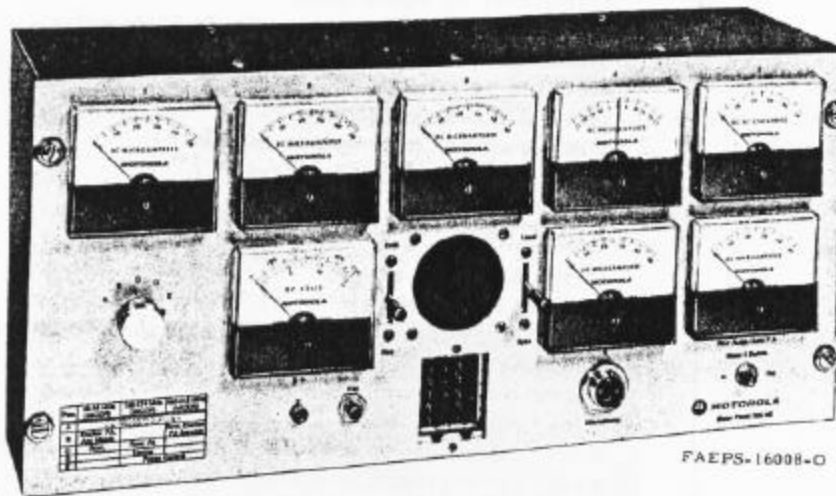


MOTOROLA TEST BENCH METERING PANEL

MODEL TEK-5E



1. INTRODUCTION

This test bench metering panel is used for testing and aligning Motorola equipment on the service bench. Eight jewel-pivot meters permit simultaneous measurement of various transmitter/receiver circuits, such as B+, discriminator input and output, i-f stages, doubler and tripler stages and final amplifier plate current. A five-position program switch enables the operator to select the metering mode required for the unit being tested. The simultaneous metering provides for greater ease in locating intermittent or

malfunctioning stages. During operation a look at the meters will show the specific metering point which is not reading normally and lead to a quick analysis of a circuit malfunction.

2. METERING FACILITIES

NOTE

"METER NO." in Table 1 corresponds to the METERING SWITCH POSITION of Motorola Test Sets and Alignment Procedure Instructions.



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Communications Division

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8/21/74-UP

Table 1. Motorola Test Sets Metering Switch Positions

METER NO. (Meter Position)	CIRCUIT MEASURED
	<u>TRANSMITTER</u>
1	Relative power output of 406-470 MHz & 890-960 MHz units
2	Oscillator on some units
3	Doubler (not used in some 25-54 MHz units).
4	Doubler or tripler
5	Doubler or tripler
6	Grid of power amplifier
PA	Plate current of power amplifier
B+	B+ (1000 volts full scale)
	<u>RECEIVER</u>
1	Grid of last i-f stage
2	Grid of first limiter
3	Refer to metering position 3 of alignment chart in radio set instruction manual
4	Discriminator output
5	Discriminator input
6	Refer to metering position 6 of alignment chart in radio set instruction manual
AUDIO	Audio output (approximately 2.5 volts full scale)
B+	B+ (1000 volts full scale)

2.1 To use the metering panel, plug the metering cable into the receptacle located in the middle of the bottom portion of the panel. When servicing "Micor" radios, the 1P84253C65 Adapter Plug Assembly (included with the TEK-5E) is required to adapt the meter panel for use with the two TEKA-72A "Micor" Cable Assemblies.

2.2 Transmitter or receiver metering is controlled by the XMIT-REC lever switch. Except for "Micor" radios, the up (XMIT) switch position is for transmitter metering and the down (REC) switch position is for receiver metering. (The lever switch is "off" in the middle position.) For "Micor" radios, all metering is done with the lever switch in the down (REC) position except for METER 4 in the transmitter. The METER 4 check must be made with the lever switch in the up (XMIT) position. In the XMIT position, the B+ meter has a 1000 volt dc full scale deflection for tube-powered, Business Dispatcher, and "Motrac" radios. For "Micor" and "Motran" radios, the B+ meter has a full scale deflection of 15 volts dc. Also, with the switch in the XMIT position, the RCVR AUDIO/XMTR PA meter measures the power amplifier plate current and the MICROPHONE socket is connected to the audio circuits.

NOTE

In the XMIT position, Meter No 4 has a full scale deflection of minus or plus 50 microamperes (meter reading times 2).

2.3 With the XMIT-REC lever switch in the down (REC) position, the B+ meter has a 1000 volt dc full scale deflection for tube-powered and "Motrac" radios and a 15 volt dc full scale deflection for "Micor" and "Motran" radios. The RCVR AUDIO/XMTR PA meter measures the audio output and has a full scale deflection of approximately 2.5 volts dc. Meter No. 4 is direct-reading and the speaker is connected to the audio output circuit.

2.4 The red pin-tip receptacle directly below the B+ meter can be used with a test lead to meter B+ in radio sets where B+ is not brought out to Pin No. 7 of the metering receptacle of the transmitter/receiver chassis. The ground return is provided by the metering cable.

2.5 With the XMIT-REC switch in the XMIT position, the transmitter may be keyed by either a microphone or the red pushbutton KEY

switch below the XMIT-REC switch. If a "Micor" microphone is used to key the transmitter in a "Micor" radio, a TEKA-74 Microphone Adapter must be used to connect the "Micor" microphone to the test panel.

2.6 With the XMIT-REC switch in the REC position, the LOAD-SPKR switch to the right of the speaker will connect the speaker to the audio circuits when in the "down" position. In the "up" position, a three-ohm load replaces the speaker. In the center position the speaker circuit is left open.

2.7 In some receivers, discriminator secondary readings may be distorted by meter loading when meter M5 is inserted into the discriminator circuit. These receivers require that meter M5 be disconnected from the metering set-up. With the metering function lever switch set to REC, the IN-OUT METER 5 SWITCH disconnects meter M5 when set to OUT. With M5 disconnected, the discriminator secondary should be adjusted to "zero" reading on Meter No. 4. A crystal-controlled 455 kHz test signal is required for this adjustment.

3. MOUNTING

3.1 The screened, steel meter panel is 19" wide; with notched mounting holes spaced to conform with standard 19" mounting racks. Compatible holes in the housing make it possible to mount the metering panel on either side of the housing. The meter panel can be mounted to the sloping side with back plate mounted vertically; or the back plate can be mounted to the sloping side with the meter panel vertical. Interchangeability of the metering panel and back plate provides either horizontal bench-top sloping front utility; or vertical sloping front bench-top utility, as shown in the accompanying illustrations.

3.2 The mounting flexibility of the Model TEK-5E Test Bench Metering Panel is not confined to back plate and metering-panel interchangeability alone. In addition, the metering panel can be turned and mounted onto the housing in several different ways to adapt the unit for preferred installation as shown in the accompanying illustrations.

3.3 The housing can be permanently bolted or screwed to test bench shelf or bench top, with either machine screws and nuts, sheet-metal screws or woodscrews. The factory-drilled holes in the housing can be used for permanent installations.

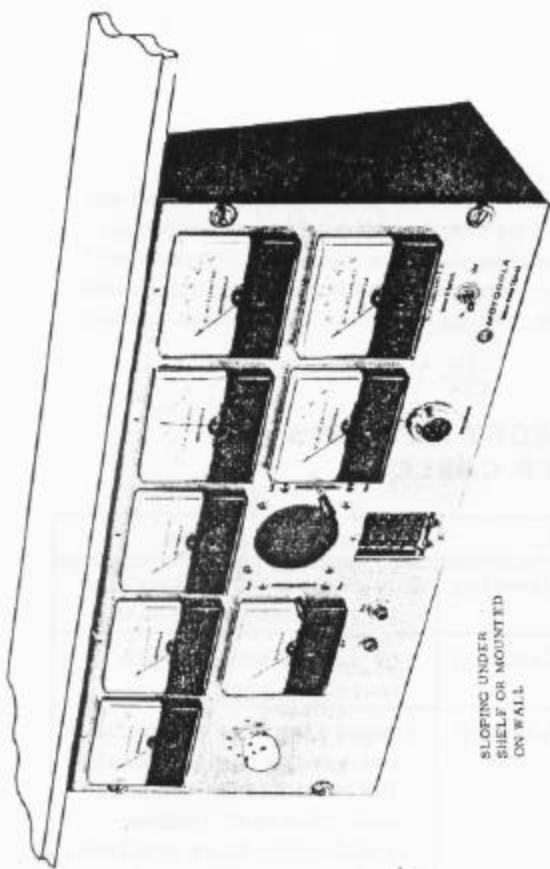
4. ACCESSORY METERING AND ADAPTER CABLES

MODEL	APPLICATION
SKN6012A Metering Cable	For radios with miniature 12-pin metering socket.
SKN6013A Metering Cable	For radios with 11-pin metering socket.
TKN6025A Adapter	Adapts standard 11-pin test set series metering cable (SKN6013A) to "Motrac" and "Motran" radios, solid-state base stations, and other equipment using 12-pin metering socket.
NKN6099A Adapter Cable	Adapts standard 11-pin test set series metering cable (SKN6013A) to PT 400 Series Portable Radios (using 9-pin metering socket).
TEKA-72A Cable Assembly (2 required)	For use with "Micor" radios.
TEKA-74 Micro-phone Adapter	Adapts "Micor" microphones to four-connector or circular receptacles.

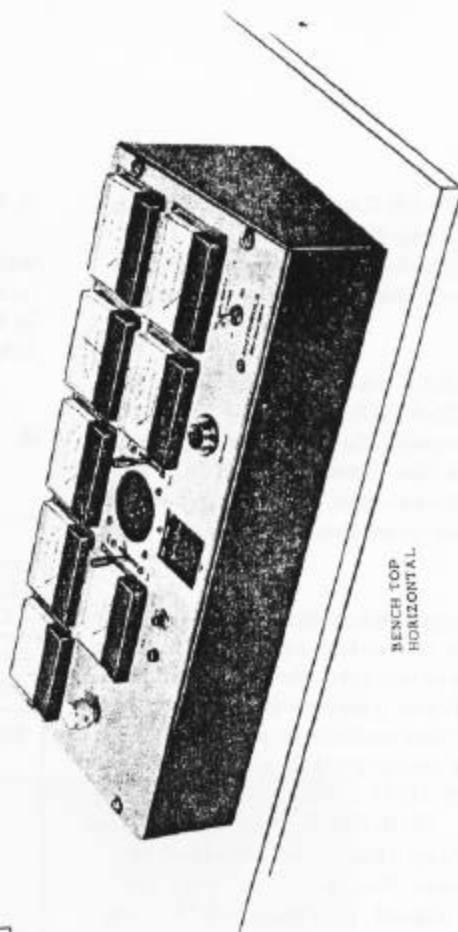
5. REFERENCE DIAGRAMS

TEK-5E Test Bench Metering
Panel Mounting Options
Detail FCEPS-16009

TEK-5E Test Bench Metering
Panel Schematic Diagram. . . PEPS-16010

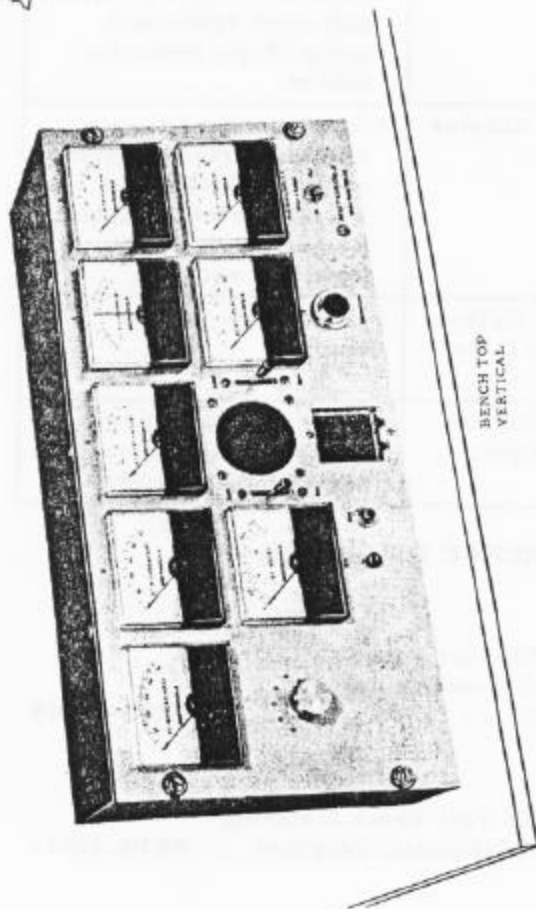


SLOPING UNDER
SHELF OR MOUNTED
ON WALL

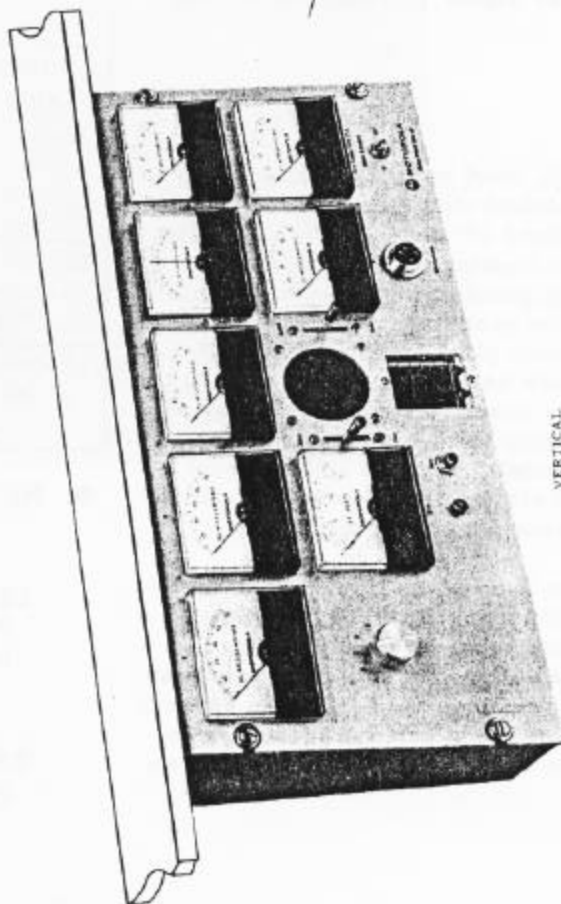


BENCH TOP
HORIZONTAL

FCEPS-16009-O



BENCH TOP
VERTICAL



VERTICAL
UNDER SHELF

TEK-5E Test Bench Metering Panel
Mounting Options Detail
Motorola No. FCEPS-16009-O
8/21/74-UP

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
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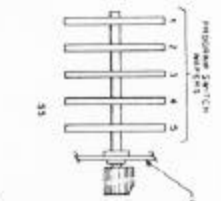
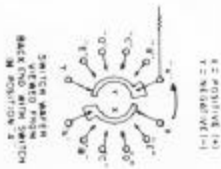
PARTS LIST

TEK-5E Test Bench Metering Panel

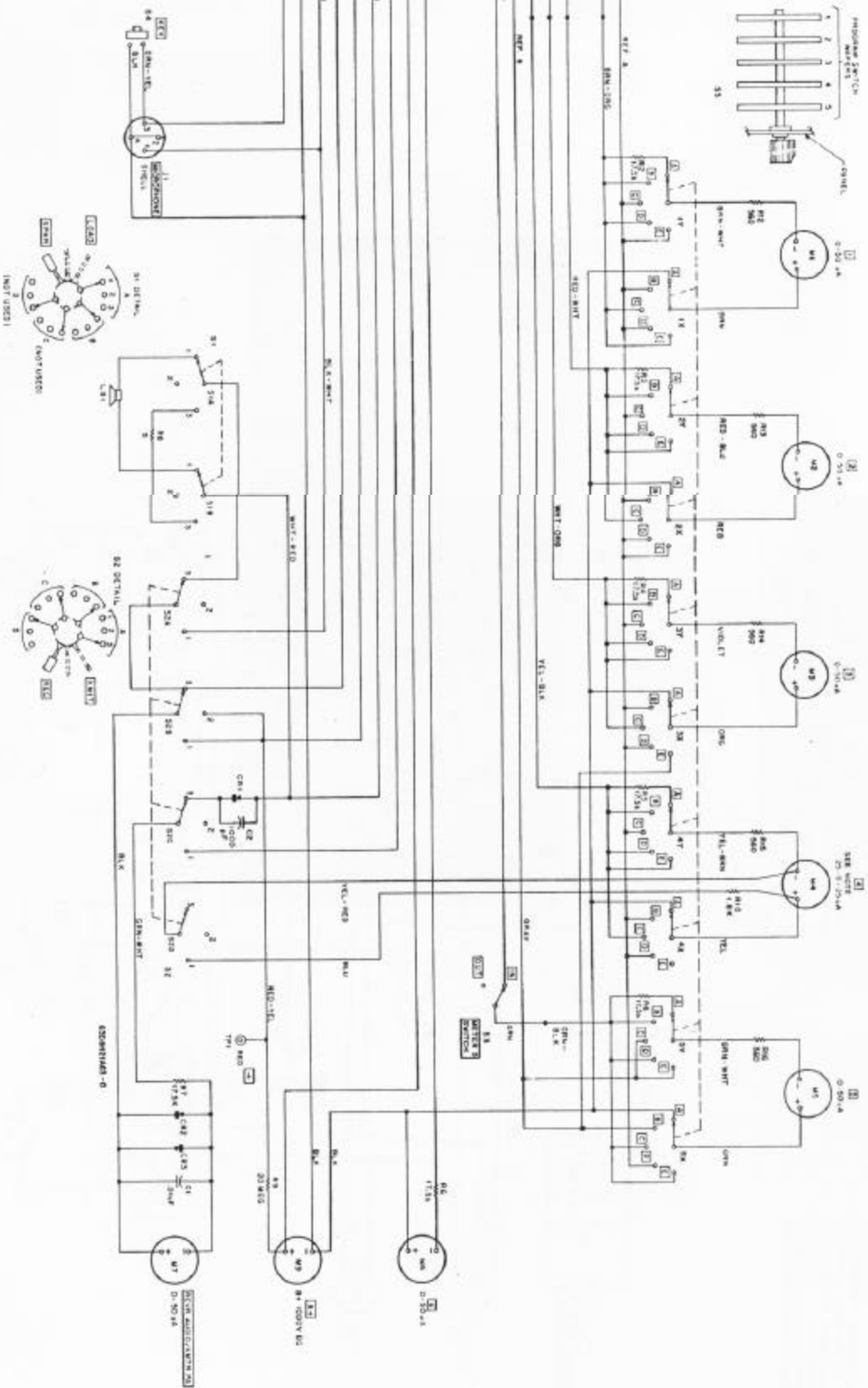
PL-3039-O

C1	21K801139	<u>CAPACITOR, fixed:</u> .01 uF +80-20%; 600 V
C2	21K865923	1000 pF ±10%; 500 V
CR1, 2, 3	48D82466H04	<u>SEMICONDUCTOR DEVICE,</u> <u>diode: (SEE NOTE)</u> silicon
J1	9K830418	<u>CONNECTOR, receptacle:</u> female; 4 cont; does not incl; 457699 LOCKWASHER: 13/16" internal 29S5279 LUG, soldering 7/8" internal dia. 2A482070 NUT, ring: knurled; 13/16-27 male; 20 cont
LS1	50B893245	<u>LOUDSPEAKER, magnetic:</u> PM dynamic; 2-1/2"; square; 3.2 ohms imp; does not incl 13A800326 GRILLE
M1, 2, 3, 5, 6, 7	72D82352F03	<u>METER,</u> Ammeter: 0-50 ua; int. res. 2000 ohms 5%
M4	72C82353F03	Ammeter: 25-0-25 uA; (zero center) int res 2000 ohms ±5%
M9	72D82352F04	Voltmeter 0-15 V; scale and 1000 V scale 2000 ohms ±5%
R1 thru 7	6K855337	<u>RESISTOR, fixed:</u> 17.5k ±2%; 1/2 W
R8	17K82839	3 ±10%; 5 W
R9	6K892455	20 meg ±2%; 2 W
R10	6D82672B57	2550 ±1%; 1/2 W
R11	6D83175C03	10k ±1%; 1/4 W
R12 thru 16	6K870438	560 ±1%, 1/2 W
S1, 2	40C82014C01	<u>SWITCH,</u> lever; 4 pole; 3 position
S3	40A80248	toggle; spdt
S4	40A881084	push: spst-no
S5	40B84253C67	rotary; 10 pole; 5 position
TP1	9K833983	<u>TEST POINT: female; single</u> cont; RED
NON-REFERENCED ITEMS		
	64D82355F04	PANEL: screened
	31-119066	TERMINAL BD: (for M1 thru M9)
	29-5321	LUG, solder: (for M1 thru M9)
	15E82175H01	HOUSING
	64D82997B01	PLATE (rear)
	55A82225F01	HANDLE, bat (2 req'd)
	36B84675F03	KNOB
	1P84253C65	ADAPTER: plug assembly (for "Micor" radio

NOTE: Replacement diodes must be ordered by Motorola
part number only for optimum performance.



NOTES:
 1. WHEN FUNCTIONAL "ANTI-REC." LEVER SWITCH IS IN "ANTI" POSITION, ALL A BEAMS SHOULD BE IN POSITION, WITH ALL "ANTI-REC." LEVER SWITCHES IN "ANTI" POSITION.
 2. THE "ANTI-REC." LEVER SWITCH SHOULD BE IN THE "ANTI" POSITION WHEN A "NOON" BEAM SET IS BEING TESTED EXCEPT WHEN CHECKING THE "ANTI-REC." LEVER SWITCH. IN THIS CASE THE SWITCH SHOULD BE IN THE "ANTI" POSITION.



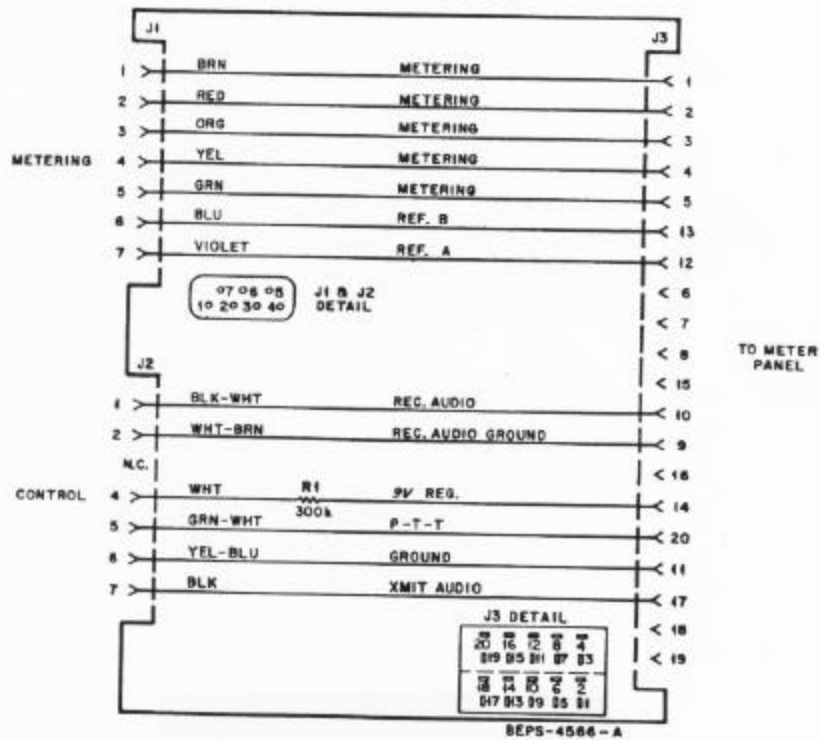
SELECTOR POSITION	TICKLE METER BEYOND POLARITIES				
	METER 1	METER 2	METER 3	METER 4	METER 5
1	24-1	24-2	24-3	24-4	24-5
2	24-1	24-2	24-3	24-4	24-5
3	24-1	24-2	24-3	24-4	24-5
4	24-1	24-2	24-3	24-4	24-5
5	24-1	24-2	24-3	24-4	24-5
6	24-1	24-2	24-3	24-4	24-5
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97	24-1	24-2	24-3	24-4	24-5
98	24-1	24-2	24-3	24-4	24-5
99	24-1	24-2	24-3	24-4	24-5
100	24-1	24-2	24-3	24-4	24-5

PARTS LIST SHOWN ON
 BACK OF THIS DIAGRAM
 IEX-5E Test Bench Metering Panel
 Schematic Diagram
 Motorola No. PEPS-16010-O
 8/21/74-UP

EPN-1577-0

1P84253C65 ADAPTER PLUG ASSEMBLY

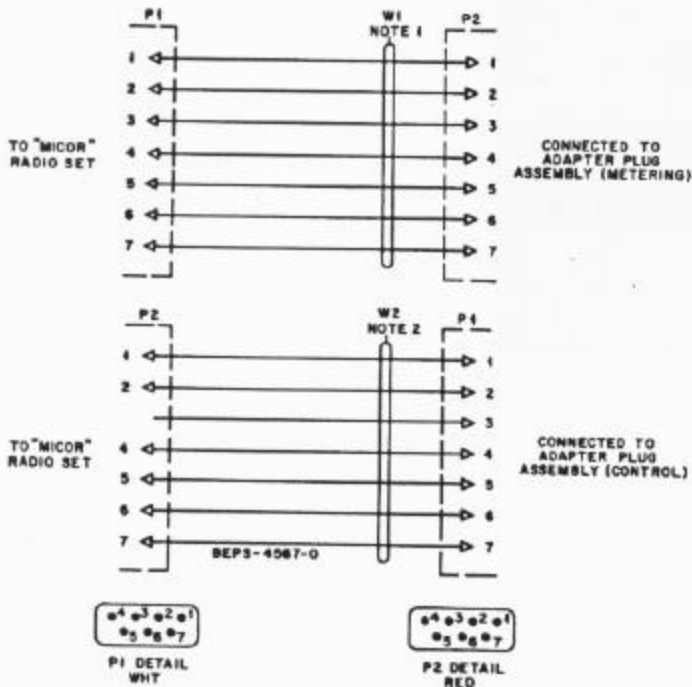
(TEK - 5 B/C WITH TEK-40 CONVERSION KIT
TO MICOR 7-PIN CABLES)



Adapter Plug Assembly

TEKA-72 CABLE ASSEMBLY

(ADAPTER PLUG TO RADIO)
NOTE 3



NOTES:

1. W1 METERING CABLE ASSEMBLY IS A 7-CONDUCTOR CABLE WITH A 7-PIN PLUG ON EACH END.
2. W2 SAME AS W1 EXCEPT PIN 3 CUT OFF ON RED HANDLE END.
3. THESE CABLES ARE NOT SUPPLIED AS PART OF THE TEK-40 CONVERSION KIT. THEY ARE AVAILABLE THROUGH LOCAL PARTS DEPOTS. THE CABLES USED WITH EITHER A TEK-17 OR TEK-37A CABLE KIT WILL INTERCHANGE WITH THESE CABLES.

EPS-4630-Q

TEKA-72 Cable Assemblies

Adapter Plug and Cable Assemblies

Wiring Diagrams

Motorola No. PEPS-4738-A

6/6/72-NPC