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Operators Manual

Tektronix

VM700A
Probe Adapter
063-0927-00

**Please check for change information at the rear
of this manual.**

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For further information, contact Tektronix, Inc., Corporate Offices, P. O. Box 1000, Wilsonville, OR 97070-1000. Phone: (503) 627-7111; TLX: 192825; TWX: (910) 467-8708; Cable: TEKWSGT.

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PROBE ADAPTER

(067-1429-00 to 067-1429-05)

PURPOSE

The Tektronix Probe Adapter accessory is designed to interface a Tektronix P6109 10X probe to the VM700A Video Measurement Set. This accessory is intended for use in manufacturing and repair applications when internal signals of an device under test are accessible only using a high-impedance probe. The Probe Adapter provides the impedance matching and signal gain needed to drive the 75Ω inputs of the VM700A.

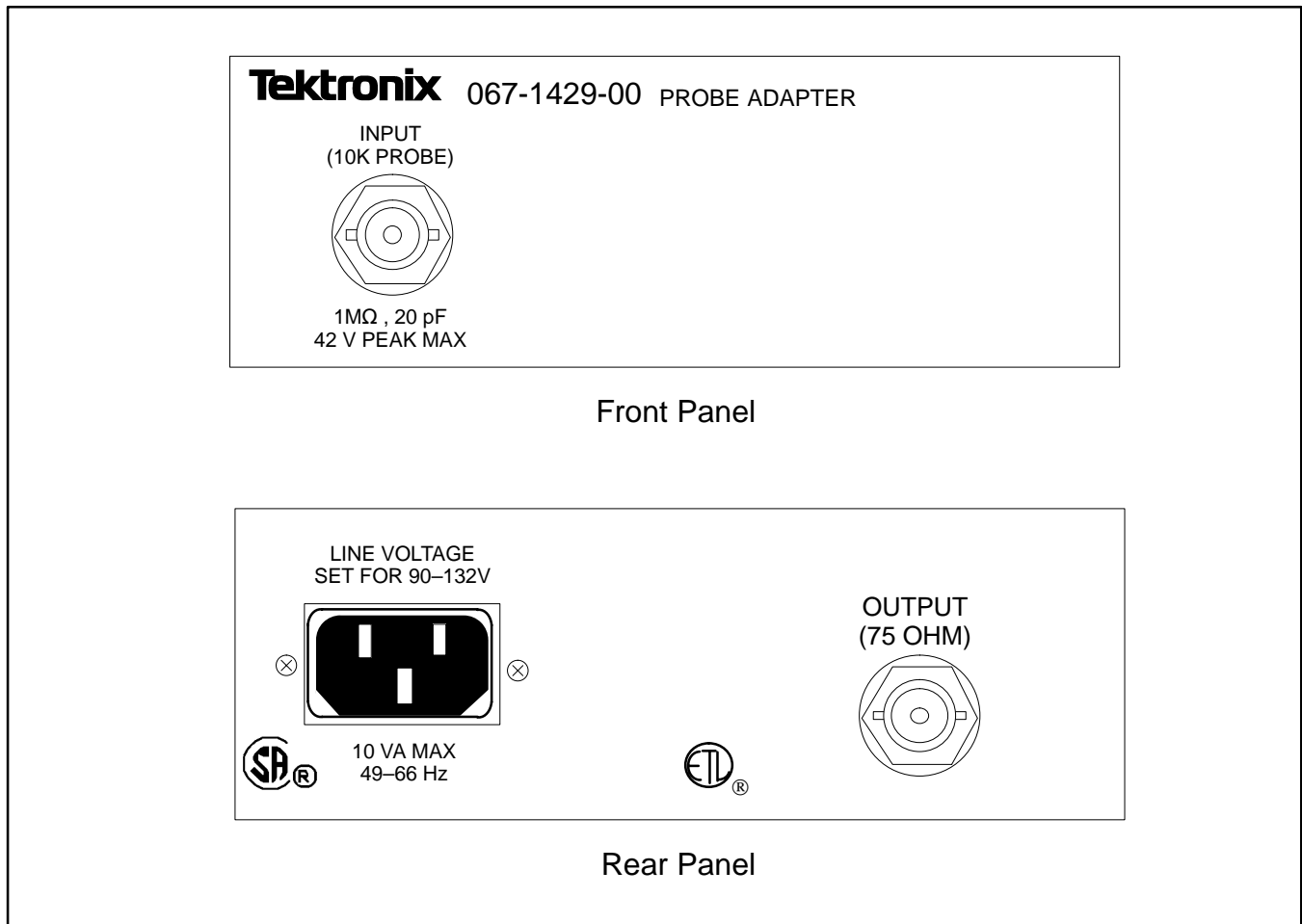


Figure 1. The VM700A Probe Adapter.

APPLICATION

When the Probe Adapter accessory is used, accurate measurement results are obtained by using the relative-to-reference feature of the VM700A's Measure Mode. The relative-to-reference feature subtracts out distortions introduced by the Probe Adapter, thereby providing measurement results that represent distortions introduced by the device under test. This feature removes the effects of the 0.3 degree differential phase and 0.3% differential gain that are inherent in the Probe Adapter, as well as any frequency response flatness errors.

Frequency response flatness from 10 Hz to 100 kHz is strongly dependent on the accuracy of the probe compensation. It is recommended that each probe be compensated to match the individual Probe Adapter that it will be used with. This adjustment should be made by observing the effect on the mid-field transition of a field square-wave signal.

Flatness in the 100 kHz to 10 MHz range varies a great deal between probe types. The Probe Adapter circuitry is optimized for the Tektronix P6109 10X probe, a common low-cost probe. Other 10X oscilloscope probes capable of driving a 1 M Ω , 20 pF input may be used, but they can degrade the flatness of the frequency response.

Two additional effects of making measurements through the Probe Adapter should be noted. First, the video signal-to-noise ratio is degraded from the VM700A's typical 82 dB to approximately 73 dB with the Probe Adapter. Secondly, the Probe Adapter introduces some output offset voltage and some minor tilt effects due to ac coupling. Both of these effects are normally eliminated by the clamping capabilities of the VM700A.

The 1 M Ω 10X probe connector provides a high impedance signal input that produces minimal circuit loading for the device under test. The output of the probe adapter is at 75 Ω to match the input of the VM700A. Use high quality 75 Ω BNC coaxial cable to connect to the VM700A input, and terminate the signal line with a 75 Ω termination at the last device in the signal path as shown in Figure 2.

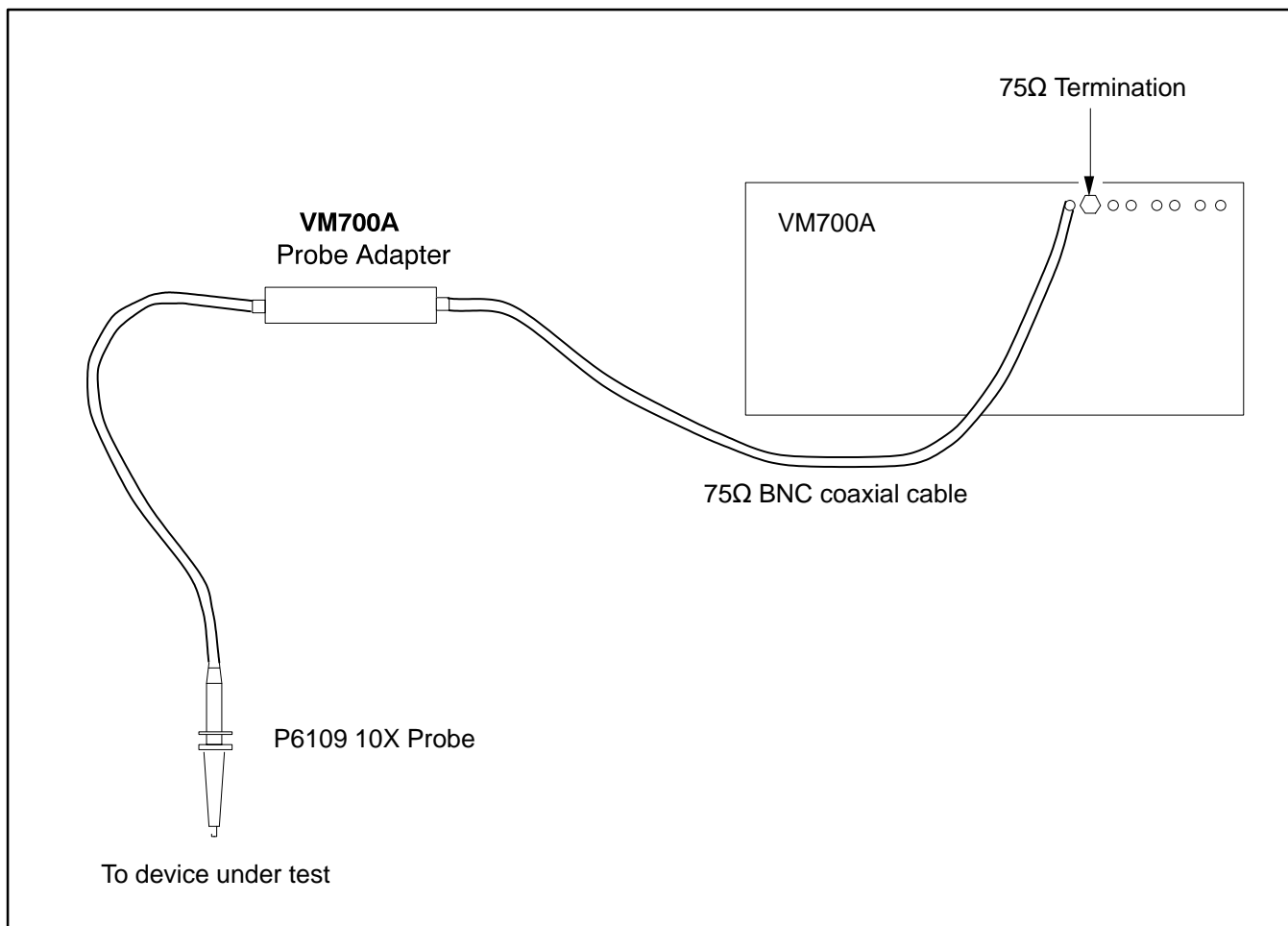


Figure 2. Typical hookup for the Probe Adapter.

SPECIFICATIONS

The specifications given in Table 1 for gain, frequency response, and tilt are with a P6109 probe that has been properly compensated for the Probe Adapter with which it is to be used.

Table 1
Specifications

Characteristic	Specification	Supplemental Information
Input Resistance	1 M Ω \pm 0.5%	
Input Capacitance	20 pF \pm 2 pF	Use a compensated probe
Gain	X1 \pm 2%	From 10X probe tip, into 75 Ω
Frequency Response		
10 Hz to 100 kHz	\pm 1%	
100 kHz to 10 MHz	\pm 1%	
Differential Gain	\leq 0.3%	Measured with 1910 or VM700A
Differential Phase	\leq 0.3 $^\circ$	Measured with 1910 or VM700A
Output Offset Voltage	\leq \pm 50 mV	\leq \pm 10 mV at 25 $^\circ$ C
Video SNR	\geq 70 dB rms	VM700A Noise Spectrum, un-weighted
Tilt (ac coupled)	\leq 1% on a 50 Hz square wave	\leq 5% when driven from 75 Ω
Output Impedance	75 Ω \pm 1%	
Line Voltage Range	90 to 132 Vac or 180 to 250 Vac	Internally set by a service person
Line Frequency Range	48 to 62 Hz	
Power Consumption	\leq 2W	

ELECTRICAL PARTS LIST

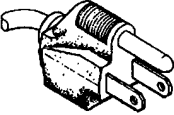
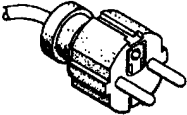
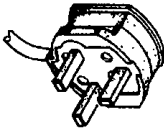

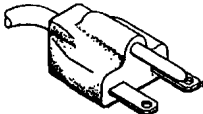
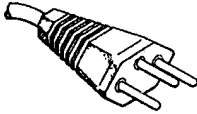
Table 2
Electrical Parts Lists

Circuit Reference	Quantity	Description	Part Number
C1,C2,C3,C4	4	Capacitor, 0.1 μ F	281-0775-01
C5,C6	2	Capacitor, 470 μ F	290-0919-00
C7,C8	2	Capacitor, 0.47 μ F	281-0563-00
C9,C10	2	Capacitor, 10 μ F	290-0804-01
C11,C17	2	Not installed	
C12	1	Capacitor, 4-40pF	281-0187-00
C14	1	Capacitor, 0.1 μ F	285-0526-00
C15	1	Capacitor, 4700pF	281-0772-00
C16	1	Capacitor, 10pF	281-0811-00
CR1	1	Diode Bridge	152-0585-00
CR2	1	Diode	152-0246-00
F1	1	Fuse 0.1 A, 250 V, 3AG Medium Blow	159-0171-00
F2, F3	2	Fuse, self-healing, RXE020, 0.2 A	307-1593-00
FL1	1	Line Filter	119-1946-00
J1	1	Connector, Wire Set	198-5783-00
J2,J4	2	Connector, BNC Female	131-3379-00
J3	1	Connector, Sq Pin Jumper	131-0993-00
Q1	1	Transistor, 151-1031-00	151-1031-00
R1	1	Resistor, 464.0K Ω	322-3449-00
R2	1	Resistor, 1.00M Ω	321-0481-07
R3	1	Resistor, 402.0 Ω	322-3155-00
R4,R6	2	Resistor, 200.0 Ω	322-3126-00
R5	1	Resistor, 374.0 Ω	322-3152-00
R7	1	Resistor, 75.0 Ω	322-3085-07
R8	1	Resistor, 1.15K Ω (0.1%)	321-0199-07
R9	1	Resistor, 7.32K Ω	322-3276-00
R10	1	Resistor, 50.5 Ω	321-1068-07
R11	1	Resistor, 100.0 Ω	322-3097-00
R12	1	Resistor, 50 Ω Variable	311-2226-00
R13	1	Resistor, 10.0 Ω	322-3001-00
T1	1	Transformer, 120-14ASIG	120-1905-00
TP1,TP2,TP3,TP4,TP5, TP6	6	Terminal, Test point	214-4085-00
U1	1	IC, MC7815	156-0312-00
U2	1	IC, MC7915	156-0527-00
U3	1	IC, CLC404	156-3962-00
VR1,VR2	2	Zener, 10V	152-0149-00
VR3,VR4	2	Zener, 6.2V	152-0166-00

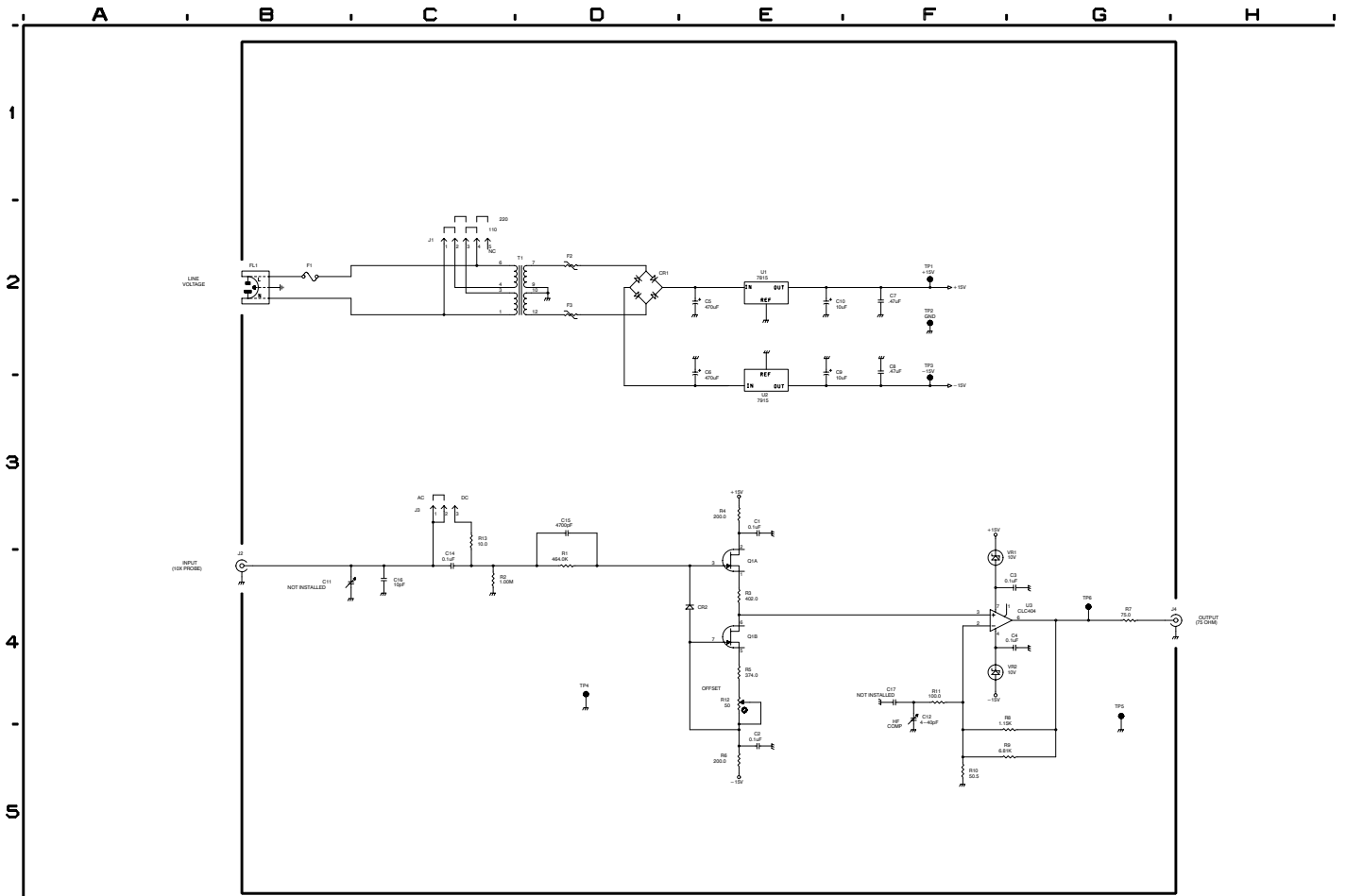
INTERNATIONAL POWER CORDS

Power cords are provided to match a variety of mains connections throughout the world. See Table 3 for plug configurations, typical use, and Probe Adapter part number to order. A separate part number has been provided to permit the customer to order the Probe Adapter with the power cord needed for their application. Probe Adapters ordered for countries having 220V AC power are internally set for 220V operation and have a label affixed on the rear panel to that effect.

Table 3
Probe Adapter Part Numbers

Plug Configuration	Typical Use	Probe Adapter Part Number
	United States 115V	067-1429-00
	European 220V	067-1429-01
	United Kingdom 240V ^a	067-1429-02
	Australian 240V	067-1429-03
	North American 240V	067-1429-04
	Switzerland 220V	067-1429-05

^a A 6 Ampere, type C fuse is also installed inside the plug of the United Kingdom power cord.



VM700A PROBE ADAPTER

PROBE ADAPTER 