

INSTRUCTION MANUAL

Tillhör service

DUALTRACKING POWER SUPPLY

PS 502

Serial Number _____



WARRANTY

All TEKTRONIX instruments are warranted against defective materials and workmanship for one year. Any questions with respect to the warranty should be taken up with your TEKTRONIX Field Engineer or representative.

All requests for repairs and replacement parts should be directed to the TEKTRONIX Field Office or representative in your area. This will assure you the fastest possible service. Please include the instrument Type Number or Part Number and Serial Number with all requests for parts or service.

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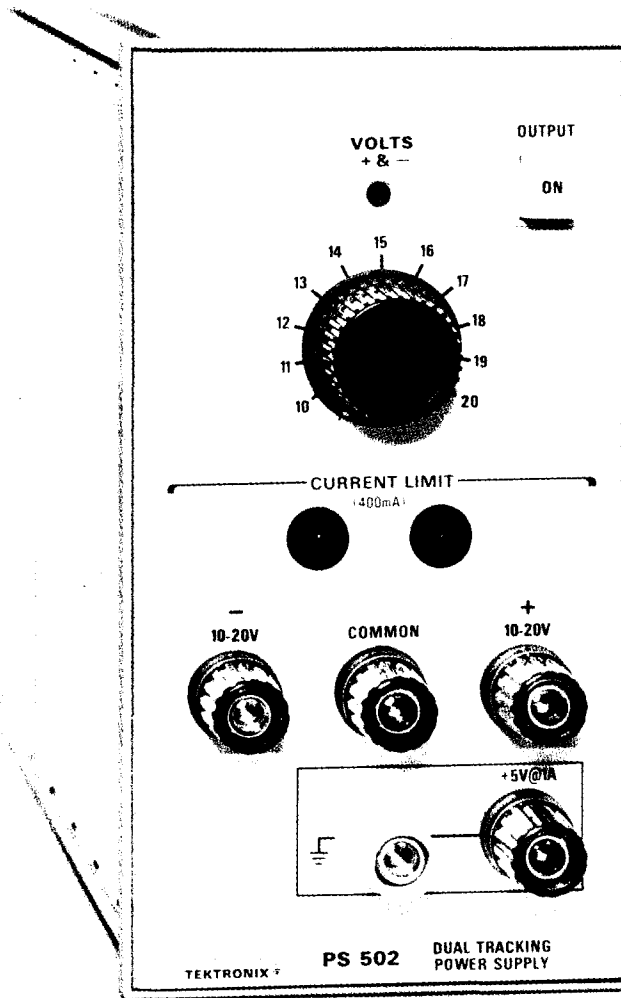
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OPERATING INSTRUCTIONS

DESCRIPTION

The PS 502 is a floating 10 to 20 V DC dual-tracking, constant-voltage, current-limiting power supply that plugs into a TM 500 Series Power Module. The supply is designed for conveniently powering complementary and linear integrated circuits such as operational and differential amplifiers as well as differential comparators. A ground-referenced +5 V auxiliary supply is also included which is suitable for bipolar logic, light-emitting diodes, incandescent displays and similar applications. With the floating supply available for powering discrete interface circuits and level shifting, the PS 502 can be used for many digital/analog applications.

The + and – outputs from the dual floating power supplies are continuously variable by a single front-panel control. The supplies provide ± 10 to 20 VDC with respect to the common terminal but can also provide 20 to 40 VDC by connecting across the + and – terminals. Either terminal may be grounded or floated to 350 V (DC + peak AC). Each supply has a fixed current limit of 400 mA.

The presence and variability of output voltage is verified by a voltage indicator light on the front panel. The brightness of this light varies with output voltage.

Hard current-limiting is indicated when the CURRENT-LIMIT indicator lights and the VOLTS + & – indicator dims.

OPERATION

Preparation

The PS 502 is calibrated and ready for use when received. It is designed to operate in any compartment of a TM 500 Series Power Module. Refer to the Power Module Instruction Manual for line voltage requirements and Power Module operation.

NOTE

It is recommended that the Power Module be turned off before inserting or removing the PS 502. Arcing at the connector terminals can reduce connector life. However, no internal damage will result if the supply is inserted into a live Power Module.

1. Install the PS 502 by aligning the upper and lower rails of the plug-in with the Power Module tracks and inserting until the plug-in panel is flush with the Power Module panel. To remove, pull the release latch to disengage the PS 502 from the Power Module.

2. Press the OUTPUT button to apply power to the PS 502. Observe that the VOLTS + & – indicator light comes on (the light will be very dim at low voltages).

3. Refer to the Front-Panel Controls, Indicators, and Connectors description on the Controls and Adjustments foldout page at the rear of this manual.

NOTE

Before using the PS 502 for the first time read the Operating Considerations in this section regarding certain precautions and proper techniques for connecting various loads.

Single (10 V to 20 V) or Combined (20 V to 40 V) Supply Operation

1. Set the VOLTS + & – control to 10.

2. Connect the load between the COMMON terminal and the + or – terminal for 10 V to 20 V operation or between the + and – terminals for 20 V to 40 V operation. Adjust the VOLTS + & – control for the desired output.

Dual (Complementary) Supply Operation

1. Set the VOLTS + & – control to 10.

2. Connect the COMMON terminal of the PS 502 to a zero-reference or common point and the + and – terminals to appropriate points in the load. Adjust the VOLTS + & – control for the desired output.

Operating Instructions—PS 502

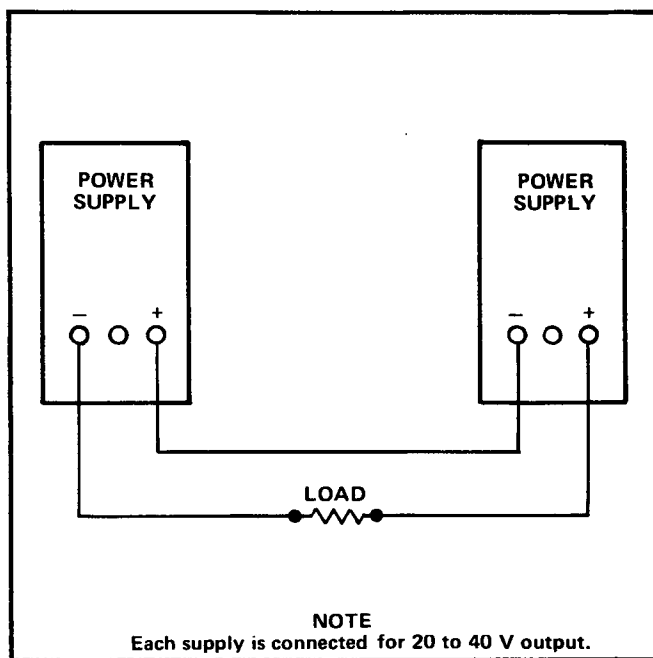


Fig. 1-1. Supplies series-connected to provide 80 V, 400 mA maximum output.

Series-Connected Supplies

The outputs of two or more PS 502's can be connected in series as shown in Fig. 1-1 to obtain an output voltage equal to the sum of the output voltages from each supply. Each supply must be adjusted individually to obtain the desired output voltage.

NOTE

The PS 502 has internal diodes connected across the output to protect the series-connected supplies against reverse polarity if the load is shorted, or one of the supplies is not on.

Parallel-Connected Supplies

The outputs of two or more PS 502's can be connected in parallel as shown in Fig. 1-2 to obtain an output current equal to the sum of the output currents from each supply (800 mA maximum).

The + and - supplies are internally connected in series. Therefore, the + and - supplies cannot be externally connected in parallel to obtain an output current equal to the sum of the currents from each supply.

One PS 502 should be set for the desired output voltage and the other for a slightly higher voltage. The

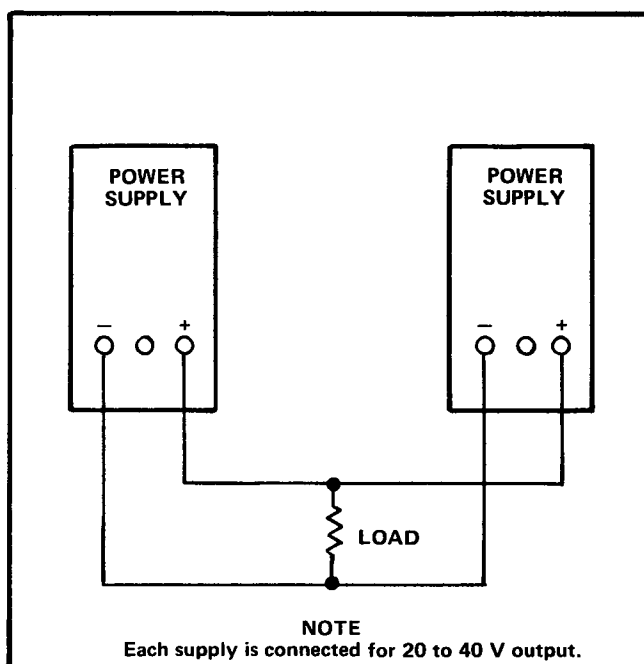


Fig. 1-2. Supplies parallel-connected to provide 40 V, 800 mA maximum output.

supply set for the desired voltage will then become a constant voltage source, while the supply with the higher voltage output becomes a current source (due to automatic crossover) which results in their output voltage decreasing to that of the supply with the lowest output voltage.

OPERATING CONSIDERATIONS

Overheating

The PS 502 is designed to operate at an ambient temperature from 0°C to +50°C. However, when operating several power supplies in a multi-plug-in Power Module, especially at low output voltages, or when operating close to other heat-producing equipment, internal temperature may exceed safe limits and actuate a thermal cutout in the Power Module. Refer to the Power Module Instruction Manual for more complete information.

Load and Monitor Connections

Improper connections between the power supply output and the load(s) and/or monitoring device(s) are a common cause of errors. Multiple loads or monitoring devices must be connected directly to the output terminals with separate pairs of leads as shown in Fig. 1-3. Avoid using clip leads, since their contact resistance can exceed the output impedance of the PS 502 and cause significant measurement error.

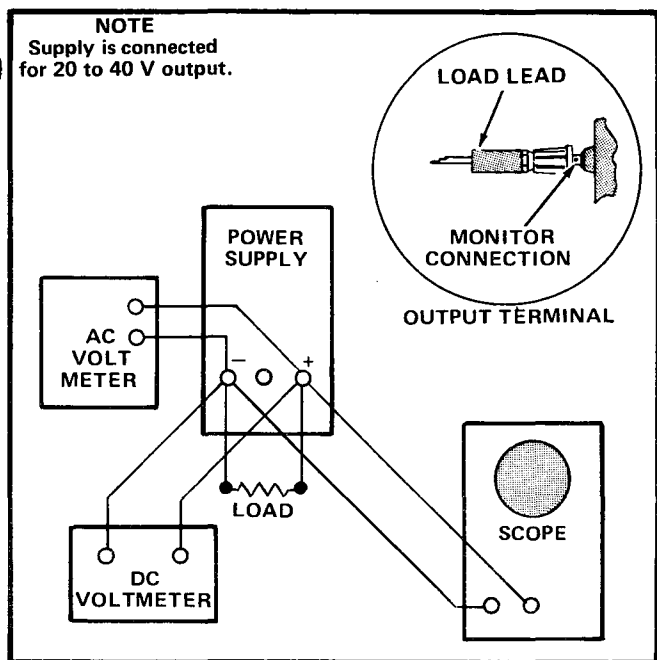


Fig. 1-3. Monitor and load connections.

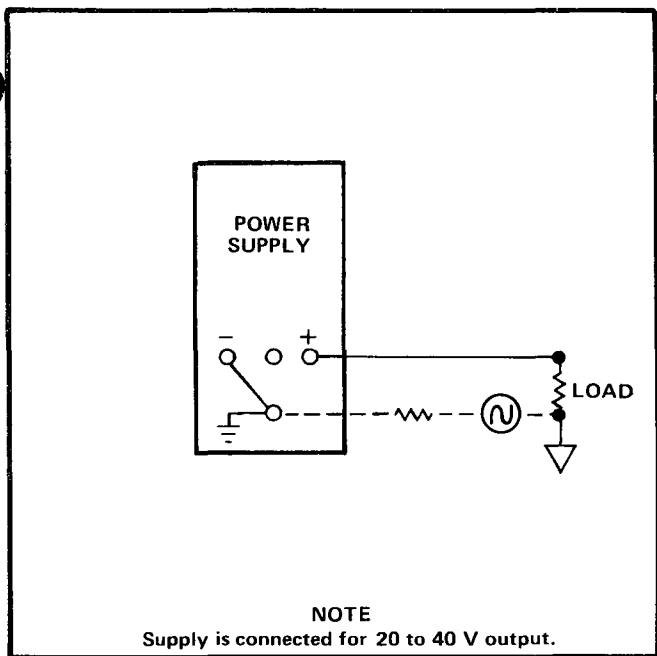


Fig. 1-4. Ground loop created by grounded remote load.

Grounded and Floating Operation

The PS 502 is a "floating" supply since no internal connections are made to either the chassis or ground. The supply can thus be used as a positive or negative supply by simply connecting between the COMMON and the + or -

output terminal. However, there may be undesirable effects caused by grounding the supply to the chassis while the load is grounded at some point removed from the supply chassis. For example, if a remote load is connected as shown in Fig. 1-4, ground currents containing the power line frequency could result and create excessive noise and ripple in series with the load. Thus, floating operation is recommended to insure against problems caused by undesirable ground currents.

Reverse Current Loading

In some bias supply and digital circuitry applications the load might behave as a current source for part of its operating cycle. Since the output circuit of a series regulated supply is unidirectional, current will not pass in the opposite direction except through undesirable paths. The internal reverse-current diodes conduct only when the PS 502 terminal voltage reverses and therefore will not work when the voltage is correctly polarized. Connecting a shunt resistor (R_s) as shown in Fig. 1-5 provides an external reverse current path so the power supply sources or delivers current only.

Overvoltage

The PS 502 is not protected from overvoltage conditions. Component failure in the PS 502 could result in load damage if external protection is not provided. Likewise, if the load (or other instruments connected to the load) produce a voltage across the PS 502 terminals which is the same polarity but of greater amplitude, damage may result depending on the amount of overvoltage and the impedance of the load.

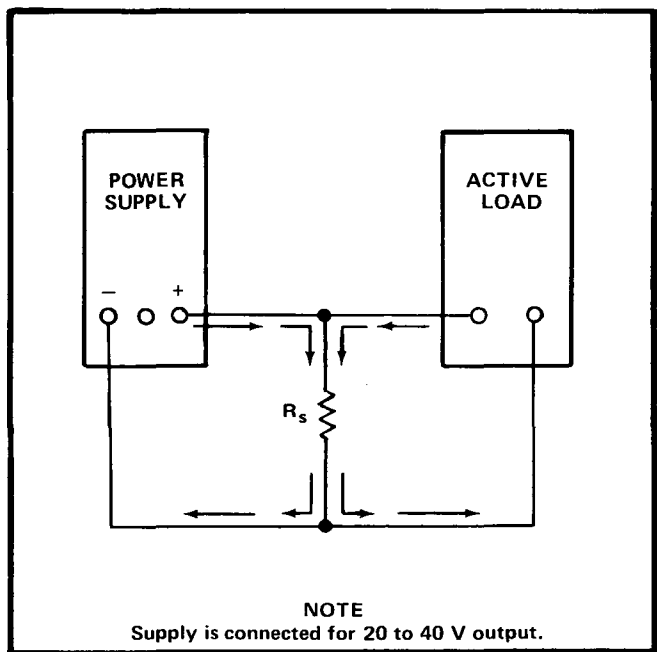


Fig. 1-5. Reverse current shunt (R_s) with active load.

Operating Instructions—PS 502

ELECTRICAL CHARACTERISTICS

Performance Conditions

The electrical characteristics are valid only if the instrument has been calibrated at an ambient temperature between +20°C and +30°C and is operating at an ambient temperature between 0°C and +50°C unless otherwise noted.

20 V Floating Supplies

OUTPUTS: 10 to at least 20 VDC with respect to the common terminal or 20 to 40 VDC across the + & - terminals. Outputs continuously variable by a single front-panel control. Both supplies insulated for 350 V (DC + peak AC) above ground. Fixed current limit of at least 400 mA.

MINIMUM RESOLUTION: 7 mV.

LOAD REGULATION: Within 50 mV with a 400 mA load change.

LINE REGULATION: Within 5 mV for a ±10% line voltage change.

RIPPLE AND NOISE: 3 mV P-P or less. 1 mV RMS or less.

TEMPERATURE COEFFICIENT: 0.02%/°C or less.

STABILITY: 0.1% + 5 mV or less drift in 8 hours at constant line, load and temperature.

TRANSIENT RECOVERY TIME: 50 μs or less for a constant voltage to recover within 10 mV of nominal output voltage after a 400 mA change in output current.

+5 V Ground-Referenced Supply¹

OUTPUT (+20°C to +30°C): 4.8 VDC to 5.2 VDC at 1 A.

LOAD REGULATION: Within 100 mV with a 1 A load change.

LINE REGULATION (+20°C to +30°C): Within 50 mV for a ±10% line voltage change.

RIPPLE AND NOISE (1 A): 5 mV P-P or less. 100 μV RMS or less.

STABILITY: 0.5% or less drift.

OVERLOAD PROTECTION: Automatic current limiting and over-temperature shutdown.

¹For additional information refer to National Semiconductor Corp. specifications for the LM309K 5 V Regulator Integrated Circuit.

THEORY OF OPERATION

Introduction

The PS 502 employs a monolithic dual-tracking regulator integrated circuit U20 to provide the + and - regulated outputs. Integrated circuit U20 is designed so that the + regulator tracks the - regulator but not the reverse. Consequently, both regulator outputs are varied simultaneously by the front-panel VOLTS + & - control which is connected to the - regulator only. The feedback circuit for both regulators is inside U20.

Since both supplies operate identically except for the voltage selecting circuitry in the - supply, this discussion will concern the - supply only. Refer to the simplified block diagram in Fig. 2-1 to aid in understanding the operation of the PS 502.

Constant Voltage Operation

The rectifier circuit supplies -33 V to the emitter of the series-pass transistor (located in the Power Module) and also to R30. Current through R30 supplies the - regulator through pin 8 of U20. The voltage drop across R30 is applied as bias to the base-emitter junction of the series-pass transistor which supplements the current available from pin 10 of U20. Both currents pass through the load.

The voltage drop across the load is applied across divider R37/R40/R43/R44. The voltage at the junction of R40/R43 is applied to pin 14 of U20 which is the inverting terminal of the error amplifier inside U20 (also inside U20, the non-inverting reference is established at exactly -6.3 V). If the voltage at pin 14 increases, due to an

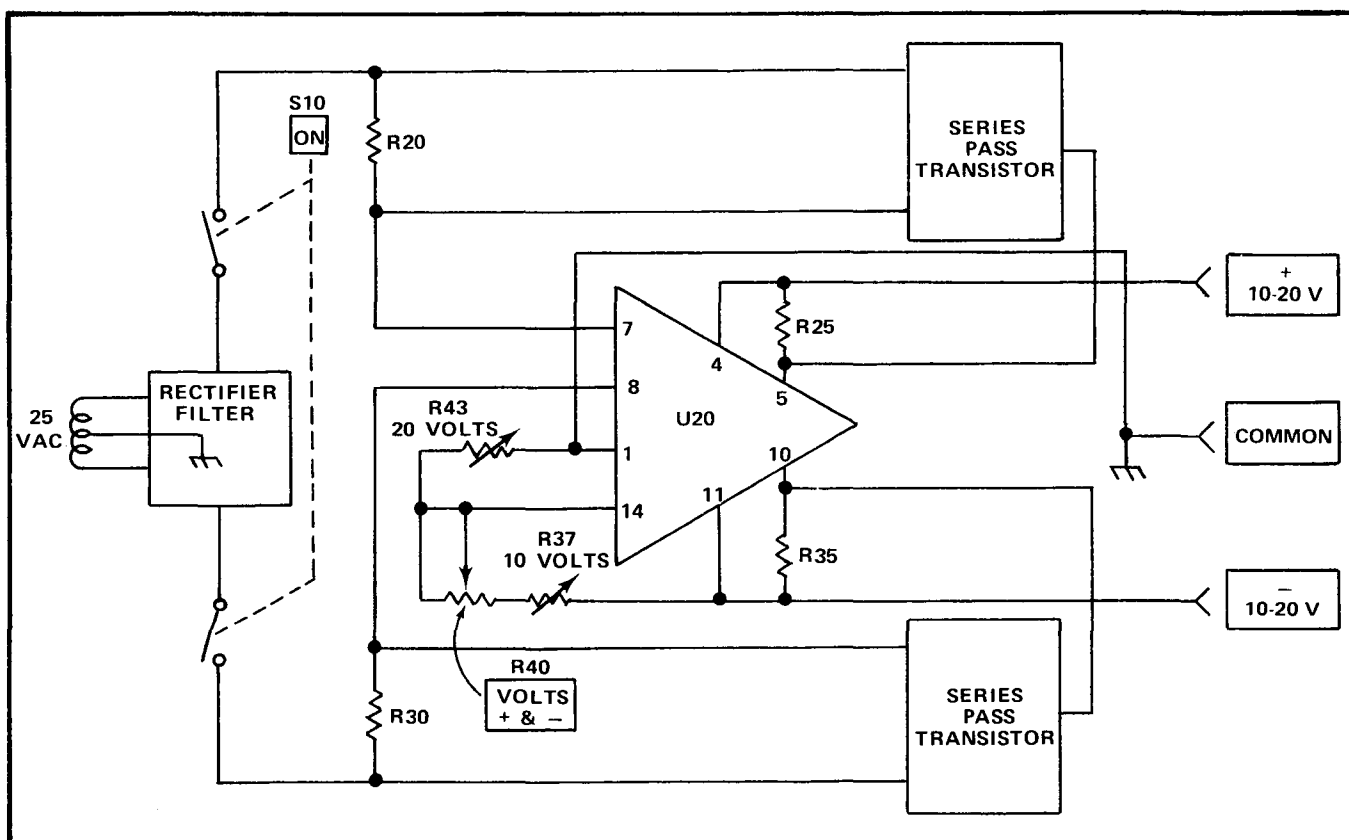


Fig. 2-1. Simplified block diagram.

Theory of Operation—PS 502

increase in the load or the VOLTS + & - control setting, U20 reduces its output current which reduces the voltage drop across R30. The series-pass transistor bias increases which decreases the output current and, subsequently, the voltage across the load until a balance is reached at -6.3 V. The reverse is true if the voltage at pin 14 decreases due to a decrease in the load or the VOLTS + & - control setting. The output voltage changes linearly with R37 + R40. R37 is adjusted to provide the 10 V minimum output and R43 is adjusted to provide the 20 V maximum output.

Current Limited Operation

Current overload is sensed by R35. The voltage drop across R35 is applied through pin 11 to the base-emitter junction of a transistor inside U20. Resistor R35 normally has no effect until approximately 0.6 V is dropped across it (approximately 400 mA of output current), then the transistor inside U20 turns on and draws current from the base of an output transistor also inside U20. The output current from pin 10 of U20 is shut off and the series-pass transistor limits the output current at approximately 400 mA.

A current overload condition in the - supply is indicated by the illumination of front-panel light-emitting diode CR37. Zener diode VR31 provides a separate -11 V

reference for CR37 which is independent of the regulated output. When the - supply output is within the normal 10 to 20 V range, CR36 and CR37 will not conduct due to reverse or inadequate bias. However, when hard limiting occurs and the - supply output drops below 10 V, CR36 and CR37 conduct in the forward direction. Light-emitting diode CR37 lights and indicates that the - supply has reached a current overload condition. (Note: since the + supply follows the - supply, the + supply output voltage also drops and its associated CURRENT LIMIT indicator also lights even though its current load may be in the normal range.) CR36 serves as a protection diode for CR37 which has a low reverse breakdown voltage.

Stabilization

RC combination C33/R33 shunts the series-pass transistor to prevent oscillation. C34 between pins 11 and 12 of U20 provides stabilization.

+5 V Ground-Referenced Supply

The Power Module supplies +9 V through pins 2A and 3A on the plug-in rear connector to pin 1 and 3 of integrated circuit U2. U2 provides a regulated +5 V output limited at 1 ampere from pin 2 and 3 to output connectors J1 and J2 on the front panel.

SERVICING INFORMATION

Contents

This section of the manual contains information necessary to service the PS 502 . Adjustment procedures are provided on the Controls and Adjustments foldout page with supporting illustrations that show internal adjustment locations and describe front-panel control functions. Also included is the electrical parts list with an illustration on the Component Location foldout page that shows the physical location of components on the etched circuit board with an alpha-numeric grid keyed to the electrical parts list (see Grid Loc column in the parts list). A schematic diagram is located opposite both the electrical parts list and the circuit board illustration to further facilitate the location of components. Table 3-1 on the inside of the Controls and Adjustments foldout page lists the rear connector pin assignments.

Mechanical parts are listed at the rear of this section with an exploded view of the instrument. A list of standard accessories and a carton assembly drawing are on the back of the exploded view foldout page.

Maintenance

General system maintenance procedures are provided in the Power Module instruction manual, i.e., preventive maintenance, troubleshooting aids, part removal and replacement procedures, parts ordering information, etc.

Service Available

Tektronix, Inc. provides complete instrument repair and calibration at local Field Service centers and at the Factory Service Center. Contact your local TEKTRONIX Field Office or representative for further information.

ADJUSTMENT PROCEDURE

Introduction

The adjustment procedure on the Controls and Adjustments foldout page is intended to return the circuits of the PS 502 within their designed operating capabilities. Adjustment is generally required after a repair has been made, or after long time intervals in which normal aging of components may affect instrument accuracy. Before making adjustments, verify instrument operation by performing the procedures described under Operation in Section 1.

Test Equipment Required

The following test equipment and accessories or the equivalent, are required for complete adjustment of the PS 502 . Specifications given for the test equipment are the minimum necessary for accurate adjustment. Therefore, some of the specifications listed may be less rigorous than the actual performance capabilities of the test equipment. All test equipment is assumed to be correctly calibrated and operating within their listed specifications.

If other test equipment is substituted, control settings or set-up may need altering to meet the requirements of the equipment used. Detailed operating instructions for the test equipment are not given in this procedure. Refer to the instruction manual for the test equipment if more information is needed.

1. DC Voltmeter. 10 V to 20 V within 3%. For example, Triplett Model 630 NA.

2. Plug-in extension for the 5000-Series Oscilloscope System. TEKTRONIX Calibration Fixture 067-0645-00 (not mandatory for this procedure).

3. DC Milliammeter. 400 to 450 mA within 3%. For example, Triplett Model 630 NA (necessary only if integrated circuit is replaced, see step 6 through 8 in the adjustment procedure).

Preliminary Considerations

Read the Operating Considerations in Section 1 before adjusting the PS 502 .

This instrument should be adjusted at an ambient temperature between +20°C and +30°C (+68°F and +86°F) for best accuracy.

Do not preset internal controls unless they are known to be significantly out of adjustment, or unless repairs have been made in the circuit. In these instances, the internal adjustments can be set to midrange.

Servicing Information—PS 502

Preparation

1. Remove the cover from the left side of the PS 502 and, if necessary, blow off accumulated dust with low-pressure compressed air.

2. Insert the PS 502 into the left compartment if a multi-plug-in Power Module is used. (Note: It may be convenient to use the plug-in extender, part no. 067-0645-00, to make internal adjustments without inserting the PS 502 into the Power Module. However, it is not mandatory for this procedure.)

3. If the extender is not used, remove the Power Module cabinet cover to gain access to the PS 502 internal adjustments.

4. Apply power to the Power Module and press the OUTPUT button on the PS 502 .




5. Refer to the Controls and Adjustments foldout page in this section for internal adjustment procedures.

NOTE

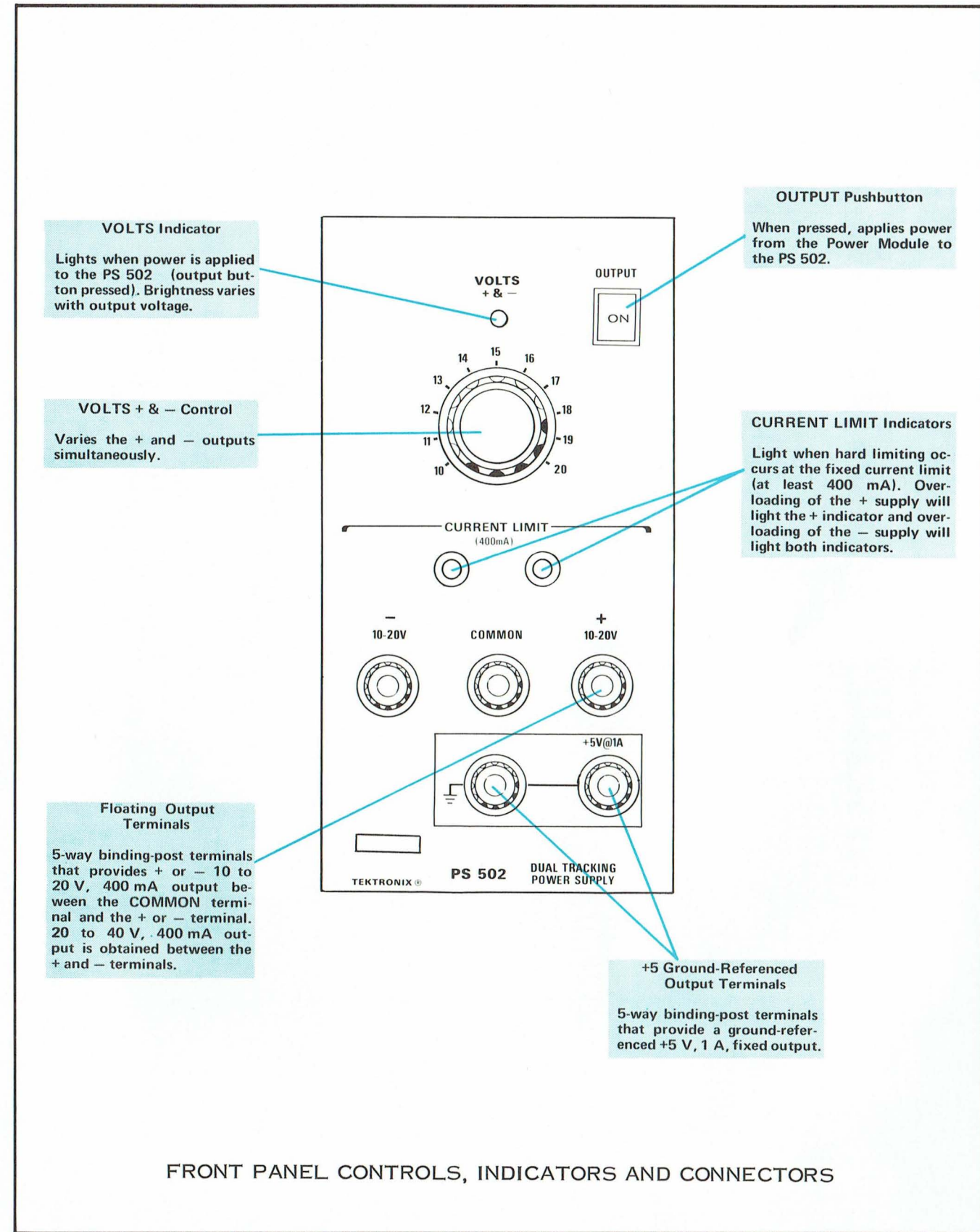
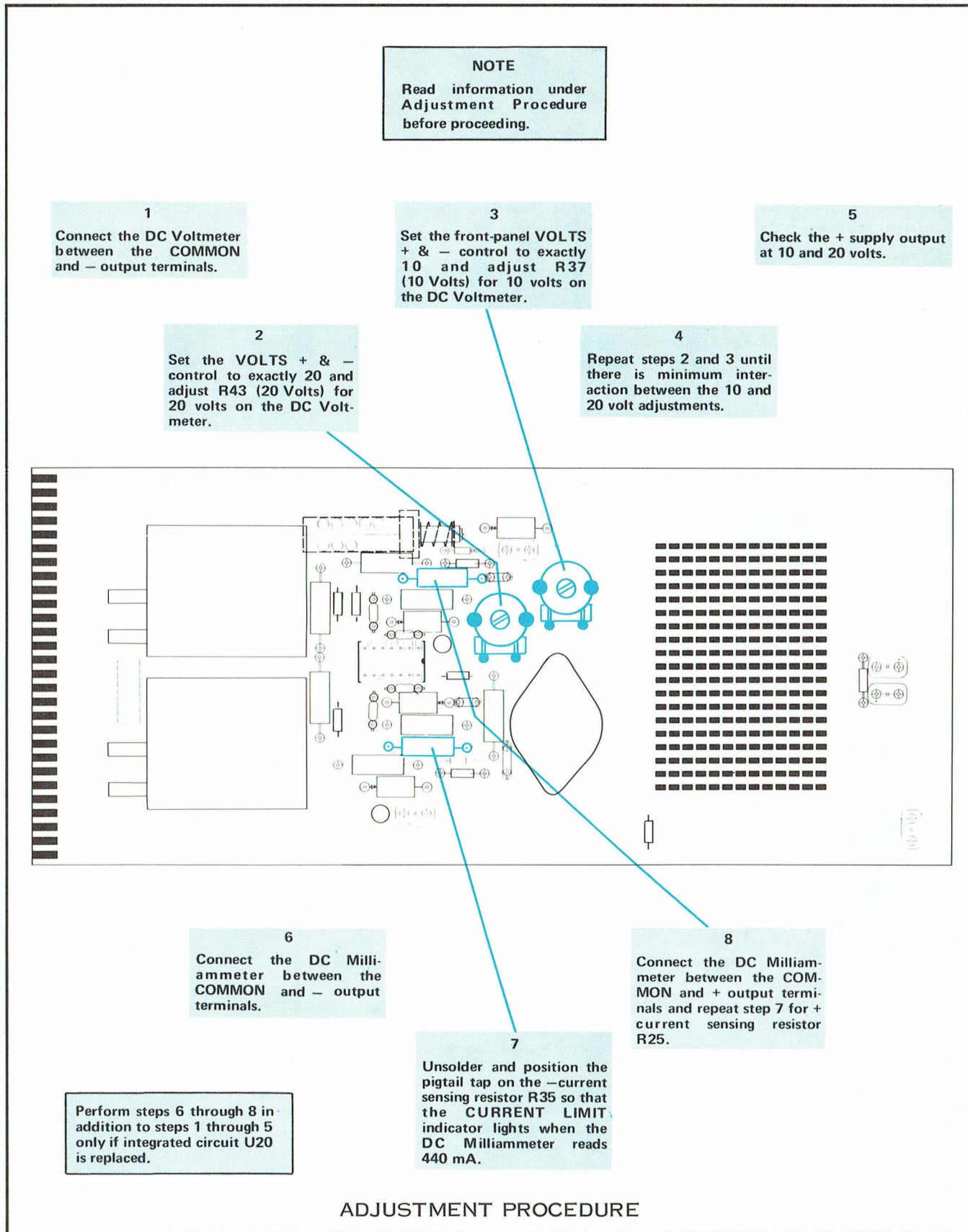
If a malfunction is detected during adjustment, refer to system maintenance in the Power Module instruction manual for troubleshooting techniques, parts removal and replacement procedures, parts ordering information, etc.

TABLE 3-1

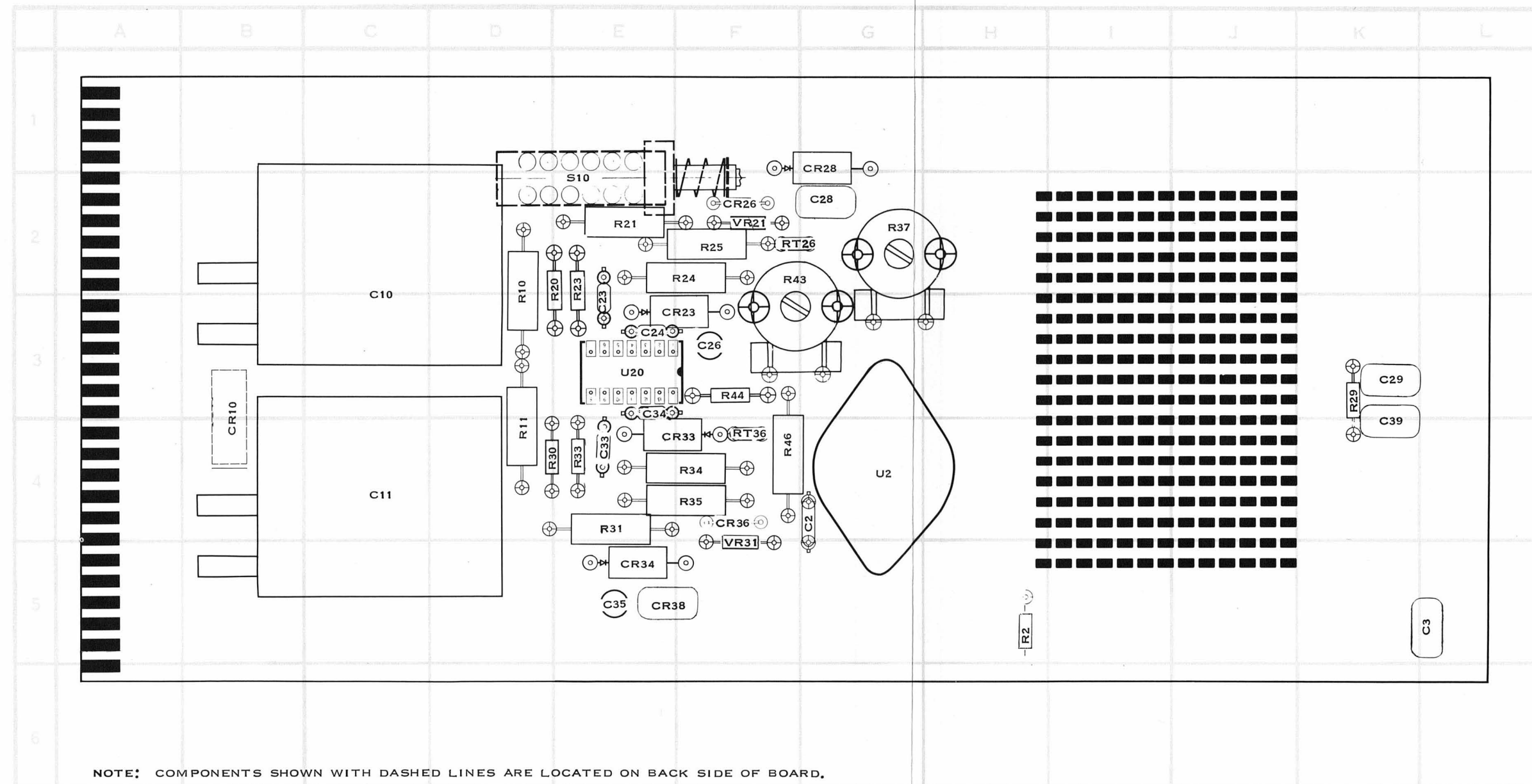
Rear Connector Pin Assignments

Pin No.	Left (A) ¹	Right (B) ¹
25 through 28	No Connection	No Connection
24	Reference Common	Reference Common
23	+Sense (R25)	-Sense (R35)
22	+Output (J20)	-Output (J30)
14 through 21	No Connection	No Connection
13	25 V RMS 	25 V RMS
12	+30.5 V Unregulated	+30.5 V Unregulated
11	Base of Series-Pass Transistor	Collector of Series-Pass Transistor
10	Emitter of Series-Pass Transistor	Transformer Shield
9	30.5 V Unregulated Common	30.5 V Unregulated Common
8	-30.5 V Unregulated	-30.5 V Unregulated
7	Emitter of Series-Pass Transistor	Collector of Series-Pass Transistor
6	Base of Series-Pass Transistor	No Connection
5	17.5 V RMS 	17.5 V RMS
3 and 4	9 V Unregulated Common	9 V Unregulated Common
2	+9 V Unregulated	+9 V Unregulated
1	25 V RMS 	25 V RMS

¹ The left (A) and right (B) sides of the rear connector are as viewed from the front of the plug-in. Pins are numbered from the bottom of the connector.



+



COMPONENT LOCATIONS

+

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ELECTRICAL PARTS LIST

Replacement parts should be ordered from the Tektronix Field Office or Representative in your area. Changes to Tektronix products give you the benefit of improved circuits and components. Please include the instrument type number and serial number with each order for parts or service.

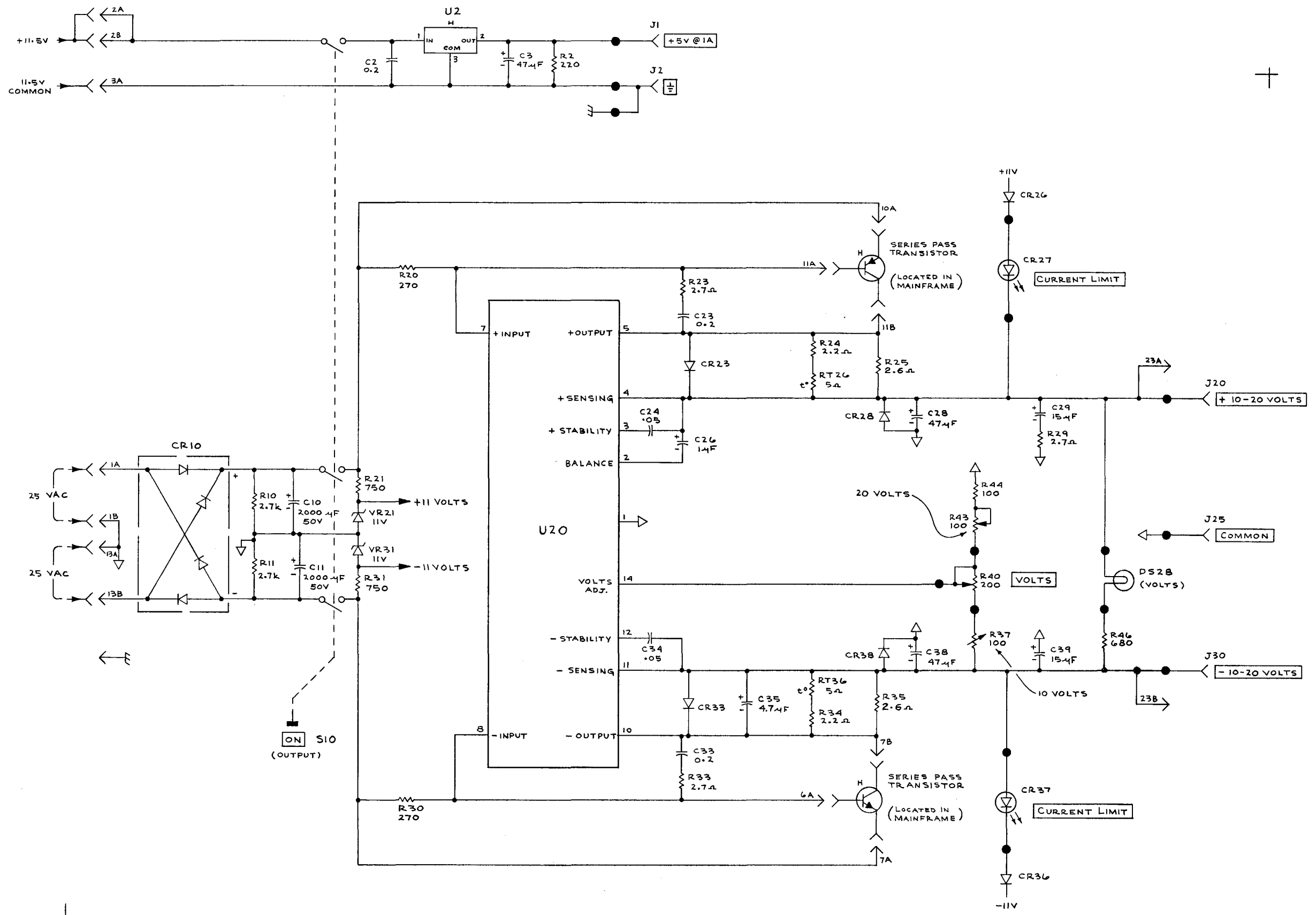
ABBREVIATIONS AND REFERENCE DESIGNATORS

A	Assembly, separable or repairable	FL	Filter	PTM	paper or plastic, tubular molded
AT	Attenuator, fixed or variable	H	Heat dissipating device (heat sink, etc.)	R	Resistor, fixed or variable
B	Motor	HR	Heater	RT	Thermistor
BT	Battery	J	Connector, stationary portion	S	Switch
C	Capacitor, fixed or variable	K	Relay	T	Transformer
Cer	Ceramic	L	Inductor, fixed or variable	TP	Test point
CR	Diode, signal or rectifier	LR	Inductor/resistor combination	U	Assembly, inseparable or non-repairable
CRT	cathode-ray tube	M	Meter	V	Electron tube
DL	Delay line	Q	Transistor or silicon-controlled rectifier	Var	Variable
DS	Indicating device (lamp)	P	Connector, movable portion	VR	Voltage regulator (zener diode, etc.)
Elect.	Electrolytic	PMC	Paper, metal cased	WW	wire-wound
EMC	electrolytic, metal cased	PT	paper, tubular	Y	Crystal
EMT	electrolytic, metal tubular				
F	Fuse				

Ckt. No.	Grid Loc	Tektronix Part No.	Serial/Model No. Eff	Disc	Description
ASSEMBLY					
A1		670-2011-00			MAIN Circuit Board Assembly
CAPACITORS					
C2	G4	283-0026-00			0.2 μ F, Cer, 25 V, +80%-20%
C3	K5	290-0529-00			47 μ F, Elect., 20 V, 20%
C10	C2	290-0577-00			2000 μ F, Elect., 50 V
C11	C4	290-0577-00			2000 μ F, Elect., 50 V
C23	E3	283-0026-00			0.2 μ F, Cer, 25 V, +80%-20%
C24	E3	283-0010-00			0.05 μ F, Cer, 50 V
C26	F3	290-0534-00			1 μ F, Elect., 35 V, 20%
C28	G2	290-0529-00			47 μ F, Elect., 20 V, 20%
C29	K3	290-0527-00			15 μ F, Elect., 20 V, 20%
C33	E4	283-0026-00			0.2 μ F, Cer, 25 V, +80%-20%
C34	E3	283-0010-00			0.05 μ F, Cer, 50 V
C35	E5	290-0524-00			4.7 μ F, Elect., 10 V, 20%
C38	E5	290-0529-00			47 μ F, Elect., 20 V, 20%
C39	K4	290-0527-00			15 μ F, Elect., 20 V, 20%
DIODES					
CR10	B3	152-0488-00			Silicon, rectifier bridge
CR23	E5	152-0066-00			Silicon, selected from 1N3194
CR26	F2	152-0141-02			Silicon, replaceable by 1N4152
CR27	Chassis	150-1001-00			Light emitting diode
CR28	G1	152-0066-00			Silicon, selected from 1N3194
CR33	E4	152-0066-00			Silicon, selected from 1N3194
CR36	F4	152-0141-02			Silicon, replaceable by 1N4152
CR37	Chassis	150-1001-00			Light emitting diode
CR38	E5	152-0066-00			Silicon, selected from 1N3194
VR21	F2	152-0055-00			Zener, replaceable by 1N962B, 0.4 W, 11 V, 5%
VR31	F5	152-0055-00			Zener, replaceable by 1N962B, 0.4 W, 11 V, 5%

ELECTRICAL PARTS LIST (cont)

Ckt No.	Grid Loc	Tektronix Part No.	Serial/Model No. Eff	Disc	Description
BULBS					
DS28	Chassis	150-0107-00			Incandescent, 0.04 A
CONNECTORS					
J1	Chassis	129-0064-01			Post, binding, red
J2	Chassis	129-0064-02			Post, binding, white
J20	Chassis	129-0064-01			Post, binding, red
J25	Chassis	129-0064-00			Post, binding, charcoal
J30	Chassis	129-0064-03			Post, binding, green
RESISTORS					
R2	H5	315-0221-00			220 Ω , 1/4 W, 5%
R10	D2	304-0272-00			2.7 k Ω , 1 W, 10%
R11	D4	304-0272-00			2.7 k Ω , 1 W, 10%
R20	D2	315-0271-00			270 Ω , 1/4 W, 5%
R21	E2	303-0751-00			750 Ω , 1 W, 5%
R23	E2	307-0103-00			2.7 Ω , 1/4 W, 5%
R24	F2	308-0686-00			2.2 Ω , 2 W, WW, 5%
R25	F2	308-0741-00			2.6 Ω , 1 W, WW, 5%
RT26	F2	307-0157-00			5 Ω , Thermal
R29	K3	307-0103-00			2.7 Ω , 1/4 W, 5%
R30	D4	315-0271-00			270 Ω , 1/4 W, 5%
R31	E4	303-0751-00			750 Ω , 1 W, 5%
R33	E4	307-0103-00			2.7 Ω , 1/4 W, 5%
R34	F4	308-0686-00			2.2 Ω , 2 W, WW, 5%
R35	F4	308-0741-00			2.6 Ω , 1 W, WW, 5%
RT36	F4	307-0157-00			5 Ω , Thermal
R37	G2	311-1120-00			100 Ω , Var
R40	Chassis	311-1416-00			200 Ω , Var
R43	F3	311-1120-00			100 Ω , Var
R44	F3	315-0101-00			100 Ω , 1/4 W, 5%
R46	F4	304-0681-00			680 Ω , 1 W, 10%
SWITCH					
S10	E2	260-1209-00			Push, ON
INTEGRATED CIRCUITS					
U2	G4	156-0176-00			5 V regulator, replaceable by LM309K
U20	E5	156-0208-00			Dual tracking volt. reg., replaceable by 5G3501D



POWER SUPPLY

MECHANICAL PARTS LIST

Replacement parts should be ordered from the Tektronix Field Office or Representative in your area. Changes to Tektronix products give you the benefit of improved circuits and components. Please include the instrument type number and serial number with each order for parts or service.

ABBREVIATIONS

BHB	binding head brass	h	height or high	OHB	oval head brass
BHS	binding head steel	hex.	hexagonal	OHS	oval head steel
CRT	cathode-ray tube	HHB	hex head brass	PHB	pan head brass
csk	countersunk	HHS	hex head steel	PHS	pan head steel
DE	double end	HSB	hex socket brass	RHS	round head steel
FHB	flat head brass	HSS	hex socket steel	SE	single end
FHS	flat head steel	ID	inside diameter	THB	truss head brass
Fil HB	fillister head brass	lg	length or long	THS	truss head steel
Fil HS	fillister head steel	OD	outside diameter	w	wide or width

FIGURE 1 EXPLODED

Fig. & Index No.	Tektronix Part No.	Serial/Model No.		Q † y	Description
		Eff	Disc		
1-1	337-1399-00			2	SHIELD, electrical, side
-2	366-0499-00			1	KNOB, gray--VOLTS
	- - - - -			-	knob includes:
	213-0153-00			1	SETScrew, 5-40 x 0.125 inch, HSS
-3	366-1257-74			1	PUSHBUTTON--ON
-4	426-0681-00			1	FRAME, pushbutton
-5	366-1422-00			1	KNOB, latch
-6	129-0064-03			1	POST, binding, green (S30)
	- - - - -			-	mounting hardware: (not included w/post)
-7	210-0457-00			1	NUT, keps, 6-32 x 0.312 inch
-8	- - - - -			1	INSULATOR, bushing, green (included w/post)
-9	129-0064-00			1	POST, binding, charcoal (J25)
	- - - - -			-	mounting hardware: (not included w/post)
-10	210-0457-00			1	NUT, keps, 6-32 x 0.312 inch
-11	358-0181-00			1	INSULATOR, bushing, charcoal
-12	129-0064-01			2	POST, binding, red (J1 & J20)
	- - - - -			-	mounting hardware for each: (not included w/post)
-13	210-0457-00			1	NUT, keps, 6-32 x 0.312 inch
-14	358-0181-01			1	INSULATOR, bushing, red
-15	129-0064-02			1	POST, binding, white (J2)
	- - - - -			-	mounting hardware: (not included w/post)
-16	210-0457-00			1	NUT, keps, 6-32 x 0.312 inch
-17	- - - - -			1	INSULATOR, bushing, white (included w/post)
-18	- - - - -			2	LAMP, LED (CR27 & CR37)

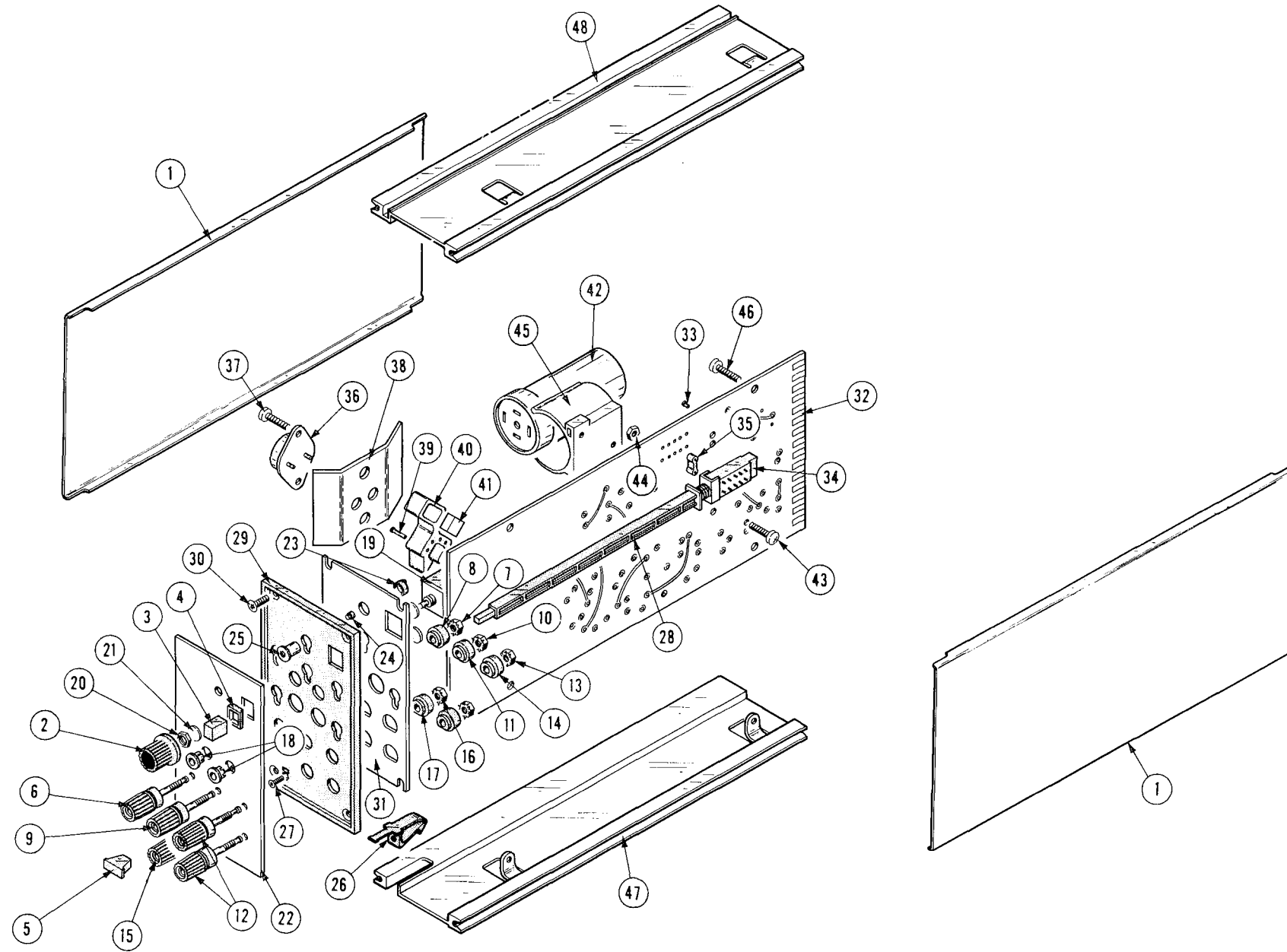
Mechanical Parts List—PS 502

FIGURE 1 EXPLODED (cont)

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Disc	Q					Description
			t	1	2	3	4	
1-19	- - - - -		1					RESISTOR, variable (R40)
	- - - - -		-					mounting hardware: (not included w/resistor)
-20	210-0583-00		1					NUT, hex., 0.25-32 x 0.312 inch
-21	210-0940-00		1					WASHER, flat, 0.25 ID x 0.312 inch OD
	210-0046-00		1					WASHER, lock, internal, 0.261 ID x 0.40 inch OD
-22	333-1572-00		1					PANEL, front
-23	200-0935-00		1					CAP, lampholder
-24	378-0602-01		1					LENS, indicator light, amber
-25	352-0157-00		1					LAMPHOLDER
-26	214-1513-00		1					LATCH, plug-in retainer
	- - - - -		-					mounting hardware: (not included w/latch)
-27	213-0254-00		1					SCREW, thread forming, 6-20 x 0.375 inch, 100° csk, FHS
-28	384-1100-00		1					SHAFT, extension, 6.20 inches long
-29	386-2232-00		1					SUBPANEL, front
	- - - - -		-					mounting hardware: (not included w/subpanel)
-30	213-0229-00		4					SCREW, thread forming, 6-20 x 0.375 inch, 100° csk, FHS
-31	337-1638-00		1					SHIELD, subpanel, rear
-32	- - - - -		1					CIRCUIT BOARD ASSEMBLY--MAIN (see A1 electrical list)
	- - - - -		-					circuit board assembly includes:
-33	136-0252-04		14					SOCKET, pin connector
-34	260-1209-00		1					SWITCH, push--ON (S10)
-35	361-0385-00		2					SPACER, switch, green
-36	- - - - -		1					INTEGRATED CIRCUIT (See U2 electrical list)
	- - - - -		-					mounting hardware: (not included w/integrated circuit)
-37	211-0510-00		2					SCREW, 6-32 x 0.375 inch, PHS
-38	214-1713-00		1					HEATSINK
-39	136-0384-00		2					SOCKET, pin terminal
-40	136-0361-00		1					SOCKET, transistor
-41	131-0847-00		2					TERMINAL, post
-42	- - - - -		2					CAPACITOR (See C10 & C11 electrical list)
	- - - - -		-					mounting hardware for each: (not included w/capacitor)
-43	211-0534-00		2					SCREW, sems, 6-32 x 0.312 inch, PHS
-44	210-0407-00		2					NUT, hex., 6-32 x 0.25 inch
-45	352-0322-00		1					HOLDER, capacitor
	- - - - -		-					mounting hardware: (not included w/circuit board assembly)
-46	213-0146-00		4					SCREW, thread forming, 6-20 x 0.312 inch, PHS
-47	426-0724-00		1					FRAME SECTION, bottom
-48	426-0725-00		1					FRAME SECTION, top

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FIG. 1 EXPLODED



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STANDARD ACCESSORIES

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Disc	Qty						Description
					1	2	3	4	5	
2-	070-1302-00			1						MANUAL, instruction (not shown)

CARTON ASSEMBLY (Part No. 065-0151-00)

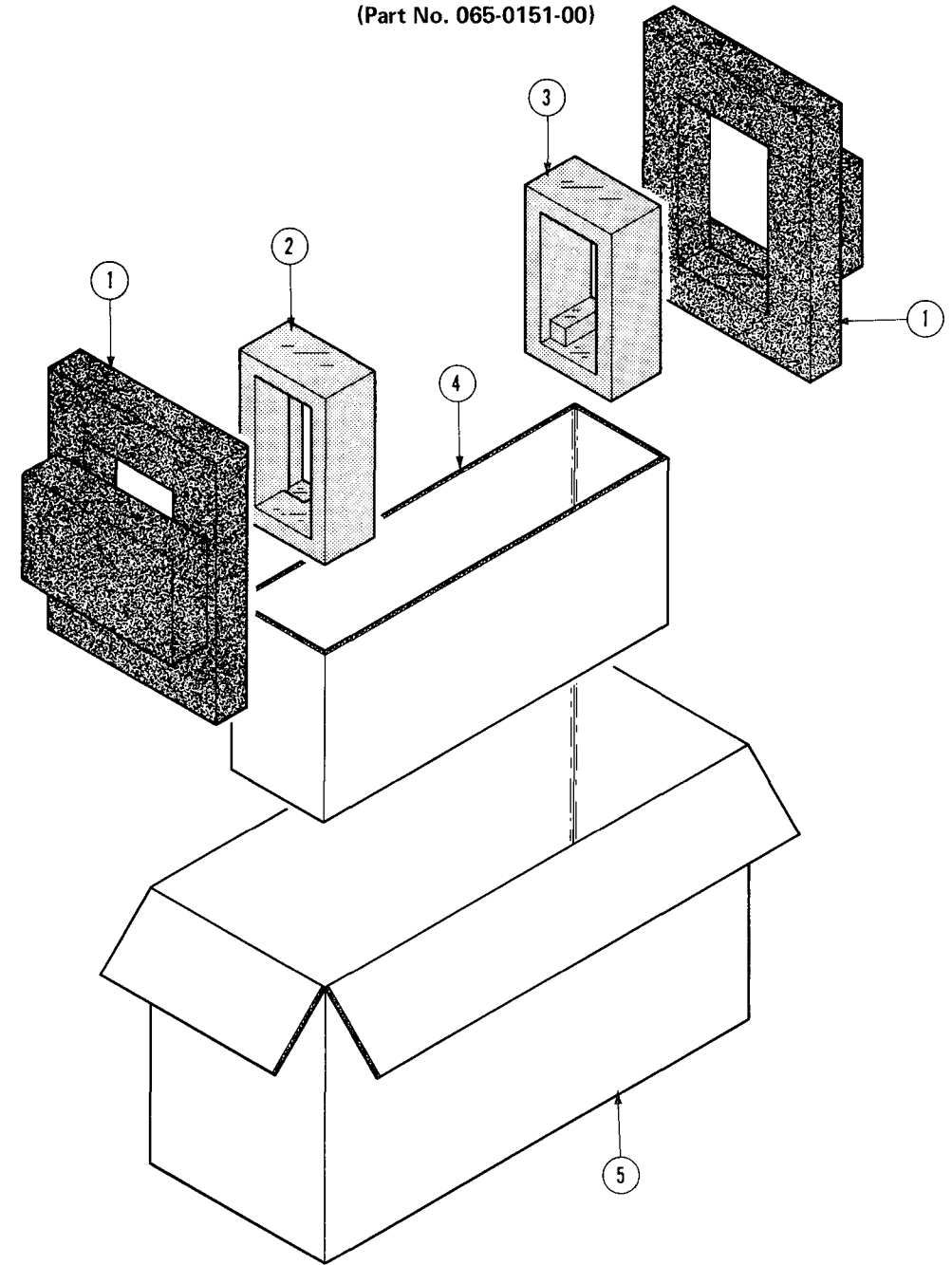


Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Disc	Qty						Description
					1	2	3	4	5	
2-	065-0151-00			1						CARTON ASSEMBLY
-	-----			-						Carton assembly includes:
-1	004-0282-00			2						FRAME
-2	004-0243-00			1						END CAP, front
-3	004-0242-00			1						END CAP, rear
-4	004-1093-00			1						PAD
-5	004-0612-00			1						CARTON