st RF	2nd RF	3rd RF	Det.	1st AF	2nd AF
Filament volts	2.0	2.0	2.0	2.0	2.0	4.75
Plate volts	110	110	110	45	105	180
Grid volts	6	6	6	0	6	40
Plate current (milliamperes)	3.2	3.2	3.2	3.2	3.2	15

Models 33X, 362X

	1st RF	2nd RF	3rd RF	Det.	1st AF	2nd AF
Filament volts	2.05	2.05	2.05	2	2.05	4.9
Plate volts	102	102	102	40	94	170
Grid volts	6	5	5	0	5	35
Plate current (milliamperes)	2.9	3.8	3.8	2.3	2.6	17

When testing in the A.F. sockets, a considerable variation will be noted in the readings as the volume control is rotated. If turned far enough to the right to make the receiver oscillate, plate voltage on the audio tube will drop somewhat. A good test of the audio amplifier is to touch one end of the grid leak. If a loud hum is produced it indicates that the audio amplifier is functioning properly.

The service man who does not possess a set analyzer or similar instrument can check the continuity of a circuit with a voltmeter and battery. A voltmeter of a type in general use should be connected in series with a battery so that a deflection of the meter occurs when the test leads are touched together. By applying the test leads to various connec-

Dynamic Speaker

A rattle or fuzzy tone in the speaker is generally caused by dust filings or some other foreign particles which have become lodged in the air space between cone sleeve and field magnet. Usually these particles can be removed by blowing through the air space. Extreme cases require the more powerful force of compressed air.

If the .015 MFD condenser across the primary of the speaker is open, it will also cause a rattle.

When a speaker is dead, check this condenser to see if it is shorted. A continuity check with a voltmeter across the speaker phone tips should show a high resistance reading. A full reading indicates a shorted .015 MFD condenser.

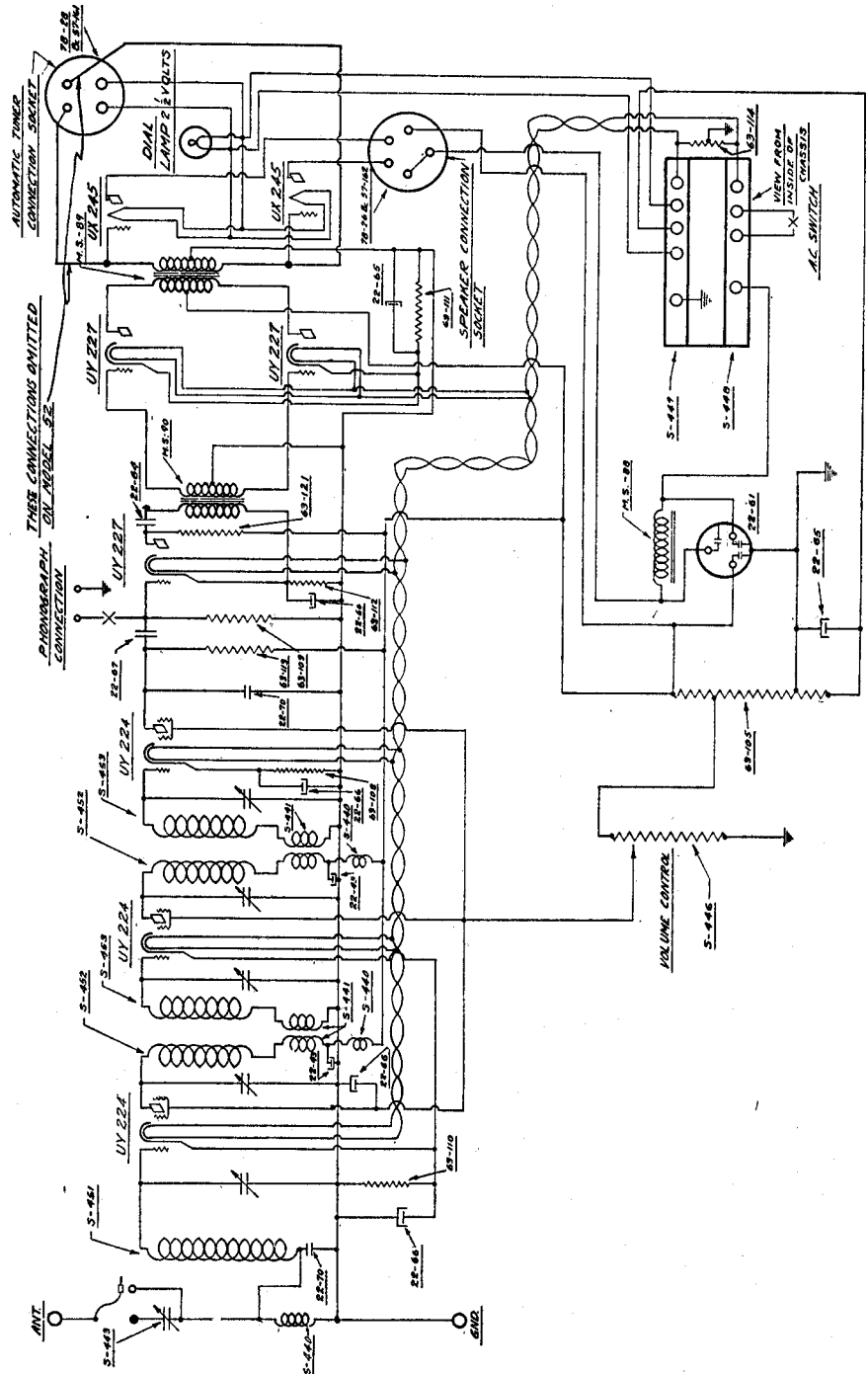


Fig. 2—Circuit diagram of Zenith Receiver, Models 33, 34, 35, 352 and 352.

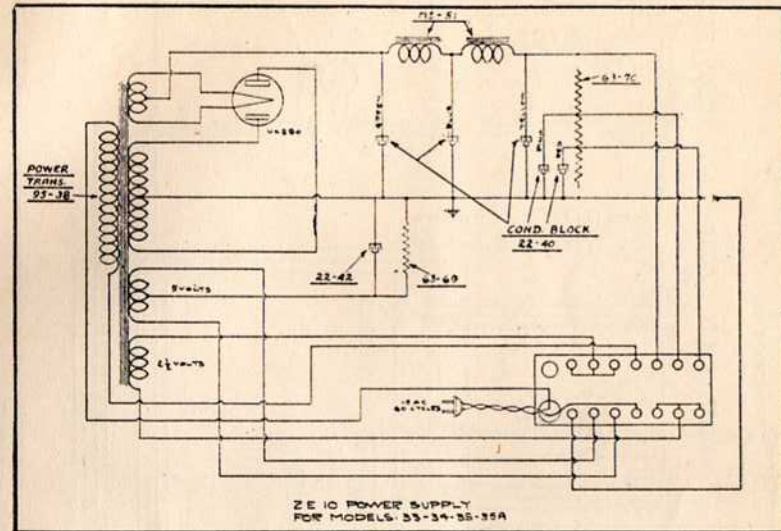
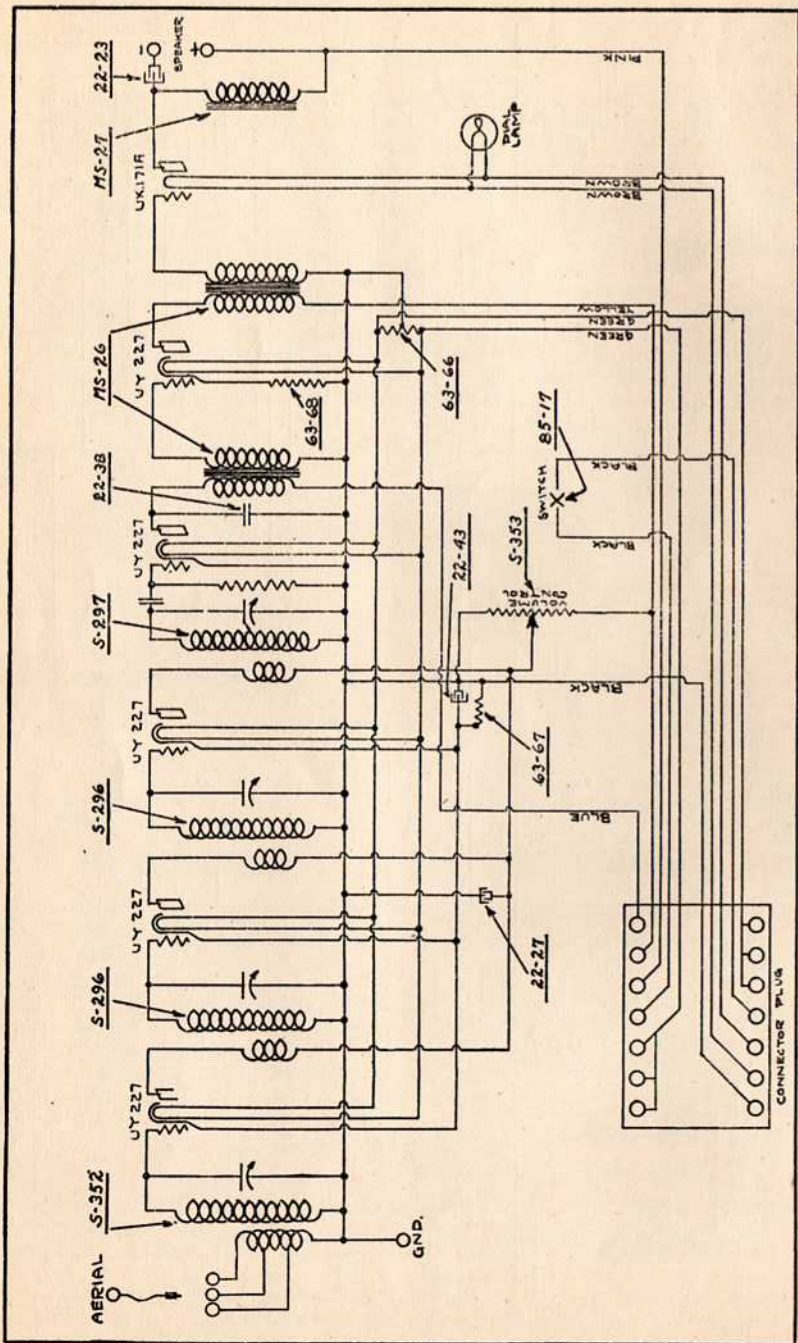


Fig. 4—Power Unit for Models 33, 33X, 34, 35 and 35A.

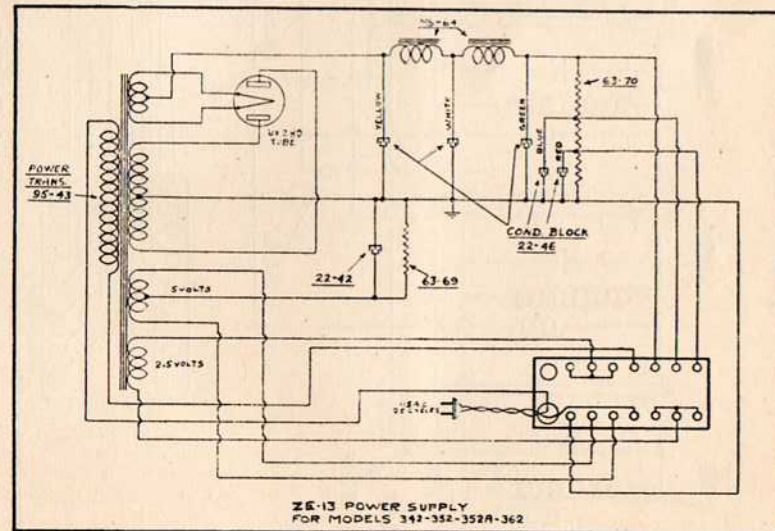


Fig. 5—Power Unit for Models 342, 352, 352A, 362, 362X.

