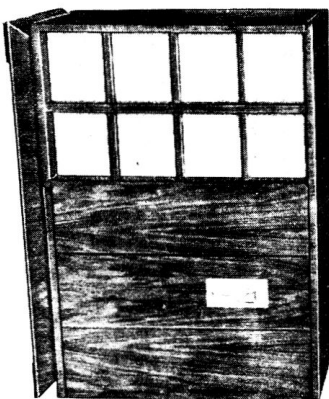


Marconi Model 333



CIRCUIT DESCRIPTION

Eleven-tube A.C. superheterodyne with self-excited pentagrid converter on AM and dual triode providing separate oscillator and converter on FM; two stages of intermediate frequency amplification, ratio discriminator, AVC, electron ray tuning indicator, and two stages of audio frequency amplification including push pull beam power output feeding matched 8" and 10" PM dynamic loudspeakers.

FREQUENCY COVERAGE

Broadcast Band.....540-1620Kc.
Frequency Modulation Band.....88.0-108.0 Mc.
Short Wave Night Band.....5.9-10.0 Mc.
Short Wave Day Band.....11.0-19.0 Mc.

POWER OUTPUT (U.P.O.).....8 watts

POWER RATING

117 volts 60 cycles.....1.0 amps.
117 volts 25 cycles.....1.1 amps.

LOUDSPEAKER DATA

Cone.....8" NO.1 10"
Field Alnico V Permanent Magnet 1.3 oz. 2.4 oz.
Voice Coil Imp. at 400 CPS 3.2 ohms 3.2 ohms
Output Transformer Primary Resistance 600 ohms

RADIOTRONS

Model	Function
12AT7.....	FM Converter
6BE6.....	AM Converter
6BA6.....	AM/FM 1st I.F. Amplifier
6AU6.....	2nd I.F. Amplifier
6AT6.....	FM Ratio Discriminator & delayed AVC
6AT6.....	AM Detector, AVC, and Audio Driver
6U5/6G5.....	Phase Inverter
6V6GT.....	Electron Ray Tuning Indicator
6V6GT.....	Beam Power Output
5Y3GT.....	Beam Power Output
5Y3GT.....	Full Wave Rectifier

VOLTAGE AND CURRENT DATA

Voltage	Radio	Phono
Rectifier Cathode.....	290 V.	290 V.
B+.....	260 V.	265 V.
6BA6 Plate.....	260 V.	265 V.
6AU6 Plate.....	95 V.	95 V.
6V6GT Cathode Bias.....	17 V.	17 V.
12AT7 Osc. Plate.....	110 V.	0
6BE6 Osc. Plate.....	260 V.	0
CURRENT		
Total Rectified Current.....	120 M.A.	115 M.A.
Choke Current.....	42 M.A.	37 M.A.

Above readings are approximate and will vary depending on the resistance of the voltmeter used. Readings are taken on lowest scale that will accommodate the voltage or current under test.

ALIGNMENT INSTRUCTIONS

In order to realign AM/FM receivers properly, the serviceman should have available the following testing instruments:

- An AM/FM signal generator with a frequency coverage from 455 Kc. to at least 110 Mc., and capable of supplying a variable frequency sweep of 0 Kc. to 450 Kc.
- A vacuum tube voltmeter or high resistance - high sensitivity D.C. voltmeter.
- An oscilloscope with synchronizing adjustment.

ADJUSTMENT OF INTERMEDIATE FREQUENCY AMPLIFIER AM CHANNEL

- Set WC switch on broadcast band and gang capacitor at maximum frequency. Connect output meter across speaker voice coil terminals.
- Apply a 455 Kc., 30% amplitude modulated signal to the 6BE6 converter grid through a 0.1 Mfd. condenser and adjust L-9, L-8, L-5 and L-4 in that order for maximum output.

NOTE: Of the two possible core positions, the one nearest the top of the can must be used.

ADJUSTMENT OF INTERMEDIATE FREQUENCY AMPLIFIER FM CHANNEL

- Set WC Switch in FM position and disconnect built in antenna from antenna terminal.
- Short pin No.2 of 12AT7 to ground (Osc.Grid).
- Connect D.C. VTVM across RL6 (Pin 3 of 6H6 to ground).
- Connect vertical plates of oscilloscope across volume control.

NOTE: Convenient points for connecting V.T.V.M., and oscilloscope are provided in the form of short leads protruding through holes in top of chassis. For location of leads refer to chassis diagram.

- Input signals should be as low as is consistent with reasonable meter readings and scope pictures.
- With low frequency input to converter cathode (Pin 8, 12AT7) apply a 10.7 Mc unmodulated signal. Adjust L-10, L-7, L-6, L-3 and L-2 in that order for maximum output on D.C. VTVM.
- Connect frequency modulated 10.7 Mc signal (linear to +100 Kc) to 12AT7 cathode and connect vertical plates of scope across volume control. Adjust L-11 for S curve of maximum linearity and centered about 10.7 Mc. Retouch L-10 if necessary.

NOTE: Of the two possible core positions, the one nearest the top of the can must be used.

R.F. ALIGNMENT BROADCAST AM

Before proceeding with R.F. alignment see that pointer is in line with left hand marking on top edge of dial back plate, with gang capacitor fully meshed.

R.F. trimmer C7 and oscillator trimmers C8 and C9 are common to the broadcast and the short wave bands and no further change should be made to them after the broadcast band adjustments have been made.

- Set W.C. switch in broadcast position and apply input signal through 400 ohms to antenna.
- Apply a 580 Kc signal and set pointer to 580 Kc. Adjust L-1 (Bc. Osc.) while rocking gang capacitor for maximum output across voice coil.
- Apply a 1620 Kc signal with gang capacitor fully open. Adjust C-8 and C-9 if necessary, for maximum output.

- Apply a 1500 Kc signal and set pointer to 1500 Kc. Adjust C-7 for maximum output and C8 or C9 for correct tracking if necessary.

R.F. ALIGNMENT - SW-A

NOTE: This band has a lower oscillator frequency than the signal frequency and it is possible that two tuning positions may be found on the oscillator coil, C-10 and C-12. The correct adjustments are as follows:

Oscillator Coil: Core set nearly in center of coil (i.e. the position of greater inductance).

- C-10: Trimmer screw turned almost all out. (i.e. the position of lower capacity).
- C-12: Trimmer screw turned almost all in (i.e. the position of greater capacity).
- Set W.C. switch to SW-A and apply input signal through 400 ohms to antenna.
- Apply 6.0 Mc signal and set pointer to 6.0 Mc. adjust oscillator core S.W.-A.
- Apply 9.5 Mc signal and set pointer to 9.5 Mc. adjust C-12.
- Repeat operations 2 and 3 until calibration is within 1/32".
- Apply 9.5 Mc signal. Adjust C10 for maximum output while rocking gang.

R.F. ALIGNMENT - SW-B

NOTE: This band has a higher oscillator frequency than the signal frequency and it is possible that two tuning positions may be found on the oscillator coil, C11 and C13. The correct adjustments are as follows:

Oscillator coil: Core set further out of coil (i.e. the position of lower inductance).

- C-11: Trimmer screw turned almost all in (i.e. the position of greater capacity).
- C-13: Trimmer screw turned almost all out (i.e. the position of lower capacity).
- Set WC switch to SW-B band and apply input signal through 400 ohms to antenna.
- Apply 12.0 Mc signal and set pointer to 12.0 Mc. Adjust oscillator core S.W.-B.
- Apply 18.0 Mc signal and set pointer to 18.0 Mc. Adjust C-13.
- Repeat operations 2 and 3 until calibration is within 1/32".
- Apply 18.0 Mc signal and set pointer to 18.0 Mc. Adjust C-11 for maximum output while rocking gang.
- Apply 12.0 Mc signal and set pointer to 12.0 Mc. Adjust oscillator core for maximum output while rocking gang capacitor.

R.F. ALIGNMENT - FM

Note: Use 300 ohm dummy antenna balanced to ground, output measured by D.C. VTVM across R-16. Input signal unmodulated.

- Apply a 106.0 Mc unmodulated signal and set pointer to 106.0 Mc. Adjust C-6 and C-5 for maximum output while rocking gang capacitor.
- Apply a 90.0 Mc unmodulated signal and set pointer to 90.0 Mc. Adjust oscillator and R.F. coils for maximum output.
- Rotate antenna coil assembly for maximum output and cement in place.
- Repeat operations 1 and 2 if necessary.