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Technical Manual

Model msi 751

Calibration Interface

For use with the msi 320 Precision Video Demodulator
and the Tektronix® 751 Aural Modulation Monitor

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1. INTRODUCTION

The Tektronix® Model 751 Aural Modulation Monitor remains a popular instrument in television stations. It was designed for use with the Tektronix 1450-1 Video Demodulator. The Tektronix 1450-1 provides an output for automatically calibrating the Tek® 751.

Several years ago, Tektronix discontinued the 1450-1. Modulation Sciences developed the msi 320 Precision Video Demodulator to replace it. Later, in response to customer requests, we added the **msi 751** Calibration Interface. This allows the **msi 320** Precision Video Demodulator to auto-calibrate the Tek 751 with the same accuracy afforded by the Tektronix 1450-1.

The **msi 751** occupies just one rack unit and is transparent to the user. There are no adjustments to the unit.

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2. SPECIFICATIONS

Dimensions:

1.75" H x 19" W x 5.75" D

44.5 mm H x 482.6 mm W x 146.1 mm D

Power Requirements:

120 VAC or 240 VAC (selected at the rear panel), 50 or 60 Hz, 10 W maximum

Fuse:

Type AGC or 3AG

0.25 A fast-blow (120 VAC)

0.125 A fast-blow (240 VAC)

Temperature Range:

0° to 50° C

RFI Protection:

Extensive shielding: RF-tight box, AC line filter, and isolated DC power supply.

Input / Output Connectors:

Four standard BNC connectors on rear panel

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3. INSTALLATION AND OPERATION

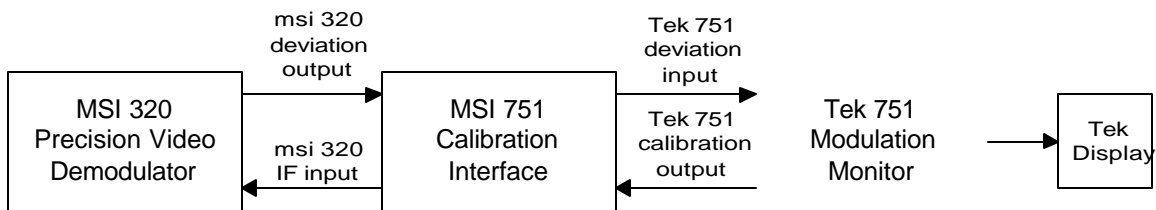
3.1 Mounting

The msi 751 occupies a single rack unit (1.75 inches), allowing an easy fit with the msi 320 Precision Video Demodulator. Mounting is not critical, provided the ambient temperature does not exceed 50° C.

3.2 Connections

The msi 751 uses standard BNC connectors for all inputs and outputs. Connect the calibration signal from the Tek 751 to the FROM 751 / CAL SIGNAL input on the msi 751. Connect a BNC cable from the IF jack of the msi 320 to the TO 320 / IF IN jack of the msi 751. Connect the DEVIATION output of the msi320 to the FROM 320 / AURAL OUT connector of the msi751. Connect a BNC cable from the TO 751 / DEV IN connector of the msi751 to the deviation input of the Tek 751.

The impedance of the coaxial cable is not critical. However, if the msi 751 is located in an environment with high ambient RF, such as transmitter room, shielding becomes important. Double shielded cable, such as a good grade of video cable, cable TV drop cable, or RG-223 would be good choices.



"Tek" is a registered trademark
of Tektronix, Inc.

3.3 Power Considerations

The msi751 is configured for 120 VAC operation at the factory. To convert the unit for 240 VAC operation, remove the fuse and discard it. Using needle-nose pliers, carefully pull out the printed circuit card located under the fuse. Turn the card over so that the legend "240 VAC" faces up and reinsert the card. Install a 0.125 A fast-blow fuse. The msi 751 uses a standard IEC power connector. A wide range of international power cords is readily available.

3.4 Adjustments and Operation

There are no adjustments on the **msi 751**. An LED on the front panel indicates power.

Connect the **msi751** to the **msi320** and the Tek 751, following the instructions on the Tek 751 setup screens, or in the manual for the proper setup and operation of that instrument.

3.5 Calibrating the Tektronix 751 to the msi 320 with the msi 751 Calibration Interface

1. Connect all cables between the **msi 320**, **msi 751**, and the Tektronix 751 as indicated on the preceding page.
2. Press the MENU (help) button on the front of the Tektronix 751.
3. Choose INSTALLATION AND ADJUSTMENT.
4. Choose Selection #1: MATCH 751 TO YOUR DEMODULATOR.
5. On the **msi 320** menu, select INPUT SOURCE and IF 45.75 MHz.
6. On the **msi 320** menu, select SPLIT - NO VISUAL.
7. Choose PROCEED on the Tektronix 751.
8. Adjust the DEMOD INPUT GAIN through the top cover of the Tektronix 751 for the lowest possible number on the screen.
9. Press DONE on the Tektronix 751. The Tektronix 751 will start automatic calibration at this point.
10. When the automatic calibration ends, choose PROCEED.
11. The Tektronix 751 should now show all displayed deviations at the 100% mark.
12. Press DONE on the Tektronix 751. Setup of the Tektronix 751 to the **msi 320** is now complete.
13. On the **msi 320** menu, select AURAL DETECTOR and QUASI PARALLEL, then select INPUT SOURCE and RF for normal operation of the **msi 320** with the Tektronix 751.

4. WARRANTY

4.1 Warranty Period

The warranty period is three years on parts and labor, beginning on the date of delivery.

4.2 MSI Warranty Policy Summary

NOTE: This is not the warranty. It is a summary of MSI's standard warranty and a description of how to obtain warranty service. The current, actual warranty is printed in its entirety on the following pages and supersedes warranty information which may be found elsewhere.

4.2.1 Who receives warranty protection?

Modulation Sciences' standard warranty protects the original end-user purchaser of record but does not apply to subsequent owners.

4.2.2 What does the warranty cover?

Modulation Sciences agrees to repair or replace, at its expense, any unit which has a defect in materials or workmanship for a period of three (3) years after the date of sale to the original end-user purchaser. This warranty includes all parts, labor, calibration, and packing.

4.2.3 What doesn't the warranty cover?

MSI's warranty does not cover:

- a) Freight and insurance charges paid by the purchaser in returning the unit for repair.
- b) Defects resulting from modifications or repairs to the unit not made by or authorized in writing by Modulation Sciences.
- c) Compensation for incidental or consequential damages resulting from any defect.
- d) Trivial or cosmetic defects which do not affect the unit's ability to function normally.
- e) Damage caused by lightning or other natural calamity.

4.2.4 How is the warranty period computed?

The warranty period begins on the date of delivery.

4.2.5 What if the unit cannot be repaired or is too expensive to repair?

If Modulation Sciences decides not to repair or replace a given unit, Modulation Sciences agrees to refund to the first end-user purchaser its full purchase price. Payment of that amount will end MSI's responsibilities and Modulation Sciences may keep the unit.

4.2.6 How is warranty service obtained?

- a) Contact the dealer or distributor from whom this product was purchased. Describe the problem and ask if there is an easy solution.
- b) If your dealer cannot help, contact Modulation Sciences' service department at (800) 826-2603 or (732) 302-3090 and explain the problem. If the unit requires factory service, you will be given a return authorization number. Any product arriving without an RA number will be refused by our receiving department.
- c) When you have your return authorization number, you may return the unit. Pack it carefully for shipment, preferably using the original packing materials. **Assume that the box will be dropped several times during shipment. Use UPS or some other private carrier you know to be reliable. Do not use the Postal Service.** The risk of loss is yours. Modulation Sciences will not be responsible for damage or loss until the package is received by Modulation Sciences. **Insure the unit for its full replacement value. Ship the unit prepaid to the address specified when you receive the return authorization and be sure to enclose a note giving the following information:**

Your company name and shipping address (not a P.O. Box).

Your Return Authorization number.

A copy of your original invoice establishing the starting date of your warranty.

As full a description as possible of the problem(s).

4.3 MSI Warranty Policy

For a summary of this text and information on obtaining warranty service, please see the pages preceding this warranty.

We warrant the equipment sold shall be free from defects in materials and workmanship under normal use and service for a period of three (3) years from the date of delivery when properly installed. Our sole obligation under this warranty shall be limited to repair or replacement, at our option, of any such part or parts of the product which our examination shall disclose to our satisfaction to be defective.

If you wish to have warranty service performed at our facilities, you shall obtain from us, in advance, permission to return the equipment and shall ship it properly packed with transportation and insurance prepaid. Service performed at our facilities under this warranty shall include parts plus labor and normal return shipping. It is expressly agreed that our obligation to repair and replace defective parts is your sole and exclusive remedy.

The warranty to repair or replace defective parts is expressly in lieu of and hereby in disclaimer of all other express warranties and is in lieu of and in disclaimer and exclusion of any implied warranties of merchantability, fitness for particular purpose, as well as all other implied warranties, in law or in equity, and of all obligations or liability on our part. There are no warranties which extend beyond the description hereof.

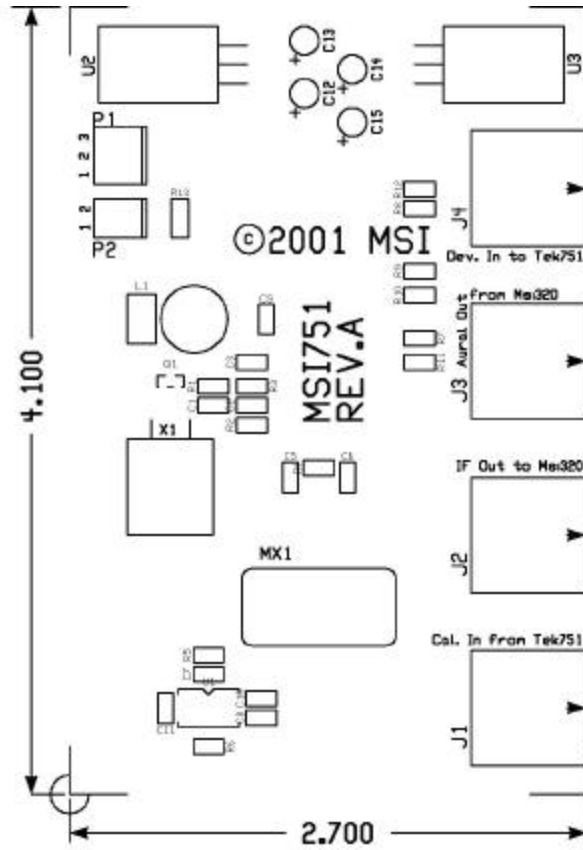
Our liability does not include any labor charges for replacement of parts, adjustments, repairs, or any work done outside our factory, unless such work is authorized in writing by us. Our obligation to repair or replace shall not apply to any equipment which shall have been repaired or altered outside our factory in any way, subjected to negligence, misuse, unauthorized alteration or abuse, damaged by lightning or other natural calamity, or damaged in transit.

Our liability hereunder shall not include losses of anticipated profits or special incidental or consequential damages.

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5. DIAGRAMS

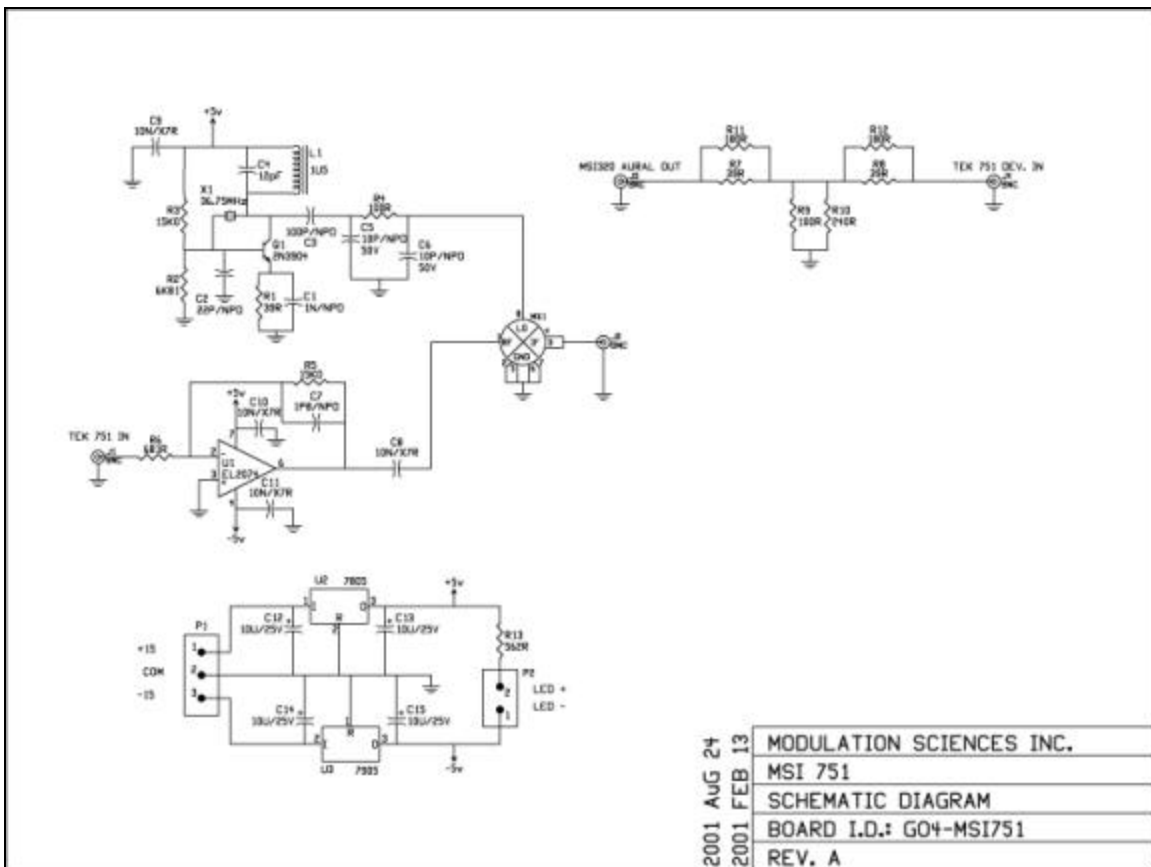
5.1 Printed Circuit Layout



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5.2 Schematic Diagram



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6. PARTS LIST

MSI Part Number	Quantity	Description	Manufacturer's Part Number	Manufacturer
V02-751H	1	MSI-751 Housing Ass'y	V02-751H	Modulation Sciences
G04-UPSC	1	Power supply PC board	G04-UPSC	
A04-100AGANH1	2	1000 uF 35 V AE	ECEB1VGE102	Panasonic
A04-1504XHNI1	2	1.5 nF feedthrough capacitor		
A04-4705JMCH1	2	0.047 uF 100 V MC		
Z09-221	2	2.2 ohm, 1/4W 5% CF resistor		
A08-241416001	1	Power transformer	DP-241-4-16	Signal Transformer
A09-F3AG10004	1	1/4 A fast-blow fuse	3AG or AGC	Bussmann or Littelfuse
B01-4003	4	Rectifier diode		
E01-I200000001	1	Red LED	5100H1	IDI
H08-002CFW001	1	2-pin connector for above		
H08-002CFW003	1	Female end connector, 26 AWG	CE100F26-2	Panduit
H08-003CFW001	1	3-pin CM end connector w/gold	CE100F24-3-DB	Panduit
H99-003000001	1	AC power input module	6J4	Corcom
J07-P18000005	1	2.3 m power cord	17251	Belden

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MSI Part Number	Quantity	Description	Reference	Manufacturer's Part Number	Manufacturer
V01-751M	1	Main PC Board Assembly		V01-751M	Modulation Sciences
G04-751M	1	Main PC board		G04-751M	
A05-550118021	1	5.5-18 pF trimmer capacitor	C4	538-011A-5.5-18	Tusonix
A54-1004HCAF1	1	1.0 nF 50V 5% chip capacitor	C1	0805CG102J9AB	Philips
A54-0020HCAF1	1	2.0 pF 50V NP0 chip capacitor	C7		
A54-X7R103J50	4	10 nF 50V X7R SM capacitor	C8-C11		
A54-1002HCAF1	2	10 pF 50V 5% chip capacitor	C5, C6	0805CG100J9AB	Philips
A04-1008FTNH1	4	10 uF 25V DT	C12-C15	19D106X0025CB1	Sprague
A54-2202HCAF1	1	22 pF 50V 5% chip capacitor	C2	0805CG220J9AB	Philips
A54-1003HCAF1	1	100 pF 50V NP0 chip capacitor	C3		
H02-002F00009	4	Right-angle PC mount BNC connr	J1-J4		
A06-A15040001	1	1.5 uH SMT inductor	L1		
A99-MIXER0001	1	RF mixer	MX1	SBL-1	Mini-Circuits
B14-N39040001	1	SOT23 NPN transistor	Q1	MMBT3904LT1	Motorola
H08-002PMS001	1	2-pin, latch head mascon w/gold	P2	MLSS100-2DB	Panduit
H08-003PMS001	1	3-pin, latch head mascon w/gold	P1	MLSS100-3DB	Panduit
Z52-24030805	1	240 ohm SMT resistor	R10		
Z52-18030805	2	180 ohm SMT resistor	R11, R12		
Z52-39020805	3	39 ohm SMT resistor	R1, R7, R8		
Z52-10030805	2	100 ohm SMT resistor	R4, R9		
Z52-56231206	1	562 ohm 1% 1/8 W resistor	R13	ERJ-8ENF5620	Panasonic
Z52-15040805	2	15 K SMT resistor	R3, R5		
Z52-68030805	1	680 ohm SMT resistor	R6		
Z52-68040805	1	6.8 K SMT resistor	R2		
C02-1P501M001	1	+5 VDC 1.5 A regulator, TO-220	U2		
C02-1N501M001	1	-5 VDC 1.5 A regulator, TO-220	U3	LM79M05CT	Motorola
C50-EL2074CS	1	Voltage-feedback amplifier	U1	EL2074CS	Elantec
A10-036750001	1	36.75 MHz crystal, HC-49, series-resonant, third overtone	X1		

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[E1] Check with Judy about the use of this font for msi products.

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[E2] I'm not sure that these are the correct current designations for these fuses -- check the Digi-Key catalog.