

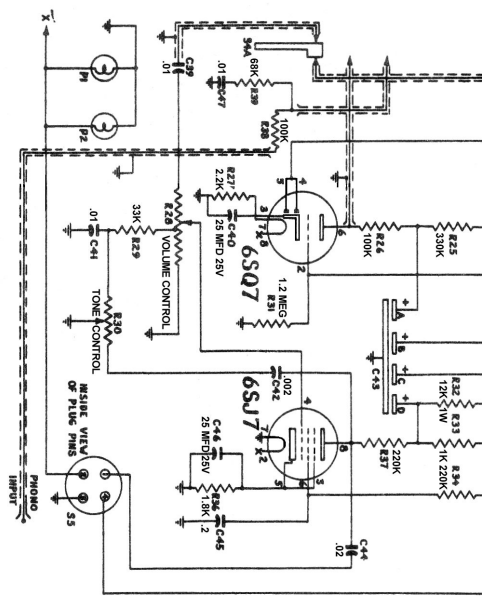
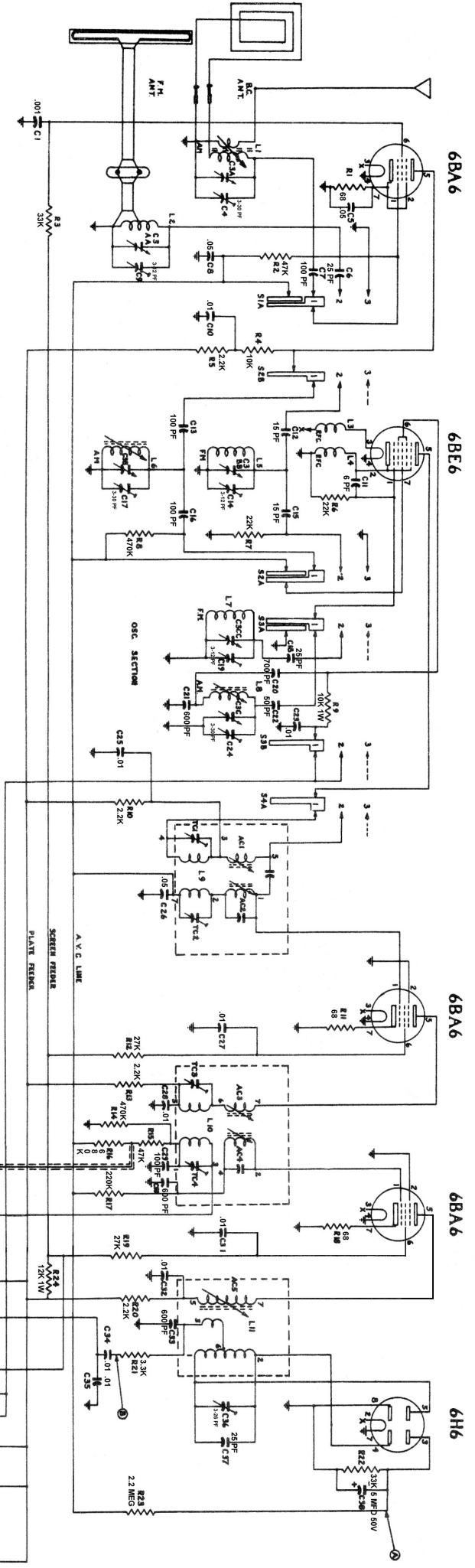
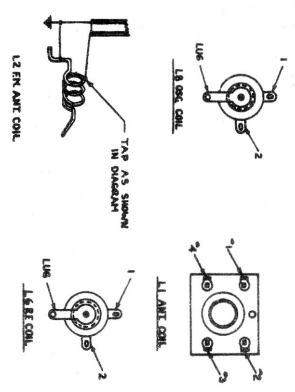
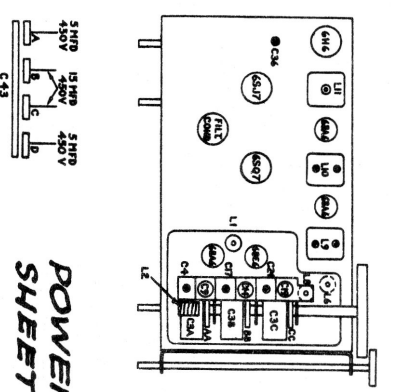
POWER SUPPLY DATA ON SHEETS 142, 143

FURTHER DATA ON SHEETS 141 to 143

MODEL M 33 TUNER

AM - FM
IF = 455 KC.
10.7 MC.

- 3 → PHONE
 2 → F.M. - 4.5 - 100 MC.
 1 → A.M. - 535 - 1650
 SWITCH SHOWN IN
 A.M. POSITION



CIRCUIT ARRANGEMENT:

Two channels are operated, each selected by a switch arrangement. The first channel handles amplitude modulated Radio Frequency signals which are amplified by means of an RF stage and mixed with the oscillator frequency produced by the oscillator circuit designed around the 6BE6 tube. The first IF transformer has a selected primary to transfer and amplify the 455 Kc IF signal to the IF amplifier tube; this in turn is carried to a dual frequency IF unit which is connected to a conventional diode detector circuit and, by means of a selector switch is amplified by an audio pentode tube and transfers an audio signal to the power amplifier located in the separate audio power unit.

The second channel consists of frequency modulated radio frequency signals which are amplified by an RF stage and mixed with the oscillator frequency signal produced by the oscillator circuit designed around the 6BE6 tube. This tube with its all glass construction and miniature size has small internal capacity and is a satisfactory amplifier of signals in the 100 mc band.

The intermediate frequency (I.F.) is passed into the dual I.F. transformer suitably switched and further amplified by two I.F. stages.

A Ratio detector transfers the carrier frequency variations into audio amplitude variations and also acts as a very satisfactory limiter of unwanted carrier amplitude changes (noise).

The triode section of the 6SQ7 is used as a pre-amplifier. The audio signal is applied to the pentode audio amplifier via the selector switch. The pentode audio tube supplies the audio energy to a separate power and audio power unit.

Tone Control—A compensated volume control circuit is employed. At one extremity the tone control introduces a bi-pass condenser between the plate circuit of the audio triode and ground, cutting the upper frequency register; simultaneously the full effect of the tone compensation circuit (conventionally introduced by means of a tapped volume control) is brought into play.

At the other end of the control, the compensation condenser is short circuited and the effect of the bi-pass condenser is nullified by the resistance element of this control. Intermediate positions of the slide contact of the tone control produces tone balance to suit the individual.

The Cable Connections:

These consist of the power feed, (B-plus, heater and ground) the B.C. antenna connection, the phonograph input (switched by the range switch mechanism) and the connection to the input of the audio power amplifier in the Audio and power unit selected, i.e. P6, P8 or P10.

The phonograph connection terminates in the Record Changer unit, the antenna is brought to the outside of the cabinet. The remaining connection terminates in a plug; the numbers of the pins are shown in the circles (See Circuit Diagram).

ALIGNMENT PROCEDURE

Order of Alignment Operation	TEST OSCILLATOR (A.M.)		TEST OSCILLATOR (F.M.)		Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbol	Indicator Connection
	Connection to Receiver	Dummy Antenna	Connection to Receiver	Dummy Antenna					
1	Control Grid 6BE6 Tube Pin No. 7	1 Mfd.	455 K.C.	—	A.M. (Broadcast)	1500 K.C.	1st I.F. Trans. 2nd I.F. Trans.	TC1-TC2 TC3-TC4	Output Meter Across Voice Coil Terminals
2	—	—	—	—	F.M. Band	100 M.C.	1st I.F. Trans. 2nd I.F. Trans. 3rd I.F. Trans.	AC1-AC3 AC3-AC4 AC5	D.C. Volt Meter Connected Between Point "A" & Gnd. Adjust to Peak (V)
3	—	—	—	—	—	10.7 M.C.	Trimmer Cond.	C36	D.C. Volt Meter Connected Between Point "B" & Gnd. Adjust to 1/2 Value In Operation #2 (V/2)
4	Antenna Lead (A.M.)	200 Mfd. 600 K.C.	—	—	A.M. (Broadcast)	600 K.C.	Slng. of Osc. Coil Sing. of Ant. Coil	L6 L7 L1	Output Meter Across Voice Coil Terminals
5	Antenna Lead (A.M.)	200 Mfd. 1500 K.C.	—	—	A.M. (Broadcast)	1500 K.C.	Broadband Osc. Trimmer R.F. & Ant. Trimmer	C24 C17 C4	"
6	—	—	—	—	F.M. Band	88 M.C.	F.M. Osc. Coil F.M. R.F. Coil	L7* L5*	"
7	—	—	—	—	F.M. Band	108 M.C.	F.M. Osc. Trim R.F. & Ant. Trim	C19 C14 C9	"

- Peak all adjustments to max. except when otherwise indicated.
 - These measurements should be made with 20,000 ohm per volt meter.
 - Self supported coils to increase inductance square coil turns together (lowers freq.) to decrease inductance separate coil turns (raises frequency)
- This is a critical and precise adjustment. Do not attempt this operation unless call for sensitivity is seriously affected.

PHONOGRAPH RECORD CHANGER:

A V.M. series 400 intermix record changer is supplied. In general this machine, once adjusted gives very little trouble. However, some maintenance is required to keep the motor operating satisfactorily.

The Phonograph motor is of the self starting induction type and operates the turntable through friction drive between the motor drive spindle and the rubber tired idler on the rim of the turntable.

The motor should be lubricated once or twice a year by placing a few drops of S.A.E. 20 or equivalent on the turntable spindle and saturating the oil retaining felt pads on the motor shaft with S.A.E. 10 oil.

Caution—the motor drive spindle and the rubber tire on the idler must be kept clean and entirely free from oil and grease at all times.

ALIGNMENT PROCEDURE

The cables connected to the tuner unit and the loudspeaker should be linked with the Audio and power supply unit provided.

Check the amplifier circuit first. Switch to phonograph operation and check the input. If this unit functions, then proceed to align.

Cathode Ray alignment is the preferable method. Connection should be made between the chassis and the slider control on the volume control. The volume control may then be used to adjust the cathode ray spot deflection.

Output Meter alignment—In general, except where otherwise indicated (see operation #2 & #3—alignment procedure chart) an output meter capable of registering up to 5 watts is recommended. This should be connected across the voice coil terminal.

Test Oscillators—For amplitude modulated alignment (i.e. Broadcast Band investigation) use a conventional Amplitude Modulated test oscillator. Connect the low side of this instrument to the chassis and keep the output of the oscillator as low as possible to avoid excessive AVC action in the receiver.

Where possible determine the exact dial settings of the test oscillator by zero beating the test oscillator against stations of known frequency. This is particularly important around frequencies used at specified alignment points. (i.e. 600 kc and 1500 kc).

For frequency modulated alignment a generator having frequency at 10.7 mcs, 88 mcs and 108 mcs, frequency modulated by an audible tone is required. For the connections to the receiver—see Alignment Chart. Note: Keep FM Generator Output Leads short.

- Frequency Ranges**
 A.M. Standard Broadcast 540 Kc-1620 Kc
 F.M. Short Wave 88 Mc-108 Mc

- R.F. Alignment Frequency**
 A.M. Standard Broadcast 1500 Kc & 600 Kc
 F.M. Short Wave—108 mc check at 88 mc*
 *Avoid adjusting the oscillator coil induct. unless absolutely essential.

- Intermediate Frequency**
 A.M. Standard Broadcast—455 Kc F.M. F.M. Short Wave—10.7 Mc

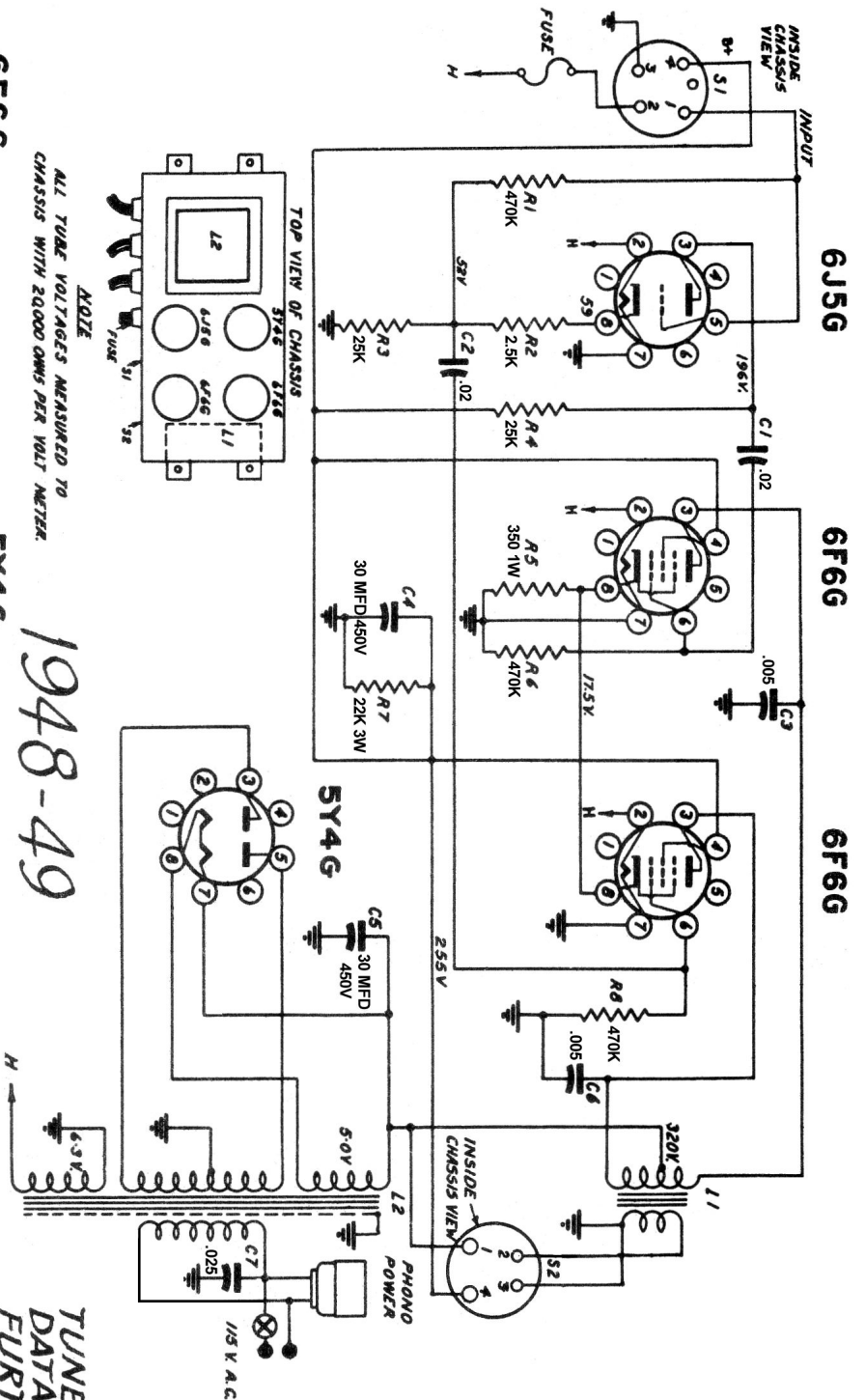
- TUBE COMPLEMENT**
 (1) Type 6BA6 Radio Frequency Amplifier
 (2) Type 6BE6 First Detector/Oscillator
 (3) Type 6BA6 Intermediate Frequency Amplifier (Comb. AM/FM)
 (4) Type 6BA6 Intermediate Frequency Amplifier F.M. only
 (5) Type 6H6 F.M. Radio Detector
 (6) Type 6SQ7 A.M. Detector (F.M. Audio Amp.)
 (7) Type 6SJ7 Audio Frequency Amplifier

**AM - FM
 MODEL
 M-333**

TUNER CIRCUIT DATA ON SHEET 140
 AUDIO AND POWER SUPPLY
 DATA ON SHEETS 142-143

MODEL P-8

POWER SUPPLY AND AUDIO

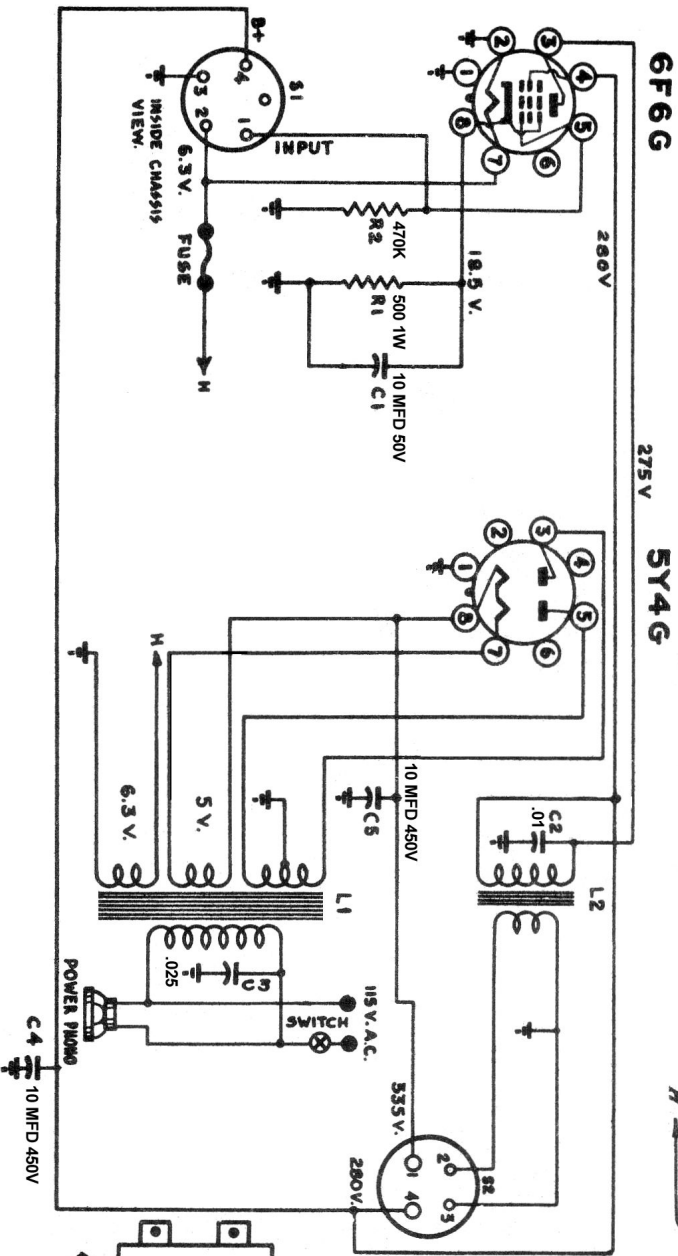


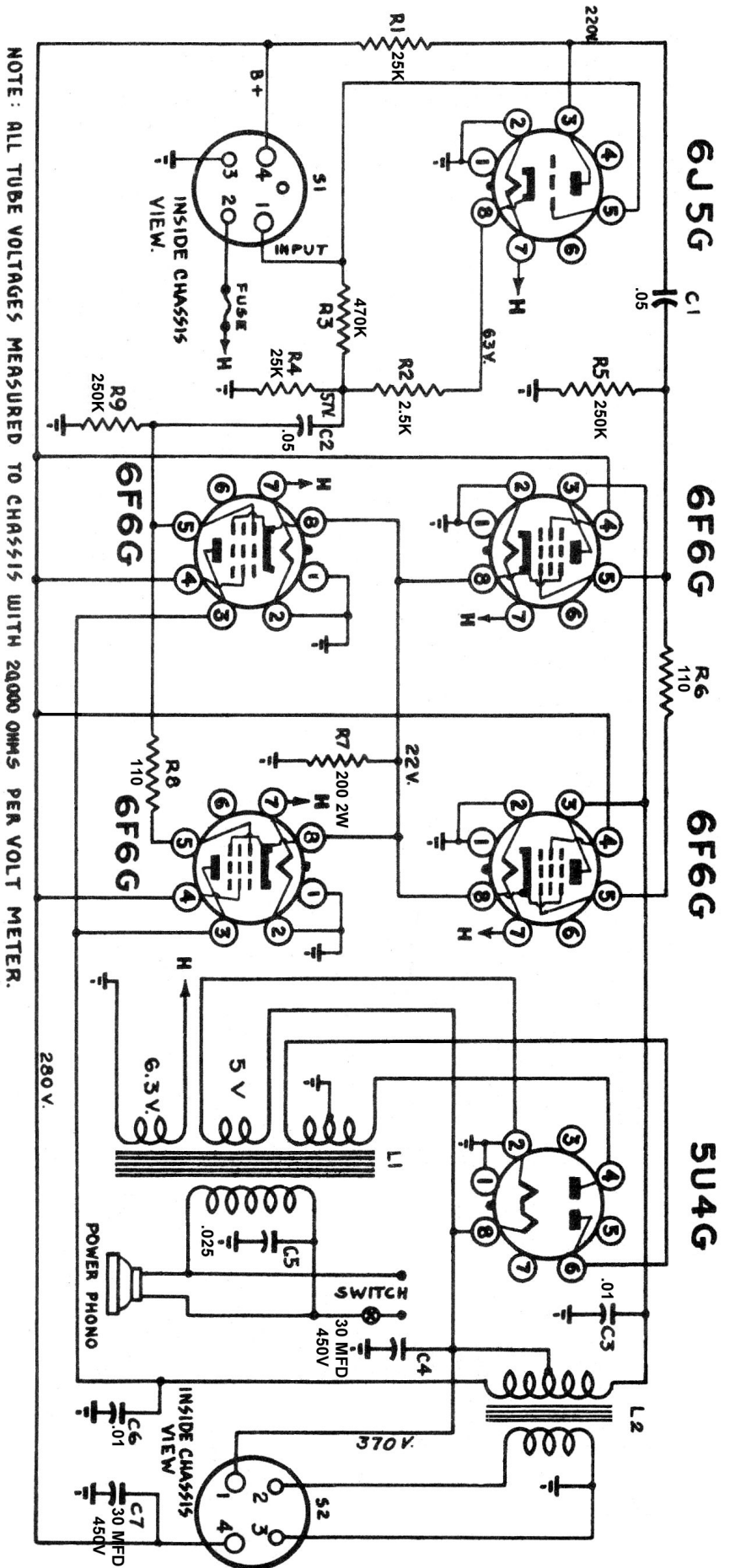
ALL TUBE VOLTAGES MEASURED TO CHASSIS WITH 20000 OHMS PER VOLT METER.

1948-49

TUNER UNIT CIRCUIT DATA ON SHEET 140 FURTHER DATA ON SHEETS 141, 143

POWER SUPPLY & AUDIO MODEL P-6





TUNER CIRCUIT ON
DATA SHEET 140
FURTHER DATA ON
SHEETS 141, 142

POWER SUPPLY AND AUDIO MODEL P10

