

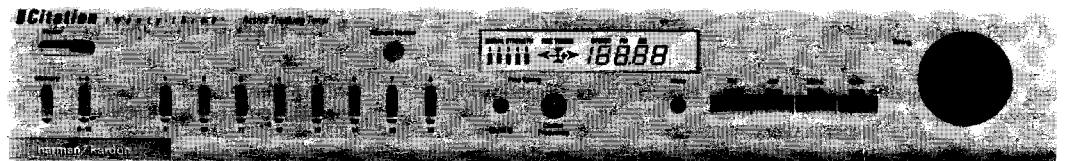
6212

The Harman Kardon Model Citation23

Manual 114A

DIGITAL SYNTHESIZED QUARTZ-LOCK TUNER

Technical Manual



The following marks found in the parts list of this manual identify the models as follows.

- UA : North America area model
- G : General model
- N : Japan model

6211

harman/kardon

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1112-3152114A8 P-088706 1500 Printed in Japan

SPECIFICATIONS

	Nominal	Limit
• FM SECTION		
Turning Range	87.5 ~ 108.0MHz	
50dB Quieting Sensitivity		
Mono normal	15.2dBf	≧ 18(23)dBf
Mono Hi-Q	20.2dBf	≧ 23(28)dBf
Stereo	73dBf	≧ 40(45)dBf
Usable Sensitivity	10.7dBf	≧ 15dBf
Image Ratio	76dBf	≧ 65dB
IF Rejection	91dB	≧ 80dB
Spurious Response Rejection	117dB	≧ 100dB
Capture Ratio	0.75dB	≧ 2.0dB
Alternate Channel Selectivity	76dB	≧ 60dB
AM Rejection	65dB	≧ 45dB
Signal to Noise Ratio		
Mono	84dB	≧ 78(72)dB
Stereo	75dB	≧ 70(64)dB
Total Harmonic Distortion		
Mono	0.07%	≧ 0.15%
Stereo	0.08%	≧ 0.3%
Stereo Separation at 1kHz	59dB	≧ 45(40)dB
Output Level (Stereo)	950(580)mV	

This figures in parentheses () in the FM section are specifications for the General model.

	Nominal	Limit
• AM SECTION		
Tuning Range	520 ~ 1,710kHz	
Usable Sensitivity		
External Antenna	12 μ V/m	≧ 20 μ V/m
Loop Antenna	320 μ V/m	≧ 450 μ V/m
Selectivity	61dB	≧ 45dB
Signal to Noise Ratio	55dB	≧ 48dB
Image Rejection	48dB	≧ 38dB
IF Rejection	67dB	≧ 50dB
• DIMENSIONS (W x H x D)		
	17-3/8" x 2-3/4" x 14-5/8" (443 x 70 x 391mm)	
• WEIGHT		
	15lbs. (6.8kg)	
• POWER SUPPLIES		
North America area	AC 120V, 60Hz	
General model	AC 220/240V, 50/60Hz	
Japan medel	AC 100V, 50/60Hz	
• POWER CONSUMPTION		
	16W	

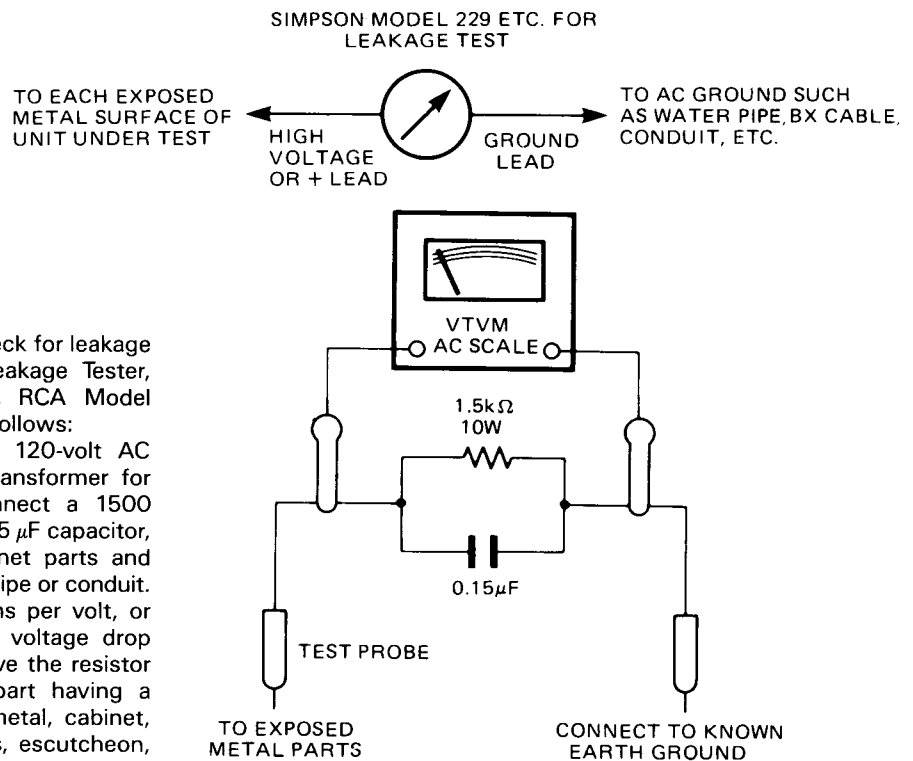
This specification is the target of servicing. But, there is a case that the specification is not applicable to the measurement condition and instrument.

Specifications and components subject to change without notice. Overall performance will be maintained or improved.

LEAKAGE TEST (FOR SERVICE ENGINEERS IN THE U.S.A.)

Before returning the unit to the user, perform the following safety checks:

- Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the unit.
- Be sure that any protective devices such as nonmetallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators, etc. which were removed for servicing are properly reinstalled.
- Be sure that no shock hazard exists; check for leakage current using Simpson Model 229 Leakage Tester, standard equipment item No. 21641, RCA Model WT540A or use alternate method as follows: Plug the power cord directly into a 120-volt AC receptacle (do not use an Isolation Transformer for this test). Using two clip leads, connect a 1500 Ohm, 10-watt resistor paralleled by a 0.15 μ F capacitor, in series with all exposed metal cabinet parts and a known earth ground, such as a water pipe or conduit. Use a VTVM or VOM with 1000 Ohms per volt, or higher sensitivity to measure the AC voltage drop across the resistor. (See Diagram.) Move the resistor connection to each exposed metal part having a return path to the chassis (antenna, metal, cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor. (This test should be performed with the power switch in both the On and Off positions.) A reading of 0.35 volt RMS or more is excessive and indicates a potential shock hazard which must be corrected before returning the unit to the owner.



ALIGNMENT PROCEDURES (REFER TO PAGES 11, 12, 22, 23, 24 AND 25)

STANDARD FREQUENCY CHECK

Conditions : • Press the "FM" switch.

Step	Connection Equipments	Station Display	For
1	• Connect the Frequency Counter to TP1(+) and ground.	98.3MHz	109MHz ± 2kHz

AM ADJUSTMENT

Conditions : • Press the "AM" switch.

• Standard modulation of the AM signal Generator is 400Hz at 30%.

Step	Alignment	Connection Equipments	Measurement Frequency	Station Display	Adjustment	For
1	Tuning voltage check	• Connect the DC Voltmeter to TP2(+) and ground(-).		520kHz		1.5V ± 0.5V
2				1710kHz		20V ± 5V
3	IF	• Connect the AM Test Loop Antenna cable into the output jack of AM Signal Generator. Place AM Test Loop Antenna close enough to couple signal into the AM Loop Antenna. • Connect the VTVM and oscilloscope to the OUTPUT jacks.	1400kHz	1400kHz	T251 T252	Maximum output level and symmetrical curve on scope.
4	Tracking		1400kHz	1400kHz	TC251	Maximum output.
5			600kHz	600kHz	L251	Maximum output.
6			Repeat steps 4 and 5 for optimum sensitivity.			
7	Meter		1000kHz	1000kHz	VR257	Adjust so that the 5 SIGNAL STRENGTH indicator lights at 54dB μ V/m input. And then, confirm the TUNED indicator lights.

FM ADJUSTMENT

Conditions : • After the POWER switch is pushed on, wait for 5 minutes before adjusting so that the most stable operation is obtained.

• Press the "FM" switch.

• Press the "Mute" switch to the off (button in) position.

	North America area model	General model
FM Signal Generator	1kHz, 100% modulation	1kHz, 53% modulation
Stereo Modulator	L + R = 45.5%, L - R = 45.5%, 19kHz = 9%	L + R = 22.5%, L - R = 22.5%, 19kHz = 8%

Step	Alignment	Connection Equipments	Measurement Frequency	Station Display	Adjustment	For
1	Discriminator	• Connect the FM Signal Generator to FM 300 Ω BAL Antenna terminals through the 300 Ω balanced dummy. (1mV input) • Connect the Distortion meter and Oscilloscope to the OUTPUT jacks.	98.1MHz ± 30 ~ 40kHz	98.1MHz	T201(A)	Adjust so that the TUNED indicator lights in the same range on both plus (+) and minus (-) sides of 98.1MHz.
2			98.1MHz	98.1MHz	T201(B)	Minimum distortion.
3			Repeat steps 1 and 2 for optimum sensitivity.			
4	Tuned indicator				VR201	Adjust so that the TUNED indicator lights at 10 μ V input.

Step	Alignment	Connection Equipments	Measurement Frequency	Station Display	Adjustment	For
5	Signal indicator	<ul style="list-style-type: none"> Connect the FM Signal Generator to FM 300Ω BAL Antenna terminals through the 300Ω balanced dummy. (1mV input) Connect the Distortion meter and Oscilloscope to the OUTPUT jacks. 			VR202	Adjust so that the 3 SIGNAL STRENGTH indicator lights at 30μV input.
6					VR203	Set the hi-select mode. Adjust so that the 3 SIGNAL STRENGTH indicator lights at 40μV input.
7			Cofirm that the 5 SIGNAL STRENGTH indicator lights at 10mV input. This confirmation should be done at each tuning mode.			
8	Hi-select	<ul style="list-style-type: none"> Connect the Stereo Modulator to FM Signal Generator. Connect FM Signal Generator to FM 300Ω BAL Antenna terminal through the 300Ω balanced dummy. Connect the Oscilloscope to the OUTPUT jacks. 	98.1MHz	98.1MHz	L203 TC201	With the Fine Tune set to its center position, adjust L203 so that the upper and lower parts of the waveform are symmetrical and TC201 so as to obtain the waveform immediately before clipping. Check to ensure that the indicator - < lights when the Fine Tune is turned counterclockwise and > + lights when it is turned clockwise.
9	MPX free run	<ul style="list-style-type: none"> Connect the Stereo Modulator to FM Signal Generator. Connect FM Signal Generator to FM 300Ω BAL Antenna terminal through the 300Ω balanced dummy. Connect the Frequency Counter to TP3(+) and ground(-). Connect the VTVM and oscilloscope to the OUTPUT jacks. 	98.1MHz (unmodulation)	98.1MHz	VR302	19.00kHz ± 0.02kHz
10	Stereo threshold		98.1MHz	98.1MHz	VR302	Adjust so that the STEREO indicator lights at 30μV ± 2dB input.
11	Sub-carrir		98.1MHz	98.1MHz	VR303 LPF301	Minimum output at 19kHz pilot signal only by Stereo Modulator.
12	Separation		98.1MHz	98.1MHz	VR301	Adjust so that the left channel output becomes minimum when only the right channel of the Stereo Modulator is modulated.
		VR301			Adjust so that the right channel output becomes minimum when only the left channel of the Stereo Modulator is modulated.	