



# H. H. SCOTT, INC.

111 POWDER MILL RD., MAYNARD, MASS., 01754

## SERVICE BULLETIN FOR MODEL 340B TUNER/AMPLIFIER

(Serial No. 235581 and Above)

### SPECIFICATIONS

#### TUNER (FM-MPX)

Usable Sensitivity (IHF)	2.2 microvolts
Spurious Response Rejection (Cross Modulation Rejection)	80 db
Signal to Noise Ratio	60 db below 100% modulation
Total Harmonic Distortion	0.8%
Frequency Deviation (Drift)	0.02%
Frequency Response (Stereo)	*50 to 15,000 cps $\pm$ 1 db
Capture Ratio	6.0 db
Selectivity	35 db
AM Suppression	55 db
Tuning Range	87 to 109 mc
Accuracy of Calibration	0.5%
Separation	Better than 30 db

\*This is limit of FCC Stereo Broadcast specifications. All H. H. Scott tuners have far wider frequency response.

#### TAPE OUTPUT

Rated Voltage Output to Tape Recorder	0.5 v
Minimum Recommended Load Resistance	100 K
Recommended Cable Capacitance - Less Than	1000 mmf
Maximum Recommended Cable Length	40 feet

#### PRE-AMPLIFIER

Input	
Tape Head and Mag. Low - Input Impedance	Approximately 50 K
Signal for Rated Output	3 mv
Mag. High - Input Impedance	Approximately 50 K
Signal for Rated Output	9 mv
High Level Inputs - Input Impedance	500 K
Signal for Rated Output	0.4 v
Frequency Response in Flat Position	20-20 kc $\pm$ 1.0 db
Treble Controls Measured at 10,000 cps, Boost and Cut	15 db $\pm$ 2 db
Bass Controls Measured at 30 cps, Boost and Cut	15 db $\pm$ 2 db
Scratch Filter	-6 db/octave over 5 KC

#### AMPLIFIER

Music Power (IHF)	35 watts each channel
Steady State (rms)	30 watts each channel
Maximum total harmonic distortion at rated output	0.8%
Frequency Response	20 to 20,000 cycles $\pm$ 1 db
Power band width at rated distortion (IHF method)	**20 to 20,000 cycles
Hum and Noise	80 db below rated power

(These characteristics are measured at a line voltage of 117 volts rms and line frequency of 60 cycles per second. No significant changes of characteristics should be experienced for normal variations of line voltages or a line frequency of 50 cycles per second.)

Range of line voltage and frequency	105-120 volts, 50-60 cycles
Power consumption - 117 volts at 60 cps (AC only)	200-280 watts

\*\*All H. H. Scott amplifiers and pre-amplifiers incorporate a low frequency roll-off filter which becomes fully operative below 20 cycles. This is designed to prevent overload of the output stage and the loudspeaker due to subsonic rumble frequencies and record eccentricity. This means that the full power of the amplifier can be concentrated into the audible range.

#### GENERAL SERVICE NOTES

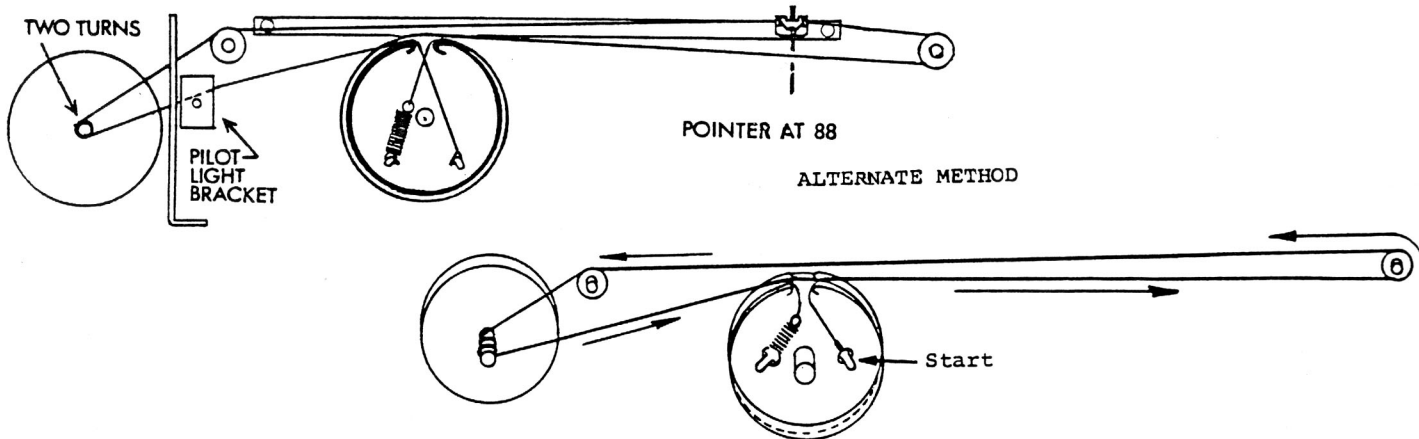
Service, other than replacement of either pilot lights or vacuum tubes, is usually not required. If the tuner is not operating properly, all external connections should be checked. The amplifier section can be checked by playing a record through the pre-amp in PHONO position. Then, the vacuum tubes should be checked by replacing them with new ones, one by one. The tubes should be tight in their sockets and provided with shields where applicable. Tube defects frequently do not show up in a tube tester. Only operation in the tuner/amplifier will insure that the tube is functioning properly. When replacing tubes, if possible, use exact replacement tubes, available from H. H. SCOTT or any authorized Warranty Service Station. Other tubes will work, but only exact replacements can give the full performance from the tuner/amplifier.

### Pilot Light Replacement

1. Remove the sheet metal screws on top and on each end of the controls shield which covers the top, front section of the unit, and carefully lift the shield up and backwards. There are wires connected to the shield so do not pull it too far.
2. Remove the dial indicator lights by squeezing in on the spring clips and pulling backwards. The replacements should be bayonet type #47 bulbs. Be sure to remove the "beam shields" from the old bulbs and reinstall them on the new bulbs.
3. If the meter bulb, located on the control shield, needs replacement, it will be necessary to contact the factory for the replacement. When ordering, specify number VPL-47-Blue.
4. Reinstall the control shield in the same manner as it was removed and replace all five screws.

### Dial Cord Replacement

1. If the dial cord should break, a replacement may be ordered from our Parts Department by specifying number ADC-8. If a new dial cord spring is required, number ASP-1 should be specified.



### ALIGNMENT INSTRUCTIONS FOR FM SECTION

When checking the FM tuner section, take the output from the "TAPE OUT" jack on the rear of the chassis. Leave the "LEVEL" control full counter-clockwise.

The recommended test equipment for aligning H. H. SCOTT FM tuners is as follows:

Oscilloscope  
VTVM  
Distortion Analyzer or 400 cycle null filter  
Measurements 210AB FM Signal General or equivalent

Under no circumstances should a sweep generator be used to align H. H. SCOTT equipment as this will give false indications of alignment due to loading of the individual circuits. When peaking the front end and IF sections, the input should be as low as practical to avoid mis-alignment and to make sure that the unit is completely peaked.

### FRONT END ALIGNMENT

**Oscillator Adjustments:** The oscillator trimmer on the top of the front end and the oscillator coil enclosed in the bottom shielded section of the front end are used to adjust dial tracking. Tune to a station on the low end of the dial (88-95 mc) whose broadcast frequency is known. If the station is higher than it should be, turn the oscillator trimmer screw slightly counter-clockwise until the station is shifted to the proper point on the dial. Now check a station of known broadcast frequency on the high end of the dial to determine that proper tracking has been maintained across the entire band.

If stations on the low end of the dial are tracked correctly but the stations on the high end of the dial are received at a higher frequency, tune to a station on the low end of the dial whose frequency is known. Remove the small tab from the shielded section on the bottom of the front end and slightly squeeze the oscillator coil closer together. Keeping the dial in the same place, turn the oscillator trimmer counter-clockwise until the station is back at its original point. Tune to the high end of the scale and note that the stations have come down slightly in frequency. These adjustments should be continued until the high end and low end of the dial track perfectly.

If the low end of the dial tracks correctly, but the high end of the dial is low, the reverse procedure is used. That is, the oscillator coil is spread slightly apart and the oscillator trimmer is turned clockwise.

RF Mixer, Trimmer, and Coil Adjustments: Connect the RF generator to the antenna terminals and at 92 mc, adjust the mixer coil for maximum output. With the FM generator and the tuner at 106 megacycles, adjust the mixer trimmer for maximum output. Repeat these adjustments until no further improvement can be noted.

Antenna, Coil, and Trimmer Adjustments: With the FM generator and the tuner at 92 megacycles, inject a very weak signal into the antenna terminals. Adjust the antenna coil for maximum output. With the FM generator and tuner at 106 megacycles, adjust the antenna trimmer for maximum output. Repeat these adjustments until no further improvement is noted.

#### IF ALIGNMENT

- A. Connect the FM generator to the antenna terminals. The generator should be internally modulated with 400 cps signal 75 KC deviation. Adjust the output of the generator for a barely adequate sine wave on the scope (on the order of 3 to 6 microvolts input to the tuner).
- B. Peak both the top and bottom slugs of the IF transformers at the same time using one non-metallic alignment tool in each hand.
- C. If a replacement IF transformer has recently been installed, it may be necessary to inject a 10.7 megacycle signal on the shield of the 6U8 in the front end and peak each IF transformer for maximum deflection of the tuning meter. This is strictly a coarse adjustment to get the IF strip close to 10.7 megacycles and should not be considered a final alignment.
- D. A final adjustment of the IF strip should be made by injecting a signal into the antenna terminals and peaking up each IF transformer for maximum audio output as seen on the VTVM.

#### DETECTOR ALIGNMENT

- A. With the input to the tuner at 3 to 6 microvolts, peak the primary (bottom slug) of the detector transformer for maximum audio output as seen on the VTVM. Now increase the output of the FM generator to 1000 microvolts. Using a distortion analyzer, adjust the detector secondary (top slug) for minimum distortion as seen on the distortion analyzer.
- B. If a 400 cycle "null filter" is used instead of the distortion analyzer, the procedure for aligning the detector is exactly the same as the procedure when using a distortion analyzer. The distortion is read on a VTVM rather than the distortion analyzer.

#### MULTIPLEX ALIGNMENT

Adjust the scope to read peak-to-peak voltages and place the scope probe at the junction point of C535, C534, C536, and T501. With a stereo signal from the multiplex generator connected to the antenna terminals, peak T501 and L501 for maximum pilot level as seen on the scope. Minimum recommended pilot level at this point is 20-40 volts peak-to-peak.

With reference to the same 19 KC test point used in the previous step, use a shorting cinch and short this test point to the opposite side of C537 to kill the 19 KC pilot level. Using another shorting cinch, short the junction point of R503 and R504 directly to ground. Adjust T502 for 0 beat as seen on the scope. Remove the short from the junction point of R503 and R504 and the short between the 19 KC test point and the opposite side of C537.

Turn the right channel separation pot and threshold adjust pot completely counter-clockwise. Turn the left channel separation pot clockwise. With a left channel stereo signal connected to the antenna terminals, take a reference reading of the left channel of the VTVM.

Take output from the right channel (TAPE OUT jacks). Adjust L501 for maximum separation and then adjust the right channel separation pot for a further increase in separation. Now modulate the right channel of the stereo signal and adjust the left channel separation pot for maximum separation. Those separation adjustments may have to be done several times in order to achieve maximum separation on both channels.

Reduce the input signal to 10 mv at the antenna terminals, turn the "Threshold Adj" until the "Stereo" light comes on.

#### AMPLIFIER OUTPUT ADJUSTMENTS

##### 340-B Bias Adjustments

Connect a milliammeter to the left channel cathode current test point and adjust the bias pot which is on the side of the chassis for 70 milliamps. Now connect the milliammeter to the right channel cathode test point and adjust the right channel bias pots for 70 milliamps. These bias adjustments interact somewhat and both left and right bias adjustments should be done at least two times to insure correct bias settings.

##### DC Balance Adjustments

Remove the phase-splitters V3 and V103 and connect the left channel output to a 16 ohm load box. Turn the unit on and allow it to warm up for a few minutes. Now adjust the left channel DC balance pot for minimum hum as seen on the VTVM. Reconnect the load box to the right channel output and adjust the right channel DC balance pots for minimum reading as seen on the VTVM.

340B - Gain Per Stage

Measurements taken with VTVM and 16 ohm load box connected to 16 ohm output tap. All measurements referenced to chassis ground and all DB measurements referenced to rated output. Input of 3 mv ( $\pm 1$  db) to MAG LOW input (-80 db). Output connected to 16 ohm load box. Level control full CW. All filters "OUT". Tone controls "0". Readings given on Left channel only. Right channel should be the same  $\pm 1$  db of input level.

<u>TUBE</u>	<u>PIN #</u>	<u>GAIN IN DB</u>	<u>AC SIG (RMS)</u>
V1	6	-52 db	.018 v
V1	1	-23 db	.46 v
V2A	7	-50 db	.07 v
V2A	6	-17 db	3.2 v
V2B	2	-32 db	.17 v
V2B	1	-19 db	2.7 v
V3	2	-23 db	1.6 v
V3	9	-2 db	19 v Distorted if seen on scope
V4	6	-2 db	19 v Distorted if seen on scope
V4	3	+21 db	245 v Distorted if seen on scope
V5	6	-2 db	19 v Distorted if seen on scope
V5	3	+21 db	245 v Distorted if seen on scope
"H" Output Tap		-7 db	11 v

To obtain rated output, this must be taken across "0" and "H" speaker taps. The "0" speaker output tap is not at chassis ground.

PARTS LIST

Amt.	Part No.	Part Description	Amt.	Part No.	Part Description
<b>Capacitor</b>			<b>Sub-Assembly</b>		
1	CEC-4X20/500	C301-305	1	PEC-222-E	Pkg.Elec.Ckt.
1	CEC-4X40/300	C307-310	1	PEC-222-E-R	Pkg.Elec.Ckt.
1	CEC-4X75/75 CP	C313-316	1	Z-FM-3	Front End
1	CEC-20/500-40/300-40/500	C305-306,C311	1	Z-MX-8	MPX
2	CET-4/250-80	C25,C125	<b>Switch</b>		
1	CET-25/25	C229	1	SPS-11-3	Power
1	CET-50/75	C318	3	SS-22-3	Comp,Monitor,Rumble
2	CETM-25/6	C16,C116	1	SS-22-3/3A	Spk. ON-OFF
<b>Coil</b>			1	SS-22-3A-1	Spk. Phase (Rear Panel)
3	L-RFC-1	R.F. Choke	1	SRW-34-4-1	Stereo Sel.
<b>Dial</b>			1	SS-22-3	Scratch
1	A-DC-8	Dial Cord	1	SRW-37-2-1	Input Sel.
1	A-FW-2	Flywheel Ass'y	<b>Transformer</b>		
1	A-P-SR-1	Dial Pointer Ass'y	1	TR-15-2	Power T301
2	A-PY-3/8	Dial Cord Pulley	2	TRA-8-5-3	Output T1,T101
1	A-SP-3	Dial Cord Tension Spg.	1	TRV-10.7-D	Detector T202
1	N-D-FM-5-5	Dial Glass	2	TRV-10.7-IF	IF T203-204
<b>Diode</b>			<b>Tube</b>		
2	D-GM-2		1	V-NE-2	Neon Dial Light
<b>Knob</b>			4	V-NE-2A	Neon Dial Light
2	KN-P-6CTT	TREBLE, BASS	3	V-PL-47	Pilot Light
4	KN-P-6LTT	LOUD, BAL, STEREO, INPUT	2	V-6AU6-A	
2	KN-P-8CT	TREBLE, BASS	1	V-6HS6	
1	KN-P-12PTT	TUNING	2	V-6U8-A	
<b>Meter</b>			5	V-12AX7	
1	M-SS-6	Tuning Meter	4	V-7591	
<b>Rectifier</b>			<b>Miscellaneous</b>		
1	SR-60/200	Selenium	1	A-JP-2C	Clear Jewel
4	SR-7.5/7.5	Silicon	1	F-SB-2.5	2.5 Amp Slo-Blo Fuse
<b>Resistor</b>			1	J-3-ST-5	Phone Jack
2	RCV-50K-PH	DC Bias	1	XF-3AG	Fuse Holder
1	RCVD-500KT-3B	Level	1	N340B-1-7	Panel
2	RCV-100K-PH	DC Bal			
2	RCVC-LMT-F	Treble, Bass			
1	RCV-LMST-3B	Stereo Bal.			
1	RWS-10-90 (3X30)	R312-314			
1	RWS-10-450 (3X150)	R309-311			
1	RWS-20-8K	R303			