

067-0995-99 
PLUG-IN TEST LOAD


INSTRUCTION MANUAL

Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97077

Serial Number _____

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CAUTION

THE FOLLOWING SERVICING INSTRUCTIONS ARE FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID PERSONAL INJURY, DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO.

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OPERATORS SAFETY SUMMARY

The general safety information in this part of the summary is for both operating and servicing personnel. Specific warnings and cautions will be found throughout the manual where they apply, but may not appear in this summary.

TERMS

In This Manual

CAUTION statements identify conditions or practices that could result in damage to the equipment or other property.

WARNING statements identify conditions or practices that could result in personal injury or loss of life.

As Marked on Equipment

CAUTION indicates a personal injury hazard not immediately accessible as one reads the marking, or a hazard to property including the equipment itself.

DANGER indicates a personal injury hazard immediately accessible as one reads the marking.

SYMBOLS

In This Manual



This symbol indicates where applicable cautionary or other information is to be found.

As Marked on Equipment



DANGER — High voltage.



Protective ground (earth) terminal.



ATTENTION — refer to manual.

Power Source

This product is intended to operate from a power module connected to a power source that will not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Grounding the Product

This product is grounded through the grounding conductor of the power module power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. A protective ground connection by way of the grounding conductor in the power module power cord is essential for safe operation.

Danger Arising From Loss of Ground

Upon loss of the protective-ground connection, all accessible conductive parts (including knobs and controls that may appear to be insulating) can render an electric shock.

Use the Proper Fuse

To avoid fire hazard, use only the fuse of correct type, voltage rating and current rating as specified in the parts list for your product.

Refer fuse replacement to qualified service personnel.

Do Not Operate in Explosive Atmospheres

To avoid explosion, do not operate this product in an explosive atmosphere unless it has been specifically certified for such operation.

Do Not Operate Without Covers

To avoid personal injury, do not operate this product without covers or panels installed. Do not apply power to the plug-in via a plug-in extender.

SERVICE SAFETY SUMMARY

FOR QUALIFIED SERVICE PERSONNEL ONLY

Refer also to the preceding Operators Safety Summary.

Do Not Service Alone

Do not perform internal service or adjustment of this product unless another person capable of rendering first aid and resuscitation is present.

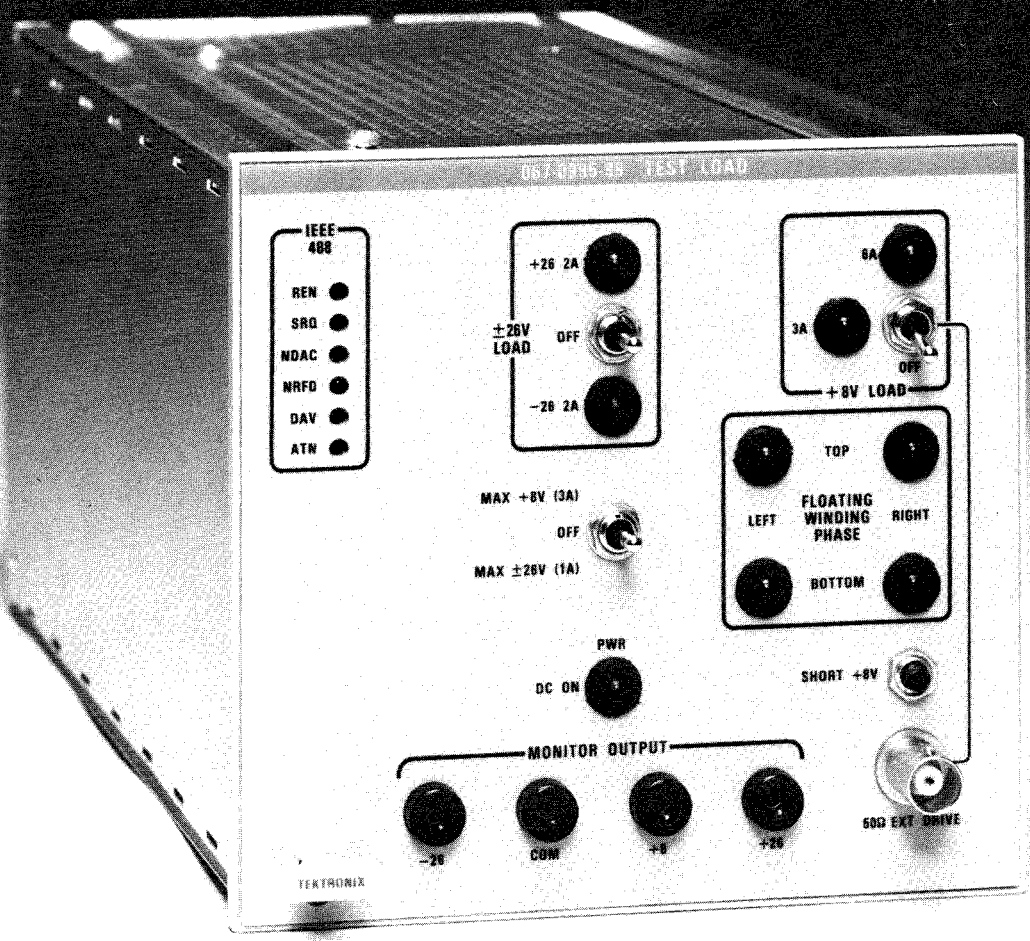
Disconnect power before removing protective panels, soldering, or replacing components.

Power Source

This product is intended to operate from a power source that will not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Use Care When Servicing With Power On

Dangerous voltages may exist at several points in this product. To avoid personal injury, do not touch exposed connections and components while power is on.



SPECIFICATION

Instrument Description

This test load plug-in is a two compartment wide load unit designed for the TM 5003 and the TM 5006. Two units are required to maximally load the TM 5006; one unit is sufficient for the TM 5003. The unit provides incrementally switched loading for the dc supply to the limits of the test load unit. The mainframe pass transistors are used as the switch elements. The condition of these transistors is indicated by front panel LED's. Front panel LED's are provided to indicate proper phasing of the floating ac windings (with respect to the common 18 V center tapped winding). Front panel monitor jacks give direct access to the dc outputs for voltage measurements. External voltage sources may also be connected to these jacks to verify the operation of the power module over-voltage shut down circuits. A front panel LED is provided to indicate the status of the power (PWR) on signal line in the power module. IEEE 488 control lines,

listed in Section 2.1, status is indicated by front panel LED's.

Performance Conditions

The electrical and environmental performance limits, together with their related validation procedures, comprise a complete statement of the electrical and environmental performance of a calibrated instrument.

Items listed in the Performance Requirements column of the Electrical Characteristics are verified by completing the Performance Check in the Calibration section of this manual. Items listed in the Supplemental Information column are not verified in this manual.

Table 1-1
ELECTRICAL CHARACTERISTICS

Characteristics	Performance Requirements	Supplemental Information
+8 Volt Load Section	Selectable Steps: OFF, 3A $\pm 20\%$, 6A $\pm 20\%$.	Voltage applied to 2.5 Ω per 3 A step – through mainframe pass transistors.
± 26 Volt Load Section	Selectable Steps: OFF, +26 V @ 2 A $\pm 20\%$, –26 V @ 2 A $\pm 20\%$, mutually exclusive.	Voltage applied to 12.5 Ω through mainframe pass transistors.
Maximum Load Switch	Allows additional load of 1 A $\pm 20\%$ on +26 V, or –26 V, or 3 A $\pm 20\%$ on +8 V.	Momentary contact to 25 Ω for ± 26 V or 2.5 Ω for +8V.
External Input	Allows 3 A $\pm 20\%$ load step to be produced on +8 V bus for dynamic testing.	50 Ω input. Suitable FG required to drive +7 V into 50 Ω . Disabled in 6 A position.
Short Switch		Shorts +8 V to common
Winding Phase Indicators		Indicates presence of 25 VAC at connector pins and proper phase with respect to 18 V ct winding. Does not indicate proper voltage levels. Does not load windings.
D.C. on indicator		Compatible with PWR signal from mainframe.
Transistor indicators		Indicate states (ON-OFF) of mainframe pass transistors according to load switch positions.

Table 1-1 (cont)

Characteristics	Performance Requirements	Supplemental Information
Control line status LEDs		<p>Indicate states of REN, SRQ, NDAC, NRFD, DAV, ATN in the IEEE 488 internal bus.</p> <p>These lines are active low, LOW = LED on. Bus loading: 100 kΩ min. Lines are not terminated.</p>

Table 1-2
PHYSICAL CHARACTERISTICS

Characteristics	Description
Finish	Laminated polycarbonate front panel with anodized aluminum chassis.
Net weight	2.75 lbs (1.25 kg)
Maximum Overall Dimensions	
Height	126.01 mm (4.961 inches)
Width	134.47 mm (5.294 inches)
Length	293.44 mm (11.553 inches)

OPERATING INSTRUCTIONS

Preparation For Use

The test load unit is ready for use when received. It operates in any two compartments of a TM 5000 series power module. See the power module instruction manual for line voltage requirements and power module operation.

CAUTION

Turn the power module off before inserting or removing the test load unit. Otherwise, arcing may occur at the rear interface connectors, reducing their useful life.

Align the test load chassis with the upper and lower guides of the selected compartment. Press the test load in to firmly seat the circuit board in the interconnecting jack. To remove the test load, pull the release latch (located in the lower left corner) until the interconnecting jack disengages and the test load slides out.

Check that the test load is fully inserted in the power module and that all front panel switches are in the off position. Press the power switch on the power module. The FLOATING WINDING PHASE indicator lights should illuminate immediately. The PWR DC ON light should illuminate within about 1/2 second indicating the PWR signal from the power module is high.

Controls, Connectors and Indicators

All controls, connectors and indicators (except for the rear interface connector) required for the operation of the test load are located on the front panel. Fig. 2-1 provides a brief description of all front panel controls, connectors and indicators.

- ① **+8 V LOAD 6A**
Illuminated when 6A is drawn from the +8 V supply.
- ② **+8 V LOAD Switch**
Selects 3A, 6A or OFF for the +8 V supply.
- ③ **+8 V LOAD 3A**
Illuminated when 3A is drawn from the +8 V supply.
- ④ **FLOATING WINDING PHASE Top Right**
This light when illuminated indicates that the 25 V ac winding connected to pin 13 of the right compartment is in proper phase.
- ⑤ **FLOATING WINDING PHASE Top Left**
This light when illuminated indicates that the 25 V ac winding connected to pin 13 of the left compartment is in proper phase.
- ⑥ **FLOATING WINDING PHASE Bottom Right**
This light when illuminated indicates that the 25 V ac winding connected to pin 1 of the right compartment is in proper phase.
- ⑦ **FLOATING WINDING PHASE Bottom Left**
This light when illuminated indicates that the 25 V ac winding connected to pin 1 of the left compartment is in proper phase.
- ⑧ **SHORT +8 V**
Pushing this button shorts the +8 V supply to ground. Use to test fault circuitry in conjunction with the PWR light.
- ⑨ **50 Ω EXT DRIVE**
Permits changing the +8 V load with an external signal. See the Specification section for details on the driving signal.
- ⑩ **MONITOR OUTPUT +26 V**
Direct access to the +26 V bus.
- ⑪ **MONITOR OUTPUT +8 V**
Direct access to the +8 V bus.
- ⑫ **MONITOR OUTPUT COM**
Chassis ground.
- ⑬ **MONITOR OUTPUT -26 V**
Direct access to the -26 V bus.

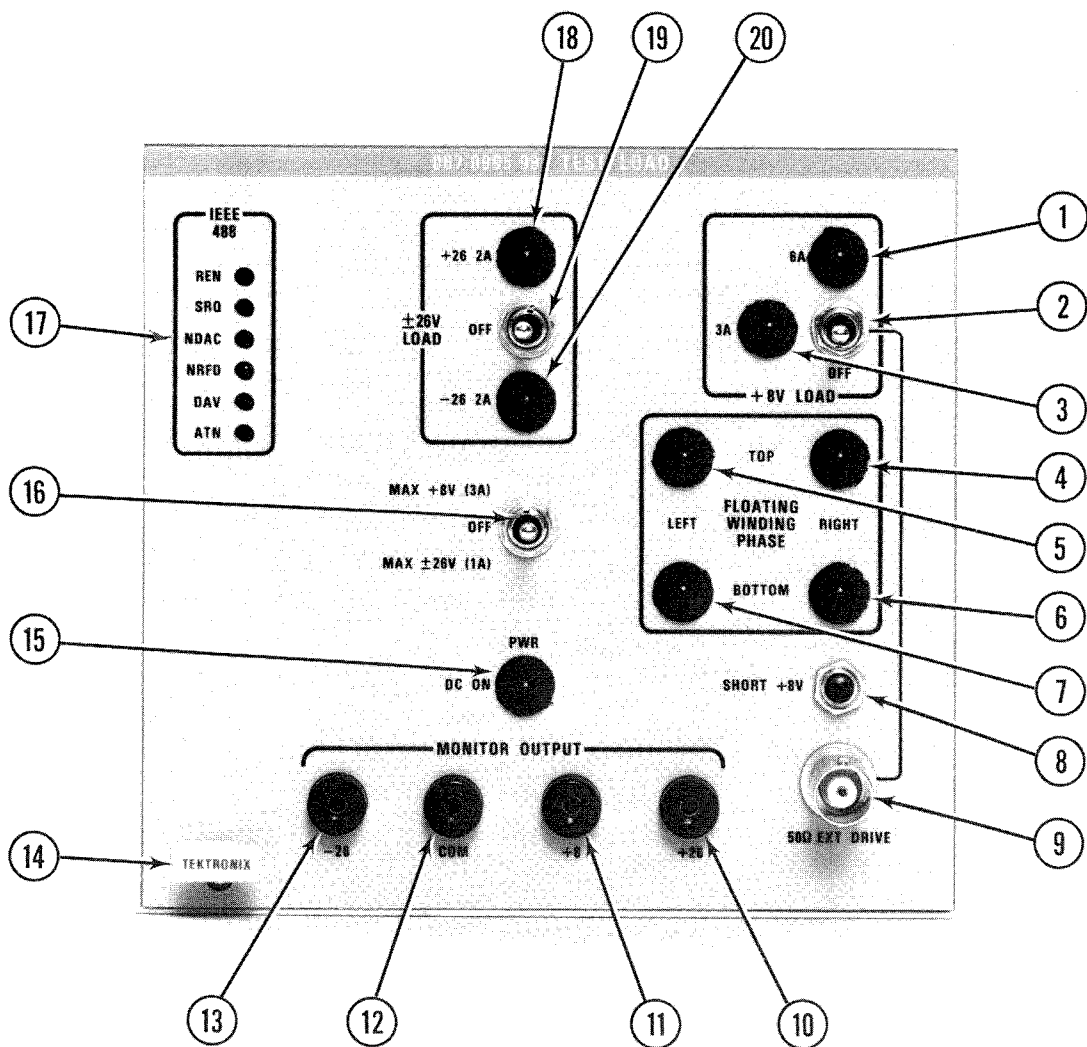


Fig. 2-1. Front Panel Controls and Connectors.

- 14 LATCH**
Pull to remove plug-in.
- 15 PWR DC ON**
This light follows the PWR signal and provides power supply status information.
- 16 MAX +8 V (3A) OFF MAX ± 26 V (1A)**
Switch in the up position provides an additional 3A load to the +8 V supply. The +8 V LOAD must be on for this feature to operate. Switch in the down position provides an additional 1A load to the ± 26 V supply. The ± 26 V LOAD must be on before this feature operates.
- 17 IEEE 488**
An illuminated light indicates a low (true) on the labeled bus.
- 18 ± 26 V LOAD OFF**
Switch selects 2A load for either the +26 V supply or the -26 V supply.
- 19 +26 2A**
Illuminated light indicates +26 V is applied to the 2A load.
- 20 -26 2A**
Illuminated light indicates -26 V is applied to the 2A load.

Test Load Operation

One test load is required to fully load the voltage buses in a three-compartment TM 5000 series power module. Two test loads are required to fully load a six-compartment TM 5000 series power module. With the test load properly installed in the power module and all switches off, note the FLOATING WINDING PHASE lights. If all lights are illuminated all 25 V windings are in phase in both compartments. If a light is not illuminated, one winding is out of phase. See the controls and connectors description for the relationship between lights and windings.

It is necessary to move the test load once in a three-compartment power module and twice in a six-compartment power module to check all of the winding phases in all compartments.

Connect an oscilloscope or voltmeter to the appropriate MONITOR OUTPUT connectors for monitoring the desired supply bus.

Next, apply the correct maximum load to the +8 V supply. The maximum load is stated in the Specification section in the power module manual. The +8 V LOAD switch applies either a 3A or 6A maximum load to the 8 V load bus. An additional 3A load can be applied for a total of 9A by raising the MAX +8 V (3A) switch to the up position.



This test load must not be operated continuously in any power module due to the power dissipation.

The MAX +8 V (3A) switch is a momentary contact switch to prevent continuous possible overloading of any supply.

The +8 V supply may be shorted to ground momentarily to check the guard and reset circuitry in the power module. Press the SHORT +8 V pushbutton and watch that the PWR light follows the PWR signal on pin 6B of the rear interface connector. This information is located in the rear interface data part of the power module manual. The 50 Ω EXT DRIVE connector provides a means for dynamically loading the +8 V supply. A signal source capable of +7 V is necessary to change supply loading by 3A. This dynamic control function is disabled when the +8 V LOAD switch is in the 6A position.

Next, apply the correct maximum load to the ± 26 V supply by operating the ± 26 V LOAD switch in the appropriate position. An additional 1A of load to either supply may be applied by placing the MAX ± 26 V (1A) switch in the down position.

WARNING

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THEORY OF OPERATION

Introduction

Refer to the schematic located in the pullout pages at the rear of this manual and this description for understanding the operation of the test load.

+8 V Loading

Loading for the various supplies is accomplished using the series-pass transistors in the power module. This provides for a check not only of the maximum capabilities of the voltage bus but of the functioning of the series pass transistors.

The +8 V load switch S1001 determines the base drive to the series-pass transistors in the mainframe used to load the +8 V. In the off and 3A position the base of the NPN series pass is connected to J430, the 50 Ω EXT DRIVE. The base of the PNP series pass transistor is grounded through R1523 and R1621. This applies a 3A load to the +8 V supply via R1601, R1501, R1401, and R1303. The voltage across these resistors illuminates the 3A front panel light DS410. In the 6A position an additional 3A load is applied via the NPN series-pass transistor. The base of this transistor connects to +8 V. This causes a 3A current flow through R1603, R1701, R1801 and R1803 and illuminates the 6A light DS 1001. For an additional 3A load, (total 9A) R1101, R1201, R1203 and R1301 are connected from the collector of the PNP transistor to ground through S500.

± 26 V Loading

The PNP and NPN series-pass transistors in the power module used to load the ± 26 V supplies are turned on through S510. For loading the +26 V supply the NPN transistor is activated and the NPN transistor is activated for the -26 V supply. The collectors are connected together to load R1112, R1122, R1210, and R1220. For the additional 1A load R1022 and R1011 are connected from the common collectors to ground through S500. The LED DS510 indicates a negative voltage across the load resistors and DS500 indicates a positive voltage across the load resistors.

+8 V Short

This switch simply shorts the +8 V bus to ground.

Winding Phase Indicators

These LEDs check the phase of the 25 V windings with respect to each other and the 18 V winding. The cathode of the LEDs are connected together and to the 18 V winding as a reference. Diodes CR1327, CR1337, CR1302 and CR1204 prevent reverse current on the negative half cycle.

IEEE 488 Status Lights

When any of the seven GPIB management or handshake lines are asserted (low), the labeled light is illuminated. The low signal is inverted and amplified by U1910, to drive the LED involved. All of the compartments in the connector on the rear panel are connected in parallel.

CALIBRATION

Performance Check Procedure

Introduction

This procedure checks the Electrical Performance Requirements as listed in the Specification section of this manual. Circuit troubleshooting is indicated if the instrument fails to meet these checks.

Test Equipment Required

The test equipment listed in Table 4-1 or equivalent is suggested to perform these checks.

Table 4-1

SUGGESTED TEST EQUIPMENT

Description	Minimum Requirements	Performance Check Step	Recommended Equipment
2 TM 5000 series power modules	In proper operating condition	All steps	TEKTRONIX TM 5003 or TM 5006
Current Measuring Device	Dc to ≈ 1 kHz to 9A	All steps	P6302 current probe, AM 503 current probe amplifier
Oscilloscope	10 mV sensitivity Dc to ≈ 1 kHz	All steps	Any suitable Tektronix oscilloscope
Function Generator	Capable of a 0 V to +7 V pulse into 50 Ω	Step 4	FG 501
2 50 Ω coaxial cables with bnc connectors		1 cable for steps 1, 2 and 3. 2 cables for step 4	Tektronix Part No. 012-0057-01
50 Ω bnc termination		In step 4 to connect AM 503 to oscilloscope if oscilloscope does not have 50 Ω input impedance	Tektronix Part No. 011-0049-01

Test Equipment Setup

Install the AM 503 current probe amplifier in one power module. Install the test load in the other power module. To gain access to the voltage buses, remove the power module covers. Location of the voltage buses can be found in Section 4 of the power module manuals.

1. Check +8 V Load

a. Connect the current probe to the +8 V bus in the power module.

b. Set the +8 V load switch to the 3A position. Note that the 3A LED is illuminated.

c. CHECK—that the current is from 2.4 A to 3.6 A.

d. Change the +8 V load switch to the 6 A position. Notice that the 6A lamp is illuminated along with the 3A lamp.

e. CHECK—that the current is from 5.8 A to 7.2 A. Return the +8 V load switch to the 3 A position.

f. Push and hold the MAX +8 V (3A) switch to the up position.

g. CHECK—that the load increases from the 3A reading by 2.4 A to 3.6 A. Remove the current probe for the next step.

2. Check the +26 V Load

a. Connect the current probe to the +26 V bus. Place the ± 26 V load switch in the up position. Notice that the +26 2A lamp is illuminated.

b. CHECK—that the current is from 1.6 A to 2.4 A.

c. Push the MAX ± 26 V (1A) switch to the down position.

d. CHECK—that the current increases from the reading obtained in Step 2b by 0.8 A to 1.2 A.

e. Return all switches to the off position.

f. Remove the current probe for the next step.

3. Check -26 V Load

a. Connect the current probe to the -26 V bus. Place the ± 26 V load switch in the down position. Notice that the -26 2A LED is illuminated.

b. CHECK—that the current reads from 1.6 A to 2.4 A.

c. Place the MAX ± 26 V (1A) switch in the down position.

d. CHECK—that the current increases from the reading obtained in Step 3b by 0.8 A to 1.2 A. Return the ± 26 V load switch to the off position. Remove the current probe for the next step.

4. Check External Input

a. Connect the function generator set for a 0 to +7 V squarewave to the 50 Ω EXT DRIVE connector using a 50 Ω coaxial cable.

b. Connect the current probe to the +8 V bus.

c. CHECK—for a current squarewave from 0 A to within 2.4 A to 3.6 A.

d. Remove all connections.

e. This completes the Performance Check Procedure.

MAINTENANCE

GENERAL MAINTENANCE INFORMATION

Static-Sensitive Components



Static discharge can damage any semiconductor component in this instrument.

This instrument contains electrical components that are susceptible to damage from static discharge. See Table 5-1 for relative susceptibility of various classes of semiconductors. Static voltages of 1 kV to 30 kV are common in unprotected environments.

Observe the following precautions to avoid damage:

1. Minimize handling of static-sensitive components.
2. Transport and store static-sensitive components or assemblies in their original containers, on a metal rail, or on conductive foam. Label any package that contains static-sensitive assemblies or components.
3. Discharge the static voltage from your body by wearing a wrist strap while handling these components. Servicing static-sensitive assemblies or components should be performed only at a static-free work station by qualified service personnel.
4. Nothing capable of generating or holding a static charge should be allowed on the work station surface.
5. Keep the component leads shorted together whenever possible.
6. Pick up the components by the body, never by the leads.
7. Do not slide the components over any surface.

8. Avoid handling components in areas that have a floor or work surface covering capable of generating a static charge.
9. Use a soldering iron that is connected to earth ground.
10. Use only special antistatic suction type or wick type desoldering tools.

Table 5-1

**RELATIVE SUSCEPTIBILITY TO
STATIC DISCHARGE DAMAGE**

Semiconductor Classes	Relative Susceptibility Levels^a
MOS or CMOS microcircuits or discretes, or linear microcircuits with MOS inputs (Most Sensitive)	1
ECL	2
Schottky signal diodes	3
Schottky TTL	4
High-frequency bipolar transistors	5
JFETS	6
Linear microcircuits	7
Low-power Schottky TTL	8
TTL (Least Sensitive)	9

^a Voltage equivalents for levels:

1 = 100 to 500 V 4 = 500 V 7 = 400 to 1000 V (est.)
 2 = 200 to 500 V 5 = 400 to 600 V 8 = 900 V
 3 = 250 V 6 = 600 to 800 V 9 = 1200 V

(Voltage discharged from a 100 pF capacitor through a resistance of 100 Ω.)

Cleaning

This instrument should be cleaned as often as operating conditions require. Loose dust accumulated on the outside of the instrument can be removed with a soft cloth or small brush. Remove dirt that remains with a soft cloth dampened in a mild detergent and water solution. Do not use abrasive cleaners.



To clean the front panel use freon, isopropyl alcohol, or denatured ethyl alcohol. Do not use petroleum based cleansing agents.

The best way to clean the interior is to blow off the accumulated dust with a dry, low-velocity air (approximately 5 lb/in²) or use a soft brush or cloth dampened with a mild detergent and water solution.

Hold the board so the cleaning residue runs away from the connectors. Do not scrape or use an eraser to clean the edge connector contacts. Abrasive cleaning can remove the gold plating.



Circuit boards and components must be dry before applying power.

Obtaining Replacement Parts

Electrical and mechanical parts can be obtained through your local Tektronix Field Office or representative. However, it may be possible to obtain many of the standard electronic components from a local commercial source. Before purchasing or ordering a part from a source other than Tektronix, Inc., check the Replaceable Electrical Parts list for the proper value, rating, tolerance, and description.

NOTE

When selecting replacement parts, remember that the physical size and shape of a component may affect its performance in the instrument.

Some parts are manufactured or selected by Tektronix, Inc., to satisfy particular requirements or are manufactured for Tektronix, Inc., to our specifications. Most of the mechanical parts used in this instrument have been manufactured by Tektronix, Inc. To determine the manufacturer, refer to the Replaceable Parts list and the Cross Reference index, Mfr. Code Number or Manufacturer.

When ordering replacement parts from Tektronix, Inc., include the following information:

1. Instrument type and option number.
2. Instrument serial number.
3. A description of the part (if electrical, include complete circuit number).
4. Tektronix part number.

Soldering Techniques

WARNING

To avoid electric-shock hazard, disconnect the instrument from the power source before soldering.

The reliability and accuracy of this instrument can be maintained only if proper soldering techniques are used when repairing or replacing parts. General soldering techniques which apply to maintenance of any precision electronic equipment should be used when working on this instrument. Use only 60/40 rosin-core, electronic grade solder. The choice of soldering iron is determined by the repair to be made.

When soldering on circuit boards or small wiring, use only a 15 watt, pencil type soldering iron. A higher wattage soldering iron can cause the etched circuit wiring to separate from the board base material and melt the insulation from small wiring. Always keep the soldering iron tip properly tinned to ensure the best heat transfer to the solder joint. Apply only enough heat to remove the component or to make a good solder joint. To protect heat sensitive components, hold the component lead with a pair of long-nose pliers between the component body and the solder joint. Use a solder removing wick to remove excess solder from connections or to clean circuit board pads.

Front Panel Latch Removal

To disassemble the latch, pry up on the pull tab bar attached to the latch assembly. The latch components can now be removed from the instrument.

REAR INTERFACE INFORMATION

Pin Assignments

Fig. 8-1 shows pin assignments for the unit. Fig. 8-2 shows GPIB connector assignments. These figures are shown in the pullout pages at the rear of this manual.

OPTIONS

No options exist for the 067-0995-99 Plug-In Test Load.

REPLACEABLE ELECTRICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

LIST OF ASSEMBLIES

A list of assemblies can be found at the beginning of the Electrical Parts List. The assemblies are listed in numerical order. When the complete component number of a part is known, this list will identify the assembly in which the part is located.

CROSS INDEX-MFR. CODE NUMBER TO MANUFACTURER

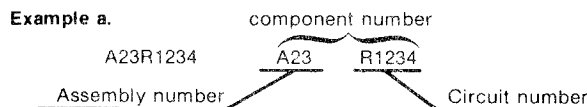
The Mfr. Code Number to Manufacturer index for the Electrical Parts List is located immediately after this page. The Cross Index provides codes, names and addresses of manufacturers of components listed in the Electrical Parts List.

ABBREVIATIONS

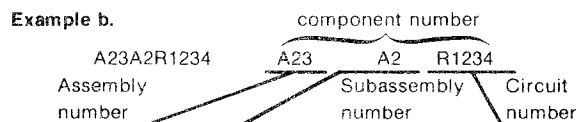
Abbreviations conform to American National Standard Y1.1.

COMPONENT NUMBER (column one of the Electrical Parts List)

A numbering method has been used to identify assemblies, subassemblies and parts. Examples of this numbering method and typical expansions are illustrated by the following:



Read: Resistor 1234 of Assembly 23



Read: Resistor 1234 of Subassembly 2 of Assembly 23

Only the circuit number will appear on the diagrams and circuit board illustrations. Each diagram and circuit board illustration is clearly marked with the assembly number. Assembly numbers are also marked on the mechanical exploded views located in the Mechanical Parts List. The component number is obtained by adding the assembly number prefix to the circuit number.

The Electrical Parts List is divided and arranged by assemblies in numerical sequence (e.g., assembly A1 with its subassemblies and parts, precedes assembly A2 with its subassemblies and parts).

Chassis-mounted parts have no assembly number prefix and are located at the end of the Electrical Parts List.

TEKTRONIX PART NO. (column two of the Electrical Parts List)

Indicates part number to be used when ordering replacement part from Tektronix.

SERIAL/MODEL NO. (columns three and four of the Electrical Parts List)

Column three (3) indicates the serial number at which the part was first used. Column four (4) indicates the serial number at which the part was removed. No serial number entered indicates part is good for all serial numbers.

NAME & DESCRIPTION (column five of the Electrical Parts List)

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

MFR. CODE (column six of the Electrical Parts List)

Indicates the code number of the actual manufacturer of the part. (Code to name and address cross reference can be found immediately after this page.)

MFR. PART NUMBER (column seven of the Electrical Parts List)

Indicates actual manufacturers part number.

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
000HZ	WIGWAM OUTDOOR STORES	10975 S.W. CANYON RD.	BEAVERTON, OR 97005
01121	ALLEN-BRADLEY COMPANY	1201 2ND STREET SOUTH	MILWAUKEE, WI 53204
01295	TEXAS INSTRUMENTS, INC., SEMICONDUCTOR GROUP	P O BOX 5012, 13500 N CENTRAL EXPRESSWAY	DALLAS, TX 75222
09353	C AND K COMPONENTS, INC.	103 MORSE STREET	WATERTOWN, MA 02172
13511	AMPHENOL CARDRE DIV., BUNKER RAMO CORP.		LOS GATOS, CA 95030
14193	CAL-R, INC.	1601 OLYMPIC BLVD.	SANTA MONICA, CA 90404
14433	ITT SEMICONDUCTORS	3301 ELECTRONICS WAY P O BOX 3049	WEST PALM BEACH, FL 33402
22526	BERG ELECTRONICS, INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
27014	NATIONAL SEMICONDUCTOR CORP.	2900 SEMICONDUCTOR DR.	SANTA CLARA, CA 95051
50522	MONSANTO CO., ELECTRONIC SPECIAL PRODUCTS	3400 HILLVIEW AVENUE	PALO ALTO, CA 94304
74970	JOHNSON, E. F., CO.	299 10TH AVE. S. W.	WASECA, MN 56093
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
81073	GRAYHILL, INC.	561 HILLGROVE AVE., PO BOX 373	LA GRANGE, IL 60525
91637	DALE ELECTRONICS, INC.	P. O. BOX 609	COLUMBUS, NE 68601

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A10	670-7168-00		CKT BOARD ASSY:GPIB EXTENDER	80009	670-7168-00
A20	670-7167-00		CKT BOARD ASSY:AUXILIARY	80009	670-7167-00
A30	670-7166-00		CKT BOARD ASSY:MAIN	80009	670-7166-00
A10	-----		CKT BOARD ASSY:GPIB EXTENDER		
A10J1640	131-1857-00		TERM. SET,PIN:36/0.025 SQ PIN,ON 0.1 CTRS	22526	65500136
A10R1900	321-0227-00		RES.,FXD,FILM:2.26K OHM,1%,0.125W	91637	MFF1816G22600F
A10R1910	321-0625-00		RES.,FXD,FILM:5.88K OHM,1%,0.125W	91637	MFF1816G58800F
A10R2000	315-0122-00		RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
A10R2001	315-0122-00		RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
A10R2002	315-0122-00		RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
A10R2010	315-0122-00		RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
A10R2011	315-0122-00		RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
A10R2012	315-0122-00		RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
A10U1900	156-0411-01		MICROCIRCUIT,LI:QUAD,COMPARATOR,SGL SPLY	27014	LM339N
A10U1910	156-0411-01		MICROCIRCUIT,LI:QUAD,COMPARATOR,SGL SPLY	27014	LM339N
A20	-----		CKT BOARD ASSY:AUXILIARY		
A20CR1204	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
A20CR1302	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
A20J1000	131-1425-00		CONTACT SET,ELE:R ANGLE,0.150" L,STR OF 36	22526	65521-136
A20J1001	131-1425-00		CONTACT SET,ELE:R ANGLE,0.150" L,STR OF 36	22526	65521-136
A20J1002	131-1425-00		CONTACT SET,ELE:R ANGLE,0.150" L,STR OF 36	22526	65521-136
A20J1005	131-1425-00		CONTACT SET,ELE:R ANGLE,0.150" L,STR OF 36	22526	65521-136
A20J1010	131-1425-00		CONTACT SET,ELE:R ANGLE,0.150" L,STR OF 36	22526	65521-136
A20J1020	131-1425-00		CONTACT SET,ELE:R ANGLE,0.150" L,STR OF 36	22526	65521-136
A20J1021	131-1425-00		CONTACT SET,ELE:R ANGLE,0.150" L,STR OF 36	22526	65521-136
A20R1011	308-0164-00		RES.,FXD,WW:50 OHM,5%,25W	91637	HL2502Z650K00J
A20R1014	308-0104-00		RES.,FXD,WW:167 OHM,5%,5W	14193	SA50
A20R1015	305-0751-00		RES.,FXD,CMPSN:750 OHM,5%,2W	01121	HB7515
A20R1022	308-0164-00		RES.,FXD,WW:50 OHM,5%,25W		
A20R1112	308-0164-00		RES.,FXD,WW:50 OHM,5%,25W		
A20R1122	308-0164-00		RES.,FXD,WW:50 OHM,5%,25W		
A20R1202	301-0182-00		RES.,FXD,CMPSN:1.8K OHM,5%,0.5W	01121	EB1825
A20R1204	315-0331-00		RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
A20R1210	308-0164-00		RES.,FXD,WW:50 OHM,5%,25W		
A20R1212	303-0331-00		RES.,FXD,CMPSN:330 OHM,5%,1W	01121	GB3315
A20R1220	308-0164-00		RES.,FXD,WW:50 OHM,5%,25W		
A20R1302	315-0331-00		RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
A20R1304	301-0182-00		RES.,FXD,CMPSN:1.8K OHM,5%,0.5W	01121	EB1825
A20R1312	303-0331-00		RES.,FXD,CMPSN:330 OHM,5%,1W	01121	GB3315

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A30	-----		CKT BOARD ASSY:MAIN		
A30CR1327	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
A30CR1337	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
A30CR1423	152-0066-00		SEMICONV DEVICE:SILICON,400V,750MA	14433	LG4016
A30J1006	131-1857-00		TERM. SET,PIN:36/0.025 SQ PIN,ON 0.1 CTRS	22526	65500136
A30J1022	131-1857-00		TERM. SET,PIN:36/0.025 SQ PIN,ON 0.1 CTRS	22526	65500136
A30J1030	131-1857-00		TERM. SET,PIN:36/0.025 SQ PIN,ON 0.1 CTRS	22526	65500136
A30Q1335	150-0190-00		LAMP,INCAND:5.0V	000HZ	715071-141
A30R1008	301-0221-00		RES.,FXD,CMPSN:220 OHM,5%,0.50W	01121	EB2215
A30R1018	301-0221-00		RES.,FXD,CMPSN:220 OHM,5%,0.50W	01121	EB2215
A30R1027	301-0221-00		RES.,FXD,CMPSN:220 OHM,5%,0.50W	01121	EB2215
A30R1101	308-0175-00		RES.,FXD,WW:10 OHM,5%,10W	91637	HL12052710R00J
A30R1201	308-0175-00		RES.,FXD,WW:10 OHM,5%,10W	91637	HL12052710R00J
A30R1203	308-0175-00		RES.,FXD,WW:10 OHM,5%,10W	91637	HL12052710R00J
A30R1301	308-0175-00		RES.,FXD,WW:10 OHM,5%,10W	91637	HL12052710R00J
A30R1303	308-0175-00		RES.,FXD,WW:10 OHM,5%,10W	91637	HL12052710R00J
A30R1326	315-0331-00		RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
A30R1328	301-0182-00		RES.,FXD,CMPSN:1.8K OHM,5%,0.5W	01121	EB1825
A30R1335	315-0103-00		RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A30R1337	315-0331-00		RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
A30R1338	301-0182-00		RES.,FXD,CMPSN:1.8K OHM,5%,0.5W	01121	EB1825
A30R1401	308-0175-00		RES.,FXD,WW:10 OHM,5%,10W	91637	HL12052710R00J
A30R1501	308-0175-00		RES.,FXD,WW:10 OHM,5%,10W	91637	HL12052710R00J
A30R1521	305-0510-00		RES.,FXD,CMPSN:51 OHM,5%,2W	01121	HB5105
A30R1523	305-0510-00		RES.,FXD,CMPSN:51 OHM,5%,2W	01121	HB5105
A30R1601	308-0175-00		RES.,FXD,WW:10 OHM,5%,10W	91637	HL12052710R00J
A30R1603	308-0175-00		RES.,FXD,WW:10 OHM,5%,10W	91637	HL12052710R00J
A30R1621	305-0510-00		RES.,FXD,CMPSN:51 OHM,5%,2W	01121	HB5105
A30R1701	308-0175-00		RES.,FXD,WW:10 OHM,5%,10W	91637	HL12052710R00J
A30R1801	308-0175-00		RES.,FXD,WW:10 OHM,5%,10W	91637	HL12052710R00J
A30R1803	308-0175-00		RES.,FXD,WW:10 OHM,5%,10W	91637	HL12052710R00J

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
CHASSIS PARTS					
DS400	150-1001-02		LT EMITTING DIO: RED, 660NM, 50MA MAX	80009	150-1001-02
DS410	150-1001-02		LT EMITTING DIO: RED, 660NM, 50MA MAX	80009	150-1001-02
DS500	150-1001-02		LT EMITTING DIO: RED, 660NM, 50MA MAX	80009	150-1001-02
DS510	150-1001-02		LT EMITTING DIO: RED, 660NM, 50MA MAX	80009	150-1001-02
DS520	150-1001-02		LT EMITTING DIO: RED, 660NM, 50MA MAX	80009	150-1001-02
DS530	150-1001-02		LT EMITTING DIO: RED, 660NM, 50MA MAX	80009	150-1001-02
DS600	150-1043-00		LT EMITTING DIO: RED, 20MA, 5V	50522	MV5774B
DS610	150-1043-00		LT EMITTING DIO: RED, 20MA, 5V	50522	MV5774B
DS620	150-1043-00		LT EMITTING DIO: RED, 20MA, 5V	50522	MV5774B
DS630	150-1043-00		LT EMITTING DIO: RED, 20MA, 5V	50522	MV5774B
DS640	150-1043-00		LT EMITTING DIO: RED, 20MA, 5V	50522	MV5774B
DS650	150-1043-00		LT EMITTING DIO: RED, 20MA, 5V	50522	MV5774B
DS1001	150-1001-02		LT EMITTING DIO: RED, 660NM, 50MA MAX	80009	150-1001-02
DS1011	150-1001-02		LT EMITTING DIO: RED, 660NM, 50MA MAX	80009	150-1001-02
DS1021	150-1001-02		LT EMITTING DIO: RED, 660NM, 50MA MAX	80009	150-1001-02
J401	136-0098-00		JACK, TIP: BLACK NYLON	74970	105-803
J405	136-0098-00		JACK, TIP: BLACK NYLON	74970	105-803
J415	136-0098-00		JACK, TIP: BLACK NYLON	74970	105-803
J420	136-0098-00		JACK, TIP: BLACK NYLON	74970	105-803
J430	131-0955-00		CONN, RCPT, ELEC: BNC, FEMALE	13511	31-279
S500	260-1485-00		SWITCH, TOGGLE:	09353	5930-00-368-1403
S510	260-1206-00		SWITCH, TOGGLE: SPDT, 5A, 115VAC CENTER OFF	09353	7103SYZQ
S1001	260-1871-00		SWITCH, TOGGLE: DPDT, 5A, 120VAC	09353	7211SYCB
S1031	260-0247-00		SWITCH, PUSH: SPST, 1A, 115VAC	81073	30YY1009

DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS

Symbols

Graphic symbols and class designation letters are based on ANSI Standard Y32.2-1975.

Logic symbology is based on ANSI Y32.14-1973 in terms of positive logic. Logic symbols depict the logic function performed and may differ from the manufacturer's data.

The overline on a signal name indicates that the signal performs its intended function when it is in the low state.

Abbreviations are based on ANSI Y1.1-1972.

Other ANSI standards that are used in the preparation of diagrams by Tektronix, Inc. are:

Y14.15, 1966 Drafting Practices.
Y14.2, 1973 Line Conventions and Lettering.
Y10.5, 1968 Letter Symbols for Quantities Used in Electrical Science and Electrical Engineering.

American National Standard Institute
1430 Broadway
New York, New York 10018

Component Values

Electrical components shown on the diagrams are in the following units unless noted otherwise:

Capacitors = Values one or greater are in picofarads (pF).
Values less than one are in microfarads (μ F).

Resistors = Ohms (Ω).

The information and special symbols below may appear in this manual.

Assembly Numbers and Grid Coordinates

Each assembly in the instrument is assigned an assembly number (e.g., A20). The assembly number appears on the circuit board outline on the diagram, in the title for the circuit board component location illustration, and in the lookup table for the schematic diagram and corresponding component locator illustration. The Replaceable Electrical Parts list is arranged by assemblies in numerical sequence; the components are listed by component number *(see following illustration for constructing a component number).

The schematic diagram and circuit board component location illustration have grids. A lookup table with the grid coordinates is provided for ease of locating the component. Only the components illustrated on the facing diagram are listed in the lookup table. When more than one schematic diagram is used to illustrate the circuitry on a circuit board, the circuit board illustration may only appear opposite the first diagram on which it was illustrated; the lookup table will list the diagram number of other diagrams that the circuitry of the circuit board appears on.

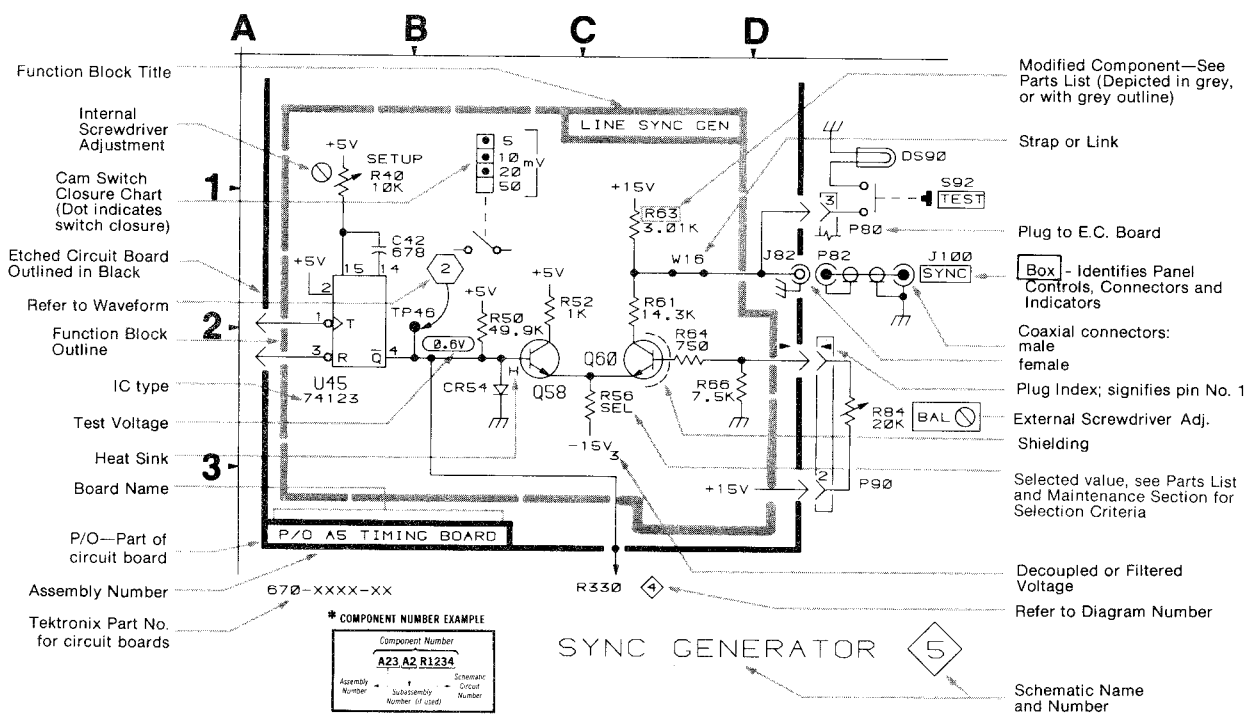


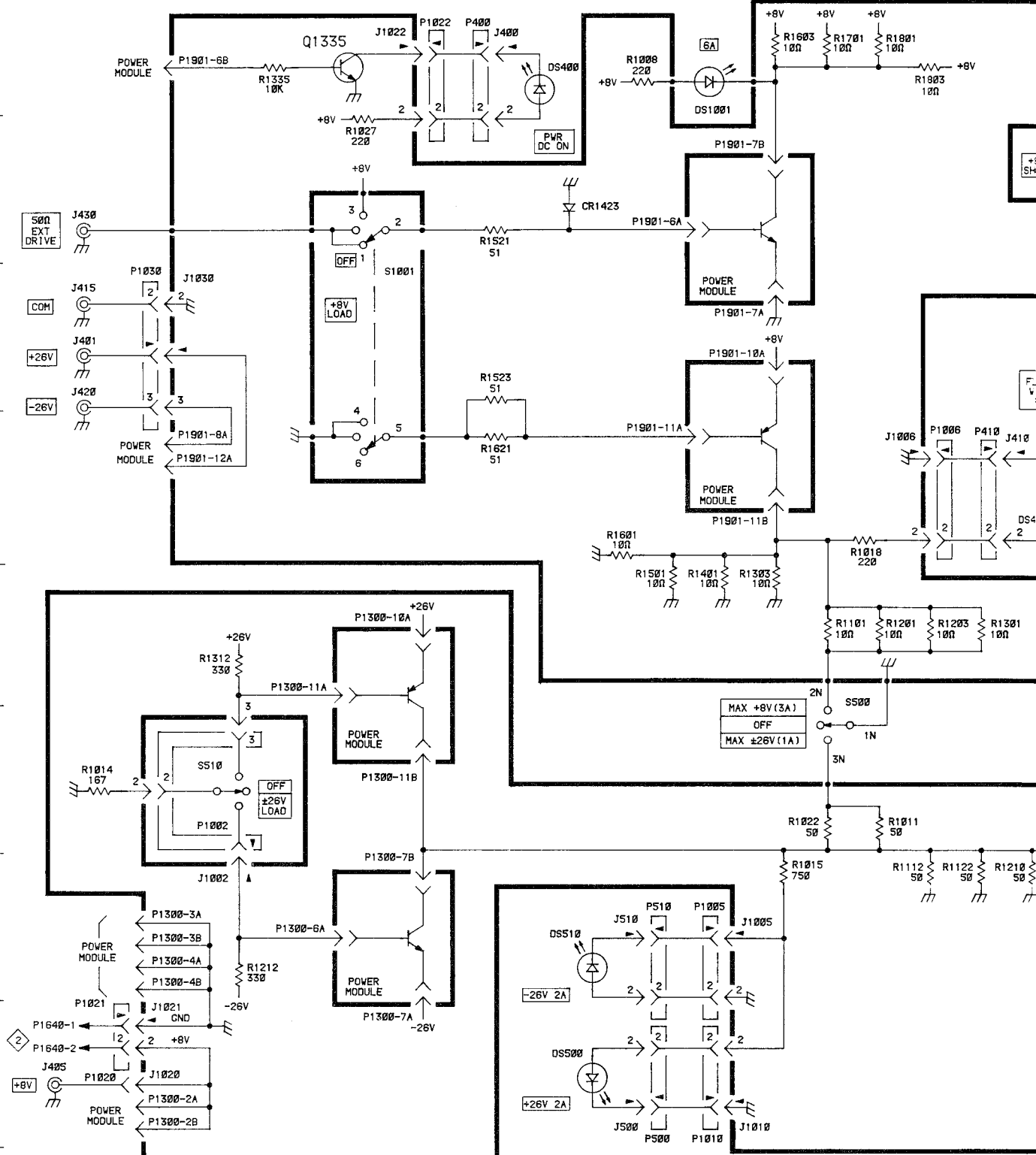
Table 8-1

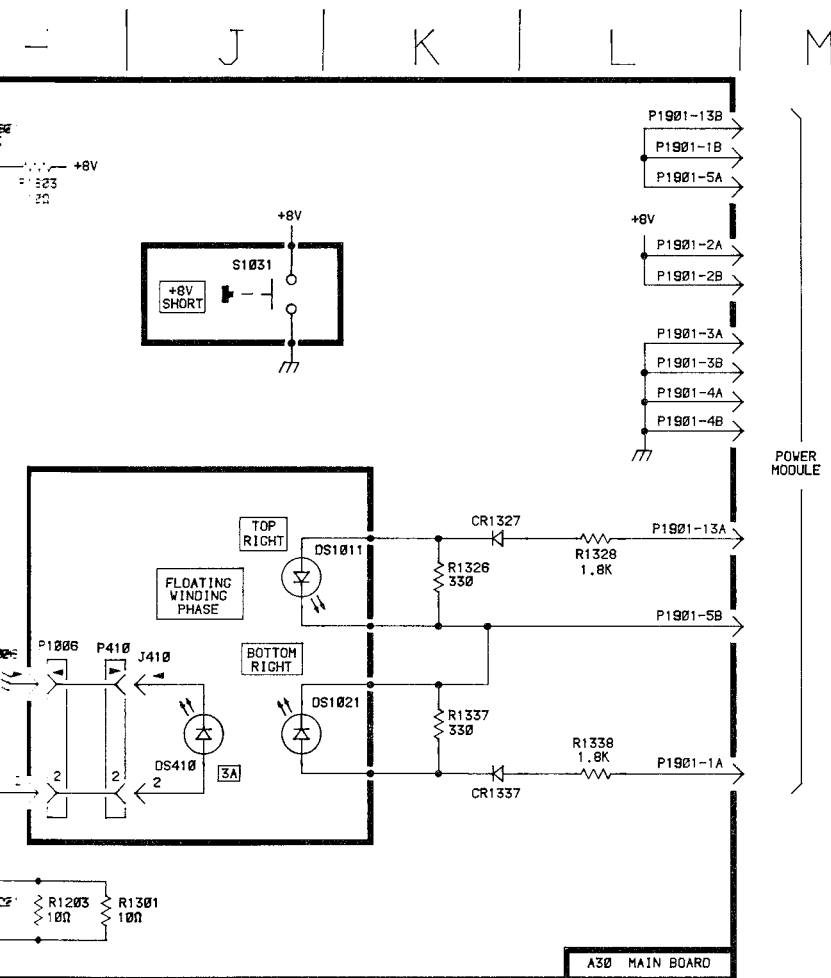
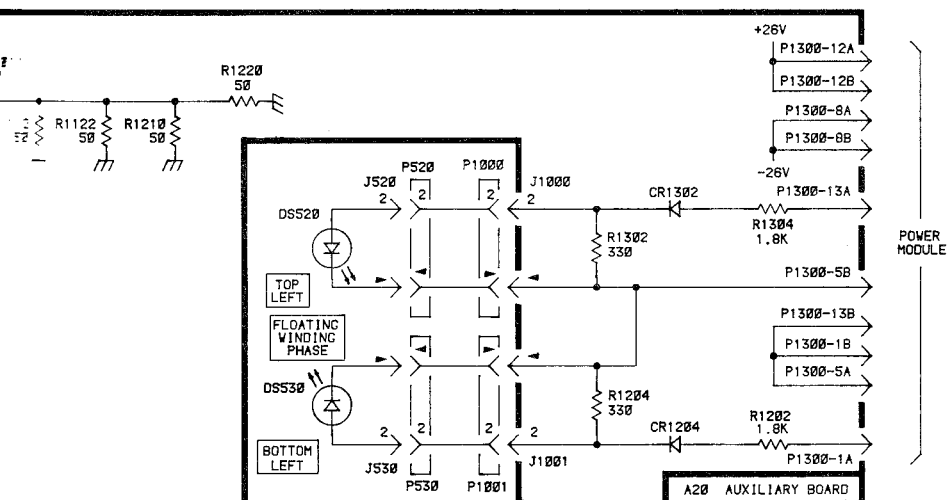
COMPONENT REFERENCE CHART

P/O A20 ASSY			POWER SUPPLY LOAD CIRCUITRY 1		
CIRCUIT NUMBER	SCHEMATIC LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEMATIC LOCATION	BOARD LOCATION
CR1204	L8	F2	R1112	H7	C4
CR1302	L7	F2	R1122	H7	D5
J1000	K7	A1	R1202	M7	F2
J1001	K8	A2	R1204	L8	F2
J1002	B6	A2	R1210	H7	E4
J1005	F7	A3	R1212	B7	F4
J1010	F8	A3	R1220	H6	F6
J1020	B8	A5	R1302	L7	F2
J1021	B8	A5	R1312	B5	F2
P1000	K7	A1	DS500	E8	Chassis
P1001	K8	A2	DS510	E7	Chassis
P1002	B6	A2	DS520	J7	Chassis
P1005	F7	A3	DS530	J8	Chassis
P1010	F8	A3	J405	A8	Chassis
P1020	A8	A5	J500	E8	Chassis
P1021	A8	A5	J510	E7	Chassis
P1300	C6	G5	J520	K7	Chassis
P1300	B7	G5	J530	K8	Chassis
P1300	B8	G5	P500	E8	Chassis
P1300	M7	G5	P510	E7	Chassis
P1300	C8	G5	P520	K7	Chassis
R1011	H6	A4	P530	K8	Chassis
R1014	A6	B3	S510	B6	Chassis
R1015	F6	B3			
R1022	F6	B5			
A30 ASSY					
CR1327	K3	H4	R1335	C1	H5
CR1337	K4	H5	R1337	K4	H5
CR1423	E2	G4	R1338	L4	H5
DS1001	F1	M1	R1401	F5	G1
DS1011	J3	M3	R1501	E5	F1
DS1021	J4	M4	R1521	D2	G4
J1006	H4	L2	R1523	D3	F4
J1022	C1	M4	R1601	E4	E1
J1030	B3	L5	R1603	F1	E2
P1006	H4	L2	R1621	D4	F4
P1022	D1	M4	R1701	F1	D2
P1030	B3	L5	R1801	H1	C1
P1901	B1	A5	R1803	H1	B1
P1901	B4	A5	S1001	C2	L2
P1901	L2	A5	S1031	J2	M5
Q1335	C1	I4	DS400	D1	Chassis
R1008	E1	L2	DS410	J4	Chassis
R1018	H4	L3	J400	D1	Chassis
R1027	C2	L4	J401	A3	Chassis
R1101	F5	K2	J415	A3	Chassis
R1201	H5	J2	J420	A3	Chassis
R1203	H5	J1	J430	A2	Chassis
R1301	H5	I1	P400	D1	Chassis
R1303	F5	H1	P410	H4	Chassis
R1326	K3	H4	S500	F6	Chassis
R1328	L3	H4			

A | B | C | D | E | F | G | H

1
2
3
4
5
6
7
8



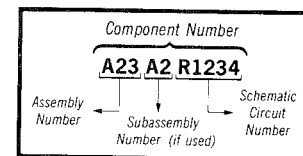
POWER
MODULEPOWER
MODULE

POWER SUPPLY LOAD CIRCUITRY

POWER SUPPLY LOAD
CIRCUITRY

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE

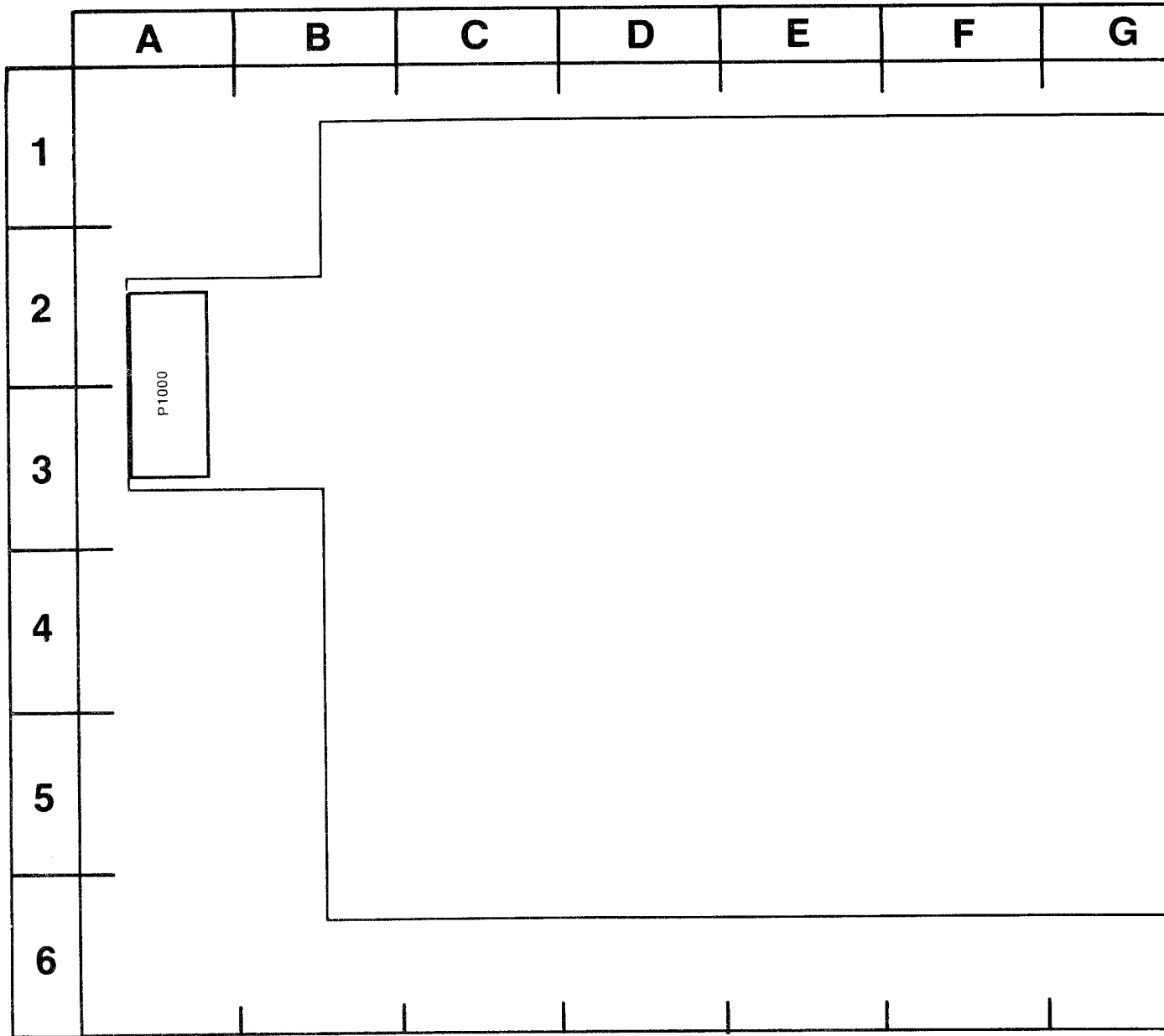


Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

1

JS

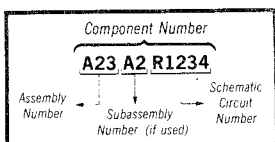
PARTS LOCA



A10
PARTS LOCATION GRID

Fig. 8-5. GPIB B

COMPONENT NUMBER EXAMPLE

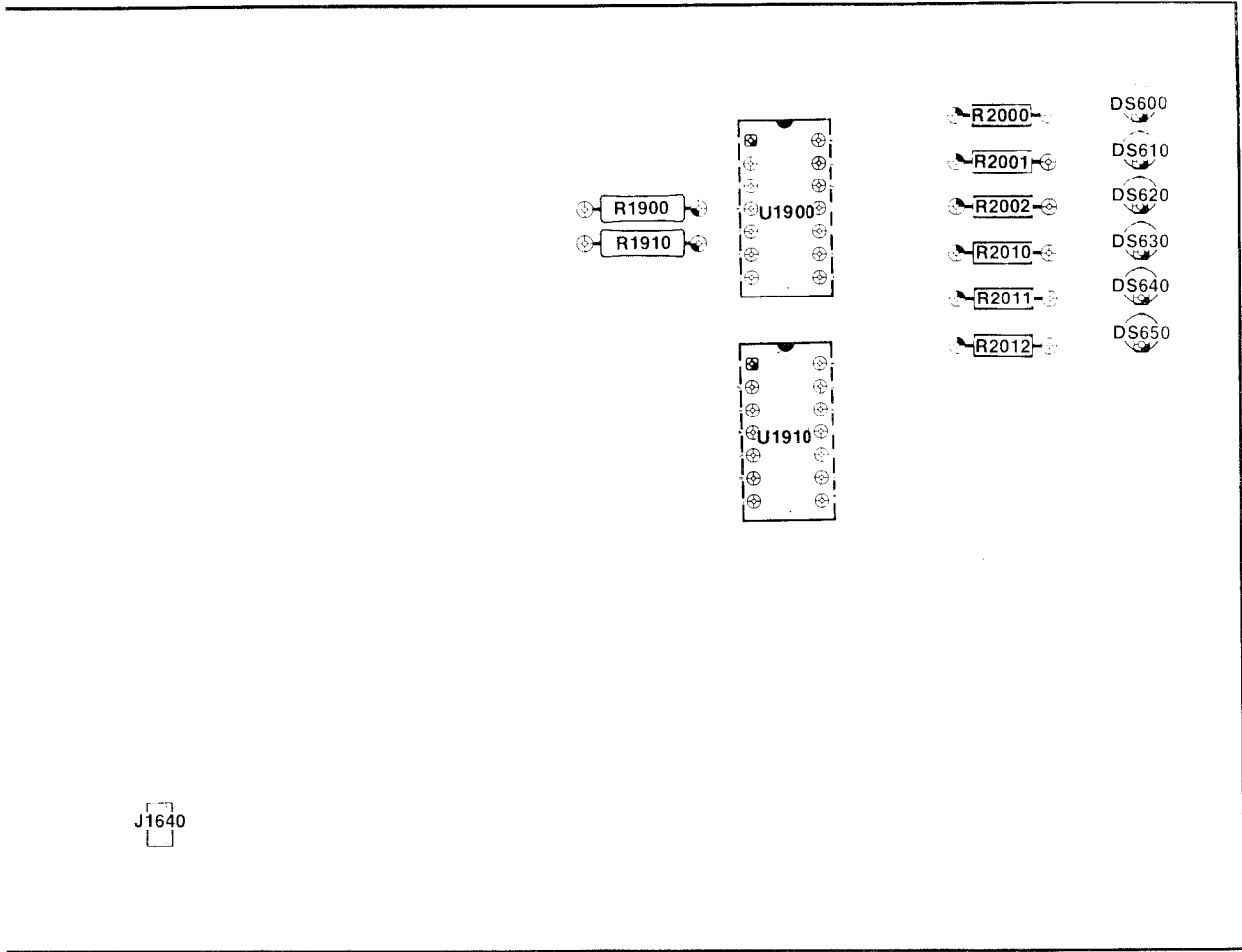


Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Static Sensitive Devices
See Maintenance Section

POSITION GRID

	H	I	J	K	L	M	N
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2412-06

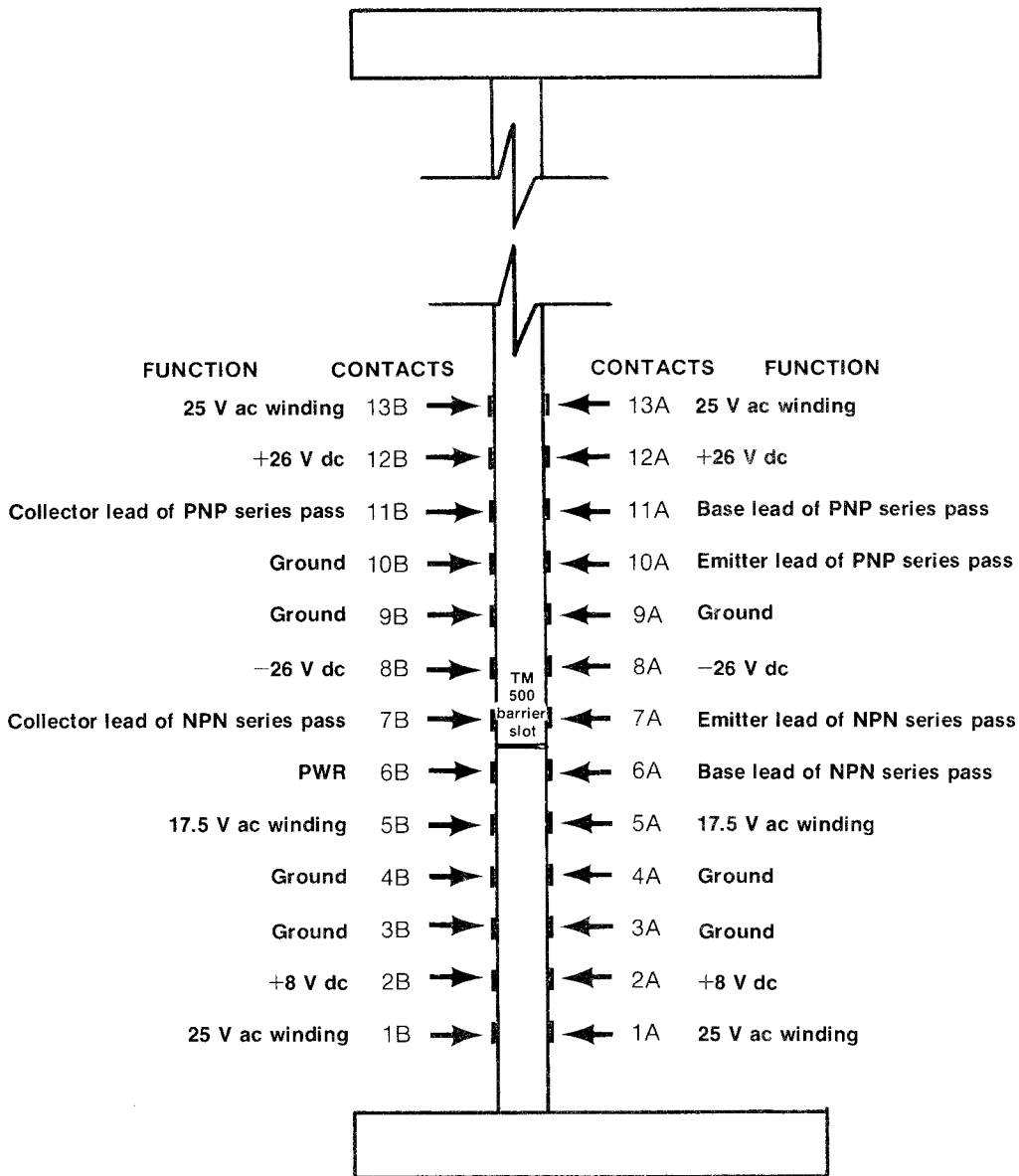
ASSY A10

s Status Board.

Table 8-2

COMPONENT REFERENCE CHART

A 10 ASSY			GPIB BUS STATUS 2		
CIRCUIT NUMBER	SCHEMATIC LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEMATIC LOCATION	BOARD LOCATION
DS600	J2	M1	R1900	D7	K2
DS610	J3	M2	R1910	D2	K2
DS620	J4	M2	R2000	F2	L1
DS630	J5	M2	R2001	F3	L2
DS640	J5	M2	R2002	F4	L2
DS650	J6	M3	R2010	F5	L2
J1000	B2	A2	R2011	F5	L2
J1640	C1	H5	R2012	F6	L3
P1000	C2	A2	U1900	E3	K2
P1640	B1	H5	U1910	E5	K3



Interface connections viewed from rear of plug-in.

Fig. 8-1. Rear Interface Connector Assignments.

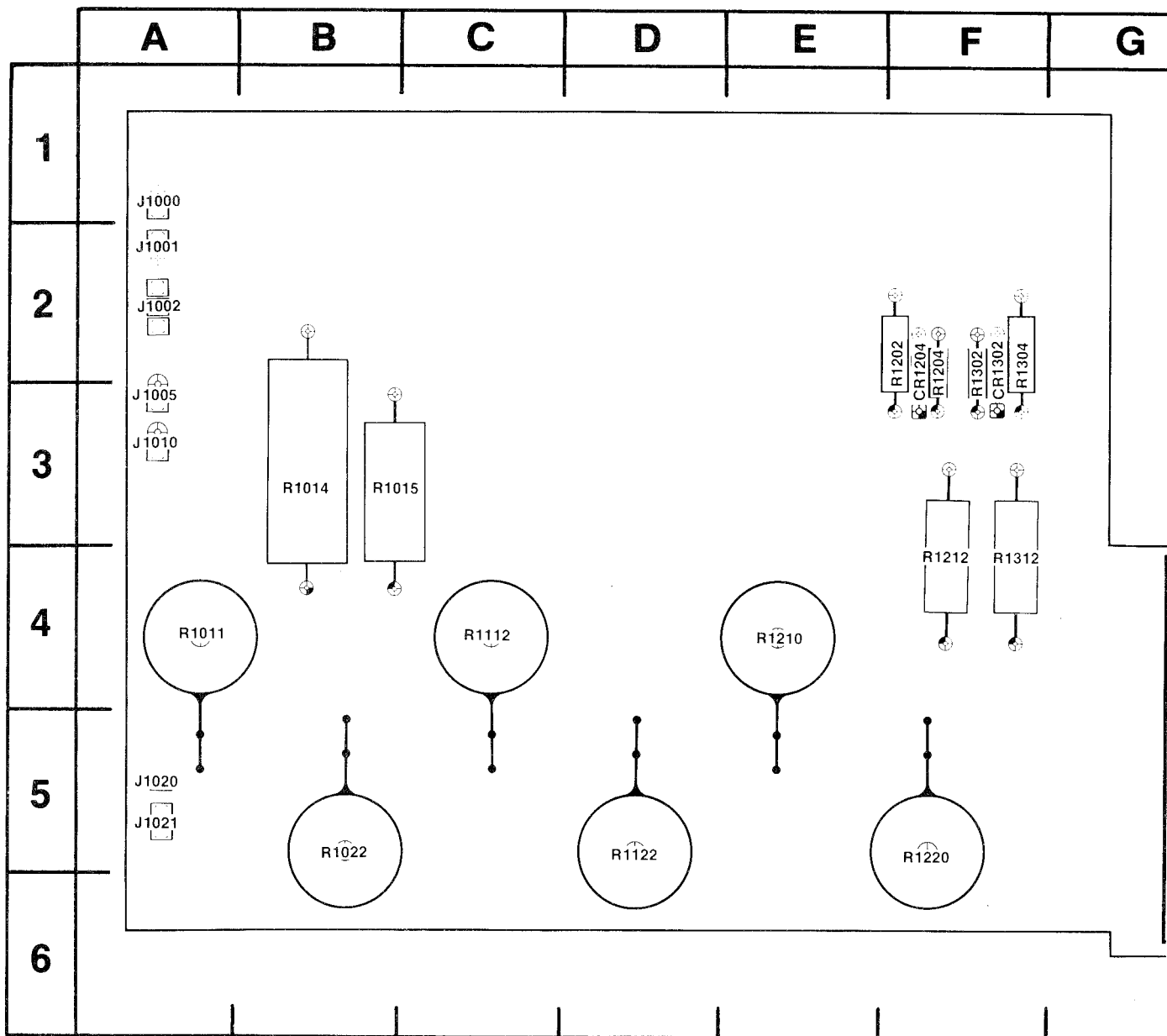
DI01	• 1	2 •	DI05
DI02	• 3	4 •	DI06
DI03	• 5	6 •	DI07
DI04	• 7	8 •	DI08
NC	• 9	10 •	NC
EOI	• 11	12 •	IFC
DAV	• 13	14 •	SRQ
NRFD	• 15	16 •	ATN
NDAC	• 17	18 •	REN
NC	• 19	20 •	NC

Connections viewed from rear of plug-in.

2412-03

Fig. 8-2. GPIB Connector.

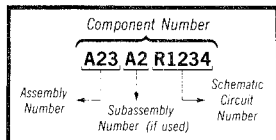
A20, A30
PARTS LOCATION GRIDS



ASS

Fig. 8-3. Auxiliary Board.

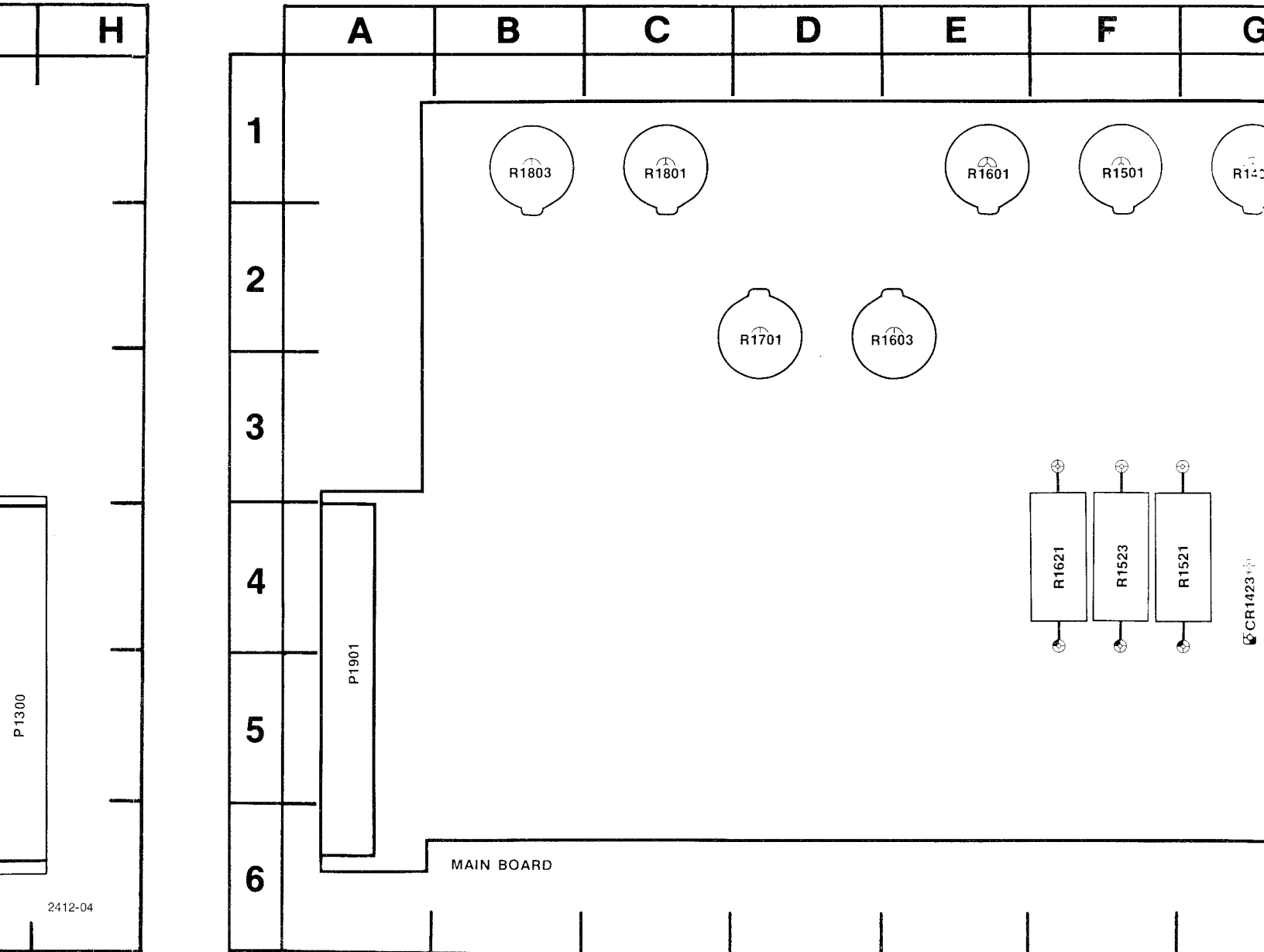
COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

 Static Sensitive Devices
See Maintenance Section

PARTS LOCATION GRIDS



SY A20

Fig. 8-4. Main

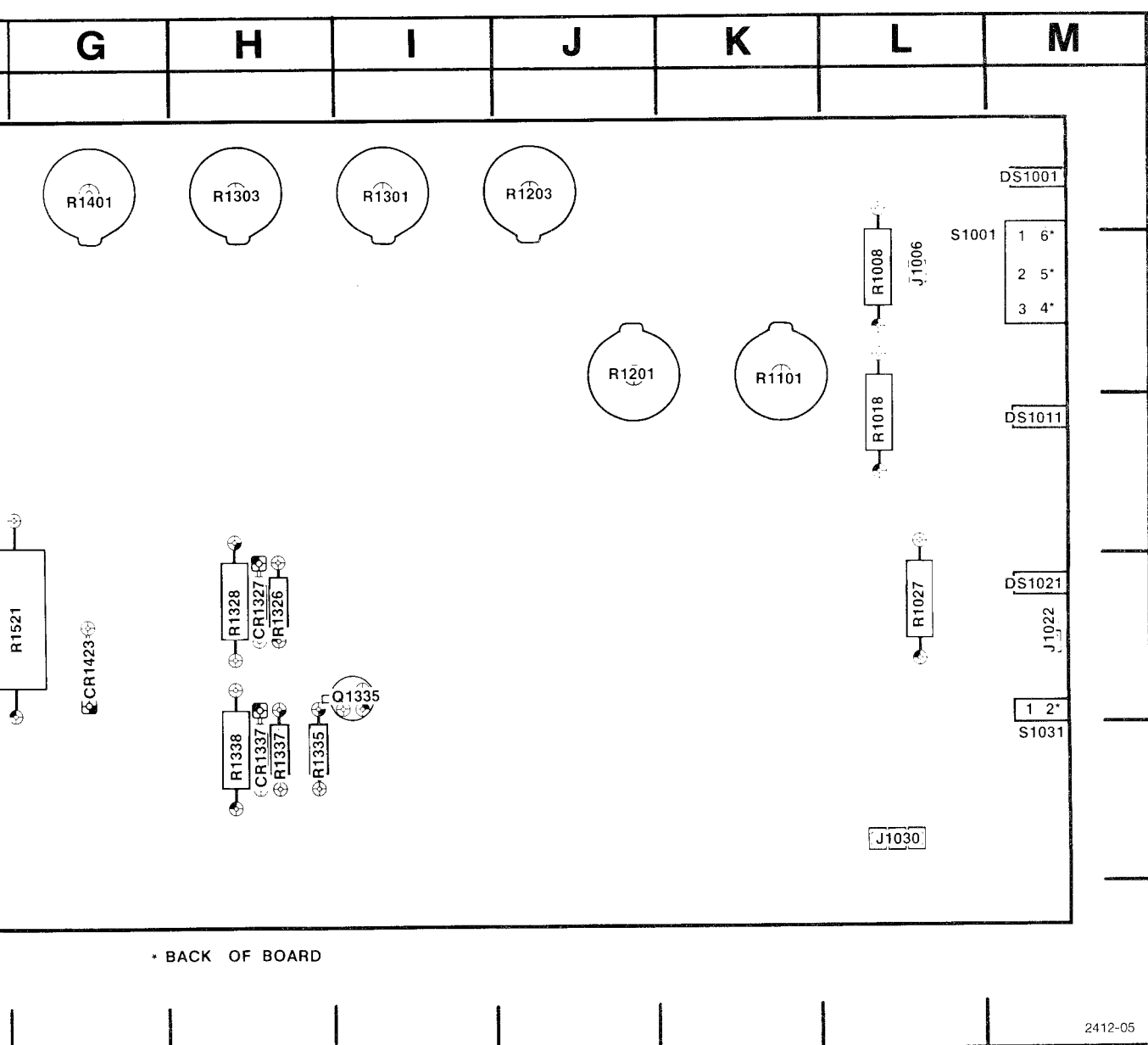


Fig. 8-4. Main Board.

ASSY A30

A

B

C

D

E

F

1

2

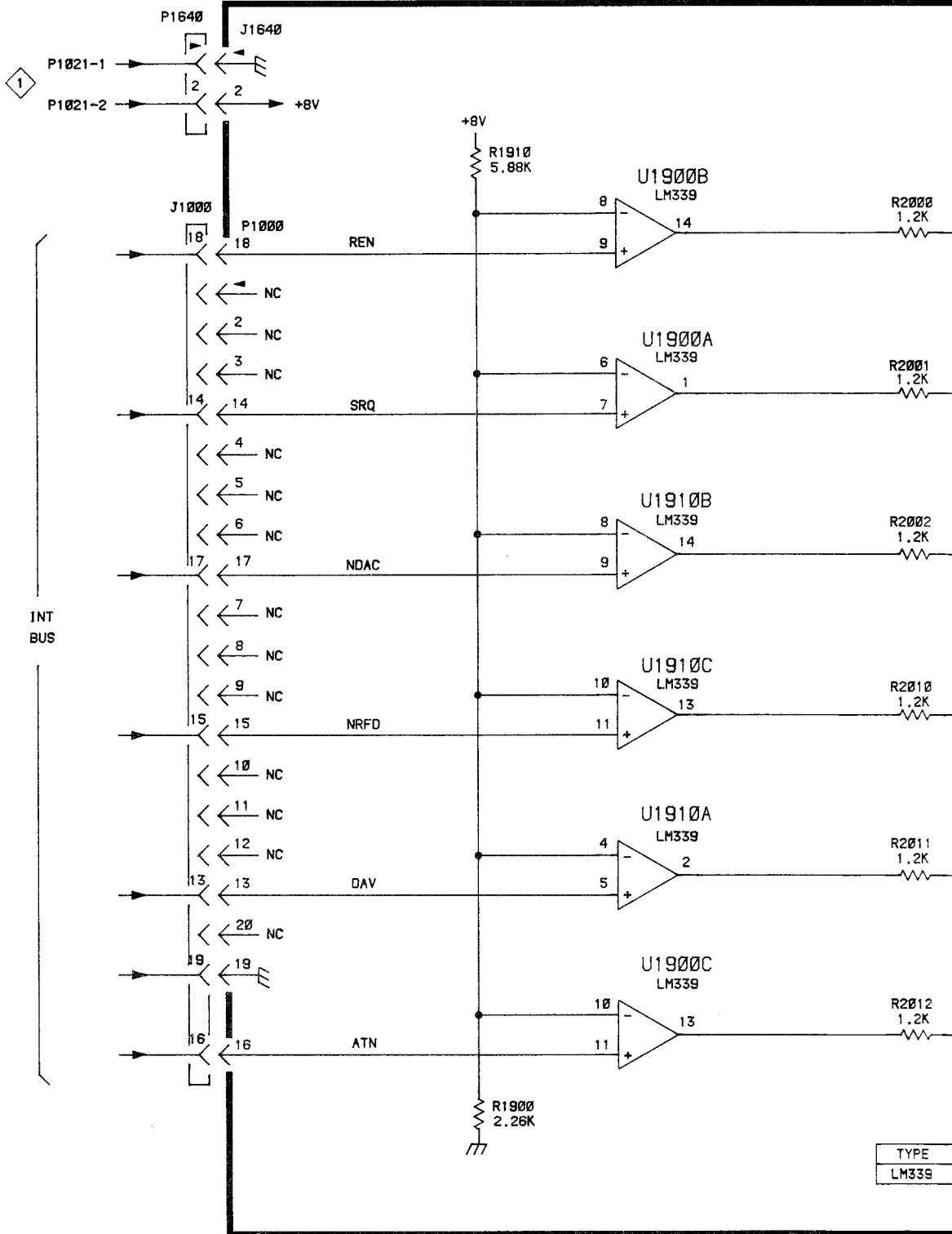
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4

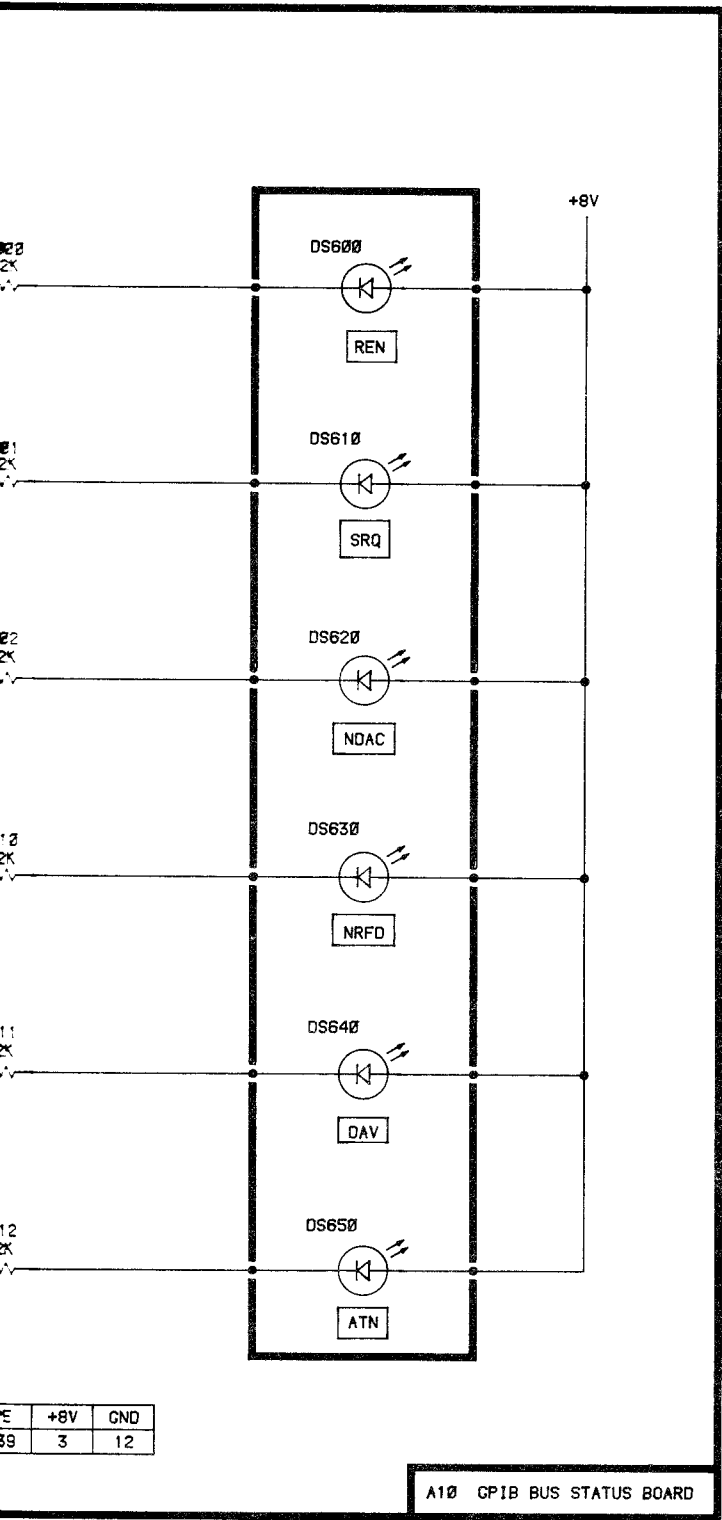
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6

7



TYPE
LM339

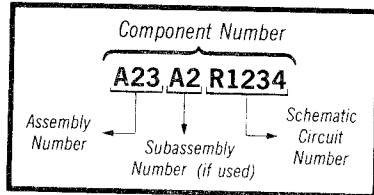


E	+8V	GND
39	3	12

GPIB BUS STATUS

 **Static Sensitive Devices**
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

2 JS

REPLACEABLE MECHANICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

SPECIAL NOTES AND SYMBOLS

X000 Part first added at this serial number
00X Part removed after this serial number

FIGURE AND INDEX NUMBERS

Items in this section are referenced by figure and index numbers to the illustrations.

INDENTATION SYSTEM

This mechanical parts list is indented to indicate item relationships. Following is an example of the indentation system used in the description column.

1 2 3 4 5 *Name & Description*

Assembly and/or Component

Attaching parts for Assembly and/or Component

Detail Part of Assembly and/or Component

Attaching parts for Detail Part

Parts of Detail Part

Attaching parts for Parts of Detail Part

Attaching Parts always appear in the same indentation as the item it mounts, while the detail parts are indented to the right. Indented items are part of, and included with, the next higher indentation. The separation symbol --- * --- indicates the end of attaching parts.

Attaching parts must be purchased separately, unless otherwise specified.

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

#	INCH NUMBER SIZE	ELCTRN	ELECTRON	IN	INCH	SE	SINGLE END
ACTR	ACTUATOR	ELEC	ELECTRICAL	INCAND	INCANDESCENT	SECT	SECTION
ADPTR	ADAPTER	ELECTLT	ELECTROLYTIC	INSUL	INSULATOR	SEMICOND	SEMICONDUCTOR
ALIGN	ALIGNMENT	ELEM	ELEMENT	INTL	INTERNAL	SHLD	SHIELD
AL	ALUMINUM	EPL	ELECTRICAL PARTS LIST	LPHLDR	LAMPHOLDER	SHLDR	SHOULDERED
ASSEM	ASSEMBLED	EQPT	EQUIPMENT	MACH	MACHINE	SKT	SOCKET
ASSY	ASSEMBLY	EXT	EXTERNAL	MECH	MECHANICAL	SL	SLIDE
ATTEN	ATTENUATOR	FIL	FILLISTER HEAD	MTG	MOUNTING	SLFLKG	SELF-LOCKING
AWG	AMERICAN WIRE GAGE	FLEX	FLEXIBLE	NIP	NIPPLE	SLVG	SLEEVING
BD	BOARD	FLH	FLAT HEAD	NON WIRE	NOT WIRE WOUND	SPR	SPRING
BRKT	BRACKET	FLTR	FILTER	OBD	ORDER BY DESCRIPTION	SQ	SQUARE
BRS	BRASS	FR	FRAME or FRONT	OD	OUTSIDE DIAMETER	SST	STAINLESS STEEL
BRZ	BRONZE	FSTNR	FASTENER	OVH	OVAL HEAD	STL	STEEL
BSHG	BUSHING	FT	FOOT	PH BRZ	PHOSPHOR BRONZE	SW	SWITCH
CAB	CABINET	FXD	FIXED	PL	PLAIN or PLATE	T	TUBE
CAP	CAPACITOR	GSKT	GASKET	PLSTC	PLASTIC	TERM	TERMINAL
CER	CERAMIC	HDL	HANDLE	PN	PART NUMBER	THD	THREAD
CHAS	CHASSIS	HEX	HEXAGON	PNH	PAN HEAD	THK	THICK
CKT	CIRCUIT	HEX HD	HEXAGONAL HEAD	PWR	POWER	TNSN	TENSION
COMP	COMPOSITION	HEX SOC	HEXAGONAL SOCKET	RCPT	RECEPTACLE	TPG	TAPPING
CONN	CONNECTOR	HLCPS	HELICAL COMPRESSION	RES	RESISTOR	TRH	TRUSS HEAD
COV	COVER	HLEXT	HELICAL EXTENSION	RGD	RIGID	V	VOLTAGE
CPLG	COUPLING	HV	HIGH VOLTAGE	RLF	RELIEF	VAR	VARIABLE
CRT	CATHODE RAY TUBE	IC	INTEGRATED CIRCUIT	RTNR	RETAINER	W/	WITH
DEG	DEGREE	ID	INSIDE DIAMETER	SCH	SOCKET HEAD	WSHR	WASHER
DWR	DRAWER	IDNT	IDENTIFICATION	SCOPE	OSCILLOSCOPE	XFMR	TRANSFORMER
		IMPLR	IMPELLER	SCR	SCREW	XSTR	TRANSISTOR

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
000BK	STAUFFER SUPPLY	105 SE TAYLOR	PORTLAND, OR 97214
06915	RICHCO PLASTIC CO.	5825 N. TRIPP AVE.	CHICAGO, IL 60646
18680	HIGHLAND MFG. CO., THE DIV. OF BUELL INDUSTRIES, INC.	1240 WOLCOTT STREET	WATERBURY, CT 06720
63743	WARD LEONARD ELECTRIC CO., INC.	31 SOUTH ST.	MOUNT VERNON, NY 10550
70485	ATLANTIC INDIA RUBBER WORKS, INC.	571 W. POLK ST.	CHICAGO, IL 60607
73743	FISCHER SPECIAL MFG. CO.	446 MORGAN ST.	CINCINNATI, OH 45206
78189	ILLINOIS TOOL WORKS, INC. SHAKEPROOF DIVISION	ST. CHARLES ROAD	ELGIN, IL 60120
79807	WROUGHT WASHER MFG. CO.	2100 S. O BAY ST.	MILWAUKEE, WI 53207
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
83385	CENTRAL SCREW CO.	2530 CRESCENT DR.	BROADVIEW, IL 60153
93907	TEXTRON INC. CAMCAR DIV	600 18TH AVE	ROCKFORD, IL 61101

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
1-1	337-1399-00		2						SHLD,ELECTRICAL:SIDE	80009	337-1399-00
-2	333-2670-00		1						PANEL,REAR: (ATTACHING PARTS)	80009	333-2670-00
-3	213-0793-00		2						SCREW,TPG,TF:6-32 X 0.4375,TAPTITE,FIL	93907	OBD
-4	386-3657-01		2						SUPPORT,PLUG IN: - - - * - - -	93907	OBD
-5	255-0581-00		AR						PLASTIC CHANNEL:0.156 X 0.156	06915	PGS-2
-6	200-1837-02		2						COVER,PLUG-IN:TOP & BOTTOM (ATTACHING PARTS)	80009	200-1837-02
-7	211-0503-00		4						SCREW,MACHINE:6-32 X 0.188 INCH,PNH STL - - - * - - -	83385	OBD
-8	366-1690-00		1						KNOB,LATCH:SIL CY,0.53 X0.23 X 1.059	80009	366-1690-00
-9	105-0719-00		1						LATCH,RETAINING:PLUG-IN (ATTACHING PARTS)	80009	105-0719-00
-10	213-0113-00		1						SCR,TPG,THD FOR:2-32 X 0.312 INCH,PNH STL - - - * - - -	93907	OBD
-11	105-0718-01		1						BAR,LATCH RLSE:	80009	105-0718-01
-12	-----		1						SWITCH,TOGGLE:(SEE S510 REPL)		
-13	210-0940-00		1						WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL	79807	OBD
-14	-----		1						SWITCH,TOGGLE:(SEE S500 REPL)		
-15	210-0940-00		1						WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL	79807	OBD
-16	-----		1						SWITCH,TOGGLE:(SEE S1001 REPL)		
-17	210-0940-00		1						WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL	79807	OBD
-18	-----		4						JACK,TIP:(SEE J401,J405,J415,J420 REPL)		
-19	210-0011-00		4						WASHER,LOCK:0.25 ID,INTL,0.025 THK STL	000BK	OBD
-20	-----		1						SWITCH,PUSH:(SEE S1031 REPL) (ATTACHING PARTS)		
-21	210-0562-00		1						NUT,PLAIN,HEX.:0.25-40 X 0.312 INCH,BBS	73743	2X20224-402
-22	-----		1						CONN,RCPT,ELEC:(SEE J430 REPL)		
-23	348-0002-00		9						GROMMET,RUBBER:	70485	54G
-24	333-2812-00		1						PANEL,FRONT:	80009	333-2812-00
-25	386-4698-00		1						SUBPANEL,FRONT: (ATTACHING PARTS)	80009	386-4698-00
-26	213-0229-00		8						SCR,TPG,THD FOR:6-20 X0.375"100 DEG,FLH STL - - - * - - -	93907	OBD
-27	337-2916-00		1						SHIELD,ELEC:FRONT,SUBPANEL	80009	337-2916-00
-28	-----		1						CKT BOARD ASSY:MAIN(SEE A30 REPL) (ATTACHING PARTS)		
-29	211-0602-00		4						SCR,ASSEM WSHR:6-32 X 0.438 INCH,PNH BRS	80009	211-0602-00
-30	210-0457-00		4						NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL - - - * - - -	83385	OBD
-31	-----		-						. CKT BOARD ASSY INCLUDES:		
-32	-----		1						. TERM.SET,PIN:(SEE J1006,J1022,J1030 REPL)		
	-----		12						. RES.,FXD,WW:(SEE A30R1101,R1201,R1203,R1301, . R1303,R1401,R1501,R1601,R1603,R1701,R1801, . R1803 REPL) (ATTACHING PARTS)		
-33	211-0507-00		12						. SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
-34	211-0553-00		12						. SCREW,MACHINE:6-32 X 1.5 INCH,PNH STL	83385	OBD
-35	210-0601-00		12						. EYELET,METALLIC:CAD PLATED	18680	A424
-36	210-0478-00		12						. INSERT,SCR THD:0.66" L,W/HEX FLG ONE END	80009	210-0478-00
-37	-----		1						CKT BOARD ASSY;AUXILIARY(SEE A20 REPL) (ATTACHING PARTS)		
-38	211-0678-00		4						SCR,ASSEM WSHR:4-40 X 0.281 L,PNH STEEL - - -	78189	OBD
-39	-----		-						. CKT BOARD ASSY INCLUDES:		
	-----		1						. CONTACT SET,ELEC:(SEE A20J1000,J1001,J1002, . J1005,J1010,J1020,J1021 REPL)		
-40	-----		6						. RES.,FXD,WW:(SEE A20R1011,R1022,R1112,R1122, . R1210,R1220 REPL) (ATTACHING PARTS)		
-41	212-0023-00		6						. SCREW,MACHINE:8-32 X 0.375 INCH,PNH STL	83385	OBD
-42	212-0134-00		6						. SCREW,MACHINE:8-32 X 1.5 L,FILH,STL CD PL	000BK	OBD
-43	210-0808-00		6						. EYELET,METALLIC:CENTERING	63743	25151.13-3
-44	210-0462-00		6						. INSERT,SCR THD:SHOULDERED,0.719 INCH LONG - - - * - - -	80009	210-0462-00

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
1-45	129-0931-00			4						SPACER,POST:1.005 L W/4-40 INT THD (ATTACHING PARTS)	80009	129-0931-00
-46	211-0678-00			4						SCR,ASSEM WSHR:4-40 X 0.281 L,PNH STEEL - - - * - - -	78189	0BD
-47	-----			1						CKT BOARD ASSY:GPIB EXTENDER(SEE A10 REPL) (ATTACHING PARTS)		
-48	211-0602-00			4						SCR,ASSEM WSHR:6-32 X 0.438 INCH,PNH BRS - - - * - - -	80009	211-0602-00
	-----			-						. CKT BOARD ASSY INCLUDES:		
-49	-----			1						. TERM.SET,PIN:(SEE A10J1640 REPL)		
-50	214-1061-00			1						SPRING,GROUND:FLAT	80009	214-1061-00
-51	407-1693-00			4						BRACKET,COVER:ALUMINUM	80009	407-1693-00
-52	426-1245-01			1						FR SECT,PLUG-IN:TOP LEFT	80009	426-1245-01
-53	426-1245-00			1						FR SECT,PLUG-IN:LEFT SIDE,TOP AND BOTTOM	80009	426-1245-00
-54	426-1246-00			2						FR SECT,PLUG-IN:RIGHT SIDE,TOP AND BOTTOM	80009	426-1246-00

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
WIRE ASSEMBLIES												
198-4505-00				2						WIRE SET,ELEC:	80009	198-4505-00
195-3159-00				1	.					LEAD,ELECTRICAL:26 AWG,2.0 L,2-N	80009	195-3159-00
-----				-	.					(FROM A10J1640 TO A20J1021)		
195-3160-00				1	.					LEAD,ELECTRICAL:26 AWG,2.0 L,1-N	80009	195-3160-00
-----				-	.					(FROM A30J1006 TO DS410)		
352-0169-09				2	.					CONN BODY,PL,EL:2 WIRE WHITE	80009	352-0169-09
175-4175-00				1	CA	ASSY,SP,ELEC:8,26	AWG,9.0	L,RIBBON			80009	175-4175-00
-----				-						(FROM A20J1000 TO DS520)		
-----				-						(FROM A20J1001 TO DS530)		
-----				-						(FROM A20J1005 TO DS500)		
-----				-						(FROM A20J1010 TO DS510)		
352-0169-02				2	.					CONN BODY,PL,EL:2 WIRE RED	80009	352-0169-00
352-0169-07				2	.					CONN BODY,PL,EL:2 WIRE PURPLE	80009	352-0169-07
352-0169-03				2	.					CONN BODY,PL,EL:2 WIRE ORANGE	80009	352-0169-03
352-0169-04				2	.					CONN BODY,PL,EL:2 WIRE YELLOW	80009	352-0169-04
175-3711-00				1	CA	ASSY,SP,ELEC:3,26	AWG,7.0	L,RIBBON			80009	175-3711-00
-----				-						(FROM A20J1002 TO S510)		
352-0161-00				1	.					HLDR,TERM CONN:3 WIRE BLACK	80009	352-0161-00
195-2785-00				1	LEAD,ELECTRICAL:26	AWG,7.0	L,4-N				80009	195-2785-00
-----				-						(FROM A20J1020 TO J405)		
352-0171-01				1	.					CONN BODY,PL,EL:1 WIRE BROWN	80009	352-0171-01
195-2786-00				1	LEAD,ELECTRICAL:26	AWG,8.0	L,3-N				80009	195-2786-00
-----				-						(FROM A20R1022 TO S500(1A))		
175-4174-00				1	CABLE	ASSY,RF:50 OHM	COAX,5.0	L,8-22			80009	175-4174-00
-----				-						(FROM A30J1022 TO DS400)		
352-0169-05				2	.					CONN BODY,PL,EL:2 WIRE GREEN	80009	352-0169-05
175-4173-00				1	CA	ASSY,SP,ELEC:3,26	AWG,4.0	L,RIBBON			80009	175-4173-00
-----				-						(FROM A30J1030 TO J401,J415 J420)		
352-0161-00				1	.					HLDR,TERM CONN:3 WIRE BLACK	80009	352-0161-00
195-2876-00				1	LEAD,ELECTRICAL:26	AWG,5.0	L,2-N				80009	195-2876-00
-----				-						(FROM A30R1101 TO S500(3A))		
195-2787-00				1	LEAD,ELECTRICAL:26	AWG,3.0	L,1-N				80009	195-2787-00
-----				-						(FROM A30 TO S500)		

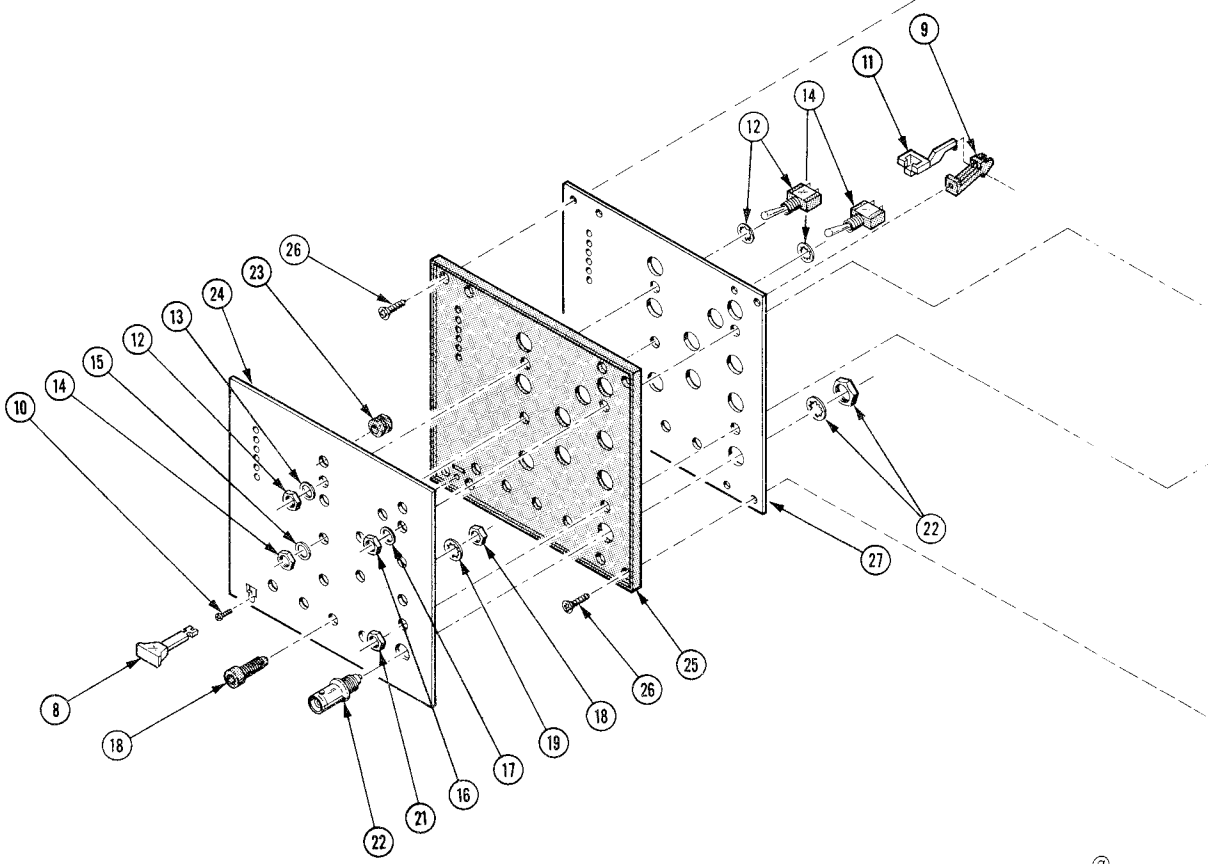
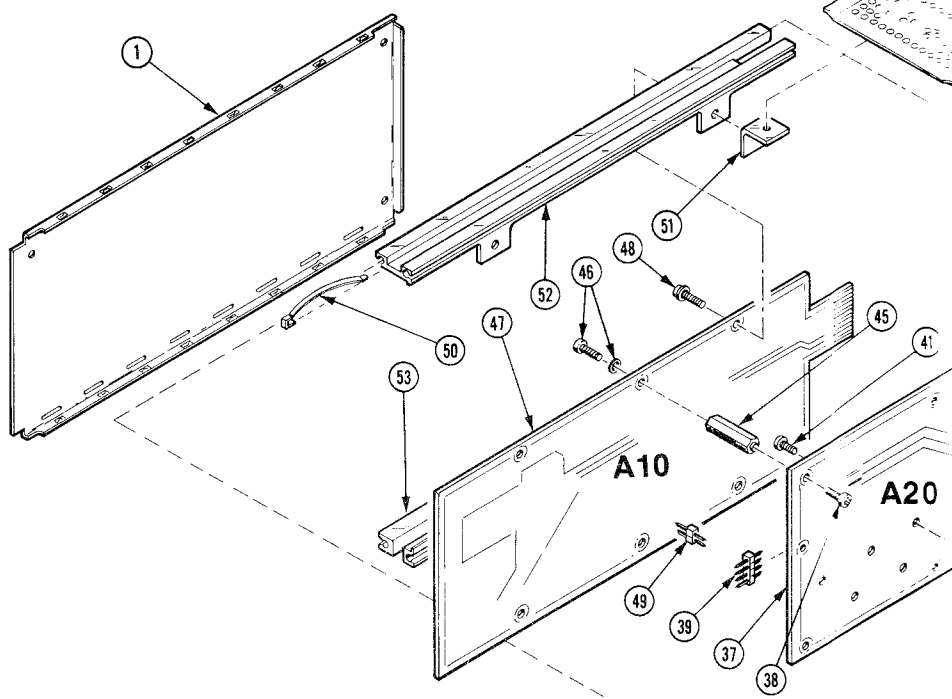
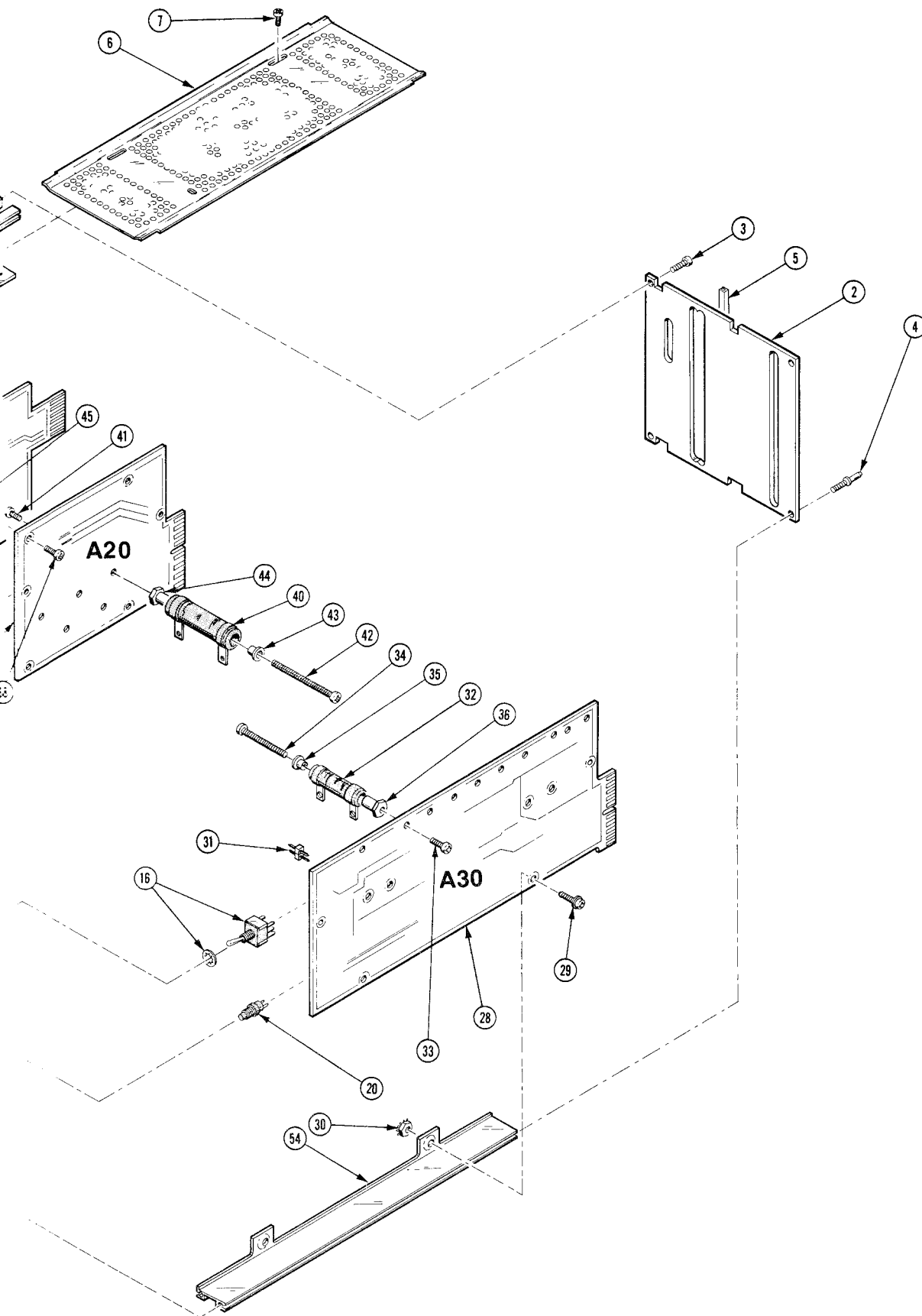


FIG. 1 EXPLODED



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067-0995-99

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
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ACCESSORIES

	061-2412-00			1						SHEET, TECH: INSTRUCTION	80009	061-2412-00
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