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070-6065-01
Product Group 48

370 PROGRAMMABLE CURVE TRACER SERVICE

Tektronix
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TEKTRONIX AB
Service
08-29 21 10

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TEK SERVICE MANUAL

Part No. 070-6065-01
Product Group 48

370
Programmable Curve Tracer
Service

WARNING

The following servicing instructions are for use by qualified service personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to the Safety Summary prior to performing any service.

Please check for CHANGE INFORMATION at the rear of this manual.

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INSTRUMENT SERIAL NUMBERS

Each instrument has a serial number on a panel insert, tag, or stamped on the chassis. The first number or letter designates the country of manufacture. The last five digits of the serial number are assigned sequentially and are unique to each instrument. Those manufactured in the United States have six unique digits. The country of manufacture is identified as follows:

B000000	Tektronix, Inc. Beaverton, Oregon, USA
100000	Tektronix Guernsey, Ltd., Channel Islands
200000	Tektronix United Kingdom, Ltd., London
300000	Sony/Tektronix, Japan
700000	Tektronix Holland, NV, Heerenveen, The Netherlands

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SAFETY SUMMARY

The Safety Summary is a listing of all safety precautions in the manual. These precautions are gathered here in a single place for convenient review of all precautions, and each also appears at a place in the manual where the reader receives the most benefit from the precaution.

WARNING

WARNING is used where, if ignored, injury or death could result, as well as instrument damage. Please read and observe the following WARNINGS:

Adjustment to the 370 should only be performed by a qualified service technician.

Dangerous voltages exist within the 370, both when operating and when not operating. Use extreme care to avoid serious injury.

Disconnect the 370 from the AC power source before changing operating voltages.

This instrument operates from a single-phase power source, and has a detachable three-wire power cord with a two-pole, three-terminal grounding-type plug. The voltage to ground (earth) from either pole of the power source must not exceed the maximum rated operating voltage (250 volts rms).

Before making connection to the power source, determine that the instrument is set for the power source voltage, and has a suitable plug (two-pole, three-terminal, grounding type).

This instrument is safety class 1 equipment (IEC designating receptacle with a grounding contact. Do not defeat the grounding connection. Any interruption of the grounding connection can create an electric shock hazard.

For electric shock protection, connect the instrument to ground before connecting to the instrument input or output terminals.

Following use of the 370 at high power settings, the device, fixture, or protective cover may be hot enough to cause injury. Avoid touching any of these items until cooled.

Up to 2000 V may appear at the front-panel collector terminals. To avoid injury or equipment damage, do not remove the protective cover or defeat the protective interlock switch.

If an item to be tested does not fit under the plastic protective cover, external test fixtures may be required. Refer construction of external test fixtures to a qualified serviceman. Refer also to the service manual for information that pertains to external test fixturing.

To avoid electric shock hazard, make sure that the 370 POWER switch is turned off before removing the high-voltage shield cover and connecting DMM to the 370, and make sure that the DMM ground lead is connected to the 370 GROUND terminal.

The 370 weighs more than 75 lbs. To avoid personal injury, use care when lifting the instrument, and where required, seek help in lifting and positioning the instrument in the rack. Once the 370 is installed in a rack, use care that the extended 370 does not tip the rack forward, causing personal injury or instrument damage.

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CAUTION

CAUTION is used where, if ignored, damage to the instrument or instrument software could result. Please read and observe the following CAUTIONS:

To prevent damage to the instrument, always check the settings of the LINE VOLTAGE SELECTOR switches located on the rear panel of the 3780 before connecting the instrument to the line-voltage source.

Double-wide test adapters are designed to fit in the left set of adapter connectors, as shown in Figure 1-1. If you try to forcibly install a double-wide test adapter in the right side, you might damage the connector. The connectors are identified by the following numbers:

A1006
A1007
A1008
A1009
A1010

To prevent equipment damage, do not short the collector and emitter terminals to one another.

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SECTION ONE
GENERAL INFORMATION

The 370 is a high-performance, GPIB-programmable digital-storage curve tracer that provides static and dynamic semiconductor device testing. This versatile instrument stimulates, measures, and displays the semiconductor characteristics of a variety of two-, three-, and four-terminal devices; including bipolar transistors, field effect transistors, silicon-controlled rectifiers, diodes, thyristors, optoisolators, wafers, integrated circuits, etc. A variety of measurements can be performed using either grounded-emitter or grounded-base configurations.

The side, top, and bottom cabinet panels provide protection to personnel from operating potentials present within the instrument. In addition, they reduce radiation of electromagnetic interference from the instrument. The cabinet panels are held in place by screws and four plastic panel retainers. To remove the panels, remove the four plastic retainers and three additional securing screws at the rear of the instrument. Pull each panel back to release the front edge, then lift the panels away from the instrument. Operate the instrument with the panels in place to protect the interior from dust, and to maintain cooling airflow.

The collector supply produces ac, rectified ac, or dc voltages ranging from 0 to ±2000 V. This high voltage, combined with a current sensitivity of 100 pA/div, permits extended breakdown measurements of a device under test. A step generator produces voltage or current steps of either polarity for application to the base or emitter terminal. The step generator may also be operated in a pulsed mode to control the power dissipated by the DUT.

In addition to conventional curve tracer performance, the 370 includes the following features:

1. Digital storage capability that allows bright and stable display and useful cursor measurements. The 370 can store up to 16 families of characteristic curves in a bubble cassette memory, display them on the crt and send them for data processing via the GPIB. The bubble memory also provides non-volatile storage for up to 16 complete front panel set-ups.

2. Two extended acquisition modes, called Averaging and Envelope. Averaging reduces display noise in high sensitivity ranges. Envelope mode displays only the maximum and minimum vertical or horizontal excursion of each curve, which is useful for detecting long-term variations such as thermal drift.

3. Almost all of the 370 front-panel settings can be controlled by GPIB commands. (Exceptions are those controls intended only for manual operation, such as INTENSITY, FOCUS, COLLECTOR SUPPLY HIGH-LOW control, etc.) Also, curve data can be sent to or received from an external controller through the GPIB.

4. The CENTRONICS-compatible plotter interface permits sending displayed curve data and digital on-screen readouts to a digital plotter without an external controller.

5. Other features include an auxiliary voltage supply, cursor measurement readout, and diagnostic routines.

RELATED DOCUMENTATION

In addition to this service manual, the 370 Operators Manual and the 370 Pocket Reference Guide will also help you understand and operate the 370.

INSTALLATION AND INITIAL INSPECTION

This instrument was inspected both mechanically and electrically before shipment. It should be free of mars or scratches and meet or exceed all electrical specifications. To confirm this, inspect the instrument for physical damage incurred in transit and test the electrical performance by following the procedures in Section 4, Checks and Adjustment. If there is damage or discrepancy, contact your local Tektronix Field Office or representative.

POWER SOURCE INFORMATION

This instrument is designed for operation from a power source with its neutral at or near ground (earth) potential. It is not intended for operation from two phases of a multi-phase system, or across legs of a single-phase, three wire system. Table 1-1 shows the 370 Line Voltage, Line Frequency, and Power consumption information.

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Operating Voltage Selection

WARNING

Disconnect the 370 from the AC power source before changing operating voltages.

The LINE VOLTAGE SELECTOR switches (NOMINAL and RANGE, located on the rear panel) allow selection of the operating line voltage. To select the correct operating line voltage, first set the NOMINAL switch to the nominal AC power source voltage, then set the RANGE switch to the operating line voltage

Table 1-1
Line Voltage Ranges

RANGE switch	NOMINAL Switch Setting	
	115 VAC	230 VAC
HIGH	107 VAC to 132 VAC	214 VAC to 250 VAC
LOW	90 VAC to 110 VAC	180 VAC to 220 VAC
Line frequency range:	48 to 66 Hz	
Power consumption:	Maximum: 315 W, 340 VA at 132 V, 60 Hz Typical: 95 W, 105 VA at 115 V, 60 Hz	

Table 1-2
Power-Cord Color Conductor Identification

Conductor	Color	Alternate color
Ungrounded (Line)	Brown	Black
Grounded (Neutral)	Light Blue	White
Grounded (Protective Ground)	Green/Yellow	Green/Yellow

A power cord with the appropriate plug configuration is supplied with each instrument. The color-coding of the power cord conductors is given in Table 1-2. Also, should you require a power-cord plug other than that supplied, refer to Section 5, Table 5-1, Option A1-A5.

WARNING

This instrument operates from a single-phase power source, and has a detachable three-wire power cord with a two-pole, three-terminal grounding-type power plug. The voltage to ground (earth) from either pole of the power source must not exceed the 250-volt maximum rated operating voltage.

Before making connection to the power source, determine that the instrument is set for the power source voltage, and has a suitable plug (two-pole, three-terminal, grounding type).

This instrument is safety class 1 equipment (IEC designating receptacle with a grounding contact. Do not defeat the grounding connection. Any interruption of the grounding connection can create an electric shock hazard.

OPERATING TEMPERATURE

The 370 can be operated where the ambient air temperature is between −10° C and −40° C and stored in ambient temperatures from −40° C to −60° C. After storage at temperatures outside the operating limits, allow the instrument temperature to reach a safe operating limit before applying power.

The 370 is cooled by air drawn through the fan from the rear and blown out through holes on the side panels. To ensure proper cooling of the instrument, maintain the proper clearance at the top, sides, and rear of the instrument.

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OPERATION MODE SELECTIONS

Several instrument features can be modified by changing internal jumpers, as described below.

Collector Supply Limit

For the user who does not need the high-voltage collector supply, the 2000-volt, 400-volt and 80-volt modes can be disabled by jumpers J101 and J102 on the A10 SENSE BOARD. See Adjustment Locations 2 in Section 7 for the location of the jumper. The selections are:

J101	at pins 1-2	2000 V disabled
	at pins 2-3	2000 V enabled (factory-set)
J102	at pins 1-2	400 V and 80 V disabled
	at pins 2-3	400 V and 80 V enabled (factory-set)

Jumper connector J34 on the A3 A/D board is provided to select step transition polarity and to generate steps one at a time. See Adjustment Locations 1 in Section 7 for the location of the jumper. The selections are:

J34	at pins 1-2	Step transition occurs at the zero crossing of the collector supply sweep (factory set)
	at pins 2-3	Step transition occurs at the peak of the collector supply sweep.
	at pins 2-4	One step occurs each time SINGLE is pressed. STORE mode is disabled.

REPACKING FOR SHIPMENT

If the 370 is to be shipped long distances, we recommend that the instrument be repackaged the same as when it arrived. The cartons and packaging material in which your instrument was shipped should be saved and used for this purpose.

If your instrument is to be shipped to a Tektronix Service Center for service or repair, attach a tag to the instrument showing the following:

Owner of the instrument (with address),

Name of a person at your firm to contact,

Instrument type,

Instrument serial number,

Description of the service required.

If the original packaging is unfit for use or not available, package the instrument as follows:

1. Obtain a corrugated cardboard shipping carton with a 375-pound test strength that has inside dimensions at least six inches greater than the instrument dimension.
2. Surround the instrument with polyethylene sheeting to protect the finish.
3. Cushion the instrument on all sides by tightly packing dunnage or urethane foam between the carton and the instrument, allowing three inches on all sides.
4. Seal the carton with shipping tape or with an industrial stapler.
5. Write the address of the Tektronix Service Center and your return address on the carton in one or more prominent locations.

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ACCESSORIES

Standard Accessories

Operators Manual	070-6064-00
Pocket Reference Guide	070-6066-00
Instrument Interface Guide	070-6067-00
FUSE 250V,2A,Slow-blow	159-0260-00
125V,4A,Slow-blow	159-0259-00
Protective Cover	337-3344-00
Bubble Cassette	020-1310-00
Power Cord	161-0066-00
Test Fixture Adapters	
Blank Adapter	A1001
In Line Adapter	A1002
Axial Lead Adapter	A1105
4&6 Lead Transistor Adapter	A1007

Optional Accessories

TO-3/TO-66 Adapter	A1003
Offset Lead/Power Adapter	A1004
Long Lead Transistor Adapter	A1006
Long Lead FET Adapter	A1008
4&6 Lead FET Adapter	A1009
IC Adapter	A1010
Service Manual	070-6065-00
Camera Adapter	016-0249-06 (for C59A Camera) 016-0357-01 (for C5C Camera) 016-0357-01 (for C7 Camera)

OPTIONS

The following option is available:

Option A1-A5 International Power Cords.

Information about the international power-cord options is provided earlier in this section, in the Operators Manual, and in Section 5, Options.

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SECTION TWO
THEORY OF OPERATION

This section describes the operation of the 370 circuits. The section is divided into two parts: Block Diagram Description and Detailed Circuit Operation. When reading this section, refer to the foldout schematic diagrams located in the rear of the manual. In each title that follows, the schematic diagram number appears inside a diamond, just preceding the topic, which is also the schematic diagram title.

BLOCK DIAGRAM DESCRIPTION

The following description is an overview of the 370 operation. Figure 2-1 is an overall block diagram of the 370. The numbers enclosed in diamonds within each block in Figure 2-1 indicate the schematic diagrams associated with the block.

The 370 is a static and dynamic semiconductor tester that displays and allows measurement of static and dynamic semiconductor characteristics obtained under simulated operating conditions.

The 370 consists of five major functional sections:

1. Stimulus Generators.
2. Data Acquisition and Display.
3. Control and Processing.
4. Interface.
5. Power Supply.

Stimulus Generators

The Stimulus Generators simulate operating conditions for the DUT by producing voltages and currents that are applied to the DUT. They include the Collector Supply, the Step Generator, the Aux Supply, and the PLL and Clock Circuits.

The Collector Supply produces sine-wave ac, full-wave rectified sine waves (positive and negative), and positive and negative DC voltages. The amplitude of the output can be varied from 0 to 2000 volts. The Collector Supply output is applied to the collector (or equivalent) terminal of the device under test.

The Step Generator Circuit produces ascending or descending steps of current or voltage at a normal rate of one step for each half-sine of the Collector Supply. The amount of current or voltage per step, total number of steps and offset voltage and current can be controlled. This Step Generator output may be applied to either the base or the emitter (or equivalent) terminals of the DUT.

The Auxiliary Supply produces auxiliary power for the DUT. The output voltage range is $\pm$0 to 40 V. This output can be applied to any terminal of the DUT.

The PLL and Clock Circuit generates a synchronous signal for the Step Generator and the Sine generator. This Circuit also generates synchronous signals for the Acquisition Circuits.

The Stimulus Generators consist of the following circuits.

Aux Gen Circuit, Diagram 4.
Step Gen Circuit, Diagram 4
Sin Gen Circuit, Diagram 4
PLL and Clock Circuit, Diagram 4
Aux Supply Circuit, Diagram 11
Collector Supply Amp Circuit, Diagram 11
Step Amp Circuit, Diagram 11
H.V. Relay Circuit, Diagram 12
L.V. Relay Circuit, Diagram 13
Collector Terminal Circuit, Diagram 15

Data Acquisition and Display

These circuits sense, acquire, and display the effect of the Collector Supply and Step Generator on the DUT. They include the Sense Circuit, the Acquisition Circuit, the Digital Display Circuit, and the Display Circuit.

The Sense Circuit senses and amplifies voltages and currents of each terminal of the DUT. This circuit also compensates for errors produced by IR drops between the DUT terminals and the supply. The amplifier sensitivity is controllable.

The Acquisition Circuit converts sensed analog data into digital data, that is, the fetch and A/D convert functions. This acquired data is sent to the CPU Circuit.

The Digital Display Circuit converts digital data into analog display signals. This digital data includes stored curve and operating information.

Data Bus (D0 through D15). The Data Bus is a 16-bit, bi-directional, tri-state bus which is the general purpose data path. It can transfer data in either byte (8-bit) or word (16-bit) lengths.

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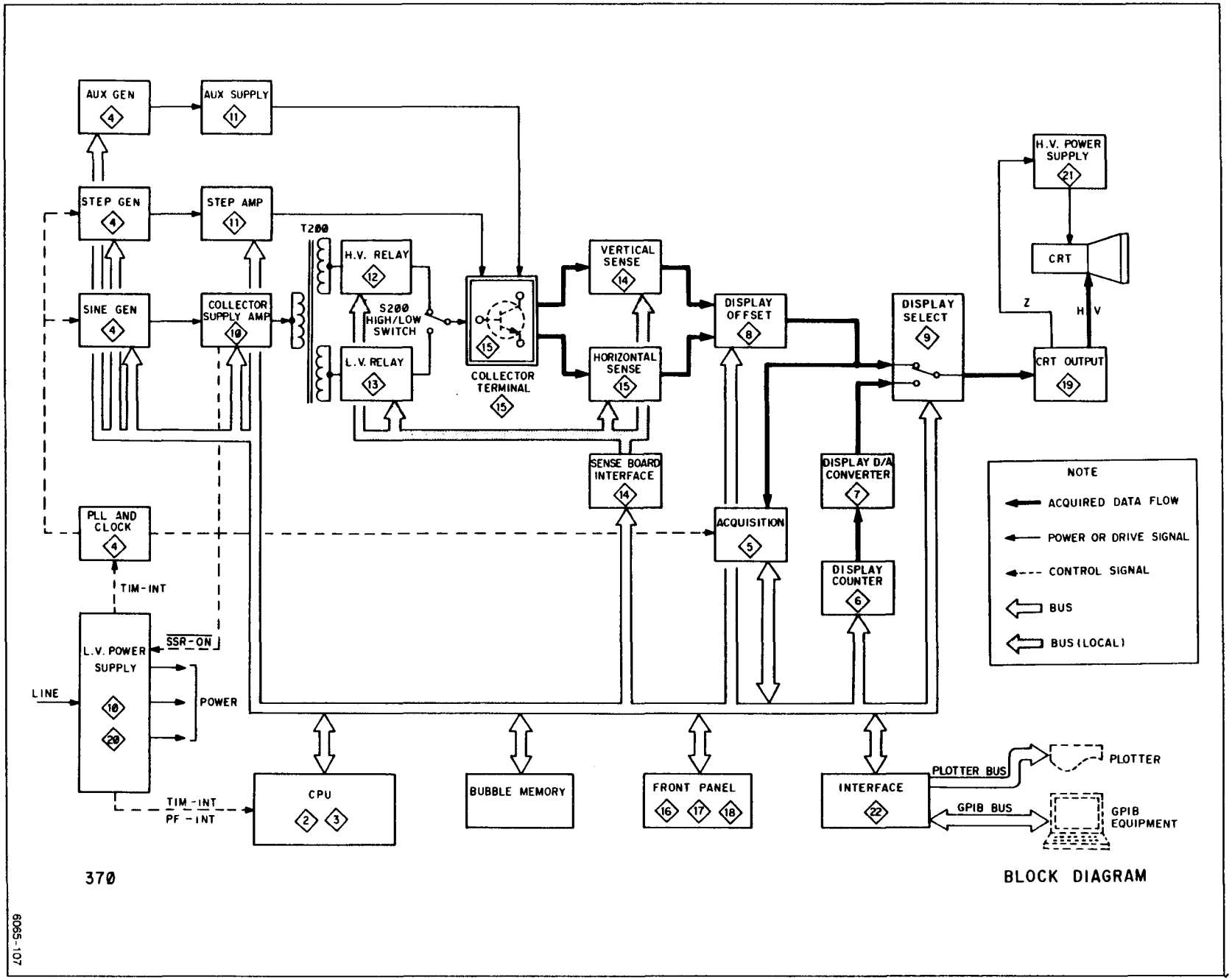

Figure 2-1. 370 Block Diagram.

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The Display Circuit selects store or non-store data and displays curves and 370 operating information.

The Data Acquisition and Display Circuits consist of the following:

Acquisition Circuit, Diagram 5
Display Counter Circuit, Diagram 6
Display D/A Converter Circuit, Diagram 7
Display Offset Circuit, Diagram 8
Display Select Circuit, Diagram 9
Vertical Sense Circuit, Diagram 14
Sense Board Interface Circuit, Diagram 14
Horizontal Sense Circuit, Diagram 15
CRT Output Circuit, Diagram 19
H.V. Power Supply Circuit, Diagram 21

Control and Processing

These circuits control the 370 and process acquired data. They include the CPU Circuit, the Front Panel Circuit, and Bubble Memory Circuit.

The CPU Circuit controls all operations of the 370, including Collector Supply and Step Generator Control, Sense Circuit Control, CRT Display Control, Front Panel Control, Bubble Memory Control, etc. The circuit also processes the acquired data from the DUT. These operations are controlled by the microprocessor and its operating programs through the Address, Data, and Control Bus lines.

The Front Panel Circuit interfaces the operator to the 370. This circuit reads keys, switches and rotary encoder information to set the 370 to the desired measurement condition. This also displays these settings to the operator by LED and alphanumeric displays.

The Bubble Memory Circuit memorizes acquired data from the device under test and the 370 setting information. The data and information are stored in the non-volatile bubble memory cassette.

The Control and Processing Circuits consist of the following:

CPU Circuit, Diagram 2 and 3.
Display Counter Circuit, Diagram 16, 17, and 18.

Interface

These circuits interface the microprocessor data with the plotter and the peripheral equipment. The circuit consists of the GPIB (General Purpose Interface Bus) interface circuit and the Plotter Control Circuit. The circuit is depicted on Diagram 22.

Power Supply

These circuits supply low-voltage operating power to the 370. These voltages in turn are used to generate the high voltages, such as that used on the CRT. There are two major circuits, the Power Supply and the Interrupt Signal Generator.

The Power Supply converts the AC line voltage into DC voltages that supply power for 370 operation.

The Interrupt Signal Generator generates timer interrupt and power fail interrupt signals. These signals synchronize the 370 circuits, and provide a harmless shutdown when power fails. The circuits are depicted on Diagrams 10 and 20, the L.V. Power Supply Circuits.

DETAILED CIRCUIT OPERATION

This part of the Theory of Operation provides a detailed description of the electrical operation of the 370. Complete schematic diagrams are provided in Section 7, Diagrams and Circuit Board Illustrations. The number enclosed in a diamond preceding a portion of text denotes the schematic diagram under discussion.

◇1 INTERCONNECTION

This circuit is located on the A1 Mother Board. The circuit connects interboard signals of the 370. These signals include control signals, drive signals, data signals, reference signals, sense signals, ground lines, and power supply lines.

Table 2-1 defines the source, purpose, and destination of the major signals and voltages in the 370.

◇2 MPU

The MPU circuitry is located on the A2 CPU board. It consists of a 6800 Microprocessor, Reset Circuit, Clock Generator, Buffers, Wait Timing Generator, and Interrupt Control Logic Circuit.

Microprocessor

The 6800 is a 16-data bit, 23-address bit microprocessor. The input and output signals can be grouped in eight categories. The following paragraphs describe each group and the signals in that group.

Address Bus (A1 through A23). The Address Bus is a uni-directional, three-state 23-bit bus, providing address information for all on and off board functions requiring address control.

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Table 2-1
Signal And Voltage Line Definitions

Title	Description	Location (Diagram Number)
+100 V +200 V	CRT Output Amplifier power supply. 200 volts is for horizontal and 100 volts is for vertical and Z-axis amplifier.	Source: 21 Dest: 19
+12V	+12-volt power supply for analog circuits.	Source: 20 Dest: 4, 5, 7, 10, 9, 14, 21 Via: 1
+12V UNREG	+12-volt unregulated power supply for Step Generator Circuit.	Source: 20 Dest: 11
+12VD	+12-volt power supply for Bubble board and A22 Interface board.	Source: 20 Dest: 22, BUBBLE Via: 1, 18
+12VDC	+12-volt relay control signal. Activated low by COVER(L) or OVERHEAT(L) signal.	Source: 14 Dest: 12, 13
+12V	+12-volt relay control signal. Activated by A10 J101. This signal enables A8 H.V. Relay board.	Source: 14 Dest: 12
+12VM	+12-volt relay control signal. Activated by A10 J102. This signal enables A9 L.V. Relay board.	Source: 14 Dest: 13
+12VS	+12-volt relay control signal.	Source: 14 Dest: 12, 13, 15
+2 V-REF	+2-volt reference voltage.	Source: 20 Dest: 4, 7, 9 Via: 1
+40V UNREG	+40-volt unregulated power supply for Step Generator and Horizontal Sense Circuit.	Source: 20 Dest: 11,15 Via: 14
+5VD	+5-volt power supply for digital circuit.	Source: 20 Dest: 2, 4, 6, 9, 10, 11, 14, 16, 18, 22 Via: 1
+5VDS	+5-volt power supply for A9 L.V. Relay and A10 Sense board.	Source: 14 Dest: 13, 14
+5VLK	+5-volt power supply for A14 Lower Key and A15 Lower Sub Key board.	Source: 18 Dest: 16, 17
+5VMK	+5-volt power supply for A11 Main Key and A12 Sub Key board.	Source: 16 Dest: 16, 17
+6.5V	+6.5-volt power supply for analog circuit.	Source: 20 Dest: 4, 6, 9, 10, 11, 14, 16, 19, 21 Via: 1

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Table 2-1 (cont)
Signal And Voltage Line Definitions

Title	Description	Location (Diagram Number)
+H	CRT Horizontal Output Amplifier positive drive signal.	Source: 9 Dest: 19 Via: 1
+HDEF	CRT horizontal positive deflection signal.	Source: 19 Dest: 21
+V	CRT Vertical Output Amplifier positive drive signal.	Source: 9 Dest: 19 Via: 1
+VDEF	CRT vertical positive deflection signal.	Source: 19 Dest: 21
-12V	-12-volt power supply for analog circuit.	Source: 20 Dest: 4, 5, 7 Via: 1
-12V UNREG	-12-volt unregulated power supply for Step Generator Circuit.	Source: 20 Dest: 11
-12VD	-12-volt power supply for Bubble board and A22 Interface board.	Source: 20 Dest.: 22, Bubble Via: 1, 18
-2V-REF	-2-volt reference voltage.	Source: 20 Dest: 4, 9 Via: 1
-40V UNREG	-40 volts unregulated power supply for Step Generator and Horizontal Sense Circuit.	Source: 20 Dest: 11, 15 Via: 14
-6.5V	-6.5 volts power supply for analog circuit.	Source: 20 Dest: 4, 5, 6, 9, 10, 11, 14, 16, 19, 21 Via: 1
-H	CRT Horizontal Output Amplifier negative drive signal.	Source: 9 Dest: 19 Via: 1
-HDEF	CRT Horizontal negative deflection signal.	Source: 19 Dest: 21
-V	CRT Vertical Output Amplifier negative drive signal.	Source: 9 Dest: 19 Via: 1
-VDEF	CRT Vertical negative deflection signal.	Source: 19 Dest: 21

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Table 2-1 (cont)
Signal And Voltage Line Definitions

Title	Description	Location (Diagram Number)
2KDC 2KAC(L)	2K volts dc/rectified sine select relay control signals:	Source: 12 Dest: 12
2KAC(L)	2k volts ac/dc select relay control signal.	Source: 12 Dest: 12
2K-(L) 2K-(L)	2k volts polarity select relay control signals.	Source: 12 Dest: 12
A-INTEN	Readout and cursor intensity control signal.	Source: 16 Dest: 9 Via: 1
A1 through A16	Microprocessor address bus.	Source: 2 Dest: 4, 5, 6, 8, 16, 17, 18, 22 Via: 1
AD(L)	A3 A/D board select signal.	Source: 3 Dest: 4 Via: 1
ARC(L)	ARC Killer Circuit output signal.	Source: 13, 14, 15 Dest: 4, 12, 13 Via: 1
ASTIG	CRT astigmatic control signal.	Source: 19 Dest: 21
AUX-OUT	AUX Supply Amplifier output signal.	Source: 11 Dest.: 15
AUX-SIG	AUX Generator output signal.	Source: 4 Dest: 11 Via: 1
B-INTEN	View intensity control signal.	Source: 16 Dest: 9 Via: 1
BUBBLE(L)	Bubble memory board select signal.	Source: 3 Dest: BUBBLE Via: 1, 18
BUSY-LED(L)	Bubble memory busy signal.	Source: BUBBLE Dest: 17 Via: 1, 16, 18
C-INTEN	STORE/NONSTORE intensity control signal.	Source: 16 Dest: 9 Via: 1

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Table 2-1 (cont)
Signal And Voltage Line Definitions

Title	Description	Location (Diagram Number)
COL-LED	Sine Generator output amplitude indicator drive signal.	Source: 4 Dest: 18 Via: 1
COL-SIG	Sine Generator output signal.	Source: 4 Dest: 10 Via: 1
COLLECT(L)	A6 Collector Supply board select signal.	Source: 3 Dest: 10 Via: 1
COLLECT-OUT	Collector Supply Amplifier output signal. This signal drives T200.	Source: 10 Dest: 14
COVER	Interlock Circuit control signal. This indicates Collector Terminal cover status.	Source: 14 Dest: 14, 18
D0 through D15	Microprocessor data bus.	Source: 2, 5, 6, 16, 18, 22 Dest: 2, 4, 5, 6, 8, 16, 18, 22 Via: 1
DONE-INT	Interrupt signal for completion of data acquisition.	Source: 4 Dest: 2, 5 Via: 1
DSP-IO(L)	A5 Display Control board select signal.	Source: 3 Dest: 8 Via: 1
DSP-RAM(L)	A4 DIGITAL Display board select signal.	Source: 3 Dest: 6 Via: 1
DZ(L)	Digital Display Z-axis signal.	Source: 7 Dest: 9 Via: 1
FOCUS	CRT focus control signal.	Source: 16 Dest: 21 Via: 1, 19
GEOM	CRT geometry control signal.	Source: 19 Dest: 21
GND-SENSE	Ground level reference voltage. This signal correlates ground level between DUT and Step Generator.	Source: 15 Dest: 11
GPIB-INT(L)	Interrupt signal from GPIB Interface.	Source: 22 Dest: 2 Via: 1

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Table 2-1 (cont)
Signal And Voltage Line Definitions

Title	Description	Location (Diagram Number)
H-OUT	Horizontal Sense Amplifier output signal.	Source: 15 Dest: 8 Via: 1, 14
H-POS	CRT horizontal position control signal.	Source: 16 Dest: 9 Via: 1
HD	Output of Horizontal Display Offset Circuit for A3 A/D board.	Source: 8 Dest: 5 Via: 1
HI(L)	Indicator signal for 2 kvolts selection.	Source: 13 Dest: 18 Via: 14
IF-CS(L)	A22 Interface board select signal.	Source: 3 Dest: 22 Via: 1
ILLUM	Scale illumination control signal.	Source: 16 Dest: 20 Via: 1
KEY(L)	A11 Main Key and A12 Sub Key board select signal.	Source: 3 Dest: 16 Via: 1
K0(L) through K6(L)	A11 Main Key and A12 Sub Key board address bus. This bus scans key matrix.	Source: 16 Dest.: 17
KD0 through KD7	A11 Main Key and A12 Sub Key board data bus.	Source: 16 17 Dest: 16, 17
L(L)	Indicator signal for LRS switch. This indicates that position of LRS switch is LEFT.	Source: 15 Dest: 18 Via: 14
L-KEY(L)	A14 Lower Key and A15 Lower Sub Key board select signal.	Source: 3 Dest: 18 Via: 1
L0(L) through L7(L)	A11 Main Key and A12 Sub Key board LED select bus.	Source: 16 Dest.: 18
LD0 through LD7	A14 Lower Key and A15 Lower Sub Key board data bus.	Source: 18 Dest: 18
LDS(L)	Microprocessor lower byte data strobe signal.	Source: 2 Dest: 4, 5, 6 Via: 1

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Table 2-1 (cont)
Signal And Voltage Line Definitions

Title	Description	Location (Diagram Number)
LKRD(L)	A14 Lower Key board read signal.	Source: 18 Dest: 18
LL0(L) through LL3(L)	A14 Lower Key board LED select bus.	Source: 18 Dest: 18
LMTR(L)	Indicator signal for Collector Supply current and voltage limiter status.	Source: 10 Dest: 18 Via: 1
LOOP-COMP	Looping compensation neutralize signal.	Source: 13 Dest: 12, 13
NST-UNBLK	Nonstore unblanking control signal.	Source: 4 Dest: 9 Via: 1
ORTHOG	Orthogonality coil (L-120) drive signal.	Source: 9 Dest: 1, 21
OVERHEAT1(L) OVERHEAT2(L)	Interlock Circuit control signal. This signal indicates temperature of specific heat sink is in limit.	Source: 10, 13 Dest: 14, 18
P-INTEN	Pulse intensity control signal.	Source: 4 Dest: 9 Via: 1
PF-INT	Power fail interrupt signal.	Source: 20 Dest: 2 Via: 1
PLOT-INT(L)	Plotter interrupt signal.	Source: 22 Dest.: 2 Via: 1
R(L)	Indicator signal for LRS switch. This indicates that position of LRS switch is RIGHT.	Source: 15 Dest.: 18 Via: 14
R10(L) through R13(L)	A8 H.V. Relay board relay control signal.	Source: 12 Dest.: 12
RD(L)	Microprocessor read control signal.	Source: 2 Dest: 5, 6, 8, 16, 18, 22 Via: 1, 4
RESET(L)	Peripheral Circuit reset control signal.	Source: 2 Dest: 5, 11, 22 Via: 1, 4
RX RY	Character display signal; RX for horizontal and RY for vertical.	Source: 7 Dest: 9 Via: 1

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Table 2-1 (cont)
Signal And Voltage Line Definitions

Title	Description	Location (Diagram Number)
SA1 through SA7	Microprocessor address bus for analog circuit.	Source: 2 Dest.: 10, 11, 12, 13, 14 Via: 1
SD0	Microprocessor data signal for analog circuit.	Source: 2 Dest.: 10, 11, 12, 13, 14 Via: 1
SENSE(L)	A10 Sense board select signal.	Source: 3 Dest.: 13, 14 Via: 1
SG(L)	A7 Step Generator board select signal.	Source: 3 Dest: 11 Via: 1
SG-OUT	Step Generator output signal.	Source: 11 Dest: 15
SG-SENSE	Sense signal for voltage source of Step Generator.	Source: 11 Dest: 15
SG-SIG	Step Generator output signal.	Source: 4 Dest: 8, 11 Via: 1
SSR-ON(L)	Collector Supply Amplifier power supply voltage Control signal.	Source: 10 Dest: 10
STATUS-0 STATUS-1	Display status control signal. STATUS-0 / STATUS-1 / DISPLAY 0 / 0 / Readout 0 / 1 / Cursor 1 / 0 / Store 1 / 1 / View	Source: 6 Dest: 9 Via: 1
SX SY	Waveform and cursor display signal. SX for horizontal, SY for vertical.	Source: 7 Dest: 9 Via: 1
T-ROTATE	Trace rotation coil (L100) drive signal.	Source: 16 Dest: 1, 21
TIM-INT	Timer interrupt signal. Derived from line frequency.	Source: 20 Dest: 2, 4 Via: 1
UDS(L)	Microprocessor upper byte data strobe signal	Source: 2 Dest: 6 Via: 1

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Table 2-1 (cont)
Signal And Voltage Line Definitions

Title	Description	Location (Diagram Number)
UNLOCK(L)	Not Used.	Source: 4 Via: 1
V-OUT	Vertical Sense Amplifier output signal.	Source: 14 Dest.: 8 Via: 1
V-POS	CRT Vertical position control signal.	Source: 16 Dest.: 9 Via: 1
VCC	Collector Supply Output Amplifier power supply. (Positive.)	Source: 10 Dest.: 10
VD	Output of Vertical DisplayOffset Circuit for A3 A/D board.	Source: 8 Dest.: 5 Via: 1
VDD	Collector Supply Output Amplifier power supply. (Negative.)	Source: 10 Dest.: 10
WAIT(L)	Microprocessor wait signal.	Source: 6, 22 Dest.: 2 Via: 1
WR(L)	Microprocessor write control signal.	Source: 2 Dest.: 4, 5, 6, 8, 11, 16, 18, 22 Via: 1
WRP-LED	Not Used.	Source: BUBBLE Via: 1, 16, 18
Z	CRT Z-axis Preamplifier output signal.	Source: 9 Dest.: 19 Via: 1
Z-OUT	CRT Z-axis Amplifier output signal.	Source: 19 Dest.: 21
Z-SEL	CRT Z-axis select signal.	Source: 7 Dest.: 9 Via: 1

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Address Strobe (AS). This signal indicates that there is a valid address on the Address Bus.

Read/Write (R/W). This signal defines the Data Bus transfer as a read cycle (logic high) or a write cycle (logic low). The R/W signal also works in conjunction with the upper and lower data strobes as explained in the next paragraph.

Upper and Lower Data Strobes (UDS and LDS). These signals control the data on the Data Bus, as shown in Table 2-2. When the R/W line is high, the microprocessor will read from the data bus as indicated. When the R/W line is low, the microprocessor will write to the Data Bus as shown.

Data Transfer Acknowledge (DTACK). This input indicates that a data transfer is completed. When the microprocessor recognizes DTACK during a read cycle, data is latched and the bus cycle is terminated. When DTACK is recognized during a write cycle, the bus cycle is terminated.

Interrupt Control (IPL0, IPL1, IPL2). These input pins indicate the encoded priority level of the device requesting the interrupt. Seven levels are possible using these three pins, with level zero (no pins active) meaning no interrupt is requested.

System Control. The system control inputs, HALT and RESET, reset the microprocessor at power on. When the HALT and RESET inputs are driven simultaneously, the Microprocessor enters the reset cycle starting at the address point by the reset vector.

Valid Peripheral Address (VPA). This input indicates that the microprocessor should use automatic vectoring for an interrupt.

Processor Status (FC0, FC1, FC2). These function outputs indicate the cycle type currently being executed. When the cycle type is the interrupt acknowledge cycle, all three outputs go high.

Clock (CLK). This is the clock input. The clock signal is derived from U100 and divided by four in U120, resulting in an 8-MHz clock signal applied to the microprocessor.

Reset Circuit. The Reset Circuit consists of U406, U408, U400A, U400B, U400D, R400 and C400, and generates the reset signal at power on. At power on, pin 2 of U406 and U408 remain low, causing the microprocessor to reset. 200 ms later, C400 charges to 5 volts, sets pin 2 of U406 and U408 high, enabling the microprocessor to run.

Clock Generator

The Clock Generator consists of 32-MHz oscillator U100 and dividers U120A and U120B. This circuit generates the 8-MHz clock signal for the microprocessor and the 16-MHz clock signal for the D-RAMs.

Address Bus Buffer

Buffers U450 and U452 isolate the Address Bus (A1-A16) for the A3 A/D board, A4 Digital Display board, A5 Display Control board, A11 Main Keyboard, A14 Lower Key board, A22 Interface board and A24 Bubble Controller board.

Data Bus Buffer

Buffers U454 and U456 isolate the Data Bus when the microprocessor is transceiving data to and from circuits off the CPU board. The ENA/B line selects which direction data is

Table 2-2
Data Strobe Control Of Data Bus

UDS	LDS	R/W	D8-D15	D0-D7
High	High	–	No Valid data	No valid data
Low	Low	High	Valid data bits 8-15	Valid data bits 0-7
High	Low	High	No valid data	Valid data bits 0-7
Low	High	High	Valid data bits 8-15	No valid data
Low	Low	Low	Valid data bits 8-15	Valid data bits 0-7
High	Low	Low	Valid data bits 0-7	Valid data bits 0-7
Low	High	Low	Valid data bits 8-15	Valid data bits 8-15

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transmitted through the buffer; the line is high when data is sent from the microprocessor off the CPU board. The EN(L) line enables or disables the data output.

Control Bus Buffer

Buffer U458 isolates the Control Bus.

Silent Bus Buffer

Buffer U462 isolates the Address Bus (SA1-SA7) and data line SD0 for A6 Collector Supply Output board, A7 Step Generator board, and A10 Sense board.

Wait Timing Generator

The Wait Timing Generator consists of U300A, U300B, U300D, U310A, U310B, U320A, U340A and U340B. This circuit inserts wait cycles by controlling the DTACK(L) input to ensure that I/O devices have time to read or write the data on the bus.

In the following discussion, note that the WAIT(L) line is activated only when the microprocessor communicates with the A4 Digital Display board and the plotter interface.

When the microprocessor communicates with the CPU board memories, no wait cycle is required. In this case, the microprocessor sets address line CA19 low, which sets pin 9 of U310B high. Pin 6 of U320A goes low at the next clock, enabling the DTACK(L) input.

When the microprocessor communicates with I/O devices (except the A4 Digital Display board and the Plotter Interface), two wait cycles are required. In this case, the microprocessor sets address line CA19 high, disabling the preset inputs of latches U320A and U320B. When the microprocessor sets the CAS(L) (address strobe) line low, the clear inputs of the latches U320A and U320B are disabled, which enables the latches to be clocked by the 8-MHz clock. Three clock cycles following the activation of the CAS(L) line, pin 6 of U320A goes low and enables the DTACK(L) input.

When the microprocessor communicates with the A4 Digital Display board and the Plotter Interface, the DTACK(L) input is controlled by the WAIT(L) signal. The A4 Digital Display board or the Plotter Interface sets the WAIT(L) line low when the microprocessor accesses it. This low sets pin 1 of U320A low, which sets pin 6 of U320A high, disabling the DTACK(L) signal. When the A4 Digital Display board or the Plotter Interface sets the WAIT(L) line high, pin 6 of U320A goes high at the next clock, activating the DTACK(L) signal.

Counters U340A and U340B prevent the microprocessor from waiting for longer than 128 clock cycles (16 μs). When the WAIT(L) line goes low, the counters begin to count. When the count reaches 128, pin 8 of U340 goes high and cancels the WAIT(L) signal on pin 5 of U300B. The output of U340B is also sent to pin 11 of U240B as TIM-OUT interrupt signal.

Interrupt Control

The Interrupt Control Circuit consists of Interrupt Signal Latches U240A, U240B, U250A, and U250B, Interrupt Priority Encoder U260, and Interrupt Acknowledge Logic U200, U210, U220 and U230.

Interrupts inform the microprocessor that something needs attention. There are six interrupt signals; power fail (PF-INT) and timer (TIM-INT) from the LV POWER board, time-out (TIMOUT-INT) from the wait control circuit, acquisition-done (DONE-INT) from the A/D Board, and interrupts from GPIB and Plotter Interface (GPIB-INT and PLOT-INT(L)). Each interrupt has its own priority level, as shown in Table 2-3.

When an interrupt occurs, the interrupt signal is latched into U240 or U250 and fed to Priority Encoder U260. U260 encodes the level of the interrupt to the 3-bit binary code onto the IPL0(L), IPL1(L) and IPL2(L) lines. For example, assume that all lines are set low on PF-INT. If the interrupt level is higher than that of the current process, the microprocessor enters the interrupt acknowledge cycle after the completion of the current instruction. It outputs the interrupt level on address lines CA1, CA2 and CA3, asserts CAS(L), and sets the function code lines CFC0, CFC1, and CFC2 high. U210 decodes the address lines CA1, CA2 and CA3, and outputs a clear signal to the interrupt latch. The high on the function code lines set pin 7 of U200 low, causing the microprocessor to enter into auto vector mode.

Table 2-3
Interrupt Priority

Priority	Interrupt Inputs	Function
1 (level 7) failure	PF-INT	Power (Non maskable)
2 (level 6)	Timer TIM-INT	(line frequency)
3 (level 5)	TIMOUT-INT	Time out
4 (level 4)	GPIB-INT	GPIB request
5 (level 3)	DONE-INT	Acquisition completed
6 (level 2)	Future use	
7 (level 1)	PLOT-INT(L)	Plotter request

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3 MEMORY

The Memory circuit consists of the ROM, DRAM, memory controller, address selector, and buffers.

ROM

The 370 firmware is located in four 32K BYTE EPROMs (U600-U630). The EPROMs are paired as U600-U610 and U620-U630 to form 16-bit words.

Dynamic RAM

DRAMs U800-U830 provide general, temporary data storage space. U800-U814 provide lower byte storage and U816-U830 provide upper byte storage. Column address strobe signals LCASA(L) and UCAS(L) select addressing for either the lower byte or the upper byte.

Each chip is capable of storing 65,536 by one bit with eight address bits. In order to address 65,536 memory locations, 16 address bits are required. To do that, the address is multiplexed into the chip 8-bits at a time by signals RAS(L) (row address strobe) and LCAS/UCAS(L) (column address strobe). In the case of both read and write, RAS(L) signal comes true first. A low on the WE(L) input enables the memory for a write.

Data Bus Buffer

Buffers U484 and U486 isolate the Data Bus. EN A/B input selects which direction data is transmitted through the buffer. A high on EN A/B transmits data from the microprocessor to the memories.

Address Bus Buffer

Buffers U480 and U482 isolate the Address Bus. U480 isolates the row address and U482 isolates the column address.

Address Multiplexer

Address Multiplexer U760-U780 multiplexes row addresses and column addresses, as determined by the select signal from pin 8 of U700B. A high on the S input selects row address (MA1-MA8), and a low on the S input selects column address (MA9-MA16).

Address Selector

Decoders U500A, U500B, U520 and U540 decode address lines A15-A20 and select addressing for memory or devices on and off the CPU board. See Table 2-4 for the address assignments.

Dynamic RAM Controller

The Dynamic RAM Controller consists of U300C, U400C, U700A, U700B, U720A, U720B, U720C, U720D, U740A and U740B. This circuit generates control signals RAS(L) (row address strobe), CAS(L) (column address strobe) and WE(L) (write enable), for DRAMs.

When the microprocessor communicates with other than DRAMs, pin 5 of U500A is high. Pin 10 of U300C is low, which holds latches U700A, U700B, U740A and U740B in the set state, disabling the RAS(L), LWE(L), UWE(L), LCAS(L) and UCAS(L) signal lines.

When the microprocessor communicates with DRAMs, pin 5 of U500A is low. When the microprocessor activates the CAS(L) (address strobe) line, indicating the Address Bus is valid, pin 10 of U300C goes high, enabling U700A and U700B to be clocked by the DRAMCK signal. Pin 5 of U700A goes low at the rising edge of the first DRAMCK after the low of the CAS(L) line, enabling the RAS(L) line to be activated. At this time, row address data (MA1-MA8) is fed to DRAMs from U760 and U780 because pin 8 of U700B stays low, and DRAMs latch the row address. Pin 8 of U700B goes high at the next DRAMCK, which enables U760 and U780 to output column address data. At the same time, pin 9 of U700B goes low, setting low on pin 2 (pin 12) of U740A (U740B). Then pin 5 (pin 7) of U740A (U740B) goes low at the next DRAMCK, activating LCAS(L) (UCAS(L)) line to enable DRAMs to latch the column address.

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Table 2-4
Decoder Address Assignment

A20	A19	A18	A17	A16	A15	A14-A1	Selection
0	0	0	0	0	X	X	ROM 0 (U600 & U610)
0	0	0	0	1	X	X	ROM 1 (U620 & U630)
0	0	0	1	0	X	X	ROM 2 (U640 & U650) (Future use)
0	0	0	1	1	X	X	not used
0	0	1	X	X	X	X	RAM
0	1	0	0	0	0	X	not used (A2 board)
0	1	0	0	0	1	X	AD(L) (A3 board)
0	1	0	0	1	0	X	DSP-RAM(L) (A4 board)
0	1	0	0	1	1	X	DSP-IO(L) (A5 board)
0	1	0	1	0	0	X	KEY(L) (A11 A12 board)
0	1	0	1	0	1	X	L-KEY(L) (A14 A15 board)
0	1	0	1	1	0	X	IF-CS(L) (A22 board)
0	1	0	1	1	1	X	BUBBLE(L) (A24 board)
0	1	1	0	0	0	X	COLLECT(L) (A6 board)
0	1	1	0	0	1	X	SG(L) (A10 board)
0	1	1	0	1	0	X	SENSE(L) (A10 board)

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4 GENERATOR

The Generator Circuit is located on the A3 A/D Board.

This circuit is roughly divided into three parts; PLL (Phase Lock Loop), Clock Generator, and Signal Generator. The PLL provides clocks synchronized with the line frequency for the Clock Generator. The Clock Generator provides clocks for the Signal Generator and the Acquisition Clock for the A/D Converter. The Signal Generator generates a sine wave for the Collector Supply Amplifier Circuit, Step Amplifier signal for the Step Amplifier Circuit, and the AUX signal for the AUX Signal Amplifier Circuit.

Control Latch and Decoder

Latches U270 and U280 and decoder U900 provide control signals for the on-board circuits. Control signals are set by the microprocessor on the MPU circuit as determined by the front panel controls. See Table 2-5 for the function of these signals.

PLL

The PLL (Phase Lock Loop) Circuit consists of U100, U110, U140A, U140B, and associated circuitry.

U100 contains an internal phase comparator and VCO (Voltage Controlled Oscillator). The VCO produces an output signal on pin 4, the frequency of which is determined by the pin 9 input voltage, set by R100, R104 and C100. The center frequency is approximately 250 kHz (4096 x line frequency). The maximum and minimum frequency is determined by R100 and R104 respectively. This VCO output is counted down to 1/4096 by frequency divider U110, and applied to pin 3 of U100. U100 compares the phase of this signal with that of the incoming TIME-INT signal (the frequency of which is the same as the line frequency), and produces an error signal on pin 13. The error signal is applied to pin 9 through low pass filter R100-R102-C100, and controls the VCO.

U140A and U140B form a window comparator that detects the unlock state. When the PLL is unlocked, the UNLOCK(L) signal goes low.

Step Generator Clock

The Step Generator Clock Circuit consists of U120, U255A, U160, U165, U180, U190A, U190B and U195B. This circuit generates clocks for the Step Generator, and the Acquisition Start Signal for the Acquisition Clock Circuit.

Data selector U120 selects clock signals for step counter U160-U165, and acquisition clock counter U200. When the COLLECTOR SUPPLY POLARITY is set to AC, the line frequency clock is supplied to the step counter, and the 1024 x line frequency clock is supplied to the acquisition clock counter. When the COLLECTOR SUPPLY POLARITY control is set other than AC, the 2 x line frequency clock is supplied to the step counter, and the 2048 x line frequency clock is supplied to the acquisition clock counter.

Data selector U180 switches the signal path according to the measurement mode of the 370: either repeat mode or single mode.

Table 2-5
Microprocessor Control Signals

Signal	Front-panel Setting
S0 - S4	Indicates number of steps
POSI	STEP POLARITY: Positive (+)
.1X	STEP MULTI .1X: ON
CSTOP(L)	Low when collector supply relays switch
AC	COLLECTOR SUPPLY POLARITY: AC
LONG	PULSE: LONG
PULSE(L)	PULSE: LONG or SHORT
AUX	AUX SUPPLY is enabled
SINGLE	MEASUREMENT: SINGLE
+ OFFSET	STEP GENERATOR OFFSET: AID
VIEW	VIEW DISPLAY mode
CURVE	Curve acquisition mode PULSE: OFF & COLLECTOR SUPPLY POLARITY: −, −, AC
AD0(L)	
AD1(L)	
AD2(L)	
AUX(L)	Low while pressing AUX SUPPLY switch
VAR(L)	Low while COLLECTOR SUPPLY VARIABLE control is rotated
OFFSET(L)	Low while STEP GENERATOR OFFSET switch is pressed

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Presettable counters U160 and U165 form a step counter. U165 provides binary data of each step for the step generator, and U160 resets U165 at the end of the step family. The preset count is loaded when the LOAD(L) input is pulled low. The value of the preset count is the same as the number of steps. Counting begins when the LOAD(L) input is pulled high.

Latches U190A, U190B and U195B generate the START signal for data acquisition. In addition, this circuit controls the LOAD(L) input signal when the 370 is in Single mode. DATA acquisition is initiated by the FIRE(L) signal. When the FIRE(L) signal is activated, U195B is cleared, and pin 5 of U190A is set high at the rising edge of the FIRE(L) signal. At the next clock from U255A, pin 9 of U190B is set high, activating the START signal.

Jumper J34 sets the step transition phase to occur either at the zero crossing or at the peak of collector supply sweep: pins 1 and 2 should be shorted for zero, pins 2 and 3 should be shorted for peak. Pin 4 is provided for calibration purpose. When pins 2 and 4 are shorted, a family of steps can be generated step by step by repeatedly pressing the SINGLE switch.

Collector Supply Enable

The Collector Supply Enable Circuit consists of U195A, U250A, U250B, U250C, U260B, U260C and U260E. This circuit disables the collector supply output when one of the following conditions occur.

1. HIGH-LOW switch selection
2. LEFT-RIGHT-STANDBY switch selection
3. Energizing relays
4. VIEW display mode of operation
5. PLL unlock
6. CPU reset

The ARC(L) signal is generated by the Arc Killer Circuit on the A10 Sense board, when the HIGH-LOW switch or LEFT-RIGHT-STANDBY switch is selected. The CSTOP(L) signal is activated when relays on the Collector Supply Circuit are energized. These two signals are provided to suppress the switching arc. When one of these signals is activated, the NST-UNBLK signal is pulled low to prevent a bright spot from appearing on the CRT.

Step Generator Pulse Circuit

The Step Generator Pulse Circuit consists of U130A, U130B, U145 and associated components. U145 is a monostable multivibrator whose time constant is determined by R146, R148 and C145. Three-state buffer U130B sets the time constant of U145 to either 300 µs or 800 ms. When the PULSE(L) signal is low, the output of U145 is supplied to U310C via U130B to form pulsed steps, and to the A5 Display Control board as the P-INTEN signal to increase the brightness of the display. The pulse signal is also supplied to U255D as the acquisition clock in the Dot Display mode.

Acquisition Clock Generator

The Acquisition Clock Generator consists of U200, U210, U220A, U220B, U230B, U240A, U240B, U240C and U250D. This circuit generates the start signal for data acquisition, acquisition clock, and the DONE-INT signal. The DONE-INT signal is an interrupt signal to inform the microprocessor that acquisition is completed.

Presettable counter U200 generates the acquisition clock for the Cycle Generator. The frequency of the acquisition clock is:

(Number of steps + 1) / clock frequency

The preset count is loaded by a low on the LOAD(L) input. The preset value equals 1 - (number of steps). The clock frequency is 2048 x line frequency, except for the AC mode, where the frequency is 1024 x line frequency.

Data selector U210 switches the source of the acquisition clock and end of acquisition signal as determined by the setting of the COLLECTOR SUPPLY POLARITY control and the PULSE switch.

The Acquisition Clock Generator is initiated by the START signal from U190B pin 9. The START signal sets U220A pin 5 high and U220A pin 6 low. A low on U220A pin 6 enables U200 to be clocked, generating an acquisition clock. A high on pin 5 of U220A enables U750 in the Cycle Generator Circuit to generate control signals to store acquired data.

When the Acquisition RAM is filled with data, the A11 signal on pin 3 of U210 is activated. This signal asserts the DONE-INT signal. The ABT(L) signal, which is activated by switching the MEASUREMENT switch between SINGLE and REPEAT, also asserts the DONE-INT signal.

Sine Wave Generator

The Sine Wave Generator consists of U440, U450, U460A, U460B, U470A, U470B, U520, U530A, U530B, U490A and associated components. This circuit generates a sine wave signal of the same frequency as the line frequency for the Collector Supply Circuit on the A6 Collector Supply Output board.

Each sine-wave cycle consists of 32 short ramps. These ramps are produced by integrator U470A-C470-R450-R464. U450 switches the input resistors, thus changing the ramp slope. The switching is controlled by four clocks, 16f(L), 8f(L), 4f(L), and 2f, from U110. U490A selects the slope polarity.

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U470B is an error amplifier that maintains a constant amplitude sine wave regardless of the line frequency.

U520 is a 12-bit multiplying D/A converter. The sine wave signal on the VREF input is multiplied by the digital data on D0-D11 inputs. The value of the digital data is controlled by the COLLECTOR SUPPLY VARIABLE control on the front panel. Data is latched internally with the low on WR(L) and VAR(L) lines. Selector U490C switches its output to ground level with the signal from U250A, disabling the collector supply output.

U530A and U490B form a full-wave rectifier to turn on the COLLECTOR SUPPLY VARIABLE LEDs.

Step Generator

The Step Generator Circuit consists of U300, U310, U320B, U330, U350, U360, U370 and U590A. This circuit generates the step signal that is applied to the Step Amplifier.

U300 converts the 4-bit digital step data from U165 into an analog step signal. U310A and U310B controls the polarity of steps with the POSI signal. U310C switches its output to ground to form pulsed steps with the pulse signal from U130 when the 370 is in PULSE mode. U320A selects the input resistor of U370 and changes the amplitude of steps. When the 370 is in 0.1 x mode, step amplitude is divided by ten.

U350 is a 12-bit D/A converter. The offset value, which is controlled by the STEP GENERATOR OFFSET control, is supplied to data lines D0-D11. The data is latched internally by a low on the WR(L) and OFFSET(L) lines. The polarity of the offset, positive or negative, is determined by the voltage on VREF Input (pin 19). This voltage is controlled by the +OFFSET signal from U280.

U370 is a summing operational amplifier, providing at the output a signal representing the sum of the step signal and the offset signal. The output voltage per step is 0.2 volts in all settings of the AMPLITUDE switch.

Aux Signal Generator

The Aux Signal Generator consists of U570, U580 and U590. This circuit generates the auxiliary supply signal.

U570 is a 12-bit D/A converter. The signal level, which is controlled by the AUX SUPPLY control, is supplied to the data lines D0-D11. The data is latched internally with the low on WR and AUX lines. The polarity supply is controlled by the AUX signal from U280.

5 ACQUISITION

The Acquisition circuit is located on the A3 A/D Board. It consists of the Sampler, A/D converter, Cycle Generator, Acquisition RAM, and Bus Interface. These circuits sample vertical and horizontal analog signals from the A5 Display Offset board and convert them into 10-bit digital data. The data are stored in the Acquisition RAMs and transferred to the CPU board.

Sampler

The Sampler Circuit consists of U720, U730, U740, U710, and associated components. U720 and U730 sample and hold the horizontal and vertical signals, respectively. Since the two circuits are so much alike, only one description is used here. (The components that form the vertical sampler are enclosed in parentheses in this description.)

When the sample input applied to pin 8 of U720 (U730) goes low, the analog signal applied to pin 3 is sampled and stored in Hold Capacitor C720 (C730). Variable resistors R724 and R734 null the offset that might appear on the output of U720 and U730. U740 selects the signal to pass to the A/D converter; i.e., a low on pin 11 selects the horizontal signal, a high on pin 11 selects the vertical signal. The horizontal signal is selected first, followed by the vertical signal. The selected analog signal is then amplified by U710 and applied to U700. Diodes CR710, CR712, VR710 and VR712 form a limiter.

A/D Converter

The A/D Converter consists of U700, Q740 and associated components. This stage converts the analog data into 10-bit digital data. Conversion is done by the successive approximation method and requires a minimum of 14 clock cycles for each bit of data.

U700 is a 12-bit A/D converter with eight data lines. The C/D line steers either four MSBs or eight LSBs to the data output. Two LSBs of the lower byte output are not used.

Cycle Generator

The cycle generator consists of U660, U230A, U650, U670A, U670B, U670C, U670D, U640A and U640B. This stage generates timing signals for the sampler, the A/D converter and the acquisition RAMs.

U660 is a 4.0-MHz oscillator that provides the clock signal for A/D converter U700 and shift register U750.

U750 generates timing signals. The signal from pin 3 controls the data output of U700; i.e., high for four MSBs

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output, low for eight LSBs output. The signal from pin 5 controls the mode of operation of acquisition RAMs U870 and U880 in the read or write mode. The signal from pin 6 increments the address of the acquisition RAMs.

Data acquisition is initiated by the the ACQCLK signal on pin 3 of U230A. The Q(L) output of U230A enables samplers U720 and U730 to start, sample and hold the analog signal. Q output of U230A is differentiated by U650 and U670C to form a pulsed signal and fed to U700 pin 11 and 12, enabling a conversion cycle to start.

When a conversion begins, the U700 ACK(L) line goes high, indicating that a conversion is in process. After 14 clocks, the ACK(L) line goes low, indicating that the conversion is completed. At this time, the U700 C/D line is high, so the four MSBs (D0-D3) are latched into U860. At the next clock after the low on the ACK(L) line, C/D goes low, enabling U700 to output six LSBs on the data lines D2-D7. Then after two clocks, U750 pin 5 goes low, enabling MSBs and LSBs to be written into acquisition RAMs U870 and U880.

After data is written into RAM, address counter U820 is incremented by the clock signal from pin 6 of U750. The AA0 line at pin 9 of U820 goes high and the selector U740 switches to pass the vertical signal. A high on the AA0 line also causes a pulsed signal on pin 6 of U670B, enabling U700 to start the conversion cycle for the vertical signal. U640A, U640B and U640D reset the acquisition circuit to inform the microprocessor that acquisition is complete.

Acquisition RAM

The acquisition RAM is made up of two 2048-word x 8-bit static RAMs, U870 and U880. U870 stores five MSBs of data and U880 stores five LSBs of data.

Bus Interface

The bus interface consists of U810, U890, U840 and U850.

U810 inhibits the access to the Acquisition RAM from the microprocessor during data acquisition. The DONE-INT signal is low during acquisition, inhibiting the access from the microprocessor. When acquisition is completed, the DONE-INT signal is set high, enabling microprocessor access. The RD line is set low to read the data from the Acquisition RAM. The ACQ(L) line increments address counter U820 to read the data sequentially. Buffers U840 and U850 isolate the Data Bus.

6 DISPLAY COUNTER CIRCUIT

The Display Counter Circuit is located on the A4 Digital Display Board. The Display Counter Circuit consists of the 4.5-MHz Oscillator, Display Counter, Address Switch & CPU Control, Display RAM, Bus Transceiver, Dot Cursor Generator and Character & Latch Controller. These circuits determine whether the CPU accesses the Display RAM, or whether the Display Counter reads out the Display RAM contents to display them on the CRT. This circuit also generates the necessary control signals for the digital display. For the display timing, see Figure 2-2.

4.5-MHz Oscillator

C-MOS oscillator U100 provides the 4.5-MHz clock for the Display Counter.

Display Counter

Dual 4-bit binary counters U110 and U120 make up the 16-bit Display Counter. This circuit counts the output of U100, producing the DC0 through DC14 signals. U110A is clocked by the Dot Cursor Generator output. The DC2 through DC14 signals are supplied to the Address Switch & CPU Control Circuit and become display RAM address inputs.

Address Switch & CPU Control

This circuit consists of data selector/multiplexer U130, U140, U150, U160, D-flip flop U350B, gates U310A, U310D, U320B, U320C, U330B, and inverter U340F. The circuit provides address inputs and control signals for the Display RAM. The Address Switch, composed of data selector U130 through U160, is controlled by D-flip flop U350B. When the U350B pin 9 is high and DSP-RAM(L) signal is low, the read/write access of the Display RAM by the CPU is enabled. When U350 pin 9 is low, the Address switch selects the Display counter outputs DC2 through DC14 for Display RAM address inputs to display the Display RAM contents on the CRT. In this case, when the DSP-RAM(L) signal is low, U330B and U320B supplies CPU control signal WAIT(L) for the CPU until pin 9 of U350B returns high. Table 2-6 shows the relationship between the pin 9 output of U350B and DSP-RAM(L).

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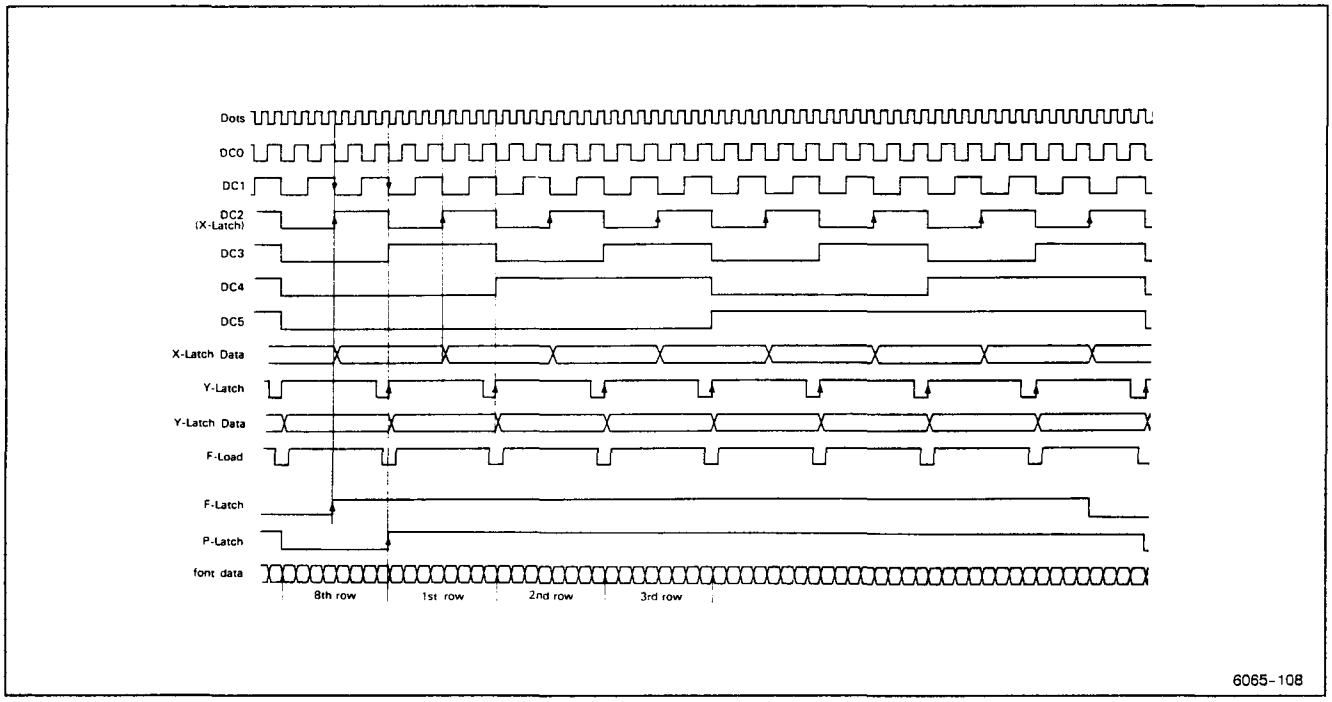

Figure 2-2. Display Timing.

Table 2-6
Display RAM States

U350B pin 9	DSP-RAM(L)	WAIT(L)	Display RAM address	Display RAM status
1	0	1	CPU address	CPU access Display RAM
1	1	1	CPU address	Display RAM not accessed
0	0	0	Display counter	Counter accesses Display RAM
0	1	1	Display counter	Counter access Display RAM

Display RAM

The Display RAM consists of 8-Kbyte static RAM devices U230 and U240. It stores the display data. Figure 2-3 shows the Display RAM memory map.

Bus Transfer

The Bus Transceiver consists of octal bus transceiver U250-U260 and gate U320A. When the pin 9 output of U350B is high and the DSP-RAM(L) signal is low, the Bus Transceiver is enabled and the Display RAM Bus is connected to the CPU Bus.

Dot Cursor Generator

The Dot Cursor Generator consists of dual 4-bit counter U170, gate U310C, U330A, U330C, U330D and inverter U340C, U340D. The circuit generates the dot cursor signal by stopping the Display Counter Clock. When both the STATUS-1 signal and pin 12 of U330D (DC2) are high, the clock input for U110A is inhibited during the U170A and U170B count for 128 cycles of the pin 8 output of U110B.

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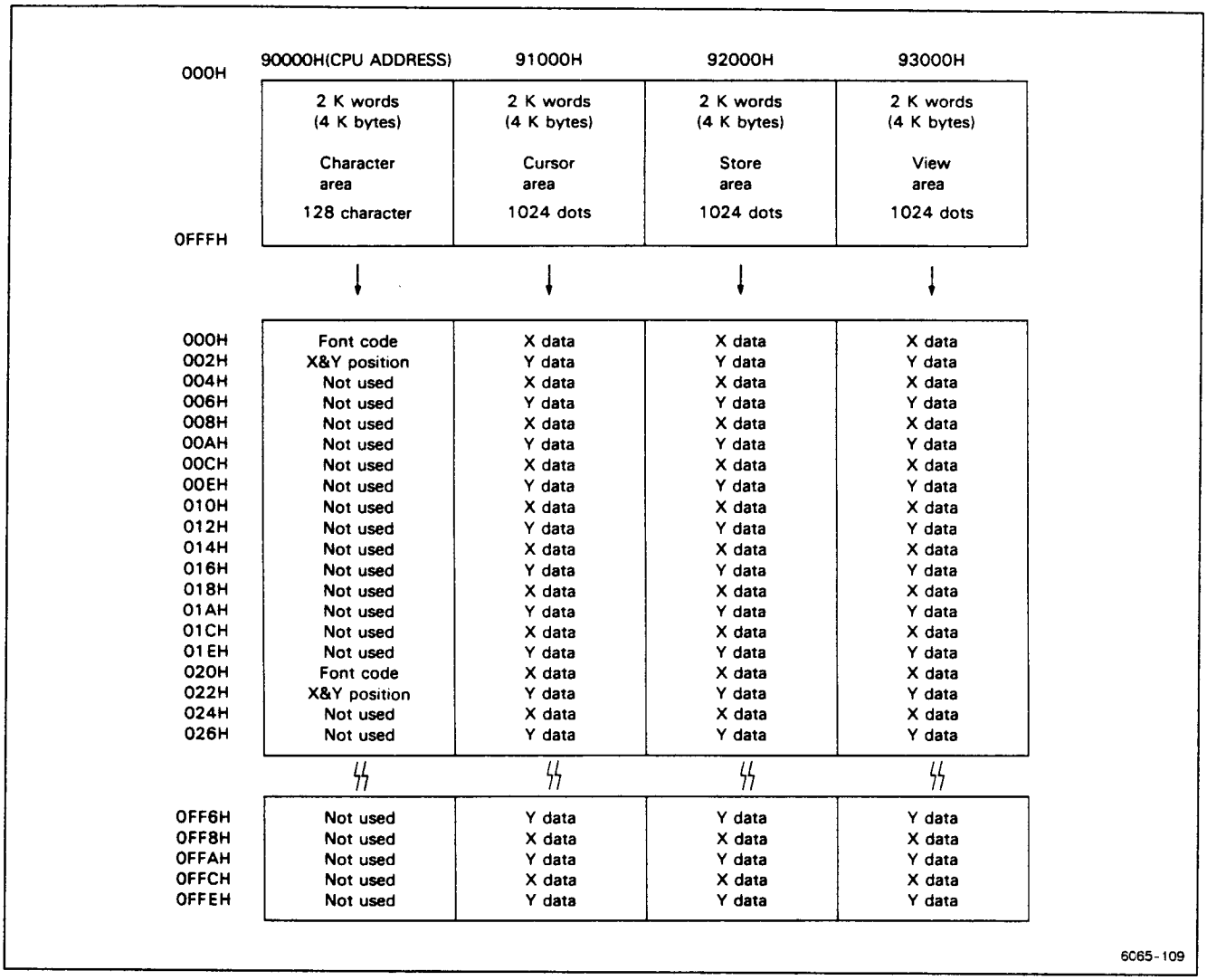

Figure 2-3. Display RAM Memory Map.

Character & Latch Controller

This circuit consists of D-flip flops U350A, U360A & B, U370A & B, and U380; plus gates U300A & C, U320D, and U340A, B, & E. This circuit provides necessary control signals to the Display D/A Converter Circuit. STATUS-0 and STATUS-1 signals that determine the display cycle are also produced by this circuit. The display cycle is shown in Figure 2-4.

The STATUS-1 signal provides a display refresh rate of 68.7 Hz (68.5 Hz if the Dot cursor is enabled). The F-LATCH signal latches the character font data. The P-LATCH signal latches the character position data. The F-LOAD signal latches the output of character ROM U620. DC2 latches the curve X data and attributes data (X-LATCH). Y-LATCH latches the curve X,Y data and attributes data. R-SEL selects Z-SEL and DZ(L) signals. DCL3-DCL5 generates Y readout position data.

7 DISPLAY D/A CONVERTER CIRCUIT

The Display D/A Converter Circuit is located on A4 Digital Display Board. The Display D/A Converter Circuit consists of:

1. X Data & Attribute Prefetch Latch.
2. X-Y Data & Attribute Load Latch.
3. X 10-bit DAC & Y 10-bit DAC.
4. X & Y Low-pass Filter.
5. Font Latch.
6. Character ROM & Shift Register.

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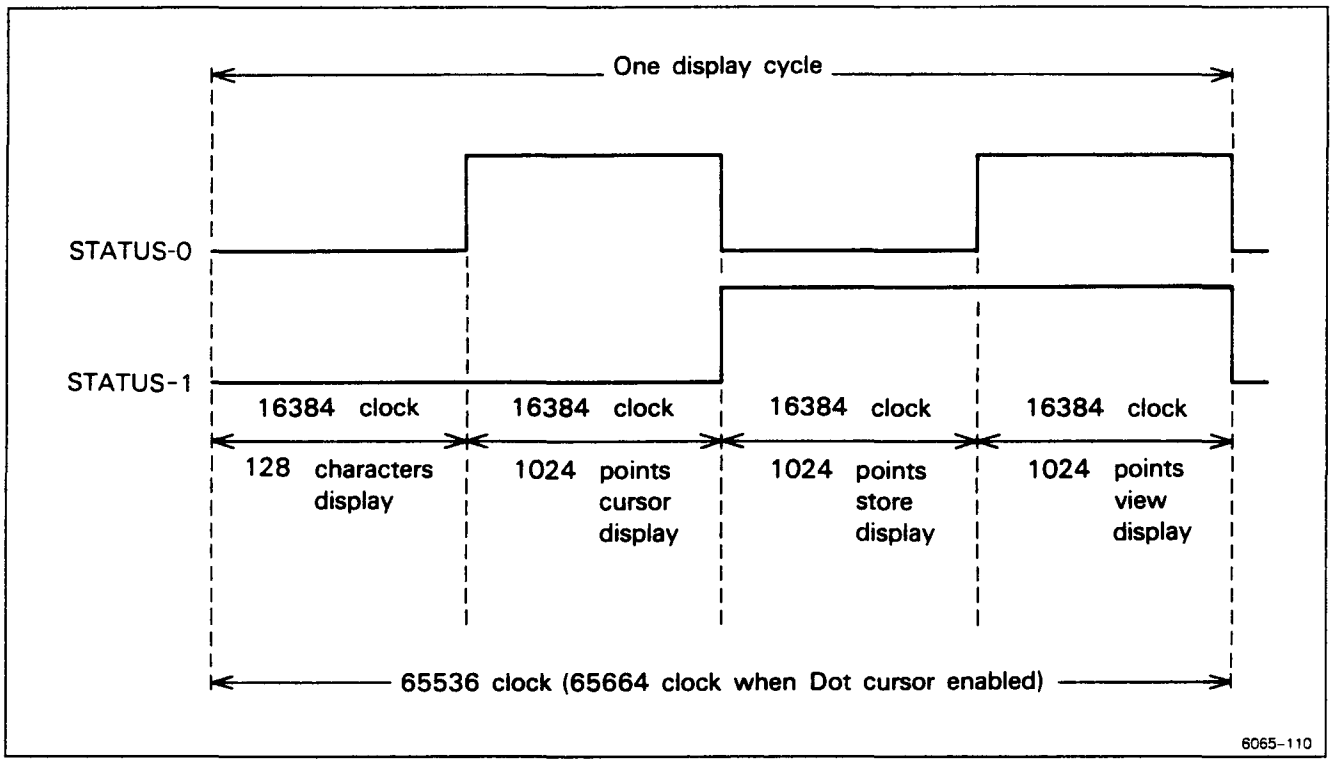

Figure 2-4. Display Cycle.

These circuits convert the digitized waveform data, readout data and cursor data from the Display RAM into an analog signal and generate the Z-axis signal.

X Data & Attribute Prefetch Latch

The X Data & Attribute Prefetch Latch consists of octal D flip flops U400 and U420. Because X coordinate data comes prior to Y coordinate data from the Display RAM, and the X and Y curve data must simultaneously be latched into the X-Y Data & Attribute Load Latch (attribute data is included in X data), temporary storage of the X curve data is needed. X data is latched by the positive edge of DC2.

X-Y Data & Attribute Load Latch

This circuit consists of octal D flip flops U440, U460 and U480. The Y-LATCH signal latches X curve data and Y curve data and provides the data to the X and Y 10-bit DAC. Attribute data included in the X data are also latched. Figure 2-5 shows the X and Y data organization.

X 10-bit DAC & Y 10-bit DAC

The X 10-bit DAC consists of 12-bit DAC U500, operational amplifier U502A and associated components. This circuit converts 10-bit X digital signals (X curve data) from the X-Y Data & Attribute Load Latch circuit into a ±1-volt analog signal.

The Y 10-bit DAC consists of 12-bit DAC U520, operational amplifier U502B and associated components. Operation of this circuit is just the same as the X 10-bit DAC, and a ±1 volt Y analog signal is generated.

X Low-Pass Filter & Y Low-Pass Filter

The X Low-pass Filter consists of operational amplifier U522A, analog switch U540B, resistors R512, R514 and capacitors C508, C510, C512, C528. This circuit is enabled when the pin 17 output of U440 is high, reducing the high frequency elements of the X analog signal so that the dots displayed on the CRT seem to be a line.

The Y Low-pass Filter consists of operation amplifier U522B, analog switch U540C, resistors R532, R534 and capacitors C530, C532. This circuit acts just like the X Low-pass Filter.

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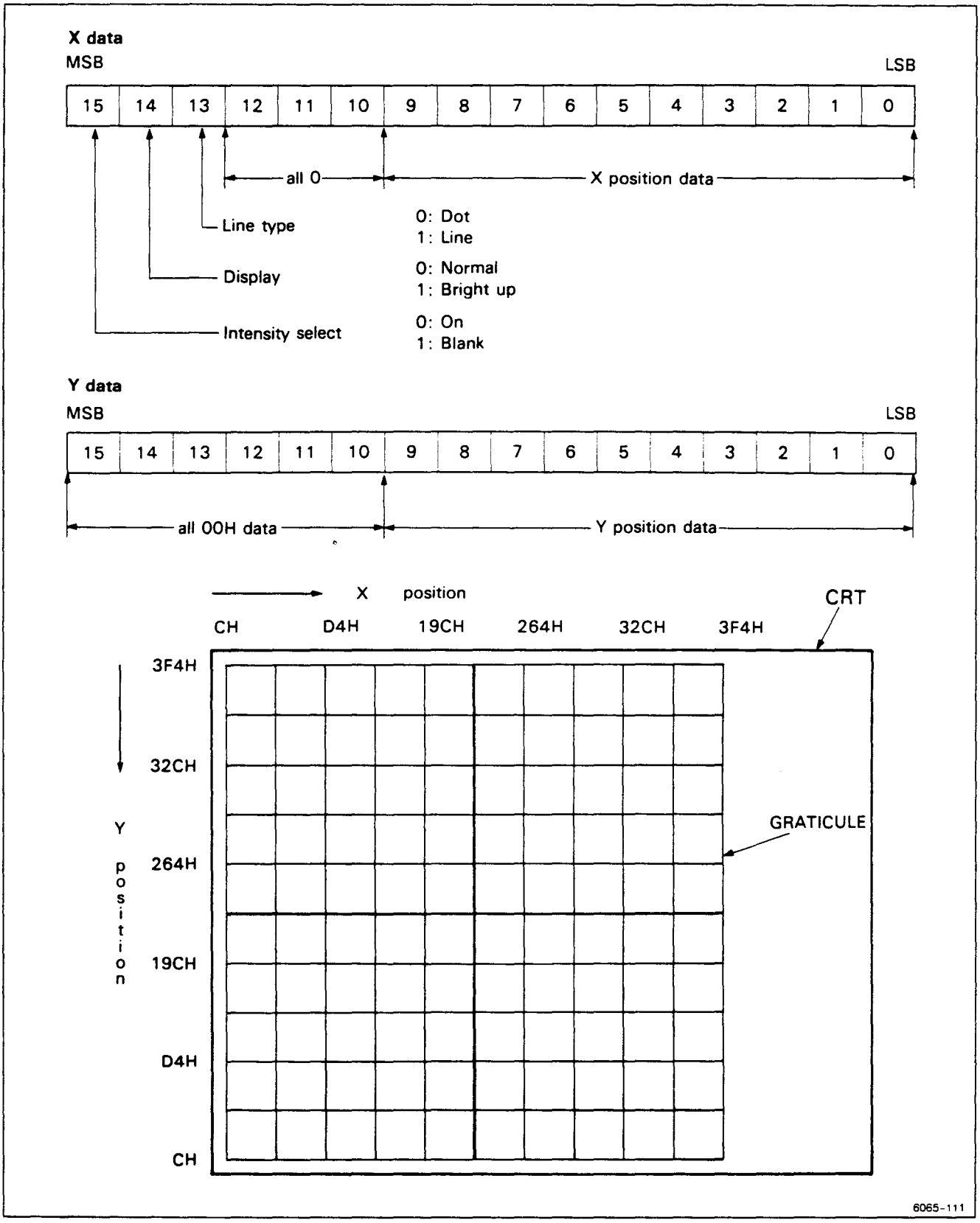

Figure 2-5. X and Y data organization.

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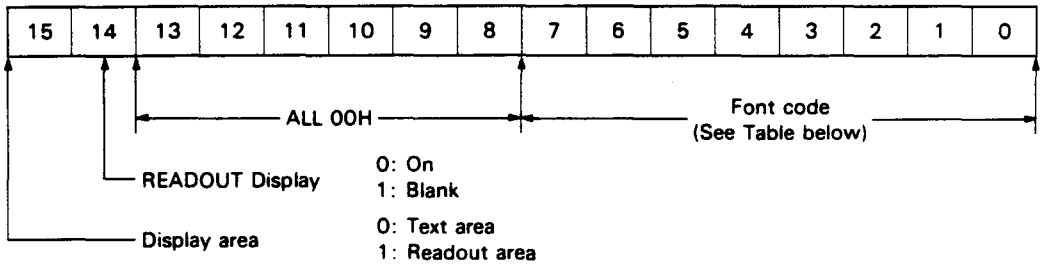
Font Latch

The Font Latch consists of octal D flip flop U600 and stores the font data of the readout character, latched by the F-LATCH signal. Figure 2-6 shows the data format of the font data word.

Character ROM & Shift Register

This circuit consists of Character ROM U620, shift register U640 and NAND gate U310B. This circuit generates Z signals for the readout character. When the F-LOAD signal is low, the output of Character ROM U620 are loaded into shift register

Font data format



FONT CODE

4LSB HEX representation

4MSB HEX representation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NU	SH	SX	EX	ET	EN	AK	BL	BS	HT	LF	VT	FF	CR	SO	SI
1	DE	D1	D2	D3	D4	NK	SY	EB	CN	EM	SB	EC	FS	GS	RS	US
2	SP	!	"	#	$	%	&	'	(	)	☆	+	,	−	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	¨
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	DL
8																
9																
A		。	「	」	;	・	o	a	i	u	e	o	ya	yu	yo	tu
B	-	a	i	u	e	o	ka	ki	ku	ke	ko	sa	si	su	se	so
C	ta	ti	tu	te	to	na	ni	nu	ne	no	ha	hi	hu	he	ho	ma
D	mi	mu	me	mo	ya	yu	yo	ra	ri	ru	re	ro	wa	n	゛	゜
E																
F																

6065-112

Figure 2-6. Font data word data format.

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U640 by the DOTS(L) signal. When the F-LOAD signal returns to high, loaded data are shifted by the DOTS(L) signal to become the serial readout Z signal. U310B is provided to shorten the readout Z signal active duration.

X & Y Readout Position Latch

The X & Y Position Latch consists of octal D flip flops U700 and U710. This circuit stores the X and Y position data for the readout character. The position data are latched by the P-LATCH signal. Figure 2-7 shows the readout position data format.

Readout Attribute Latch

Dual D-type flip flop U660 is the Attribute Latch; it stores readout attribute data prefetched in the X Data & Attribute Prefetch Latch. The readout attribute data are latched by the P-LATCH signal.

8-Bit Adder

The 8-Bit Adder consists of adder U760 and U770. It adds DCL3 through DCL5 to Y readout position data PY0 through PY7. The RY0 through RY7 outputs of this circuit are supplied to the Y Readout DAC as the Y readout data.

X Readout Step Generator

The X Readout Step Generator consists of U720B, C, D and resistors R700, R702, R704, R710, R712, R714, R716, R718, R720. This circuit generates the X step signal from DC0 through DC2 signals and provides this step signal with the X readout DAC output as the X readout signal, RX.

X Readout DAC

The X Readout DAC consists of 8-bit DAC U800, operational amplifier U802A, B, analog switch U540A and their associated components. This circuit converts the X position data output PX0 through PX7 from the X & Y Position Latch into an X analog signal and adds the output of the X Readout Step Generator to the converted output. If the output of the Readout Attribute Latch U660A is high, U540A switches to offset the U802B by the U822B output so that the readout can be written in the SETUP readout area. The output of U802B provides the X readout signal, RX.

Y Readout DAC

The Y Readout DAC consists of 8-bit DAC U820, operational amplifier U822A and associated components. This circuit converts the RY0 through RY7 outputs of the 8-bit adder into the Y readout signal, RY.

8 DISPLAY OFFSET CIRCUIT

The Display Offset Circuit is located on the A5 Display Control Board. The Display Offset Circuit consists of the Control Logic Circuit, Offset D/A Converter, Polarity Select Circuit, Source Select Circuit, Zero & Invert Select Circuit and Gain Select Circuit. These circuits select the horizontal and vertical source inputs for the CRT display and provide them with calibrated offset voltages to execute display functions such as DISPLAY OFFSET, MAG, CRT CAL, DISPLAY INVERT and COLLECTOR SUPPLY POLARITY.

Control Logic

U100, U120 and U140 are 8-bit addressable latches and U160A and B form a dual, 2-line to 4-line decoder/multiplexer. These components form the Control Logic stage. This circuit decodes the address A1 through A5 from the CPU. D0 data from the CPU determines the display functions. Table 2-7 shows the display functions that are controlled by the address A1 through A5 and data D0.

Offset D/A Converter

The Offset D/A Converter consists of analog switches U660 and U670, and resistors R661 through R674. This circuit generates display offset voltages selected by the front panel DISPLAY OFFSET INCR or DECR button. The DO0 through DO5 output of the CONTROL LOGIC circuit determines the display offset. This offset output is supplied to the Polarity select circuit.

Polarity Select

The Polarity Select Circuit consists of analog switches U680, U685, operational amplifiers U690, U695 and their associated components. This circuit provides display offset resulting from the setting of the front panel COLLECTOR SUPPLY POLARITY switch.

Pin 11 input of U685 (or U680) determines whether the display is horizontally (vertically) offset by the display offset produced in the Offset D/A Converter. U685 pins 9 and 10 provide the display offset when the COLLECTOR SUPPLY POLARITY switch is set to −, AC or -.

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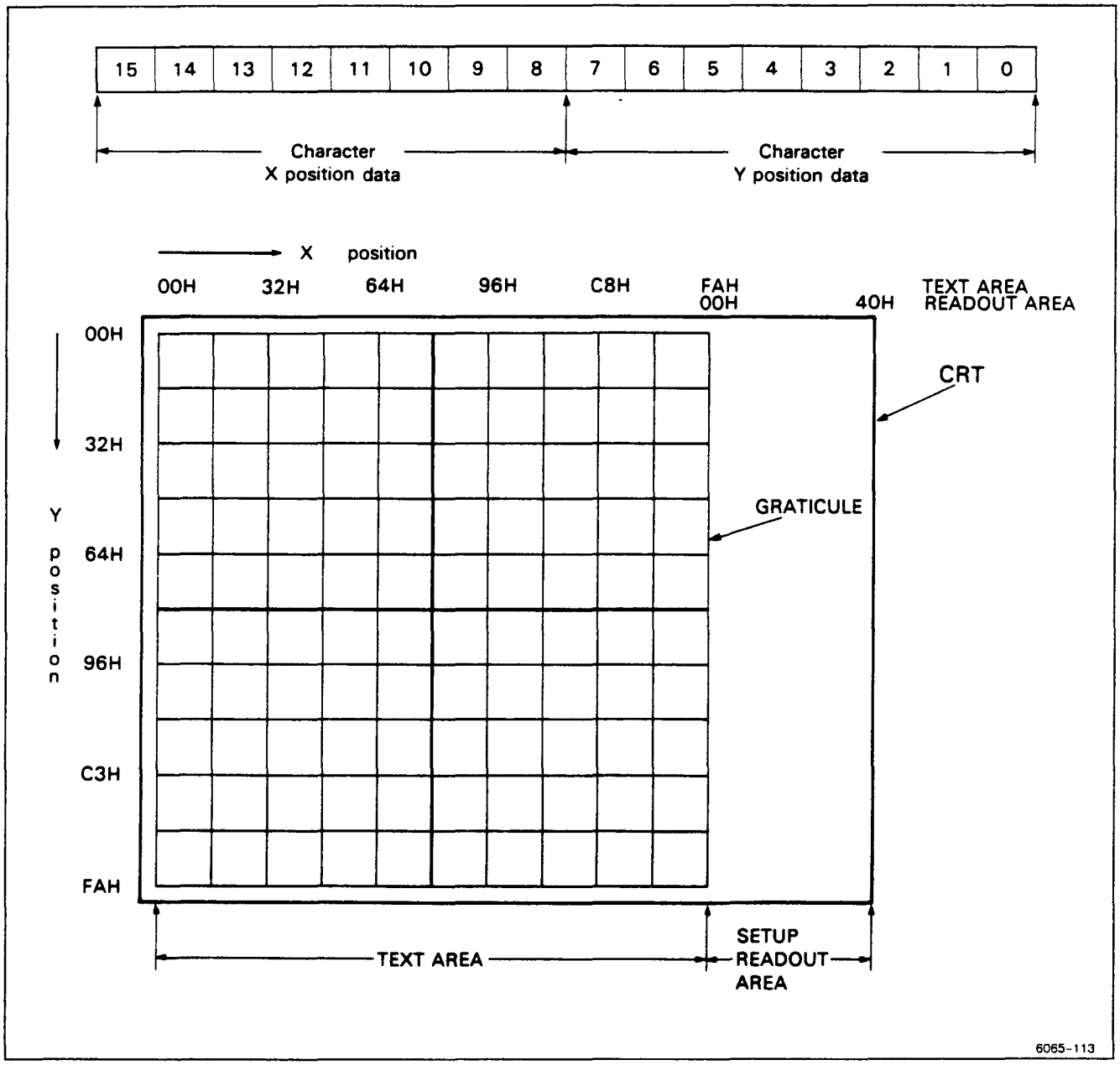

Figure 2-7. Readout character position data format.

Source Select

The Source Select Circuit consists of analog switches U600 and U610. U610 selects the horizontal source input from the (NPN or PNP) CAL voltages, SG-SIG signal or H OUT signal. U600 selects the vertical source input from the (NPN or PNP) CAL voltages, SG-SIG signal or V OUT signal.

Zero & Invert Select

The Zero & Invert Select circuit consists of analog switches U605 and U615. This circuit determines if the ZERO offset voltage (0 volt) is used for the source input and if the source input is inverted. Display offset selected by the Polarity Offset Circuit is applied to this circuit.

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Table 2-7
Display Function

Address								Display function determined by D0
A5	A4	A3	A2	A1	(A0)	HEX	Signal	
0	0	0	0	0	x	00	D00	
0	0	0	0	1	x	02	D01	
0	0	0	1	0	x	04	D02	offset
0	0	0	1	1	x	06	D03	
0	0	1	0	0	x	08	D04	
0	0	1	0	1	x	0A	D05	offset polarity
0	0	1	1	0	x	0C	not used	(1 for minus)
0	0	1	1	1	x	0E	not used	
0	1	0	0	0	x	10	V00	1 for NPN mode
0	1	0	0	1	x	12	V01	1 for AC mode
0	1	0	1	0	x	14	H00	1 for NPN mode
0	1	0	1	1	x	16	H01	1 for AC mode
0	1	1	0	0	x	18	VSRC	1 for SG sig
0	1	1	0	1	x	1A	HSRC	1 for SG sig
0	1	1	1	0	x	1C	MOV	1 for offsetted
0	1	1	1	1	x	1E	MOH	1 for offsetted
1	0	0	0	0	x	20	CAL	0 for cal
1	0	0	0	1	x	22	ZERO	1 for zero
1	0	0	1	0	x	24	INVERT	1 for invert
1	0	0	1	1	x	26	VMAG	1 for mag
1	0	1	0	0	x	28	HMAG	1 for mag
1	0	1	0	1	x	2A	NON-STORE	1 for non-store
1	0	1	1	0	x	2C	not used	
1	0	1	1	1	c	2E	not used	

X Gain Select

The X Gain Select circuit consists of operational amplifier U630, U635, U655, analog switch U650 and associated components. This circuit determines the gain of the selected X source input as set by the HMAG signal from the CONTROL LOGIC. When the HMAG signal is high, analog switch U650 switches so that the X source input is magnified 10 times.

Y Gain Select

The Y Gain Select Circuit consists of operational amplifier U620, U625, U645, analog switch U640 and their associated components. This circuit operates the same as the X Gain Select Circuit. The output of this circuit is supplied to the Display Select Circuit and Acquisition Circuit (part of A3 A/D board)

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9 DISPLAY SELECT

The Display Select circuit is located on the A5 Display Control board. The circuit consists of the Signal Select Logic Circuit, Unblank & Z Select Circuit, and the Horizontal & Vertical Preamp. This circuit block selects and amplifies the source inputs that are displayed on the CRT. Selection of the source inputs are performed by the Signal Select Logic Circuit. The Z signal for the source inputs is controlled by the Unblank & Z Select Circuit. Figure 2-8 and Figure 2-9 show the display select timing.

Signal Select Logic

The Signal Select Logic Circuit consists of decoder U800B, data selector U810B, operational amplifier U820A, NAND gate U850A, B, C, D, U860A, inverter U840A, C, F, and associated components. This circuit generates two kinds of select signals: AS (AS0, AS1) and BS (BS0, BS1). Decoder U800B and NAND gate U850B, C, D generate the BS0 and BS1 select signals as follows:

Display cycle signals STATUS-0 and STATUS-1 are applied to decoder U800B, so when the pin 6 output of U850B is high, outputs of U800B are inverted by NAND gate U850C and U850D, becoming the BS0 and BS1 signals. When the pin 6 output of the NAND gate U850B is low, the BS0 and BS1 signals are both high.

The two input signals to NAND gate U850B (NON-ST and AS1) determine the non-store display cycle. When NON-ST is high, the active AS1 signal provides the non-store waveform display cycle. This AS1 signal goes active (high) in one of the following conditions:

1. STATUS-1 is high
2. Z-SEL is high
3. Output of comparator U820A is low (this occurs if the front panel READOUT/CURSOR INTENSITY control is adjusted counterclockwise to lower the voltage level of the A-INTEN below 2.5 volts).

The AS1 signal determines the AS0 signal. AS1 signal is applied to the B select input of data selector U810B and provides either the NON-ST signal or STATUS-0 signal to its output as AS0.

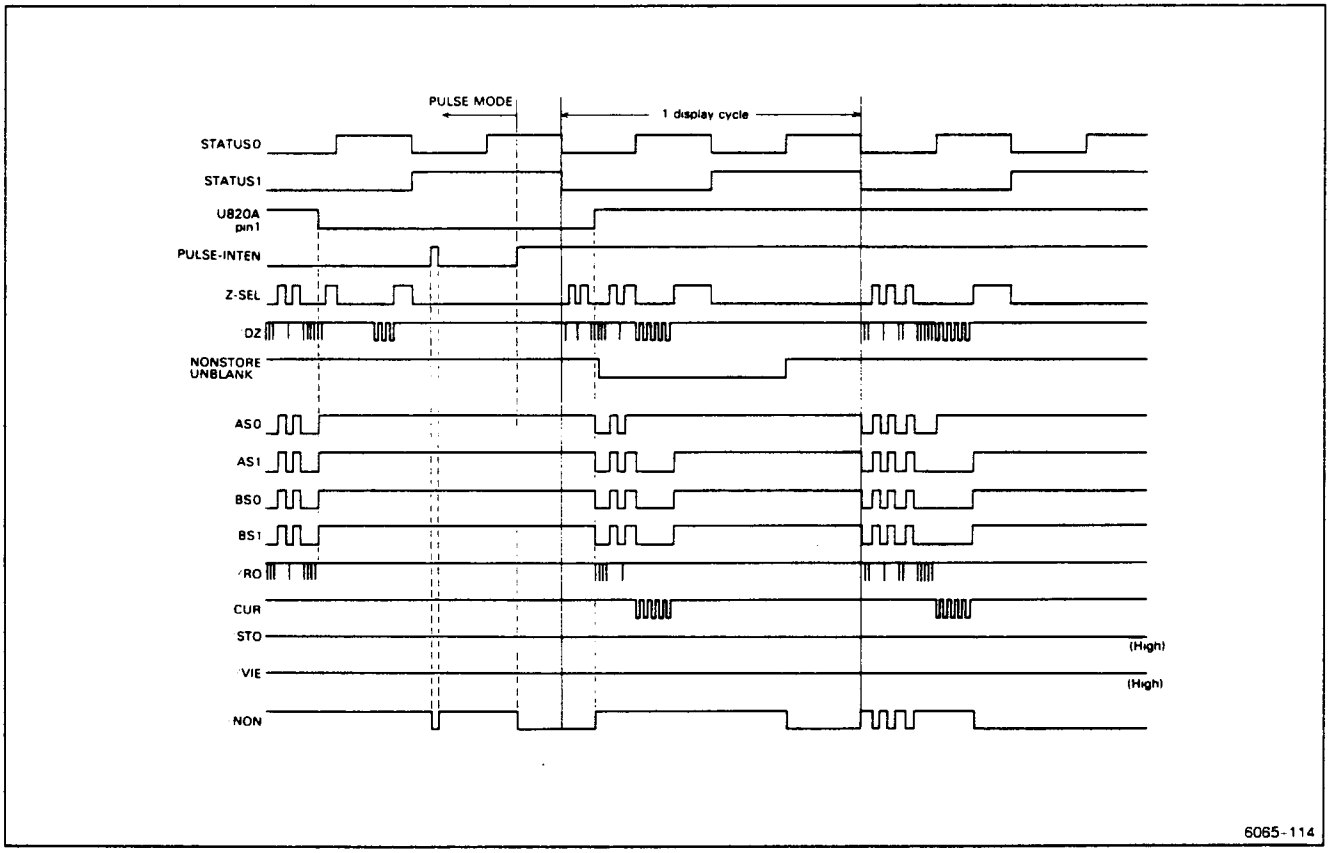

Figure 2-8. Display select timing (with NON-ST high).

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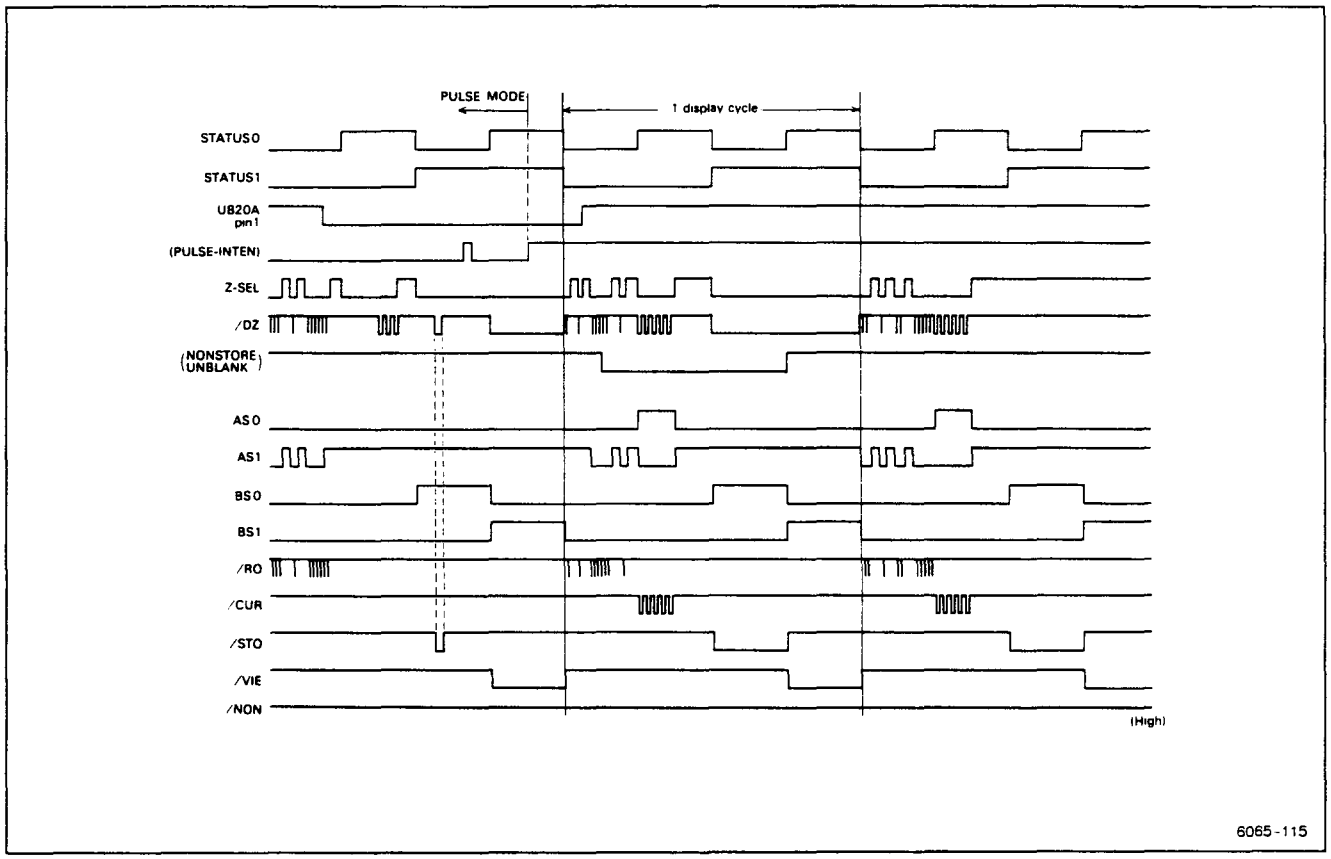

Figure 2-9. Display select timing (with NON-ST low).

Unblank & Z Select

This circuit consists of transistors Q850, Q852, Q860, Q862, Q870, data selector U810A, demultiplexer U800A, U830B, gate U860C, U860D, U870A and associated components. The unblank logic consists of U810A, U860C, U860D and U870A. This circuit is provided to cut off the Z signal when the front-panel switches are changed. When the display mode is NON STORE, U810A selects the pin 3 input. This input is controlled by the P-INTEN and NST-UNBLK signals. When either of these signals turns low, pin 3 input of U810A turns to high, and the pin 7 output of U810A turns all outputs of demultiplexer U800A and U830B high, so that the Z signal is disabled. Z select circuit outputs the Z signal that corresponds with the display cycle. The Z signal is selected by the AS0, AS1, BS0 and BS1 signals.

Horizontal & Vertical Preamp

The Horizontal and Vertical Preamp Circuit consists of data selector U500, U520, decoder U830A, transistor Q540, Q541, Q542, Q543, Q556, Q576, NAND gate U860B, inverter U840B, D and their associated components. This circuit selects the horizontal and vertical signals, and amplifies the selected signals. The horizontal signal is selected in data selector U500. AS0 and AS1 signals are decoded by U830A into signals RON, SON and NON. These provide the select input for U500. The selected horizontal signal is applied to the base of Q540 and the H POS level is applied to the base of Q541. Transistors Q540 and Q541 are configured as an emitter-coupled, paraphase amplifier, with Q556 acting as a constant-current emitter source. The Vertical Preamp operates the same as the Horizontal preamp but has a different amplification factor.

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10 COLLECTOR SUPPLY AMPLIFIER

This circuit is located on the A6 Collector Supply board and the A19 L.V. Supply board. The circuit consists of the Collector Supply Amplifier Circuit, the Voltage Limiter Circuit, the Current Limiter Circuit, the Limit Detector Circuit, the Power Supply and Control Circuit and the Control Signal Decoder Circuit. These circuits amplify signals from the Sine Wave Generator (located on the A3 A/D board) and provide driving voltage for collector supply transformer T200.

Collector Supply Amplifier

The circuit consists of operational amplifier U400, transistors Q424 and Q524, FETs Q438, Q440, Q538 and Q540 and diodes CR402 and CR404. This circuit amplifies the signal from the Sine Wave Generator (A3 A/D Board) into the driving voltage for collector supply transformer T200. U400B and associated components form a low pass filter, and U400A is an inverter. Q424, Q524, Q438, Q538, Q440 and Q540 form a differential output, capacitorless single-ended push-pull circuit. Resistor R412 adjusts final stage offset.

Voltage Limiter

This circuit consists of operational amplifiers U210 and U212, analog switch U200 and diodes CR210 and CR212. The circuit limits the board output voltage to 100%, 50%, 25% and 5%, under the control of the A2 CPU board. Analog switch U200 selects the output voltage limit. Operational amplifier U212A is a voltage follower and U212B is an inverter. U210 and diodes CR210 and CR212 make up two diode function generators. This circuit compares the output voltage of U400B with the positive and negative limits of the output voltage, which are set by U200. If the output voltage of U400B exceeds these limits, one of two diode generators U210A or U210B is turned on and the output voltage is clamped within upper or lower limits.

Current Limiter

This circuit consists of transistors Q444 and Q544, resistor pairs R444-R544, R446-R546 and R448-R548, relay drivers U102 and U103, relays K448, K548, K446 and K546 and associated components. This circuit limits the output current of this board to 200 mA, 1.2 A and 2.0 A under the control of relays (K446-K548). When the output current swing exceeds the limit, the voltage drop of each resistor pair turns Q444 or Q544 on and the emitter currents of Q424 and Q524 correspondingly decrease. This in turn decreases the gate-source voltages of Q438 and Q440 or Q538 and Q540 and as a result, output current of this circuit is clamped within the current limit. These limits are set by the A2 CPU board.

Limit Detector

This circuit consists of operational amplifiers U302A, U302B, U310A and U310B. U302A senses output voltage of the Collector Supply Amplifier and U302B senses driving voltage of the final stage. These signals are of opposite phase. They are added together and led to window comparator U310A-U310B. If the input voltage exceeds limits, the window comparator transfers the LMTR(L) signal. This LMTR(L) signal is used by the A14 Lower Key board to notify the operator that the current limiter is controlling Collector Supply output.

Power Supply and Control

This circuit consists of operational amplifier U330A, solid-state relay (SSR) U700, diode CR316, CR710, CR712, CR720, CR722, CR730, transformer T100B, capacitor C336, C700, C720, C722 and associated components. The circuit supplies and controls voltages applied to the final stage of the Collector Supply amplifier. To meet various output voltage requirements for the Collector Supply Circuit, this circuit provides two different voltages. If the output voltage of the Collector Supply Amplifier exceeds 60 volts, U330A transfers the SSR ON(L) signal to U700 and U700 is turned on. This inserts an additional winding of T100 into the supply circuit, increasing the VCC and VDD supply voltages from ±70 volts to ±115 volts.

Control Signal Decoder

This circuit consists of 8-bit addressable latch U100. The circuit decodes control signals (SA1-SA3) and generates corresponding control signals (HL0 and HL1). These control signals control the voltage limiter and current limiter.

11 STEP AMPLIFIER

The Step Amplifier circuits are located on the A7 Step Generator board. This circuit transforms the output of the Step Generator on the A3 A/D Board into current or voltage steps of various amplitudes to be applied to the device under test. The AMPLITUDE switch determines the amplitude of the steps. The circuit consists of the Control Signal Latches, Relay Drivers, 0.5-1-2 Ranging Circuit, and Step Amplifier. This circuit also includes the Auxiliary Supply Circuit.

Control Signal Latches

Latches U120, U140 and U160 latch the control signals from the microprocessor on the CPU board. Decoder U100 decodes address signals for the latches.

Relay Driver

Transistor array U180-U190 drives relays K500-K571 to switch the operation mode of the Mode Control Circuit., Current

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Ranging Circuit and the Current Limiter Circuit. The drive signal is fed from the control signal latches. When the input signal of the driver is high, the corresponding relay is energized.

0.5–1–2 Ranging

The 0.5–1–2 Ranging Circuit consists of U200, U300, U310, R300, R302, R304 and associated components. See Table 2–8. This circuit attenuates the output of the Step Generator by a factor of 1, 2, or 4 as determined by the STEP/OFFSET AMPLITUDE switch. Control signals SR0 and SR1 are fed from U120.

Table 2–8
Ranging Circuit Steps

Attenuation	SR0	SR1	Output
4	0	0	50 mV/step
2	0	1	0.1 V/step
1	1	1	0.2 V/step

This ranging circuit is used for both the current step mode and the voltage step mode.

Step Amplifier

The Step Amplifier Circuit has two modes of operation, current step mode and voltage step mode.

Current Step Mode. When the current step mode is selected by the STEP/OFFSET AMPLITUDE switch, the V/I signal from U120 pin 4 goes low. This causes U330C and U370C to provide a signal path through R340, U330C, U340, R370, U370C, and U380. The low of the V/I signal also de-energizes relays K570 and K571. The step signal from the 0.5–1–2 Ranging Circuit is attenuated and inverted by the first amplifier stage, consisting of U340, R340 and R344. Voltage gain of this stage is 0.1, as determined by R340 and R344. The output is then amplified and inverted again by the second amplifier stage, composed of U380, Q400–Q495, R370, R372, R410, R412 and associated circuitry. Voltage gain of this stage is 10, as determined by R370 and R372. U380 is a precision inverting amplifier. Q400–Q495 form a power amplifier with a voltage gain of 11, which is determined by resistors R410 and R412. Q400 and Q450 form a gain cell. Q460 and Q490 form a booster for positive output current. Q480 and Q495 form a booster for negative output current.

The output voltage of the second amplifier stage is transmitted through one of the current-setting resistors, R500–R514, to the device under test. The voltage output of the current-setting resistor is fed back through R342 and U600 to the negative input of U340. The current of the current-setting resistor is obtained by the following equation:

$$I_{out} = V_{in}/R_s$$

where
I_{out} is the current to the DUT
V_{in} is the input from the 0.5–1–2 Ranging Circuit
R_s is the value of the current-setting resistor.

Current to the device under test can be varied in seven steps for each voltage by selecting one of the seven resistors.

Q612, Q620, Q630 and associated circuitry form a floating power supply for U600. This circuit is driven by the output voltage of U600. The purpose of this circuit is to extend the operating range of U600 by shifting the power supply of U600 according to the output voltage level. R610 and C610 provide phase compensation for U600 and the floating power supply circuit.

U330A, CR340 and CR342 limit the voltage that can be applied to the device under test in the reverse direction when using opposing offset. If, for example, positive-going steps are to be applied to the device under test, the output of U340 is connected to its negative input through U330A and CR340. If negative offset is applied by pushing the OPPOSE button, the output of U340 is limited to the forward threshold level of CR340, approximately +0.6 volts. Because the second amplifier stage inverts this voltage and multiplies it by 10, the output to the DUT will be limited to about -6 V.

CR402 and CR482 are provided to supply current if more than 0.4 ampere is needed. When the output current increases until the collector voltage of Q490 reaches 11.4 volts (due to the voltage drop across R490–R493), CR402 conducts to supply additional current.

Voltage Step Mode. When the voltage step mode is selected by the AMPLITUDE switch, the V/I signal goes high. U330C provides a signal path through R330, U330C and U340. U370C and U330B provide a signal path through R350 or R352, U330B, U370C and U380. Relays K570 and K571 are energized.

The step signal from the 0.5–1–2 Ranging Circuit is amplified by U380 and Q400–Q495, and fed to the device under test. U380 is a precision inverting amplifier. Q400–Q495 from a power amplifier with a voltage gain of 11, set by resistors R410 and R412. Q400 and Q450 form a gain cell. Q460 and Q490 form a booster for positive output current. Q480 and Q495 form a booster for negative output current. At the lower voltage ranges (50 mV, 100 mV and 200 mV per step), the overall voltage gain of the amplifier is 1, as determined by resistance ratio between R352 and R356–R357. At the higher voltage ranges (500 mV, 1 V and 2 V per step), the overall voltage gain of the amplifier is 10, as determined by resistance ratio between R350 and R354–R355.

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Voltage on the ground sense terminal is fed back through the inverter U360 to the negative input of U380. This ensures exact voltage between the base and emitter terminals by compensating for voltage drop on the emitter terminal.

R520, R522, R524, R536, Q560, and Q562 form a current limiter. When using voltage steps, the current conducted at the step generator input to the device under test may increase rapidly and possibly damage the device under test (especially when testing transistors). The Current Limiter Circuit limits this current in the voltage mode. If, for example, the current limit is set 20 mA, K520S, K522S and K524S are all disconnected, and the current to the device under test flows through R536. When the current increases to 20 mA, the voltage across R536 reaches 0.6 V. If positive-going steps are being produced, this voltage forward-biases the base-emitter junction of Q560 and turns it on. When Q560 turns on, the voltage on the output side of R536 becomes 1.4 volts below the base voltage of Q460. As this voltage is almost the same as the emitter voltage of Q490, output current through R536 is disabled. CR450 and CR452 clamp the base-emitter voltage of Q450 to limit current through Q450, CR460, CR560 and Q560.

If negative-going steps are being produced, voltage across R536 forward-biases the base-emitter junction of Q562 and turns it on. When Q562 turns on, it supplies the current demanded by CR480. This reduces the base current of Q480 which reduces the drive to Q495 and limits current through R536. Current through Q562 and CR562 is limited by CR480.

R526 and CR526 limit reverse current from the base-emitter junction of the device under test.

12 COLLECTOR SUPPLY HIGH VOLTAGE

This circuit is located on the A8 H.V. Relay board and A10 Sense board and is active when the HIGH/LOW Switch is set to HIGH. The circuit consists of Transformer T200, Full-wave Rectifier Circuit, Smoothing Circuit, Output Power Limiter Circuit, Relay Control Signal Decoder Circuit and Relay Circuit. These circuits provide the sine-wave ac, the full-wave rectified sine wave and the DC voltage, ranging from 0 volts to 2000 volts peak. These voltages are applied to the collector of the device under test via the A10 Sense board, the A17 Sub LOR board and the A16 LOR SW board.

Transformer

This circuit consists of transformer T200 and associated components. The circuit supplies AC high voltage. The input of T200 is a swept AC sine-wave voltage that ranges from 0 volts to 100 volts from the A6 Collector Supply board; the voltage is applied to the primary windings. The range of induced voltage on the secondary windings of T200 is from 0 volts to 2000 volts.

Full-wave Rectifier

This circuit consists of diodes CR200, CR202, CR204 and CR206 and forms a full-wave bridge rectifier. They rectify applied voltages ranging from 0 volts to 2000 volts. The output of the circuit is a full-wave rectified sine wave ranging from 0 volts to 2000 volts peak.

Smoothing

This circuit consists of resistors R204, R205 and R206 and capacitor C206. The input of the circuit is a full-wave rectified sine wave; the voltage range is from 0 volts to 2000 volts. When this circuit is selected, the ripple component of the input voltage is bypassed to ground.

Output Power Limiter

This circuit consists of resistors R400B, R402, R403, R404, R405, R406, R407 and R408. These resistors are selected by the Relay circuit. The selected resistors are inserted into the output circuit of this board in series to limit the output current. The resulting output power of this circuit is limited to the MAX PEAK POWER control setting. The selectable power limits are 50 watts, 10 watts, 2 watts, 0.4 watts and 0.08 watts.

Relay Control Signal Decoder

This circuit consists of 8 bit addressable latch U800 and relay drivers U810 and U820. The circuit decodes control signals from the A2 CPU board and drives corresponding relays. The relay drive signals are transferred to corresponding relays except the 2KDC, 2KDC(L) and R13(L) signals. These exceptions occur when the ARC Killer Circuit transfers the ARC(L) signal to U820. This ARC(L) signal protects the 370 from damaging arc discharges.

Relay

The Relay Circuit consists of K202, K204, K210, K211, K212, K213, K214, K215, K300, K302, K304 and K306. The Relay Circuit is controlled by the Control Signal Decoder Circuit, providing the desired output set by the POLARITY switch (S330 and S332) and MAX PEAK POWER switch (S320 and S322) of the A14 Lower Key board. As a result, the Collector Supply High Voltage Circuit provides five different outputs (+dc, – full wave rectified sine, ac, -full wave rectified sine and -dc), each ranging from 0.08 watts to 50 watts. The combinations of the activated relays for each setting are described in Table 2-9.

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Table 2-9
Activated Relays for High Voltage

A14 Lower Keyboard Setting		
COLLECTOR SUPPLY Setting	**Position**	**Activated Relays**
Output POLARITY select	+	K211 and K214
	-	K212 and K213
	AC	K210 and K215
	DC	K204
	Full wave	K202
MAX PEAK POWER WATTS	50	K300
	10	K302
	2	K304
	0.4	K306
	0.08	–

13 COLLECTOR SUPPLY LOW VOLTAGE

This circuit is located on the A8 H.V. RELAY board and the A9 L.V. RELAY board. The circuit consists of Transformer T200, Full-wave Rectifier Circuit, Smoothing Circuit, Output Power Limiter Circuit, Looping Compensator Circuit, Relay Control Signal Decoder Circuit, and Relay Circuit. These circuits provide the sine-wave ac, the full-wave rectified sine wave and the DC voltages. These voltages are supplied in three ranges, from 0 volts to 16 volts, from 0 volts to 80 volts and from 0 volts to 400 volts. These voltages are applied to the collector of the device under test via the A10 Sense board, the A17 Sub LOR board and the A16 LOR SW board.

Transformer

This circuit consists of Transformer T200, which supplies low AC voltages. The input of this circuit is a swept AC sine-wave voltage ranging from 0 volts to 100 volts from the A6 Collector Supply board; this voltage is applied to the primary windings of T200. The ranges of induced voltages on the three secondary windings of T200 are from 0 volts to 16 volts, from 0 volts to 80 volts and from 0 volts to 400 volts. Depending on the output voltage, waveform and current desired, the output voltages of this circuit are switched to the corresponding processing circuit of the board.

Full-wave Rectifier

This circuit is actually two full-wave bridge rectifiers. The first bridge rectifier consists of diode pairs CR200, CR202 and CR204, which produce the voltages from which the 0 volts to 16 volts are derived. The second bridge rectifier consists of diode bridge CR300, which produces the voltages from which the 0 volts to 80 volts and 0 volts to 400 volts are derived.

Smoothing

This circuit comprises three sets of smoothing circuits. The first set consists of resistors R206 and R208 and capacitor C208. The second set consists of resistors R316 and R318 and capacitor C318. The third set consists of resistors R306, R308 and R309 and capacitors C308 and C309. Each input of the circuit is a full-wave rectified sine wave; the voltage range is from 0 volts to 16 volts, 0 volts to 80 volts and 0 volts to 400 volts, respectively. When this circuit is selected, the ripple component of each input voltage is shunted to ground.

Output Power Limiter

This circuit consists of resistors R400A, R416, R417, R418 and R419. The resistors are selected by the Relay Circuit. The selected resistors are inserted into the output circuit of this board in series to limit the output current. The resulting output power is limited to the setting of the MAX PEAK POWER switch, located on the A14 Lower Key board. Output power settings are 220 watts, 50 watts, 10 watts, 2 watts, 0.4 watts and 0.08 watts.

Looping Compensator

This circuit consists of variable resistors R500, R502 and R504 and capacitors C500, C501, C502, C510, C512, C520 and C522. The circuit neutralizes the effect of stray capacitance by applying reverse voltage to the sensing circuit. This neutralization is adjusted by variable resistors R500, R502 and R504.

NOTE

To cancel the stray capacitance effect, the 370 uses two different circuits. The first circuit is a neutralizing circuit, and the second is a canceling circuit. The neutralizing circuit reduces the stray capacitance effect before sensing. This circuit is the circuit mentioned in this section. The cancel circuit cancels the stray capacitance effect on the sensed signal by a subtraction technique applied after sensing. This circuit is located on the A10 Sense board and is controlled by the LOOPING COMPENSATION control on the 370 front panel.

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Relay Control Signal Decoder

This circuit consists of 3-to-8 demultiplexer U100, 8-bit addressable latches U102, U106 and U110 and relay drivers U104, U108, U109 and U112. This circuit decodes control signals from SA1 to SA7 from the A2 CPU board via the A10 Sense board and generates corresponding relay drive signals.

Relay

The Relay Circuit consists of relays K204-K214, K300-K314, K400-K416, and K500. These relays are controlled by the relay address decoder to provide the desired output, set up by the MAX PEAK VOLTS switch (S310 and S312), POLARITY switch (S330 and S332), and MAX PEAK POWER switch (S320 and S322) on the A14 Lower Key board. This circuit provides five different outputs (+dc, -full wave rectified sine, ac, -full wave rectified sine and -dc), with a range of 0.08 watts to 220 watts. The combinations of the activated relays for each setting are listed in Table 2-10.

14 VERTICAL SENSE

This circuit is located on the A10 Sense board and the A16 LOR SW board, and consists of the Sense Board Interlock Circuit, the Interface Circuit, and the Vertical Sense Circuit. The Interlock Circuit protects this board from arc generation, overheat and operation under cover opening. The Sense Board Interface Circuit interfaces this board with the A2 CPU board. The Vertical Sense Circuit compensates for looping, senses and amplifies collector and emitter current.

Interlock

This circuit consists of the Interlock Circuit and the Arc Killer Circuit, which protect the 370 operator and the 370 from harm. The circuit consists of cover switches S400 and S402 (located on diagram 15), thermal switches S90 and S92 (located on diagram 10), and relay K700. This circuit prevents potentially dangerous voltages from appearing at the collector terminal when the cover is opened. When the collector terminal cover is opened, interlock switches S400 and S402 open the relay drive line for K700 and in turn, open the primary input line for collector supply output transformer T200. Another contact point of K700 opens the relay drive line for K204 on the A8 H.V. RELAY board, K204 and K308 on the A9 L.V. Relay board. Because these relays are connected to capacitors in which dangerous high voltages are stored, the resultant output voltage of the collector supply remains low. The same occurs when the temperature rises above 60° C at series resistor R400 on the A9 L.V. Relay board and the transistor heat sink on the A6 Collector Supply board, because thermal switches S90 and S92 are connected serially with interlock cover switches S400 and S402; see Figure 2-10.

The Arc Killer Circuit consists of monostable multivibrator U700 and transistor Q740. This circuit protects the 370 from dangerous high voltage arc discharge. High voltages that can cause an arc can be generated when the Left-Right-Standby switch setting is changed while a voltage is applied. Contact points B10, B11 and B12 of Left-Right-Standby switch form a motion detector signal generator and generate the ARC motion detect signal when the Left-Right-Standby switch changes setting. The LR-SEL(L) signal is expanded by U700 and inverted into ARC(L) by Q740. This ARC(L) signal is used by the A3 A/D Board to cut off the Collector Supply Amplifier output and by the A8 H.V. Relay and A9 L.V. Relay boards to

Table 2-10
Activated Relays For Low Voltage

A14 Lower Keyboard Setting			
COLLECTOR SUPPLY Setting	**Position**	**Voltage**	**Activated Relays**
POLARITY	+	16 80 400	K210 K314 K314
	-	16 80 400	K212 K312 K312
	AC	16 80 400	K214 K310 K310
	DC	16 80 400	K204 K308 K308
	Full-wave	16 80 400	K500 K300 and K302 K304 and K306
MAX PEAK POWER WATTS	220	16 80 400	K400 K404 K408
	50	16 80 400	K402 K406 K410
	10	16 80 400	K404 K408 K412
	0.4	16 80 400	K408 K412 K416 and K414

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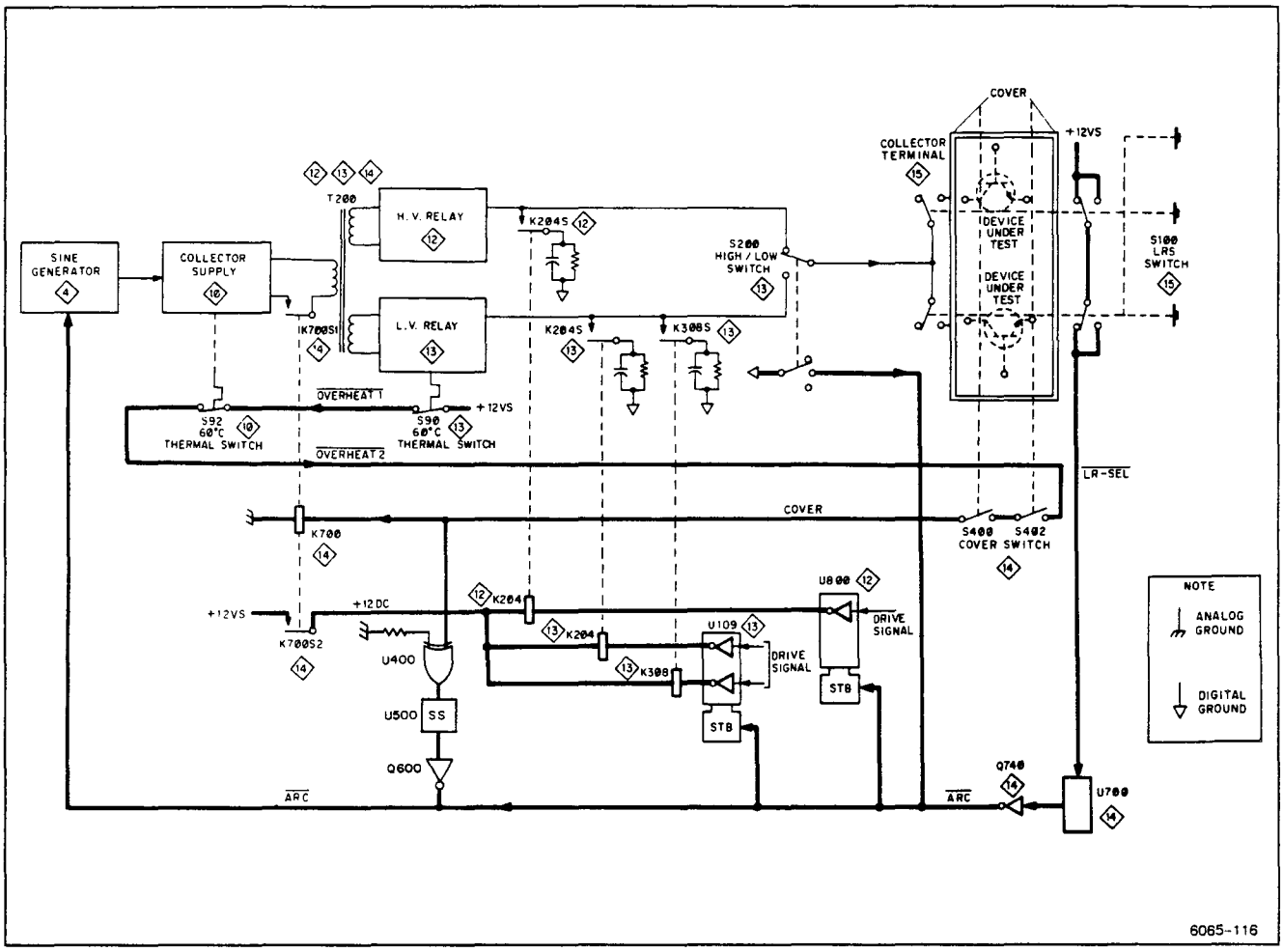

Figure 2-10. Interlock and Arc Killer Circuit.

disconnect high voltage charges. The ARC(L) signal is also generated when the HIGH/LOW switch (S200) setting is changed or when the Protective Cover is opened or closed. The HIGH/LOW switch is located on diagram 13 and the Protective Cover are suppression circuit (A60 Timer board) is located on diagram 15.

Interface

The Interface Circuit consists of 3-to-8 demultiplexer U720, 8-bit addressable latches U730, U740, U750, U760 and U770 and relay drivers U745, U755, U765 and U775. This circuit decodes the control signals from the A2 CPU board and controls the relays. U720 decodes address signals (SA4-SA7) from the A2 CPU board and generates chip select signals for addressable latches U730 through U770. Then the selected addressable latch decodes data (SA1-SA3) and stores the results. This stored data is transferred to corresponding relays through relay drivers. Internal wiring J102 enables or disables the 80 and 400-volt collector supply peak voltage ranges. J101 enables or disables the 2000 volts range.

Vertical Sense

This circuit consists of the Looping Compensator Circuit, the Vertical Amplifier Circuit, the Collector Current Sense Circuit, and the Emitter Current Sense Circuit. These circuits compensate for the undesired effect of stray capacitance on measurements, and sense and amplify the collector and emitter current.

There is a certain amount of non-discrete capacitance associated with the collector supply. This undesired capacitance effects the measurement, which shows up in the display as looping. Part of this undesired capacitance is stray capacitance, which provides an AC current path between the collector supply and chassis ground, as does the capacitance of the device under test. The transformer and the guard box also exhibit some undesired capacitance between the guard box potential and chassis ground (see Fig. 2-11). To cancel this effect, the 370 uses two different circuits, the Neutralize Circuit and the Cancel Circuit. The Neutralize Circuit reduces the stray capacitance effect before sensing. This circuit is located on the A8 H.V. Relay board and the A9 L.V. Relay board. The Cancel Circuit cancels the stray capacitance effect

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on the sensed signal through a subtraction technique after sensing. This is the Looping Compensation Circuit described here.

The Looping Compensator Circuit consists of operational amplifiers U220, U230 and U240, diode CR220, resistors R140-R148 and capacitors C120-126. This circuit cancels the looping effect. The looping current is measured by placing resistors R140, R142, R144, R146 and R148 between capacitors C120 and C126 and the current return point for the collector supply, then measuring the developed voltage across these resistors. Operational amplifiers U220 and U230 sense and amplify the looping signal. The front-panel LOOPING COMPENSATION adjustment controls the amplitude of this signal. This signal is then isolated by U240 and subtracted electrically from the vertical signal. As a result, the looping effect is canceled. (See Figure 2-12).

The Vertical Amplifier Circuit consists of operational amplifiers U200, U210, U250 and U260 and analog switch U270. They form a high input impedance amplifier. The looping signal is subtracted at this stage. U260 and U270 form a 1-2.5-5 gain-selectable amplifier.

The Collector Current Sense Circuit consists of resistors R100 through R116. When the COLLECTOR SUPPLY POLARITY switch of the A14 Lower Key board is set to ±dc, ±full wave rectified sine, or ac, this circuit senses the collector current of the device under test. The measurement is done by placing resistors R100-R106 between chassis ground and the current return point for the collector supply and measuring the developed voltage across them. Total value of placed resistors can be changed by the relays from 0.025 Ω to 25 kΩ. Table 2-11 shows the control signals for the relays.

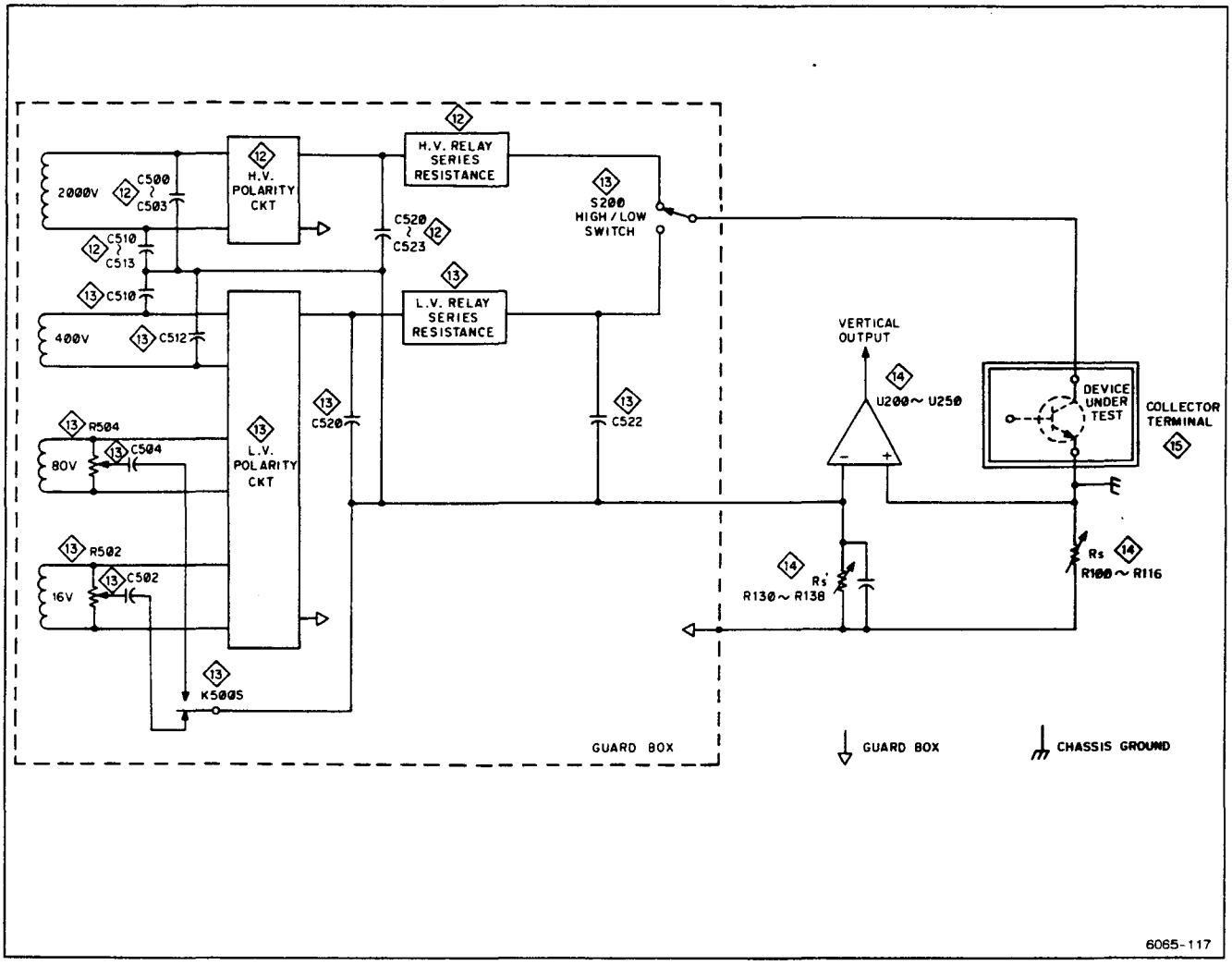

Figure 2-11. Looping Compensation (caused by stray capacitance).

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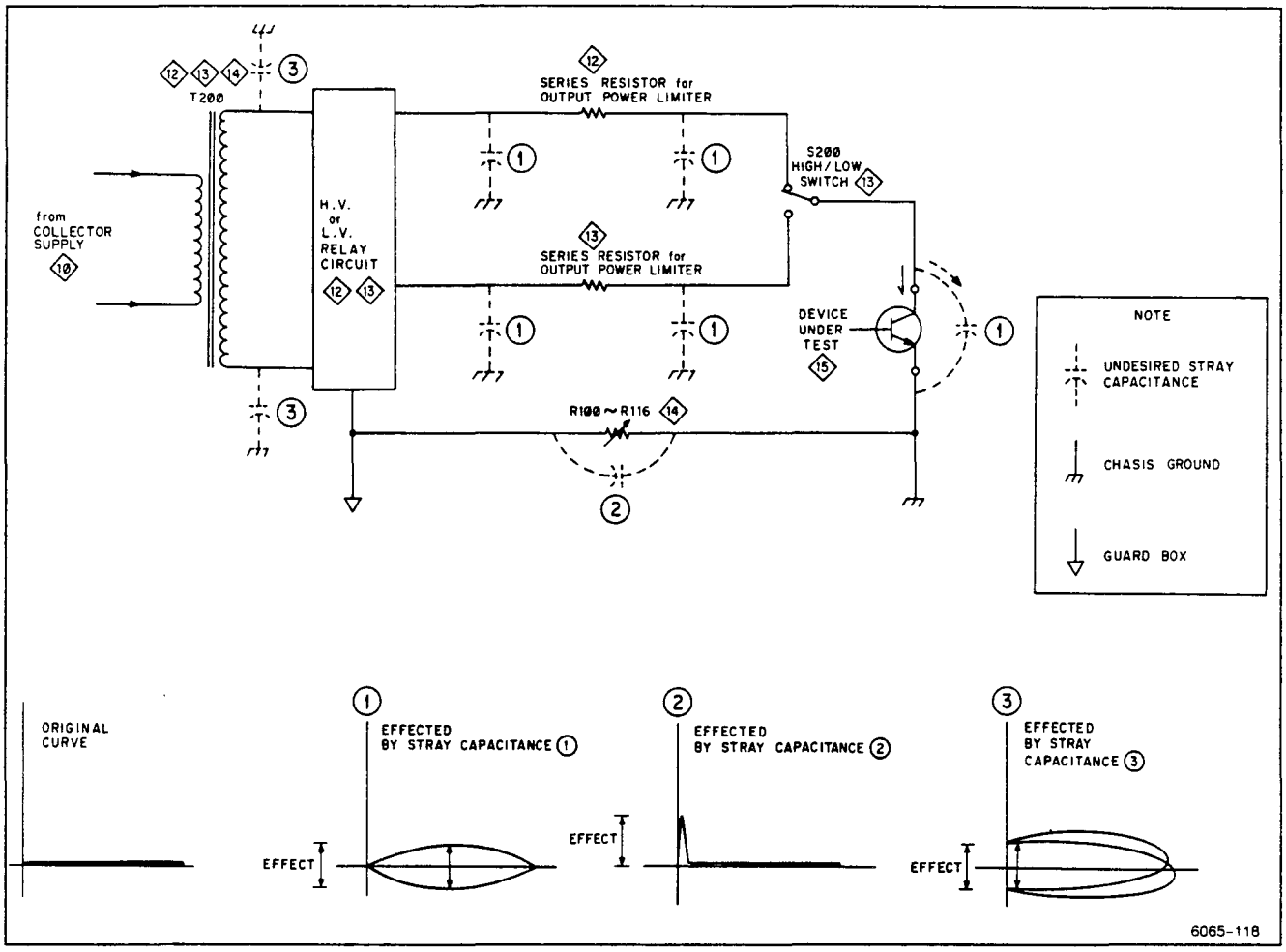

Figure 2-12. Effect of undesired stray capacitance on curve.

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Table 2–11
Relay Control Signals for Collector Current Sense

Vertical Current/Div		Relay Control Signals												
		VS RC	V1	V2	V3	V4	V5	V6	V7	V8	V9	V11	V13	V14
STEP GEN		1	1	0	0	0	0	0	0	0	0	1	0	0
COLLECTOR	2 A	0	1	0	0	0	0	0	0	0	0	1	0	0
	1 A	0	1	0	0	0	0	0	0	0	0	1	0	1
	500 mA	0	0	1	0	0	0	0	0	0	0	1	1	0
	200 mA	0	0	1	0	0	0	0	0	0	0	1	0	0
	100 mA	0	0	1	0	0	0	0	0	0	0	1	0	1
	50 mA	0	0	0	1	0	0	0	0	0	0	0	1	0
	20 mA	0	0	0	1	0	0	0	0	0	0	0	0	0
	10 mA	0	0	0	1	0	0	0	0	0	0	0	0	1
	5 mA	0	0	0	0	1	0	0	0	0	0	0	1	0
	2 mA	0	0	0	0	1	0	0	0	0	0	0	0	0
	1 mA	0	0	0	0	1	0	0	0	0	0	0	0	1
	500 μA	0	0	0	0	0	1	0	0	0	0	0	1	0
	200 μA	0	0	0	0	0	1	0	0	0	0	0	0	0
	100 μA	0	0	0	0	0	1	0	0	0	0	0	0	1
	50 μA	0	0	0	0	0	0	1	0	0	0	0	1	0
	20 μA	0	0	0	0	0	0	1	0	0	0	0	0	0
	10 μA	0	0	0	0	0	0	1	0	0	0	0	0	1
	5 μA	0	0	0	0	0	0	0	1	0	0	0	1	0
	2 μA	0	0	0	0	0	0	0	1	0	0	0	0	0
	1 μA	0	0	0	0	0	0	0	1	0	0	0	0	1

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Table 2-12
Relay Control Signals

Vertical Current/Div		Relay Control Signals												
		VS RC	V1	V2	V3	V4	V5	V6	V7	V8	V9	V11	V13	V14
STEP GEN		1	0	0	0	1	0	0	0	0	0	1	0	0
COLLECTOR-BASE OR EMITTER	2 mA	0	0	0	0	1	0	0	0	0	0	1	0	0
	1 mA	0	0	0	0	1	0	0	0	0	0	1	0	1
	500 μA	0	0	0	0	0	1	0	0	0	0	1	1	0
	200 μA	0	0	0	0	0	1	0	0	0	0	1	0	0
	100 μA	0	0	0	0	0	1	0	0	0	0	1	0	1
	50 μA	0	0	0	0	0	0	1	0	0	0	1	1	0
	20 μA	0	0	0	0	0	0	1	0	0	0	1	0	0
	10 μA	0	0	0	0	0	0	1	0	0	0	1	0	1
	5 μA	0	0	0	0	0	0	0	1	0	0	1	1	0
	2 μA	0	0	0	0	0	0	0	1	0	0	1	0	0
	1 μA	0	0	0	0	0	0	0	1	0	0	1	0	1
	500 nA	0	0	0	0	0	0	0	0	1	0	1	1	0
	200 nA	0	0	0	0	0	0	0	0	1	0	1	0	0
	100 nA	0	0	0	0	0	0	0	0	1	0	1	0	1
	50 nA	0	0	0	0	0	0	0	0	0	1	1	1	0
	20 nA	0	0	0	0	0	0	0	0	0	1	1	0	0
	10 nA	0	0	0	0	0	0	0	0	0	1	1	0	1
	5 nA	0	0	0	0	0	0	0	0	0	0	1	1	0
	2 nA	0	0	0	0	0	0	0	0	0	0	1	0	0
	1 nA	0	0	0	0	0	0	0	0	0	0	1	0	1

The Emitter Current Sense Circuit consists of resistors R100 through R122 and capacitors C110, C112 and C114. If the COLLECTOR SUPPLY POLARITY switch on the A14 Lower Key board is set to ±LEAKAGE, this circuit senses emitter or collector-base current of the device under test. The measurement is done by placing resistors R100-R122 between chassis ground and the common terminal selected by the CONFIGURATION control and measuring the voltage across these resistors. If emitter current is to be measured, the CONFIGURATION control must be set to EMITTER-COMMON and BASE-OPEN or BASE-SHORT. If collector-base current is to be measured, the CONFIGURATION switch must be set to BASE-COMMON and EMITTER-OPEN. The resistor value can be set from 25 Ω to 25 MΩ. Table 2-12 shows the control signal for the relays. It should be remembered that the vertical deflection factor is always decreased by 1000 times, the COMMON line is not grounded to the chassis when the LEAKAGE mode is selected, and the step generator is disabled.

15 HORIZONTAL SENSE

This circuit consists of the Horizontal Sense Circuit, the Configuration Circuit, the Timer Circuit and the Device Select Circuit. The Horizontal Sense Circuit senses collector and base voltages. The Configuration Circuit detects the CONFIGURATION control setting. The Timer Circuit eliminates transient voltage on the Collector Terminal. The Device Select Circuit selects the device, applies voltages, and senses resultant voltages and currents.

Horizontal Sense

The Horizontal Sense Circuit consists of the Horizontal Amplifier Circuit, the Collector Voltage Sense Circuit, and the

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Base Voltage Sense Circuit. It measures either collector or base voltage of the device under test. These voltage measurements can be done between either the collector sense terminal or the base sense terminal and the common sense terminal; this is determined by the CONFIGURATION control on the A14 Lower Key board.

The Horizontal Amplifier Circuit consists of operational amplifier U460, dual 4 to 1 multiplexer U470, and associated components. This circuit forms a 0.4-1-2-4 gain-selectable amplifier.

The Collector Voltage Sense Circuit consists of operational amplifiers U400, U410 and U420, analog switches U430 and U440, diodes CR400, CR402, CR410 and CR412, Zener diodes VR400 and VR402 and associated components. This circuit measures the collector voltage of the device under test. Figure 2-13 shows a simplified collector voltage measurement circuit. (The setting of the CONFIGURATION switch is assumed to be EMITTER COMMON.

To avoid the current error caused by the attenuator, both the attenuator and the common current return point of the collector supply are connected to the guard box. The output voltage of U400 is expressed as:

$$V(U400) = (VC-VG)/n + VG$$

where
V (U400) : output voltage of U400
VG : voltage of guard box
VC : voltage of collector terminal
n: ratio of attenuator

If the resistor values are appropriate, the output voltage of U450 is:

$$V (U450) = (VC-VE)/n$$

where
VE : voltage of emitter terminal

The above expression shows that VG is canceled and U450 outputs only net voltage without the VG bias voltage. The appropriate value of resistors to realize this condition is expressed as follows by using resistance unit R. (In the case of the 370, R is 20 kΩ.)

$$RC = RC' = R$$
$$RF = R$$
$$RE = n*R$$
$$RG = n*R/(n-1)$$

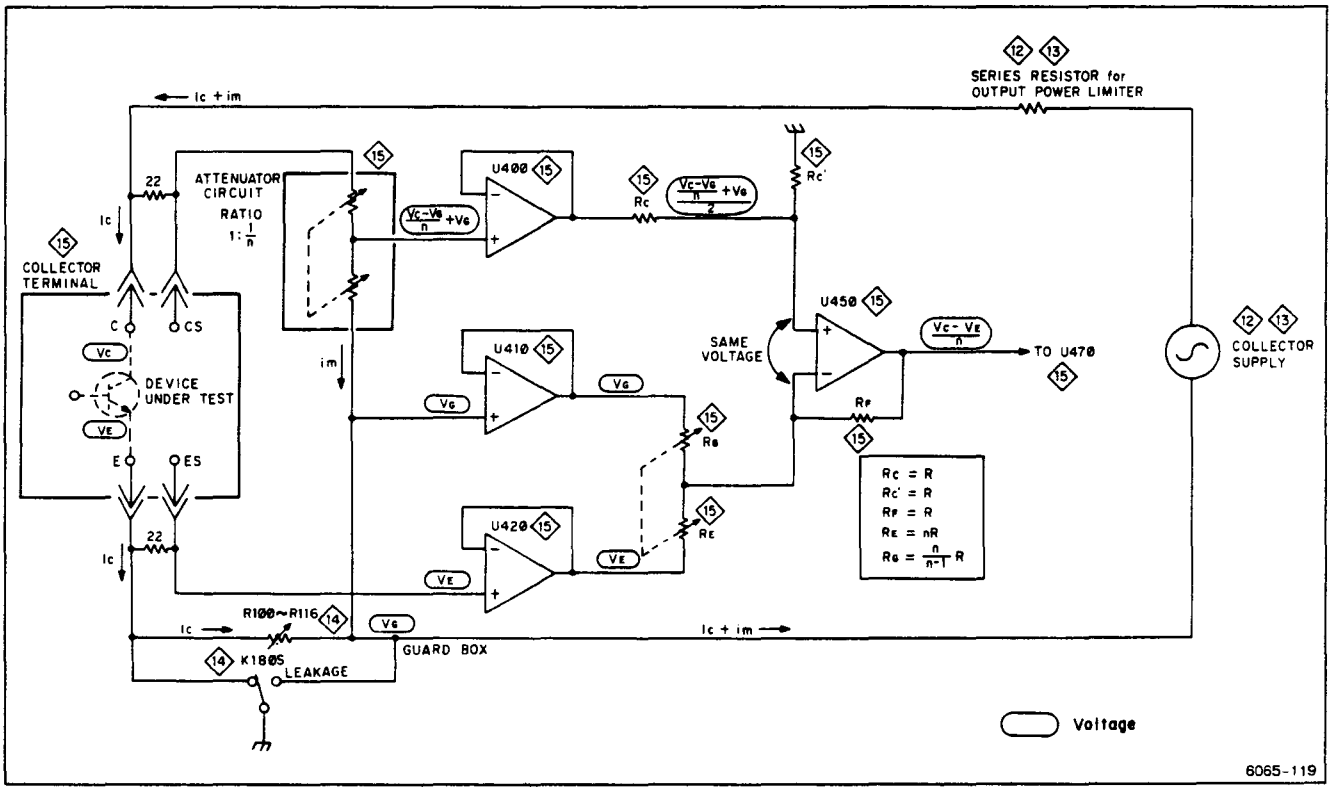

Figure 2-13. Simplified collector voltage measurement circuit.

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Table 2-13 lists the relay control signals for each setting of the HORIZONTAL VOLTS/DIV control. Relays K300 through K370 select the attenuator. U400, U410 and U420 are high input impedance buffers. Analog switch U430 selects RE and RG. Analog switch U440 selects the collector voltage or base voltage to be measured. U450 forms a subtractor circuit.

The Base Voltage Sense Circuit consists of operational amplifier U500, transistors Q520, Q530 and Q540, diode CR500, Zener diodes VR530 and VR534 and constant current diodes CR520 and CR540. This circuit forms a high input impedance buffer that senses the base voltage of the device under test. In order to increase dynamic range, Q520, Q530, and Q540 form a floating power supply circuit for U500.

Configuration

This circuit consists of relays K600 through K608. These relays are driven by the CONFIGURATION control. Table 2-14 shows the control signal for the relays.

Timer

The Timer Circuit turns off the Collector Supply momentarily whenever the Protective Cover is opened or closed. It is located on the A60 Timer board. The outputs of U400A and U400B are always of opposite polarity. When the Protective Cover is opened or closed, U400A and U400C reverse the state of their outputs. The output of U400A is delayed by the RC circuit preceding U400B. This causes U400D to produce a

Table 2-13
Relay Control Signals for Horizontal Sense

Horizontal Volts/Div Setting		Relay Control Signal											
		HS RS	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11
Step Gen		1	1	0	0	0	0	1	1	0	1	0	0
Base	2 V	0	1	0	0	0	0	1	1	0	1	0	0
	1 V	0	1	0	0	0	0	1	1	0	1	1	0
	.5 V	0	1	0	0	0	0	1	1	0	1	0	1
	.2 V	0	1	0	0	0	0	1	1	1	0	0	0
	.1 V	0	1	0	0	0	0	1	1	1	0	1	0
	.05 V	0	1	0	0	0	0	1	1	1	0	0	1
Collector	500 V	0	1	0	0	0	0	1	1	0	0	1	1
	200 V	0	1	0	0	0	0	1	1	0	0	0	0
	100 V	0	1	0	0	0	0	1	1	0	0	1	0
	50 V	0	1	0	0	0	0	1	1	0	0	0	1
	20 V	0	0	1	0	0	0	0	1	0	0	0	0
	10 V	0	0	1	0	0	0	0	1	0	0	1	0
	5 V	0	0	1	0	0	0	0	1	0	0	0	1
	2 V	0	0	0	1	0	1	1	0	0	0	0	0
	1 V	0	0	0	1	0	1	1	0	0	0	1	0
	.5 V	0	0	0	1	0	1	1	0	0	0	0	1
	.2 V	0	0	0	0	1	1	0	0	0	0	0	0
	.1 V	0	0	0	0	1	1	0	0	0	0	1	0
	.05 V	0	0	0	0	1	1	0	0	0	0	0	1

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Table 2-14
Relay Control Signals for Configuration Setting

Configuration	Setting	Relay Control Signal				
Emitter	Base	T0	T1	T2	T2'	T3
Common	Step Gen	1	0	0	0	0
Common	Ext	1	0	0	0	1
Common	Short	1	1	0	0	0
Ext	Common	0	0	1	1	1
Step Gen	Common	0	0	1	1	0

negative pulse. U500 stretches the pulse and turns Q600 on for 100 ms, generating the ARC(L) signal.

Device Select

The Device Select Circuit consists of the A16 LOR Switch board, the A17 Sub LOR Switch board, and the collector terminal. This circuit selects the device under test and applies voltages to the terminals. The circuit also senses resultant voltages and currents. The selection of the device is done with the Left-Right-Standby switch (S100A-S100C). This switch also generates the arc suppression signal LR-SEL(L).

16 FRONT PANEL KEY INTERFACE

This circuit is located on the A11 Main Key board, and consists of the Bus Buffer Circuit, the Address Decoder Circuit, the Variable Control Circuit, and the Switch Matrix Circuit. These circuits interface signals between the A2 CPU board and the A12 Sub Key board, set up VERTICAL, HORIZONTAL and STEP/OFFSET AMPLITUDE settings, and control focus and intensity, etc.

Bus Buffer

Bus buffer U120 isolates the data bus (D0-D7) from the A2 CPU board. Once through U120, the signal titles are changed to KD0-KD7 and are sent to the A12 Sub Key board. The direction of buffering is controlled by the RD(L) select signal from the A2 CPU board. This buffering function is activated while the KEY(L) signal from the A2 CPU board is activated low.

Address Decoder

The Address Decoder consists of 3-to-8 demultiplexers U140 and U160 and dual 2-to-4 demultiplexer U180. The circuit decodes address signals A2-A7 from the A2 CPU board and generates corresponding chip select signals L0(L)-L7(L) and K0(L)-K6(L). The decoding function of U140 and U160 is activated when control signal KEY(L) and RD(L) (for U160) or WR(L) (for U140) are activated low. (The KEY(L) signal is activated low when the microprocessor on the A2 CPU board accesses address A0000*hex* through A7FFF*hex*. U180A is activated when the decoded signal from U160 is the key-read signal for S210, S220 and S230. This selection occurs when the microprocessor accesses address A007x*hex* and A7(L), RD(L) and KEY(L) signals are all activated low.

Variable Control

This circuit consists of variable resistors R302, R312, R322, R330, R340, R350, R360 and R370 and resistors R300, R304, R310, R314, R320, and R324. This circuit adjusts the NON STORE/STORE INTENSITY, the VIEW INTENSITY, the READOUT/CURSOR INTENSITY, the FOCUS, the SCALE ILLUM, the VERT POSITION, the HORIZ POSITION and the TRACE ROTATION.

Switch Matrix

The Switch Matrix Circuit consists of rotary switches S210, S220 and S230 and diodes from CR210 through CR221. S210 and its associated diodes CR210, CR213, CR216 and CR219 set the VERTICAL CURRENT/DIV. S220 and diodes CR211, CR214, CR217 and CR220 set the HORIZONTAL VOLTS/DIV. S230 and diodes CR212, CR215, CR218 and CR221 set the STEP/OFFSET AMPLITUDE. Address signals A2 and A3 from

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the A2 CPU board are decoded by U180A, and applied as A0070, A0074 and A0078 to the Switch Matrix circuit. Depending on the switch setting, these signals are transferred to data bus KD0-KD3 through switches and diodes (see Table 2-15).

Table 2-15
Switch Matrix Data Input/Output

Input	Output	Switch	Data	
A0070	KD0	S210	Vertical	LSB
	KD1		Vertical	
	KD2		Vertical	
	KD3		Vertical	MSB
A0074	KD0	S220	Horizontal	LSB
	KD1		Horizontal	
	KD2		Horizontal	
	KD3		Horizontal	MSB
A0078	KD0	S230	Step/Offset	LSB
	KD1		Step/Offset	
	KD21		Step/Offset	
	KD3		Step/Offset	MSB

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17 FRONT PANEL LED & KEY

This circuit is located on the A12 Sub Key board, and consists of the Front Panel Display Circuit and the Front Panel Key Matrix Circuit. The circuit is controlled by the A11 Main Key board, displays the Main Key setting information, and transfers key input data from the key matrix.

Front Panel Display

This circuit consists of 8-bit addressable latches U100, U110, U120, U130, U140, U150, U160 and U170, BCD to seven segment decoder/latch/driver U210, transistor Q170, LEDs from DS100 through DS171 and seven segment numerical displays DS200 and DS210. This circuit controls and drives the front-panel LEDs and the numerical display under the control of control signals L0(L)-L7(L) and KD0 and address signals A1-A3. This display information is sent from the A2 CPU board and processed through the A11 Main Key board. Among these signals, L0(L)-L7(L) are chip select signals, A1-A3 are display codes and KD0 is the enable signal. The chip select signals select one latch among U100 through U170 to fetch and store display information. The enable signal enables information fetching and storing. The stored information is transferred directly to the corresponding LED, with the exception of U170. The signals ID0-ID3 are the 370 Bubble Memory index display information from U170. These signals are decoded to BCD by seven segment decoder/latch/driver U210 and transferred to numerical display DS210. Signal ID4 is also the Bubble Memory index display signal and, through transistor Q170, drives numerical display DS200.

Front Panel Key Matrix

This circuit consists of keys S300-S365 and diodes CR300-CR365, connected as a matrix. The key matrix sweep signals are applied to the matrix as row signal K0(L)-K6(L). The resultant output signals are obtained from the column of the matrix KD0-KD5.

18 LOWER KEY

This circuit is located on the A14 Lower Key board and A15 Lower Sub Key board, and consists of the Bus Buffer Circuit, the Address Decoder Circuit, the Rotary Encoder Circuit, the Status Port Circuit, Lower Panel Display Circuit and the Lower Panel Key Matrix Circuit. These circuits interface signals with the A2 CPU board, set up collector supply VARIABLE settings, transfer the status data to the A2 CPU board, display the LOWER KEY setting information and transfers key input data from the key matrix.

Bus Buffer

The Bus Buffer Circuit consists of bus buffer U100. This circuit isolates the Data Bus (D0-D7) from the A2 CPU board. After isolation, names of these signals are changed to LD0-LD7. The direction of buffering is controlled by the RD(L) signal from the A2 CPU board. This buffering is controlled by the RD(L) signal from the A2 CPU board. This buffering function is activated when the L-KEY(L) signal from the A2 CPU board is activated low.

Address Decoder

This circuit consists of dual 2-to-4 demultiplexer U140, and decodes address signals A4-A5 from the A2 CPU board, generating corresponding chip select signals LL0(L)-LL3(L), LKRD(L), CCW(L) and CW(L). This decoding function is activated when control signals L-KEY(L) and RD(L) (or L-KEY(L) and WR(L)) from the A2 CPU board is activated low. The L-KEY(L) signal is activated low when the microprocessor accesses address A8000*hex* through AFFFF*hex*.

Rotary Encoder

The Rotary Encoder Circuit consists of hex inverter U200, dual D-flip flop U220, dual 4-bit binary counters U240 and U260, octal 3-state D-flip flops U300 and U320 and associated components. U240 and U260 operate as up and down counters. The rotary encoder generates two pulse trains; each is 90° away from the other. Making use of this phase difference, the direction of rotation can be detected. The rotation is encoded into the number of pulses that is proportional to the angle of rotation; this circuit counts these pulses with the up or down counter, according to the direction of rotation. The pulse shape of the generated pulse train is improved by U220, then sent to U240 and U260.

If S500 rotates clockwise, the pulse train only appears at U220 pin 9, and up counter U240 counts, because the D-flip flop is cleared by the leading pulse. Conversely, if S500 rotates counterclockwise, the pulse train appears only at U220 pin 5, and down counter U260 counts down. This counted data is periodically cleared by the microprocessor of the A2 CPU board and as a result, the counted data expresses the velocity of rotation during a given interval. The rotation velocity data is applied to U300 and U320. When the microprocessor on the A2 CPU board reads address A8000*hex* and A8010*hex*, the data of rotating velocity are read by the microprocessor respectively.

Status Port

This circuit consists of hex 3-state bus buffer U500, and reads the 370 status information such as L(L) and R(L) (Left-Right-Standby switch information), HI(L) (HIGH/LOW switch information), OVERHEAT(L) (overheat information) and COVER (cover switch information). To obtain the data, the microprocessor reads address A8020*hex*.

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Lower Panel Display

The Lower Panel Display Circuit consists of 8-bit addressable latches U100, U120, U140 and U160, linear-mode 5-dot LED driver U420, LEDs DS100 through DS454, diodes CR300 through CR332, switches S300 through S332 and associated components. This circuit controls and drives lower panel LED displays under the control of control signals LL0(L)-LL3(L), LD0, and address signals A1-A3. The display information is sent from the A2 CPU board. Among these signals, LL0(L)-LL3(L) are chip select signals, A1-A3 are display codes and LD0 is the enable signal. The chip select signals select one latch among U100 through U160 to fetch and store display information. The enable signal enables information fetching and storing. This stored information is transferred directly to the corresponding LED. U420 translates the analog voltage input of COL-LED from the A3 A/D board into 5-dot LED drive signals.

Lower Panel Key

This circuit consists of keys S300-S332 and diodes CR300-CR332. When the microprocessor reads address A8030*hex*, the key status is read into the microprocessor.

19 CRT OUTPUT AMPLIFIER

This circuit is located on the A18 CRT OUTPUT board, and consists of the Horizontal Output Amplifier, the Vertical Output Amplifier, and the Z-axis Amplifier. The Horizontal and Vertical Output Amplifiers convert current signals from the preamplifier of the A5 Display Control board into deflection plate driving voltages for the CRT. The Z-axis Amplifier converts the current signal from the unblanking logic of the A5 Display Control board into the driving voltage for the Grid Bias and DC Restorer Circuit of the A20 H.V. REG board. The Horizontal and Vertical Output Amplifiers are similar, so only the Horizontal Output Amplifier is discussed here.

Horizontal Output Amplifier

The Horizontal Output Amplifier consists of transistors Q100, Q102, Q110, Q112, Q120, Q122 Q130 and Q132, Schottky diodes CR102 and CR104, Zener diode VR100, diodes CR100, CR110 and CR112 and associated components. This circuit symmetrically amplifies both +H and -H signals. Thus, only the -H amplifier Circuit is discussed here.

The bias network, which is composed of CR100 and R100, sets a constant base bias voltage for Q100. This constant voltage is obtained from the subtraction of the voltage drop at diode CR100 from +6.5 volts. As a result, the emitter voltage of Q100 is a nearly constant −6.5 volts, which forces the preamplifiers of the A5 Display Control board to operate as a current amplifier, making the output signal (-H) into constant voltage and variable current. The output stage of this amplifier consists of Q110, Q120 and Q130 and uses a self-biasing configuration, where the bias current for Q110 is supplied through R130. The voltage at the collector of Q120 balances at a level where the current through R130 and CR110 raises the voltage at the collector of Q100 to about zero volts. At this point any change in current through Q100 results in an equal but opposite change in current through R130. The output voltage (-H DEF) change is equal to the change in voltage across R130. Transistor Q130, Zener diode VR100 and resistor R128 form a constant current supply circuit for the output stage. Transistors Q110 and Q120 form a sink for the excess current not carried by R130. Schottky diodes CR102 and CR104 prevent excessive signal difference.

Vertical Output Amplifier

This circuit consists of transistors Q200, Q202, Q210, Q212, Q220, Q222, Q230 and Q232, Schottky diodes CR202 and CR204, Zener diode VR200, diodes CR200, CR210 and CR212 and associated components. This circuit operates in the same way as does the Horizontal Output Amplifier. Please refer to the Horizontal Output Amplifier description.

Z-Axis Amplifier

This circuit consists of transistors Q300, Q310, Q312, Q320 and Q330, Schottky diode CR306, diodes CR300, CR302 and CR304 and associated components. The circuit converts the current signal from the unblanking logic of the A5 Display Control board into the driving voltage for the Grid Bias and DC restorer Circuit of the A20 H.V. REG board. The bias network, which is composed of CR300 and R300, sets up the base bias voltage of Q300 to be a constant voltage. This constant voltage is obtained through the subtraction of voltage drop at diode CR300 from +6.5 volts. As a result, the emitter voltage of Q300 is an almost constant voltage of +6.5 volts and this, in turn, forces the unblanking logic of the A5 Display Control board to operate as a current amplifier and the output signal Z to be a constant voltage and varying current. The signal current Z from the A5 Display Control board via Q300 develops a voltage across R306. When the Z signal is blanked, the developed voltage turns off diodes CR302 and CR304. Schottky diode CR306 prevents this voltage from exceeding approximately +0.4 volts. Q310, Q312, Q320 and Q330 and associated components form a current-to-voltage inverting amplifier. For a blanked signal, the output voltage from the collectors of Q320 and Q330 is approximately −3.8 volts, and this voltage provides current flow through feedback resistor R308 to bias resistor R310. As a result, bias voltage for Q310 and Q312 are provided. Because diodes CR302 and CR304 are reverse biased and cut off, they don't affect the output of Q310 and Q312. To unblank the CRT, the unblanking logic of the A5 Display Control board reduces the current signal Z. This in turn reduces the voltage across R306 and turns on diodes CR302 and CR304 by forward biasing. The forward-biased diodes

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sink bias currents of Q310 and Q312 away from each base terminal. These reduced bias currents lower the Q310 base bias and increases Q312 base bias. As a result, the collectors of Q320 and Q330 forced high, so that the current through R308 can maintain the forward bias current of diodes CR302 and CR304. This output voltage supplies current through R308 to diodes CR302 and CR304. If this current is equal to the current that can maintain diodes CR302 and CR304 at the cut off level, the circuit balances. The maximum output voltage of the amplifier is approximately + 25 volts and CRT intensity may be set anywhere between these limits, depending on the value of the Z current signal.

20 POWER SUPPLY

This circuit is located on the A19 L.V. Signal board and the A27 Primary board. This board consists of the Primary Circuit, the Low-voltage Power Supply Circuit and the Interrupt Generator Circuit. This circuit supplies low voltage power for the 370 and generates the interrupt signals.

Primary

This circuit consists of line filter FL100, LINE VOLTAGE SELECTOR switches S200 and S300, transformer T100, spark gaps E100 and E200 and air cooling fan B100. This circuit provides AC line power supply voltages for the 370. The 370 can be operated from either a 115-volt or a 230-volt nominal line voltage source by setting the LINE VOLTAGE SELECTOR switches (S200 and S300, which are located on the 370 rear panel). In the 115-volt position of S200, the primary windings of T100 are connected parallel. Conversely, in the 230-volt position, the two primary windings of T100 are connected serially. Thus, the output of the secondary windings of T100 is the same if the operator sets S200 correctly. S300 determines how many turns of each primary is used to compensate for variations in line voltage. Spark gaps E100 and E200 protect the rectifier and filter circuit from line surges over 230 volts peak-to-peak. This board also supplies AC power voltages to air cooling fan B100.

Low-voltage Power Supplies

The Low-voltage Power Supply Circuit provides five regulated voltages (+5V, +6.5V, +12V, -6.5V, -12V) and four unregulated voltages (+12V UNREG, -12V UNREG, +40V UNREG and -40V UNREG). The two reference voltages (+2V-REF and -2V-REF) and the scale illumination voltage are also provided by this circuit.

+5-volt Supply. This circuit produces regulated +5 volts for the digital circuits and consists of diode CR100, capacitors C100, C102 and C140 and voltage regulator U100. Fixed resistor R102 sets the output of U100 to −5.2 volts.

+6.5 and -6.5-volt Supply. This circuit provides regulated +6.5 and -6.5 volts for analog circuits; the circuit consists of transistors Q130 and Q230, capacitors C134 and C234 and operational amplifier U130. The reference voltage of U130 is supplied by U120, elsewhere on the board. The output voltages of +6.5 volts and -6.5 volts are sensed and divided by resistor pair R134-R136 (+6.5 volts) or R234-R236 (-6.5 volts). These divided voltages are compared with the reference voltage of −2.5 V-REF and the differential voltages are obtained by U130. U130 amplifies each differential voltage, and this output controls Q130 and Q230, respectively, to make the +6.5 volts and -6.5 volts constant.

+12-volt Supply. This circuit consists of diode CR300, capacitors C300 and C312 and voltage regulator U310.

-12-volt Supply. This circuit consists of diode CR400, capacitors C400, C422 and C412 and voltage regulator U410.

+12, -12, +40, and -40-volt unregulated supplies. These supply circuits provide operating power for the Step Generator, the AUX Supply, etc. The unregulated −40 and -40 volts supply consist of diode CR500, capacitors C500 and C502 and resistor R501. Unregulated +12 and - 12 volts are obtained from pre-regulated stages of the −12 and -12 volts supplies, respectively.

ILLUM voltage supply. This circuit consists of transistors Q600 and Q602 resistor R602. The circuit supplies current to the A28 LAMP A and A29 LAMP B boards under the control of the the ILLUM signal, the level of which is set by the GRAT ILLUM control of the A11 Main Key board.

+2.0 volts and -2.0 volts REF. These reference supply circuits consist of operational amplifier U500 and reference regulator U120. Resistors R500 and R516 adjust the +2.0 volts and -2.0 volts, respectively.

Interrupt Generator

This circuit consists of comparators U560A and U4560B and associated components. The circuit provides interrupt signals for the A2 CPU board and the A3 A/D Board, namely, TIM-INT (line frequency timer interrupt) and PF-INT (power fail interrupt).

The TIM-INT Generator Circuit synchronizes the line frequency. Comparator U560A produces the clock signal of the AC line frequency for the PLL and the microprocessor. It consists of diodes CR570 and CR572 and U560A. This TIM-INT clock signal is used by the PLL Circuit on the A3 A/D Board to synchronize waveform generation timing and by the A2 CPU board to initiate periodical input procedures such as keyboard data reading of the microprocessor.

The PF-INT Generator Circuit consists of diodes CR560 and CR562, resistors R560 and R562, capacitor C562 and U560B. When the power supply of the AC line shuts down, this circuit produces the active high PF-INT signal for the microprocessor before the +5-volt supply shuts down, so that

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the microprocessor has time to initiate and complete the Power Failure support procedure.

21 H.V. POWER SUPPLY

The H.V. Power Supply is located on the A20 H.V. REG board. This circuit consists of the High-voltage Generator Circuit, the High-voltage Regulator Circuit, the Grid Bias And DC Restorer Circuit, the Focus Amplifier and DC Restorer Circuit, the Anode Multiplier Circuit, the Rectifier Filter Circuit and the CRT Circuit. This circuit provides the various high voltage operating potentials required by the CRT, and displays the 370 data.

High-voltage Generator

This circuit consists of transistor Q100 and transformer T100 and associated components. Q100 and two primary windings of T100 are connected to form an oscillator. The frequency of oscillation is approximately 20 kHz. The 20 kHz AC voltage induces high voltage in the secondary windings of T100.

High-voltage Regulator

The High-voltage Regulator Circuit consists of U200A and associated components. This circuit monitors the cathode voltage of the CRT and controls base bias current of Q100. This results in a controlled high voltage output from the T100 secondary windings.

Grid Bias and DC Restorer

The Grid Bias and DC Restorer Circuit provides the CRT control-grid bias voltage and couples both the DC and low frequency components of the Z-OUT drive signal to the CRT control-grid. The circuit operates by impressing the grid bias setting and the Z-OUT drive signal on an AC waveform. This shaped waveform is then AC-coupled to the high-potential CRT environment where the DC components of the original signal are restored. An AC drive voltage of approximately 400 volts peak-to-peak is applied to this circuit from pin 7 of transformer T100. This signal is coupled to the junction of a positive clamp (made up of R208, R210, CR202, VR200 and VR202) and a negative clamp (made up of CR204) through resistor R204 and R205 and capacitor C202. Grid bias potentiometer R210 determines the overall CRT intensity. The positive and negative clamped AC waveform and Z-axis signal is applied to pin 9 and pin 10 of the U100 high voltage module, respectively. The capacitor connected to pin 9 and the two diodes attached to its other terminal in U100 form a rectifier circuit. This circuit charges the capacitor connected to pin 10 to a potential below the -2400 volt level of the CRT cathode. A positive transition of the Z-OUT signal voltage moves the control-grid bias positive by approximately the same voltage, thereby increasing CRT beam current.

Focus Amplifier and DC Restorer

The Focus Amplifier and DC Restorer Circuit provides the level shifting of the operator-controlled FOCUS signal to the high potential environment of the CRT. This level shifting is done in a manner similar to that just described for the last stage, the Grid Bias and DC Restorer. The active positive clamp, made up of U200B, Q200 and their associated components, provides a variable voltage clamp that limits the positive swing of the AC waveform. Diode CR200 limits the negative swing. The 800 volts of AC signal is applied to the clamping node through resistors R200 and R202 and capacitor C200. Operational amplifier U200B changes its output so that feedback through R222 maintains the voltage on pin 6 equal to that on pin 5, which is zero volts. The FOCUS signal from the A11 Main Key board is divided by R226 and R224. FOCUS can be adjusted from zero to −6.5 volts. This provides a range of clamping levels from −650 volts (FOCUS equals zero volts) to +344 volts (FOCUS equals +6.5 volts). Q200 provides voltage isolation for the output of U200B. When CR210 is forward biased by a voltage swing that exceeds the clamping level, U200B absorbs the excess current through R220, Q200 and R228 so that feedback current through R222 can remain unchanged.

The positive and negative clamped AC signal from T100 is fed to pin 7 of U100. The Capacitor connected to pin 7 and the two diodes attached to the capacitor's other terminal within U100 form a rectifier circuit. This circuit charges the capacitor connected to pin 8 to a potential above the -2400 volt level of the CRT cathode. This voltage is applied to the focus-grid of the CRT to control spot size.

Anode Multiplier

Anode Multiplier U300 is a conventional voltage multiplier of 12 stages; it produces 12 kilovolts accelerating potential for the CRT.

Rectifier Filter

The Rectifier Filter Circuit consists of diodes CR300, CR310 and CR320 and capacitors C300, C310 and C320. This circuit provides approximately + 100 volts and − 200 volts to the CRT output amplifier from the 200 volts peak-to-peak AC supplied by T100.

CRT

This circuit consists of the CRT (Cathode Ray Tube), orthogonality coil L120, trace rotation coil L100 and associated components. This circuit displays the 370 data. L100 and L120 control trace rotation and orthogonality of the CRT. Pin assignment of CRT is described in Table 2-16.

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Table 2-16
CRT Pin Assignment

Pin No.	Pin Name	Connected Signal
1 14	Heater power supply	6.3-volt heater line
2	Cathode	Cathode (-2400 volts)
3	No. 1 grid	Intensity control line
4	No. 1 plate	Focus control line
5	No. 2 grid	Geometry
6	Collector	GND
7 9	Vertical deflection plates	+VDEF -VDEF
11 12	Horizontal deflection plates	-HDEF +HDEF

22 GPIB & PLOTTER INTERFACE

This circuit is located on the A22 Interface board. The circuit consists of the Bus Buffer Circuit, the Address Decoder Circuit, the GPIB Address Switch, the GPIB Controller Circuit, the GPIB Bus Driver Circuit, the Plotter Controller Circuit and the Plotter Bus Driver Circuit. The function of this circuit is to transfer the microprocessor data to the plotter and to communicate with other instruments via the bidirectional general purpose interface bus (GPIB). These functions are under control of the microprocessor and the communication handling software, which are located on the A2 CPU board.

Bus Buffer

The Bus Buffer Circuit consists of U120 and U140; it isolates data bus D0-D7, address bus A1-A4 and control signals (RD(L), WR(L), RESET(L) and IF-CS(L)). After isolation, the names of these signals are changed to IFD0-IFD7 (data bus), IFA1-IFA4 (address bus) and IFRD(L), IFWR(L), IFRESET(L) and IFCE(L) (control signals) respectively. Because the data bus (IFD0-IFD7) is a bidirectional bus, data bus driver U140 switches the direction of buffering under the control of the IFRD(L) signal. The address bus and control signals are unidirectional signals from the A2 CPU board and are isolated by U120 and changed in name as mentioned before.

Address Decoder

The Address Decoder Circuit consists of dual 2-to-4 demultiplexers U220. This circuit generates chip select signals for GPIB controller U300, plotter controller U400, and GPIB address switch U360 by decoding address signals of IFA2, IFA3 and IFA4, which are derived from the A2 CPU board. The decoded signals are transferred to the corresponding circuit of the board when the IFCE(L) control signal is asserted. (Address signals IFA0(L)-IFA4(L) are also used to select internal registers of GPIB controller U300 for reference by the microprocessor.)

GPIB Address Switch

The GPIB Address Switch Circuit consists of S360 DIP switch and U360, which determine the GPIB address and data delimiter. The right five digits of the switch (No. 2-No. 6) set GPIB address from 0 to 31 in binary notation. The leftmost digit of the switch (No. 1) sets the data delimiter.

GPIB Controller

The GPIB Controller Circuit consists of GPIB controller U300 (TMS-9914A). This circuit manages all interfacing procedures needed to complete GPIB data communication.

GPIB Bus Driver

GPIB Bus Drivers U320 and U340 transfer signals to and from the GPIB and the GPIB Controller Circuit. U320 drives the GPIB control signals from U300 to the GPIB. U340 drives the GPIB data signals between U300 and the GPIB.

Plotter Controller

The Plotter Controller Circuit consists of serial/parallel communication controller U400 (LH8572). U400 has both serial and parallel communication capabilities. The 370 makes use of the parallel communication capability of U400 to control the plotter. U400 operates under the control of the A2 CPU board.

Plotter Driver

The Plotter Driver consists of U440 and U460; this circuit transfers the signals between the Plotter Controller and the Plotter Bus. U440 drives the plotter control signals and U460 drives data.

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SECTION THREE
MAINTENANCE

This section of the manual contains information for performing preventive maintenance, troubleshooting, and corrective maintenance for the 370 Programmable Curve Tracer.

PREVENTIVE MAINTENANCE

Preventive maintenance, when performed on a regular basis, can prevent instrument breakdown and may improve the reliability of the instrument. The severity of the environment to which the instrument is subjected will determine the frequency of maintenance. A convenient time to perform preventive maintenance is preceding electrical adjustment of the instrument.

CABINET PANEL REMOVAL

WARNING

Dangerous potentials exist at several points throughout this instrument. When the instrument is operated with the covers removed, do not touch exposed connections or components. Some transistors have voltages present on the case. Disconnect power before cleaning the instrument or replacing parts.

The side, top, and bottom cabinet panels provide protection to personnel from operating potentials present within the instrument. In addition, they reduce radiation of electromagnetic interference from the instrument. The cabinet panels are held in place by slotted fasteners. To remove the panels, remove the four plastic retainers and three additional securing screws at the rear of the instrument. Pull each panel back to release the front edge, then lift the panels away from the instrument. Operate the instrument with the panels in place to protect the interior from dust, and to maintain cooling airflow.

CLEANING

The 370 should be cleaned as often as operating conditions require. Accumulation of dirt in the instrument can cause overheating and component breakdown. Dirt on components acts as an insulating blanket and prevents efficient heat dissipation. It also provides an electrical conduction path that may result in instrument failure.

CAUTION

Avoid the use of chemical cleaning agents that might damage the plastics used in this instrument. Use a non-residue type of cleaner, preferably isopropyl alcohol, totally denatured ethyl alcohol, or a Freon TF cleaner such as Spray-On #2002. Before using any other type of cleaner, consult your Tektronix Service Center or representative.

Exterior

Loose dust accumulated on the outside of the instrument can be removed with a soft cloth or small brush. The brush is particularly useful for dislodging dirt on and around the front-panel controls. Dirt that remains can be removed with a soft cloth dampened in a mild detergent and water solution. Abrasive cleaners should not be used.

CRT

Clean the plastic light filter, implosion shield, and the CRT faceplate with a soft, lint-free cloth dampened with denatured alcohol.

Interior

Cleaning the interior of the instrument should only be occasionally necessary. The best way to clean the interior is to blow off the accumulated dust with dry, low-velocity air (approximately 5 lbs/sq in). Remove any dirt that remains with a soft brush or a cloth dampened with a mild detergent and water so-

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lution. A cotton swab is useful for cleaning in narrow spaces, or for cleaning more delicate circuit components.

CAUTION

Circuit boards and components must be dry before applying power to prevent damage from electrical arcing.

The high-voltage circuits should receive special attention. Excessive dirt in this area may cause high-voltage arcing and result in improper instrument operation.

VISUAL INSPECTION

The 370 should be inspected occasionally for such defects as broken connections, improperly seated semiconductors, damaged or improperly installed circuit boards, and heat-damaged parts. The corrective procedure for most visible defects is obvious; however, particular care must be taken if heat-damaged parts are found. Overheating usually indicates other trouble in the instrument; therefore, correcting the cause of overheating is important to prevent recurrence of the damage.

SEMICONDUCTOR CHECKS

Periodic checks of the semiconductors are not recommended. The best check of semiconductor performance is actual operation in the instrument. More details on semiconductors are given under Troubleshooting later in this section.

PERIODIC ELECTRICAL ADJUSTMENT

To ensure accurate measurements, check the electrical adjustment of this instrument after each 1000 hours of operation, or every six months if used infrequently. In addition, replacement of components may necessitate adjustment of the affected circuits. Complete adjustment instructions are given in Section Four, Performance Check and Adjustment. This procedure can be helpful in localizing certain troubles in the instrument, and in some cases, may correct them.

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TROUBLESHOOTING

The following information is provided to facilitate troubleshooting of the 370 Programmable Curve Tracer. Information containing in other sections of this manual should be used in conjunction with the following data to aid in locating a defective component. An understanding of the circuit operation is helpful in locating troubles. See Section Two, Theory of Operation, for this information.

TROUBLESHOOTING AIDS

Diagrams

Complete schematic diagrams are given on the pullout pages in Section 7, Diagrams and Circuit Board Illustrations. The component number and electrical value of each component in this instrument are shown on these diagrams. (See the first page of the Diagrams and Circuit Board Illustrations section for definitions of the reference designators and symbols used to identify components in this instrument.) Important voltages and numbered waveform test points are also shown on the diagrams. Important waveforms, and the numbered test points where each was obtained, are located adjacent to each diagram. The portions of circuits mounted on circuit boards are enclosed with heavy solid-black lines.

Circuit Board Illustrations

To aid in locating circuit boards, a circuit board location illustration appears on the back of the pullout page that faces the appropriate schematic diagram. In addition, circuit board illustrations are included that identify the physical location of the components and waveform test points that appear on the schematic diagram. Each circuit board illustration includes a grid locator with an index to aid rapid location of components contained in the schematic diagrams.

Troubleshooting Charts

Troubleshooting charts are given in Section 7, Diagrams and Circuit Board Illustrations, to aid in locating a defective circuit. The circuits listed are discussed in detail in Section 2, Theory of Operation.

Adjustment and Test Point Locations

To aid in locating test point and adjustable components called out in the various portions of the Adjustment procedure, the Adjustment and Test Point Locations pullout pages appear in Section 7, Diagrams and Circuit Board Illustrations.

Component Color Coding

The instrument contains brown composition resistors, some metal-film resistors, and some wire-wound resistors. The resistance value of a wire-wound resistor is usually printed on the component body. The resistance value of a composition resistor or metal-film resistor is color-coded on the component, using the EIA color code. (Some metal-film resistors may have the value printed on the body.)

The color code is read starting with the stripe nearest the end of the resistor. Composition resistors have four stripes, which consist of two significant figures, a multiplier, and a tolerance value (see Fig. 3-1). Metal-film resistors have five stripes that consist of three significant figures, a multiplier, and a tolerance value.

The values of common disc capacitors and small electrolytic capacitors are marked on the side of the component body. The white ceramic and epoxy-coated tantalum capacitors used in the instrument are color coded using a modified EIA code (see Fig. 3-1).

The cathode end of glass-encased diodes is indicated by a stripe, a series of stripes, or a dot. The cathode and anode ends of metal encased diodes can be identified by the diode symbol marked on the body.

STATIC-SENSITIVE DEVICES

CAUTION

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 3-1 to determine the 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.

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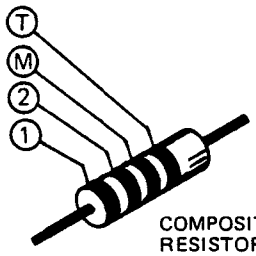
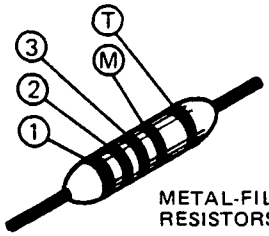
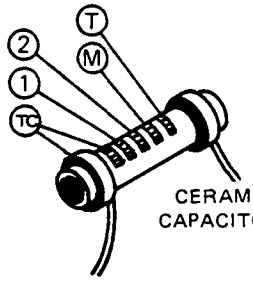
COLOR CODE



COMPOSITION RESISTORS



METAL-FILM RESISTORS



CERAMIC CAPACITORS

① ② and ③ - 1ST, 2ND, AND 3RD SIGNIFICANT FIGS. Ⓜ - MULTIPLIER Ⓣ - TOLERANCE; ⓉⒸ - TEMPERATURE COEFFICIENT.

Ⓣ AND/OR ⓉⒸ COLOR CODE MAY NOT BE PRESENT ON SOME CAPACITORS;

COLOR	SIGNIFICANT FIGURES	RESISTORS		CAPACITORS		
		MULTIPLIER (OHMS)	TOLERANCE	MULTIPLIER (pF)	TOLERANCE	
					OVER 10pF	UNDER 10pF
BLACK	0	1	---	1	±20%	±2pF
BROWN	1	10	±1%	10	±1%	±0.1pF
RED	2	10^2 or 100	±2%	10^2or 100	±2%	---
ORANGE	3	10^3or 1 K	±3%	10^3 or 1000	±3%	---
YELLOW	4	10^4 or 10K	±4%	10^4 or 10,000	+100% −0%	---
GREEN	5	10^5 or 100 K	±1/2%	10^5or 100,000	±5%	±0.5pF
BLUE	6	10^6 or 1 M	±1/4%	10^6 or 1,000,000	---	---
VIOLET	7	---	±1/10%	10^7 or 10,000,000	---	---
GRAY	8	---	---	10^{-2} or 0.01	+80% −20%	±0.25pF
WHITE	9	---	---	10^{-1} or 0.1	±10%	±1pF
GOLD	---	10^{-1} or 0.1	±5%	---	---	---
SILVER	---	10^{-2} or 0.01	±10%	---	---	---
NONE	---	---	±20%	---	±10%	±1pF

6065-120

Figure 3-1. Resistor and capacitor color coding.

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Table 3-1
Relative Susceptibility to Damage from Static Discharge

Semiconductor Class	Relative Susceptibility Level
MOS or CMOS microcircuits, and discrete or linear microcircuits with MOS inputs (most sensitive)	1 (100 to 500 volts)
ECL	2 (200 to 500 volts)
Schottky Signal Diodes	3 (250 volts)
Schottky TTL	4 (500 volts)
High-frequency bipolar transistors	5 (400 to 600 volts)
JFETs	6 (600 to 800 volts)
Linear Microcircuits	7 (700 to 1000 volts)
Low-power Schottky TTL	8 (900 volts)
TTL (least sensitive)	9 (1200 volts)

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

2. Transport and store static-sensitive components or assemblies in the original container on a metal rail, or on conductive foam.

3. Discharge the static voltage from your body by wearing a wrist strap while handling static-sensitive components. Servicing static-sensitive components should be performed only at a static-free work station by qualified service personnel. We recommend use of the Static Control Mat, Tektronix Part 006-3414-00, and Wrist Strap, Tektronix 006-3415-00.

4. Allow nothing capable of generating or holding a static charge on the work station surface.

5. Keep the component leads shorted together whenever possible.

6. Pick up components by the body, never by the leads.

7. Do not slide the component 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 anti-static suction-type desoldering tools.

Multi-Pin Connector Identification

Multi-pin (harmonica, ribbon cable) connector pins are marked with a triangle, dot, or square symbol on the connector, which denotes pin 1 of the connector. When making a connection to a circuit board, match the symbol position on the connector to the index symbol that is printed on the board near the connector (see Fig. 3-2).

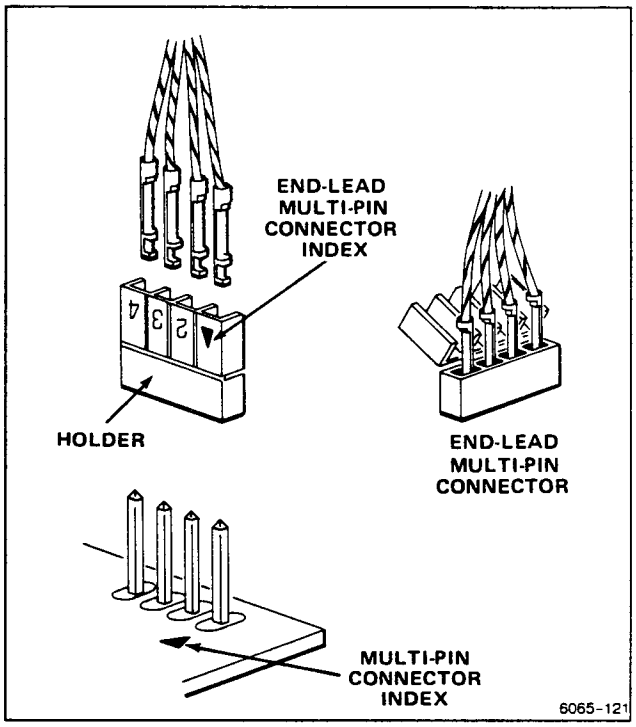

Figure 3-2. Connector pin indexing.

TROUBLESHOOTING EQUIPMENT

The following equipment is useful for troubleshooting the 370 Programmable Curve Tracer.

1. Transistor Tester

Description: Dynamic type tester.

Purpose: Test semiconductors.

Recommended type: SONY/TEKTRONIX 370 Programmable Curve Tracer.

2. Digital Multimeter

Description: 10 MΩ input impedance and 0 to 1 kV range, AC and DC; ohmmeter, accuracy, within 0.1%. Test probes must be insulated to prevent accidental shorting.

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Purpose: Check voltages and resistances.

Recommended type: TEKTRONIX DM 501A Digital Multimeter.

3. Test Oscilloscope

Description: Frequency response, DC to 150 MHz minimum; deflection factor, 2 mV to 5 V/division. A 10X, 10 MΩ voltage probe should be used to reduce circuit loading for voltage measurements.

Purpose: Check operating waveforms.
Recommended type: TEKTRONIX 2445a Oscilloscope.

4. Variable Autotransformer

Description: Output variable from 0 to 140 volts, 10 amperes minimum rating. Must have three-wire power cord, plug, and receptacle.

Purpose: Vary line voltage when troubleshooting the power-supply.

Recommended type: General Radio W10MT3W Variac Autotransformer.

5. Calibration Fixtures

a. Extender Board

Purpose: Troubleshooting the circuit boards.

Recommended type: TEKTRONIX 670-9303-00 Extender.

b. Extension Cable

Purpose: Troubleshooting with the drawer unit extended.

Recommended type: TEKTRONIX 174-0351-00, 174-0352-00.

The above calibration fixtures are obtained in kit form: TEKTRONIX 067-1286-00.

Troubleshooting Techniques

This troubleshooting procedure is arranged to check the simple trouble possibilities before proceeding with extensive troubleshooting. The first few checks ensure proper connection and operation of associated equipment. If the trouble is not located by these checks, the remaining steps aid in locating the defective component. When the defective component is located, replace it using the replacement procedures given under Corrective Maintenance.

1. Check Control Settings

Incorrect control settings can indicate a trouble that does not exist. If there is any question about the correct function or operation of any control on the the instrument, refer to the Operators Manual.

2. Check Associated Equipment

Before proceeding with troubleshooting, check that the equipment used with this instrument is operating correctly. Also, check that the input signals are properly connected and that the interconnecting cables are not defective. Also check the line-voltage source.

3. Visual Check

Visually check the portion of the instrument in which the trouble is located. Many troubles can be found by visible indications, such as unsoldered connections, loose cable connections, broken wires, damaged circuit boards, and damaged components.

4. Check Instrument Adjustment

Check the electrical adjustment of this instrument, or of the affected circuit if the trouble appears in one circuit. The apparent trouble may only be a result of misadjustment. Complete adjustment instructions are given in Section 4, Performance Check and Adjustment.

5. Isolate Trouble to a Circuit

To isolate trouble to a particular circuit, note the trouble symptom. The symptom often identifies the circuit in which the trouble is located. When trouble symptoms appear in more than one circuit, check the affected circuits by taking voltage and waveform measurements.

Also check for the correct output signals at the front- and rear-panel output connectors with a test oscilloscope. If the signal is correct, the circuit is working correctly up to that point.

Incorrect operation of all circuits often indicates trouble in the power supply. Check first for correct voltage of the individual supplies. However, a defective component elsewhere in the instrument can appear as a power-supply trouble and may also affect the operation of other circuits.

The 370 Troubleshooting charts in the Diagrams and Circuit Board Illustrations, Section 7, provides a guide for locating defective circuits. Start at the top of the chart and perform the checks until one of the checks fails.

6. Check Voltages

Often the defective component can be located by checking for the correct voltages in the circuit. Typical voltages are given in Section 6, Diagrams and Circuit Board Illustrations.

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NOTE

Voltages appearing in Section 7, Diagrams and Circuit Board Illustrations, are not absolute and may vary slightly between 370 Programmable Curve Tracers. To obtain operating conditions used to take these readings, see the Voltage Conditions adjacent to the schematic diagram.

7. Check Individual Components

The following procedures describe methods of checking individual components in the 370. Components that are soldered in place (excluding integrated circuits) are best checked by first disconnecting one end. This isolates the measurement from the effects of surrounding circuitry.

CAUTION

To avoid electric shock hazard, always turn off the mainframe power switch before removing or replacing components.

Fuses: Check for open fuses by checking continuity with an ohmmeter.

WARNING

Before replacing an open fuse, determine the cause of failure. Refer to the Power Supply Board and Interconnect diagrams and the adjacent board illustrations Section 7 of this manual for component locations.

Transistors: A good check of transistor operation is actual performance under operating conditions. A transistor can most effectively be checked by substituting a new component for it (or one that has been previously checked). However, be sure that circuit conditions are not such that a replacement transistor might also be damaged.

If substitute transistors are not available, use a dynamic tester. Static testers are not recommended, because they do not check operation under simulated operating conditions.

Integrated Circuits: These can be checked with a test oscilloscope, digital tester or by direct substitution.

CAUTION

Direct substitution must not be attempted with soldered-in integrated circuits. The I.C., circuit board, or both, may be damaged due to the heat required to melt the solder from the connections. Refer to Soldering Techniques later in this section.

Use care when checking voltages and waveforms around the integrated circuits so that adjacent leads are not shorted together. The integrated circuit test clip provides a convenient means of clipping a test probe to the in-line, multi-pin, integrated circuit.

A good understanding of the circuit operation is essential to troubleshooting circuits using integrated circuits. Operating conditions and other information for the integrated circuits are given in Section 2, Theory of Operation, and Section 7, Diagrams and Circuit Board Illustrations.

Diodes: A diode can be checked for an open or shorted condition by measuring the resistance between terminals with an ohmmeter on a scale having a low internal source current, such as the R x 1k scale. The resistance should be very high in one direction and very low when the meter leads are reversed.

CAUTION

When checking diodes, do not use an ohmmeter scale setting that has a high internal current, because high currents may damage the diodes under test.

Resistors: Check the resistors with an ohmmeter. Resistor tolerances are given in Section 6, Replaceable Electrical Parts. Normally, resistors need not be replaced unless the measured varies widely from the specified value.

Capacitors: A leaky or shorted capacitor can best be determined by checking resistance with an ohmmeter on the highest scale. Do not exceed the voltage rating of the capacitor. The resistance reading should be high after initial charge of the capacitor. An open capacitor can best be detected with a capacitance meter or by checking if the capacitor passes AC signals.

8. Repair and Adjust the Circuit

If any defective parts are located, follow the replacement procedures given under Component Replacement in this section. Check the performance of any circuit that has been repaired or that has had any electrical components replaced. Adjustment of the circuit may be necessary.

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CORRECTIVE MAINTENANCE

Corrective maintenance consists of component replacement and instrument repair. Special techniques required to replace components in the 370 Programmable Curve Tracer are given here.

COMPONENT REMOVAL AND REPLACEMENT

WARNING

To avoid electric-shock hazard, always disconnect the instrument from the power source before removing or replacing components or plug-in units.

The exploded-view drawings associated with the Replaceable Mechanical Parts list (located at the rear of this manual) may be helpful in the removal or disassembly of individual components or sub-assemblies.

Preparations for Component Removal and Replacement

Before removing or replacing a component, it may be necessary to open or remove panels, keyboards, etc. The following are the for these preparations.

Cabinet Panel Removal

1. The 370 has three cabinet panels, top, right, and left.
2. Remove the four cabinet panel retainers from each corner of the 370 rear panel.
3. Remove the top cabinet panel by first removing its securing screw at the rear. Slide the panel back to remove it.
4. Remove the right and left cabinet panels by first removing each securing screw at the rear. Pull each panel back slightly to release it from the front casting. Then, move the top of the panel outward. Remove each panel by either sliding it to the rear or by lifting it from the bottom groove in the main body.
5. Replace cabinet panels in the reverse order of removal.

Connector Replacement

1. The 370 uses many types of connectors; some of them are very similar in appearance. Tag each connector before removing to avoid confusing one connector with another. (See Fig. 3-2.)
2. Some connectors have latches to prevent erroneous removal during operation. Release these latches when disconnecting.
3. Be sure to properly orient each connector when reconnecting it.

CAUTION

Some connectors are symmetrical. These are indexed by a mark that denotes pin 1.

Test Fixture Module Removal

1. Remove the right and the left cabinet panels from the main body.
2. Remove the eight screws (four flat-head and four round-head) from each of the mounting brackets that secure the test fixture module to the main body. Remove both the right and the left mounting brackets.
3. Pull the test fixture module forward away from the 370.

NOTE

Depending on the repair to be made, it may not be necessary to completely remove the test fixture module. Most of the circuit boards inside the module are accessible without removing it.

4. Replace the test fixture module in the reverse order of removal.

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NOTE

Before replacing the left or right mounting bracket, make certain that its access hole is properly aligned with the internal potentiometers. (The brackets are interchangeable and could be installed on the wrong side.)

Cathode-Ray Tube Removal

NOTE

Before removing the CRT, be certain that removal is necessary by checking associated circuits.

Remove the Cathode-Ray Tube (CRT) as follows:

WARNING

The CRT may retain a dangerous electrical charge. Before removing the CRT, the anode must be fully discharged by shorting the CRT anode to the chassis. Wait approximately ten minutes and again firmly short the anode to the chassis, then remove the CRT.

Use extreme care when handling a CRT. Breakage of the CRT causes a high-velocity scattering of glass fragments (implosion). Wear protective clothing and safety glasses. Avoid striking the CRT on any object that might cause it to crack or implode. When storing a CRT, place it in a protective carton or face down in a protected location on a smooth surface with a soft mat under the faceplate.

1. Remove the rear panel and the top cabinet.
2. Loosen the two screws located on both sides of the CRT base-pin until the tension of the springs on these screws is released.
3. Remove the CRT base-pin socket from the rear of the CRT.
4. Disconnect CRT anode cap from the jack located on the left side of the CRT. Ground the CRT anode to the chassis to dissipate any stored charge remaining in the CRT.
5. Remove the CRT bezel cover from the lower side of the CRT bezel by pulling it off with your fingernail. Remove the CRT bezel from the front panel by removing the two screws located on the lower side of the bezel.
6. Remove the CRT filter, CRT spacer, and CRT implosion shield from the CRT frame.
7. Remove the four screws located on the inner sides of the frame.
8. Remove the CRT frame by removing the four remaining screws located on the outer sides of the CRT frame. Remove the cushion from the CRT faceplate.
9. Remove the graticule illumination lamp assembly from both sides of the CRT.
10. Hold one hand on the CRT faceplate and gently pull out the CRT while pushing on the CRT base-pin.

Cathode-Ray Tube Replacement

Replace the Cathode-Ray Tube (CRT) as follows:

1. Place four CRT retainers into each guide line located at each corner of the CRT guide hole of the front panel.
2. Insert the CRT into the CRT guide hole and set it firmly against the CRT clamp ring, located at the rear of the CRT shield.
3. Clean the CRT faceplate and place the A28 and A29 lamp boards on the right and left side of the CRT, respectively.
4. Replace the CRT cushion. Fasten the CRT frame by fixing four screws located on the outer sides of the CRT frame.
5. Tighten the four screws located inner sides of the CRT frame by applying 5 Kg/cm (4.3 inch-lb) of torque.
6. Tighten the two screws beside the CRT base until the springs on the screws are fully compressed.
7. Replace the CRT base-pin socket on the CRT base pins.
8. Replace the CRT implosion shield, CRT spacer, and CRT filter.
9. Replace the CRT bezel and bezel cover.
10. Reconnect the CRT anode cap.
11. Replace the rear panel and the top cabinet.

NOTE

Replacing the CRT may require re-adjustment of the 370.

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BOARDS

To determine the location of a circuit board, see Figure 7-2 in Section 7.

Chassis-Mounted Boards

Remove and replace all chassis-mounted circuit boards as follows:

1. Disconnect all pin connectors attached to the board, or that connect the board to other parts of the instrument.
2. Remove the securing screws.
3. Remove the chassis-mounted board.
4. Replace chassis-mounted boards in the reverse order of removal. Be sure to match the index arrow on the multi-pin connectors to the corresponding arrow on the board.

NOTE

To replace a specific circuit board, other circuit boards, chassis parts or panels may require removal. If such is the case, refer to the removal instructions for that assembly as required.

Plug-In Boards

Remove and replace the plug-in boards as follows:

1. Remove the two circuit board retainers.
2. Remove the plug-in board by pulling up on the ejector Tab at each end of the board.
3. Slide the board down through the slots until the edge connectors rest on the bus slot connectors on the A1 Mother board.
5. Push the module down into the bus slot connectors of the A1 Mother board. Press firmly on the board, but do not press on components.
6. Replace the two circuit board retainers.

A2, A3, A4, A5 Plug-in Circuit Board

These boards are plug-in circuit boards; use the Plug-in Circuit Board Removal instructions above to remove these boards.

A6 Collector Supply Output Circuit Board

Remove and replace the A6 Collector Supply Output Circuit board as follows.

1. Remove the shield for the board from the main body.
2. Remove connectors J60 and J62 from the board and remove connector J64 from the A19 L.V. Supply board.
3. Remove the six screws securing the board.
4. Carefully remove the A6 board. If the circuit board is to be replaced, remove the four screws and insulation washers on the Q438, Q440, Q538, and Q540 transistors.
5. Replace the A6 Collector Supply Output board in the reverse order of removal.

CAUTION

Make sure that all four insulation washers on Q438, Q440, Q538, Q540 are placed in position. Without these insulators, destructive electric short circuits will occur.

NOTE

At the time of replacement, no silicone grease application is required because of the high heat conductivity of the insulation washer.

A7 Step Generator Circuit Board

Remove and replace the A7 Step Generator circuit board as follows:

1. Remove connectors J70, J72, and J74 from the board.
2. Remove the three screws located on the lower side of the board.
3. Remove the three screws fastening the heat sink of the board to the main body. Support the board as these screws are removed so it does not fall and become damaged.
4. Remove the A7 Step Generator circuit board.
5. Replace the A7 Step Generator circuit board in the reverse order of removal.

A8 H.V.Relay Circuit Board

Remove and replace the A8 H.V. Relay circuit board as follows:

1. Remove the A9 L.V. Relay circuit board. (See the A9 L.V. Relay Circuit Board removal instructions.)

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2. Remove connectors J83, J84, J85, J86, J87 and J88 from the board.

3. Remove connector J80 from A10 Sense circuit board located to the right of the A8 H.V. Relay circuit board. (See A10 Sense Circuit board removal instructions.)

CAUTION

When removing connectors (J83, J84, J85, J86, J87 and J88) from the board, tag each wire to identify its destination. Unless the wires are tagged, confusion might result when reconnecting the wires.

4. Remove the board by removing five spacers and one screw from the board and pulling the board upward.

5. Replace the A8 H.V.Relay circuit board in the reverse order of removal.

A9 L.V. Relay Circuit Board

Remove and replace the A9 L.V.Relay circuit board as follows:

1. Pull out the drawer unit from the main body of the 370.

2. Remove the two screws from the left side of the guard box assembly cover and the two screws securing the cover to the board. Remove the cover.

3. Remove connectors J92, J93, J94, J95, J96, J97, and J98 from the board. Remove connector J90 from the A10 Sense circuit board, which is located to the right of the A9 L.V. Relay circuit board.

4. Remove the two spacer posts and three screws from the board.

5. Remove the board by squeezing each nylon circuit board retainer together and lifting the board away from it.

6. Replace the A9 L.V. Relay circuit board in the reverse order of removal.

CAUTION

Note the similar appearance of the connectors, and make sure that each is reconnected in its proper position.

A10 Sense Circuit Board

Remove and replace the A10 Sense circuit board as follows:

1. Pull out the drawer unit from the main body.

2. Remove the A24 Bubble Memory Control circuit board, the Bubble Memory Control cover, and the bracket from the drawer unit (test fixture module) as follows:

a. Remove the A24 Bubble Memory Control circuit board. (See the removal instructions for the A24 Bubble Memory Control circuit board.)

b. Remove the A60 Timer circuit board. (See the removal instructions for the A60 Timer circuit board.)

c. Remove the two, hex-shaped, spacer posts from the bracket. (These posts secured the A60 Timer board.)

d. Remove the screw from the front, left side of the bracket.

e. Remove the four flat-head screws securing the bracket from the right side of the drawer unit.

f. Remove the connectors J106 and J144 from the A10 Sense circuit board. Move these connector wires forward and away from the bracket.

g. Remove the bracket by carefully lifting and sliding it from underneath the wires of the J02 connector.

3. Remove the connectors J80, J90, J103, J104, J105, J172, J414, J415, J416, J417, and J418 from the board.

NOTE

When removing connectors from the board, tag each wire to identify its destination. Unless the wires are tagged, confusion might result when reconnecting the wires.

4. Remove the two flat-head screws securing the board heat sink to the right side of the drawer unit.

5. Remove the three screws and hex-shaped posts and the insulator plate that covers the left inside corner of the board. Remove the three screws from the right front and rear corners of the board. Remove the screw from the right center that holds the heat sink (and board) to the chassis.

6. Remove the four nuts securing the Bubble Memory Guide to the front panel. Remove the guide.

7. Remove the A10 Sense circuit board by carefully lifting and sliding it (towards the right side) from underneath the wires of the J02 connector.

8. Replace the A10 Sense circuit board in the reverse order of removal.

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A11 Main Key Circuit Board

Remove and replace the A11 Main Key circuit board as follows:

1. Pull off the eight knobs (three large and five small) from the front panel.
2. Remove the CRT bezel from the front panel. (see step 5 of the Cathode-Ray Tube Removal procedure.)
3. Remove the right cabinet panel from the main body.
4. Remove the two flat-head securing screws located in the upper right side of the front frame.
5. Remove the ground wire connection from the circuit board chassis.
6. Remove the front panel by disconnecting the J110 connector from the A1 Mother circuit board.
7. Remove the A11 Main Key circuit board by removing the six screws securing the board.

NOTE

The A11 Main Key circuit board and A12 Sub Key circuit board are connected to one another by circuit board mounted connectors J100, J120, P100 and P120. Be careful not to damage the connectors when removing and replacing the board.

8. Replace the A11 Main Key circuit board in the reverse order of removal.

A12 Sub Key Circuit Board

Remove and replace the A12 Sub Key circuit board as follows:

1. Remove the A11 Main Key circuit board. (See the NOTE in the last part of the A11 Main Key Circuit Board Removal procedure.)
2. Remove the A12 Sub Key circuit board by removing the six spacer posts from the board.
3. Replace the A12 Sub Key circuit board in the reverse order of removal.

A14 Lower Key Circuit Board and A15 Lower Sub Key Circuit Board.

Remove and replace the A15 Lower Key and the A15 Lower Sub Key circuit boards as follows:

1. Pull out the drawer unit from the main body of the 370.
2. Remove the connector J02 from the A24 Bubble Memory Control circuit board. Remove the protective box from the Test Adapters.
3. Remove the four flat-head screws securing the Test Adapter Mounting Plate assembly to the center front of the drawer unit.
4. Remove the two flat-head screws that secure the Collector Supply Panel assembly to the right front side of the drawer unit.
5. Remove the Collector Supply Panel assembly from the drawer unit by disconnecting the connectors J140 and J144 from the A15 Lower Key board. Disconnect the connector J142 from this board after the assembly is removed from the drawer unit.
6. Remove the metal shield from the bottom of the A15 Lower Sub Key board by removing the four securing screws.
7. Remove the A15 Lower Sub Key circuit board by removing its four spacer posts and one screw. (Before separating the boards, read the following NOTE.)

NOTE

A14 Lower Key circuit board and A15 Lower Sub Key circuit board are connected to one another by circuit board mounted connector P100. Be careful not to damage the connector when removing and replacing the board.

8. Remove the A14 Lower Key circuit board by removing the five spacers from the board.
9. Replace the A14 Lower Key circuit board and the A15 Lower Sub Key circuit board in the reverse order of removal.

A16 LOR SW Circuit Board and A17 SUB LOR Circuit Board

Remove and replace the A16 LOR SW circuit board and A17 SUB LOR circuit board as follows:

1. Pull out the drawer unit from the main body of the 370.
2. Remove the flat-head screws securing the Test Adapter Mounting Plate assembly to the center front of the drawer unit.

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3. Remove the two flat-head screws securing the left front panel to the left front side of the drawer unit.

4. Remove the left front panel by lifting it out.

5. Remove the (plastic) insulator from the drawer unit after removing its two screws.

NOTE

When removing connectors from the board, tag each wire to prevent misconnection while reassembling.

6. Remove connectors J170 and J172 from the A17 Sub LOR circuit board. Remove connectors J160, J162, J164, J166, J167, J168, and J169 from the A16 LOR Switch circuit board.

NOTE

The A16 LOR SW circuit board and the A17 SUB LOR circuit boards come as a single assembly and cannot be separated.

7. Remove the A16 LOR Switch and A17 Sub LOR circuit boards as a unit by removing the four securing screws from the A16 LOR Switch circuit board.

8. Replace the A16 LOR Switch and A17 Sub LOR circuit boards in the reverse order of removal.

A18 CRT Output Circuit Board

Remove and replace the A18 CRT Output circuit board as follows:

1. Remove the top cabinet panel from the main body of the 370.

2. Remove the (plastic) insulator by removing its four securing screws from the A18 CRT Output circuit board.

3. Remove connectors J180, J182, J184, and J186 from the board.

4. Remove the A18 CRT Output circuit board by removing the four spacer posts from the board.

5. Replace the A18 CRT Output circuit board in the reverse order of removal.

A19 L.V.Supply Circuit Board

Remove and replace the A19 L.V. Supply Circuit board as follows:

1. Remove the top cabinet panel.

2. Remove the rear panel. (See the Rear Panel removal instructions in this section.)

NOTE

When removing connectors from a board, tag each one to prevent misconnection while reassembling.

3. Remove connectors J192, J190, J194, J198, J72, J196, J64, J280, and J290 from the board.

4. Remove the three screws that secure the heat sink of the A19 L.V. Supply circuit board to the chassis.

5. Remove the A19 L.V. Supply circuit board by removing its three securing screws from the rear edge of the board.

6. Replace the A19 L.V. Supply circuit board in the reverse order of removal.

A20 H.V. Regulator Circuit Board

Remove and replace the A20 H.V. Regulator circuit board as follows:

1. Remove the left cabinet panel from the main body.

2. Remove the shield covering the A20 H.V. Regulator circuit board from the main body by removing the four securing screws.

3. Remove the retainer, that holds the transistor on the board to the chassis, by removing its screw.

WARNING

The CRT anode circuit retains up to 2400 V of charge. Be sure the anode cap is completely grounded to the chassis before handling the circuit board.

4. Remove the CRT anode cap from the jack on the left side of the CRT. Ground the CRT anode cap to the chassis to dispel any stored charge.

5. Remove connectors J182, J194, and J200 from the board..

6. Remove the A20 H.V. Regulator circuit board by removing the four screws from the corners of the board.

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7. Replace the A20 H.V. Regulator circuit board in the reverse order of removal.

A22 Interface Circuit Board

Remove and replace the A22 Interface circuit board as follows:

1. Remove the A2 CPU and the A3 A/D circuit boards. (See the A2, A3, A4, and A5 Plug-in Circuit Board removal instructions.)
2. Remove connector J220 from the A1 Mother circuit board.
3. Remove the two screws that secure the IEEE STD 488 PORT connector to the rear panel. Also remove the two screws and bail brackets that secure the PLOTTER INTERFACE PORT connector to the rear panel.
4. Remove the rear panel. (See the Rear Panel removal procedure in this section.)
5. Remove the A22 Interface circuit board and its (plastic) insulation cover by removing the four securing screws from the board.
6. Replace the A22 Interface circuit board in the reverse order of removal.

A24 Bubble Memory Control Circuit Board

Remove and replace the A24 Bubble Memory Control circuit board as follows:

1. Pull the drawer unit from the main body of the 370.
2. Remove the connector J02 from the board.
3. Remove the four screws securing the circuit board cover.
4. Lift the A24 Bubble Memory Control circuit board and its cover. Remove the board and cover by moving them towards the rear of the 370.
5. Replace the A24 Bubble Memory Control circuit board in the reverse order of removal.

NOTE

Move any wires away from the circuit board mounting posts before replacing the board.

A27 Primary Circuit Board

Remove and replace the A27 Primary circuit board as follows:

1. Remove the rear panel. (See the Rear Panel removal procedure in this section.)
2. Remove connectors J270, J272, and J274 from the board.

NOTE

Removal of connector J272 may be difficult with the (plastic) insulation cover installed over the board. The upper corner of the cover may keep one of the connector's latches from releasing. Remove the cover first if this problem occurs.

3. Remove the (plastic) insulation cover and loosen the board by removing the four securing screws from the board.
4. Remove the A27 Primary circuit board.
5. Replace the A27 Primary circuit board in the reverse order of removal.

A28, A29 Graticule Illumination Lamp Circuit Board

Remove and replace the A28 and A29 Graticule Illumination Lamp circuit boards as follows:

1. Remove the CRT bezel cover from the lower side of the CRT bezel by pulling it off with your fingernail. Remove the CRT bezel from the front panel by removing the two screws located on the lower side of the bezel.
2. Remove the (blue) CRT filter, the CRT spacer, and the CRT implosion shield from the CRT frame.
3. Remove the CRT frame by first removing the four round head screws from the inner sides of the frame. Then remove the four flat-head screws from the outer sides of the CRT frame.
4. Remove the black plastic top cabinet. (This part may be fastened to the CRT frame.)

NOTE

When removing connectors from a board, tag each one to prevent misconnection while reassembling.

5. Remove connector(s) J280 and/or J290 from the A19 L.V. Supply circuit board.

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6. Remove the (internal scale illumination) light reflector, the light reflector retainer, and the retainer spring by pulling them out from alongside the CRT faceplate.

7. Remove the A28 or A29 Graticule Illumination Lamp circuit board by removing the two screws that secure the board in place.

8. Replace the A28 or A29 Graticule Illumination Lamp circuit board in the reverse order of removal.

A60 Timer Circuit Board

Remove and replace the A60 Timer circuit board as follows:

1. Pull out the drawer unit from the main body of the 370.

2. Disconnect the connectors J168A and J168B from the board.

3. Remove the two screws from the board.

4. Remove the A60 Timer circuit board.

5. Replace the A60 Timer circuit board in reverse order of removal.

Rear Panel

1. Remove the four cabinet panel retainers from each corner of the rear panel.

2. Remove the top cabinet panel by first removing its securing screw at the rear. Slide the panel back to remove it.

3. Remove any connector(s) attached to the outside of the rear panel at the IEEE STD 488 PORT, the PLOTTER INTERFACE PORT, or the AC INPUT.

4. Remove the six screws securing the rear panel.

5. Pull the rear panel out and carefully lower it away from the main body. Do not stretch any connector wires inside the panel.

NOTE

Use care to not damage the wire bundle of the J196 connector (on the A19 L.V. Supply circuit board). It may be dressed behind the fan housing. Move this wire bundle aside to allow the rear panel to be lowered.

When removing connectors from a board, tag each one to prevent misconnection while reassembling.

6. Remove the following connectors from inside the rear panel:

   J270 and J274 from the A27 Primary circuit board
   P16 and P18 from the FL100 Filter

NOTE

Remove the A2 CPU and the A3 A/D circuit boards before the next step. (See the Plug-In Boards removal instructions in this section.)

   J220 from the A1 Mother circuit board
   Both ground wires from the main body chassis

7. Remove the rear panel.

NOTE

Removal of the A22 Interface circuit board, the A27 Primary circuit board, or the B100 cooling fan is described elsewhere in this section. To remove one of these circuit boards or the fan from the rear panel, see the removal instructions for that component.

8. Replace the rear panel in the reverse order of removal.

Cooling Fan

Remove and replace the cooling fan (B100) as follows:

1. Remove the rear panel. (See the previous procedure in this section.)

2. Remove connector J272 from the A27 Primary circuit board.

NOTE

Removal of connector J272 may be difficult with the (plastic) insulation cover installed over the A27 Primary circuit board. The upper corner of this cover may keep one of the connector's latches from releasing. Remove the insulation cover first if this problem occurs.

3. Remove the cooling fan together with the fan cover, filter, and fan guard by removing the four nuts on the fan housing.

NOTE

The fan cover, filter, and fan guard are a loosely-knit unit. The fan guard and filter will fall from the fan cover if the cover is inverted.

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NOTE

Before reinstalling the cooling fan, be certain that the J272 wires are at the bottom right corner (as facing the rear). Also check that the air flow arrow marked on the fan housing is pointing toward the inside of the 370.

4. Replace the cooling fan in the reverse order of removal.

Line Fuse

The line fuse used in the 370 is located within the filter unit on the rear panel. Replace the fuse only with one of proper type and rating.

Remove and replace the line fuse as follows:

1. Remove the AC power cable connector from the line filter housing in the rear panel.
2. Remove the fuse cover by pulling it out from the line filter. Insert some flat-edged tool (such as a straight-slot, screwdriver blade tip) into the small groove in the outer left side of the housing. Use the tool to pull, or pry, the fuse cover loose.
3. Remove the line fuse from its fuse cover.
4. Replace the line fuse in the reverse order of removal.

Semiconductors

Do not replace semiconductors unless actually defective. If removed from their sockets during routine maintenance, return them to their original sockets. Unnecessary replacement of semiconductors may affect the adjustment of the instrument. When semiconductors are replaced, check the operation of circuits that may be affected.

WARNING

To avoid electric shock hazard, always disconnect the 370 from the power source before removing or replacing components.

Replacement semiconductors should be of the original type or a direct replacement. When removing soldered-on transistors, use a solder removing wick to remove the solder from the circuit board pads.

If the transistor has a heat sink or is mounted on the chassis and uses silicone grease to increase heat conductivity, replace the silicone grease on both sides of the insulating washer when replacing these transistors.

WARNING

Handle silicone grease with care. Avoid getting the silicone grease in your eyes. Wash hands thoroughly after use.

An extracting tool should be used to remove the in-line integrated circuits to prevent damaging the pins. This tool is available from Tektronix, Inc.; order Tektronix part 003-0619-00.

If an extracting tool is not available, use care to avoid damaging the pins. Pull slowly and evenly on both ends of the integrated circuit. Try to avoid disengaging one end before the other.

ADJUSTMENT AFTER REPAIR

After any electrical component has been replaced, the adjustment of that particular circuit should be checked, as well as the adjustment of any closely related circuits.

DIAGNOSTIC ROUTINES

The 370 has four diagnostic routines: Two Power On Diagnostic routines, a User Initiated Diagnostic routine, and GPIB diagnostic routine.

Power On Diagnostic Routines

At power on, the 370 runs the Power On Diagnostic routine to execute following tests by turns:

System ROM check
System RAM check
Display RAM check
Acquisition RAM check
Up/down switch and Push button test

After the completion of Power On Diagnostic routines, the 370 displays a "SELFTEST PASS" message at the error message area of the CRT and sets the initial settings.

If the 370 is turned on with the FAST/SHIFT key pressed, a more detailed Power On Diagnostic routine is made, in the following order:

System ROM check
System RAM check
Display RAM check

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Acquisition RAM check
LED check
Display quality check
Up/down switch and Push button test

To exit this diagnostic routine, press the FAST/SHIFT key.

System ROM Check

After confirming that the system ROMs are in the correct sockets, the 370 diagnoses the system ROMs by checksum.

If a system ROM fatal error is found, (such as mis-insertion) the Bubble memory index display blinks with 0 and 1.

When checksum errors are found, the error message is displayed on the error message area of the CRT. The format of this messages is as follows:

```
ROM 000X
```

Where X is the hexadecimal number whose bit 1 through bit 4 respectively indicates the error status of system ROM U600, U610, U620, and U630. (For example, error message "ROM 0002" indicates that checksum error is detected in ROM U610.)

In the above cases, the 370 does not advance the diagnostics routines.

System RAM Check

The 370 checks the system RAM by read/write operation. If a system RAM fatal error is found (such as bus shorted), the Bubble memory index display blinks with 0 and 2.

When a read/write error is found, the error message is displayed on the error message area of the CRT. The format of this message is as follows:

```
RAM XXXXX YYYYY
```

Where XXXXX is a hexadecimal representation of the address of the RAM in error, and YYYY is a hexadecimal representation of error bits in that address (for example, error message "RAM 00000 0018" indicates that a read/write error is detected in bit 4 and bit 5 of the system RAM at address 00000).

In the above cases, the 370 does not advance the diagnostics routines.

Display RAM Check

The 370 checks the Display RAM by read/write operation.

If a read/write error is found (such as bus shorted), the Bubble memory index display blinks with 0 and 3, and the 370 does not advance the diagnostics routines.

Acquisition RAM Check

The 370 checks the Acquisition RAM by read/write operation.

If a read/write error is found (such as bus shorted), the Bubble memory index display blinks with 0 and 4, and the 370 does not advance the diagnostics routines. Table 3-2 shows the Power-on System Error Messages displayed on the Bubble memory index display.

Table 3-2
Power on System Error Messages

Display	Meaning
0/1(blink)	System ROM error (such as mis-insertion)
0/2(blink)	System RAM error (such as bus shorted)
0/3(blink)	Display RAM Read/Write error (such as bus shorted)
0/4(blink)	Acquisition RAM Read/Write error (such as bus shorted)

LED Check

The 370 turns on all front-panel LEDs sequentially for visual check.

Display Quality Check

The 370 displays the Logo mark (SONY/TEKTRONIX), and a CRT adjustment pattern on the CRT for CRT control adjustment. For the implementation of this adjustment pattern, refer to Section 4, Performance Checks and Adjustment.

Pressing the FAST/SHIFT key exits this routine.

Up/Down Switch and Push Button Test

The 370 executes the up/down switch and pushbutton test. (LEFT-RIGHT-STANDBY switch, FAST/SHIFT button are not tested in this case). If an error is found, the error message is displayed at the error message area of the CRT. The Error Message is indicated by the following format:

```
KEY ERROR <NUM>
```

Where <NUM> indicates the number of corresponding up/down switches or pushbuttons on the front panel, listed in Table 3-3.

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Table 3-3
Front Panel Control Index Numbers

Control	Number or Message
NON STORE	1
STORE	2
COMPARE	3
VIEW	4
ENTER	5
SAVE	6
RECALL	7
INDEX DOWN	8
INDEX UP	9
DISPLAY INVERT	10
CRT CAL UP	11
CRT CAL DOWN	12
DISPLAY OFFSET DECR	13
DISPLAY OFFSET INCR	14
DISPLAY MAG UP	15
DISPLAY MAG DOWN	16
ACQUISITION MODE UP	17
ACQUISITION MODE DOWN	18
STEP GEN INVERT	19
STEP GEN MULTI	20
NUMBER OF STEPS UP	21
NUMBER OF STEPS DOWN	22
PULSE UP	23
PULSE DOWN	24

Table 3-3 (cont.)
Front Panel Control Index Numbers

Control	Number or Message
STEP GEN LIMIT UP	25
STEP GEN LIMIT DOWN	26
OFFSET OPPOSE	27
OFFSET AID	28
USER REQUEST	29
RESET TO LOCAL	30
PLOT	31
REPEAT	32
SINGLE	33
AUX SUPPLY DECR	34
AUX SUPPLY INCR	35
CURSOR MODE UP	36
CURSOR MODE DOWN	37
UP ARROW	38
LEFT ARROW	39
DOWN ARROW	40
RIGHT ARROW	41
FAST/SHIFT	42
CONFIGURATION UP	43
CONFIGURATION DOWN	44
MAX PEAK VOLTS UP	45
MAX PEAK VOLTS DOWN	46
MAX PEAK POWER WATTS UP	47
MAX PEAK POWER WATTS DOWN	48
COLLECTOR SUPPLY POLARITY UP	49
COLLECTOR SUPPLY POLARITY DOWN	50

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Table 3-3 (cont.)
Front Panel Control Index Numbers

Control	Number or Message
LEFT-RIGHT-STANDBY	LRSSW RIGHT
	LRSSW LEFT
	LRSSW BOTH
	LRSSW STANDBY
HIGH-LOW	HILOWSW HIGH
	HILOWSW LOW
INTERLOCK	COVER ON
	COVER OFF
VERTICAL CURRENT/DIV	VERT SENSE XX(0 - 20)
HORIZONTAL VOLTS/DIV	HORIZ SENSE XX(0 - 19)
STEP/OFFSET AMPLITUDE	STEP AMP XX(0 - 26)
VARIABLE COLLECTOR SUPPLY	VCS(%) = XXX.X(0 - 100)

The following message appears on the test area of the CRT simultaneously with the above error message:

```
PUSH FAST KEY TO GO ON
```

You can ignore the displayed error and push the FAST/SHIFT key to carry out the measurement, but the displayed key function will not necessarily occur correctly.

User Initiated Diagnostic Routine

Pressing both the FAST/SHIFT key and NON STORE key enters the User Initiated Diagnostic routine. This routine displays a number or message that corresponds to the front panel push button, rotary switch or up/down switch pressed or rotated. Thus, you can diagnose whether the front panel controls are operating normally. Table 3-3 lists the buttons, switches and associated numbers or messages. To exit this routine, press both the FAST/SHIFT key and the NON STORE key again.

GPIB Diagnostic Routine

The GPIB TEST? command initiates the 370 system ROM and RAM diagnostic routines. The 370 responds to this command by returning system ROM and RAM information to the controller in the following format:

TEST ROM:000X (ROM error code), RAM:YYYY (RAM error code)

The TEST query response consists of two hexadecimal numbers that indicate if a ROM or RAM IC was found to be defective. These numbers must be translated to the binary equivalent to determine the ROM and RAM locations. (If all ROMs and RAMs are good, the TEST query response is ROM:0000, RAM:0000.)

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SECTION FOUR
PERFORMANCE CHECK AND ADJUSTMENT

The Performance Check and Adjustment Procedure:

- Checks key electrical specifications
- Provides instructions for determining whether adjustment is necessary
- Provides instructions for making all internal adjustments
- Provides optional functional check instructions

Adjustment Interval

To maintain instrument accuracy, check performance every 2000 hours of operation or annually if used infrequently.

IMPORTANT:

The Performance Check and Adjustment Procedure is a multipurpose procedure. Time can be saved by performing only those steps necessary for your application. Carefully read Table 4-1 to select the appropriate procedure option for the task to be performed.

Table 4–1
Performance Check and Adjustment Procedure Options

Task	Procedure Options
Performance Check (Checking key electrical specifications)	· Perform the Power-Up Sequence at the beginning of the Performance Check and Adjustment Procedure. · Perform those steps with titles beginning with "Checking" and identified with a ✓ in the bar above the heading (see the Procedure Index at the beginning of the procedure). **IMPORTANT:** If a "Checking" step also contains the word "Adjusting" in the title and a ⊖ in the bar above the title, ignore those parts of the step with adjustment instructions.
Adjustment	· Perform the Power-Up Sequence at the beginning of the Performance Check and Adjustment Procedure. · Perform only those steps with "Adjusting" in the title and a ⊖ in the bar above the title (see the Procedure Index at the beginning of the procedure). **IMPORTANT:** Perform all parts of these adjustment steps; most adjustments are preceded by instructions for determining whether adjustment is necessary and followed by instructions for verifying that the adjustment was correctly performed.

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TABLE 4–1 (Cont.)
Performance Check and Adjustment Procedure Options

Task	Procedure Options
Performance Check and Adjustment	· Perform the Power-Up Sequence at the beginning of the Performance Check and Adjustment Procedure. · Perform all steps in the procedure with a ⌐ or a ⊖ (or both) in the bar above the step title (see the Procedure Index at the beginning of the procedure). **IMPORTANT:** Steps for "Examining" characteristics only (i.e., those with no "Checking" or "Adjusting" instructions included) are not necessary for checking specifications or making adjustments.
Partial Performance Check or Adjustment	· Perform the Power-Up Sequence at the beginning of the Performance Check and Adjustment Procedure. · Perform the desired steps (e.g., A1, B3, etc.) using the SETUP CONDITIONS at the beginning of each step. **IMPORTANT:** Although a partial adjustment procedure can be performed, we recommend that the entire subsection procedure (e.g., A. Power Supply, F. Step Generator, etc.) be performed if any adjustments are made.
Functional Check of Front Panel Controls and Connectors	· Perform the ***First Time Operation*** procedure in Section 3 of the 370 Operators Manual.
Complete Functional Check	· Perform the Power-up Sequence at the beginning of the Performance Check and Adjustment Procedure. · Perform only those steps with titles beginning with "Checking" or "Examining." **IMPORTANT:** If a "Checking" or an "Examining" step also contains the word "Adjusting" in the title and a ⊖ in the bar above the title, ignore those parts of the step with adjustment instructions.

Before making adjustments, thoroughly clean and inspect the 370 instrument as instructed in the Maintenance section of this manual.

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USING THIS PROCEDURE

The following aids are used in this procedure:

Performance Check Summary

The Performance Check Summary lists key characteristics checked in the procedure and the procedure steps in which they are checked. It also indicates which steps contain adjustments which may affect the specified performance of characteristics.

Procedure Index

The Index lists all steps included in each procedure subsection. The beginning page number is given for each step for easy location if a portion of the procedure is performed.

The steps in the Index are marked with ✓ and ⊖ symbols, which are also used in the procedure to designate specification checks and internal adjustments.

Power-Up Sequence

The Power-Up Sequence ensures that operating conditions are stable and repeatable, and must be performed before any complete or partial procedure is performed.

Initializing the 370

The 370 is initialized at the beginning of most procedure steps to prevent the carry-over of inappropriate setup conditions from previous steps. Initialization also allows each step to be performed independently if only portions of the procedure are performed.

Subsection Headings

The procedure is divided into subsections by major circuit function. For example: A. Power Supply, B. CRT, etc. Each subsection contains steps to check or adjust characteristics of that major circuit.

Step Titles and Title Bars

The title of each step begins with Checking, Adjusting, or Examining, or a combination of these words.

- **Checking** indicates that an electrical specification is checked.
- **Adjusting** indicates that instructions are given to make one or more internal adjustments.
- **Examining** indicates that a functional check of the circuit is performed and that no electrical specifications are checked.

Each step with instructions for checking and/or adjusting instrument characteristics has a title bar positioned over the step title. The title bar contains a ✓ and/or a ⊖ to quickly identify the purpose of the step.

Specifications

All steps that check specifications list those specifications immediately after the step title.

Setup Conditions

Each step has setup conditions enclosed in a box, which include all equipment, connections, and control settings necessary to begin the step.

Parts of Steps

Each step is composed of sequential parts with alphabetic indexing. The parts are arranged into functional groups so that, for instance, if a performance check is being performed, adjustment instructions may be skipped.

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PERFORMANCE CHECK SUMMARY

Table 4-2 lists key characteristics checked in this procedure and the steps in which they are checked. Also listed are steps containing adjustment instructions which may affect a characteristic's specified performance. The specifications for characteristics listed in Table 4-2 are given at the beginning of the procedure step in which they are checked.

Table 4-2
Performance Check Summary

Characteristic	Checked	Adjusted
COLLECTOR SUPPLY		
POLARITY	Not specified; examined in H3	
+ LEAKAGE	Not specified; examined in H3	
+ DC	Not specified; examined in H3	
+ ⌒	Not specified; examined in H3	
AC ∿	Not specified; examined in H3	
- ⌒	Not specified; examined in H3	
-DC	Not specified; examined in H3	
-LEAKAGE	Not specified; examined in H3	
DC Mode Ripple	H4	
Max Peak Volts		
LOW range	H4	
HIGH range	H4	
Voltage Accuracy	H4	
Range	H4	
Max Peak Current	H5	
Minimum Series Resistance (ohms)	H6	
Maximum Series Resistance (ohms)	H6	

Table 4-2 (Cont.)
Performance Check Summary

Characteristic	Checked	Adjusted
COLLECTOR SUPPLY (CONT)		
Series Resistance Available (Ω, ±5% or 0.1 W)	H6	
Peak Power Watts		
LOW range (16, 80 and 400V)	H6	
HIGH range (2000V)		H2
Variable Collector 0 to 100.0% Supply	Not specified; examined in H1	H1
% Indicator (5 LEDs)	Not specified; examined in H1	
Safety Interlocks	Not specified; examined in H3	
Collector Supply Disabled (LED)	Not specified; examined in H3	
Warning Indicator	Not specified; examined in H3	
Limiter Indicator	Not specified; examined in H3	
Looping compensation	Not specified; examined in H7a	
Current limiter	H5, H9	
STEP GENERATOR		
Accuracy (Current or voltage steps including offset)		
Incremental	F5, F7	
Absolute (With .1X STEP MULT enabled)	F11, F6 F7	
Offset control range	F7	
Resolution	F7	
Current Mode		
Amplitude range	F4	
Max current	F9	
Max Voltage	F14	

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Table 4-2 (Cont.)
Performance Check Summary

Characteristic	Checked	Adjusted
STEP GENERATOR (CONT)		
Max Opposing Volts	F14	
Ripple plus noise	F4	
Voltage Mode		
Amplitude switch range	F2	
Max voltage	F8	
Max current	F12	
Short circuit current limiting	F12	
Max Opposing Offset Volts	F11	
Max Opposing Current	F15	
Ripple plus noise	F2	F2
Step Rates	F18	
Pulsed Steps	F17	
Steps and offset polarity	F10	
Number of Steps	F5	
AUX SUPPLY		
Range (and resolution)	G1	
Accuracy	G1	
Output current	G2	
Ripple plus noise	G3	
NON STORE VERTICAL DEFLECTION SYSTEM		
NON STORE MODE		
Maximum displayed noise or ripple	D4	
Step Generator Display		
Range	E6	
Accuracy	E6	

Table 4-2 (Cont.)
Performance Check Summary

Characteristic	Checked	Adjusted
DIGITAL STORAGE VERTICAL ACQUISITION		
Collector Current		
Range	E5a, E5b	
Accuracy	E5a, E5b	E1
Emitter Current		
Range	E4	
Accuracy	E4	
Display offset	C6	
Accuracy	C4	C4
Display Mag X10 accuracy	C7	
Display invert accuracy	C5	
NON STORE HORIZONTAL DEFLECTION SYSTEM		
Collector volts		
Displayed Noise	D4	
Base/Emitter Volts		
Displayed noise	D4	
Step Generator Display		
Accuracy	D5	

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Table 4-2 (Cont.)
Performance Check Summary

Characteristic	Checked	Adjusted
DIGITAL STORAGE HORIZONTAL ACQUISITION		
Collector volts		
Range	D3	
Accuracy	D3	D1
Base/Emitter Volts		
Range	D2	
Accuracy	D2	D1
Display offset		
Range	C6	
Accuracy	C6	C2, C3, C4
Display Mag X10 Accuracy	C7	
Display Invert Accuracy	C5	
CRT AND READOUT		
CRT		
Geometry	C4	C4
Orthogonality	C4	C4
READOUT		
AUX SUPPLY	G1	

Table 4-2 (Cont.)
Performance Check Summary

Characteristic	Checked	Adjusted
CONNECTORS		
Aux Supply Connector		
Maximum output voltage	G1	
Maximum output current	G2	
POWER SUPPLY		
Power supply reference voltage	A2, A3	A2, A3

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PERFORMANCE CHECK AND ADJUSTMENT PROCEDURE

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Tektronix Field Service

Tektronix Field Service Centers and the Factory Service Center provide instrument repair and adjustment services. Contact your Tektronix Field Office or representative for further information.

Test Equipment

The test equipment listed in Table 4-3 is required for a complete Performance Check and Adjustment of the instrument. However, complete checking or adjusting may not always be necessary or desirable. You may be satisfied with checking only selected characteristics, thereby reducing the amount of test equipment actually required.

The specifications for test equipment listed in Table 4-3 are the minimum required to check performance requirements of the 370. Detailed operating instructions for test equipment are not given in these procedures; refer to the test equipment instruction manual if more information is needed.

Special Fixtures

Special fixtures are used where they facilitate instrument adjustment. These fixtures are available from Tektronix, Inc. Order by part number from Tektronix Field Offices or representatives.

Test Equipment Alternatives

The checks and adjustment procedures are based on the first item of equipment given as an example. When other equipment is substituted, control settings or setups may have to be altered. If the exact item of equipment given as an example in Table 4-3 is not available, first check the Minimum Specifications column carefully to see if any other equipment might suffice. Then check the Purpose column to see where this item is used. If used for a performance check or adjustment that is of little or no importance for your measurement requirements, the item and corresponding step(s) can be deleted.

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Table 4-3
Test Equipment

Item	Minimum Specification	Purpose	Example of Applicable Test Equipment
1. Test Oscilloscope	Bandwidth, DC to 150 MHz; deflection factor, 2 mV to 5 V/DIV (with 10X, 10 MΩ probe)	Used to check Ripple.	a. Tektronix 2445A 150 MHz Oscilloscope with P6131 Probe. b. Refer to Tektronix Products catalog for compatible equipment.
2. DC Voltage Source	Voltage range: 500.0 mV to 1000 V; Accuracy: 0.1 mV; Resolution: 0.1 mV	Supplies a reference voltage to the 370.	Fluke 5101B
3. DC Current Source	Current range: 10.00 μA to 1.999 A; Accuracy: 0.1%	Supplies a reference current to the 370	Fluke 5101B
4. Digital Multimeter	DCV: 1000 V, 4.5 digit; Accuracy: 0.05%; Resolution: 0.1 mV; Input imp: > 10 MΩ (100 mV,10 V range); DCA: 2 A; Accuracy: 0.1%; Resolution 0.1 nA; OHM: 25 MΩ; Accuracy: 0.05%; Resolution: 0.01 Ω	Used throughout the Checks and Adjustments to measure voltage, current, and resistance	a. Fluke 8505A and Tektronix DM501A (for 2A measurement only) b. Keithley 195A W/OP 1950
5. Tool, Alignment	Combination hex wrench and screwdriver tips for electronics use	Used to perform internal adjustments	Tektronix Part No. 003-0489-00
6. Banana Plugs	Banana plug with cap	Used to hold resistors	Tektronix Part No. 134-0016-01
7. Screw Driver	POZIDRIV; Length: 8-1/2 inch; Point Size #1, #2	Used to remove Panels and High Voltage Shield Cover	Tektronix Part No. 003-0293-00
8. Patch Cord	Banana Plug-Jack to Banana Plug-Jack	Used throughout the procedure	Tektronix Part No. 012-0031-00 (Black) 012-0039-00 (Red)
9. High Voltage Probe	Voltage range: 0 - 3 kV (DC,AC); Accuracy: ±1%	Used to examine -2400 V.	Fluke 80K-6
10. Test lead		Used throughout the procedure	Fluke Y8131
11. Resistors	25 MΩ, 0.1%, 1/2 W; 2.5 MΩ, 0.1%, 1/2 W; 250 kΩ, 0.1%, 1/2 W; 1 MΩ, 5%, 1/4 W; 10 MΩ, 5%, 1/4 W; 100 kΩ, 0.1%, 1/8 W; 10 kΩ, 0.1%, 1/8 W; 100 Ω, 0.1%, 1/8 W; 1 Ω, 0.1%, 3W; 0.1 Ω, 0.1%, 10 W	To check: 1) Emitter accuracy; 2) Displayed horizontal noise; 3) Base input impedance 4)Step Generator Ripple	Tektronix Part No. 067-1337-00.

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Table 4-3 (Cont.)
Test Equipment

Item	Minimum Specification	Purpose	Example of Applicable Test Equipment
12. Transistor	2N3904	Used as DUT for acquisition of curve data	Tektronix Part No. 151-0190-00
13. Plotter	8-bit parallel interface; HPGL support	Used to check the plotter interface	Tektronix HC100 Centronix cable: Option 1
14. Controller	GPIB Support	Used to check the GPIB	a. Tektronix 4041 b. Tektronix 4050 series c. Hewlett-Packard 9836A
15. Bubble Memory Cassette		Used to store displayed curve data and instrument settings	Tektronix Part No. 020-1310-00
16. Test Adapter		Used to hold the DUT	Tektronix A1007
17. Extender Cables		Operate instrument with drawer unit detached.	Tektronix Part No. 067-1286-00.

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Power-Up Sequence

The performance of this instrument can be checked at any ambient temperature from +10° C to +40° C unless otherwise stated. Adjustments must be made at an ambient temperature from +15° C to +25° C for the specified tolerances to apply.

WARNING

Adjustment of the 370 should only be performed by a qualified service technician.

1. Check that the 370 has been set for the proper power source, and that a suitable power cord has been attached.

2. Remove the 370 cabinet panels to gain access to internal adjustments and test points.

   For instructions on cabinet panel removal, refer to the description under the heading COMPONENT REMOVAL AND REPLACEMENT in Section 3 of this manual.

WARNING

Use extreme care when operating the 370 with the covers removed, due to the line voltage, high voltage, and high current levels present.

3. Connect the 370 to a suitable power source.

4. Press the POWER button and allow at least 20 minutes warmup before proceeding.

Initializing the 370

The following procedure saves the power-up default 370 settings for use when the procedure calls for you to "Initialize the 370."

1. Insert a Bubble Cassette (write-protect on enable position) into the 370 Bubble Cassette receptacle until a click is heard.

2. Press the SETUP SAVE button to store the default settings in memory location 1.

   These default settings plus the manual initialization settings are used as starting settings throughout this procedure, except as noted otherwise.

3. Now, to Initialize the 370:

   a. Set the COLLECTOR SUPPLY HIGH-LOW switch to LOW.
   b. Press the SETUP RECALL button (with the MEMORY Index set to location 1.
   c. Make the additional manual settings:

   LEFT-RIGHT STANDBY ..... STANDBY
   Protective Cover ..... CLOSED

The initial manual settings are as follows:

HIGH-LOW SWITCH ..... LOW
LEFT-RIGHT-STANDBY ..... STANDBY
Protective Cover ..... CLOSED

The power-up default settings are as follows:

DISPLAY
- MODE ..... STORE
- VERTICAL ..... 2 A COLLECTOR
- HORIZONTAL ..... 2 V COLLECTOR
- INVERT ..... OFF
- MAG ..... OFF
- OFFSET ..... OFF
- ACQUIRE ..... NORM

STEP GENERATOR
- STEP/OFFSET AMPLITUDE ..... 50 nA
- NUMBER OF STEPS 5
- OFFSET ..... 0.0 nA
- POLARITY ..... +
- STEP MULTI .1X ..... OFF
- LIMIT ..... 20 mA
- PULSE ..... OFF

COLLECTOR SUPPLY
- VARIABLE 0%
- MAX PEAK VOLTS 16
- MAX PEAK POWER WATTS 0.08
- POLARITY ..... +⌒

CONFIGURATION ..... BASE STEP GEN
MEASUREMENT ..... REPEAT
AUX SUPPLY ..... 0.00 V

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A. POWER SUPPLY

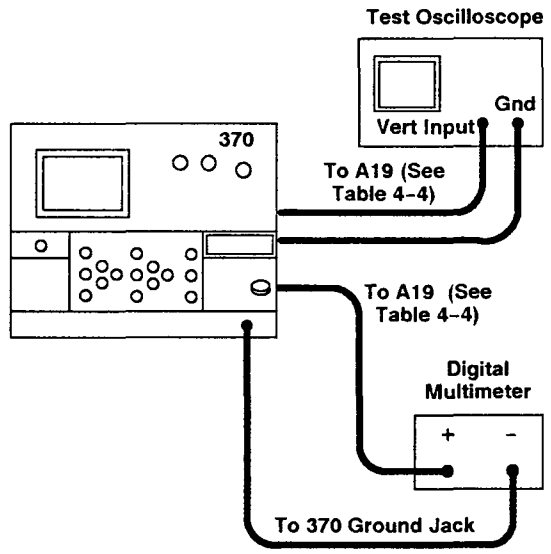
Equipment Required (see Table 4–3):	• Test Oscilloscope • Digital Multimeter

A1. Examining Voltage Deviation and Ripple

IMPORTANT:

The characteristics examined in this step are examples of typical instrument operation; *they are not specifications*.

A1 SETUP CONDITIONS



370 settings:

Initialize the 370.

Test Equipment settings:

Digital Multimeter
Mode ..... DC Voltage
Test Oscilloscope
Vertical Sensitivity ..... 20 mV/division
Time ..... 5 ms/division
Trigger ..... Auto

6065-401

NOTE

See **Test Point and Adjustment Locations 3** *in Section 7 for the location of test points for this step.*

Examining Voltage Deviation

a. Connect the digital multimeter to the +5 test point on the A19 LV Supply board.

b. **EXAMINE** the digital multimeter reading at the +5 test point and each of the other power supply test points listed in Table 4–4 for voltage levels within the given deviation.

Examining Ripple

c. Disconnect the digital multimeter and connect the test oscilloscope to the +5 test point.

d. **EXAMINE** the test oscilloscope display at each of the test points listed in Table 4–4 for ripple displays within the given deviation.

Removing the Setup

e. Disconnect the test oscilloscope.

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Table 4-4
Voltage Regulation and Ripple

Voltage	Test Point	Deviation Limits (V)	Ripple (mV)
+5 V	+5	+4.80 to +5.20	≤200
-12 V	-12	-11.4 to -12.6	≤100
+12 V	+12	+11.4 to +12.6	≤100
-6.5 V	-6.5	-6.37 to -6.63	≤50
+6.5 V	+6.5	+6.37 to +6.63	≤50

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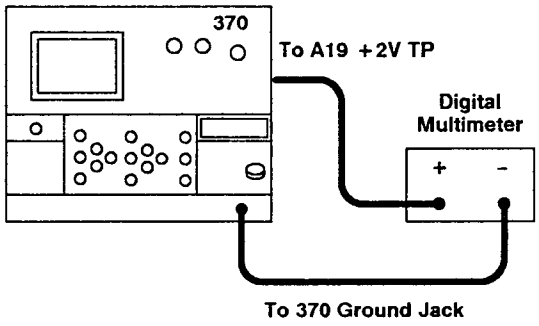
A2. Checking the +2 V Reference

Adjusting the +2 V Reference (A19R500)

Specification:

- The +2 V Reference is accurate to within 0.001 V.

A2 SETUP CONDITIONS



370 settings:

Initialize the 370.

Test Equipment settings:
Digital Multimeter
Mode ..... DC Voltage

6065-402

NOTE

See **Test Point and Adjustment Locations 3** *in Section 7 for the location of the test point and adjustment for this step.*

Checking the +2 V Reference

a. **CHECK** for a digital multimeter reading of +1.999 V to +2.001 V.

If not within these limits, the following adjustment is necessary.

Adjusting the +2 V Reference

b. **ADJUST** +2 VADJ on the A19 LV Supply Board, for a digital multimeter reading of +2.000 V.

Removing the Setup

c. Disconnect the positive lead of the digital multimeter from the test point.

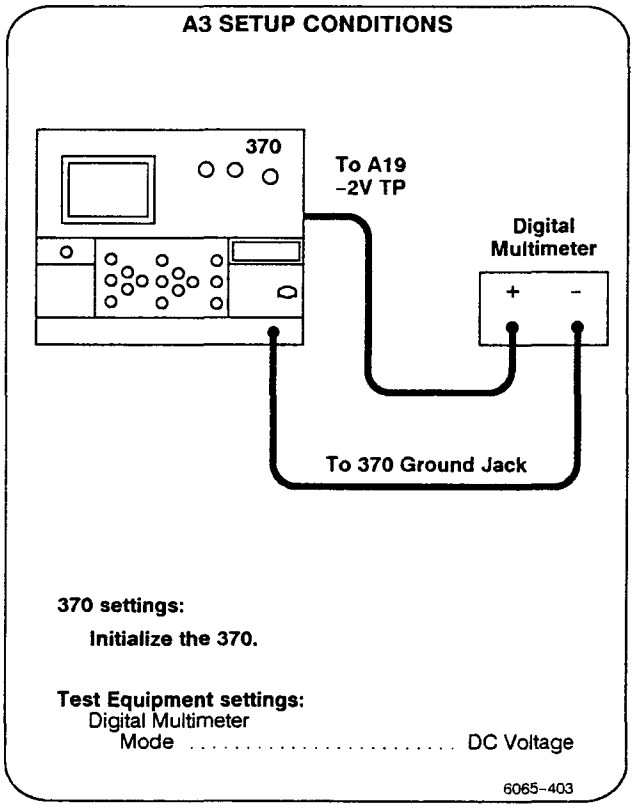
Scan by Zenith

A3. Checking the –2 V Reference

Adjusting the –2 V Reference (A19R516)

Specification:

- The –2 V Reference is accurate to within 0.001 V.



NOTE

See **Test Point and Adjustment Locations 3** *in Section 7 for the location of the test point and adjustment for this step.*

Checking the –2 V Reference

a. **CHECK** for a digital multimeter reading of –1.999 V to –2.001 V.

If not within these limits, perform part b.

Adjusting the –2 V Reference

b. **ADJUST** –2 VADJ on the A19 LV Supply Board, for a digital multimeter reading of –2.000 V.

Removing the Setup

c. Disconnect the digital multimeter leads from the 370.

Scan by Zenith

B. CRT

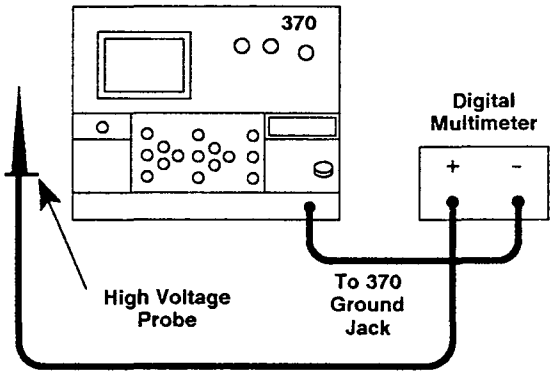
Equipment Required (see Table 4-3):	· Digital Multimeter · High Voltage Probe for Digital Multimeter · Pozidrive Screwdriver with #1 Point

B1. Examining the -2400 V Cathode Supply

IMPORTANT:

The characteristics examined in this step are examples of typical instrument operation; *they are not specifications*.

B1 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

INTENSITY
NON-STORE/
STORE ..... Full counterclockwise

Test Equipment settings:
Digital Multimeter with High Voltage Probe
Mode ..... DC Voltage

6065-404

Removing the High Voltage Shield

WARNING

To avoid electric shock hazard, be certain the 370 POWER switch is set to OFF before removing or replacing the high voltage shield and connecting the digital multimeter to the 370. Be certain that the digital multimeter ground lead is connected to the 370 ground terminal.

a. Change the following 370 setting:

POWER ..... OFF

b. Use a #1 Pozidrive screwdriver to remove the high voltage shield from the left side of the 370. (There are three shields on the left side; remove the center shield.)

Measuring the Cathode Voltage

NOTE

See **Test Point and Adjustment Locations 3** *in Section 7 for the location of the test point used in this step.*

c. Connect the negative digital multimeter lead to chassis ground, and the high voltage probe to TP400 on the A20 HV Regulator Board.

Scan by Zenith

d. Change the following 370 setting:

POWER ..... ON

e. **EXAMINE** the digital multimeter for a reading of –2352 V to –2448 V.

Disconnecting the Meter

f. Change the following 370 setting:

POWER ..... OFF

WARNING

To avoid electric shock hazard, be certain the 370 POWER switch is set to OFF before disconnecting the digital multimeter lead.

g. Disconnect the high voltage digital multimeter probe and negative lead from the 370.

Replacing the High Voltage Shield

WARNING

To avoid electric shock hazard, be certain the 370 POWER switch is set to OFF before replacing the high voltage shield.

h. Replace the high voltage shield.

i. Change the following 370 setting:

POWER ..... ON

Scan by Zenith

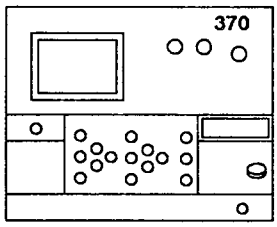
B2. Examining CRT Bias

Adjusting CRT Bias (A20R210)

IMPORTANT:

The characteristics examined in this step are provided as examples of typical instrument operation to aid in the adjustment of R210; *they are not specifications*.

B2 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

Test Equipment settings:

DISPLAY
Mode ..... NON-STORE
COLLECTOR SUPPLY
POLARITY ..... AC

6065-405

Examining CRT Bias

a. Change the following 370 settings:

INTENSITY
NON-STORE/STORE ..... Full counterclockwise
VIEW ..... Full counterclockwise
READOUT/CURSOR ..... Full counterclockwise
GRAT ILLUM ..... Full counterclockwise

b. **EXAMINE** the CRT for the displayed spot to be barely visible.

If the spot is bright or not visible at all, the following adjustment may be necessary.

Adjusting CRT Bias

NOTE

R210 can be adjusted through the access hole in the high voltage shield.

c. **ADJUST** Grid Bias adjustment R210 on the A20 HV Regulator Board until the CRT spot is barely visible.

Scan by Zenith

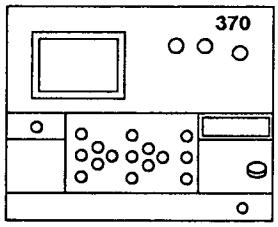
B3. Examining Astigmatism

Adjusting Astig (A18R420)

IMPORTANT:

The characteristics examined in this step are provided as examples of typical instrument operation to aid in the adjustment of R420; *they are not specifications*.

B3 SETUP CONDITIONS



370 settings:

Initialize the 370.

6065-406

Examining Astigmatism

a. Change the following 370 settings:

COLLECTOR SUPPLY
POLARITY ..... AC

A spot will appear at the center of the CRT.

FOCUS INTENSITY ..... Full counterclockwise

NON-STORE/STORE ..... Largest possible displayed spot

b. **EXAMINE** the spot for a circular shape.

If the spot is not circular, the following adjustment may be necessary.

Adjusting Astigmatism

NOTE

See **Test Point and Adjustment Locations 3** *for the location of the adjustment associated with this step.*

c. **ADJUST** Astig adjustment R420 on the A18 CRT Output Board for a circular spot shape.

Removing the Setup

d. Change the following 370 settings:

FOCUS INTENSITY ..... Clockwise for smallest possible spot

NON-STORE/STORE ..... Normal viewing

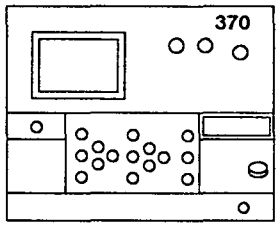
Scan by Zenith

B4. Examining NON STORE/STORE INTENSITY Operation

IMPORTANT:

The characteristics examined in this step are examples of typical instrument operation; *they are not specifications*.

B4 SETUP CONDITIONS



370 settings:

Initialize the 370.

6065-407

Examining STORE

a. **EXAMINE** the CRT for a continuous increase in spot brightness when the NON STORE/STORE INTENSITY control is turned from fully counterclockwise to fully clockwise.

Examining NON STORE

b. Change the following 370 setting:

DISPLAY
Mode ..... NON STORE

c. **EXAMINE** the CRT for a continuous increase in spot brightness as the NON STORE/STORE INTENSITY control is turned from fully counterclockwise to fully clockwise.

d. Change the following 370 setting:

INTENSITY
NON STORE/STORE ..... Normal viewing level

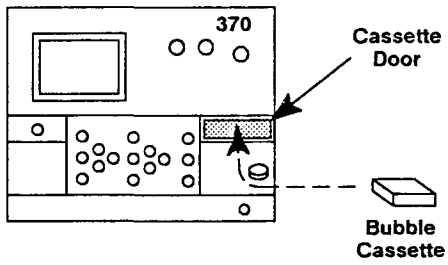
Scan by Zenith

B5. Examining VIEW INTENSITY Operation

IMPORTANT:

The characteristics examined in this step are examples of typical instrument operation; *they are not specifications*.

B5 SETUP CONDITIONS



370 settings:

Initialize the 370.

6065-408

a. Install in the 370 a bubble memory cassette containing a stored waveform.

b. Change the following 370 setting:

MEMORY
Index ..... Memory location containing the stored waveform
DISPLAY
Mode ..... VIEW

c. **EXAMINE** the CRT for a continuous increase in brightness of the viewed trace as the VIEW INTENSITY control is turned from full counterclockwise to full clockwise.

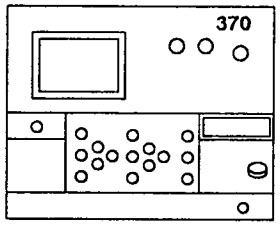
Scan by Zenith

B6. Examining READOUT/CURSOR INTENSITY Operation

IMPORTANT:

The characteristics examined in this step are examples of typical instrument operation; *they are not specifications*.

B6 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following control as indicated.

CURSOR
Mode ..... CROSS

6065-409

a. **EXAMINE** the display for a continuous increase in readout and cursor brightness as the READOUT/CURSOR INTENSITY control is turned from fully counterclockwise to fully clockwise.

b. Change the following 370 setting:

INTENSITY
READOUT/CURSOR ..... Normal viewing level

Scan by Zenith

C. DISPLAY

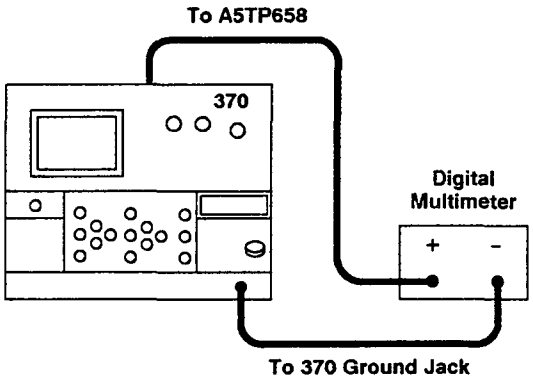
Equipment Required (see Table 4–3):	• Digital Multimeter

C1. Examining Display Offset

IMPORTANT:

The characteristics examined in this step are examples of typical instrument operation; *they are not specifications*.

C1 SETUP CONDITIONS



370 settings:

Initialize the 370.

Test Equipment settings:
Digital Multimeter
Mode ..... DC Voltage

6065-410

NOTE

See **Test Point and Adjustment Locations 1** *in Section 7 for the location of test points used in this step.*

Examining Negative Horizontal Offset

a. Change the following 370 setting:

DISPLAY
CRT CAL ..... ZERO CHK

b. **EXAMINE** the digital multimeter for a reading between −0.995 V and −1.005 V.

Examining Positive Horizontal Offset

c. Change the following 370 setting:

DISPLAY
CRT CAL ..... CAL CHK

d. **EXAMINE** the digital multimeter for a reading between +0.995 V and +1.005 V.

e. Disconnect the digital multimeter from TP658.

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Examining Negative Vertical Offset

f. Connect the digital multimeter to TP648 on the A5 Display Control Board.

g. Change the following 370 setting:

DISPLAY
CRT CAL ..... ZERO CHK

h. **EXAMINE** the digital multimeter for a reading between -0.995 V and -1.005 V.

Examining Positive Vertical Offset

i. Change the following 370 setting:

DISPLAY
CRT CAL ..... CAL CHK

j. **EXAMINE** the digital multimeter for a reading between +0.995 V and +1.005 V.

Removing the Setup

k. Change the following 370 setting:

DISPLAY
CRT CAL ..... OFF

l. Disconnect the digital multimeter from TP648.

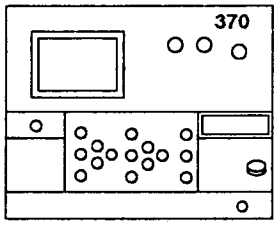
Scan by Zenith

C2. Adjusting V Zero and H Zero (A3R734 and A3R724)

IMPORTANT:

The characteristics examined in this step are provided as examples of typical instrument operation to aid in the adjustment of R734 and R724; *they are not specifications*.

C2 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

COLLECTOR SUPPLY
POLARITY ..... AC
CURSOR
Mode ..... DOT
DISPLAY
CRT CAL ..... ZERO CHECK

6065-411

Determining if Adjustment is Necessary

a. **EXAMINE** the vertical CURSOR readout for a reading that does not exceed ±0.06 A and the the horizontal CURSOR readout for a reading that does not exceed 0.06 V.

If the CURSOR readouts are not within these limits, the following adjustment is necessary.

Adjusting H Zero and V Zero

NOTE

See **Test Point and Adjustment Locations 1** *in Section 7 for the location of adjustments in this step.*

b. **ADJUST** H Zero adjustment R724 and V Zero adjustment R734 on the A3 A/D Board for a CURSOR readout of 0.00 fo r Vertical and 0.00 for Horizontal.

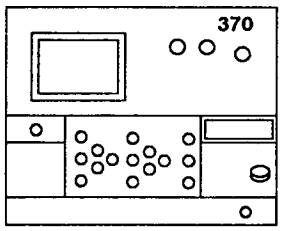
Scan by Zenith

C3. Adjusting AD Gain (A3R700)

IMPORTANT:

The characteristics examined in this step are provided as examples of typical instrument operation to aid in the adjustment of R700; *they are not specifications*.

C3 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
CRT CAL ..... ZERO CHECK
CURSOR
Mode ..... DOT

6065-412

Determining if Adjustment is Necessary

a. **EXAMINE** the vertical and horizontal CURSOR readouts for readings of 0.00 ±0.06.

If the CURSOR readouts are not within these limits, the following adjustment is necessary.

Adjusting AD Gain

NOTE

See **Test Point and Adjustment Locations 1** *in Section 7 for the location of the adjustment in this step.*

b. **ADJUST** AD Gain adjustment R700 on the A3 A/D Board for Vertical and Horizontal CURSOR readouts of 0.00.

Examining AD Gain for CAL CHK

c. Change the following 370 setting:

DISPLAY
CRT CAL ..... CAL CHK

d. **EXAMINE** the vertical and horizontal CURSOR readout for a reading of 20.00 ±0.36.

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C4. Checking Orthogonality and Geometry

Examining Store Position, Non Store Gain, and D/A Gain

Adjusting SX Position (A5R508), SY Position (A5R528), D/A Gain (A4R842), X-Gain (A5R554), Y-Gain (A5R574), Orthogonality (A5R80), Geom (A18R410)

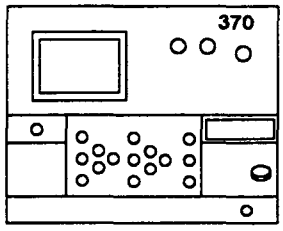
Specifications:

- Orthogonality is 90° ±0.5 minor division.
- Geometry includes two categories: (1) Tilt or bowing is no more than 0.5 minor division. (2) Keystone effect is no more than 0.75 minor division.

IMPORTANT:

Characteristics in EXAMINE steps are provided as examples of typical instrument operation to aid in adjustment; *they are not specifications*.

C4 SETUP CONDITIONS



370 settings:

None.

6065-413

NOTE

See **Test Point and Adjustment Locations 1 and 3** *in Section 7 for the location of adjustments associated with this step.*

Initiating the Test Pattern

a. Change the following 370 setting:

POWER ..... OFF

b. Hold the FAST key depressed and set the 370 POWER to ON.

This initiates the diagnostic routine. The Sony/Tektronix logo first appears, followed by the display test pattern shown in Figure 4–1.

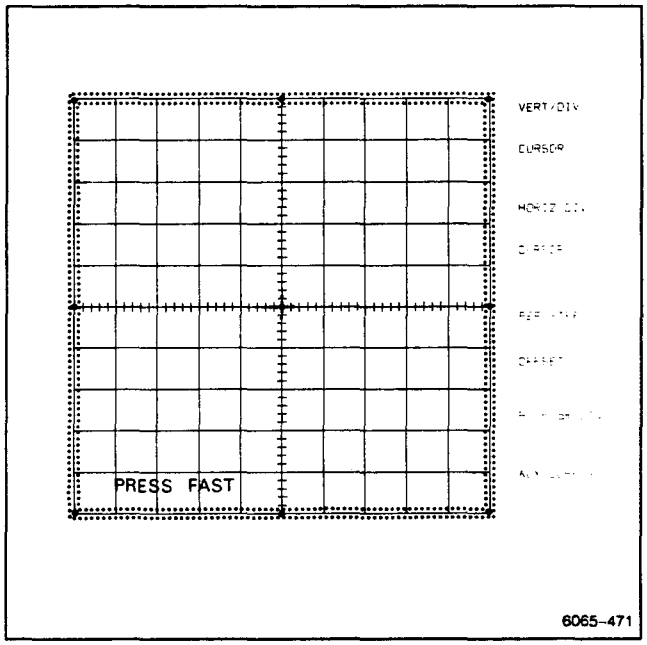


Figure 4–1. Diagnostic test pattern display.

The test pattern consists of the Frame Test Pattern overlayed over the Dot Test Pattern.

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c. Turn the GRAT ILLUM control fully clockwise for maximum brightness.

d. Set the Frame Test Pattern to the same intensity as the graticule using the Intensity READOUT/CURSOR control and set the Dot Test Pattern slightly brighten using the Intensity NON STORE/STORE control.

Examining Store Position

e. **EXAMINE** the display to determine whether the center cross mark of the Frame Test Pattern aligns with the center dot of the Dot Pattern.

If the pattern centers do not align, the following adjustments are necessary.

Adjusting SY Position and SX Position

The SX and SY Position controls change the Frame Test Pattern position without affecting the Dot Test Pattern position.

f. **ADJUST** SY Position adjustment R528 and SX Position adjustment R508 on the A5 Display Control Board so that the center cross mark of the Frame Test Pattern conforms to the center dot of the Dot Pattern (not the center of the graticule).

Examining and Adjusting D/A Gain

g. **EXAMINE** the display to determine whether the outer eight dots of the Dot Pattern are located between the inner frame and outer frame of the Frame Test Pattern.

If the location is not correct, the following adjustment is necessary.

h. **ADJUST** D/A Gain adjustment R842 on the A4 Digital Display Board to position the outer eight dots between the inner frame and outer frame of the Frame Test Pattern.

D/A Gain adjusts the size of the Frame Test Pattern without changing the Dot Test Pattern size.

Checking and Adjusting the Display

The Dot and Frame Test Patterns are visual aids for display alignment. Positioning, straightening and sizing of the display involves several adjustments. Three of these adjustments, GEOMETRY, TRACE ROTATION, and ORTHOGONALITY, are interactive.

- GEOMETRY adjusts the curvature of the sides, top and bottom of the test pattern:
- TRACE ROTATION tilts the test pattern about a pivot point approximately $2^1/_2$ divisions from the right side of the graticule on the horizontal center line.
- ORTHOGONALITY changes the test pattern shape from rhombic to rectangular.
- X-GAIN and Y-GAIN change the test pattern from rectangular to square.
- Front-panel POSITION controls change the position of the whole display.

Checking Orthogonality

i. Change the following 370 settings:

POSITION
Vertical and Horizontal ..... Position the center dot to graticule center.
TRACE ROTATION ..... Position the three intermediate horizontal dots on the center horizontal graticule line.

j. **CHECK** that the three intermediate vertical dots conform to the center vertical graticule line within 0.5 minor division.

If the dots do not conform, the following adjustment is necessary.

Adjusting Orthogonality

k. **ADJUST** Orthogonality adjustment R80 on the A5 Display Control Board so that the three intermediate vertical dots conform to the center vertical graticule line.

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Examining Non-Store Gain

l. **EXAMINE** the display to determine if the Dot Pattern's outer eight dots are positioned within the inner and outer frame patterns.

If the positioning is not correct, the following adjustment is necessary.

Adjusting X-Gain and Y-Gain

m. **ADJUST** X-Gain adjustment R554 and Y-Gain adjustment R574 on the A5 Display Control Board to position the Dot Pattern's outer eight dots within the inner and outer Frame Patterns.

Checking and Adjusting Geometry

n. Change the following 370 settings:

POSITION
Horizontal and Vertical . . . . . Position the center dot of the Dot Pattern at graticule center.

o. **CHECK** the Frame Pattern for $\leq$0.5 minor division of bowing and $\leq$0.75 minor division of keystone effect.

If the bowing and keystone effect are not within these limits, the following adjustment may be necessary.

p. **ADJUST** Geometry adjustment R410 on the A18 CRT Output Board (if necessary) for minimum display bowing.

Examining the Display for Adjustment Interaction

q. **EXAMINE** the display for all dots to be between the outer frame and inner frame of the Frame Test Pattern, within 0.5 minor division.

If not, repeat parts j through n.

r. **EXAMINE** the display for the graticule periphery to be between the outer frame and inner frame of the frame test pattern, within 0.5 minor division.

If not, repeat parts j through n.

s. **EXAMINE** the display for the center dot to be at graticule center, within 0.5 minor division.

Removing the Test Pattern

t. Press the FAST key to exit the diagnostic routine.

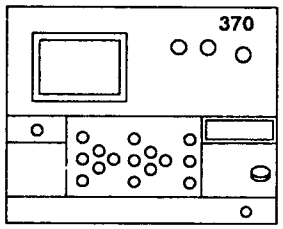
Scan by Zenith

C5. Checking DISPLAY INVERT Accuracy

Specification:

- DISPLAY INVERT for Digital Storage Vertical and Horizontal Acquisition is accurate to within 0.04 x VERT/DIV or HORIZ/DIV setting.

C5 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
CRT CAL ..... ZERO CHECK
CURSOR Mode ..... DOT

6065-414

a. Change the following 370 setting:

DISPLAY
INVERT ..... On

The indicator above the INVERT button will light.

b. **CHECK** that the spot moves from lower left corner to the upper right corner of the graticule and the vertical CURSOR readout and horizontal CURSOR readout are 0.00 ±0.08.

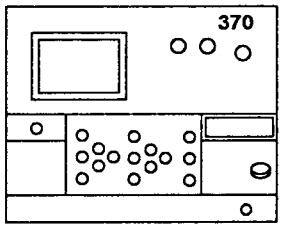
Scan by Zenith

C6. Checking DISPLAY MAG OFFSET

Specifications:

- For Digital Storage Vertical and Horizontal Acquisition, the center-line display can be vertically offset up to ten divisions in 20 half-division steps.
- DISPLAY MAG OFFSET is accurate to within (0.5% of the offset (in divisions) + 0.01 division of the setting).

C6 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
  CRT CAL ..... ZERO CHK
  MAG
    MODE ..... VERT X1
CURSOR
  Mode ..... DOT

6065-415

Checking Positive Vertical Offset

a. Change the following 370 setting:

DISPLAY
  MAG
    OFFSET INCR ..... Press the button once to move the displayed spot up 0.5 division.

b. **CHECK** that the Vertical CURSOR readout is within the limits given in Table 4-5.

c. **CHECK** that the Vertical CURSOR readout is accurate within the limits given in Table 4-5 by repeating steps a and b for each OFFSET setting in Table 4-5.

Checking Negative Vertical Offset

d. Change the following 370 settings:

COLLECTOR SUPPLY
  POLARITY ..... -
DISPLAY
  MAG
    OFFSET ..... Simultaneously press the INCR and DECR buttons.

Simultaneously pressing INCR and DECR sets OFFSET to zero.

e. Change the following 370 setting:

DISPLAY
  MAG
    OFFSET DECR ..... Press the button once to move the displayed spot down 0.5 division.

f. **CHECK** that the Vertical CURSOR readout is within the limits given in Table 4-5.

g. **CHECK** that the Vertical CURSOR readout is accurate within the limits given in Table 4-5 by repeating steps e and f for each OFFSET setting in Table 4-5.

0.01 × setting = 0.01 × 2 = 0.02
0.5% of offset × 2

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Table 4-5
Offset Accuracy

DISPLAY OFFSET (vertical or horizontal divisions)	Vertical CURSOR Readout Limits (±)	Horizontal CURSOR Readout Limits (±)
0.5	0.02 A	0.02 V 0.025
1.0	0.02 A	0.02 V 0.03
1.5	0.02 A	0.02 V 0.035
2.0	0.04 A	0.04 V 0.04
2.5	0.04 A	0.04 V 0.045
3.0	0.04 A	0.04 V 0.05
3.5	0.04 A	0.04 V 0.055
4.0	0.04 A	0.04 V 0.06
4.5	0.04 A	0.04 V 0.065
5.0	0.04 A	0.04 V 0.07
5.5	0.04 A	0.04 V 0.075
6.0	0.06 A	0.06 V 0.08
6.5	0.06 A	0.06 V 0.085
7.0	0.06 A	0.06 V 0.09
7.5	0.06 A	0.06 V 0.095
8.0	0.06 A	0.06 V 0.1
8.5	0.06 A	0.06 V 0.105
9.0	0.06 A	0.06 V 0.11
9.5	0.06 A	0.06 V 0.115
10	0.08 A	0.08 V 0.12

0.02 0.03 0.04 0.06 0.08 0.1 0.12

offs hol hol /J.J

(0.5 * 0.5% + 0.01) X 2 = 0.025
(1 x 0.5% + 0.01) x 2 = 0.03
(1.5 ± 0.5% + 0.01) x 2 = 0.035

(9.5 ± 0.5% + 0.01) x 2 = 0.115

Checking Negative Horizontal Offset

h. Change the following 370 settings:

DISPLAY
MAG
MODE ..... HORIZ X1
OFFSET ..... Simultaneously press the INCR and DECR buttons.

OFFSET is now reset to zero.

i. Change the following 370 setting:

DISPLAY
MAG
OFFSET DECR ..... Press the DECR button once to move the displayed spot 0.5 division to the left.

j. **CHECK** that the Horizontal CURSOR readout is within the limits given in Table 4-5.

k. **CHECK** that the Horizontal CURSOR readout is accurate within the limits given in Table 4-5 by repeating steps i and j for each OFFSET setting in Table 4-5.

Checking Positive Horizontal Offset

l. Change the following 370 settings:

COLLECTOR SUPPLY
POLARITY ..... +
DISPLAY
MAG OFFSET ..... Simultaneously press the INCR and DECR buttons.

OFFSET is reset to zero.

m. Change the following 370 setting:

DISPLAY
MAG
OFFSET INCR ..... Press the INCR button once to move the displayed spot 0.5 division to the right.

n. **CHECK** that the Horizontal CURSOR readout is within the limits given in Table 4-5.

o. **CHECK** that the Horizontal CURSOR readout is accurate within the limits given in Table 4-5 by repeating steps m and n for each OFFSET setting in Table 4-5.

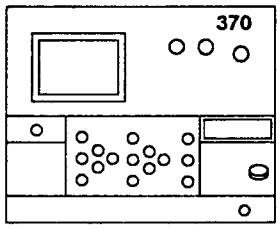
Scan by Zenith

C7. Checking DISPLAY MAG X10 Accuracy

Specification:

- OFFSET with DISPLAY MAG set to X10 is accurate to within (0.5% of the readout + 0.3 division of the setting).

C7 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
MAG MODE ..... HORIZ X10
CRT CAL ..... ZERO CHK
COLLECTOR SUPPLY
POLARITY ..... AC
CURSOR ..... DOT

6065-416

Checking Offset for HORIZ X10

a. Change the following 370 setting:

DISPLAY
MAG
OFFSET INCR ..... Press the INCR button once to position the spot 5 divisions to the right of graticule center.

b. Note the horizontal CURSOR readout.

c. Change the following 370 setting:

DISPLAY
MAG
OFFSET DECR ..... Press the DECR button twice to move the spot 10 divisions to the left.

d. **CHECK** that the difference between the Horizontal CURSOR reading in step b and the current reading is $\leq$60 mV.

Checking Offset for VERT X10

e. Change the following 370 settings:

DISPLAY
MODE ..... VERT X10
MAG
OFFSET ..... Simultaneously press the INCR and DECR buttons.

Offset will be reset to zero.

f. Change the following 370 setting:

DISPLAY
MAG
OFFSET INCR .... Press the INCR button once to move the spot up 5 divisions.

g. Note the vertical CURSOR readout.

h. Press the DISPLAY MAG OFFSET DECR key twice to reposition the spot down 10 divisions.

i. **CHECK** that the difference between the vertical CURSOR reading in part g and the current reading is $\leq$60 mA.

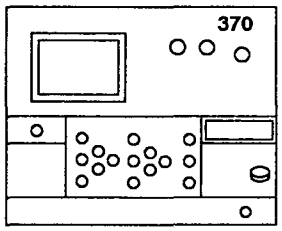
Scan by Zenith

C8. Examining ACQ MODE Operation

IMPORTANT:

The characteristics examined in this step are examples of typical instrument operation; *they are not specifications*.

C8 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following control as indicated.

DISPLAY
ACQ MODE ..... AVG 4

6065-417

Examining AVG 4 and AVG 32

a. **EXAMINE** the upper right corner of the display for the Average Count readout to appear and count up from 1 to 4.

b. Change the following 370 setting:

DISPLAY
ACQ MODE ..... AVG 32

c. **EXAMINE** the upper right corner of the display for the Average Count readout to appear and count up from 1 to 32.

Examining ENV VERT and ENV HORIZ

d. Change the following 370 setting:

DISPLAY
ACQ MODE ..... ENV VERT

e. **EXAMINE** the area to the left of the ENV VERT switch position for the ENV VERT indicator to be lit.

f. Change the following 370 setting:

DISPLAY
ACQ MODE ..... ENV HORIZ

g. **EXAMINE** the area to the left of the ENV HORIZ switch position for the ENV HORIZ indicator to be lit.

Scan by Zenith

D. HORIZONTAL

Equipment Required (see Table 4-3):

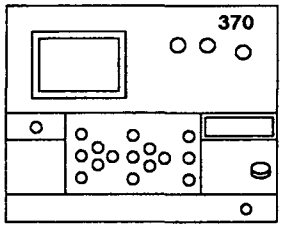
- DC Voltage Source
- 1 MΩ, 5%, 0.25 W Resistor
- 10 MΩ, 5%, 0.25 W Resistor

D1. Adjusting H Zero (A10R460)

IMPORTANT:

The characteristics examined in this step are provided as examples of typical instrument operation to aid in the adjustment of R460; *they are not specifications.*

D1 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following control as indicated.

CURSOR
Mode ..... DOT

6065-418

Determining if Adjustment is Necessary

a. **EXAMINE** the horizontal CURSOR readout for a reading of 0.0 ±1.0 V when DISPLAY HORIZONTAL VOLTS/DIV is set to 50 V and 0.0 ±2.0 V when DISPLAY HORIZONTAL VOLTS/DIV is set to 200 V. Ignore short-term changes in the readout.

If the reading is not within these limits, the following adjustment is necessary.

Adjusting H Zero

NOTE

See **Test Point and Adjustment Locations 2** *in Section 7 for the location of the adjustment for this step.*

b. **ADJUST** H Zero adjustment R460 on the A10 Sense Board for a horizontal CURSOR readout of 0.00 V when HORIZONTAL VOLTS/DIV is set to 200 V and 50 V.

A cutout in the right side rail provides adjustment access.

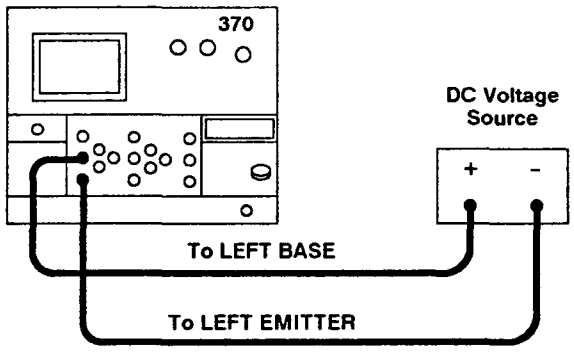
Scan by Zenith

D2. Checking HORIZONTAL BASE/EMITTER Accuracy and Range in STORE DISPLAY Mode

Specifications:

- The range of HORIZONTAL BASE/EMITTER selections in STORE DISPLAY mode is from 50 mV to 2 V in a 1-2-5 sequence of six steps.
- The BASE/EMITTER settings are accurate to within 1.5% of the readout + 0.03 division of the setting.

D2 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
HORIZONTAL
VOLTS/DIV ..... 50 mV BASE/EMITTER
COLLECTOR SUPPLY
POLARITY ..... +DC
MAX PEAK VOLTS 400
CURSOR
Mode ..... DOT
CONFIGURATION ..... BASE OPEN (EXT)
Protective Cover ..... Removed

Test Equipment settings:

DC Voltage Source
Mode ..... DC Voltage
Voltage ..... 0.00 V

6065-419

NOTE

Disregard the flashing cursor on the 370 display.

Checking Base/Emitter Accuracy

a. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... LEFT

b. **CHECK** that the horizontal CURSOR readout is within the CURSOR Readout limits for each HORIZONTAL (BASE/EMITTER) VOLTS/DIV and DC Voltage setting listed in Table 4-6.

There are two DC Voltage values given for each HORIZONTAL VOLTS/DIV setting in Table 4-6; check for both.

Table 4-6
Base/Emitter Voltage Accuracy

HORIZONTAL VOLTS/DIV Setting	DC Voltage Source	Horizontal CURSOR Readout
50 mV	0.000 mV	±1.5 mV
	500.0 mV	491 to 509 mV
100 mV	0.000 mV	±3 mV
	1000 mV	982 to 1018 mV
200 mV	0.000 mV	±6 mV
	2000 mV	1964 to 2036 mV
500 mV	0.000 mV	±15 mV
	5000 mV	4910 to 5090 mV
1 V	0.00 V	±30 mV
	10.00 V	9.82 to 10.18 V
2 V	0.00 V	±60 mV
	20.00 V	19.64 to 20.36 V

Scan by Zenith

Removing the Setup

c. Change the following Test Equipment setting:

DC Voltage Source
Output ..... Standby

d. Disconnect the DC voltage source leads from the 370.

NOTE

The next step is also be performed with the Protective Cover removed. If the next step will not be performed, replace the Protective Cover now.

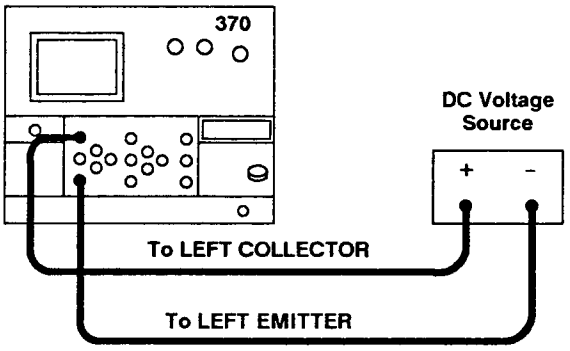
Scan by Zenith

D3. Checking COLLECTOR Voltage Accuracy and Range in STORE DISPLAY Mode

Specifications:

- The range of HORIZONTAL COLLECTOR settings in STORE DISPLAY mode is from 50 mV/div to 500 V/div in a 1-2-5 sequence of 21 steps.
- The HORIZONTAL COLLECTOR settings are accurate to within 1.5% of the readout + 0.03 division of the setting.

D3 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
  HORIZONTAL
    VOLTS/DIV ..... 50 mV COLLECTOR
COLLECTOR SUPPLY
  MAX PEAK VOLTS 400
CURSOR
  Mode ..... DOT
Protective Cover ..... Removed
LEFT-RIGHT-STANDBY ..... LEFT

Test Equipment settings:

DC Voltage Source
  Mode ..... DC Voltage
  Voltage ..... 0.00 V

6065-420

WARNING

Extreme caution must be used when performing the following step due to the dangerous potentials present at the input of the 370.

Checking Collector Voltage Accuracy

a. **CHECK** that the horizontal CURSOR readout is within the CURSOR Readout limits for each HORIZONTAL CURRENT VOLTS/DIV and DC Voltage setting listed in Table 4-7.

There are two DC Voltage values given for each HORIZONTAL VOLTS/DIV setting in Table 4-7; check for both.

Removing the Setup

b. Change the following 370 settings:

LEFT-RIGHT-STANDBY ..... STANDBY
COLLECTOR SUPPLY
  LOW-HIGH ..... LOW

c. Change the following test equipment settings:

DC Voltage Source
  Voltage ..... 0.00 V
  Output ..... Standby

WARNING

Be certain that the output of the DC voltage source is set to Off or Standby before connecting or disconnecting the test leads.

d. Disconnect the DC voltage source leads from the 370.

e. Replace the Protective Cover on the 370.

Scan by Zenith

Table 4–7
Collector Voltage Accuracy

HORIZONTAL VOLTS/DIV Setting	DC Voltage Source	Horizontal CURSOR Readout
50 mV	0.00 mV	±1.5 mV
	500.0 mV	491 to 509 mV
100 mV	0.00 mV	±3 mV
	1000 mV	982 to 1018 mV
200 mV	0.00 mV	±6 mV
	2000 mV	1964 to 2036 mV
500 mV	0.00 mV	±15 mV
	5000 mV	4910 to 5090 mV
1 V	0.00 mV	±0.03 V
	10.00 V	9.82 to 10.18 V
2 V	0.00 mV	±0.06 V
	20.00 V	19.64 to 20.36 V
5 V	0.00 mV	±0.15 V
	50.00 V	49.10 to 50.90 V
10 V	0.00 mV	±0.3 V
	100.0 V	98.2 to 101.8 V
20 V	0.00 mV	±0.6 V
	200.0 V	196.4 to 203.6 V
50 V	0.00 mV	±1.5 V
	500.0 V	491.0 to 509.0 V
100 V	0.00 mV	±3 V
	1000 V	982 to 1018 V
200 V	0.00 mV	±6 V
	1000 V	978 to 1022 V
500 V	0.00 mV	±15 V
	1000 V	975 to 1025 V

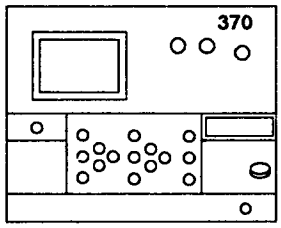
Scan by Zenith

D4. Checking Displayed Noise for NON STORE COLLECTOR Settings

Specification:

- Displayed noise (peak-peak) for each COLLECTOR SUPPLY MAX PEAK VOLTS setting is no more than 2 mV for 16, 10 mV for 80, 50 mV for 400, and 250 mV for 2000.

D4 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
Mode ..... NON-STORE
MAG MODE ..... HORIZ X10
HORIZONTAL
VOLTS/DIV ..... 5 mV COLLECTOR
COLLECTOR SUPPLY
POLARITY ..... AC
MAX PEAK POWER WATTS 220
VARIABLE 0%
HIGH-LOW ..... LOW
Protective Cover ..... Closed

6065-421

Checking Noise at 16 MAX PEAK VOLTS

a. **CHECK** that the spot width is no more than 2 mV (2 minor divisions) peak-peak (see Table 4-8).

Table 4-8
Displayed Horizontal Noise

COLLECTOR SUPPLY MAX PEAK VOLTS	Horizontal Spot Width (Noise)
16	2 mV (2 minor div)
80	10 mV (2 div)
400	50 mV (10 div)
2000	250 mV (5 div)

Checking Noise at 80 MAX PEAK VOLTS

b. Change the following 370 setting:

MAX PEAK VOLTS 80

c. **CHECK** that the spot width is no more than 10 mV (2 divisions) peak-peak (see Table 4-8).

Checking Noise at 400 MAX PEAK VOLTS

d. Change the following 370 setting:

MAX PEAK VOLTS 400

e. **CHECK** that the spot width is no more than 50 mV (10 divisions) peak-peak (see Table 4-8).

Checking Noise at 2000 MAX PEAK VOLTS

f. Change the following 370 settings:

DISPLAY
MAG MODE ..... OFF
COLLECTOR SUPPLY
HIGH-LOW ..... HIGH
DISPLAY
HORIZONTAL VOLTS/DIV ..... 50 mV

g. **CHECK** that the spot width is no more than 250 mV (5 divisions) peak-peak (see Table 4-8).

Removing the Setup

h. Change the following 370 setting:

COLLECTOR SUPPLY
HIGH-LOW ..... LOW

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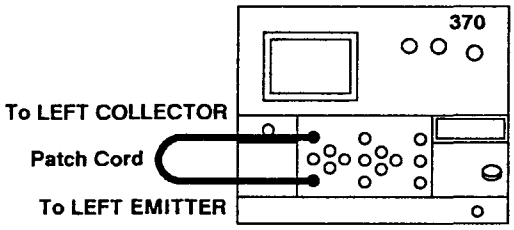
D5. Checking Step Generator Display Accuracy

Specification:

- The displayed step generator steps are located within 0.3 division of the graticule lines.

D5 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated. .

DISPLAY
Mode ..... NON-STORE
HORIZONTAL VOLTS/DIV ..... STEP GEN
VERTICAL CURRENT/DIV . 2 mA COLLECTOR
STEP GENERATOR
NUMBER OF STEPS 10
LEFT-RIGHT-STANDBY ..... LEFT

6065-424

Checking Accuracy

a. Close the Protective Cover.

b. Change the following 370 setting:

COLLECTOR SUPPLY
VARIABLE ..... Rotate clockwise until the tallest trace reaches the top graticule line.

c. **CHECK** that the top of each displayed trace is within 0.3 division of a graticule line.

Removing the Setup

d. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... STANDBY

e. Remove the patch cord and close the Protective Cover.

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E. VERTICAL

Equipment Required (see Table 4–3):

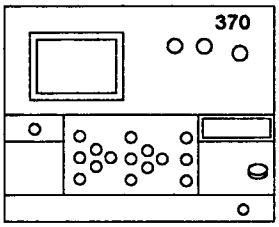
- Precision Voltage Source
- Precision Current Source
- Resistor: 25 MΩ, 0.1%, 0.5 W
- Resistor: 2.5 MΩ, 0.1%, 0.5 W
- Resistor: 250 kΩ, 0.1%, 0.5 W
- Resistor: 0.1 Ω, 0.1%, 10 W

E1. Adjusting V Zero (A10R250)

IMPORTANT:

The characteristics examined in this step are provided as examples of typical instrument operation to aid in the adjustment of R250; *they are not specifications.*

E1 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
MAG MODE ..... VERT X10
VERTICAL
CURRENT/DIV ..... 200 mA COLLECTOR
COLLECTOR SUPPLY
POLARITY ..... AC
CURSOR Mode ..... DOT

6065-425

Determining if Adjustment is Necessary

a. Rotate the LOOPING COMPENSATION control fully clockwise.

b. **EXAMINE** the vertical CURSOR readout for a reading within the limits given in Table 4–9 when the VERTICAL CURRENT/DIV control is set to 200, 100, and 50 mA.

If the readout is not within these limits, the following adjustment is necessary.

Adjusting V Zero

NOTE

*See **Test Point and Adjustment Locations 2** in Section 7 for the location of the adjustment for this step.*

c. **ADJUST** V Zero adjustment R250 on the A10 Sense Board; for a vertical CURSOR readout of 20 mA or less when the VERTICAL CURRENT/DIV control is rotated between 200 mA and 50 mA.

The adjustment is accessible through the right lower rail cutout.

Scan by Zenith

Table 4–9
Vertical Zero Check

VERTICAL CURRENT/DIV Setting	Vertical CURSOR Readout
200 mA	0.0 ±6 mA
100 mA	0.0 ±3 mA
50 mA	0.0 ±1.5 mA

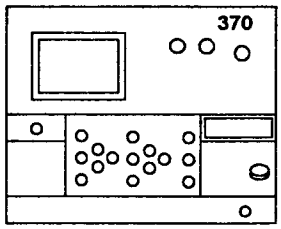
Scan by Zenith

E2. Adjusting Looping Balance (A10R238)

IMPORTANT:

The characteristics examined in this step are provided as examples of typical instrument operation to aid in the adjustment of R238; *they are not specifications*.

E2. SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
VERTICAL
CURRENT/DIV ..... 1 A COLLECTOR
MAG MODE ..... VERT X10
COLLECTOR SUPPLY
POLARITY ..... AC
CURSOR Mode ..... DOT
CONFIGURATION ..... BASE OPEN

6065-426

Determining if Adjustment is Necessary

a. Set the LOOPING COMPENSATION control fully counterclockwise.

b. **EXAMINE** the vertical CURSOR readout for a reading of ≤10 mA.

If the readout is not within these limits, the following adjustment may be necessary.

Adjusting Looping Compensation

NOTE

See Test Point and Adjustment Locations 2 in Section 7 for the location of the adjustment associated with this step.

c. **ADJUST** Looping Balance adjustment R238 on the A10 Sense Board; for a vertical CURSOR readout of 0.00 mA.

Removing the Setup

d. Set the LOOPING COMPENSATION control to midrange.

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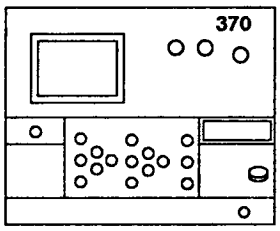
E3. Adjusting Leakage Compensation (A10R270)

IMPORTANT:

The characteristics examined in this step are provided as examples of typical instrument operation to aid in the adjustment of R270; they are not specifications.

E3 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
VERTICAL
CURRENT/DIV . . . . . 1 µA COLLECTOR
COLLECTOR SUPPLY
POLARITY . . . . . + LEAKAGE
CURSOR Mode . . . . . DOT
CONFIGURATION . . . . . BASE OPEN
LOOPING COMPENSATION . . . . . Midrange

6065-427

Determining if Adjustment is Necessary

a. **EXAMINE** the Vertical CURSOR readout for a reading of 0.00 nA ±0.03 nA.

If the readout is not within these limits, the following adjustment is necessary. Otherwise, proceed to the next step.

Adjusting Leakage Compensation

NOTE

*See **Test Point and Adjustment Locations 2** in Section 7 for the location of the adjustment associated with this step.*

b. **ADJUST** Leakage Comp adjustment R270 on the A10 Sense Board; for a Vertical CURSOR readout of 0.00 nA.

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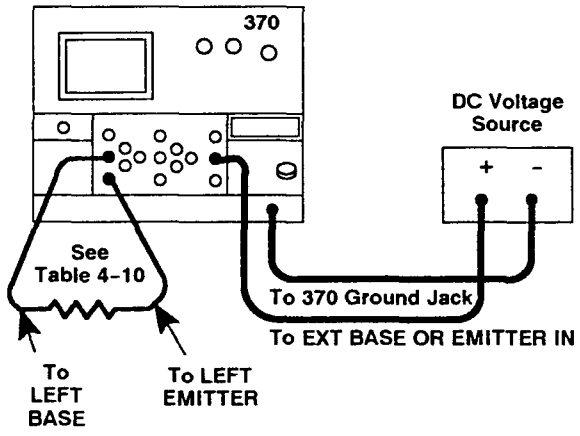
E4. Checking STORE Mode EMITTER CURRENT/DIV Accuracy and Range

Specifications:

- STORE mode EMITTER CURRENT/DIV settings are accurate to within 1.5% of the readout + 0.03 division of the setting + 1 nA.
- The range of STORE mode EMITTER CURRENT/DIV settings is between 1 μA/division and 2 A/division in a 1-2-5 sequence of 20 steps.

E4 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

COLLECTOR SUPPLY
  POLARITY ..... + LEAKAGE
DISPLAY
  HORIZONTAL
    VOLTS/DIV ..... 100 V COLLECTOR
  VERTICAL
    CURRENT/DIV ..... 1 nA EMITTER
STEP GENERATOR
  STEP/OFFSET AMPLITUDE ..... 500 mV
  NUMBER OF STEPS 0
CONFIGURATION ..... BASE OPEN
CURSOR
  Mode ..... DOT
Protective Cover ..... Closed

Test Equipment settings:
Precision Voltage Source:
  Mode ..... DC Volts
  Output ..... 0.000 V

6065-428

Checking 1 nA to 5 nA with 25 MΩ

a. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... LEFT

b. **CHECK** that the vertical CURSOR readout is within the limits listed in Table 4-10 for each combination of VERTICAL CURRENT/DIV setting and Precision Voltage Source for 25 MΩ of resistance.

Checking 10 nA to 50 nA with 2.5 MΩ

c. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... STANDBY

d. Open the Protective Cover and remove the 25 MΩ resistor.

e. Connect the 2.5 MΩ resistor to the Left Base and Left Emitter jacks.

f. Close the Protective Cover.

g. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... LEFT

h. **CHECK** that the vertical CURSOR readout is within the limits listed in Table 4-10 for each combination of VERTICAL CURRENT/DIV setting and Precision Voltage Source for 2.5 MΩ of resistance.

Checking 100 nA to 500 nA with 250 kΩ

i. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... STANDBY

j. Open the Protective Cover and remove the 2.5 MΩ resistor.

k. Connect the 250 kΩ resistor to the Left Base and Left Emitter jacks.

l. Close the Protective Cover.

m. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... LEFT

n. **CHECK** that the vertical CURSOR readout is within the limits listed in Table 4-10 for each combination of

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VERTICAL CURRENT/DIV setting and Precision Voltage Source for 250 kΩ of resistance.

Removing the Setup

o. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... STANDBY

p. Open the Protective Cover and remove the resistor.

q. Disconnect the DC voltage source from the 370.

r. Close the Protective Cover.

Table 4-10
Emitter Current Accuracy

Resistor	VERTICAL CURRENT/DIV Setting	Precision Voltage Source (V)	Vertical CURSOR Readout (nA)
25 MΩ	1 nA	0.000	0.00 ± 1.03
		0.500	8.82 to 11.18
	2 nA	0.000	0.00 ± 1.06
		1.000	18.64 to 21.36
	5 nA	0.000	0.00 ± 1.75 1.15
		2.500	48.10 to 51.90
2.5 MΩ	10 nA	0.000	0.0 ± 1.3
		0.500	97.2 to 102.8
	20 nA	0.000	0.0 ± 1.6
		1.000	195.4 to 204.6
	50 nA	0.000	0.0 ± 2.5
		2.500	490.0 to 510.0
250 kΩ	100 nA	0.000	0 ± 4
		0.500	981 to 1019
	200 nA	0.000	0 ± 6 7
		1.000	1964 to 2036 37
	500 nA	0.000	0 ± 15 16
		2.500	4910 to 5090 91

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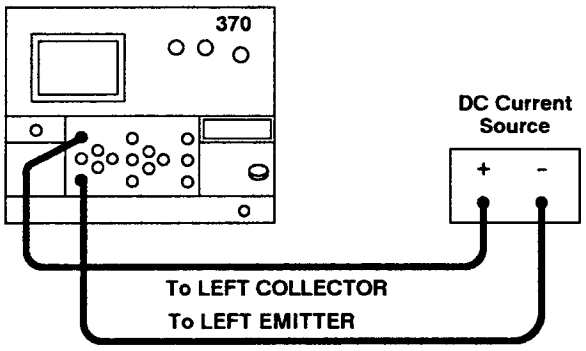
E5a. Checking STORE Mode COLLECTOR CURRENT/DIV Accuracy and Range

Specifications:

- STORE mode COLLECTOR CURRENT/DIV settings are accurate to within 1.5% of the readout + 0.03 division of the setting.
- The range of STORE mode COLLECTOR CURRENT/DIV settings is from 1 μA/division to 2 A/division in a 1-2-5 sequence of 20 steps.

E5a SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
  VERTICAL
    CURRENT/DIV ..... 1 μA COLLECTOR
  HORIZONTAL
    VOLTS/DIV ..... 100 V COLLECTOR
COLLECTOR SUPPLY
  POLARITY ..... -
  MAX PEAK POWER WATTS 220
CURSOR
  Mode ..... DOT
LEFT-RIGHT-STANDBY ..... LEFT

Test Equipment settings:

Current Source
  Mode ..... DC Current
  Output 0.00

6065-429

a. **CHECK** that each setting of the VERTICAL CURRENT/DIV control listed in Table 4-11 produces a vertical CURSOR readout within the limits given for a Current Source setting of 0.00 μA (open circuit).

b. Change the following test equipment setting:

Current Source
  Output ..... 10.00 μA

c. **CHECK** that each combination of VERTICAL CURRENT/DIV and Current Source settings listed in Table 4-11 produces a vertical CURSOR readout within the given limits.

Removing the Setup

d. Change the following test equipment setting:

Current Source
  Output ..... 0.00 μA

e. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... STANDBY

f. Disconnect the DC current source from the 370.

g. Close the protective cover.

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Table 4–11
Collector Current/DIV Accuracy

VERTICAL CURRENT/ DIV	Current Source	Vertical CURSOR Readout
1 µA	0.00 µA	±0.03 µA
	10.00 µA	-9.82 to -10.18 µA
2 µA	0.00 µA	±0.06 µA
	20.00 µA	-19.64 to -20.36 µA
5 µA	0.00 µA	±0.15 µA
	50.00 µA	-49.10 to -50.90 µA
10 µA	0.00 µA	±0.3 µA
	100.0 µA	-98.2 to -101.8 µA
20 µA	0.00 µA	±0.6 µA
	200.0 µA	-196.4 to -203.6 µA
50 µA	0.00 µA	±1.5 µA
	500.0 µA	-491.0 to -509.0 µA
100 µA	0.00 µA	±3 µA
	1000 µA	-982 to -1018 µA
200 µA	0.00 µA	±6 µA
	2000 µA	-1964 to -2036 µA
500 µA	0.00 µA	±15 µA
	5000 µA	-4910 to -5090 µA
1 mA	0.00 µA	±0.03 mA
	10.00 mA	-9.82 to -10.18 mA
2 mA	0.00 µA	±0.06 mA
	20.00 mA	-19.64 to -20.36 mA
5 mA	0.00 µA	±0.15 mA
	50.00 mA	-49.10 to -50.90 mA
10 mA	0.00 µA	±0.3 mA
	100.0 mA	-98.2 to -101.8 mA
20 mA	0.00 µA	±0.6 mA
	200.0 mA	-196.4 to -203.6 mA

Table 4–11 (Cont.)
Collector Current/DIV Accuracy

VERTICAL CURRENT/ DIV	Current Source	Vertical CURSOR Readout
50 mA	0.00 µA	±1.5 mA
	500.0 mA	-491.0 to -509.0 mA
100 mA	0.00 µA	±3 mA
	1000 mA	-982 to -1018 mA
200 mA	0.00 µA	±6 mA
	1999 mA	-1963 to -2035 mA
500 mA	0.00 µA	±15 mA
	1999 mA	-1954 to -2044 mA
1 A	0.00 µA	±0.03 A
	1.999 A	-1.94 to -2.06 A
2 A	0.00 µA	±0.06 A
	1.999 A	-1.91 to -2.09 A

Scan by Zenith

E5b. Checking STORE mode COLLECTOR CURRENT/DIV Accuracy for 500 mA/div through 2A/div (Alternate method)

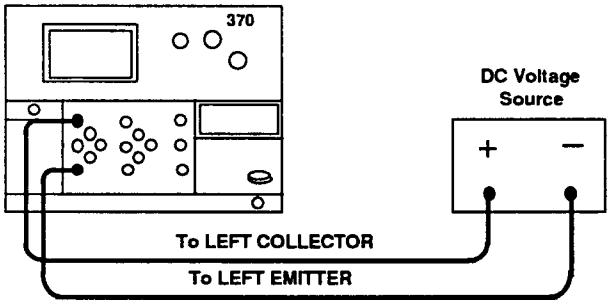
Specification:

See step E5a for accuracy and range specifications.

NOTE

This step is recommended for full scale measurement of CURRENT/DIV settings greater than 500mA/div.

E5b SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY	
MAG MODE	HORIZ X 10
VERTICAL	
CURRENT/DIV	500 mA COLLECTOR
HORIZONTAL	
VOLTS/DIV	5 mV COLLECTOR
ACQ MOD	AVG4
COLLECTOR SUPPLY	
POLARITY	+ DC
MAX PEAK VOLTS	400
CURSOR	
Mode	Dot
Protective cover	Open

Test equipment settings:

Precision Voltage Source	
Mode	DC Voltage
Output	125 mV

Checking Accuracy

a. Change the following 370 setting:

LEFT-RIGHT-STANDBY	LEFT
MAG OFFSET	Press the INCR button to move the dot to the center vertical graticule line.

b. Note the Horizontal CURSOR readout.

c. Change the following 370 and Test Equipment settings:

Precision Voltage Source	
Output	250 mV
370	
MAG OFFSET	Press the DECR button to move the dot to the center vertical graticule line.

d. Note the Horizontal CURSOR readout.

e. Change the following 370 and Test Equipment settings:

370	
COLLECTOR SUPPLY	
MAX PEAK VOLTS	16
MAX PEAK POWER WATTS	220
HORIZ MAG	X 1
Precision Voltage Source	
Output	Standby

f. Disconnect the Precision Voltage Source.

g. Connect the 0.025 Ω resistor as shown in Figure 4-2, then close the Protective cover.

h. Change the following 370 settings:

COLLECTOR SUPPLY	
VARIABLE	Clockwise until the Horizontal CURSOR readout is the nearest as that noted in part b of this step. (Difference value should be within ± 0.50 mV).

i. CHECK that the Vertical CURSOR readout is within the range of 4910 to 5090 mA.

Scan by Zenith

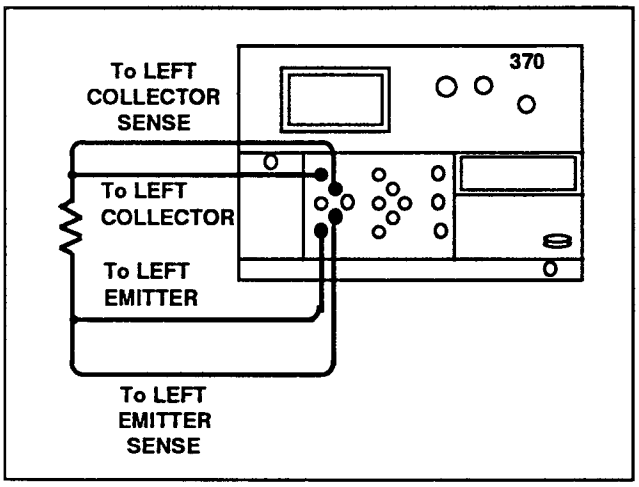


Figure 4-2. Resistor connection for checking accuracy.

Checking 1 A/div Accuracy

j. Change the following 370 settings:

DISPLAY
VERTICAL
CURRENT/DIV 1A COLLECTOR
COLLECTOR SUPPLY
VARIABLE Clockwise until the Horizontal CURSOR readout is the nearest as that noted in part d of this step. (Difference value should be within ± 0.50 mV).

k. Check that the Vertical CURSOR readout is within the range of 9.82 to 10.18 A.

l. Change the following 370 settings:

DISPLAY
VERTICAL
CURRENT/DIV 2A COLLECTOR
COLLECTOR SUPPLY
VARIABLE Clockwise until the Horizontal CURSOR readout is the nearest as that noted in part d of this step. (Difference value should be within ±0.50 mV).

m. Check that the Vertical CURSOR readout is within the range of 9.79 to 10.21 A.

Removing the Setup

n. Change the following 370 setting:

LEFT-RIGHT-STANDBY STANDBY

o. Open the Protective Cover

WARNING

The resistor may be too hot to handle due to high current levels. To avoid injury, wait a few moments before removing the resistor.

p. Remove the resistor.

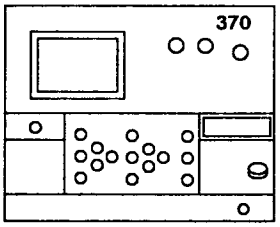
Scan by Zenith

E6. Checking Step Generator Display Accuracy and Range (Without Multiplier)

Specification:

- The step generator display is accurate to within 0.3 division of the graticule lines.
- Range of the step generator display is 1 step/division (without VERT X10 MAG MODE and without STEP GENERATOR STEP MULTI .1X).

E6 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
  Mode ..... NON-STORE
  HORIZONTAL
    VOLTS/DIV ..... 1 V COLLECTOR
  VERTICAL
    CURRENT/DIV ..... STEP GEN
STEP GENERATOR
  NUMBER OF STEPS 10
Protective cover ..... Closed

6065-433

a. Change the following 370 settings:

COLLECTOR SUPPLY
  VARIABLE ..... Extend the longest trace to the right graticule edge
INTENSITY ..... Set as necessary

b. **CHECK** that the other traces do not deviate from the horizontal graticule lines by more than 0.3 division.

Scan by Zenith

F. STEP GENERATOR

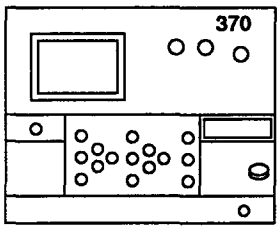
Equipment Required (see Table 4-3):

- Digital Multimeter
- Resistor, 10 MΩ, 5%, 0.25 W
- Resistor, 1 MΩ, 5%, 0.5 W
- Resistor, 100 kΩ, 0.1%, 0.125 W
- Resistor, 10 kΩ, 0.1%, 0.125 W
- Resistor, 1 kΩ, 0.1%, 0.125 W
- Resistor, 100 Ω, 0.1%, 0.125 W
- Resistor, 1.0 Ω, 0.1%, 3 W

F1. Adjusting Step Generator Zero

Adjusting Current Zero (A7R603 for serial number 300399 and up)

F1 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
Mode ..... NON-STORE
MAG ..... X10 HORIZ
HORIZONTAL
VOLTS/DIV ..... 50 mV BASE/EMITTER
STEP GENERATOR
NUMBER OF STEPS 0
STEP/OFFSET AMPLITUDE ..... 500 mV
COLLECTOR SUPPLY
POLARITY ..... AC

6065-468

NOTE

See **Test Point and Adjustment Locations 2** *in Section 7 for the location of the adjustment associated with this step.*

Checking and Adjusting for Zero Output Volts

a. **CHECK** that while changing the setting of the STEP/OFFSET AMPLITUDE control between 500 mV and 200 mV, the spot (or the end of the trace caused by noise) does not move.

If the spot moves, the following adjustment is necessary.

b. **ADJUST** SG ZERO adjustment R310 on the A7 Step Generator Board as required for minimum spot (or trace) movement as the STEP/OFFSET AMPLITUDE setting is changed between 500 mV and 200 mV.

Checking and Adjusting for Zero Output Current

c. Connect the resistor in the Table to the Left Base and Left Emitter jacks and close the Protective cover.

Scan by Zenith

d. Change the following 370 settings:

DISPLAY
HORIZONTAL
VOLTS/DIV ..... 5 mV BASE/EMITTER
STEP GENERATOR
STEP/OFFSET AMPLITUDE ..... 5 mA
LEFT-RIGHT-STANDBY ..... LEFT

e. **CHECK** that for each setting of the STEP/OFFSET AMPLITUDE control, according to the Table, the spot (or end of the trace caused by the noise) remains within ±5 divisions.

If the spot is not within this limit, the following adjustment is necessary.

f. **ADJUST** Current Zero adjustment R603 on the A7 Step Generator Board as required for minimum spot (or trace) shift as the HORIZONTAL VOLTS/DIV and the STEP/OFFSET AMPLITUDE settings are changed as follows:

RESISTOR VALUE	HORIZONTAL VOLTS/DIV	STEP/OFFSET AMPLITUDE
1 kΩ	5 mV BASE	5 mA
1 kΩ	10 mV BASE	10 mA
1 kΩ	20 mV BASE	20 mA
100 Ω	50 mV BASE	50 mA
100 Ω	100 mV BASE	100 mA
100 Ω	200 mV BASE	200 mA

g. Remove the 1 kΩ resistor and close the Protective Cover.

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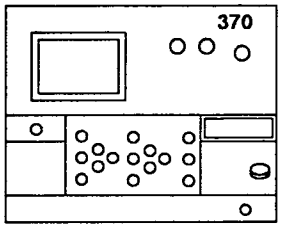
F2. Checking Voltage Mode Amplitude Range, Ripple and Noise

Specifications:

- Amplitude range in voltage mode is from 50 mV to 2 V in a 1-2-5 sequence.
- Voltage Mode Ripple and Noise is less than 0.5% of the STEP AMPLITUDE setting + 10 mV.

F2 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
Mode ..... NON-STORE
MAG ..... X10 HORIZ
HORIZONTAL
VOLTS/DIV ..... 5 mV BASE/EMITTER
STEP GENERATOR
NUMBER OF STEPS 0
STEP/OFFSET AMPLITUDE ..... 50 mV
COLLECTOR SUPPLY
POLARITY ..... AC

6065-468

Checking Ripple and Noise

a. **CHECK** that for each setting of the STEP/ OFFSET AMPLITUDE control, the displayed spot is within the limits given in Table 4-13.

Table 4-13
Step Generator Voltage Mode Ripple and Noise

STEP/OFFSET AMPLITUDE	Maximum Spot Width
50 mV	10 mV
100 mV	11 mV
200 mV	11 mV
500 mV	13 mV
1 V	15 mV
2 V	20 mV

Checking Ripple and Noise for INVERT

b. Change the following 370 setting:

STEP GENERATOR
POLARITY INVERT ..... On

The indicator above the INVERT button will light.

c. **CHECK** that for each setting of the STEP/ OFFSET AMPLITUDE control, the displayed spot for INVERT is within the limits given in Table 4-13.

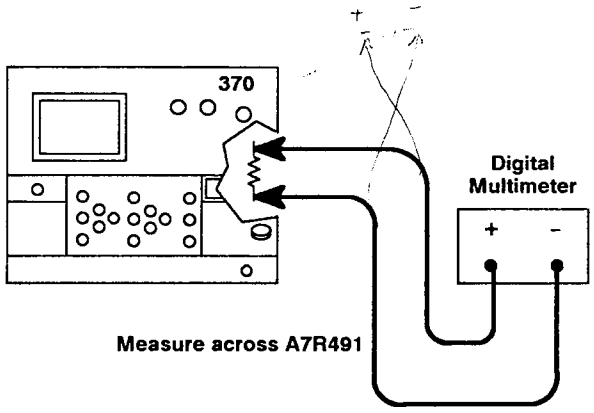
Scan by Zenith

F3. Adjusting Bias (A7R467 for serial number 300200 and up)

IMPORTANT:

The characteristic examined in this step is provided as an example of typical instrument operation to aid in the adjustment of R467; it is not a specification.

F3 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
Mode ..... NON-STORE
MAG ..... HORIZ X10
HORIZONTAL
VOLTS/DIV ..... 5 mV BASE/EMITTER
STEP GENERATOR
NUMBER OF STEPS 0
COLLECTOR SUPPLY
POLARITY ..... AC

Test Equipment settings:
Digital Multimeter
Mode ..... DC Volts

6065-469

NOTE

*See **Test Point and Adjustment Locations 2** for the location of the adjustment made in this step.*

a. **ADJUST** BIAS adjustment R467 on the A7 Step Generator Board for a Digital Multimeter reading of 6 mV.

This adjustment sets bias current to the optimum level for long term reliability.

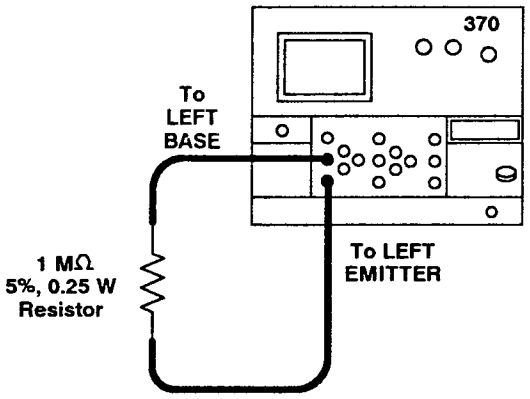
Scan by Zenith

F4. Checking Current Mode Amplitude Range, Ripple and Noise

Specifications:

- Amplitude range in current mode is from 50 nA to 200 mA in a 1-2-5 sequence.
- Current Mode Ripple and Noise is less than 0.5% of the STEP AMPLITUDE setting + 10 nA.

F4 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
Mode ..... NON-STORE
MAG MODE ..... X10 HORIZ
HORIZONTAL
VOLTS /DIV ..... 10 mV BASE/EMITTER
VERTICAL CURRENT/DIV .. 1 μA COLLECTOR
STEP GENERATOR
STEP/OFFSET AMPLITUDE ..... 50 nA
NUMBER OF STEPS 0
COLLECTOR SUPPLY
POLARITY ..... AC
LEFT-RIGHT-STANDBY ..... LEFT
Protective Cover ..... Open

6065-470

Checking 50 nA to 2 μA with 1 MΩ

a. **CHECK** that the displayed spot is within the limit given in Table 4-14.

b. **CHECK** that the spot width for STEP/OFFSET AMPLITUDE settings between 100 nA and 2 μA is within the limits given in Table 4-14.

Checking 5 μA to 20 μA with 100 kΩ

c. Change the following 370 settings:

LEFT-RIGHT-STANDBY ..... STANDBY
Protective Cover ..... Open

d. Replace the 1 MΩ resistor with the 100 kΩ resistor.

e. Change the following 370 settings:

Protective Cover ..... Closed
LEFT-RIGHT-STANDBY ..... LEFT

f. **CHECK** that the spot width for STEP/OFFSET AMPLITUDE settings between 5 μA and 20 μA is within the limits given in Table 4-14.

Checking 50 μA to 200 μA with 10 kΩ

g. Change the following 370 settings:

LEFT-RIGHT-STANDBY ..... STANDBY
Protective Cover ..... Open

h. Replace the 100 kΩ resistor with the 10 kΩ resistor.

i. Change the following 370 settings:

Protective Cover ..... Closed
LEFT-RIGHT-STANDBY ..... LEFT

j. **CHECK** that the spot width for STEP/OFFSET AMPLITUDE settings between 50 μA and 200 μA is within the limits given in Table 4-14.

Checking 500 μA to 2 mA with 1 kΩ

k. Change the following 370 settings:

LEFT-RIGHT-STANDBY ..... STANDBY
Protective Cover ..... Open

l. Replace the 10 kΩ resistor with the 1 kΩ resistor.

m. Change the following 370 settings:

Protective Cover ..... Closed
LEFT-RIGHT-STANDBY ..... LEFT

n. **CHECK** that the spot width for STEP/OFFSET AMPLITUDE settings between 50 μA and 2 mA is within the limits given in Table 4-14.

Scan by Zenith

Checking 5 mA to 20 mA with 100 Ω

o. Change the following 370 settings:

LEFT-RIGHT-STANDBY ..... STANDBY
Protective Cover ..... Open

p. Replace the 1 kΩ resistor with the 100 Ω resistor.

q. Change the following 370 settings:

Protective Cover ..... Closed
LEFT-RIGHT-STANDBY ..... LEFT

r. **CHECK** that the spot width for STEP/OFFSET AMPLITUDE settings between 5 mA and 20 mA is within the limits given in Table 4-14.

Checking 50 mA to 200 mA with 1 Ω

s. Change the following 370 settings:

LEFT-RIGHT-STANDBY ..... STANDBY
Protective Cover ..... Open

t. Replace the 100 Ω resistor with the 1.0 Ω resistor.

u. Change the following 370 settings:

Protective Cover ..... Closed
LEFT-RIGHT-STANDBY ..... LEFT

v. **CHECK** that the spot width for STEP/OFFSET AMPLITUDE settings between 50 mA and 200 mA is within the limits given in Table 4-14.

Checking INVERT

w. Change the following 370 settings:

LEFT-RIGHT-STANDBY ..... STANDBY
Protective Cover ..... Open

x. Remove the 1.0 Ω resistor and replace it with the 1 MΩ resistor.

y. Change the following 370 settings:

Protective Cover ..... Closed
STEP GENERATOR
  POLARITY INVERT ..... On
  STEP/OFFSET AMPLITUDE ..... 50 nA
LEFT-RIGHT-STANDBY ..... LEFT

z. **CHECK** all settings of the STEP/OFFSET AMPLITUDE control for INVERT by repeating parts a through x.

Table 4-14
Step Generator Current Mode Ripple and Noise

Resistance	STEP/OFFSET AMPLITUDE	Maximum Spot Width
1 MΩ	50 nA	10 mV
1 MΩ	100 nA	11 mV
1 MΩ	200 nA	11 mV
1 MΩ	500 nA	13 mV
1 MΩ	1 μA	15 mV
1 MΩ	2 μA	20 mV
100 kΩ	5 μA	4 mV
100 kΩ	10 μA	6 mV
100 kΩ	20 μA	11 mV
10 kΩ	50 μA	3 mV
10 kΩ	100 μA	5 mV
10 kΩ	200 μA	10 mV
1 kΩ	500 μA	3 mV
1 kΩ	1 mA	5 mV
1 kΩ	2 mA	10 mV
100 Ω	5 mA	3 mV
100 Ω	10 mA	5 mV
100 Ω	20 mA	10 mV
10 Ω	50 mA	3 mV
10 Ω	100 mA	5 mV
10 Ω	200 mA	10 mV

Scan by Zenith

F5. Checking Incremental Accuracy in Voltage Mode and Number of Steps

Specifications:

- Absolute accuracy of the Step Generator is less than 1.5% of the output voltage +3% of the STEP/ OFFSET AMPLITUDE setting +1 mV.
- Incremental accuracy is 1.5%.
- The number of steps ranges from 0 to 10.

NOTE

See **Test Point and Adjustment Locations 1** *for the location of the circuit board and jumper associated with this step.*

Moving the Store/Non-Store Jumper

a. Change the following 370 setting:

POWER ..... OFF

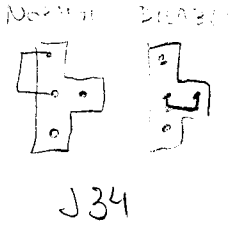
b. Remove the A3 A/D Board from the card cage located on the right side of the 370.

See **Test Point and Adjustment Locations 1** *for the location of A3 and jumper J34. For details on removing and replacing Plug-In Boards, see the instructions under "Component Removal and Replacement" in Section 4, Maintenance.*

c. Change the position of jumper J34 from pins 1-2 to pins 2-4 (CAL position).

When the jumper is moved from pins 1-2 to pins 2-4, STORE Mode is disabled.

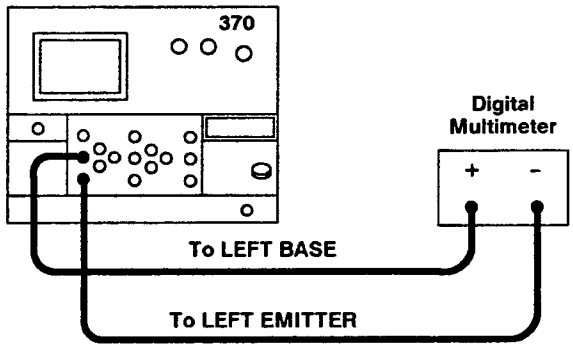
d. Replace the A3 A/D Board in the 370 card cage. Do not re-install the circuit board retainers.



e. Change the following 370 setting:

POWER ..... ON

F5 SETUP CONDITIONS



370 settings:

Set the following controls as indicated.

DISPLAY
- Mode ..... NON-STORE

HORIZONTAL
- VOLTS/DIV ..... 1 V BASE/EMITTER

STEP GENERATOR
- STEP/OFFSET AMPLITUDE ..... 1 V
- NUMBER OF STEPS 10

COLLECTOR SUPPLY
- POLARITY ..... +DC
- MAX PEAK POWER WATTS ..... 220 W
- MEASUREMENT ..... SINGLE

Protective Cover ..... Open
LEFT-RIGHT-STANDBY ..... LEFT

Test Equipment settings:

Digital Multimeter
- Mode ..... DC Voltage

6065-434

Scan by Zenith

Checking Steps 0 and 1

f. **CHECK** that the digital multimeter reading is 0.000 V ±31 mV (as shown in Table 4-15).

g. Change the following 370 setting:

MEASUREMENT ..... Press the MEASUREMENT SINGLE button to move the displayed spot 1 division to the right

The SINGLE button may need to be pressed twice to move the spot one division from the beginning point.

h. **CHECK** that the digital multimeter reading is 1.000 V ±46 mV and that the reading for Step 1 differs from the reading for Step 0 by 1.000 V ±15 mV (as shown in Table 4-15).

Checking Steps 2 through 9

i. **CHECK** that for each time the spot is advanced one division with the MEASUREMENT SINGLE button, the new digital multimeter reading and the voltage difference from the previous reading are within the limits given in Table 4-15.

Checking INVERT

j. Change the following 370 setting:

MEASUREMENT ..... Press the MEASUREMENT SINGLE button to return to Step 0

k. Change the following 370 settings:

DISPLAY
MAG MODE ..... HORIZ X1
MAG OFFSET Press the INCR button to position the spot on the line at the right graticule edge.
STEP GENERATOR
POLARITY INVERT ..... On

l. **CHECK** STEP GENERATOR step accuracy for INVERT by repeating parts f through i. (For INVERT, the spot will move in the opposite direction).

m. Change the following 370 setting:

MEASUREMENT ..... Press the SINGLE button to return to Step 0.

IMPORTANT:

If steps F6, F7, F8, and F9 will not be performed, complete the instructions given under Replacing the Store/Non-Store Jumper, at the end of Step F9, before proceeding to another step or ending the procedure.

Table 4-15
Step Generator Incremental Accuracy in Voltage Mode

Step	Digital Multimeter Reading (±)	Difference Between Adjacent Steps (±)
0	0.000 V ±31 mV	
1	1.000 V ±46 mV	1.000 V ±15 mV
2	2.000 V ±61 mV	1.000 V ±15 mV
3	3.000 V ±76 mV	1.000 V ±15 mV
4	4.000 V ±91 mV	1.000 V ±15 mV
5	5.000 V ±106 mV	1.000 V ±15 mV
6	6.000 V ±121 mV	1.000 V ±15 mV
7	7.000 V ±136 mV	1.000 V ±15 mV
8	8.000 V ±151 mV	1.000 V ±15 mV
9	9.000 V ±166 mV	1.000 V ±15 mV
10	10.000 V ±181 mV	1.000 V ±15 mV

Scan by Zenith

F6. Checking Step Multi .1X Accuracy

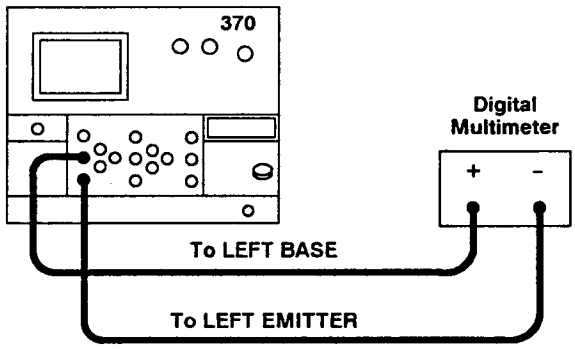
Specification:

- Accuracy with STEP MULTI .1X pressed is less than (1.5% of total output + 10% of the STEP AMPLITUDE setting + 1 mV).
- Incremental accuracy is 1.5%.

IMPORTANT:

If the previous step was not performed, complete the instructions given under Moving the Store/Non-Store Jumper, at the beginning of Step F5, before proceeding with this step.

F6 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
- Mode ..... NON-STORE

HORIZONTAL
- VOLTS/DIV ..... 1 V BASE/EMITTER
- MAG ..... HORIZ X10.

STEP GENERATOR
- STEP/OFFSET AMPLITUDE ..... 1 V
- NUMBER OF STEPS 10
- STEP MULTI .1X ..... ON

COLLECTOR SUPPLY ..... AC
- POLARITY .....
- MAX PEAK POWER WATTS 220

LEFT-RIGHT-STANDBY ..... LEFT
Protective Cover ..... Open

Test Equipment settings:

Digital Multimeter
- Mode ..... DC Voltage

6065-435

Checking Steps 0 and 1

a. Change the following 370 setting:

DISPLAY
MAG OFFSET ..... Press the DECR button once to position the spot on the line that forms the left graticule edge.

b. **CHECK** the digital multimeter for a reading of 0.00 mV ±11 mV (as shown in Table 4-16 for Step 0).

c. Change the following 370 settings:

MEASUREMENT ..... Press the SINGLE button to move the spot 1 division to the right.

d. **CHECK** the digital multimeter for a reading of 100 mV ±12.5 mV and that the reading for Step 1 differs from the reading for Step 0 by 100 mV ±1.5 mV (as shown in Table 4-16 for Step 1).

Checking Steps 2 through 9

e. **CHECK** that for each time the spot is advanced one division with the MEASUREMENT SINGLE button, the new digital multimeter reading and the voltage difference from the previous reading are within the limits given in Table 4-16.

Checking INVERT

f. Change the following 370 settings:

MEASUREMENT ..... Press the SINGLE button to return to Step 0.

DISPLAY
MAG ..... Press the OFFSET INCR button twice to place the spot on the line that forms the right graticule edge.

STEP GENERATOR
POLARITY INVERT ..... On

Scan by Zenith

g. **CHECK** STEP MULTI .1X accuracy for INVERT by repeating parts c through f. (For INVERT, the spot will move in the opposite direction).

h. Change the following 370 settings:

MEASUREMENT ..... Press the SINGLE button to return to Step 0.

IMPORTANT:

If steps F7, F8, and F9 will not be performed, complete the instructions given under Replacing the Store/Non-Store Jumper, at the end of Step F9, before proceeding to another step or ending the procedure.

Table 4-16
STEP MULTI .1X Accuracy

Step	Digital Multimeter Reading	Difference Between Adjacent Steps
0	0.00 mV±11.0 mV	
1	100.0 mV±12.5 mV	100.0 mV±1.5 mV
2	200.0 mV±14.0 mV	100.0 mV±1.5 mV
3	300.0 mV ±15.5 mV	100.0 mV ±1.5 mV
4	400.0 mV ±17.0 mV	100.0 mV ± 1.5 mV
5	500.0 mV ±18.5 mV	100.0 mV ± 1.5 mV
6	600.0 mV ±20.0 mV	100.0 mV ± 1.5 mV
7	700.0 mV ±21.5 mV	100.0 mV ± 1.5 mV
8	800.0 mV ±23.0 mV	100.0 mV ± 1.5 mV
9	900.0 mV ±24.5 mV	100.0 mV ± 1.5 mV
10	1.000 V ±26.0 mV	100.0 mV ± 1.5 mV

Scan by Zenith

F7. Checking STEP GENERATOR Current Mode Accuracy, Offset Control Range, and Offset Control Resolution

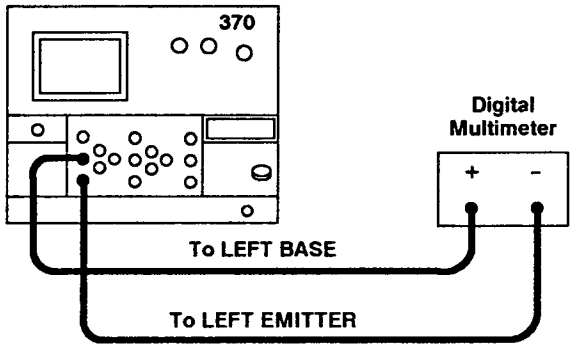
Specifications:

- Incremental Accuracy is 1.5%.
- Absolute Accuracy is less than (1.5% of the total output + 3% of the STEP AMPLITUDE setting + 1 nA).
- OFFSET Control Range is variable from −10 times to +10 times the STEP AMPLITUDE setting.
- OFFSET Control Resolution is 1% of the STEP AMPLITUDE setting.
- AMPLITUDE Range is 50 nA to 200 mA in a 1-2-5 sequence of 21 steps.

IMPORTANT:

If the previous step was not performed, complete the instructions given under Moving the Store/Non-Store Jumper, at the beginning of Step F5, before proceeding with this step.

F7 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
- Mode ..... NON-STORE
- VERTICAL CURRENT/DIV ..... STEP GEN
- HORIZONTAL ..... COLL
- VOLTS/DIV ..... 2 V ~~BASE/EMITTER~~

STEP GENERATOR
- STEP/OFFSET AMPLITUDE ..... 1 mA
- NUMBER OF STEPS 10

COLLECTOR SUPPLY
- MAX PEAK POWER WATTS 220

Protective Cover ..... Open
LEFT-RIGHT-STANDBY ..... LEFT

AC VxI OFF

Test Equipment settings:

Digital Multimeter
- Mode ..... DC Current

6065-438

Checking Accuracy of Steps 0 and 1

a. **CHECK** that the digital multimeter reading is 0 mA ±30 µA.

b. Press MEASUREMENT REPEAT once. Note that the displayed spot moves one division higher.

c. **CHECK** that the digital multimeter reading is between 0.955 and 1.045 mA and the difference between Step 0 and Step 1 is 1 mA ±15 µA.

Scan by Zenith

Checking Accuracy of Steps 2 through 10

d. **CHECK** that each time MEASUREMENT REPEAT is pressed, the displayed spot moves one division higher and the new digital multimeter current reading is within the limits given in Table 4–17.

Checking Resolution

e. Change the following 370 setting:

STEP GENERATOR
STEP/OFFSET AMPLITUDE ..... 500 µA

f. **CHECK** that each time the STEP GENERATOR OFFSET AID button is pressed, the OFFSET readout and digital multimeter reading change 5 µA.

Checking AID OFFSET Range

g. Change the following 370 settings:

STEP GENERATOR
STEP/OFFSET AMPLITUDE ..... 50 nA
OFFSET ..... Press both the FAST and AID buttons until the PER STEP readout indicates the maximum level (500 nA).

h. **CHECK** the digital multimeter for a reading within the limits shown in Table 4–18, under **(Maximum OFFSET)**, for each setting of the STEP/OFFSET AMPLITUDE control.

Table 4–17
Step Generator Current Mode Incremental Accuracy

Step	Digital Multimeter Reading	Difference Between Adjacent Steps
0	-0.030 mA to +0.030 mA	
1	0.955 mA to 1.045 mA	1 mA ± 15 µA
2	1.94 mA to 2.06 mA	1 mA ± 15 µV
3	2.92 mA to 3.08mA	1 mA ± 15 µV
4	3.91 mA to 4.09 mA	1 mA ± 15 µV
5	4.90 mA to 5.10 mA	1 mA ± 15 µV
6	5.88 mA to 6.12 mA	1 mA ± 15 µV
7	6.86 mA to 7.14 mA	1 mA ± 15 µV
8	7.85 mA to 8.15 mA	1 mA ± 15 µV
9	8.83 mA to 9.17 mA	1 mA ± 15 µV
10	9.82 mA to 10.18 mA	1 mA ± 15 µV

Scan by Zenith

Table 4-18
Step Generator Current Mode Accuracy and Offset Range

STEP/OFFSET AMPLITUDE Setting (±)	Digital Multimeter Reading Limits with No OFFSET (±)	Digital Multimeter Reading Limits with Maximum OFFSET (±)
50 nA	47 nA to 53 nA	490 nA to 510 nA
100 nA	94 nA to 107 nA	981 nA to 1019 nA
200 nA	188 nA to 212 nA	1963 nA to 3037 nA
500 nA	476 nA to 524 nA	4909 nA to 5091 nA
1 µA	954 nA to 1046 nA	9.819 µA to 10.18 µA
2 µA	1.909 µA to 2.091 µA	19.64 µA to 20.36 µA
5 µA	4.774 µA to 5.226 µA	49.1 µA to 50.9 µA
10 µA	9.549 µA to 10.451 µA	98.2 µA to 101.8 µA
20 µA	19.10 µA to 20.90 µA	196.4 µA to 203.6 µA
50 µA	47.75 µA to 52.25 µA	491 µA to 509 µA
100 µA	95.50 µA to 104.50 µA	982 µA to 1018 µA
200 µA	191.00 µA to 209.0 µA	1964 µA to 2036 µA
500 µA	477.5 µA to 522.5 µA	4910 µA to 5090 µA
1 mA	955.0 µA to 1045.0 µA	9.82 mA to 10.18 mA
2 mA	1.910 mA to 2.090 mA	19.64 mA to 20.36 mA
5 mA	4.775 mA to 5.225 mA	49.1 mA to 50.9 mA
10 mA	9.550 mA to 10.450 mA	98.2 mA to 101.8 mA
20 mA	19.10 mA to 20.90 mA	196.4 mA to 203.6 mA
50 mA	47.75 mA to 52.25 mA	491 mA to 509 mA
100 mA	95.50 mA to 104.50 mA	982 mA to 1018 mA
200 mA	191.0 A to 209.0 A	1964 mA to 2036 mA

Scan by Zenith

Checking OPPOSE OFFSET Range

i. Change the following 370 settings (in the given sequence):

STEP GENERATOR
STEP/OFFSET AMPLITUDE ..... 50 nA
INVERT ..... On
OFFSET ..... Simultaneously press the STEP GENERATOR OPPOSE and AID buttons to reset OFFSET to 0.0 nA.

j. Press the REPEAT button once. The dot will move down one division to the second line of the graticule.

k. **CHECK** the digital multimeter for a reading within the limits shown in Table 4-18, under **(No OFFSET)**, for each setting of the STEP/OFFSET AMPLITUDE control. Repeat j. for each setting change.

IMPORTANT:

If step F8 or F9 will not be performed, complete the instructions given under Replacing the Store/Non-Store Jumper, at the end of Step F9, before proceeding to another step or ending the procedure.

Scan by Zenith

F8. Checking Maximum Voltage Output and STEP AMPLITUDE Control Range

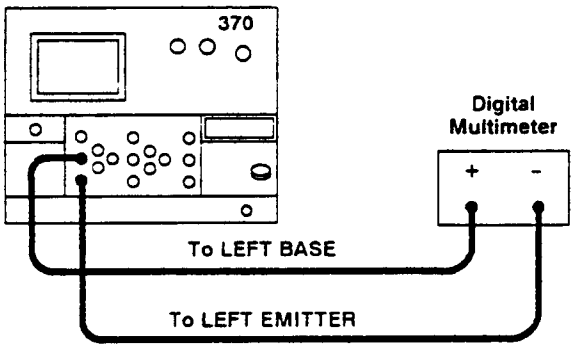
Specifications:

- Maximum voltage output is 20 times the STEP AMPLITUDE setting.
- STEP AMPLITUDE control range is 50 mV to 2 V in a 1-2-5 sequence.

IMPORTANT:

If the previous step was not performed, complete the instructions given under Moving the Store/Non-Store Jumper, at the beginning of Step F5, before proceeding with this step.

F8 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY	
Mode	NON-STORE
HORIZONTAL	
VOLTS/DIV	2 V BASE/EMITTER
STEP GENERATOR	
STEP/OFFSET AMPLITUDE	50 mV
NUMBER OF STEPS	10
OFFSET	500 mV
COLLECTOR SUPPLY	
POLARITY	AC
MAX PEAK POWER WATTS	10
MEASUREMENT	SINGLE
LEFT-RIGHT-STANDBY	LEFT
Protective Cover	Open

Test Equipment settings:

Digital Multimeter	
Mode	DC Voltage

6065-436

Checking Maximum Voltage

a. Change the following 370 setting:

MEASUREMENT . . . . . Press the SINGLE button several times to maximize the digital multimeter reading.

The Digital Multimeter reading should be approximately 1.000 V.

b. **CHECK** that the digital multimeter reading is between 0.982 and 1.018 V (see Table 4-19).

Scan by Zenith

Table 4-19
Maximum Voltage Output

STEP/OFFSET AMPLITUDE	Digital Multimeter Reading
50 mV	0.982 to 1.018 V
100 mV	1.966 to 2.034 V
200 mV	3.933 to 4.067 V
500 mV	9.834 to 10.166 V
1 V	19.67 to 20.33 V
2 V	39.34 to 40.66 V

1.5% of tot + 3% of sit + 1mV

c. Change the following 370 setting:

STEP GENERATOR
STEP/OFFSET AMPLITUDE ..... Next setting (see Table 4-19).
MEASUREMENT ..... Press the SINGLE button several times to maximize the digital multimeter reading.

d. **CHECK** that the digital multimeter is within the tolerance given for the STEP GENERATOR OFFSET/AMPLITUDE setting in Table 4-19.

e. Repeat c and d for each STEP/OFFSET AMPLITUDE setting in Table 4-19.

Removing the Setup

f. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... STANDBY

g. Disconnect the digital multimeter leads from the 370.

IMPORTANT:

If step F9 will not be performed, complete the instructions given under Replacing the Store/Non-Store Jumper, at the end of Step F9, before proceeding to another step or ending the procedure.

Scan by Zenith

F9. Checking Maximum Current Output

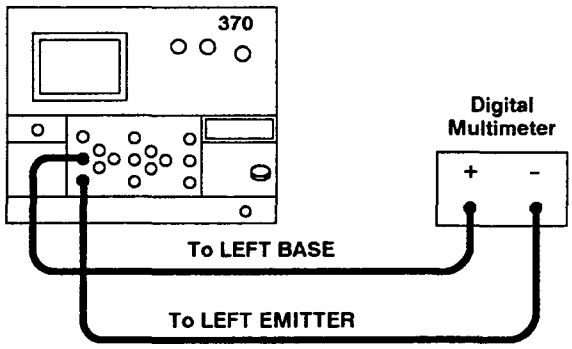
Specification:

- Maximum current output is 20 times the STEP AMPLITUDE setting, except at 200 mA, where it is 10 times the setting.

IMPORTANT:

If the previous step was not performed, complete the instructions given under Moving the Store/Non-Store Jumper, at the beginning of Step F5, before proceeding with this step.

F9 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
  Mode ..... NON-STORE
VERTICAL
  CURRENT/DIV ..... 500 mA COLLECTOR
STEP GENERATOR
  NUMBER OF STEPS 10
  OFFSET ..... 500 nA
COLLECTOR SUPPLY
  MAX PEAK POWER WATTS 220
  POLARITY ..... AC
MEASUREMENT ..... SINGLE
Protective Cover ..... Open

Test Equipment settings:
Digital Multimeter
  Mode ..... DC Current

6065-437

Checking 50 nA through 50 mA

a. Change the following 370 settings (in the given sequence):

LEFT-RIGHT-STANDBY ..... LEFT
MEASUREMENT ..... Press the SINGLE button until the reading on the Digital Multimeter no longer increases (typically 11 times).

b. **CHECK** that the digital multimeter reading is within the limits given in Table 4-20 for 50 nA.

c. Change the following 370 setting:

STEP GENERATOR
  POLARITY INVERT ..... On
MEASUREMENT ..... Press the SINGLE button until the reading on the Digital Multimeter no longer increases (typically 11 times).

d. **CHECK** that the digital multimeter reading is within the limits given in Table 4-20 for 50 nA.

e. Change the following 370 setting:

STEP GENERATOR
  STEP/OFFSET AMPLITUDE ..... Next setting
MEASUREMENT ..... Press the SINGLE button until the reading on the Digital Multimeter no longer increases (typically 11 times).

f. **CHECK** that the digital multimeter reading for each STEP GENERATOR STEP/OFFSET setting in Table 4-20 is within the given limits when STEP GENERATOR POLARITY INVERT is enabled and disabled (inverted and non-inverted).

g. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... STANDBY

h. Disconnect the digital multimeter leads from the 370.

CAUTION

The current meter recommended for this step will only accept input levels of 1.999 amperes and below. The remainder of this step checks the two highest STEP/OFFSET AMPLITUDE settings.

Scan by Zenith

Changing the Setup

i. Connect a patch cord from the Left Collector jack (C) to the Left Base jack (B).

j. Change the following 370 settings:

STEP GENERATOR
POLARITY ..... + (non-inverted)
STEP/OFFSET AMPLITUDE ..... 100 mA
CURSOR
Mode ..... CROSS
LEFT-RIGHT-STANDBY ..... LEFT

Checking 100 mA

See OP, 1-16 Spec

k. Use the CURSOR positioning buttons (↑↓) to position the vertical cursor to intersect the spot on the display.

l. **CHECK** that the vertical CURSOR readout is -1.922 to -2.078 A.

Checking 200 mA

m. Change the following 370 setting:

STEP GENERATOR
STEP/OFFSET AMPLITUDE ..... 200 mA.

n. **CHECK** that the vertical CURSOR readout is -1.922 to -2.078 A.

NOTE

Maximum 370 Step Generator current is 2 amperes; therefore, the 100 mA and 200 mA STEP GENERATOR STEP/OFFSET AMPLITUDE settings have the same performance requirement.

Table 4-20
Step Generator Maximum Current

STEP/OFFSET AMPLITUDE	Digital Multimeter Reading (±)
50 nA	.98 to 1.18 µA
100 nA	1.96 to 2.03 µA
200 nA	3.93 to 4.07 µA
500 nA	9.83 to 10.17 µA
1 µA	19.67 to 20.33 µA
2 µA	39.34 to 40.66 µA
5 µA	98.35 to 101.65 µA
10 µA	196.7 to 203.3 µA
20 µA	393.4 to 406.6 µA
50 µA	983.5 to 1016.5 ~~mA~~ µA
100 µA	1.967 to 2.033 mA
200 µA	3.934 to 4.066 mA
500 µA	9.835 to 10.165 mA
1 mA	19.67 to 20.33 mA
2 mA	39.34 to 40.66 mA
5 mA	98.35 to 101.65 mA
10 mA	196.7 to 203.3 mA
20 mA	393.4 to ~~404.6~~ mA 406.6
50 mA	983.5 to 1016.5 mA
	1.967 - 2032
	1.979 - 2021

Scan by Zenith

Replacing the Store/Non-Store Jumper

o. Change the following 370 setting:

POWER ..... OFF

p. Remove the A3 A/D Board.

See **Test Point and Adjustment Locations 1** *for the location of A3 and jumper J34. For details on removing and replacing Plug-In Boards, see the instructions under "Component Removal and Replacement" in Section 4, Maintenance.*

q. Move jumper J34 from pins 2-4 to pins 1-2.

r. Replace the A3 A/D Board and the circuit board retainers across the top of the card cage.

s. Change the following 370 setting:

POWER ..... ON

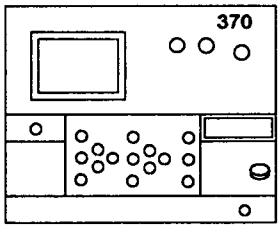
Scan by Zenith

F10. Checking OFFSET Polarity

Specifications:

- OFFSET polarity corresponds with the COLLECTOR SUPPLY polarity when STEP GENERATOR POLARITY INVERT is disabled.
- OFFSET polarity is opposite the COLLECTOR SUPPLY when INVERT is selected or CONFIGURATION is set to COMMON BASE.
- STEP GENERATOR POLARITY INVERT is disabled when CONFIGURATION is set to COMMON BASE.

F10 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
  HORIZONTAL
  VOLTS/DIV ..... 2 V BASE EMITTER
STEP GENERATOR
  STEP/OFFSET AMPLITUDE ..... 1 V
  NUMBER OF STEPS 0
COLLECTOR SUPPLY
  POLARITY ..... AC
  Cursor Mode ..... DOT

6065-439

Checking AID OFFSET Polarity

a. Press and hold the STEP GENERATOR OFFSET AID button.

b. **CHECK** that the spot moves continuously to the right and the horizontal CURSOR readout increases continuously.

Checking OPPOSE OFFSET Polarity

c. Press the STEP GENERATOR OFFSET AID and OPPOSE buttons simultaneously.

The offset is reset to zero and the spot returns to graticule center.

d. Press and hold the STEP GENERATOR OFFSET OPPOSE button.

e. **CHECK** that the spot moves continuously to the left and the horizontal CURSOR readout decreases continuously.

Checking Polarity INVERT

f. Change the following 370 settings:

STEP GENERATOR
  POLARITY INVERT ..... On
  OFFSET ..... Press the AID and OPPOSE buttons simultaneously to reset the offset is zero.

g. Press and hold the STEP GENERATOR OFFSET AID button.

h. **CHECK** that the spot moves continuously to the left as the horizontal CURSOR readout decreases continuously.

i. Change the following 370 settings:

STEP GENERATOR
  OFFSET ..... Press the AID and OPPOSE buttons simultaneously to reset the offset is zero.

j. Press and hold the STEP GENERATOR OFFSET OPPOSE button.

k. **CHECK** that the spot moves continuously to the right and the horizontal CURSOR readout increases continuously.

Checking COMMON BASE CONFIGURATION

l. Change the following 370 setting:

COLLECTOR SUPPLY
  CONFIGURATION ... COMMON BASE/STEP GEN

m. **CHECK** that the STEP GENERATOR POLARITY INVERT indicator remains lit.

n. **CHECK** that OFFSET polarity is opposite the COLLECTOR SUPPLY polarity by repeating the Polarity INVERT check, parts g through k.

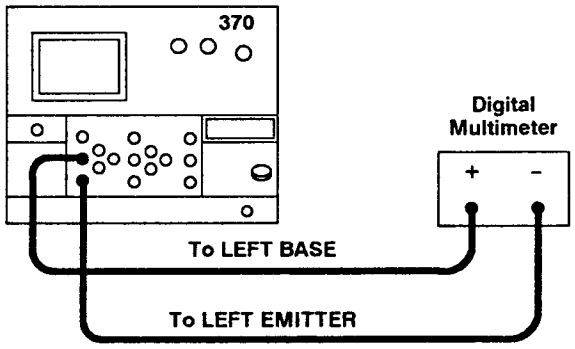
Scan by Zenith

F11. Checking Maximum Opposing OFFSET Voltage and Absolute Accuracy in Voltage Mode

Specification:

- Maximum Opposing Offset Voltage is 10 times the STEP AMPLITUDE setting.
- Absolute accuracy is less than (1.5% of the total output + 3% of the STEP AMPLITUDE setting + 1 mV).

F11 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
  HORIZONTAL
    VOLTS/DIV ..... 2 V BASE/EMITTER
STEP GENERATOR
  STEP/OFFSET AMPLITUDE ..... 2 V
  NUMBER OF STEPS 0
COLLECTOR SUPPLY
  POLARITY ..... AC
Protective Cover ..... Open

Test Equipment settings:
Digital Multimeter:
  Mode ..... DC Voltage

6065-440

Checking Zero OFFSET Without INVERT

a. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... LEFT

b. **CHECK** that the digital multimeter measurement is within the limits shown in Table 4-21 under No OFFSET for each setting of the STEP/OFFSET AMPLITUDE control.

Checking Zero OFFSET With INVERT

c. Change the following 370 setting:

STEP GENERATOR
  POLARITY INVERT ..... On

The indicator above the INVERT button will light up.

d. **CHECK** that the digital multimeter measurement is within the limits shown in Table 4-21 under No OFFSET for each setting of the STEP/OFFSET AMPLITUDE control.

Checking Maximum OFFSET With INVERT

e. Change the following 370 settings:

STEP GENERATOR
  STEP/OFFSET AMPLITUDE ..... 2 V
  OFFSET AID ..... -20 V

f. **CHECK** that the Digital Multimeter measurement is within the limits shown in Table 4-21 under Maximum OFFSET for each setting of the STEP/OFFSET AMPLITUDE control.

Scan by Zenith

Checking Maximum OFFSET Without INVERT

g. Change the following 370 setting:

STEP GENERATOR
POLARITY INVERT ..... Off

The INVERT indicator will go out.

h. **CHECK** that the digital multimeter measurement is within the limits shown in Table 4-21 under Maximum OFFSET for each setting of the STEP/OFFSET AMPLITUDE control.

Removing the Setup

i. Change the following 370 settings:

LEFT-RIGHT-STANDBY ..... STANDBY

j. Remove the digital multimeter leads from the 370.

Table 4-21
Step Generator Maximum Offset Voltage

STEP/OFFSET AMPLITUDE Setting	Digital Multimeter Reading (Zero OFFSET)	Digital Multimeter Reading (Maximum OFFSET)
2 V	0.0 ±61 mV	± 19.64 to ± 20.36 V
1 V	0.0 ±31 mV	± 9.82 to ± 10.18 V
500 mV	0.0 ± 16 mV	± 4909 to ± 5091 mV
200 mV	0.0 ±7 mV	± 1963 to ± 2037 mV
100 mV	0.0 ±4 mV	± 981 to ± 1019 mV
50 mV	0.0 ±2.5 mV	± 490 to ± 510 mV

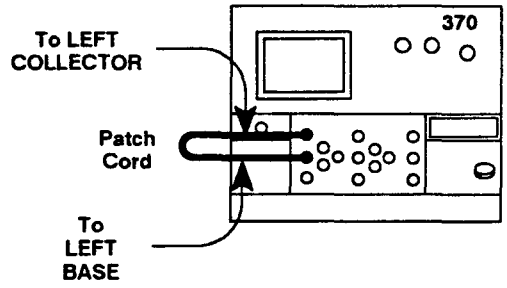
Scan by Zenith

F12. Checking Maximum Current in Voltage Mode

Specification:

- Maximum Current in Voltage Mode is 2 A for 10 volts or less, 10 mA for 40 V.

F12 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
- HORIZONTAL
  - VOLTS/DIV ..... 10 V COLLECTOR
- VERTICAL
  - CURRENT/DIV ..... 5 mA COLLECTOR

STEP GENERATOR
- STEP/OFFSET AMPLITUDE ..... 2 V
- NUMBER OF STEPS 10
- OFFSET ..... 20 V
- LIMIT ..... 2 A

COLLECTOR SUPPLY
- VARIABLE 0%
- MAX PEAK VOLTS 80
- MAX PEAK POWER WATTS 0.4
- POLARITY ..... AC
- CURSOR Mode ..... DOT

Protective Cover ..... Closed
LEFT-RIGHT-STANDBY ..... LEFT

6065-441

Checking 40 V Without INVERT

a. Set the COLLECTOR SUPPLY VARIABLE control so the negative travel of the outside right vertical line of the displayed waveform extends past the second horizontal graticule line below graticule center (see Figure 4-3).

b. Use the CURSOR position buttons to position the cursor dot at the bottom of the outside right vertical line of the displayed waveform (see Figure 4-3).

c. **CHECK** the horizontal CURSOR readout for a reading between 39.34 and 40.66 V and the vertical CURSOR readout for a reading greater than -9.37 mA.

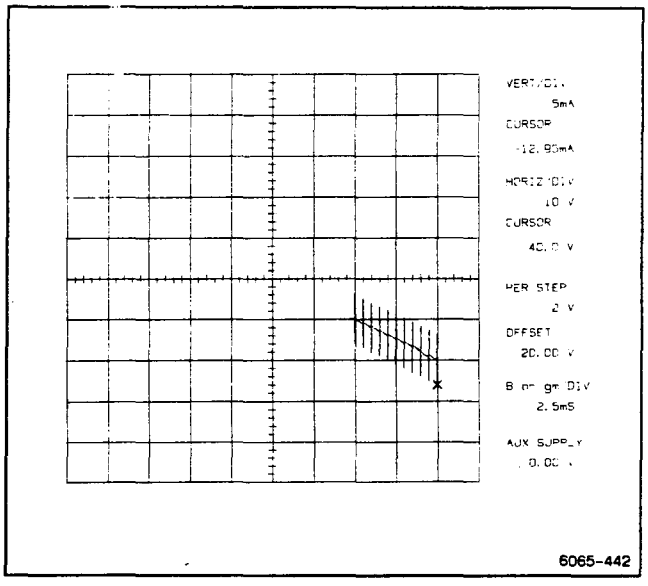
Checking 40 V with INVERT

d. Change the following 370 setting:

STEP GENERATOR
- POLARITY INVERT ..... On

e. Use the CURSOR position buttons to position the cursor dot to the top of the displayed waveform's outside left vertical line.

f. **CHECK** the horizontal CURSOR readout for a reading between -39.34 and -40.66 V and the vertical CURSOR readout for a reading greater than 9.37 mA.



6065-442

Figure 4-3. First test display for maximum current check, left collector and left base connected.

Scan by Zenith

Checking 10 V Without INVERT

g. Change the following 370 settings:

LEFT-RIGHT-STANDBY ..... STANDBY
DISPLAY
  HORIZONTAL VOLTS/DIV ..... 5 V COLLECTOR
  VERTICAL CURRENT/DIV ..... 1 A COLLECTOR
STEP GENERATOR
  POLARITY INVERT ..... Off
COLLECTOR SUPPLY
  MAX PEAK POWER WATTS 10
  MAX PEAK VOLTS 16
LEFT-RIGHT-STANDBY ..... LEFT

h. Set the COLLECTOR SUPPLY VARIABLE control to display a curve similar to that shown in Figure 4–4.

i. Use the CURSOR position buttons to position the cursor dot to the point at which the trace begins its upward excursion.

j. **CHECK** that the horizontal CURSOR readout is at least 10.00 V and that the vertical CURSOR readout at least –2 A.

Checking 10 V With INVERT

k. Change the following 370 settings:

STEP GENERATOR
  POLARITY INVERT ..... On

The INVERT indicator will light.

l. Use the CURSOR position (arrow) buttons to position the cursor dot to the point at which the trace begins its downward excursion.

m. **CHECK** that the horizontal CURSOR readout is at least –10 V and that the vertical CURSOR readout is at least 2 A.

Removing the Setup

n. Change the following 370 settings:

COLLECTOR SUPPLY
  VARIABLE 0%
LEFT-RIGHT-STANDBY ..... STANDBY

o. Remove the patch cord from the 370.

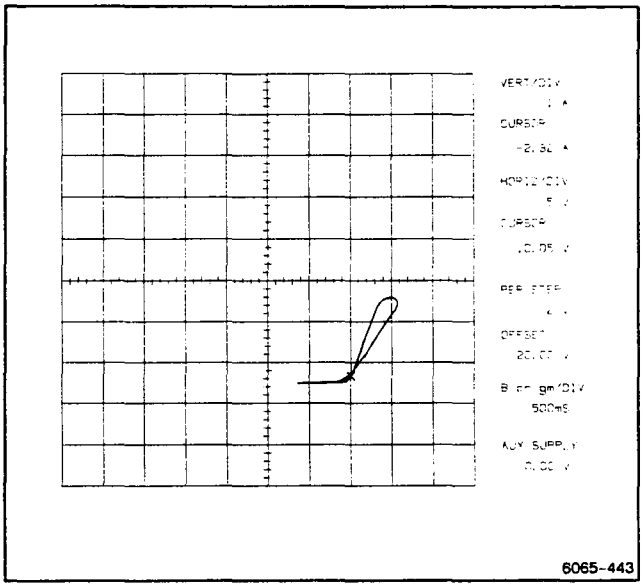


Figure 4–4. Second test display for maximum current check.

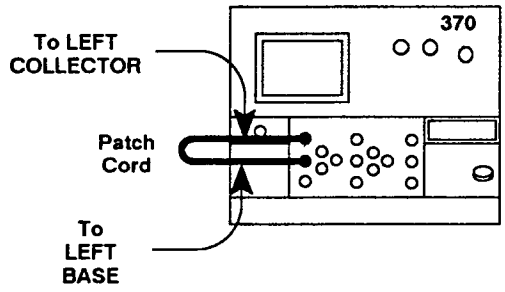
Scan by Zenith

F13. Checking the Current Limiter

Specification:

- Short Circuit Current Limit accuracy is +50% to −20% for the 20 mA, 100 mA, 500 mA, and 2 A settings of the LIMIT selector.

F13 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
  HORIZONTAL
    VOLTS/DIV ..... 10 V COLLECTOR
  VERTICAL
    CURRENT/DIV ..... 10 mA COLLECTOR
STEP GENERATOR
  STEP/OFFSET AMPLITUDE ..... 2 V
  NUMBER OF STEPS 10
  OFFSET ..... 20 V
COLLECTOR SUPPLY
  MAX PEAK POWER WATTS 220
  POLARITY ..... AC
  CURSOR Mode ..... DOT
Protective Cover ..... Closed
LEFT-RIGHT-STANDBY ..... LEFT

6065-444

a. **CHECK** that the vertical CURSOR readout is within the limits given in Table 4-22 for each combination of settings for the STEP GENERATOR LIMIT and VERTICAL CURRENT/DIV controls.

Table 4-22
Current Limiter

STEP GENERATOR LIMIT	VERTICAL CURRENT/DIV	Vertical CURSOR Readout
20 mA	10 mA	−16 mA to −30 mA
0.1 A	50 mA	−80 mA to −150 mA
0.5 A	200 mA	−400 mA to −750 mA
2 A	1 A	−1.6 A to −3 A

Removing the Setup

b. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... STANDBY

c. Remove the Patch Cord from the 370.

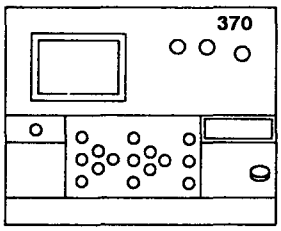
Scan by Zenith

F14. Checking Maximum Opposing Volts and Maximum Voltage for Current Mode

Specifications:

- Maximum Opposing Volts in Current Mode is less than 7 volts.
- Maximum Voltage is at least 10 volts.

F14 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
  HORIZONTAL
    VOLTS/DIV ..... 2 V BASE/EMITTER
STEP GENERATOR
  NUMBER OF STEPS 0
  OFFSET ..... -500 nA
COLLECTOR SUPPLY
  POLARITY ..... AC
  Cursor Mode ..... DOT

6065-445

Checking Maximum Opposing Volts Without INVERT

a. Set the LEFT-RIGHT-STANDBY switch to LEFT.

b. **CHECK** that the horizontal CURSOR readout is no more than -7.0 V when the STEP/OFFSET AMPLITUDE control is rotated through its range of 50 nA to 200 mA.

Checking Maximum Opposing Volts With INVERT

c. Change the following 370 settings:

STEP GENERATOR
  POLARITY INVERT ..... On

The indicator beside the INVERT button will light.

d. **CHECK** that the horizontal CURSOR readout is no more than +7.0 V when the STEP/OFFSET AMPLITUDE control is rotated through its range (50 nA to 200 mA).

Checking Maximum Voltage With INVERT

e. Change the following 370 settings:

STEP GENERATOR
  STEP/OFFSET AMPLITUDE ..... 50 nA
  OFFSET AID ..... -500 nA
COLLECTOR SUPPLY
  MAX PEAK VOLTS 80

CHECK that the horizontal CURSOR readout is greater than -10 V when the STEP/OFFSET AMPLITUDE control is rotated throughout its range.

If the voltage is greater than -10.22 V, the horizontal CURSOR readout will be flashing.

Checking Maximum Voltage Without INVERT

f. Change the following 370 settings:

STEP GENERATOR
  POLARITY INVERT ..... Off

The indicator beside the INVERT button will go out.

g. **CHECK** that the horizontal CURSOR readout is greater than +10 V when the STEP/OFFSET AMPLITUDE control is rotated through its range (50 nA to 200 mA).

If the voltage is greater than +10.22 V, the horizontal CURSOR readout will be flashing.

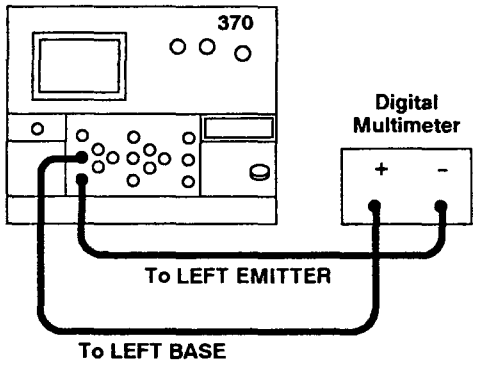
Scan by Zenith

F15. Checking Maximum Opposing OFFSET Current

Specification:

- Maximum opposing offset current is less than 10 mA.

F15 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
HORIZONTAL
VOLTS/DIV ..... 2 V BASE/EMITTER
STEP GENERATOR
STEP/OFFSET AMPLITUDE ..... 2 V
NUMBER OF STEPS 0
OFFSET ..... -20 V
COLLECTOR SUPPLY
POLARITY ..... AC
Protective Cover ..... Open

Test Equipment settings:
Digital Multimeter:
Mode ..... DC Current

6065-446

Checking Without INVERT

a. Set the LEFT-RIGHT-STANDBY switch to LEFT.

b. **CHECK** for a Digital Multimeter reading of less than 10 mA when the STEP/OFFSET AMPLITUDE control is rotated through its range (2 V to 50 mV).

Checking With INVERT

c. Change the following 370 setting:

STEP GENERATOR
POLARITY INVERT ..... On

The INVERT indicator will light up.

d. **CHECK** for a Digital Multimeter reading less than 10 mA when the STEP/OFFSET AMPLITUDE control is rotated through its range (2 V to 50 mV).

Removing the Setup

e. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... STANDBY

f. Disconnect the Digital Multimeter leads from the 370.

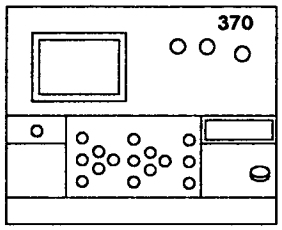
Scan by Zenith

F16. Examining Single Measurement Mode Operation

IMPORTANT:

The characteristics examined in this step are examples of typical instrument operation; *they are not specifications*.

F16 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
MODE ..... NON-STORE
HORIZONTAL VOLTS/DIV ..... STEP GEN
STEP GENERATOR
NUMBER OF STEPS 10
COLLECTOR SUPPLY
POLARITY ..... AC

6065-448

a. Press the MEASUREMENT SINGLE button once.

b. **EXAMINE** the CRT for a spot scanning from left to right.

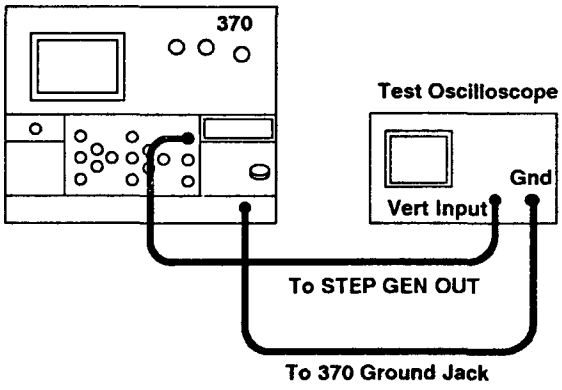
Scan by Zenith

F17. Checking PULSE Width

Specification:

- Pulse Width is 80 s ±10% for the SHORT setting of the PULSE selector and 300 s ±10% for the LONG setting.

F17 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

STEP GENERATOR
- STEP/OFFSET AMPLITUDE ..... 2 V
- NUMBER OF STEPS 1
- PULSE ..... SHORT

Test Equipment settings:

Test Oscilloscope
- Vertical sensitivity ..... 2 V/division
- Horizontal ..... 20 µs/division
- Trigger mode ..... Auto

6065-449

Checking SHORT PULSE Width

a. **CHECK** that the pulse width is 80 µs ±10% (as measured by the test oscilloscope).

Checking LONG PULSE Width

b. Change the following 370 and Test Equipment settings:

370:

STEP GENERATOR
- PULSE ..... LONG

Test Equipment:

Test Oscilloscope
- Horizontal ..... 50 µs/division

c. **CHECK** that the pulse width is 300 µs ±10%.

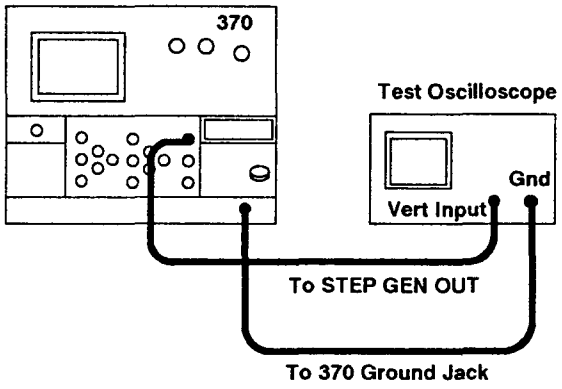
Scan by Zenith

F18. Checking Step Rate

Specifications:

- Step Rate is twice the line frequency when COLLECTOR SUPPLY POLARITY is set to +⏠ or -⏡
- Step Rate is equal to the line frequency when COLLECTOR SUPPLY POLARITY is set to AC∿.

F18 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

STEP GENERATOR
- STEP/OFFSET AMPLITUDE ..... 1 V
- NUMBER OF STEPS 10

Protective Cover ..... Open

Test Equipment settings:

Test Oscilloscope:
- Vertical sensitivity ..... 2 V/division
- Horizontal ..... 10 ms/division
- Trigger Mode ..... Auto

6065-450

Checking +⏠ Step Rate

a. **CHECK** that the interval between steps displayed on the Test Oscilloscope is approximately 8.3 ms (when the power line frequency is 60 Hz) or approximately 10 ms (when the power line frequency is 50 Hz).

Checking AC ∿ Step Rate

b. Change the following 370 setting:

COLLECTOR SUPPLY
POLARITY ..... AC ∿

c. **CHECK** that the interval between steps displayed on the Test Oscilloscope is approximately 16.6 ms (when line frequency is 60 Hz) or approximately 20 ms (when line frequency is 50 Hz) .

Checking -⏡ Step Rate

d. Change the following 370 setting:

COLLECTOR SUPPLY
POLARITY ..... -⏡ .

e. **CHECK** that the interval between steps displayed on the Test Oscilloscope is approximately 8.3 ms (when the power line frequency is 60 Hz) or approximately 10 ms (when the power line frequency is 50 Hz), and that the staircase waveform displayed on CRT is inverted.

Removing the Setup

f. Disconnect the Test Oscilloscope from the 370.

Scan by Zenith

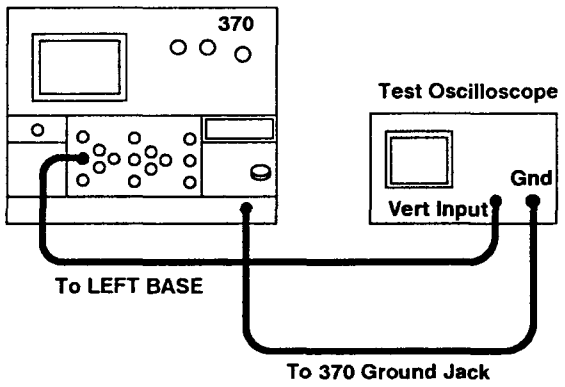
F19. Examining Base Configuration Selections for Internal and External Step Generator Operation

IMPORTANT:

The characteristics examined in this step are examples of typical instrument operation; *they are not specifications*.

The following procedure checks operation of the relays that carry the Step Generator signal to the Test Fixture Adapter Jacks.

F19 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

STEP GENERATOR
- STEP/OFFSET AMPLITUDE ..... 1 V
- NUMBER OF STEPS 10
- Protective Cover ..... Open

Test Equipment settings:
Test Oscilloscope:
- Vertical sensitivity ..... 2 V/division
- Horizontal ..... 10 ms/division
- Trigger ..... Auto

6065-451

Examining Internal Operation for LEFT

a. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... LEFT

b. **EXAMINE** the test oscilloscope display for a step waveform.

Examining Internal Operation for RIGHT

c. Connect the test oscilloscope between the RIGHT B (Base) and ground jacks.

d. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... RIGHT

e. **EXAMINE** the test oscilloscope display for a step waveform.

Examining External Base Input for RIGHT

f. Change the following 370 setting:

CONFIGURATION ..... BASE OPEN (EXT)

g. Use a patch cord to connect the STEP GEN OUT and EXT BASE or EMITTER IN jacks.

h. **EXAMINE** the test oscilloscope display for a step waveform.

Examining External Base Input for LEFT

i. Connect the test oscilloscope between the LEFT B (Base) and ground jacks.

j. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... LEFT

k. **EXAMINE** the test oscilloscope display for a step waveform.

Scan by Zenith

5

Examining BASE OPEN CONFIGURATION for LEFT

l. Disconnect the patch cord.

m. **EXAMINE** the test oscilloscope for no step waveform to be displayed.

6

Examining BASE OPEN CONFIGURATION for RIGHT

n. Connect the test oscilloscope between the RIGHT B (Base) and ground jacks.

o. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... RIGHT

p. **EXAMINE** the test oscilloscope for no step waveform to be displayed.

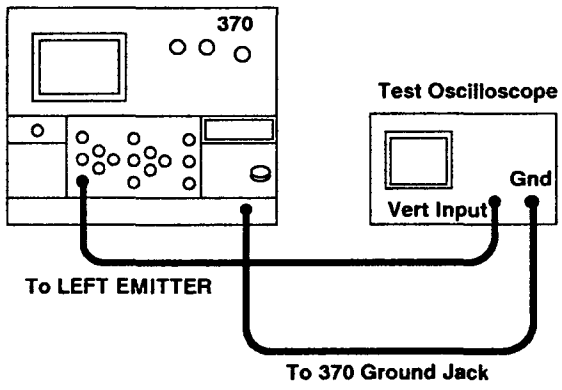
Scan by Zenith

F20. Examining Emitter Configuration Selections for Internal and External Step Generator Operation

IMPORTANT:

The characteristics examined in this step are examples of typical instrument operation; *they are not specifications*.

F20 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

STEP GENERATOR
STEP/OFFSET AMPLITUDE ..... 1 V
NUMBER OF STEPS 10
CONFIGURATION ..... EMITTER STEP GEN
Protective Cover ..... Open

Test Equipment settings:

Test Oscilloscope:
Vertical sensitivity ..... 2 V/division
Horizontal ..... 10 ms/division
Trigger ..... Auto

6065-456

Examining Internal Operation for LEFT

a. **EXAMINE** the test oscilloscope for a step waveform display.

Examining Internal Operation for RIGHT

b. Connect the test oscilloscope between the RIGHT E (Emitter) and ground jacks.

c. **EXAMINE** the test oscilloscope for a step waveform display.

Examining External Operation for RIGHT

d. Change the following 370 settings:

CONFIGURATION ..... EMITTER OPEN (EXT)

e. Use a patch cord to connect the STEP GEN OUT and EXT BASE or EMITTER IN jacks.

f. **EXAMINE** the test oscilloscope for a step waveform display.

Examining External Operation for LEFT

g. Connect the test oscilloscope between the LEFT E (Emitter) and ground jacks.

h. **EXAMINE** the test oscilloscope for a step waveform display.

Removing the Setup

i. Disconnect the test oscilloscope and remove the patch cord from the 370.

Scan by Zenith

G. AUX SUPPLY

Equipment Required (see Table 4-3):

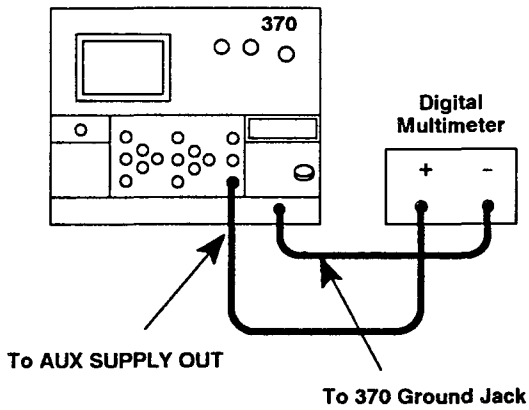
- Test Oscilloscope
- Digital Multimeter

G1. Checking Aux Supply Accuracy, Resolution, and Range

Specifications:

- The Aux Supply is accurate to less than (50 mV + 1.5% of the total output).
- Resolution is 20 mV.
- Range is from –40 V to +40 V.

G1 SETUP CONDITIONS



370 settings:

Initialize the 370.

Test Equipment settings:
Digital Multimeter
Mode ..... DC Voltage

6065-452

Checking Accuracy

a. **CHECK** that the AUX SUPPLY readout on the 370 display is 0.00 V.

b. **CHECK** that the digital multimeter reading is within the limits given in Table 4-23 for 0.00 V.

Table 4-23
AUX SUPPLY Accuracy

AUX SUPPLY Readout	Digital Multimeter Reading
0.00 V	±0.05 V
–40.00 V	–39.35 to –40.65 V
+40.00 V	+39.35 to +40.65 V

Checking Resolution

c. **CHECK** that each time one of the AUX SUPPLY arrow buttons (up or down) is pressed, the AUX SUPPLY readout and digital multimeter reading change by 20 mV.

Checking Range

d. Change the following 370 setting:

AUX SUPPLY ..... –40.00 V (as indicated in the AUX SUPPLY readout)

Press and hold the FAST and AUX SUPPLY down arrow button to set the AUX SUPPLY to –40.00 V.

e. **CHECK** that the digital multimeter measurement is within the limits given in Table 4-23 for –40.00 V.

Scan by Zenith

f. Change the following 370 setting:

AUX SUPPLY . . . . . +40.00 V (as indicated in the AUX SUPPLY readout)

Press and hold the FAST and AUX SUPPLY up arrow button to set the AUX SUPPLY to +40.00 V.

g. **CHECK** that the digital multimeter measurement is within the limits given in Table 4–23 for +40.00 V.

Removing the Setup

h. Disconnect the digital multimeter leads from the 370.

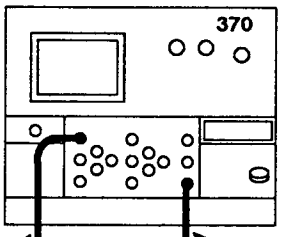
Scan by Zenith

G2. Checking Aux Supply Maximum Output Current

Specification:

- Output Current is 10 mA for AUXILIARY SUPPLY output between −40 V and +40 V, and at least 100 mA between −20 V and +20 V.

G2 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
  VERTICAL
    CURRENT/DIV ..... 5 mA COLLECTOR
  HORIZONTAL
    VOLTS/DIV ..... 10 V COLLECTOR
COLLECTOR SUPPLY
  MAX PEAK POWER WATTS 0.4
  MAX PEAK VOLTS 80
  POLARITY ..... AC
AUX SUPPLY ..... 40.0 V
LEFT-RIGHT-STANDBY ..... LEFT
CURSOR Mode ..... DOT

6065-453

Checking 10 mA at ±40 V

a. **CHECK** that the vertical CURSOR readout is between −9.37 and −10.70 mA.

b. Change the following 370 setting:

AUX SUPPLY ..... −40.00 V

Press and hold the FAST and AUX SUPPLY down arrow button to set the AUX SUPPLY to −40.00 V.

c. **CHECK** that the vertical CURSOR readout is between 9.37 and 10.70 mA.

Checking 100 mA at ±20 V

d. Change the following 370 settings:

DISPLAY
  VERTICAL
    CURRENT/DIV ..... 50 mA COLLECTOR
COLLECTOR SUPPLY
  MAX PEAK POWER WATTS 10
AUX SUPPLY ..... +20.00

e. **CHECK** that the vertical CURSOR readout is at least −100 mA.

f. Change the following 370 setting:

AUX SUPPLY ..... −20.00 V

Press and hold the FAST and AUX SUPPLY down arrow button to set the AUX SUPPLY to −20 V.

g. **CHECK** that the vertical CURSOR readout is at least 100 mA.

h. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... STANDBY

Removing the Setup

i. Remove the patch cord from the 370.

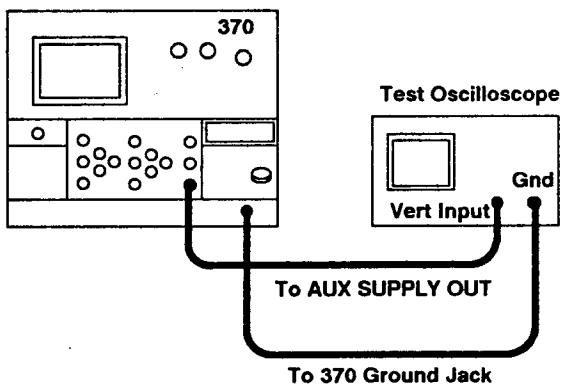
Scan by Zenith

G3. Checking Aux Supply Ripple and Noise

Specification:

- Displayed Ripple and Noise is less than 50 mV peak to peak.

G3 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following control as indicated.

AUX SUPPLY ..... +40.00 V

Test Equipment settings:

Test Oscilloscope
- Vertical Sensitivity ..... 10 mV/division
- Vertical Coupling ..... AC
- Horizontal ..... 5 ms/division
- Trigger ..... Auto

6065-454

Checking Ripple and Noise

a. **CHECK** that any ripple or noise displayed on the test oscilloscope does not exceed 50 mV peak to peak.

b. Change the following 370 setting:

AUX SUPPLY ..... -40.00 V

Press FAST and the AUX SUPPLY down arrow button to set the AUX SUPPLY to -40.00 volts.

c. **CHECK** that any ripple or noise displayed on the test oscilloscope does not exceed 50 mV peak to peak.

Removing the Setup

d. Disconnect the test oscilloscope from the 370.

Scan by Zenith

H. COLLECTOR SUPPLY

Equipment Required (see Table 4-3):

- Digital Multimeter
- Extender Cables (2; for an alternate step)

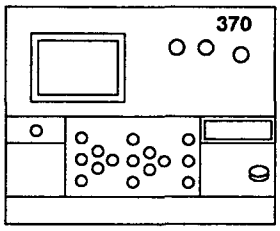
H1. Examining Collector Supply Variable Operation

Adjusting Collector Supply Offset (A6R412)

IMPORTANT:

The characteristics examined in this step are examples of typical instrument operation; *they are not specifications*.

H1 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
Mode ..... NON-STORE
VERTICAL
CURRENT/DIV ..... 1 µA COLLECTOR
COLLECTOR SUPPLY
MAX PEAK POWER WATTS 50
Protective Cover ..... Closed

6065-455

Examining Collector Supply Variable Operation

a. **EXAMINE** the display, as the COLLECTOR SUPPLY VARIABLE control is rotated clockwise, for the spot to become a horizontal line starting in the lower left corner and extending continuously to the right along the bottom horizontal graticule.

b. Change the following 370 settings:

LOOPING COMPENSATION ..... Minimum looping
COLLECTOR SUPPLY
VARIABLE 0%

c. **EXAMINE** the LED display beside the COLLECTOR SUPPLY VARIABLE control and note that it lights up and extends toward 100 % as the COLLECTOR SUPPLY VARIABLE control is rotated clockwise.

Removing the Electrical Shield

d. Change the following 370 settings:

POWER ..... OFF

WARNING

To avoid electric shock hazard, be certain the 370 POWER switch is set to OFF before removing or replacing the electrical shield and connecting the digital multimeter to the 370.

e. Use a #1 Pozidrive screwdriver to remove the electric shield on the left side of the 370 that covers the A6 Collector Supply Board. (These are three shields on the left side; remove the rear shield.)

Scan by Zenith

Adjusting Collector Supply Offset

f. Change the following Test Equipment setting:

DIGITAL MULTIMETER
MODE ..... DC VOLTAGE

g. Connect the digital multimeter test leads to pin 1 and pin 3 of P62. (These are the COLLECT-OUT and ground pins.)

h. Change the following 370 setting:

POWER ..... ON

i. **ADJUST** CS OFFSET adjustment R412 on the A6 Collector Supply Board for a digital multimeter readout of 0.0 mV ±1 mV.

j. Change the following 370 settings:

COLLECTOR SUPPLY
POLARITY ..... + DC
MAX PEAK POWER WATTS ..... 220 W
VARIABLE 100%
CURSOR ..... DOT

k. **CHECK** that the Horizontal CURSOR readout displays a reading of 16.0 to 17.6 V. If not, readjust CS OFFSET for a CURSOR reading within that range.

Removing the Setup

l. Change the following 370 setting:

POWER ..... OFF

m. Remove the digital multimeter test leads from the 370.

n. Replace the electrical shield.

o. Change the following 370 setting:

POWER ..... ON

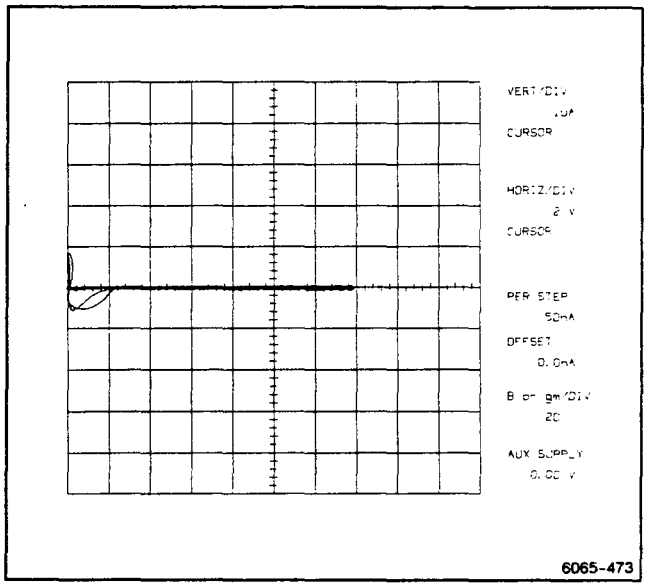


Figure 4–5. Switching noise display.

Scan by Zenith

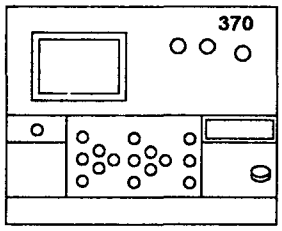
H2. Adjusting Collector Supply Gain (A6R401)

IMPORTANT:

The characteristic examined in this step is provided as an example of typical instrument operation to aid in the adjustment of R401.

Although not a specification, Collector Supply Gain may affect the accuracy of MAX PEAK VOLTS when checked in step H4.

H2 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
HORIZONTAL
VOLTS/DIV ..... 200 V COLLECTOR
COLLECTOR SUPPLY
POLARITY ..... +DC
MAX PEAK VOLTS LOW-HIGH ..... HIGH
MAX PEAK POWER WATTS 50
CURSOR Mode ..... DOT
Protective Cover ..... Closed

6065-457

Adjusting Collector Supply Gain

a. Change the following 370 setting:

COLLECTOR SUPPLY
VARIABLE ..... Position the displayed spot on the graticule line that forms the right graticule edge.

b. **EXAMINE** the horizontal CURSOR readout for a reading of 2000 V. If the horizontal CURSOR readout is not 2000 V, the following adjustment is necessary.

NOTE

See **Test Point and Adjustment Locations 2** *in Section 7 for the location of the adjustment associated with this step.*

c. **ADJUST** CS Gain adjustment R401 on the A6 Collector Supply Board for a horizontal CURSOR readout of 2000 V.

R401 can be adjusted through the access hole in the protective shield.

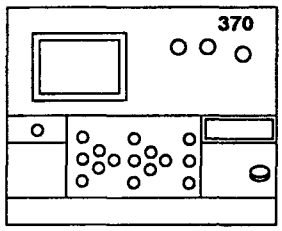
Scan by Zenith

H3. Examining the Protective Cover Interlock and Polarity Settings

IMPORTANT:

The characteristics examined in this step are examples of typical instrument operation; *they are not specifications.*

H3 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

COLLECTOR SUPPLY
VARIABLE 100%
CURSOR Mode ..... DOT

6065-458

Examining the Protective Cover Interlock and Warning Indicators

a. **EXAMINE** the display for the horizontal trace to extend along the bottom horizontal graticule line from the lower left corner.

b. Change the following 370 setting:

Protective Cover ..... Open

c. **EXAMINE** the 370 for the following:

- The displayed trace returns to a spot in the lower left corner
- The DISABLED LED turns on
- The WARNING LED turns off

d. Change the following 370 settings:

Protective Cover ..... Closed

e. **EXAMINE** the 370 for the following:

- The displayed spot returns to a trace
- The DISABLE LED turns off
- The WARNING LED turns on

Examining AC POLARITY

f. Change the following 370 settings:

COLLECTOR SUPPLY
POLARITY ..... AC
VARIABLE 100%

g. **EXAMINE** the display for a horizontal trace starting from graticule center and extending out of the display area.

Examining – POLARITY

h. Change the following 370 settings:

COLLECTOR SUPPLY
POLARITY ..... –
VARIABLE 100%

i. **EXAMINE** the display for a horizontal trace extending along the top horizontal graticule line from the upper right corner.

Examining –DC POLARITY

j. Change the following 370 settings:

COLLECTOR SUPPLY
POLARITY ..... –DC
INTENSITY ..... VISIBLE DISPLAY

k. **EXAMINE** the display for the spot to move from the upper right corner–along the top horizontal graticule line–as the COLLECTOR SUPPLY VARIABLE control is rotated clockwise to 100%.

Scan by Zenith

Examining –LEAKAGE POLARITY

l. Change the following 370 setting:

COLLECTOR SUPPLY
POLARITY ..... –LEAKAGE
VARIABLE 0%

m. **EXAMINE** the display for the spot to move from the upper right corner–along the top horizontal graticule line–as the COLLECTOR SUPPLY VARIABLE control is rotated clockwise to 100%.

Examining +DC POLARITY

n. Change the following 370 settings:

COLLECTOR SUPPLY
POLARITY ..... +DC

o. **EXAMINE** the display for the spot to move from the lower left corner–along the bottom horizontal graticule line–as the COLLECTOR SUPPLY VARIABLE control is rotated clockwise to 100%.

Examining +LEAKAGE POLARITY

p. Change the following 370 setting:

COLLECTOR SUPPLY
POLARITY ..... +LEAKAGE
VARIABLE 0%

q. **EXAMINE** the display for the spot to move from the lower left corner–along the bottom horizontal graticule line–as the COLLECTOR SUPPLY VARIABLE control is rotated clockwise to 100%.

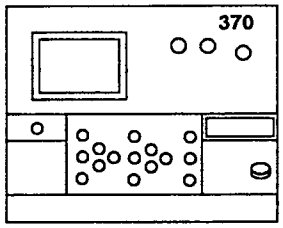
Scan by Zenith

H4. Checking Collector Supply Max Peak Volts Range, Accuracy, and Ripple

Specifications:

- MAX PEAK VOLTS selections include 16, 80, 400, and 2000.
- MAX PEAK VOLTS accuracy for the COLLECTOR SUPPLY is +10% and -0% for the 16, 80, 400, and 2000 V settings.
- DC Mode Ripple is 2% or less of the voltage or 0.1% of the full range voltage.

H4 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

COLLECTOR SUPPLY
MAX PEAK POWER WATTS 50
VARIABLE 100%
CURSOR Mode ..... DOT

6065-458

Checking 16 Max Peak Volts

a. Use the CURSOR position arrows to set the cursor dot to the right end of the trace extending along the bottom horizontal graticule line from the lower left corner.

b. **CHECK** the horizontal CURSOR readout for a reading within the limits given in Table 4-24 for 16 MAX PEAK VOLTS.

Checking 80 MAX PEAK VOLTS

c. Change the following 370 settings:

DISPLAY
HORIZONTAL VOLTS/DIV .... 10 V COLLECTOR
COLLECTOR SUPPLY
MAX PEAK VOLTS 80
VARIABLE 100%

d. **CHECK** the horizontal CURSOR readout for a reading within the limits given in Table 4-24 for 80 MAX PEAK VOLTS.

Checking 400 MAX PEAK VOLTS

e. Change the following 370 settings:

DISPLAY
HORIZONTAL VOLTS/DIV ..... 50 V COLLECTOR
COLLECTOR SUPPLY
MAX PEAK VOLTS 400
VARIABLE 100%

f. **CHECK** the horizontal CURSOR readout for a reading within the limits given in Table 4-24 for 400 MAX PEAK VOLTS.

Scan by Zenith

Checking 2000 MAX PEAK VOLTS

g. Change the following 370 settings:

DISPLAY
  HORIZONTAL
    VOLTS/DIV ..... 500 V COLLECTOR
COLLECTOR SUPPLY
  MAX PEAK VOLTS LOW-HIGH ..... HIGH
  VARIABLE 100%

h. **CHECK** the horizontal CURSOR readout for a reading within the limits given in Table 4-24 for 2000 MAX PEAK VOLTS.

Checking 2000 MAX PEAK VOLTS Ripple

i. Change the following 370 settings:

DISPLAY
  HORIZONTAL
    VOLTS/DIV ..... 2000 V COLLECTOR
    Mode ..... NON-STORE
COLLECTOR SUPPLY
  POLARITY ..... + DC
DISPLAY
  MAG MODE ..... HORIZ X1.

j. With the Collector Supply VARIABLE remaining at 100%, use the MAG DECR button to move the displayed spot near the center of the bottom line of the graticule.

k. Change the following 370 settings:

DISPLAY
  MAG MODE ..... HORIZ X10

l. **CHECK** the displayed spot for its width to be within the limit given in Table 4-24 for 2000 MAX PEAK VOLTS.

Checking 400 MAX PEAK VOLTS Ripple

m. Change the following 370 settings:

DISPLAY
  MAG MODE ..... HORIZ X1
  MAG OFFSET ..... ZERO
  HORIZONTAL VOLTS/DIV ..... 50 V COLLECTOR
COLLECTOR SUPPLY
  MAX PEAK VOLTS LOW-HIGH ..... LOW
  MAX PEAK VOLTS 400
  VARIABLE 100%

n. With the Collector Supply VARIABLE remaining at 100%, use the MAG DECR button to move the displayed spot near the center of the bottom line of the graticule.

o. Change the following 370 settings:

DISPLAY
  MAG MODE ..... HOPRIZ X10

p. **CHECK** the displayed spot for its width to be within the limit given in Table 4-24 for 400 MAX PEAK VOLTS.

Checking 80 MAX PEAK VOLTS Ripple

q. Change the following 370 settings:

DISPLAY
  MAG MODE ..... HORIZ X1
  MAG OFFSET ..... ZERO
  HORIZONTAL VOLTS/DIV ..... 10 V COLLECTOR
COLLECTOR SUPPLY
  MAX PEAK VOLTS 80
  VARIABLE 100%

r. With the Collector Supply VARIABLE remaining at 100%, use the MAG DECR button to move the displayed spot near the center of the bottom line of the graticule.

s. Change the following 370 settings:

DISPLAY
  MAG MODE ..... HORIZ X10

t. **CHECK** the displayed spot for its width to be within the limit given in Table 4-24 for 80 MAX PEAK VOLTS.

Checking 16 MAX PEAK VOLTS Ripple

u. Change the following 370 settings:

DISPLAY
  MAG MODE ..... HORIZ X1
  MAG OFFSET ..... ZERO
  HORIZONTAL VOLTS/DIV ..... 2 V COLLECTOR
COLLECTOR SUPPLY
  MAX PEAK VOLTS 16
  VARIABLE 100%

v. With the Collector Supply VARIABLE remaining at 100%, use the MAG DECR button to move the displayed spot near the center of the bottom line of the graticule.

w. Change the following 370 settings:

DISPLAY
  MAG MODE ..... HORIZ X10

x. **CHECK** the displayed spot for its width to be within the limit given in Table 4-24 for 16 MAX PEAK VOLTS.

Scan by Zenith

Table 4-24
Collector Supply Max Peak Volts

MAX PEAK VOLTS Setting	HORIZONTAL VOLTS/DIV Setting	Horizontal CURSOR Readout Limits	Maximum Spot Width (Ripple)
16	2 V	16.00 V to 17.60 V	320 mV
80	10 V	80.00 V to 88.00 V	1.6 V
400	50 V	400.0 V to 440.0 V	8.0 V
2000	500 V	2000 V to 2200 V	40 V

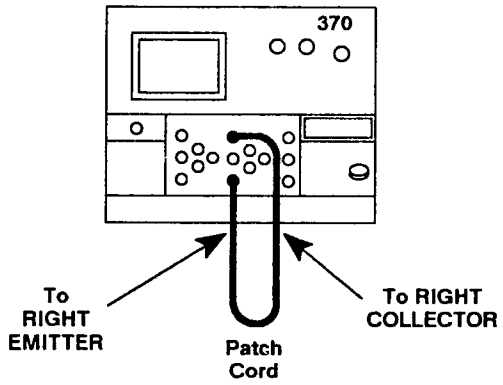
Scan by Zenith

H5. Checking Collector Supply Short Circuit Current

Specification:

- Maximum Peak Current is ≥10 A for the 16 V COLLECTOR SUPPLY, ≥2 A for 80 V, 400 mA for 400 V, and 50 mA for 2000 V.

H5 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

COLLECTOR SUPPLY
MAX PEAK POWER WATTS 220
VARIABLE 100%
LEFT-RIGHT-STANDBY ..... RIGHT
CURSOR Mode ..... DOT

6065-459

Checking 16 V Maximum Current

a. Use the CURSOR arrow position buttons to set the cursor dot to the top of the trace.

b. **CHECK** that the vertical CURSOR readout is within the limits specified in Table 4-25.

Checking 80 V Maximum Current

c. Change the following 370 settings:

DISPLAY
VERTICAL CURRENT/DIV ..... 500 mA
COLLECTOR SUPPLY
MAX PEAK VOLTS 80
VARIABLE 100%

d. **CHECK** Short Circuit Current for 80 MAX PEAK VOLTS by repeating parts a and b.

Checking 400 V Maximum Current

e. Change the following 370 settings:

DISPLAY
HORIZONTAL VOLTS/DIV ..... 50 V COLLECTOR
VERTICAL CURRENT/DIV ..... 100 mA
COLLECTOR SUPPLY
MAX PEAK VOLTS 400
VARIABLE 100%

f. **CHECK** Short Circuit current for 400 MAX PEAK VOLTS by repeating parts a and b.

Checking 2000 V Maximum Current

g. Change the following 370 settings:

DISPLAY
VERTICAL CURRENT/DIV ..... 20 mA
COLLECTOR SUPPLY
MAX PEAK VOLTS LOW-HIGH ..... HIGH
VARIABLE 100%

h. **CHECK** Short Circuit Current for 2000 MAX PEAK VOLTS by repeating parts a and b.

Removing the Setup

i. Change the following 370 settings:

COLLECTOR SUPPLY
MAX PEAK VOLTS LOW-HIGH ..... LOW
LEFT-RIGHT-STANDBY ..... STANDBY

j. Remove the patch cord from the 370.

Scan by Zenith

Table 4–25
Collector Supply Short Circuit Current

MAX PEAK VOLTS Setting	MAX PEAK POWER WATTS	VERTICAL CURRENT/DIV Setting	HORIZONTAL VOLTS/DIV Setting	Vertical CURSOR Readout
16 V	220	2 A	2 V	≥10 A
80 V	220	500 mA	10 V	≥2 A
400 V	220	100 mA	50 V	≥400 mA
2000 V	50	20 mA	200 V	≥50 mA

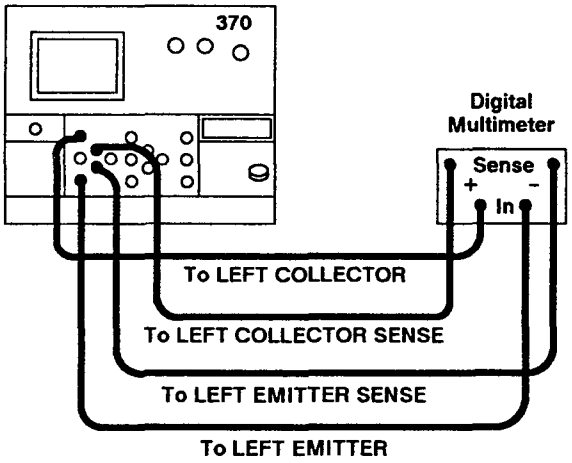
Scan by Zenith

H6. Checking Series Resistance

Specifications:

- Minimum series resistance values for the 16, 80, 400, and 2000 MAX PEAK VOLTS settings are 0.26 Ω, 6.4 Ω, 160 Ω, and 20 kΩ respectively.
- Maximum series resistance values are 800 Ω, 20 kΩ, 500 kΩ, and 12.5 MΩ.
- Series Resistance accuracy is the greater of ±5% or 0.1 Ω, and applies to the following resistance values (in Ω): 0.26, 1.3, 6.4, 32, 160, 800, 4 k, 20 k, 100 k, 500 k, 12.5 M.
- The MAX PEAK POWER WATTS selector selects the following settings (in W): 220, 50, 10, 2, 0.4, 0.08.

H6 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
HORIZONTAL
VOLTS/DIV ..... 200 V COLLECTOR
COLLECTOR SUPPLY
MAX PEAK POWER WATTS 220
POLARITY ..... AC
Protective Cover ..... Open
LEFT-RIGHT-STANDBY ..... LEFT

Test Equipment settings:
Digital Multimeter:
Mode ..... Resistance

6065-460

Checking Resistance Accuracy

a. **CHECK** that the digital multimeter reading is within the limits specified in Table 4-26 for each combination of MAX PEAK VOLTS AND MAX PEAK POWER WATTS settings.

Removing the Setup

b. Disconnect the digital multimeter from the 370.

Scan by Zenith

Table 4-26
Series Resistor Check

COLLECTOR SUPPLY HIGH-LOW	MAX PEAK VOLTS Setting	MAX PEAK POWER WATTS Setting	Digital Multimeter Reading
LOW	16	220	0.16 Ω to 0.36 Ω
LOW	16	50	1.2 ~~1.3~~ Ω to 1.4 Ω
LOW	16	10	6.08 Ω to 6.72 Ω
LOW	16	2	30.4 Ω to 33.6 Ω
LOW	16	0.4	152 Ω to 168 Ω
LOW	16	0.08	760 Ω to 840 Ω
LOW	400	10	3.8 kΩ to 4.2 kΩ
LOW	400	2	19 kΩ to 21 kΩ
LOW	400	0.4	95 kΩ to 105 kΩ
LOW	400	0.08	475 kΩ to 525 kΩ
HIGH	2000	50	20 kΩ[1] to 22 kΩ[1]
HIGH	2000	10	96 kΩ[1] to 106 kΩ[1]
HIGH	2000	2	466 kΩ[1] to 512 kΩ[1]
HIGH	2000	0.4	2.15 MΩ[2] to 2.38 MΩ[2]
HIGH	2000	0.08	7.91 MΩ[2] to 8.75 MΩ[2]

[1]Includes 1 kΩ collector supply transformer resistance.
[2]Includes 25 MΩ horizontal sense attenuator resistance in parallel.

Scan by Zenith

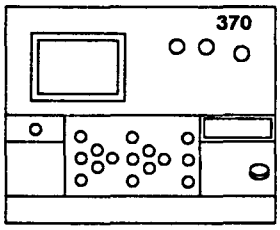
H7a. Examining Looping Compensation

Adjusting 16 V and 80 V Looping Compensation (A8R504, A8R502)

IMPORTANT:

The characteristics examined in this step are provided as examples of typical instrument operation to aid in the adjustment of R502 and R504; *they are not specifications.*

H7a SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

DISPLAY
  Mode ..... NON-STORE
  VERTICAL
    CURRENT/DIV ..... 1 μA COLLECTOR
  MAG MODE ..... X1 VERT
COLLECTOR SUPPLY
  VARIABLE 100%
  MAX PEAK POWER WATTS 220
Protective Cover ..... Closed
LEFT-RIGHT-STANDBY ..... LEFT

6065-461

Examining 16 V Looping

a. Press the DISPLAY MAG OFFSET INCR button ten times to move the trace to graticule center.

b. Set the front-panel LOOPING COMPENSATION control for a slightly open loop.

c. **EXAMINE** the displayed trace for optimum overlay of the two loops (see Figure 4-6). If the overlay is not optimum, the following adjustment is necessary.

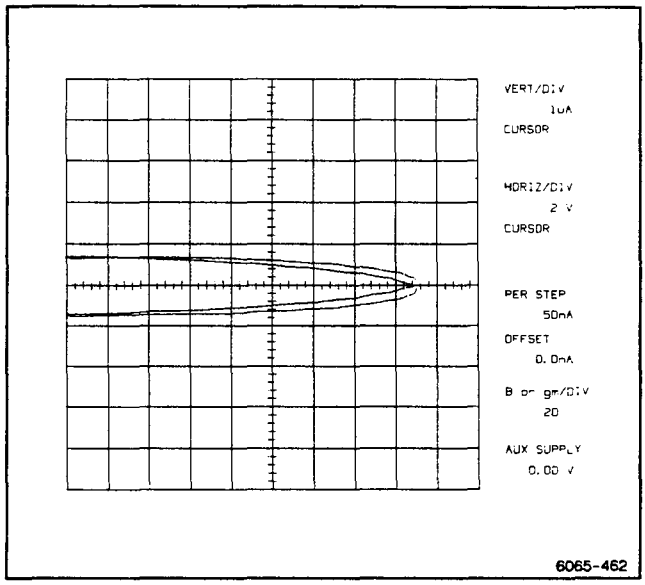


Figure 4-6. Looping compensation display.

Adjusting 16 V Looping

NOTE

See **Test Point and Adjustment Locations 2** *in Section 7 for the location of the adjustments associated with this step.*

d. **ADJUST** 16V Looping adjustment R504 on the A8 HV Relay Board for optimum overlay of the loops.

Examining 80 V Looping

e. Change the following 370 settings:

DISPLAY
  HORIZONTAL VOLTS/DIV ..... 10 V COLLECTOR
COLLECTOR SUPPLY
  MAX PEAK POWER WATTS 50
  MAX PEAK VOLTS 80
  VARIABLE 100%
LOOPING COMPENSATION ..... Slightly open loop

Scan by Zenith

f. **EXAMINE** the displayed trace for optimum overlay of the two loops.

If the overlay is not optimum, the following adjustment is necessary.

Adjusting 80 V Looping

g. **ADJUST** 80V Looping adjustment R502 on the A8 HV Relay Board for optimum overlay of the loops.

Set the front-panel LOOPING COMPENSATION control for minimum trace width.

NOTE

If satisfactory looping compensation cannot be obtained with this step, perform the following alternate step, H7b.

Scan by Zenith

H7b. Adjusting Looping Compensation–Alternate Method (A9R500, A8R504, A8R502)

IMPORTANT:

Only perform this step if satisfactory looping compensation cannot be obtained with the preceding step (H7a).

Removing the Test Fixture Module

a. Change the following 370 setting:

POWER ..... OFF

b. Remove the 370 Test Fixture Module from the 370 mainframe.

NOTE

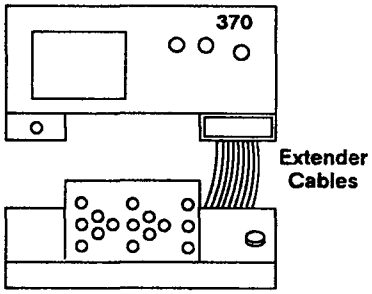
For details on removing the Test Fixture Module, see the instructions under "Component Removal and Replacement" in Section 4, Maintenance.

c. Connect two extender cables between the 370 mainframe and the test fixture module.

d. Change the following 370 setting:

POWER ..... ON

H7b SETUP CONDITIONS



370 settings:

Set the following controls as indicated.

Protective Cover ..... Closed
DISPLAY
Mode ..... NON-STORE
VERTICAL
CURRENT/DIV ..... 1 µA COLLECTOR
MAG MODE ..... X1 VERT
COLLECTOR SUPPLY
VARIABLE 100%
MAX PEAK POWER WATTS 220
DISPLAY
MAG OFFSET ..... Press the INCR button ten times to place the trace at graticule center
MAG MODE ..... X10 VERT
LOOPING COMPENSATION ..... Minimum trace width

6065-472

Adjusting 16 V Looping

NOTE

See **Test Point and Adjustment Locations 2** *in Section 7 for the location of the adjustments associated with this step.*

e. **ADJUST** Looping Comp adjustment R500 on the A9 LV Relay Board and 16V Looping adjustment R504 on the A8 HV Relay Board to match trace start points.

Scan by Zenith

Adjusting 80 V Looping

f. Change the following 370 settings:

DISPLAY
HORIZONTAL VOLTS/DIV ..... 10 V COLLECTOR
COLLECTOR SUPPLY
MAX PEAK POWER WATTS 50
MAX PEAK VOLTS 80
VARIABLE 100%
LOOPING COMPENSATION ..... Minimum trace width

g. **EXAMINE** the displayed trace for the beginning to be at one point.

If the beginning is not at one point, the following adjustment is necessary.

h. **ADJUST** 80 V Looping adjustment R502 on the A8 HV Relay Board to match the trace start points.

Installing the Test Fixture Module

NOTE

If step H8 will be performed, do H8 before replacing the Test Fixture Module.

i. Change the following 370 setting:

POWER ..... OFF

j. Remove the extenders and re-install the Test Fixture Module.

k. Change the following 370 setting:

POWER ..... ON

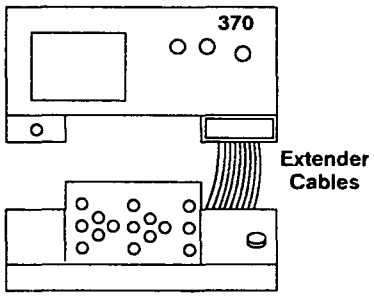
Scan by Zenith

H8. Checking the Timer Board Ouput

IMPORTANT:

The characteristics examined in this step are examples of typical instrument operation; *they are not specifications.*

H9 SETUP CONDITIONS



370 settings:

Then set the following controls as indicated.

POWER ..... OFF

Test Equipment settings:

Digital Multimeter:
- Mode ..... DC Volts

Test Oscilloscope:
- Vertical sensitivity ..... 2 V/division
- Horizontal ..... 20 ms/division
- Trigger slope ..... Negative slope (-)

6065-472

Removing the Test Fixture Module

a. Remove the 370 Test Fixture Module from the 370 mainframe.

NOTE

For details on removing the Test Fixture Module, see the instructions under "Component Removal and Replacement" in Section 4, Maintenance.

b. Connect two extender cables between the 370 mainframe and the test fixture module.

Checking ARC(L) Output

c. Connect the oscilloscope probe to J168B pin 8 on the A60 Timer Board.

d. Change the following 370 setting:

POWER ..... ON

e. With the Protective Cover in place, open and close the Protective Cover several times.

f. **CHECK** that each time the Protective Cover is opened or closed, the voltage monitored by the oscilloscope transitions to a low TTL level and remains at this level for 80 to 120 ms.

Installing the Test Fixture Module

g. Change the following 370 setting:

POWER ..... OFF

h. Remove the oscilloscope probe and the extender cables and re-install the Test Fixture Module.

i. Change the following 370 setting:

POWER ..... ON

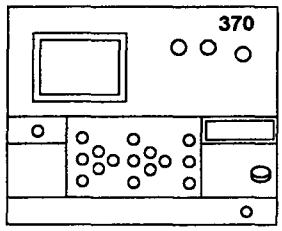
Scan by Zenith

H9. Examining the Limiter Indicator in Voltage Mode

IMPORTANT:

The characteristics examined in this step are examples of typical instrument operation; *they are not specifications*.

H9 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

COLLECTOR SUPPLY
MAX PEAK VOLTS 400

6065-463

Examining the Limiter Indicator for LOW Range

j. **EXAMINE** the LIMITER indicator beside the COLLECTOR SUPPLY VARIABLE control for illumination when the COLLECTOR SUPPLY VARIABLE is rotated clockwise.

Examining the Limiter Indicator for HIGH Range

k. Change the following 370 setting:

COLLECTOR SUPPLY
MAX PEAK VOLTS HIGH-LOW ..... HIGH

l. **EXAMINE** the LIMITER indicator beside the COLLECTOR SUPPLY VARIABLE control for illumination on when the COLLECTOR SUPPLY VARIABLE is rotated clockwise.

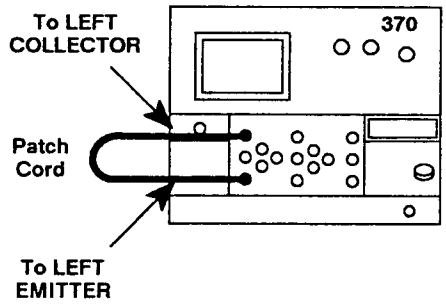
Scan by Zenith

H10. Examining the Limiter Indicator in Current Mode

IMPORTANT:

The characteristics examined in this step are examples of typical instrument operation; *they are not specifications*.

H10 SETUP CONDITIONS



370 settings:

Initialize the 370; then set the following controls as indicated.

COLLECTOR SUPPLY
MAX PEAK VOLTS 80
MAX PEAK POWER WATTS 220
LEFT-RIGHT-STANDBY ..... LEFT

6065-464

Examining the Limiter at 220 W

a. **EXAMINE** the LIMITER indicator beside the COLLECTOR SUPPLY VARIABLE control for illumination when the COLLECTOR SUPPLY VARIABLE is rotated clockwise.

Examining the Limiter at 50 W

b. Change the following 370 settings:

DISPLAY
VERTICAL CURRENT/DIV .... 50 mA COLLECTOR
COLLECTOR SUPPLY
MAX PEAK POWER WATTS 50
VARIABLE 0%

c. **EXAMINE** the LIMITER indicator beside the COLLECTOR SUPPLY VARIABLE control for illumination when the COLLECTOR SUPPLY VARIABLE is rotated clockwise.

Examining Limiter at 10 W

d. Change the following 370 settings:

DISPLAY
VERTICAL
CURRENT/DIV ..... 5 mA COLLECTOR
COLLECTOR SUPPLY
MAX PEAK POWER WATTS 10
VARIABLE 0%

e. **EXAMINE** the LIMITER indicator beside the COLLECTOR SUPPLY VARIABLE control for illumination when the COLLECTOR SUPPLY VARIABLE is rotated clockwise.

Removing the Setup

f. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... STANDBY

g. Remove the Patch Cord from the 370.

Scan by Zenith

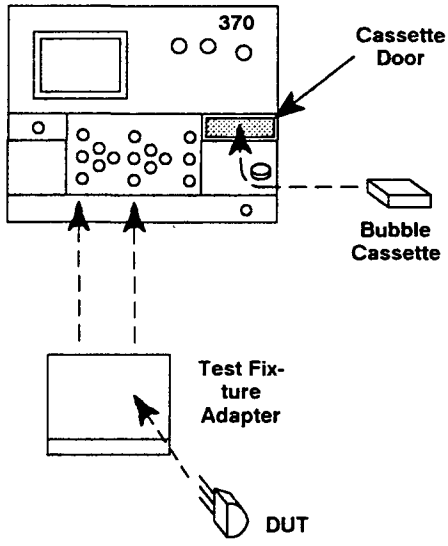
I. BUBBLE MEMORY

Equipment Required (see Table 4-3):	• Transistor (2N3904) • Test Fixture Adapter (A1007)

IMPORTANT:

The characteristics examined in this step are examples of typical instrument operation; *they are not specifications.*

I1 SETUP CONDITIONS



370 settings:

Initialize the 370.

6065-465

Installing the Bubble Memory Cassette

a. Install a bubble memory cassette in the 370.

The cassette used to initialize the 370 may be used for the remainder of this step if it has memory locations available.

Examining Memory Index Operation

b. Install a Test Fixture Adapter (A1007) on the 370.

c. Install a transistor (2N3904) in the right socket of the adapter and close the protective cover.

d. Change the following 370 settings:

DISPLAY
  VERTICAL
    CURRENT/DIV . . . . . 1 mA COLLECTOR
STEP GENERATOR
  STEP/OFFSET AMPLITUDE . . . . . 10 μA
Protective Cover . . . . . Open
LEFT-RIGHT-STANDBY . . . . . RIGHT

e. **EXAMINE** the MEMORY INDEX window for sequentially increasing or decreasing numbers as the MEMORY INDEX selector is pressed up or down.

Examining STORE Mode Operation

f. Set the MEMORY INDEX to a number (e.g., 2) and note the number for later use.

g. Rotate the COLLECTOR SUPPLY VARIABLE control to display a characteristic curve.

Scan by Zenith

h. Press the ENTER button, then press the SAVE button.

i. Set the 370 POWER switch to OFF then ON.

j. Set the MEMORY INDEX to the number noted earlier in part f.

k. Change the following 370 setting:

SETUP ..... RECALL

l. **EXAMINE** the display for a characteristic curve to be displayed in STORE mode.

This can be verified by rotating the COLLECTOR SUPPLY VARIABLE control.

Examining VIEW Mode Operation

m. Change the following 370 settings:

DISPLAY
Mode ..... VIEW
VIEW INTENSITY ..... Visible display

n. **EXAMINE** the display for the VIEW mode characteristic curve stored in the bubble cassette.

Examining COMPARE Mode Operation

o. Change the following 370 setting:

DISPLAY
Mode ..... COMPARE

p. **EXAMINE** the display for both the STORE mode and VIEW mode characteristic curves.

Removing the Setup

q. Change the following 370 setting:

LEFT-RIGHT-STANDBY ..... STANDBY

r. Remove the Test Fixture Adapter from the 370.

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SECTION FIVE
INSTRUMENT OPTIONS

Your instrument may be equipped with one or more instrument options. A brief description of each available option is given in the following discussion. Option information is incorporated into the appropriate sections of the manual. For further information on instrument options, see your Tektronix Products catalog or contact your Tektronix Field Office.

Option A1–A5: See Table 5–1.

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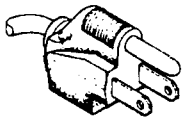
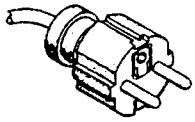
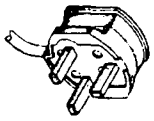
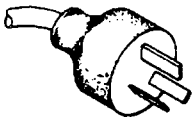
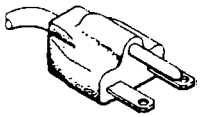
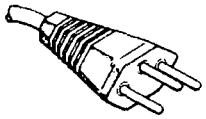
Table 5-1
Option A1-A5

Plug Configuration	Usage (Max Rating)	Reference Standards & Certification	Option #
	North American 125 V/6 A	[1]ANSI C73.11 [2]NEMA 5-15-P [3]IEC 83 [10]UL [11]CSA	Standard
	European 220 V/6 A	[4]CEE (7),II, IV, VII [3]IEC 83 [8]VDE [9]SEMKO	A1
	United Kingdom 240 V/6 A	[5]BSI 1363 [3]IEC 83	A2
	Australian 240 V/6 A	[6]AS C112 [12]ETSA	A3
	North American 250 V/10 A	[1]ANSI C73.20 [2]NEMA 6-15-P [3]IEC 83 [10]UL [11]CSA	A4
	Switzerland 240 V/6 A	[7]SEV	A5

[1]ANSI – American National Standards Institute
[2]NEMA – National Electrical Manufacturer's Association
[3]IEC – International Electrotechnical Commission
[4]CEE – International Commission on Rules for the Approval of Electrical Equipment
[5]BSI – British Standards Institute
[6]AS – Standards Association of Australia
[7]SEV – Schweizevischer Elektrotechischer Verein
[8]VDE – Verband Deutscher Elektrotechniker
[9]SEMKO – Swedish Institute for Testing and Approval of Electrical Equipment
[10]UL – Underwriters Laboratories
[11]CSA – Canadian Standards Association
[12]ETSA – Electricity Trust of South Australia

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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.

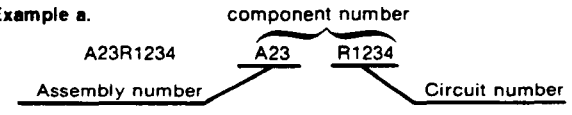
ABBREVIATIONS

Abbreviations conform to American National Standard Y1.1.

COMPONENT NUMBER (column one of the Electrical Parts List)

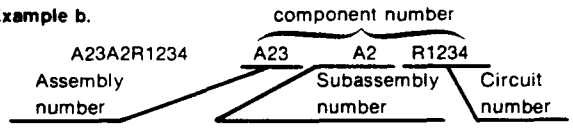
A numbering method has been used to identify assemblies, subassemblies and parts. Examples of this numbering method and typical expansions are illustrated by the following:

Example a.



Read: Resistor 1234 of Assembly 23

Example b.



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.

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CROSS INDEX - MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip Code
00853	SANGAMO WESTON INC COMPONENTS DIV	SANGAMO RD PO BOX 128	PICKENS SC 29671-9716
01121	ALLEN-BRADLEY CO	1201 S 2ND ST	MILWAUKEE WI 53204-2410
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR GROUP	13500 N CENTRAL EXPY PO BOX 655012	DALLAS TX 75265
02735	RCA CORP SOLID STATE DIVISION	ROUTE 202	SOMERVILLE NJ 08876
04222	AVX CERAMICS DIV OF AVX CORP	19TH AVE SOUTH P O BOX 867	MYRTLE BEACH SC 29577
04713	MOTOROLA INC SEMICONDUCTOR PRODUCTS SECTOR	5005 E MCDOWELL RD	PHOENIX AZ 85008-4229
06665	PRECISION MONOLITHICS INC SUB OF BOURNS INC	1500 SPACE PARK DR	SANTA CLARA CA 95050
07263	FAIRCHILD SEMICONDUCTOR CORP NORTH AMERICAN SALES SUB OF SCHLUMBERGER LTD MS 118	10400 RIDGEVIEW CT	CUPERTINO CA 95014
07716	TRW INC TRW IRC FIXED RESISTORS/BURLINGTON	2850 MT PLEASANT AVE	BURLINGTON IA 52601
12515	TELEDYNE THERMATICS A TELEDYNE INC CO	HWY 301 S PO BOX 909	ELM CITY NC 27822
14433	ITT SEMICONDUCTORS DIV		WEST PALM BEACH FL
14552	MICROSEMI CORP	2830 S FAIRVIEW ST	SANTA ANA CA 92704-5948
19701	MEPCO/CENTRALAB A NORTH AMERICAN PHILIPS CO MINERAL WELLS AIRPORT	PO BOX 760	MINERAL WELLS TX 76067-0760
20932	KYOCERA INTERNATIONAL INC	11620 SORRENTO VALLEY RD PO BOX 81543 PLANT NO 1	SAN DIEGO CA 92121
22526	DU PONT E I DE NEMOURS AND CO INC DU PONT CONNECTOR SYSTEMS DIV MILITARY PRODUCTS GROUP	515 FISHING CREEK RD	NEW CUMBERLAND PA 17070-3007
24546	CORNING GLASS WORKS	550 HIGH ST	BRADFORD PA 16701-3737
25088	SIEMENS CORP	186 WOOD AVE S	ISELIN NJ 08830-2704
27014	NATIONAL SEMICONDUCTOR CORP	2900 SEMICONDUCTOR DR	SANTA CLARA CA 95051-0606
32997	BOURNS INC TRIMPOT DIV	1200 COLUMBIA AVE	RIVERSIDE CA 92507-2114
50434	HEWLETT-PACKARD CO OPTOELECTRONICS DIV	370 W TRIMBLE RD	SAN JOSE CA 95131
51642	CENTRE ENGINEERING INC	2820 E COLLEGE AVE	STATE COLLEGE PA 16801-7515
54473	MATSUSHITA ELECTRIC CORP OF AMERICA	ONE PANASONIC WAY PO BOX 1501	SECAUCUS NJ 07094-2917
54583	TDK ELECTRONICS CORP	12 HARBOR PARK DR	PORT WASHINGTON NY 11550
55680	NICHICON /AMERICA/ CORP	927 E STATE PKY	SCHAUMBURG IL 60195-4526
56289	SPRAGUE ELECTRIC CO WORLD HEADQUARTERS	92 HAYDEN AVE	LEXINGTON MA 02173-7929
57668	ROHM CORP	8 WHATNEY PO BOX 19515	IRVINE CA 92713
59660	TUSONIX INC	7741 N BUSINESS PARK DR PO BOX 37144	TUCSON AZ 85740-7144
59821	MEPCO/CENTRALAB A NORTH AMERICAN PHILIPS CO	7158 MERCHANT AVE	EL PASO TX 79915-1207
61957	USM CORP SUB OF EMHART INDUSTRIES INC	140 FEDERAL ST	BOSTON MA 02107
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077-0001
91637	DALE ELECTRONICS INC	2064 12TH AVE PO BOX 609	COLUMBUS NE 68601-3632
92966	GTE PRODUCTS CORP LIGHTING PRODUCTS GROUP HILLSBORO MINIATURE LAMP PLANT	WEST MAIN ST	HILLSBORO NH 03244
S0293	MATSUSHITA ELECTRIC IND CO LTD	1048 KADOMA KADOMA-CITY	OSAKA JAPAN
S4431	MURATA MFG CO LTD	16 KAIDEN NISHIJM CHO NAGAOKAKY-CITY	KYOTO JAPAN
S4549	JAPAN AVIATION ELECTRONICS IND LTD	21 6 DOGUZAKA SHILHUYA QU 1 CHOME	TOKYO JAPAN

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CROSS INDEX - MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip Code
S4997	HITACHI LTD	4-6 KANDA SURUGADAI CHIYODA-KU	TOKYO JAPAN
S5011	ISHIZUKA ELECTRONICS CORP	3-16-7 HIGASHI-KOIWA EDOGAWA-KU	TOKYO JAPAN
S5372	HITACHI LTD	1-5-1 MARUNOUCHI CHIYODA-KU	TOKYO JAPAN
TK00G	SEIKO EPSON CORP	2-4-1 NISHI-SHINJUKU SHINJUKU-KU	TOKYO JAPAN
TK00M	NIPPON CHEMI-CON COPR.	2-7-8 TOYOMACHI SHINAGAWA-KU	TOKYO JAPAN
TK0191	SONY TEKTRONIX	PO BOX 14 HANEDA AIRPORT	TOKYO JAPAN
TK0510	PANASONIC COMPANY DIV OF MATSUSHITA ELECTRIC CORP	ONE PANASONIC WAY	SECAUCUS NJ 07094
TK0935	MARQUARDT SWITCHES INC	67 ALBANY ST PO BOX 465	CAZENOVIA NY 13035-1219
TK0961	NEC ELECTRONICS USA INC ELECTRON DIV	401 ELLIS ST PO BOX 7241	MOUNTAIN VIEW CA 94039
TK0AB	NATIONAL SEMICONDUCTOR CORP	4-403 IKEBUKURO TOSHIMA-KU	TOKYO JAPAN
TK0AE	P C N CO LTD	721-8 YOSHIOKA MANO-MACHI SADO-GUN	NIIGATA JAPAN
TK0HD	TOKIN CORP	2-5-8 KITA-AOYAMA MINATO-KU	TOKYO JAPAN

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A1	670-9302-00	.300000	.300702	CIRCUIT BD ASSY:MAIN	TK0191	670-9302-00
A1	671-0236-00	.300703		CIRCUIT BD ASSY:MOTHER	TK0191	ORDER BY DESCR
A2	670-9304-00	.300000	.300297	CIRCUIT BD ASSY:CPU	TK0191	670-9304-00
A2	670-9304-01	.300298	.300490	CIRCUIT BD ASSY:CPU	TK0191	ORDER BY DESCR
A2	670-9304-02	.300491	.301032	CIRCUIT BD ASSY:CPU	TK0191	ORDER BY DESCR
A2	670-9304-06	.301033	.301108	CIRCUIT BD ASSY:CPU	80009	670-9304-06
A2	670-9304-07	.301109		CIRCUIT BD ASSY:CPU	80009	670-9304-07
A3	670-9305-00	.300000	.300398	CIRCUIT BD ASSY:A/D	TK0191	670-9305-00
A3	670-9305-01	.300399		CIRCUIT BD ASSY:A/D	80009	670-9305-01
A4	670-9306-00	.300000	.300376	CIRCUIT BD ASSY:DIGITAL DISPLAY	TK0191	670-9306-00
A4	670-9306-01	.300377	.300492	CIRCUIT BD ASSY:DIGITAL DISPLAY	80009	670-9306-01
A4	670-9306-02	.300493		CIRCUIT BD ASSY:DIGITAL DISPLAY	TK0191	ORDER BY DESCR
A5	670-9307-00	.300000	.300376	CIRCUIT BD ASSY:DISPLAY CONTROL	TK0191	670-9307-00
A5	670-9307-01	.300377		CIRCUIT BD ASSY:DISPLAY CONTROL	80009	670-9307-01
A6	670-9308-00	.300000	.300297	CIRCUIT BD ASSY:COLLECTOR SUPPLY OUTPUT	TK0191	670-9308-00
A6	670-9308-01	.300298		CIRCUIT BD ASSY:COLLECTOR SUPPLY OUTPUT	TK0191	ORDER BY DESCR
A7	670-9309-00	.300000	.300398	CIRCUIT BD ASSY:STEP GENERATOR	TK0191	670-9309-00
A7	670-9309-01	.300399	.300512	CIRCUIT BD ASSY:STEP GENERATOR	80009	670-9309-01
A7	670-9309-02	.300513		CKT BD SUBASSY:STEP GEN	80009	670-9309-02
A8	670-9310-00			CIRCUIT BD ASSY:H V RELAY	TK0191	670-9310-00
A9	670-9311-00	.300000	.301035	CIRCUIT BD ASSY:L V RELAY	TK0191	670-9311-00
A9	670-9311-01	.301036		CIRCUIT BD ASSY:L.V. RELAY	80009	670-9311-01
A10	670-9312-00	.300000	.300297	CIRCUIT BD ASSY:SENSE	TK0191	670-9312-00
A10	670-9312-01	.300298	.300398	CIRCUIT BD ASSY:SENSE	80009	670-9312-01
A10	670-9312-02	.300399	.300492	CIRCUIT BD ASSY:SENSE	TK0191	ORDER BY DESCR
A10	670-9312-03	.300493		CIRCUIT BD ASSY:SENSE	80009	670-9312-03
A11	670-9313-00			CIRCUIT BD ASSY:MAIN KEY	TK0191	670-9313-00
A12	670-9314-00			CIRCUIT BD ASSY:SUB KEY	TK0191	670-9314-00
A14	670-9315-00			CIRCUIT BD ASSY:LOWER KEY	TK0191	670-9315-00
A15	670-9316-00			CIRCUIT BD ASSY:LOWER SUB KEY	TK0191	670-9316-00
A16	672-0180-00			CIRCUIT BD ASSY:L-O-R SWITCH (ASSEMBLY INCLUDES A16,A17)	80009	672-0180-00
A16	----- -----			CIRCUIT BD ASSY:L-O-R SWITCH		
A17	----- -----			CIRCUIT BD ASSY:SUB L-O-R SWITCH		
A18	670-9319-00	.300000	.300398	CIRCUIT BD ASSY:CRT OUTPUT	TK0191	670-9319-00
A18	670-9319-01	.300399		CIRCUIT BD ASSY:CRT OUTPUT	80009	670-9319-01
A19	670-9320-00			CIRCUIT BD ASSY:L V SUPPLY	TK0191	670-9320-00
A20	670-9321-00	.300000	.300873	CIRCUIT BD ASSY:H V REGULATOR	TK0191	670-9321-00
A20	670-9321-01	.300874		CIRCUIT BD ASSY:H.V. REGULATOR	TK0191	ORDER BY DESCR
A22	670-9322-00			CIRCUIT BD ASSY:INTERFACE	TK0191	670-9322-00
A27	670-9323-00			CIRCUIT BD ASSY:PRIMARY	TK0191	670-9323-00
A28	670-9324-00			CIRCUIT BD ASSY:LAMP	TK0191	670-9324-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A29	670-9324-00			CIRCUIT BD ASSY:LAMP	TK0191	670-9324-00
A60	671-0066-00	.300298		CIRCUIT BD ASSY:TIMER	TK0191	ORDER BY DESCR
A1	670-9302-00	.300000	.300702	CIRCUIT BD ASSY:MAIN	TK0191	670-9302-00
A1	671-0236-00	.300703		CIRCUIT BD ASSY:MOTHER	TK0191	ORDER BY DESCR
A1J10	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 6)	22526	48283-036
A1J12	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 6)	22526	48283-036
A1J20	131-3651-00			CONN,RCPT,ELEC:HEADER,2 X 32,0.1 SPACING	TK0191	131-3651-00
A1J22	131-3649-00			CONN,RCPT,ELEC:CKT BD,RTANG,2 X 22,0.1 SPACING	TK0191	131-3649-00
A1J30	131-3651-00			CONN,RCPT,ELEC:HEADER,2 X 32,0.1 SPACING	TK0191	131-3651-00
A1J32	131-3649-00			CONN,RCPT,ELEC:CKT BD,RTANG,2 X 22,0.1 SPACING	TK0191	131-3649-00
A1J40	131-3651-00			CONN,RCPT,ELEC:HEADER,2 X 32,0.1 SPACING	TK0191	131-3651-00
A1J42	131-3649-00			CONN,RCPT,ELEC:CKT BD,RTANG,2 X 22,0.1 SPACING	TK0191	131-3649-00
A1J50	131-3651-00			CONN,RCPT,ELEC:HEADER,2 X 32,0.1 SPACING	TK0191	131-3651-00
A1J52	131-3649-00			CONN,RCPT,ELEC:CKT BD,RTANG,2 X 22,0.1 SPACING	TK0191	131-3649-00
A1J110	131-3660-00			CONN,RCPT,ELEC:HEADER,2 X 20	TK0191	131-3660-00
A1J180	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 6)	22526	48283-036
A1J190	131-3668-00			CONN,RCPT,ELEC:CKT BD,4 PIN	TK0191	131-3668-00
A1J220	131-3661-00			CONN,RCPT,ELEC:HEADER,2 X 13	TK0191	131-3661-00
A1J400	131-3662-00			CONN,RCPT,ELEC:HEADER,2 X 17	TK0191	131-3662-00
A1J410	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 6)	22526	48283-036
A1J412	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 5)	22526	48283-036
A1W60	174-0291-00			CA ASSY,SP,ELEC:16,28 AWG,18.5 L,RIBBON	TK0191	174-0291-00
A1W70	174-0292-00			CA ASSY,SP,ELEC:16,28 AWG,4.3 L,RIBBON	TK0191	174-0292-00
A1W100	131-0566-00	.300703	.301132	BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225 L	24546	OMA 07
A1W100	131-0566-04	.301133		BUS,CONDUCTOR:DUMMY RES,18MM OD X 3.2MM L,W/WIRE LEADS	80009	131-0566-04
A1W192	174-0294-00			CA ASSY,SP,ELEC:16,28 AWG,12.6 L,RIBBON	TK0191	174-0294-00
A2	670-9304-00	.300000	.300297	CIRCUIT BD ASSY:CPU	TK0191	670-9304-00
A2	670-9304-01	.300298	.300490	CIRCUIT BD ASSY:CPU	TK0191	ORDER BY DESCR
A2	670-9304-02	.300491	.301032	CIRCUIT BD ASSY:CPU	TK0191	ORDER BY DESCR
A2	670-9304-06	.301033	.301108	CIRCUIT BD ASSY:CPU	80009	670-9304-06
A2	670-9304-07	.301109		CIRCUIT BD ASSY:CPU	80009	670-9304-07
A2C120	290-0778-00	.300578		CAP,FXD,ELCTLT:1UF,20%,50V,NPLZD	54473	ECE-A50N1
A2C400	290-0778-00	.300000	.300577	CAP,FXD,ELCTLT:1UF,20%,50V,NPLZD	54473	ECE-A50N1
A2C400	290-0804-00	.300578		CAP,FXD,ELCTLT:10UF,+50-20%,25V	55680	ULB1E100TAAANA
A2C410	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A2C410	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A2C412	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C460	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A2C900	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A2C900	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A2C902	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C904	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C906	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A2C908	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C910	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C920	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A2C920	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A2C922	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C924	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C926	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C928	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C930	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C932	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C934	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C936	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C937	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C938	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C940	290-1007-00			CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A2C940	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A2C940	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A2C942	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C944	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C946	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C948	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C950	281-0775-00	.300000	.300772	CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C952	281-0775-00	.300000	.300772	CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C954	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C956	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C958	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C960	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A2C960	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A2C962	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C964	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C966	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C968	281-0775-00	.300000	.301032	CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C970	281-0775-00	.300000	.301032	CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C972	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C974	281-0775-00	.300000	.301032	CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C976	281-0775-00	.300000	.301032	CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C978	281-0775-00	.300000	.301032	CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C980	281-0775-00	.300000	.301032	CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C982	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C984	281-0775-00	.300000	.301032	CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C986	281-0775-00	.300000	.301032	CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C988	281-0775-00	.300000	.301032	CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C990	281-0775-00	.300000	.301032	CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C992	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C994	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C996	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2CR120	152-0327-00	.300578		SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A2CR400	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A2FL400	119-1762-00			FILTER,RFI:0.022UF,+50/-20%,50V	80009	119-1762-00
A2J400	131-0608-00	.300000	.300772	TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 2)	22526	48283-036
A2L900	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A2L920	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A2L940	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A2L960	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A2P20	131-3650-00			CONN,PLUG,ELEC:CKT BD,RTANG,2 X 32,0.1 SPACING	TK0191	131-3650-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A2P22	131-3648-00			CONN,PLUG,ELEC:CKT BD,RTANG,2 X 22,0.1 SPACING	TK0191	131-3648-00
A2R120	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A2R121	315-0203-00	.300578		RES,FXD,FILM:20K OHM,5%,0.25W	57668	NTR25J-E 20K
A2R270	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A2R272	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A2R274	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A2R300	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A2R400	315-0473-00	.300000	.300577	RES,FXD,FILM:47K OHM,5%,0.25W	57668	NTR25J-E47K0
A2R400	315-0153-00	.300578		RES,FXD,FILM:15K OHM,5%,0.25W	19701	5043CX15K00J
A2R402	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A2R404	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A2R406	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A2R408	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A2R409	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A2R410	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A2R412	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A2R414	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A2R416	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A2R418	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A2R420	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A2R422	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A2R450	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A2R452	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A2R454	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A2R456	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A2R458	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A2R460	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A2R462	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A2U100	119-2314-00			OSCILLATOR,DI:32MHZ,CRYSTAL	TK0191	119-2314-00
A2U120	156-2009-00			MICROCKT,DGTL:FLIP-FLOP,DUAL D	80009	156-2009-00
A2U200	156-2316-00			MICROCKT,DGTL:3/8 LINE DECODER	80009	156-2316-00
A2U210	156-2316-00			MICROCKT,DGTL:3/8 LINE DECODER	80009	156-2316-00
A2U220	156-2820-00			MICROCKT,DGTL:CMOS,QUAD 2-INPUT AND	80009	156-2820-00
A2U230	156-2820-00			MICROCKT,DGTL:CMOS,QUAD 2-INPUT AND	80009	156-2820-00
A2U240	156-2009-00			MICROCKT,DGTL:FLIP-FLOP,DUAL D	80009	156-2009-00
A2U250	156-2009-00			MICROCKT,DGTL:FLIP-FLOP,DUAL D	80009	156-2009-00
A2U260	156-2833-00			MICROCKT,DGTL:CMOS,8-3 ENCODER	TK0191	156-2833-00
A2U300	156-2026-00			MICROCKT,DGTL:CMOS,QUAD 2 INPUT NOR GATE	80009	156-2026-00
A2U310	156-2009-00			MICROCKT,DGTL:FLIP-FLOP,DUAL D	80009	156-2009-00
A2U320	156-2009-00			MICROCKT,DGTL:FLIP-FLOP,DUAL D	80009	156-2009-00
A2U340	156-2813-00			MICROCKT,DGTL:CMOS,DUAL BIN COUNTER	TK0191	156-2813-00
A2U400	156-2253-00			MICROCKT,DGTL:MOS,QUAD NAND GATE	TK0191	156-2253-00
A2U404	156-2820-00	.301033		MICROCKT,DGTL:CMOS,QUAD 2-INPUT AND	80009	156-2820-00
A2U406	156-2277-00			MICROCKT,DGTL:TRANSISTOR	TK0191	156-2277-00
A2U408	156-2277-00			MICROCKT,DGTL:TRANSISTOR	TK0191	156-2277-00
A2U410	156-1445-00	.300000	.300871	MICROCKT,DGTL:NMOS,16-BIT MICROPROCESSOR	04713	MC68000L8 (CC1)
A2U410	156-1445-05	.300872	.300903	MICROCKT,DGTL:NMOS,16 BIT MICROPRCR,8MHZ	S5372	HD68000P8
A2U410	156-1445-04	.300904		MICROCKT,DGTL:NMOS,16 BIT MICROPROCESSOR	04713	MC68000P8
A2U430	156-2253-00			MICROCKT,DGTL:MOS,QUAD NAND GATE	TK0191	156-2253-00
A2U450	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A2U452	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A2U454	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A2U456	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A2U458	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A2U460	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A2U462	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A2U480	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A2U482	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A2U484	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A2U486	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A2U500	156-2825-00			MICROCKT,DGTL:CMOS,DUAL 2-4 DCDR	80009	156-2825-00
A2U520	156-2316-00			MICROCKT,DGTL:3/8 LINE DECODER	80009	156-2316-00
A2U540	156-2316-00			MICROCKT,DGTL:3/8 LINE DECODER	80009	156-2316-00
A2U600	160-3910-00	.300000	.300297	MICROCKT,DGTL:32768 X 8 EPROM,PRGM	TK0191	160-3910-00
A2U600	160-3910-01	.300298	.300490	MICROCKT,DGTL:32768 X 8 EPROM,PRGM	S4997	ORDER BY DESCR
A2U600	160-3910-02	.300491	.301032	MICROCKT,DGTL:32768 X 8 EPROM,PRGM	S5372	ORDER BY DESCR
A2U600	160-3910-04	.301033	.301108	MICROCKT,DGTL:32768 X 8 EPROM,PRGM	80009	160-3910-04
A2U600	160-3910-05	.301109		MICROCKT,DGTL:32768 X 8 EPROM,PRGM	80009	160-3910-05
A2U610	160-3911-00	.300000	.300297	MICROCKT,DGTL:32768 X 8 EPROM,PRGM	TK0191	160-3911-00
A2U610	160-3911-01	.300298	.300490	MICROCKT,DGTL:32768 X 8 EPROM,PRGM	S4997	ORDER BY DESCR
A2U610	160-3911-02	.300491	.301032	MICROCKT,DGTL:32768 X 8 EPROM,PRGM	S5372	ORDER BY DESCR
A2U610	160-3911-04	.301033	.301108	MICROCKT,DGTL:32768 X 8 EPROM,PRGM	80009	160-3911-04
A2U610	160-3911-05	.301109		MICROCKT,DGTL:32768 X 8 EPROM,PRGM	80009	160-3911-05
A2U620	160-3912-00	.300000	.300297	MICROCKT,DGTL:32768 X 8 EPROM,PRGM	TK0191	160-3912-00
A2U620	160-3912-01	.300298	.300490	MICROCKT,DGTL:32768 X 8 EPROM,PRGM	S4997	ORDER BY DESCR
A2U620	160-3912-02	.300491	.301032	MICROCKT,DGTL:32768 X 8 EPROM,PRGM	S5372	ORDER BY DESCR
A2U620	160-3912-04	.301033	.301108	MICROCKT,DGTL:32768 X 8 EPROM,PRGM	80009	160-3912-04
A2U620	160-3912-05	.301109		MICROCKT,DGTL:32768 X 8 EPROM,PRGM	80009	160-3912-05
A2U630	160-3913-00	.300000	.300297	MICROCKT,DGTL:32768 X 8 EPROM,PRGM	TK0191	160-3913-00
A2U630	160-3913-01	.300298	.300490	MICROCKT,DGTL:32768 X 8 EPROM,PRGM	S4997	ORDER BY DESCR
A2U630	160-3913-02	.300491	.301032	MICROCKT,DGTL:32768 X 8 EPROM,PRGM	S5372	ORDER BY DESCR
A2U630	160-3913-04	.301033	.301108	MICROCKT,DGTL:32768 X 8 EPROM,PRGM	80009	160-3913-04
A2U630	160-3913-05	.301109		MICROCKT,DGTL:32768 X 8 EPROM,PRGM	80009	160-3913-05
A2U700	156-2009-00	.300000	.300962	MICROCKT,DGTL:FLIP-FLOP,DUAL D	80009	156-2009-00
A2U700	156-0388-00	.300963		MICROCKT,DGTL:DUAL D FLIP-FLOP	01295	SN74LS74 N OR J
A2U710	156-2009-00	.301033		MICROCKT,DGTL:FLIP-FLOP,DUAL D	80009	156-2009-00
A2U720	156-2808-00			MICROCKT,DGTL:CMOS,QUAD 2-INPUT OR	TK0191	156-2808-00
A2U740	156-2009-00			MICROCKT,DGTL:FLIP-FLOP,DUAL D	80009	156-2009-00
A2U760	156-2088-00			MICROCKT,DGTL:CMOS,QUAD 2 TO 1 LINE MULTIPL EXER	80009	156-2088-00
A2U780	156-2088-00			MICROCKT,DGTL:CMOS,QUAD 2 TO 1 LINE MULTIPL EXER	80009	156-2088-00
A2U800	156-2807-00	.300000	.301032	MICROCKT,DGTL:64K BITS D-RAM	TK0191	156-2807-00
A2U800	156-2882-00	.301033		MICROCKT,DGTL:NMOS,65536 X 4 DRAM	TK0961	UPD41464C-15
A2U802	156-2807-00	.300000	.301032	MICROCKT,DGTL:64K BITS D-RAM	TK0191	156-2807-00
A2U804	156-2807-00	.300000	.301032	MICROCKT,DGTL:64K BITS D-RAM	TK0191	156-2807-00
A2U806	156-2807-00	.300000	.301032	MICROCKT,DGTL:64K BITS D-RAM	TK0191	156-2807-00
A2U808	156-2807-00	.300000	.301032	MICROCKT,DGTL:64K BITS D-RAM	TK0191	156-2807-00
A2U810	156-2807-00	.300000	.301032	MICROCKT,DGTL:64K BITS D-RAM	TK0191	156-2807-00
A2U810	156-2882-00	.301033		MICROCKT,DGTL:NMOS,65536 X 4 DRAM	TK0961	UPD41464C-15
A2U812	156-2807-00	.300000	.301032	MICROCKT,DGTL:64K BITS D-RAM	TK0191	156-2807-00
A2U814	156-2807-00	.300000	.301032	MICROCKT,DGTL:64K BITS D-RAM	TK0191	156-2807-00
A2U816	156-2807-00	.300000	.301032	MICROCKT,DGTL:64K BITS D-RAM	TK0191	156-2807-00
A2U818	156-2807-00	.300000	.301032	MICROCKT,DGTL:64K BITS D-RAM	TK0191	156-2807-00
A2U820	156-2807-00	.300000	.301032	MICROCKT,DGTL:64K BITS D-RAM	TK0191	156-2807-00
A2U820	156-2882-00	.301033		MICROCKT,DGTL:NMOS,65536 X 4 DRAM	TK0961	UPD41464C-15
A2U822	156-2807-00	.300000	.301032	MICROCKT,DGTL:64K BITS D-RAM	TK0191	156-2807-00
A2U824	156-2807-00	.300000	.301032	MICROCKT,DGTL:64K BITS D-RAM	TK0191	156-2807-00
A2U826	156-2807-00	.300000	.301032	MICROCKT,DGTL:64K BITS D-RAM	TK0191	156-2807-00
A2U828	156-2807-00	.300000	.301032	MICROCKT,DGTL:64K BITS D-RAM	TK0191	156-2807-00
A2U830	156-2807-00	.300000	.301032	MICROCKT,DGTL:64K BITS D-RAM	TK0191	156-2807-00
A2U830	156-2882-00	.301033		MICROCKT,DGTL:NMOS,65536 X 4 DRAM	TK0961	UPD41464C-15
A3	670-9305-00	.300000	.300398	CIRCUIT BD ASSY:A/D	TK0191	670-9305-00
A3	670-9305-01	.300399		CIRCUIT BD ASSY:A/D	80009	670-9305-01

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A3C100	283-0603-00			CAP,FXD,MICA DI:113PF,2%,300V	00853	D155F1130G0
A3C102	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A3C102	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A3C104	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A3C104	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A3C120	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C130	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C145	285-1117-00			CAP,FXD,PLASTIC:0.018UF,2%,100V	80009	285-1117-00
A3C152	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C160	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C165	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C170	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A3C195	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C200	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C210	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C230	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C240	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C316	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
A3C320	290-0804-00			CAP,FXD,ELCTLT:10UF,+50-20%,25V	55680	ULB1E100TAAANA
A3C346	281-0759-00			CAP,FXD,CER DI:22PF,10%,100V	04222	MA101A220KAA
A3C360	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A3C361	281-0768-00			CAP,FXD,CER DI:470PF,20%,100V	04222	MA101A471MAA
A3C370	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C372	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C374	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C376	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C470	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C472	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A3C472	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A3C474	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A3C474	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A3C476	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A3C476	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A3C478	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C490	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C520	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A3C521	281-0768-00			CAP,FXD,CER DI:470PF,20%,100V	04222	MA101A471MAA
A3C524	290-1007-00			CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A3C524	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A3C526	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A3C526	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A3C560	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A3C561	281-0768-00			CAP,FXD,CER DI:470PF,20%,100V	04222	MA101A471MAA
A3C566	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C570	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C640	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C650	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C670	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C700	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C702	290-0770-00			CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	54473	ECE-A25V100L
A3C704	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C706	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A3C710	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C712	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C714	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C715	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C720	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A3C722	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A3C730	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A3C732	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A3C740	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C741	281-0788-00			CAP,FXD,CER DI:470PF,10%,100V	04222	SA102C471KAA
A3C742	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C744	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C750	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C760	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A3C810	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C840	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C850	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C870	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C880	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C890	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A3C910	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A3C910	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A3C920	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A3C920	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A3C930	290-0770-00			CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	54473	ECE-A25V100L
A3C940	290-0770-00			CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	54473	ECE-A25V100L
A3C950	290-0770-00			CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	54473	ECE-A25V100L
A3C960	290-0770-00			CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	54473	ECE-A25V100L
A3CR132	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A3CR300	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A3CR470	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A3CR472	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A3CR474	152-0327-00	.300703		SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A3CR710	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A3CR712	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A3CR740	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A3J34	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 4)	22526	48283-029
A3J34	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 4)	22526	48283-036
A3L910	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A3L930	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A3L940	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A3L950	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A3L960	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A3P30	131-3650-00			CONN,PLUG,ELEC:CKT BD,RTANG,2 X 32,0.1 SPACING	TK0191	131-3650-00
A3P32	131-3648-00			CONN,PLUG,ELEC:CKT BD,RTANG,2 X 22,0.1 SPACING	TK0191	131-3648-00
A3P34	210-3082-00			EYELET,METALLIC:0.047 OD X 0.133 L,BRS NP (QUANTITY OF 4)	61957	S6494 (MODIFIED)
A3P34	131-0993-00	.300000	.300632	BUS,CONDUCTOR:SHUNT ASSEMBLY,BLACK	22526	65474-005
A3P34	131-4311-00	.300633		BUS,CONDUCTOR:WHITE,SHUNT ASSY	80009	131-4311-00
A3Q740	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A3R100	321-0331-00			RES,FXD,FILM:27.4K OHM,1%,0.125W,TC=T0	19701	5043ED27K40F
A3R102	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A3R104	321-0353-00			RES,FXD,FILM:46.4K OHM,1%,0.125W,TC=T0	07716	CEAD46401F
A3R106	315-0473-00			RES,FXD,FILM:47K OHM,5%,0.25W	57668	NTR25J-E47K0
A3R108	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A3R110	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R130	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R131	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A3R132	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R134	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R140	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A3R142	315-0303-00			RES,FXD,FILM:30K OHM,5%,0.25W	19701	5043CX30K00J
A3R144	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R146	321-0306-00			RES,FXD,FILM:15.0K OHM,1%,0.125W,TC=T0	19701	5033ED15J00F
A3R148	321-0264-00			RES,FXD,FILM:5.49K OHM,1%,0.125W,TC=T0	07716	CEAD54900C
A3R165	307-0729-00			RES NTWK,FXD,FI:4,10K OHM,10%,0.125W	80009	307-0729-00
A3R240	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R250	307-0921-00			RES NTWK,FXD,FI:(8)33K OHM,5%,0.125W	80009	307-0921-00
A3R310	321-0105-00			RES,FXD,FILM:121 OHM 1%,0.125W,TC=T0	07716	CEAD121R0F
A3R312	321-0816-07			RES,FXD,FILM:5K OHM,0.1%,0.125W,TC=T9	19701	5033RE5K000B
A3R314	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A3R318	321-0222-07			RES,FXD,FILM:2.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE2K000B
A3R320	321-0222-07			RES,FXD,FILM:2.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE2K000B
A3R340	321-0385-07			RES,FXD,FILM:100K OHM,0.1%,0.125W,TC=T9	19701	5033RE100K0B
A3R342	315-0333-00			RES,FXD,FILM:33K OHM,5%,0.25W	57668	NTR25J-E33K0
A3R345	321-0229-00			RES,FXD,FILM:2.37K OHM,1%,0.125W,TC=T0	19701	5043ED2K37F
A3R346	321-0385-07			RES,FXD,FILM:100K OHM,0.1%,0.125W,TC=T9	19701	5033RE100K0B
A3R348	321-0481-07			RES,FXD,FILM:1M OHM,0.1%,0.125W,TC=T9	19701	5033RE1M000B
A3R350	321-0385-07			RES,FXD,FILM:100K OHM,0.1%,0.125W,TC=T9	19701	5033RE100K0B
A3R360	315-0471-00			RES,FXD,FILM:470 OHM,5%,0.25W	57668	NTR25J-E470E
A3R362	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A3R370	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R372	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R374	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R376	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R400	307-0882-00			RES NTWK,FXD,FI:8,100K OHM,10%,0.125W	80009	307-0882-00
A3R410	307-0882-00			RES NTWK,FXD,FI:8,100K OHM,10%,0.125W	80009	307-0882-00
A3R440	307-0729-00			RES NTWK,FXD,FI:4,10K OHM,10%,0.125W	80009	307-0729-00
A3R450	321-0306-00			RES,FXD,FILM:15.0K OHM,1%,0.125W,TC=T0	19701	5033ED15J00F
A3R452	321-0307-00			RES,FXD,FILM:15.4K OHM,1%,0.125W,TC=T0	19701	5043ED15K40F
A3R454	321-0311-00			RES,FXD,FILM:16.9K OHM,1%,0.125W,TC=T0	07716	CEAC16901F
A3R456	321-0316-00			RES,FXD,FILM:19.1K OHM,1%,0.125W,TC=T0	07716	CEAD19101F
A3R458	321-0325-00			RES,FXD,FILM:23.7K OHM,1%,0.125W,TC=T0	07716	CEAD23701F
A3R460	321-0337-00			RES,FXD,FILM:31.6K OHM,1%,0.125W,TC=T0	07716	CEAD31601F
A3R462	321-0357-00			RES,FXD,FILM:51.1K OHM,1%,0.125W,TC=T0	07716	CEAD51101F
A3R464	321-0403-00			RES,FXD,FILM:154K OHM,1%,0.125W,TC=T0	07716	CEAD15402F
A3R470	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0	19701	5033ED10K0F
A3R472	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0	19701	5033ED10K0F
A3R474	315-0103-00	.300000	.300702	RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R476	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R490	315-0304-00			RES,FXD,FILM:300K OHM,5%,0.25W	57668	NTR25J-E300K
A3R492	315-0332-00			RES,FXD,FILM:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
A3R494	315-0304-00			RES,FXD,FILM:300K OHM,5%,0.25W	57668	NTR25J-E300K
A3R496	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R498	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R530	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A3R532	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A3R534	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R536	321-0337-00			RES,FXD,FILM:31.6K OHM,1%,0.125W,TC=T0	07716	CEAD31601F
A3R538	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0	19701	5033ED100K0F
A3R540	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0	19701	5033ED100K0F
A3R542	321-0385-00			RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0	19701	5033ED100K0F
A3R544	321-0097-00			RES,FXD,FILM:100 OHM,1%,0.125W,TC=T0	91637	CMF55116G100R0F
A3R546	321-0270-00			RES,FXD,FILM:6.34K OHM,1%,0.125W,TC=T0	19701	5043ED6K340F
A3R548	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R549	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R562	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A3R570	321-0385-07			RES,FXD,FILM:100K OHM,0.1%,0.125W,TC=T9	19701	5033RE100K0B
A3R574	321-0414-07			RES,FXD,FILM:200K OHM,0.1%,0.125W,TC=T9	24546	NE55E2003B

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A3R576	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R578	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A3R580	321-0256-00			RES,FXD,FILM:4.53K OHM,1%,0.125W,TC=T0	19701	5033ED4K530F
A3R700	311-1244-01			RES,VAR,NONWW:TRMR,100 OHM,20%,0.5W	TK0191	311-1244-01
A3R702	321-0039-00			RES,FXD,FILM:24.9 OHM,1%,0.125W,TC=T0	91637	CMF55116G24R90F
A3R704	321-0068-00			RES,FXD,FILM:49.9 OHM,0.5%,0.125W,TC=T0	91637	CMF55116G49R90F
A3R706	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R710	315-0222-00			RES,FXD,FILM:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
A3R712	321-0222-07			RES,FXD,FILM:2.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE2K000B
A3R714	321-1749-07			RES,FXD,FILM:7.77K OHM,0.1%,0.125W,TC=T9	TK0191	321-1749-07
A3R716	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A3R718	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A3R722	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R724	311-1740-02			RES,VAR,NONWW:1K OHM,20%,0.5W	80009	311-1740-02
A3R726	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R732	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R734	311-1740-02			RES,VAR,NONWW:1K OHM,20%,0.5W	80009	311-1740-02
A3R736	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A3R740	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A3R742	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A3R744	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A3R746	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A3R760	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A3R762	315-0222-00			RES,FXD,FILM:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
A3R890	307-0882-00			RES NTWK,FXD,FI:8,100K OHM,10%,0.125W	80009	307-0882-00
A3TP100	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A3TP200	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A3TP300	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A3TP400	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A3TP500	214-0579-00	.300399		TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A3TP700	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A3U100	156-0704-00			MICROCKT,LINEAR:CMOS,PHASE LOCK LOOP	04713	MC14046CP
A3U110	156-2835-00			MICROCKT,DGTL:CMOS,12 STAGE,CNTR	TK0191	156-2835-00
A3U120	156-1825-00			MICROCKT,DGTL:C2MOS,DUAL 4 TO 1 LINE MULTIPLEXER	80009	156-1825-00
A3U130	156-2809-00			MICROCKT,DGTL:6 BIT 3 STATE BUFFER	TK0191	156-2809-00
A3U140	156-1778-00			MICROCKT,LINEAR:DUAL COMPARATOR	TK0191	156-1778-00
A3U145	156-0402-04			MICROCKT,LINEAR:TIMER	80009	156-0402-04
A3U160	156-2798-00			MICROCKT,DGTL:SYNC,4 BIT COUNTER	TK0191	156-2798-00
A3U165	156-2798-00			MICROCKT,DGTL:SYNC,4 BIT COUNTER	TK0191	156-2798-00
A3U180	156-1824-00			MICROCKT,DGTL:C2MOS,QUAD 2 TO 1 LINE MULTIPLEXER	80009	156-1824-00
A3U190	156-1828-00			MICROCKT,DGTL:C2MOS,DUAL D-TYPE FLIP FLOP	80009	156-1828-00
A3U195	156-1828-00			MICROCKT,DGTL:C2MOS,DUAL D-TYPE FLIP FLOP	80009	156-1828-00
A3U200	156-2798-00			MICROCKT,DGTL:SYNC,4 BIT COUNTER	TK0191	156-2798-00
A3U210	156-1824-00			MICROCKT,DGTL:C2MOS,QUAD 2 TO 1 LINE MULTIPLEXER	80009	156-1824-00
A3U220	156-1828-00			MICROCKT,DGTL:C2MOS,DUAL D-TYPE FLIP FLOP	80009	156-1828-00
A3U230	156-1828-00			MICROCKT,DGTL:C2MOS,DUAL D-TYPE FLIP FLOP	80009	156-1828-00
A3U240	156-1831-00			MICROCKT,DGTL:C2MOS,GATE 2 INP NOR	80009	156-1831-00
A3U250	156-1766-00			MICROCKT,DGTL:CMOS,QUAD 2 INPUT NAND GATE	80009	156-1766-00
A3U255	156-1828-00			MICROCKT,DGTL:C2MOS,DUAL D-TYPE FLIP FLOP	80009	156-1828-00
A3U260	156-1831-00			MICROCKT,DGTL:C2MOS,GATE 2 INP NOR	80009	156-1831-00
A3U270	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A3U280	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A3U290	156-2791-00			MICROCKT,DGTL:QUAD,2 INPUT AND HC40H008P	TK0191	156-2791-00
A3U300	156-1589-00			MICROCKT,LINEAR:D/A CONVERTER,12 BIT,HIGH SPEED,MONOLITHIC	06665	DAC312FR

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A3U310	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A3U320	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A3U330	156-2795-00			MICROCKT,LINEAR:OPERATIONAL PRECISION	TK0191	156-2795-00
A3U350	156-2810-00			MICROCKT,LINEAR:12 BIT,D/A CONV	TK0191	156-2810-00
A3U360	156-2795-00			MICROCKT,LINEAR:OPERATIONAL PRECISION	TK0191	156-2795-00
A3U370	156-2795-00			MICROCKT,LINEAR:OPERATIONAL PRECISION	TK0191	156-2795-00
A3U440	156-2836-00			MICROCKT,DGTL:CMOS,EXCLUSIVE/OR	TK0191	156-2836-00
A3U450	156-0513-00			MICROCKT,DGTL:CMOS,8-CHANNEL MUX	04713	MC14051BCL
A3U460	156-0158-00			MICROCKT,LINEAR:BIPOLAR,DUAL OPNL AMPL	04713	MC1458P1/MC1458U
A3U470	156-0158-00			MICROCKT,LINEAR:BIPOLAR,DUAL OPNL AMPL	04713	MC1458P1/MC1458U
A3U490	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A3U520	156-2810-00			MICROCKT,LINEAR:12 BIT,D/A CONV	TK0191	156-2810-00
A3U530	156-0158-00			MICROCKT,LINEAR:BIPOLAR,DUAL OPNL AMPL	04713	MC1458P1/MC1458U
A3U570	156-2810-00			MICROCKT,LINEAR:12 BIT,D/A CONV	TK0191	156-2810-00
A3U580	156-2795-00			MICROCKT,LINEAR:OPERATIONAL PRECISION	TK0191	156-2795-00
A3U590	156-1699-00			MICROCKT,LINEAR:DUAL BI-FET,OPNL AMPL	01295	TL288CP
A3U640	156-2811-00			MICROCKT,DGTL:DUAL,DECADE,COUNTER	TK0191	156-2811-00
A3U650	156-1823-00			MICROCKT,DGTL:C2MOS,QUAD LATCH/CLEAR	80009	156-1823-00
A3U660	119-2313-00	.300000	.300398	OSCILLATOR:4MHZ,CRYSTAL	TK0191	119-2313-00
A3U660	119-2579-00	.300399		OSCILLATOR,RF:XTAL,3MHZ,SG-11	TK00G	SG-11
A3U670	156-1766-00			MICROCKT,DGTL:CMOS,QUAD 2 INPUT NAND GATE	80009	156-1766-00
A3U700	156-2799-00			MICROCKT,DGTL:12 BIT,A/D CONV	TK0191	156-2799-00
A3U710	156-2832-00	.300000	.300512	MICROCKT,LINEAR:OP-AMP,BIFET	TK0191	156-2832-00
A3U710	156-2832-01	.300513		MICROCKT,DGTL:OP AMP,BIFET	TK0AB	LF411CN
A3U720	156-2812-00			MICROCKT,LINEAR:SAMPLE/HOLD	TK0191	156-2812-00
A3U730	156-2812-00			MICROCKT,LINEAR:SAMPLE/HOLD	TK0191	156-2812-00
A3U740	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A3U750	156-2805-00			MICROCKT,DGTL:8 BIT SHIFT REGISTER	TK0191	156-2805-00
A3U760	156-2796-00			MICROCKT,DGTL:HEX INVERTER	TK0191	156-2796-00
A3U805	156-2796-00			MICROCKT,DGTL:HEX INVERTER	TK0191	156-2796-00
A3U810	156-1824-00			MICROCKT,DGTL:C2MOS,QUAD 2 TO 1 LINE MULTIPLEXER	80009	156-1824-00
A3U820	156-2835-00			MICROCKT,DGTL:CMOS,12 STAGE,CNTR	TK0191	156-2835-00
A3U840	156-1767-00			MICROCKT,DGTL:CMOS,OCTAL BUS TRANSCEIVER	80009	156-1767-00
A3U850	156-1767-00			MICROCKT,DGTL:CMOS,OCTAL BUS TRANSCEIVER	80009	156-1767-00
A3U860	156-2837-00			MICROCKT,DGTL:CMOS,QUAD,3 STATE,LATCH	TK0191	156-2837-00
A3U870	156-2838-00			MICROCKT,DGTL:8 X 2K STATIC,RAM	TK0191	156-2838-00
A3U880	156-2838-00			MICROCKT,DGTL:8 X 2K STATIC,RAM	TK0191	156-2838-00
A3U890	156-1827-00			MICROCKT,DGTL:C2MOS,3 LINE TO 8 LINE DECODER	80009	156-1827-00
A3U900	156-1827-00			MICROCKT,DGTL:C2MOS,3 LINE TO 8 LINE DECODER	80009	156-1827-00
A3VR100	152-0195-00			SEMICOND DVC,DI:ZEN,SI,5.1V,5%,0.4W,DO-7	04713	SZ11755RL
A3VR710	152-0166-00			SEMICOND DVC,DI:ZEN,SI,6.2V,5%,400MW,DO-7	04713	SZ11738RL
A3VR712	152-0166-00			SEMICOND DVC,DI:ZEN,SI,6.2V,5%,400MW,DO-7	04713	SZ11738RL
A3VR744	152-0938-00			SEMICOND,DVC,DI:ZENER,5.2V,0.1V,0.5W	TK0191	152-0938-00
A3W300	131-0566-00	.300000	.301132	BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225 L	24546	OMA 07
A3W300	131-0566-04	.301133		BUS,CONDUCTOR:DUMMY RES,18MM OD X 3.2MM L,W/WIRE LEADS	80009	131-0566-04
A4	670-9306-00	.300000	.300376	CIRCUIT BD ASSY:DIGITAL DISPLAY	TK0191	670-9306-00
A4	670-9306-01	.300377	.300492	CIRCUIT BD ASSY:DIGITAL DISPLAY	80009	670-9306-01
A4	670-9306-02	.300493		CIRCUIT BD ASSY:DIGITAL DISPLAY	TK0191	ORDER BY DESCR
A4C10	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A4C10	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A4C20	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A4C20	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A4C30	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A4C30	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A4C40	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A4C40	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A4C110	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C120	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C130	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C140	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C150	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C160	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C170	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C200	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C210	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C220	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C230	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C240	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C250	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C260	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C300	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C310	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C320	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C330	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C340	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C350	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C360	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C370	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C380	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C400	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C420	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C440	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C460	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C480	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C500	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C502	281-0811-00			CAP,FXD,CER DI:10PF,10%,100V	04222	MA101A100KAA
A4C504	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C506	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C508	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C510	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A4C512	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A4C520	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C522	281-0811-00			CAP,FXD,CER DI:10PF,10%,100V	04222	MA101A100KAA
A4C524	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C526	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C528	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C530	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A4C532	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A4C540	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C542	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C600	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C620	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C640	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C660	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C670	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C680	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C700	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C710	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C720	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A4C760	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C770	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C800	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C802	281-0759-00			CAP,FXD,CER DI:22PF,10%,100V	04222	MA101A220KAA
A4C804	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C806	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C808	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C820	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C822	281-0759-00			CAP,FXD,CER DI:22PF,10%,100V	04222	MA101A220KAA
A4C824	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C826	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C840	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C842	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C900	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A4C900	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A4C1000	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4C1002	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A4CR220	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A4L10	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A4L20	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A4L30	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A4L40	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A4L900	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A4P40	131-3650-00			CONN,PLUG,ELEC:CKT BD,RTANG,2 X 32,0.1 SPACING	TK0191	131-3650-00
A4P42	131-3648-00			CONN,PLUG,ELEC:CKT BD,RTANG,2 X 22,0.1 SPACING	TK0191	131-3648-00
A4R200	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A4R210	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A4R220	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A4R250	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A4R260	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A4R500	321-0222-00			RES,FXD,FILM:2.00K OHM,1%,0.125W,TC=T0	19701	5033ED2K00F
A4R502	321-0222-00			RES,FXD,FILM:2.00K OHM,1%,0.125W,TC=T0	19701	5033ED2K00F
A4R504	321-0928-07			RES,FXD,FILM:250 OHM,0.1%,0.125W,TC=T9	19701	5033RE250R0B
A4R506	321-0927-07			RES,FXD,FILM:125 OHM,0.1%,0.125W,TC=T9	19701	5033RE125R0B
A4R508	321-0928-07			RES,FXD,FILM:250 OHM,0.1%,0.125W,TC=T9	19701	5033RE250R0B
A4R510	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A4R512	315-0432-00			RES,FXD,FILM:4.3K OHM,5%,0.25W	57668	NTR25J-E04K3
A4R514	315-0432-00			RES,FXD,FILM:4.3K OHM,5%,0.25W	57668	NTR25J-E04K3
A4R520	321-0222-00			RES,FXD,FILM:2.00K OHM,1%,0.125W,TC=T0	19701	5033ED2K00F
A4R522	321-0222-00			RES,FXD,FILM:2.00K OHM,1%,0.125W,TC=T0	19701	5033ED2K00F
A4R524	321-0928-07			RES,FXD,FILM:250 OHM,0.1%,0.125W,TC=T9	19701	5033RE250R0B
A4R526	321-0927-07			RES,FXD,FILM:125 OHM,0.1%,0.125W,TC=T9	19701	5033RE125R0B
A4R528	321-0928-07			RES,FXD,FILM:250 OHM,0.1%,0.125W,TC=T9	19701	5033RE250R0B
A4R530	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A4R532	315-0432-00			RES,FXD,FILM:4.3K OHM,5%,0.25W	57668	NTR25J-E04K3
A4R534	315-0432-00			RES,FXD,FILM:4.3K OHM,5%,0.25W	57668	NTR25J-E04K3
A4R700	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A4R702	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A4R704	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A4R710	321-0222-00			RES,FXD,FILM:2.00K OHM,1%,0.125W,TC=T0	19701	5033ED2K00F
A4R712	321-0222-00			RES,FXD,FILM:2.00K OHM,1%,0.125W,TC=T0	19701	5033ED2K00F
A4R714	321-0222-00			RES,FXD,FILM:2.00K OHM,1%,0.125W,TC=T0	19701	5033ED2K00F
A4R716	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	19701	5033ED1K00F
A4R718	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	19701	5033ED1K00F
A4R720	321-0222-00			RES,FXD,FILM:2.00K OHM,1%,0.125W,TC=T0	19701	5033ED2K00F
A4R722	321-0409-00	.300000	.300376	RES,FXD,FILM:178K OHM,1%,0.125W,TC=T0	57668	CRB25 FXE 178K

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A4R722	321-0399-00	.300377		RES,FXD,FILM:140K OHM,1%,0.125W,TC=T0	07716	CEAD14002F
A4R724	321-0409-00	.300000	.300376	RES,FXD,FILM:178K OHM,1%,0.125W,TC=T0	57668	CRB25 FXE 178K
A4R724	321-0399-00	.300377		RES,FXD,FILM:140K OHM,1%,0.125W,TC=T0	07716	CEAD14002F
A4R726	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	19701	5033ED1K00F
A4R800	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	19701	5033ED1K00F
A4R802	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	19701	5033ED1K00F
A4R804	321-0612-00			RES,FXD,FILM:500 OHM,1%,0.125W,TC=T0 MI	07716	CEAD500R0F
A4R806	321-0928-07			RES,FXD,FILM:250 OHM,0.1%,0.125W,TC=T9	19701	5033RE250R0B
A4R808	321-0612-00			RES,FXD,FILM:500 OHM,1%,0.125W,TC=T0 MI	07716	CEAD500R0F
A4R810	321-0612-00			RES,FXD,FILM:500 OHM,1%,0.125W,TC=T0 MI	07716	CEAD500R0F
A4R812	321-0612-00			RES,FXD,FILM:500 OHM,1%,0.125W,TC=T0 MI	07716	CEAD500R0F
A4R814	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A4R820	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	19701	5033ED1K00F
A4R822	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	19701	5033ED1K00F
A4R824	321-0612-00			RES,FXD,FILM:500 OHM,1%,0.125W,TC=T0 MI	07716	CEAD500R0F
A4R826	321-0928-07			RES,FXD,FILM:250 OHM,0.1%,0.125W,TC=T9	19701	5033RE250R0B
A4R828	321-0612-00			RES,FXD,FILM:500 OHM,1%,0.125W,TC=T0 MI	07716	CEAD500R0F
A4R830	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A4R840	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A4R842	311-1621-01			RES,VAR,NONWW:200 OHM,20%,0.5W	TK0191	311-1621-01
A4R844	321-0260-00	.300000	.300492	RES,FXD,FILM:4.99K OHM,1%,0.125W,TC=T0	19701	5033ED4K990F
A4R844	321-0239-00	.300493		RES,FXD,FILM:3.01K OHM,1%,0.125W,TC=T0	19701	5043ED3K010F
A4R846	321-0222-00			RES,FXD,FILM:2.00K OHM,1%,0.125W,TC=T0	19701	5033ED2K00F
A4R848	321-0222-00			RES,FXD,FILM:2.00K OHM,1%,0.125W,TC=T0	19701	5033ED2K00F
A4TP10	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A4TP20	214-0579-00	.300377		TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A4U100	119-2312-00			OSCILLATOR:4.5MHZ,CRYSTAL	TK0191	119-2312-00
A4U110	156-2813-00			MICROCKT,DGTL:CMOS,DUAL BIN COUNTER	TK0191	156-2813-00
A4U120	156-2813-00			MICROCKT,DGTL:CMOS,DUAL BIN COUNTER	TK0191	156-2813-00
A4U130	156-2088-00			MICROCKT,DGTL:CMOS,QUAD 2 TO 1 LINE MULTIPL EXER	80009	156-2088-00
A4U140	156-2088-00			MICROCKT,DGTL:CMOS,QUAD 2 TO 1 LINE MULTIPL EXER	80009	156-2088-00
A4U150	156-2088-00			MICROCKT,DGTL:CMOS,QUAD 2 TO 1 LINE MULTIPL EXER	80009	156-2088-00
A4U160	156-2088-00			MICROCKT,DGTL:CMOS,QUAD 2 TO 1 LINE MULTIPL EXER	80009	156-2088-00
A4U170	156-2813-00			MICROCKT,DGTL:CMOS,DUAL BIN COUNTER	TK0191	156-2813-00
A4U200	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A4U210	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A4U220	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A4U230	156-1817-00			MICROCKT,DGTL:CMOS,RAM 8K X 8	80009	156-1817-00
A4U240	156-1817-00			MICROCKT,DGTL:CMOS,RAM 8K X 8	80009	156-1817-00
A4U250	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A4U260	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A4U300	156-2814-00			MICROCKT,DGTL:CMOS,TRI 3-INPUT NAND	TK0191	156-2814-00
A4U310	156-2253-00			MICROCKT,DGTL:MOS,QUAD NAND GATE	TK0191	156-2253-00
A4U320	156-2808-00			MICROCKT,DGTL:CMOS,QUAD 2-INPUT OR	TK0191	156-2808-00
A4U330	156-2820-00			MICROCKT,DGTL:CMOS,QUAD 2-INPUT AND	80009	156-2820-00
A4U340	156-2309-00			MICROCKT,DGTL:HEX INVERTER	80009	156-2309-00
A4U350	156-2009-00			MICROCKT,DGTL:FLIP-FLOP,DUAL D	80009	156-2009-00
A4U360	156-2009-00			MICROCKT,DGTL:FLIP-FLOP,DUAL D	80009	156-2009-00
A4U370	156-2009-00			MICROCKT,DGTL:FLIP-FLOP,DUAL D	80009	156-2009-00
A4U380	156-2310-00			MICROCKT,DGTL:HEX D TYPE FF	80009	156-2310-00
A4U400	156-2821-00			MICROCKT,DGTL:CMOS,OCTAL LATCH	80009	156-2821-00
A4U420	156-2821-00			MICROCKT,DGTL:CMOS,OCTAL LATCH	80009	156-2821-00
A4U440	156-2821-00			MICROCKT,DGTL:CMOS,OCTAL LATCH	80009	156-2821-00
A4U460	156-2821-00			MICROCKT,DGTL:CMOS,OCTAL LATCH	80009	156-2821-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A4U480	156-2821-00			MICROCKT,DGTL:CMOS,OCTAL LATCH	80009	156-2821-00
A4U500	156-1589-00			MICROCKT,LINEAR:D/A CONVERTER,12 BIT,HIGH S PEED,MONOLITHIC	06665	DAC312FR
A4U502	156-2822-00			MICROCKT,LINEAR:OP-AMP	80009	156-2822-00
A4U520	156-1589-00			MICROCKT,LINEAR:D/A CONVERTER,12 BIT,HIGH S PEED,MONOLITHIC	06665	DAC312FR
A4U522	156-1699-00			MICROCKT,LINEAR:DUAL BI-FET,OPNL AMPL	01295	TL288CP
A4U540	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A4U600	156-2821-00			MICROCKT,DGTL:CMOS,OCTAL LATCH	80009	156-2821-00
A4U620	160-3916-00	.300000	.300667	MICROCKT,DGTL:16384 X 8 EPROM,PRGM	TK0191	160-3916-00
A4U620	160-3916-01	.300668		MICROCKT,DGTL:16384 X 8 EPROM,PRGM	80009	160-3916-01
A4U640	156-2834-00			MICROCKT,DGTL:8 BIT SHIFT REGISTER	TK0191	156-2834-00
A4U660	156-2009-00			MICROCKT,DGTL:FLIP-FLOP,DUAL D	80009	156-2009-00
A4U670	156-2827-00			MICROCKT,DGTL:CMOS,DUAL,4-1,SEL/MUX	80009	156-2827-00
A4U680	156-2088-00			MICROCKT,DGTL:CMOS,QUAD 2 TO 1 LINE MULTIPL EXER	80009	156-2088-00
A4U700	156-2821-00			MICROCKT,DGTL:CMOS,OCTAL LATCH	80009	156-2821-00
A4U710	156-2821-00			MICROCKT,DGTL:CMOS,OCTAL LATCH	80009	156-2821-00
A4U720	156-2820-00			MICROCKT,DGTL:CMOS,QUAD 2-INPUT AND	80009	156-2820-00
A4U760	156-2823-00			MICROCKT,DGTL:CMOS,4 BIT ADDER	80009	156-2823-00
A4U770	156-2823-00			MICROCKT,DGTL:CMOS,4 BIT ADDER	80009	156-2823-00
A4U800	156-1255-02			MICROCKT,LINEAR:8 BIT HS MULTI D/A CONV	80009	156-1255-02
A4U802	156-2822-00			MICROCKT,LINEAR:OP-AMP	80009	156-2822-00
A4U820	156-1255-02			MICROCKT,LINEAR:8 BIT HS MULTI D/A CONV	80009	156-1255-02
A4U822	156-2822-00			MICROCKT,LINEAR:OP-AMP	80009	156-2822-00
A4W00	175-0733-00			WIRE,ELECTRICAL:STRD,26 AWG,150V RMS,BLACK, PVC	12515	ORDER BY DESCR
A5	670-9307-00	.300000	.300376	CIRCUIT BD ASSY:DISPLAY CONTROL	TK0191	670-9307-00
A5	670-9307-01	.300377		CIRCUIT BD ASSY:DISPLAY CONTROL	80009	670-9307-01
A5C10	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A5C20	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A5C30	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A5C40	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A5C50	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A5C60	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A5C100	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C120	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C140	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C160	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C500	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C502	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C520	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C522	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C555	281-0763-00			CAP,FXD,CER DI:47PF,10%,100V	04222	MA101A470KAA
A5C562	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C565	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C575	281-0763-00			CAP,FXD,CER DI:47PF,10%,100V	04222	MA101A470KAA
A5C582	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C585	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C600	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C602	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C605	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C607	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C610	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C612	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA

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A5C615	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C617	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C620	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C622	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C625	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C627	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C630	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C632	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C635	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C637	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C640	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C641	281-0763-00			CAP,FXD,CER DI:47PF,10%,100V	04222	MA101A470KAA
A5C642	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C643	281-0763-00			CAP,FXD,CER DI:47PF,10%,100V	04222	MA101A470KAA
A5C645	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C647	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C650	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C651	281-0763-00			CAP,FXD,CER DI:47PF,10%,100V	04222	MA101A470KAA
A5C652	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C653	281-0763-00			CAP,FXD,CER DI:47PF,10%,100V	04222	MA101A470KAA
A5C655	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C657	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C660	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C662	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C670	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C672	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C680	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C682	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C685	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C687	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C690	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C691	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A5C692	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C695	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C696	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A5C697	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C800	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C810	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C820	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C830	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C840	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C850	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C860	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5C865	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A5C870	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A5CR590	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A5L10	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A5L20	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A5L30	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A5L40	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A5L50	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A5L60	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A5P50	131-3650-00			CONN,PLUG,ELEC:CKT BD,RTANG,2 X 32,0.1 SPACING	TK0191	131-3650-00
A5P52	131-3648-00			CONN,PLUG,ELEC:CKT BD,RTANG,2 X 22,0.1 SPACING	TK0191	131-3648-00
A5Q540	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A5Q541	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00

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A5Q542	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A5Q543	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A5Q556	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A5Q576	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A5Q850	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A5Q852	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A5Q860	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A5Q862	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A5Q870	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A5R10	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R12	315-0105-00			RES,FXD,FILM:1M OHM,5%,0.25W	19701	5043CX1M000J
A5R15	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R20	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R22	315-0105-00			RES,FXD,FILM:1M OHM,5%,0.25W	19701	5043CX1M000J
A5R25	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R30	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R32	315-0105-00			RES,FXD,FILM:1M OHM,5%,0.25W	19701	5043CX1M000J
A5R35	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R80	311-1743-02			RES,VAR,NONWW:10K OHM,20%,0.5W	80009	311-1743-02
A5R82	315-0470-00			RES,FXD,FILM:47 OHM,5%,0.25W	57668	NTR25J-E47E0
A5R90	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A5R91	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A5R92	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A5R93	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A5R94	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A5R95	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A5R96	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A5R97	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A5R98	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A5R102	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R103	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R104	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R105	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R106	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R107	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R120	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R121	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R122	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R123	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R124	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R125	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R126	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R127	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R140	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R141	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R142	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R143	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R144	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R145	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R500	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A5R502	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A5R504	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A5R506	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A5R508	311-1613-00			RES,VAR,NONWW:20K OHM,20%,0.5W	80009	311-1613-00
A5R520	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A5R522	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A5R524	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A5R526	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J

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A5R528	311-1613-00			RES,VAR,NONWW:20K OHM,20%,0.5W	80009	311-1613-00
A5R550	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A5R552	321-0197-00			RES,FXD,FILM:1.10K OHM,1%,0.125W,TC=T0	07716	CEAD11000F
A5R554	311-1238-01			RES,VAR,NONWW:TRMR,5K OHM,20%,0.5W	TK0191	311-1238-01
A5R558	321-0172-00			RES,FXD,FILM:604 OHM,1%,0.125W,TC=T0	19701	5033ED604R0F
A5R559	321-0172-00			RES,FXD,FILM:604 OHM,1%,0.125W,TC=T0	19701	5033ED604R0F
A5R562	315-0302-00			RES,FXD,FILM:3K OHM,5%,0.25W	57668	NTR25J-E03K0
A5R563	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R564	315-0202-00			RES,FXD,FILM:2K OHM,5%,0.25W	57668	NTR25J-E 2K
A5R566	321-0188-00			RES,FXD,FILM:887 OHM,1%,0.125W,TC=T0	07716	CEAD887R0F
A5R568	321-0188-00			RES,FXD,FILM:887 OHM,1%,0.125W,TC=T0	07716	CEAD887R0F
A5R569	315-0562-00			RES,FXD,FILM:5.6K OHM,5%,0.25W	57668	NTR25J-E05K6
A5R570	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A5R572	321-0244-00	.300000	.300367	RES,FXD,FILM:3.40K OHM,1%,0.125W,TC=T0	19701	5043ED3K400F
A5R572	321-0258-00	.300368		RES,FXD,FILM:4.75K OHM,1%,0.125W,TC=T0	19701	5033ED4K750F
A5R574	311-1238-00	.300000	.300367	RES,VAR,NONWW:TRMR,5K OHM,0.5W	32997	3386X-DY6-502
A5R574	311-1238-01	.300368		RES,VAR,NONWW:TRMR,5K OHM,20%,0.5W	TK0191	311-1238-01
A5R578	321-0202-00			RES,FXD,FILM:1.24K OHM,1%,0.125W,TC=T0	24546	NA55D1241F
A5R579	321-0202-00			RES,FXD,FILM:1.24K OHM,1%,0.125W,TC=T0	24546	NA55D1241F
A5R582	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A5R583	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R584	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R586	321-0230-00			RES,FXD,FILM:2.43K OHM,1%,0.125W,TC=T0	19701	5043ED2K430F
A5R588	321-0230-00			RES,FXD,FILM:2.43K OHM,1%,0.125W,TC=T0	19701	5043ED2K430F
A5R590	321-0258-00			RES,FXD,FILM:4.75K OHM,1%,0.125W,TC=T0	19701	5033ED4K750F
A5R592	321-0204-00			RES,FXD,FILM:1.30K OHM,1%,0.125W,TC=T0	19701	5033ED1K300F
A5R594	315-0241-00			RES,FXD,FILM:240 OHM,5%,0.25W	19701	5043CX240R0J
A5R596	315-0471-00			RES,FXD,FILM:470 OHM,5%,0.25W	57668	NTR25J-E470E
A5R602	315-0202-00			RES,FXD,FILM:2K OHM,5%,0.25W	57668	NTR25J-E 2K
A5R620	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A5R621	315-0332-00			RES,FXD,FILM:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
A5R622	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A5R623	315-0332-00			RES,FXD,FILM:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
A5R624	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A5R625	315-0332-00			RES,FXD,FILM:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
A5R626	321-0385-07			RES,FXD,FILM:100K OHM,0.1%,0.125W,TC=T9	19701	5033RE100K0B
A5R627	315-0332-00			RES,FXD,FILM:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
A5R630	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A5R631	315-0332-00			RES,FXD,FILM:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
A5R632	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A5R633	315-0332-00			RES,FXD,FILM:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
A5R634	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A5R635	315-0332-00			RES,FXD,FILM:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
A5R636	321-0385-07			RES,FXD,FILM:100K OHM,0.1%,0.125W,TC=T9	19701	5033RE100K0B
A5R637	315-0332-00			RES,FXD,FILM:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
A5R640	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A5R642	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A5R644	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A5R646	321-0385-07			RES,FXD,FILM:100K OHM,0.1%,0.125W,TC=T9	19701	5033RE100K0B
A5R647	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A5R648	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A5R650	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A5R652	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A5R654	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A5R656	321-0385-07			RES,FXD,FILM:100K OHM,0.1%,0.125W,TC=T9	19701	5033RE100K0B
A5R657	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A5R658	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A5R661	321-0414-07			RES,FXD,FILM:200K OHM,0.1%,0.125W,TC=T9	24546	NE55E2003B

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A5R662	321-0414-07			RES,FXD,FILM:200K OHM,0.1%,0.125W,TC=T9	24546	NE55E2003B
A5R663	321-0414-07			RES,FXD,FILM:200K OHM,0.1%,0.125W,TC=T9	24546	NE55E2003B
A5R664	321-0414-07			RES,FXD,FILM:200K OHM,0.1%,0.125W,TC=T9	24546	NE55E2003B
A5R665	321-0414-07			RES,FXD,FILM:200K OHM,0.1%,0.125W,TC=T9	24546	NE55E2003B
A5R666	321-0414-07			RES,FXD,FILM:200K OHM,0.1%,0.125W,TC=T9	24546	NE55E2003B
A5R671	321-0385-07			RES,FXD,FILM:100K OHM,0.1%,0.125W,TC=T9	19701	5033RE100K0B
A5R672	321-0385-07			RES,FXD,FILM:100K OHM,0.1%,0.125W,TC=T9	19701	5033RE100K0B
A5R673	321-0385-07			RES,FXD,FILM:100K OHM,0.1%,0.125W,TC=T9	19701	5033RE100K0B
A5R674	321-0385-07			RES,FXD,FILM:100K OHM,0.1%,0.125W,TC=T9	19701	5033RE100K0B
A5R680	315-0304-00			RES,FXD,FILM:300K OHM,5%,0.25W	57668	NTR25J-E300K
A5R682	321-1747-07			RES,FXD,FILM:320K OHM,0.1%,0.125W,TC=T9	80009	321-1747-07
A5R684	321-1748-07			RES,FXD,FILM:160K OHM,0.1%,0.125W,TC=T9	80009	321-1748-07
A5R686	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A5R688	315-0753-00			RES,FXD,FILM:75K OHM,5%,0.25W	57668	NTR25J-E75K0
A5R690	315-0304-00			RES,FXD,FILM:300K OHM,5%,0.25W	57668	NTR25J-E300K
A5R692	321-1747-07			RES,FXD,FILM:320K OHM,0.1%,0.125W,TC=T9	80009	321-1747-07
A5R694	321-1748-07			RES,FXD,FILM:160K OHM,0.1%,0.125W,TC=T9	80009	321-1748-07
A5R696	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A5R698	315-0753-00			RES,FXD,FILM:75K OHM,5%,0.25W	57668	NTR25J-E75K0
A5R800	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A5R801	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A5R802	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A5R803	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A5R804	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A5R805	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A5R820	315-0512-00			RES,FXD,FILM:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
A5R822	315-0512-00			RES,FXD,FILM:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
A5R824	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A5R826	315-0512-00			RES,FXD,FILM:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
A5R850	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R852	315-0681-00			RES,FXD,FILM:680 OHM,5%,0.25W	57668	NTR25J-E680E
A5R854	315-0751-00			RES,FXD,FILM:750 OHM,5%,0.25W	57668	NTR25J-E750E
A5R860	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R862	315-0751-00			RES,FXD,FILM:750 OHM,5%,0.25W	57668	NTR25J-E750E
A5R864	315-0751-00			RES,FXD,FILM:750 OHM,5%,0.25W	57668	NTR25J-E750E
A5R865	315-0203-00			RES,FXD,FILM:20K OHM,5%,0.25W	57668	NTR25J-E 20K
A5R870	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A5R872	315-0751-00			RES,FXD,FILM:750 OHM,5%,0.25W	57668	NTR25J-E750E
A5R880	315-0911-00			RES,FXD,FILM:910 OHM,5%,0.25W	57668	NTR25J-E910E
A5TP10	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A5TP20	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A5TP30	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A5TP60	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A5TP70	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A5TP80	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A5TP90	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A5TP100	214-0579-00	.300377		TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A5TP500	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A5TP502	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A5TP648	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A5TP658	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A5U100	156-2824-00			MICROCKT,DGTL:CMOS,DI,LATCH,OCT	80009	156-2824-00
A5U120	156-2824-00			MICROCKT,DGTL:CMOS,DI,LATCH,OCT	80009	156-2824-00
A5U140	156-2824-00			MICROCKT,DGTL:CMOS,DI,LATCH,OCT	80009	156-2824-00
A5U160	156-2825-00			MICROCKT,DGTL:CMOS,DUAL 2-4 DCDR	80009	156-2825-00
A5U500	156-1834-00			MICROCKT,LINEAR:ANALOG MULTIPLEXER HYBRID	80009	156-1834-00
A5U520	156-1834-00			MICROCKT,LINEAR:ANALOG MULTIPLEXER HYBRID	80009	156-1834-00
A5U600	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A5U605	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A5U610	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A5U615	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A5U620	156-2826-00			MICROCKT,LINEAR:OP-AMP,BIFET	80009	156-2826-00
A5U625	156-2826-00			MICROCKT,LINEAR:OP-AMP,BIFET	80009	156-2826-00
A5U630	156-2826-00			MICROCKT,LINEAR:OP-AMP,BIFET	80009	156-2826-00
A5U635	156-2826-00			MICROCKT,LINEAR:OP-AMP,BIFET	80009	156-2826-00
A5U640	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A5U645	156-2826-00			MICROCKT,LINEAR:OP-AMP,BIFET	80009	156-2826-00
A5U650	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A5U655	156-2826-00			MICROCKT,LINEAR:OP-AMP,BIFET	80009	156-2826-00
A5U660	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A5U670	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A5U680	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A5U685	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A5U690	156-2795-00			MICROCKT,LINEAR:OPERATIONAL PRECISION	TK0191	156-2795-00
A5U695	156-2795-00			MICROCKT,LINEAR:OPERATIONAL PRECISION	TK0191	156-2795-00
A5U800	156-2825-00			MICROCKT,DGTL:CMOS,DUAL 2-4 DCDR	80009	156-2825-00
A5U810	156-2827-00			MICROCKT,DGTL:CMOS,DUAL,4-1,SEL/MUX	80009	156-2827-00
A5U820	156-1778-00			MICROCKT,LINEAR:DUAL COMPARATOR	TK0191	156-1778-00
A5U830	156-2825-00			MICROCKT,DGTL:CMOS,DUAL 2-4 DCDR	80009	156-2825-00
A5U840	156-2309-00			MICROCKT,DGTL:HEX INVERTER	80009	156-2309-00
A5U850	156-2253-00			MICROCKT,DGTL:MOS,QUAD NAND GATE	TK0191	156-2253-00
A5U860	156-2253-00			MICROCKT,DGTL:MOS,QUAD NAND GATE	TK0191	156-2253-00
A5U870	156-2253-00			MICROCKT,DGTL:MOS,QUAD NAND GATE	TK0191	156-2253-00
A5W640	131-0566-00	.300000	.300376	BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225 L	24546	OMA 07
A5W650	131-0566-00	.300000	.300376	BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225 L	24546	OMA 07
A6	670-9308-00	.300000	.300297	CIRCUIT BD ASSY:COLLECTOR SUPPLY OUTPUT	TK0191	670-9308-00
A6	670-9308-01	.300298		CIRCUIT BD ASSY:COLLECTOR SUPPLY OUTPUT	TK0191	ORDER BY DESCR
A6C212	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A6C302	281-0707-00			CAP,FXD,CER DI:15000PF,10%,200V	20932	402EM200AD153K
A6C304	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
A6C305	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A6C306	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A6C336	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A6C336	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A6C400	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A6C406	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A6C406	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A6C407	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A6C407	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A6C424	283-0923-00			CAP,FXD,CER DI:47PF,10%,500V	80009	283-0923-00
A6C452	283-0000-00			CAP,FXD,CER DI:0.001UF,+100-0%,500V	59660	831-610-Y5U0102P
A6C480	290-1168-00	.300298		CAP,FXD ELCTLT:47UF,20%,16V	TK00M	ORDER BY DESCR
A6C524	283-0923-00			CAP,FXD,CER DI:47PF,10%,500V	80009	283-0923-00
A6C552	283-0000-00			CAP,FXD,CER DI:0.001UF,+100-0%,500V	59660	831-610-Y5U0102P
A6CR210	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A6CR212	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A6CR316	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A6CR402	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A6CR404	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A6CR446	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A6CR448	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A6J60	131-3672-00			CONN,RCPT,ELEC:HEADER,16 PIN	TK0191	131-3672-00
A6J62	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
				(QUANTITY OF 4)		
A6J66	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL	22526	48283-036
				(QUANTITY OF 2)		
A6K446	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A6K448	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A6K546	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A6K548	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A6L306	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A6L406	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A6L407	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A6Q424	151-0559-00			TRANSISTOR:NPN,SI,PWR	TK0191	151-0559-00
A6Q438	151-1201-00			TRANSISTOR:PMOS,FET,PWR,200V	TK0191	151-1201-00
A6Q440	151-1201-00			TRANSISTOR:PMOS,FET,PWR,200V	TK0191	151-1201-00
A6Q444	151-0558-00			TRANSISTOR:PNP,SI	TK0191	151-0558-00
A6Q524	151-0558-00			TRANSISTOR:PNP,SI	TK0191	151-0558-00
A6Q538	151-1202-00			TRANSISTOR:NMOS,FET,PWR,200V	TK0191	151-1202-00
A6Q540	151-1202-00			TRANSISTOR:NMOS,FET,PWR,200V	TK0191	151-1202-00
A6Q544	151-0559-00			TRANSISTOR:NPN,SI,PWR	TK0191	151-0559-00
A6R103	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A6R104	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A6R110	307-0885-00			RES NTWK,FXD,FI:5,100K OHM,5%,0.125W	80009	307-0885-00
A6R200	321-0347-00			RES,FXD,FILM:40.2K OHM,1%,0.125W,TC=T0	91637	CMF55116G40201F
A6R202	321-0318-03			RES,FXD,FILM:20.0K OHM,0.125%,0.125W,TC=T2	19701	5033RC20K00C
A6R204	321-0231-00			RES,FXD,FILM:2.49K OHM,1%,0.125W,TC=T0	19701	5033ED2K49F
A6R206	321-0222-07			RES,FXD,FILM:2.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE2K000B
A6R208	321-0164-00			RES,FXD,FILM:499 OHM,1%,0.125W,TC=T0	19701	5033ED499R0F
A6R212	315-0512-00			RES,FXD,FILM:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
A6R214	321-0289-06			RES,FXD,FILM:10.0K OHM,0.25%,0.125W,TC=T9	19701	5033RE10K00C
A6R216	321-0289-06			RES,FXD,FILM:10.0K OHM,0.25%,0.125W,TC=T9	19701	5033RE10K00C
A6R300	315-0103-00	.300000	.300297	RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A6R300	315-0104-00	.300298		RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A6R302	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A6R304	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A6R305	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A6R310	321-0289-06			RES,FXD,FILM:10.0K OHM,0.25%,0.125W,TC=T9	19701	5033RE10K00C
A6R312	321-0289-06			RES,FXD,FILM:10.0K OHM,0.25%,0.125W,TC=T9	19701	5033RE10K00C
A6R314	315-0511-00			RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J
A6R318	321-0211-00			RES,FXD,FILM:1.54K OHM,1%,0.125W,TC=T0	07716	CEAD15400F
A6R320	321-0401-00			RES,FXD,FILM:147K OHM,1%,0.125W,TC=T0	19701	5043ED147K0F
A6R322	321-0401-00			RES,FXD,FILM:147K OHM,1%,0.125W,TC=T0	19701	5043ED147K0F
A6R330	315-0123-00			RES,FXD,FILM:12K OHM,5%,0.25W	57668	NTR25J-E12K0
A6R332	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A6R334	315-0204-00			RES,FXD,FILM:200K OHM,5%,0.25W	19701	5043CX200K0J
A6R336	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A6R340	315-0333-00			RES,FXD,FILM:33K OHM,5%,0.25W	57668	NTR25J-E33K0
A6R342	315-0511-00			RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J
A6R344	315-0333-00			RES,FXD,FILM:33K OHM,5%,0.25W	57668	NTR25J-E33K0
A6R346	315-0511-00			RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J
A6R400	321-0222-07	.300000	.300737	RES,FXD,FILM:2.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE2K000B
A6R400	321-0929-07	.300738		RES,FXD,FILM:2.5K OHM,0.1%,0.125W,TC=T9	19701	5033RE2K500B
A6R401	311-0634-04			RES,VAR,NONWW:TRMR,500 OHM,20%,0.5W	80009	311-0634-04
A6R402	321-0222-07	.300000	.300737	RES,FXD,FILM:2.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE2K000B
A6R402	321-0210-07	.300738		RES,FXD,FILM:1.5K OHM,0.1%,0.125W,TC=T9	19701	5033RE1K50B
A6R403	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A6R404	321-0414-04			RES,FXD,FILM:200K OHM,0.1%,0.125W,TC=T2	19701	5033RC200K0B
A6R406	315-0392-00			RES,FXD,FILM:3.9K OHM,5%,0.25W	57668	NTR25J-E03K9
A6R408	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A6R410	315-0511-00	.300000	.300297	RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A6R410	315-0221-00	.300298		RES,FXD,FILM:220 OHM,5%,0.25W	57668	NTR25J-E220E
A6R412	311-2041-00	.300000	.300297	RES,VAR,NONWW:CKT BD,10K OHM,10%,0.5W	80009	311-2041-00
A6R412	311-2388-00	.300298		RES,VAR,NONWW:TRMR,10K OHM,10%,0.5W	S4431	POT1102P-1-103
A6R414	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A6R420	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A6R422	315-0392-00			RES,FXD,FILM:3.9K OHM,5%,0.25W	57668	NTR25J-E03K9
A6R424	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A6R428	315-0512-00			RES,FXD,FILM:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
A6R434	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A6R436	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A6R438	307-1286-00			RES,FXD,FILM:1 OHM,5%,2W	80009	307-1286-00
A6R440	307-1286-00			RES,FXD,FILM:1 OHM,5%,2W	80009	307-1286-00
A6R442	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A6R444	315-0033-00			RES,FXD,CMPSN:3.3 OHM,5%,0.25	80009	315-0033-00
A6R446	307-1294-00			RES,FXD,FILM:0.51 OHM,5%,2W	TK0191	307-1294-00
A6R448	308-0885-00			RES,FXD,WW:0.3 OHM,1%,2W	80009	308-0885-00
A6R452	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A6R480	315-0153-00	.300298		RES,FXD,FILM:15K OHM,5%,0.25W	19701	5043CX15K00J
A6R481	307-1289-00	.300298		RES,FXD,FILM:15K OHM,5%,1W	TK0191	307-1289-00
A6R520	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A6R522	315-0392-00			RES,FXD,FILM:3.9K OHM,5%,0.25W	57668	NTR25J-E03K9
A6R524	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A6R528	315-0512-00			RES,FXD,FILM:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
A6R534	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A6R536	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A6R538	307-1286-00			RES,FXD,FILM:1 OHM,5%,2W	80009	307-1286-00
A6R540	307-1286-00			RES,FXD,FILM:1 OHM,5%,2W	80009	307-1286-00
A6R542	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A6R544	315-0033-00			RES,FXD,CMPSN:3.3 OHM,5%,0.25	80009	315-0033-00
A6R546	307-1294-00			RES,FXD,FILM:0.51 OHM,5%,2W	TK0191	307-1294-00
A6R548	308-0885-00			RES,FXD,WW:0.3 OHM,1%,2W	80009	308-0885-00
A6R552	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A6S92	260-2332-00			SWITCH,THRMSTC:NC,60 OPEN,3A,250V	TK0191	260-2332-00
A6U100	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A6U102	156-0447-00			MICROCKT,DGTL:DIGITAL TRANSISTOR	TK0191	156-0447-00
A6U103	156-0447-00			MICROCKT,DGTL:DIGITAL TRANSISTOR	TK0191	156-0447-00
A6U200	156-0514-03	.300000	.300667	MICROCKT,DGTL:DIFF 4-CHANNEL MUX	80009	156-0514-03
A6U200	156-0514-00	.300668		MICROCKT,DGTL:CMOS,DIFF 4-CHANNEL MUX	02735	CD4052BF-98
A6U210	156-1771-00			MICROCKT,LINEAR:DUAL OP-AMP	80009	156-1771-00
A6U212	156-1771-00			MICROCKT,LINEAR:DUAL OP-AMP	80009	156-1771-00
A6U302	156-1771-00			MICROCKT,LINEAR:DUAL OP-AMP	80009	156-1771-00
A6U310	156-1778-00			MICROCKT,LINEAR:DUAL COMPARATOR	TK0191	156-1778-00
A6U330	156-2839-00			MICROCKT,LINEAR:DUAL OP-AMP	TK0191	156-2839-00
A6U400	156-2847-00	.300000	.300297	MICROCKT,LINEAR:DUAL OP-AMP	TK0191	156-2847-00
A6U400	156-1699-00	.300298		MICROCKT,LINEAR:DUAL BI-FET,OPNL AMPL	01295	TL288CP
A6U1008	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A6U2008	156-0514-00			MICROCKT,DGTL:CMOS,DIFF 4-CHANNEL MUX	02735	CD4052BF-98
A6U3108	156-1778-00			MICROCKT,LINEAR:DUAL COMPARATOR	TK0191	156-1778-00
A6U4008	156-2847-00			MICROCKT,LINEAR:DUAL OP-AMP	TK0191	156-2847-00
A6W64	174-0301-00			CA ASSY,SP,ELEC:4,22 AWG,16.0 L	TK0191	174-0301-00
A6W66	174-0304-00			CA ASSY,SP,ELEC:2,26 AWG,6.0 L,RIBBON	TK0191	174-0304-00
A7	670-9309-00	.300000	.300398	CIRCUIT BD ASSY:STEP GENERATOR	TK0191	670-9309-00
A7	670-9309-01	.300399	.300512	CIRCUIT BD ASSY:STEP GENERATOR	80009	670-9309-01
A7	670-9309-02	.300513		CKT BD SUBASSY:STEP GEN	80009	670-9309-02
A7C20	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A7C20	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A7C30	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A7C30	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A7C40	290-1067-00	.300000	.300462	CAP,FXD,ELCTLT:100UF,20%,63V	80009	290-1067-00
A7C40	290-0950-00	.300463		CAP,FXD,ELCTLT:100UF,+50-20%,50WVDC	80009	290-0950-00
A7C50	290-1067-00	.300000	.300462	CAP,FXD,ELCTLT:100UF,20%,63V	80009	290-1067-00
A7C50	290-0950-00	.300463		CAP,FXD,ELCTLT:100UF,+50-20%,50WVDC	80009	290-0950-00
A7C60	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
A7C70	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
A7C120	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A7C120	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A7C122	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A7C180	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A7C180	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A7C200	281-0772-00	.300000	.300398	CAP,FXD,CER DI:4700PF,10%,100V	04222	MA201C472KAA
A7C200	281-0772-00	.300399		CAP,FXD,CER DI:4700PF,10%,100V	04222	MA201C472KAA
A7C340	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A7C344	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A7C354	281-0768-00	.300000	.300398	CAP,FXD,CER DI:470PF,20%,100V	04222	MA101A471MAA
A7C354	281-0768-00	.300399		CAP,FXD,CER DI:470PF,20%,100V	04222	MA101A471MAA
A7C355	281-0768-00	.300000	.300398	CAP,FXD,CER DI:470PF,20%,100V	04222	MA101A471MAA
A7C355	281-0768-00	.300399		CAP,FXD,CER DI:470PF,20%,100V	04222	MA101A471MAA
A7C364	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A7C380	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A7C380	281-0788-00	.300000	.300398	CAP,FXD,CER DI:470PF,10%,100V	04222	SA102C471KAA
A7C380	281-0788-00	.300399		CAP,FXD,CER DI:470PF,10%,100V	04222	SA102C471KAA
A7C410	281-0758-00			CAP,FXD,CER DI:15PF,20%,100V	04222	SA102A150MAA
A7C460	281-0772-00	.300001	.300202	CAP,FXD,CER DI:4700PF,10%,100V	04222	MA201C472KAA
A7C462	281-0767-00			CAP,FXD,CER DI:330PF,20%,100V	04222	MA106C331MAA
A7C480	281-0767-00			CAP,FXD,CER DI:330PF,20%,100V	04222	MA106C331MAA
A7C490	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
A7C491	290-0821-00			CAP,FXD,ELCTLT:10UF,+50-10%,160V	80009	290-0821-00
A7C495	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
A7C496	290-0821-00			CAP,FXD,ELCTLT:10UF,+50-10%,160V	80009	290-0821-00
A7C561	281-0773-00	.300000	.300398	CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
A7C561	281-0773-00	.300399		CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
A7C600	281-0811-00			CAP,FXD,CER DI:10PF,10%,100V	04222	MA101A100KAA
A7C610	281-0814-00	.300000	.300398	CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A7C630	290-1007-00	.300000	.300398	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A7C630	290-0974-00	.300399		CAP,FXD,ELCTLT:10UF,20%,50VDC	55680	ULB1H100MAA
A7C800	283-0212-00			CAP,FXD,CER DI:2UF,20%,50V	04222	SR405E205MAA
A7C801	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A7C814	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A7C822	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A7C830	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A7C850	281-0811-00			CAP,FXD,CER DI:10PF,10%,100V	04222	MA101A100KAA
A7CR340	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR342	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR350	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR351	152-0327-00	.300000	.300398	SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR351	152-0327-00	.300399		SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR352	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR353	152-0327-00	.300000	.300398	SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR353	152-0327-00	.300399		SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR354	152-0327-00	.300000	.300398	SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR354	152-0327-00	.300399		SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR355	152-0327-00	.300000	.300398	SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR355	152-0327-00	.300399		SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A7CR356	152-0327-00	.300000	.300398	SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR356	152-0327-00	.300399		SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR357	152-0327-00	.300000	.300398	SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR357	152-0327-00	.300399		SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR358	152-0327-00	.300000	.300398	SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR358	152-0327-00	.300399		SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR359	152-0327-00	.300000	.300398	SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR359	152-0327-00	.300399		SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR402	152-0853-00			SEMICOND DVC,DI:DUAL RECT,SI,400V,5A,TO-220 AB	TK0191	152-0853-00
A7CR450	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR452	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR460	152-0327-00	.300000	.300398	SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR462	152-0327-00	.300000	.300398	SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR464	152-0327-00	.300000	.300398	SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR480	152-0460-00			SEMICOND DVC,DI:FE,SI,25V,1MA,TO-7	04713	SCL072
A7CR482	152-0853-00			SEMICOND DVC,DI:DUAL RECT,SI,400V,5A,TO-220 AB	TK0191	152-0853-00
A7CR526	152-0853-00			SEMICOND DVC,DI:DUAL RECT,SI,400V,5A,TO-220 AB	TK0191	152-0853-00
A7CR527	152-0460-00	.300000	.300398	SEMICOND DVC,DI:FE,SI,25V,1MA,TO-7	04713	SCL072
A7CR527	152-0460-00	.300399		SEMICOND DVC,DI:FE,SI,25V,1MA,TO-7	04713	SCL072
A7CR528	152-0460-00	.300000	.300398	SEMICOND DVC,DI:FE,SI,25V,1MA,TO-7	04713	SCL072
A7CR528	152-0460-00	.300399		SEMICOND DVC,DI:FE,SI,25V,1MA,TO-7	04713	SCL072
A7CR560	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR562	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR600	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR602	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR614	152-0460-00	.300000	.300398	SEMICOND DVC,DI:FE,SI,25V,1MA,TO-7	04713	SCL072
A7CR620	152-0460-00	.300000	.300398	SEMICOND DVC,DI:FE,SI,25V,1MA,TO-7	04713	SCL072
A7CR810	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR812	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR830	152-0460-00			SEMICOND DVC,DI:FE,SI,25V,1MA,TO-7	04713	SCL072
A7CR840	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR841	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR842	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7CR843	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A7J70	131-2230-01	.300000	.300398	CONN,RCPT,ELEC:HEADER,2 X 8,2.54 SPACING	80009	131-2230-01
A7J72	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 9)	22526	48283-029
A7J74	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 9)	22526	48283-029
A7K102	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A7K104	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A7K500	148-0187-00			RELAY,ARM:DPDT,3A,200V,COIL,12VDC	TK0191	148-0187-00
A7K502	148-0188-00			RELAY,ARM:SPDT,5A,AC380V,COIL,12VDC	TK0191	148-0188-00
A7K506	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A7K508	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A7K510	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A7K512	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A7K520	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A7K522	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A7K524	148-0188-00			RELAY,ARM:SPDT,5A,AC380V,COIL,12VDC	TK0191	148-0188-00
A7K526	148-0187-00			RELAY,ARM:DPDT,3A,200V,COIL,12VDC	TK0191	148-0187-00
A7K570	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A7K571	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A7L20	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A7L30	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A7L120	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A7L801	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A7Q400	151-0770-01			TRANSISTOR:NPN,SI,TO-126	80009	151-0770-01
A7Q450	151-0739-01			TRANSISTOR:PNP,SI,TO-126	80009	151-0739-01
A7Q460	151-0770-01			TRANSISTOR:NPN,SI,TO-126	80009	151-0770-01
A7Q462	151-0561-00	.300399		TRANSISTOR:NPN,SI,PWR	TK0191	151-0561-00
A7Q480	151-0739-01			TRANSISTOR:PNP,SI,TO-126	80009	151-0739-01
A7Q490	151-0560-00			TRANSISTOR:NPN,SI,PWR	TK0191	151-0560-00
A7Q495	151-0560-00			TRANSISTOR:NPN,SI,PWR	TK0191	151-0560-00
A7Q560	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A7Q562	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A7Q612	151-0770-01	.300000	.300398	TRANSISTOR:NPN,SI,TO-126	80009	151-0770-01
A7Q620	151-0739-01	.300000	.300398	TRANSISTOR:PNP,SI,TO-126	80009	151-0739-01
A7Q620	151-0562-00	.300399		TRANSISTOR:PNP,SI,PWR	TK0191	151-0562-00
A7Q630	151-0770-01	.300000	.300398	TRANSISTOR:NPN,SI,TO-126	80009	151-0770-01
A7Q630	151-0561-00	.300399		TRANSISTOR:NPN,SI,PWR	TK0191	151-0561-00
A7Q810	151-0770-01			TRANSISTOR:NPN,SI,TO-126	80009	151-0770-01
A7Q814	151-0739-01			TRANSISTOR:PNP,SI,TO-126	80009	151-0739-01
A7Q816	151-0560-00			TRANSISTOR:NPN,SI,PWR	TK0191	151-0560-00
A7Q830	151-0739-01			TRANSISTOR:PNP,SI,TO-126	80009	151-0739-01
A7Q832	151-0560-00			TRANSISTOR:NPN,SI,PWR	TK0191	151-0560-00
A7R100	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A7R110	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A7R200	315-0105-00			RES,FXD,FILM:1M OHM,5%,0.25W	19701	5043CX1M000J
A7R300	321-0318-07	.300000	.300512	RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A7R300	321-0222-07	.300513		RES,FXD,FILM:2.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE2K000B
A7R302	321-0289-07	.300000	.300512	RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A7R302	321-0193-07	.300513		RES,FXD,FILM:1K OHM,0.1%,0.125W,TC=T9	19701	5033RE1K000B
A7R304	321-0289-07	.300000	.300512	RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A7R304	321-0193-07	.300513		RES,FXD,FILM:1K OHM,0.1%,0.125W,TC=T9	19701	5033RE1K000B
A7R306	315-0103-00	.300000	.300512	RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A7R306	315-0102-00	.300513		RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A7R310	311-2041-00	.300000	.300398	RES,VAR,NONWW:CKT BD,10K OHM,10%,0.5W	80009	311-2041-00
A7R310	311-0633-02	.300399		RES,VAR,NONWW:TRMR,5K OAM,0.5W	80009	311-0633-02
A7R311	315-0272-00	.300399		RES,FXD,FILM:2.7K OHM,5%,0.25W	57668	NTR25J-E02K7
A7R312	315-0272-00	.300399		RES,FXD,FILM:2.7K OHM,5%,0.25W	57668	NTR25J-E02K7
A7R320	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A7R321	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A7R322	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A7R323	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A7R324	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A7R330	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A7R332	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A7R340	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A7R342	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A7R344	321-0222-07			RES,FXD,FILM:2.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE2K000B
A7R346	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A7R350	321-0222-07			RES,FXD,FILM:2.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE2K000B
A7R352	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A7R354	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A7R354	321-0289-07	.300000	.300398	RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A7R354	321-0289-07	.300399		RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A7R355	321-0289-07	.300000	.300398	RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A7R355	321-0289-07	.300399		RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A7R356	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A7R356	321-0289-07	.300000	.300398	RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A7R356	321-0289-07	.300399		RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A7R357	321-0289-07	.300000	.300398	RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A7R357	321-0289-07	.300399		RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A7R360	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A7R362	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A7R364	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A7R366	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A7R370	321-0222-07			RES,FXD,FILM:2.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE2K000B
A7R372	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A7R400	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A7R402	315-0222-00			RES,FXD,FILM:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
A7R410	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A7R412	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A7R450	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A7R460	315-0101-00	.300000	.300202	RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A7R460	315-0470-00	.300203		RES,FXD,FILM:47 OHM,5%,0.25W	57668	NTR25J-E47E0
A7R462	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A7R464	311-0635-04	.300203	.300398	RES,VAR,NONWW:TRMR,1K OHM,20%,0.5W	80009	311-0635-04
A7R465	315-0682-00	.300399		RES,FXD,FILM:6.8K OHM,5%,0.25W	57668	NTR25J-E06K8
A7R466	315-0242-00	.300399		RES,FXD,FILM:2.4K OHM,5%,0.25W	57668	NTR25J-E02K4
A7R467	311-0635-04	.300399		RES,VAR,NONWW:TRMR,1K OHM,20%,0.5W	80009	311-0635-04
A7R480	315-0101-00	.300001	.300202	RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A7R480	315-0470-00	.300203		RES,FXD,FILM:47 OHM,5%,0.25W	57668	NTR25J-E47E0
A7R482	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A7R490	307-1304-00			RES,FXD,FILM:330 OHM,5%,5W	TK0191	307-1304-00
A7R491	308-0878-00			RES,FXD,WW:0.3 OHM,10%,2W	TK0191	308-0878-00
A7R492	307-1304-00			RES,FXD,FILM:330 OHM,5%,5W	TK0191	307-1304-00
A7R493	307-1304-00			RES,FXD,FILM:330 OHM,5%,5W	TK0191	307-1304-00
A7R495	307-1304-00			RES,FXD,FILM:330 OHM,5%,5W	TK0191	307-1304-00
A7R496	308-0878-00	.300203		RES,FXD,WW:0.3 OHM,10%,2W	TK0191	308-0878-00
A7R497	307-1304-00			RES,FXD,FILM:330 OHM,5%,5W	TK0191	307-1304-00
A7R498	307-1304-00			RES,FXD,FILM:330 OHM,5%,5W	TK0191	307-1304-00
A7R500	308-0880-00			RES,FXD,WW:9.0 OHM,0.1%,2W	80009	308-0880-00
A7R502	308-0879-00			RES,FXD,WW:1.0 OHM,0.1%,3W	80009	308-0879-00
A7R506	321-0097-07			RES,FXD,FILM:100 OHM,0.1%,0.125W,TC=T9	91637	CMF55116C100R0B
A7R508	321-0193-07			RES,FXD,FILM:1K OHM,0.1%,0.125W,TC=T9	19701	5033RE1K000B
A7R510	321-1289-07			RES,FXD,FILM:10.1K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K10B
A7R512	321-1389-07			RES,FXD,FILM:111K OHM,0.1%,0.125W,TC=T9	19701	5033RE1113BB298F
A7R514	321-0481-07			RES,FXD,FILM:1M OHM,0.1%,0.125W,TC=T9	19701	5033RE1M000B
A7R516	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A7R520	307-0115-00			RES,FXD,CMPSN:7.5 OHM,5%,0.25W	80009	307-0115-00
A7R522	307-1305-00			RES,FXD,FILM:1.2 OHM,5%,1/2W	TK0191	307-1305-00
A7R524	308-0878-00			RES,FXD,WW:0.3 OHM,10%,2W	TK0191	308-0878-00
A7R526	315-0101-00	.300000	.300398	RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A7R526	315-0101-00	.300399		RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A7R527	321-0289-07	.300000	.300398	RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A7R527	321-0289-07	.300399		RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A7R528	321-0289-07	.300000	.300398	RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A7R528	321-0289-07	.300399		RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A7R536	315-0390-00			RES,FXD,FILM:39 OHM,5%,0.25W	57668	NTR25J-E39E0
A7R560	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A7R561	315-0100-00	.300000	.300398	RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A7R561	315-0100-00	.300399		RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A7R562	315-0101-00	.300000	.300398	RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A7R562	315-0101-00	.300399		RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A7R570	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A7R600	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A7R601	315-0302-00	.300399		RES,FXD,FILM:3K OHM,5%,0.25W	57668	NTR25J-E03K0
A7R602	315-0302-00	.300399		RES,FXD,FILM:3K OHM,5%,0.25W	57668	NTR25J-E03K0
A7R603	311-1227-00	.300399	.300492	RES,VAR,NONWW:TRMR,5K OHM,0.5W	32997	3386F-T04-502

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A7R603	311-0633-02	.300493		RES,VAR,NONWW:TRMR,5K OAM,0.5W	80009	311-0633-02
A7R610	315-0472-00	.300000	.300398	RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A7R612	315-0101-00	.300000	.300398	RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A7R620	315-0101-00	.300000	.300398	RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A7R620	315-0103-00	.300399		RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A7R622	315-0100-00	.300000	.300398	RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A7R630	315-0101-00	.300000	.300398	RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A7R630	315-0103-00	.300399		RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A7R632	315-0100-00	.300000	.300398	RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A7R800	315-0105-00			RES,FXD,FILM:1M OHM,5%,0.25W	19701	5043CX1M000J
A7R810	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A7R812	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A7R814	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A7R816	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A7R820	315-0471-00			RES,FXD,FILM:470 OHM,5%,0.25W	57668	NTR25J-E470E
A7R822	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A7R832	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A7R840	307-0107-00			RES,FXD,CMPSN:5.6 OHM,5%,0.25W	01121	CB56G5
A7R841	307-0107-00	.300000	.300247	RES,FXD,CMPSN:5.6 OHM,5%,0.25W	01121	CB56G5
A7R841	307-0106-00	.300248		RES,FXD,CMPSN:4.7 OHM,5%,0.25W	01121	CB 47G5
A7R850	321-0321-07			RES,FXD,FILM:21.5K OHM,0.1%,0.125W,TC=T9	19701	5033RE21K50B
A7R852	321-1746-07			RES,FXD,FILM:1.13K OHM,0.1%,0.125W,TC=T9	80009	321-1746-07
A7U100	156-1827-00			MICROCKT,DGTL:C2MOS,3 LINE TO 8 LINE DECODE R	80009	156-1827-00
A7U102	156-0447-00			MICROCKT,DGTL:DIGITAL TRANSISTOR	TK0191	156-0447-00
A7U120	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A7U140	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A7U160	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A7U170	156-0446-00			MICROCKT,DGTL:3-TERM POSI VOL REG +12V,1A T 0-220C	TK0191	156-0446-00
A7U180	156-1837-00			MICROCKT,LINEAR:DRIVER W/STROBE	80009	156-1837-00
A7U190	156-1837-00			MICROCKT,LINEAR:DRIVER W/STROBE	80009	156-1837-00
A7U200	156-2829-00			MICROCKT,LINEAR:OP-AMP	TK0191	156-2829-00
A7U300	156-0514-03	.300000	.300667	MICROCKT,DGTL:DIFF 4-CHANNEL MUX	80009	156-0514-03
A7U300	156-0514-00	.300668		MICROCKT,DGTL:CMOS,DIFF 4-CHANNEL MUX	02735	CD4052BF-98
A7U310	156-1114-00			MICROCKT,LINEAR:MOS/FET INP,COS/MOS OUT	02735	CA3160E
A7U330	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A7U340	156-2829-00			MICROCKT,LINEAR:OP-AMP	TK0191	156-2829-00
A7U360	156-2829-00			MICROCKT,LINEAR:OP-AMP	TK0191	156-2829-00
A7U370	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A7U380	156-2829-00			MICROCKT,LINEAR:OP-AMP	TK0191	156-2829-00
A7U600	156-2793-00			MICROCKT,LINEAR:OPERATIONAL,BIFET	TK0191	156-2793-00
A7U800	156-2829-00			MICROCKT,LINEAR:OP-AMP	TK0191	156-2829-00
A7VR610	152-0055-00	.300000	.300398	SEMICOND DVC,DI:ZEN,SI,11V,5%,0.4W,DO-7	14433	Z5407
A7VR611	152-0055-00	.300000	.300398	SEMICOND DVC,DI:ZEN,SI,11V,5%,0.4W,DO-7	14433	Z5407
A7VR612	152-0195-00	.300000	.300398	SEMICOND DVC,DI:ZEN,SI,5.1V,5%,0.4W,DO-7	04713	SZ11755RL
A7VR620	152-0055-00	.300000	.300398	SEMICOND DVC,DI:ZEN,SI,11V,5%,0.4W,DO-7	14433	Z5407
A7VR620	152-0243-00	.300399		SEMICOND DVC,DI:ZEN,SI,15V,5%,0.4W,DO-7	04713	SZ13203 (1N965B)
A7VR630	152-0243-00	.300399		SEMICOND DVC,DI:ZEN,SI,15V,5%,0.4W,DO-7	04713	SZ13203 (1N965B)
A7W496	131-0566-00	.300000	.300202	BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225 L	24546	OMA 07
A8	670-9310-00			CIRCUIT BD ASSY:H V RELAY	TK0191	670-9310-00
A8C206	285-1373-00			CAP,FXD,PLASTIC:0.1UF,10%,2.5KV	TK0191	285-1373-00
A8C300	283-0928-00			CAP,FXD,CER DI:10PF,5%,2KV	TK0191	283-0928-00
A8C301	283-0928-00			CAP,FXD,CER DI:10PF,5%,2KV	TK0191	283-0928-00
A8C302	283-0928-00			CAP,FXD,CER DI:10PF,5%,2KV	TK0191	283-0928-00

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A8C303	283-0928-00			CAP,FXD,CER DI:10PF,5%,2KV	TK0191	283-0928-00
A8C500	283-0924-00			CAP,FXD,CER DI:47PF,5%,1KV	TK0191	283-0924-00
A8C501	283-0924-00			CAP,FXD,CER DI:47PF,5%,1KV	TK0191	283-0924-00
A8C502	283-0924-00			CAP,FXD,CER DI:47PF,5%,1KV	TK0191	283-0924-00
A8C503	283-0924-00			CAP,FXD,CER DI:47PF,5%,1KV	TK0191	283-0924-00
A8C510	283-0924-00			CAP,FXD,CER DI:47PF,5%,1KV	TK0191	283-0924-00
A8C511	283-0924-00			CAP,FXD,CER DI:47PF,5%,1KV	TK0191	283-0924-00
A8C512	283-0924-00			CAP,FXD,CER DI:47PF,5%,1KV	TK0191	283-0924-00
A8C513	283-0924-00			CAP,FXD,CER DI:47PF,5%,1KV	TK0191	283-0924-00
A8C520	283-0925-00			CAP,FXD,CER DI:22PF,5%,1KVDC	TK0191	283-0925-00
A8C521	283-0925-00			CAP,FXD,CER DI:22PF,5%,1KVDC	TK0191	283-0925-00
A8C522	283-0925-00			CAP,FXD,CER DI:22PF,5%,1KVDC	TK0191	283-0925-00
A8C523	283-0925-00			CAP,FXD,CER DI:22PF,5%,1KVDC	TK0191	283-0925-00
A8CR200	152-0941-00			SEMICOND DVC,DI:HV RECT,SI,8KV	80009	152-0941-00
A8CR202	152-0941-00			SEMICOND DVC,DI:HV RECT,SI,8KV	80009	152-0941-00
A8CR204	152-0941-00			SEMICOND DVC,DI:HV RECT,SI,8KV	80009	152-0941-00
A8CR206	152-0941-00			SEMICOND DVC,DI:HV RECT,SI,8KV	80009	152-0941-00
A8E408	276-0810-00			CORE,EM:FERRITE	TK0191	276-0810-00
A8J83	131-3659-00			TERM,QIK DISC:CKT,0.187 X 25,TAB	TK0191	131-3659-00
A8J84	131-3659-00			TERM,QIK DISC:CKT,0.187 X 25,TAB	TK0191	131-3659-00
A8J85	131-3659-00			TERM,QIK DISC:CKT,0.187 X 25,TAB	TK0191	131-3659-00
A8J86	131-3659-00			TERM,QIK DISC:CKT,0.187 X 25,TAB	TK0191	131-3659-00
A8J87	131-3659-00			TERM,QIK DISC:CKT,0.187 X 25,TAB	TK0191	131-3659-00
A8J88	131-3659-00			TERM,QIK DISC:CKT,0.187 X 25,TAB	TK0191	131-3659-00
A8K202	148-0172-00			RELAY,ARMATURE:SPST,12V,6KDC	TK0191	148-0172-00
A8K204	148-0172-00			RELAY,ARMATURE:SPST,12V,6KDC	TK0191	148-0172-00
A8K210	148-0172-00			RELAY,ARMATURE:SPST,12V,6KDC	TK0191	148-0172-00
A8K211	148-0172-00			RELAY,ARMATURE:SPST,12V,6KDC	TK0191	148-0172-00
A8K212	148-0172-00			RELAY,ARMATURE:SPST,12V,6KDC	TK0191	148-0172-00
A8K213	148-0172-00			RELAY,ARMATURE:SPST,12V,6KDC	TK0191	148-0172-00
A8K214	148-0172-00			RELAY,ARMATURE:SPST,12V,6KDC	TK0191	148-0172-00
A8K215	148-0172-00			RELAY,ARMATURE:SPST,12V,6KDC	TK0191	148-0172-00
A8K300	148-0172-00			RELAY,ARMATURE:SPST,12V,6KDC	TK0191	148-0172-00
A8K302	148-0172-00			RELAY,ARMATURE:SPST,12V,6KDC	TK0191	148-0172-00
A8K304	148-0172-00			RELAY,ARMATURE:SPST,12V,6KDC	TK0191	148-0172-00
A8K306	148-0172-00			RELAY,ARMATURE:SPST,12V,6KDC	TK0191	148-0172-00
A8R204	307-1301-00			RES,FXD,FILM:2K OHM,5%,3W	TK0191	307-1301-00
A8R205	307-1301-00			RES,FXD,FILM:2K OHM,5%,3W	TK0191	307-1301-00
A8R206	325-0407-00			RES,FXD,FILM:10 OHM,5%,1W	80009	325-0407-00
A8R206	325-0407-00	.300000	.300462	RES,FXD,FILM:10 OHM,5%,1W	80009	325-0407-00
A8R206	325-0409-00	.300463		RES,FXD,FILM:10M OHM,2%,1W	80009	325-0409-00
A8R210	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A8R211	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A8R212	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A8R213	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A8R214	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A8R215	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A8R216	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A8R217	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A8R220	307-1302-00			RES,FXD,FILM:240K OHM,5%,2W	TK0191	307-1302-00
A8R221	307-1302-00			RES,FXD,FILM:240K OHM,5%,2W	TK0191	307-1302-00
A8R222	307-1302-00			RES,FXD,FILM:240K OHM,5%,2W	TK0191	307-1302-00
A8R223	307-1302-00			RES,FXD,FILM:240K OHM,5%,2W	TK0191	307-1302-00
A8R300	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A8R302	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A8R304	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A8R306	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A8R308	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A8R310	315-0513-00			RES,FXD,FILM:51K OHM,5%,0.25W	57668	NTR25J-E51K0
A8R312	315-0513-00			RES,FXD,FILM:51K OHM,5%,0.25W	57668	NTR25J-E51K0
A8R402	307-1303-00			RES,FXD,FILM:100K OHM,2%,3W	TK0191	307-1303-00
A8R403	307-1303-00			RES,FXD,FILM:100K OHM,2%,3W	TK0191	307-1303-00
A8R404	307-1303-00			RES,FXD,FILM:100K OHM,2%,3W	TK0191	307-1303-00
A8R405	307-1303-00			RES,FXD,FILM:100K OHM,2%,3W	TK0191	307-1303-00
A8R406	325-0408-00			RES,FXD,FILM:1M OHM,2%,1W	80009	325-0408-00
A8R407	325-0408-00			RES,FXD,FILM:1M OHM,2%,1W	80009	325-0408-00
A8R408	325-0409-00			RES,FXD,FILM:10M OHM,2%,1W	80009	325-0409-00
A8R500	321-0385-00	.300000	.300171	RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0	19701	5033ED100K0F
A8R500	321-0379-00	.300172		RES,FXD,FILM:86.6K OHM,1%,0.125W,TC=T0	07716	CEAD86601F
A8R502	311-1979-01			RES,VAR,NONWW:2K OHM,20%,0.5W	80009	311-1979-01
A8R504	311-1198-00			RES,VAR,NONWW:TRMR,20K OHM,0.5W	32997	3386X-T07-203
A8W80	174-0289-00			CA ASSY,SP,ELEC:14,28 AWG,3.5 L,RIBBON	TK0191	174-0289-00
A8W95	174-0298-00			CA ASSY,SP,ELEC:2,26 AWG,4.0 L,RIBBON	TK0191	174-0298-00
A8W98	174-0299-00			CA ASSY,SP,ELEC:6,26 AWG,8.3 L,RIBBON	TK0191	174-0299-00
A8W308	174-0300-00			CA ASSY,SP,ELEC:1,24 AWG,6.3 L,	TK0191	174-0300-00
A9	670-9311-00	.300000	.301035	CIRCUIT BD ASSY:L V RELAY	TK0191	670-9311-00
A9	670-9311-01	.301036		CIRCUIT BD ASSY:L.V. RELAY	80009	670-9311-01
A9C100	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A9C102	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A9C106	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A9C110	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A9C208	290-1138-00			CAP,FXD,ELCTLT:1000UF,20%,25V	TK0191	290-1138-00
A9C308	290-1139-00			CAP,FXD,ELCTLT:22UF,+30-10%,350V	TK0191	290-1139-00
A9C309	290-1139-00			CAP,FXD,ELCTLT:22UF,+30-10%,350V	TK0191	290-1139-00
A9C318	290-1140-00			CAP,FXD,ELCTLT:100UF,20%,160V	TK0191	290-1140-00
A9C500	283-0927-00			CAP,FXD,CER DI:100PF,10%,2KV	TK0191	283-0927-00
A9C501	285-1371-00			CAP,FXD,PLASTIC:0.01UF,10%,160V	TK0191	285-1371-00
A9C502	283-0231-00			CAP,FXD,CER DI:470PF,10%,500V	80009	283-0231-00
A9C510	283-0928-00			CAP,FXD,CER DI:10PF,5%,2KV	TK0191	283-0928-00
A9C512	283-0928-00			CAP,FXD,CER DI:10PF,5%,2KV	TK0191	283-0928-00
A9C520	283-0925-00			CAP,FXD,CER DI:22PF,5%,1KVDC	TK0191	283-0925-00
A9C522	283-0925-00			CAP,FXD,CER DI:22PF,5%,1KVDC	TK0191	283-0925-00
A9CR200	152-0930-00			SEMICOND DVC,DI:16A,40V	80009	152-0930-00
A9CR202	152-0929-00			SEMICOND DVC,DI:8A,40V	80009	152-0929-00
A9CR204	152-0929-00			SEMICOND DVC,DI:8A,40V	80009	152-0929-00
A9CR300	152-0934-00			SEMICOND,DVC,DI:10A,600V	80009	152-0934-00
A9E500	276-0810-00			CORE,EM:FERRITE	TK0191	276-0810-00
A9J92	131-3670-00			CONN,RCPT,ELEC:CKT BD,9 PIN	TK0191	131-3670-00
A9J93	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 4)	22526	48283-029
A9J94	131-3670-00			CONN,RCPT,ELEC:CKT BD,9 PIN	TK0191	131-3670-00
A9J95	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 3)	22526	48283-029
A9J96	131-3659-00			TERM,QIK DISC:CKT,0.187 X 25,TAB	TK0191	131-3659-00
A9J97	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 3)	22526	48283-029
A9J98	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 3)	22526	48283-029
A9K204	148-0188-00			RELAY,ARM:SPDT,5A,AC380V,COIL,12VDC	TK0191	148-0188-00
A9K210	148-0189-00			RELAY,ARM:DPST,8A,380V,COIL,12VDC	TK0191	148-0189-00
A9K212	148-0189-00			RELAY,ARM:DPST,8A,380V,COIL,12VDC	TK0191	148-0189-00
A9K214	148-0189-00			RELAY,ARM:DPST,8A,380V,COIL,12VDC	TK0191	148-0189-00
A9K300	148-0188-00			RELAY,ARM:SPDT,5A,AC380V,COIL,12VDC	TK0191	148-0188-00
A9K302	148-0188-00			RELAY,ARM:SPDT,5A,AC380V,COIL,12VDC	TK0191	148-0188-00
A9K304	148-0188-00			RELAY,ARM:SPDT,5A,AC380V,COIL,12VDC	TK0191	148-0188-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A9K306	148-0188-00			RELAY,ARM:SPDT,5A,AC380V,COIL,12VDC	TK0191	148-0188-00
A9K308	148-0188-00			RELAY,ARM:SPDT,5A,AC380V,COIL,12VDC	TK0191	148-0188-00
A9K310	148-0189-00			RELAY,ARM:DPST,8A,380V,COIL,12VDC	TK0191	148-0189-00
A9K312	148-0189-00			RELAY,ARM:DPST,8A,380V,COIL,12VDC	TK0191	148-0189-00
A9K314	148-0189-00			RELAY,ARM:DPST,8A,380V,COIL,12VDC	TK0191	148-0189-00
A9K400	148-0189-00			RELAY,ARM:DPST,8A,380V,COIL,12VDC	TK0191	148-0189-00
A9K402	148-0189-00			RELAY,ARM:DPST,8A,380V,COIL,12VDC	TK0191	148-0189-00
A9K404	148-0188-00			RELAY,ARM:SPDT,5A,AC380V,COIL,12VDC	TK0191	148-0188-00
A9K406	148-0188-00			RELAY,ARM:SPDT,5A,AC380V,COIL,12VDC	TK0191	148-0188-00
A9K408	148-0188-00			RELAY,ARM:SPDT,5A,AC380V,COIL,12VDC	TK0191	148-0188-00
A9K410	148-0188-00			RELAY,ARM:SPDT,5A,AC380V,COIL,12VDC	TK0191	148-0188-00
A9K412	148-0188-00			RELAY,ARM:SPDT,5A,AC380V,COIL,12VDC	TK0191	148-0188-00
A9K414	148-0188-00			RELAY,ARM:SPDT,5A,AC380V,COIL,12VDC	TK0191	148-0188-00
A9K416	148-0188-00			RELAY,ARM:SPDT,5A,AC380V,COIL,12VDC	TK0191	148-0188-00
A9K500	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A9R100	307-0922-00			RES NTWK,FXD,FI:(8)100K OHM,5%,0.125W	80009	307-0922-00
A9R110	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A9R200	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A9R202	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A9R204	307-1288-00			RES,FXD,FILM:470 OHM,5%,1W	TK0191	307-1288-00
A9R206	307-1287-00			RES,FXD,FILM:1.5 OHM,5%,1W	TK0191	307-1287-00
A9R300	307-1290-00			RES,FXD,FILM:510K OHM,5%,1W	TK0191	307-1290-00
A9R302	307-1290-00			RES,FXD,FILM:510K OHM,5%,1W	TK0191	307-1290-00
A9R304	307-1292-00			RES,FXD,FILM:100K OHM,5%,2W	TK0191	307-1292-00
A9R306	307-1284-00			RES,FXD,FILM:160 OHM,5%,5W	TK0191	307-1284-00
A9R308	307-1291-00			RES,FXD,FILM:110K OHM,5%,1W	TK0191	307-1291-00
A9R309	307-1291-00			RES,FXD,FILM:110K OHM,5%,1W	TK0191	307-1291-00
A9R314	307-1293-00			RES,FXD,FILM:5.6K OHM,5%,2W	TK0191	307-1293-00
A9R316	307-1295-00			RES,FXD,FILM:6.8 OHM,5%,5W	TK0191	307-1295-00
A9R318	307-1289-00			RES,FXD,FILM:15K OHM,5%,1W	TK0191	307-1289-00
A9R416	307-1285-00			RES,FXD,FILM:160K OHM,2%,3W	TK0191	307-1285-00
A9R417	307-1285-00			RES,FXD,FILM:160K OHM,2%,3W	TK0191	307-1285-00
A9R418	307-1296-00			RES,FXD,FILM:200K OHM,2%,1W	TK0191	307-1296-00
A9R419	307-1296-00			RES,FXD,FILM:200K OHM,2%,1W	TK0191	307-1296-00
A9R500	321-0385-00	.300000	.300171	RES,FXD,FILM:100K OHM,1%,0.125W,TC=T0	19701	5033ED100K0F
A9R500	311-0606-00	.300172		RES,VAR,NONWW:TRMR,500K OHM,0.5W	32997	3329-H-G48-504
A9R600	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A9R602	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A9U100	156-1827-00			MICROCKT,DGTL:C2MOS,3 LINE TO 8 LINE DECODER	80009	156-1827-00
A9U102	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A9U104	156-1837-00			MICROCKT,LINEAR:DRIVER W/STROBE	80009	156-1837-00
A9U106	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A9U108	156-1837-00			MICROCKT,LINEAR:DRIVER W/STROBE	80009	156-1837-00
A9U109	156-1837-00			MICROCKT,LINEAR:DRIVER W/STROBE	80009	156-1837-00
A9U110	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A9U112	156-1837-00			MICROCKT,LINEAR:DRIVER W/STROBE	80009	156-1837-00
A9W90	174-0290-00			CA ASSY,SP,ELEC:20,28 AWG,4.0 L,RIBBON	TK0191	174-0290-00
A10	670-9312-00	.300000	.300297	CIRCUIT BD ASSY:SENSE	TK0191	670-9312-00
A10	670-9312-01	.300298	.300398	CIRCUIT BD ASSY:SENSE	80009	670-9312-01
A10	670-9312-02	.300399	.300492	CIRCUIT BD ASSY:SENSE	TK0191	ORDER BY DESCR
A10	670-9312-03	.300493		CIRCUIT BD ASSY:SENSE	80009	670-9312-03
A10C110	285-1370-00			CAP,FXD,PLASTIC:0.001UF,10%,160V	TK0191	285-1370-00
A10C112	285-1371-00			CAP,FXD,PLASTIC:0.01UF,10%,160V	TK0191	285-1371-00
A10C114	285-1372-00			CAP,FXD,PLASTIC:0.1UF,10%,160V	TK0191	285-1372-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10C120	283-0929-00			CAP,FXD,CER DI:100PF,5%,2KV	TK0191	283-0929-00
A10C122	283-0929-00			CAP,FXD,CER DI:100PF,5%,2KV	TK0191	283-0929-00
A10C124	283-0929-00			CAP,FXD,CER DI:100PF,5%,2KV	TK0191	283-0929-00
A10C126	283-0929-00			CAP,FXD,CER DI:100PF,5%,2KV	TK0191	283-0929-00
A10C138	283-0142-00			CAP,FXD,CER DI:0.0027UF,5%,200V	54583	CK45YE2D272J-A
A10C148	283-0142-00			CAP,FXD,CER DI:0.0027UF,5%,200V	54583	CK45YE2D272J-A
A10C220	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A10C234	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A10C242	281-0763-00			CAP,FXD,CER DI:47PF,10%,100V	04222	MA101A470KAA
A10C246	281-0763-00			CAP,FXD,CER DI:47PF,10%,100V	04222	MA101A470KAA
A10C260	281-0763-00			CAP,FXD,CER DI:47PF,10%,100V	04222	MA101A470KAA
A10C262	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A10C264	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A10C300	283-0640-00			CAP,FXD,MICA DI:160PF,1%,500V	00853	D155F161F0
A10C310	283-0928-00			CAP,FXD,CER DI:10PF,5%,2KV	TK0191	283-0928-00
A10C311	283-0928-00			CAP,FXD,CER DI:10PF,5%,2KV	TK0191	283-0928-00
A10C312	283-0620-00			CAP,FXD,MICA DI:470PF,1%,500V	00853	D155F471F0
A10C320	283-0639-00			CAP,FXD,MICA DI:56PF,1%,500V	00853	D155E560F0
A10C322	283-0620-00			CAP,FXD,MICA DI:470PF,1%,500V	00853	D155F471F0
A10C400	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A10C410	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A10C420	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A10C422	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A10C430	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A10C432	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A10C434	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A10C450	281-0763-00			CAP,FXD,CER DI:47PF,10%,100V	04222	MA101A470KAA
A10C452	281-0763-00			CAP,FXD,CER DI:47PF,10%,100V	04222	MA101A470KAA
A10C460	281-0763-00			CAP,FXD,CER DI:47PF,10%,100V	04222	MA101A470KAA
A10C500	283-0260-00			CAP,FXD,CER DI:5.6PF,+/-0.25PF,200V	51642	150 200NP0569C
A10C501	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A10C504	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A10C520	283-0178-02			CAP,FXD,CER DI:0.1UF,+80-20%,100V	TK0191	283-0178-02
A10C540	283-0178-02			CAP,FXD,CER DI:0.1UF,+80-20%,100V	TK0191	283-0178-02
A10C700	290-0770-00	.300000	.300247	CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	54473	ECE-A25V100L
A10C700	290-1142-00	.300248		CAP,FXD,ELCTLT:100UF,20%,25V	TK0191	290-1142-00
A10C702	290-0770-00	.300000	.300247	CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	54473	ECE-A25V100L
A10C702	290-1142-00	.300248		CAP,FXD,ELCTLT:100UF,20%,25V	TK0191	290-1142-00
A10C704	290-0770-00	.300000	.300247	CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	54473	ECE-A25V100L
A10C704	290-1142-00	.300248		CAP,FXD,ELCTLT:100UF,20%,25V	TK0191	290-1142-00
A10C706	290-0770-00	.300000	.300247	CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	54473	ECE-A25V100L
A10C706	290-1142-00	.300248		CAP,FXD,ELCTLT:100UF,20%,25V	TK0191	290-1142-00
A10C720	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A10C740	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A10C740	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A10C750	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A10CR200	152-0939-00			SEMICOND DVC,DI:DUAL,100MA,20V	80009	152-0939-00
A10CR202	152-0939-00			SEMICOND DVC,DI:DUAL,100MA,20V	80009	152-0939-00
A10CR210	152-0939-00			SEMICOND DVC,DI:DUAL,100MA,20V	80009	152-0939-00
A10CR212	152-0939-00			SEMICOND DVC,DI:DUAL,100MA,20V	80009	152-0939-00
A10CR220	152-0939-00			SEMICOND DVC,DI:DUAL,100MA,20V	80009	152-0939-00
A10CR222	152-0939-00			SEMICOND DVC,DI:DUAL,100MA,20V	80009	152-0939-00
A10CR400	152-0939-00			SEMICOND DVC,DI:DUAL,100MA,20V	80009	152-0939-00
A10CR402	152-0939-00			SEMICOND DVC,DI:DUAL,100MA,20V	80009	152-0939-00
A10CR410	152-0936-00			SEMICOND,DVC,DI:DUAL,1A,100V	80009	152-0936-00
A10CR412	152-0937-00			SEMICOND,DVC,DI:DUAL,1A,100V	80009	152-0937-00
A10CR420	152-0937-00			SEMICOND,DVC,DI:DUAL,1A,100V	80009	152-0937-00
A10CR422	152-0936-00			SEMICOND,DVC,DI:DUAL,1A,100V	80009	152-0936-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10CR500	152-0939-00			SEMICOND DVC,DI:DUAL,100MA,20V	80009	152-0939-00
A10CR520	152-0460-00			SEMICOND DVC,DI:FE,SI,25V,1MA,TO-7	04713	SCL072
A10CR540	152-0460-00			SEMICOND DVC,DI:FE,SI,25V,1MA,TO-7	04713	SCL072
A10CR550	152-0939-00			SEMICOND DVC,DI:DUAL,100MA,20V	80009	152-0939-00
A10CR630	152-0327-00	.300493		SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A10CR640	152-0327-00	.300493		SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A10E100	119-0181-00			ARSR,ELEC SURGE:230,GAS FILLED	25088	B1-A230
A10E620	276-0810-00			CORE,EM:FERRITE	TK0191	276-0810-00
A10E700	119-0181-00			ARSR,ELEC SURGE:230,GAS FILLED	25088	B1-A230
A10J80	131-3664-00			CONN,RCPT,ELEC:HEADER,14 PIN	TK0191	131-3664-00
A10J90	131-3665-00			CONN,RCPT,ELEC:HEADER,20 PIN	TK0191	131-3665-00
A10J101	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 3)	22526	48283-036
A10J102	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 3)	22526	48283-036
A10J103	131-3671-00			CONN,RCPT,ELEC:CKT BD,15 PIN	TK0191	131-3671-00
A10J104	131-3666-00			CONN,RCPT,ELEC:CKT BD,2 PIN	TK0191	131-3666-00
A10J105	131-3659-00			TERM,QIK DISC:CKT,0.187 X 25,TAB	TK0191	131-3659-00
A10J106	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 3)	22526	48283-036
A10J144	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 6)	22526	48283-036
A10J168	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 7)	22526	48283-036
A10J172	131-3659-00			TERM,QIK DISC:CKT,0.187 X 25,TAB	TK0191	131-3659-00
A10J414	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 4)	22526	48283-036
A10J415	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 8)	22526	48283-036
A10J416	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 6)	22526	48283-036
A10J417	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 10)	22526	48283-036
A10J418	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 8)	22526	48283-036
A10K110	148-0189-00			RELAY,ARM:DPST,8A,380V,COIL,12VDC	TK0191	148-0189-00
A10K120	148-0189-00			RELAY,ARM:DPST,8A,380V,COIL,12VDC	TK0191	148-0189-00
A10K130	148-0191-00			RELAY,ARM:QPST,4A,250V,COIL,12VDC	TK0191	148-0191-00
A10K140	148-0191-00			RELAY,ARM:QPST,4A,250V,COIL,12VDC	TK0191	148-0191-00
A10K150	148-0191-00			RELAY,ARM:QPST,4A,250V,COIL,12VDC	TK0191	148-0191-00
A10K160	148-0191-00			RELAY,ARM:QPST,4A,250V,COIL,12VDC	TK0191	148-0191-00
A10K170	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A10K190	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A10K200	148-0186-00			RELAY,ARM:SPDT,3A,200V,COIL,12VDC	TK0191	148-0186-00
A10K230	148-0187-00			RELAY,ARM:DPDT,3A,200V,COIL,12VDC	TK0191	148-0187-00
A10K280	148-0192-00			RELAY,ARM:DPDT,4A,250V COIL,12VDC	TK0191	148-0192-00
A10K300	148-0172-00			RELAY,ARMATURE:SPST,12V,6KDC	TK0191	148-0172-00
A10K310	148-0172-00			RELAY,ARMATURE:SPST,12V,6KDC	TK0191	148-0172-00
A10K340	148-0190-00			RELAY,REED:0.25A,100V,COIL,12VDC	TK0191	148-0190-00
A10K350	148-0190-00			RELAY,REED:0.25A,100V,COIL,12VDC	TK0191	148-0190-00
A10K360	148-0190-00			RELAY,REED:0.25A,100V,COIL,12VDC	TK0191	148-0190-00
A10K370	148-0190-00			RELAY,REED:0.25A,100V,COIL,12VDC	TK0191	148-0190-00
A10K600	148-0189-00			RELAY,ARM:DPST,8A,380V,COIL,12VDC	TK0191	148-0189-00
A10K602	148-0189-00			RELAY,ARM:DPST,8A,380V,COIL,12VDC	TK0191	148-0189-00
A10K604	148-0192-00			RELAY,ARM:DPDT,4A,250V COIL,12VDC	TK0191	148-0192-00
A10K606	148-0192-00			RELAY,ARM:DPDT,4A,250V COIL,12VDC	TK0191	148-0192-00
A10K608	148-0192-00			RELAY,ARM:DPDT,4A,250V COIL,12VDC	TK0191	148-0192-00
A10K630	148-0191-00			RELAY,ARM:QPST,4A,250V,COIL,12VDC	TK0191	148-0191-00
A10K640	148-0191-00			RELAY,ARM:QPST,4A,250V,COIL,12VDC	TK0191	148-0191-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10K700	148-0189-00	.300000	.300297	RELAY,ARM:DPST,8A,380V,COIL,12VDC	TK0191	148-0189-00
A10K700	148-0207-00	.300298		RELAY,ARMATURE:DPST,8A,380V,COIL 9VDC,360 OHM	S0293	ST2-DC9V
A10L700	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A10L702	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A10L704	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A10L706	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A10P101	131-0993-00	.300000	.300632	BUS,CONDUCTOR:SHUNT ASSEMBLY,BLACK	22526	65474-005
A10P101	131-4311-00	.300633		BUS,CONDUCTOR:WHITE,SHUNT ASSY	80009	131-4311-00
A10P102	131-0993-00	.300000	.300632	BUS,CONDUCTOR:SHUNT ASSEMBLY,BLACK	22526	65474-005
A10P102	131-4311-00	.300633		BUS,CONDUCTOR:WHITE,SHUNT ASSY	80009	131-4311-00
A10Q520	151-0559-00			TRANSISTOR:NPN,SI,PWR	TK0191	151-0559-00
A10Q530	151-0559-00			TRANSISTOR:NPN,SI,PWR	TK0191	151-0559-00
A10Q540	151-0558-00			TRANSISTOR:PNP,SI	TK0191	151-0558-00
A10Q740	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A10R100	308-0884-00	.300000	.300247	RES,FXD,WW:0.225 OHM,0.1%,4W	TK0191	308-0884-00
A10R100	308-0884-01	.300248	.300427	RES,FXD,WW:0.025 OHM,0.1%,4W	80009	308-0884-01
A10R100	308-0884-02	.300428		RES,FXD,WW:0.025 OHM,0.1%,4W	TK0AE	AQS-0194
A10R104	308-0881-00			RES,FXD,WW:2.25 OHM,0.1%,2W	TK0191	308-0881-00
A10R106	308-0882-00			RES,FXD,WW:22.5 OHM,0.1%,2W	TK0191	308-0882-00
A10R108	308-0883-00			RES,FXD,WW:225 OHM,0.1%,2W	TK0191	308-0883-00
A10R110	323-0222-07			RES,FXD,FILM:2K OHM,0.1%,0.5W,TC=25PPM	80009	323-0222-07
A10R112	321-0928-07			RES,FXD,FILM:250 OHM,0.1%,0.125W,TC=T9	19701	5033RE250R0B
A10R114	323-0318-07			RES,FXD,FILM:20K OHM,0.1%,0.5W,TC=T9	19701	5053RE25K00B
A10R116	321-0929-07			RES,FXD,FILM:2.5K OHM,0.1%,0.125W,TC=T9	19701	5033RE2K500B
A10R118	323-0742-07			RES,FXD,FILM:250K OHM,0.1%,0.5W,TC=T9	91637	CMF65116C25002B
A10R119	321-0231-00			RES,FXD,FILM:2.49K OHM,1%,0.125W,TC=T0	19701	5033ED2K49F
A10R120	325-0403-00			RES,FXD,FILM:2.778M OHM,0.1%,0.5W	80009	325-0403-00
A10R122	325-0402-00			RES,FXD,FILM:25M OHM,0.1%,0.5W	80009	325-0402-00
A10R130	315-0024-00			RES,FXD,CMPSN:2.4 OHM,5%,0.25W	80009	315-0024-00
A10R132	321-0039-00			RES,FXD,FILM:24.9 OHM,1%,0.125W,TC=T0	91637	CMF55116G24R90F
A10R134	321-0135-00			RES,FXD,FILM:249 OHM,1%,0.125W,TC=T0	07716	CEAD249R0F
A10R136	321-0235-00			RES,FXD,FILM:2.74K OHM,1%,0.125W,TC=T0	07716	CEAD27400F
A10R138	321-0356-00			RES,FXD,FILM:49.9K OHM,1%,0.125W,TC=T0	19701	5033ED49K90F
A10R140	315-0024-00			RES,FXD,CMPSN:2.4 OHM,5%,0.25W	80009	315-0024-00
A10R142	321-0039-00			RES,FXD,FILM:24.9 OHM,1%,0.125W,TC=T0	91637	CMF55116G24R90F
A10R144	321-0135-00			RES,FXD,FILM:249 OHM,1%,0.125W,TC=T0	07716	CEAD249R0F
A10R146	321-0235-00			RES,FXD,FILM:2.74K OHM,1%,0.125W,TC=T0	07716	CEAD27400F
A10R148	321-0327-00			RES,FXD,FILM:24.9K OHM,1%,0.125W,TC=T0	07716	CEAD24901F
A10R200	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A10R210	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A10R220	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A10R230	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0	19701	5033ED10K0F
A10R232	321-0392-00			RES,FXD,FILM:118K OHM,1%,0.125W,TC=T0	07716	CEAD11802F
A10R233	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A10R234	321-0289-00			RES,FXD,FILM:10.0K OHM,1%,0.125W,TC=T0	19701	5033ED10K0F
A10R235	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A10R236	321-0392-00			RES,FXD,FILM:118K OHM,1%,0.125W,TC=T0	07716	CEAD11802F
A10R237	315-0204-00			RES,FXD,FILM:200K OHM,5%,0.25W	19701	5043CX200K0J
A10R238	311-1743-02			RES,VAR,NONWW:10K OHM,20%,0.5W	80009	311-1743-02
A10R239	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A10R240	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A10R242	321-1752-07			RES,FXD,FILM:16K OHM,0.1%,0.125W,TC=T9	80009	321-1752-07
A10R244	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A10R246	321-1752-07			RES,FXD,FILM:16K OHM,0.1%,0.125W,TC=T9	80009	321-1752-07
A10R250	311-1743-02			RES,VAR,NONWW:10K OHM,20%,0.5W	80009	311-1743-02
A10R254	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A10R256	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10R260	321-0603-07			RES,FXD,FILM:15K OHM,0.1%,0.125W,TC=T9	19701	5033RE15K00B
A10R262	321-0816-07			RES,FXD,FILM:5K OHM,0.1%,0.125W,TC=T9	19701	5033RE5K000B
A10R264	321-0816-07			RES,FXD,FILM:5K OHM,0.1%,0.125W,TC=T9	19701	5033RE5K000B
A10R270	311-1743-02			RES,VAR,NONWW:10K OHM,20%,0.5W	80009	311-1743-02
A10R272	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A10R274	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A10R300	325-0406-00			RES,FXD,FILM:24.975M OHM,0.1%,2W	80009	325-0406-00
A10R302	321-0986-07			RES,FXD,FILM:25K OHM,0.1%,0.125W,TC=T9	19701	5033RE25K00B
A10R304	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A10R310	325-0405-00			RES,FXD,FILM:2.475 OHM,0.1%,1W	80009	325-0405-00
A10R312	321-0986-07			RES,FXD,FILM:25K OHM,0.1%,0.125W,TC=T9	19701	5033RE25K00B
A10R314	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A10R316	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A10R318	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A10R320	325-0404-00			RES,FXD,FILM:2.25M OHM,0.1%,0.25W	80009	325-0404-00
A10R322	321-0618-07			RES,FXD,FILM:250K OHM,0.1%,0.125W,TC=T9	80009	321-0618-07
A10R324	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A10R326	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A10R328	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A10R334	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A10R400	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A10R410	307-1300-00			RES,FXD,FILM:51 OHM,5%,5W	TK0191	307-1300-00
A10R411	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A10R412	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A10R414	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A10R416	321-0414-07			RES,FXD,FILM:200K OHM,0.1%,0.125W,TC=T9	24546	NE55E2003B
A10R418	315-0205-00			RES,FXD,FILM:2M OHM,5%,0.25W	01121	CB2055
A10R420	307-1284-00			RES,FXD,FILM:160 OHM,5%,5W	TK0191	307-1284-00
A10R421	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A10R421	315-0103-00	.300399		RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A10R422	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A10R423	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A10R424	315-0206-01			RES,FXD,CMPSN:20M OHM,5%,0.25W	01121	CB2065 (AB ONLY)
A10R426	321-0414-00			RES,FXD,FILM:200K OHM,1%,0.125W,TC=T0	07716	CEAD20002F
A10R430	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A10R432	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A10R434	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A10R436	321-0226-00			RES,FXD,FILM:2.21K OHM,1%,0.125W,TC=T0	01121	RNK2211F
A10R438	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A10R440	321-0130-00			RES,FXD,FILM:221 OHM,1%,0.125W,TC=T0	19701	5043ED221R0F
A10R442	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A10R444	315-0220-00			RES,FXD,FILM:22 OHM,5%,0.25W	19701	5043CX22R00J
A10R446	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A10R448	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A10R450	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A10R452	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A10R454	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A10R460	311-1743-02			RES,VAR,NONWW:10K OHM,20%,0.5W	80009	311-1743-02
A10R462	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A10R466	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A10R470	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A10R472	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A10R474	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A10R476	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A10R478	321-0603-07			RES,FXD,FILM:15K OHM,0.1%,0.125W,TC=T9	19701	5033RE15K00B
A10R500	301-0105-00			RES,FXD,FILM:1M OHM,5%,0.50W	19701	5053CX1M000J
A10R502	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A10R504	301-0471-00			RES,FXD,FILM:470 OHM,5%,0.5W	19701	5053CX 470R0J

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10R506	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A10R520	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A10R522	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A10R540	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A10R542	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A10R550	321-0414-07			RES,FXD,FILM:200K OHM,0.1%,0.125W,TC=T9	24546	NE55E2003B
A10R552	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A10R554	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A10R556	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A10R558	321-0318-07			RES,FXD,FILM:20.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE20K00BCM
A10R600	301-0471-00			RES,FXD,FILM:470 OHM,5%,0.5W	19701	5053CX 470R0J
A10R710	315-0153-00			RES,FXD,FILM:15K OHM,5%,0.25W	19701	5043CX15K00J
A10R712	315-0153-00			RES,FXD,FILM:15K OHM,5%,0.25W	19701	5043CX15K00J
A10R714	315-0153-00			RES,FXD,FILM:15K OHM,5%,0.25W	19701	5043CX15K00J
A10R716	315-0153-00			RES,FXD,FILM:15K OHM,5%,0.25W	19701	5043CX15K00J
A10R718	315-0153-00	.300000	.300297	RES,FXD,FILM:15K OHM,5%,0.25W	19701	5043CX15K00J
A10R718	315-0562-00	.300298		RES,FXD,FILM:5.6K OHM,5%,0.25W	57668	NTR25J-E05K6
A10R720	307-1181-00			RES NTWK,FXD,FI:(8) 10K OHM,5%,0.1W	TK0191	307-1181-00
A10R722	315-0332-00			RES,FXD,FILM:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
A10R730	307-0909-00			RES NTWK,FXD,FI:(4)10K OHM,5%,0.25W EACH	80009	307-0909-00
A10R732	307-0909-00			RES NTWK,FXD,FI:(4)10K OHM,5%,0.25W EACH	80009	307-0909-00
A10R740	315-0242-00			RES,FXD,FILM:2.4K OHM,5%,0.25W	57668	NTR25J-E02K4
A10R742	315-0332-00			RES,FXD,FILM:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
A10R750	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A10R752	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A10TP250	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A10TP420	214-0579-00	.300399		TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A10TP460	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A10TP708	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A10U200	156-2793-00			MICROCKT,LINEAR:OPERATIONAL,BIFET	TK0191	156-2793-00
A10U210	156-2793-00			MICROCKT,LINEAR:OPERATIONAL,BIFET	TK0191	156-2793-00
A10U220	156-2793-00			MICROCKT,LINEAR:OPERATIONAL,BIFET	TK0191	156-2793-00
A10U230	156-2832-00	.300000	.300512	MICROCKT,LINEAR:OP-AMP,BIFET	TK0191	156-2832-00
A10U230	156-2832-01	.300513		MICROCKT,DGTL:OP AMP,BIFET	TK0AB	LF411CN
A10U240	156-2832-00	.300000	.300512	MICROCKT,LINEAR:OP-AMP,BIFET	TK0191	156-2832-00
A10U240	156-2832-01	.300513		MICROCKT,DGTL:OP AMP,BIFET	TK0AB	LF411CN
A10U250	156-2832-00	.300000	.300512	MICROCKT,LINEAR:OP-AMP,BIFET	TK0191	156-2832-00
A10U250	156-2832-01	.300513		MICROCKT,DGTL:OP AMP,BIFET	TK0AB	LF411CN
A10U260	156-2832-00	.300000	.300512	MICROCKT,LINEAR:OP-AMP,BIFET	TK0191	156-2832-00
A10U260	156-2832-01	.300513		MICROCKT,DGTL:OP AMP,BIFET	TK0AB	LF411CN
A10U270	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A10U400	156-2793-00			MICROCKT,LINEAR:OPERATIONAL,BIFET	TK0191	156-2793-00
A10U410	156-2793-00			MICROCKT,LINEAR:OPERATIONAL,BIFET	TK0191	156-2793-00
A10U420	156-2793-00			MICROCKT,LINEAR:OPERATIONAL,BIFET	TK0191	156-2793-00
A10U430	156-0514-03	.300000	.300667	MICROCKT,DGTL:DIFF 4-CHANNEL MUX	80009	156-0514-03
A10U430	156-0514-00	.300668		MICROCKT,DGTL:CMOS,DIFF 4-CHANNEL MUX	02735	CD4052BF-98
A10U440	156-0514-03	.300000	.300667	MICROCKT,DGTL:DIFF 4-CHANNEL MUX	80009	156-0514-03
A10U440	156-0514-00	.300668		MICROCKT,DGTL:CMOS,DIFF 4-CHANNEL MUX	02735	CD4052BF-98
A10U450	156-2832-00	.300000	.300512	MICROCKT,LINEAR:OP-AMP,BIFET	TK0191	156-2832-00
A10U450	156-2832-01	.300513		MICROCKT,DGTL:OP AMP,BIFET	TK0AB	LF411CN
A10U460	156-2832-00	.300000	.300512	MICROCKT,LINEAR:OP-AMP,BIFET	TK0191	156-2832-00
A10U460	156-2832-01	.300513		MICROCKT,DGTL:OP AMP,BIFET	TK0AB	LF411CN
A10U470	156-0514-03	.300000	.300667	MICROCKT,DGTL:DIFF 4-CHANNEL MUX	80009	156-0514-03
A10U470	156-0514-00	.300668		MICROCKT,DGTL:CMOS,DIFF 4-CHANNEL MUX	02735	CD4052BF-98
A10U500	156-2793-00			MICROCKT,LINEAR:OPERATIONAL,BIFET	TK0191	156-2793-00
A10U700	156-0402-04			MICROCKT,LINEAR:TIMER	80009	156-0402-04
A10U720	156-1827-00			MICROCKT,DGTL:C2MOS,3 LINE TO 8 LINE DECODER	80009	156-1827-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A10U730	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A10U740	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A10U745	156-2903-00			MICROCKT,DGTL:8 UNIT DARLINGTON XSTR ARRAY	80009	156-2903-00
A10U750	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A10U755	156-2903-00			MICROCKT,DGTL:8 UNIT DARLINGTON XSTR ARRAY	80009	156-2903-00
A10U760	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A10U765	156-2903-00			MICROCKT,DGTL:8 UNIT DARLINGTON XSTR ARRAY	80009	156-2903-00
A10U770	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A10U775	156-2903-00			MICROCKT,DGTL:8 UNIT DARLINGTON XSTR ARRAY	80009	156-2903-00
A10U800	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A10U810	156-1837-00			MICROCKT,LINEAR:DRIVER W/STROBE	80009	156-1837-00
A10U820	156-1837-00			MICROCKT,LINEAR:DRIVER W/STROBE	80009	156-1837-00
A10VR200	152-0395-00			SEMICOND DVC,DI:ZEN,SI,4.3V,5%,0.4W	04713	SZG35009K18
A10VR202	152-0395-00			SEMICOND DVC,DI:ZEN,SI,4.3V,5%,0.4W	04713	SZG35009K18
A10VR400	152-0395-00			SEMICOND DVC,DI:ZEN,SI,4.3V,5%,0.4W	04713	SZG35009K18
A10VR402	152-0395-00			SEMICOND DVC,DI:ZEN,SI,4.3V,5%,0.4W	04713	SZG35009K18
A10VR530	152-0168-00			SEMICOND DVC,DI:ZEN,SI,12V,5%,0.4W,DO-763B	14552	TD331689
A10VR534	152-0166-00			SEMICOND DVC,DI:ZEN,SI,6.2V,5%,400MW,DO-7	04713	SZ11738RL
A10VR820	152-0166-00			SEMICOND DVC,DI:ZEN,SI,6.2V,5%,400MW,DO-7	04713	SZ11738RL
A11	670-9313-00			CIRCUIT BD ASSY:MAIN KEY	TK0191	670-9313-00
A11C10	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A11C10	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A11C20	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A11C20	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A11C30	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A11C30	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A11C100	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A11CR210	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A11CR211	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A11CR212	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A11CR213	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A11CR214	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A11CR215	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A11CR216	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A11CR217	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A11CR218	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A11CR219	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A11CR220	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A11CR221	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A11L10	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A11L20	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A11L30	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A11P100	131-3656-00	.300000	.300332	CONN,RCPT,ELEC:HEADER,STR,15 PIN,0.1 SPACING	TK0191	131-3656-00
A11P100	131-3656-01	.300333		CONN,RCPT,ELEC:HEADER,STR,15 PIN,0.1 SPACING	S4549	PS15PAS4T1PKL3
A11P120	131-3656-00	.300000	.300332	CONN,RCPT,ELEC:HEADER,STR,15 PIN,0.1 SPACING	TK0191	131-3656-00
A11P120	131-3656-01	.300333		CONN,RCPT,ELEC:HEADER,STR,15 PIN,0.1 SPACING	S4549	PS15PAS4T1PKL3
A11R110	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R111	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R112	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R113	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R114	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R115	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A11R116	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R117	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R118	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R119	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R120	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R121	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R122	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R123	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R124	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R125	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R126	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R127	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R128	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A11R130	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A11R131	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A11R132	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A11R133	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A11R134	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A11R135	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A11R136	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A11R137	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A11R300	315-0153-00			RES,FXD,FILM:15K OHM,5%,0.25W	19701	5043CX15K00J
A11R302	311-1623-00			RES,VAR,NONWW:10K OHM,10%,0.25W	80009	311-1623-00
A11R304	315-0153-00			RES,FXD,FILM:15K OHM,5%,0.25W	19701	5043CX15K00J
A11R310	315-0153-00			RES,FXD,FILM:15K OHM,5%,0.25W	19701	5043CX15K00J
A11R312	311-1623-00			RES,VAR,NONWW:10K OHM,10%,0.25W	80009	311-1623-00
A11R314	315-0153-00			RES,FXD,FILM:15K OHM,5%,0.25W	19701	5043CX15K00J
A11R320	315-0153-00			RES,FXD,FILM:15K OHM,5%,0.25W	19701	5043CX15K00J
A11R322	311-1623-00			RES,VAR,NONWW:10K OHM,10%,0.25W	80009	311-1623-00
A11R324	315-0153-00			RES,FXD,FILM:15K OHM,5%,0.25W	19701	5043CX15K00J
A11R330	311-1623-00			RES,VAR,NONWW:10K OHM,10%,0.25W	80009	311-1623-00
A11R340	311-1623-00			RES,VAR,NONWW:10K OHM,10%,0.25W	80009	311-1623-00
A11R350	311-1624-00			RES,VAR,NONWW:10K OHM,10%,0.25W	80009	311-1624-00
A11R360	311-1624-00			RES,VAR,NONWW:10K OHM,10%,0.25W	80009	311-1624-00
A11R370	311-1624-00			RES,VAR,NONWW:10K OHM,10%,0.25W	80009	311-1624-00
A11S210	260-2325-00			SWITCH,ROTARY:4 BITS,GRAY	TK0191	260-2325-00
A11S220	260-2325-00			SWITCH,ROTARY:4 BITS,GRAY	TK0191	260-2325-00
A11S230	260-2325-00			SWITCH,ROTARY:4 BITS,GRAY	TK0191	260-2325-00
A11U120	156-1767-00			MICROCKT,DGTL:CMOS,OCTAL BUS TRANSCEIVER	80009	156-1767-00
A11U140	156-1827-00			MICROCKT,DGTL:C2MOS,3 LINE TO 8 LINE DECODER	80009	156-1827-00
A11U160	156-2316-00			MICROCKT,DGTL:3/8 LINE DECODER	80009	156-2316-00
A11U180	156-2825-00			MICROCKT,DGTL:CMOS,DUAL 2-4 DCDR	80009	156-2825-00
A12	670-9314-00			CIRCUIT BD ASSY:SUB KEY	TK0191	670-9314-00
A12C10	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A12C170	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A12CR300	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR301	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR302	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR303	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR304	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR305	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR310	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR311	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR312	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A12CR313	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR314	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR315	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR320	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR321	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR322	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR323	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR324	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR325	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR330	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR331	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR332	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR333	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR334	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR335	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR340	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR341	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR342	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR343	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR344	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR345	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR350	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR351	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR352	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR353	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR354	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR355	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR360	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR361	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR362	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR363	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR364	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12CR365	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A12DS100	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS101	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS102	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS103	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS104	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS105	150-1175-00			LT EMITTING DIO:YELLOW	TK0191	150-1175-00
A12DS106	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS107	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS110	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS112	150-1173-00			LT EMITTING DIO:RED	TK0191	150-1173-00
A12DS112	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS113	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS114	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS115	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS116	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS117	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS120	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS121	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS122	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS123	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS124	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS125	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS126	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS127	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS130	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A12DS131	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS132	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS133	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS134	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS135	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS136	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS137	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS140	150-1173-00			LT EMITTING DIO:RED	TK0191	150-1173-00
A12DS141	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS142	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS143	150-1173-00			LT EMITTING DIO:RED	TK0191	150-1173-00
A12DS144	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS145	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS146	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS147	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS150	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS151	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS152	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS153	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS154	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS155	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS156	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS157	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS160	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS161	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS162	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS163	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS164	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS165	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS166	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS167	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS170	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A12DS171	150-1173-00			LT EMITTING DIO:RED	TK0191	150-1173-00
A12DS200	150-1174-00			LT EMITTING DIO:YELLOW,7 SEGMENT	TK0191	150-1174-00
A12DS210	150-1174-00			LT EMITTING DIO:YELLOW,7 SEGMENT	TK0191	150-1174-00
A12DS300	150-1173-00			LT EMITTING DIO:RED	TK0191	150-1173-00
A12J100	131-3657-00	.300000	.300332	CONN,PLUG,ELEC:STR,15 PIN,0.1 SPACING	TK0191	131-3657-00
A12J100	131-3657-01	.300333		CONN,PLUG,ELEC:STR,15 PIN,0.1 SPACING	S4549	PS-15SD-S4TS1-2
A12J120	131-3657-00	.300000	.300332	CONN,PLUG,ELEC:STR,15 PIN,0.1 SPACING	TK0191	131-3657-00
A12J120	131-3657-01	.300333		CONN,PLUG,ELEC:STR,15 PIN,0.1 SPACING	S4549	PS-15SD-S4TS1-2
A12Q170	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A12R10	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A12R11	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A12R12	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A12R13	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A12R14	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A12R15	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A12R16	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A12R17	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A12R20	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A12R21	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A12R22	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A12R30	315-0334-00			RES,FXD,FILM:330K OHM,5%,0.25W	57668	NTR25J-E 330K
A12R100	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R104	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R110	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R112	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R114	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A12R120	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R124	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R130	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R132	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R136	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R140	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R142	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R143	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R146	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R157	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R160	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R166	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R170	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R171	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R172	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R200	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R202	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R210	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R211	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R212	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R213	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R214	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R215	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R216	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12R400	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A12S300	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S301	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S302	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S303	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S304	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S305	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S310	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S311	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S312	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S313	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S314	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S315	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S320	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A12S321	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A12S322	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A12S323	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A12S324	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A12S325	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A12S330	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A12S331	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A12S332	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A12S333	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A12S334	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A12S335	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A12S340	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S341	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S342	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S343	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S344	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S345	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S350	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S351	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S352	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A12S353	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S354	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S355	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S360	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A12S361	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A12S362	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A12S363	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A12S364	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12S365	260-2156-00			SWITCH,KEY:SPST	80009	260-2156-00
A12U100	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A12U110	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A12U120	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A12U130	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A12U140	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A12U150	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A12U160	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A12U170	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A12U210	156-0795-01			MICROCKT,DGTL:BCD 7-SEG LCH DCDR,SCREENED	02735	CD4511 BFX
A14	670-9315-00			CIRCUIT BD ASSY:LOWER KEY	TK0191	670-9315-00
A14A154	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A14C50	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A14C60	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A14C70	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A14C80	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A14CR300	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A14CR302	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A14CR310	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A14CR312	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A14CR320	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A14CR322	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A14CR330	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A14CR332	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A14DS100	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS101	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS102	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS103	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS104	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS120	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS121	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS122	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS123	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS124	150-1178-00			LT EMITTING DIO:YELLOW	TK0191	150-1178-00
A14DS140	150-1175-00			LT EMITTING DIO:YELLOW	TK0191	150-1175-00
A14DS141	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS142	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS143	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS144	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS145	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS146	150-1175-00			LT EMITTING DIO:YELLOW	TK0191	150-1175-00
A14DS160	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS161	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS162	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS163	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS164	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00
A14DS165	150-1179-00			LT EMITTING DIO:GREEN	TK0191	150-1179-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A14DS400	150-1176-00			LT EMITTING DIO:RED	TK0191	150-1176-00
A14DS450	150-1177-00			LT EMITTING DIO:RED	TK0191	150-1177-00
A14DS451	150-1177-00			LT EMITTING DIO:RED	TK0191	150-1177-00
A14DS452	150-1177-00			LT EMITTING DIO:RED	TK0191	150-1177-00
A14DS453	150-1177-00			LT EMITTING DIO:RED	TK0191	150-1177-00
A14DS454	150-1177-00			LT EMITTING DIO:RED	TK0191	150-1177-00
A14J100	131-3657-00	.300000	.300332	CONN,PLUG,ELEC:STR,15 PIN,0.1 SPACING	TK0191	131-3657-00
A14J100	131-3657-01	.300333		CONN,PLUG,ELEC:STR,15 PIN,0.1 SPACING (A14J100A)	S4549	PS-15SD-S4TS1-2
A14J100	131-3676-00	.300000	.300332	CONN,PLUG,ELEC:STR,5 PIN,0.1 SPACING	TK0191	131-3676-00
A14J100	131-3676-01	.300333		CONN,PLUG,ELEC:STR,5 PIN,0.1 SPACING (A14J100B)	S4549	PS-05SD-S4T1-2
A14R100	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A14R120	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A14R124	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A14R140	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A14R160	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A14R200	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A14R200	315-0512-00			RES,FXD,FILM:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
A14R300	307-0865-00			RES NTWK,FXD,FI:8,1K OHM,5%,0.1W	80009	307-0865-00
A14R400	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A14R450	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A14R451	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A14R452	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A14R453	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A14R454	315-0301-00			RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A14S300	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A14S302	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A14S310	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A14S312	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A14S320	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A14S322	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A14S330	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A14S332	260-2327-00			SWITCH,PUSH:MOMENTARY,KEY	TK0191	260-2327-00
A14U100	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A14U120	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A14U140	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A14U160	156-1822-00			MICROCKT,DGTL:C2MOS,8 BIT ADDRESSABLE LATCH	80009	156-1822-00
A14U420	156-2806-00			MICROCKT,LINEAR:BAR GRAPH DRIVER	TK0191	156-2806-00
A15	670-9316-00			CIRCUIT BD ASSY:LOWER SUB KEY	TK0191	670-9316-00
A15C10	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A15C10	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A15C20	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A15C30	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A15C40	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A15C200	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A15C210	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A15J140	131-3674-00			CONN,RCPT,ELEC:HEADER,34 PIN	TK0191	131-3674-00
A15J142	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 4)	22526	48283-029
A15J144	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 4)	22526	48283-029
A15L10	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A15P100	131-3656-00	.300000	.300332	CONN,RCPT,ELEC:HEADER,STR,15 PIN,0.1 SPACING	TK0191	131-3656-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A15P100	131-3656-01	.300333		CONN,RCPT,ELEC:HEADER,STR,15 PIN,0.1 SPACIN G (A15P100A)	S4549	PS15PAS4T1PKL3
A15P100	131-3675-00	.300000	.300332	CONN,RCPT,ELEC:HEADER,STR,5 PIN,0.1 SPACING	TK0191	131-3675-00
A15P100	131-3675-01	.300333		CONN,RCPT,ELEC:HEADER,STR,5 PIN,0.1 SPACING (A15P100B)	S4549	PS05PAS4T1PKKK13
A15R100	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A15R120	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A15R140	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A15R200	315-0512-00			RES,FXD,FILM:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
A15R202	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A15R204	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A15R210	315-0512-00			RES,FXD,FILM:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
A15R212	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A15R214	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A15R500	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A15R600	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A15U100	156-1767-00			MICROCKT,DGTL:CMOS,OCTAL BUS TRANSCEIVER	80009	156-1767-00
A15U120	156-1829-00			MICROCKT,DGTL:C2MOS,GATE,QUAD 2 INP OR	80009	156-1829-00
A15U140	156-2825-00			MICROCKT,DGTL:CMOS,DUAL 2-4 DCDR	80009	156-2825-00
A15U200	156-2796-00			MICROCKT,DGTL:HEX INVERTER	TK0191	156-2796-00
A15U220	156-1828-00			MICROCKT,DGTL:C2MOS,DUAL D-TYPE FLIP FLOP	80009	156-1828-00
A15U240	156-1818-00			MICROCKT,DGTL:C2MOS,DUAL 4-BIT BINARY	80009	156-1818-00
A15U260	156-1818-00			MICROCKT,DGTL:C2MOS,DUAL 4-BIT BINARY	80009	156-1818-00
A15U300	156-2792-00			MICROCKT,DGTL:OCTAL D-F.F	TK0191	156-2792-00
A15U320	156-2792-00			MICROCKT,DGTL:OCTAL D-F.F	TK0191	156-2792-00
A15U500	156-1821-00			MICROCKT,DGTL:C2MOS,HEX NON-INVERTING 3-STA TE BUFFER	80009	156-1821-00
A16	672-0180-00			CIRCUIT BD ASSY:L-O-R SWITCH (ASSEMBLY INCLUDES A16,A17)	80009	672-0180-00
A16	----- -----			CIRCUIT BD ASSY:L-O-R SWITCH		
A16DS100	150-1180-00			LT EMITTING DIO:RED	TK0191	150-1180-00
A16E100	276-0810-00			CORE,EM:FERRITE	TK0191	276-0810-00
A16E102	276-0810-00			CORE,EM:FERRITE	TK0191	276-0810-00
A16E104	276-0810-00			CORE,EM:FERRITE	TK0191	276-0810-00
A16E106	276-0810-00			CORE,EM:FERRITE	TK0191	276-0810-00
A16J160	131-3659-00			TERM,QIK DISC:CKT,0.187 X 25,TAB	TK0191	131-3659-00
A16J162	131-3659-00			TERM,QIK DISC:CKT,0.187 X 25,TAB	TK0191	131-3659-00
A16J164	131-3659-00			TERM,QIK DISC:CKT,0.187 X 25,TAB	TK0191	131-3659-00
A16J166	131-3659-00			TERM,QIK DISC:CKT,0.187 X 25,TAB	TK0191	131-3659-00
A16J167	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 2)	22526	48283-036
A16J168	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 7)	22526	48283-036
A16J169	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 2)	22526	48283-036
A16R100	315-0751-00			RES,FXD,FILM:750 OHM,5%,0.25W	57668	NTR25J-E750E
A16S100	260-2296-00			SWITCH,PUSH:LEFT-OFF-RIGHT	59821	2KDM0100201008
A17	----- -----			CIRCUIT BD ASSY:SUB L-O-R SWITCH		
A17J170	131-3659-00			TERM,QIK DISC:CKT,0.187 X 25,TAB	TK0191	131-3659-00
A17J172	131-3659-00			TERM,QIK DISC:CKT,0.187 X 25,TAB	TK0191	131-3659-00
A17R100	301-0471-00			RES,FXD,FILM:470 OHM,5%,0.5W	19701	5053CX 470R0J

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A18	670-9319-00	.300000	.300398	CIRCUIT BD ASSY:CRT OUTPUT	TK0191	670-9319-00
A18	670-9319-01	.300399		CIRCUIT BD ASSY:CRT OUTPUT	80009	670-9319-01
A18C60	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A18C62	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A18C70	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A18C82	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A18C100	283-0002-00			CAP,FXD,CER DI:0.01UF,+80-20%,500V	59821	D103Z40Z5ULADEG
A18C102	283-0240-00			CAP,FXD,CER DI:1PF,20%,500V	56289	53C141
A18C104	283-0240-00			CAP,FXD,CER DI:1PF,20%,500V	56289	53C141
A18C106	283-0002-00			CAP,FXD,CER DI:0.01UF,+80-20%,500V	59821	D103Z40Z5ULADEG
A18C120	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A18C122	283-0002-00			CAP,FXD,CER DI:0.01UF,+80-20%,500V	59821	D103Z40Z5ULADEG
A18C200	283-0002-00			CAP,FXD,CER DI:0.01UF,+80-20%,500V	59821	D103Z40Z5ULADEG
A18C202	283-0240-00			CAP,FXD,CER DI:1PF,20%,500V	56289	53C141
A18C204	283-0240-00			CAP,FXD,CER DI:1PF,20%,500V	56289	53C141
A18C206	283-0002-00			CAP,FXD,CER DI:0.01UF,+80-20%,500V	59821	D103Z40Z5ULADEG
A18C220	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A18C222	283-0002-00			CAP,FXD,CER DI:0.01UF,+80-20%,500V	59821	D103Z40Z5ULADEG
A18C300	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A18C302	283-0240-00			CAP,FXD,CER DI:1PF,20%,500V	56289	53C141
A18C304	283-0002-00			CAP,FXD,CER DI:0.01UF,+80-20%,500V	59821	D103Z40Z5ULADEG
A18C306	283-0002-00			CAP,FXD,CER DI:0.01UF,+80-20%,500V	59821	D103Z40Z5ULADEG
A18C400	283-0002-00			CAP,FXD,CER DI:0.01UF,+80-20%,500V	59821	D103Z40Z5ULADEG
A18C420	283-0002-00			CAP,FXD,CER DI:0.01UF,+80-20%,500V	59821	D103Z40Z5ULADEG
A18CR100	152-0832-00	.300000	.300398	SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A18CR100	152-0832-00	.300399		SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A18CR102	152-0322-00			SEMICOND DVC,DI:SCHOTTKY,SI,15V,1.2PF,DO-35	50434	5082-2672
A18CR104	152-0322-00			SEMICOND DVC,DI:SCHOTTKY,SI,15V,1.2PF,DO-35	50434	5082-2672
A18CR110	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A18CR112	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A18CR200	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A18CR202	152-0322-00			SEMICOND DVC,DI:SCHOTTKY,SI,15V,1.2PF,DO-35	50434	5082-2672
A18CR204	152-0322-00			SEMICOND DVC,DI:SCHOTTKY,SI,15V,1.2PF,DO-35	50434	5082-2672
A18CR210	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A18CR212	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A18CR300	152-0832-00	.300000	.300398	SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A18CR300	152-0832-00	.300399		SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A18CR302	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A18CR304	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A18CR306	152-0322-00			SEMICOND DVC,DI:SCHOTTKY,SI,15V,1.2PF,DO-35	50434	5082-2672
A18J180	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 9)	22526	48283-029
A18J182	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 8)	22526	48283-029
A18J184	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 4)	22526	48283-029
A18J186	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 3)	22526	48283-029
A18Q100	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A18Q102	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A18Q110	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A18Q112	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A18Q120	151-0423-00			TRANSISTOR:NPN,SI,TO-220AB	80009	151-0423-00
A18Q122	151-0423-00			TRANSISTOR:NPN,SI,TO-220AB	80009	151-0423-00
A18Q130	151-0721-00			TRANSISTOR:PNP,SI,TO-220AB	80009	151-0721-00
A18Q132	151-0721-00			TRANSISTOR:PNP,SI,TO-220AB	80009	151-0721-00
A18Q200	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A18Q202	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A18Q210	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A18Q212	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A18Q220	151-0423-00			TRANSISTOR:NPN,SI,TO-220AB	80009	151-0423-00
A18Q222	151-0423-00			TRANSISTOR:NPN,SI,TO-220AB	80009	151-0423-00
A18Q230	151-0721-00			TRANSISTOR:PNP,SI,TO-220AB	80009	151-0721-00
A18Q232	151-0721-00			TRANSISTOR:PNP,SI,TO-220AB	80009	151-0721-00
A18Q300	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A18Q310	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A18Q312	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A18Q320	151-0721-00			TRANSISTOR:PNP,SI,TO-220AB	80009	151-0721-00
A18Q330	151-0423-00			TRANSISTOR:NPN,SI,TO-220AB	80009	151-0423-00
A18R100	315-0123-00			RES,FXD,FILM:12K OHM,5%,0.25W	57668	NTR25J-E12K0
A18R102	315-0513-00			RES,FXD,FILM:51K OHM,5%,0.25W	57668	NTR25J-E51K0
A18R104	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	19701	5033ED1K00F
A18R106	321-0193-00			RES,FXD,FILM:1K OHM,1%,0.125W,TC=T0	19701	5033ED1K00F
A18R108	315-0513-00			RES,FXD,FILM:51K OHM,5%,0.25W	57668	NTR25J-E51K0
A18R110	315-0151-00			RES,FXD,FILM:150 OHM,5%,0.25W	57668	NTR25J-E150E
A18R112	315-0511-00			RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J
A18R114	315-0471-00			RES,FXD,FILM:470 OHM,5%,0.25W	57668	NTR25J-E470E
A18R116	315-0151-00			RES,FXD,FILM:150 OHM,5%,0.25W	57668	NTR25J-E150E
A18R118	315-0511-00			RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J
A18R120	315-0471-00			RES,FXD,FILM:470 OHM,5%,0.25W	57668	NTR25J-E470E
A18R128	315-0244-00			RES,FXD,FILM:240K OHM,5%,0.25W	19701	5043CX240K0J
A18R130	322-0327-00			RES,FXD,FILM:24.9K OHM,1%,0.25W,TC=T0	19701	5043RD24K90F
A18R132	322-0327-00			RES,FXD,FILM:24.9K OHM,1%,0.25W,TC=T0	19701	5043RD24K90F
A18R140	315-0681-00			RES,FXD,FILM:680 OHM,5%,0.25W	57668	NTR25J-E680E
A18R142	315-0431-00			RES,FXD,FILM:430 OHM,5%,0.25W	19701	5043CX430R0J
A18R200	315-0123-00			RES,FXD,FILM:12K OHM,5%,0.25W	57668	NTR25J-E12K0
A18R202	315-0513-00			RES,FXD,FILM:51K OHM,5%,0.25W	57668	NTR25J-E51K0
A18R204	321-0241-00			RES,FXD,FILM:3.16K OHM,1%,0.125W,TC=T0	07716	CEAD31600F
A18R206	321-0241-00			RES,FXD,FILM:3.16K OHM,1%,0.125W,TC=T0	07716	CEAD31600F
A18R208	315-0513-00			RES,FXD,FILM:51K OHM,5%,0.25W	57668	NTR25J-E51K0
A18R210	315-0151-00			RES,FXD,FILM:150 OHM,5%,0.25W	57668	NTR25J-E150E
A18R212	315-0751-00			RES,FXD,FILM:750 OHM,5%,0.25W	57668	NTR25J-E750E
A18R214	315-0471-00			RES,FXD,FILM:470 OHM,5%,0.25W	57668	NTR25J-E470E
A18R216	315-0151-00			RES,FXD,FILM:150 OHM,5%,0.25W	57668	NTR25J-E150E
A18R218	315-0751-00			RES,FXD,FILM:750 OHM,5%,0.25W	57668	NTR25J-E750E
A18R220	315-0471-00			RES,FXD,FILM:470 OHM,5%,0.25W	57668	NTR25J-E470E
A18R228	315-0124-00			RES,FXD,FILM:120K OHM,5%,0.25W	19701	5043CX120K0J
A18R230	322-0327-00			RES,FXD,FILM:24.9K OHM,1%,0.25W,TC=T0	19701	5043RD24K90F
A18R232	322-0327-00			RES,FXD,FILM:24.9K OHM,1%,0.25W,TC=T0	19701	5043RD24K90F
A18R240	315-0681-00			RES,FXD,FILM:680 OHM,5%,0.25W	57668	NTR25J-E680E
A18R242	315-0431-00			RES,FXD,FILM:430 OHM,5%,0.25W	19701	5043CX430R0J
A18R300	315-0123-00			RES,FXD,FILM:12K OHM,5%,0.25W	57668	NTR25J-E12K0
A18R306	315-0242-00			RES,FXD,FILM:2.4K OHM,5%,0.25W	57668	NTR25J-E02K4
A18R308	322-0327-00			RES,FXD,FILM:24.9K OHM,1%,0.25W,TC=T0	19701	5043RD24K90F
A18R310	315-0513-00			RES,FXD,FILM:51K OHM,5%,0.25W	57668	NTR25J-E51K0
A18R312	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A18R314	315-0682-00			RES,FXD,FILM:6.8K OHM,5%,0.25W	57668	NTR25J-E06K8
A18R316	315-0204-00			RES,FXD,FILM:200K OHM,5%,0.25W	19701	5043CX200K0J
A18R318	315-0271-00			RES,FXD,FILM:270 OHM,5%,0.25W	57668	NTR25J-E270E
A18R320	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A18R322	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A18R410	311-0606-00	.300000	.300397	RES,VAR,NONWW:TRMR,500K OHM,0.5W	32997	3329-H-G48-504
A18R410	311-2377-00	.300398		RES,VAR,NONWW:TRMR,500K OHM,0.5W	80009	311-2377-00
A18R412	315-0104-00	.300000	.300398	RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A18R412	315-0104-00	.300399		RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A18R420	311-0606-00	.300000	.300397	RES,VAR,NONWW:TRMR,500K OHM,0.5W	32997	3329-H-G48-504
A18R420	311-2377-00	.300398		RES,VAR,NONWW:TRMR,500K OHM,0.5W	80009	311-2377-00
A18R422	315-0164-00	.300000	.300398	RES,FXD,FILM:160K OHM,5%,0.25W	57668	NTR25J-E160K
A18R422	315-0164-00	.300399		RES,FXD,FILM:160K OHM,5%,0.25W	57668	NTR25J-E160K
A18TP100	214-0579-00	.300399		TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A18VR100	152-0195-00			SEMICOND DVC,DI:ZEN,SI,5.1V,5%,0.4W,DO-7	04713	SZ11755RL
A18VR200	152-0195-00			SEMICOND DVC,DI:ZEN,SI,5.1V,5%,0.4W,DO-7	04713	SZ11755RL
A18W410	131-0566-00	.300000	.300398	BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225 L	24546	OMA 07
A18W420	131-0566-00	.300000	.300398	BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225 L	24546	OMA 07
A19	670-9320-00			CIRCUIT BD ASSY:L V SUPPLY	TK0191	670-9320-00
A19C100	290-1136-00			CAP,FXD,ELCTLT:6800UF,20%,16V	TK0191	290-1136-00
A19C102	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A19C120	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A19C132	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A19C134	290-1142-00	.300000	.300462	CAP,FXD,ELCTLT:100UF,20%,25V	TK0191	290-1142-00
A19C134	290-0770-00	.300463		CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	54473	ECE-A25V100L
A19C140	290-1142-00	.300000	.300462	CAP,FXD,ELCTLT:100UF,20%,25V	TK0191	290-1142-00
A19C140	290-0770-00	.300463		CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	54473	ECE-A25V100L
A19C150	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A19C200	290-1136-00			CAP,FXD,ELCTLT:6800UF,20%,16V	TK0191	290-1136-00
A19C232	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A19C234	290-1142-00	.300000	.300462	CAP,FXD,ELCTLT:100UF,20%,25V	TK0191	290-1142-00
A19C234	290-0770-00	.300463		CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	54473	ECE-A25V100L
A19C300	290-1137-00	.300000	.300462	CAP,FXD,ELCTLT:10000UF,+30-10%,25V	TK0191	290-1137-00
A19C300	290-0506-01	.300463		CAP,FXD,ELCTLT:10000UF,+30-10%,35V	TK0191	290-0506-01
A19C312	290-1142-00	.300000	.300462	CAP,FXD,ELCTLT:100UF,20%,25V	TK0191	290-1142-00
A19C312	290-0770-00	.300463		CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	54473	ECE-A25V100L
A19C400	290-1137-00	.300000	.300462	CAP,FXD,ELCTLT:10000UF,+30-10%,25V	TK0191	290-1137-00
A19C400	290-0506-01	.300463		CAP,FXD,ELCTLT:10000UF,+30-10%,35V	TK0191	290-0506-01
A19C412	290-1142-00	.300000	.300462	CAP,FXD,ELCTLT:100UF,20%,25V	TK0191	290-1142-00
A19C412	290-0770-00	.300463		CAP,FXD,ELCTLT:100UF,+50-20%,25VDC	54473	ECE-A25V100L
A19C422	290-0779-00			CAP,FXD,ELCTLT:10 UF +50% -10%,50VDC	56289	502D237
A19C500	290-1141-00			CAP,FXD,ELCTLT:220UF,20%,100V	TK0191	290-1141-00
A19C502	290-1141-00			CAP,FXD,ELCTLT:220UF,20%,100V	TK0191	290-1141-00
A19C562	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A19C571	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A19C704	285-1272-00			CAP,FXD,PLASTIC:0.22UF,20%,250V	TK0510	ECQ-E2A224MW
A19C710	290-1143-00	.300000	.300462	CAP,FXD,ELCTLT:1000UF,20%,50V	TK0191	290-1143-00
A19C710	290-0922-00	.300463		CAP,FXD,ELCTLT:1000UF,20%,50V	55680	ULB1E102TFAANA
A19C712	290-0766-00			CAP,FXD,ELCTLT:2.2UF,+50-10%,160VDC	54473	ECEA2CS2R2
A19C720	290-1143-00	.300000	.300462	CAP,FXD,ELCTLT:1000UF,20%,50V	TK0191	290-1143-00
A19C720	290-0922-00	.300463		CAP,FXD,ELCTLT:1000UF,20%,50V	55680	ULB1E102TFAANA
A19C722	290-0766-00			CAP,FXD,ELCTLT:2.2UF,+50-10%,160VDC	54473	ECEA2CS2R2
A19CR100	152-0933-00			SEMICOND,DVC,DI:8A,100V,CENTER TAP	80009	152-0933-00
A19CR104	152-0935-00			SEMICOND,DVC,DI:SI,1.0A,280V	80009	152-0935-00
A19CR130	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A19CR200	152-0606-00			SEMICOND DVC,DI:POWER,SI,100V,8A	80009	152-0606-00
A19CR230	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A19CR300	152-0933-00			SEMICOND,DVC,DI:8A,100V,CENTER TAP	80009	152-0933-00
A19CR310	152-0935-00			SEMICOND,DVC,DI:SI,1.0A,280V	80009	152-0935-00
A19CR400	152-0606-00			SEMICOND DVC,DI:POWER,SI,100V,8A	80009	152-0606-00
A19CR410	152-0935-00			SEMICOND,DVC,DI:SI,1.0A,280V	80009	152-0935-00
A19CR500	152-0931-00			SEMICOND DVC,DI:BRIDGE,1.5A,200V	80009	152-0931-00
A19CR560	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A19CR562	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A19CR570	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A19CR572	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A19CR604	152-0832-00			SEMICOND DVC,DI:SW,SI,50V,0.12A,DO-34	80009	152-0832-00
A19CR710	152-0932-00			SEMICOND,DVC,DI:4A,100V	80009	152-0932-00
A19CR712	152-0935-00			SEMICOND,DVC,DI:SI,1.0A,280V	80009	152-0935-00
A19CR720	152-0932-00			SEMICOND,DVC,DI:4A,100V	80009	152-0932-00
A19CR722	152-0935-00			SEMICOND,DVC,DI:SI,1.0A,280V	80009	152-0935-00
A19CR730	152-0932-00			SEMICOND,DVC,DI:4A,100V	80009	152-0932-00
A19J64	131-3668-00			CONN,RCPT,ELEC:CKT BD,4 PIN	TK0191	131-3668-00
A19J72	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 8)	22526	48283-029
A19J190	131-3668-00			CONN,RCPT,ELEC:CKT BD,4 PIN	TK0191	131-3668-00
A19J192	131-3658-00			CONN,PLUG,ELEC:HEADER,16 PIN	TK0191	131-3658-00
A19J194	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 8)	22526	48283-029
A19J196	131-3671-00			CONN,RCPT,ELEC:CKT BD,15 PIN	TK0191	131-3671-00
A19J198	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 8)	22526	48283-029
A19J280	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 2)	22526	48283-036
A19J290	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 2)	22526	48283-036
A19Q130	151-0562-00			TRANSISTOR:PNP,SI,PWR	TK0191	151-0562-00
A19Q230	151-0561-00			TRANSISTOR:NPN,SI,PWR	TK0191	151-0561-00
A19Q600	151-0561-00			TRANSISTOR:NPN,SI,PWR	TK0191	151-0561-00
A19Q602	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A19R100	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A19R102	315-0124-00			RES,FXD,FILM:120K OHM,5%,0.25W	19701	5043CX120K0J
A19R130	315-0151-00			RES,FXD,FILM:150 OHM,5%,0.25W	57668	NTR25J-E150E
A19R132	315-0201-00			RES,FXD,FILM:200 OHM,5%,0.25W	57668	NTR25J-E200E
A19R134	321-0260-00			RES,FXD,FILM:4.99K OHM,1%,0.125W,TC=T0	19701	5033ED4K990F
A19R136	321-0280-00			RES,FXD,FILM:8.06K OHM,1%,0.125W,TC=T0	19701	5033ED8K060F
A19R138	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A19R230	315-0151-00			RES,FXD,FILM:150 OHM,5%,0.25W	57668	NTR25J-E150E
A19R232	315-0201-00			RES,FXD,FILM:200 OHM,5%,0.25W	57668	NTR25J-E200E
A19R234	321-0300-00			RES,FXD,FILM:13.0K OHM,1%,0.125W,TC=T0	07716	CEAD13001F
A19R236	321-0260-00			RES,FXD,FILM:4.99K OHM,1%,0.125W,TC=T0	19701	5033ED4K990F
A19R238	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A19R500	311-0605-03			RES,VAR,NONWW:TRMR,200 OHM,20%,0.5W	80009	311-0605-03
A19R501	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A19R502	321-0830-03			RES,FXD,FILM:2.41K OHM,0.25%,0.125W,TC=T2	07716	CEAC24100C
A19R504	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A19R506	315-0471-00			RES,FXD,FILM:470 OHM,5%,0.25W	57668	NTR25J-E470E
A19R508	315-0471-00			RES,FXD,FILM:470 OHM,5%,0.25W	57668	NTR25J-E470E
A19R510	315-0512-00			RES,FXD,FILM:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
A19R512	321-0289-07			RES,FXD,FILM:10.0K OHM,0.1%,0.125W,TC=T9	19701	5033RE10K00B
A19R514	321-0298-00			RES,FXD,FILM:12.4K OHM,1%,0.125W,TC=T0	07716	CEAD12401F
A19R516	311-0605-03			RES,VAR,NONWW:TRMR,200 OHM,20%,0.5W	80009	311-0605-03
A19R560	315-0154-00			RES,FXD,FILM:150K OHM,5%,0.25W	57668	NTR25J-E150K
A19R562	315-0154-00			RES,FXD,FILM:150K OHM,5%,0.25W	57668	NTR25J-E150K
A19R564	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A19R570	315-0752-00			RES,FXD,FILM:7.5K OHM,5%,0.25W	57668	NTR25J-E07K5
A19R571	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A19R574	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A19R576	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A19R600	315-0511-00			RES,FXD,FILM:510 OHM,5%,0.25W	19701	5043CX510R0J
A19R602	307-1294-00			RES,FXD,FILM:0.51 OHM,5%,2W	TK0191	307-1294-00
A19R604	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A19R606	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K

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A19R700	315-0203-00			RES,FXD,FILM:20K OHM,5%,0.25W	57668	NTR25J-E 20K
A19R701	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A19R702	315-0203-00			RES,FXD,FILM:20K OHM,5%,0.25W	57668	NTR25J-E 20K
A19R704	315-0203-00			RES,FXD,FILM:20K OHM,5%,0.25W	57668	NTR25J-E 20K
A19R706	315-0621-00			RES,FXD,FILM:620 OHM,5%,0.25W	57668	NTR25J-E620E
A19R712	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A19R722	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A19R750	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10RR00J
A19R750	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A19TP100	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029
A19TP130	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029
A19TP230	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029
A19TP310	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029
A19TP410	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029
A19TP500	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029
A19TP510	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029
A19TP520	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029
A19U100	156-2831-00			MICROCKT,LINEAR:VOLTAGE REG,+5V STR9005	TK0191	156-2831-00
A19U120	156-1173-00			MICROCKT,LINEAR:VOLTAGE REFERENCE	04713	MC1403UDS
A19U130	156-1771-00			MICROCKT,LINEAR:DUAL OP-AMP	80009	156-1771-00
A19U310	156-2830-00			MICROCKT,LINEAR:VOLTAGE REG,+12V	TK0191	156-2830-00
A19U410	156-0872-00			MICROCKT,LINEAR:VOLTAGE REGULATOR	04713	MC7912CT
A19U500	156-1771-00			MICROCKT,LINEAR:DUAL OP-AMP	80009	156-1771-00
A19U560	156-1778-00			MICROCKT,LINEAR:DUAL COMPARATOR	TK0191	156-1778-00
A19U700	148-1010-00			RELAY,SOL STATE:5A,250VAC	TK0191	148-1010-00
A19W16	196-3110-00			LEAD,ELECTRICAL:18 AWG,7.0 L,8-0	TK0191	196-3110-00
A19W18	196-3111-00			LEAD,ELECTRICAL:18 AWG,7.0 L,8-9	TK0191	196-3111-00
A19W270	174-0327-00			CA ASSY,SP,ELEC:2,18 AWG,7.0 L	TK0191	174-0327-00
A20	670-9321-00	.300000	.300873	CIRCUIT BD ASSY:H V REGULATOR	TK0191	670-9321-00
A20	670-9321-01	.300874		CIRCUIT BD ASSY:H.V. REGULATOR	TK0191	ORDER BY DESCR
A20C54	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
A20C56	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
A20C100	290-0927-00			CAP,FXD,ELCTLT:330UF,20%,35V	80009	290-0927-00
A20C102	285-0560-00			CAP,FXD,PLASTIC:0.022UF,10%,630V	80009	285-0560-00
A20C104	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
A20C200	283-0000-00			CAP,FXD,CER DI:0.001UF,+100-0%,500V	59660	831-610-Y5U0102P
A20C202	283-0000-00			CAP,FXD,CER DI:0.001UF,+100-0%,500V	59660	831-610-Y5U0102P
A20C210	283-0002-00			CAP,FXD,CER DI:0.01UF,+80-20%,500V	59821	D103Z40Z5ULADEG
A20C220	283-0013-00			CAP,FXD,CER DI:0.01UF,-0+100%,1000V	59660	818-602ZSU0103P
A20C228	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
A20C230	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
A20C232	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A20C300	290-0821-00			CAP,FXD,ELCTLT:10UF,+50-10%,160V	80009	290-0821-00
A20C310	290-0821-00			CAP,FXD,ELCTLT:10UF,+50-10%,160V	80009	290-0821-00
A20C320	290-0821-00			CAP,FXD,ELCTLT:10UF,+50-10%,160V	80009	290-0821-00
A20C340	285-1376-00			CAP,FXD,PLASTIC:0.01UF,20%,2.5KV	TK0191	285-1376-00
A20C460	281-0814-00			CAP,FXD,CER DI:100 PF,10%,100V	04222	MA101A101KAA
A20CR200	152-0608-00			SEMICOND DVC,DI:POWER,SI,1000V,0.2A	80009	152-0608-00
A20CR202	152-0242-00			SEMICOND DVC,DI:SIG,SI,225V,0.2A,DO-7	07263	FDH5004
A20CR204	152-0242-00			SEMICOND DVC,DI:SIG,SI,225V,0.2A,DO-7	07263	FDH5004
A20CR210	152-0608-00			SEMICOND DVC,DI:POWER,SI,1000V,0.2A	80009	152-0608-00
A20CR300	152-0242-00			SEMICOND DVC,DI:SIG,SI,225V,0.2A,DO-7	07263	FDH5004
A20CR310	152-0242-00			SEMICOND DVC,DI:SIG,SI,225V,0.2A,DO-7	07263	FDH5004
A20CR320	152-0242-00			SEMICOND DVC,DI:SIG,SI,225V,0.2A,DO-7	07263	FDH5004
A20J182	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 7)	22526	48283-029

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A20J194	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 7)	22526	48283-029
A20J200	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ (QUANTITY OF 7)	22526	48283-029
A20L100	108-1346-00	.300000	.300873	COIL,RF:FXD,470UH,1A	80009	108-1346-00
A20L100	108-1431-00	.300874		COIL.RF:FXD,300UH	TK0HD	ORDER BY DESCR
A20Q100	151-0563-00			TRANSISTOR:NPN,SI	TK0191	151-0563-00
A20Q200	151-0667-00	.300000	.300873	TRANSISTOR:NPN,SI,TO-5	80009	151-0667-00
A20Q200	151-0769-00	.300874		TRANSISTOR:NPN,SI,TO-220AB	80009	151-0769-00
A20R50	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A20R52	321-0388-00			RES,FXD,FILM:107K OHM,1%,0.125W,TC=T0	07716	CEAD10702F
A20R54	321-0205-00			RES,FXD,FILM:1.33K OHM,1%,0.125W,TC=T0	19701	5033ED1K330F
A20R56	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A20R100	315-0152-00			RES,FXD,FILM:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
A20R200	315-0513-00			RES,FXD,FILM:51K OHM,5%,0.25W	57668	NTR25J-E51K0
A20R202	315-0513-00			RES,FXD,FILM:51K OHM,5%,0.25W	57668	NTR25J-E51K0
A20R204	315-0184-00			RES,FXD,FILM:180K OHM,5%,0.25W	19701	5043CX180K0J
A20R206	315-0184-00			RES,FXD,FILM:180K OHM,5%,0.25W	19701	5043CX180K0J
A20R208	315-0472-00			RES,FXD,FILM:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
A20R210	311-1272-00			RES,VAR,NONWW:TRMR,100K OHM,0.5W	32997	3329P-L58-104
A20R214	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A20R216	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A20R218	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A20R220	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A20R222	315-0475-00			RES,FXD,FILM:4.7M OHM,5%,0.25W	01121	CB4755
A20R224	315-0473-00			RES,FXD,FILM:47K OHM,5%,0.25W	57668	NTR25J-E47K0
A20R226	315-0104-00			RES,FXD,FILM:100K OHM,5%,0.25W	57668	NTR25J-E100K
A20R228	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A20R230	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A20RT100	307-1496-00	.300874		RES,THERMAL:8 OHM,15%	S5011	ORDER BY DESCR
A20T100	120-1679-00			TRANSFORMER,RF:HIGH VOLTAGE	TK0191	120-1679-00
A20TP100	214-0579-00	.300000	.300873	TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A20TP200	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A20TP300	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A20TP400	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A20U100	119-1684-01			MULTIPLIER,HV:2X,W/DC RESTORER	TK0191	119-1684-01
A20U200	156-1422-00			MICROCKT,LINEAR:DUAL OPNL AMPL	80009	156-1422-00
A20U300	119-2162-00	.300000	.300422	HV MODULER:2KV INPUT,12KV OUTPUT	TK0191	119-2162-00
A20U300	119-2162-01	.300423		HV MODULER:2KV INPUT,12KV OUTPUT	80009	119-2162-01
A20VR200	152-0286-00			SEMICOND DVC,DI:ZEN,SI,75V,5%,0.4W,DO-7	14552	1N982B
A20VR202	152-0265-00			SEMICOND DVC,DI:ZEN,SI,24V,5%,0.4W	04713	1N970B
A22	670-9322-00			CIRCUIT BD ASSY:INTERFACE	TK0191	670-9322-00
A22C100	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A22C120	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A22C140	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A22C200	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A22C240	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A22C300	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A22C320	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A22C340	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A22C360	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A22C400	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A22C420	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A22C440	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A22C460	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A22C500	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A22C500	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A22C520	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A22C520	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A22C540	290-1007-00	.300000	.300462	CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A22C540	290-0745-00	.300463		CAP,FXD,ELCTLT:22UF,+50-20%,25WVDC	54473	ECE-A25V22L
A22J350	131-3652-00			CONN,RCPT,ELEC:CKT,BD,24 PIN,FEMALE	TK0191	131-3652-00
A22J450	131-3653-00	.300000	.300397	CONN,RCPT,ELEC:CKT BD,36 PIN,FEMALE	TK0191	131-3653-00
A22J450	131-3653-01	.300398		CONN,RCPT,ELEC:CKT BD,36PIN,FEMALE	80009	131-3653-01
A22L500	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A22L520	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A22L540	108-0948-00			COIL,RF:FIXED,100UH,10%	80009	108-0948-00
A22R100	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A22R102	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A22R104	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A22R110	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A22R112	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A22R114	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A22R120	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A22R140	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A22R320	307-0881-00			RES NTWK,FXD,FI:8,10K OHM,10%,0.125W	80009	307-0881-00
A22R340	307-0881-00			RES NTWK,FXD,FI:8,10K OHM,10%,0.125W	80009	307-0881-00
A22R360	307-0923-00			RES NTWK,FXD,FI:(8)330K OHM,5%,0.125W	80009	307-0923-00
A22R440	307-0881-00			RES NTWK,FXD,FI:8,10K OHM,10%,0.125W	80009	307-0881-00
A22R460	307-0881-00			RES NTWK,FXD,FI:8,10K OHM,10%,0.125W	80009	307-0881-00
A22S360	260-2326-00			SWITCH,TOGGLE:DTS-6H	TK0191	260-2326-00
A22U100	156-2828-00			MICROCKT,DGTL:CMOS,OCTAL BUS DRIVER	TK0191	156-2828-00
A22U120	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A22U140	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A22U200	119-2313-00			OSCILLATOR:4MHZ,CRYSTAL	TK0191	119-2313-00
A22U220	156-2825-00			MICROCKT,DGTL:CMOS,DUAL 2-4 DCDR	80009	156-2825-00
A22U240	156-2026-00			MICROCKT,DGTL:CMOS,QUAD 2 INPUT NOR GATE	80009	156-2026-00
A22U300	156-1444-01			MICROCKT,DGTL:NMOS,GPIB INTFC CONTROLLER	01295	TMS9914A (NL
A22U320	156-1414-02	.300000	.300667	MICROCKT,DGTL:OCTAL GPIB BUS XCVR,SCRN	27014	DS75160A N
A22U320	156-1414-00	.300668		MICROCKT,DGTL:TTL,OCTAL GPIB XCVR DATA BUS	01295	SN75160 (N OR J)
A22U340	156-1415-01	.300000	.300667	MICROCKT,DGTL:OCTAL GPIB XCVR-MANAGEMENT	27014	DS75161A NA+
A22U340	156-1415-00	.300668		MICROCKT,DGTL:TTL,OCTAL GPIB XCVR MGT BUS	01295	SN75161A N
A22U360	156-2300-00			MICROCKT,DGTL:OCTAL BUFFER W/3 STATE OUT	80009	156-2300-00
A22U400	156-2797-00			MICROCKT,DGTL:PLOTTER INTERFACE	TK0191	156-2797-00
A22U420	156-0515-00			MICROCKT,DGTL:CMOS,TRIPLE 2-CHAN MUX	02735	CD4053BF
A22U440	156-1111-02	.300000	.300667	MICROCKT,DGTL:OCTAL BUS XCVR W/3 STATE OUT	01295	SN74LS245N3
A22U440	156-1111-00	.300668		MICROCKT,DGTL:OCTAL BUS TRANSCEIVERS	01295	SN74LS245N
A22U460	156-1111-02	.300000	.300667	MICROCKT,DGTL:OCTAL BUS XCVR W/3 STATE OUT	01295	SN74LS245N3
A22U460	156-1111-00	.300668		MICROCKT,DGTL:OCTAL BUS TRANSCEIVERS	01295	SN74LS245N
A22W220	174-0295-00			CA ASSY,SP,ELEC:26,28 AWG,11.0 L,RIBBON	TK0191	174-0295-00
A27	670-9323-00			CIRCUIT BD ASSY:PRIMARY	TK0191	670-9323-00
A27C100	285-1377-00			CAP,FXD,PLASTIC:0.22UF,20%,250V	TK0191	285-1377-00
A27C200	285-1377-00			CAP,FXD,PLASTIC:0.22UF,20%,250V	TK0191	285-1377-00
A27E100	307-1324-00			RES,V SENSITIVE:240VDC,0.8W	80009	307-1324-00
A27E200	307-1324-00			RES,V SENSITIVE:240VDC,0.8W	80009	307-1324-00
A27J270	131-3667-00			CONN,RCPT,ELEC:CKT BD,3 PIN	TK0191	131-3667-00
A27J272	131-3666-00			CONN,RCPT,ELEC:CKT BD,2 PIN	TK0191	131-3666-00
A27J274	131-3669-00			CONN,RCPT,ELEC:CKT BD,6 PIN	TK0191	131-3669-00
A27S200	260-1980-01			SWITCH,SLIDE:DPDT,10A,125V,MKD 115V/230V	TK0935	4021.1913
A27S300	260-1980-00			SWITCH,SLIDE:DPDT,10A,125V,HI/LOW	TK0935	4021.1914

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A28	670-9324-00			CIRCUIT BD ASSY:LAMP	TK0191	670-9324-00
A28DS100	150-0097-00			LAMP,INCAND:6.3V,0.2A,#7381,WIRE LEADS	92966	7381
A28DS102	150-0097-00			LAMP,INCAND:6.3V,0.2A,#7381,WIRE LEADS	92966	7381
A28DS104	150-0097-00			LAMP,INCAND:6.3V,0.2A,#7381,WIRE LEADS	92966	7381
A29	670-9324-00			CIRCUIT BD ASSY:LAMP	TK0191	670-9324-00
A29DS100	150-0097-00			LAMP,INCAND:6.3V,0.2A,#7381,WIRE LEADS	92966	7381
A29DS102	150-0097-00			LAMP,INCAND:6.3V,0.2A,#7381,WIRE LEADS	92966	7381
A29DS104	150-0097-00			LAMP,INCAND:6.3V,0.2A,#7381,WIRE LEADS	92966	7381
A60	671-0066-00	.300298		CIRCUIT BD ASSY:TIMER	TK0191	ORDER BY DESCR
A60C200	290-0995-00			CAP,FXD,ELCTLT:47UF,20%,16V	80009	290-0995-00
A60C310	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A60C320	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A60C330	290-1007-00			CAP,FXD,ELCTLT:22UF,20%,16V	80009	290-1007-00
A60C340	281-0775-00			CAP,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A60C400	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
A60C410	281-0812-00			CAP,FXD,CER DI:1000PF,10%,100V	04222	MA101C102KAA
A60C500	290-0684-00			CAP,FXD,ELCTLT:10UF,20%,16V	80009	290-0684-00
A60CR100	152-0327-00			SEMICOND DVC,DI:SIG,SI,100MA,75V,D2X5,BAX13	80009	152-0327-00
A60J168	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL (QUANTITY OF 15)	22526	48283-036
A60Q600	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A60R100	315-0751-00			RES,FXD,FILM:750 OHM,5%,0.25W	57668	NTR25J-E750E
A60R200	315-0910-00			RES,FXD,FILM:91 OHM,5%,0.25W	19701	5043CX91R00J
A60R400	315-0123-00			RES,FXD,FILM:12K OHM,5%,0.25W	57668	NTR25J-E12K0
A60R410	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A60R420	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A60R430	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A60R500	315-0103-00			RES,FXD,FILM:10K OHM,5%,0.25W	19701	5043CX10K00J
A60R510	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A60U300	156-0991-00			MICROCKT,LINEAR:VOLTAGE REGULATOR	04713	MC78L05ACP
A60U400	156-2836-00			MICROCKT,DGTL:CMOS,EXCLUSIVE/OR	TK0191	156-2836-00
A60U500	156-1152-00			MICROCKT,DGTL:DUAL PRCN RETRIGGERABLE	04713	MC14538BCL
A1				CHASSIS PARTS		
A24	119-2109-00			MEMORY CONTROL:BUBBLE	TK0191	119-2109-00
B100	119-2310-00			FAN,TUBEAXIAL:2650RPM,14W,100V	TK0191	119-2310-00
C704	281-0773-00			CAP,FXD,CER DI:0.01UF,10%,100V	04222	MA201C103KAA
E506	119-0181-00			ARSR,ELEC SURGE:230,GAS FILLED	25088	B1-A230
E604	119-0181-00			ARSR,ELEC SURGE:230,GAS FILLED	25088	B1-A230
E608	119-0181-00			ARSR,ELEC SURGE:230,GAS FILLED	25088	B1-A230
E702	119-0181-00			ARSR,ELEC SURGE:230,GAS FILLED	25088	B1-A230
E704	119-0181-00			ARSR,ELEC SURGE:230,GAS FILLED	25088	B1-A230
F100	159-0259-00			FUSE,CARTRIDGE:4A,125V,MEDIUM	TK0191	159-0259-00
F100	159-0260-00			FUSE,CARTRIDGE:2A,250V,MEDIUM (OPTION A1 ONLY)	TK0191	159-0260-00
FL100	119-2311-00			FILTER:115/230V,4A	TK0191	119-2311-00
J500	136-0887-00			SOCKET,PIN TERM:0.16 DIA,RED	TK0191	136-0887-00
J502	136-0887-00			SOCKET,PIN TERM:0.16 DIA,RED	TK0191	136-0887-00
J504	136-0888-00			SOCKET,PIN TERM:0.16 DIA,GRAY	TK0191	136-0888-00
J506	136-0888-00			SOCKET,PIN TERM:0.16 DIA,GRAY	TK0191	136-0888-00
J508	136-0888-00			SOCKET,PIN TERM:0.16 DIA,GRAY	TK0191	136-0888-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
J510	136-0888-00			SOCKET,PIN TERM:0.16 DIA,GRAY	TK0191	136-0888-00
J600	136-0887-00			SOCKET,PIN TERM:0.16 DIA,RED	TK0191	136-0887-00
J602	136-0887-00			SOCKET,PIN TERM:0.16 DIA,RED	TK0191	136-0887-00
J604	136-0888-00			SOCKET,PIN TERM:0.16 DIA,GRAY	TK0191	136-0888-00
J606	136-0888-00			SOCKET,PIN TERM:0.16 DIA,GRAY	TK0191	136-0888-00
J608	136-0888-00			SOCKET,PIN TERM:0.16 DIA,GRAY	TK0191	136-0888-00
J610	136-0888-00			SOCKET,PIN TERM:0.16 DIA,GRAY	TK0191	136-0888-00
J702	136-0888-00			SOCKET,PIN TERM:0.16 DIA,GRAY	TK0191	136-0888-00
J704	136-0888-00			SOCKET,PIN TERM:0.16 DIA,GRAY	TK0191	136-0888-00
J706	136-0888-00			SOCKET,PIN TERM:0.16 DIA,GRAY	TK0191	136-0888-00
L100	108-1345-01			COIL,TUBE DEFL:TRACE ROTATION	TK0191	108-1345-01
L120	108-1347-01			COIL,TUBE DEFL:Y-AXIS ALIGNMENT	TK0191	108-1347-01
R200	301-0220-00	.300000	.300492	RES,FXD,FILM:22 OHM,5%,0.5W	19701	5053CX22R00J
R200	301-0220-02	.300493		RES,FXD,CMPSN:22 OHM,5%,0.50W	80009	301-0220-02
R202	301-0220-00	.300000	.300492	RES,FXD,FILM:22 OHM,5%,0.5W	19701	5053CX22R00J
R202	301-0220-02	.300493		RES,FXD,CMPSN:22 OHM,5%,0.50W	80009	301-0220-02
R204	301-0220-00	.300000	.300492	RES,FXD,FILM:22 OHM,5%,0.5W	19701	5053CX22R00J
R204	301-0220-02	.300493		RES,FXD,CMPSN:22 OHM,5%,0.50W	80009	301-0220-02
R300	301-0220-00	.300000	.300492	RES,FXD,FILM:22 OHM,5%,0.5W	19701	5053CX22R00J
R300	301-0220-02	.300493		RES,FXD,CMPSN:22 OHM,5%,0.50W	80009	301-0220-02
R302	301-0220-00	.300000	.300492	RES,FXD,FILM:22 OHM,5%,0.5W	19701	5053CX22R00J
R302	301-0220-02	.300493		RES,FXD,CMPSN:22 OHM,5%,0.50W	80009	301-0220-02
R304	301-0220-00	.300000	.300492	RES,FXD,FILM:22 OHM,5%,0.5W	19701	5053CX22R00J
R304	301-0220-02	.300493		RES,FXD,CMPSN:22 OHM,5%,0.50W	80009	301-0220-02
R400	307-1257-01			RES,FXD,FILM:1.1 OHM TO 20K OHM,2%,W/CONNECTORS	TK0191	307-1257-01
R500	311-1624-00			RES,VAR,NONWW:10K OHM,10%,0.25W	80009	311-1624-00
S90	260-2328-00			SWITCH,THRMSTC:60 DEG,3A,250V	TK0191	260-2328-00
S100	260-2323-00			SWITCH,PUSH:DPST,15A,250V,ON/OFF	TK0191	260-2323-00
S200	260-2297-00			SWITCH,ROTARY:HI-LO	TK0191	260-2297-00
S400	260-2324-00			SW,SENSITIVE:SPDT,3A,250VAC,INTERLOCK	TK0191	260-2324-00
S402	260-2324-00			SW,SENSITIVE:SPDT,3A,250VAC,INTERLOCK	TK0191	260-2324-00
S500	260-2329-00	.300000	.300811	SWITCH,ROTARY:ENCODER	TK0191	260-2329-00
S500	260-2396-00	.300812		SWITCH,ROTARY:ENCODER,5VDC,50UA	80009	260-2396-00
T100	120-1678-00	.300000	.300247	XFMR,PWR,STPDN:	TK0191	120-1678-00
T100	120-1678-01	.300248		XFMR,PWR,STU:100-120VAC IN,48-66HZ,7 CH	80009	120-1678-01
T200	120-1677-00			XFMR,PWR,STU:CLCT SUPPLY	TK0191	120-1677-00
V100	154-0895-00			ELECTRON TUBE:CRT,P31,INT SCALE	TK0191	154-0895-00
W14	196-3099-00			LEAD,ELECTRICAL:24 AWG,10.0 L	TK0191	196-3099-00
W16	196-3110-00			LEAD,ELECTRICAL:18 AWG,7.0 L,8-0	TK0191	196-3110-00
W17	196-3112-00			LEAD,ELECTRICAL:18 AWG,6.0 L,5-4	TK0191	196-3112-00
W18	196-3111-00			LEAD,ELECTRICAL:18 AWG,7.0 L,8-9	TK0191	196-3111-00
W64	174-0301-00			CA ASSY,SP,ELEC:4,22 AWG,16.0 L	TK0191	174-0301-00
W66	174-0304-00			CA ASSY,SP,ELEC:2,26 AWG,6.0 L,RIBBON	TK0191	174-0304-00
W72	174-0310-00			CA ASSY,SP,ELEC:10,22 AWG,18.0 L,RIBBON	TK0191	174-0310-00
W88	196-3100-00			LEAD,ELECTRICAL:22 AWG,9.5 L,9-N	TK0191	196-3100-00
W93	174-0325-00			CA ASSY,SP,ELEC:2,26 AWG,7.0 L,RIBBON	TK0191	174-0325-00
W95	174-0298-00			CA ASSY,SP,ELEC:2,26 AWG,4.0 L,RIBBON	TK0191	174-0298-00
W96	196-3101-00			LEAD,ELECTRICAL:22 AWG,5.0 L,9-N	TK0191	196-3101-00
W97	174-0323-00			CA ASSY,SP,ELEC:3,26 AWG,6.5 L,RIBBON	80009	174-0323-00
W98	174-0299-00			CA ASSY,SP,ELEC:6,26 AWG,8.3 L,RIBBON	TK0191	174-0299-00
W103	198-5557-00	.300000	.301002	WIRE SET,ELEC:	TK0191	198-5557-00
W103	198-5557-01	.301003		WIRE SET,ELEC:	80009	198-5557-01
W105	196-3102-00	.300000	.301002	LEAD,ELECTRICAL:18 AWG,0.5 L,8-0	TK0191	196-3102-00
W105	196-3102-01	.301003		LEAD,ELECTRICAL:18 AWG,10.5 L,8-0	80009	196-3102-01
W106	174-0321-00			CA ASSY,SP,ELEC:3,26 AWG,14.0 L,RIBBON	TK0191	174-0321-00
W111	196-3096-00			LEAD,ELECTRICAL:18 AWG,3.5 L,5-4	TK0191	196-3096-00
W112	196-3097-00			LEAD,ELECTRICAL:18 AWG,5.5 L,5-4	TK0191	196-3097-00

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Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
W142	174-0317-00			CA ASSY,SP,ELEC:3,26 AWG,3.0 L,RIBBON	TK0191	174-0317-00
W144	174-0316-00			CA ASSY,SP,ELEC:6,26 AWG,14.0 L,RIBBON	TK0191	174-0316-00
W160	196-3104-00			LEAD,ELECTRICAL:22 AWG,11.0 L,9-N	TK0191	196-3104-00
W162	196-3103-00			LEAD,ELECTRICAL:22 AWG,11.0 L,9-2	TK0191	196-3103-00
W164	196-3105-00			LEAD,ELECTRICAL:22 AWG,11.0 L,9-4	TK0191	196-3105-00
W166	196-3106-00			LEAD,ELECTRICAL:22 AWG,11.0 L,9-6	TK0191	196-3106-00
W167	174-0305-00			CA ASSY,SP,ELEC:2,26 AWG,8.0 L,RIBBON	TK0191	174-0305-00
W168	174-0315-00			CA ASSY,SP,ELEC:7,26 AWG,24.0 L,RIBBON (FROM A16J168 TO A60J168A)	TK0191	174-0315-00
W169	174-0306-00			CA ASSY,SP,ELEC:2,26 AWG,14.0 L,RIBBON	TK0191	174-0306-00
W170	196-3107-00			LEAD,ELECTRICAL:22 AWG,8.0 L,9-N	TK0191	196-3107-00
W172	196-3108-00			LEAD,ELECTRICAL:22 AWG,14.0 L,9-2	TK0191	196-3108-00
W180	174-0314-00			CA ASSY,SP,ELEC:9,26 AWG,7.5 L,RIBBON	TK0191	174-0314-00
W182	174-0309-00			CA ASSY,SP,ELEC:10,22 AWG,5.0 L,RIBBON	TK0191	174-0309-00
W190	174-0328-00			CA ASSY,SP,ELEC:4,18 AWG,15.5 L	TK0191	174-0328-00
W194	174-0308-00			CA ASSY,SP,ELEC:6,22 AWG,20.0 L,RIBBON	TK0191	174-0308-00
W221	196-3098-00			LEAD,ELECTRICAL:18 AWG,7.0L,5-4	TK0191	196-3098-00
W240	174-0297-00			CA ASSY,SP,ELEC:34,28 AWG,13.0 L,RIBBON	TK0191	174-0297-00
W270	174-0327-00			CA ASSY,SP,ELEC:2,18 AWG,7.0 L	TK0191	174-0327-00
W280	174-0313-00			CA ASSY,SP,ELEC:2,26 AWG,30.0 L,RIBBON	TK0191	174-0313-00
W290	174-0312-00			CA ASSY,SP,ELEC:2,26 AWG,22.0 L,RIBBON	TK0191	174-0312-00
W308	174-0300-00			CA ASSY,SP,ELEC:1,24 AWG,6.3 L,	TK0191	174-0300-00
W400	174-0296-00			CA ASSY,SP,ELEC:34,28 AWG,5.5 L,RIBBON	TK0191	174-0296-00
W410	174-0307-00			CA ASSY,SP,ELEC:8,22 AWG,10.5 L,RIBBON	TK0191	174-0307-00
W412	174-1008-00			CA ASSY,SP,ELEC:12,22 AWG,15.0 L	80009	174-1008-00
W414	174-0311-00			CA ASSY,SP,ELEC:8,22 AWG,5.0 L,RIBBON	TK0191	174-0311-00
W600	198-5593-00	.300298		WIRE SET,ELEC:370 (FROM A10J168 TO A60J168B)	TK0191	ORDER BY DESCR
W660	174-0304-00			CA ASSY,SP,ELEC:2,26 AWG,6.0 L,RIBBON	TK0191	174-0304-00
W934	174-0325-00			CA ASSY,SP,ELEC:2,26 AWG,7.0 L,RIBBON	TK0191	174-0325-00

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Schematic 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/IEEE Std 91-1984 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:

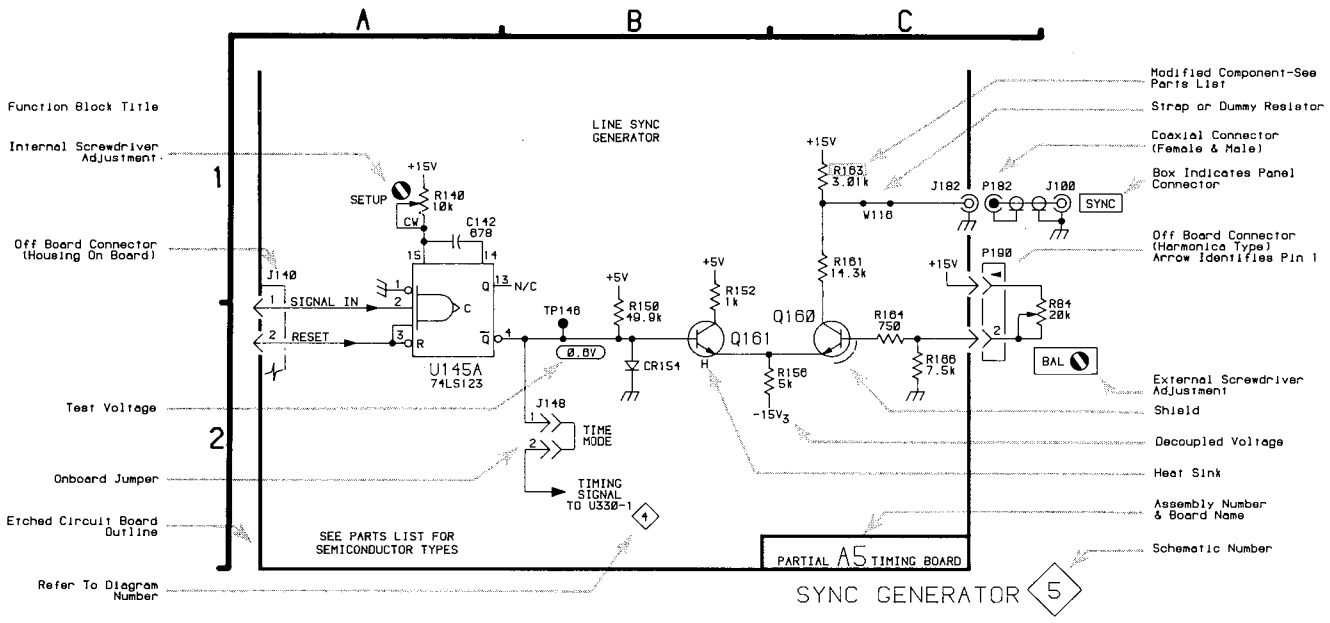
Capacitors =	Values one or greater are in picofarads (pF). Values less than one are in microfarads (μF).
Resistors =	Ohms (Ω).

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.

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.



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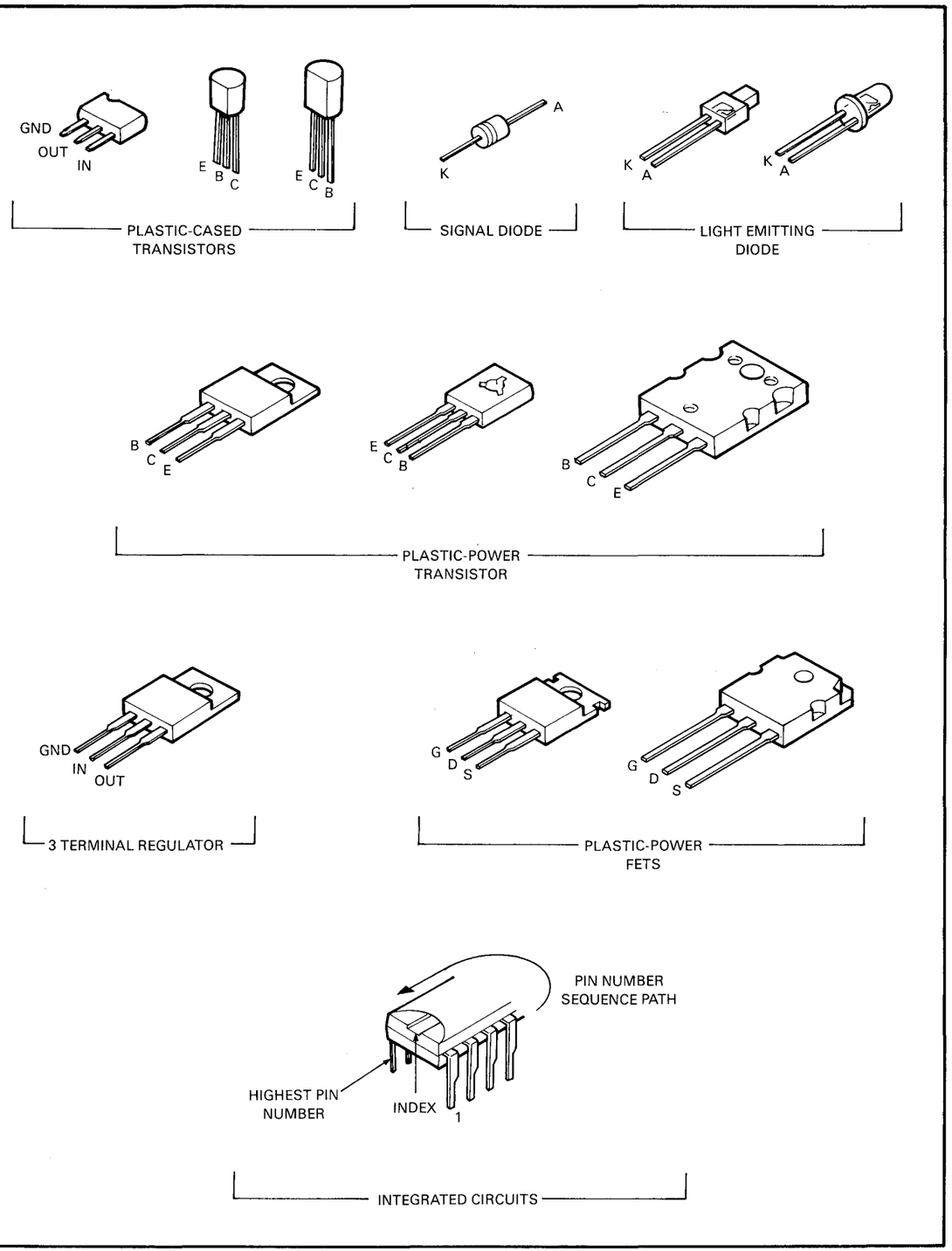
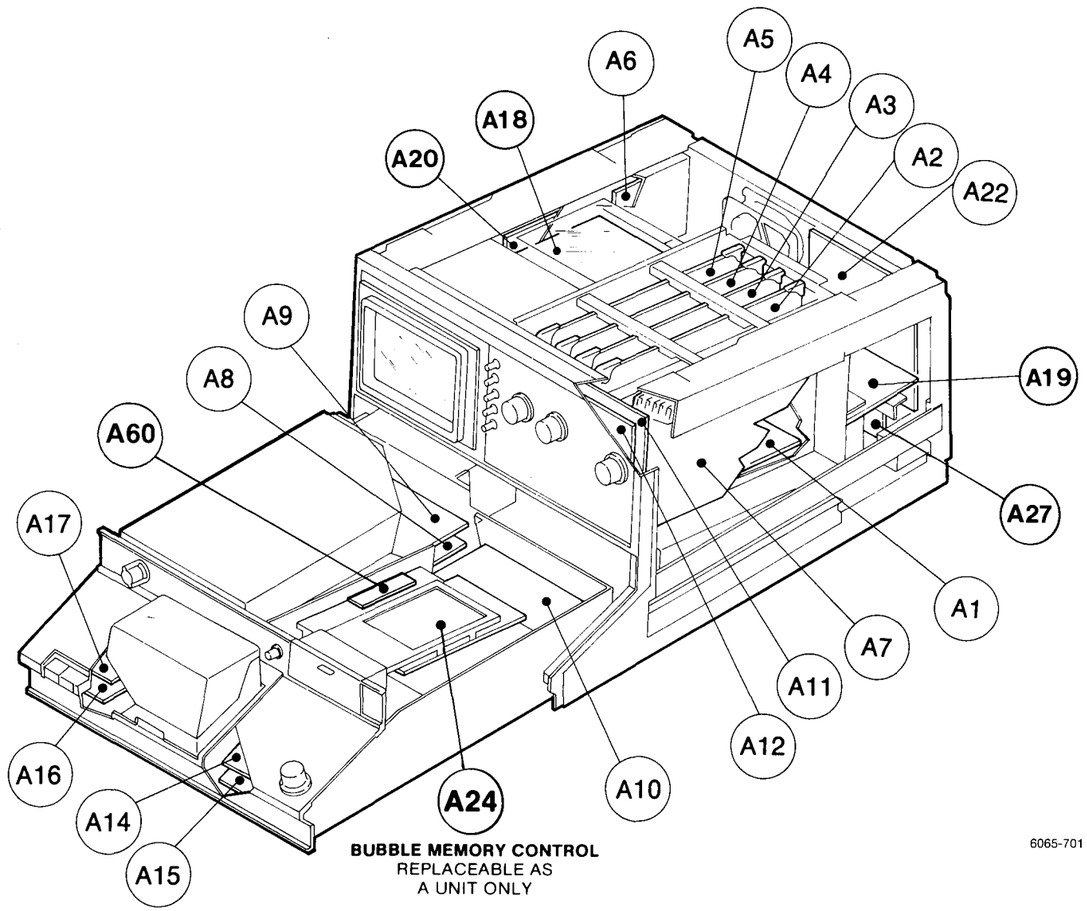


Figure 7-1. Semiconductor Lead Configurations.



ASSEMBLY NUMBER	DIAGRAM NUMBER(S)	ASSEMBLY NUMBER	DIAGRAM NUMBER(S)
A1	1	A14	18
A2	2 & 3	A15	18
A3	4 & 5	A16	14 & 15
A4	6 & 7	A17	15
A5	8 & 9	A18	19
A6	10	A19	10 & 20
A7	11	A20	21
A8	12 & 13	A22	22
A9	13	A24	NO SCHEMATIC
A10	12 , 14 & 15	A27	20
A11	16	A60	15
A12	17		

Figure 7-2. 370 Circuit Board Locator.

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Circuit Board Interconnections 1

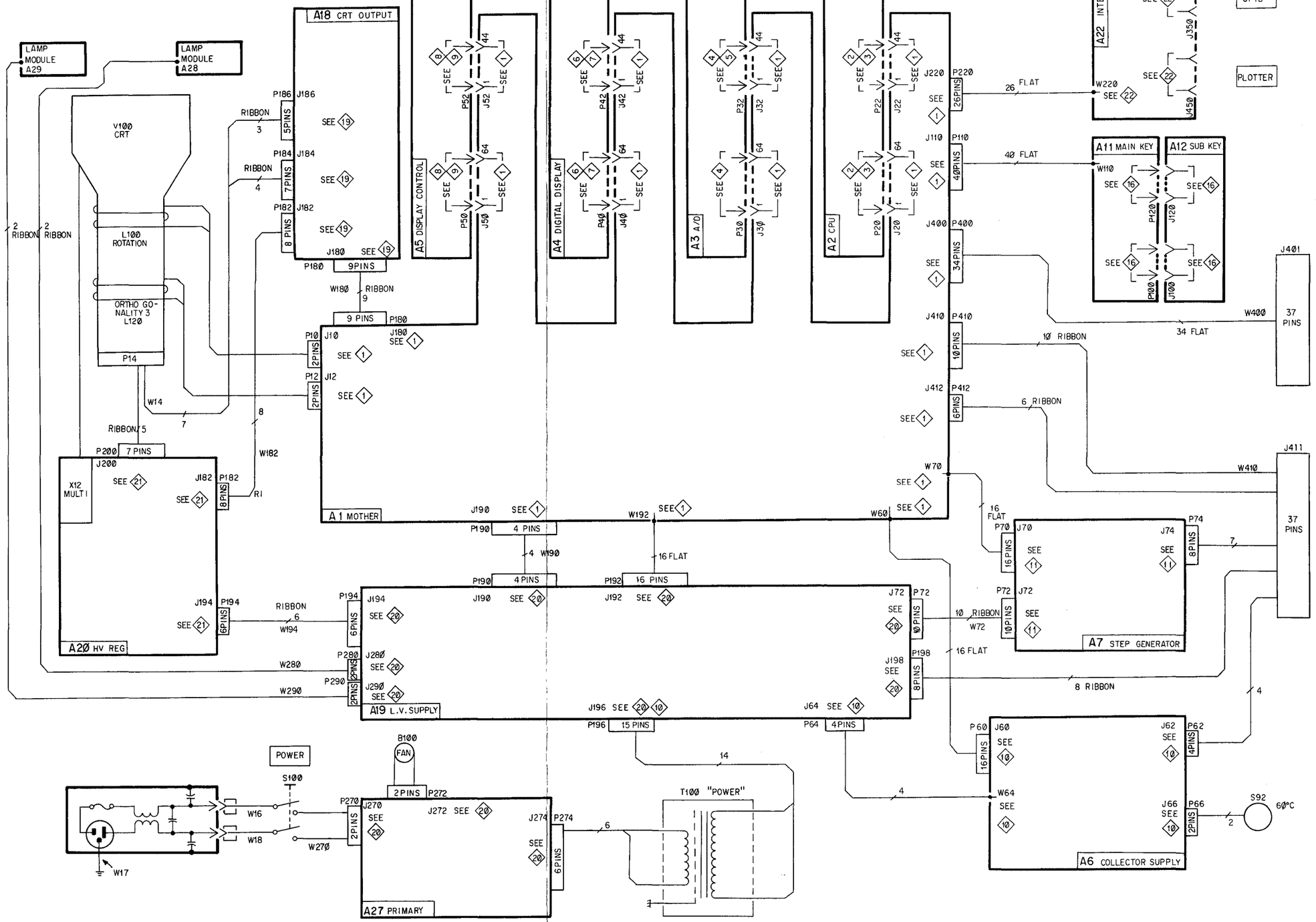

Figure 7-3. Circuit Board Interconnections 1.

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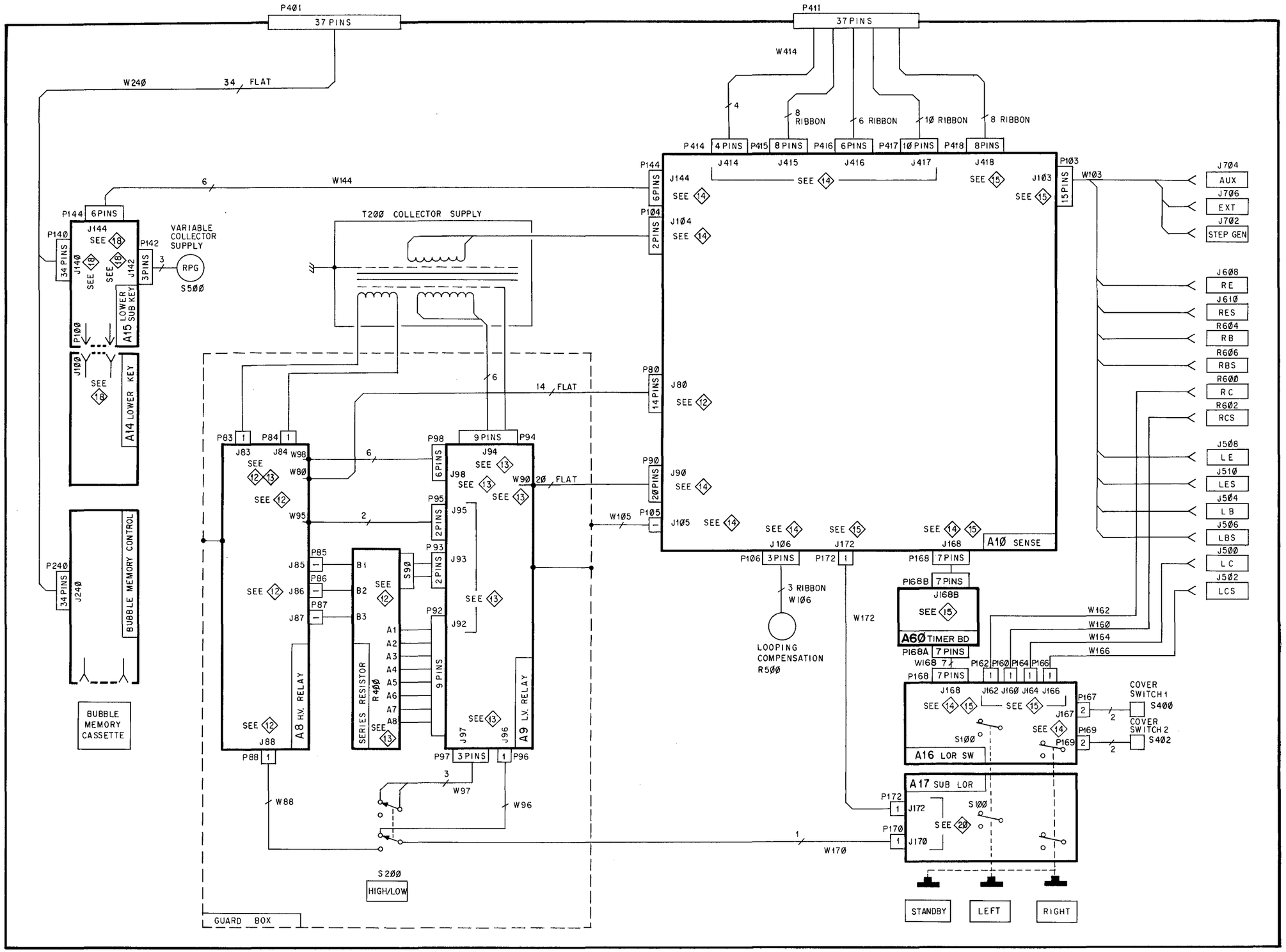

Figure 7-4. Circuit Board Interconnections 2.

CIRCUIT BOARD INTERCONNECTIONS 2

6065-703

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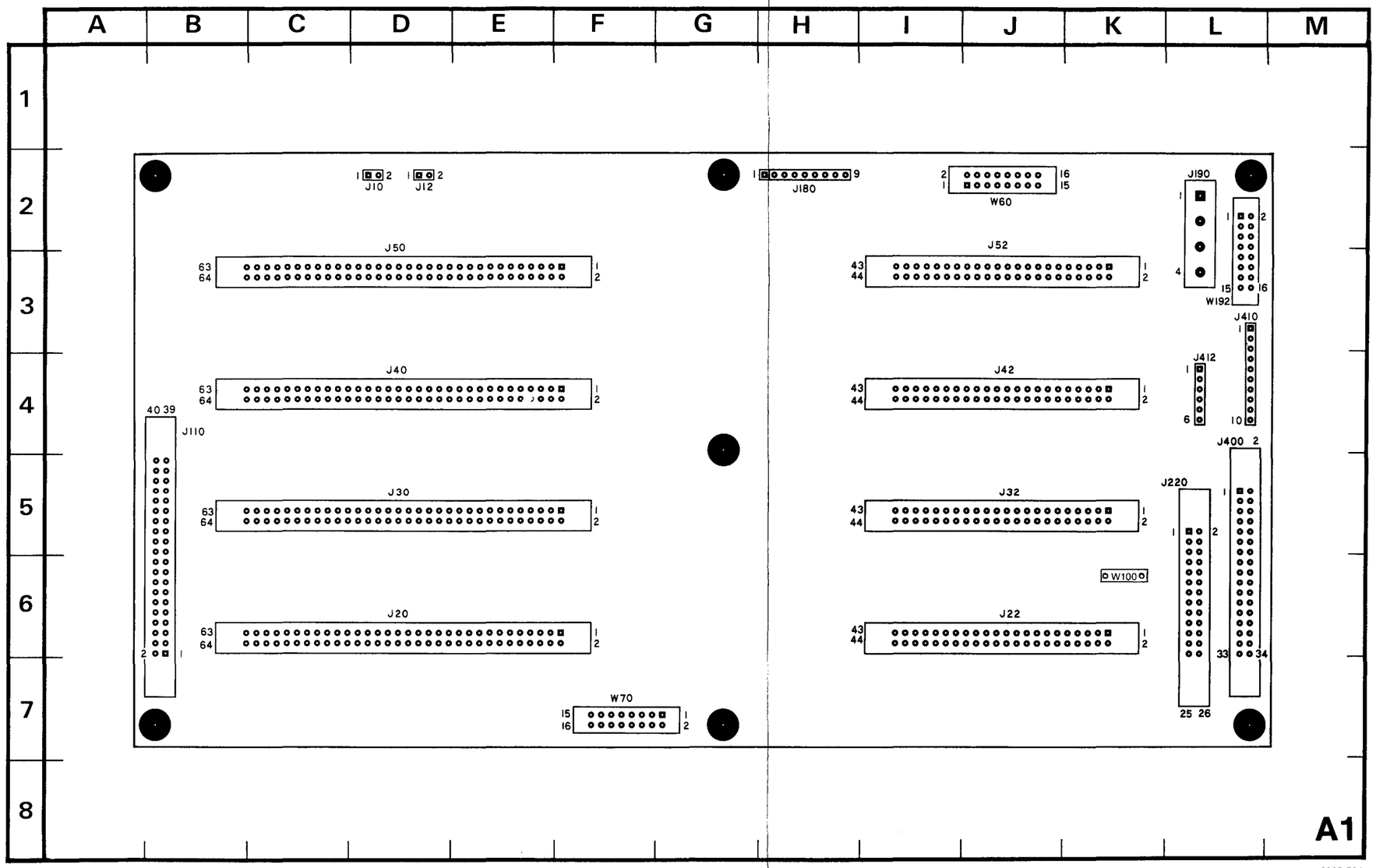

6065-704

Figure 7-5. A1—Interconnection circuit board assembly.

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE

Component Number
A23 A2 R1234
Assembly Number — *Subassembly Number (if used)* — *Schematic Circuit Number*

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

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INTERCONNECTION ◇1

ASSEMBLY A1

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
J10	A1	D2	J50	B4	D2	J412	E1	L4
J12	A2	D2	J52	B2	J2			
J20	D4	D6	J110	E2	B4	W60	A4	J2
J22	D2	J6	J180	A3	H2	W70	A5	F7
J30	C4	D5	J190	A7	L2	W192	A2	L3
J32	C2	J5	J220	E6	L5			
J40	C4	D4	J400	E4	L4			
J42	C2	J4	J410	A6	L3			

CHASSIS MOUNTED PARTS

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
J401	E4	CHASSIS	L100	A1	CHASSIS	P401	E4	CHASSIS
J411	A6, E1	CHASSIS	L120	A2	CHASSIS	P411	A6, E1	CHASSIS

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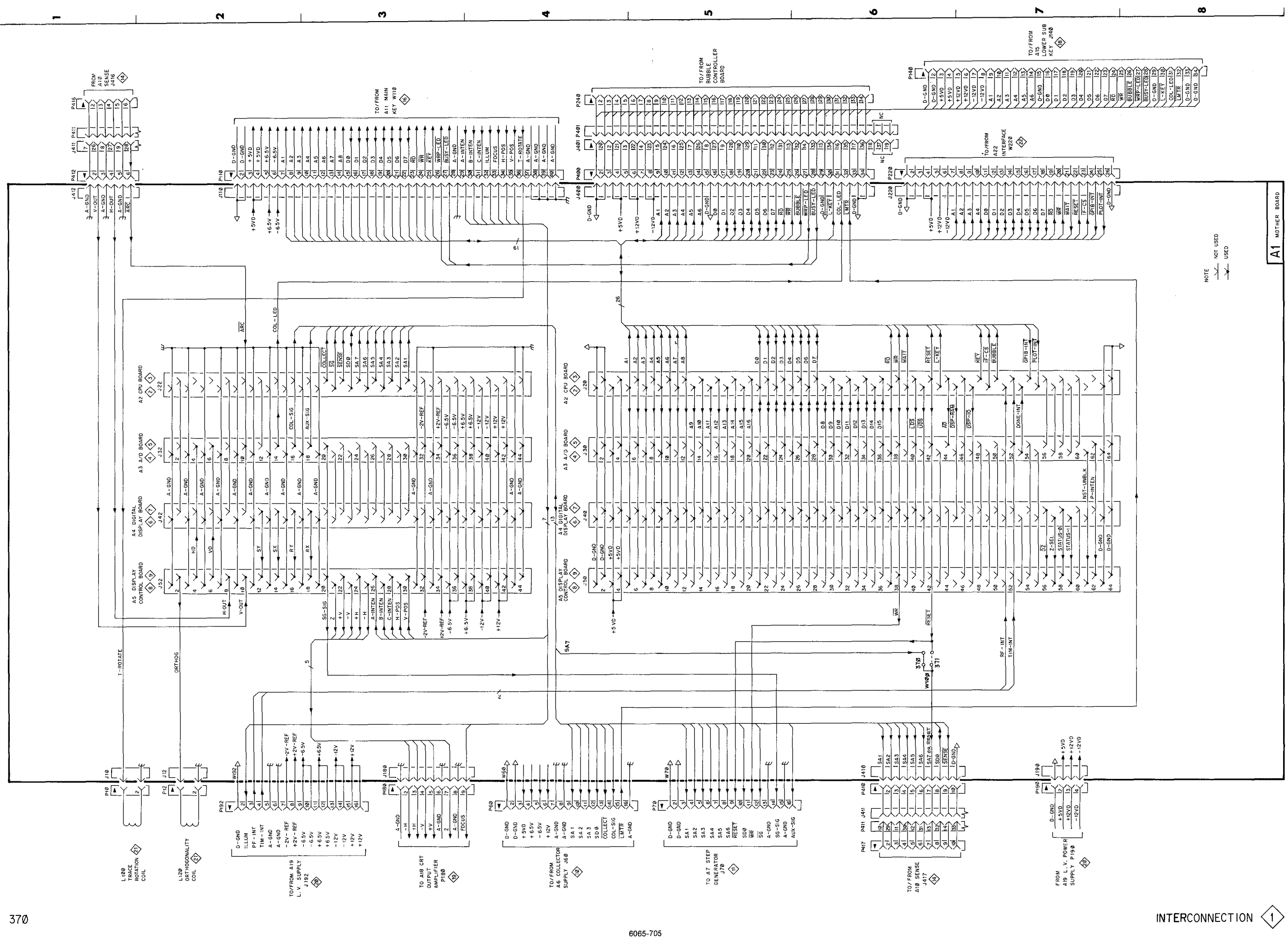

1 Interconnections | Reverse Side A2

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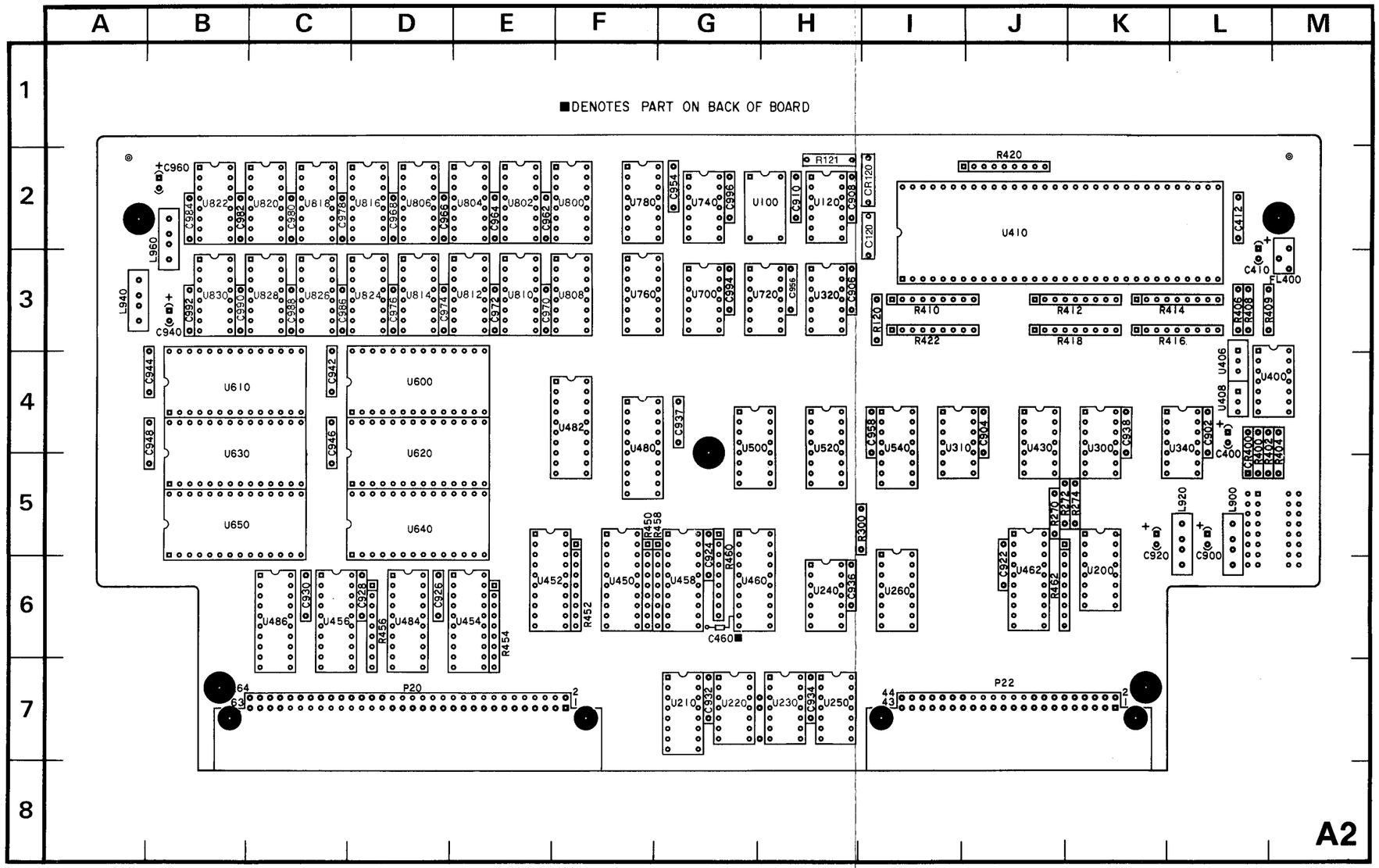
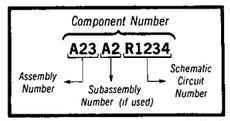


SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OR PARTS OUTLINED OR DEPICTED IN GREY.

Figure 7-6. A2—CPU circuit board assembly.

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



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

A2—CPU circuit board illustration to be used with diagrams 2 *and* 3

Assembly A2

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MPU 2

ASSEMBLY A2

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C120	B4	I2
C400	C5	L4
C410	D3	L3
C412	E3	L2
C460	A2	G6
C900	B5	L5
C902	B5	L4
C904	B5	J4
C906	B5	H3
C908	B5	H2
C910	B5	H2
C920	B5	K5
C922	B5	J6
C924	B5	G6
C926	B5	D6
C928	B5	D6
C930	B5	C6
C932	B5	G7
C934	B5	H7
C936	B5	H6
C937	B5	G4
C938	B5	K4
C940	B5	B3
C942	B5	C4
C944	B5	B4
C946	B5	C4
C948	B5	B4
C954	B5	G2
C956	B5	H3
C958	B5	I4
C960	B5	B2
C962	B5	E2
C964	B5	E2
C966	B5	D2
C968	B5	D2
C970	B5	E3
C972	B5	E3
C974	B5	D3
C976	B5	D3
C978	B5	C2
C980	B5	C2
C982	B5	B2
C984	B5	B2
C986	B5	C3
C988	B5	C3
C990	B5	B3
C992	B5	B3
C994	B5	G3
C996	B5	G2

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
CR120	B4	I2
CR400	C5	L4
FL400	D3	M3
L900	A5	L5
L920	A5	L5
L940	A5	A3
L960	A5	B2
P20	A1, H1, H3	D7
P22	H2	J7
R120	C4	I3
R121	B4	H2
R270	D1	J5
R272	D1	J5
R274	D1	K5
R300	A3	I5
R400	C5	L4
R402	C5	L4
R404	C5	M4
R406	D5	L3
R408	D5	L3
R409	C4	L3
R410A	E3	I3
R410B	E3	I3
R410C	E3	I3
R410D	E3	I3
R410E	E3	I3
R410F	E4	I3
R410G	E4	I3
R410H	E4	I3
R412	E5	K3
R414B	D2	L3
R414C	D2	L3
R414D	D2	L3
R414E	E1	L3
R414F	E1	L3
R414G	E1	L3
R414H	E1	L3
R416	F1	L3
R418	F2	K3
R420A	F4	J2
R420B	F4	J2
R420C	F4	J2
R420F	E2	J2
R420G	E2	J2
R420H	E2	J2

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
R422	F3	I3
R450	G1	F5
R452	H1	F6
R454	G3	E6
R456	H3	D6
R458	H5	G5
R460	B1	G6
R462	G2	J6
U100	A4	H2
U120A	B4	H2
U120B	B4	H2
U200	D3	K6
U210	D3	G7
U220	C3	G7
U230	C3	H7
U240A	C1	H6
U240B	C1	H6
U250A	C2	H7
U250B	C2	H7
U260	D1	I6
U300A	C3	K4
U300B	C3	K4
U300D	C4	K4
U310A	C4	I4
U310B	C4	I4
U320A	D4	H3
U320B	D4	H3
U340A	B2	L4
U340B	B2	L4
U400A	C5	M4
U400B	C5	M4
U400D	C5	M4
U406	D5	L4
U408	D5	L4
U410	E1	J2
U430A	F5	J4
U430B	F4	J4
U430C	F5	J4
U430D	F4	J4
U450	F1	F6
U452	G1	E6
U454	F4	E6
U456	G3	C6
U458	G5	G6
U460	B2	G6
U462	F2	J6

MEMORY 3

ASSEMBLY A2

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
P20	I1	D7
P22	I2	J7
U300C	B2	K4
U400C	C3	M4
U480	B3	F4
U482	B4	F4
U484	A3	D6
U486	A4	C6
U500A	A2	G4
U500B	B2	G4
U520	A1	H4
U540	B1	I4
U600	E1	D4
U610	F1	B4

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
U620	G1	D5
U630	G1	B5
U640	H1	D5
U650	I1	B5
U700A	C2	G3
U700B	C2	G3
U720A	D2	H3
U720B	D1	H3
U720C	C1	H3
U720D	C2	H3
U740A	D1	G2
U740B	D2	G2
U760	C3	F3
U780	C4	F2
U800	D3	F2

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
U802	E3	E2
U804	E3	E2
U806	F3	D2
U808	G3	F3
U810	G3	E3
U812	H3	E3
U814	I3	D3
U816	D4	D2
U818	E4	C2
U820	E4	C2
U822	F4	B2
U824	G4	D3
U826	G4	C3
U828	H4	C3
U830	I4	B3

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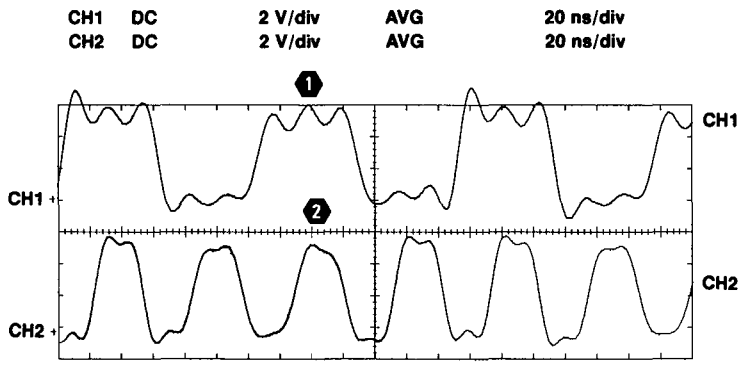
WAVEFORM CONDITIONS

The waveforms shown below apply regardless of 370 settings.

Waveform Conditions. The waveforms shown below were obtained using a test oscilloscope with 1 Megohm input impedance (TEKTRONIX 2430 oscilloscope with plotter).



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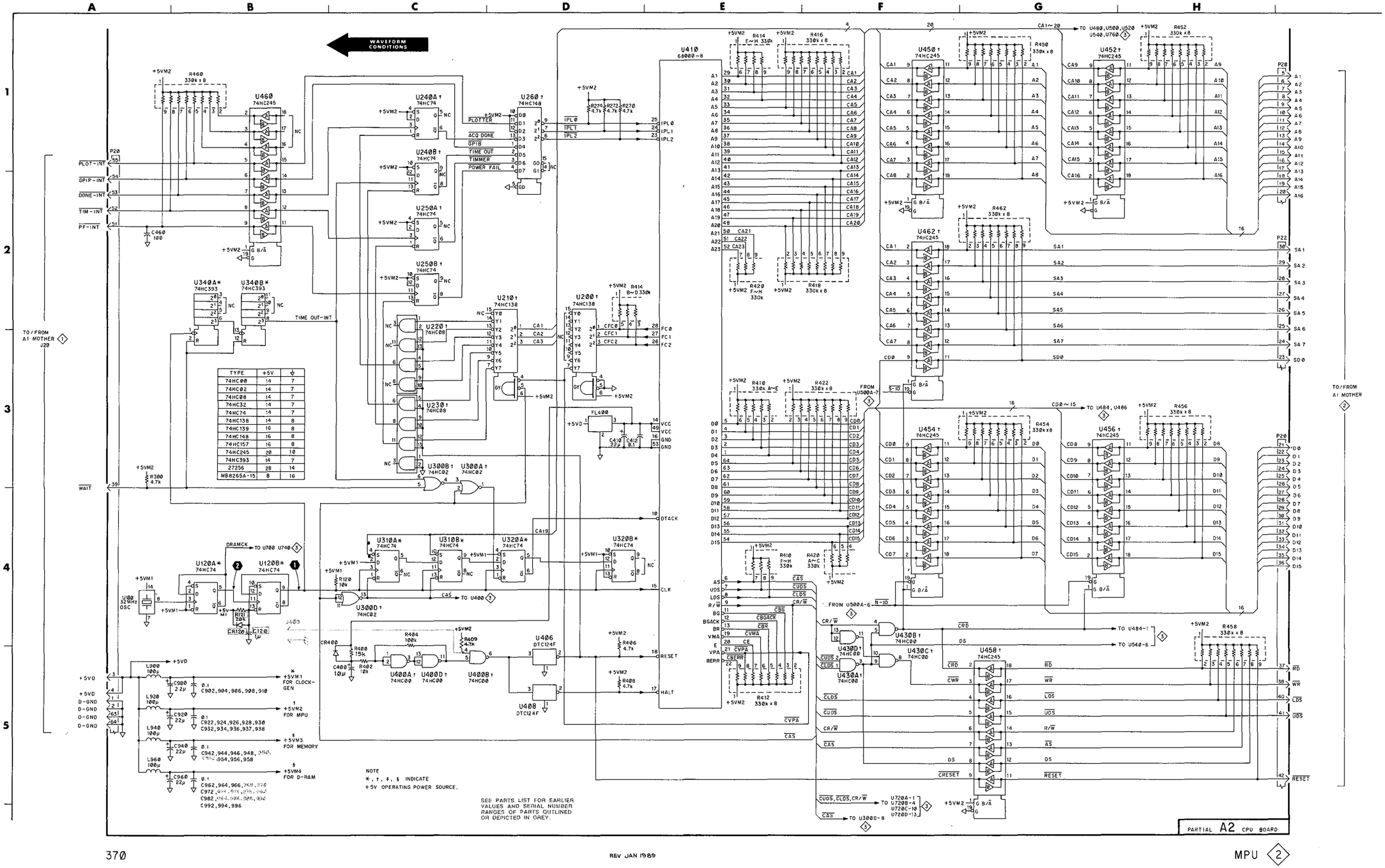

TYPE	+5V	⏚
74HC00	14	7
74HC02	14	7
74HC08	14	7
74HC32	14	7
74HC74	14	7
74HC138	14	8
74HC139	16	8
74HC148	16	8
74HC157	16	8
74HC245	20	10
74HC393	14	7
27256	28	14
MB8265A-15	8	16

NOTE
*, †, ‡, § INDICATE +5V OPERATING POWER SOURCE.

SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.

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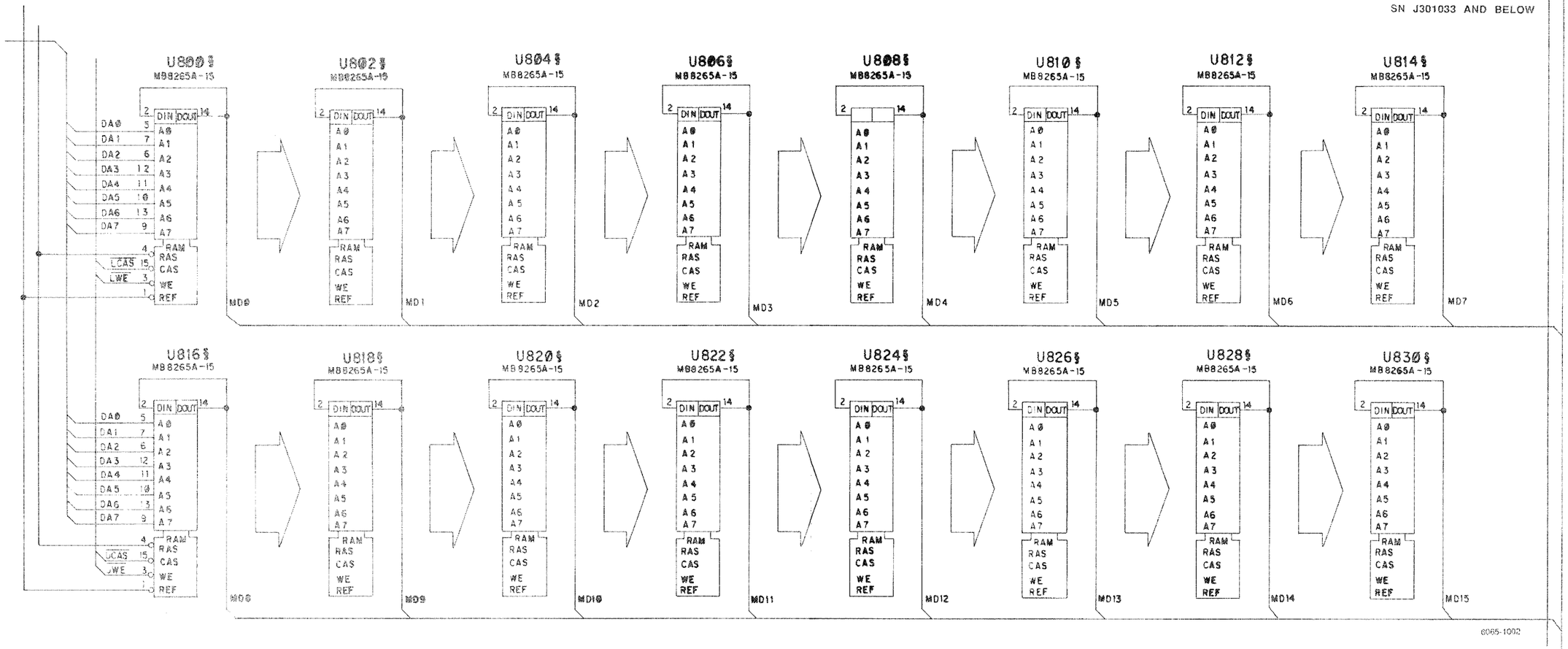
SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OR PARTS OUTLINED OR DEPICTED IN GREY.

SN J301033 AND BELOW



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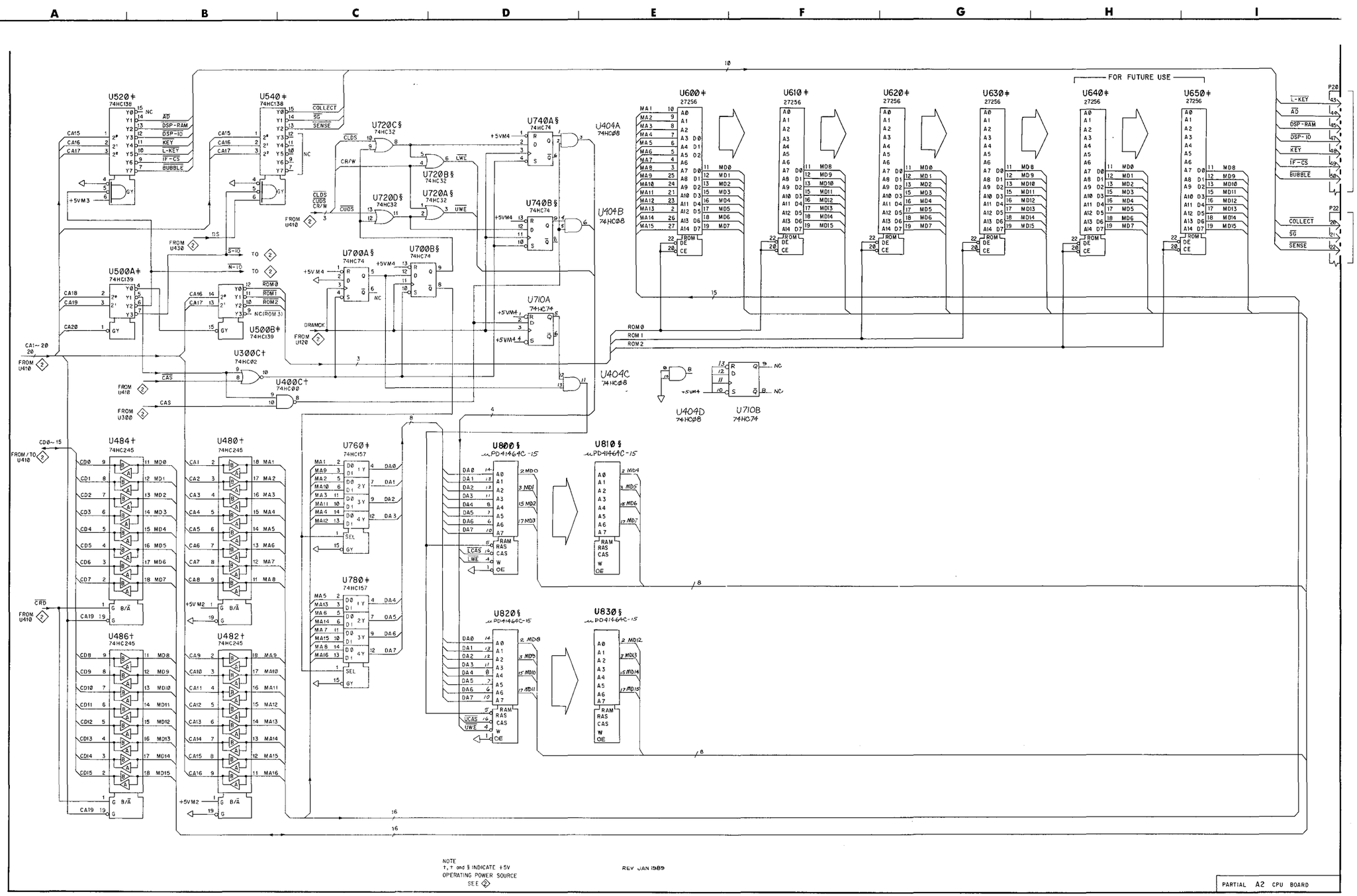


Scan by Zenith

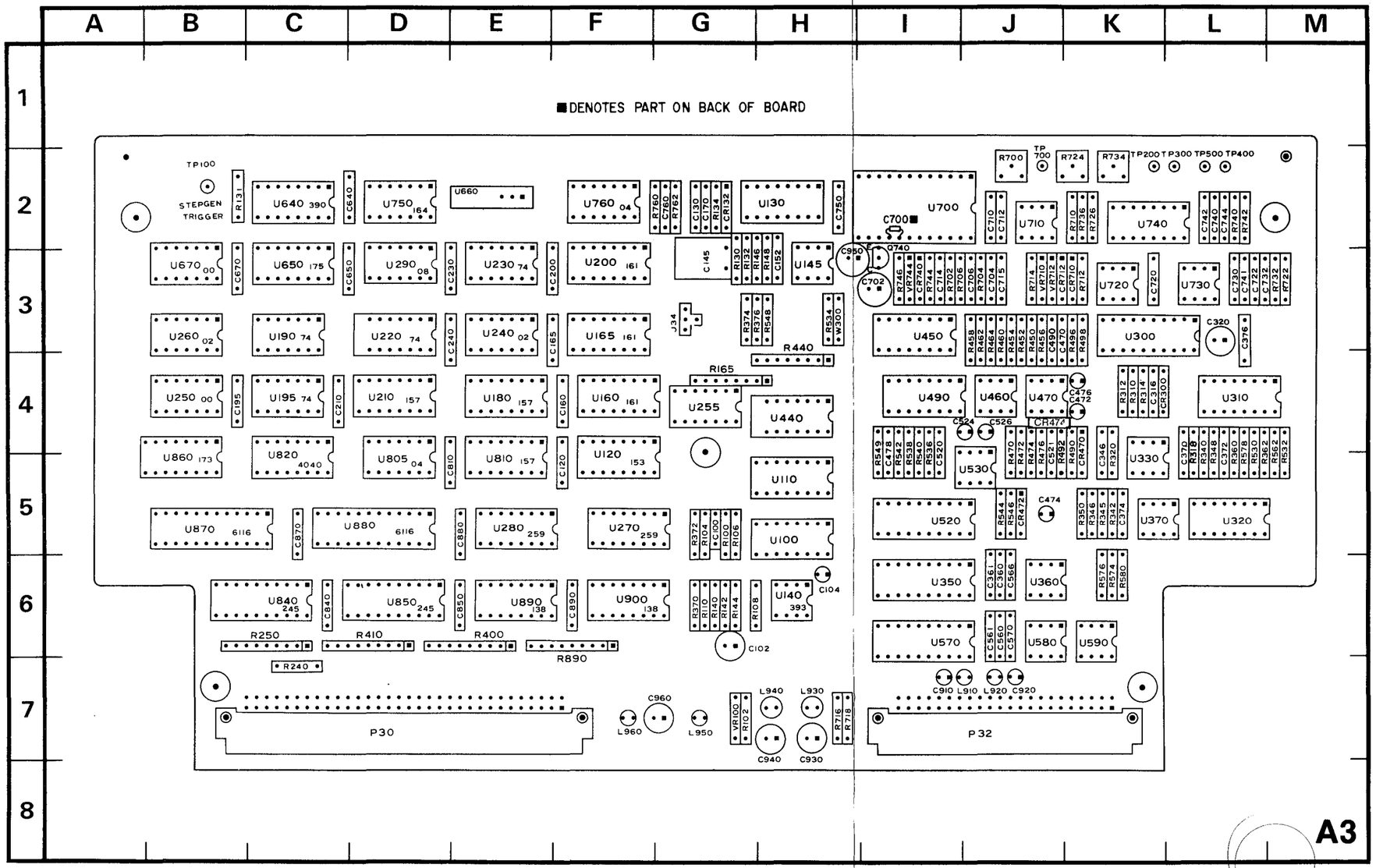
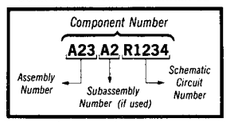


Figure 7-7. A3—A/D circuit board assembly.

A3—A/D circuit board illustration to be used with diagrams 4 *and* 5

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



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

ASSEMBLY A3

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C100	A2	G5
C102	B2	H6
C104	B1	H6
C120	A4	F5
C130	A4	G2
C145	D2	G3
C152	D3	H3
C160	A4	F4
C165	A4	E3
C170	C2	G2
C195	A4	B4
C200	A4	E3
C210	A4	C4
C230	A4	E3
C240	A4	E3
C316	G4	K4
C320	G4	L3
C346	I4	K5
C360	I4	J6
C361	H4	J6
C370	A3	L5
C372	A3	L5
C374	A3	K5
C376	A3	L3
C470	H2	J3
C472	G2	K4
C474	G2	J5
C476	H1	K4
C478	A3	I5
C490	A3	J3
C520	I2	I5
C521	H2	J5
C524	I2	J4
C526	I2	J4
C560	I5	J6
C561	H5	J6
C566	A3	J6
C570	A4	J6
C640	A4	D2
C650	A4	D3
C670	A4	B3
C740	A3	L2
C742	A3	L2
C744	A3	L2
C810	A4	E5
C840	A4	C6
C850	A4	E6
C870	A4	C5
C880	A4	E5
C890	A4	F6
C910	A2	I7
C920	A3	J7
C930	A3	H8
C940	A3	H8
C950	A4	H3
C960	A4	G7
CR132	D2	G2
CR300	G3	K4
CR470	G2	K5
CR472	H2	J5
CR474	G2	J4
J34	C4	G3
L910	A2	J7
L920	A3	J7
L930	A3	H7
L940	A3	H7
L950	A4	G7
L960	A4	F7
P30	A2, A4, J1, J3	D7
P32	A1, A2, J3	J7
R100	A1	G5
R102	A1	G7
R104	A2	G5
R106	B2	G5
R108	B2	J5
R110	A1	H6
R130	F2	
R131	E3	
R132	D2	
R134	C2	
R140	B1	
R142	B1	
R144	B1	
R146	D2	
R148	D2	
R165	D3	
R250A	E2	
R250B	E2	
R250C	H3	
R250D	E2	
R250E	C1	
R250F	E1	
R250G	D2	
R250H	E1	
R310	G4	
R312	G4	
R314	G4	
R318	G3	
R320	G4	
R340	I4	
R342	I3	
R345	I4	
R346	I4	
R348	I3	
R350	I4	
R360	I4	
R362	I3	
R370	G5	
R372	H3	
R374	H3	
R376	G3	
R400	A5	
R410	A5	
R440	F1	
R450	G1	
R452	G1	
R454	G1	
R456	G2	
R458	G2	
R460	G2	
R462	G2	
R464	G2	
R470	F2	
R472	F2	
R476	G2	
R490	G2	
R492	G2	
R494	G2	
R496	G2	
R498	H1	
R530	J2	
R532	J2	
R534	H1	
R536	H2	
R538	I2	
R540	I2	
R542	I1	
R544	I2	
R546	I2	
R548	I2	
R549	I2	
R562	I5	
R574	H5	
R576	G5	
R578	I5	
R580	H5	
R890	A5	
TP100	E3	
TP200	I3	
TP300	I3	
TP400	J2	
TP500	I5	

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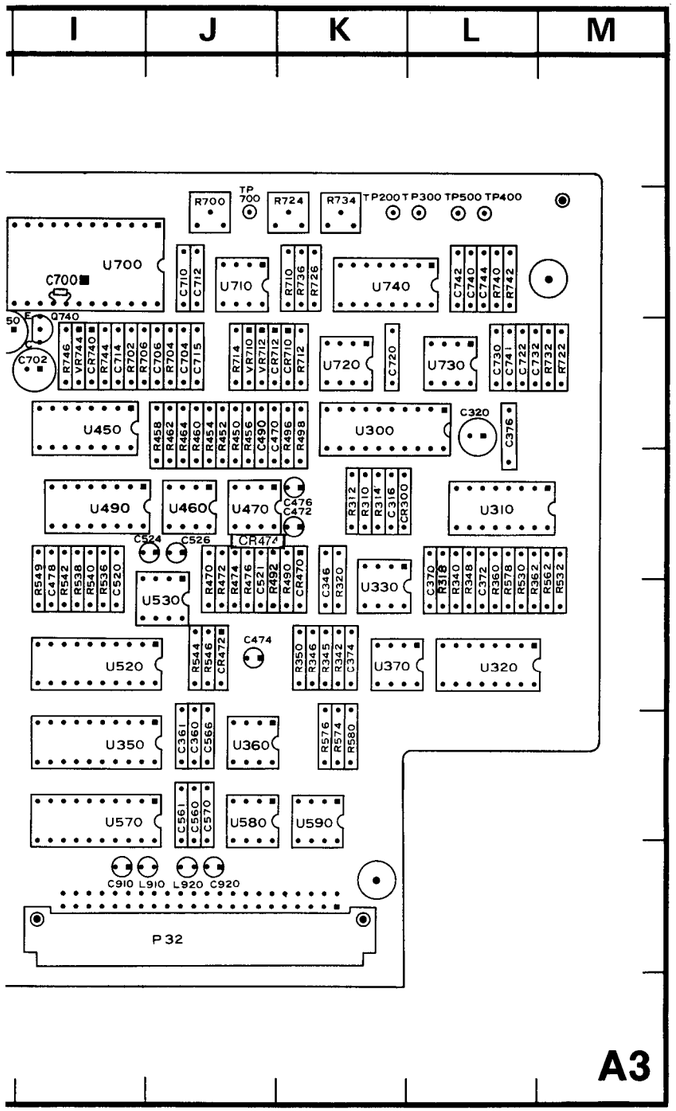

6065-709

4 and 5

GENERATOR 4

ASSEMBLY A3

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C100	A2	G5
C102	B2	H6
C104	B1	H6
C120	A4	F5
C130	A4	G2
C145	D2	G3
C152	D3	H3
C160	A4	F4
C165	A4	E3
C170	C2	G2
C195	A4	B4
C200	A4	E3
C210	A4	C4
C230	A4	E3
C240	A4	E3
C316	G4	K4
C320	G4	L3
C346	I4	K5
C360	I4	J6
C361	H4	J6
C370	A3	L5
C372	A3	L5
C374	A3	K5
C376	A3	L3
C470	H2	J3
C472	G2	K4
C474	G2	J5
C476	H1	K4
C478	A3	I5
C490	A3	J3
C520	I2	I5
C521	H2	J5
C524	I2	J4
C526	I2	J4
C560	I5	J6
C561	H5	J6
C566	A3	J6
C570	A4	J6
C640	A4	D2
C650	A4	D3
C670	A4	B3
C740	A3	L2
C742	A3	L2
C744	A3	L2
C810	A4	E5
C840	A4	C6
C850	A4	E6
C870	A4	C5
C880	A4	E5
C890	A4	F6
C910	A2	I7
C920	A3	J7
C930	A3	H8
C940	A3	H8
C950	A4	H3
C960	A4	G7
CR132	D2	G2
CR300	G3	K4
CR470	G2	K5
CR472	H2	J5
CR474	G2	J4
J34	C4	G3
L910	A2	J7
L920	A3	J7
L930	A3	H7
L940	A3	H7
L950	A4	G7
L960	A4	F7
P30	A2, A4, J1, J3	D7
P32	A1, A2, J3	J7
R100	A1	G5
R102	A1	G7
R104	A2	G5
R106	B2	G5
R108	B2	G6
R110	A1	G6
R130	F2	G3
R131	E3	B2
R132	D2	G3
R134	C2	G2
R140	B1	G6
R142	B1	G6
R144	B1	G6
R146	D2	G3
R148	D2	H3
R165	D3	G4
R250A	E2	C6
R250B	E2	C6
R250C	H3	C6
R250D	E2	C6
R250E	C1	C6
R250F	E1	C6
R250G	D2	C6
R250H	E1	C6
R310	G4	K4
R312	G4	K4
R314	G4	K4
R318	G3	L5
R320	G4	K5
R340	I4	L5
R342	I3	K5
R345	I4	K5
R346	I4	K5
R348	I3	L5
R350	I4	K5
R360	I4	L5
R362	I3	L5
R370	G5	G6
R372	H3	G5
R374	H3	G3
R376	G3	G3
R400	A5	E6
R410	A5	D6
R440	F1	H3
R450	G1	J3
R452	G1	J3
R454	G1	J3
R456	G2	J3
R458	G2	J3
R460	G2	J3
R462	G2	J3
R464	G2	J3
R470	F2	J5
R472	F2	J5
R476	G2	J5
R490	G2	K5
R492	G2	J5
R494	G2	J5
R496	G2	K3
R498	H1	K3
R530	J2	L5
R532	J2	M5
R534	H1	H3
R536	H2	I5
R538	I2	I5
R540	I2	I5
R542	I1	I5
R544	I2	J5
R546	I2	J5
R548	I2	H3
R549	I2	I5
R562	I5	M5
R574	H5	K6
R576	G5	K6
R578	I5	L5
R580	H5	K6
R890	A5	F7
TP100	E3	B2
TP200	I3	K2
TP300	I3	L2
TP400	J2	L2
TP500	I5	L2
U100	B1	H5
U110	B1	H5
U120	C3	F5
U130A	D2	H2
U130B	E2	H2
U140A	B1	H6
U140B	B1	H6
U145	D2	H3
U160	D4	F4
U165	D3	F3
U180	C4	E4
U190A	C5	C3
U190B	C5	C3
U195A	D1	C4
U195B	D5	C4
U200	F3	F3
U210	E4	D4
U220B	F4	D3
U230B	F4	E3
U240A	F3	E3
U240B	F4	E3
U240C	F4	E3
U250A	E1	B4
U250B	D2	B4
U250C	C1	B4
U250D	E3	B4
U255A	C3	G4
U255B	E2	G4
U260A	E2	B3
U260B	D1	B3
U260C	D1	B3
U260D	E2	B3
U260E	D1	B3
U270	B3	F5
U280	B4	E5
U290A	E3	D3
U290B	E2	D3
U300	G4	K3
U310A	G3	L4
U310B	G4	L4
U310C	H3	L4
U320A	H3	L5
U320B	H5	L5
U320C	H4	L5
U330	G3	K5
U350	H4	I6
U360	I4	J6
U370	I3	K5
U440A	F2	H4
U440B	F1	H4
U440C	F1	H4
U440D	F2	H4
U450	G1	I3
U460A	F2	J4
U460B	F2	J4
U470A	H2	J4
U470B	G2	J4
U490A	G1	I4
U490B	H1	I4
U490C	I2	I4
U520	H2	I5
U530A	I1	J5
U530B	I2	J5
U570	H5	I6
U580	I5	J6
U590A	H4	K6
U590B	H5	K6
U805B	C4	D5
U805F	C2	D5
U900	B5	F6
VR100	A1	G7
W300	A4	H3

ACQUISITION 5

ASSEMBLY A3

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C700	E1	I2
C702	E1	I3
C704	E1	J3
C706	E1	J3
C710	C1	J2
C712	C2	J2
C714	E1	I3
C715	E1	J3
C720	B1	K3
C722	A1	L3
C730	B1	L3
C732	A1	L3
C741	B2	L3
C750	E2	H2
C760	D2	G2
CR710	C1	K3
CR712	C1	J3
CR740	F2	I3
Q740	E2	I3
P32	A1	J7
R240	D4	C7
R700	D2	J2
R702	D1	I3
R704	E1	J3
R706	E1	I3
R710	C2	K2
R712	C1	K3
R714	C1	J3
R716	C1	H7
R718	C2	H7
R722	A1	M3
R724	B1	K2
R726	B1	K2
R732	A1	M3
R734	B2	K2
R736	B2	K2
R740	B2	L2
R742	A2	L2
R744	F2	I3
R746	E2	I3
R760	D2	G2
R762	D2	G2
TP700	D1	J2
U230A	A2	E3
U290C	B4	D3
U290D	B4	D3
U640A	B3	C2
U640B	B3	C2
U650	C2	C3
U660	A2	E2
U670A	B3	B3
U670B	C2	B3
U670C	C2	B3
U670D	C3	B3
U700	D1	I2
U710	C2	J2
U720	B1	K3
U730	B1	L3
U740	B1	K2
U750	C2	D2
U760A	D2	F2
U760B	C2	F2
U760C	D2	F2
U760D	A2	F2
U760E	D2	F2
U760F	D3	F2
U805A	C3	D5
U805C	C4	D5
U805D	D4	D5
U805E	C3	D5
U810	D3	E5
U820	E3	C5
U840	D4	C6
U850	C5	D6
U860	E3	B5
U870	F3	B5
U880	F3	D5
U890	B3	E6
VR710	C1	J3
VR712	C1	J3
VR744	F2	I3

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VOLTAGE AND WAVEFORM CONDITIONS

The waveforms shown below apply regardless of 370 settings except for the Collector Supply VARIABLE control.

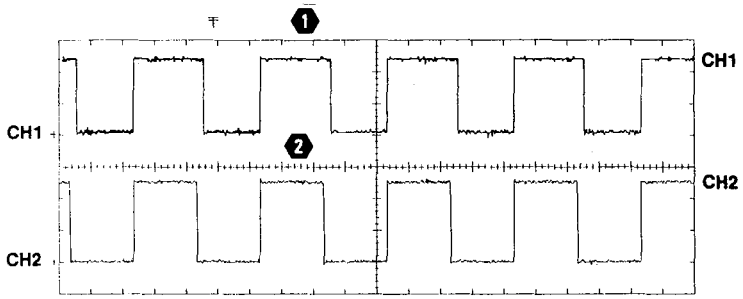
Voltage Conditions. The voltages shown on the diagram were obtained using a digital multimeter with a 10 Megohm input impedance. These voltages are independent of 370 settings.

Waveform Conditions. The waveforms shown below were obtained using a test oscilloscope with 1 Megohm input impedance (TEKTRONIX 2430 oscilloscope with plotter) from the 370 under the following conditions.

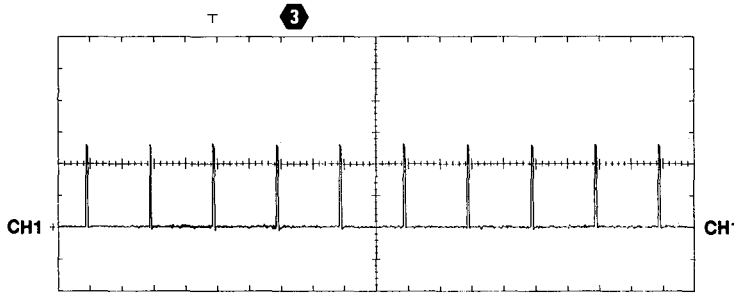
Waveform 1, 2, 3, 4, 7, and 8 conditions: These waveforms apply regardless of 370 settings.

Waveform 5, 6, 9 and 10 conditions: These waveforms apply when the 370 Collector Supply VARIABLE is set at 100%.

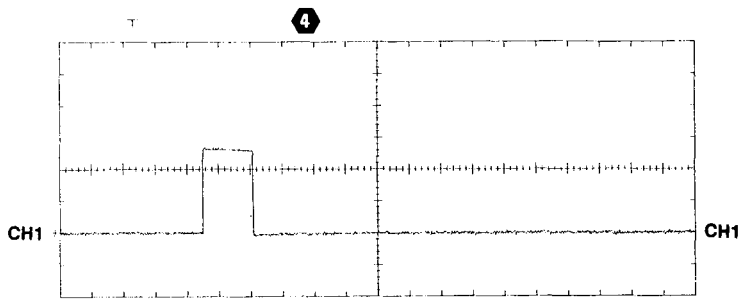
CH1 DC 2 V/div AVG 5 ms/div
CH2 DC 2 V/div AVG 5 ms/div

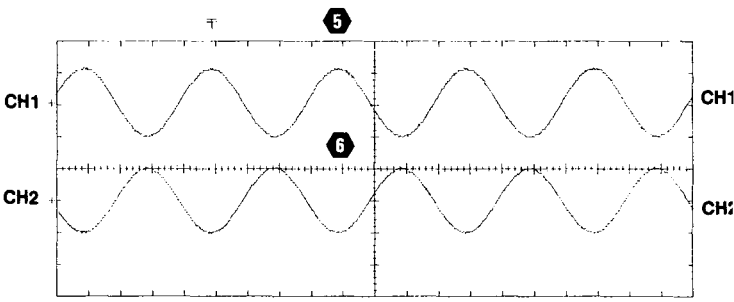


CH1 DC 2 V/div NORMAL 5 ms/div

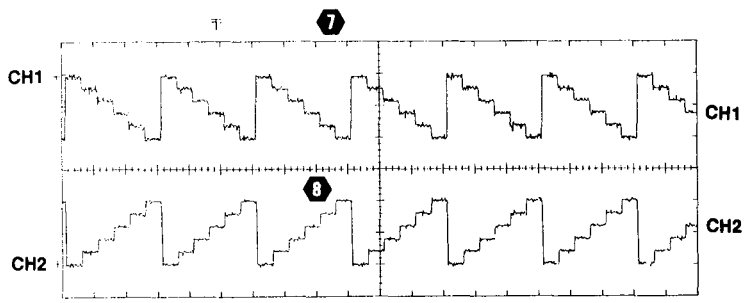


CH1 DC 2 V/div NORMAL 50 µs/div

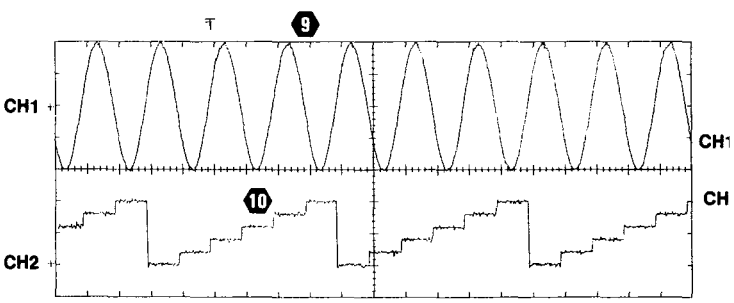




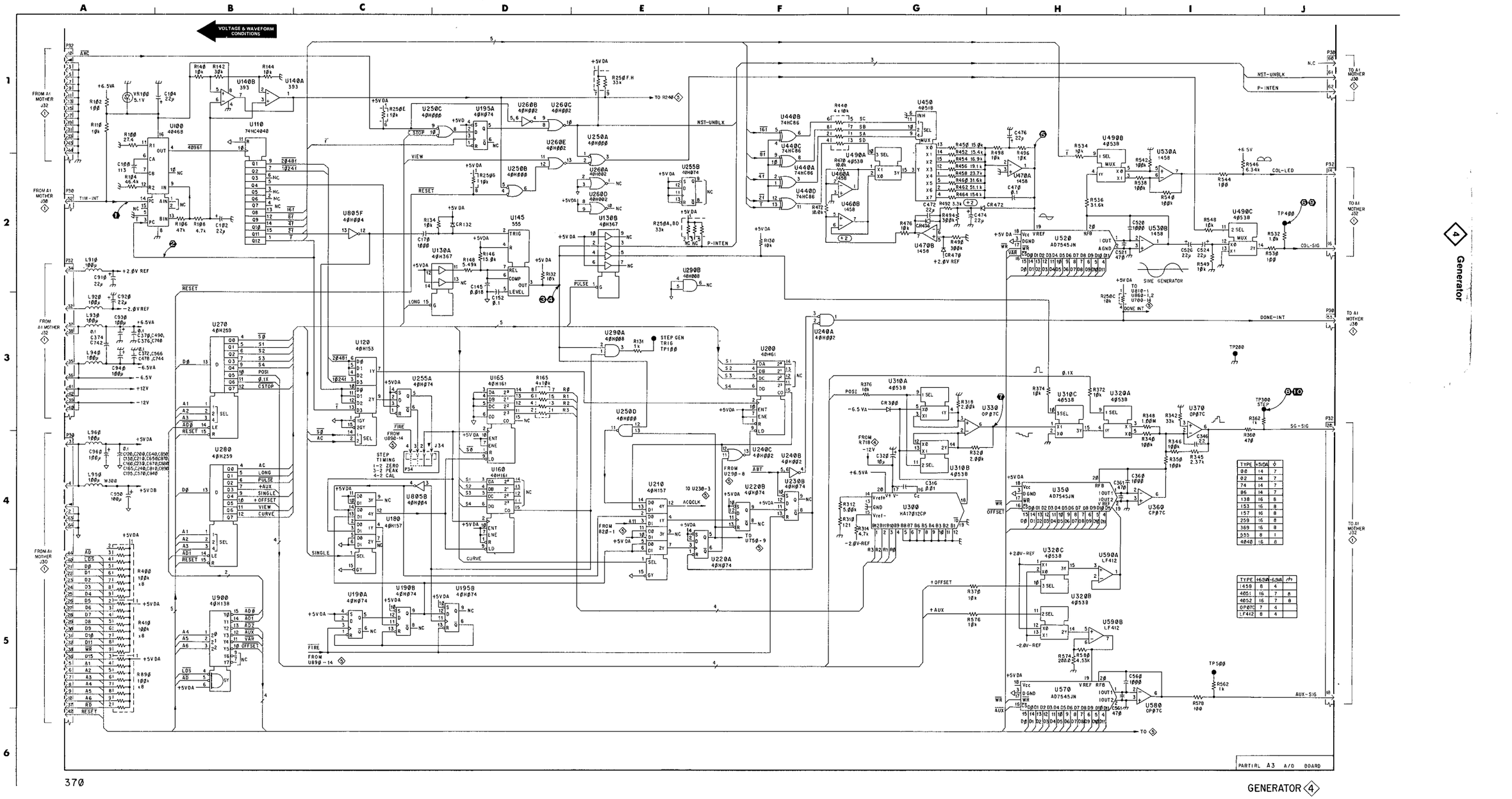
CH1 DC 500 mV/div NORMAL 20 ms/div
CH2 DC 500 mV/div NORMAL 20 ms/div



CH1 DC 1 V/div NORMAL 10 ms/div
CH2 DC 500 mV/div NORMAL 10 ms/div



Scan by Zenith



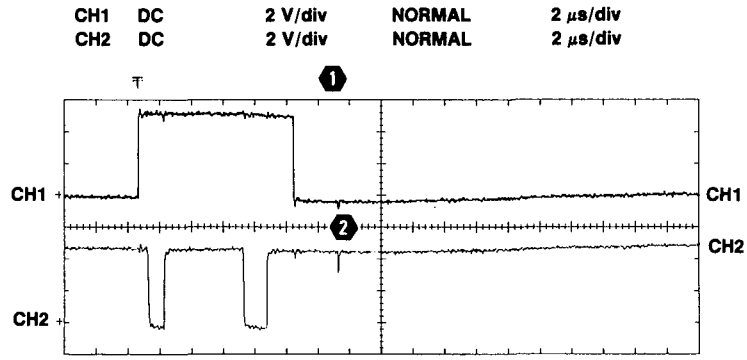
Scan by Zenith

VOLTAGE AND WAVEFORM CONDITIONS

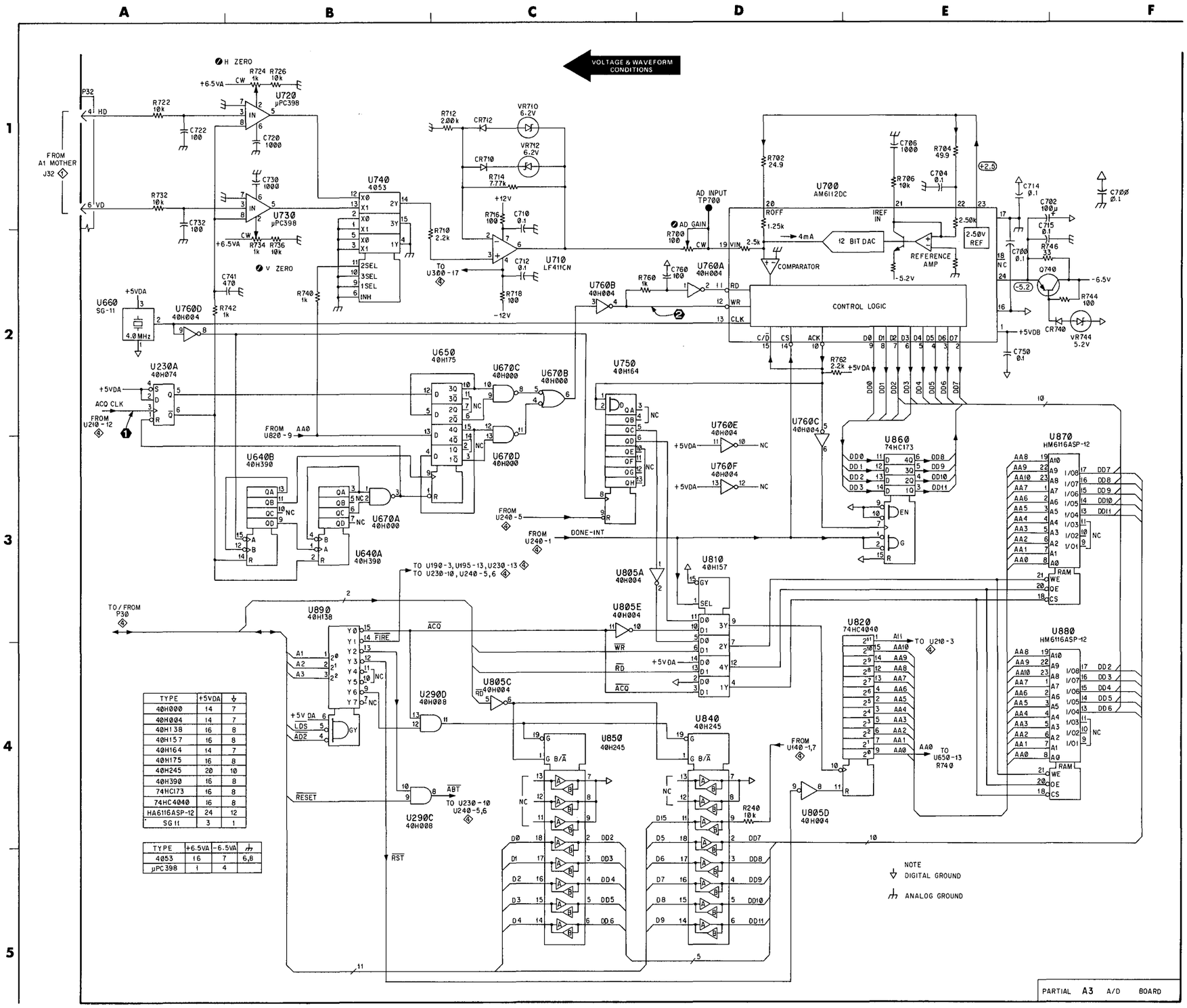
The waveforms shown below apply regardless of the 370 settings.

Voltage Conditions. The voltages shown on the diagram were obtained using a digital multimeter with a 10 Megohm input impedance. These voltages are not affected by the 370 settings.

Waveform Conditions. The waveforms shown below were obtained using a test oscilloscope with 1 Megohm input impedance (TEKTRONIX 2430 oscilloscope with plotter).



Scan by Zenith



TYPE	+5VDA	⏚
40H000	14	7
40H004	14	7
40H138	16	8
40H157	16	8
40H164	14	7
40H175	16	8
40H245	20	10
40H390	16	8
74HC173	16	8
74HC4040	16	8
HA6116ASP-12	24	12
SG11	3	1

TYPE	+6.5VA	-6.5VA	⏚
4053	16	7	6,8
µPC398	1	4	

Scan by Zenith

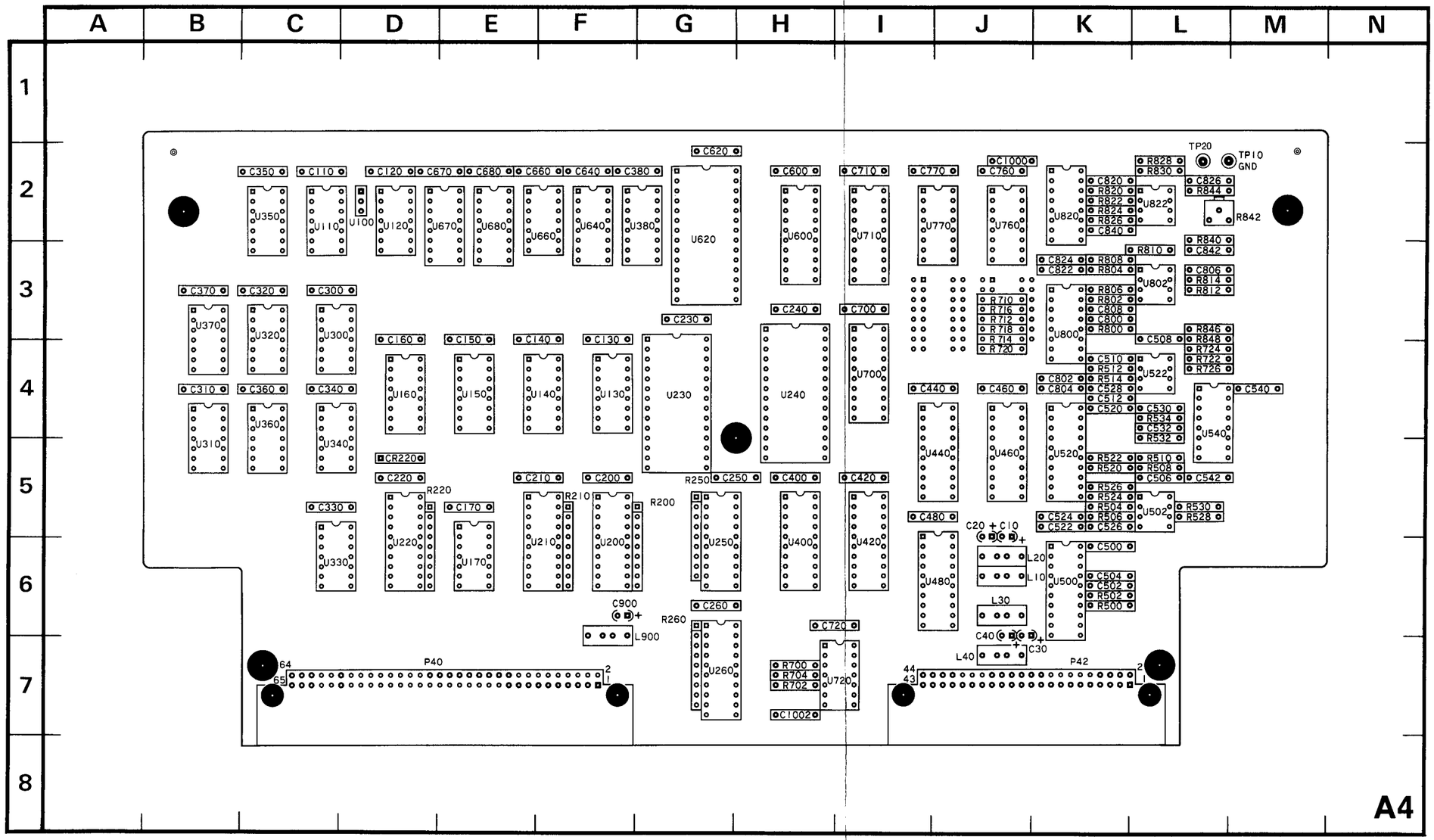


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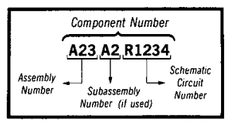
Figure 7-8. A4—Digital Display circuit board assembly.

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



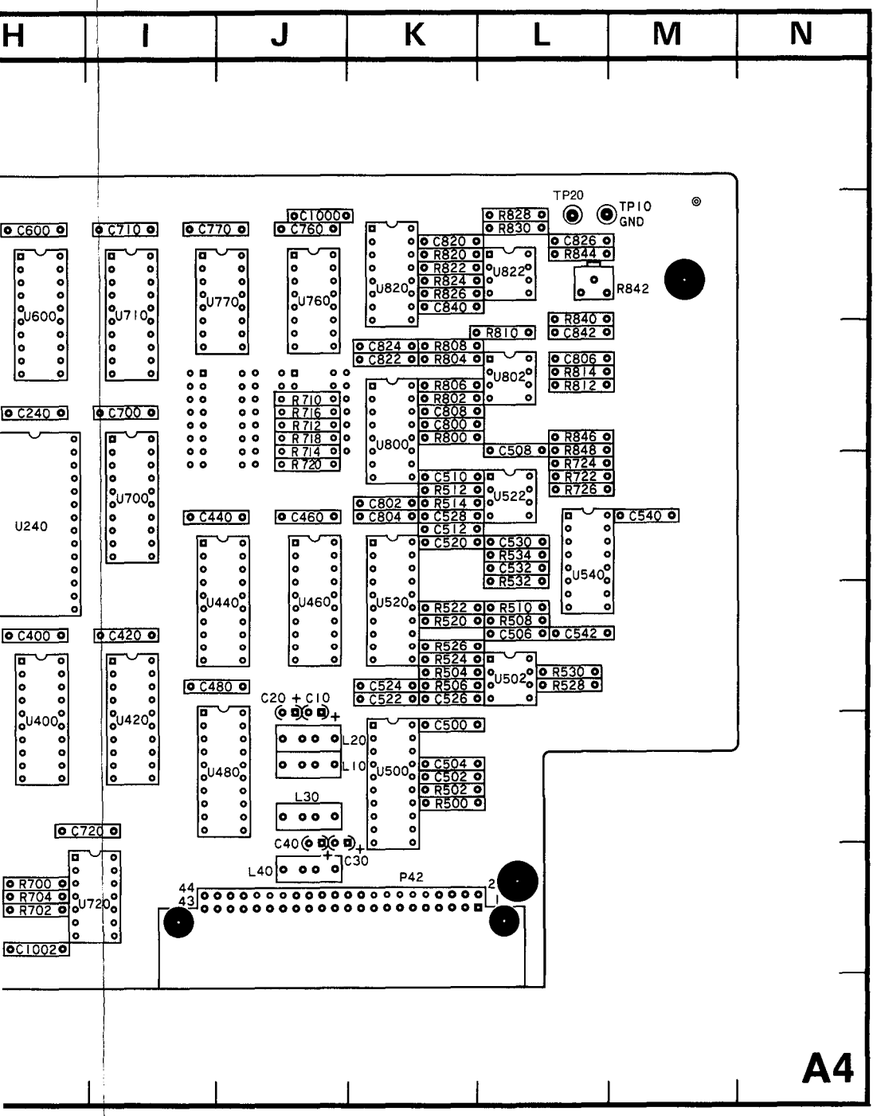
Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

A4—Digital Display circuit board illustration to be used with diagrams ◇6◇ *and* ◇7◇

ASSEMBLY A4

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCH LOCAT
C30	H2	K7	C670	B3
C40	H3	J7	C680	B3
C110	B3	C2	C700	B3
C120	B3	D2	C710	B3
C130	B3	F4	C720	H2
C140	B3	F4	C760	B3
C150	B3	E4	C770	B3
C160	B3	D4	C900	B3
C170	B3	E5		
C200	B3	F5	CR220	B4
C210	B3	F5		
C220	B3	D5	L30	H2
C230	B3	G3	L40	H3
C240	B3	H3	L900	B3
C250	B3	G5		
C260	B3	G6	P40	A1
C300	B3	C3	P42	H2
C310	B3	B4		
C320	B2	C3	R200	B1
C330	B3	C5	R210	B1
C340	B3	C4	R220	B4
C350	B3	C2	R250	H1
C360	B3	C4	R260	H1
C370	B3	B3		
C380	B3	F2	U100	C3
C400	B3	H5	U110A	D2
C420	B3	I5	U110B	D2
C440	B3	J4	U120A	E2
C460	B3	J4	U120B	E2
C480	B3	J5	U130	C1
C540	H2	M4	U140	D1
C542	H3	L5	U150	E1
C600	B3	H2	U160	E1
C620	B3	G2	U170A	D3
C640	B3	F2	U170B	D3
C660	B3	F2		

Scan by Zenith



A4

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uit board assembly.

ith diagrams 6 *and* 7

DISPLAY COUNTER 6

ASSEMBLY A4

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C30	H2	K7
C40	H3	J7
C110	B3	C2
C120	B3	D2
C130	B3	F4
C140	B3	F4
C150	B3	E4
C160	B3	D4
C170	B3	E5
C200	B3	F5
C210	B3	F5
C220	B3	D5
C230	B3	G3
C240	B3	H3
C250	B3	G5
C260	B3	G6
C300	B3	C3
C310	B3	B4
C320	B2	C3
C330	B3	C5
C340	B3	C4
C350	B3	C2
C360	B3	C4
C370	B3	B3
C380	B3	F2
C400	B3	H5
C420	B3	I5
C440	B3	J4
C460	B3	J4
C480	B3	J5
C540	H2	M4
C542	H3	L5
C600	B3	H2
C620	B3	G2
C640	B3	F2
C660	B3	F2
C670	B3	E2
C680	B3	E2
C700	B3	I3
C710	B3	I2
C720	H2	H6
C760	B3	J2
C770	B3	I2
C900	B3	F6
CR220	B4	D5
L30	H2	J6
L40	H3	J7
L900	B3	G7
P40	A1, H1	D7
P42	H2,	K7
R200	B1	G5
R210	B1	F5
R220	B4	D5
R250	H1	G5
R260	H1	G6
U100	C3	D2
U110A	D2	C2
U110B	D2	C2
U120A	E2	D2
U120B	E2	D2
U130	C1	F4
U140	D1	F4
U150	E1	E4
U160	E1	D4
U170A	D3	E6
U170B	D3	E6
U200	B1	F6
U210	B2	F6
U220	B4	D6
U230	F1	G4
U240	F2	H4
U250	G1	G6
U260	G2	G7
U300A	F5	C3
U300B	C2	C3
U300C	F4	C3
U310A	D2	B5
U310C	E3	B5
U310D	F2	B5
U320A	G3	C2
U320B	E4	C2
U320C	F2	C2
U320D	G4	C2
U330A	E3	C6
U330B	E2	C6
U330C	D3	C6
U330D	B3	C6
U340A	G3	C5
U340B	F4	C5
U340C	E4	C5
U340D	D4	C5
U340E	F5	C5
U340F	E2	C5
U350A	G3	C2
U350B	D2	C2
U360A	G5	C4
U360B	G5	C4
U370A	G4	B3
U370B	G4	B3
U380	G5	G2

DISPLAY D/A CONVERTER 7

ASSEMBLY A4

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C10	G1	J5
C20	G1	J5
C500	E1	K6
C502	E1	K6
C504	E2	K6
C506	F1	L5
C508	F1	L4
C510	F1	K4
C512	F2	K4
C520	E2	K4
C522	E2	K5
C524	E3	K5
C526	F1	K5
C528	F2	K4
C530	F2	L4
C532	F2	L4
C800	E3	K3
C802	E3	K4
C804	E3	K4
C806	F3	L3
C808	F3	K3
C820	E4	K2
C822	E4	K3
C824	E4	K3
C826	F4	L2
C840	F4	K2
C842	G4	L3
C1000	G3	J2
C1002	G3	H7
L10	G1	K6
L20	G1	K6
P40	G5	D7
P42	G1	K7
R500	E1	K6
R502	E2	K6
R504	F1	K5
R506	E1	K5
R508	F1	L5
R510	F1	L5
R512	F1	K4
R514	F1	K4
R520	E2	K5
R522	E3	K5
R524	F2	K5
R526	E2	K5
R528	F2	L5
R530	F2	L5
R532	F2	L5
R534	F2	L4
R700	E4	H7
R702	E5	H7
R704	F4	J3
R710	F4	J3
R712	F5	J3
R714	F5	J3
R716	F4	J3
R718	F5	J3
R720	F5	J4
R722	F3	L4
R724	F3	L4
R726	F4	L4
R800	E3	K3
R802	E3	K3
R804	F3	K3
R806	E3	K3
R808	F3	K3
R810	F3	L3
R812	G3	L3
R814	G3	L3
R820	E4	K2
R822	E4	K2
R824	F4	K2
R826	E4	K2
R828	F4	L2
R830	F4	L2
R840	G4	L3
R842	G4	M2
R844	G4	L2
R846	F4	L3
R848	F4	L4
TP10	F1	M2
TP20	F1	L2
U310B	D5	B4
U400	B1	H6
U420	B2	I6
U440	C1	J5
U460	C2	J5
U480	C2	J6
U500	E1	K6
U502A	F1	L5
U502B	F2	L5
U520	E2	K5
U522A	F1	L4
U522B	F2	L4
U540A	G3	L4
U540B	G1	L4
U540C	G2	L4
U600	C4	H2
U620	D4	G2
U640	D4	F2
U660A	B5	F2
U660B	C5	F2
U670A	D1	E2
U670B	D1	E2
U680	E5	E2
U700	B3	I4
U710	B4	I2
U720A	F5	I7
U720B	F5	I7
U720C	F4	I7
U720D	F4	I7
U760	C3	J2
U770	C4	J2
U800	E3	K3
U802A	F3	L3
U802B	G3	L3
U820	E4	K2
U822A	F4	L2
U822B	G4	L2

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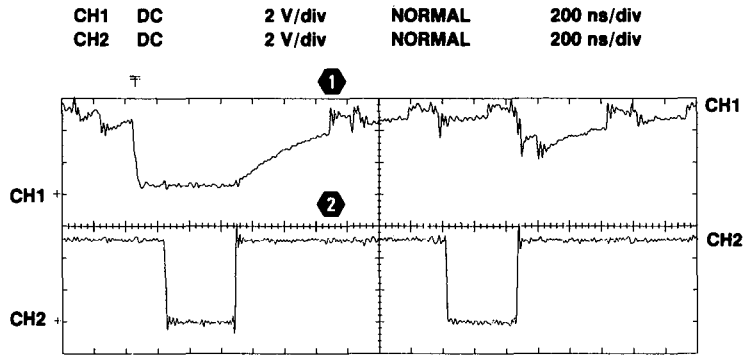
WAVEFORM CONDITIONS

The waveforms shown apply regardless of the 370 settings.

Waveform Conditions. The waveforms shown below were obtained using a test oscilloscope with 1 Megohm input impedance (TEKTRONIX 2430 oscilloscope with plotter).



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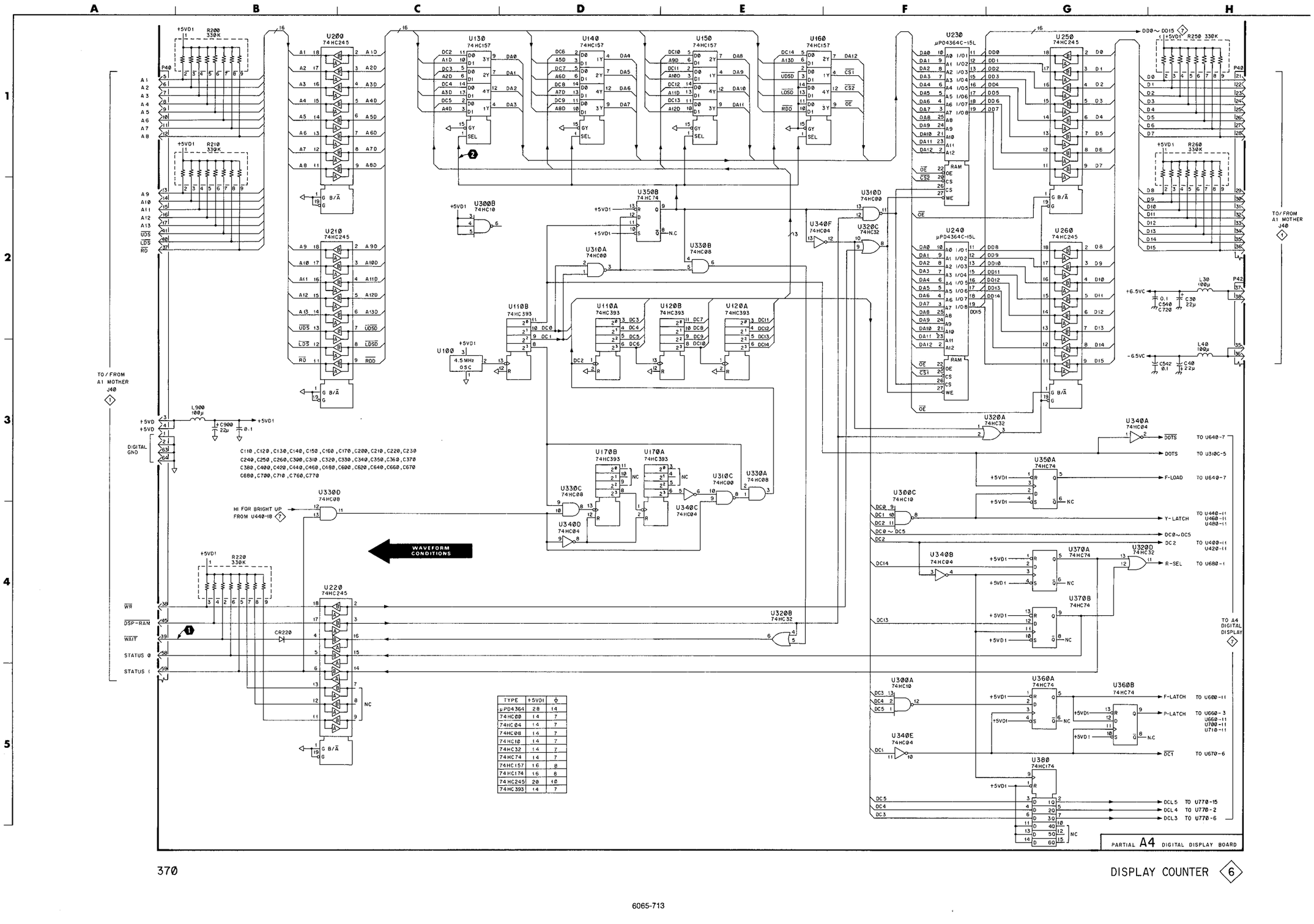

TYPE	+5VD1	⏚
µPD4364	28	14
74HC00	14	7
74HC04	14	7
74HC08	14	7
74HC10	14	7
74HC32	14	7
74HC74	14	7
74HC157	16	8
74HC174	16	8
74HC245	20	10
74HC393	14	7

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VOLTAGE AND WAVEFORM CONDITIONS

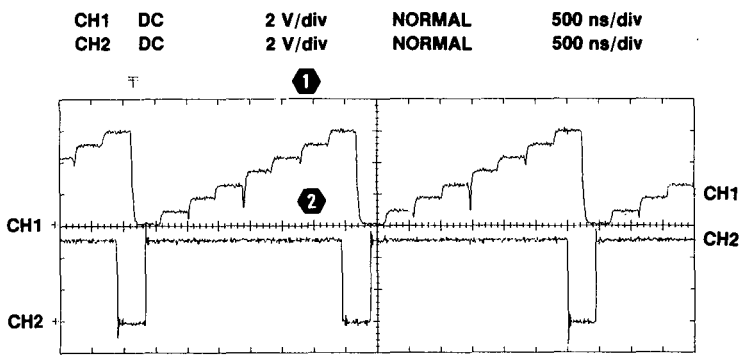
The waveforms shown apply regardless of the 370 settings except for the Collector Supply VARIABLE control.

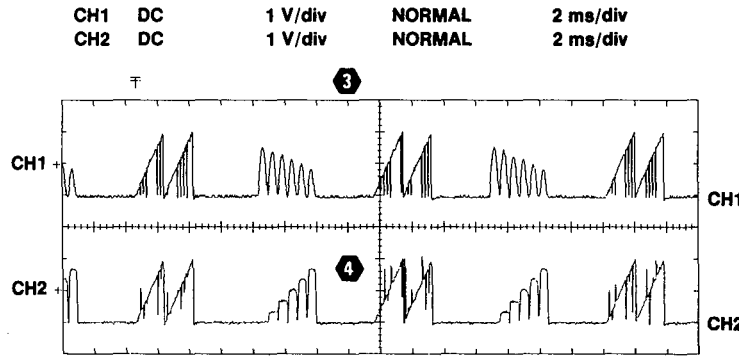
Voltage Conditions. The voltages shown on the diagram were obtained using a digital multimeter with a 10 Megohm input impedance. These voltages are not affected by the 370 settings.

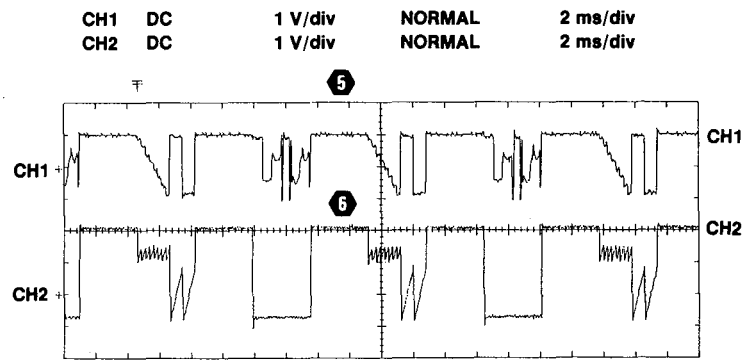
Waveform Conditions. The waveforms shown below were obtained using a test oscilloscope with 1 Megohm input impedance (TEKTRONIX 2430 oscilloscope with plotter) from the 370 under the following conditions.

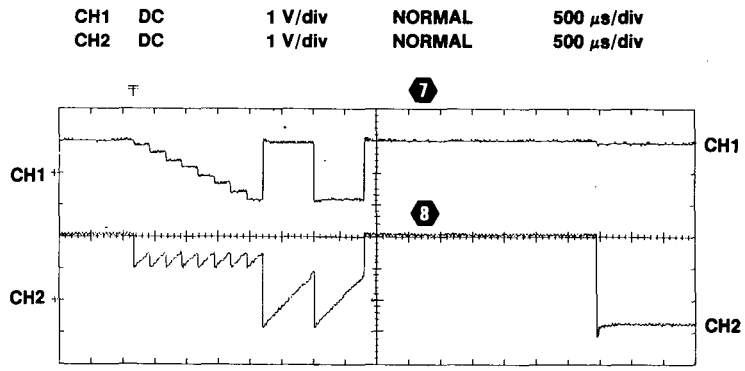
Waveform 1, 2, 5, 6, 7, and 8 conditions: These waveforms apply regardless of the 370 settings.

Waveform 3 and 4 conditions: These waveforms apply regardless of the 370 settings, except that the Collector Supply VARIABLE is set to 100%.









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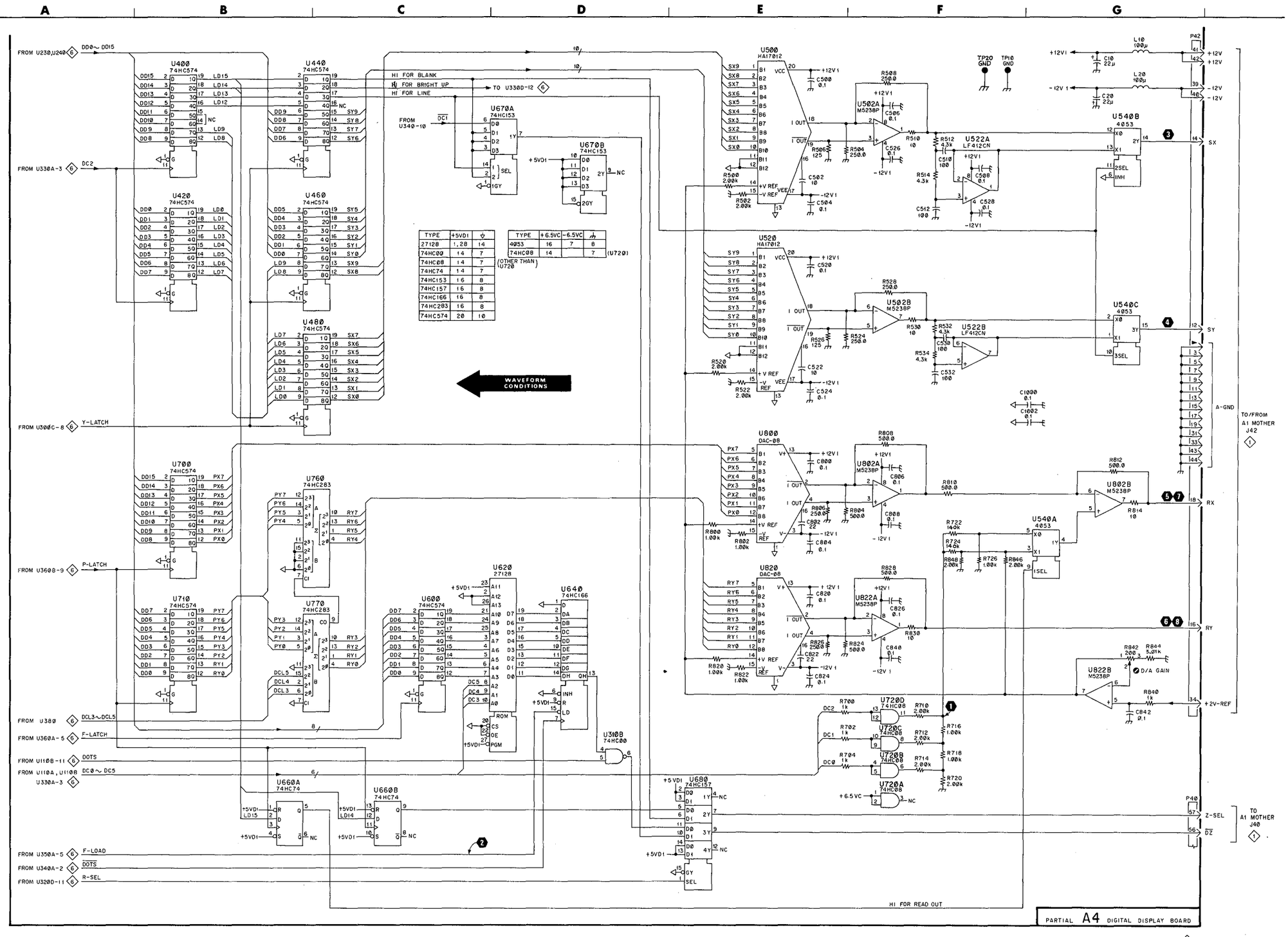

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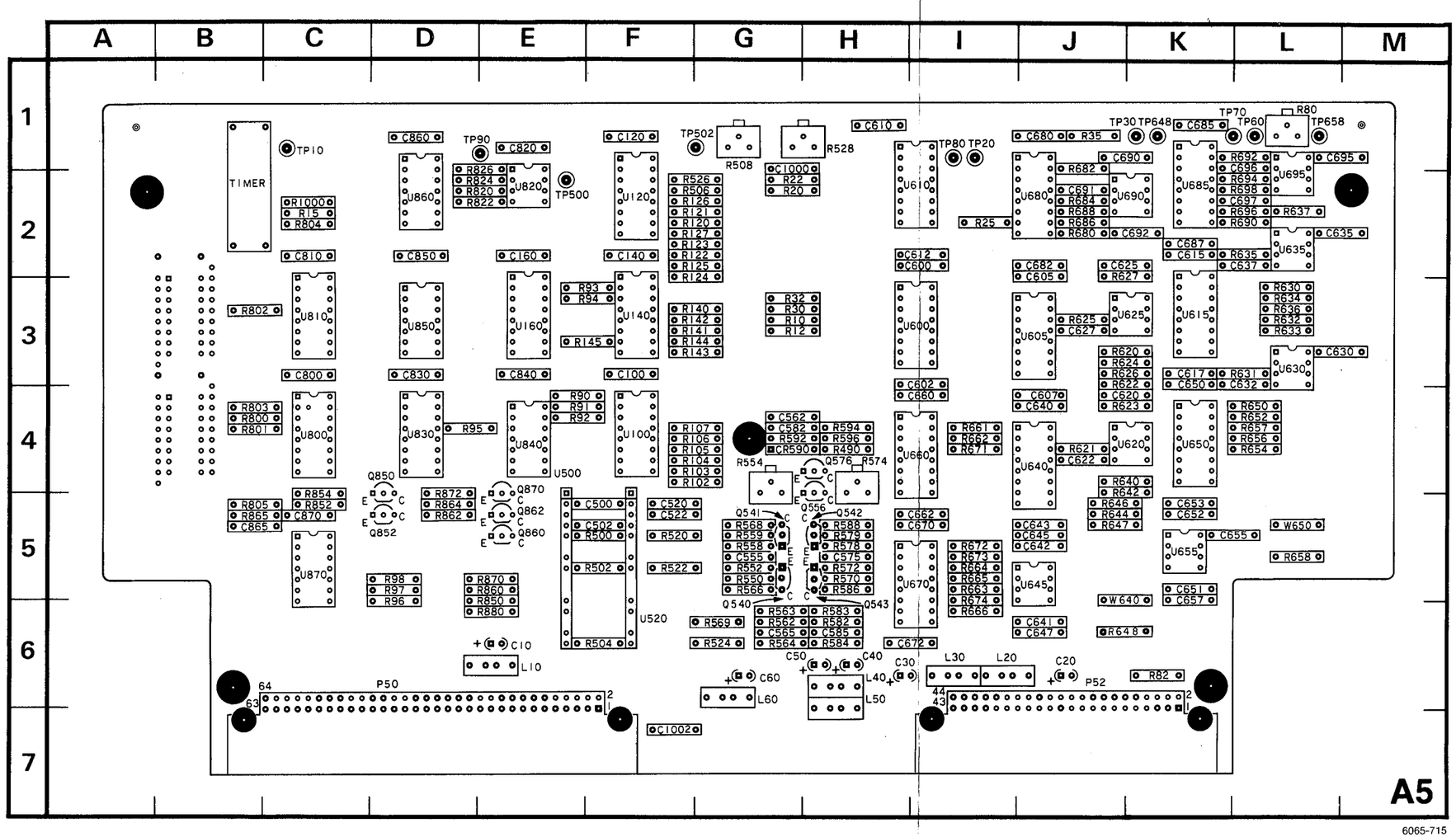


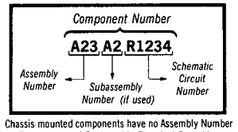
6065-715

Figure 7-9. A5—Display Control circuit board assembly.

A5—Display Control circuit board illustration to be used with diagrams 8 *and* 9

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



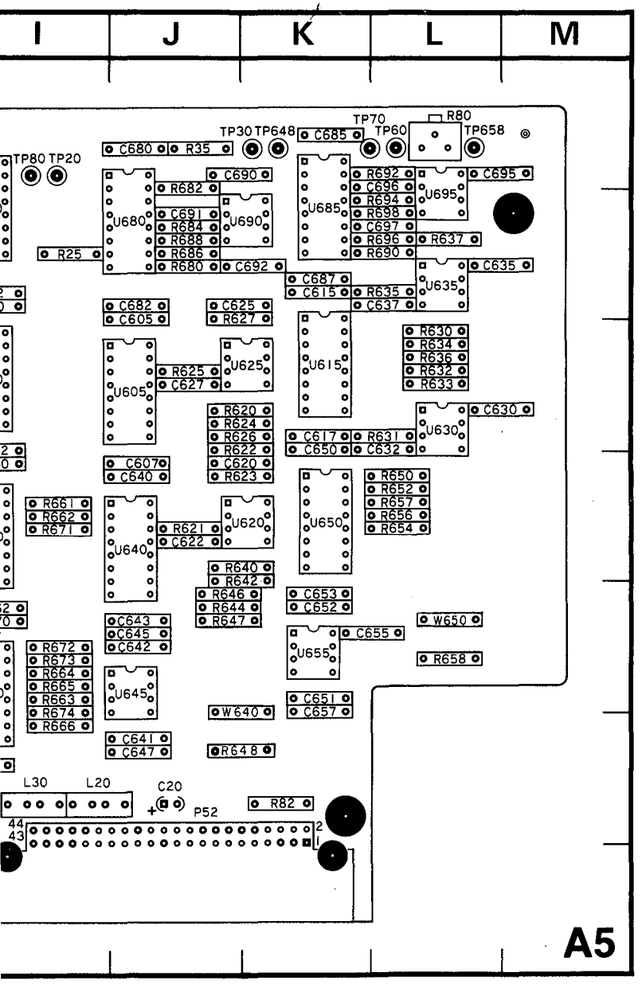
Chassis mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

DISPLAY OFFSET

ASSEMBLY A5

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C40	G2	H6
C50	G2	G6
C641	F3	J6
C643	F3	J5
C651	F4	K5
C653	F4	K5
C691	E1	J2
C696	E2	L1
L40	G2	H6
L50	G2	H6
P50	A1	D6
P52	A4, G2	J6
R10	B4	G3
R12	B4	G3
R20	B4	G2
R22	B4	G2
R30	B4	G3
R32	B4	G3
R90	B1	E4
R91	B1	E4
R92	B1	E4
R93	B1	F3
R94	B1	F3
R95	B2	D4
R96	B2	D6
R97	B2	D5
R98	B2	D5
R102	C1	G4
R103	C1	G4
R104	C1	G4
R105	C1	G4
R106	C1	G4
R107	C1	G4
R120	C2	G2
R121	C2	G2
R122	C2	G2
R123	C2	G2
R124	C2	G3
R125	C2	G2
R126	C2	G2
R127	C2	G2
R140	C3	G3
R141	C3	G3
R142	C3	G3
R143	C3	G3
R144	C3	G3
R145	C3	G3
R620	E3	J4
R621	E3	J4
R622	F3	J4
R623	E3	J4
R624	F3	J3
R625	E3	J3
R626	F3	J3
R627	E3	J2
R630	F4	L3
R631	E4	L3
R632	F4	L3
R633	E4	L3
R634	F4	L3
R635	E4	L2
R636	F4	L3
R637	E4	L2
R640	F3	J4
R642	F3	J5
R644	F3	J5
R646	F3	J5
R647	G3	J5
R648	G3	J6
R650	F4	L4
R652	F4	L4
R654	F4	L4
R656	F4	L4
R657	G4	L4
R658	G4	L5
R661	D1	I4
R662	D1	I4
R663	D2	I5
R664	D4	I5
R665	D2	I5
R666	D2	I6
R671	D1	I4
R672	D2	I5
R673	D2	I5
R674	D2	I6
R680	E1	J2
R682	E1	J2
R684	E1	J2
R686	E1	J2

Scan by Zenith



6065-715

y.

8 and 9

DISPLAY OFFSET 8

ASSEMBLY A5

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C40	G2	H6	R142	C3	G3	R688	E1	J2
C50	G2	G6	R143	C3	G3	R690	E2	L2
C641	F3	J6	R144	C3	G3	R692	E2	L1
C643	F3	J5	R145	C3	F3	R694	E2	L2
C651	F4	K5	R620	F3	J3	R696	E2	L2
C653	F4	K5	R621	E3	J4	R698	E2	L2
C691	E1	J2	R622	F3	J4			
C696	E2	L1	R623	E3	J4	TP60	F2	L1
			R624	F3	J3	TP70	F1	L1
L40	G2	H6	R625	E3	J3	TP648	G3	K1
L50	G2	H6	R626	F3	J3	TP658	G3	L1
			R627	E3	J2			
P50	A1	D6	R630	F4	L3	U100	C1	F4
P52	A4, G2	J6	R631	E4	L3	U120	C2	F2
			R632	F4	L3	U140	C3	F3
R10	B4	G3	R633	E4	L3	U160A	B1	E3
R12	B4	G3	R634	F4	L3	U160B	B2	E3
R20	B4	G2	R635	E4	L2	U600	D3	I3
R22	B4	G2	R636	F4	L3	U605	E3	J3
R30	B4	G3	R637	E4	L2	U610	D4	I2
R32	B4	G3	R640	F3	J4	U615	E4	K3
R90	B1	E4	R642	F3	J5	U620	E3	K4
R91	B1	E4	R644	F3	J5	U625	E3	K3
R92	B1	E4	R646	F3	J5	U630	E4	L3
R93	B1	F3	R647	G3	J5	U635	E4	L2
R94	B1	F3	R648	G3	J6	U640	F3	J4
R95	B2	D4	R650	F4	L4	U645	F3	J5
R96	B2	D6	R652	F4	L4	U650	F4	K4
R97	B2	D5	R654	F4	L4	U655	F4	K5
R98	B2	D5	R656	F4	L4	U660	D1	I4
R102	C1	G4	R657	G4	L4	U670	D2	I5
R103	C1	G4	R658	G4	L5	U680	E1	J2
R104	C1	G4	R661	D1	I4	U685	E2	K2
R105	C1	G4	R662	D1	I4	U690	E1	K2
R106	C1	G4	R663	D2	I5	U695	E2	L2
R107	C1	G4	R664	D4	I5	U820B	G1	E2
R120	C2	G2	R665	D2	I5	U840E	B3	E4
R121	C2	G2	R666	D2	I6	U870B	B3	C5
R122	C2	G2	R671	D1	I4	U870C	B3	C5
R123	C2	G2	R672	D2	I5	U870D	B3	C5
R124	C2	G3	R673	D2	I5			
R125	C2	G2	R674	D2	I6	W640	G3	J5
R126	C2	G2	R680	E1	J2	W650	G4	L5
R127	C2	G2	R682	E1	J2			
R140	C3	G3	R684	E1	J2			
R141	C3	G3	R686	E1	J2			

DISPLAY SELECT 9

ASSEMBLY A5

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C10	B5	E6	C850	B5	D2	R582	G2	H6
C20	G5	J6	C860	B5	D1	R583	G2	H6
C30	G4	H6	C865	B3	B5	R584	G2	H6
C60	G3	G6	C870	B5	C5	R586	F2	H5
C100	B5	F3	C1002	C2	F7	R588	F2	H5
C120	B5	F1				R590	F2	H4
C140	B5	F2	CR590	F2	G4	R592	F2	G4
C160	B5	E2				R594	F1	H4
C500	G4	F5	L10	B5	E6	R596	F2	H4
C502	G5	F5	L20	G5	I6	R800	B4	B4
C520	G4	F5	L30	G4	I6	R801	B4	B4
C522	G5	F5	L60	G3	G6	R802	B3	B3
C555	F1	G5				R803	B3	B4
C562	F2	G4	P50	A3	D6	R804	B3	C2
C565	G1	G6	P52	A1, A2, A4, G1	J6	R805	B3	B5
C575	F3	H5				R820	B2	E2
C582	F2	G4	Q540	F1	G6	R822	B3	E2
C585	G2	H6	Q541	G1	G5	R824	B4	E2
C600	G4	I2	Q542	F2	H5	R826	B3	E2
C602	G5	I3	Q543	G2	H6	R850	B4	E6
C605	G4	J3	Q556	F2	H5	R852	E4	C5
C607	G5	J4	Q576	F2	H4	R854	E4	C5
C610	G4	H1	Q850	E4	D4	R860	B4	E5
C612	G5	I2	Q852	E4	D5	R862	E4	D5
C615	G4	K2	Q860	D4	E5	R864	E4	D5
C617	G5	K3	Q862	E4	E5	R865	B3	B4
C620	G4	K4	Q870	E4	E4	R870	B4	E5
C622	G5	J4				R872	E4	D5
C625	G4	J2	R15	B5	C2	R880	E4	E6
C627	G5	J3	R25	F5	I2			
C630	G4	L3	R35	F4	J1	TP10	B4	C1
C632	G5	L3	R80	G3	L1	TP20	F5	I1
C635	G4	L2	R82	G3	K6	TP30	F4	K1
C637	G5	L2	R500	D1	F5	TP80	G3	I1
C640	G4	J4	R502	D1	F5	TP90	B5	E1
C642	G5	J5	R504	D1	F6	TP500	E1	E2
C645	G4	J5	R506	D1	G2	TP502	E2	G1
C647	G5	J6	R508	D1	G1			
C650	G4	K3	R520	D2	F5	U500	E1	E4
C652	G5	K5	R522	D2	F5	U520	E2	F6
C655	G4	K5	R524	D2	G6	U800A	E5	C4
C657	G5	K5	R526	D2	G2	U800B	C4	C4
C660	G4	I4	R528	D2	H1	U810	D3	C3
C662	G5	I5	R550	F1	G5	U820A	B4	E2
C670	G4	I5	R552	F1	G5	U830A	D3	D4
C672	G5	I6	R554	F1	G4	U830B	D4	D4
C680	G4	J1	R558	F1	G5	U840A	C4	E4
C682	G5	J2	R559	F1	G5	U840B	D3	E4
C685	G4	K1	R562	G1	G6	U840C	C3	E4
C687	G5	K2	R563	G1	G6	U840D	D3	E4
C690	G4	J1	R564	G1	G6	U840F	B3	E4
C692	G5	K2	R566	F1	G5	U850A	C4	D3
C695	G4	L1	R568	F1	G5	U850B	C3	D3
C697	G5	L2	R569	G1	G6	U850C	D4	D3
C800	B5	C3	R570	F2	H5	U850D	D4	D3
C810	B5	C2	R572	F2	H5	U860A	B3	D2
C820	B5	E1	R574	F2	H4	U860B	E3	D2
C830	B5	D3	R578	F3	H5	U860C	C3	D2
C840	B5	E3	R579	F3	H5	U860D	C3	D2
						U870A	B3	C5

CHASSIS MOUNTED PARTS

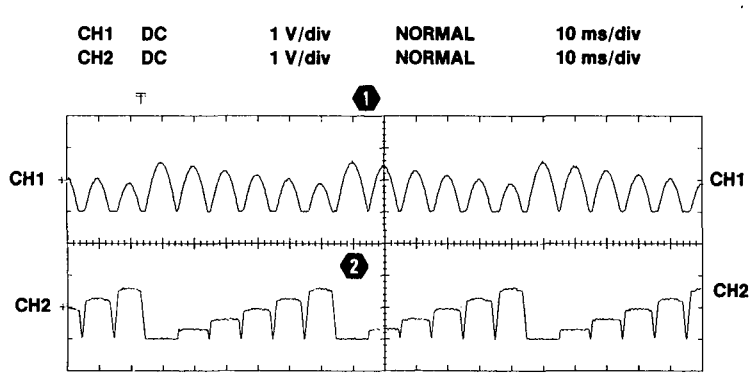
CIRUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
L120	H3	CHASSIS

Scan by Zenith

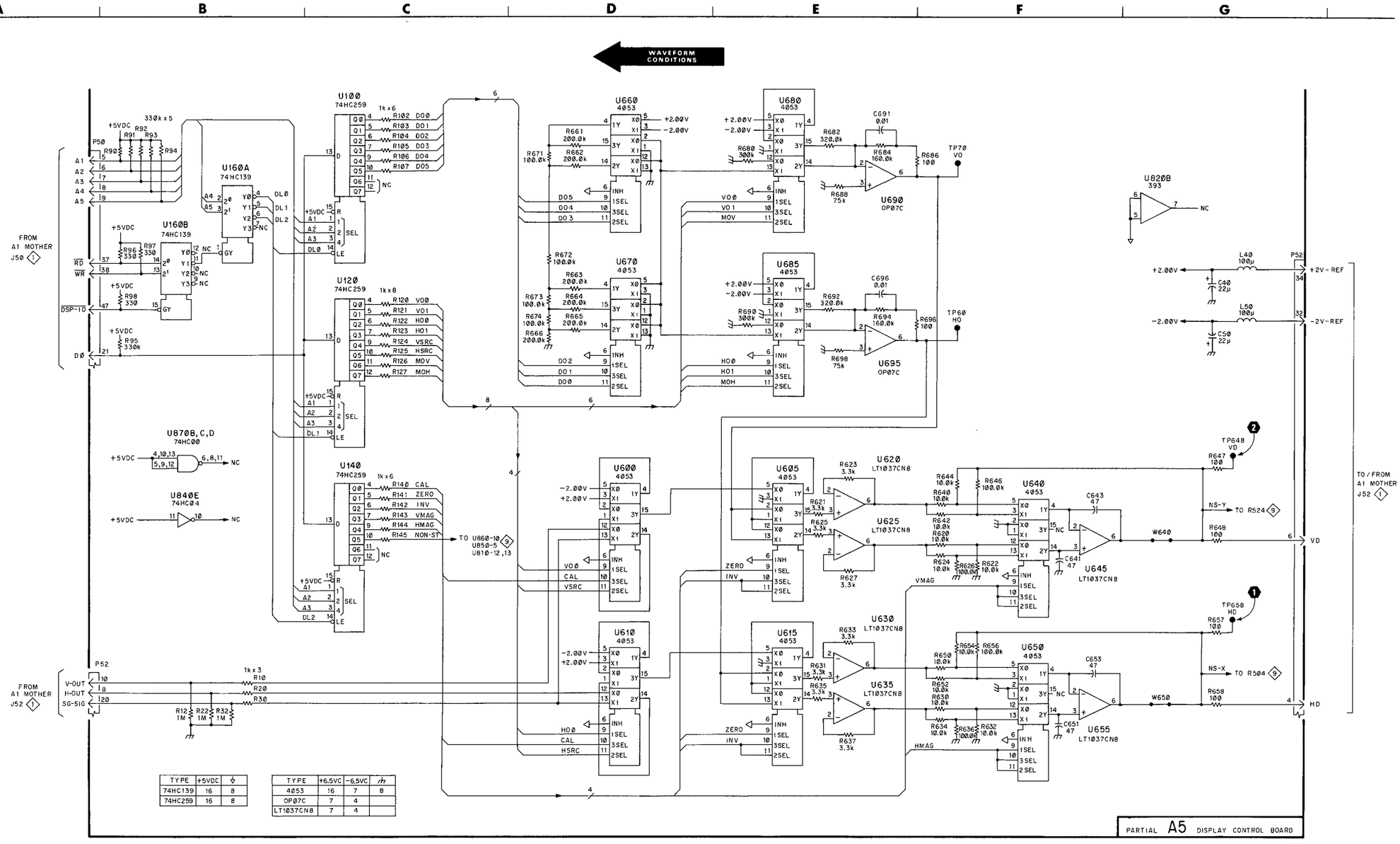
WAVEFORM CONDITIONS

The waveforms shown apply regardless of the 370 settings, except for the Collector Supply VARIABLE control.

Waveform Conditions. The waveforms shown below were obtained using a test oscilloscope with 1 Megohm input impedance (TEKTRONIX 2430 oscilloscope with plotter) from the 370 with Collector Supply VARIABLE 100%.



Scan by Zenith



TYPE	+5VDC	⏚
74HC139	16	8
74HC259	16	8

TYPE	+6.5VC	-6.5VC	⏚
4053	16	7	8
OP07C	7	4	
LT1037CN8	7	4	

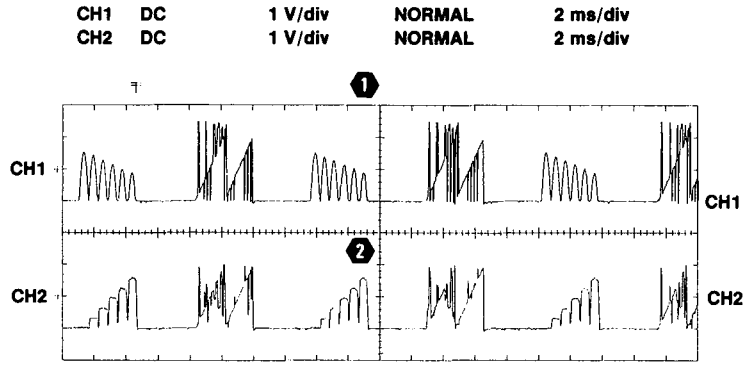
Scan by Zenith

VOLTAGE AND WAVEFORM CONDITIONS

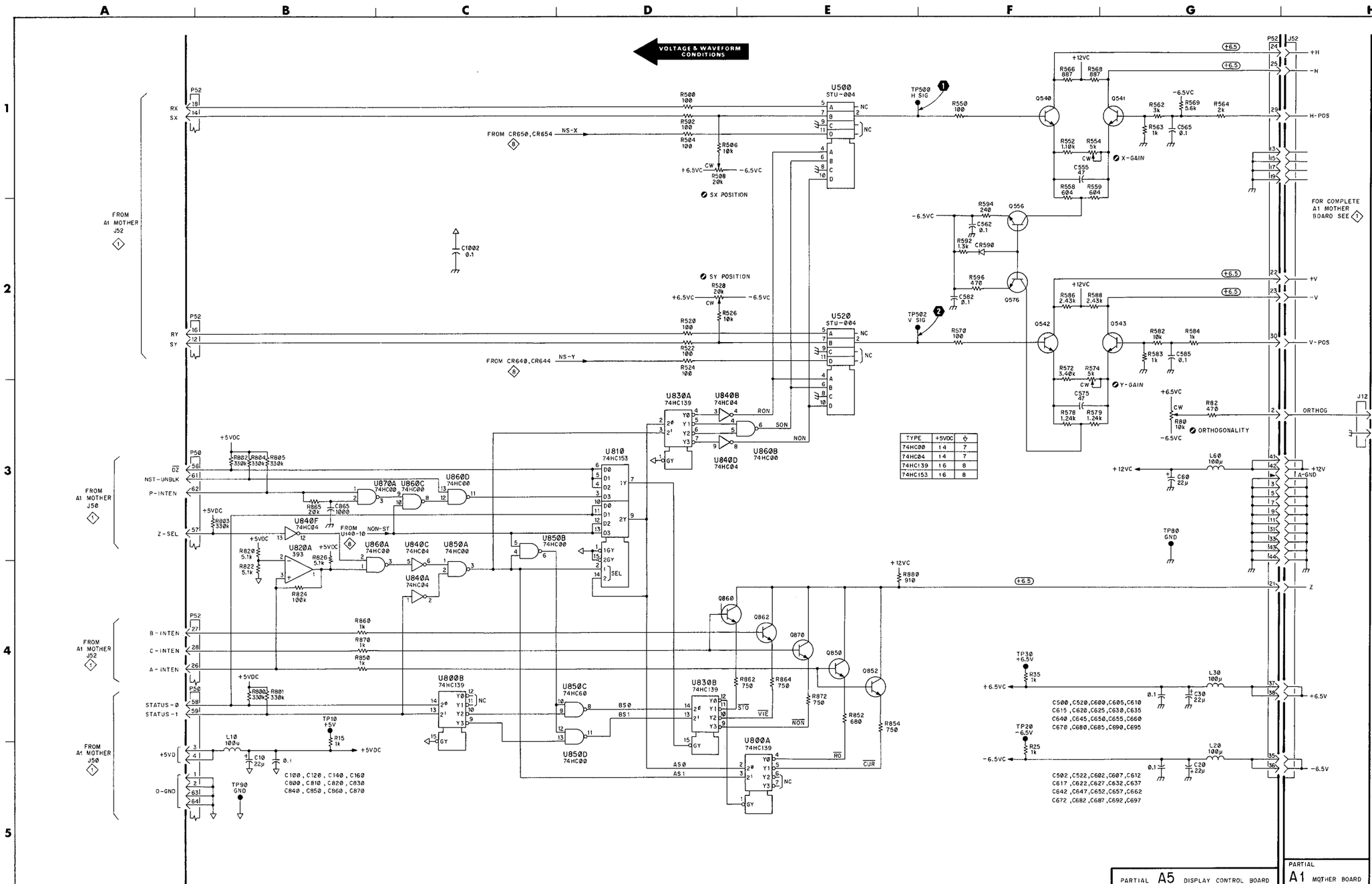
The waveforms shown apply regardless of the 370 settings except for the Collector Supply VARIABLE control and DISPLAY mode.

Voltage Conditions. The voltages shown on the diagram were obtained using a digital multimeter with a 10 Megohm input impedance. These voltages are not affected by the 370 settings.

Waveform Conditions. The waveforms shown below were obtained using a test oscilloscope with 1 Megohm input impedance (TEKTRONIX 2430 oscilloscope with plotter) from the 370 with Collector Supply VARIABLE 100% and DISPLAY mode STORE.



Scan by Zenith



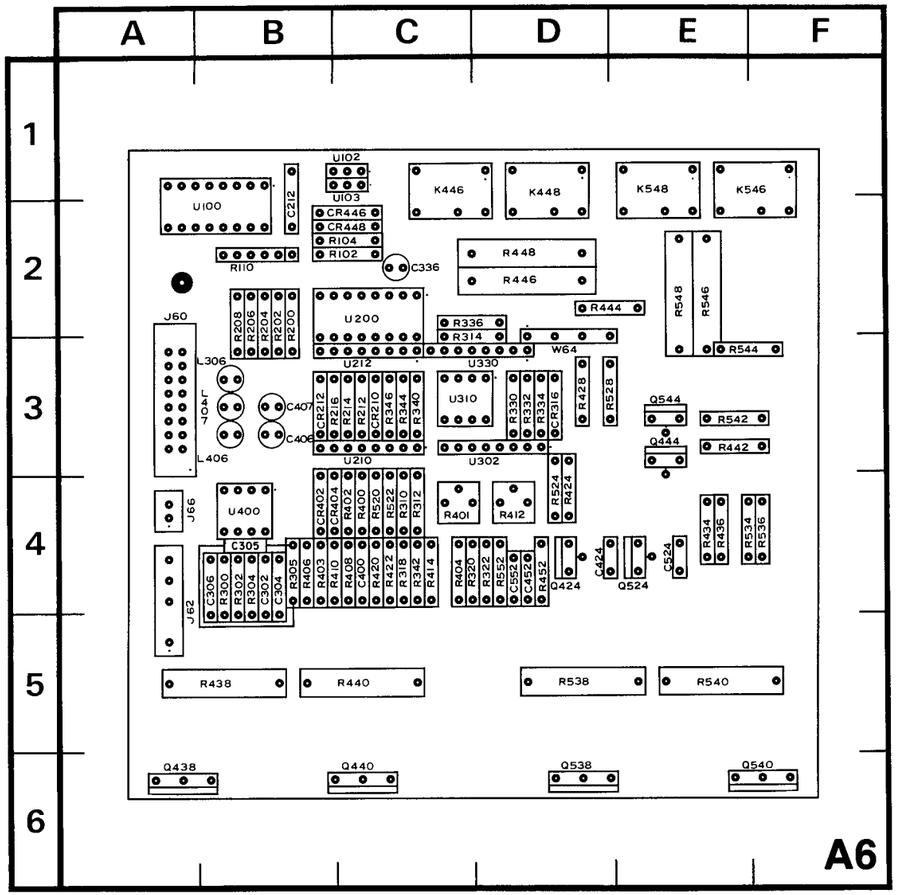
TYPE	+5VDC	⏚
74HC00	14	7
74HC04	14	7
74HC139	16	8
74HC153	16	8

C100, C120, C140, C160
C800, C810, C820, C830
C840, C850, C860, C870

C500, C520, C600, C605, C610
C615, C620, C625, C630, C635
C640, C645, C650, C655, C660
C670, C680, C685, C690, C695

C502, C522, C602, C607, C612
C617, C622, C627, C632, C637
C642, C647, C652, C657, C662
C672, C682, C687, C692, C697

Scan by Zenith



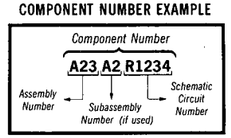
6065-718

Figure 7-10. A6—Collector Supply Output circuit board assembly.

A19—Low Voltage Supply circuit board illustration and component locator grid is located on the reverse side of 19

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



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

COLLECTOR SUPPLY AMPLIFIER 10

ASSEMBLY A6

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C212	A1	B1
C302	B1	B4
C304	B1	B4
C305	B1	B4
C306	B1	B4
C336	D3	C2
C400	C2	C4
C406	A1	B3
C407	A1	B3
C424	D1	D4
C452	D1	D4
C524	D1	E4
C552	D1	D4
CR210	C2	C3
CR212	C1	B3
CR316	D3	D3
CR402	D1	B4
CR404	D1	B4
CR446	E2	C2
CR448	E2	C2
J60	A1	A2
J62	F1	A4
J66	F1	A4
K446	E2	C1
K448	E2	D1
K546	E2	F1
K548	E2	E1
L306	A1	B3
L406	A1	B3
L407	A1	B3
Q424	D1	D4
Q438	E1	A6
Q440	E1	C6
Q444	D1	E3
Q524	D1	E4
Q538	E1	D6
Q540	E1	F6
Q544	D2	E3
R102	B2	C2
R104	B2	C2
R110	A2	B2
R200	B1	B2
R202	B1	B2
R204	B1	B2
R206	B1	B2
R208	B2	B2
R212	C1	C3
R214	C1	C3
R216	C1	C3
R300	B1	B4
R302	B1	B4
R304	B1	B4
R305	B1	B4
R310	D2	C4
R312	D3	C4
R314	C2	C2
R318	D3	C4
R320	E3	C4
R322	E3	D4
R330	D3	D3
R332	D3	D3
R334	D3	C2
R336	D3	C2
R340	D2	C3
R342	D2	C4
R344	D3	C3
R346	D3	C3
R400	C1	C4
R401	C1	C4
R402	C1	C4
R403	C2	B4
R404	E2	C4
R406	C1	B4
R408	C1	C4
R410	C1	B4
R412	C1	D4
R414	C1	C4
R420	D1	C4
R422	D1	C4
R424	D1	D4
R428	D1	D3
R434	D1	E4
R436	E1	E4
R438	E1	B5
R440	E1	C5
R442	D1	E3
R444	E1	D2
R446	E1	D2
R448	E1	D2
R452	D1	D4
R520	D1	C4
R522	D2	C4
R524	D1	D4
R528	D2	D3
R534	D1	E4
R536	E1	F4
R538	E1	D5
R540	E1	E5
R542	D2	E3
R544	E2	E3
R546	E2	E2
R548	E1	E2
R552	D1	D4
U100	B2	B2
U102	E2	C1
U103	E2	C1
U200	B1	C2
U210A	C2	C3
U210B	C1	C3
U212A	B1	C3
U212B	C1	C3
U302A	D3	D3
U302B	D2	D3
U310A	D3	C3
U310B	D2	C3
U330A	D3	D3
U330B	D3	D3
U400A	D1	B4
U400B	B1	B4
W64	C3	D3

CHASSIS MOUNTED PARTS

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
J411	F1	CHASSIS
P411	F1	CHASSIS
S92	F1	CHASSIS
T100	A3	CHASSIS

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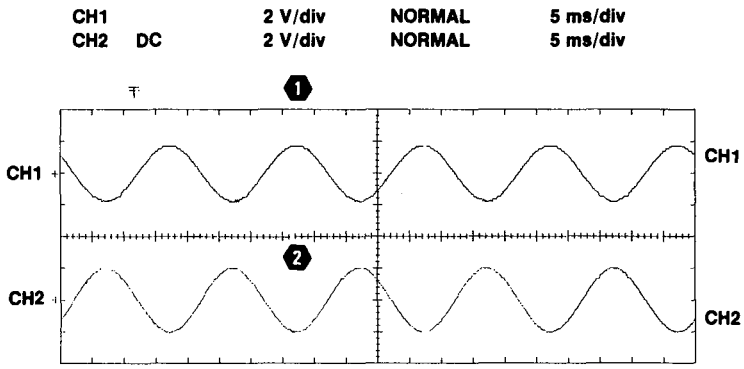
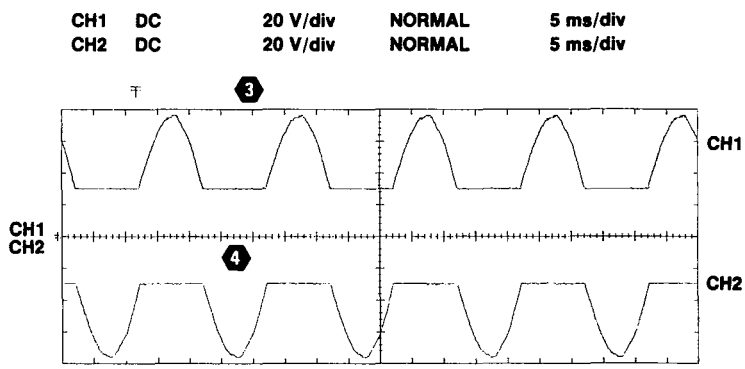
VOLTAGE AND WAVEFORM CONDITIONS

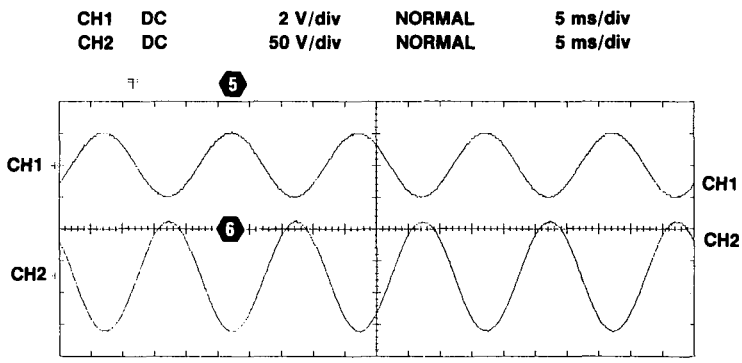
The waveforms shown below apply regardless of the 370 settings.

Voltage Conditions. The voltages shown on the diagram were obtained using a digital multimeter with a 10 Megohm input impedance. These voltages are not affected by the 370 settings.

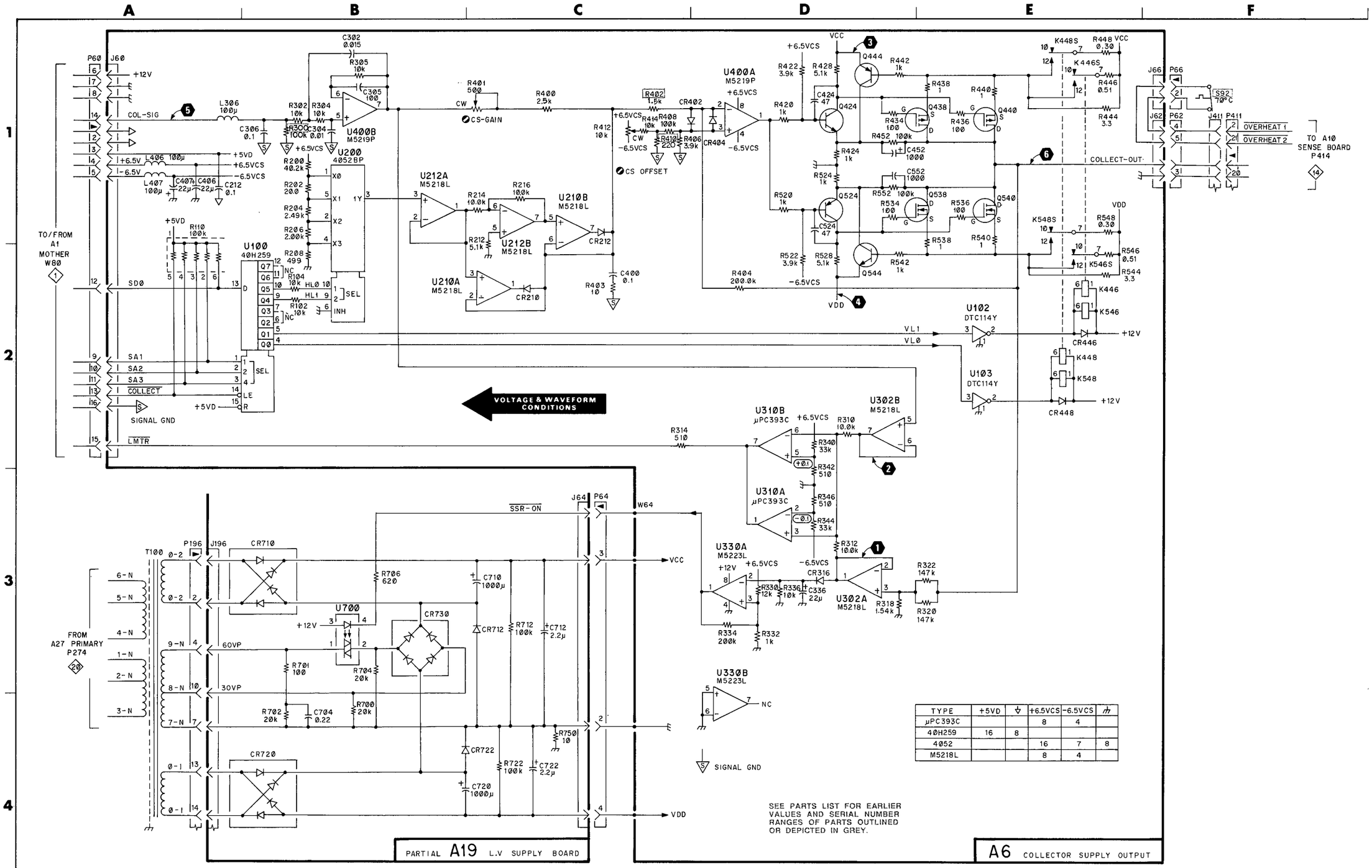
Waveform Conditions. The waveforms shown below were obtained using a test oscilloscope with 1 Megohm input impedance (TEKTRONIX 2430 oscilloscope with plotter).





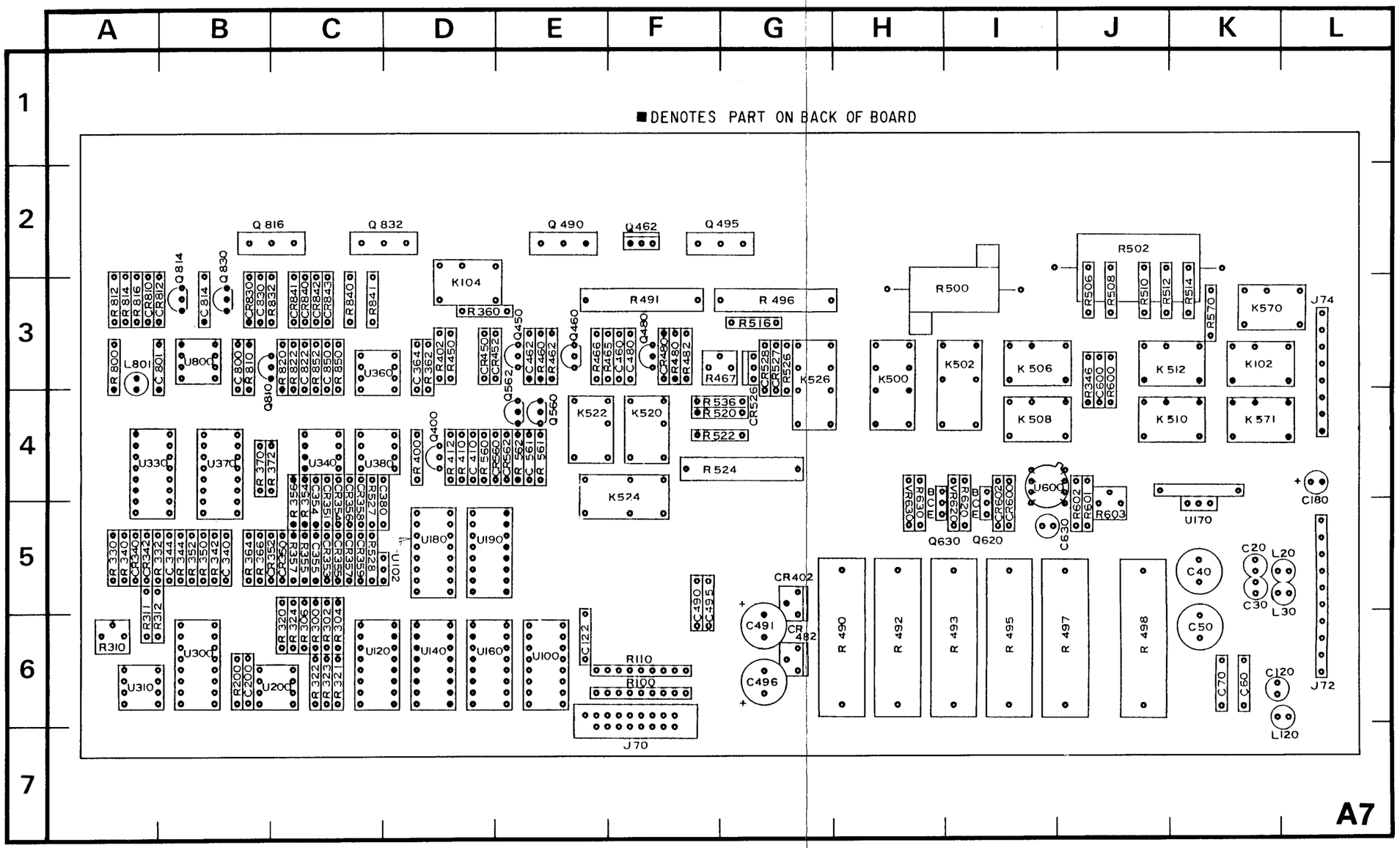


Scan by Zenith



TYPE	+5VD	⏚	+6.5VCS	-6.5VCS	⏚
µPC393C			8	4	
40H259	16	8			
4052			16	7	8
M5218L			8	4	

Scan by Zenith

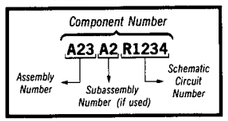


6065-720

Figure 7-11. A7—Step Generator circuit board assembly.

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



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

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STEP AMPLIFIER 11

ASSEMBLY A7

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C20	H5	K5
C30	H5	K5
C40	H5	K5
C50	H5	K6
C60	H4	K6
C70	H4	K6
C120	H5	K6
C122	H5	E6
C180	G5	L4
C200	A1	B6
C340	C2	B5
C344	C2	B5
C354	F1	C4
C355	F1	C5
C362	E1	E3
C364	D2	D3
C380	D2	D4
C410	D2	D4
C460		F3
C480	E2	F3
C490	E1	F5
C491	E1	G6
C495	E2	F5
C496	E2	G6
C561	E2	E4
C600	C3	J3
C630	B3	I5
C800	D4	B3
C801	D3	A3
C814	E3	B3
C822	E4	C3
C830	E4	B3
C850	D4	C3
C462	E1	E3
CR340	B2	A5
CR342	B2	A5
CR350	C2	C5
CR351	F1	C4
CR352	C2	B5
CR353	F1	C5
CR354	F1	C4
CR355	F1	C5
CR356	F1	C4
CR357	F1	C5
CR358	F1	C4
CR359	F1	C5
CR402	E1	G5
CR450	E1	D3
CR452	E1	D3
CR480	E2	F3
CR482	E3	G6
CR526	F1	G3
CR527	F1	G3
CR528	F1	G3
CR560	E2	D4
CR562	E2	E4
CR600	B3	I5
CR602	B3	I5
CR810	E3	A3
CR812	E3	A3
CR830	E4	B3
CR840	E3	C3
CR841	E3	C3
CR842	E4	C3
CR843	E4	C3
J70	A1	F6
J72	H4	L5
J74	H1	L3
K102	G4	K3
K104	G4	D3
K500	F5	G3
K502	F5	I3
K506	F5	I3
K508	F5	I4
K510	F5	J4
K512	F5	J3
K520	E5	F4
K522	E5	E4
K524	E5	F4
K526	G4	G3
K570	G4	K3
K571	G5	K4
L20	H5	L5
L30	H5	L5
L120	H5	L6
J801	D3	A3
Q400	D1	D4
Q450	E1	E3
Q460	E1	E3
Q462	E2	F2
Q480	E2	F3
Q490	E1	E2
Q495	E2	F2
Q560	E2	E4
Q562	E2	E4
Q620	B3	I5
Q630	B3	H5
Q810	D3	B3
Q814	E3	B3
Q816	E3	B2
Q830	E4	B3
Q832	E4	C2
R100	A3	F6
R110	A4	F6
R200	A1	B6
R300	A1	C6
R302	A2	C6
R304	A2	C6
R306	A1	C6
R310	B1	A6
R311	B1	A5
R312	B1	A5
R320	B2	C6
R321	C2	C6
R322	A2	C6
R323	A3	C6
R324	C2	C6
R330	B1	A5
R332	C1	A5
R340	B2	A5
R342	B2	B5
R344		B5
R346	A3	J3
R350	C1	B5
R352	C2	B5
R354	C1	C4
R355	F1	C5
R356	C1	C4
R360	D2	D3
R362	D2	D3
R364	C2	B5
R370	C1	B4
R372	D1	B4
R400	D1	D4
R402	D1	D3
R410	D2	D4
R412	D2	D4
R450	E1	D3
R460	E1	E3
R462	E2	E3
R465	E2	E3
R466	E2	E3
R467	E2	F3
R480	E2	F3
R482	E2	F3
R490	E1	H6
R491	E2	F3
R492	E1	H6
R493	E1	I6
R495	E2	I6
R496		G3
R497	E2	J6
R498	E2	J6
R500	F2	I3
R502	F2	J2
R506	F2	J3
R508	F2	J3
R510	F2	J3
R512	F3	J3
R514	F3	K3
R516	F2	G3
R520	F2	F4
R522	F2	F4
R524	F3	G4
R526	F1	G3
R527	F1	C4
R528	F1	C5
R536	E2	F4
R560	E2	D4
R561	E2	E4
R562	E2	E4
R570	G1	K3
R600	C3	J3
R601	B3	J5
R602	B3	J5
R603	B3	J5
R620	B3	I5
R630	B3	H5
R800	D3	A3
R810	D3	B3
R812	D3	A3
R814	D3	A3
R816	E3	A3
R820	D4	D3
R822	E4	C3
R832	E4	B3
R840	E3	C3
R841	E4	C3
R850	D4	C3
R852	D4	C3
U100	B4	E6
u102	D4	D5
U120	B5	C6
U140	C5	D6
U160	C5	D6
U170	G5	K4
U180	D5	D5
U190	D5	D5
U200	A1	C6
U300	B1	B6
U310	B1	A6
U330	B1	A4
U340	C1	C4
U360	D2	C3
U370	D1	B4
U380	D1	C4
U600	B3	I4
U800	D3	B3
VR620	B3	I5
VR630	B3	H5

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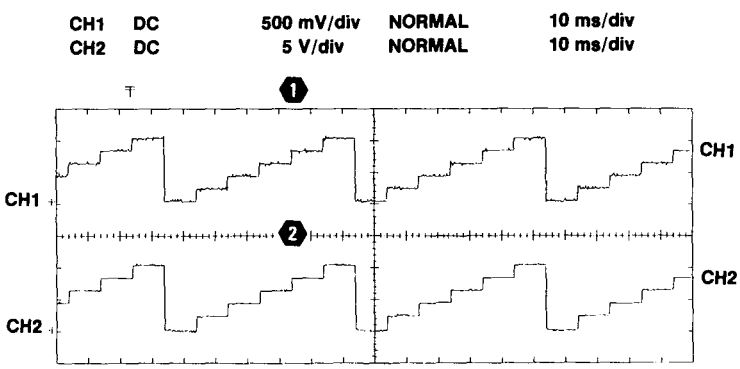
WAVEFORM CONDITIONS

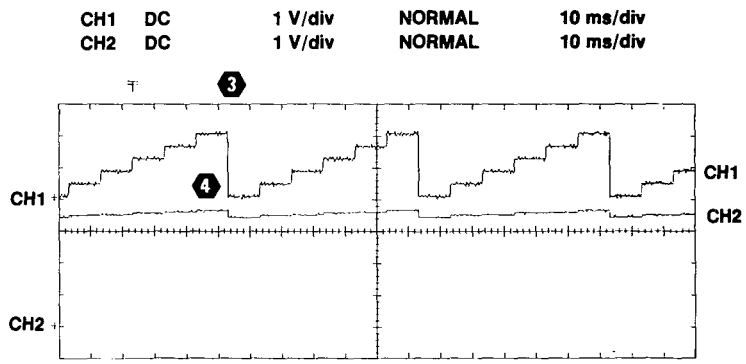
The waveforms shown apply regardless of the 370 settings, except for the STEP GEN and BASE-terminal and Emitter-terminal.

Waveform Conditions. The waveforms shown below were obtained using a test oscilloscope with 1 Megohm input impedance (TEKTRONIX 2430 oscilloscope with plotter) from the 370 under the following conditions.

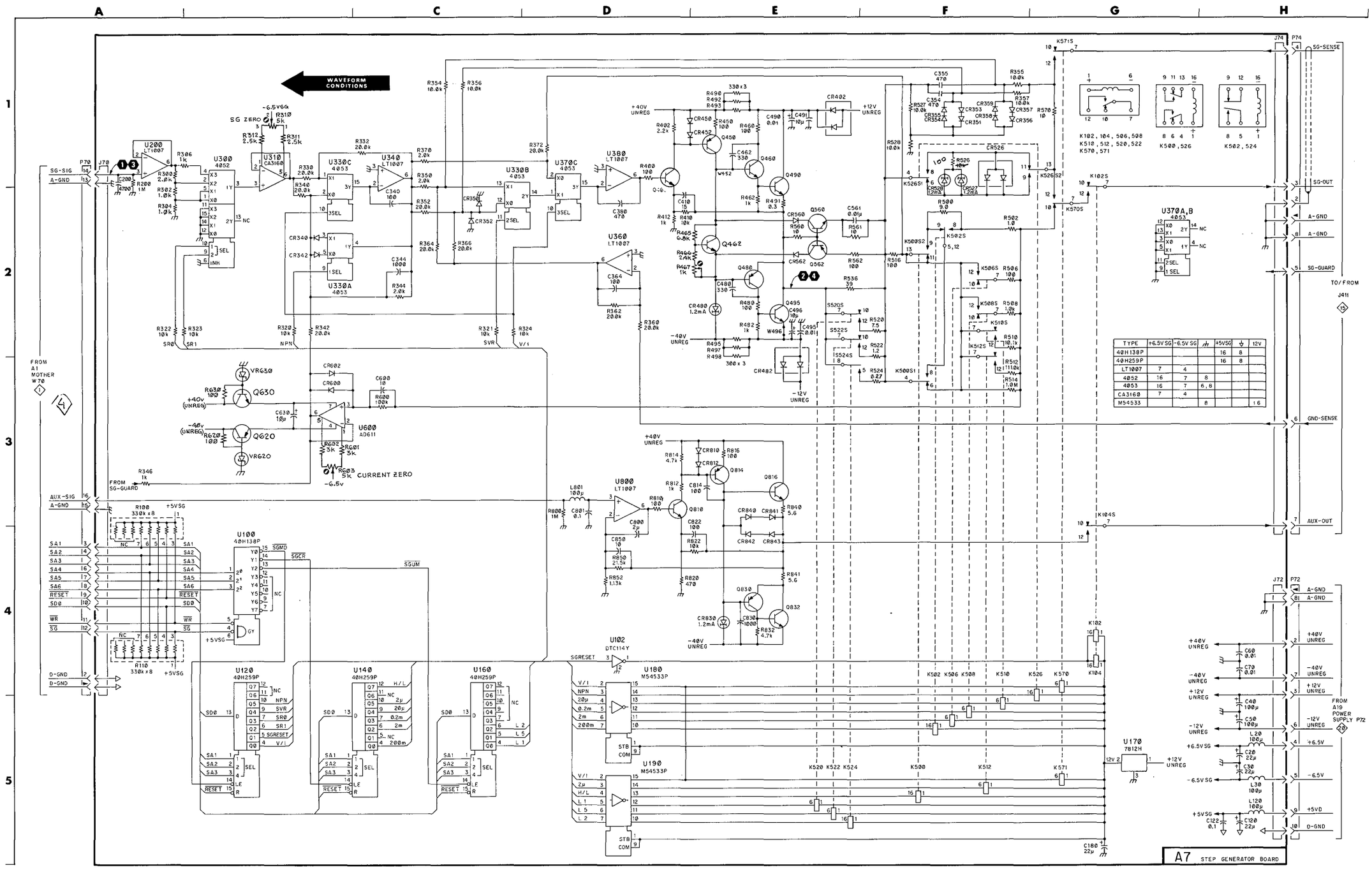
Waveform 1 and 2 conditions: These waveforms were obtained from the 370 with STEP GEN set to 2 V/step.

Waveform 3 and 4 conditions: These waveforms were obtained from the 370 with STEP GEN set to 200 mA/step, and Base-terminal and Emitter-terminal open.



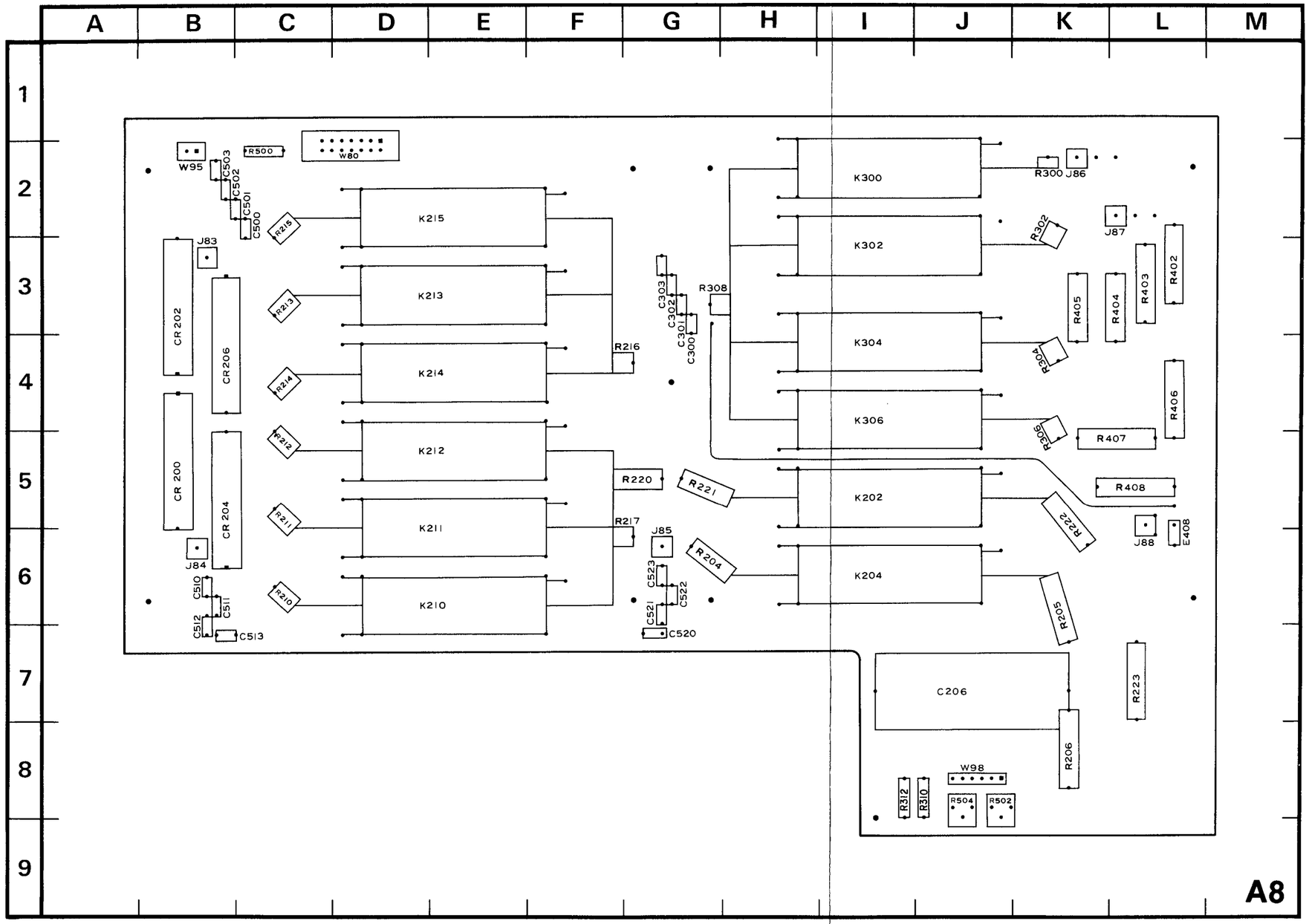


Scan by Zenith



TYPE	+6.5V SG	-6.5V SG	⏚	+5VSG	⏚	12V
40H138P				16	8	
40H259P				16	8	
LT1007	7	4				
4052	16	7	8			
4053	16	7	6,8			
CA3160	7	4				
M54533			8			16

Scan by Zenith

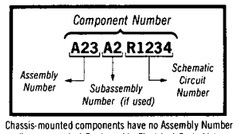


6065-722

Figure 7-12. A8—High Voltage Relay circuit board assembly.

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



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

A10—Sense circuit board illustration and component locator grid is located on the reverse side of 13

A8—High Voltage Relay circuit board illustration to be used with diagrams 12 *and* 13

COLLECTOR SUPPLY HIG

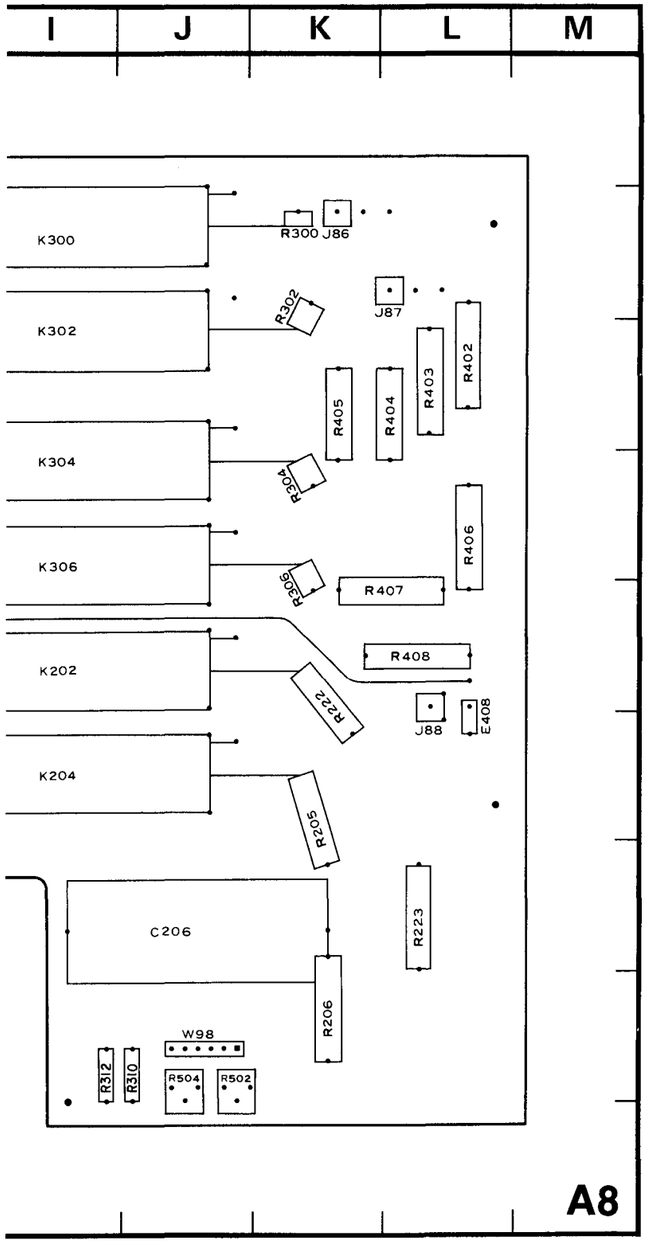
ASSEMBLY A8

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C206	D1	J7
C300	E2	G3
C301	E2	G3
C302	E2	G3
C303	E2	G3
C500	B2	C2
C501	B2	C2
C502	B2	B2
C503	B2	B2
C510	B2	B6
C511	B2	B6
C512	B2	B7
C513	B2	B7
C520	D2	G6
C521	D2	G6
C522	D2	G6
C523	D2	G6
CR200	B1	B5
CR202	B1	B3
CR204	B1	B5
CR206	B1	B4
E408	E1	L6
J83		A1
J84		A1
J85		D1
J86		D1
J87		D1
J88		E1
K202		D2
K204		D2
K210		C2
K211		C2
K212		C3
K213		C3
K214		C3
K215		C2
K300		D3
K302		D3
K304		E3
K306		E2
R204		D2
R205		D1
R206		D2
R210		C1
R211		C1
R212		C1

CHASSIS MOUNTED PARTS

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
R400B	D1	CHASSIS

Scan by Zenith



6065-722

bly.

e Relay circuit board illustration to be used with diagrams 12 and 13

COLLECTOR SUPPLY HIGH VOLTAGE 12

ASSEMBLY A8

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C206	D1	J7
C300	E2	G3
C301	E2	G3
C302	E2	G3
C303	E2	G3
C500	B2	C2
C501	B2	C2
C502	B2	B2
C503	B2	B2
C510	B2	B6
C511	B2	B6
C512	B2	B7
C513	B2	B7
C520	D2	G6
C521	D2	G6
C522	D2	G6
C523	D2	G6
CR200	B1	B5
CR202	B1	B3
CR204	B1	B5
CR206	B1	B4
E408	E1	L6
J83	A1	B3
J84	A1	B6
J85	D1	G6
J86	D1	K2
J87	D1	L2
J88	E1	L6
K202	D2	I5
K204	D2	I6
K210	C2	E6
K211	C2	E5
K212	C3	E5
K213	C3	E3
K214	C3	E4
K215	C2	E2
K300	D3	I2
K302	D3	I3
K304	E3	I4
K306	E2	I4
R204	D2	G6
R205	D1	K6
R206	D2	K8
R210	C1	C6
R211	C1	C5
R212	C1	C5
R213	C1	C3
R214	C2	C4
R215	C2	C2
R216	C2	F4
R217	D1	F6
R220	C1	G5
R221	C1	G5
R222	D1	K5
R223	D1	L7
R300	D1	K2
R302	D1	K2
R304	E1	K4
R306	E1	K5
R308	E1	G3
R402	D1	L3
R403	D1	L3
R404	E1	L3
R405	E1	K3
R406	E1	L4
R407	E1	L5
R408	E1	L5
R500	C2	C2
W80	B2	D2
W95	E2	B2
W308	E1	H5

CHASSIS MOUNTED PARTS

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
R400B	D1	CHASSIS

COLLECTOR SUPPLY LOW VOLTAGE 13

ASSEMBLY A8

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
R310	E1	I8
R312	E1	I8
R502	E1	J8
R504	E1	J8
W98	D1	J8

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FROM A9 L.V. RELAY T200 13

P84 J84 9-N

P83 J83 9-2

MAX 1414 VAC

FLOATING GROUND IS CONNECTED TO GUARD BOX

CR204 CR200 CR206 CR202

R210 33 K210S

R211 33 K211S

R213 33 K213S

R212 33 K212S

R214 33 K214S

R215 33 K215S

C500 47 C501 47 C502 47 C503 47

C510 47 C511 47 C512 47 C513 47

R217 33 R220 240k R221 240k R222 240k R223 240k

K202S K204S K205S K206S

R204 2k R205 2k R206 10M C206 0.1

C523 22 C522 22 C521 22 C520 22

R500 100k R216 33

J85 P85 B1 R400B 20k 80k B3 P87 B2 P86 J86

R300 33 K300S

J87 R402 100k R403 100k R404 100k R405 100k R406 1k R407 1M R408 10M E408

R302 33 K302S R304 33 K304S R306 33 K306S R308 33

J88 P88 W88 TO A9 HIGH/LOW SWITCH 13

W308

C300 10 C301 10 C302 10 C303 10

W95 P95 2 TO A9 L.V.RELAY BOAD J95 13

J80 P80 W80

2	NC	
3	+12VH	+12VH
4	+12VH	+12VH
5	+12VDC	+12VDC
6	2KDC	
7	$\overline{2KDC}$	
8	R13	
9	$\overline{2KAC}$	
10	$\overline{2K+}$	
11	$\overline{2K-}$	
12	$\overline{R10}$	
13	$\overline{R11}$	
14	$\overline{R12}$	

TO A10 SENSE R138 14

LOOP-COMP

+12VDC K204 K202

+12VH K306

K210 K215 K211 K214 K213 K212

K300 K302 K304

PARTIAL A8 H.V. RELAY BOARD

9

FROM A10 SENSE J417 14

SD0 13

U800 40H259

U810 M54533

U820 M54533

+5VDS

STB

2KAC $\overline{2KAC}$ 2K+ $\overline{2K+}$ 2K− $\overline{2K-}$ R10 $\overline{R10}$ R11 $\overline{R11}$ R12 $\overline{R12}$ 2KDC R13

FROM A10 SENSE Q740 14

$\overline{ARC}$

VR820 6.2V +12VS

NC 2KDC $\overline{2KDC}$ $\overline{R13}$

SA1 SA2 SA3 SEL

FROM A10 SENSE U720−10 14

$\overline{S5}$ LE +5VDS R

TYPE	+5VDS	⏚	+12VS	⫽
40H259	16	8		
M54533			16,9	8

PARTIAL A10 SENSE BOARD

Scan by Zenith

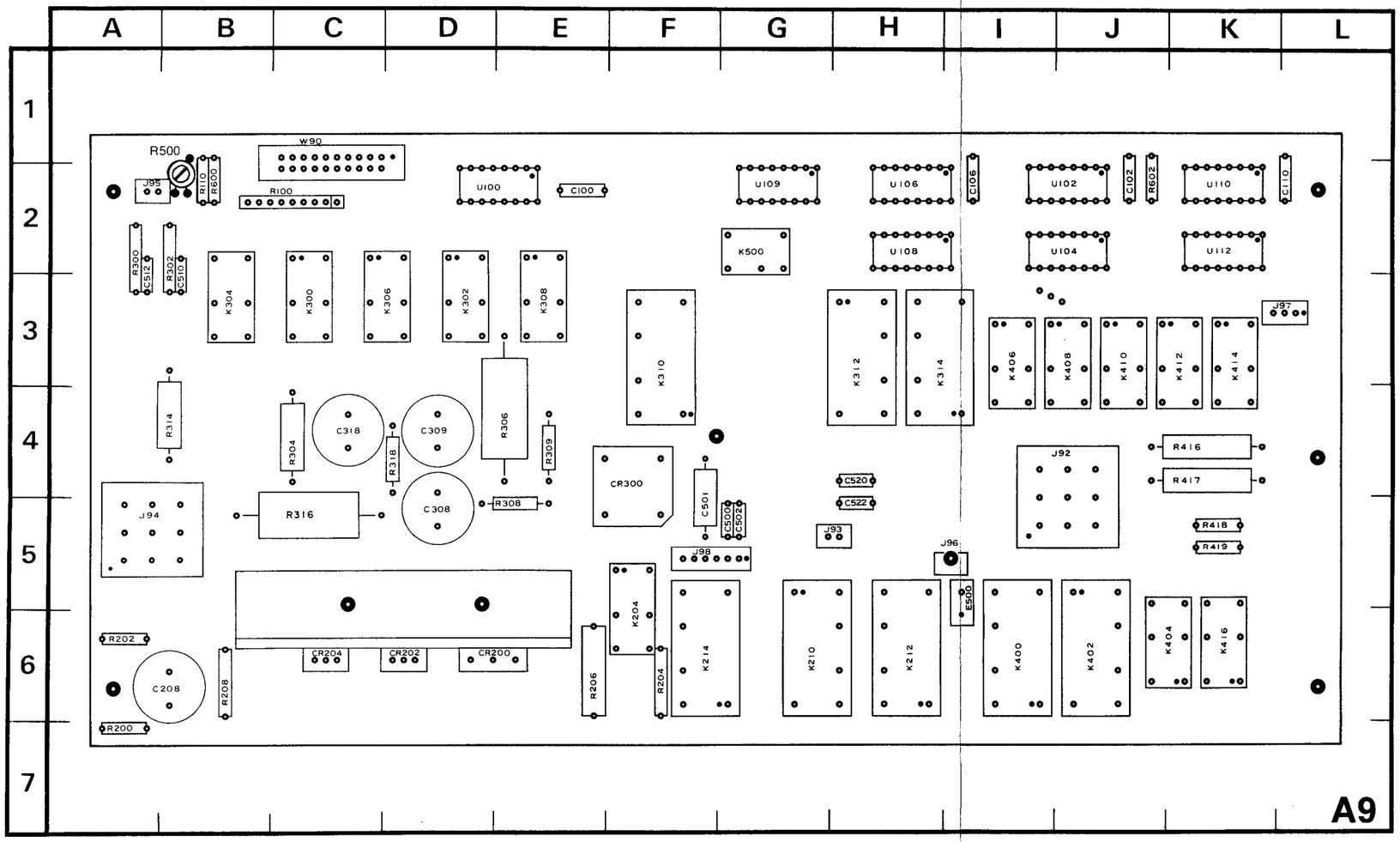

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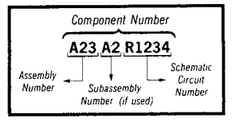
Figure 7-13. A9—Low Voltage Relay circuit board assembly.

A8—High Voltage Relay circuit board illustration and component locator grid is located on the reverse side of 11

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



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

COLLECT

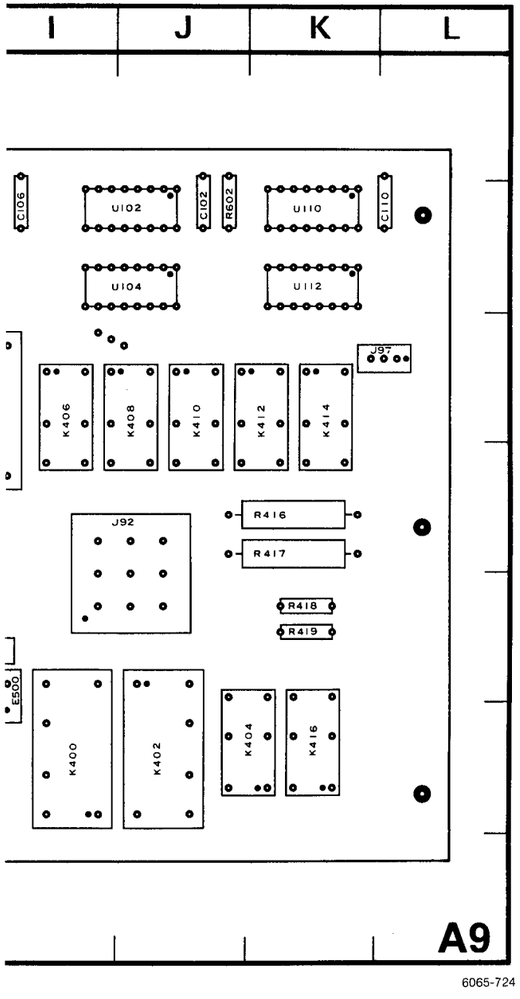
ASSEMBLY A9

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C100	B4	E2
C102	B4	J2
C106	B4	I2
C110	B4	L2
C208	C3	B6
C308	B2	D5
C309	B2	D4
C318	C2	C4
C500	E1	G5
C501	E1	F5
C502	E1	G5
C510	B2	B3
C512	B3	A3
C520	D1	H4
C522	F2	H5
CR200	C3	D6
CR202	C3	D6
CR204	C3	C6
CR300	B2	F4
E500	F3	I5
J92	D2	J4
J93	E2	H5
J94	A4	A5
J95	F1	A2
J96	F3	I5
J97	F2	L3
J98	D1, E1	F5

CHASSIS MOUNTED PARTS

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
P84	A1	CHASSIS
P90	A3	CHASSIS
P104	A2	CHASSIS
R400A	E2	CHASSIS

Scan by Zenith



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COLLECTOR SUPPLY LOW VOLTAGE 13

ASSEMBLY A9

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C100	B4	E2
C102	B4	J2
C106	B4	I2
C110	B4	L2
C208	C3	B6
C308	B2	D5
C309	B2	D4
C318	C2	C4
C500	E1	G5
C501	E1	F5
C502	E1	G5
C510	B2	B3
C512	B3	A3
C520	D1	H4
C522	F2	H5
CR200	C3	D6
CR202	C3	D6
CR204	C3	C6
CR300	B2	F4
E500	F3	I5
J92	D2	J4
J93	E2	H5
J94	A4	A5
J95	F1	A2
J96	F3	I5
J97	F2	L3
J98	D1, E1	F5
K204	C3	F6
K210	D3	G6
K212	D3	H6
K214	D2	F6
K300	C2	C3
K302	C2	D3
K304	C2	B3
K306	C2	D3
K308	C2	E3
K310	D2	F3
K312	D2	H3
K314	D2	H3
K400	D3	I6
K402	E3	J6
K404	E3	K6
K406	E3	I3
K408	E3	J3
K410	E3	J3
K412	E3	K3
K414	E3	K3
K416	E3	K6
K500	E2	G2
R100	B4	C2
R110	B4	B2
R200	C3	A7
R202	B3	A6
R204	C3	F6
R206	C3	E6
R208	C3	B6
R300	B3	A2
R302	B3	B2
R304	C2	C4
R306	B2	E4
R308	C2	E5
R309	C2	E4
R314	C2	B4
R316	C2	C5
R318	C2	D4
R416	E3	K4
R417	E2	K4
R418	E2	K5
R419	F2	K5
R500	E1	B2
R600	F2	B2
R602	F2	J2
U100	C4	D2
U102	D4	J2
U104	E4	J2
U106	C4	H2
U108	E4	H2
U109	E4	G2
U110	D4	K2
U112	E4	K2
W90	A3	C1

CHASSIS MOUNTED PARTS

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
P84	A1	CHASSIS
P90	A3	CHASSIS
P104	A2	CHASSIS
R400A	E2	CHASSIS
S90	E2	CHASSIS
S100B	F3	CHASSIS
S200B	F2	CHASSIS
T200	A1	CHASSIS

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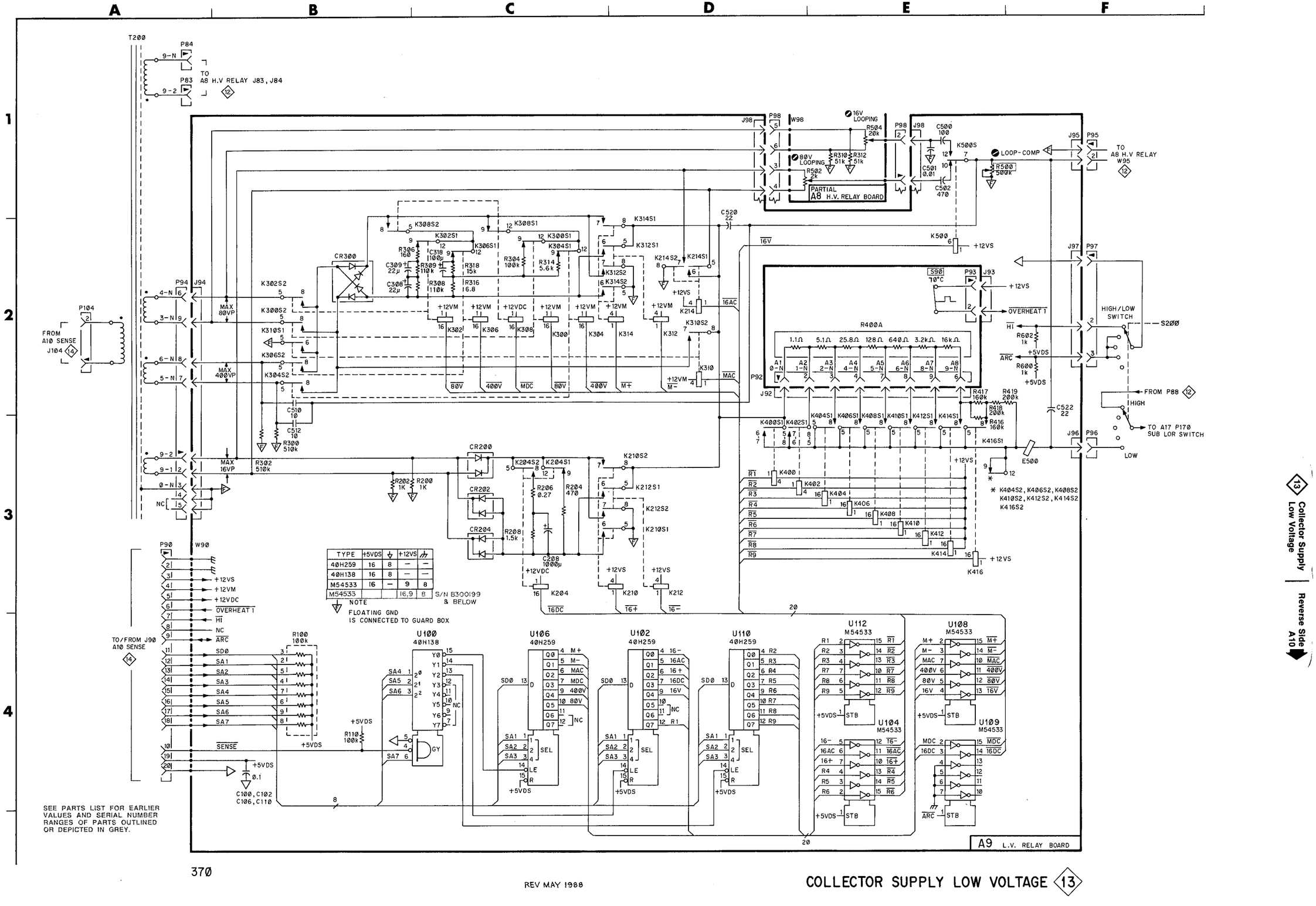

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COLLECTOR SUPPLY LOW VOLTAGE 13

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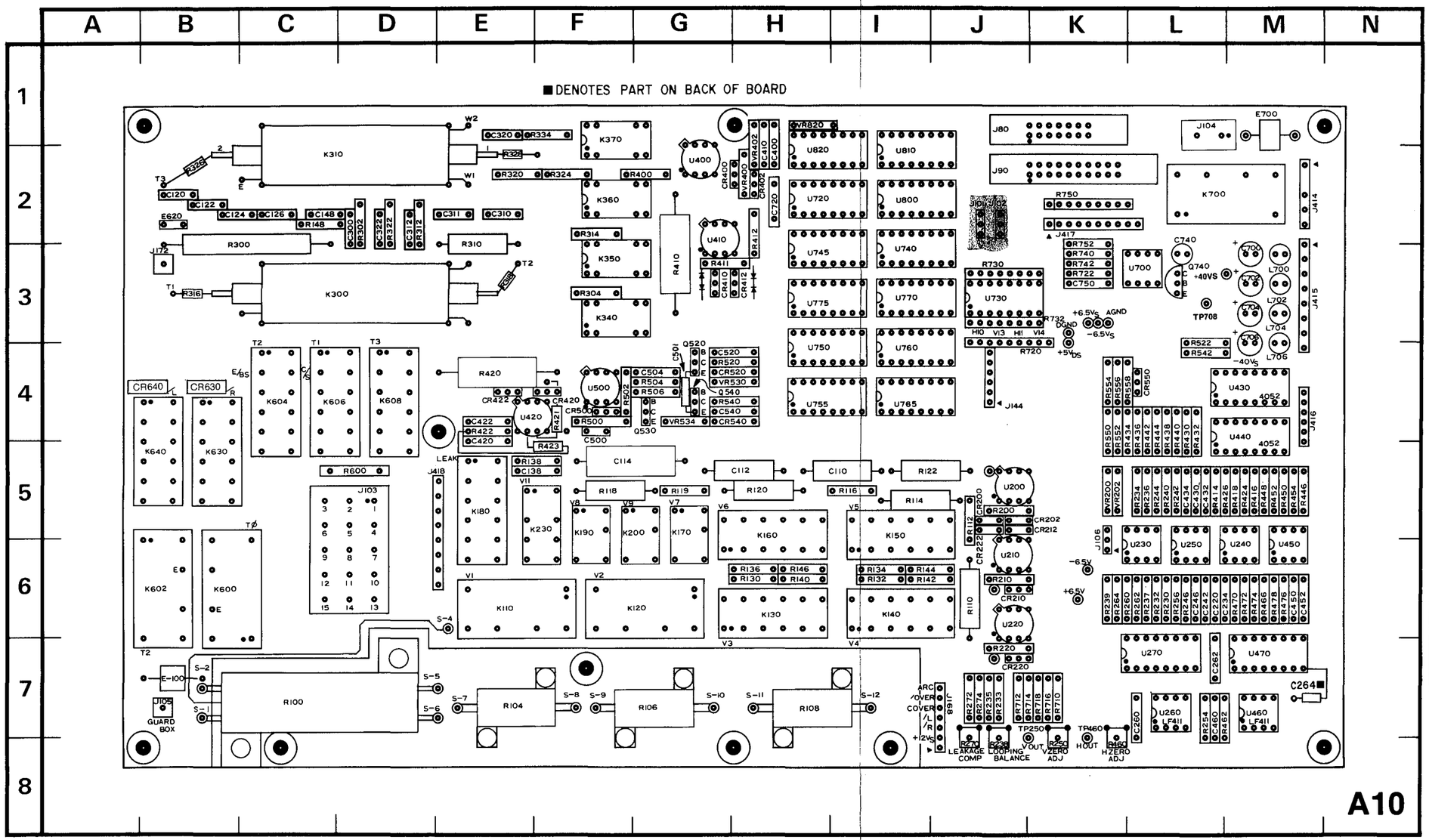
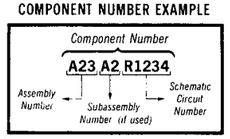


Figure 7-14. A10—Sense circuit board assembly.

A10—Sense circuit board illustration to be used with diagrams 12 , 14 *and* 15

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



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

A16—LOR SW
circuit board illustration
and component locator grid
is located on the reverse side of 14

Assembly A10

COLLECTOR SUPPLY HIG

ASSEMBLY A10

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION
J80	A2	J1	U800	B4
			U810	C4
			U820	D4

VERTICAL SENS

ASSEMBLY A10

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION
C110	D2	I5	K130	B4
C112	D2	H5	K140	C4
C114	D2	F5	K150	C4
C120	A3	B2	K160	C4
C122	A3	B2	K170	C4
C124	A3	B2	K180	D4
C126	A3	C2	K190	D4
C138	B3	E5	K200	D4
C148	B3	C2	K230	D4
C220	B1	L6	K700	G3
C234	F3	L6		
C242	E2	L6	L700	A1
C246	E2	L6	L702	A1
C260	F2	L7	L704	A1
C262	B1	L7	L706	A1
C264	A1	M7		
C400	A1	H2	Q740	G2
C410	B1	H2		
C420	B1	E4	R100	B2
C422	B1	E4	R104	B2
C430	B1	L5	R106	B2
C432	B1	L5	R108	C2
C434	B1	L5	R110	C2
C700	A1	M3	R112	C2
C702	A1	M3	R114	C2
C704	B1	M3	R116	C2
C706	A1	M3	R118	D2
C720	A1	H2	R119	D2
C740	G1	L3	R120	D2
C750	A1	K3	R122	D2
			R130	B2
CR200	E2	J5	R132	C2
CR202	E2	J5	R134	C2
CR210	E2	J6	R136	C2
CR212	E3	J5	R138	B3
CR220	E3	J7	R140	B3
CR222	E3	J5	R142	C3
			R144	C3
E700	H3	M1	R146	C3
			R148	B3
J90	H4	K2	R200	D2
J101	G3	J2	R210	D3
J102	G3	J2	R220	D3
J104	H3	L1	R230	E3
J105	A2	B7	R232	E3
J106	F3	K6	R233	E4
J144	H1	J4	R234	E4
J168	H1	J7	R235	E4
J414	H2	M2	R236	E4
J415	A1	M3	R237	F3
J416	H2	M4	R238	E4
J417	A5	K2	R239	F3
			R240	E2
K110	B4	E6	R242	E2
K120	B4	G6	R244	E2

CHASSIS MOUNTED PARTS

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION
J411	A1, H2	CHASSIS	S400	H1
			S402	H2
P411	A1, H2	CHASSIS		
R500	F4	CHASSIS		

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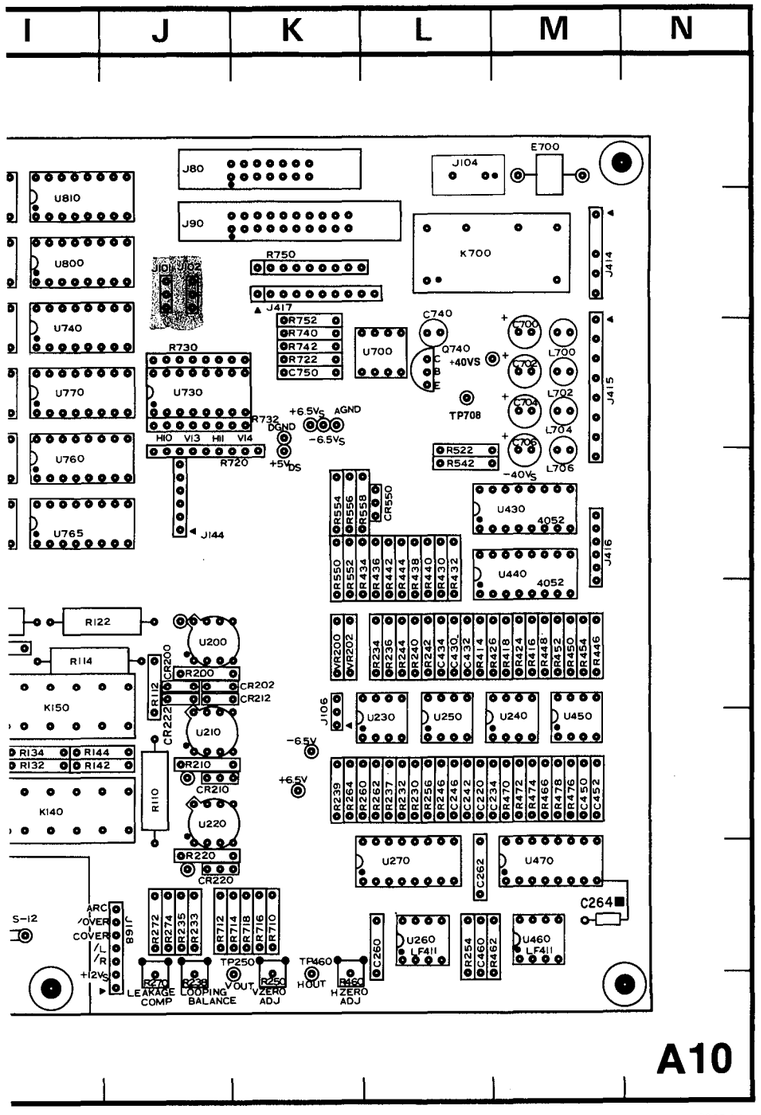

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oly.

ration to be used with diagrams 12 , 14 *and* 15

COLLECTOR SUPPLY HIGH VOLTAGE 12

ASSEMBLY A10

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
J80	A2	J1	U800	B4	I2	VR820	D3	H1
			U810	C4	I2			
			U820	D4	H2			

VERTICAL SENSE 14

ASSEMBLY A10

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C110	D2	I5	K130	B4	H6	R246	E2	L6
C112	D2	H5	K140	C4	I6	R250	F2	K7
C114	D2	F5	K150	C4	I5	R254	F2	L7
C120	A3	B2	K160	C4	H5	R256	F2	L6
C122	A3	B2	K170	C4	G5	R260	F2	L6
C124	A3	B2	K180	D4	E5	R262	F2	L6
C126	A3	C2	K190	D4	F5	R264	F2	K6
C138	B3	E5	K200	D4	G5	R270	E2	J7
C148	B3	C2	K230	D4	F5	R272	D2	J7
C220	B1	L6	K700	G3	L2	R274	D2	J7
C234	F3	L6				R710	G1	K7
C242	E2	L6	L700	A1	M3	R712	G1	J7
C246	E2	L6	L702	A1	M3	R714	G1	K7
C260	F2	L7	L704	A1	M3	R716	G1	K7
C262	B1	L7	L706	A1	M4	R718	G1	K7
C264	A1	M7				R720	G2	J4
C400	A1	H2	Q740	G2	L3	R722	G2	K3
C410	B1	H2				R730	D5	J3
C420	B1	E4	R100	B2	C7	R732	D5	J3
C422	B1	E4	R104	B2	E7	R740	G1	K3
C430	B1	L5	R106	B2	G7	R742	G2	K3
C432	B1	L5	R108	C2	H7	R750	G5	K2
C434	B1	L5	R110	C2	J6	R752	G5	K3
C700	A1	M3	R112	C2	J5			
C702	A1	M3	R114	C2	I5	TP250	G2	K7
C704	B1	M3	R116	C2	I5	TP708	A1	L3
C706	A1	M3	R118	D2	F5			
C720	A1	H2	R119	D2	G5	U200	E2	J5
C740	G1	L3	R120	D2	H5	U210	E3	J6
C750	A1	K3	R122	D2	I5	U220	E3	J6
			R130	B2	H6	U230	E3	L6
CR200	E2	J5	R132	C2	I6	U240	F3	M6
CR202	E2	J5	R134	C2	I6	U250	E2	L6
CR210	E2	J6	R136	C2	H6	U260	F2	L7
CR212	E3	J5	R138	B3	E5	U270A	F2	L7
CR220	E3	J7	R140	B3	H6	U270B	F2	L7
CR222	E3	J5	R142	C3	I6	U270C	F3	L7
			R144	C3	I6	U700	G1	L3
E700	H3	M1	R146	C3	H6	U720	B5	H2
			R148	B3	C2	U730	D5	J3
J90	H4	K2	R200	D2	J5	U740	F5	I3
J101	G3	J2	R210	D3	J6	U745	F5	H3
J102	G3	J2	R220	D3	J7	U750	B5	H4
J104	H3	L1	R230	E3	L6	U755	B5	H4
J105	A2	B7	R232	E3	L6	U760	C5	I4
J106	F3	K6	R233	E4	J7	U765	C5	I4
J144	H1	J4	R234	E4	L5	U770	E5	I3
J168	H1	J7	R235	E4	J7	U775	E5	H3
J414	H2	M2	R236	E4	L5			
J415	A1	M3	R237	F3	L6	VR200	E1	K5
J416	H2	M4	R238	E4	J7	VR202	E1	K5
J417	A5	K2	R239	F3	K6			
			R240	E2	L5			
K110	B4	E6	R242	E2	L5			
K120	B4	G6	R244	E2	L5			

CHASSIS MOUNTED PARTS

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
J411	A1, H2	CHASSIS	S400	H1	CHASSIS	T200	H3	CHASSIS
P411	A1, H2	CHASSIS	S402	H2	CHASSIS			
R500	F4	CHASSIS						

HORIZONTAL SENSE 15

ASSEMBLY A10

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C300	D3	D2	K608	C5	D4	R446	G4	M5
C310	D3	E2	K630	B4	B5	R448	G4	M5
C311	D3	E2	K640	B4	B5	R450	G4	M5
C312	D3	D2				R452	G4	M5
C320	D3	E1	Q520	D1	G4	R454	G4	M5
C322	D4	D2	Q530	D1	G4	R460	H3	K7
C450	G3	M6	Q540	D2	G4	R462	H3	L7
C452	G3	M6				R466	G3	M6
C460	H3	L7	R300	D3	C2	R470	G2	M6
C500	E1	F4	R302	D3	D2	R472	G3	M6
C501	F2	G4	R304	E3	F3	R474	G3	M6
C504	E1	G4	R310	D3	E3	R476	G3	M6
C520	D1	H4	R312	D3	D2	R478	G3	M6
C540	D2	H4	R314	E3	F2	R500	E1	F4
			R316	D3	B3	R502	E1	F4
CR400	E3	H2	R318	D3	E3	R504	E1	G4
CR402	E3	H2	R320	D3	E2	R506	D1	G4
CR410	E4	G3	R322	D4	D2	R520	D1	G4
CR412	E3	H3	R324	E3	F2	R522	D1	L4
CR420	E4	F4	R326	D3	B2	R540	D2	G4
CR422	E4	E4	R328	D3	E2	R542	D2	L4
CR500	E2	F4	R334	E4	F1	R550	F2	K4
CR520	D1	G4	R400	E3	G2	R552	F2	K4
CR540	D2	G4	R410	E4	G3	R554	F2	K4
CR550	F2	L4	R411	E4	G3	R556	F2	K4
CR630	B4	B4	R412	E4	H2	R558	F2	L4
CR640	B4	B4	R414	F4	L5	R600	D4	D5
			R416	F4	M5			
E100	D4	B7	R418	F4	M5	TP460	H3	K8
E620	C3	B2	R420	E4	E4			
			R421	E4	F4	U400	E3	G2
J103	A4	D5	R422	E4	E4	U410	E4	G2
J172	C3	B3	R423	E4	F5	U420	E4	E4
J418	A5	E5	R424	F4	M5	U430	F3	M4
			R426	F4	L5	U440	G3	M4
K300	D3	D3	R430	F3	L4	U450	G3	M6
K310	D4	D2	R432	F3	L4	U460	H3	M7
K340	E3	F3	R434	F4	L4	U470	H3	M7
K350	E3	F3	R436	F4	L4	U500	E1	F4
K360	E4	F2	R438	F4	L4			
K370	E4	F1	R440	F4	L4	VR400	E3	H2
K600	C4	B6	R442	F4	L4	VR402	E3	H2
K602	C5	B6	R444	F4	L4	VR530	D2	H4
K604	C4	C4				VR534	D1	G4
K606	C4	C4						

Scan by Zenith

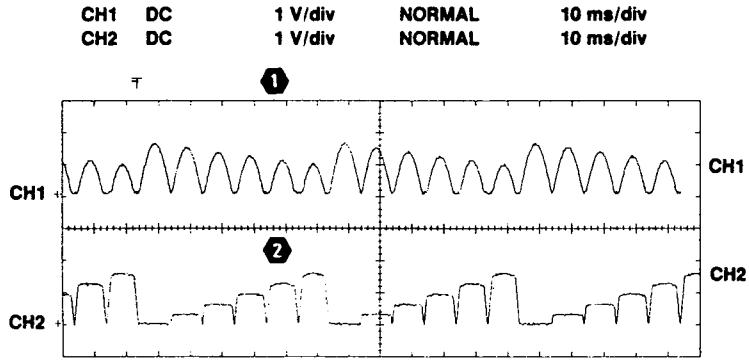
WAVEFORM CONDITIONS

The waveforms shown were obtained from the 370 with a Tektronix part no. 151-0190-00 mounted on the 370 Test Adapter.

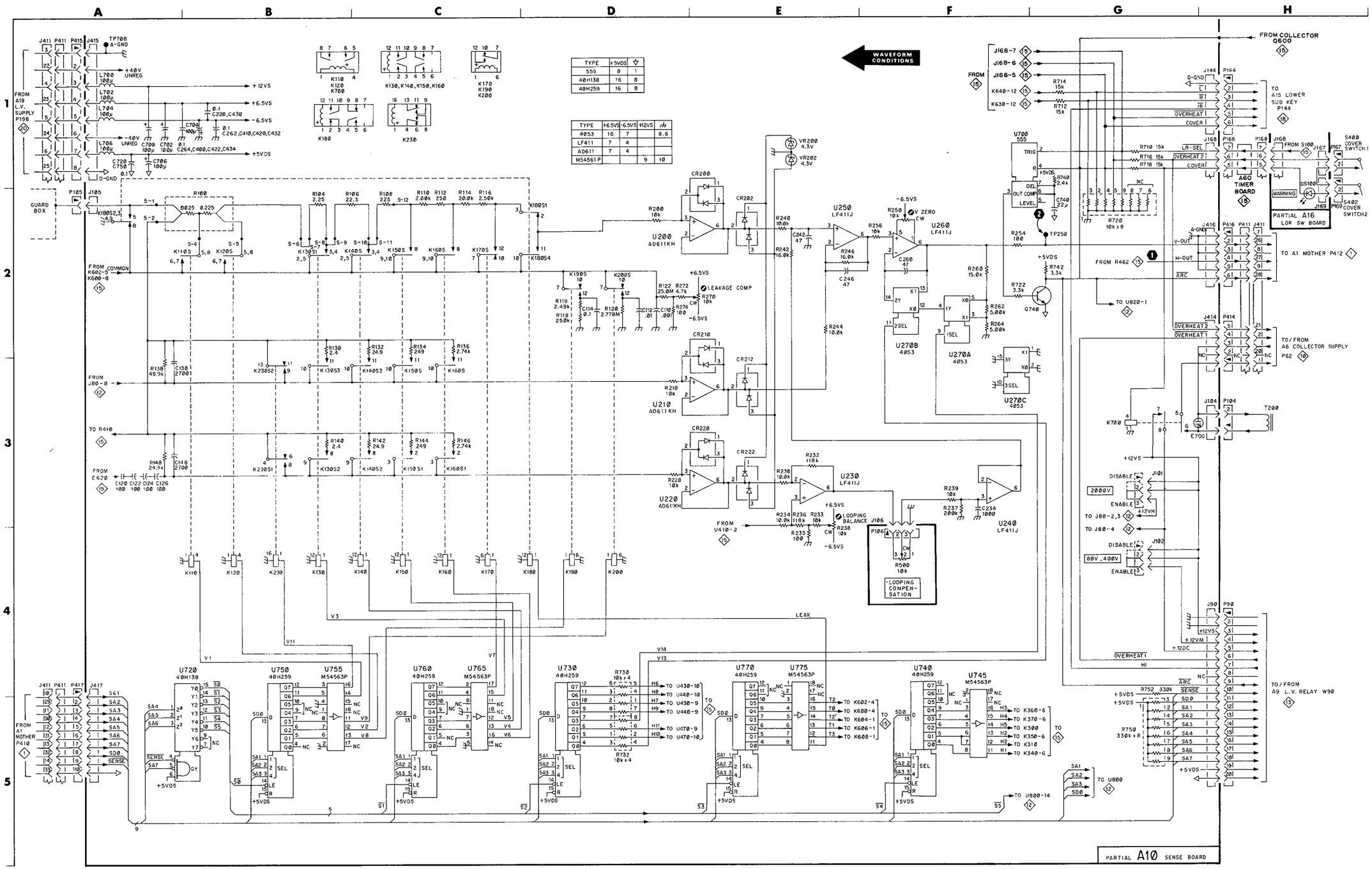
Waveform Conditions. The waveforms shown below were obtained using a test oscilloscope with 1 Megohm input impedance (TEKTRONIX 2430 oscilloscope with plotter) from the 370 under the following condition.

With Tektronix part no. 151-0190-00 mounted in the 370 Test Adapter, the 370 setting is as follows:

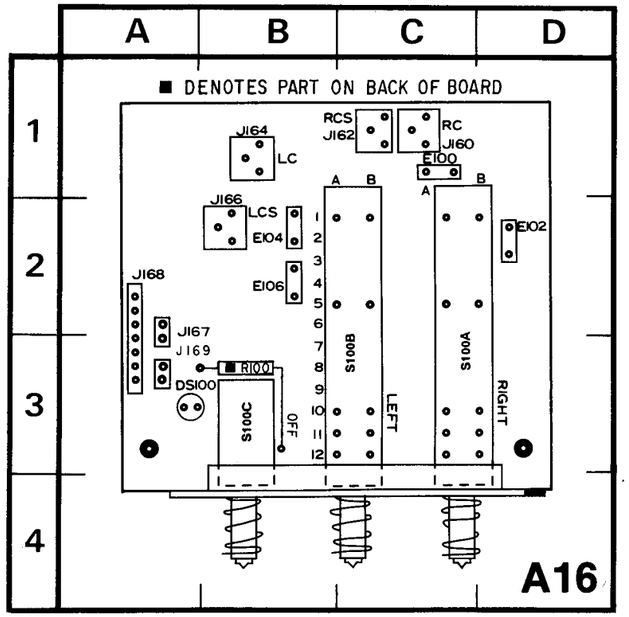
VERT/DIV	1 mA
HORIZ/DIV	2 V
PER STEP	10 μA
OFFSET	0.0 μA
B or gm/DIV	100



Scan by Zenith



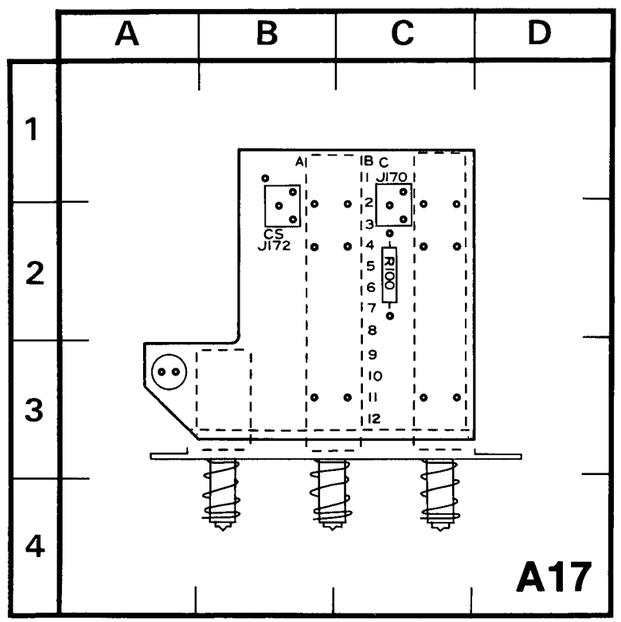
Scan by Zenith



6065-728

Figure 7-15. A16—LOR SW circuit board assembly.

A16—LOR SW circuit board illustration to be used with diagrams ◇14◇ *and* ◇15◇



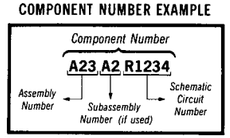
6065-729

Figure 7-16. A17—Sub LOR SW circuit board assembly.

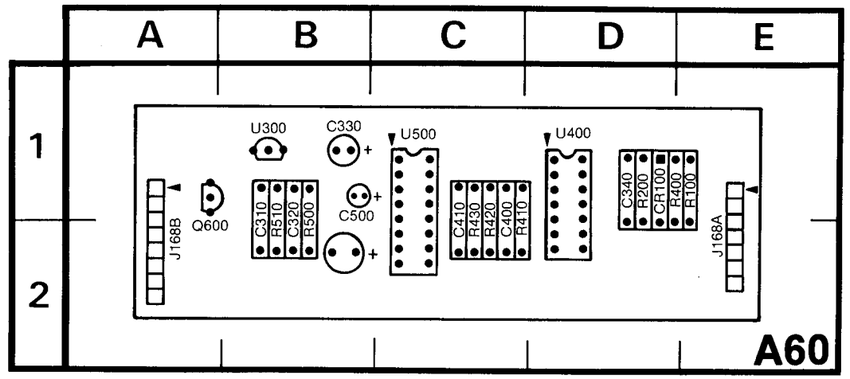
A10—Sense circuit board illustration and component locator grid is located on the reverse side of ◇13◇

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



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



6065-782

Figure 7-17. A60—Timer circuit board assembly.

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VERTICAL SENSE 14

ASSEMBLY A16

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
DS100	H2	A3	J167	H1	A2
			J168	H1	A2
			J169	H1	A3

HORIZONTAL SENSE 15

ASSEMBLY 16

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
E100	B2	C1	J160	A2	C1	R100	B1	B3
E102	B2	D2	J162	A2	C1			
E104	B2	B2	J164	A2	B1	S100A	B1	D3
E106	B2	B2	J166	A2	B2	S100B	B1	C3
			J168	B1	A2	S100C	B1	B3

ASSEMBLY A17

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
J170	B3	C2	R100	B3	C2
J172	B3	B2			

ASSEMBLY 60

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C310	C1	B1	J160A	C1	E2	R420	C1	C1
C320	D1	B1	J160B	E1	A2	R430	D1	C1
C330	D1	B1				R500	D1	B1
C340	D1	D1	Q600	E2	A1	R510	D1	B1
C400	C1	C1						
C410	C2	C1	R100	C1	E1	U300	D1	B1
C500	D1	B1	R200	C1	D1	U400	D1	D1
			R400	C1	D1	U500	D2	C1
CR100	C1	D1	R410	C1	C1			

CHASSIS MOUNTED PARTS

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C704	A4	CHASSIS	J504	A3	CHASSIS	J704	A4	CHASSIS
			J506	A3	CHASSIS	J706	A4	CHASSIS
E506	A3	CHASSIS	J508	A3	CHASSIS			
E604	A2	CHASSIS	J510	A3	CHASSIS	P411	A5	CHASSIS
E608	A2	CHASSIS	J600	A1	CHASSIS			
E702	A3	CHASSIS	J602	A1	CHASSIS	R200	A2	CHASSIS
E704	A4	CHASSIS	J604	A2	CHASSIS	R202	A3	CHASSIS
			J606	A2	CHASSIS	R204	A3	CHASSIS
J411	A5	CHASSIS	J608	A2	CHASSIS	R300	A1	CHASSIS
J500	A2	CHASSIS	J610	A2	CHASSIS	R302	A2	CHASSIS
J502	A2	CHASSIS	J702	A3	CHASSIS	R304	A2	CHASSIS

Scan by Zenith

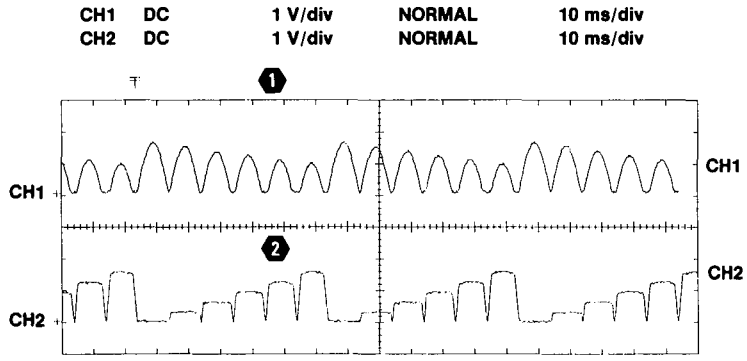
WAVEFORM CONDITIONS

The waveforms shown were obtained from the 370 with a Tektronix part no. 151-0190-00 mounted on the 370 Test Adapter.

Waveform Conditions. The waveforms shown below were obtained using a test oscilloscope with 1 Megohm input impedance (TEKTRONIX 2430 oscilloscope with plotter) from the 370 under the following condition.

With Tektronix part no. 151-0190-00 mounted in the 370 Test Adapter, the 370 setting is as follows:

VERT/DIV	1 mA
HORIZ/DIV	2 V
PER STEP	10 μA
OFFSET	0.0 μA
B or gm/DIV	100



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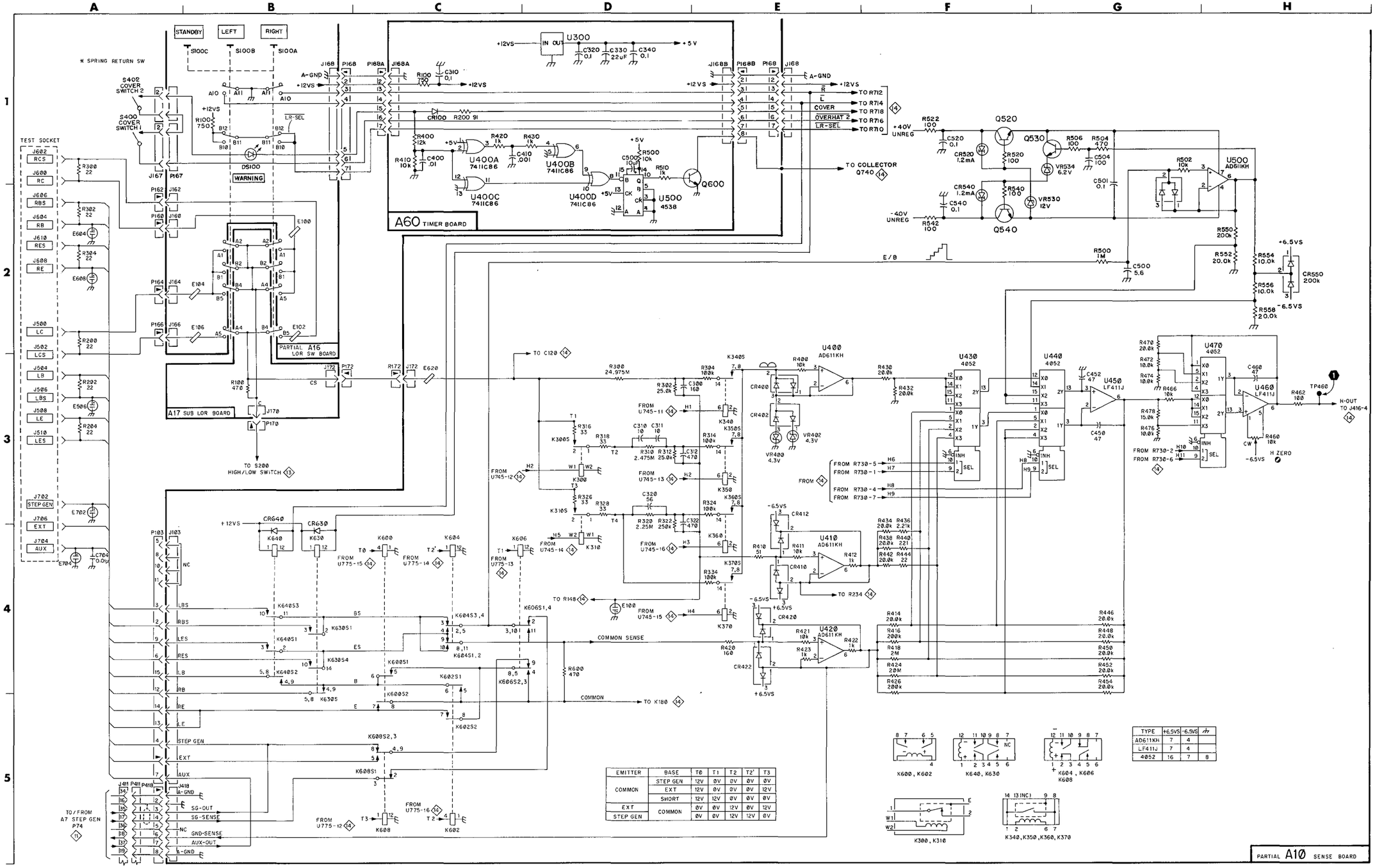
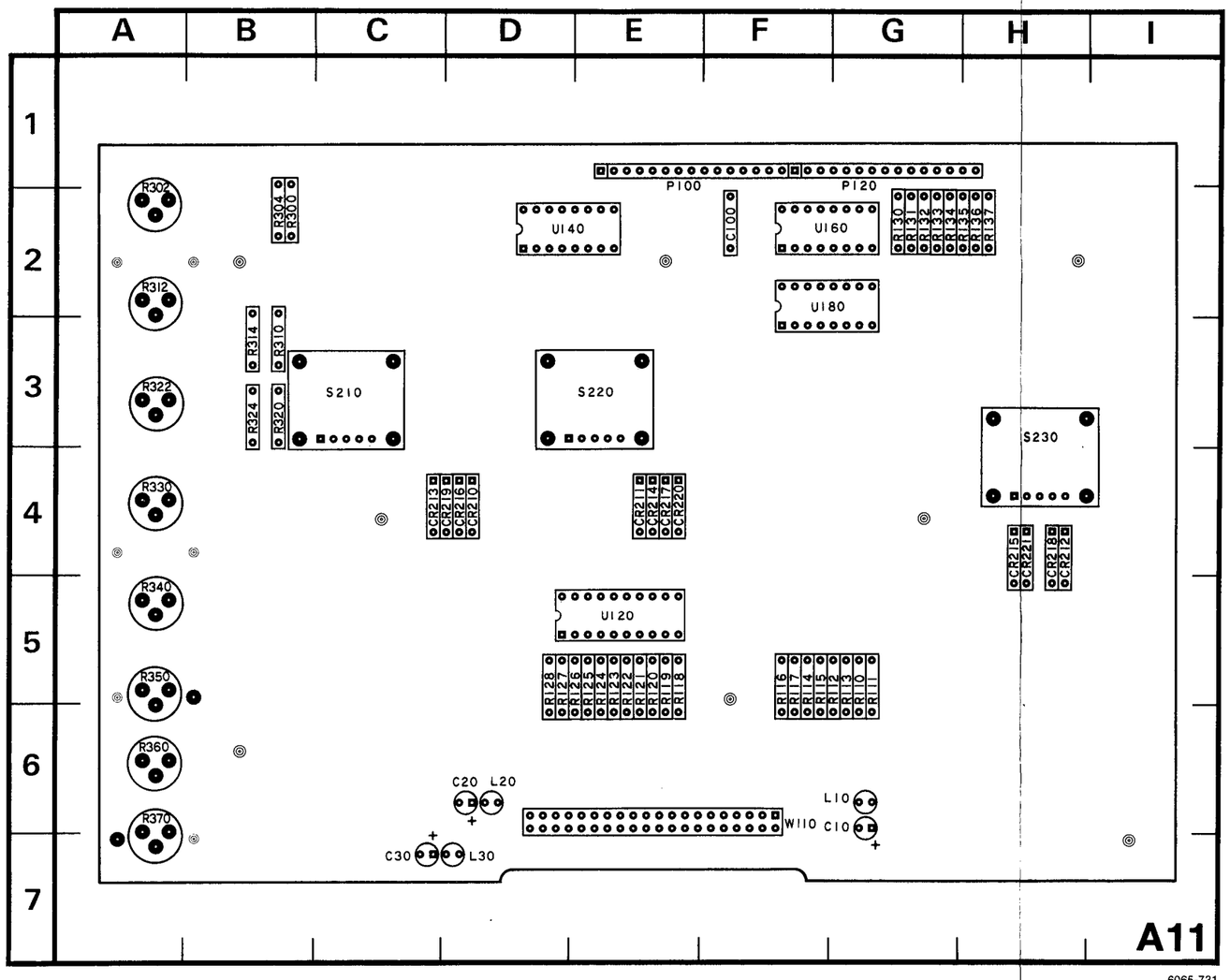


TYPE	+6.5VS	-6.5VS	
AD611KH	7	4	
LF411J	7	4	
4052	16	7	8

EMITTER	BASE	T0	T1	T2	T2'	T3
COMMON	STEP GEN	12V	0V	0V	0V	0V
	EXT	12V	0V	0V	0V	12V
	SHORT	12V	12V	0V	0V	0V
EXT	COMMON	0V	0V	12V	0V	12V
STEP GEN		0V	0V	12V	12V	0V

Scan by Zenith



6065-731

Figure 7-18. A11—Main Key circuit board assembly.

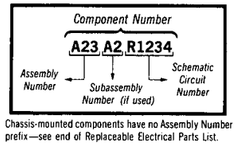
FRONT PANEL KEY INTERFACE 16

ASSEMBLY A11

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C10	B2	G6	R112	B1	G5	R304	D4	B2
C20	B5	D6	R113	B1	G5	R310	D4	B3
C30	B5	C7	R114	B1	F5	R312	D4	A2
C100	B2	F2	R115	B1	F5	R314	D4	B3
			R116	B1	F5	R320	D4	B3
CR210	D1	D4	R117	B1	F5	R322	D4	A3
CR211	D2	E4	R118	B3	E5	R324	D4	B3
CR212	D2	H4	R119	B3	E5	R330	E4	A4
CR213	D1	C4	R120	B3	E5	R340	E4	A5
CR214	D2	E4	R121	B3	E5	R350	E5	A5
CR215	D2	H4	R122	B3	E5	R360	E5	A6
CR216	D1	D4	R123	B3	E5	R370	E5	A7
CR217	D2	E4	R124	B3	E5			
CR218	D2	H4	R125	B3	E5	S210	C1	C3
CR219	D2	D4	R126	B4	E5	S220	C2	E3
CR220	D2	E4	R127	B4	D5	S230	C2	H4
CR221	D2	H4	R128	B4	D5			
			R130	E3	G2	U120	C3	E5
L10	B2	G6	R131	E3	G2	U140	E1	D2
L20	B5	D6	R132	E3	G2	U160	E2	F2
L30	B5	D7	R133	E3	G2	U180A	C1	F2
			R134	E3	G2	U180B	C1	F2
P100	F1	E1	R135	E3	G2			
P120	F2	G1	R136	E3	H2	W110	A1	E6
			R137	E3	H2			
R110	B1	G5	R300	D4	B2			
R111	B1	G5	R302	D4	A2			

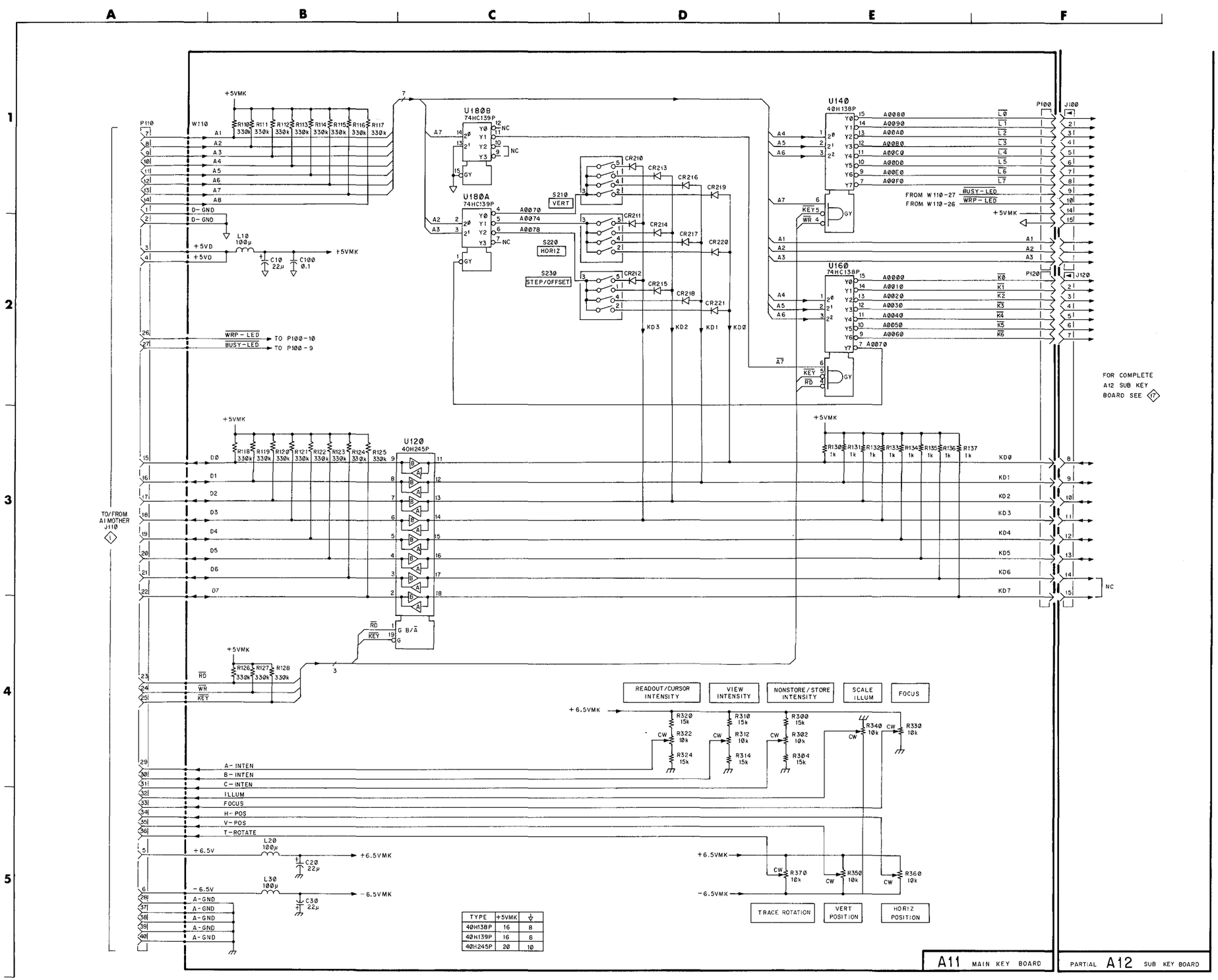
Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



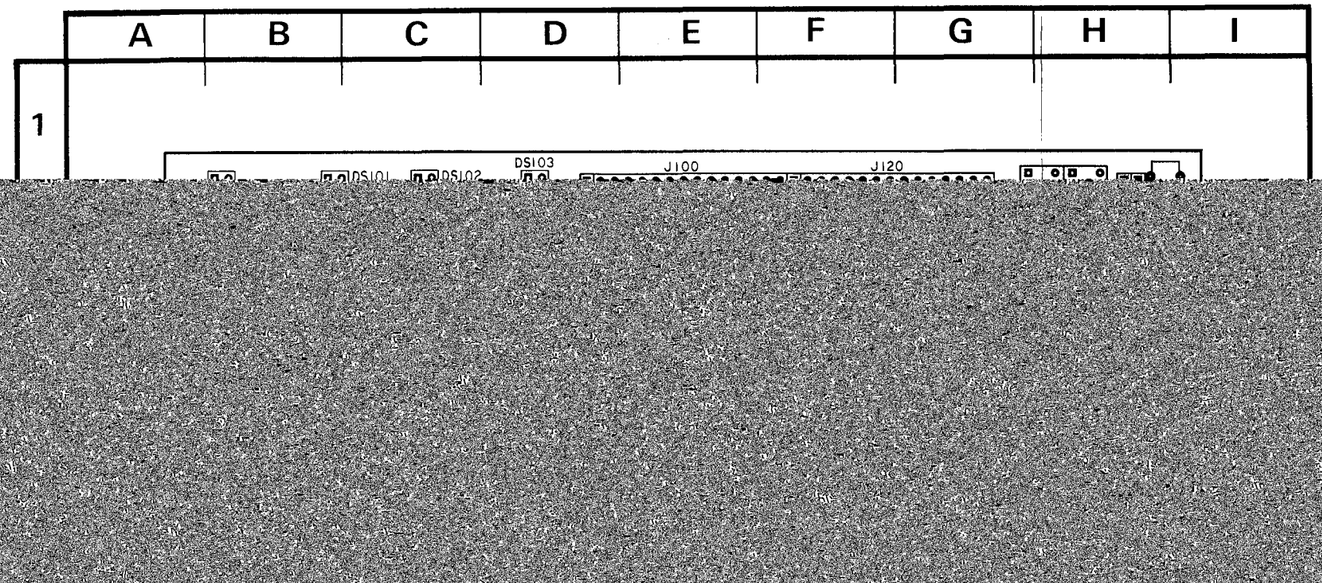
Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Scan by Zenith



Scan by Zenith

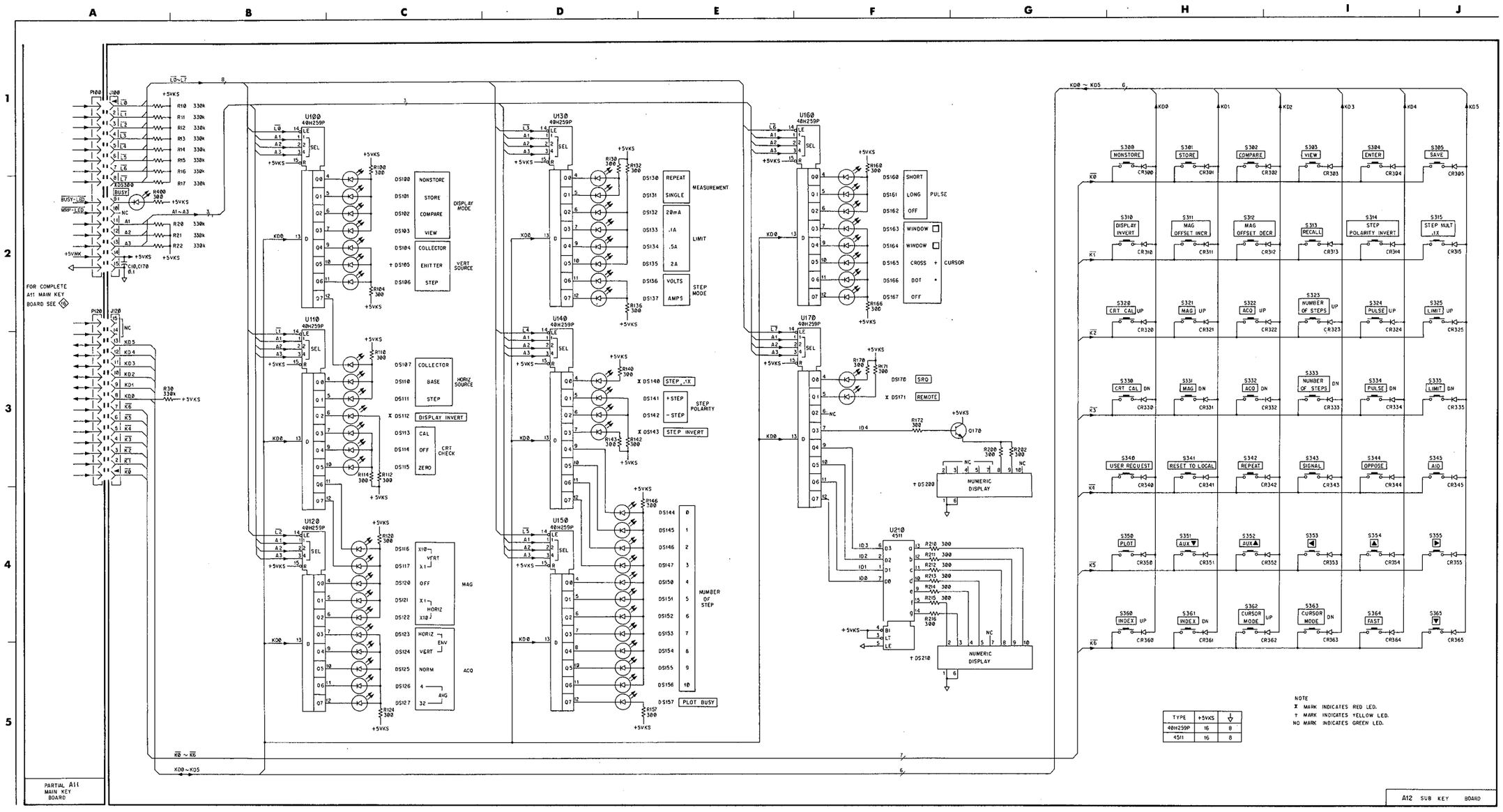
FRONT PANEL LED & KEY 17



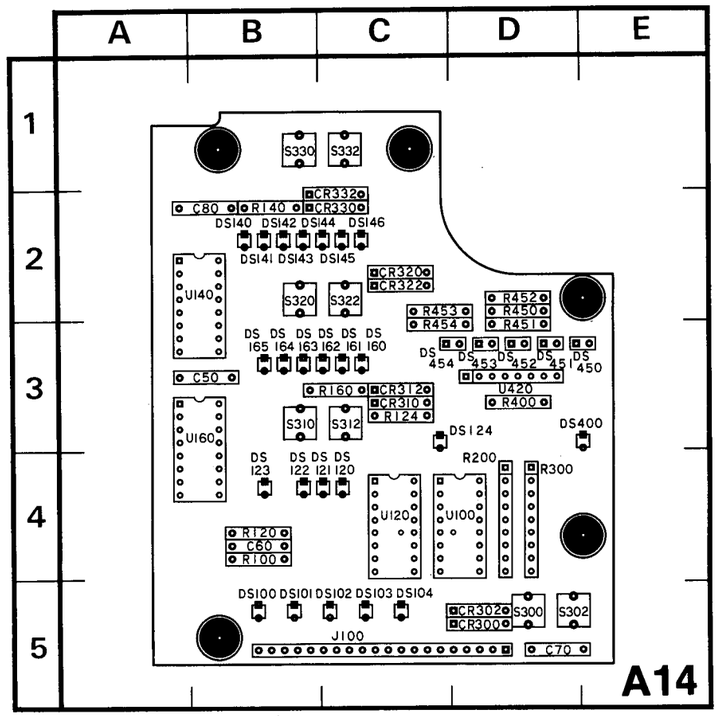
ASSEMBLY A12

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C10	A2	F2	DS130	D2	D6	R160	F1	D5
C170	A2	H6	DS131	D2	E6	R166	F2	C6
			DS132	D2	F5	R170	F3	C6
CR300	H1	B2	DS133	D2	F5	R171	F3	C6

Scan by Zenith

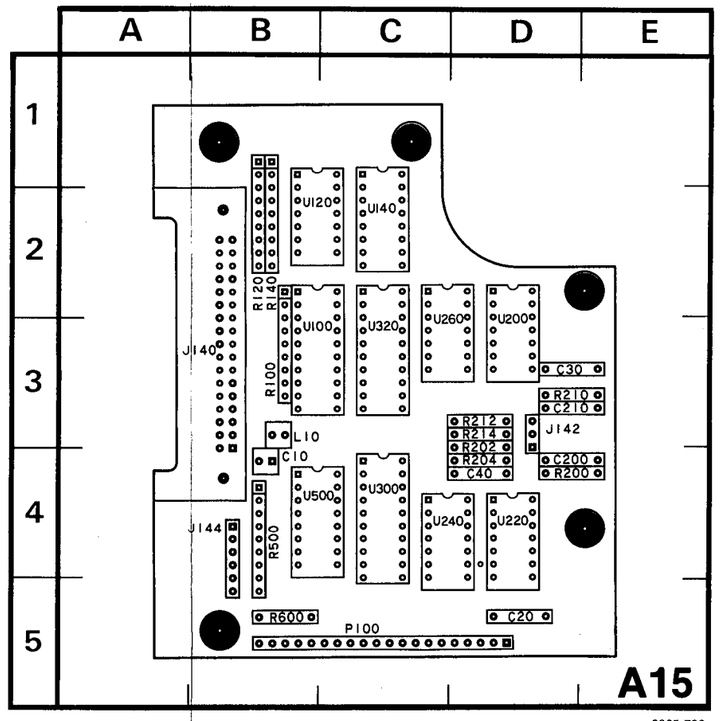


Scan by Zenith



6065-735

Figure 7-20. A14—Lower Key circuit board assembly.

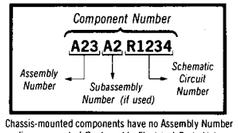


6065-736

Figure 7-21. A15—Lower Sub Key circuit board assembly.

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



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

LOWER KE

ASSEMBLY A14

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C50	E5	B3
C60	E5	B4
C70	E5	D5
C80	E5	B2
CR300	E1	D5
CR302	E1	D5
CR310	E1	C3
CR312	E2	C3
CR320	E2	C2
CR322	E2	C2
CR330	E2	C2
CR332	E2	C2
DS100	G1	B5
DS101	G1	B5
DS102	G1	C5
DS103	G1	C5
DS104	G1	C5
DS120	G2	C4
DS121	G2	C4
DS122	G2	B4
DS123	G2	B4
DS124	G2	D3
DS140	G3	B2
DS141	G3	
DS142	G3	
DS143	G3	
DS144	G3	
DS145	G3	
DS146	G4	
DS160	G4	
DS161	G4	
DS162	G4	
DS163	G4	
DS164	G4	
DS165	G4	
DS400	E5	
DS450	G5	
DS451	G5	
DS452	G5	
DS453	G5	
DS454	G5	
J100	E4	
R100	G1	
R120	G2	
R124	G2	
R140	G3	

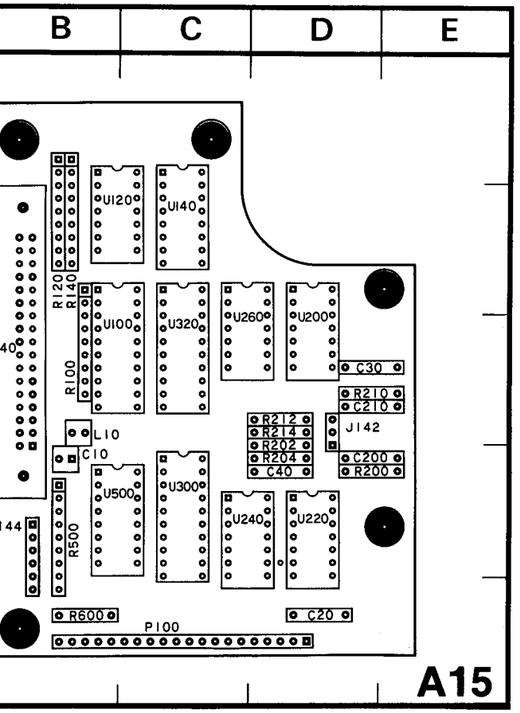
ASSEMBLY A15

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C10	B5	B4
C20	B5	D5
C30	B5	D3
C40	B5	D4
C200	B1	D4
C210	B2	D4
J140	B3	B3
J142	B1	D3
J144	B2	B4
L10	B5	B3
P100	E4	C5
R100	B3	B3
R120	B4	B2
R140A-E	D4	
R140F-H	B4	
R200	B1	
R202	B1	
R204	C1	
R210	B1	
R212	B1	
R214	C1	
R500	B2	
R600	B5	
U100	C3	
U120A	C5	
U120B	C4	
U120C	C4	
U120D	C5	
U140A	C4	

CHASSIS MOUNTED PARTS

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
S500	A1	CHASSIS

Scan by Zenith



. A15—Lower Sub Key circuit board assembly.

LOWER KEY 18

ASSEMBLY A14

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C50	E5	B3
C60	E5	B4
C70	E5	D5
C80	E5	B2
CR300	E1	D5
CR302	E1	D5
CR310	E1	C3
CR312	E2	C3
CR320	E2	C2
CR322	E2	C2
CR330	E2	C2
CR332	E2	C2
DS100	G1	B5
DS101	G1	B5
DS102	G1	C5
DS103	G1	C5
DS104	G1	C5
DS120	G2	C4
DS121	G2	C4
DS122	G2	B4
DS123	G2	B4
DS124	G2	D3
DS140	G3	B2
DS141	G3	B2
DS142	G3	B2
DS143	G3	B2
DS144	G3	B2
DS145	G3	C2
DS146	G4	C2
DS160	G4	C3
DS161	G4	C3
DS162	G4	C3
DS163	G4	B3
DS164	G4	B3
DS165	G4	B3
DS400	E5	E3
DS450	G5	E3
DS451	G5	D3
DS452	G5	D3
DS453	G5	D3
DS454	G5	C3
J100	E4	C5
R100	G1	B4
R120	G2	B4
R124	G2	C3
R140	G3	B2
R160	G4	C3
R200	E4	D4
R300	E3	D4
R400	E5	D3
R450	G5	D2
R451	G5	D3
R452	G5	D2
R453	G5	C2
R454	G5	C3
S300	F1	D5
S302	F1	D5
S310	F2	B3
S312	F2	C3
S320	F2	B2
S322	F2	C2
S330	F2	B1
S332	F2	C1
U100	F1	D4
U120	F2	C4
U140	F3	D2
U160	F4	B3
U420	F5	D3

ASSEMBLY A15

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C10	B5	B4
C20	B5	D5
C30	B5	D3
C40	B5	D4
C200	B1	D4
C210	B2	D4
J140	B3	B3
J142	B1	D3
J144	B2	B4
L10	B5	B3
P100	E4	C5
R140A-E	D4	B2
R140F-H	B4	B2
R200	B1	D4
R202	B1	D4
R204	C1	D4
R210	B1	D3
R212	B1	D3
R214	C1	D3
R500	B2	B4
R600	B5	B5
U100	C3	B3
U120A	C5	B2
U120B	C4	B2
U120C	C4	B2
U140B	C4	C2
U200A	D4	D3
U200B	B2	D3
U200C	C2	D3
U200D	C1	D3
U200E	B1	D3
U200F	D3	D3
U220A	C1	D4
U220B	C1	D4
U240A	D1	C4
U240B	D1	C4
U260A	D3	C3
U260B	D2	C3
U300	D1	C4
U320	D2	C3

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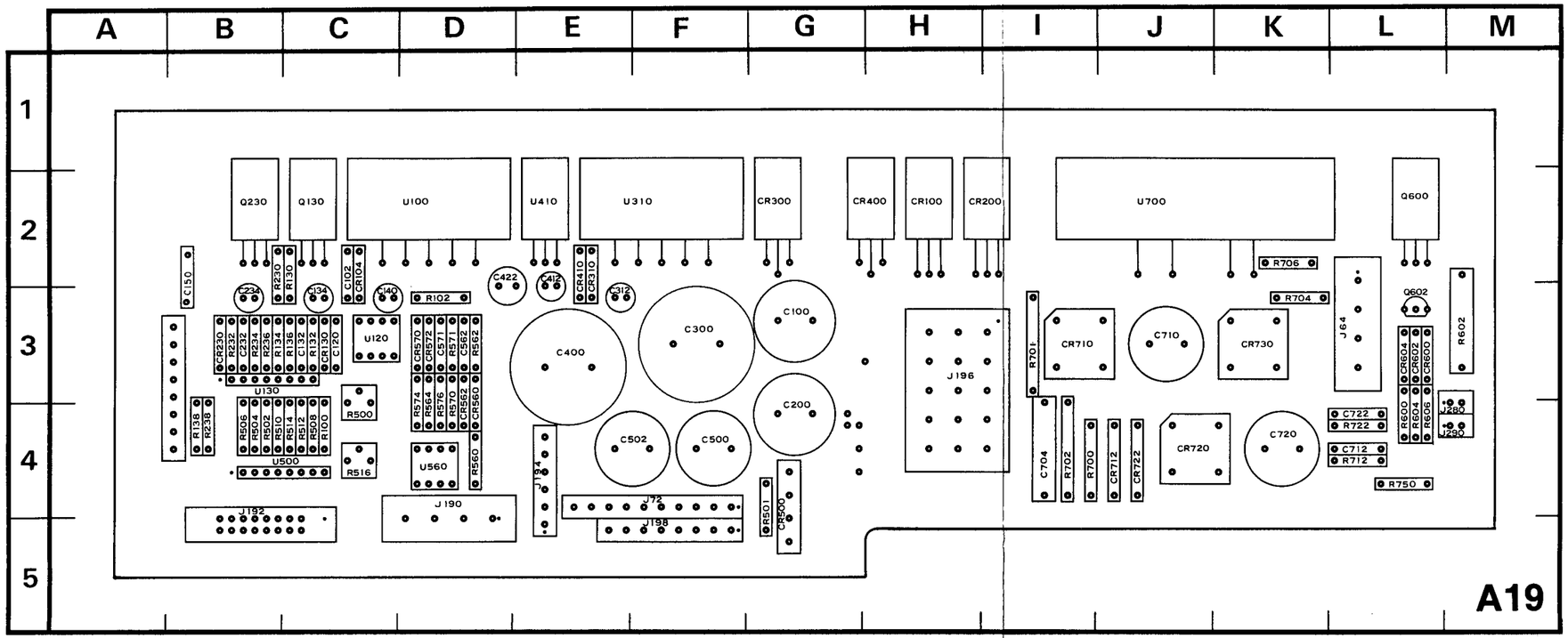

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Figure 7-23. A19—Low Voltage Supply circuit board assembly.

A19—Low Voltage Supply circuit board illustration to be used with diagrams ◇10◇ *and* ◇20◇

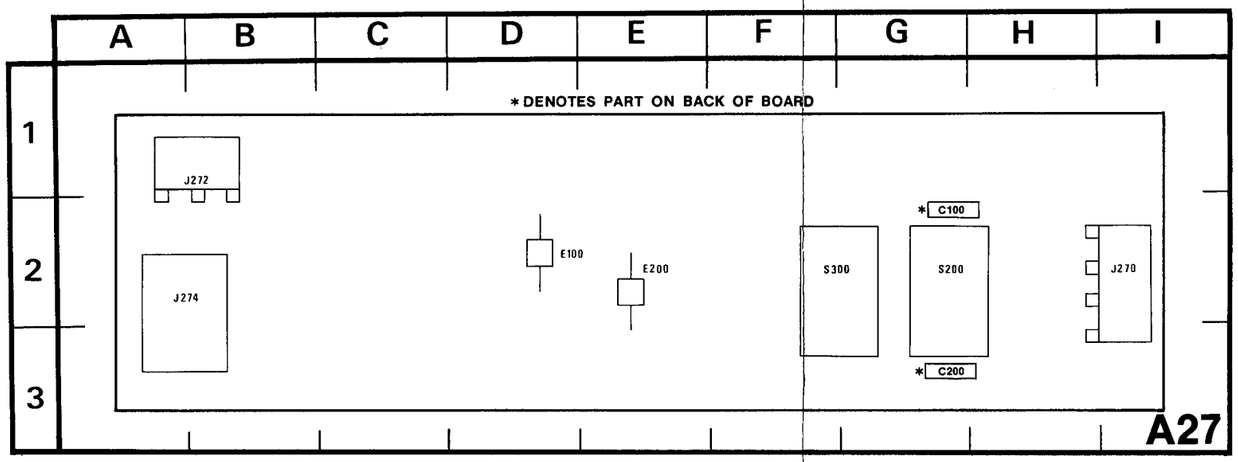

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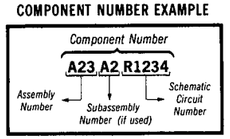
Figure 7-24. A27—Primary circuit board assembly.

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



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

COLLECTOR SUPPLY AMPLI

ASSEMBLY A19

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATIO
C704	B4	I4	CR720	B4	J4
C710	C3	J3	CR722	C4	J4
C712	C3	L4	CR730	B3	K3
C720	C4	K4			
C722	C4	L4	J64	C3	L3
CR710	B3	I3	R700	B4	I4
CR712	C3	J4	R701	B3	I3

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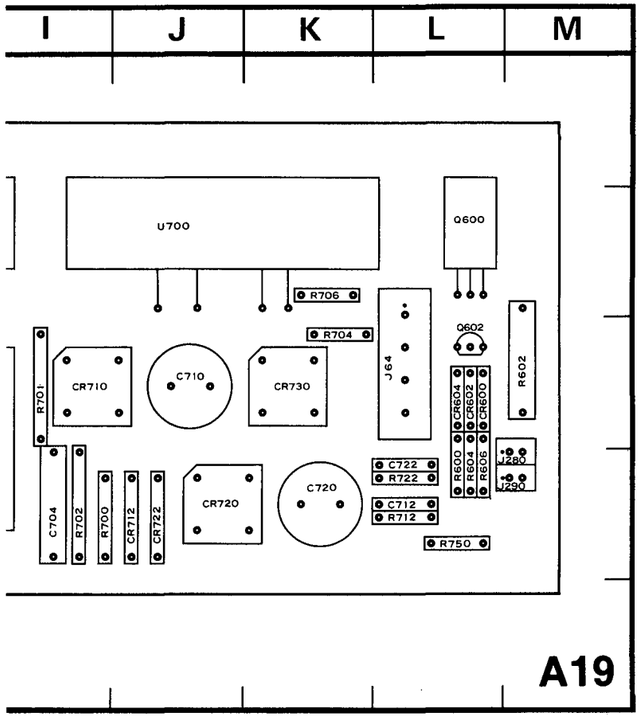

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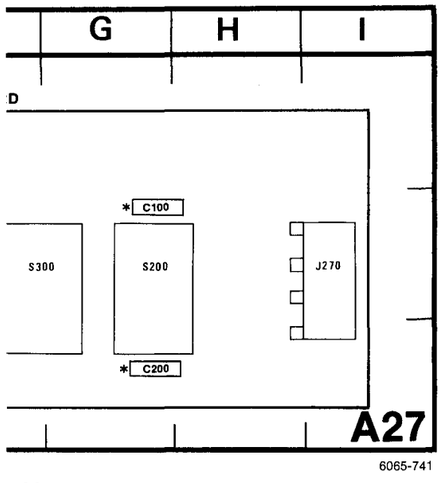

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COLLECTOR SUPPLY AMPLIFIER 10

ASSEMBLY A19

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C704	B4	I4	CR720	B4	J4	R702	B4	I4
C710	C3	J3	CR722	C4	J4	R704	B3	K3
C712	C3	L4	CR730	B3	K3	R706	B3	K2
C720	C4	K4				R712	C3	L4
C722	C4	L4	J64	C3	L3	R722	C4	L4
						R750	C4	L4
CR710	B3	I3	R700	B4	I4			
CR712	C3	J4	R701	B3	I3	U700	B3	J2

POWER SUPPLY 20

ASSEMBLY A19

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C100	C3	G3	J72	E1	F4	R516	B4	C4
C102	D3	C2	J190	E1	D4	R560	C4	D4
C120	B3	C3	J192	E2	B4	R562	C4	D3
C132	D3	C3	J194	E3	E4	R564	D4	D4
C134	D3	C3	J196	C1	H3	R570	C4	D4
C140	E3	C3	J198	E3	F5	R571	C4	D3
C150	E3	B2	J280	E4	M4	R574	D4	D4
C200	C4	G4	J290	E4	M4	R576	C4	D4
C232	D3	B3				R600	D4	L4
C234	D4	B3	Q130	D3	C2	R602	E4	M4
C300	D2	F3	Q230	D4	B2	R604	D4	L4
C312	E2	E3	Q600	D4	L2	R606	D4	L4
C400	D2	E3	Q602	D4	L3			
C412	E2	E2				TP100	E2	A3
C422	D2	D2	R100	E3	C4	TP130	D3	A3
C500	C1	F4	R102	D3	D3	TP230	D4	A3
C502	C1	F4	R130	D3	C2	TP310	D1	A3
C562	C4	D3	R132	C3	C3	TP410	D2	A3
C571	C4	D3	R134	D3	B3	TP500	C3	A4
			R136	D3	C3	TP510	C4	A4
CR100	C2	H2	R138	D3	B4	TP520	E3	A4
CR104	D2	C2	R230	D4	B2			
CR130	C3	C3	R232	C3	B3	U100	D2	D2
CR200	C4	I2	R234	D4	B3	U120	B3	C3
CR230	C3	B3	R236	D3	B3	U130A	D3	B3
CR300	C1	G2	R238	D4	B4	U130B	D3	B3
CR310	D1	E2	R500	B3	C4	U310	D1	F2
CR400	C2	H2	R501	C1	G4	U410	D2	E2
CR410	D2	E2	R502	B3	B4	U500A	B3	C4
CR500	C1	G4	R504	B3	B4	U500B	B4	C4
CR560	C4	D4	R506	C3	B4	U560A	C5	D4
CR562	C4	D4	R508	B4	C4	U560B	D4	D4
CR570	C4	D3	R510	B4	B4			
CR572	C5	D3	R512	B4	C4			
CR604	D4	L3	R514	B4	C4			

ASSEMBLY A27

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C100	A2	G1	J270	A2	I2	S200	A1	G2
C200	A2	G2	J272	B2	B1	S300	B1	F2
			J274	B1	B2			
E100	B2	D2						
E200	B2	E2						

CHASSIS MOUNTED PARTS

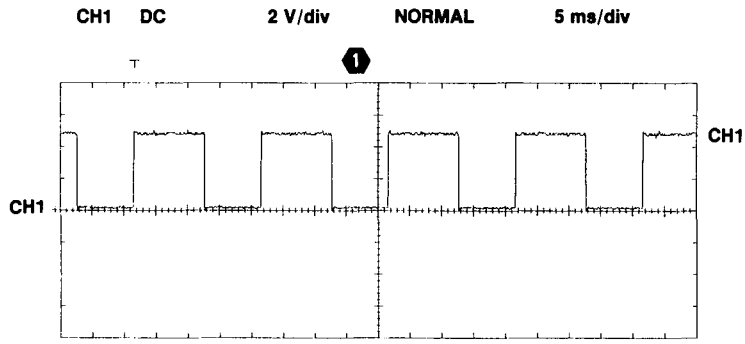
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
B100	B3	CHASSIS	J411	E3	CHASSIS	S100	B2	CHASSIS
F100	A3	CHASSIS	P411	F3	CHASSIS	T100	B1	CHASSIS
FL100	A3	CHASSIS						

Scan by Zenith

WAVEFORM CONDITIONS

The waveforms shown apply regardless of the 370 settings.

Waveform Conditions. The waveforms shown below were obtained using a test oscilloscope with 1 Megohm input impedance (TEKTRONIX 2430 oscilloscope with plotter).



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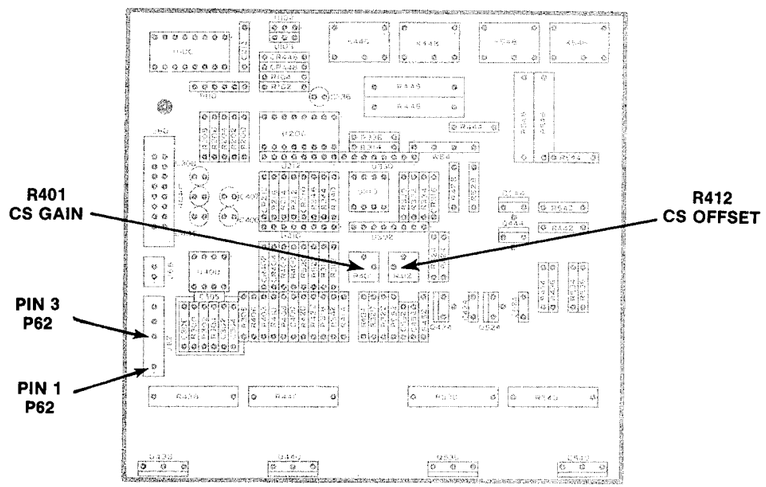
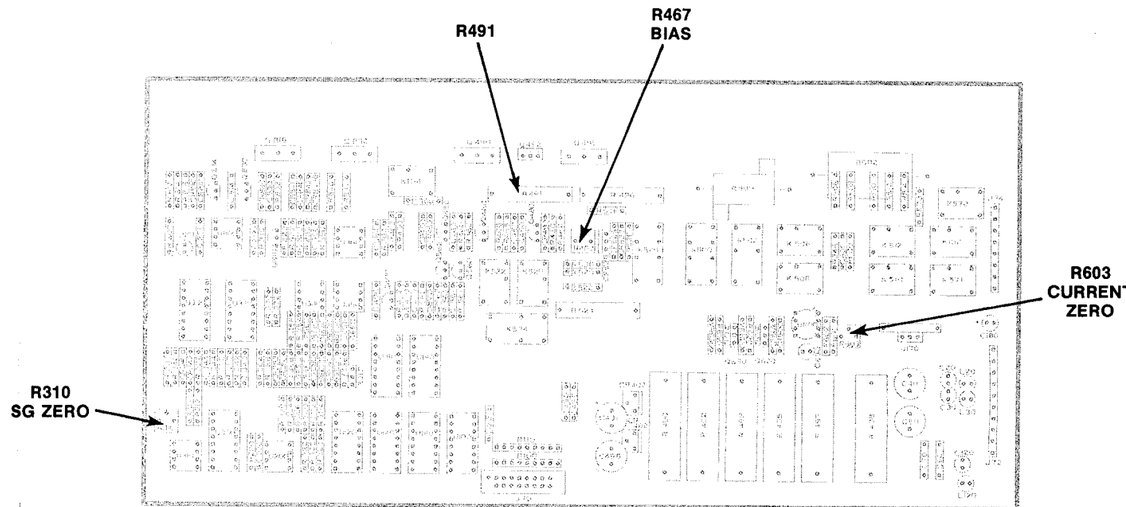
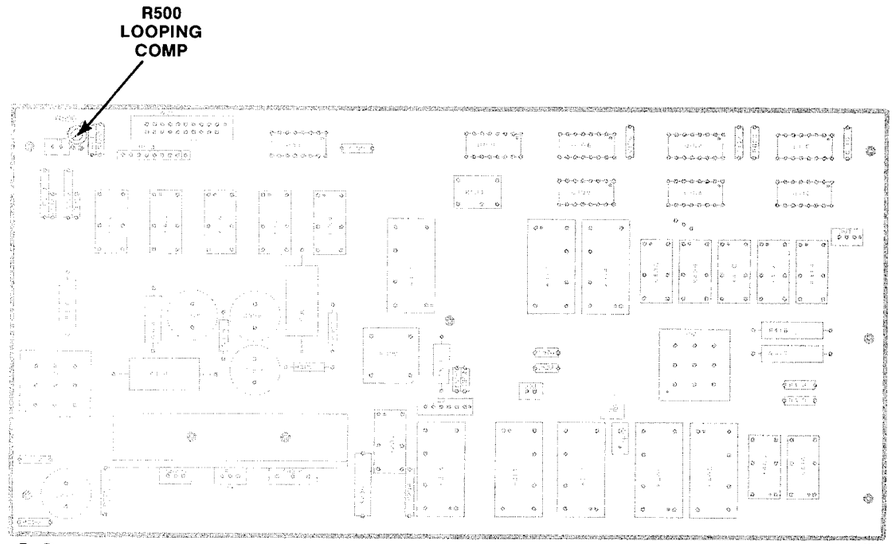


A6 COLLECTOR SUPPLY



A7 STEP GENERATOR



A9 L.V. RELAY

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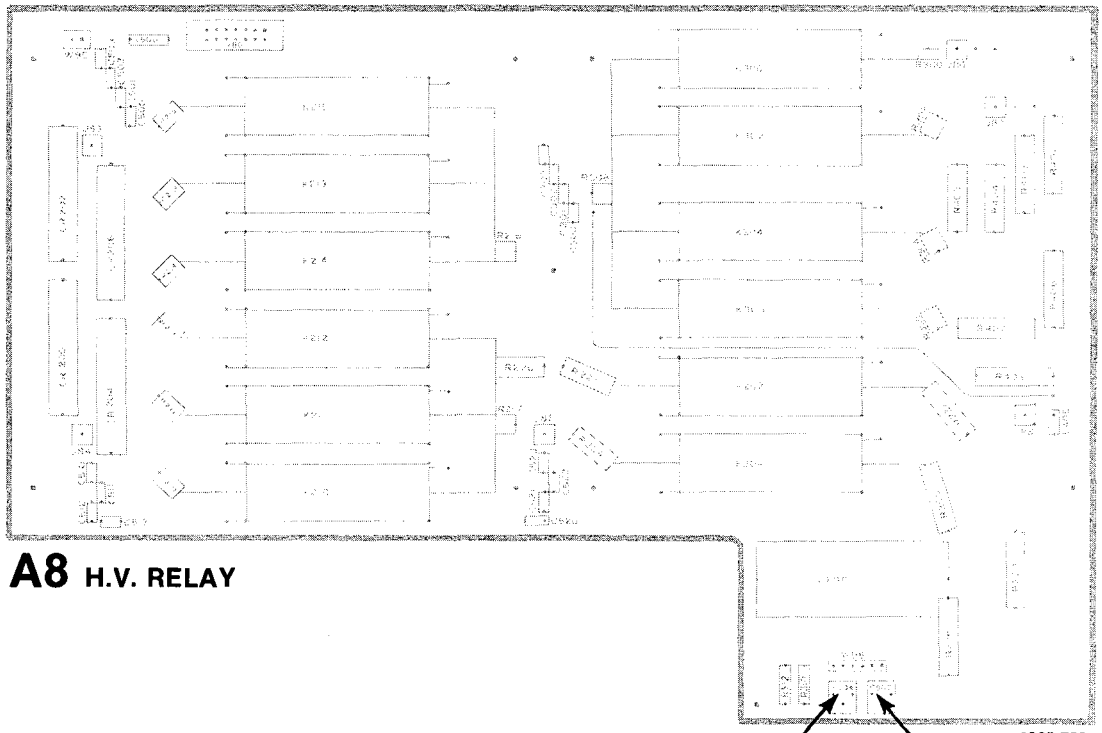
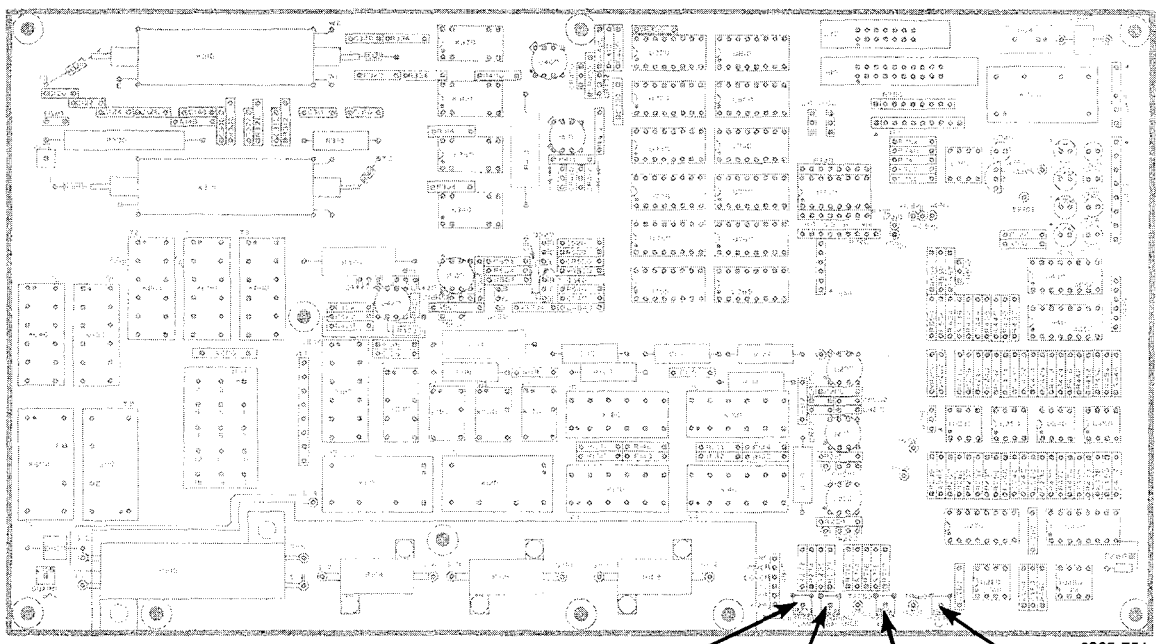


A8 H.V. RELAY



A10 SENSE

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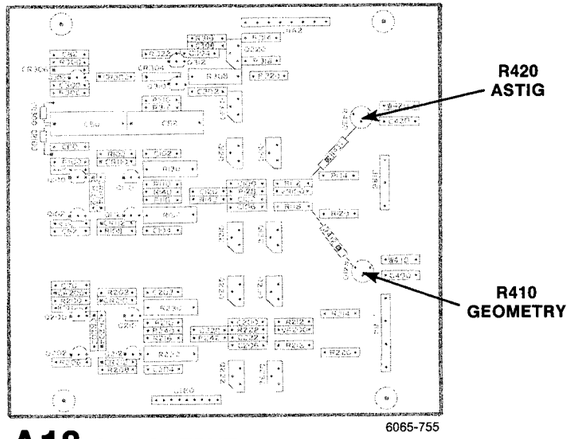

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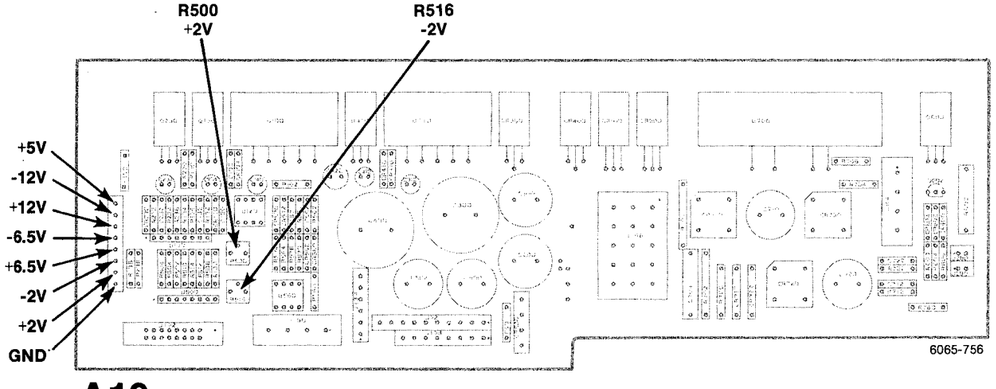
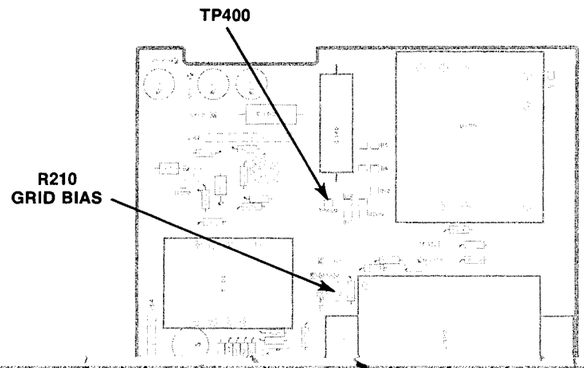


A19 L.V. SUPPLY



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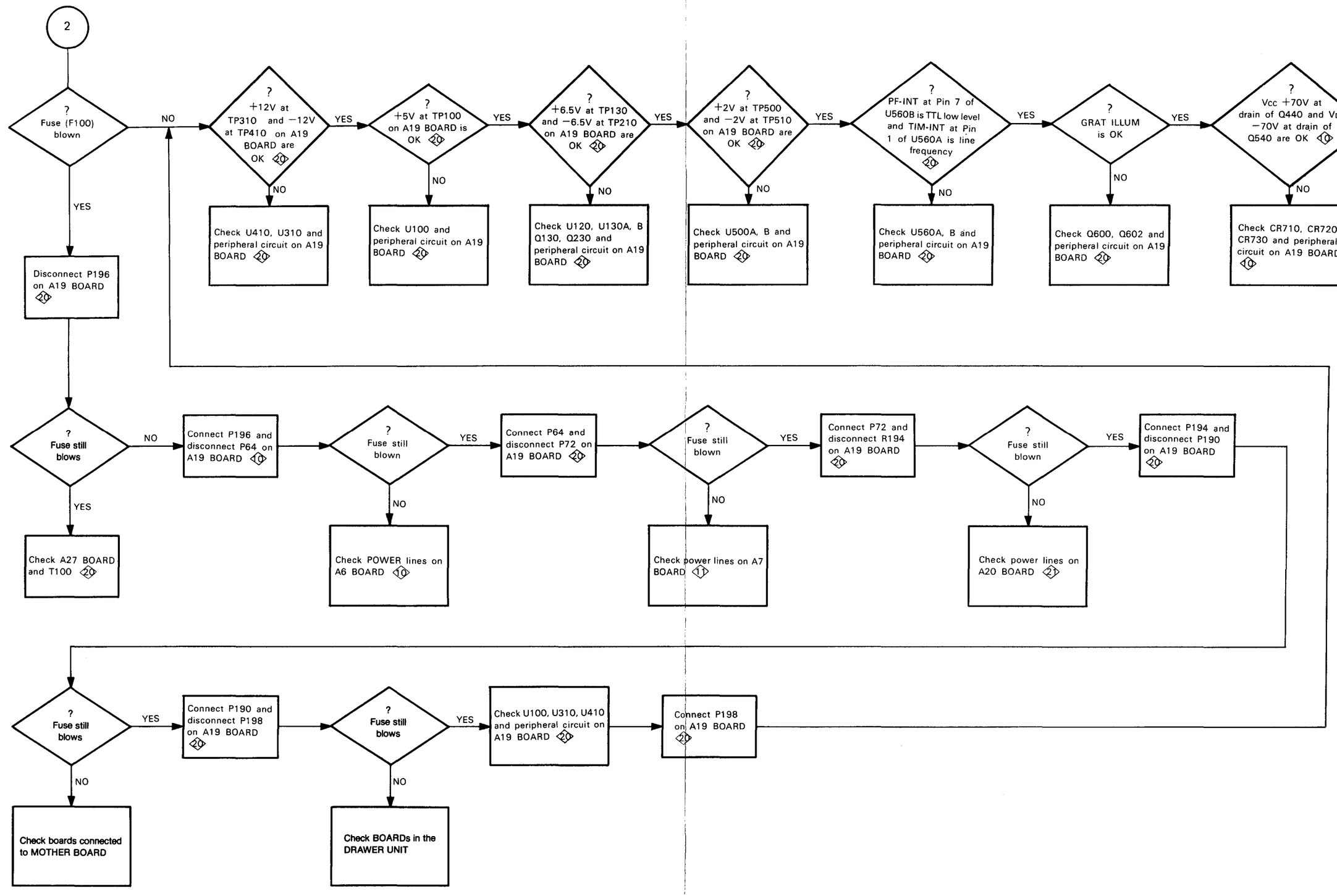

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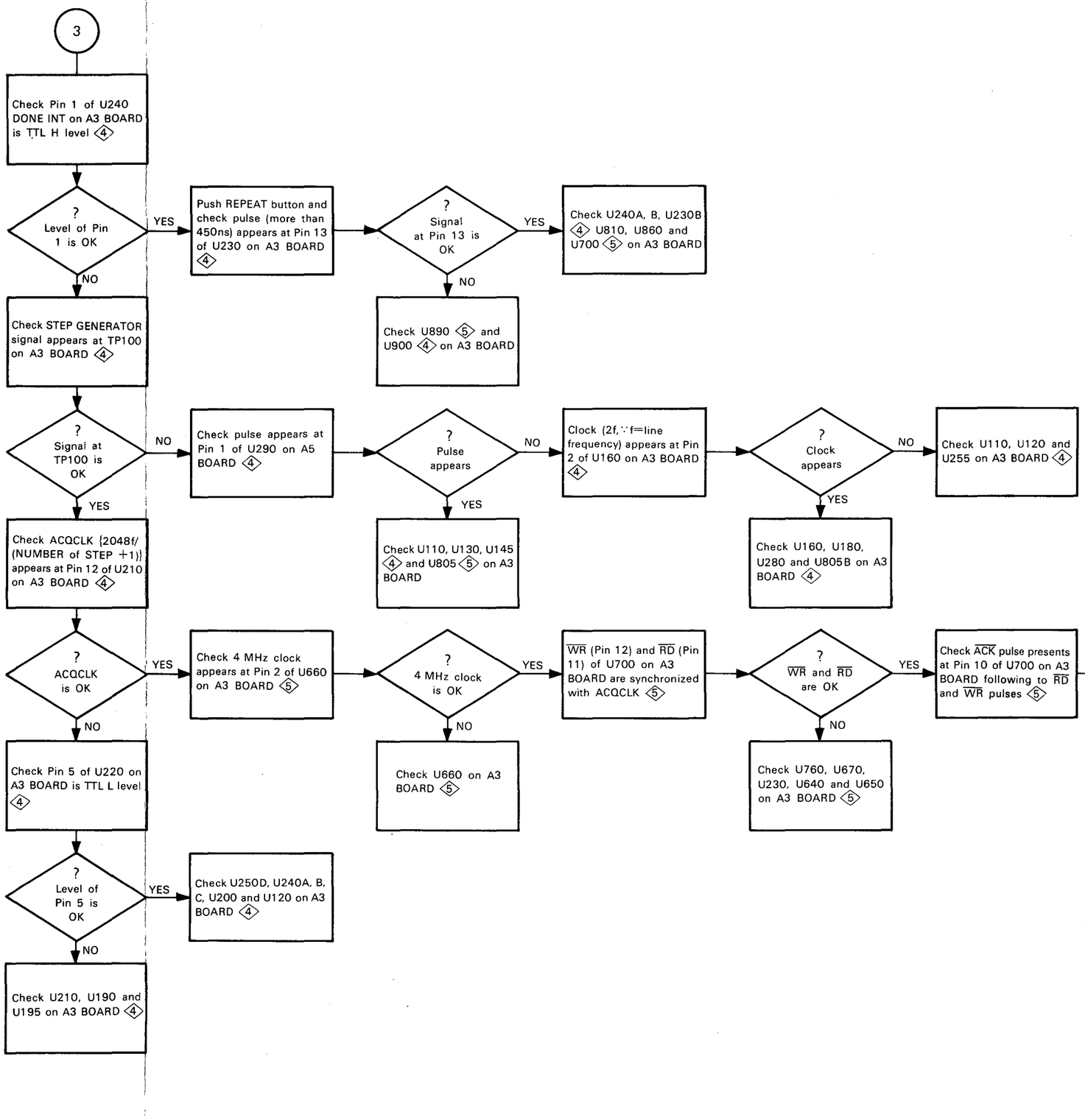

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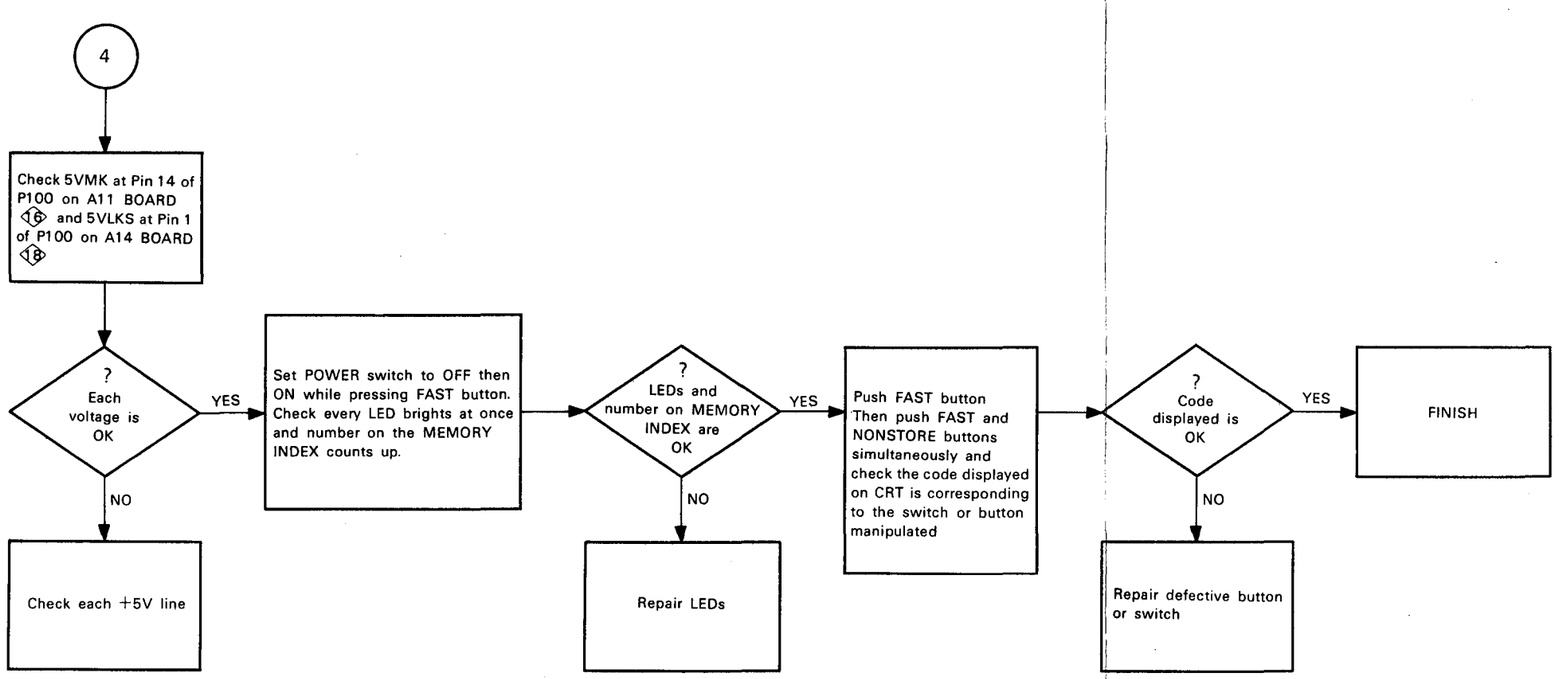

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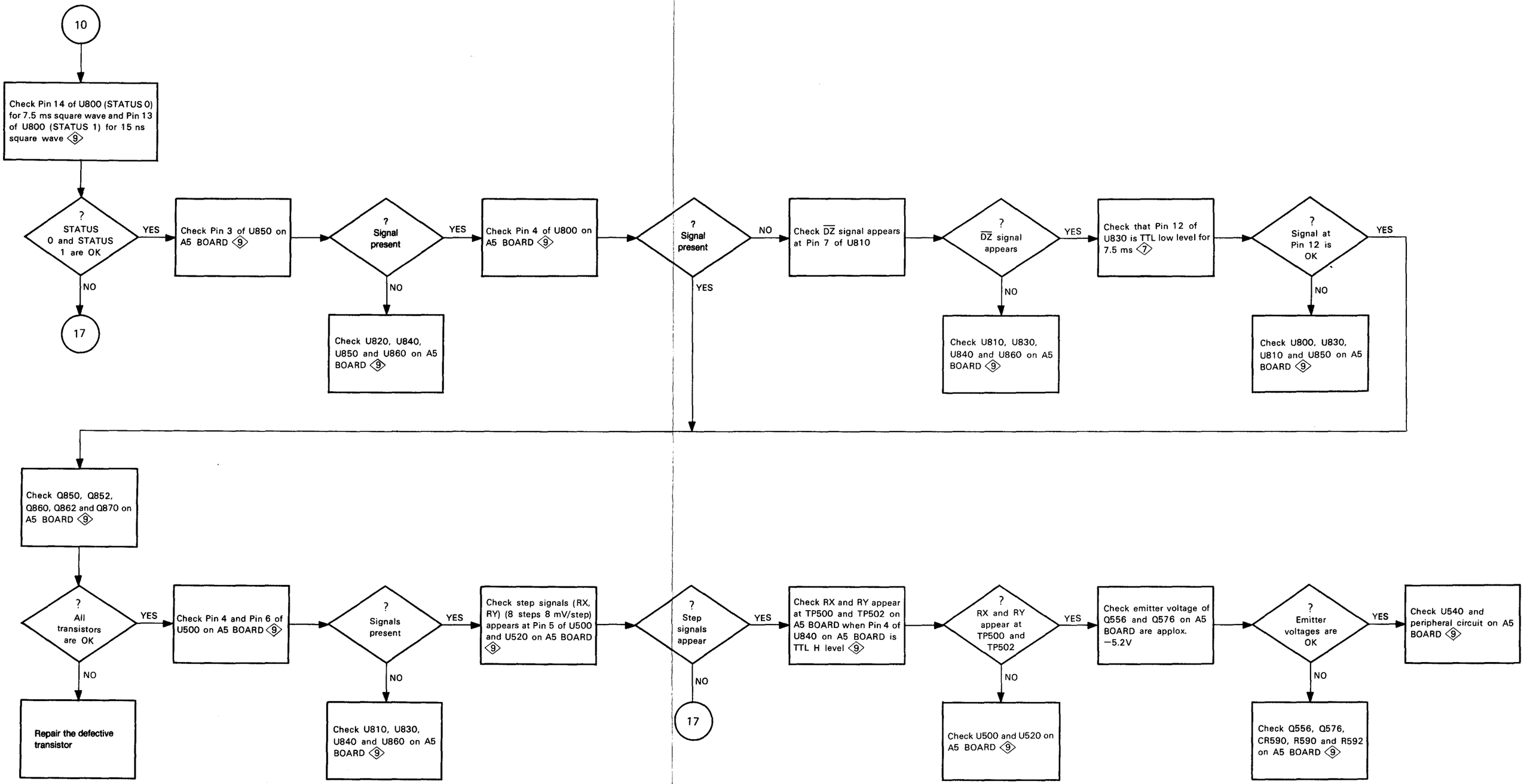

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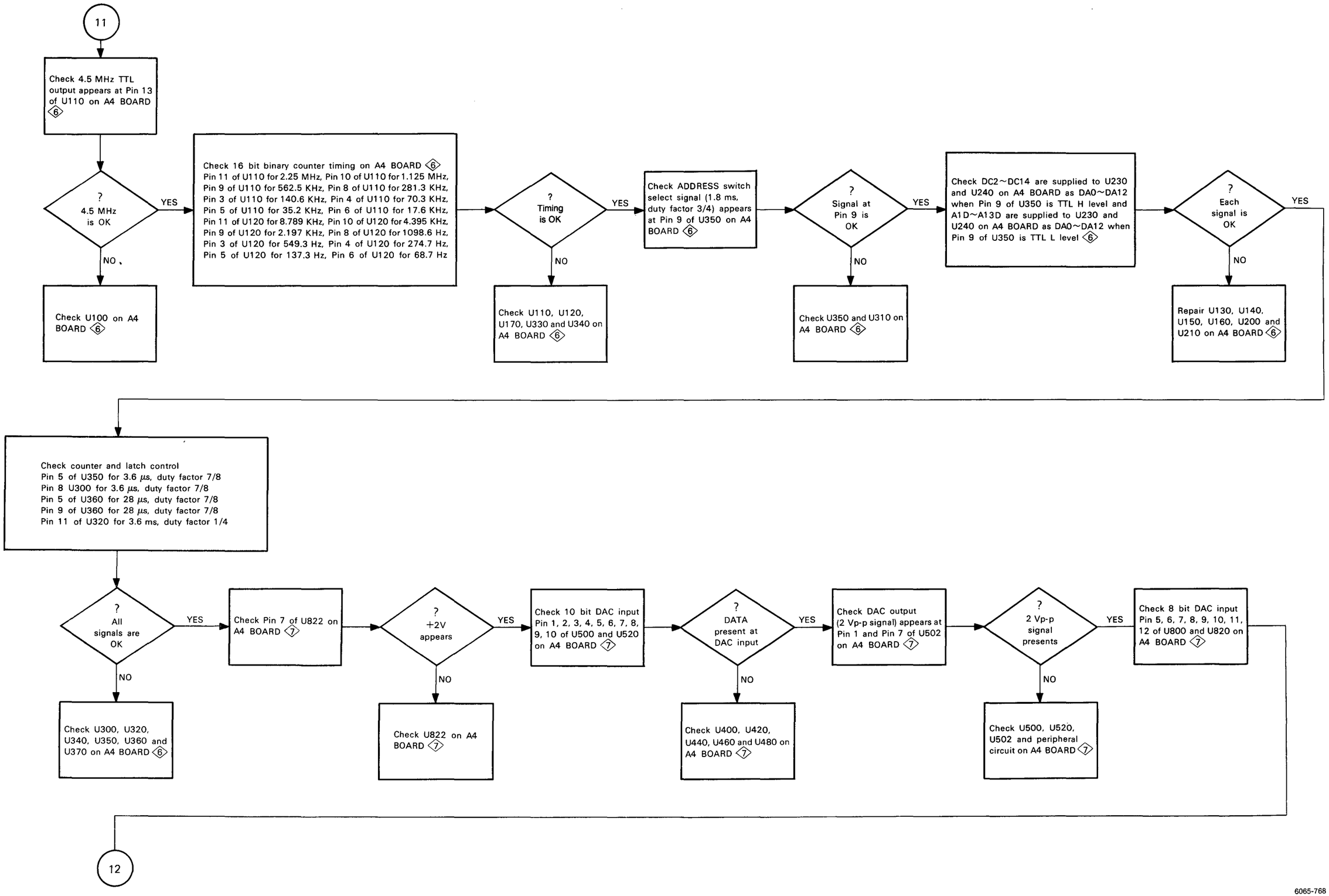

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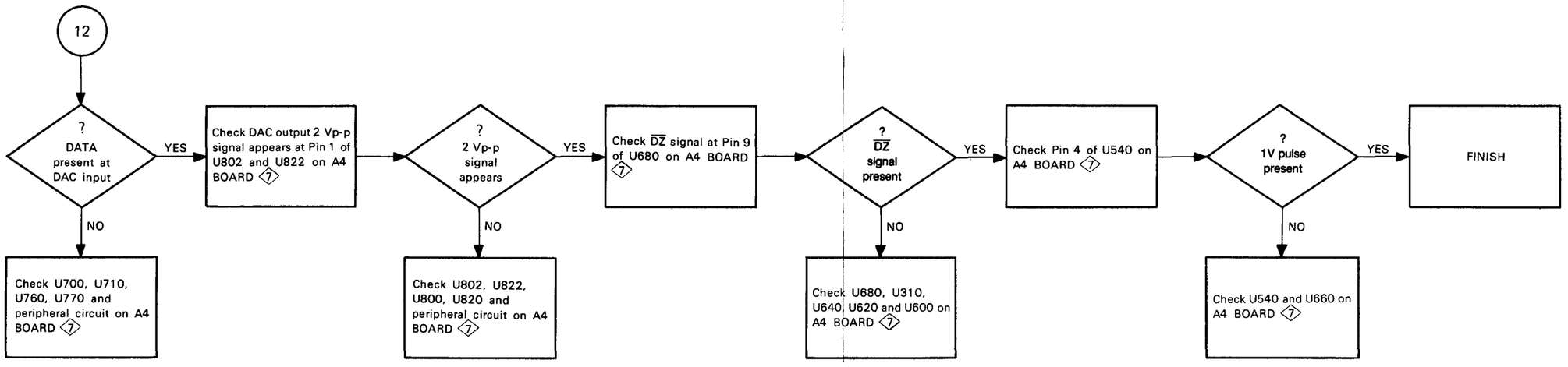

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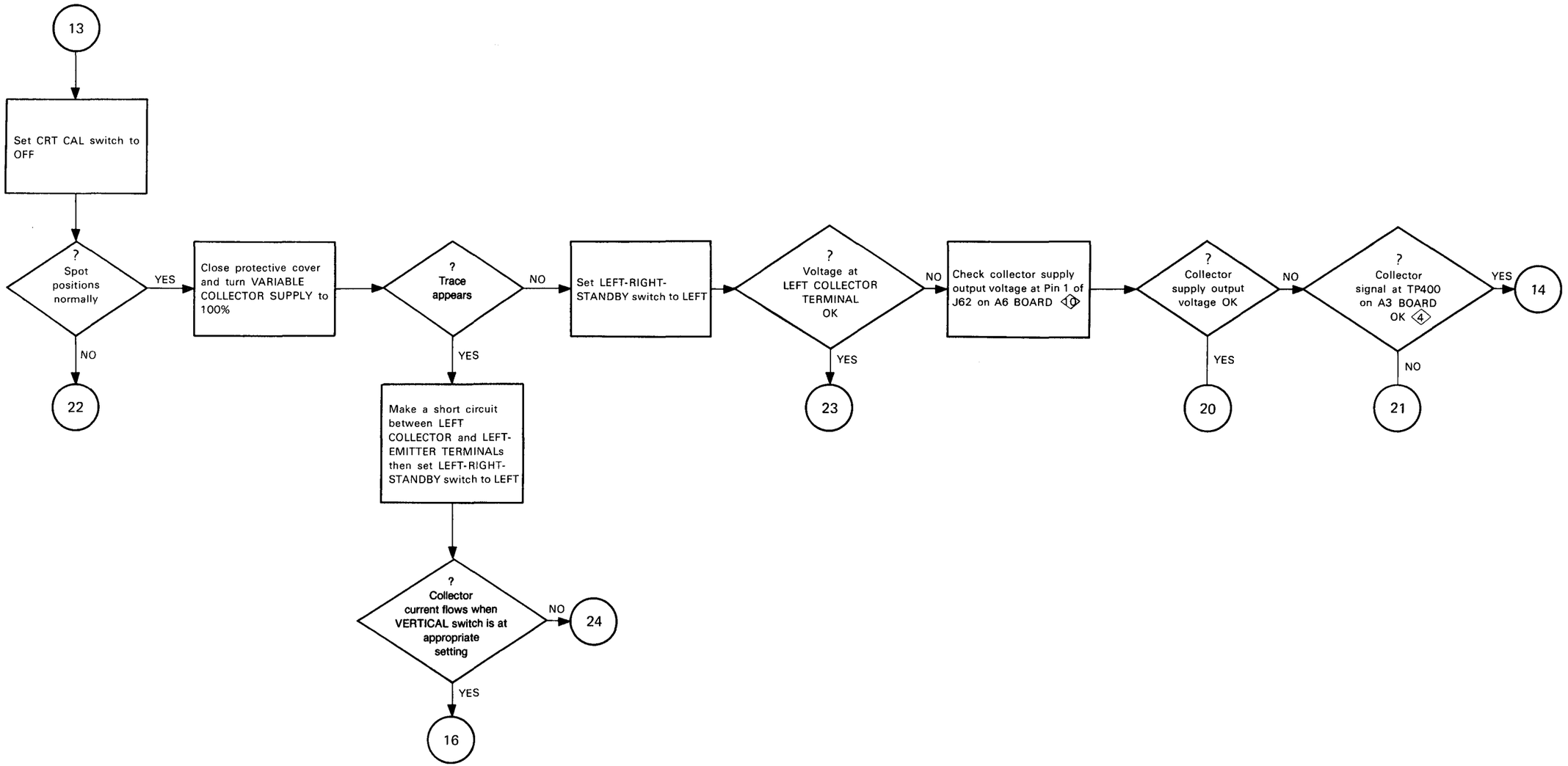

Troubleshooting Tree 13
Reverse Side Troubleshooting Tree 14

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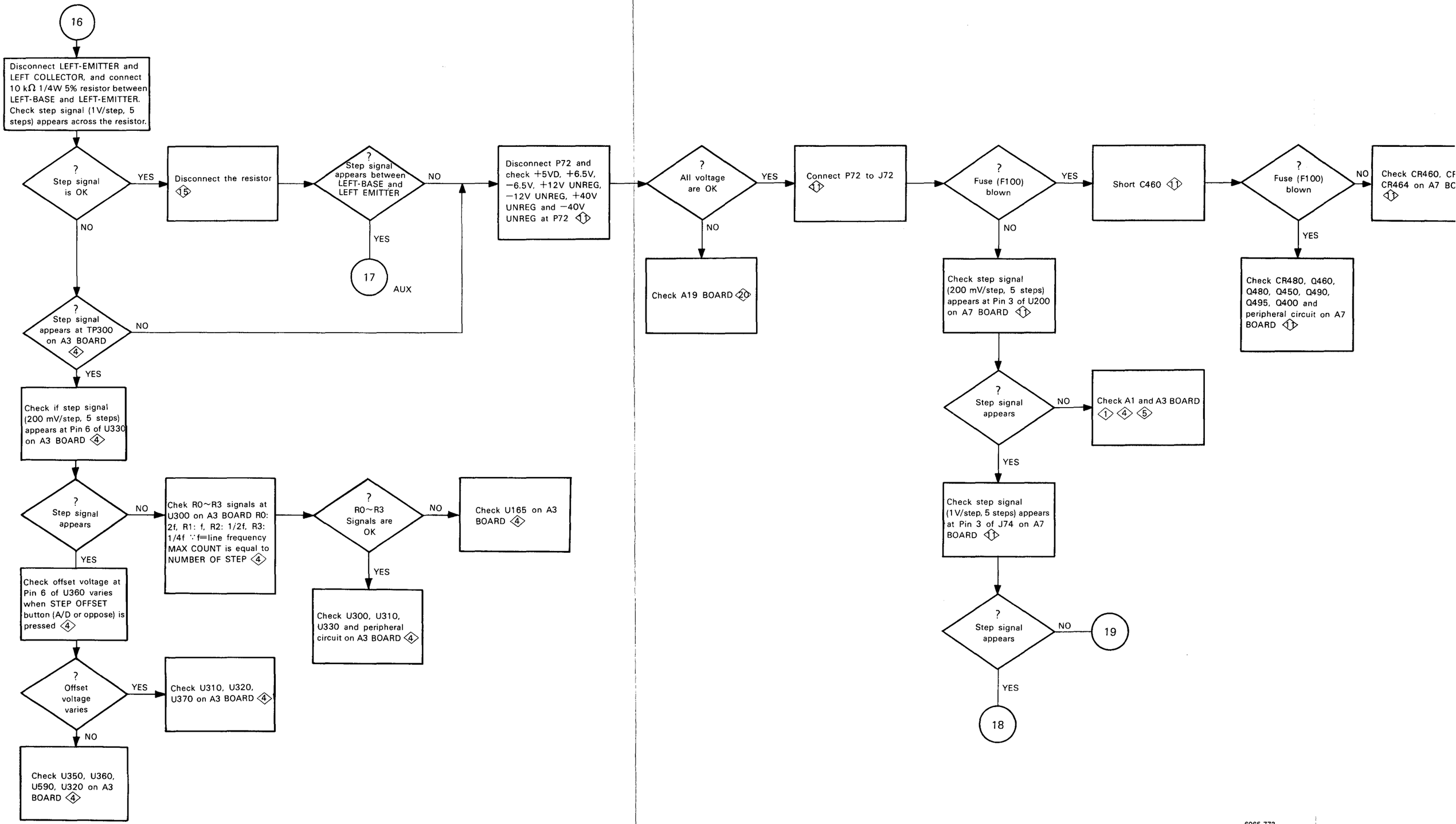

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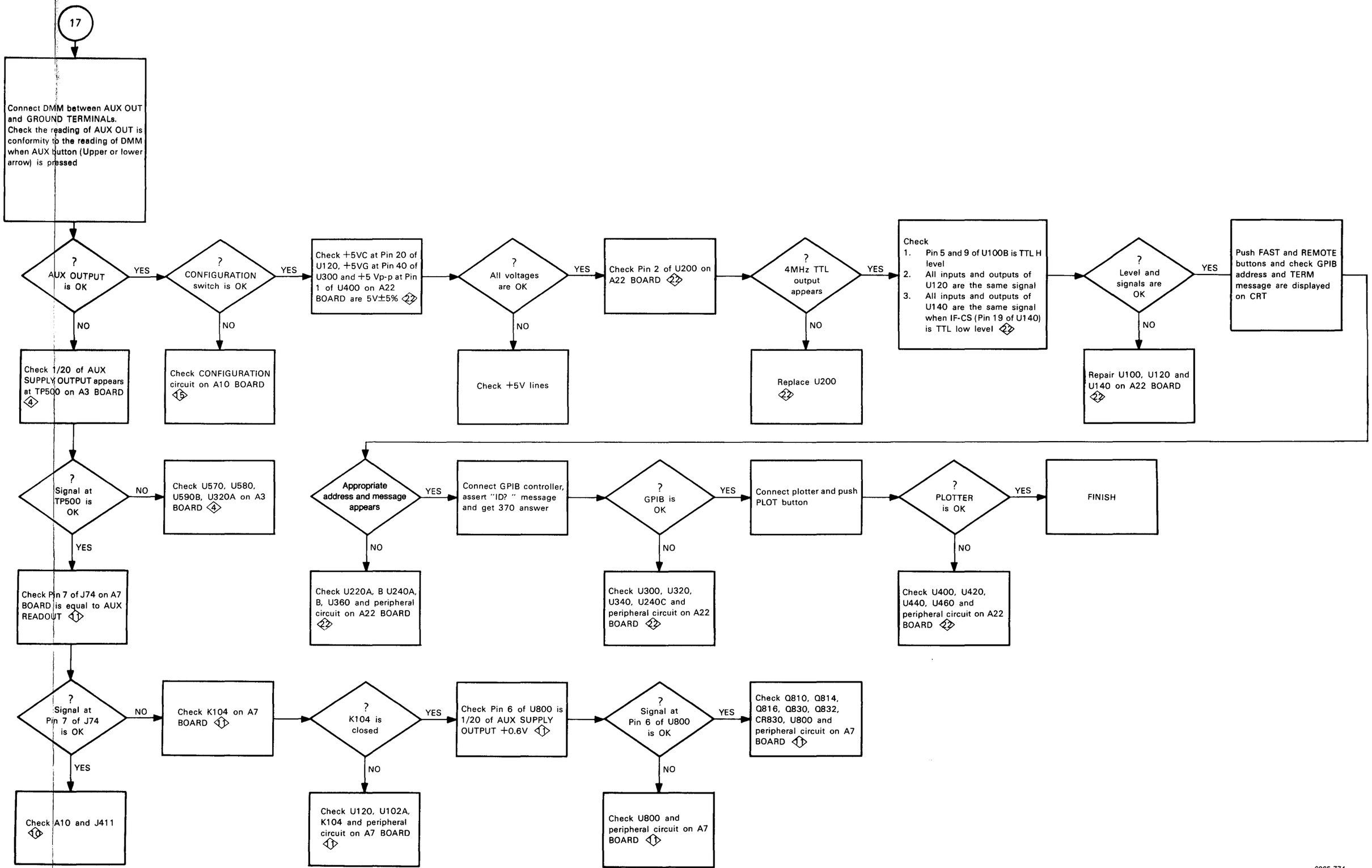

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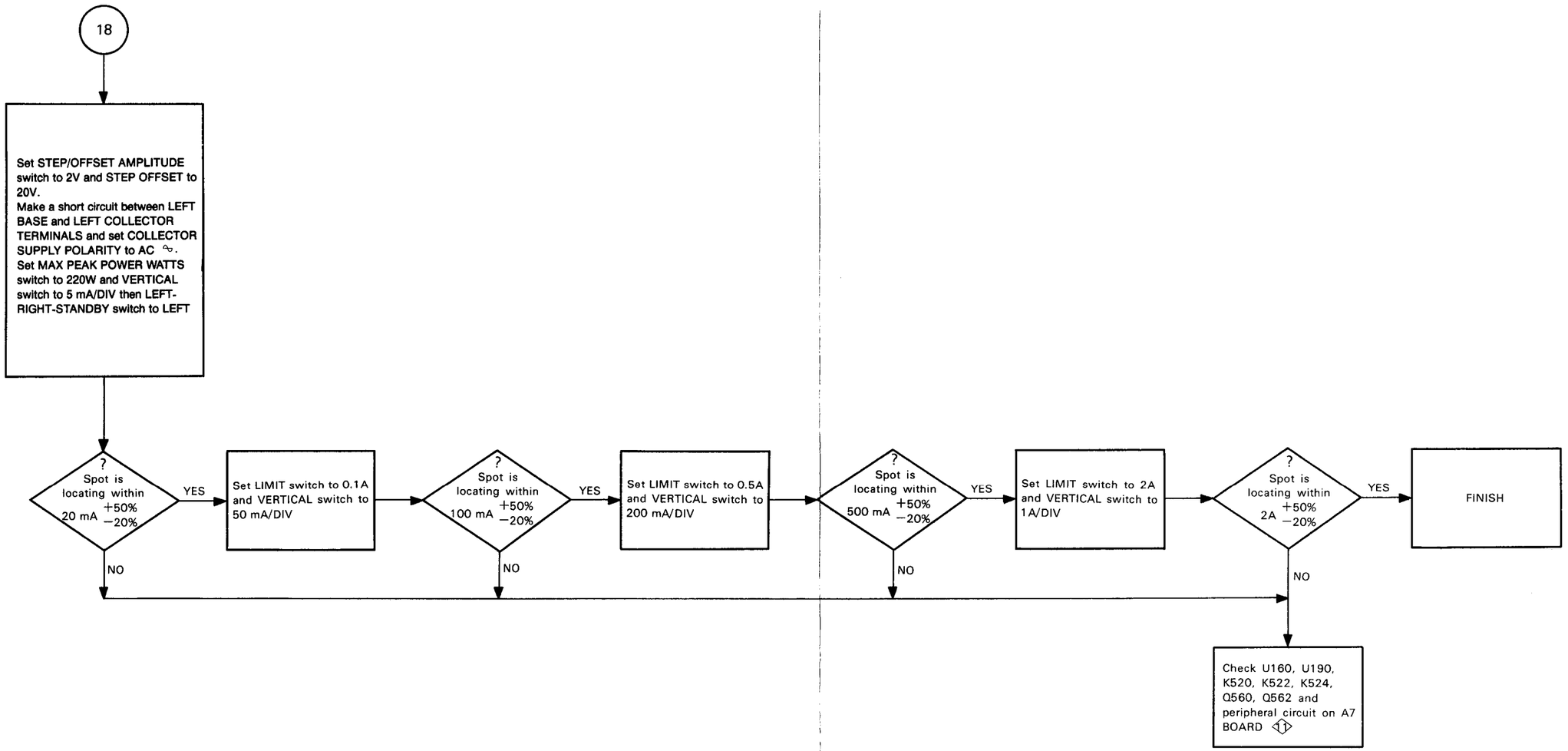

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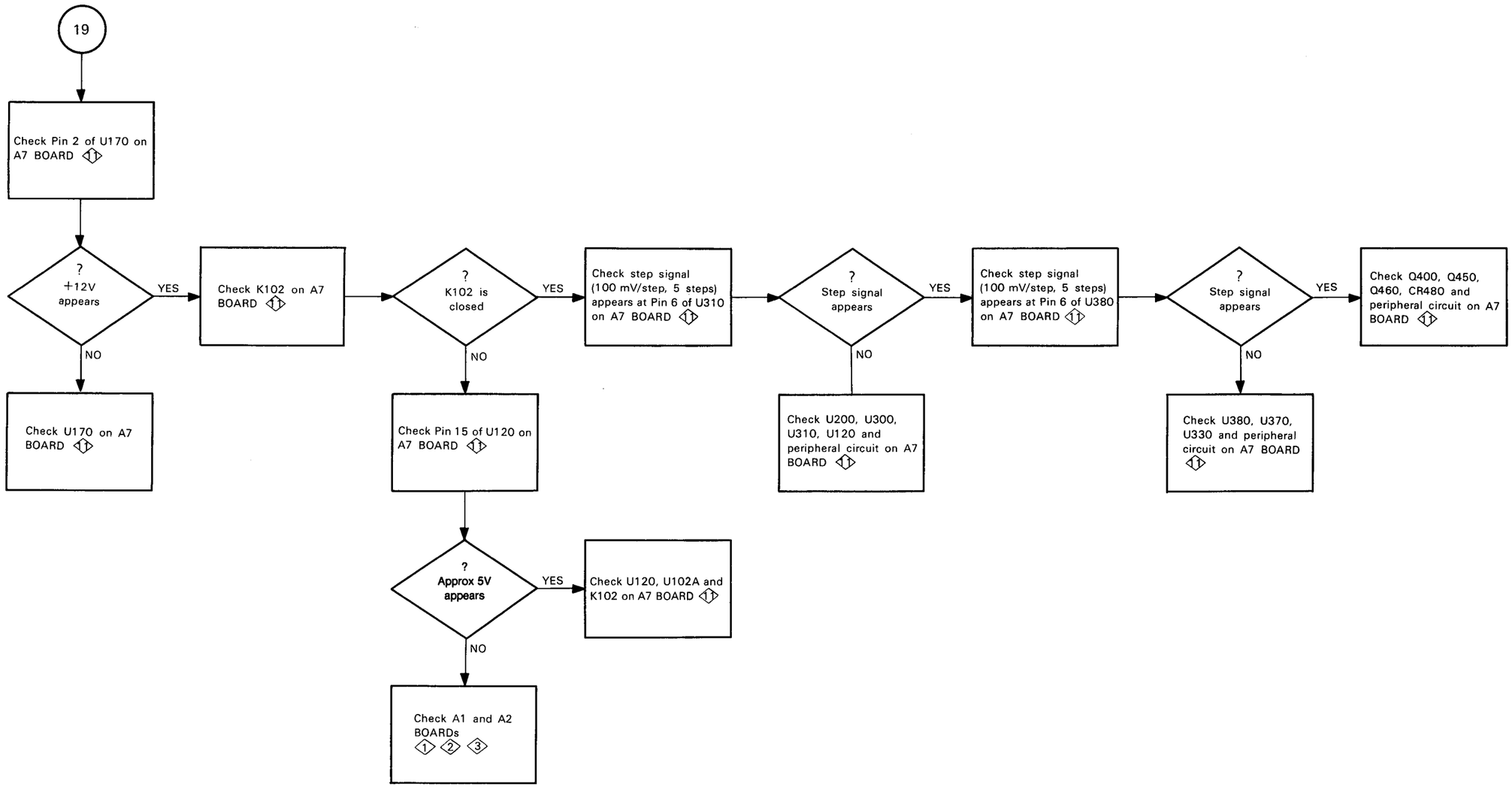

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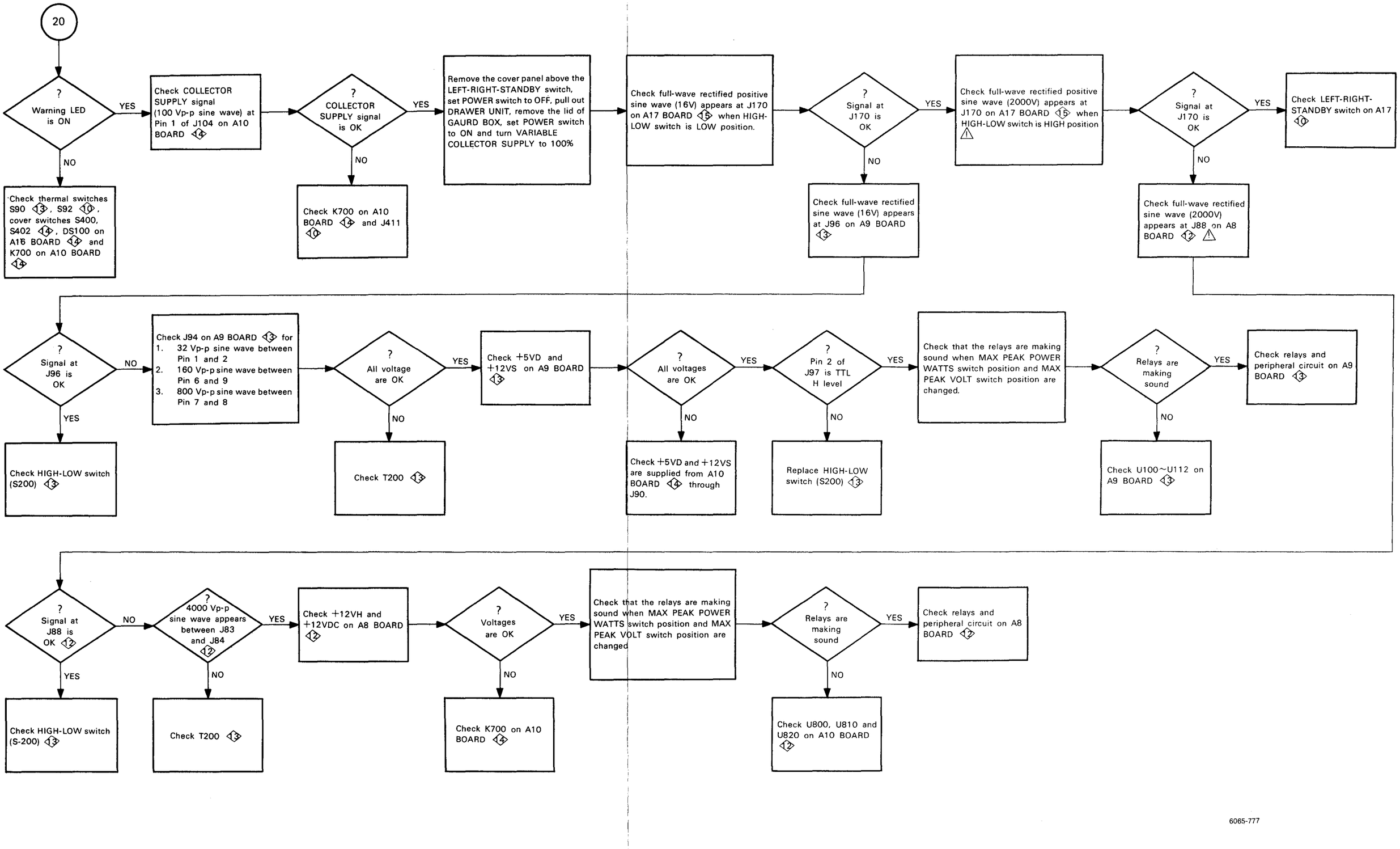

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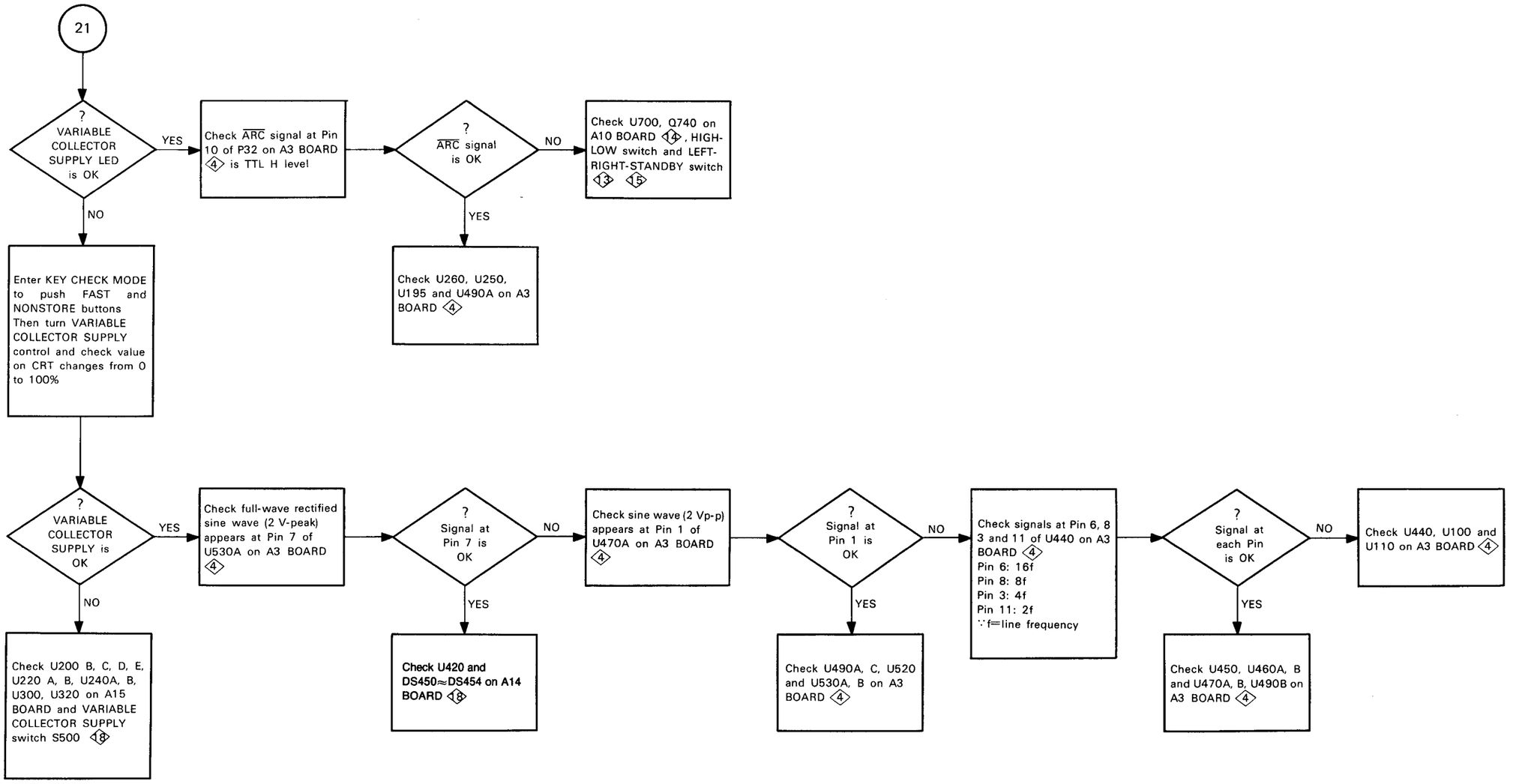

Troubleshooting Tree 21
Reverse Side Troubleshooting Tree 22

6065-778

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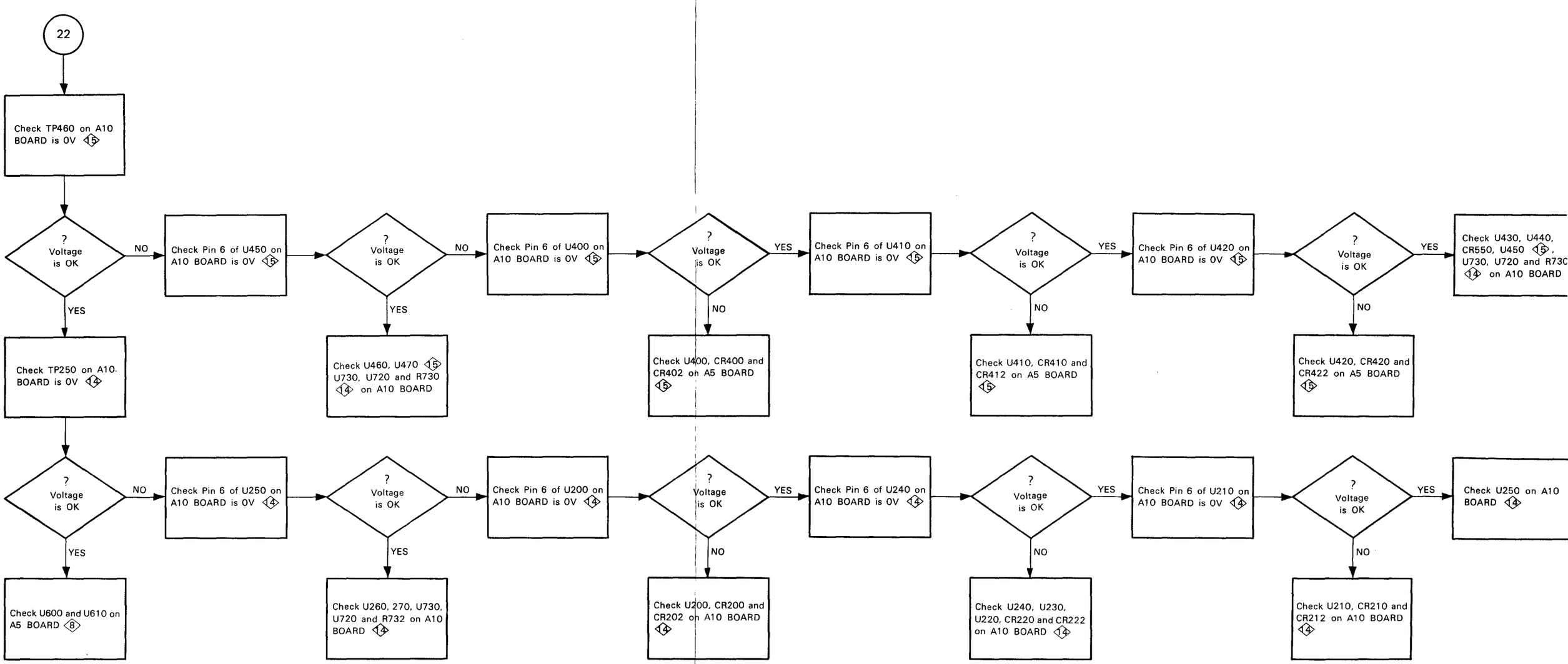

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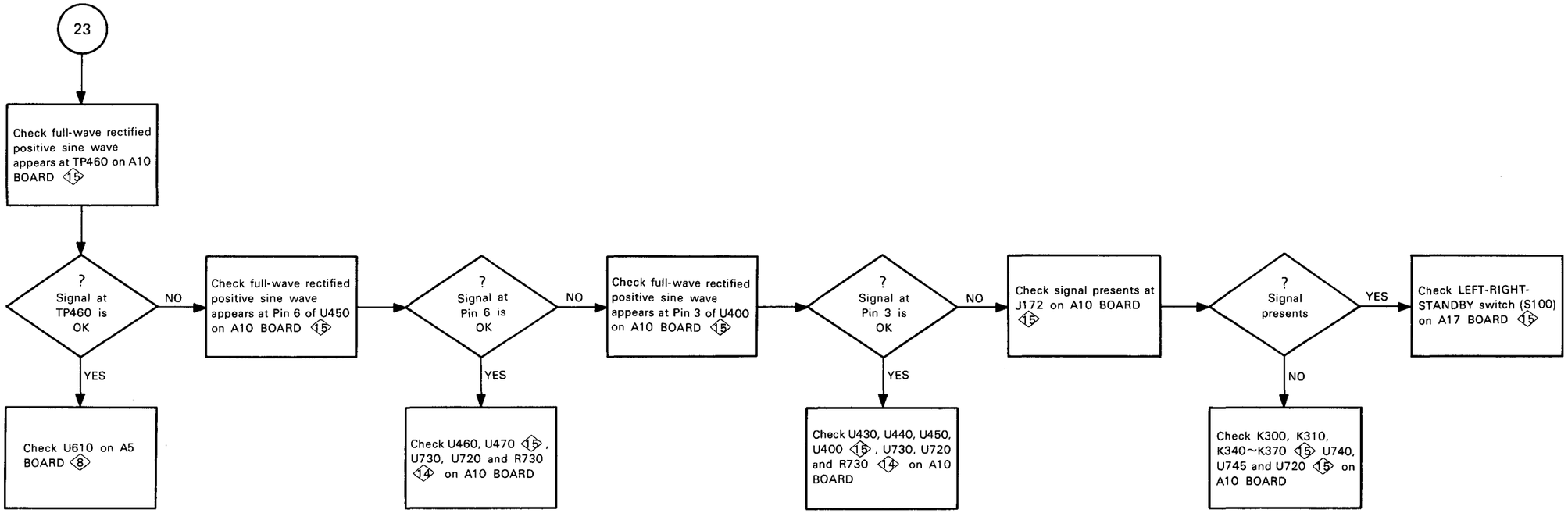

Troubleshooting Tree 23

Reverse Side Troubleshooting Tree 24

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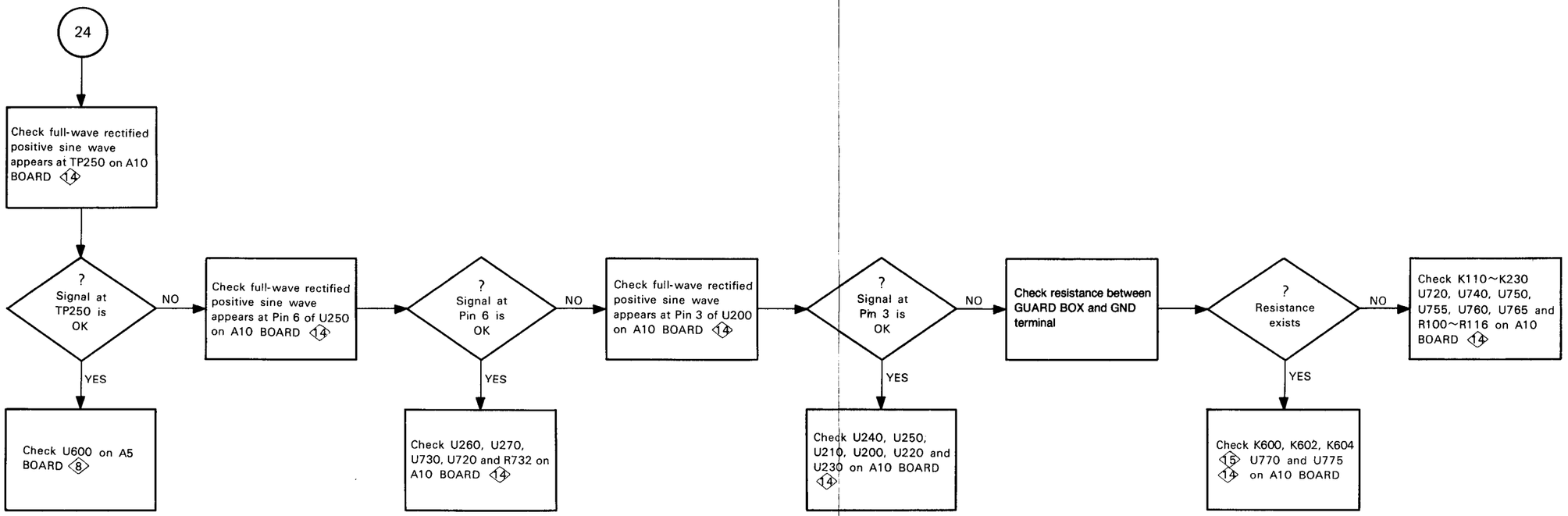

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REPLACEABLE MECHANICAL PARTS

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.

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.

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
	**** END ATTACHING PARTS ****
	Detail Part of Assembly and/or Component
	Attaching parts for Detail Part
	**** END ATTACHING PARTS ****
	Parts of Detail Part
	Attaching parts for Parts of Detail Part
	**** END ATTACHING PARTS ****

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.

Attaching parts must be purchased separately, unless otherwise specified.

ABBREVIATIONS

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

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CROSS INDEX - MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip Code
01536	TEXTRON INC CAMCAR DIV SEMS PRODUCTS UNIT	1818 CHRISTINA ST	ROCKFORD IL 61108
06383	PANDUIT CORP	17301 RIDGELAND	TINLEY PARK IL 07094-2917
06950	SCREWCORP VSI AEROSPACE PRODUCTS DIV SUB OF FAIRCHILD INDUSTRIES INC	13001 E TEMPLE AVE PO BOX 730	CITY OF INDUSTRY CA 91746-1417
12136	P H C INDUSTRIES INC	1643 HADDON AVE PO BOX 1448	CAMDEN NJ 08103-3109
12327	FREEWAY CORP	9301 ALLEN DR	CLEVELAND OH 44125-4632
13103	THERMALLOY CO INC	2021 W VALLEY VIEW LN PO BOX 810839	DALLAS TX 75381
16428	COOPER BELDEN ELECTRONIC WIRE AND CA SUB OF COOPER INDUSTRIES INC	NW N ST	RICHMOND IN 47374
22526	DU PONT E I DE NEMOURS AND CO INC DU PONT CONNECTOR SYSTEMS DIV MILITARY PRODUCTS GROUP	515 FISHING CREEK RD	NEW CUMBERLAND PA 17070-3007
31918	ITT SCHADOW INC	8081 WALLACE RD	EDEN PRAIRIE MN 55344-2224
55285	BERGQUIST CO INC THE	5300 EDINA INDUSTRIAL BLVD	MINNEAPOLIS MN 55435-3707
70903	COOPER BELDEN ELECTRONICS WIRE AND C SUB OF COOPER INDUSTRIES INC	2000 S BATAVIA AVE	GENEVA IL 60134-3325
73743	FISCHER SPECIAL MFG CO	111 INDUSTRIAL RD	COLD SPRING KY 41076-9749
77900	ILLINOIS TOOL WORKS SHAKEPROOF DIV	ST CHARLES RD	ELGIN IL 60120
78189	ILLINOIS TOOL WORKS INC SHAKEPROOF DIV	ST CHARLES ROAD	ELGIN IL 60120
78584	STEWART STAMPING CORP SUB OF INSILCO CORP	630 CENTRAL PARK AVE	YONKERS NY 10704-2018
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077-0001
83385	MICRODOT MFG INC GREER-CENTRAL DIV	3221 W BIG BEAVER RD	TROY MI 48098
83486	ELCO INDUSTRIES INC	1101 SAMUELSON RD	ROCKFORD IL 61101
86928	SEASTROM MFG CO INC	701 SONORA AVE	GLENDALE CA 91201-2431
93907	TEXTRON INC CAMCAR DIV	600 18TH AVE	ROCKFORD IL 61108-5181
99742	PERMACEL TAPE DIV AN AVERY CO	U S HIGHWAY 1 P O BOX 671	NEW BRUNSWICK NJ 08903
S3109	FELLER	ASA ADOLF AG STOTZWEID CH8810	HORGEN SWITZERLAND
TK0191	SONY TEKTRONIX	PO BOX 14 HANEDA AIRPORT	TOKYO JAPAN
TK0435	LEWIS SCREW CO	4300 S RACINE AVE	CHICAGO IL 60609-3320
TK0858	STAUFFER SUPPLY CO (DIST)	810 SE SHERMAN	PORTLAND OR 97214
TK1179	PANEL COMPONENTS CORP	1360 N DUTTON AVE PO BOX 6626	SANTA ROSA CA 95406
TK1373	PATELEC-CEM (ITALY)	10156 TORINO	VAICENTALLO 62/45S ITALY
TK1543	CAMCAR/TEXTRON	600 18TH AVE	ROCKFORD IL 61108-5181
TK2278	COMTEK MANUFACTURING OF OREGON (METALS)	PO BOX 4200	BEAVERTON OR 97076-4200

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Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
1-1	390-0984-00			1	CABINET SIDE:LEFT	TK0191	390-0984-00
					(ATTACHING PARTS)		
-2	211-0507-00			1	SCREW,MACHINE:6-32 X 0.312,PNH,STL	83385	ORDER BY DESCR
					(END ATTACHING PARTS)		
-3	367-0116-00			2	HANDLE,CARRYING:16.54 L,BLUE VINYL	12136	ORDER BY DESCR
					(ATTACHING PARTS)		
-4	212-0628-00			8	SCREW,SHOULDER:10-32 X 0.4 L,RDH,STL	TK1543	ORDER BY DESCR
-5	386-1624-00			4	PLATE,HDL RTNG:STAINLESS STEEL	80009	386-1624-00
					(END ATTACHING PARTS)		
-6	386-1283-01			4	PLATE,HDL MTG:FRONT	80009	386-1283-01
-7	200-0728-00			4	COVER,HDL END:1.91 X 0.91 X 0.36 BLUE	80009	200-0728-00
-8	426-2139-00			1	FRAME SECT,CAB.:TOP LEFT	TK0191	426-2139-00
					(ATTACHING PARTS)		
-9	211-0538-00			2	SCREW,MACHINE:6-32 X 0.312,FLH,100 DEG,STL	93907	ORDER BY DESCR
-10	211-0559-00			2	SCREW,MACHINE:6-32 X 0.375,FLH,100 DEG	TK0435	1593-300
-11	211-0538-00			4	SCREW,MACHINE:6-32 X 0.312,FLH,100 DEG,STL	93907	ORDER BY DESCR
					(END ATTACHING PARTS)		
-12	124-0446-00			1	STRIP,TRIM:TOP RIGHT	TK0191	124-0446-00
-13	426-2140-00			1	FRAME SECT,CAB.:TOP RIGHT	TK0191	426-2140-00
					(ATTACHING PARTS)		
-14	211-0538-00			2	SCREW,MACHINE:6-32 X 0.312,FLH,100 DEG,STL	93907	ORDER BY DESCR
-15	211-0559-00			2	SCREW,MACHINE:6-32 X 0.375,FLH,100 DEG	TK0435	1593-300
-16	211-0504-00			5	SCREW,MACHINE:6-32 X 0.250,PNH,STL	TK0435	ORDER BY DESCR
					(END ATTACHING PARTS)		
-17	124-0447-00			1	STRIP,TRIM:TOP RIGHT	TK0191	124-0447-00
-18	426-2141-00			1	FRAME SECT,CAB.:LEFT	TK0191	426-2141-00
					(ATTACHING PARTS)		
-19	211-0559-00			1	SCREW,MACHINE:6-32 X 0.375,FLH,100 DEG	TK0435	1593-300
-20	211-0504-00			4	SCREW,MACHINE:6-32 X 0.250,PNH,STL	TK0435	ORDER BY DESCR
					(END ATTACHING PARTS)		
-21	426-2142-00			1	FRAME SECT,CAB.:RIGHT	TK0191	426-2142-00
					(ATTACHING PARTS)		
-22	211-0559-00			1	SCREW,MACHINE:6-32 X 0.375,FLH,100 DEG	TK0435	1593-300
-23	211-0504-00			3	SCREW,MACHINE:6-32 X 0.250,PNH,STL	TK0435	ORDER BY DESCR
					(END ATTACHING PARTS)		
-24	407-3476-00			1	BRACKET,SUPPORT:TEST FIXTURE	TK0191	407-3476-00
					(ATTACHING PARTS)		
-25	212-0002-00			4	SCREW,MACHINE:8-32 X 0.25,FLH,100 DEG,STL	83385	ORDER BY DESCR
-26	212-0004-00			4	SCREW,MACHINE:8-32 X 0.312,PNH,STL	TK0435	ORDER BY DESCR
					(END ATTACHING PARTS)		
					SUPPORT BRACKET INCLUDES:		
-27	334-6692-00			1	.MARKER,IDENT:MKD POT	TK0191	334-6692-000
-28	407-3522-00			1	BRACKET,MTG:TEST FIXTURE,RIGHT	TK0191	407-3522-00
					(ATTACHING PARTS)		
-29	212-0002-00			4	SCREW,MACHINE:8-32 X 0.25,FLH,100 DEG,STL	83385	ORDER BY DESCR
-30	212-0004-00			4	SCREW,MACHINE:8-32 X 0.312,PNH,STL	TK0435	ORDER BY DESCR
					(END ATTACHING PARTS)		
					MOUNTING BRACKET INCLUDES:		
-31	334-6693-00			1	.MARKER,IDENT:MKD POT	TK0191	334-6693-00
-32	426-2137-00			1	FRAME SECT,CAB.:BOTTOM,LEFT	TK0191	426-2137-00
					(ATTACHING PARTS)		
-33	211-0559-00			2	SCREW,MACHINE:6-32 X 0.375,FLH,100 DEG	TK0435	1593-300
					(END ATTACHING PARTS)		
-34	124-0448-00			2	STRIP,TRIM:BOTTOM	TK0191	124-0448-00
-35	348-0128-00			4	FOOT,CABINET:BLACK POLYURETHANE	80009	348-0128-00
					(ATTACHING PARTS)		
-36	211-0513-00			8	SCREW,MACHINE:6-32 X 0.625,PNH,STL	93907	B80-00032-003
					(END ATTACHING PARTS)		
-37	426-2134-00			1	FRAME SECT,CAB.:LEFT	TK0191	426-2134-00
					(ATTACHING PARTS)		
-38	211-0538-00			2	SCREW,MACHINE:6-32 X 0.312,FLH,100 DEG,STL	93907	ORDER BY DESCR
					(END ATTACHING PARTS)		
-39	426-2138-00			1	FRAME SECT,CAB.:BOTTOM RIGHT	TK0191	426-2138-00
					(ATTACHING PARTS)		
-40	211-0559-00			2	SCREW,MACHINE:6-32 X 0.375,FLH,100 DEG	TK0435	1593-300
					(END ATTACHING PARTS)		
-41	334-3379-01			1	MARKER,IDENT:MARKED GROUND SYMBOL	80009	334-3379-01
-42	426-2135-00			1	FRAME SECT,CAB.:RIGHT	TK0191	426-2135-00

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Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
1-					(ATTACHING PARTS)		
-43	211-0538-00			2	SCREW,MACHINE:6-32 X 0.312,FLH,100 DEG,STL	93907	ORDER BY DESCR
					(END ATTACHING PARTS)		
-44	351-0770-00			2	GUIDE,TEST FXTR:BOTTOM	TK0191	351-0770-00
					(ATTACHING PARTS)		
-45	211-0038-00			6	SCREW,MACHINE:4-40 X 0.312,FLH,100 DEG,STL	93907	ORDER BY DESCR
					(END ATTACHING PARTS)		
-46	441-1739-00			1	CHAS,CURVE TRCR:BOTTOM	TK0191	441-1739-00
					(ATTACHING PARTS)		
-47	211-0541-00			2	SCREW,MACHINE:6-32 X 0.25,FLH,100 DEG,STL	93907	ORDER BY DESCR
					(END ATTACHING PARTS)		
-48	390-0987-00			1	CABINET BOTTOM:	TK0191	390-0987-00
					(ATTACHING PARTS)		
-49	211-0007-00			6	SCREW,MACHINE:4-40 X 0.188,PNH,STL	93907	ORDER BY DESCR
					(END ATTACHING PARTS)		
-50	390-0986-00			1	CABINET TOP:	TK0191	390-0986-00
					(ATTACHING PARTS)		
-51	211-0507-00			1	SCREW,MACHINE:6-32 X 0.312,PNH,STL	83385	ORDER BY DESCR
					(END ATTACHING PARTS)		
-52	426-2136-00			1	FRAME SECT,CAB.:REAR	TK0191	426-2136-00
-53	390-0985-00			1	CABINET SIDE:RIGHT	TK0191	390-0985-00
					(ATTACHING PARTS)		
-54	211-0507-00			1	SCREW,MACHINE:6-32 X 0.312,PNH,STL	83385	ORDER BY DESCR
					(END ATTACHING PARTS)		
-55	333-3343-00			1	PANEL,REAR:	TK0191	333-3343-00
					(ATTACHING PARTS)		
-56	211-0507-00			6	SCREW,MACHINE:6-32 X 0.312,PNH,STL	83385	ORDER BY DESCR
					(END ATTACHING PARTS)		
-57	343-1272-00			2	RTNR,CAB.,COVER:BLUE,PLASTIC	TK0191	343-1272-00
					(ATTACHING PARTS)		
-58	213-0782-00			2	SCREW,TPG,TF:8-32 X 0.625,FILH,STL	83486	ORDER BY DESCR
					(END ATTACHING PARTS)		
-59	----- -----			1	MARKER,IDENT:MKD SERIAL NO.		
					(SERIAL NO. MARKERS ARE NOT AVAILABLE)		
-60	200-3300-00			1	GUARD,FAN:	TK0191	200-3300-00
					(ATTACHING PARTS)		
-61	129-1126-00			4	SPACER,POST:21.5MM L,4-40,6-32 THD,BRS,HEX	TK0191	129-1126-00
					(END ATTACHING PARTS)		
-62	378-0278-00			1	FILTER,AIR:125MM X 5MM THK	TK0191	378-0278-00
-63	200-3277-00			1	COVER,FAN:AL	TK0191	200-3277-00
					(ATTACHING PARTS)		
-64	211-0008-00			4	SCREW,MACHINE:4-40 X 0.25,PNH,STL	93907	ORDER BY DESCR
					(END ATTACHING PARTS)		
-65	343-1271-00			2	RTNR,CAB.,COVER:BLUE,PLASTIC	TK0191	343-1271-00
					(ATTACHING PARTS)		
-66	213-0782-00			2	SCREW,TPG,TF:8-32 X 0.625,FILH,STL	83486	ORDER BY DESCR
					(END ATTACHING PARTS)		
-67	----- -----			1	FAN,TUBEAXIAL:(SEE B100 REPL)		
					(ATTACHING PARTS)		
-68	210-0457-00			4	NUT,PL,ASSEM WA:6-32 X 0.312,STL CD PL	78189	511-061800-00
					(END ATTACHING PARTS)		
-69	129-0992-00			4	SPACER,POST:0.41 L,4-40 INT,BRS,0.19 HEX	80009	129-0992-00
-70	361-0704-00			4	SPACER,CKT BD:0.504 L X 0.188 HEX,BRS	80009	361-0704-00
-71	342-0784-00			1	INSULATOR,PLATE:INTERFACE BOARD	TK0191	342-0784-00
-72	----- -----			1	CKT BOARD ASSY:INTERFACE (SEE A22 REPL)		
					(ATTACHING PARTS)		
-73	211-0661-00			4	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
					CKT BOARD ASSY INCLUDES:		
-74	----- -----			1	.CONN,RCPT,ELEC:(SEE A22J350 REPL)		
-75	----- -----			1	.CONN,RCPT,ELEC:(SEE A22J450 REPL)		
-76	----- -----			1	.CA ASSY,SP,ELEC:(SEE A22W220 REPL)		
-77	342-0782-00			1	INSULATOR,FILM:PRIMARY BOARD	TK0191	342-0782-00
-78	----- -----			1	CKT BOARD ASSY:PRIMARY (SEE A27 REPL)		
					(ATTACHING PARTS)		
-79	211-0661-00			4	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
					CKT BOARD ASSY INCLUDES:		

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Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
1-80	----- -----			1	.CONN,RCPT,ELEC:(SEE A27J272 REPL)		
-81	----- -----			1	.CONN,RCPT,ELEC:(SEE A27J274 REPL)		
-82	----- -----			1	.CONN,RCPT,ELEC:(SEE A27J270 REPL)		
-83	----- -----			1	FILTER:115/230V,4A (SEE FL100 REPL)		
					(ATTACHING PARTS)		
-84	211-0038-00			2	SCREW,MACHINE:4-40 X 0.312,FLH,100 DEG,STL	93907	ORDER BY DESCR
					(END ATTACHING PARTS)		
-85	----- -----			1	LEAD,ELECTRICAL:18AWG,6.0L (SEE W17 REPL)		
-86	210-0202-00			1	TERMINAL,LUG:0.146 ID,LOCKING,BRZ TIN PL	86928	A-373-158-2
					(ATTACHING PARTS)		
-87	210-0407-00			1	NUT,PLAIN,HEX:6-32 X 0.25,BRS CD PL	73743	3038-402
					(END ATTACHING PARTS)		

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Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
2-					(ATTACHING PARTS)		
-45	211-0578-00			4	SCREW,MACHINE:6-32 X 0.438,PNH,STL	93907	ORDER BY DESCR
-46	210-0949-00			4	WASHER,FLAT:0.141 ID X 0.5 OD X 0.062,BRS (END ATTACHING PARTS)	12327	ORDER BY DESCR
-47	----- -----			1	LEAD,ELEC:24 AWG,10.0 L,CRT (SEE W14 REPL)		
-48	----- -----			1	ANODE CAP (PART OF A20U300)		
-49	366-0625-00			5	KNOB:DOVE GRAY,3.25MM ID X 9.5MM OD 13MM H	TK0191	366-0625-00
-50	358-0378-00			3	BUSHING,SLEEVE:0.131 ID X 0.18 OD X 0.125 L	80009	358-0378-00
-51	366-0620-00			3	KNOB:DOVE GRAY	TK0191	366-0620-00
-52	333-3344-00			1	PANEL,FRONT:MAIN (ATTACHING PARTS)	TK0191	333-3344-00
-53	210-0586-00			2	NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL (END ATTACHING PARTS)	78189	211-041800-00
-54	378-0277-00			1	FILTER,LT,CRT:SMOKE GRAY	TK0191	378-0277-00
-55	366-0618-00			8	KNOB,LEVER:DOVE GRAY	TK0191	366-0618-00
-56	351-0771-00			1	GUIDE,PB:MAIN KEYBD	TK0191	351-0771-00
-57	----- -----			1	CKT BOARD ASSY:SUB KEY (SEE A12 REPL) (ATTACHING PARTS)		
-58	129-1131-00			6	SPACER,POST:12.7MM L,4-40 THD ONE END,BRASS	TK0191	129-1131-00
-58.1	210-1002-00	.300513		6	WASHER,FLAT:0.125 ID X 0.25 OD X 0.022 (END ATTACHING PARTS)	86928	5714-147-20N
					CKT BOARD ASSY INCLUDES:		
-59	129-1128-00			59	.SPACER,POST:5.1MM,L,POLYCARBONATE	TK0191	129-1128-00
-60	131-3677-00			4	.CONN,RCPT,ELEC:1 X 5 FEMALE	TK0191	131-3677-00
-61	----- -----			26	.SWITCH,KEY:(SEE A12S300-305,S310-315, .S340-345,S350-355,S364,S365 REPL)		
-62	366-0617-00			26	PUSH BUTTON:DOVE GRAY	TK0191	366-0617-00
-63	----- -----			1	CKT BOARD ASSY:MAIN KEY (SEE A11 REPL) (ATTACHING PARTS)		
-64	211-0661-00			6	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ (END ATTACHING PARTS)	01536	821-01655-024
					CKT BOARD ASSY INCLUDES:		
-65	407-3474-00			1	.BRACKET,ANGLE:VAR RES MTG	TK0191	407-3474-00
-66	----- -----			5	.RES,VAR,NONWW:(SEE A11R302,R312,R322,R330, .R340 REPL) (ATTACHING PARTS)		
-67	210-0583-00			5	.NUT,PLAIN,HEX:0.25-32 X 0.312,BRS CD PL	73743	2X-20319-402
-68	210-0046-00			4	.WASHER,LOCK:0.261 ID,INTL,0.018 THK,STL (END ATTACHING PARTS)	77900	1214-05-00-0541C
-69	407-3475-00			1	.BRACKET,ANGLE:VAR RES MTG	TK0191	407-3475-00
-70	----- -----			3	.RES,VAR,NONWW:(SEE R350,R360,R370 REPL) (ATTACHING PARTS)		
-71	210-0583-00			3	.NUT,PLAIN,HEX:0.25-32 X 0.312,BRS CD PL	73743	2X-20319-402
-72	210-0046-00			2	.WASHER,LOCK:0.261 ID,INTL,0.018 THK,STL (END ATTACHING PARTS)	77900	1214-05-00-0541C
-73	210-0223-00			2	.TERMINAL,LUG:0.26 ID,LOCKING,BRZ TIN PL	86928	5441-37
-74	----- -----			1	.LEAD ELECTRICAL: (SEE W111 REPL)		
-75	----- -----			1	.LEAD,ELECTRICAL: (SEE W112 REPL)		
-76	174-0293-00			1	.CA ASSY,SP,ELEC:40,28 AWG,4.3 L,RIBBON	TK0191	174-0293-00
-77	210-0201-00			1	.TERMINAL,LUG:0.12 ID,LOCKING,BRZ TIN PL	86928	A373-157-2
-78	211-0008-00			1	SCREW,MACHINE:4-40 X 0.25,PNH,STL	93907	ORDER BY DESCR
-79	407-3483-00			1	BRACKET,FR PNL:ALUMINUM (ATTACHING PARTS)	TK0191	407-3483-00
-80	211-0106-00			2	SCREW,MACHINE:4-40 X 0.625,FLH,100 DEG,STL (END ATTACHING PARTS)	TK0435	ORDER BY DESCR

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Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
3-1	441-1740-00	.300000	.300702	1	CHASSIS,CKT BD:	TK0191	441-1740-00
	441-1740-01	.300703		1	CHASSIS,CKT BD:	80009	441-1740-01
-2	----- -----			1	CKT BOARD ASSY:LV SUPPLY (SEE A19 REPL)		
	348-0953-00			1	GROMMET,PLASTIC:177MM L,CHANNEL	TK0191	348-0953-00
-3	343-0778-00			2	CLAMP,CABLE:5MM ID,NYLON	80009	343-0778-00
-4	348-0948-00			1	GROMMET,PLASTIC:BLACK,RING,9.5MM ID	TK0191	348-0948-00
-5	351-0769-00			2	GUIDE,CKT BD:	TK0191	351-0769-00
-6	343-1289-00			1	CLAMP,CABLE:STEEL	TK0191	343-1289-00
-7	343-1084-00			4	CLAMP,CABLE:NYLON	80009	343-1084-00
-8	348-0958-00			1	GROMMET,PLASTIC:63MM L,CHANNEL	80009	348-0958-00
-9	348-0954-00			1	GROMMET,PLASTIC:305MML,CHANNEL	TK0191	348-0954-00
-10	----- -----			1	CKT BOARD ASSY:STEP GEN (SEE A7 REPL)		
					(ATTACHING PARTS)		
-11	211-0661-00			3	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
					CKT BOARD ASSY INCLUDES:		
-12	----- -----			4	.XISTOR:(SEE A7Q490,Q495,Q816,Q832 REPL)		
					(ATTACHING PARTS)		
-13	211-0315-00			4	.SCR,ASSEM WSHR:4-40 X 0.437,PHN,STL CD PL	78189	ORDER BY DESCR
-14	342-0787-00			4	.INSULATOR,PLATE:TRANSISTOR,TO-3P,SI RUBBER	TK0191	342-0787-00
					(END ATTACHING PARTS)		
-15	214-3875-00	.300000	.300398	1	.HT SK,CKT BD:STEP GENERATOR BD,AL	TK0191	214-3875-00
	214-3875-01	.300399		1	.HT SK,CKT BD:CKT BD,AL	80009	214-3875-01
-16	----- -----	.300399		1	.TRANSISTOR:NPN,SI (SEE A7Q462 REPL)		
					(ATTACHING PARTS)		
-17	211-0244-00	.300399		1	.SCR,ASSEM WSHR:4-40 X 0.312,PNH STL	TK0858	211-0244-00
					(END ATTACHING PARTS)		
-18	131-2230-01			1	.CONN,RCPT,ELEC:HEADER,2 X 8,2.54 SPACING	80009	131-2230-01
-19	----- -----			1	.RES,FXD,WW:(SEE A7R500 REPL)		
					(ATTACHING PARTS)		
-20	211-0661-00			2	.SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
-21	----- -----			1	.MICROCKT,LI:(SEE A7U170 REPL)		
-22	214-3498-00	.300000	.300398	1	.HEAT SINK,XSTR:TO-220	80009	214-3498-00
-23	214-4003-00	.300399		1	.HEAT SINK,XSTR:TO-220,AL	80009	214-4003-00
					(ATTACHING PARTS)		
-24	211-0661-00			1	.SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
-25	210-0586-00	.300399		1	.NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL	78189	211-041800-00
					(END ATTACHING PARTS)		
-26	131-0589-00			18	.TERMINAL,PIN:0.46 L X 0.025 SQ PH BRZ	22526	48283-029
-27	----- -----			1	CKT BOARD ASSY:MOTHER (SEE A1 REPL)		
					(ATTACHING PARTS)		
-28	211-0661-00			7	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
					CKT BOARD ASSY INCLUDES:		
-29	----- -----			1	.CA ASSY,SP,ELEC:(SEE A1W70 REPL)		
-30	----- -----			1	.CA ASSY,SP,ELEC:(SEE A1W60 REPL)		
-31	----- -----			1	.CA ASSY,SP,ELEC:(SEE A1W192 REPL)		
-32	----- -----			4	.CONN,RCPT,ELEC:(SEE A1J20,J30,J40,J50 REPL)		
-33	----- -----			4	.CONN,RCPT,ELEC:(SEE A1J22,J32,J42,J52 REPL)		
-34	----- -----			1	.CONN,RCPT,ELEC:(SEE A1J400 REPL)		
-35	----- -----			1	.CONN,RCPT,ELEC:(SEE A1J220 REPL)		
-36	----- -----			1	.CONN,RCPT,ELEC:(SEE A1J110 REPL)		
-37	----- -----			1	.CONN,RCPT,ELEC:(SEE A1J190 REPL)		
-38	----- -----			29	.TERM,PIN:(SEE A1J10,J12,J180,J410,J412 REPL		
-39	----- -----			1	CA ASSY,SP,ELEC:7.5L (SEE W180 REPL)		
-40	407-3479-00			1	BRACKET,CKT BD:ALUMINUM	TK0191	407-3479-00
					(ATTACHING PARTS)		
-41	211-0507-00			2	SCREW,MACHINE:6-32 X 0.312,PNH,STL	83385	ORDER BY DESCR
					(END ATTACHING PARTS)		
-42	----- -----			1	CKT BOARD ASSY:LV SUPPLY (SEE A19 REPL)		
					(ATTACHING PARTS)		
-43	211-0661-00			3	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
-44	211-0507-00			3	SCREW,MACHINE:6-32 X 0.312,PNH,STL	83385	ORDER BY DESCR
					(END ATTACHING PARTS)		
					CKT BOARD ASSY INCLUDES:		
-45	214-3874-00			1	.HT SK,PWR SPLY:LV,AL	TK0191	214-3874-00
					(ATTACHING PARTS)		

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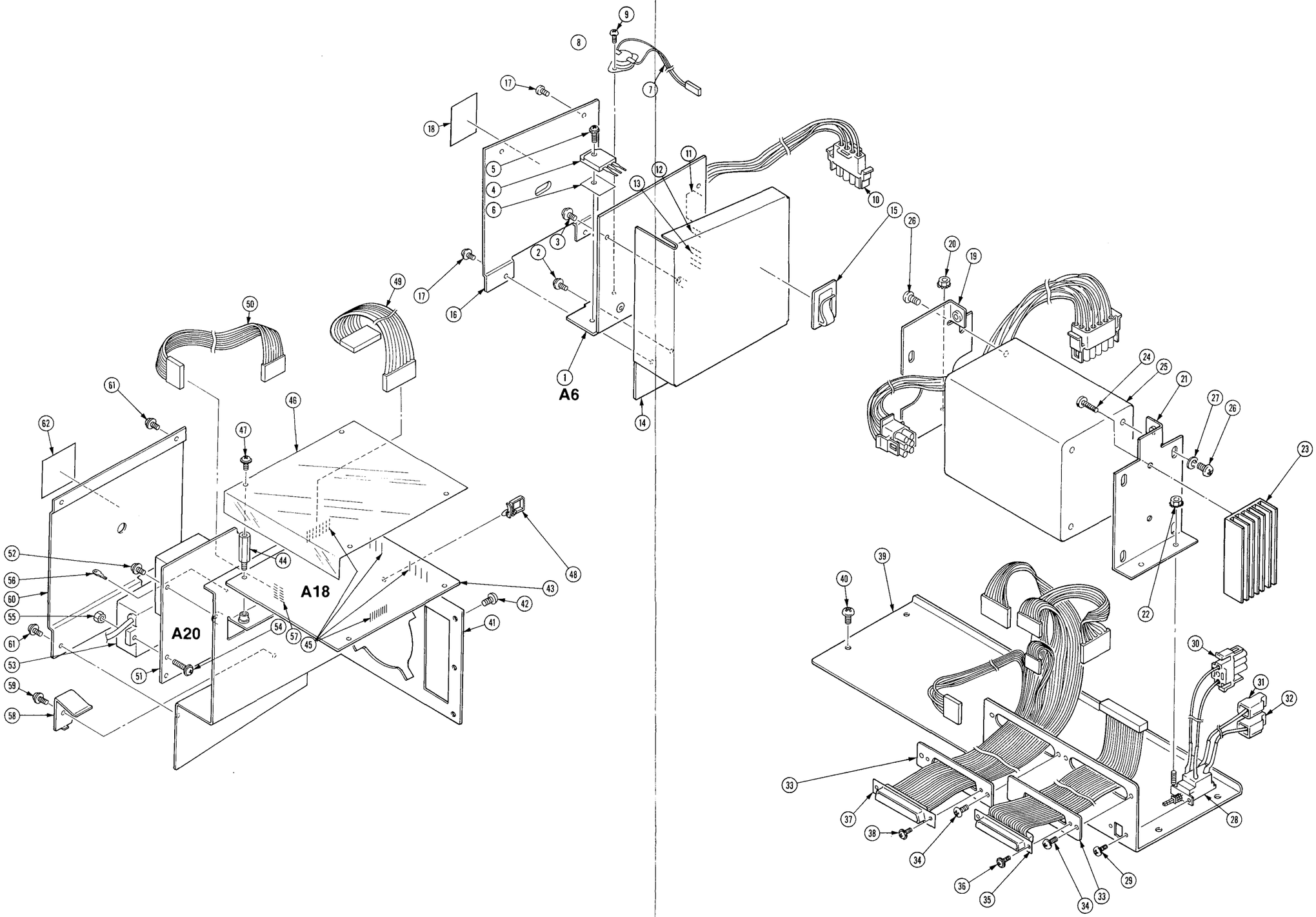

FIG. 4 POWER SUPPLY

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Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
4-1	----- -----			1	CKT BOARD ASSY:COLL SPLY OUT (SEE A6 REPL)		
					(ATTACHING PARTS)		
-2	211-0507-00			2	SCREW,MACHINE:6-32 X 0.312,PNH,STL	83385	ORDER BY DESCR
-3	211-0661-00			2	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
					CKT BOARD ASSY INCLUDES:		
-4	----- -----			4	.XISTOR:(SEE A6Q438,Q440,Q538,Q540 REPL)		
					(ATTACHING PARTS)		
-5	211-0315-00			4	.SCR,ASSEM WSHR:4-40 X 0.437,PHN,STL CD PL	78189	ORDER BY DESCR
-6	342-0787-00			4	.INSULATOR,PLATE:TRANSISTOR,TO-3P,SI RUBBER	TK0191	342-0787-00
					(END ATTACHING PARTS)		
-7	----- -----			1	.CA ASSY,SP,ELEC:(SEE A6W66 REPL)		
-8	----- -----			1	.SWITCH,THERMOSTATIC:(SEE A6S92 REPL)		
					(ATTACHING PARTS)		
-9	211-0661-00	.300000	.300802	2	.SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
	211-0007-00	.300803		2	.SCREW,MACHINE:4-40 X 0.188,PNH,STL	93907	ORDER BY DESCR
					(END ATTACHING PARTS)		
-10	----- -----			1	.CA ASSY,SP,ELEC:(SEE A6W64 REPL)		
-11	----- -----			1	.CONN,RCPT,ELEC:(SEE A6J60 REPL)		
-12	----- -----			2	.TERMINAL,PIN:(SEE A6J66 REPL)		
-13	----- -----			4	.TERMINAL,PIN:(SEE A6J62 REPL)		
	407-3520-00			1	BRKT,CMPNT MTG:TRANSISTOR	TK0191	407-3520-00
					(MOUNTS INSIDE FIG 1 INDEX 14 BRACKET)		
					(ATTACHING PARTS)		
	211-0507-00			2	SCREW,MACHINE:6-32 X 0.312,PNH,STL	83385	ORDER BY DESCR
					(END ATTACHING PARTS)		
-14	407-3470-00			1	BRACKET,CKT BD:COLLECTOR SUPPLY OUTPUT	TK0191	407-3470-00
-15	343-1084-00	.300000	.300702	1	CLAMP,CABLE:NYLON	80009	343-1084-00
	343-1084-00	.300703		2	CLAMP,CABLE:NYLON	80009	343-1084-00
-16	337-3330-00			1	SHIELD,ELEC:COLLECTOR SUPPLY	TK0191	337-3330-00
					(ATTACHING PARTS)		
-17	211-0008-00			4	SCREW,MACHINE:4-40 X 0.25,PNH,STL	93907	ORDER BY DESCR
					(END ATTACHING PARTS)		
-18	334-6695-00			1	MARKER,IDENT:MKD DANGER & POT	TK0191	334-6695-00
-19	407-3478-00	.300000	.300247	1	BRACKET,XFMR:LEFT,AL	TK0191	407-3478-00
	407-3478-01	.300248		1	BRACKET,XFMR:LEFT,ALUMINUM	80009	407-3478-01
					(ATTACHING PARTS)		
-20	220-0410-00			2	NUT,PL,ASSEM WA:10-32 X 0.375 HEX,STL CD PL	78189	511-101800-50
					(END ATTACHING PARTS)		
-21	407-3477-00	.300000	.300247	1	BRACKET,XFMR:RIGHT,AL	TK0191	407-3477-00
	407-3477-01	.300248		1	BRACKET,XFMR:RIGHT,ALUMINUM	80009	407-3477-01
					(ATTACHING PARTS)		
-22	220-0410-00			2	NUT,PL,ASSEM WA:10-32 X 0.375 HEX,STL CD PL	78189	511-101800-50
					(END ATTACHING PARTS)		
-23	214-3974-00	.300248		1	HEAT SINK,ELEC:TRANSFORMER,ALUMINUM	80009	214-3974-00
					(ATTACHING PARTS)		
-24	211-0538-00	.300248		2	SCREW,MACHINE:6-32 X 0.312,FLH,100 DEG,STL	93907	ORDER BY DESCR
					(END ATTACHING PARTS)		
-25	----- -----			1	XFMR,PWR,STDN: (SEE T100 REPL)		
					(ATTACHING PARTS)		
-26	212-0507-00			8	SCREW,MACHINE:10-32 X 0.375,PNH,STL	TK0435	ORDER BY DESCR
-27	210-1003-00	.300248		8	WASHER,FLAT:0.2 ID X 0.438 OD X 0.036 BRS	86928	5714-50-32N
					(END ATTACHING PARTS)		
-28	----- -----			1	SWITCH,PUSH:ON/OFF (SEE S100 REPL)		
					(ATTACHING PARTS)		
-29	211-0751-00			2	SCR,ASSEM WSHR:M3 X 8	TK0191	211-0751-00
					(END ATTACHING PARTS)		
-30	----- -----			1	CA ASSY,SP,ELEC:7.0 L (SEE W270 REPL)		
-31	----- -----			1	LEAD,ELECTRICAL:7.0 L (SEE W16 REPL)		
-32	----- -----			1	LEAD,ELECTRICAL:7.0 L (SEE W18 REPL)		
-33	386-5485-00			2	PLATE,CONN MTG:FEMALE,STEEL	80009	386-5485-00
					(ATTACHING PARTS)		
-34	211-0507-00			4	SCREW,MACHINE:6-32 X 0.312,PNH,STL	83385	ORDER BY DESCR
					(END ATTACHING PARTS)		
-35	----- -----			1	CA ASSY,SP,ELEC:5.5 L (SEE W400 REPL)		
					(ATTACHING PARTS)		
-36	211-0661-00			2	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		

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Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
5-95	----- -----			1	RES,VAR,NONWW: (SEE R500 REPL)		
					(ATTACHING PARTS)		
-96	210-0583-00			1	NUT,PLAIN,HEX:0.25-32 X 0.312,BRS CD PL	73743	2X-20319-402
-97	210-0046-00			1	WASHER,LOCK:0.261 ID,INTL,0.018 THK,STL	77900	1214-05-00-0541C
					(END ATTACHING PARTS)		
-98	366-0626-00			1	KNOB:DOVE GRAY	TK0191	366-0626-00
-99	----- -----			1	CA ASSY,SP,ELEC:14.0 L (SEE W106 REPL)		
-100	351-0779-00			1	GUIDE,BUBBLE ME:	TK0191	351-0779-00
					(ATTACHING PARTS)		
-101	210-0586-00			4	NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL	78189	211-041800-00
					(END ATTACHING PARTS)		
-102	----- -----			1	MEMORY CONTROL:BUBBLE (SEE A24 REPL)		
					(ATTACHING PARTS)		
-103	211-0661-00			4	SCR,ASSEM WSHR:4-40 X 0.25,PNH,STL,POZ	01536	821-01655-024
					(END ATTACHING PARTS)		
-104	407-3480-00			1	BRACKET,SUPPORT:ALUMINUM	TK0191	407-3480-00
					(ATTACHING PARTS)		
-105	211-0507-00	.300000	.300297	3	SCREW,MACHINE:6-32 X 0.312,PNH,STL	83385	ORDER BY DESCR
	211-0507-00	.300298		1	SCREW,MACHINE:6-32 X 0.312,PNH,STL	83385	ORDER BY DESCR
-106	129-0208-00	.300298		2	SPACER,POST:0.312 L,W/6-32 THD 1 END	80009	129-0208-00
					(END ATTACHING PARTS)		
-107	334-6696-00			1	.MARKER,IDENT:MKD DANGER	TK0191	334-6696-00
-108	344-0394-00	.300000	.300297	1	CLIP,CABLE:NYLON	TK0191	344-0394-00
-109	----- -----	.300298		1	CKT BOARD ASSY:TIMER (SEE A60 REPL)		
					(ATTACHING PARTS)		
-110	211-0504-00	.300298		2	SCREW,MACHINE:6-32 X 0.250,PNH,STL	TK0435	ORDER BY DESCR
					(END ATTACHING PARTS)		
					CKT BOARD ASSY INCLUDES:		
-111	----- -----			15	.TERM,PIN:(SEE A60J168 REPL)		
-112	----- -----			1	WIRE SET,ELEC: (SEE W600 REPL)		

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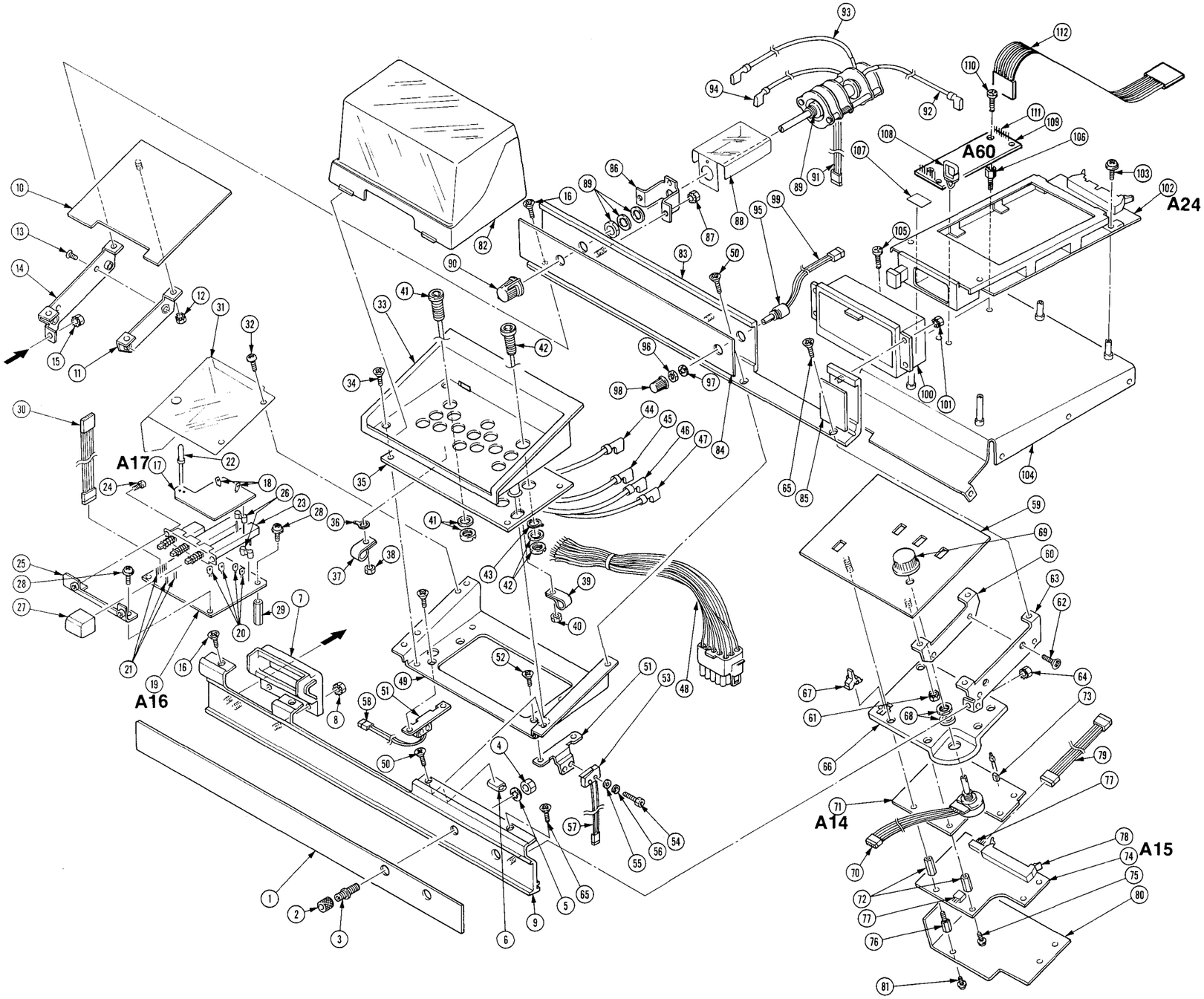

FIG. 5 FRONT PANEL: L-O-R, BUBBLE MEMORY

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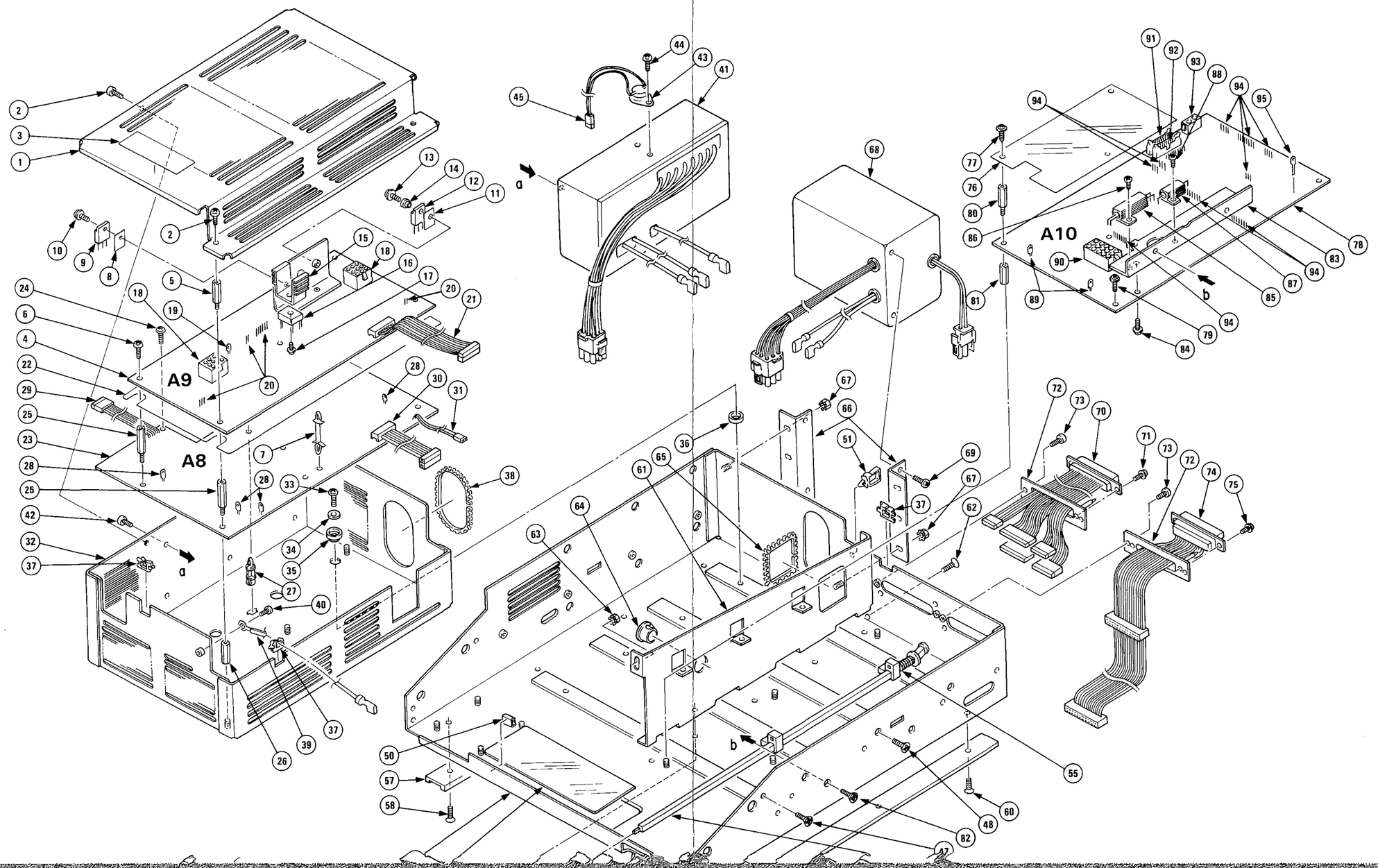

FIG. 6 LV, HV, SENSE BOARDS

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Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345	Name & Description	Mfr. Code	Mfr. Part No.
7-						STANDARD ACCESSORIES		
	070-6064-00			1		MANUAL,TECH:OPERATORS,370	80009	070-6064-00
	070-6066-00			1		MANUAL,TECH:OPERATORS REF GUIDE,370	80009	070-6066-00
	070-6067-00			1		MANUAL,TECH:OPERATORS INSTR INTFC GUIDE,370	80009	070-6067-00
-1	161-0066-00			1		CABLE ASSY,PWR,:3,18AWG,115V,98.0 L	16428	CH8481, FH8481
-2	161-0066-09			1		CABLE ASSY,PWR,:3,0.75MM SQ,220V,99.0 L (OPTION A1 ONLY)	S3109	86511000
-3	161-0066-10			1		CABLE ASSY,PWR,:3,0.75MM SQ,240V,96.0 L (OPTION A2 ONLY)	TK1373	24230
-4	161-0066-11			1		CABLE ASSY,PWR,:3,0.75MM,240V,96.0 L (OPTION A3 ONLY)	S3109	ORDER BY DESCR
-5	161-0066-12			1		CABLE ASSY,PWR,:3,18 AWG,250V,99.0 L (OPTION A4 ONLY)	70903	CH-77893
-6	161-0157-00			1		CABLE ASSY,PWR,:3 X 0.75MM SQ,250V,7.0 L,SW ISS,MALE (OPTION A5 ONLY)	TK1179	ORDER BY DESCR
						OPTIONAL ACCESSORIES		
	016-0249-06			1		ADAPTER,CAMERA:	80009	016-0249-06
	016-0357-01			1		ADAPTER HOOD:	80009	016-0357-01
	067-1286-00			1		FIXTURE,CAL:370,MAINTENANCE	80009	067-1286-00
	070-6065-01			1		MANUAL,TECH:SERVICE,370	80009	070-6065-01

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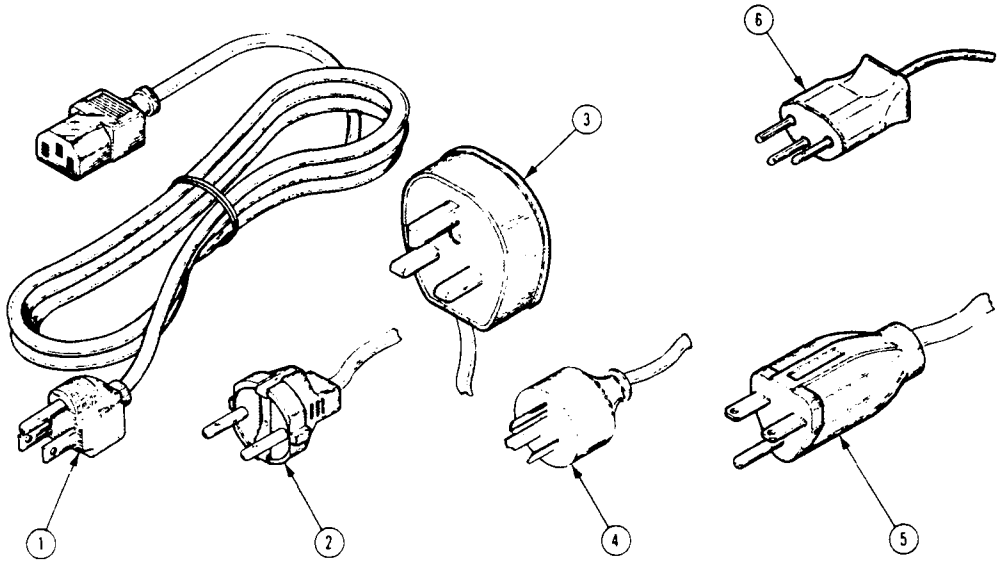
FIG. 7 ACCESSORIES