

MODEL MU-101 DYNAMIC MUTUAL CONDUCTANCE TUBE TESTER

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CANADIAN MARCONI COMPANY
SPECIAL SERVICES DIVISION

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INSTRUCTION MANUAL

MODEL MU-101

DYNAMIC MUTUAL CONDUCTANCE TUBE TESTER

INDEX

<u>TITLE</u>	<u>PARAGRAPH NO.</u>
GENERAL	1.0
PURPOSE AND USE	2.0
TECHNICAL CHARACTERISTICS	3.0
DESCRIPTION AND FUNCTION OF TEST SET	4.0
OPERATING INSTRUCTIONS AND TEST FUNCTIONS	5.0
PRELIMINARY STARTING PROCEDURE	5.1
SET-UP AND TEST PROCEDURE	5.2
TEST PROCEDURE	5.3
	<u>PAGE</u>
TEST DATA FOR BALLAST TUBES	11 to 17
PARTS LIST	18 to 19
SCHEMATIC DIAGRAM	20

1.0 GENERAL

This manual describes the Tube Tester Model MU-101 and covers the purpose, use, technical characteristics, description, functions, operating instructions and test functions.

2.0 PURPOSE AND USE

2.1 This test set is a portable solid state tube tester of the dynamic mutual conductance type. It is used to test and to measure performance capabilities and to determine rejection limits for electron tubes used in various types of electronic equipments.

2.2 The following tests can be made with this test set:

2.2.1 Dynamic mutual conductance test

2.2.2 Rectifier test

2.2.3 Gas test

2.2.4 Short test

2.2.5 Noise test

2.2.6 Panel lamp test

2.2.7 Life test

2.2.8 Continuity test

2.2.9 Filament and heater continuity test

2.2.10 Ballast tube test

2.2.11 Nuvistors, Compactrons and European Tube tests

3.0 TECHNICAL CHARACTERISTICS

3.1 TYPE: Solid State - 19 test sockets.

POWER SUPPLY

Input Voltage: 103 to 125VAC single phase (adjustable)

Frequency: 60Hz

Power Consumption: 70VA MAX at 115VAC 60Hz.

3.2 METER:

Three mutual conductance ranges: 3000, 6000, 15000 micromhos.

The meter also has an ENGLISH reading range indicating either a GOOD (Green sector) tube or a bad REPLACE (Red sector) tube. It also indicates a doubtful (?) tube.

3.3 OPERATING TEMPERATURE:

-40⁰ to +50⁰ Celsius

3.4 INDICATING LIGHTS

Short, Fuse and Pilot

4.0 DESCRIPTION AND FUNCTION OF TEST SET

4.1 Controls.

The function of the various controls are clearly identified on the front panel of the test set.

4.2 The functions of these controls are as follows:

4.2.1 Power ON/OFF switch SW12, controls the ac power input to the test set.

4.2.2 Selector Switches, Filament SW3, Filament SW4, Grid SW5, Plate SW6, Screen SW7, Cathode SW8, Suppressor SW9, connect proper internal circuits to apply correct test voltages to the various pins of the tube under test. The range of the selector switches is indicated by the letters A to Z which control the filament connections to the tube under test. The numbered switches control the GRID, PLATE, SCREEN, CATHODE, SUPPRESSOR, in that order.

Example: JR-6237-5, starting at the left hand side, the first switch is selected to the letter "J", the second is turned to "R" which connect the heater voltage to Pin 1 and 8 of the tube under test; by selecting the Numbers 6237-5 on the remaining switches the GRID is connected to Pin 6, PLATE to Pin 2, SCREEN to Pin 3, CATHODE to Pin 7, and SUPPRESSOR to Pin 5.

Due to a special design all selector switches are interlocked preventing applications of two voltages on the same selector switch contacts, thus avoiding tube damage during test.

- 4.2.3 BIAS Control R7 adjusts the proper value of the bias voltage applied to the tube under test. Adjustment range is from 0 to 100.
- 4.2.4 SHORT switch SW 2, is a six position switch. Postions 1 through 5 of this switch connect the various elements of the tube under test to the test circuit which contains the shorts indicator neon lamp PL2. By turning this switch successively through position 1 to 5, various electrodes are tested for inter-element shorts. The TUBE TEST position is self-explanatory.
- 4.2.5 FILAMENT switch SW10, provides an 18-step selection of filament or heater voltages from .6 volts through 117VAC a position marked BLST permits the testing of ballast tube.

4.2.6 ENGLISH Control R4, R5 is a 0 to 150 ohm potentiometer used when called up in the Tube Test Data for LIFE TEST check.

4.2.7 MICROMHOS Switch SW1 consists of a three-position range switch:

0 - to 3000, 6000, 15,000, used when testing mutual conductance value.

The English dial setting is not used when the micromhos settings are used.

The fourth position marked ENGLISH on the MICROMHOS switch is used when it is desired to test tube in terms of replace-good conditions (Good, ?, Bad).

Push button switches (P1 through P7) are located at centre lower location of the test panel and are designated as follows:

- P1 DIODE, this switch permits testing of low-power diodes such as 6H6.
- P2 0Z4, this switch is used to test cold cathode rectifiers such as 0Z4.
- P3 RECT, this switch is used to test rectifiers such as 5Y3, 6X4, 83 etc.
- P4 G.M., used for testing for mutual conductance.
- P5 - P6 GAS 1 and GAS 2, these two switches are used to test amplifiers and gas tubes for gas content.
- P7 LINE ADJUST, P7, this switch is used for the application of the line voltage on the test set meter while the line adjust rheostat is adjusted for LINE TEST indication on the meter.

4.2.8 METER, this meter indicates the line voltage and tube condition either in dynamic mutual conductance or replace/good indications.

4.2.9 METER REVERSE/METER NORMAL SWITCH. This switch is used to reverse the polarity of voltage applied to the meter when certain types of tubes are tested (117N7).

4.2.10 GRID and PLATE Jacks, these jacks are used when the Tube Test Data indicates CAP = G or CAP = P, indicating that the top cap connection of the tube under test is to be connected to the G - GRID or P - PLATE Jacks of the test set.

4.2.11 LIFE TEST/NORMAL Switch, this switch enables LIFE TEST to be performed on the tubes under test, used for dynamic mutual conductance test, it is not applicable to rectifier tubes.

4.2.12 LINE ADJUST - This potentiometer is used to set the input AC voltage to the instrument.

5.0 OPERATING INSTRUCTIONS AND TEST FUNCTIONS

5.1 PRELIMINARY STARTING PROCEDURE

5.1.1 Check the voltage and frequency of the alternating (ac) power source to be used for the operation of TUBE TESTER MU-101. The voltage must be between 103 and 123 volts ac.

5.1.2 Release the latches (2) and raise the cover of the tube tester.

5.1.3 NOTE: Do not insert tube into socket until all selector switches are in specified position.

SET-UP AND TEST PROCEDURE

- 5.2.1 Locate the type number of the tube to be tested from the test data roll chart or Supplementary Data Manual supplied with the instrument.
- 5.2.2 Set up the controls as indicated on the test data roll chart (See Para. 4.2)
- 5.2.3 Insert the tube into the proper test socket.
- 5.2.4 If the tube to be tested has a top cap, attach the electrical clips to the jacks located on the test panel. Directions as to which clip to use are given in the NOTES column on the Tube Test Data.
- 5.2.5 Turn POWER switch ON/OFF to ON and adjust the LINE ADJUST potentiometer (R25) to LINE TEST indicator on the meter.
- 5.2.6 Proceed with set up and the performance of tube testing as per the instruction listed on the Tube Test Data. Recheck LINE ADJUST as in para. 5.2.5 above.

TEST PROCEDURE

- 5.3.1 Shorts Test: The shorts test is performed by turning the SHORTS switch (SW2) through the five positions (1 to 5), a short is indicated by a steady glow of the neon lamp in certain positions of the SHORTS switch, a momentary flash of the lamp as the switch is turned should be disregarded. Method of locating shorted elements is shown in TABLE 1 below.

SHORTED TUBE ELEMENTS	1	2	3	4	5
Fil to Cathode			X		
Fil to Grid	X	X			X
Fil to Plate	X	X		X	X
Fil to Screen	X		X	X	X
Fil to Suppressor		X			
Grid to Cathode	X	X	X		X
Grid to Plate				X	
Grid to Screen		X	X	X	
Grid to Suppressor	X				X
Plate to Screen		X	X		
Plate to Suppressor	X			X	X
Screen to Suppressor	X	X	X	X	X

TABLE 1

5.3.2 Continuity Test: This test set can be used to perform continuity through resistance up to 200K ohms on any equipment in lieu of an ohmmeter or conventional multimeter.

- a) Place SHORTS Switch to Position 4
- b) Connect two leads to the GRID and PLATE JACKS
- c) Touch the test leads to the terminals through which continuity is to be determined.
- d) The neon lamps will glow if the circuit has continuity.

- 5.3.3 Noise Test: To perform a noise test connect the noise test jacks to the antenna and ground posts of a radio receiver. Tap the tube under test with the finger as the SHORTS switch is rotated through Positions 1 to 5, excess noise indication should cause the neon lamp to glow, intermittent disturbances too brief to register on the neon lamp will be reproduced by the loud speaker of the receiver as static.
- 5.3.4 Gas Test: (Amplifier tubes) set MICROMHOS Switch to 3000, press P5 and hold down while turning the BIAS dial for an indication of 100 micromhos on the METER. Hold P 5 down and press P 6, if the tube contains gas the METER indication will increase. If the increase is no more than one small division the gas content is acceptable. With some tubes i.e., Type 45, the meter reading cannot be brought down to 100 by adjusting the BIAS. In such case, turn the BIAS dial to 100 and test for gas.
- 5.3.5 Dynamic Mutual Conductance Test: When testing for mutual conductance push switch P4. The meter will indicate mutual conductance in MICROMHOS in three ranges: 0-3,000, 0-6,000, and 0-15,000, the range of the indicating meter is controlled by the MICROMHOS switch. The setting of the ENGLISH switch is not required when performing this test. The setting of the ENGLISH position is used when performing a GOOD/REPLACE test. The English reading meter scale is based in the Dynamic Mutual Conductance. It is not an emission test.
- 5.3.6 Rectifier Test: Switch P1, P2, and P3 are used to test various types of rectifiers as follows:
- a) Detector diodes test: Switch P1 is used and applies a low voltage to the tube elements, GOOD diodes will indicate above the DIODE OK mark on the test meter.

- b) Cold cathode rectifier: Switch P2 is used and applies the voltage required to cause ionization of the rectifier and start conduction. Good tubes will read in the GREEN (GOOD) sector of the test meter.
- c) Other rectifier such as 5Y3; Switch P3 is used and applies a medium voltage to the elements of the tubes under test. Good tubes will read in the GREEN (GOOD) sector of the test meter.

5.3.7 Life Test: This test is performed as follows:

(Paragraphs a to d are NOT applicable to rectifier tube)

- a) Select switch to NORMAL
- b) Select the MICROMHO range switch to ENGLISH
- c) Press P4 and adjust the ENGLISH dial until the tube under test reads in the GREEN (GOOD) sector at 2000 on the METER scale.
- d) While holding everything constant, throw switch to LIFE TEST. This reduces the cathode voltage and the test meter should still read in the GREEN sector which indicates a large life reserve in the tube.
- e) For rectifier tubes place LIFE TEST/NORMAL switch to NORMAL.
- f) Set FILAMENT switch to normal filament value.
- g) Reduce filament voltage by one position on the FILAMENT switch and note loss of reading. It should not drop more than 25 percent.

Filament and Heater Continuity:

- a) Turn test set on
- b) Set test set selector switches as per Tube Test Data
- c) Set FILAMENT to BLST and NOT as per Tube Test Data voltage set.
- d) Set SHORTS Test switch to Position 1.
- e) Insert tube under test in the proper socket.
- f) If the neon lamp glows, the filament is good and complete test should be performed, by setting FILAMENT switch to proper position, and while the tube heats, rotate the SHORTS Test switch through all positions, if no shorts are indicated, set the switch in TUBE TEST position and proceed with tube test.
- g) If neon lamp does not glow, the filament is open. There is a possibility that tubes will show continuity when cold, but will open when it warms up when tapped lightly.

5.3.9 Panel Lamp Test: This test is performed by inserting the lamp under test in Socket V13 (seven pin socket) by controlling voltage with the filament switch (up to 12.6V) this test can be performed.

5.3.10 Ballast tube Test

- a) Turn Tester On.
- b) Set Filament switch to BLST
- c) Set SHORTS Test switch on 1
- d) Set first selector switch (lettered A to K) to letter shown in column marked (first selector switch).
Set all numbered selectors on zero.

e) Rotate second selector switch (lettered P to Z) from P to Z. NEON LAMP SHOULD LIGHT IN POSITIONS NOTED.

TEST DATA FOR BALLAST TUBES

TUBE TYPE	FIRST SELECTOR		NEON LAMP SHOULD LIGHT IN THESE POSITIONS					
1A1-1B1-1C1-1E1-1F1-1G1-1J1-1K1-1L1-1N1-1P1-1Q1-1R1G-1S1G-1T1G-1U1G-1V1-1Y1-1Z1-2	J	R						
2UR224	J			T				X
2LR212	H	R	S		U			
3	J	R						
03G	J			T				
4-5	J	R						
6-133	J			T				
6-6AA	J	R						
7-8-9	J	R						
10A-10AG	J			T				
10AB	J			T				X
K17B-M17C-BM17C	J			T				X
M17HG-M17H	J D	R	S					X
K23B-K23C-KX23B-KX30C	J			T				X
M30H	J D	R	S					X
30A-K30A	J			T				
33A-33AG	J			T				
K34B	J			T				X

TUBE TYPE	First Selector		Neon lamp should light in these positions					
36A	J			T				
K36B-BK36B-L36C-BM-L36C-KX36C	J			T				X
KX36A	J	R						
36D-L36D	J	R		T				X
L36DJ	J	R		T	U			X
K36H- M36H-M36HG	J D	R	S					X
L40S1-L40S2	J	R		T		V		
42A	J			T				
42A1	H				U			
42A2-42B2	H		S		U			
K42B-L42B-M42B-KX42B-LX42B-L42BX-K42C-L42C-M42C	J			T				X
BK42D-K42D-L42D	J	R		T				X
LX42D-L42DX	J	R	S	T				
K42E-L42E	J			T				X
L42F	J D	R						X
42HA-K42HJ-M42H-M42HG	J E	R	S	T				X
KX42C	J			T				X
L42S1	J	R		T		V		
49A-49AJ-K49AJ	J			T				
KX49A	J			T				X
49A1	H				U			
49A2-49B2	H		S		U			
K49B-L49B-M49B-BM49B-K49C-M49C-BM49C-BK49C-K49E-L49E	J			T				X
K49D-BK49D-L49D	J			T				X
L49F	J D	R						X
M49H- M49HG	J D	R	S					X
KZ49B-KZ49C	J	R				V		

TUBE TYPE	First Selector			Neon lamp should light in these positions				
K49BJ-L49BJ	J			T	U			X
L49S2	J	R		T		V		
49AJ-K49AJ	J			T				
KX49B-LX49B-LX49C	J			T				X
L49DJ	J	R		T	U			X
L49S3	J	R		T		V		
50A2	J	R		T				
50A2MF-50B2	J	R				V		
50X3	J	R						
K52H-M52H	J D	R	S					X
K54B	J			T				X
55A-K55A	J			T				
55A1	H				U			
KX55A	J	R						
55B-K55B-BM55B-L55BG-LX55B	J			T				X
55A2-55B2	H		S		U			
K55C-L55C-KX55C	J			T				X
K55CP	J			T		V		X
K55D-L55D	J	R		T				X
L55E-M55E	J			T				X
L55F-M55F-BL55F	J D	R						X
K55H-M55H-M55HG	J D	R	S					X
L55S1-L55S2	J	R		T		V		X
60R30G	J	R		T				
64.23	J			T				
67A	J			T				
K67B-L67B	J			T				X
L73B-K74B-L74B-CX74C	J			T				X

TUBE TYPE	First Selector		Neon lamp should light in these positions					
80A	J			T				
K79B-K80B-M80B-KX80B-L80B	J			T			X	
K80F	J D	R					X	
KX87B-LX87B-L90B	J			T			X	
K90F-M90F-K92F-M92F	J D	R					X	
92A	J			T				
L92B-95K2	J			T			X	
L99D	J	R		T			X	
100R8	J			T			X	
120R	J	R						
120RS-135K1	J			T			X	
135K1A	J			T	U		X	
140L4-140L8-L40R4-140R8	J	R		T				
140R	J	R						
140L44-140R44	J	R	S	T				
165L4-165R4-165R8	J	R		T				
165R	J	R						
165L44-165R44	J	R	S	T				
185L4-185L8-185R4-185R8	J	R		T				
185R	J	R						
185L44-185R44	J	R	S	T				
200R-250R	J	R						
250R8-290L4	J			T			X	
300R4-320R4	J			T			X	
340	J	R						
808-1	J			T	U		X	
E14980-W43357-W4588-3613	J			T			X	
3334-3334A	J	R		T			X	

TUBE TYPE	First Selector		Neon lamp should light in these positions					
8593-8598-8601-8664	J			T	U			X
3ER248	J	R		T	U			X
3CR241	J	R		T				X

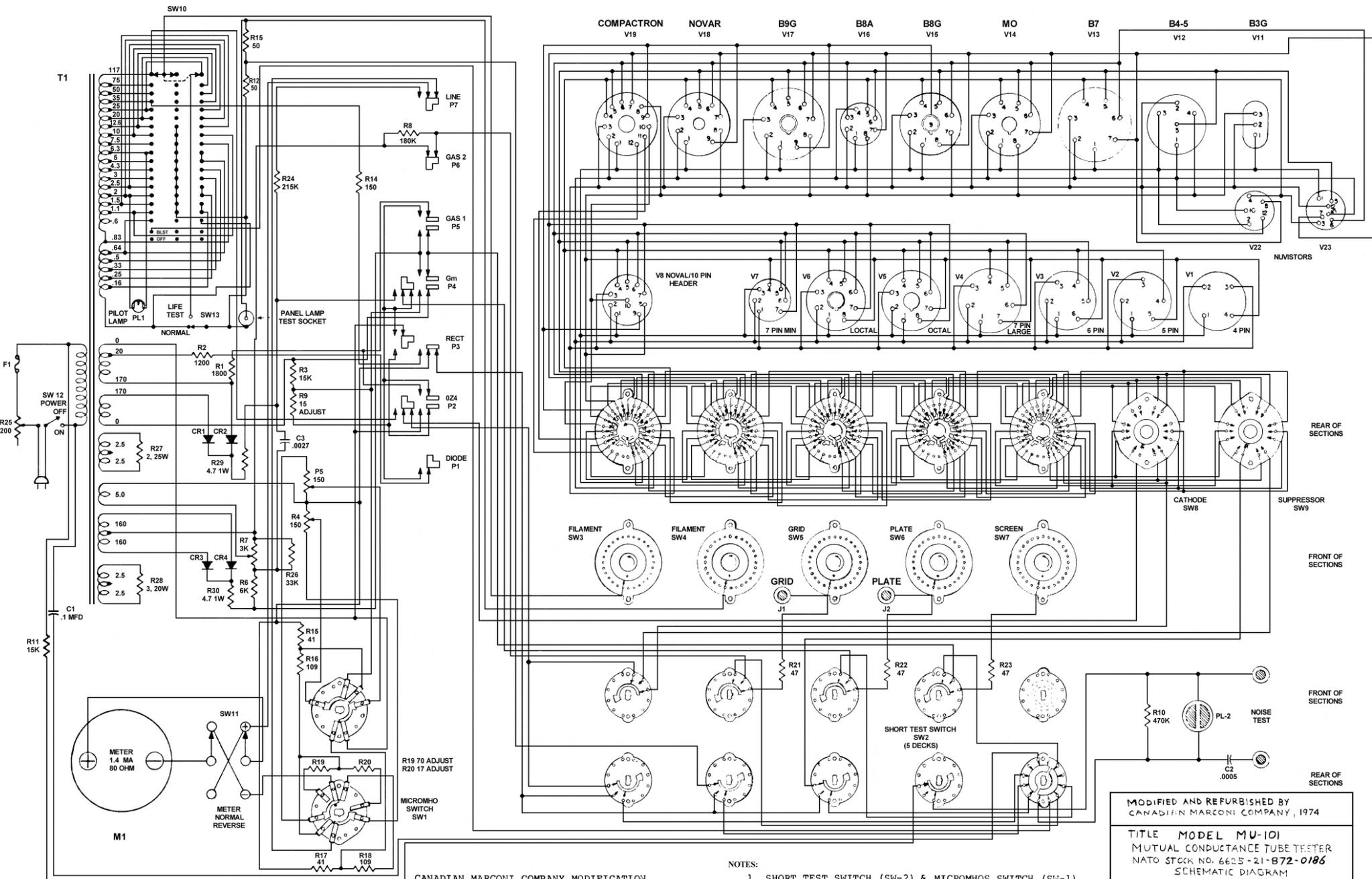
TUBE TYPE	FIRST SELECTOR	NEON LAMP SHOULD LIGHT IN THESE POSITIONS							
B9M15822	B			T					
	E					V			
	G							X	Y
B9M16067	J	R		T		V	W	X	
B9M16275	B			T	U	V	W	X	Y
B9M16534	J	R		T		V	W	X	
B9M17571	H	R		T					
	J				U	V		X	
B9M18941	B		S	T					
	E					V			
	G							X	Y
17A470303	J	R	S			V			
	D				U				
	G							X	
17A485459	J	R	S				W		
	D				U				
TBR102D	B		S	T	U	V			
	G							X	Y
TBR103D	B		S		U	V			
	G							X	Y
TBR104D	B		S	T	U	V			
	G							X	Y
397021	B		S	T					
397022	E					V	W		
397023	J							X	
397036	C					V			

TUBE TYPE	FIRST SELECTOR		NEON LAMP SHOULD LIGHT IN THESE POSITIONS						
407100	J	R	S			V			
408100	J	R	S			V			
	D				U				
SW507300	J	R		T		V	W	X	
571606	B		S	T					
	E					V	W		
	J							X	

PARTS LIST

PART OR DWG. NO.	DESCRIPTION	REF. SYMBOL OR FUNCTION
NPN-640	CABINET - NOREL PRODUCTS	
07-001-02	FRONT PANEL - CANADIAN MARCONI COMPANY	
R/78-S4-111	SOCKET 4 PIN - AMPHENOL	V-1
R/78-S5-111	SOCKET 5 PIN - AMPHENOL	V-2
R/78-S6-111	SOCKET 6 PIN - AMPHENOL	V-3
78-7CD-111	SOCKET 7 PIN - (WITH PILOT TEST) AMPHENOL	V-4
R/78-S8-111	SOCKET OCTAL - AMPHENOL	V-5
7790	SOCKET LOCTAL - EBY CO.	V-6
R/78-7P	SOCKET 7 PIN MINIATURE - AMPHENOL	V-7
121-11-12-024	SOCKET 10 PIN HEADER - CINCH	V-8
07-001-07C	SOCKET 3 PIN - CANADIAN MARCONI COMPANY	V-11
07-001-07A	SOCKET 4 PIN - MCMURDO	V-12
07-001-07D	SOCKET 7 PIN - CANADIAN MARCONI COMPANY	V-13
07-001-07F	SOCKET 8 PIN - MCMURDO	V-14
78-S8L-111	SOCKET LOCTAL - AMPHENOL	V-15
07-001-07E	SOCKET OCTAL - SHIELDED - CANADIAN MARCONI COMPANY	V-16
07-001-07B	SOCKET 9 PIN - CANADIAN MARCONI COMPANY	V-17
149-10-033	SOCKET NOVAR - CINCH	V-18
149-10-30-025	SOCKET COMPACTRON - CINCH	V-19
133-65-10-001	SOCKET 5 PIN - NUVISTOR - CINCH	V-22
133-67-90-004	SOCKET 7 PIN - NUVISTOR - CINCH	V-23
144-5-5	SWITCH ROTARY 1 POLE 4 POSITION--STARK MICROMHO	SW-1
19912-203	SWITCH ROTARY 5 POLE 6 POSITION - HICKOCK SHORT TEST	SW-2
HA-7888	SWITCH ROTARY 1 POLE 14 POSITIONS OAK/HART	SW-3, SW-7
HA-7867	SWITCH ROTARY 1 POLE 14 POSITIONS OAK/HART	SW-8, SW-9
144-5-9	SWITCH SLIDE DPDT - STARK	MTR REVERSE/ SW-11
5930-00-636-1227	SWITCH TOGGLE SP.ST.	POWER/ SW-12
ST-22	SWITCH TOGGLE DPDT	LIFE TEST/ SW-13
144-5-8	SWITCH - PUSH BUTTON 7 GANG STARK	P1-P7
19912-180	SWITCH 2 POLE 20 POSITIONS - HICKOCK	FIL VOLTS
4B102-73/MS210	METER MODEL 29 1.4Ma. 80 OHMS BACH-SIMPSON	M-1
IN-4007	RECTIFIER DIODE	CR1, CR2, CR3, CR4
148-2-3	TRANSFORMER POWER 117V. STARK	T-1
	RESISTOR - FIXED 1800 OHMS 10% 10 WATT	R-1
RC-32	RESISTOR - FIXED 1200 OHMS 10% 1 WATT	R-2
MIL-RC-20	RESISTOR - FIXED 15000 OHMS 10% 1/2W	R-3
5905-00-158-5741	RESISTOR - VARIABLE 150-150 - OHMS 4W LIN. TAPER	R-4, R-5
MIL-PW-10	RESISTOR - FIXED 6000 OHMS 10% 10 WATT IRC	R-6
5905-21-444-1242	RESISTOR - VARIABLE W.W. 3000 OHMS SPECIAL TAPER	R-7
MIL-RC-20	RESISTOR - FIXED 180K OHMS 10% 1/2W	R-8
WW4J	RESISTOR - ADJUSTABLE 15 OHMS WW PRECISION IRC	R-9
MIL-RC-20	RESISTOR - FIXED - 470K OHMS 20% 1/2 W	R-10
MIL-RC-32	RESISTOR - FIXED - 15K OHMS 5% 1W	R-11
MIL-RW-29	RESISTOR - FIXED WW100 OHMS 10W CENTRE-TAP	R-12, R-13
	RESISTOR - FIXED WW150 OHMS PRECISION	R-14
	RESISTOR - FIXED WW41 OHMS PRECISION	R-15, R-17
	RESISTOR - FIXED WW109 OHMS PRECISION	R-16, R-18
MIL-RW-29	RESISTOR - ADJUSTABLE 70 OHMS WW	R-19

PART OR DWG. NO.	DESCRIPTION	REF. SYMBOL OR FUNCTION
MIL-RW-29	RESISTOR - ADJUSTABLE 17 OHMS WW	R-20
MIL-RC-20	RESISTOR - FIXED 47 OHMS 5% ½W	R-21, R-22, R-23
MIL-RC-20	RESISTOR - FILM 215K OHMS 1% ½W	R-24
	RESISTOR VARIABLE 200 OHMS 25W WW	R-25
MIL-RC-20	RESISTOR - FIXED 33K OHMS 5% ½W	R-26
0200 K	RESISTOR - FIXED 2 OHMS 10% 25W OHMITE	R-27
1802-C	RESISTOR - FIXED 3 OHMS 10% 20W WW OHMITE	R-28
MIL-RC-32	RESISTOR - FIXED 4.7 OHMS 5% 1W	R-29, R-30
MPY 4968	CAPACITOR - PAPER*1 uF 400 VDC C-D	C-1
TF-51KF	CAPACITOR - MICA. 500 pF 500 VDC C-D	C-2
DC27KF	CAPACITOR - MICA. 2700 pF 500 VDC C-D	C-3
81	LAMP AUTO 6 VOLTS	PL-1 (FUSE)
44	LAMP - BAYONET BASE 6-8 VOLTS	PL-2 (PILOT)
NE-48	BULB - NEON ½W	SHORT INDICATOR
5935-00-498-0462	PIN JACK - BLACK	NOISE TEST
5935-00-817-8929	PIN JACK - RED	NOISE TEST
5355-21-100-8921	KNOB - PUSH-BUTTON BLACK	
5355-21-100-8922	KNOB - PUSH-BUTTON RED	
	KNOB POINTER BLACK	
07-001-03	BRACKET ANGLE	USED WITH T-1
07-001-04	BRACKET ANGLE	USED ON CABINET
07-001-05	NUVISTOR MOUNTING PLATE	USED WITH V22-V23
77-115	SOCKET AMPHENOL - 1 PIN (2 REQUIRED)	PART OF 07-001-07C
07-001-06	BRACKET - REINFORCING	PANEL
07-001-01	SCHEMATIC DIAGRAM	
NCL 5/16	CABLE CLIP, 5/16"	USED WITH LINE CORD
8120-0015	LINE CORD, MOLDED, 3 WIRE	
07-001-09B	TEST LEAD, BLACK	
07-001-09R	TEST LEAD, RED	
C-67-326-000/		
MQ-001	ROLL CHART	
07-001-10	SUPPLEMENTARY TUBE DATA	



MARCONI MU-101 (1974 updated version)

CANADIAN MARCONI COMPANY MODIFICATION
 RECTIFIER L1 REPLACED BY RECTIFIERS CR1, CR2.
 RECTIFIER L2 REPLACED BY RECTIFIERS CR3, CR4.
 RESISTORS R27, R28, R29, R30 ADDED.

- NOTES:
1. SHORT TEST SWITCH (SW-2) & MICROMHOS SWITCH (SW-1) ARE SHOWN IN MAXIMUM COUNTER-CLOCKWISE POSITION.
 2. SELECTOR SWITCHES SHOWN IN OFF (12 O'CLOCK) POSITION ON ALL SWITCHES AS VIEWED FROM THE FRONT.

MODIFIED AND REFURBISHED BY CANADIAN MARCONI COMPANY, 1974			
TITLE MODEL MU-101 MUTUAL CONDUCTANCE TUBE TESTER NATO STOCK NO. 6625-21-872-0186 SCHEMATIC DIAGRAM			
DRAWN J.S. Stock	CHECKED	APPROVED	DRAWING NUMBER REDRAWN PACIFIC TV 1987/10 (J)
H.A.C.	2/27	J.P.	90073-07-001-01