TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, AND DS/GS MAINTENANCE MANUAL

(INCLUDING REPAIR PARTS)
FOR
485/R485 OSCILLOSCOPE

(PATRIOT AIR DEFENSE GUIDED MISSILE SYSTEM)

HEADQUARTERS, DEPARTMENT OF THE ARMY
AUGUST 1987

WARNING

DANGEROUS VOLTAGE

is used to operate this equipment

DEATH ON CONTACT

may result if safety precautions are not observed.

Never work on electronic equipment unless there is someone nearby who is familiar with the operation and hazards of the equipment and is able to give first aid. When the technician is aided by operators, he must warn them about dangerous areas.

When possible, shut off power to equipment before beginning work on equipment. Ground every capacitor likely to hold a dangerous potential. When working inside equipment, after the power has been turned off, always ground every part before touching it.

Be careful not to contact high-voltage connections when installing or operating this equipment.

When possible, keep one hand away from equipment to reduce the hazard of current flowing through the vital organs of the body.

Read FM 21-11, First Aid for Soldiers, and learn how to administer artificial respiration.

WARNING

Do not be misled by the term "low voltage." Under adverse conditions, potentials as low as 50 volts may cause death.

TECHNICAL MANUAL

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HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., *1 August 1987*

Operator, Organizational, and DS/GS Maintenance Manual

(INCLUDING REPAIR PARTS)

FOR

485/R485 OSCILLOSCOPE

(PATRIOT AIR DEFENSE GUIDED MISSILE SYSTEM)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes, or if you find a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 direct to: Commander, U.S. Army Missile Command, ATTN: AMSMI-LC-ME-PM, Redstone Arsenal, Alabama 35898-5238. A reply will be furnished to you.

WARNING

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SECTION 0

GENERAL

0-1 MAINTENANCE FORMS AND RECORDS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System (TAMMS) .

0-2 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

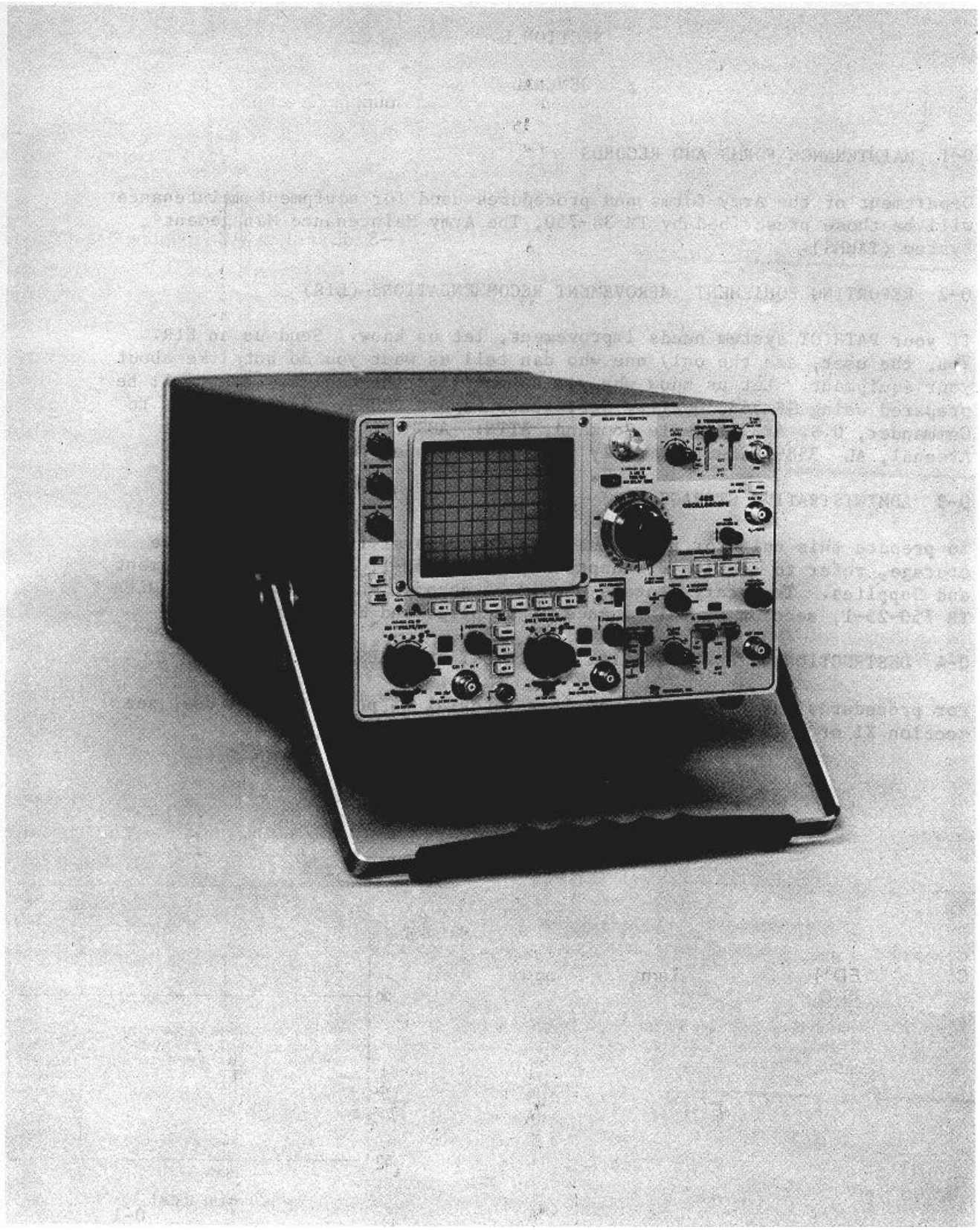
If your PATRIOT system needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you do not like about your equipment. Let us know why you do not like the design. EIRs will be prepared using SF 368, Quality Deficiency Report (QDR). Mail the QDRs to Commander, U.S. Army Missile Command, ATTN: AMSMI-LC-ME-PMH, Redstone Arsenal, AL 35898-5238. A reply will be furnished to you.

0-3 ADMINISTRATIVE STORAGE

To prepare this unit for placement into and removal from administrative storage, refer to section 3, chapter 4, of AR 750-1, Maintenance Equipment and Supplies. Temporary storage should be accomplished in accordance with TB 750-25-1, section 2, Maintenance of Supplies and Equipment.

0-4 DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE

For procedures for destruction of Army material to prevent enemy use, see section XI of TM 9-4935-393-14-1.



The 485 Portable Oscilloscope.
485/R485 Service

SPECIFICATION

Introduction

The 485/R485 is a general-purpose, environmentalized, high-performance, portable, wide-band oscilloscope which has a dual-channel vertical amplifier with selectable input impedance (DC to 350 MHz bandwidth with 50 Ω input impedance; DC to 250 MHz bandwidth with 1 MΩ input impedance). The 485 has a 1 ns sweep rate, stable triggering to bandwidth limits and calibrated X-Y capabilities. Delayed sweep has calibrated delay time, can be triggered after delay and can be displayed with the intensified main sweep in an alternate sweep switching display. Additional features are X10, X100 probe scale factor readout, 8 div X10 div graticule area, small spot size and high writing rate. A 20 MHz bandwidth limiter, 1 MHz and 1 kHz fast-rise calibrator and autofocus are also included. The 50 Ω input is automatically disconnected from excessive voltages. An external trigger view feature is also provided. The 485-1 and 485-2 have no external trigger view. The 485-2 has only 50 Ω vertical input impedance.

ELECTRICAL CHARACTERISTICS

VERTICAL DEFLECTION SYSTEM
(2 identical channels)

Selectable Input Impedance

50 Ω within 0.5%. VSWR ≤1.25:1 on 5 mV/div and
10 mV/div, 1.15:1 from 20 mV to 5 V/div to 350 MHz.
1 M Ω within 1% paralleled by approximately 20 pF.

Bandwidth[1] and Risetime[2] (VARIABLE gain CALIBRATED[3]) From 50 W Terminated Source -15° C to +35° C

From 50 Ω terminated source -15° C to +35° C.
50 Ω DC to at least 350 MHz, 1 ns
1 MΩ DC to at least 250 MHz, 1.4 ns

[1] Bandwidth (BW) measured at -3 dB down.

[2] Risetime calculated from 0.35/BW. From +35° C to +55° C, BW is 300 MHz for 50 W and 200 MHz for 1 MW.

[3] See Fig. 1-1 for effect of VARIABLE gain control.

Input Coupling Selection

AC; DC; GND (provides zero reference, precharges coupling capacitor, disconnects 50 Ω load in 50 Ω mode).

Lower -3 dB Point (AC coupling from 50 W source)

50 Ω, input, 1 kHz or less.
1 M Ω input 1X, 10 Hz or less.

Deflection Factor

5 mV/div to 5 V/div in 10 calibrated steps (1-2-5 sequence), accurate within 2%. Uncalibrated, continuously variable between steps to at least 12.5 V/div. Lights at edge of knob skirts indicate correct deflection factor for 1X, 10X and 100X probes.

Gain can be recalibrated at front panel. 1 MΩ, BAL is available at bottom panel to eliminate step attenuator shift above 10 mV/div, in the 1 MΩ mode.

Display Modes

Channel 1; Alternate; Chopped (approximately 1 MHz rate); Added; X-Y (CH 1 -Y and CH 2 -X); Channel 2 (+Up or Inverted).

Internal Trigger Source

Normal (displayed signal), Channel 1 or Channel 2 signal.

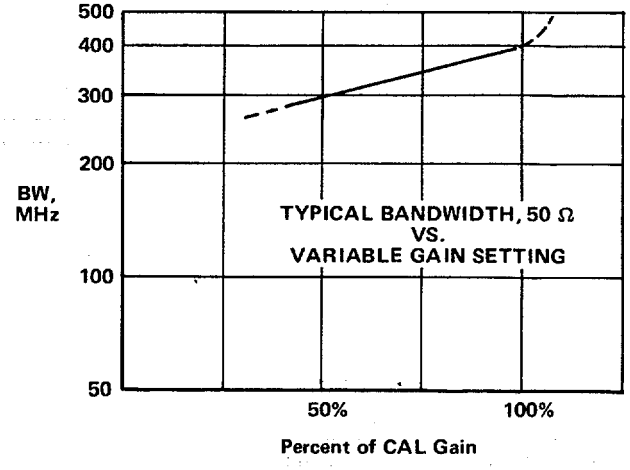


Figure 1-1. Typical Bandwidth, 50 Ω vs. Variable Gain Setting (varies considerably depending on instrument SN)

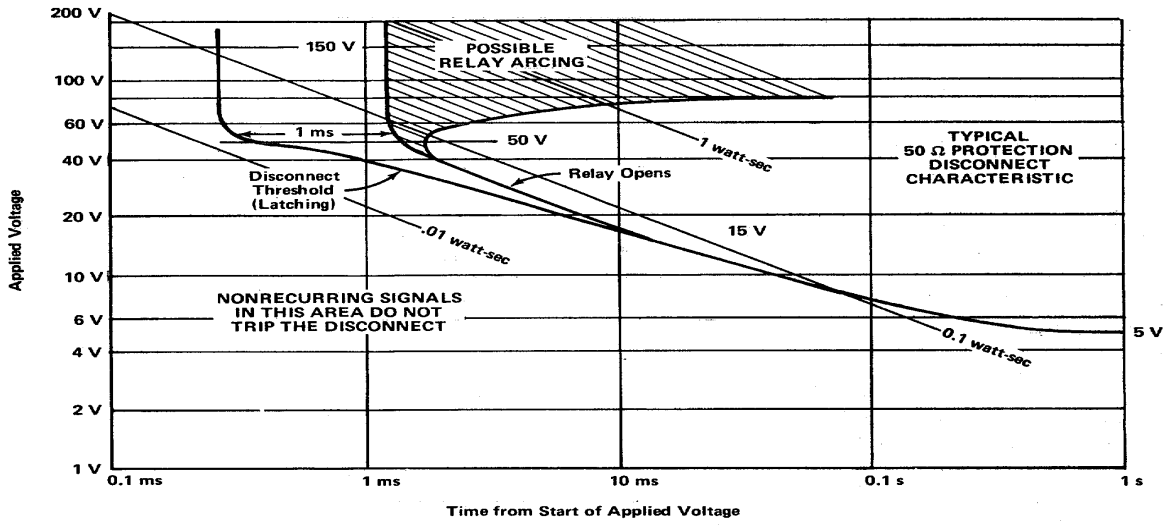


Figure 1-2. Typical 50 W Protection Disconnect Characteristic.

50 W Protection

Internal detection circuitry automatically disconnects excessive signals of up to 50 V. The disconnected condition is indicated, and has manual reset.

Maximum Input Voltage

50 Ω Disconnect occurs for voltages that exceed approximately 5 V RMS continuous or 0.1 watt-second for instantaneous voltages of 5 V to 50 V.

Repeated application of voltages in excess of 50 volts and greater than 0.1 watt-second will cause deterioration of K1S1 relay contacts, due to arcing. Signals in excess of 150 volts will damage the instrument.

1 MΩ-DC coupled 250 V (DC + peak AC), 500 V P-P to
1 kHz. AC coupled 500 V (DC + peak AC), 500 V P-P to
1 kHz.

Common Mode Rejection

Added Mode with Channel 2 inverted. At least 10:1 at 50 MHz for 8-division signal after adjusting CH 2 gain for best CMR at 50 kHz and 20 mV/div.

Bandwidth Limiter

Limits to approximately 20 MHz the Vertical Amplifier and Internal Trigger signals.

Channel Isolation

At least 30:1 at 350 MHz.

A Ext Trigger Display (R485 and 485 only)

Momentary pushbutton in VERT MODE area enables display of EXT A Trigger when A source is in EXT position. Deflection factor is approximately 50 mV/div. Risetime is approximately 1.5 ns. Delay match to CH 1 or CH 2 input is within 0.5 ns at 50% amplitude. Triggering level is within 0.5 div of center-screen.

Probe Power
Two 4-pin connectors at the rear of the instrument provide power suitable for optional active probes such as the P6201.

PROBE PERFORMANCE
(Probes are Optional Accessories)

Type	Atten.	Input Impedance	Lower -3 dB point (maximum)	Bandwidth with 485 (minimum)	Temperature Range for this Bandwidth Specification
For Use With 50 Ω Input					
P6056 010-6056-03 - 6 ft. 010-6056-05 - 9 ft.	10X	500 Ω 1 pF	200 Hz	350 MHz	
P6057 010-6057-03 - 6 ft. 010-6057-05 - 9 ft.	100X	5 kΩ 1 pF	20 Hz	350 MHz	-15° C to +35° C
P6201 010-6201-01 - 6 ft. (FET Probe)	1X	100 kΩ 3 pF	10 Hz		
	Plug- 10X	1 MΩ <1.5 pF	1 Hz	330 MHz	0° C to +35° C
	On 100X	1 MΩ <1.5 pF	10 Hz		
For Use With 1 MΩ Input					
010-6053-11 - 3 1/2 ft. P6053A		1 MΩ 9.5 pF		250 MHz	
010-6053-13 - 6 ft.	10X	1 MΩ 12 pF	1 Hz	250 MHz	-15° C to +35° C
010-6053-15 - 9ft.		1 MΩ 13.5 pF		200 MHz	

A and B TRIGGERING

A Trigger Mode
NORMAL.
Sweep runs only when triggered.
AUTOMATIC.
Sweep free-runs in the absence of a triggering signal and for signals below 20 Hz.
SINGLE SWEEP.
Sweep runs one time on the first triggering event after pressing the reset selector.
B Trigger Mode
B RUNS AFTER DELAY TIME.
Starts automatically at the end of the delay time.
B TRIGGERABLE AFTER DELAY TIME.
Runs when triggered. The B (delayed) sweep runs once, in each of these modes, following the A sweep delay time.

Time Base A and B Trigger Sensitivity

Trigger Mode	To 50 MHz	At 350 MHz
DC Int	0.3 div	1.5div
DC Ext	20 mV	100 mV
AC	Signals below 16 Hz are attenuated.	
LF Reject	Signals below 16 kHz are attenuated.	
HF Reject	Signals below 16 Hz and above 50 kHz are attenuated.	

Level and Slope
Internal, permits selection of triggering point at any level on the positive and negative slope of the displayed waveform. External, level is adjustable through at least ±0.5 V for either polarity (+5 V for EXT ÷ 10).

A Source
Internal, Line, External, External ÷ 10.

REV. B, AUG. 1977

B Source
B runs after Delay Time, Internal, External, External ÷ 10.

External Inputs
1 MΩ paralleled by approximately 20 pF. Maximum input voltage 500 V (DC + peak AC), 500 V P-P to 1 kHz.

Jitter
Less than 0.1 ns at 350 MHz and 1 ns/div.

HORIZONTAL DEFLECTION

Time Base A and B
1 ns/div to 0.5 s/div in 27 calibrated steps (1-2-5 sequence). Uncalibrated, A is continuously variable between steps and to at least 1.25 s/div.

Time Base A and B Sweep Accuracy (Center 8 screen divisions)

Sweep Rate	+15° C to +35° C	-15° C to +55° C
1 ns/div to 20 ns/div	±3%	±5%
50 ns/div to 0.1 s/div	±2%	±4%
0.2 s/div to 0.5 s/div	±3%	±5%

Display Modes
A, A INTENsified during B delayed, ALTernate display of A INTEN and B (delayed sweep). Only A sweep is displayed for A sweep rates of 1, 2 and 5 ns/div.

Minimum Sweep Holdoff (A Trigger Holdoff in Norm detent)

A Time Setting	
1 ns/div to 0.1 µs/div	Less than 0.4 µs
0.2 µs/div	Less than 1.0 µs
0.5 µs/div to 0.5 s/div	Less than 2 times the A TIME/DIV setting.

A Trigger Holdoff
Adjustable control permits a stable presentation of repetitive complex waveforms. The control covers at least the time of one full sweep for sweeps faster than 0.2 s/div.

B Ends A
The A sweep is reset at the end of the B sweep to allow the fastest possible sweep repetition rate for increased trace intensity in the delayed sweep mode.

CALIBRATED SWEEP DELAY

Delay Time Range
0 to 9.9 times the Delay Time/Div settings of 10 ns/div to 0.5 s/div.

Differential Delay Time Accuracy (+15° C to+35° C)
Exclude the first (above 0.0) 1.0 turn or the first 40 ns of the DELAY dial.

DELAY TIME Setting	
10 ns/div and 20 ns/div	±(1% of measurement +0.2% of full scale[3])
50 ns/div to 1 ms/div	± (0.5% of measurement +0.1% of full scale)
2 ms/div to 0.5 s/div	±(1% of measurement +0.1% of full scale)

[3] **Full scale is 10X the Delay Time/Div Setting**.

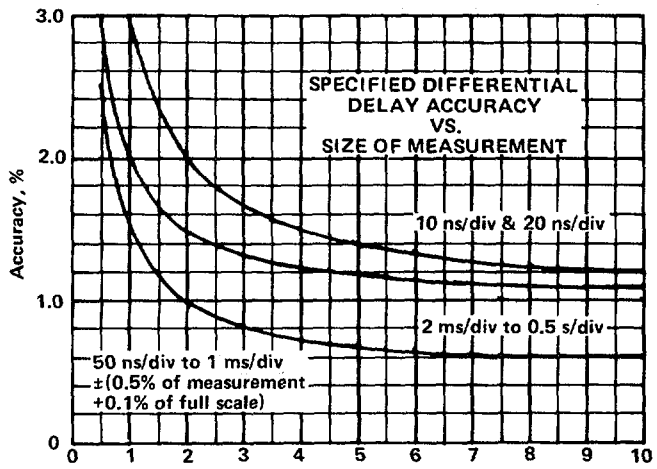


Fig. 1-3. Specified Differential Delay Accuracy vs. Size of Measurement.

Jitter
Less than 0.005% (one part in 20,000) of full scale plus 0.2 ns. (Wrap-around cover must be in place.)

X-Y

Full Sensitivity
(CH 1 Vert, CH 2 Horizontal.) 5 mV/div to 5 V/div in 10 calibrated steps (1-2-5 sequence) accurate within 2%. Gain can be recalibrated at front panel.

Y Performance
Identical to CH 1. See Vertical Deflection.

X-Axis Bandwidth
DC to 4 MHz (with 10 div reference signal).

X-Y Phase Match (Full BW and BW Limit)
Within 3° to 4 MHz.

X-Gain Match to CH 2
+15°Cto +35°C: 1%
-15°Cto +55°C: 3%

CRT

TEKTRON IX CRT
4-inch rectangular tube; 8X 10 divisions (0.8 cm/div) display area. P31 phosphor normally supplied: P11 supplied as Option 78. 21kV accelerating potential.

Photographic Writing Speed
At least 3 div/ns for standard P31 phosphor; at least 6 div/ns for optional P11 phosphor (with the TEKTRONIX C-31-R Camera and POLAROID 10,000 ASA film).

Auto Focus
Automatically maintains beam focus for all intensity settings. (Intensified zone and EXT Z axis are not auto-focused).

Graticule
Internal, no parallax. Variable edge-lighting. Markings for measurement of risetime. Graticule is dark with illumination off.

Beam Finder
Limits display within graticule area.

External Z-Axis
Risetime 15 ns. Input R 500 Ω. +0.2 V (DC to 20 MHz) blanks trace of average intensity. +2 V (DC to 2 MHz) blanks maximum intensity trace.

Beam Current Limit
Automatically limits the average beam current to protect the CRT phosphor. (Limits average current to 20 µA for sweep rates faster than 50 ms/div; 5 µA for 50 ms/div and slower sweep rates and for X-Y. Backup system shuts down power supply if average current reaches approximately 30 µA.)

CALIBRATOR

Two-Frequency Fast-Rise Calibrator

Accuracies	+15° C to +35° C	-15° C to +55° C
5 V amplitude to 1 MΩ load	0.5%	1%
0.5 V amplitude to 50 Ω ±0.5% load	1%	1.5%
50 mA amplitude to optional BNC accessory current loop	1%	1.5%
Selectable Frequency of 1 MHz and 1 kHz	0.25%	0.5%

Output Resistance
450 Ω

Risetime
Positive edge into 50 Ω, less than 1 ns. Overshoot and ringing less than 2% into 50 Ω at 1 GHz bandwidth.

1 kHz Duty Cycle
49.8% to 50.2%

OTHER CHARACTERISTICS

Signal Outputs
Positive gates from both time bases (approximately 4 V), and a positive-going Sawtooth from Time Base A (approximately 10 V). Gates and Sawtooth are approximately 0.5 V amplitude into 50 Ω.

Power Requirement
Two-position line voltage selector 115 V (90V to 136 V) and 230 V (180 V to 272 V) 48 to 440 Hz. 60 watts maximum at 115 V and 60 Hz. 0.9 A maximum at 115 V and 60 Hz. Line fuse: 3 A fast.

Cooling
Quiet, filtered, forced-air ventilation. Fan speed increases smoothly with increasing ambient temperature.

ENVIRONMENTAL CHARACTERISTICS

Ambient Temperature
Operating: -15° C to +55° C
Storage: -35° C to +75° C

Altitude
Operating: to 15,000 feet. Maximum allowable ambient temperature decreased by 1° C per 1000 feet from 5,000 to 15,000 feet.
Nonoperating: to 50,000 feet.

Vibration[5]
Operating: 15 minutes along each of the three axis, 0.025 inch peak-to-peak displacement (4 g's at 55 Hz) 10 to 55 to 10 Hz in 1-minute cycles.

Shock[5]
Operating and Nonoperating: 30 g's, one half sine, 11-ms duration, 2 shocks per axis in each direction for a total of 12 shocks.

Electromagnetic Interference
(With 485 EMI modification option 4). Meets interference requirements of MIL-1-618D: power line conducted, 150 kHz to 25 MHz; radiated, 150 kHz to GHz.

Humidity
Operating and Storage: 5 cycles (120 hours) to 95% relative humidity referenced to MIL-E-16400F (par. 4.5.9 through 4.5.9.5.1, class 4).

Dimensions and Weight
Height: 6 and 9/16 inches.

Width: (with handle) 12 inches.

Depth (including panel cover): 18 and 1/2 inches.

Depth (handle extended): 20 and 5/8 inches.

Net weight (without accessory case and panel cover): 21 pounds.

Net weight (with panel cover, accessory case and accessories): 24 pounds.

Domestic shipping weight: 31 pounds.

Export-packed weight: 42 pounds.

[5] SR485 strapped to table, not mounted in rack.

OPERATING INFORMATION

General

To effectively use the 485, the operation and capabilities of the instrument must be known. This section describes the operation of the controls and connections and gives first-time and general operating information.

PRELIMINARY INFORMATION

Operating Voltage

WARNING

This instrument is designed for operation from a power source with its neutral at or near earth (ground) potential with a separate safety-earth conductor. It is not intended for operation from two phases of a multi-phase system, or across the legs of a single-phase, three-wire system.

The 485 can be operated from either a 115 V or 230 V nominal line voltage source, or a 220 V external battery pack. The Line Voltage Selector switch on the rear panel converts this instrument from one operating voltage to the other.

Power Cord Conductor Identification

Conductor	Color	Alternate Color
Ungrounded (Line)	Brown	Black
Grounded (Neutral)	Blue	White
Grounding (Earthing)	Green-Yellow	Green-Yellow

CAUTION

This instrument may be damaged if operated with the Line Voltage Selector switch set to incorrect positions for the line voltage applied.

115 V	90-136 V
230 V	180-272 V

The 485 is designed to be used with a three-wire AC power system. If the three to two-wire adapter is used to connect this instrument to a two-wire AC power system, be sure to connect the ground lead of the adapter to earth (ground). Failure to complete the ground system may allow the chassis of this instrument to be elevated above ground potential and pose a shock hazard.

Operating Temperature

The 485 can be operated where the ambient air temperature is between -15° C and +55° C (+5° F and +131° F). This instrument can be stored in ambient temperatures between -55° C and +75° C (-67° F and +167° F). After storage at temperatures beyond the operating limits, allow the chassis temperature to come within the operating limits before power is applied.

The 485 is cooled by air entering through the air filter on the rear panel and exiting through the holes on the sides. Adequate clearance must be provided at these locations. Allow at least one inch clearance behind the air filter and at least one inch on the sides.

A thermal cutout in this instrument provides thermal protection and disconnects the power to the instrument if the internal temperature exceeds a safe operating level. Power is automatically restored when the temperature returns to a safe level. Clean the air filter periodically; a dirty filter prevents adequate air flow into the instrument.

CONTROLS AND CONNECTORS

General

The major controls and connectors for operation of the 485 are located on the front panel of the instrument. Some auxiliary functions are provided on the side, top, bottom and rear panel. To make full use of the capabilities of this instrument, the operator should be familiar with the function and use of each of these controls and connectors. A brief description of each control and connector is given here.

Front Panel

POWER Pushbutton	Turns instrument on or off.
CAL 5 V Connector	BNC connector for square-wave voltage calibrator output signal.
FREQ Pushbutton	Selects one of two frequencies (1 kHz or 1 MHz) for the fast-rise calibrator signal.
INTENSITY Control	Controls intensity of writing beam.
B INTENSITY Control	Provides additional intensity control for the B SWEEP.

SCALE ILLUM Control	Controls illumination of internal CRT graticule.
BEAM FINDER Pushbutton	Compresses trace within graticule area, regardless of position control settings or amplitude of signal applied.
BW LIMIT Pushbutton	Limits to approximately 20 MHz the bandwidth of the vertical amplifier system and of the INTernal TRIGger signal.
20 MHz Indicator	Lights when bandwidth of vertical amplifier is being limited.
VERT MODE Pushbutton Selector	
CH 1	Displays Channel 1 only.
ALT	Dual trace display by switching between channels at the end of A sweep.
CHOP	Dual trace display by switching between channels every 0.5 µs (1 MHz chopped display).
ADD	Algebraically adds CH 1 and CH 2 input signals.
X-Y	Permits X-Y operation. Displays CH 1 signal on the vertical (Y) axis and the CH 2 signal on the horizontal (X) axis, with a 4 MHz phase-compensated bandwidth.
CH 2	Displays CH 2 only.
INT TRIG Pushbutton Selector	
NORM	The signal being displayed is the internal trigger source.
CH 1	Selects CH 1 as the internal trigger source.
CH 2	Selects CH 2 as the internal trigger source.
VOLTS/DIV Switch, CH 1 and CH 2	Selects 1X calibrated deflection factors from 5 mV/div to 5 V/div in ten steps (1-2-5 sequence). Attenuating probe tip deflection factors for X10 and X100 coded probes are automatically indicated by the three readout lamps at the circumference of this knob. All three lamps are off when the channel is not selected for display by the VERT MODE selector, or when using probe IDENTify.
VARIABLE volts/div Control, CH 1 and CH 2	Provide continuously variable deflection factors between calibrated steps. Maximum deflection factor range is extended to 12.5 V/div. Push-away control provides calibrated deflection factor in the CAL IN position.
GAIN Adjustment, CH 1 and CH 2	Screwdriver adjustment allows calibration of vertical deflection factor:
A EXT TRIG Pushbutton (momentary not on 485-1 and 485-2)	Overrides other vertical controls to display the external signal being used for A sweep triggering.
1 MΩ /50 Ω Switch, CH 1 and CH 2 (485-2 has RESET-PUSH)	Illuminated push-push selection for input impedance. Is also used to reset 50 Ω overload condition (1 MΩ/50 Ω switch must be pushed twice to return to 50 Ω input impedance). 485-2 is non-illuminated momentary switch for RESET only.
RESET Indicator	When maximum input power is exceeded in the 50 Ω mode causing the overload disconnect to operate, the RESET indicator is illuminated, and the 1 MΩ/50 Ω lamp is turned off.
Input Selector Switch, CH 1 and CH 2	
AC	Capacitively couples input signal to vertical amplifier.
GND	Grounds the amplifier input and permits precharging the AC input coupling capacitor. 50 Ω , termination disconnected in the 50 Ω mode.
DC	Signal is directly coupled to the vertical amplifier.
Input CH 1 or Y Connector and CH 2 or X Connector	BNC connectors for applying external signals. Included are concentric coding rings for probes with scale factor and identify switching.
POSITION Controls, CH 1 and CH 2	Vertically positions the display. In X-Y mode, CH 1 controls positions in the Y (vertical) axis and the CH 2 control positions in the X (horizontal) axis.

CH 2 POLARITY Switch	+UP and INVERT slide selector provides for inverting CH 2 display.
HORIZ DISPLAY Pushbutton Selector (Blue Panel Background)	(Inoperative in the X-Y, VERT MODE, and when timing knobs are locked in the 1, 2, and 5 ns/div position.)
A	Displays A sweep.
INTEN (A)	Displays A sweep intensified (after the delay time) for the duration of B sweep.
ALT	Alternately provides INTEN (A) and B (DLY'D) displays.
B (DLY'D)	Displays B (DLY'D) sweep.
TRACE SEPARATION Control	Provides additional positioning to B (DLY'D) display in the ALT horizontal display mode.
Triggering Source Switch, A TRIGGERING and B Triggering	(Green Panel Background)
INT	Uses the signal selected by the INT TRIG switch as the triggering signal.
LINE (A TRIGGERING only)	Uses a portion of the line-frequency voltage as a trigger signal.
B RUNS AFTER DELAY TIME (B TRIGGERING Only)	B runs automatically after the time selected by A TIME/DIV and the calibrated DELAY TIME POSITION control.
EXT	Permits triggering on signals applied to the EXT TRIG INPUT connector.
EXT 10	Attenuates external trigger signal by a factor of 10.
Triggering COUPLING Switch, A TRIGGERING and B TRIGGERING	
AC	Trigger signals are AC (capacitively) coupled to the trigger circuitry. Trigger signals below 16 Hz are attenuated.
LF REJ (AC Coupled)	Attenuates triggering signals below 16 kHz.
HF REJ (AC Coupled)	Triggering signals below 16 Hz and above 50 kHz are attenuated.
DC	DC (direct) couples all trigger signals to the trigger circuitry.
EXT TRIG Input Connector	BNC connector providing input for external trigger signals.
SLOPE Switch, A TRIGGERING and B TRIGGERING	Permits triggering the sweep on the positive or negative-going portion of the trigger signal.
LEVEL Control, A TRIGGERING and B TRIGGERING	Selects amplitude point on the triggering signal where sweep-triggering occurs.
TRIG'D Indicator	Lights when A sweep is triggered.
SWEEP MODE Switch, A TRIGGERING	
AUTO TRIG	Permits normal triggering on waveforms with repetition rates of at least 20 Hz. Sweep free-runs in the absence of an adequate triggering signal.
NORM TRIG	Permits normal triggering. No CRT display in the absence of an adequate trigger signal.
SINGLE SWEEP	Displays one sweep only until reset.
RESET	A momentary-contact position of the SWEEP MODE switch that provides for re-arming the A sweep generator during the SINGLE SWEEP mode of operation.
READY Indicator	Is illuminated when A sweep is armed in the SINGLE SWEEP mode.
A TRIGGER HOLDOFF	Adjustable control of the time between sweep steps, permits a stable presentation of repetitive Complex waveforms. The control covers at least the time of one full sweep for all but the two slowest sweeps.
DELAYTIME POSITION	Ten-turn calibrated control delays B sweep start (or B trigger arming) from 0 to 9.9 times the Time Base A TIME/DIV setting after the start of A sweep.
A and B TIME/DIV AND DELAY TIME Switch	Selects calibrated A and B sweep rates from 0.5 s/div to 1 ns/div in 27 steps (1-2-5 sequence). Delay Time operation extends from 0.5 s/div to 10 ns/div.

A VARIABLE Control	Provides continuously variable A sweep rate to approximately 2.5 times the calibrated setting (uncalibrated sweep rate is extended to 1.25 s/div). Push away control provides calibrated rate in the CAL IN position.
DLY'D SWEEP PULL Knob	Provides for advancing the B (DLY'D) sweep rate ahead of the A (DELAYING) sweep rate. (When A rate is 1, 2, or 5 ns/div the concentric knobs are locked together, and only the A sweep is displayed.)
POSITION (horizontal) Control	Horizontally positions trace. Inoperative in X-Y mode.

Rear Panel

TRACE ROTATION Adjustment	Screwdriver adjustment to align trace with horizontal graticule lines.
FOCUS and ASTIG Adjustment	Adjustment used to obtain a well defined display. Requires infrequent readjustment.
B +GATE	BNC Connector providing a positive-going rectangular waveform coincident with B sweep.
A +GATE	BNC connector providing a positive-going rectangular waveform coincident with A sweep.
A SWEEP Connector	BNC connector provides a sample of A sawtooth generator signal.
Z AXIS INPUT Connector	BNC input connector for intensity modulation of the CRT display.
PROBE POWER	Two 4-pin connectors at the rear of the instrument provide power suitable for optional active probes such as the P6201.
LINE CORD	Power cord is a 3-wire, permanently attached cable, approximately 7.5 feet in length.
LINE VOLTAGE SELECTOR	Recessed slide switch selects nominal operating line range. 115 V (90 to 136 V) or 230 V (180 to 272 V).
OPERATING TIME	Elapsed operating time indicator. 5000 hr. scale (present in SN B010100 through SN B079999 only).

Bottom Side

1 MΩ BAL, CH 1 and CH 2	Adjustment provides for DC balance of 1 MΩ Buffer amplifier.

NOTE

Two types of crt graticules have been used in some Tektronix oscilloscopes. One graticule has 0% and 100% risetime reference points that are separated by 6 vertical graticule divisions. The other graticule has the 0% and 100% risetime reference points separated by 5 vertical divisions. In your manual, illustrations of the crt face or risetime measurement instructions may not correspond with the graticule markings on your oscilloscope

CIRCUIT DESCRIPTION

Introduction

This section describes the electrical operation and relationship of the circuits in the Type 485. The theory of operation for circuits that are used only in this instrument are described in detail in this discussion. Circuits that are commonly used in the electronics industry are not described in detail.

50 Ω ATTENUATOR

Two identical attenuators, one for each vertical channel, are used to select the desired vertical sensitivity of the 485. Each attenuator is an integral unit containing various 50 Ω attenuators, input overload protection circuitry and, where applicable, a 1 megohm attenuator and 1 megohm buffer amplifier.

The 50 Ω attenuator is comprised of a delay line, DL1, and four 50 Ω attenuator sections. The ÷ 2 and ÷ 2.5 50 Ω attenuator sections are shared by a 1 MΩ buffer amplifier. The two ÷ 10 attenuator sections are used only in the 50 Ω mode. The delay line equalizes the delay differences between the 1 MΩ buffer amplifier and the 50 Ω mode. R127 provides termination for the 1 MΩ buffer amplifier when the instrument is operating in the 50 Ω mode.

1 MEGOHM BUFFER AMPLIFIER

The 1 megohm buffer amplifier provides a high input impedance and unity gain when terminated in 50 Ω. It is connected to the input through relay K1S1 only in the 1 megohm mode and when the RESET light is on.

C33 and R33 provide input current limiting. CR33 clamps negative transients in excess of 9.6 V to protect FET Q34. The gate to drain junction of Q34 gives clamping for positive-going overloads. The high frequency signal path goes from the input FET to Q40, an emitter follower. R53 sets the high frequency gain. Q60 drives Q62; CR62 balances out the base-emitter voltage of Q62 and temperature compensates it to keep the standing current in Q62 independent of temperature. Q62 current drives the output for positive signal swings. Q60 also drives Q70, which pulls the output negative through R69 and serves as reverse termination at high frequencies. CR64 and CR65 work as expanders for high amplitude signals. R55 and C55 are high frequency adjustments which affect the first five nanoseconds of the transient response. L56 and L71 are integral parts of the circuit board providing high frequency peaking. Q50 is a low impedance drive for the low frequency feedback path.

Low frequency feedback is accomplished by U48, which compares the voltage levels at the base of Q40 and the output, J70. C46 matches the time constant of C77 and R75 with the time constant of R42 and parallel combination of C46 and C47. C48 sets the bandwidth of U48.

50 Ω OVERLOAD PROTECTION

In the 50 Ω mode, K1 is closed by U80, which routes the signal to the 50 Ω attenuator. 50 Ω input protection is provided by an RMS detecting circuit in U80. R84 and R107 attenuate the input signal 100X for U80. C86, C87, and R87 integrate a signal proportional to the RMS value of the signal at pin 3 of U80. When an overload is detected, K1 is de-energized, removing the signal from the 50 Ω attenuator section and applying it to the input of the 1 megohm buffer amplifier. U80 also lights DS96, the RESET light. To reset, S125B is switched to the 1 megohm position, causing the scope to be in the 1 megohm mode. Return to the 50 Ω mode is then accomplished by pushing S125B (50 Ω/1 megohm mode switch) again.

VERTICAL PREAMPLIFIER

CH 2 is identical to CH 1 except that CH 2 has a polarity switch. Only CH 2 will be described here. The CH 2 signal is received from the CH 2 attenuator through J300. Diode bridge CR301, CR302, CR303, and CR304 protects the input from large signals that occur too fast for the input protection relay to react. T305 is a balun, providing a push-pull signal to U310 at high frequencies. The 50 Ω input termination consists of R308, R305, and R309. R308 is adjusted to give 50 Ω DC resistance at input connector J1. CH 2 offset control R306 adjusts the voltage at the input connector J1 to zero in the absence of an input signal. Either R310 or R312 is selected by the POLARITY switch S310, allowing the variable control to be balanced in both invert and normal modes. The output leads of U310 (pins 5, 6, 8, and 9) are crossed over so that the polarity of the signal can be inverted. R90, the variable control, and the resistor network R317, R319, R325, R326, R327, and R328 determine the ratio of currents in pin 11 and pin 12, hence the ratio of currents in transistors connected to pins 6 and 8 to the current in transistors connected to pins 5 and 9. Varying this ratio controls the gain of U310[1]. At all sensitivities other than 5 mV/div, pins 11 and 12 of U350 are shorted together by S95. Thus half the signal current in U350 is lost through R367 and R368. In 5 mV/div, S95 contacts open, causing all of the signal current to flow in the transistors connected to pins 5 and 9, doubling the gain

[1]Gilbert, Barrie, A New Wide-Band Amplifier Technique, IEEE Journal of Solid State Circuits, Vol SC-3 number 4, December, 1968, P353.

of U350. Other S95 contacts (shown on schematic 4) close to maintain the voltage at outer collectors pins 5 and 9 of U350. R355, R356, and R357 are low frequency (thermal) transient response compensations. The CH 2 gain control R358 is used to allow the CH 2 gain control (front-panel) to be centered in its range.

SIGNAL CHANNEL SWITCH

Signal from U350 is connected to pins 13 and 1 of U430 and exits U430 at pins 16 and 14. The signal then continues on to and is terminated by the trigger channel switch U530, diminished slightly in bandwidth by the energy extracted by U430.

A push-pull position control signal is injected between U430 and U530 through R376 and R386.

If no current flows through Q436, pin 12 is 0.3 V higher than pin 11 and U430 is on. Under this condition, the amplified signal leaves pins 5 and 9 on 100 Ω EC board transmission lines, joins with the signal from channel 1 and enters the A Ext Trigger relay K410 on 50 Ω EC board transmission lines.

Instruments without the A Ext Trigger option contain jumper wires in place of the relay. The A Ext Trigger signal is injected by the relay at this location, which is considered to be the interface between the preamplifier and the main vertical amplifier. A RLC network consisting of C407, L409, R407, etc. provides some boost to compensate for delay line losses at high frequencies.

The signal next passes into the delay line DL410 which delays the vertical signal 75 ns so that the sweep may start before presentation of the triggering signal.

INTERNAL TRIGGER AMPLIFIER

Signals looped through U430 continue to trigger channel switch U530 and are terminated in R528 and R529 which are the collector loads for U350. If no current flows in Q538, voltage divider R534 and R535 holds pin 12 of U530 above pin 11 and the CH 2 trigger signal amplified in U530 appears between pins 5 and 9 of U530. Trigger channel switch U530 is turned off when Q538 conducts 4 mA, pulling pin 12 down to 9.8 V (0.3 V below pin 11). Signal current in this case is shorted out by the connection between pins 6 and 8. In either case, the total current in U530 is unchanged so that the voltage on pins 5 and 9 of U510 remains unchanged at +12 V.

0544 and 0546 provide small additional gain for the trigger signal. RT551 temperature compensates the gain of stages U310 through Q564. Q552 and Q556 select the bandwidth of the trigger signal.

In the full bandwidth mode Q556 is on and Q552 is off. Filter L559, R559, R557, and C557 provides a constant impedance at all frequencies as the collector load of Q556 and thus full bandwidth. In the 20 MHz mode Q552 is on, Q556 is off, and high frequencies are attenuated by C557. Since the bandwidth filter in the vertical amplifier is a two-pole filter, the 3 dB point of the trigger's single pole filter is slightly less than 20 MHz. The low frequency phase shift of the two filters is identical, however, so that phase match may occur in X-Y operation of the scope.

Signals at the collector of Q556 are buffered by emitter follower Q564 and sent to A and B trigger amplifiers via J568 and J566 respectively. CR562 matches the base emitter junction of Q564, and R560 is adjusted so that the zero signal voltage at Q564's emitter is zero. R562 pulls away the collector current of Q556 or Q552.

Q572 and Q576 buffer the trigger signal, which becomes the X signal in X-Y mode. C572 is part of the filter which matches the delay of the vertical delay line DL410.

Trace Separation

Trace separation circuitry injects a positioning signal at the main vertical interface during the operation of B sweep in the ALTernate sweep mode.

Q440, Q456, Q444, and Q454 provide the push-pull trace separation signal through R440 and R456. R458 and C458 ensure that the output impedance of the trace separation circuitry is 100 Ω at all frequencies.

MAIN VERTICAL AMPLIFIER

The signal received from delay line DL410 is terminated and T coil peaked by the inductance of pins 1, 13, 14, and 16 of U620. The required additional inductance L621 and L625 is achieved in the leads to pins 16 and 14 which are lengths of run on the etched circuit board. This inductance plus C621 and C625, made from 3 layers of etched circuit board, and R621 and R625 form the forward termination of the delay line. The same method of termination and peaking is used in each stage using the 151-0078 integrated circuit.[2] The network attached to pins 2 and 3 of U620, provides delay line and thermal transient response compensation. The gain of the main vertical amplifier is adjusted by R629. Vertical amplifier gain is temperature-compensated by RT644.

[2]Addis, John "Three Technologies On One Chip Make A Broadband Amplifier", Electronics, June 5, 1972, Pg. 103.

The network connected between U650 and U660 is the bandwidth limiter network. The network provides a constant impedance of 50 Ω per side at all frequencies looking from pins 4 and 10 of U660. In the full bandwidth mode, signal from pins 5 and 9 of U650 loops through U660 and is terminated in the bandwidth limit network. In the 20 MHz mode, the signal is obtained from pins 6 and 8 of U650. In passing through the bandwidth limit network signals above 20 MHz are attenuated at 12 dB/octave.

U660 is an FT doubler configuration with the input T coil peaked. Bias for the inner set of bases is set by R672 and R673. The output transistors are high voltage devices which drive the CRT's distributed deflection structure.

In the event of a loss of a CRT termination resistor, the long tail current through R657 pulls pins 2, 8, and 3 of U660 down. When the +27 V supply goes below 25 V, Q686 turns on, turning on Q688 which shorts the 25 V supply. The loss of the +25 V supply will shut down the power supply inverter. See inverter current limiting.

SCALE FACTOR READOUT

Scale factor readout control circuitry is in U80. With a 1X probe or with an non-readout coded connector connected to the input connector code ring surrounding J1, pin 11 of U80 is connected to +5 V through R81. The voltage at pin 11 is sensed by U80 and pin 10 is pulled down, lighting the X1 light emitting diode (LED), CR99. 11 K Ω to ground from the code ring shuts off CR99, and turns on CR98, the X10 LED. A 6.8 kΩ from the code ring to ground will shut off the X10 LED and light CR97, the X100 LED. A short circuit on the code ring provides trace ID which pulls down pin 7 of U80, shifts the trace upward one-fourth of a division, and shuts off the scale factor light. The trace ID signal goes to R289 on CH 1 and R389 on CH 2 to provide trace shift in the vertical pre-amplifiers.

VERTICAL MODE CONTROL

U1535B controls the vertical logic (diagram 3) via two control leads from pins 8 and 9. These leads also are connected via Q1590 and Q1594 to the trigger logic (diagram 4) when the trigger is NORM. The trigger logic is independent of U1535B when CH 1 or CH 2 triggers are called up.

U1535B is controlled by the mode switch in CH 1, CH 2, ADD, or X-Y. In the ALT or CHOP mode, the IC's control the input to pin 7 of U1535B to cause it to either alternate on command from A GATE or to CHOP. When the HORIZ is in ALT, and the vertical in ALT, U1535B changes state only every other A GATE. Note that A GATE is the signal that activates U1535 in ALT and the signal from U1530B pin 6 only allows every other A GATE through. U1535A output is A GATE 2, and U1535B is A GATE 4.

In the CHOP mode, U1585 is on and U1535B changes state every time U1585 makes an output. While U1585 is making an output a signal from U1585 pin 4 blanks to prevent displaying the switching from CH 1 and CH 2 and back.

Z AXIS

U1560 output drives the Z AXIS amplifier. U1560 is controlled by the A and B GATES, the A-B control via pin 15, the INTENsity controls and the EXT Z AXIS.

The circuit consisting of Q1566 and Q1568 disconnects the B INTENSITY control during X-Y or when A=1, 2, or 5 ns.

A TRIGGER AMPLIFIER

The Source Switch SW700 selects one of the four modes which the 485 will trigger on: INT, LINE, EXT, or EXT ÷ 10. Signals above approximately 1 MHz, except in HF REJ are coupled through C705. R705 and R709 form a 1 MΩ input resistance and a loss pad to compensate for the loss across C705, matching high frequency and low frequency gains. R708 protects Q712A input by limiting current when CR711 or Q712A is forward biased. Q712A and Q712B form a source follower with the source voltage very close to zero. The source follower drives Q716, an emitter follower, which drives U730. The balun coil T719 produces a differential signal. U730, U738, and U740 are cascade amplifiers. The slope switch SW720, switches the collectors of U740 to give selection of the triggering slope.

A EXT TRIGGER IDENTIFY

The A EXT TRIG IDENTIFY function is driven by the emitters of U730; this allows U830 to be coupled to the trigger signal and the level control. The center line crossing point of the A EXT TRIG signal corresponds to the trigger point of the sweep for timing information.

When the EXT TRIGGER IDENTIFY switch is pushed, U830 is turned on and its collectors are connected to the vertical delay line via relay K410. VR838 and VR839 provide DC level shift.

The cables between J842 and J843 and relay K10 have a time delay so that the EXT trigger signal will be displayed with the same time position as signals arriving through CH 1 or CH 2 input.

A TRIGGER GENERATOR

The trigger amplifier drives a Schmitt Trigger circuit based around CR751 and a constant resistance load. This circuit provides a standardized output pulse that is time related to the trigger event. This standardized pulse and a holdoff signal drive a two tunnel diode circuit to provide stable triggering from DC to at least 350 MHz with very low trigger Jitter.

CR762 is the arming tunnel diode and CR772 is the output tunnel diode. After CR762 is fully armed and CR772 is partially armed (at the end of holdoff), a pulse from CR751 causes CR762 to go to its high state. This increases the current through R764 to fully arm CR772, which goes to its high state when the same pulse that fired CR762 is received through the short delay line. The output of CR772 drives differential pair Q792 and Q794. When CR772 is in its high state pin 1 of U780 is high, turning on the light DS781 (TRIG'D). Q792 provides the A GATE through emitter follower Q810. The output of Q794 couples to a differential pair Q802 and Q804, which provide the sweep gates.

When the sweep is completed, a positive signal from A sweep turns on Q816 and Q822 to provide a signal to pin 16 of U780. This initiates the holdoff portion of U780 and pin 17 goes positive. Pin 17 stays positive as determined by timing R's and C's on the timing switch to pin 8. The holdoff signal on pin 17 of U780 drives Q768 and Q778. Q768 and Q778 gate the current to CR762 and CR772. When Q768 and Q778 are off, CR762 and CR772 are receiving the appropriate current as set by R765 (A arming T.D.) and R775 (A output T.D.). When Q768 and Q778 are on they reset CR762 and CR772 to their low states.

In AUTO TRIG pin 19 of U780 is grounded. The trigger signals must recur at least every 50 ms, which is the lowest rate the circuit will provide a triggered sweep in AUTO MODE. The timing of the AUTO MODE is determined by the time constant of R787 and C787.

In SINGLE SWEEP mode +5.5 V is applied to pin 12 of U780. There will be only one sweep for each time U780 is armed by pushing the RESET switch. The sweep will fire when a trigger signal is received while or after the RESET switch is depressed. The READY light on pin 11 of U780 indicates when the sweep is armed.

B TRIGGER GENERATOR

Is similar to A Trigger Generator except it has RUNS AFTER DELAY TIME mode that disconnects the trigger amplifier. In addition, it uses A Trigger Gate and delay pickoff gate as hold-off.

In the triggerable mode, the B Trigger Generator triggers only after receiving both the delay pickoff and A Gate signals. Delay pickoff gate drives comparator Q1092 and Q1096. Both A Gate and delay pickoff gate are required to drive Q1082. The output of Q1074 provides arming current for CR1062 and CR1104. When the triggering signal causes CR1052 to go to its high state, CR1062 is properly armed, and will fire arming CR1104, which fires approximately 1.5 ns after CR1062.

In B RUNS AFTER DELAY TIME mode, the trigger amplifier is turned off via R1038 and enough current is flowing in the base of Q1068 so that it is in saturation. This saturation routes enough current to CR1104 to turn it on when A Gate and delay pickoff gate arrive.

In both cases when CR1104 goes to its high state, comparator Q1106 and Q1110 changes state giving a B GATE out thru Q1114. Q1106 is connected to comparator Q1121 and Q1124 which changes state, giving plus and minus sweep gate out.

In A 1, 2, and 5 ns, B is in B RUNS AFTER DELAY TIME. In addition in 1 and 2 ns the voltage to which C1121 charges is varied by the HORIZONTAL POSITION control. This gives a time position to these two sweep speeds when using the HORIZONTAL POSITION control.

A and B SWEEPS

A and B sweep generators each produce, upon receipt of a gate, a negative going sweep of 1.0 V/div of horizontal excursion, starting at +13 V.

In A Sweep, Q884 and Q888 are the miller amplifier. Timing resistors R873 and R1409 to R1422 return to +50 V in calibrated settings. The values of the timing resistors and capacitors C877 to C882, C1404 and C1405, at various sweep speeds may be determined on the Timing Switch and Generator schematics. Q892 compares the sweep output to +13 V and sends the error signal to the miller input via R866 and Q854. Receipt of a + gate at TP851 turns off Q854, allowing the sweep to run. CR867 must not conduct during baseline, so Q866 sinks the higher timing currents. Q934 turns on at the end of the sweep, producing a + going stop pulse that terminates the sweep gate. Q856 and Q858 feed a current to the miller input at the end of the gate to prevent large negative voltages and long recovery times at low timing currents. R863 affects linearity at 10 and 20 ns/div.

The Delay Comparator Q902 enables B Sweep when the sweep voltage becomes less than the voltage on the Delay Time position control, where U910 is a voltage follower.

Q908 disables B Sweep in A HORIZ DISPLAY mode and Q914 introduces an offset at 10 and 20 ns/div. Switch A9 opens when A Sweep speed is 1, 2, or 5 ns/div to start B Sweep with minimum delay, since the B Sweep Generator produces these speeds regardless of the HORIZ DISPLAY mode.

B Sweep generator is similar to A except that the maximum output rate is 5 times faster. The sequence of timing components is different from A Sweep. Q1238 prevents large positive voltages that would occur at the miller input after the end of the sweep but before the end of the gate.

For A Sweep speed settings of 10 ns/div or slower, A HORIZ DISPLAY mode displays A Sweep. B HORIZ DISPLAY mode displays B, ALT, INTEN, and INTEN (A) function. However, when A Sweep speed is set at 1, 2, or 5 ns/div the Horizontal system displays B Sweep which has been gated on by A trigger. Switch A9 is open so that the Delay Time Position control is effectively set to zero. At A = 5 ns/div, the displayed B Sweep is positioned horizontally in the amplifier. At A = 1 or 2 ns/div, the POSITION control is disconnected from the Horizontal Amplifier via switches B19 and B20. The POSITION control is connected to a variable delay circuit Q1102 which time-positions B Gate for about 30 ns after A Gate.

HORIZONTAL AMPLIFIER

The A sweep or B sweep may be selected by saturating Q1312 or Q1318 respectively. This is done by the horizontal control logic level at N4. If N4 is below -5 V, Q1336 is off and Q1338 saturates. This allows the node R1313, R1314 to go up and turns off Q1318 and saturates Q1312. The output of A sweep generator has been selected. Q1338 being saturated also shunts to ground any signal from B sweep generator that might be present in ALTernate mode. If N4 is -3 V, B sweep is selected as Q1336 saturates, turning off Q1338 and pulling down on R1314, saturating Q1318 and turning Q1312 off. CR1311 will shunt any signal from A sweep.

A +1 V at N4 will turn Q1342 on which turns off Q1358, disconnecting A and B sweeps and saturating Q1356, selecting the X signal for X-Y.

In A = 1, 2, or 5 ns, B18 closes and Q1331 turns on, saturating Q1322, a 2X magnifier. To provide offset to enable viewing at sweep start, in 5 ns B22 closes and offset through R1327 is provided. In 1 and 2ns, the base of Q1328 is moved and a current from Q1328 through Q1331 and the base collector of Q1332 is inserted to provide offset.

Q1362 and Q1364 compose a HI gain amplifier. The feedback R is R1364 and R1366. The input resistance in B sweep is R1321 and R1322. If A sweep is selected the input resistance is R1307 and R1308.

By selecting B sweep and adjusting R1366, the horizontal gain is set. Then by selecting A sweep and adjusting R1308, A sweep may be calibrated. Both adjustments are done in 0.1 ms/div. To get A and B sweep to start at the same point on screen, R1325 (B REGISTER) provides some offset current for positioning B sweep relative to A sweep. This is done in ALT horizontal mode. Q1378 and R1368 provide a constant current for the operational amplifier Q1362, Q1364. Q1366 is saturated in Beam Finder by S600B. This cuts the feedback resistor value by 2/3 and Rf/RI is reduced. C1364 provides linearity control for 1, 2, and 5 ns/div.

Q1372 and Q1374 are a paraphase amplifier to provide a differential signal to the horizontal amplifier. C1372, C1374, R1372, and R1374 provides thermal compensation for Q1372 and Q1374. Since the horizontal is symmetrical, we will deal with one half only. Q1172 provides isolation between the CRT capacitance and the input amplifier Q1154. Q1172 and Q1174 provide the current path to drive the deflection plate. Q1192 is an emitter follower to provide feedback to Q01154. By using active feedback the actual feedback resistance may be lowered without sacrificing gain. This is accomplished by utilizing the impedance of Q1192, emitter to base, and the divider circuit of R1177 and R1178. CR1156 provides a -5 V reference for Q1154 and CR1152. CR1153 limits the voltage swing to keep either half of the horizontal from saturating. This allows the horizontal to be very linear.

HORIZONTAL CONTROL

This circuit is activated by the HORIZ DISPLAY controls. Several output signals are derived; B disable, horizontal control, A-B control autofocus, trace separation and vertical control drive.

The basic circuit consists of U1535A which is controlled by the HORIZ DISPLAY. The HORIZ DISPLAY switch is overridden when B sweep is used in A = 1, 2, or 5 ns or is X-Y. A truth table is shown on the diagram 12.

The main function of U1535 is to provide a HORIZ CONTROL signal to the horizontal B preamplifier. With the X-Y control of Q1520 (which saturates in X-Y), this signal on pin N4 has 3 levels. In the ALT mode, U1535 switches from one state to another each time the A GATE goes negative. U1530C inverts the A GATE to get the positive edge required by U1535A. (It is important to maintain correct timing with the sweep control since switching must

occur during holdoff.) Pin 5 of U1535A alternates from HI to LO and the sweep switches from A to B and back again. When B is called up and pin 5 is HI, the Z AXIS IC will be in the B mode via pin 15 signal and the B intensity control will function and Autofocus control is also provided. Also, the trace separation signal will be LO, causing the trace separation control to function. This is via control of U1530B. All inputs must be HI to get LO outputs, and this only occurs in ALT when B is called up. The output of U1530B also drives the vertical logic when the HORIZ DISPLAY is in ALT. B disable is controlled by A, the X-Y signal, and switch SWA2 (which is closed when A = 1, 2, or 5 ns).

POWER INVERTER/REGULATOR

General

The Power Inverter/Regulator circuit provides the operating power for this instrument from a line voltage source or DC voltage source. This circuit also includes the Line Voltage Selector switch to allow for selection of a 115 V or 230 V nominal operating voltage. Fig. 3-1 shows a block diagram of the Power Inverter/Regulator circuit. A schematic is shown on diagram 14 at the rear of this manual.

Line Filter

The purpose of the Line Filter is to prevent the instrument from injecting power supply frequency interference into the power line, or power-line interference from entering the instrument. L1812 and L1813 provide both common-mode and differential filtering. R1812 and R1813 are damping resistors. C1812 and C1813 are common-mode filters and C1814 is a differential filter. R1811 discharges C1814 when the power switch is off.

Line Input Circuit

Thermal cutout S1802 provides thermal protection for this instrument. If the temperature exceeds a safe operating level, S1802 opens to interrupt the applied power. When the temperature returns to a safe operating level, S1802 automatically closes to re-apply the power.

CR1821 contains the main power rectifiers for the Line Input circuit. C1822 and C1823 are the line-storage capacitors. With S1803 in the 115 V position, the circuit acts as a full-wave voltage doubler so that the voltage across the series combination of C1822 and C1823 will be the peak-to-peak value of the line voltage. In the 230 V position, CR1821 acts as a full-wave bridge rectifier. Therefore the voltage developed across C1822 and C1823 will be approximately the same for either 115 V or 230 V operation.

RT1821 and RT1822 are thermistors which limit the charging currents during turn on. When the POWER switch is turned off, the Line Stop circuit stops the Inverter and C1822 and C1823 discharge thru R1822 and R1823.

WARNING

Because the discharge is slow, dangerous potentials will exist across capacitors C1822, C1823, and other connected components for several minutes after the POWER switch is turned off. The presence of voltage in the circuit is indicated by relaxation oscillator R1824, C1824, and DS1824. Neon bulb DS1824 blinks until the potential drops to approximately 100 V.

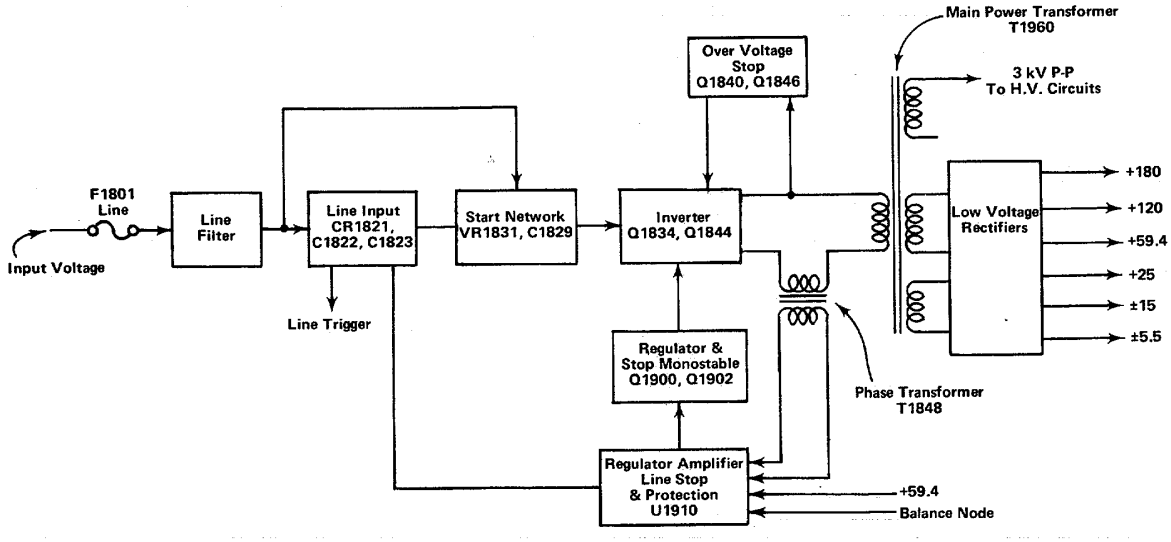


Figure. 3-1. Block diagram of power inverter/regulator circuit.

DS1801 and DS1802 are line voltage transient protectors. With S1803 in the 115 V position, only DS1801 is connected across the line. If a peak voltage surge in excess of approximately 230 V is present on the line, DS1801 will break down and conduct sufficient current to open the line fuse F1801. In the 230 V position, DS1801 and DS1802 are in series across the line to protect against voltage surges exceeding 460 V.

Transformer T1801 provides a sample of the line voltage for triggering at line frequencies. It also provides a signal to the Line Stop circuit to indicate the presence of line voltage at the input to this circuit. T1825, C1825, and C1827 provide common-mode filtering. C1826 and L1825 act as a differential filter.

Start Network

Resistive divider R1828 and R1829 is connected between the input line and the negative side of C1823. When the line voltage goes positive, C1829 charges. At the same time CR1842 conducts, charging C1835, and CR1843 conducts to charge C1848. When the voltage on C1829 reaches approximately 32 V, VR1831 conducts, discharging C1829 thru the base of Q1844. As Q1844 turns on, C1835 discharges thru L1835 to start the Inverter. After operation has begun, CR1842 discharges C1829 with each cycle of the Inverter. This disables the start network.

Inverter

Refer to the simplified schematic shown in Fig. 3-2. Once the Inverter has been started by the Start Network, the Inverter is self-oscillating. Feedback necessary for oscillation is provided by base-drive transformer T1831. The series-resonant circuit, consisting of L1835 and C1835, has a nominal resonant frequency of about 25 kilohertz. To provide regulation of the voltages induced in the secondary circuit, the action of regulator transistor Q1900 varies the frequency of oscillation on the low side of resonance by holding both Q1834 and Q1844 off for a time during each half cycle as determined by the Regulator circuit (see Inverter Regulator for a more detailed discussion of regulation).

Transistors Q1834 and Q1844 are a switching pair, where only one transistor can conduct at a time. The direction of current flow in the feedback winding of T1831 determines which transistor will conduct. Transistors Q1834 and Q1844 change states every half cycle. The switching action provides a square-wave voltage at the emitter of Q1834, which has a peak-to-peak voltage about equal to the DC voltage from the Line Input circuit. This square-wave voltage supplies the drive necessary to maintain oscillation in the resonant circuit. When both Q1834 and Q1844 are being held off by Q1900, resonant circuit current flows through CR1834 or CR1844. The resonant circuit current drives the primary of the power transformer T1960 and thus supplies power to the Secondary circuit.

In normal operation, the sequence of events during one cycle of operation is as follows:

1. Assume the current in the resonant circuit is at 0 ampere and beginning to increase in the direction to cause conduction in CR1834. At the time the current reaches 0 ampere, regulator transistor Q1900 is turned on by the Inverter Control circuit. The Regulator transistor holds both Q1834 and Q1844 off for a controlled amount of time. During this time, resonant circuit current flows through CR1834.

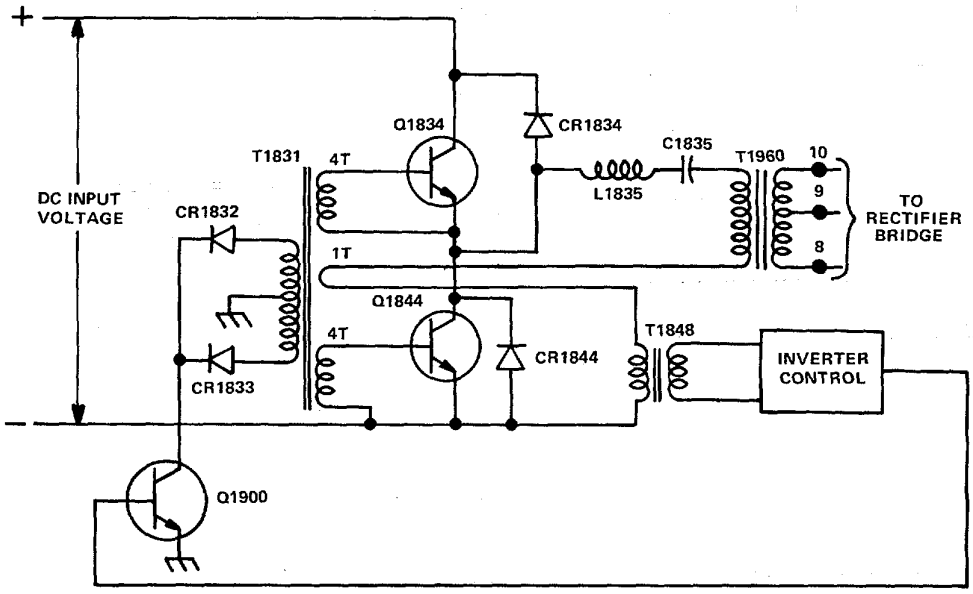


Figure 3-2. Simplified schematic of inverter.

2. At a controlled time after the resonant circuit current passes through 0 ampere, regulator transistor Q1900 is turned off by the Inverter Control circuit. When Q1900 is turned off, the direction of current flow in the feedback winding T1831 is such that it induces a voltage in the base windings of T1831, which turns on Q1844 and holds off Q1834. Transistor Q1844 conducts while the resonant circuit current builds up to a maximum and falls off toward 0 ampere.

3. When the resonant circuit current reaches 0 ampere and begins to increase in the opposite direction, regulator transistor Q1900 is again turned on by the Inverter Control circuit. This holds both Q1834 and Q1844 off for a controlled amount of time. While Q1900 is on, resonant circuit current flows through CR1844.

4. When Q1900 is turned off by the Inverter Control circuit, the direction of current flow in the feedback winding of T1831 is such that the induced voltage in the base windings of T1831 turns on Q1834 and holds off Q1844. Transistor Q1834 conducts as the resonant circuit current increases to maximum and falls off toward 0 ampere.

5. When the resonant circuit current reaches 0 ampere and begins to increase in the opposite direction the cycle begins to repeat.

Inverter Regulator

The Inverter Regulator circuit schematic is located in diagram 14 at the rear of this manual. The purpose of the Inverter Regulator is to maintain constant voltages at the semi-regulated supply outputs. This is accomplished by varying the inverter frequency. The nominal resonant frequency of L1835 and C1835 is 28 kHz. Regulation is achieved by operating on the low side of resonance, in the range of 20 to 28 kHz. At the lowest line voltage and highest load, the Inverter will operate at a frequency close to resonance. If either the line voltage is increased or the load is reduced, the inverter frequency will decrease.

Power and phase information to the regulator circuit is provided by current transformer T1848. CR1931, CR1932, CR1933, and CR1934, are connected as a bridge rectifier to deliver both positive and negative voltages. The +7.5 V at pin 6 of U1910 is internally shunt regulated. The -2 V at pin 7 is unregulated. VR1945 provides a stable reference for the sensing divider string consisting of R1940, R1941, R1942, and R1944.

U1910 contains the regulator circuit consisting of a voltage amplifier and a variable pulse width monostable multivibrator. Pin 15 (normally near ground potential) is the input to the voltage amplifier. The charging ramp of the monostable is available at pin 12. Inputs that trigger the start of the monostable appear at pins 10 and 11. The output at pin 9 drives the regulator transistor Q1900. Circuit operation is as follows: In the stable state of the multivibrator, pin 9 will be near ground, holding Q1900 off. As the inverter current goes thru zero, either pin 10 or pin 11 will go positive depending on polarity. This positive pulse sets the multivibrator into its unstable state. During the unstable state, pin 9 will be positive holding Q1900 on. The duration of the unstable state is determined by the voltage sensed at pin 15. If the voltage is low, the duration will be short. As the voltage increases, the duration becomes longer.

The monostable pulse width controls the inverter frequency by the fact that when Q1900 is on, both Q1834 and Q1844 are off. Power delivered to T1960 varies with inverter frequency because the impedance of the series resonant circuit L1835 and C1835 varies with frequency.

Inverter Current Limiting Circuit

U1910 also contains the Inverter Current Limiting circuit. Circuit operation is similar to voltage regulation except that the pulse width of the multivibrator is varied so that the inverter current never exceeds a safe level. The current limit circuit takes over control of the multivibrator during the turn on surge or whenever an overload on a semi-regulated supply causes the inverter current to reach the limit value. R1926 is the current sensing resistor. Voltage at TP1926 will be the negative rectified inverter current to a scale of approximately 0.7 V/ampere. The current sense input at pin 13 will normally be held positive by R1922. During current limit, the negative voltage at TP1926 pulls pin 13 toward ground. Multivibrator pulse width then increases until the current limits at a value which holds pin 13 near ground. If the circuit remains in current limit for more than approximately 30 ms, pin 8 will go positive, tripping the stop monostable, which stops the Inverter. (See protection circuit description.)

Overvoltage Stop Circuit

Q1840 and Q1846 provide a circuit to stop the Inverter whenever the voltage across the primary of T1960 exceeds a safe level. This circuit will be active whenever the connector between the Inverter and power board is removed or the normal regulating path thru Q1900 and T1831 is inoperative. CR1848 charges C1848 to the peak of the voltages across T1960. If this voltage exceeds a safe level, VR1846 will conduct turning on Q1846. C1848 will then discharge thru R1846 into the base of Q1840. When Q1840 is on, Q1844 will be held off stopping the Inverter. The Inverter cannot restart until CR1843 has charged C1848 to the breakdown voltage of VR1831.

Line Stop Circuit and Surge Limiting

The Line Stop Circuit stops the Inverter when the POWER switch is turned off or the AC line voltage falls below a minimum value. This circuit function is necessary to limit the turn-on surge current and thereby protect the POWER switch, Line Fuse, and Line Rectifier Bridge.

When the instrument is first turned on, thermistors RT1821 and RT1822 have a value of approximately

5 ohms. Line current charging C1822 and C1823 is limited by the thermistors. As the instrument continues to operate, the thermistors heat and drop in resistance. When the instrument is turned off, the Line Stop circuit stops the Inverter, leaving C1822 and C1823 charged. The line storage capacitors now discharge through R1822 and R1823 at a rate approximately equal to the thermal recovery of the thermistors. This rate ensures enough thermistor resistance to limit surge current whenever the instrument is turned back on.

A simplified schematic of the Line Stop circuit is shown in Fig. 3-3. Line Trigger transformer T1801 generates a ground referenced Line Frequency signal of approximately 1 V peak-to-peak. This signal is biased to +0.4 V by R1916 and R1917. Under normal operation, C1918 charges toward +7.5 V through R1918 until a positive going signal from T1801 turns Q1 on discharging C1918. This repeats each line cycle. When the POWER switch is turned off, Q1 stays off allowing C1918 to charge. When the voltage at pin 3 of U1910 reaches approximately +0.7 V the inverter control circuit inside U1910 allows pin 8 to go positive, triggering the stop monostable, which stops the Inverter. For trouble-shooting at low line voltage, the line stop circuit may be disabled by grounding the Line Stop test point TP1918. (L.S.).

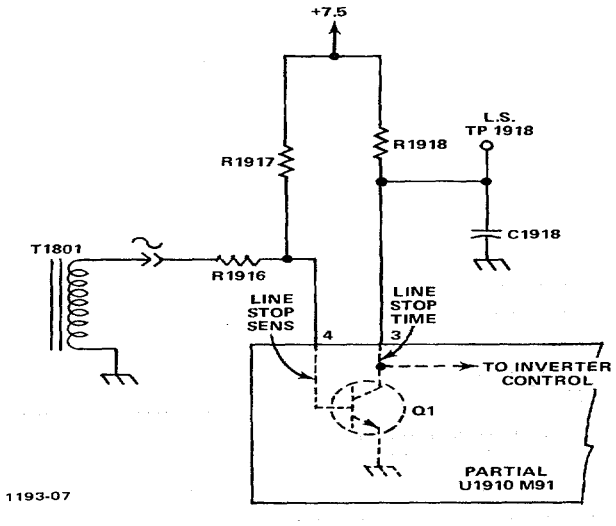


Fig. 3-3. Line stop circuit.

Procedure for Converting the 485 to DC Operation

Read the circuit description entitled Line Stop Circuit and Surge Limiting before proceeding

1. Set the LINE VOLTAGE SELECTOR switch (rear panel) to 230 V.
2. Check that the DC source voltage range is within 220 V to 350 V DC limits.
3. For DC operation the Line Stop Circuit must be disabled while the instrument is running. Two methods are possible, depending upon the current available from the DC source. The object is to prevent high surge currents, which can occur during hot turn on when the thermistors are low in value and the line storage capacitors are discharged.

a. If the instantaneous current available from the DC source is limited to 30 A or less, connect a jumper from the Line Stop test point (TP1918) to ground. Circuit board holes for this purpose are provided in the rear corner of the power board. This jumper must be removed whenever the instrument is operated on AC.

b. If the DC source is not current limited, an auxiliary switch must be provided to stop the 485 Inverter BEFORE the power is turned off. Stopping the Inverter will prevent rapid discharge of the line storage capacitors. A schematic showing the auxiliary switch is shown in Fig. 3-4A. When operating with the auxiliary switch, always move the switch to the off position BEFORE turning off the power. When turning the instrument on, move the auxiliary switch to the on position BEFORE turning the power on.

4. Check polarity of the power source. The line side (black) must be connected to the positive. The neutral side (white) must be connected to the negative. The safety ground must be connected to earth potential. Proper polarity at the 485 plug is shown in Fig. 3-4B.

LOW VOLTAGE SUPPLIES

± 15 V Supply

The plus and minus 15 V supplies are generated by the same winding on T1960. The center tap (pin 9) is connected to ground. The voltage at pins 8 and 10 is a square wave, swinging positive and negative with a peak value of 15.7 V and a risetime of approximately 2 µs. Each supply is rectified full wave and filtered with a pi section filter.

± 5.5 V Supply

The plus and minus 5.5 V supplies are identical to the 15 V supplies except the transformer voltage is 6.2 V peak.

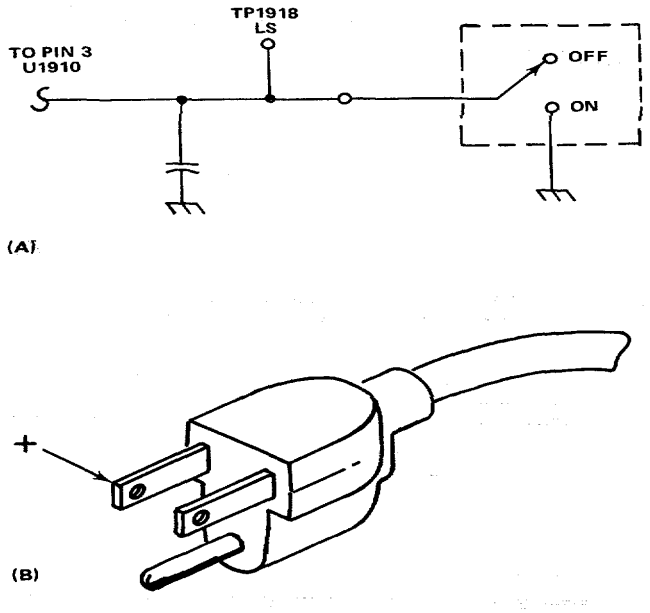


Fig. 3-4. (A) Schematic showing auxiliary switch for disabling line stop circuit, (B) power plug polarity for DC operation.

+59.4 V and +120 V Supplies

The 59.4 and 120 V supplies are similar to the 15 V supplies except for the output connection, which ties the negative rectified voltage to ground. This elevates the transformer center tap to the peak AC voltage on one side of the winding, which is 59.4 V. The 120 V supply is generated by the full rectified voltage on the transformer.

+180 V Supply

The 180 V supply is formed by a voltage doubler which rectifies the 59.4 V peak AC swing and adds it on the 120 V supply.

+25 V Supply

The 25 V supply is formed by a voltage doubler, which rectifies the 12.4 V AC peak-to-peak swing on the 5.5 V winding and adds it on to the 15 V supply.

+50 V Supply

The 50 V supply is regulated from 59.4 V by Q2046. A temperature-compensated reference is provided by VR2042. The reference voltage is compared to a sample of the 50 V output at U2042 which acts as an inverting amplifier. If the +50 V goes negative, the output of U2042 goes positive. CR2042 is short circuit protection for U2042.

+9 V Supply

The 9 V supply is re-regulated from the +15 V supply by Q2056. A 9 V reference is provided by a divider from the +50 V supply. U2052 is an inverting amplifier which drives Q2056 directly.

+5 V Supply

The +5 V supply is essentially identical to the +9 V supply except for the value of the output voltage.

-9 V and -5 V Supplies

The -9 V and -5 V supplies are essentially identical to +9 V and +5 V supplies except that the driving amplifiers are ground referenced.

POWER SUPPLY PROTECTION CIRCUIT

The power supply protection circuit provides fault protection for the inverter, low voltage, and high voltage power circuits. Fig. 3-5 shows a simplified block diagram of the protection circuit. A schematic of this circuit is shown on diagram 14 at the rear of this manual.

Power supply protection is accomplished by operating the Inverter in a pulse mode. When a fault is present, the Inverter will come on for a short period of time, then shut off for a longer period of time. The cycle repeats until the fault is removed. Approximate timing of the duty cycle is shown in Fig. 3-6.

Stop Monostable

Q1900 and Q1902 form a monostable multivibrator which acts to stop the Inverter when a fault is detected by U1910. During the start period T1831 supplies current to charge C1901 and C1904 thru CR1901 and CR1904. At the same time T1848 supplies power to U1910. As U1910 becomes active, pin 8 acts as a current sink, holding Q1902 off. Pin 8 of U1910 will remain at ground during the start period and sampling period. If a fault exists at the end of the sampling period, pin 8 of U1910 stops conducting, allowing Q1901 and Q1902 to turn on. When these transistors turn on, the voltage on all secondaries of T1831 will go to zero, stopping the Inverter. Once triggered on, the stop monostable will stay on while C1901 discharges through R1902 into the base of Q1902. If U1910 is removed from its socket or is otherwise nonfunctional, the stop monostable will stop the Inverter after the first few cycles of operation. In this mode, the duty cycle will be much shorter because C1901 will not have sufficient time to charge.

Balance Node

The Balance Node provides short circuit protection for all semi-regulated and regulated DC voltages. It also provides over current protection for the H.V. winding of T1960 and beam current protection for the CRT. Pin 2 of U1910 is the input to the voltage balance amplifier. If the voltage at pin 2 of U1910 is more positive than +200 mV or

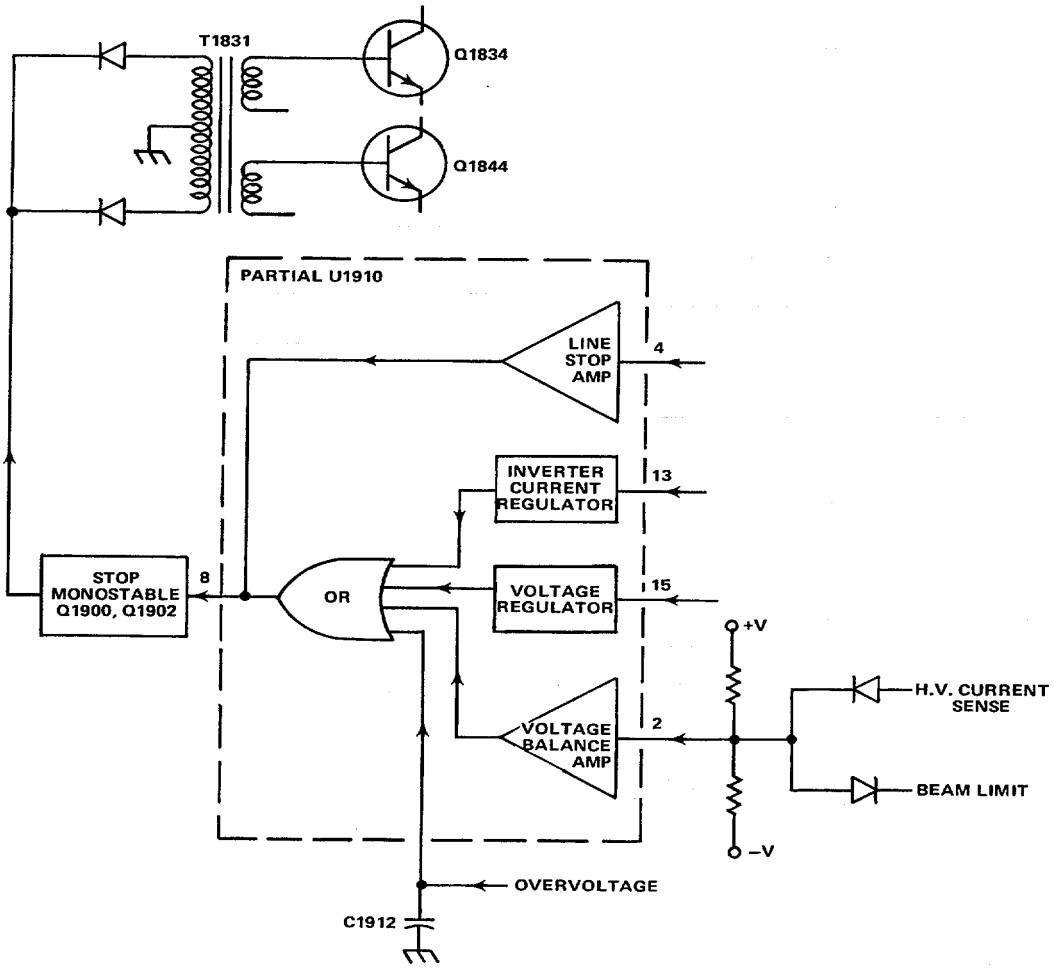


Fig. 3-5. Simplified block diagram of power supply protection circuit.

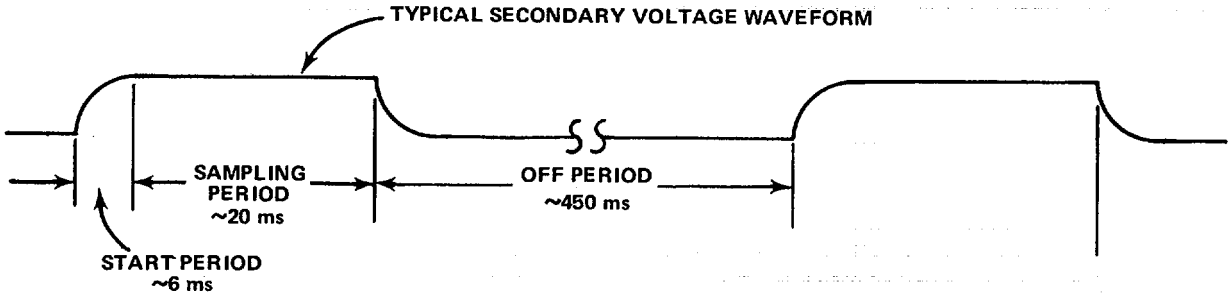


Fig. 3-6. Protection circuit duty cycle.

more negative than -200 mV, the output will generate an error to stop the Inverter. Under normal operating conditions, current from positive supplies to the Balance Node will equal current to the negative supplies, allowing pin 2 to operate near ground, typically within 50 mV. If any supply is shorted the currents will be unbalanced, causing the voltage at pin 2 to shift into the error region. Shorting a positive supply moves the Balance Node negative, and vice versa.

TP1958 (HV) is the high voltage current sense point. Normally the signal at TP1958 does not have sufficient amplitude to cause conduction in CR1958 and therefore has no effect on the Balance Node. If excessive current is drawn from the cathode multiplier or the H.V. winding in T1960, the amplitude at TP1958 will increase causing CR1958 to conduct, producing an error which stops the Inverter. The DC level at TP1953 (LIM)will normally be at +15 V when the intensity controls are off. As the intensity is increased, CRT beam current will increase, causing TP1959 to move toward ground. If TP1959 goes more negative than -.7 V, CR1959 will conduct, causing an error at the Balance Node, which stops the Inverter. This will only occur when the normal beam limit circuit is inoperative.

Overcurrent Protection

Pin 13 of U1910 is the input to the Inverter Current Regulator circuit. If a semi-regulated supply is shorted, the regulator circuit allows the inverter current to increase to the limit value and remain there throughout the sampling period. At the end of the sampling period, pin 8 of U1910 will go positive, stopping the Inverter.

Low Line Voltage Protection

If the line voltage drops significantly below the minimum specified value, the Inverter will not maintain the correct voltages at the semi-regulated supply outputs. When this occurs, an error will be generated by the voltage regulator, which will cause pin 8 of U1910 to go positive, stopping the Inverter. The Line Stop Circuit will also stop the Inverter if the line voltage is low (see Line Stop Circuit Description).

Sampling Period Timer and Overvoltage Protection

When an error is present at the input to the OR circuit, (see Fig. 3-5) a current is generated which charges C1912 thru pin 1 of U1910. The time it takes pin 1 to reach +0.7 V determines the sampling period. When pin 1 reaches +0.7 V, pin 8 of U1910 will go positive, stopping the Inverter. Over-voltage on the +120V supply will cause VR1912 to conduct, charging C1912 which stops the Inverter.

CRT CIRCUIT

General

The CRT Circuit produces the high voltage potentials and provides the control circuits necessary for the operation of the cathode-ray tube (CRT). This circuit also includes the Z-Axis amplifier and the Auto-Focus amplifier. Fig. 3-7 shows a detailed block diagram of the CRT circuit. A schematic of this circuit is shown on diagram 13 in the rear of this manual.

Filament Voltage

Filament voltage for the CRT heaters is provided by a separate winding on T1960. The filament voltage is elevated to cathode potential through R1687 and decoupled by C1687. Short circuit protection is provided by DS1687.

High Voltage Supplies

A semi-regulated voltage for operation of the high voltage supplies is provided by the high voltage winding of T1960. One end of T1960 is connected to ground through the high voltage current sensing resistor R2094. A 3 kV peak-to-peak square wave is generated and provides the power necessary to operate the Anode Supply, Cathode Supply, and DC Restorer Circuits.

Anode Supply. The Anode Supply consists of 6X multiplier assembly U1600.

Cathode Supply. The -3000 V CRT cathode voltage (marked -2950 in some instruments) is generated by a 2X multiplier consisting of CR1601, CR1602, C1601, and C1603. R1611 and C1611 provide high frequency filtering. R1612 and C1612 provide high frequency filtering and an AC coupling path for the cathode regulator.

Cathode Regulator. The cathode regulator maintains the cathode at -3000 V and reduces AC ripple. U1624 is a non-inverting preamplifier and Q1614 and Q1618 form an inverting output amplifier. A DC change at U1624 input sensed by R1642B and R1642C (thick film resistors) starts the regulator action. If the voltage at U1624 input goes positive, the output at TP1614 goes negative. This causes the voltage on C1601 to increase during the positive voltage cycle of T1960. Note that the voltage on C1601 is the difference between the positive voltage on T1960 and the voltage at TP1614.

During the negative half of T1960 voltage cycle, the increased voltage on C1601 increases the voltage at the output of the cathode multiplier, thus correcting the original error. R1633 and C1633 provide a low impedance

coupling path for AC changes to the input of U1624. The output correction is AC coupled through C1612 directly to the cathode. CR1618, CR1621, CR1626, and CR1627 provide short-circuit protection.

Grid DC Restorer. The purpose of the DC restorer circuit is to elevate the output of the Z-Axis amplifier to a potential more negative than the cathode, thereby allowing the grid to control the beam current of the CRT. The circuits are short-circuit protected by R1685, DS1684, and DS1685; R1668, DS1668, and DS1669.

The DC Restorer is current driven from the square wave at the high voltage winding through R1603, R1604, R1605, and R1606. When T1960 goes positive, CR1660 conducts at the grid bias voltage potential. This clamping action establishes the positive swing of the DC Restorer drive. On the negative swing of T1960, CR1663 conducts at the voltage established by the Z-Axis output. This clamping action establishes the negative swing of the DC Restorer drive. The AC swing of the DC Restorer drive is coupled from the low voltage section to the high voltage section by C1663. On the positive swing of the DC Restorer drive, the high voltage end of C1663 is clamped to the cathode voltage by CR1666. During the negative swing of the DC Restorer drive, CR1664 charges C1664 to a voltage more negative than the cathode by an amount equal to the difference between the grid bias setting and the voltage at the output of the Z-Axis amplifier. Fast AC-coupling between the Z-Axis and the CRT grid is provided by C1684. A slower AC path is by way of R1684 and C1664.

Focus DC Restorer. The operation of the Focus DC Restorer circuit is similar to the operation of the Grid DC Restorer. The AC swing of the DC Restorer drive is coupled from the low voltage circuit to the high voltage circuit by C1651. The positive swing will be established when CR1656 clamps at the Focus DC Restorer level voltage. This voltage is approximately 173 V. The negative swing is established when CR1652 clamps at the output voltage of the Auto-Focus amplifier. During the positive swing of the Focus DC Restorer drive, the high voltage end of C1651 is clamped to the focus pot voltage by CR1646. During the negative swing of the Focus DC Restorer drive, CR1651 charges C1652 and thereby establishes the proper level at

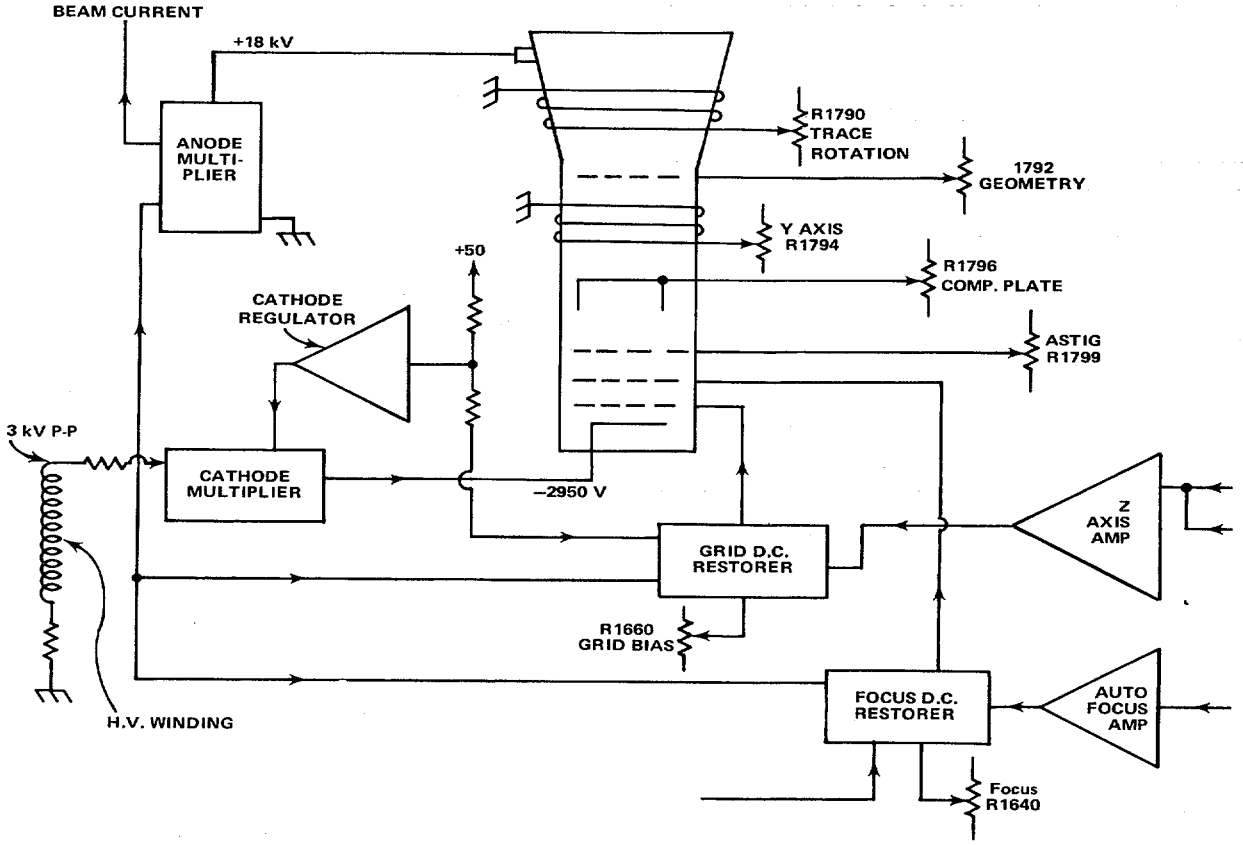


Fig. 3-7 CRT circuit block diagram

the focus electrode. The focus pot R1640 is set for optimum focus at low intensity level.

Beam Current Limit

The amplifier consisting of Q1544, Q1546, and Q1548 controls the voltage to the INTENSITY and B INTENSITY controls.

For sweep speeds of 50 ms/div and slower and X-Y, the current in resistor R1536, about 5 μA, pulls the base of Q1544 up to about +6 V. All three transistors are saturated. The average beam current of the CRT post-accelerator is available at the low-voltage end of the high voltage multiplier and is also connected to the base of Q1544. When the beam current is zero, the 5 μA current of R1536 flows into the base of the saturated Q1544. When due to high intensity, the average beam current exceeds the 5 μA value, the voltage at Q1544 base decreases at a rate determined by the net discharge current delivered to C1537. As this voltage goes negative, the transistors Q1544, Q1546, and Q1548 come out of saturation, and into the control range, when the input base voltage has dropped to +4 V. In the linear range the three-stage amplifier gain is about -5 V. Input voltages of +4 V and +1 V result in output voltages of -15 V and 0 V respectively.

The positive going voltage at the intensity controls (Q1548C) gives reduced Z-Axis drive and less beam current. In the linear range of the amplifier the output voltage stabilizes at a voltage resulting in the 5 μA average beam current.

The beam current limit becomes 20 μA if the additional 15 μA current of R1534 is not pulled away by closed A1 contact on S1420 (sweep 50 ms/div and slower) or by X-Y switch closure. Diodes CR1532, CR1534, and CR1535 are involved in this switching.

The time response to an overcurrent is in two parts: A delay for the input to charge to a voltage where the output transistor comes out of saturation, followed by a linear response time constant. Initial delay is 10 ms for maximum beam current and increases for smaller over-currents. The linear response time constant is 10 ms.

Power Supply Shutdown Caused by Excessive Beam Current

If, due to some failure, the control loop is unable to keep the average beam current within either the 5 μA or 20 μA limit, the voltage at the amplifier input discharges below the +1 V level. As the voltage reaches about +0.5 V the Q1546 collector voltage is approximately -0.9 V, and operates the power supply shutdown by connection through diode CR1959.

To prevent shutdown being signaled during the first 200 ms of instrument turn-on, C1538 (thru R1538) provides a delay to compensate for charging currents in the CRT post-accelerator supply. Diode CR1533 biases the 15 μA network so that this current is connected to the Q1544 base before it can drop to the +0.5 V shutdown voltage level. Thus, the higher beam current, (approximately 28 μA) is always required to trip shutdown.

In troubleshooting the instrument it may become necessary to disable the beam limit or beam shutdown loops. This can be done by grounding TP1544 at the collector of Q1544.

CRT CONTROL CIRCUITS

The ASTIG adjustment R1799, which is used in conjunction with the FOCUS adjustment R1640 to obtain a well defined display, varies the positive level on the astigmatism grid. Geometry adjustment R1792 varies the positive potential on the mesh to control the overall geometry of the display.

Two adjustments control the trace alignment by varying the magnetic field around the CRT. Y Axis Align adjustment R1794 controls the current through L1794, which affects the CRT beam after vertical deflection, but before horizontal deflection. Therefore, it affects only the vertical (Y) components of the display. TRACE ROTATION adjustment R1790 controls current through L1790 and affects both the vertical and horizontal rotation of the beam.

R1796 adjust the voltage on the compensation plates to the average vertical deflection plate structure potential. If this adjustment is not precise, proper focusing can not be achieved by the focus control.

AUTO-FOCUS CIRCUIT

The Auto-Focus circuit provides an output voltage that keeps the display focused for all settings of INTENSITY control. To do this, it amplifies the intensity control voltages in a non-linear fashion and gates the B INTENSITY function.

U1710 provides gating, limiting and part of the shaping of the auto-focus. Gating is of the B INTENSITY current pin 1, by the A-B control function pin 15. In ALTernate sweep operation the A-B control switches from -0.1 V to +0.9 V at the end of A sweep (A display), steering the B INTENSITY current to the output, pin 8. The sweep holdoff time, a minimum of 300 ns, is used for the amplifier that follows to settle to the new focus voltage for

the subsequent A sweep (B display). The first segment of non-linear shaping is done in U1710 by the biasing, which gives no output for an INTENSITY control setting between ground and -3.8 V. No change in Focus voltage is required over this low-intensity range.

The MAX Focus adjustment is used to set the limiting in this stage to coincide with maximum Z limiting. The resistor, pot, and diode network between pin 8 of U1710 and the base of Q1716 serve to provide the last two segment of non-linear shaping and focus gain setting. At the low-intensity condition, the base of Q1716 is at +10 V and CR1710 is conducting. At higher intensity, as current passes into pin 8 of U1710, the voltage drops and CR1710 disconnects as the voltage reaches +8.5 V. When the maximum (limit value) current into pin 8 is reached, this voltage is typically +5 V. The Focus Gain adjustment provides for optimizing the high intensity focus.

The Auto-Focus amplifier provides a stablized voltage gain of about +35 from the Focus Gain control to the output at Q1728 collector. At maximum intensity level, this output voltage can be adjusted from about zero to +70 V and is typically in the +20 V to +50 V range, after proper Focus Gain adjustment.

The network at the base of Q1736 causes its conduction to be proportional to the amplitude and frequency of the Auto-Focus output voltage. This arrangement permits the power transistors Q1728 and Q1732 to operate at a minimum power level consistent with the displacement current output required.

A DC-Restorer network provides for coupling the output of the Auto-Focus amplifier to the focus electrode of the CRT. This consists of four diodes, six capacitors and four resistors including C1651 and C1681. The low-intensity focus is controlled by the high voltage focus pot, which is located for operator adjustment at the rear of the instrument.

CALIBRATOR

Q2106, Q2112, and associated circuitry compose an emitter coupled multivibrator. The frequency of operation, 1 kHz or 1 MHz, is selectable from the front panel by switch S2105. R2109 and R2112 are the current sources for the emitter coupled multivibrator. Accurate 50% duty cycle is obtained by close match of these resistors. R2106 and R2111 are used to protect Q2106 and Q2112 from damage if they are plugged in with power on. C2111 is a speed up capacitor.

Q2114 and Q2124 compose a current mode switch. When Q2124 is on, CR2133 is off and the calibrator voltage (at J2134) is virtually zero. When Q2114 turns on, the current in Q2124 is diverted through Q2114 and the calibrator output voltage is determined solely by the current through R2131 and R2132. R2133 keeps the output impedance at 450 Ω when CR2133 is off. R2124 damps the resonant circuit created by the inductance of CR2133 and the collector capacitance of Q2124. Schottky diodes, CR2124, and CR2133, are used for low capacitance fast switching. CR2124 keeps Q2124 from saturation.

Risetime of the calibrator is less than 1 ns only when terminated in a 50 Ω 2 load. The negative-going edge is not suitable for checking amplifier transient response.

MAINTENANCE

Introduction

This section of the manual contains maintenance information for use in preventive maintenance, corrective maintenance, or troubleshooting of the 485.

Cover Removal

WARNING

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

1. Move handle away from front of instrument and snap front plastic cover in place.
2. Place instrument front panel down on working surface and remove the rear feet (four screws).
3. Work the small, blue rear panel rim away from the back of the instrument. It may stick in place, due to EMI finger stock. The edge opposite the BNC connectors must tip up first in order to clear the BNC connectors.
4. Back the Accessory pouches large retaining screw out so that its tip will clear the back panel for removal of the wrap-around cover, and slip the cover up and off the instrument.

Reinstalling the Cover

1. Orient the instrument face down (with the plastic knob cover in place) on a working surface.
2. Slide the wrap-around cover on using care to avoid pinching any cables. Make sure that the cover edge is inserted into the EMI gasket groove around the full periphery.
3. Work the blue rear panel rim into place at the rear end. Slip the edge over the BNC connectors first and press the ring down around the EMI finger stock.
4. Set the feet and screws in place and recheck that the front end edge of the cover is in the front panel EMI gasket groove. Tighten the four screws of the rear feet to a snug fit. Don't over-tighten these screws. Retighten the pouch retaining screw.

The cover protects this instrument from dust in the interior and also provides protection to personnel from the operating potentials present. In addition, it reduces the EMI radiation from the instrument or EMI interference to the display due to other equipment.

WARNING

Extreme caution must be used when troubleshooting in the Power Supply, due to the line voltage and the high potentials present. Refer to the discussion entitled Troubleshooting the Power Supply for troubleshooting information.

PREVENTIVE MAINTENANCE

General

Preventive maintenance consists of cleaning, visual inspection, lubrication, etc. Preventive maintenance performed on a regular basis may prevent instrument breakdown and will improve the reliability of this instrument. The severity of the environment to which the 485 is subjected determines the frequency of maintenance. A convenient time to perform preventive maintenance is preceding recalibration of the instrument.

Cleaning

General. The 485 should be cleaned as often as operating conditions require. The cover provides protection against dust in the interior of the instrument. Operation without the cover in place necessitates more frequent cleaning. Accumulation of dust and dirt in the instrument can cause overheating and component breakdown. Dirt on components acts as an insulating blanket, preventing efficient heat dissipation. It also provides an electrical conduction path that can result in instrument failure, especially under high humidity conditions. The best way to clean the interior is to blow off the accumulated dust with dry, low-pressure air (approximately 9 pounds per square inch). Remove any remaining dirt with a soft brush or a cloth dampened with a mild detergent and water solution. A cotton-tipped applicator is useful cleaning in narrow spaces or for cleaning ceramic terminal strips and circuit boards.

CAUTION

Avoid the use of chemical cleaning agents that might damage the plastics used in this instrument. Do not use chemicals that contain acetone, benzene, toluene, xylene, petroleum ether, white kerosene, carbon tetrachloride, methylene chloride, trichloroethane, trichlorotrifluoroethane (Freon 113, -tf, -ta, -te, -tmc) and trichlorethylene. Recommended cleaning agents are isopropyl alcohol, a solution of kelite (1 part kelite, 20 parts water), and a solution of 1% mild detergent and 99% water.

Most spray circuit coolants contain Freon 12 as a propellant. Because many Freons adversely affect switch contacts, check the contents and brand name before using a spray coolant. The following brand names are acceptable coolants: Artic Freeze, Quik-Freeze, and Can-O-Gas. Do not use Zero Mist brand of circuit coolant. The only recommended circuit coolants for the volts/division attenuators are dry ice ($C0_2$) or isopropyl alcohol.

Switch Contacts. Most of the switches in the 485 are circuit-board mounted, cam-actuated contacts. Care must be exercised to preserve the high-frequency characteristics of these switches. Switch maintenance is seldom necessary, but if it is required, observe the following precautions.

Clean the switch contacts only with isopropyl alcohol, especially in the area of the vertical attenuator boards. Carbon-based solvents will damage the boards used for the attenuators. Apply the isopropyl alcohol with a camel hair brush. Do not use cotton swabs, as they tend to snag on contacts, possibly causing damage, and the contacts may hold strands of cotton, causing intermittent electrical contact.

Horizontal Amplifier. The high voltage section of the horizontal amplifier board is coated with Humiseal. This is to prevent arcing due to moisture collecting near high voltage nodes. Do not use alcohol to clean any of the area near Humiseal coating as alcohol acts as a solvent with Humiseal. The only recommended cleaning agent is a solution of kelite (1 part kelite, 20 parts water).

Air Filter. The air filter should be visually checked every few weeks and cleaned or replaced if dirty. More frequent inspections are required under severe operating conditions. If the filter is to be replaced, order new air filters from your local Tektronix Field Office or representative; order by Tektronix Part No. 378-0036-01. The following procedure is suggested for cleaning the filter.

1. Remove the filter by pulling it out of the retaining frame on the rear panel. Be careful not to drop any of the accumulated dirt into the instrument.
2. Flush the loose dirt from the filter with a stream of hot water.
3. Place the filter in a solution of mild detergent and hot water and let it soak for several minutes.
4. Squeeze the filter to wash out any dirt which remains.
5. Rinse the filter in clean water and allow it to dry.
6. Coat the dry filter with an air-filter adhesive (available from air conditioner suppliers or order Tektronix Part No. 006-0580-00).
7. Let the adhesive dry thoroughly.
8. Re-install the filter in the retaining frame.

Exterior. Loose dust accumulated on the outside of the 485 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 which 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, and the CRT face with a soft, lint-free cloth dampened with denatured alcohol.

The CRT mesh filter (furnished with EMI Option 4 only) can be cleaned in the following manner:

1. Hold the mesh filter in a vertical position and brush lightly with a soft No. 7 water-color brush to remove light coatings of dust or lint.
2. Greasy residues or dried-on dirt can be removed with a solution of warm water and a neutral-pH liquid detergent. Use the brush to lightly scrub the filter.
3. Rinse the filter thoroughly in clean water and allow to air dry.
4. If any lint or dirt remains, use clean low-pressure air to remove it. Do not use tweezers or other hard cleaning tools on the filter, as the special finish may be damaged.
5. When not in use, store the mesh filter in a lint-free, dust-proof container such as a plastic bag.

Interior. Dust in the interior of the instrument should be removed occasionally due to its electrical conductivity under high-humidity conditions. The best way to clean the interior

is to blow off the accumulated dust with dry, low-pressure air. Remove any dirt which remains with a soft paint brush or cloth dampened with a mild detergent and water solution. A cotton-tipped applicator is useful for cleaning in narrow spaces or for cleaning ceramic terminal strips and circuit boards.

The high-voltage circuits, particularly parts located in the high-voltage compartment and the area surrounding the post-deflection anode leads, should receive special attention. Excessive dirt in these areas may cause highvoltage arcing and result in improper instrument operation.

Lubrication

The potentiometers, cam switches and pushbutton switches used in this instrument are factory lubricated and should not require further lubrication.

The fan-motor bearings are sealed and do not require lubrication.

Visual Inspection

The 485 should be inspected occasionally for such defects as broken connections, broken or damaged ceramic strips, 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 components are found. Overheating usually indicates other trouble in the instrument; therefore, it is important that the cause of overheating be corrected to prevent recurrence of the damage.

Semiconductor Checks

Periodic checks of the semiconductors in the 485 are not recommended. The best check of semiconductor performance is actual operation in the instrument. More details on checking semiconductor operation are given under troubleshooting.

Recalibration

To ensure accurate measurements, check the calibration of this instrument after each 1000 hours of operation or every six months if used infrequently. In addition, replacement of components may necessitate recalibration of the affected circuits. The calibration procedure can also be helpful in localizing certain troubles in the instrument. In some cases, minor troubles may be revealed and/or corrected by recalibration.

An elapsed-time meter is installed on the rear panel. This meter provides a full-scale indication of 5,000 hours of operating time and can be used to indicate when recalibration is necessary. Each minor division on this meter indicates 200 hours of operation. When the elapsed-time meter reaches 5,000 hours (full scale), it should be replaced.

TROUBLESHOOTING

Introduction

The following information is provided to facilitate troubleshooting of the 485. Information contained in other sections of this manual should be used along with the following information to aid in locating the defective component. An understanding of the circuit operation is helpful in locating troubles, particularly where integrated circuits are used. See the Circuit Description section for this information.

Troubleshooting Aids

Diagrams. Complete circuit diagrams are given on foldout pages in the Diagrams section. The component number and electrical value of each component in this instrument are shown on the diagrams (see first page of the Diagrams section for definition of the reference designators used to identify components in this instrument). Each main circuit is assigned a series of component numbers. Table 4-1 lists the main circuits in the 485 and the series of component numbers assigned to each. Important voltages and waverforms are also shown on the diagrams. The portions of the circuit mounted on circuit boards are enclosed with blue lines.

TABLE 4-1 Component Numbers

Diagram Number	Circuit	Component Numbers On Diagrams
1	ATTEN	1-199
2	PREAMPS	200-399
3	VERT SW	400-499
4	TRIG AMP	500-599
5	VERT AMP	600-699
6	A TRIG GEN	700-849
7	A TIME-BASE	850-999
8	B TRIG GEN	1000-1149
9	B TIME-BASE	1200-1299
10	TIMING SW	1400-1479
11	HORIZONTAL AMP	1300-1399 1150-1199
12	LOGIC	1500-1599
13	CRT	1600-1799
14	POWER INVERTER	1800-1849 1900-1959
		1900-1959
15	POWER SUP	2000-2099
16	CALIBRATOR & FAN	1480-1499, 2100-2139

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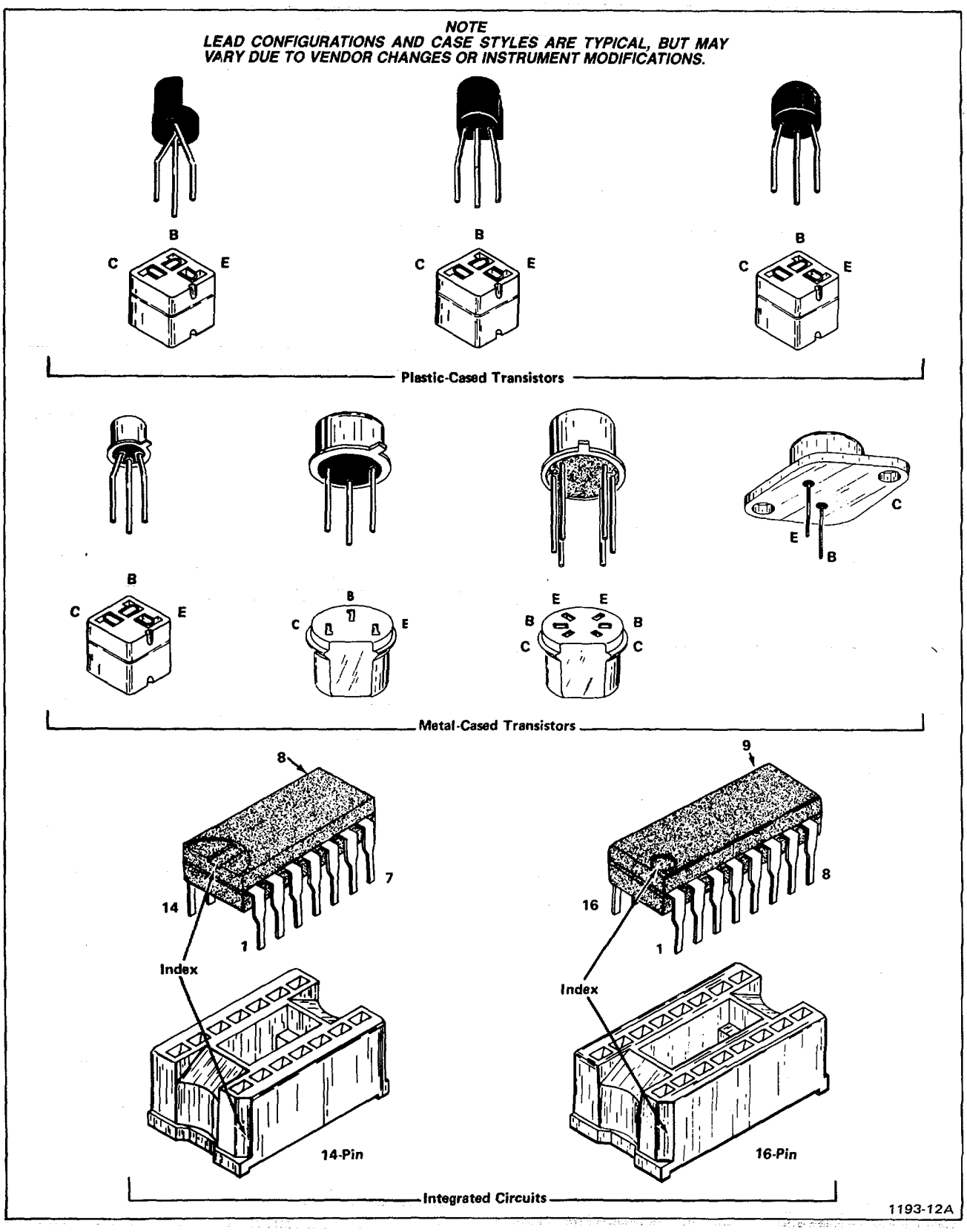


Fig 4-1. Electrode configuration for semiconductors in this instrument.

Circuit Boards. Circuit board assembly numbers are used on the diagrams and in the parts list to aid in locating the boards. Pictures of the circuit boards are located in the Diagrams section, on the back of the page opposite the circuit diagram, to aid the cross-referencing between the diagrams and the circuit-board pictures. Each electrical component on the boards is identified by its circuit number. The circuit boards are also outlined on the diagrams with a blue line to show which portions of the circuit are located on a circuit board.

Wiring Color-Code. All insulated wire and cable used in the 485 is color-coded to facilitate circuit tracing. Table 4-2 gives the wiring color-code used in this instrument.

WARNING

This color code applies to leads within the 485 only. Color code of the AC power cord is:

Black	*Line*
White	*Neutral*
Green	*Safety earth (ground)*

TABLE 4-2
Wiring Color Code

Supply or Function	Background Color	Stripe[1]
+ 15 volts	Red	Yellow
+9 volts	Red	Orange
+5.5 volts	Red	Brown
+5.0 volts	Red	Black
-5.0 volts	Violet	Black
-5.5 volts	Violet	Red
- 9 volts	Violet	Orange
- 15 volts	Violet	Yellow

Other power supply voltages are conducted by the comb connectors.

Semiconductors Lead Configuration. Fig. 4-1 shows the lead configuration for the semiconductors used in this instrument. This view is as seen from the bottom of the semiconductors.

[1]If more than one stripe appears on lead, extra stripes are for lead identification only (for circuit tracing).

Troubleshooting Equipment

The following equipment is useful for troubleshooting the 485.

1. Transistor Tester

   Description: Dynamic tester. Must be capable of measuring reverse breakdown voltages of at least 400 volts.

   Recommended type: Tektronix Type 576 Transistor Curve Tracer.

2. Multimeter

   Description, 10 megohm input impedance and 0 to 500 volts range, AC and DC; ohmmeter, 0 to 50 megohms. Accuracy, within 3%. Test probes must be insulated to prevent accidental shorting.

Note

A 20,000 ohms/volt VOM can be used to check the voltages in this instrument if allowances are made for the circuit loading of the VOM at high-impedance points.

3. Test Oscilloscope

   Description: Frequency response, DC to 100 megahertz minimum; deflection factor, 5 millivolts to 5 volts/division.

   Purpose: To check operating waveforms in this instrument.

4. Isolation Transformer

   Description: 1:1 turns ratio, 300 volt-amperes minimum rating, 50-60 cycle. Must have three-wire power cord, plug, and receptacle with ground connection carried through from input to output.

   Purpose: To isolate the 485 from the line potential when troubleshooting in the power supply.

   Recommended type: Stancor #P6298 (for 115-volt line only) modified to include three-wire power cord, plug, and receptacle.

5. Variable Autotransformer

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

Purpose: To vary the input line voltage when troubleshooting in the power supply.

Recommended type: General Radio W1OMT3W Metered Variac Autotransformer.

Troubleshooting Techniques

IMPORTANT

Special techniques are required to safely troubleshoot certain areas of this instrument. Read Troubleshooting Techniques and Special Troubleshooting Information completely before beginning actual troubleshooting.

Power Supply. 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. Table 4-3 lists the tolerances of the power supplies in this instrument. These voltages are measured between the power-supply and ground test points (on Low-Voltage Regulator board). If a power-supply voltage is within the listed tolerance, the supply can be assumed to be working correctly. If outside the tolerance, the supply may be misadjusted or operating incorrectly. Use the procedure given in the Calibration section to adjust the power supplies.

Power Supply Interaction. The semi-regulated supplies ±5.5, ±15, +25, +120, and +180 will track the adjustment of the +59.4-volt supply.

Regulated supplies ± 5.0 and ± 9.0 will track with +50. The cathode regulator will interact with both +50 and +59.4-volt supplies.

NOTE

See the specific information in this section on Troubleshooting the Power Supply for further information.

Check Voltages and Waveforms. Often the defective component can be located by checking for the correct voltage or waveform in the circuit. Typical voltages are given on the diagrams and power supply waveforms are shown in Fig. 4-2 in this section.

TABLE 4-3
Power Supply Tolerance and Ripple
(Referenced to TP GND)

Power Supply	Tolerance	Maximum Ripple (Peak to Peak)
+59.4 volts	±0.25 V	150 mV
+50 volts Cath Reg (+95 volts)	±0.1 V ±8.0 V (Beam Off)	5 mV
+5 volts	±0.1 V	10 mV
-5 volts	±0.1 V	10 mV
+9 volts	±0.15 V	10 mV
-9 volts	±0.15 V	10 mV
+15 volts	±0.25 V	20 mV
-15 volts	±0.25 V	20 mV
+25 volts	±0.6 V	50 mV
+120 volts	±2.4 V	300 mV
+180 volts	±3.6 V	1.0 volt
-2950 volts	±50.0 V	150 mV (Beam Off)

NOTE

Voltages are not absolute and may vary slightly between instruments. To obtain operating conditions similar to those used to take these readings, see the VOLTAGE CONDITIONS listed on each diagram page.

A. SEMICONDUCTORS.

CAUTION

POWER switch must be turned off before removing or replacing semiconductors.

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 which has been checked previously). 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-type testers are not recommended, since they do not check operation under simulated operating conditions.

Integrated circuits can be checked with a voltmeter, test oscilloscope, or by direct substitution. A good understanding of the circuit description is essential to troubleshooting circuits using integrated circuits. In addition, operating waveforms, logic levels, and other operating information for the integrated circuits are given in the Circuit Description section. Use care when checking voltages and waveforms around the integrated circuits so that adjacent leads are not shorted together. A convenient means of clipping a test probe to the 14- and 16-pin integrated circuits is with an integrated-circuit test clip. This device also doubles as an integrated-circuit extraction tool.

Special Troubleshooting Information

General. The following information provides a step-by-step procedure to aid in the troubleshooting of some of the more complex circuits and/or systems in the 485. A thorough understanding of the circuit operation is essential before troubleshooting in these areas. Read the applicable portions of the Circuit Description in Section 3 before proceeding with troubleshooting. This troubleshooting procedure refers to the diagrams, operating voltages, and waveforms in Section 8 and Fig. 4-2. Specifications for the troubleshooting equipment referred to in these procedures are given earlier in this section under Troubleshooting Equipment.

Troubleshooting the Power Supply. Table 4-4 gives a guide to troubleshooting the power supply of the 485.

A short on a semi-regulated supply may lower the transformer voltage so far that no supply can perform. An overloaded supply often discharges very fast when the inverter shuts off. Isolate shorts and overloads by withdrawing and replacing all connectors one by one; however, comb connectors BB, CC, DD, S, T, U, V, and W must not be removed with power on. With power off, any or all of the comb connectors can be removed for troubleshooting with an ohmmeter.

To detect a short in the -2950 V supply, perform the following: 1) Turn power off: 2) Remove comb U, and bend pin 3 to prevent contact; 3) Re-install comb U and turn power on.

If other supplies now perform correctly, locate and repair the short in the -2950 V supply. Turn power off, straighten pin 3 and re-install comb U.

WARNING

Line AC and stored DC potentials are present on the Inverter circuit board and on the transformer circuit board. The stored DC remains long after the instrument is disconnected from the power line. Verify that the line cord is disconnected and that the line storage capacitors, C1822 and C1823, are completely discharged before attempting any repairs or ohmic measurements. The stored DC voltage can be measured between TP1834 (POS) and TP1844 (NEG). If manual discharge is necessary use a 1.5k 2 W insulated resistor with insulated leads. USE EXTREME CAUTION.

TABLE 44
Power Supply Troubleshooting

Trouble Symptom	Checks to Make	Comments
Inverter starts then shuts off at slow rate (3 Hz or less).	Check Balance Node TP1951 during 20 ms "sampling period"	BAL T.P. more positive than +200 mV means short on negative supply or overcurrent in H.V. winding of T1960. BAL T.P. more negative than -200 mV means short on positive supply or high beam current. Error on BAL T.P. stops inverter. SEE BALANCE NODE NOTE preceding Fig. 4-2.
	Check inverter current TP1926 during 20 ms "sampling period"	If current remains at limit level for entire sampling period, U1910 will stop inverter. Possible short on semi-regulated supply.
	Check Line Stop TP1918 during 20 ms "sampling period". Check Line Selector switch for correct position.	If proper AC voltage from T1801 does not reach pin 4 of U1910, TP1918 will go positive stopping the inverter.

TABLE 4-4 (cont)

Trouble Symptoms	Checks to Make	Comments
Inverter starts then shuts off at fast rate (10 Hz or faster).	Check comb connector "R" for proper inverter installation.	Overvoltage Stop circuit stops inverter when connector is out.
	Check power from T1848 reaching U1910 Pin 6 = +7.5 Pin 7 = -2 V	Stop monostable will stop inverter if U1910 does not have power to function.
	Check secondary voltages for overvoltage.	Overvoltage Stop circuit stops inverter if U1910 does not regulate.
Excessive ripple on semi-regulated supplies.	Look for an open rectifier diode. Compare ripple frequency on the input capacitor of each Semi-regulated Supply	Due to symmetry of operation an open rectifier on one supply will cause ripple on all supplies.
	See Table 4-3 for max output ripple values.	Matching of the forward voltage drop of the two rectifiers in a supply may be necessary to avoid excess ripple.
Inverter won't start.	Check for blinking neon oscillator DS1824 on Inverter board.	If DS1824 is blinking, Line Input circuit is okay. If DS1824 is not blinking, check for open line fuse or other malfunction.
	Check for start pulse with AC-coupled probe at TP1835.	AC-coupled probe required due to lack of ground reference in Inverter circuit. Start pulse should occur each line cycle.
	Check Q1900 and Q1902 for shorts.	If either transistor is shorted, the inverter will not start.
Line fuse opens when power is turned on.	Check Line Selector switch for correct position.	If Line Selector is correct, check semiconductors on Inverter board with line cord disconnected and all capacitors completely discharged.
No intensity control or poor focus control (see Fig. 4-2).	Check DC restorer diodes in CRT circuit. Check for proper levels at outputs of Z Axis and Auto Focus circuits.	If diodes check okay compare circuit waveforms to those given in Fig. 4-2.
No high voltage.	Check Cathode Multiplier and Anode Multiplier circuits.	The Transformer board can be removed by first removing the Power board and Inverter board, disconnect Line Cord and wait five minutes for Line Storage capacitors to discharge before removing Inverter board.

NOTE

For additional information see circuit descriptions, Table 4-2, and circuit board connection map at the end of this section. Waveforms for comparison are given in Fig. 4-2A through Fig. 4-2P.

BALANCE NODE NOTE

The balance node (TP1951) acts as an "OR" circuit for various faults which will stop the inverter. To isolate the fault, determine the voltage level at TP1951 during the 20 ms sampling period which immediately follows the turn-on transient of approximately 6 ms. If the balance node is more positive than +200 mV, look for a short on a negative supply or over-current in the H. V. winding of T1960. A H. V. current fault is present if the voltage at TP1958 (H. V.) goes positive during the sampling period, causing CR1958 to conduct. When observing power supplies, check to see that each supply comes up to nominal value during the sampling period. If the balance node is more negative than -200 mV, look for a short on a positive supply or high beam current. A beam limit fault is present if the voltage at TP1959 (LIM) goes negative during the sampling period causing CR1959 to conduct. A fault in the vertical circuit (output leads shorted, etc.) will cause Q688 to crowbar the +25 V supply which stops the inverter via the balance node. If the relays click each time the inverter starts, some semi-regulated supplies are briefly coming up to value. Look for a fault on +25 V, Beam Limit Shutdown, or a short on one of the regulated supplies (+50, +9, -9, +5, or -5 V).

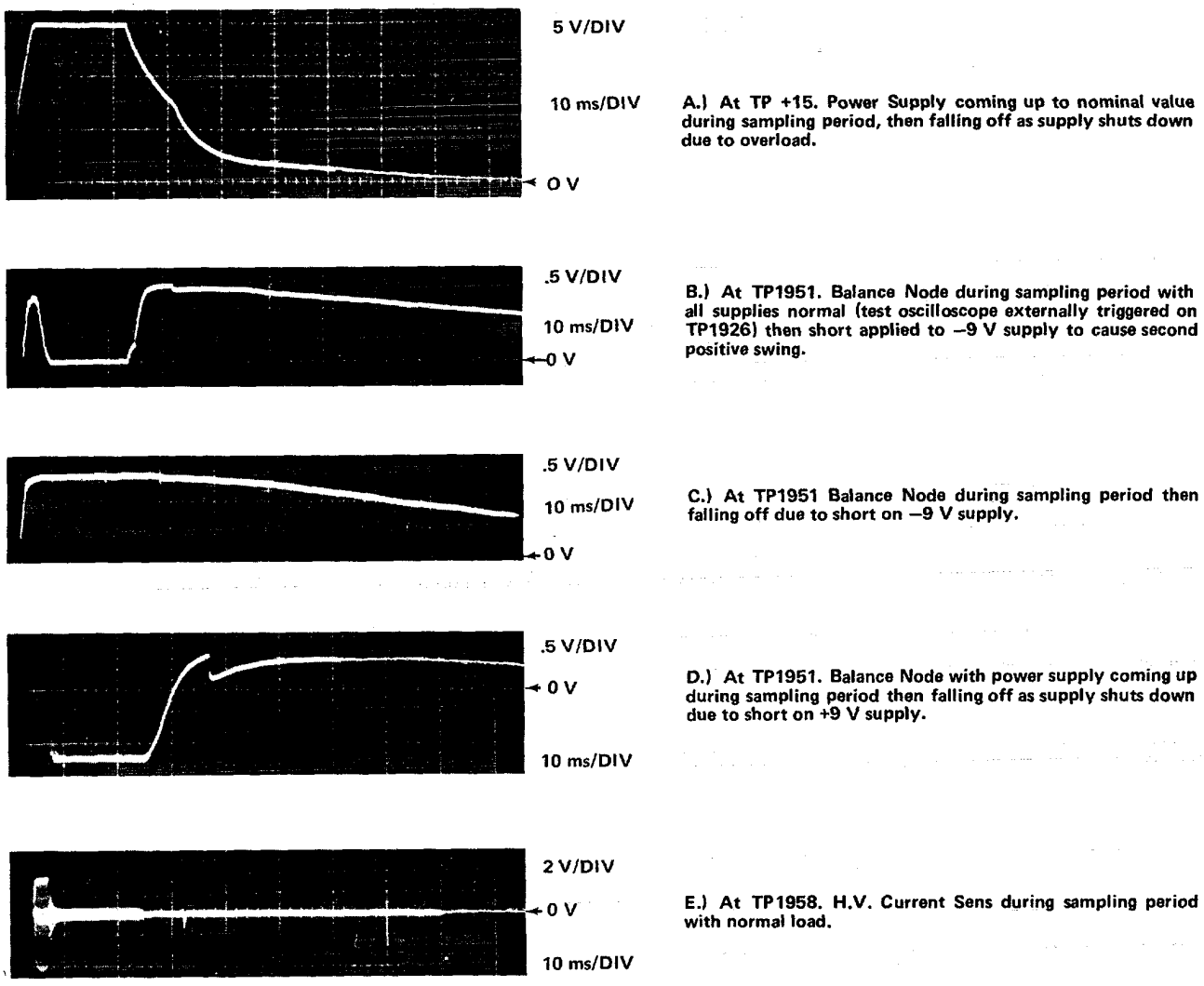
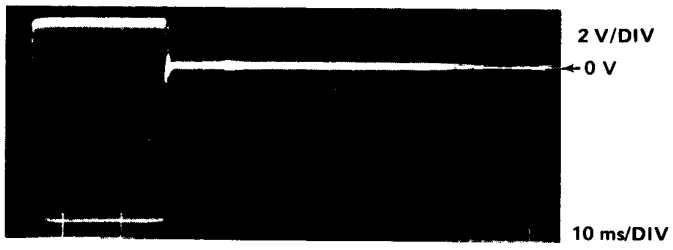
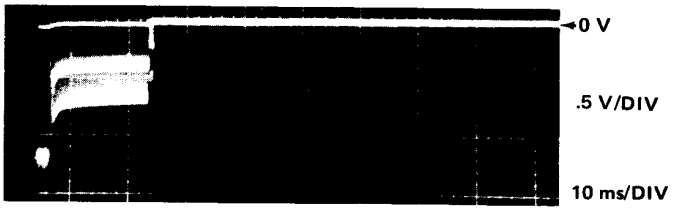


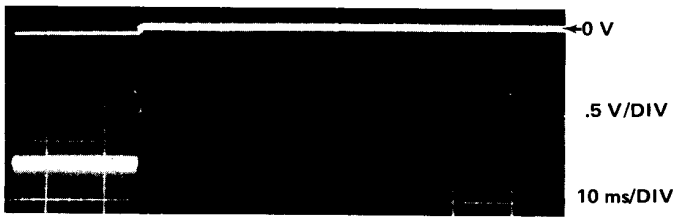
Fig. 4-2. Power Supply waveforms. Test oscilloscope internally triggered unless otherwise noted Fig. 4-2 continued on following pages.



F.) At TP1958 H.V. Current Sens during sampling period with short on −2950 supply.



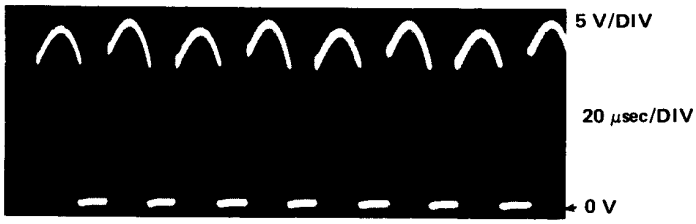
G.) At TP1926. Inverter Current Sens during sampling period with all supplies normal.



H.) At TP1926. Inverter Current Sens during sampling period with short on +15 supply.

I.) At TP1926. Inverter Current Sens during normal operation.

J.) At TP1919. Mono Ramp during normal operation.

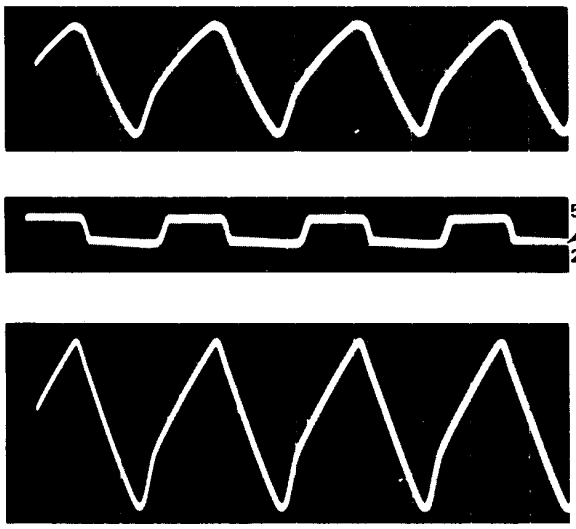


K.) At collector of Q1900 during normal operation.

L.) At TP +59.4. Ripple on +59.4 supply during normal operation (AC coupled).

M.) X10 Probe at Anode of CR1660 Normal operation with intensity off.

Fig. 4-2. Power Supply Waveforms cont.



N.) AC coupled at TP1665. Normal operation with intensity off.

O.) X10 Probe at Anode of CR1656 Normal operation with intensity off.

P.) AC coupled at TP1653. Normal operation with intensity off.

Fig. 4-2. Power Supply Waveforms cont.

CORRECTIVE MAINTENANCE

General

Corrective maintenance consists of component replacement and instrument repair. Special techniques required to replace components in this instrument are given here.

If any defective parts are located, follow the replacement procedures given in this section. Be sure to check the performance of any circuit that has been repaired or that has had any electrical components replaced.

Obtaining Replacement Parts

Standard Parts. Most electrical and mechanical parts can be obtained through your local Tektronix Field Office or representative. However, you should be able to obtain many of the standard electronic components from a local commercial source in your area. Before you purchase or order a part from a source other than Tektronix Inc., please check the electrical parts list for the proper value, rating, tolerance and description.

NOTE

When selecting replacement parts, it is important to remember that the physical size and shape of a component may affect its performance in the instrument, particularly at high frequencies. All replacement parts should be direct replacements unless it is known that a different component will not adversely affect instrument performance.

Special Parts. In addition to the standard electronic components, some special components are used in the 485. These components are manufactured or selected by Tektronix, Inc. to meet specific performance requirements, or are manufactured for Tektronix, Inc. in accordance with our specifications. Most of the mechanical parts used in this instrument have been manufactured by Tektronix, Inc. Order all special parts directly from your local Tektronix Field Office or representative.

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

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

Soldering Techniques

WARNING

Disconnect the instrument from the power source before soldering.

The reliability and accuracy of this instrument can be maintained only if proper soldering techniques are used when repairing or replacing parts. General soldering techniques which apply to maintenance of any precision electronic equipment should be used when working on this instrument. Use only 60/40 rosin-core, electronic-grade solder. The choice of soldering iron is determined by the repair to be made. When soldering on circuit boards, use a 35- to 40-watt pencil-type soldering iron with a 1/8-inch wide, wedge-shaped tip. Keep the tip properly tinned for best heat transfer to the solder joint. A higher wattage soldering iron may separate the wiring from the base material. Avoid excessive heat; apply only enough heat to remove the component or to make a good solder joint. Also, apply only enough solder to make a firm solder joint; do not apply too much solder.

CAUTION

The Vertical Preamplifier Attenuator circuit boards are made of material easily damaged by excessive heat. When soldering to these boards, do not use a soldering iron with a rating of more than approximately 15 watts. Avoid prolonged applications of heat to circuit-board connections. Use only isopropyl alcohol when cleaning this circuit board.

For metal terminals (e.g., switch terminals, potentiometers, etc.) a higher wattage-rating soldering iron may be required. Match the soldering iron to the work being done. For example, if the component is connected to the chassis or other large heat-radiating surface, it will require a 75-watt or larger soldering iron. The pencil-type soldering iron used on the circuit board can be used for soldering switch terminals, potentiometers, or metal terminals mounted in plastic holders.

Component Replacement

WARNING

Disconnect the instrument from the power source before replacing components.

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

WARNING

Line AC and stored DC potentials are present inside the power unit. This instrument should be operated with an isolation transformer whenever troubleshooting the circuitry on that board. Follow the recommended troubleshooting procedure given under Special Troubleshooting Information.

Circuit Board Replacement. If a circuit board is damaged beyond repair, the entire assembly including all soldered on components, can be replaced. Part numbers are given in the Parts List.

Most of the main circuit boards in this instrument plug onto the chassis or onto other circuit boards. Use the following procedure to remove the plug-on circuit boards (removal instructions for the exceptions will be given later).

To remove circuit boards first remove all plug-on type wiring and comb connectors. Plugs with more than one lead are indexed with the arrow on the board matching the arrow on the plug. A group of single plugs in the same area have abbreviations of the wire color silkscreened by the pin.

a. To remove circuit boards, remove all plug-on type wiring and comb connectors.

b. Remove all of the securing screws on the board.

c. Lift the board away from the instrument being careful not to bend any pins protruding from the board.

d. To replace the circuit board, position it so that the securing screws align with the mounting holes.

e. Do not tighten the securing screws until all of the comb connectors have been inserted.

f. Uniformly tighten the securing screws. Recommended torque is four to six inch-pounds.

TIMING BOARD REMOVAL.

a. Remove upper two rows of sweep board comb connectors.

b. Remove Horizontal Amplifier board.

c. Remove Sweep board.

d. Remove Inverter board (see Inverter board removal procedure).

e. Remove shield around the rear portion of the Timing board.

f. Remove Timing switch knobs.

g. Remove the blue rear panel rim.

h. Remove the blue rear panel cover (10 screws).

i. Remove the fan blade.

j. Remove 8 screws holding the Timing board.

k. Tilt outside edge of the board up and carefully lift the board out of the instrument.

I. To install, reverse the procedure.

TRANSFORMER BOARD REMOVAL.

a. Slide Inverter board out of the way (see Inverter board removal procedure).

b. Remove the Sweep board.

c. Remove the Power board.

WARNING

A high voltage charge will remain on the Post Accelerating Anode lead after the instrument has been turned off. When disconnecting the Post Accelerating lead, pull it out in a manner that it will touch and discharge to the chassis ground immediately after clearing the housing (take care to avoid discharge to the nearby Vertical Deflection connections). This procedure must be repeated every time the Post Accelerating lead is removed. If it is connected and removed without the instrument being turned on, it will have accepted a charge from the Anode Multiplier and will again be dangerous when disconnected.

d. Disconnect the Post Accelerating Anode lead (top side of instrument). Unclamp the female connection housing for this lead.

e. Remove plastic shield on rear of the Horizontal Amplifier board. Remove the two comb connectors from under the shield and the one in front of the shield.

f. Remove the blue wrap-around rear panel rim.

g. Remove the blue rear panel cover (10 screws).

h. Disconnect the three plugs with leads that are connected to the CRT base socket at the rear of the oscilloscope.

i. Unclamp the interconnecting lead to the Inverter board.

j. Remove the Transformer board mounting screws (four No. 4 screws). This does not include the two No. 6 screws (transformer mounting).

k. Slide the Transformer board out.

I. To install the Transformer board, reverse this procedure.

m. Connect all interconnecting leads.

INVERTER BOARD REMOVAL

WARNING

Line AC and stored DC potentials are present on the Inverter and Transformer boards. The stored DC remains long after the instrument is disconnected from the power line. Verify that the line cord is disconnected and that the line storage capacitors, C1822 and C1823, are completely discharged before attempting any repairs (wait three minutes after DS1824, located under the metal shield, stops flashing). The stored DC can be measured between TP1834 (POS) and TP1844 (NEG). If manual discharge is necessary use a 1.5 kΩ, 2W insulated resistor with insulated leads. USE EXTREME CAUTION.

a. Remove the metal protective shield (4 screws).
b. Remove the 4 shield mounting standoffs so that the board can come straight out.
c. Remove the comb connector and unplug the 2 pin cable.
d. Remove the 4 screws holding the Inverter board and the 4 screws holding the insulating material of the two large transistors at the rear of the board.
e. To repair the Inverter board or gain access to the Transformer board, lift the Inverter board up and turn it to one side. It is not necessary to unsolder the primary leads.
f. For complete removal of the Inverter board, unsolder the three primary leads.
g. To install the board, reverse the procedure.

Semiconductor Replacement. Semiconductors should not be replaced unless actually defective. If removed from their sockets during routine maintenance, return them to their original sockets. Unnecessary replacement of semiconductors may affect the calibration of this instrument. When semiconductors are replaced, check the operation of the part of the instrument which may be affected.

CAUTION

POWER switch must be turned off before removing or replacing semiconductors.

Replacement semiconductors should be of the original type or a direct replacement. Fig. 4-1 shows the lead configuration of the semiconductors used in this instrument. Some plastic case transistors have lead configurations which do not agree with those shown here. If a replacement transistor is made by a different manufacturer than the original, check the manufacturer's basing diagram for correct basing. All transistor sockets in this instrument are wired for the standard basing as used for metal-cased transistors. Transistors which have heat radiators or are mounted on the chassis use silicone grease to increase heat transfer. Replace the silicone grease when replacing these transistors.

WARNING

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

An extracting tool should be used to remove the 14- and 16-pin integrated circuits to prevent damage to the pins. This tool is available from Tektronix, Inc. Order Tektronix Part No. 003-0619-00. If an extracting tool is not available when removing one of these integrated circuits, pull slowly and evenly on both ends of the device. Try to avoid having one end of the integrated circuit disengage from the socket before the other, as this may damage the pins.

Interconnecting Pin Replacement. The following information provides the replacement procedure for the various types of interconnecting methods.

A. CIRCUIT-BOARD PINS.

NOTE

A circuit-board replacement kit including necessary tools, instructions and replacement pins is available from Tektronix, Inc. Order Tektronix Part No. 040-0542-00.

To replace a pin which is mounted on a circuit board, first disconnect any pin connectors. Then, unsolder the damaged pin and pull it out of the circuit board with a pair

of pliers. Be careful not to damage the wiring on the board with too much heat. Ream out the hole in the circuit board with a 0.031-inch drill. Remove the ferrule from the new interconnecting pin and press the new pin into the hole in the circuit board. Position the pin in the same manner as the old pin. Then, solder the pin on both sides of the circuit board. If the old pin was bent at an angle to mate with a connector, bend the new pin to match the associated pins.

B. CIRCUIT BOARD PIN SOCKETS.

The pin sockets on the circuit boards are soldered to the rear of the board. To replace one of these sockets, first unsolder the pin (use a vacuum-type desoldering tool to remove excess solder). Then, straighten the tabs on the socket and remove it from the hole in the circuit board. Place the new socket in the circuit-board hole and press the tabs down against the board. Solder the tabs of the socket to the circuit board; be careful not to get solder into the socket.

NOTE

The spring tension of the pin sockets ensures a good connection between the circuit board and the pin. This spring tension can be destroyed by using the pin sockets as a connecting point for spring-loaded probe tips, alligator clips, etc.

C. END-LEAD PIN CONNECTORS.

The pin connectors used to connect the wires to the interconnecting pins are clamped to the ends of the associated leads. To replace damaged end-lead pin connectors, remove the old pin connector from the end of the lead and clamp the replacement connector to the lead.

Some of the pin connectors are grouped together and mounted in a plastic holder; the overall result is that these connectors are removed and installed as a multi-pin connector. To provide correct orientation of this multi-pin connector when it is replaced, an arrow is stamped on the circuit board or chassis and a matching arrow is molded into the plastic housing of the multi-pin connector. Be sure these arrows are aligned as the multi-pin connector is replaced. If the individual end-lead pin connectors are removed from the plastic holder, note the color of the individual wires for replacement.

Cathode-Ray Tube Replacement. To replace the cathode-ray tube, proceed as follows:

WARNING

Use care when handling a CRT. Protective clothing and safety glasses should be worn. Avoid striking it on any object which might cause it to crack or implode. When storing a CRT, place it in a protective carton or set it face down in a protected location on a smooth surface with a soft mat under the faceplate to protect it from scratches. A high voltage charge remains on the Post Accelerating Anode lead after the instrument has been turned off. When disconnecting the Post Accelerating lead pull it out in a manner that it will touch and discharge to the chassis ground immediately after clearing the housing (take care to avoid discharge to the nearby vertical deflection connections). This procedure must be repeated every time the Post Accelerating lead is removed. If it is connected and removed without the instrument being turned on, it will have accepted a charge from the Anode Multiplier and will again be dangerous when disconnected.

1. Disconnect Post Accelerating lead.
2. Disconnect the 6 CRT deflection plate leads.
3. Remove rear panel for access to CRT base.
4. Remove CRT base connector.
5. Remove four screws from CRT bezel and remove bezel from the front of the instrument.
6. Push CRT carefully out the front of the instrument.

REPACKAGING FOR SHIPMENT

If the Tektronix instrument is to be shipped to a Tektronix Service Center for service or repair, attach a tag showing: owner (with address) and the name of an individual at your firm that can be contacted. Include complete instrument serial number and a description of the service required.

Save and re-use the package in which your instrument was shipped. If the original packaging is unfit for use or not available, repackage the instrument as follows:

Surround the instrument with polyethylene sheeting to protect the finish of the instrument. Obtain a carton of corrugated cardboard of the correct carton strength and having inside dimensions of no less than six inches more than the instrument dimensions. Cushion the instrument by tightly packing three inches of dunnage or urethane foam between carton and instrument, on all sides. Seal carton with shipping tape or industrial stapler.

The carton test strength for your instrument is 275 pounds.

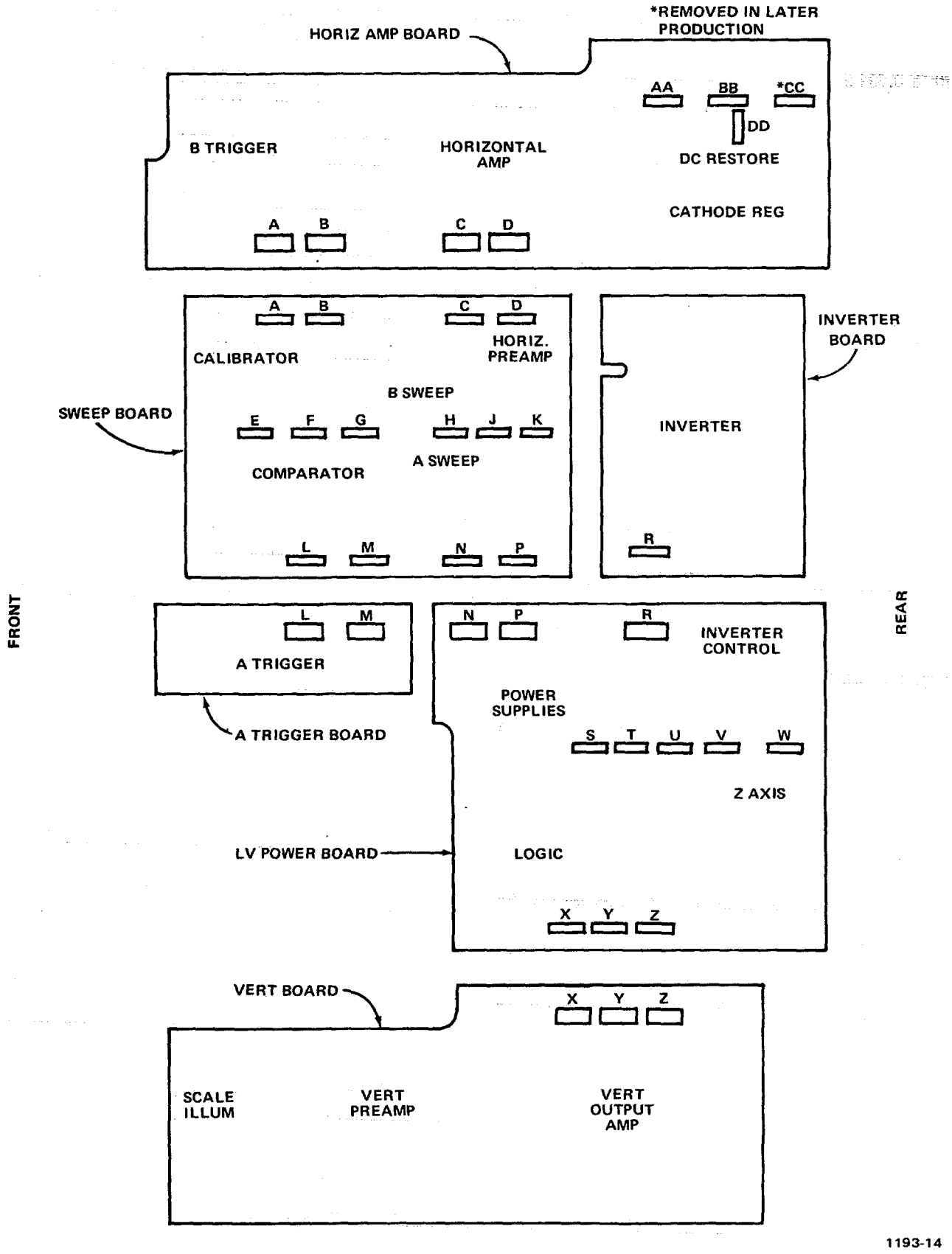


Fig. 4-3. Interboard comb connection locations

CALIBRATION

Introduction

To ensure instrument accuracy, check the calibration of the 485 after every 1000 hours of operation, or every six months if used infrequently. Before complete calibration, thoroughly clean and inspect the instrument as outlined in the Maintenance Section.

TEKTRONIX Field Service

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

Using This Procedure

Part 1 - Performance Check. Performance of this instrument can be checked without removing the covers or making internal adjustments. This procedure checks the instrument against the SPECIFICATION tolerances (Section 1). Screwdriver adjustments accessible from the outside of the instrument are adjusted in this procedure.

Part 2 - Calibration Procedure. Completion of each step in this procedure ensures that this instrument is correctly adjusted and performing within all listed tolerances.

Partial Calibration. A partial check or adjustment is often desirable after replacing components, or to touch up the adjustment of a portion of the instrument between complete recalibrations. To check or adjust only part of the instrument, set the controls according to Preliminary Control Settings, then start with the major section containing the part to be adjusted (horizontal, vertical, or triggers). To avoid unnecessary recalibration of other parts of the instrument, readjust only if the tolerance given in the CHECK part of the step is not met. If readjusted, also check the calibration of any other steps listed in the INTERACTION part of this step.

TEST EQUIPMENT REQUIRED

The following test equipment and accessories, or its equivalent, is required for complete calibration of the 485. The equipment specifications given are the minimum necessary for accurate calibration and may be less than those of the listed test equipment. The test equipment must be operating within the listed specifications and correctly calibrated.

Not all of the listed test equipment is required for the Performance Check; those items not required for the Performance Check are indicated by footnote 1.

If equipment substitutes are made, the calibration setup may have to be altered to fit the requirements of that equipment. Detailed operating instructions for the test equipment are not given in this procedure. Refer to the test equipment instruction manual if further instruction is needed.

Special Calibration Fixtures

Special TEKTRONIX calibration fixtures are used in this procedure only where they aid instrument calibration. These special calibration fixtures are available from Tektronix, Inc. Order by part number through your local TEKTRONIX Field Office or representative.

Calibration Equipment Alternatives

All of the test equipment listed is required to completely check and adjust this instrument. Complete checking or adjustment, however, may not always be necessary or desirable. The user may only check selected characteristics, thereby reducing the amount of test equipment actually required. For example, the basic measurement capabilities of this instrument can be verified by checking vertical deflection accuracy using the two Standard Amplitude Calibrators; bandwidth and triggering using the two Constant-Amplitude Signal Generators; and horizontal timing accuracy using the Time-Mark Generator.

TABLE 5-1
TEST EQUIPMENT

Description	Minimum Specifications	Usage	Examples of Applicable Test Equipment
Precision Multimeter (DVM)[1]	Range 0 to 180 V; accuracy within 0.01%.	Adjust: CAL 5 V. +59.4 and 50 V supplies; Vert Comp Plates; Grid Bias; Auto Focus; Main Vert Gain; 50 Q Input Impedance. Check: Vert Linearity.	Data Precision Digital Multimeter Model 2400.
DC Voltmeter (VOM)[1]	0 to 4000 V; accuracy within 2%.	High Voltage measurement.	Triplett Model 630-NA or a precision divider with the DVM.
Time-Mark Generator	Marker output 2ns to 0.5s within 0.1% accuracy; trigger output 50 ns.	Adjust: Geometry; Horiz Gain; Cal 5 V freq; Y Axis; A timing; B timing; Differential timing; Delay Jitter.	TEKTRONIX Type 184 Time-Mark Generator. TEKTRONIX 2901Time-Mark Generator.
Medium-Frequency Constant-Amplitude Signal Generator	2 MHz to 50 MHz; reference frequency, 50 kHz; output amplitude, 50 mV to 2 V P-P into 50 Ω; output accuracy, within 2%.	Adjust: A and B trigger; X-Y phasing. Check: Ext Z Axis blanking; CMR; Ext Trigger; Single Sweep; X-Y Bandwidth; Bandwidth limit.	TEKTRONIX Type 191 Constant Amplitude Signal Generator.
High-Frequency Constant-Amplitude Signal Generator	Frequency, 100 to 350 MHz; output amplitude, 0.5 to 5 V; reference frequency, 3 MHz; accuracy within 1%.	Vertical bandwidth check.	TEKTRONIX 067-0532-01 Calibration Fixture.
Test Oscilloscope	Bandwidth, DC to 100 MHz; deflection factor, 5 mV/div; accurate within 2%.	Adjust: Z Axis Compensation and risetime; Auto Focus; CH 1 Trigger Gain.	TEKTRONIX 465 with P6065 X10 probe.
Amplitude Calibrator and Comparator	Amplitude, 20 mV to 100 V; accurate to 0.25%.	Adjust: 1 MΩ amplifier gain. Check: 1 MΩ deflection factor. Ext Trig Level range.	TEKTRONIX 067-0502-01 Calibration Fixture.
50 Ω Amplitude Calibrator	12 mV to 2 V range.	Adjust: CH 1 and CH 2 Gain; Invert Gain; Added Mode Gain; X-Y Gain. Check: 50 Ω and 1 ME, Gain match.	TEKTRONIX 067-0508-00 Calibration Fixture.
Tunnel Diode Pulser	Driven by the Type 106 Square-Wave Generator.	Adjust: 50 Ω and 1 MΩ transient response. Check: Ext Trig Delay Match; A Ext Trig response.	TEKTRONIX 067-0681-01 Calibration Fixture.

[1] Not required for Performance Check.

TABLE 5-1
TEST EQUIPMENT (cont)

Description	Minimum Specifications	Usage	Examples of Applicable Test Equipment
Square-Wave Generator	Frequency Range, 100 Hz to 100 kHz; Amplitude variable 0.5 to 12 V.	Adjust: 50 Ω high frequency transient response; 50 &2 low frequency transient response; 1 MΩ 10 kHz transient response ; 1 MΩ input attenuator compensations; Ext Trig indent delay match; A Ext Trig response.	TEKTRONIX Type 106 Square-Wave Generator.
2X Attenuator' (2 required)	Impedance, 50 Ω accuracy, 2%; BNC connectors.	Used throughout the procedure for signal attenuation.	TEKTRONIX Part No. 011-0069-02.
5X Attenuator[1]	Impedance, 50 Ω; accuracy, 2%; BNC connectors.	Used throughout the procedure for signal attenuation.	TEKTRONIX Part No. 011-0060-02.
10X Attenuator	Impedance, 50 Ω; accuracy, 2%; BNC connector.	Used throughout the procedure for signal attenuation.	TEKTRONIX Part No. 011-0059-02.
T Connector	Connector, BNC.	Ext Trig checks.	TEKTRONIX Part No. 103-0030-00.
Termination (2 required)	Impedance, 50 Ω; accuracy, 2%; connectors, BNC.	CMR check.	TEKTRONIX Part No. 011-0049-01.
Cable (2 required)	Impedance, 50 Ω; type RG-58/U; length, 42 inch; connectors, BNC.	Used throughout the procedure for signal interconnection.	TEKTRONIX Part No. 012-0057-01.
GR thru-line termination	Impedance, 50 Ω; accuracy, 2%; connectors, GR874 to BNC male.	1 MΩ bandwidth check.	TEKTRONIX Part No. 017-0083-00.
Adapter	GR874 to BNC male.	50 Ω vertical bandwidth check.	TEKTRONIX Part . No. 017-0064-00.
Screwdriver	Three-Inch shaft, 3/32 inch bit.	Used throughout the procedure to adjust variable resistors.	Xcelite R-3323.
Low Capacitance Screwdriver[1]	1 1/2 inch shaft.	Used throughout the procedure to adjust variable capacitors.	TEKTRONIX Part No. 003-0000-00.
Nylon Tuning Tool	Fits 5/64 inch (ID) hex cores.	X-Y phasing.	Handle and insert TEKTRONIX Part No. 003-0307-00 and 003-0310-00.

[1] Not required for Performance Check.

TABLE 5-1
TEST EQUIPMENT (cont)

Description	Minimum Specifications	Usage	Examples of Applicable Test Equipment
Input RC Normalizer[1]	1 MΩ x 20 pF; attenuation, 2X; connector, BNC.	1 MΩ, input attenuator compensations.	TEKTRONIX Part No. 067-0538-00.
Cable	Impedance, 50 Ω; type RG-58/U; length, 18 inches; connectors, BNC.	Used throughout the procedure for signal interconnection.	TEKTRONIX Part No. 012-0076-00.
Dual Input Cable, BNC	Dual BNC.	Inserting identical signals into both channels.	TEKTRONIX Part No. 067-0525-00.

TABLE 5-2
TEST EQUIPMENT FOR OPTIONAL CHECK

Characteristic	Performance Requirement	Supplemental Information
VSWR AUTOTESTER with GRATICULE	100 to 350 MHz.	WILTRON COMPANY, Model 67.
561 B/2B67/3A9	2 µ V sensitivity.	Differential Amplifier.
or		
5103N/5B10N/5A22N	20 µ V sensitivity.	Differential Amplifier.
or		
7403N/7B50/7A22	20 µ V sensitivity.	Differential Amplifier.

PART 1 - PERFORMANCE CHECK

Connect the 485 to a power source which meets the specified voltage and frequency requirements. Press the POWER pushbutton to turn the 485 on and allow a 20 minute instrument warmup before commencing the Performance checks. The Performance checks in Part 1 of this section may be performed anywhere within the -15° C to +55° C operating ambient temperature range unless otherwise specified.

1. CHECK EXT Z AXIS BLANKING

a. Apply 0.2 V P-P of 20 MHz from Type 191 Signal Generator to EXT Z AXIS blanking (rear panel) and A EXT TRIG; A SOURCE SW to EXT; HORIZ DISPLAY to A; TIME/DIV to 0.1 µs.
b. Adjust trigger LEVEL for TRIG'D LIGHT.
c. At normal intensity, check for intensity modulation.
d. Change generator to 2 V P-P of 2 MHz; set TIME/ DIV to 0.5 µs.
e. Turn INTENSITY higher and check for intensity modulation.

2. CHECK OUTPUT WAVEFORMS (With Sweeps Running at 1 ms/div)

a. With test oscilloscope, check the following outputs (located on the rear panel).
b. A and B GATES, approximate amplitude 4 V (0.5 V into 50 Ω).
c. A SAWTOOTH, approximate amplitude to 10 V (0.5 V into 50 Ω).

3. ADJUST TRACE ROTATION

a. Position trace to graticule center.

b. Adjust TRACE ROTATION (rear panel) so trace parallels the center graticule line.

4. CHECK B SWEEP TIMING ACCURACY

a. Check timing over center eight graticule divisions.

b. Position one time mark to 1 and read error at 9.

NOTE

+15° C to +35° C	-15° C to +55° C
1 ns to 20 ns; within 0.24 division (3%)	0.4 div (5%)
50 ns to 0. 1 s; within 0. 16 division (2%)	0.32 div (4%)
0.2 s and 0.5 s; within 0.24 division (3%)	0.4 div (5%)

5. CHECK A SWEEP TIMING ACCURACY

NOTE

+15° C to +35° C	-15° C to +55° C
1 ns to 20 ns; within 0.24 division (3%)	0.4 div (5%)
50 ns to 0.1 s; within 0.16 division (2%)	0.32 div (4%)
0.2 s to 0.5 s; within 0.24 division (3%)	0.4 div (5%)

6. CHECK DELAY TIME ACCURACY, 10 ns/div to 0.5 s/div (+15° C to +35° C only)

a. Use time marks that give 1 to 5 markers/div on the A display. Use B TIME/DIV of 1 ns for A TIME/DIV settings of 10 ns through 0.1 µs. For A TIME/DIV setting of 0.2 µs and slower, maintain an A:B ratio of 100:1.

b. Set the DELAY TIME POSITION (DTP) dial exactly to the reference position (1.0 except as shown in table below). Use the horizontal POSITION control to move the marker on the B display to a reference position.

c. Rotate the DTP to 9.0 and then slightly from 9.0 to place the B display marker to the same screen reference position. Read the error from (9.00) in minor dial divisions on the DTP dial.

A Time/Div	Reference DTP Position	Maximum DTP Dial Error at Setting near 9.0 (minor divisions)
10 ns	4.0	7
20 ns	2.0	9
50 ns to 1 ms	1.0	5
2 ms to 0.5 s	1.0	9

7. CHECK B ENDS A OPERATION

a. HORIZ DISPLAY to INTEN; A TIME/DIV to 1 ms; B TIME/DIV to 0.1 ms; A TRIGGER HOLDOFF to B ENDS A; SWEEP MODE to AUTO.

b. Rotate DTP; check that sweep ends after the intensified zone.

8. CHECK CH 1 LIGHT EMITTING DIODES (LED'S)

a. Check that the probe lights the corresponding LED, e.g., X10 probe lights X10 LED.

b. Check that CH 2 LED'S are off with VERT MODE in CH 1.

c. Check that CH 1 LED'S are on in CH 1, ALT, CHOP, ADD, and X-Y.

d. If probes are not available: an 11 kΩ resistor to ground from the code ring (around each input BNC) lights the X10 LED. A 6.8 kΩ resistor lights the X100 LED and a short circuit causes trace ident.

9. CHECK CH 2 LED'S

a. Check that the probe lights the corresponding LED.

b. Check that CH 1 LED'S are off with VERT MODE in CH 2.

c. Check that CH 2 LED'S are on in CH 2, ALT, CHOP, ADD, and X-Y.

10. CHECK TRACE !DENT FUNCTION CH 1 and CH 2

a. Check TRACE IDENT function on the probe, shifts the trace approximately 0.2 div up.

b. Check that the LED for that channel turns off.

11. CHECK INPUT LIGHTS CH 1 and CH 2

a. Check that 50 Ω is lit when 50 Ω/1 MΩ pushbutton is out.

b. Check that 1 Ω, is lit when 50 Ω/1 MΩ pushbutton is in.

12. CHECK BEAM FINDER

a. Check that trace remains within the graticule area with BEAM FINDER depressed.

b. Check beam finder operation under all combinations of HORIZONTAL, CH 1 and CH 2 POSITION controls.

13. CHECK 50 W DEFLECTION FACTOR ACCURACY, ± 2%, CH 1 and CH 2

a. Use the 50 Ω Amplitude Calibrator square wave as the signal source. Use 6 division display except at 0.5 V/div and above, where 2 V signal must be used.

b. Adjust GAIN for zero error in 20 mV/div position.

c. Check for ± 2% deflection factor accuracy of all VOLTS/DIV positions.

14. CHECK 1 MW DEFLECTION FACTOR ACCURACY, ± 2%, CH 1 and CH 2

a. Use the Standard Amplitude Calibrator square wave as the signal source. Use 4 or 5 division display.

b. Adjust GAIN for zero error in 20 mV/div position.

c. Check for ± 2% deflection factor accuracy of all VOLTS/DIV positions.

15. CHECK COMMON MODE REJECTION, 50 W and 1 MW

a. Connect the Type 191 Signal Generator to CH 1 and CH 2 thru the 10X attenuator and dual BNC input cable (TEKTRONIX Part No. 067-0525-00).

b. CH 1 and CH 2 inputs 50 Ω, DC; VOLTS/DIV to 20 mV; VERT MODE to CH 1. Apply 8 divisions of 50 kHz signal.

c. Set VERT MODE to ADD; CH 2 INVERTED. Push to release CH 2 VARIABLE GAIN and adjust for minimum deflection.

d. Set Type 191 Signal Generator to 50 MHz and check for 0.8 div or less of vertical deflection.

e. Change generator to 50 kHz, and inputs to 1 MΩ. Add 50 Ω BNC termination's at inputs.

f. Readjust CH 2 VARIABLE GAIN for minimum deflection.

g. Change generator to 50 MHz and check for 0.8 div or less of vertical deflection.

h. Push CH 2 VARIABLE GAIN to CAL.

16. CHECK BANDWIDTH 50 W and 1 MW, CH 1 and CH 2

a. Use 6 div of 3 MHz from the High-Frequency Constant-Amplitude Sine-Wave Generator (TEKTRONIX Part No. 067-0532-01) as reference.

b. Check for a minimum of 4.2 divisions of signal at 350 MHz in the 50Ω input mode. (4.2 divisions at 300 MHz +35° C to +55° C.)

c. Select the 1 MΩ impedance; terminate the Sine-Wave Generator into the GR 50Ω thru-line termination.

d. Use 6 div of 3 MHz from the Sine-Wave Generator as reference.

e. Check for a minimum of 4.2 divisions of signal at 250 MHz. (4.2 divisions at 200 MHz +35° C to +55° C.)

17. CHECK TRIGGER SENSITIVITY A and B

a. Check in AC, LF REJ, and DC with source switch in INT, that triggering occurs on 0.3 div of 3 MHz, 0.3 div of 50 MHz and 1.5 div of 350 MHz.

b. Set SOURCE switch to EXT; signal applied to vertical input and EXT TRIG.
c. Check that the instrument triggers on 20 mV of 50 MHz and 100 mV of 350 MHz signal.

18. CHECK SINGLE SWEEP

a. Trigger on 0.5 div of 50 MHz.
b. Remove signal and go to SINGLE SWEEP.
c. READY lamp should light.
d. Apply signal; one sweep should occur and READY lamp should go off.
e. Remove signal and reset. The READY lamp should light.

19. CHECK X-Y PHASING

a. Connect CH 1 and CH 2 to Type 191 Signal Generator by the dual BNC input cable connector. Set CH 1 to 50 mV and CH 2 VOLTS/DIV to 20 mV/div, VERT MODE to X-Y, and ground CH 1 input.
b. Apply 10 div of 50 kHz.
c. Set CH 1 input to DC.
d. Switch Type 191 Signal Generator to 4 MHz.
e. Check for less than 0.52 div of vertical opening at center of lissajous figure (3%).

20. CHECK X-Y BANDWIDTH

a. GND CH 1, then apply 6 div of 50 kHz to CH 2.
b. Check for at least 4.2 div at 4 MHz.

21. CHECK CALIBRATOR AMPLITUDE

a. Set CH 1 VOLTS/DIV to 1 V; CH 1 input to 1 MΩ ; apply 5 V of Amplitude Calibrator and Comparator signal to CH 1; adjust CH 1 VARIABLE volts/div for 5 divisions of deflection. Use separate 1 MΩ test oscilloscope for 485-2.
b. Connect CAL 5 V to CH 1 input.
c. Check for 5 divisions of signal ± 0.025 div (0.5%). (Outside +15° C to +35° C range check for 0.05 div 1%.)
d. Set input impedance to 50 Ω; apply 0.6 V from 50 Ω Amplitude Calibrator. Set VOLTS/DIV to 0.1 V; adjust VARIABLE for 6 divisions of deflection: Connect CAL 5 V to CH 1 input.
e. Check for 5 divisions of signal, ± 0.05 div (1.0%). (Outside +15° C to +35° C range check for 0.25 div 1.5%.)

22. CHECK CALIBRATOR FREQUENCY (+15° C to +35° C, 0.25%; -15° C to +55 °C, 0.5%)

a. Set TIME/DIV to 0.2ms/div; INT TRIG to CH 1; VERT MODE to ALT.
b. Apply 1 ms markers from the Time-Mark Generator to CH 1 50Ω input; connect CAL FREQ 1 kHz to CH 2 50Ω input.
c. Set VOLTS/DIV to obtain about 2 div of signal, for CH 1 and CH 2.
d. Trigger display (markers).
e. Check for less than 2.5 cycles (10 div) of drift in one second. (Outside +15° C to +35° C range check for same drift in one-half second.)
f. Set TIME/DIV to 1 ms/div; INT TRIG to NORM; CAL FREQ to 1 MHz; change markers to 1 µs.
g. Trigger at top of waveform from the CW end of trigger LEVEL. Use A TRIGGER HOLDOFF to obtain display showing the beat frequency.
h. Check for beat period greater than 400 µs. (Outside +15° C to +35° C range check for beat period greater than 200 µs.)

23. CHECK CALIBRATOR 1 kHz DUTY CYCLE (49.8 to 50.2%)

a. Connect 1 kHz of CAL 5 V to CH 1 input. CH 1 impedance to 50 Ω; CH 1 VOLTS/DIV to 0.1 V; INT TRIG to NORM; A TIME/DIV to 0.1 ms; B TIME/DIV to 1 µs;

HORIZ DISPLAY to INTEN; B TRIGGER SOURCE to B RUNS AFTER DELAY TIME.

b. Trigger A on + SLOPE. Use DELAY TIME POSITION control to position the intensified portion of the negative step near center screen.

c. Switch HORIZ DISPLAY to B and position the negative step to center screen.

d. Switch A SLOPE polarity and check that the transition changes less than 3 divisions horizontally.

24. CHECK DELAY JITTER

a. Set A TIME/DIV to 1 ms; B trigger source to B RUNS AFTER DELAY TIME. Set B TIME/DIV to 1 µs and Time-Mark generator to 1 ms. Set HORIZ DISPLAY to ALT; use A trigger LEVEL to obtain a stable display.

b. Set HORIZ DISPLAY to B. Rotate DELAY TIME POSITION dial from 1 to 9, checking for 0.5 div of jitter or less on B display.

25. CHECK INPUT PROTECTION TRIP LEVELS for CH 1 and CH 2

a. Set Type 106 High Amplitude control to minimum; Frequency to 1 kHz and Symmetry for 50% duty cycle. Set CH 1 and CH 2 inputs to DC; VOLTS/DIV to 2 V; position trace to top graticule line; input impedance to 50 Ω.

b. Connect Type 106 High Amplitude to CH 1 input; slowly increase Type 106 amplitude.

c. Check that the input disconnects (trace returns to top graticule line) and reset lamp lights after the trace crosses the 2.8 graticule division point and before it reaches the 4.25 division point. Return Type 106 amplitude to minimum and repeat for CH 2.

PART 2 - 485 CALIBRATION PROCEDURE

Remove the wrap-around cover as described in the Maintenance Section.

Connect the 485 to a power source which meets specified voltage and frequency requirements. Press the POWER pushbutton to turn the 485 on and allow it to warmup for at least 20 minutes before commencing Part 2 Calibration procedure. This instrument should be adjusted at an ambient temperature of +25° C (±5° C) for best overall accuracy.

Preliminary Control Settings

CONTROL		CONTROL	
INTENSITY	CCW	SWEEP MODE	NORM TRIG
B INTENSITY	CCW	A and B TRIGGER	
SCALE ILLUM	CCW	COUPLING	AC
BW LIMIT	OFF	LEVEL	MIDR
CH 1 and CH 2		SLOPE	+
VOLTS/DIV	0.1 V	A TRIGGER SOURCE	INT
VARIABLE	CAL	B TRIGGER SOURCE	B RUNS AFTER DELAY TIME
INPUT	GND	POSITION (HORIZ)	MIDR
POSITION	MIDR	HORIZ DISPLAY	A
1 MΩ /50Ω	50Ω	TRACE SEPARATION	MIDR
VERT MODE	CH 1	CAL 5 V FREQ	1 MHz
INT TRIG	NORM	TIME/DIV	1 ms
CH 2 POLARITY	+ UP	DELAY TIME POSITION	4.00

1. CHECK +59.4 V SUPPLY (±0.06 V)

a. Using DVM measure at +59.4 V test point on Power Supply board.

b. If necessary adjust +59.4 (R1940).

c. INTERACTION will affect the operation of most circuits in the 485.

2. CHECK +50 V SUPPLY (±0.05 V)

a. Measure at +50 V test point on Power Supply board.

b. If necessary adjust +50 V (R2048).

c. INTERACTION will affect the operation of most circuits in the 485.

3. CHECK LOW VOLTAGE SUPPLIES (Use Ground Reference Test Point on Power Supply Board)

5V ± 0.1V	-9V ± 0.15V
+15V ± 0.25V	+9V ± 0.15V
-5 V ± 0.1 V	+25 V ± 0.6 V
-15 V ± 0.3 V	+120 V ± 2.4 V
-5.5 V ± 0.25 V	+180 V ± 3.6 V
+5.5 V ± 0.25 V	

4. CHECK CALIBRATOR AMPLITUDE

a. Remove Q2114 located on Sweep board near Calibrator output.
b. Using DVM measure voltage at CAL 5 V output on front panel. Record the voltage.
c. Remove Q2124.
d. Check that CAL 5 V output is 5 V more positive (±5 mV) than the voltage recorded in step b.
e. If necessary adjust CAL 5 V (R2130).
f. Replace Q2114 and Q2124.

5. ADJUST CALIBRATOR FREQUENCY

a. Set TIME/DIV to 0.2 ms; INT TRIG to CH 1;VERT MODE to ADD.
b. Apply 1 ms markers from the Time-Mark Generator to CH 1 50 Ω input; connect CAL 5 V, FREQ 1 kHz to CH 2.
c. Set VOLTS/DIV to obtain about 2 div of signal.
d. Trigger display (markers).
e. Adjust 1 kHz (R2105) for less than 0.5 cycles (2.5 div) of square wave (calibrator) drift in 1 second. (0.5 Hz/1 kHz = 0.0005 or 0.05%).
f. Set TIME/DIV to 2ms; INT TRIG to NORM; coupling to DC; CAL 5 V frequency to 1 MHz; Time-Mark Generator to 1 µs; VERT MODE to ADD.
g. Trigger at top of waveform from the CW end of trigger LEVEL. Use A TRIGGER HOLDOFF to obtain display showing the beat frequency.
h. Adjust 1 MHz (R2100) for beat period greater than 2 ms. (0.5 kHz/1 MHz = 0.0005 or 0.05%.)

6. CHECK CALIBRATOR 1 kHz DUTY CYCLE (49.8 to 50.2%)

a. Connect 1 kHz of CAL 5 V to CH 1 input; CH 1 impedance to 50 Ω; CH 1 VOLTS/DIV to 0.1 V; INT TRIG to NORM; A TIME/DIV to 0.1 ms; B TIME/DIV to 1 ms; HORIZ DISPLAY to INTEN; B TRIGGER SOURCE to B RUNS AFTER DELAY TIME.
b. Trigger A on + SLOPE; use DELAY TIME POSITION control to position the intensified portion of the negative step near center screen.
c. Switch HORIZ DISPLAY to B and position the negative step to center screen.
d. Switch A SLOPE polarity and check that the transition changes less than 3 divisions horizontally.

7. CHECK CATHODE REGULATOR +95V (±8 V)

a. Set INTENSITY controls CCW.
b. Measure at CATH REG test point on rear of Horizontal Amp board.
c. If necessary adjust R1625 located next to CATH REG test point.

8. CHECK -3000 V for ±50 V; or ±500 V With VOM Accurate to 2% (this voltage is marked -2950 in some instruments)

a. Make this measurement using the precision divider in conjunction with the precision DC voltmeter, or use high voltage scale of 2% VOM.
b. Measure through hole in plastic cover at rear of Horizontal Amp board.
c. This voltage should be within the -2950 to -3050 V range because of correct adjustments performed in steps 1, 2, and 7.

9. CHECK COMPENSATION PLATE VOLTAGE

NOTE

Adjustments and test points are accessible from the top of the instrument.

a. Set SWEEP MODE to AUTO TRIG.
b. With vertical POSITION control center the trace.
c. With DVM measure the two vertical deflection plate voltages at the CRT neck pins fed from the output of U660. (May need 1 kΩ resistor in series with the test leads to prevent vertical oscillations.)
d. Calculate the average of two voltages.
e. Connect DVM to COMP PL test point located next to the COMP PL potentiometer at rear of Horizontal Amp board.
f. Check for the calculated voltage, ±0.3 V.
g. If necessary adjust COMP PL (R1796).

10. ADJUST GRID BIAS

a. With low intensity level, set VERT MODE to X-Y.
b. Adjust FOCUS and ASTIG (rear panel) for optimum spot size.
c. Set INTENSITY and B INTENSITY CCW.
d. Connect DVM to Z OUT DC test point (at rear of Power Supply board) and note the DC voltage (normally in the +7 to +11 V range).
e. With the INTENSITY control, increase the DVM reading by 4 V.
f. Adjust GRID (R1660), located at rear of Horizontal Amp board, so that the CRT spot is at the threshold of visibility in low ambient light.

11. CHECK Z AXIS COMPENSATION and RISE-TIME

NOTE

Adjustments and test points are located at the rear of the Power Supply board.

a. Set TIME/DIV to 0.1 µs; HORIZ DISPLAY to A, and VERT MODE to CH 1 (make sure SWEEP MODE is in AUTO TRIGGER).
b. Set test oscilloscope to 0.05 µs/div and 0.1 volt/div.
c. Connect 10X probe (1 V/div at probe tip) to Z OUT HF test point.
d. Adjust INTENSITY for 4 div of signal.
e. Check aberrations for 2% or less.
f. If necessary adjust Z COMP (C1762, C1765, and R1765).
g. Check Z AXIS RISETIME for 15 ns or less.

12. CHECK EXT Z AXIS BLANKING

a. Apply 0.2 V P-P of 20 MHz from Type 191 Signal Generator to EXT Z AXIS blanking (rear panel) and A EXT TRIG.
b. Adjust trigger LEVEL for TRIG'D LIGHT.
c. At normal intensity check for intensity modulation.
d. Change Type 191 to 2 V P-P and 2 MHz to EXT Z AXIS blanking and A EXT TRIG; set TIME/DIV to 0.5 µs.
e. Turn INTENSITY up and check for intensity modulation.

13. CHECK AUTO FOCUS

NOTE

Adjustments and test points are located at the rear of the Power Supply board.

a. Apply 2 div amplitude of 3 MHz to CH 1 input.
b. Trigger CH 1, set TIME/DIV to 0.2 µs/div, HORIZ DISPLAY to A.
c. With low intensity adjust the FOCUS and ASTIG (rear panel) for the best defined 3 MHz trace.

d. Set A TRIGGER HOLDOFF to max; test oscilloscope to 1 V/div (10 V/div at probe tip) and connect 10X test probe to Z OUT DC test point.

e. Set INTENSITY for 50 V step.

f. Connect the DVM to the AUTO FOC test point. Measure and record the DC voltage.

g. Observe the 485 display and adjust FOC GAIN (R1710) for optimum focus. If the original setting cannot be improved, reset FOC GAIN to the voltage recorded in step f and continue to step 14.

h. If focus was improved by adjusting FOC GAIN, preset MAX Z (R1560) CW and MAX FOC (R1700) CW.

i. Set A TRIGGER HOLDOFF to NORM.

j. Set FOCUS and ASTIG for optimum focus at low display intensity.

k. Set A TRIGGER HOLDOFF to max and adjust INTENSITY for a 70 V step at Z OUT DC test point.

l. Adjust FOC GAIN for best focus.

m. Record the new DC voltage at the AUTO FOC test point.

n. Turn INTENSITY to max and adjust MAX Z (R1560) for a 72 V step on the test oscilloscope.

o. Set MAX FOC for the voltage recorded in step 13 part m.

p. Set A TRIGGER HOLDOFF to NORM.

14. CHECK OUTPUT WAVEFORMS (With Sweeps Running at 1 ms/div)

a. With test oscilloscope check the following outputs (located on the rear panel).

b. A and B GATES, approximate amplitude 4 V; 0.5 V into 50 Ω.

c. A SAWTOOTH, approximate amplitude 10 V; 0.5 V into 50 Ω.

15. ADJUST TRACE ROTATION

a. Position trace to graticule center.

b. Adjust TRACE ROTATION (rear panel) so trace parallels center graticule line.

16. ADJUST Y AXIS ALIGNMENT

a. Apply 1 ms and 0.1 ms markers of full screen amplitude to CH 1.

b. Set TIME/DIV to 1 ms.

c. Adjust A VARIABLE TIME/DIV for two markers per div.

d. Adjust Y AXIS (R1794), located towards rear of B Trigger board, for vertical alignment at the graticule center.

17. ADJUST GEOMETRY

Adjust GEOM, (R1792), located towards rear of B Trigger board, for least bowing of the vertical lines at the graticule edges.

18. ADJUST HORIZONTAL GAIN

a. Set HORIZ DISPLAY to B; TIME/DIV to 0.1 ms/div, A VARIABLE TIME/DIV to CAL.

b. Apply 0.1 ms markers.

c. Use POSITION (HORIZ) control to keep markers aligned with graticule lines.

d. Adjust H GAIN (R1366), upper rear of Sweep board, for one marker/div and for exact alignment of markers at 1 and 9 (center 8 divisions).

19. ADJUST A SWEEP CAL

a. Set HORIZ DISPLAY to A.

b. Use POSITION (HORIZ) control to keep markers aligned with graticule lines.

c. Adjust A CAL (R1308), located near center rear of Sweep board, for one marker/div and for exact alignment of markers at 1 and 9 (center 8 divisions).

20. CHECK A VARIABLE TIME/DIV

a. Set Time-Mark Generator to 1 ms markers; TIME ON to 0.1 ms.
b. Push and release VARIABLE TIME/DIV to CCW end.
c. Check for 4 divisions or less between markers.
d. Push VARIABLE TIME/DIV into CAL.

21. ADJUST B REGISTER

a. Set HORIZ DISPLAY to ALT; B TRIGGERING SOURCE to INT; DELAY TIME POSITION (DTP) to 0.
b. Trigger A and B sweeps on the 0.1 ms markers.
c. Adjust B REGIS (R1325), located next to the B REGIS test point on Sweep board, for coincidence of the markers at the beginning of the A and B sweeps.

22. CHECK HORIZONTAL CENTERING

a. Set HORIZ DISPLAY to A.
b. While rotating POSITION (HORIZ) control to extremes, observe both ends of the sweep cross the graticule center line.
c. If necessary adjust HORIZ CENT (R1150), located on the center of the B Trigger board.

23. CHECK A SWEEP LENGTH

Greater than 10 but less than 11.5 divisions.

24. ADJUST DELAY START and DELAY STOP (Located on Sweep Board)

a. Set A TIME/DIV to 0.1 ms; B TIME/DIV to 1 μs; HORIZ DISPLAY to ALT; DELAY TIME POSITION (DTP) dial to exactly 1.0; B SOURCE to RUNS AFTER DELAY TIME; Trigger A on the + SLOPE of the 0.1 ms time mark.
b. Adjust DELAY START (R918) to get intensified portion on the second time mark and the pulse on B trace to just start positive at the front of B trace.
c. Set the DTP dial to exactly 9.0.
d. Adjust DELAY STOP (R925) for the intensified portion on the tenth time mark and the pulse on B trace to just start positive at the front of B trace.
e. Repeat steps b through d for identical B displays at the two DTP dial settings.

25. CHECK 0.1 ms DELAY LINEARITY

a. Same setup as in step 24, except change time marks to 50 μs.
b. Turn DTP dial fully CCW. The first marker should be displayed on B display.
c. Set DTP dial to exactly 0.95. A marker should be near the middle of B display. Adjust POSITION (HORIZ) to put B display at midscreen reference position.
d. Set DTP dial to exactly 8.95. The marker should be within 0.2 div of being at the same midscreen reference. If necessary make a slight readjustment of DELAY STOP to get the screen position for a DTP dial reading of 8.95 to agree with that for a DTP dial reading 0.95. Note that in this setup one minor DTP dial division corresponds to one screen division, and these procedures require careful settings for repeat reading.
e. Set the DTP dial to settings of exactly 0.45, 0.95, 1.45, 1.95, 2.45, through to 9.45. At each setting observe the marker position on the B display, noting the maximum + and - excursions from the center screen reference position. The total excursion from most negative to most positive, should not exceed 1.4 screen divisions (1 div spec plus ± 0.2 div for operator setting of the dial).

26. ADJUST 0.1 μs TIMING, A and B

a. Set A TIME/DIV to 0.1 μs; B TIME/DIV to 10 μs; HORIZ DISPLAY to ALT; apply 0.1 μs markers.

b. Set the DTP to 1.00 and align the marker to a reference point, then turn the DTP to 9.00 and adjust C882, (behind relay on A Sweep) for zero error at the reference point.

c. Set B TIME/DIV to 0.1 µs, and set DTP to approximately 0.00 to align the beginning of the A and B sweeps.

d. Adjust C1248 (above the relay in B Sweep) so that B Sweep matches A Sweep timing on screen.

27. ADJUST 1 µs TIMING A and B, CHECK 1µs DELAY LINEARITY

a. Set A and B TIME/DIV to 1µs and 0.1µs ; time marks to 1 µs; HORIZ DISPLAY to ALT.

b. Trigger A on the + SLOPE of the time marks.

c. Set the DTP dial to exactly 0.95. With the POSITION (HORIZ), set the leading edge of the B display to a reference position while keeping the first 10 markers of A display on the screen. The intensified zone of A must start on the second time mark.

d. Set the DTP to exactly 8.95.

e. Adjust C877 (located in front of the relay on the lower half of the Sweep board) to move the B display to the reference position of step b. The intensified zone of A must start on the tenth time mark.

f. Repeat steps b through e for identical B display at the two DTP dial settings.

g. Check the delay linearity by setting dial to exactly 4.95. The marker on the B display must be within 0.15 div of the reference position.

h. Set B TIME/DIV to 1 µs; HORIZ DISPLAY to B and the DTP dial to 0.00.

i. Adjust C1242 (located below the relay on the upper half of the Sweep board) for one time mark per division and for exactly 1 to 9 timing (center 8 divisions).

28. ADJUST A SWEEP LINEARITY (R863)

a. Set the 485 for a 20 ns/div AUTO TRIG Sweep with the A TRIGGER HOLDOFF at max (but not B ENDS A).

b. Connect the 485 A GATE (rear panel) to the Ext Trigger Input of the test oscilloscope using a 50 Ω termination at the test oscilloscope. Also, set the test oscilloscope to 20 ns/div and trigger it on the + SLOPE of the 485 A GATE.

c. Connect the test oscilloscope 10X probe (10 MΩ) to the IN test point located near the center of the Sweep board. Make the probe ground connection at one of the GND test points on the Sweep board. Set test oscilloscope Volts/Div for a probe tip deflection factor of 50 mV/div.

d. This display of the A sweep generator input, consists of a positive step having overshoot followed by a positive going linear ramp.

e. Adjust R863, (located below and in front of the lower relay on the Sweep board) to extend the ramp at the right of the display as linearly as possible back towards the step at the left. Ringing should be minimized, except for one overshoot cycle at the step.

f. Switch the 485 to 10 ns; the step and ramp amplitudes will increase. Make further adjustment if necessary to optimize the "linear ramp" on the two sweep speeds (10 ns/div and 20 ns/div).

29. ADJUST 5 ns TIMING

a. Connect 5 ns time markers from H.F. Selector Output to CH 1 input; connect 50 ns time marks to EXT TRIG INPUT; A TRIG SOURCE to EXT; A TIME/DIV to 5 ns; then center trace (If using a 2901 Time Mark Generator, set Trigger Out for 0.1 µs).

b. Adjust C1190, (located between Q1168 and Q1172 on B Trigger board) for one time mark per division and for exactly 1 to 9 timing (center 8 divisions).

30. ADJUST 2 ns LINEARITY and TIMING

a. Set A TIME/DIV to 2 ns; select 2 ns time marks from the Time-Mark Generator.

b. With the POSITION (HORIZ) control keep the peak of one time mark positioned to center screen. Adjust C1364, (located in front of H GAIN pot on Sweep board) for most symmetrical timing (best linearity) of the sweep over the center 8 graticule divisions.

c. Adjust R1226, (located above the relay on the lower half of the Sweep board) for one time mark per division and for exactly 1 to 9 timing (center 8 divisions).

d. INTERACTION with 5 ns timing, repeat steps 26 and 27 if necessary.

31. ADJUST 1 ns TIMING

a. Set TIME/DIV to 1 ns.

b. Adjust 1 ns (R1228), (located in back of the lower relay on the Sweep board) for exactly 1 to 9 timing (four 2 ns markers over the center 8 divisions).

c. If exact timing cannot be achieved, a compromise adjustment may be done.

32. CHECK 1, 2, and 5 ns SWEEP LINEARITY

a. Less than 0.1 division of error with timing adjusted on (1 ns through 20 ns). With time marks exactly aligned at 1 and 9 the remaining marks must be no greater than 0.1 div away from their respective graticule lines. The incremental error must not exceed 0.1 div over any one division.

33. CHECK B SWEEP TIMING ACCURACY

a. Check timing over center 8 graticule divisions; position one time mark to 1 and read error at 9.

b. 1 ns to 20 ns;-within 0.16 div (2%).

c. 50 ns to 0.1 s;-within 0.1 div (1.25%).

d. 0.2 s to 0.5 s;-within 0.16 div (2%).

34. CHECK A SWEEP TIMING ACCURACY

a. 1 ns to 20 ns;-within 0.16 div (2%).

b. 50 ns to 0.1 s;-within 0.1 div (1.25%).

c. 0.2 s to 0.5 s;-within 0.16 div (2%).

35. CHECK AUTO REPETITION RATE

a. Set A TIME/DIV to 50,µs; SWEEP MODE to AUTO TRIG.

b. Check that sweep triggers on 50 ms markers and will not trigger on 0.1 s markers.

36. CHECK DELAY TIME ACCURACY, 10 ns/ div to 0.5 s/div

a. Use time marks that give 1 to 5 markers/div on the A display. Use B TIME/DIV for 1 ns for A TIME/DIV settings of 10 ns through 0.1 µs. For A TIME/DIV setting of 0.2,µs and slower maintain an A:B ratio of 100:1.

b. Set the DTP dial exactly to the reference position (1.0 except at the fastest speeds). Use the POSITION (HORIZ) control to move the marker on the B display to a reference position.

c. Rotate the DTP to 9.0 and then slightly from 9.0 to place the B display marker to the same screen reference position. Read the error (from 9.00) in the minor dial divisions on the DTP dial.

TABLE 5-4

A Time/Div	Reference DTP Position	Maximum DTP Dial Error at Setting near 9.0 (minor divisions)
10 ns	4.0	6
20 ns	2.0	7
50 ns to 1 ms	1.0	4
2 ms to 0.5 s	1.0	8

37. CHECK INCREMENTAL DELAY ACCURACY 10, 20, and 50 ns/div

NOTE

Check the error at each turn against the requirements given in the chart at the end of this step. Detailed procedure is given for the 10 ns/div.

a. A and B TIME/DIV of 10ns and 1 ns; HORIZ DISPLAY to B; A TRIGGER HOLDOFF to NORM; time marks of 10 ns.

b. Set the DTP dial to exactly 4.0. Adjust the POSITION (HORIZ) for marker leading edge at midscreen. Turn the DTP dial CW one turn at a time and bring a marker to the exact midscreen position.

c. Check that the dial errors at 5.0, 6.0, and 7.0 are within the allowable limits (at 10 ns/div the change in error over any one turn is not to exceed 2 minor dial divisions, and the total error at any turn is not to exceed 3 minor dial divisions).

d. Set the DTP dial to exactly 6.0. Adjust the POSITION (HORIZ) for marker leading edge at midscreen. Turn the DTP dial CW one turn at a time and bring a marker to the exact midscreen position. Check that the dial errors at 7.0, 8.0, and 9.0 are within the allowable limits.

e. Use the same procedure to check the 20 ns and 50 ns ranges.

TABLE 5-5

Time/Div	Dial Setting		Max Error in Minor DTP Dial Div	
	Reference	Read Errors At	Change Over Any 1 Turn	Total at Any Turn
10 ns	4.0	5, 6, and 7	2	3
1 ns	6.0	7, 8, and 9	2	3
20 ns	2.0	3, 4, 5, and 6	2	4
1 ns	5.0	6, 7, 8, and 9	2	4
50 ns	1.0	2, 3, 4, and 5	1	2
1 ns	5.0	6, 7, 8, and 9	1	2

38. CHECK DELAY JITTER

a. Set A TIME/DIV to 1 ms; B trigger SOURCE to B RUNS AFTER DELAY TIME; B TIME/DIV to 1 µs; set Time-Mark Generator to 1 ms markers; set HORIZ DISPLAY to ALT; use A trigger LEVEL to obtain a stable display.

b. Set HORIZ DISPLAY to B; rotate DELAY TIME POSITION from 1 to 9; check for 0.5 div or less of jitter on B display.

39. CHECK B ENDS A OPERATION

a. HORIZ DISPLAY to INTEN; A TIME/DIV to 1 ms; B TIME/DIV to 0.1 ms; A TRIGGER HOLDOFF to B ENDS A.

b. Rotate DTP; check that sweep ends after the intensified zone.

40. CHECK CH 1 LIGHT EMITTING DIODES (LED'S)

a. Check that the probe lights the corresponding LED, e.g., X10 probe lights X10 LED.

b. Check that CH 2 LED'S are off with VERT MODE in CH 1.

c. Check that CH 1 LED'S are on in CH 1, ALT, CHOP, ADD, and X-Y.

d. If probes are not available: an 11 kΩ resistor to ground from the code ring (around each input BNC)light the X10 LED, a 6.8 kΩ resistor lights X100 LED, and a short circuit causes trace ident.

41. CHECK CH 2 LED'S

a. Check that the probe lights the corresponding LED.

b. Check that CH 1 LED's are off with VERT MODE in CH 2.

c. Check CH 2 LED's are on in CH 2, ALT, CHOP, ADD, and X-Y.

42. CHECK TRACE IDENT FUNCTION CH 1 and CH 2

Check TRACE IDENT function on probe shifts trace approximately 0.2 div up, and turns off the LED for that channel.

43. CHECK INPUT LIGHTS CH 1 and CH 2

a. Check that 50 Ω is lit when 50 Ω/1 MΩ pushbutton is out.

b. Check that 1 MΩ is lit when 50 Ω/1 MΩ pushbutton is in.

44. CHECK INPUT PROTECTION TRIP LEVELS for CH 1 and CH 2

a. Set the Type 106 High Amplitude control to minimum, Frequency to 1 kHz, and Symmetry for 50% duty cycle. Set the 485 CH 1 and CH 2 inputs to DC; VOLTS/DIV to 2 V; Position trace to top graticule line; set input impedance selector to 50 Ω (button out).

b. Connect Type 106 High Amplitude to CH 1 input; slowly increase Type 106 amplitude.

c. Check that the input disconnects (trace returns to top graticule line) and reset lamp lights after the trace crosses the 2.8 graticule division point and before it crosses the 4.25 division point. Return Type 106 Amplitude Control to minimum and repeat for CH 2.

45. CHECK PROBE POWER

NOTE

Measure voltages at the respective pins. See Fig. 5-1.

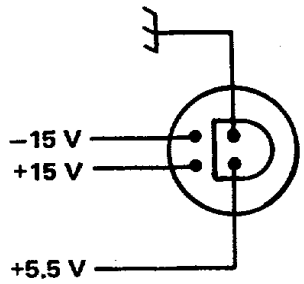


Fig. 5-1. Probe Power Voltages.

46. ADJUST MAIN VERTICAL BALANCE (ADD SHIFT)

a. Set VERT MODE to CHOP; position CH 1 and CH 2 trace to graticule center.

b. Push ADD and observe trace position (if less than 0.2 div away from center, proceed to step 47).

c. Push CHOP and adjust MAIN VERT BAL (R600), (located at the lower rear of Vertical board) for same trace position.

d. Position CH 1 and CH 2 trace to graticule center.

e. Push ADD and check for less than 0.2 div shift.

47. CHECK MAIN VERTICAL GAIN

a. Position CH 2 trace to graticule center.

b. Connect DVM to test points at output of CH 1 channel switch (test points 418 and 419) and observe reading (must not exceed 15 mV).

c. Set CH 2 POSITION control for a reading of 200 mV greater than the reading in step b.

d. Adjust Main Vert Gain (R629) (located on upper rear of Vertical board) for 4 div of deflection from graticule center line.

48. CHECK VERTICAL LINEARITY

a. With CH 2 POSITION control move trace to opposite edge of graticule.

b. Check the DVM reading should be within ±10 mV of being 200 mV away from the reading in 47b.

49. ADJUST 50 W INPUT IMPEDANCE CH 1 and CH 2

a. Set input to 50 Ω; VOLTS/DIV to 50 mV; VERT MODE to CH 1; position trace to center graticule line.

b. Set DVM to correct ohms scale and connect to CH 1 input. Note the amount of trace shift caused by the meter current. If the trace has shifted over 2 div (100 mV) the measurement will be invalid, and a lower current ohmmeter must be used.

c. Set VOLT/DIV to 10 mV.

d. Short ohmmeter leads together and record first reading.

e. Connect-ohmmeter to CH 1 input and record second reading. Reverse the leads of the ohmmeter and record the third reading.

f. Input resistance is the average of readings two and three minus the first reading. Note: the first reading is the residual resistance in the ohmmeter leads. The second and third readings are averaged to cancel the effects of any offset current in the 485.

g. This calculated value of Input R must be within 49.75 to 50.25 Ω.

h. If necessary adjust Input R, R208 CH 1 R308 CH 2, (located at front of Vertical board) for 50 Ω calculated.

i. Repeat procedure for CH 2.

50. ADJUST 50 W INPUT OFFSET CURRENT CH 1 and CH 2

a. Set inputs to GND; VOLTS/DIV to 10 mV.

b. Switch input to DC then back to GND.

c Adjust Input I (R206) for CH 1 and Input I (R306) for CH 2, (located on front of Vertical-board) for no trace shift.

51. ADJUST VARIABLE BALANCE CH 1 and CH 2

a. Set VOLTS/DIV to 10 mV; input to GND.

b. Rotate VARIABLE volts/div fully CCW. Adjust VAR BAL (R215), (located on front of Vertical board) for less than 0.1 div of shift while switching from Uncal to calibrated.

c. Check for 0.2 div or less of shift while rotating VARIABLE CW to CCW.

d. Repeat in CH 2 adjusting NVB (R312) (located on front of Vertical board).

e. Change CH 2 POLARITY to INVERT and repeat in CH 2 adjusting INVB (R310) (located on front of Vertical board).

52. ADJUST 5mV/DIV BALANCE CH 1 and CH 2

a. Set input to GND; POLARITY + UP; 10 mV/div.

b. Adjust R350, (located above U350) for no shift when switching in CH 2 between 10 and 5 mV.

c. Recheck CH 2 variable balance.

d. Repeat in CH 1 adjusting R250 (located above U250).

53. CHECK INVERT SHIFT

a. Set VARIABLE volts/div to cal; VOLTS/DIV to 5 mV; CH 2 to 50 Ω; VERT MODE to CH 2; then center trace.

b. Switch CH 2 POLARITY between + UP and INVERT.

c. Check for ±1.0 div of trace shift or less.

54. CHECK BEAM FINDER

a. Check that trace remains within the graticule area with BEAM FINDER depressed.

b. Check beam finder operation under all combinations of HORIZONTAL, CH 1, and CH 2 POSITION controls.

55. ADJUST LOW FREQUENCY VERTICAL TRANSIENT RESPONSE

a. These adjustments (part of MAIN VERT TRANS RESP) are located at the rear of the Vertical board. They are the first four pots above the MAIN VERT BAL adjustment, and are adjusted beginning with the bottom one first.

b. Input to 50 Ω; DC coupled. Connect the High Amplitude Output of the Type 106 Square-Wave Generator to CH 1 input.

c. Use a VOLTS/DIV setting of 0.5 V with the Type 106, and an on-screen amplitude of 5 to 6 divisions. Note that the maximum output of this generator will trip the 50 Ω RESET.

d. The adjustments are to be set for best flatness of the top front corner of the square wave.

TABLE 5-6

		TIME/DIV	SQUARE WAVE
Bottom Adjustment	(R606)	5 ms	100 Hz
Next Adjustment	(R607)	0.5 ms	1 kHz
Next Adjustment	(R608)	20 µ s	20 kHz
Next Adjustment	(R609)	20 µ s	20 kHz

c. Repeat step d as there may be interaction.

56. ADJUST CH 1 and CH 2 50 Ω GAIN

a. Located next to second stage IC's towards front of Vertical board.

b. Set VOLTS/DIV to 20 mV.

c. Connect 120 mV from 50 Ω, Amplitude Calibrator to CH 1 and CH 2.

d. Adjust front panel GAIN for mid-range.

e. Adjust CH 2 GAIN (R358) and CH 1 GAIN (R255) for 6 divisions of deflection.

f. On CH 1 check that the gain in 20MHz limit is within ±1% of the full bandwidth gain.

57. ADJUST INVERT GAIN (Located Lower Front of Vertical Board)

a. Set POLARITY to INVERT.

b. Connect 120 mV from 50 Ω source to CH 2.

c. Adjust INV Gain (R318) for 6 divisions.

58. CHECK ADDED MODE GAIN

a. Connect 50Ω Amplitude Calibrator CH 1 and CH 2 using dual input cable, (067-0525-01); CH 1 and CH 2 DC coupled.

b. Adjust each channel for 4 div of deflection, with VARIABLE VOLTS/DIV.

c. Set POLARITY to + UP.

d. Switch VERT MODE to ADD.

e. Check for 8 div ± 0.1 div.

f. Switch POLARITY to INVERT.

g. Check for < 0.1 div deflection with CH 1 and CH 2 centered.

h. If any deflection was noted in step g, adjust CH 2 VARIABLE VOLTS/DIV for a null (single trace) on the 485 display (do not change this setting unless specified in the following steps).

59. ADJUST CH 1 TRIGGER GAIN (TRIG MODE in NORM)

a. Connect probe to test point (TP568), (located towards rear of Vertical board).

b. Adjust Trig GAIN, (located in middle of Vertical board), to null signal displayed on the test oscilloscope.

60. CHECK 50 ATTENUATOR ACCURACY ±2%, CH 1 and CH 2

Check all 50 Ω attenuator positions with a 1 kHz square wave from 50 Ω Amplitude Calibrator.

61. ADJUST POSITION CENTER CH 1 and CH 2

a. CH 1 to 20 mV/div; DC coupled; apply 8 div of 50 kHz from the Type 191 Constant-Amplitude Signal Generator.

b. Switch to 10 mV/div and adjust POS CTR (R275) so the top and bottom are equal spacing from the graticule center, when POSITION control is rotated to both ends of its range.

c. Repeat for CH 2 adjusting POS CTR (R375).

62. ADJUST 50 W HIGH FREQUENCY TRANSIENT RESPONSE, CH 1 and CH 2

NOTE

These adjustments are the five remaining adjustments in the MAIN VERT TRANS RESP set, the slug-tuned coil near the output IC, and four adjustments by the input stages of each channel. Total aberrations after adjustment should be within 4% P-P.

a. Signal source is the TU-5, Tunnel Diode Pulser driven by the Type 106 Square-Wave Generator (Set 106 to 100 kHz). The test setup path from the Type 106 to the 485 is as follows:

Type 106 High Amplitude output, 50 Ω input of the cable

Tunnel Diode Pulser, 2X BNC attenuator, 50 Ω input of the 485.

Adjust the Pulser and the Type 106 so that the Pulser just triggers; do not overdrive. A 4 to 7 div step can be used (keep VOLTS/DIV VARIABLE to CAL). The Tunnel Diode Pulser is flat for only 150 ns, so don't use for adjustment of longer time constants.

b. Adjust for best response.

Four of five upper adjustments in the MAIN VERT TRANS RESP set (all but C617 next to the IC).	R613 R614 R615	Adjust for best flat top response.
Slug-tuned coil near the output IC.	L654	Best flat top response.
CH 1 adjustments above U210.	C214 R214	Best front corner level.
CH 1 adjustments behind U210.	C240 R240	Fastest Risetime.
CH 2 adjustments above U310.	C315 R315	Best front corner level.
CH 2 adjustments behind U310.	C340 R340	Fastest Risetime.
Uppermost adjustment in the MAIN VERT TRANS RESP set.	C617	Minimum ringing and fastest risetime for CH 1 and CH 2.

N0TE

U510 and U530 may be raised part way out of their sockets to match the level of the first 3 ns to the remainder of the waveform for CH 1 and CH 2 transient response respectively.

63. ADJUST 1 MW DC BAL CH 1 and CH 2

NOTE

These adjustments are accessible at the bottom of the instrument.

a. Input to 50 Ω; VOLTS/DIV to 5 mV; VERT MODE to CH 1; input to GND.

b. Switch to 1 MΩ; and adjust R45 for 0 shift between 50 Ω; and 1 MΩ;.

64. CHECK 1 MW GATE CURRENT CH 1 and CH 2

Switch from GND to DC in 5 mV; check for 0.2 div or less of shift.

65. ADJUST 1 MW; AMPLIFIER GAIN CH 1 and CH 2

NOTE

Adjustments are labeled on the bottom shield of the attenuator compartments.

a. Set VOLTS/DIV to 20 mV.

b. Apply 100 mV from Amplitude Calibrator and Comparator, then adjust R78 for 5 div of deflection.

c. Check 50 Ω /1 MΩ gain match; +1% in 20 mV/div.

d. Set the 1 MΩ /50Ω switch to 1 MΩ (button in).

66. ADJUST 1 MW 10 kHz TRANSIENT RESPONSE, CH 1 and CH 2

a. Connect Type 106 High Amplitude with 6 div of 10 kHz through 5X attenuator, GR cable, 50 Ω termination.

b. Adjust C46 and R53 for optimum response.

67. ADJUST 1 MW INPUT ATTENUATOR COMPENSATIONS, CH 1 and CH 2

a. Connect the bnc end of a 10X probe (485 Optional Accessory, P6106, P6063B, or equivalent) to the CH 1 input connector. Connect a Probe-tip-to-bnc adapter (Tektronix 013-0084-01) to the probe tip.

b. Set VERT MODE to CH 1 and set CH 1 VOLTS/DIV to .2 V.

NOTE

In the following parts of Step 67, adjust generator Amplitude and add or remove attenuators as required to maintain a 5-vertical-division display. Set sweep controls to display several cycles of the generator waveform.

c. Set High Amplitude Square-wave generator (106 or equivalent) to 1 kHz and connect 2X or 5X or 10X attenuators (as required) in series between the generator output connector and 50Ω termination (see above note). Connect the Probe-tip-to-bnc adapter to the termination.

d. Adjust the CH 1 C12 (only if necessary) to near minimum capacitance (back adjustment screw out toward hole in attenuator shield). CH 1 C12 is set at the factory to provide CH 2 C12 enough range to match the CH 2 input capacitance with the CH 1 input capacitance. Unless there have been extensive circuit repairs, the CH 1 C12 should not require readjustment. When adjusting either C12 or other adjustments, if the low-capacitance screwdriver contains a metal bit, the metal may affect the adjustment. Check adjustment after screwdriver is removed, and readjust as necessary.

e. Obtain a 5-vertical-division display and adjust the probe compensation for the best flat-top waveform. Do not re-adjust probe compensation for the remainder of Step 67.

f. Check CH 1 50 mV, .1 V, and .5 V VOLTS/DIV settings for optimum flat-top on a 5-division displayed waveform.

g. Set VOLTS/DIV to 1 V and adjust CH 1 C24 and C26 for best flat-top and best front corner on a 5-division displayed waveform.

h. Check CH 1 2 V and 5 V VOLTS/DIV settings for optimum flat-top and front corner on 5-division displayed waveform.

i. Set CH 1 VOLTS/DIV to 10 V (if necessary, remove the 50Ω termination to maintain a 5-division display). Adjust CH 1 C20 and C22 for best flat-top and best front corner on displayed waveform.

j. Reduce generator output amplitude to minimum. Re-insert attenuators and termination between generator output and Probe-tip-to-bnc adapter. Transfer the bnc end of the probe from the CH 1 input connector to the CH 2 input connector.

k. Set VERT MODE to CH 2, and set CH 2 VOLTS/ DIV to .2 V. Set generator Amplitude and add or remove attenuators as necessary to maintain a 5-division display for the remainder of Step 67.

l. Adjust CH 2 C12 for best flat-top waveform.

m. Repeat parts f through i substituting CH 2 adjustments for the CH 1 adjustments.

68. ADJUST 1 MW AMPLIFIER HIGH FREQUENCY TRANSIENT RESPONSE

a. Set Type 106 to 100 kHz; TD Pulser 2X attenuator and 50Ω termination. Set CH 1 and CH 2 VOLTS/DIV to 20 mV.

b. Set TIME/DIV to 20 ns/div. Adjust C55 and R55 for optimum front corner. Adjust C70 and C57 (SN B188389-up) for best level behind the leading edge.

69. CHECK COMMON MODE REJECTION 50W, and 1 MW

a. Connect Type 191 Signal Generator to 50Ω input CH 1 and CH 2 thru the 10X attenuator and dual BNC input cable (067-0525-00).

b. CH 1 and CH 2 inputs 50Ω, DC; VOLTS/DIV to 20 mV; VERT MODE to CH 1. Apply 8 divisions of 50 kHz.

c. Set VERT MODE to ADD; CH 2 INVERTED. Push to release CH 2 VARIABLE GAIN and adjust for minimum deflection; position to center of graticule with CH 2 POSITION control.

d. Set Type 191 to 50 MHz and check for 0.8 div or less of vertical deflection.

e. Set generator to 50 kHz; inputs to 1 MΩ ; add 50Ω BNC termination's at inputs.

f. Readjust CH 2 GAIN for minimum deflection.

g. Set Type 191 to 50 MHz and check for 0.8 div or less of vertical deflection.

h. Push CH 2 VARIABLE GAIN to CAL.

70. CHECK BANDWIDTH 50W and 1 MW , CH 1 and CH 2

NOTE

Use 6 div of 3 MHz from the High-Frequency Constant-Amplitude Signal Generator (067-0532-01) as reference.

a. Check for minimum of 4.4 div of signal at 350 MHz in the 50Ω , mode.

b. Check 5, 10, 20, 50 mV, and 0.1 V.

c. Check for minimum of 4.4 div of signal at 250 MHz in the 1 MΩ mode.

d. Check 5, 10, 20, 50 mV, and 0.1 V.

e. Repeat check for 1 V using 4 divisions as reference and 2.9 divisions the minimum deflection.

71. OPTIONAL CHECK VSWR

NOTE

TEKTRONIX supplies this procedure for a 5000 hour, or as needed, verification of VSWR. Equipment: VSWR AUTOTESTER and Graticule; 561B/ 3A9/2B67; High-Frequency Constant-Amplitude Signal Generator (067-0532-01).

a. Ground 3A9 CH 2 input; connect VSWR Autotester, VSWR OUT to 3A9 CH 1 input; 3A9 to 20µV/div; DC coupled; adjust 3A9 DC offset for VSWR = 1.00 on VSWR graticule.

b. Connect Signal Generator to VSWR Autotester RF IN through 10X and 5X attenuators. Set generator frequency to 100 MHz and adjust amplitude for VSWR = 1.22.

c. Disconnect the Signal Generator and recheck VSWR = 1.00.

d. Connect VSWR Autotester to 485 CH 1 input; set 485 input to 50Ω , DC coupled.

e. Remove the 10X attenuator and reconnect the generator to VSWR Autotester RF IN.

f. Sweep the generator frequency from 100 MHz to 350 MHz. VSWR should be less than 1.25 for deflection factors of 5 mV and 10 mV/div. VSWR should be less than 1.15 for deflection factors of 20 mV/div through 5 V/div.

72. OPTIONAL - CHECK CALIBRATOR OVERSHOOT, RINGING, and RISETIME

NOTE

These characteristics have been factory verified to specifications. Due to their long term stability (failure to perform is most likely the result of catastrophic failure) only a qualitative check is done here. The Calibrator overshoot and ringing on the 485 is compared to that observed from the Tunnel Diode Pulser.

a. Set CH 1 input to 50Ω, DC coupled; TIME/DIV to 1 ns; VOLTS/DIV to 20 mV.

b. Connect the Type 106/Tunnel Diode Pulser through a 2X BNC attenuator to the CH 1 input (approximately 5 div step). Observe the reference "flat" portion following the positive step.

c. Connect a 5X BNC attenuator to the CAL 5 V output and connect this signal to CH 1 input (5 div step). Again, observe the "flat" portion following the positive step. This response should be within ±0.1 div (±2%) of the reference "flat" portion observed in b.

d. Check positive edge risetime of the Calibrator as observed on the 485. Should be less than 1.4 ns.

73. ADJUST A TRIGGER (Board Next to Atten Shield on Bottom of Oscilloscope)

a. Set HORIZ DISPLAY to A; A TIME/DIV to 10 µs/ div; A COUPLING to AC; A TRIG HOLDOFF to NORM; A SOURCE to INT; A SLOPE to +; SWEEP MODE to NORM.

b. Set LEV CTR, R725 (R1025)[1], to midrange; A TRIG SENS, R755 (R1055), CCW; ARM TD, R765 (R1075), CW; OUT TD, R775 (R1065), CW; LEVEL, R720, (R1020) CW. Apply one division of 50 kHz reference signal from the Type 191 Signal Generator to the CH 1 input.

c. Turn ARM TD CCW until trace disappears. Note position of pot.

d. Adjust LEVEL for a stable display.

e. Turn ARM TD further CCW until trace disappears. Note position of pot.

f. Adjust ARM TD pot halfway between positions noted in steps c and e.

g. Disconnect coax from J763 (J1063 for B trigger). J763 is rear white and brown coax on A trigger board (J1063 is rear white and brown coax on B trigger board).

[1]Circuit numbers in parenthesis pertain to B trigger adjustments, see step 74B.

h. Monitor the voltage at the OUT TD test point (located near the OUT TD control) and adjust the OUT TD control R775 (R1065) until the trace just disappears. Record this voltage.

i. Reconnect the coax to J763 (J1063).

j. Adjust the OUT TD control CCW until the trace just disappears again. Record this voltage.

k. Subtract the voltage in part j from the voltage recorded in part h. Multiply the result by 0.8 and add this quantity to the voltage recorded in part j.

I. Adjust the OUT TD control to produce a reading that equals the final amount calculated in part k.

m. Adjust TRIGGER SENS, R755 (R1055) until display cannot be triggered on 0.15 div of signal by rotating the LEVEL control, but can be triggered on 0.18 div of signal by rotating the LEVEL control, (to set signal amplitude to 0.15 or 0.18 div, first adjust the generator amplitude for a display of 1.5 or 1.8 divisions, then increase the VOLTS/ DIV setting by a factor of 10). Increase generator signal to produce a two division display.

n. Adjust LEV CTR for a stable display with LEVEL knob dot positioned at top center (12:00 o'clock).

o. Switch trigger COUPLING to DC, adjust INT TRIG DC BAL, R560 (located on Vertical Amplifier board), for stable triggering with display vertically centered on graticule.

p. Apply signal to CH 2 input. Check for triggering within 0.5 divisions of graticule center with SLOPE in + and - positions when VERTICAL MODE is set to CH 1 and CH 2; and within one division of graticule center when VERTICAL MODE is set to ADD. Disconnect signal from 485.

74A. ADJUST EXTERNAL TRIGGER LEVEL CENTERING

a. Set A trigger SOURCE to EXT; A LEVEL knob dot to 12:00 o'clock.

b. Connect the Type 191 Signal Generator to the A EXT TRIG connector. Hold the A EXT TRIG button in, and adjust the Type 191 for a 2 division display of 50 kHz signal.

c. Adjust R830 (IDENT) while depressing the A EXT TRIG button, so the trace starts at an equal distance above and below graticule center when switching the A Trigger SLOPE switch from + to -. Release the A EXT TRIG button.

d. Remove the signal from the A EXT TRIG connector, and apply it to the CH 1 input.

74B. ADJUST B TRIGGERS (Located on Board Behind B Triggering Switches on Top of Oscilloscope)

NOTE

To prevent possible interference from the 1 MHz calibrator signal, set the calibrator FREQ pushbutton to 1 kHz position during B Trigger checks and adjustments.

a. Set HORIZ DISPLAY to B; A TIME/DIV to 50 µs; B TIME/DIV to 10 µs; B SOURCE to INT; A & B COUPLING to AC; A & B LEVEL CW; SWEEP MODE to AUTO TRIG; VERT MODE to CH 1.

b. Adjust the B triggering by repeating step 73, parts b through n (substitute the J1063 coax for the J763 coax in step 73 parts g and i, and substitute the following adjustment controls; R1055 for R755, R1075 for R765, R1065 for R775, R1025 for R725, R1020 for R720).

c. Use LEVEL controls to trigger the A and B sweeps; set HORIZ DISPLAY to ALT; rotate the DTP and check that the intensified zone of the A trace jumps from cycle to cycle without movement of the B trace. Disconnect the Type 191 from the 485.

75A. CHECK EXTERNAL A and B TRIGGERS

a. Set VERT MODE to CH 2; INT TRIG to NORM; HORIZ DISPLAY to A; SWEEP MODE to NORM TRIG; A Trigger SOURCE to EXT, CH 2 input to 50 Ω.

b. Apply 20 mV of 50 kHz reference signal (as viewed on the CRT) from the 191 through the network shown in Fig. 5-2. Set the 191 to 50 MHz (without changing the Amplitude control). Set the A & B TIME/DIV controls to 20 ns/division. Adjust the LEVEL control and check that stable triggering can be achieved. Disconnect the Type 191 from the Fig. 5-2 network.

c. Connect the High Frequency Constant-Amplitude Signal Generator to the Fig. 5-2 T connector through a GR to BNC adapter. Adjust generator amplitude to provide 100 mV of displayed Reference Frequency signal on the CRT (use external attenuators as necessary between the generator cable and the T connector to obtain the 100 mV displayed signal).

d. Switch the generator to 350 MHz without changing the amplitude setting. Set the A TIME/DIV to one ns/division (for B trigger check, set A TIME/DIV to 10 ns/division and B TIME/DIV to one ns/division.

e. Check that stable triggering can be achieved by adjusting the LEVEL control.

f. Set the SWEEP MODE to AUTO; A trigger SOURCE to INT; HORIZ DISPLAY to B. Remove the connection from the A EXT TRIG input and connect it to the B EXT TRIG input; set B trigger SOURCE to EXT.

g. Repeat Step 75A parts b through e for the B trigger.

h. Disconnect generator and Fig. 5-2 network from the 485.

75B. CHECK INTERNAL A and B 350 MHz TRIGGERING

a. Set VERT MODE to CH 2; INT TRIG to NORM; A Trigger SOURCE to INT; CH 2 input to 50 Ω; CH 2 VOLTS/DIV to 100 mV/division; A TIME/DIV to one ns.

b. Apply a 350 MHz signal from the High Frequency Constant-Amplitude Signal Generator to the CH 2 input through a GR to BNC adapter and adjust for a 1.5 division CRT display (change CH 2 VOLTS/DIV and generator amplitude control as necessary to produce the 1.5 division display).

c. Check that stable triggering can be achieved by adjusting the LEVEL control.

d. Set the SWEEP MODE to AUTO; HORIZ DISPLAY to B; B trigger SOURCE to INT; A TIME/DIV to 10 ns/ division; B TIME/DIV to one ns/division.

e. Repeat step 75B parts b and c for B sweep 350 MHz internal triggering.

f. Disconnect generator and cables from the 485.

76. CHECK A EXT TRIGGER DELAY MATCH TO CH 2

a. CH 2 50 mV/div; DC coupled; A triggering SOURCE EXT; COUPLING AC; SLOPE +; TIME/DIV 1 ns; CAL 5 FREQ 1 MHz.

b. Connect 50 Ω termination at A EXT TRIG; connect 2X attenuators to 50 Ω termination and CH 2 input; connect Dual Input cable to 2X attenuators; connect CAL 5 V output to Dual Input Connector. See Fig. 5-2.

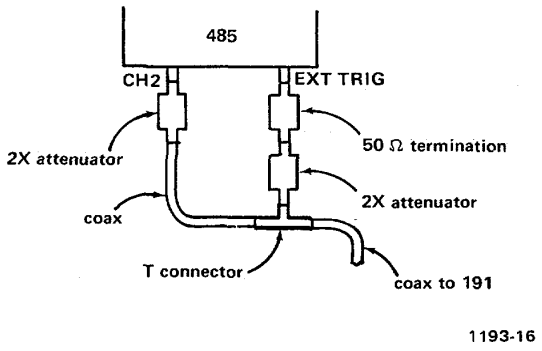


Fig. 5-2. External trigger Check Connection.

c. Use the A LEVEL control to trigger on the larger of the positive steps. This should give a 3.3 div display (167 mV) on CH 2. Use CH 2 POSITION control to center the CH 2 step vertically.

d. Hold the A EXT TRIG pushbutton and use the A LEVEL to center the large step vertically. Use POSITION (HORIZ) to set the 50% amplitude point exactly 0.1 div to the right of center screen (this 0.1 ns offset compensates for the delay through the one 50 Ω BNC termination).

e. Check for 0.5 ns or less delay match of EXT TRIG to CH 2 50Ω (± 0.5 div).

f. Add a 50 Ω BNC termination at CH 2 input; CH 2 input to 1 MΩ.

g. Repeat step d, but use POSITION (HORIZ) to set 50% amplitude point exactly to center screen.

h. Check for 0.5 ns or less delay match of EXT TRIG to CH 2 1 MΩ (± 0.5 div).

77. CHECK EXTERNAL TRIGGER LEVEL RANGE A and B

a. Connect 1 V from the Amplitude Calibrator to A EXT TRIG; A TRIGGER SOURCE to EXT; SWEEP MODE to NORM.

b. Rotate LEVEL and check that sweep stops running at both ends of the LEVEL range.

c. Amplitude Calibrator to 10 V; A TRIGGER SOURCE to EXT ÷ 10.

d. Rotate LEVEL and check that sweep stops running at both ends of the LEVEL range.

e. SWEEP MODE to AUTO; HORIZ DISPLAY to B.

f. Repeat for B.

78. CHECK SINGLE SWEEP

a. Trigger A Sweep on 1 div of 50 kHz.

b. Remove signal and switch to SINGLE SWEEP.

c. Reset lamp should light.

d. Apply signal, should have one sweep, READY light should go off.

e. Remove signal and reset. RESET lamp should light.

79. CHECK A EXT TRIG RESPONSE

a. Connect TD Pulser through a 50Ω termination to the A EXT TRIG input.

b. Depress the A EXT TRIG switch and check risetime to less than 1.6 ns.

80. ADJUST X-Y BALANCE (Located Rear of Sweep Board)

a. Set VERT MODE to ALT; VOLTS/DIV to 20 mV.

b. Center both traces.

c. Set VERT MODE to X-Y.

d. Adjust X-Y center (R1355 located on Sweep board) to center spot.

81. ADJUST X-Y GAIN (Located Rear of Vertical Board)

a. Connect 120 mV from 50Ω Amplitude Calibrator to CH 2 50Ω input impedance.

b. Adjust X GAIN (R575) for 6 div, must match CH 2 gain ± 1%.

c. 5 mV/div to 5 V/div gain accuracy ± 2%.

82. ADJUST X-Y PHASING (Located Rear of Sweep Board)

a. Connect CH 1 and CH 2 to Type 191 generator through dual input cable.

b. Apply 10 div of 50 kHz; CH 1 to 50 mV, CH 2 to 20 mV.

c. Switch to 4 MHz.

d. Adjust X-Y L1346 (Sweep board) for a closed lissajous figure.
e. Switch Type 191 to next lower range, adjust X-Y R1348 (Sweep board) for closed lissajous figure.
f. Recheck steps d and e as they may interact.
g. Switch to 20 MHz limit, compromise phasing adjustments between full and 20 MHz limit for less than 0.2 div opening with 7 div of signal.

83. CHECK X-Y BANDWIDTH

a. Ground CH 1, apply 10 div of 50 kHz to CH 2.
b. Check for at least 4 MHz bandwidth at -3 dB point.

84. CHECK BANDWIDTH LIMIT

a. Set VERT MODE to CH 1 and apply 6 div of 50 kHz.
b. Hold BANDWIDTH pushbutton in.
c. Check for 17 to 23 MHz bandwidth at -3 dB point.

RACKMOUNTING

Introduction

The TEKTRONIX Type R485 Oscilloscope is designed to mount in a standard 19-inch rack.

Rack Dimensions

Height. At least seven inches of vertical space is required to mount this instrument in a cabinet rack.

Width. Minimum width of the opening between the left and right front rails of the rack must be 17-5/8 inches. This allows room on each side of the instrument for the slide-out tracks to operate freely, permitting the instrument to move smoothly in and out of the rack.

Depth. Total depth necessary to mount the Type R485 in a cabinet rack is 19-3/8 inches. This allows room for air circulation, power cord and the necessary mounting hardware.

Slide-Out Tracks

The hardware provided for mounting the slide-out tracks is shown in Fig. 6-1. Since the hardware is intended to make the tracks compatible with a variety of cabinet racks and installation methods, not all of it will be needed for this installation. Use only the hardware that is required for the mounting method used.

Fig. 6-2 shows the Type R485 installed in a cabinet-type rack. The slide-out tracks provided with the Type R485 permit it to be extended out of the rack for maintenance or calibration without removing the instrument from the rack. In the fully extended position, the Type R485 can be tilted up so the bottom of the instrument can be reached for maintenance or calibration. To operate the Type R485 in the extended position, be sure the power cord and any interconnecting cables are long enough for this purpose. When not extended, the instrument is held in the rack with four securing screws (see Fig. 6-2A).

The slide-out tracks consist of two assemblies-one for the left side of the instrument and one for the right side. Fig. 6-3 shows the complete slide-out track assemblies. The stationary section of each assembly attaches to the front and rear rails of the rack, and the chassis section is attached to the instrument. The intermediate section slides between the stationary and chassis sections and allows the Type R485 to be extended out of the track. When the instrument is shipped, the stationary and intermediate sections of the tracks are packaged as matched sets and should not be separated. To identify the left or right assembly note the position of the automatic latch (see Fig. 6-3). When mounted in the rack, the automatic latch should be at the top of both assemblies. The chassis sections are installed on the instrument at the factory.

Mounting Procedure

The front flanges of the stationary sections may be mounted in front of (outside) or behind (inside) the front rails of the rack, depending on the type of rack. If the front rails of the rack are tapped for 10-32 screws, the front flanges are mounted outside of the rails. If the front rails of the rack are not tapped for 10-32 screws, the front flanges are mounted inside the front rail and a bar nut is used. Fig. 6-4 shows these methods of mounting the stationary sections.

Use the following procedure to install the Type R485 in a rack:

1. Select the proper front-rail mounting holes for the stationary sections, using the measurements shown in Fig. 6-5.

2. If the mounting flanges of the stationary sections are to be mounted in front of the front rails (rails tapped for 10-32 screws), mount each stationary section as shown in Fig. 6-4A.

3. If the mounting flanges of the stationary sections are to be mounted behind the front rails (rails not tapped for 10-32 screws), mount each stationary section as shown in Fig. 6-4B.

4. Refer to Fig. 6-6 to insert the instrument into the rack. Do not connect the power cord or install the securing screws until all adjustments have been made.

5. Position the instrument so the pivot screws (widest part of instrument) are approximately even with the front rails.

6. Adjust the alignment of the stationary sections according to the procedure outlined in Fig. 6-7.

7. After the tracks operate smoothly, connect the power cord to the power source.

8. Push the instrument all the way into the rack and secure it to the rack with the securing screws and washers as shown in Fig. 6-6.

Alternate Rear Mounting Methods

CAUTION

Although the following methods provide satisfactory mounting under normal conditions, they do not provide solid support at the rear of the instrument. If the instrument will be subjected to severe shock or vibration consult your local TEKTRONIX Field Engineer for rear support mounting information.

An alternative method of supporting the rear of the instrument is shown in Fig. 6-8. The rear support brackets supplied with the instrument allow it to be mounted in a rack which has a spacing between the front and rear rails of 11 to 24 inches. Fig. 6-8A illustrates the mounting method if the rear rails are tapped for 10-32 screws, and Fig. 6-8B illustrates the mounting method if the rear rails are not tapped for 10-32 screws.

If the rack does not have a rear rail, or if the distance between the front and rear rails are too large, the instrument may be mounted without the use of the slide-out tracks. Fasten the instrument to the front rails of the rack with the securing screws and washers. This mounting method should be used only if the instrument will not be subjected to shock or vibration and if it is installed in a stationary location.

Removing or Installing the Instrument

After initial installation and adjustment of the slide-out tracks, the Type R485 can be removed or installed by following the instructions given in Fig. 6-6. No further adjustments are required under normal conditions.

To remove the R485 from the rack without removing the rack mount housing;

a. Remove the 4 screws from the feet at rear of the instrument.

b. Disconnect all connections to the rear of the instrument, unplug the power cord.

c. Remove the blue rear panel rim around the rear of the instrument.

d. Pull the R485 out the front of the rack mount housing.

e. To insert the R485 into the rack mount housing check the maintenance section, reinstalling the wrap around cover, for caution.

Slide-Out Track Lubrication

The slide-out tracks normally require no lubrication. The special finish on the sliding surfaces provide permanent lubrication. However, if the tracks do not slide smoothly even after proper adjustment, a thin coating of paraffin rubbed onto the sliding surfaces may improve operation.

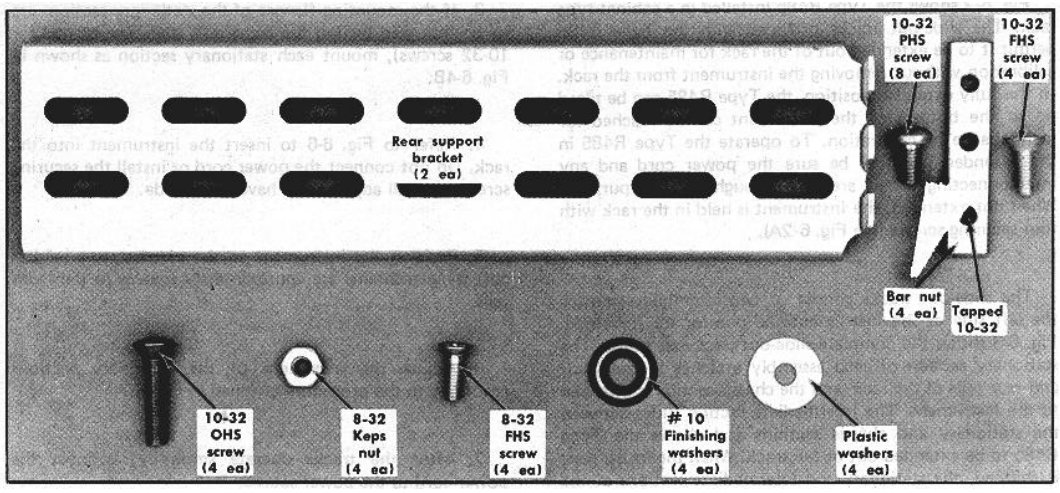


Fig. 6-1. Hardware needed to mount the instrument in the cabinet rack.

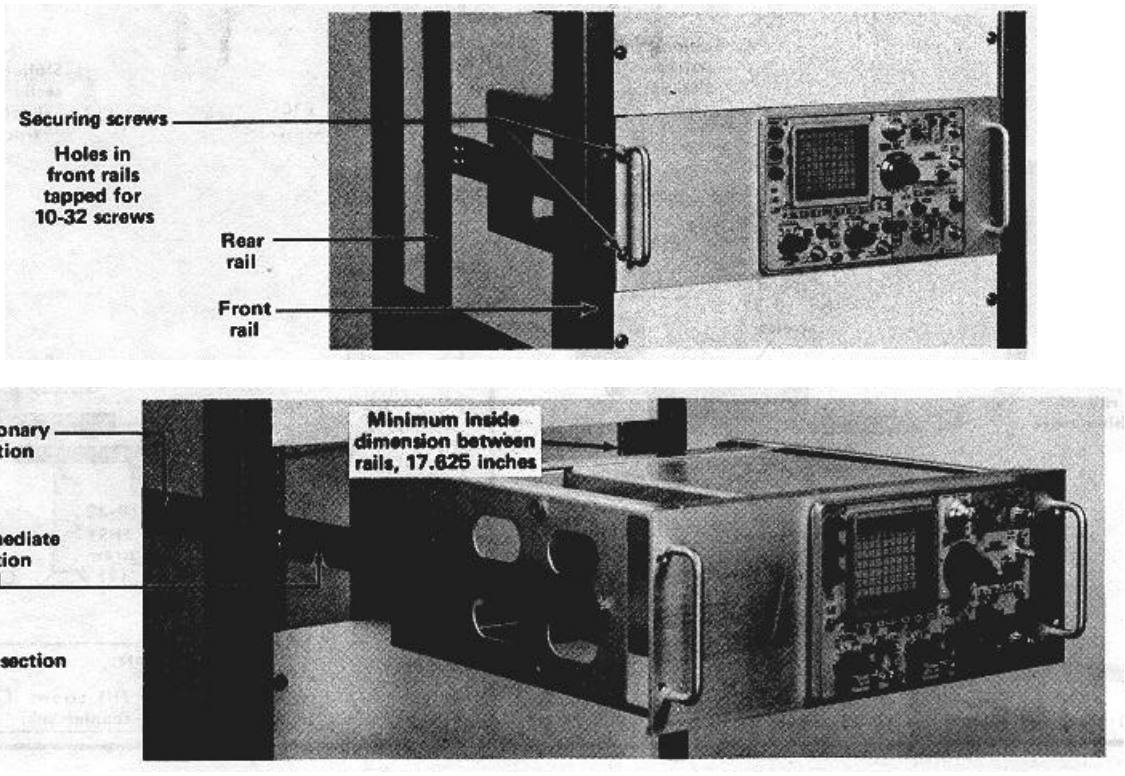


Fig. 6-2. The 485 installed in a cabinet rack (sides removed); (A) held into rack with securing screws, (B) extended on slideout tracks

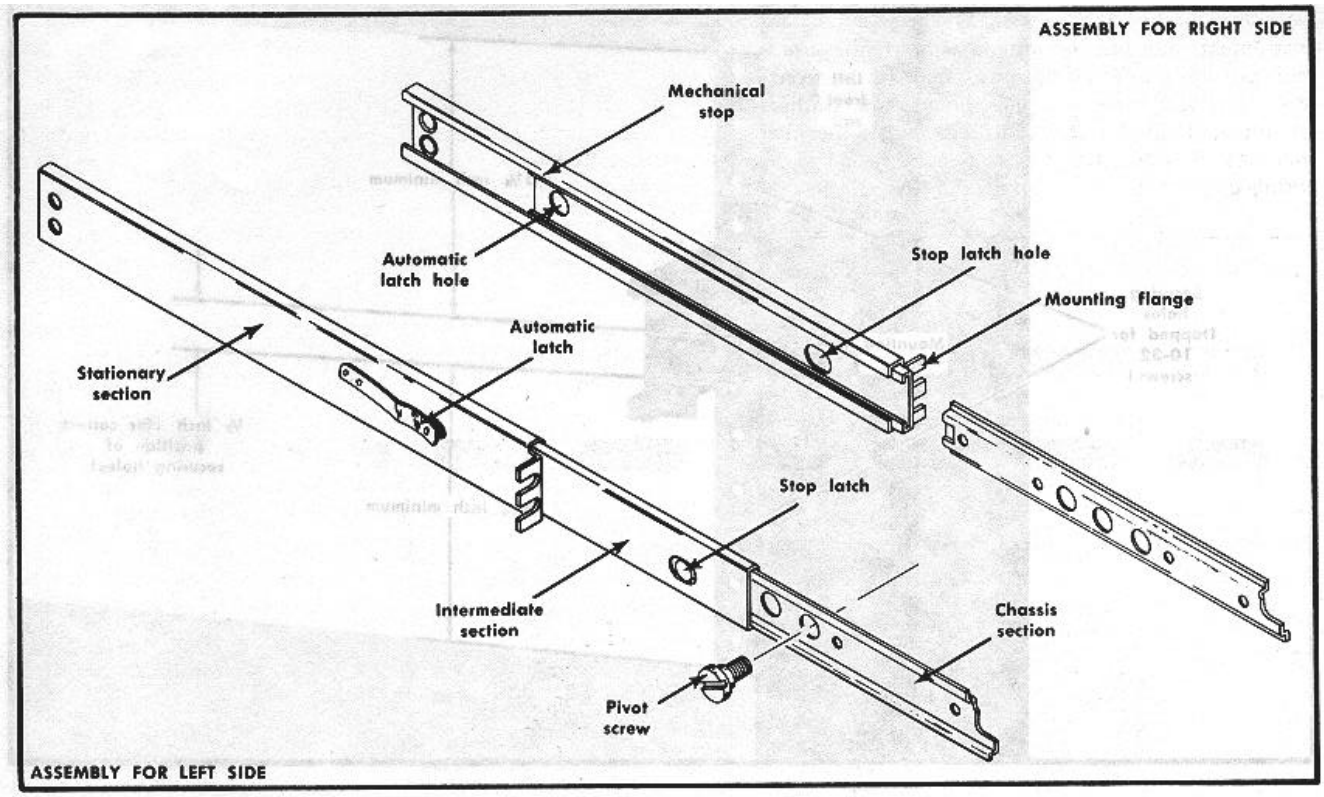


Fig. 6-3. Slideout track assemblies.

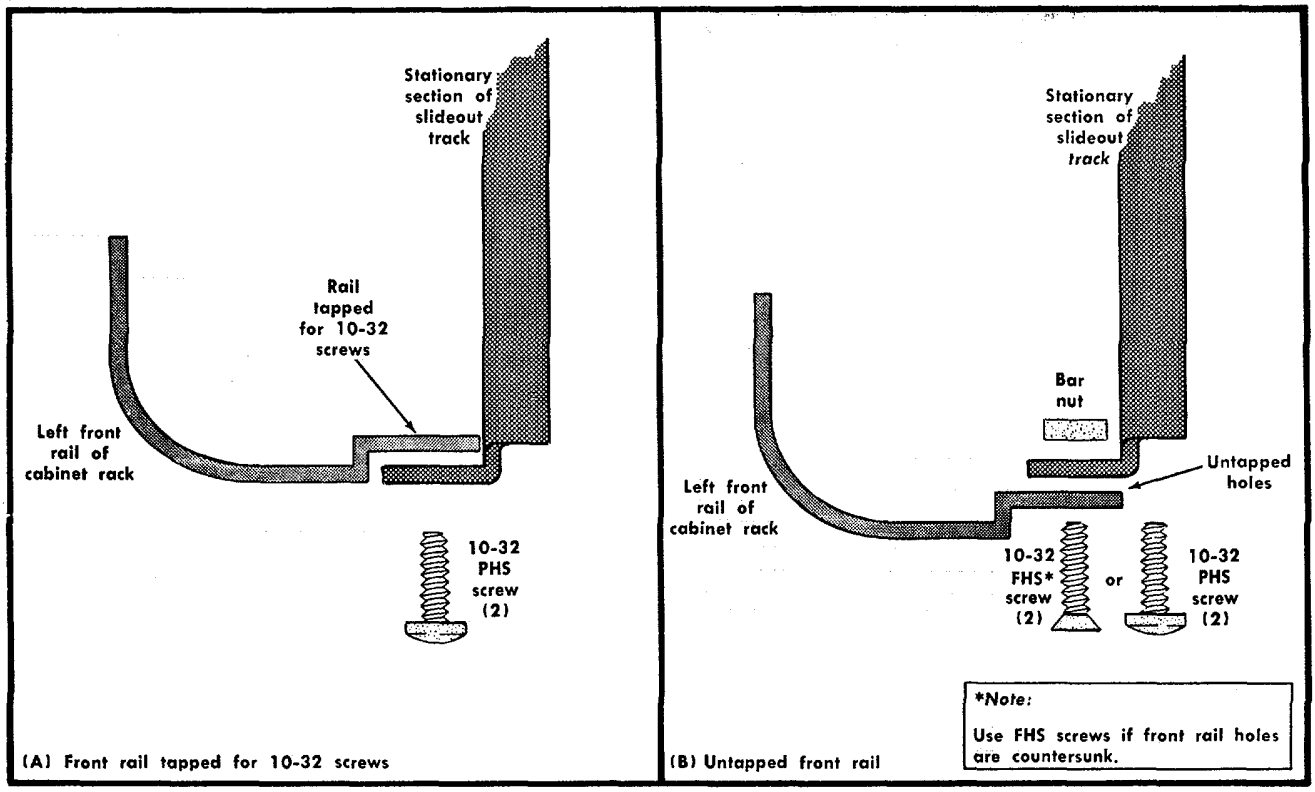


Fig. 6-4. Methods of mounting the stationary section to the front rails.

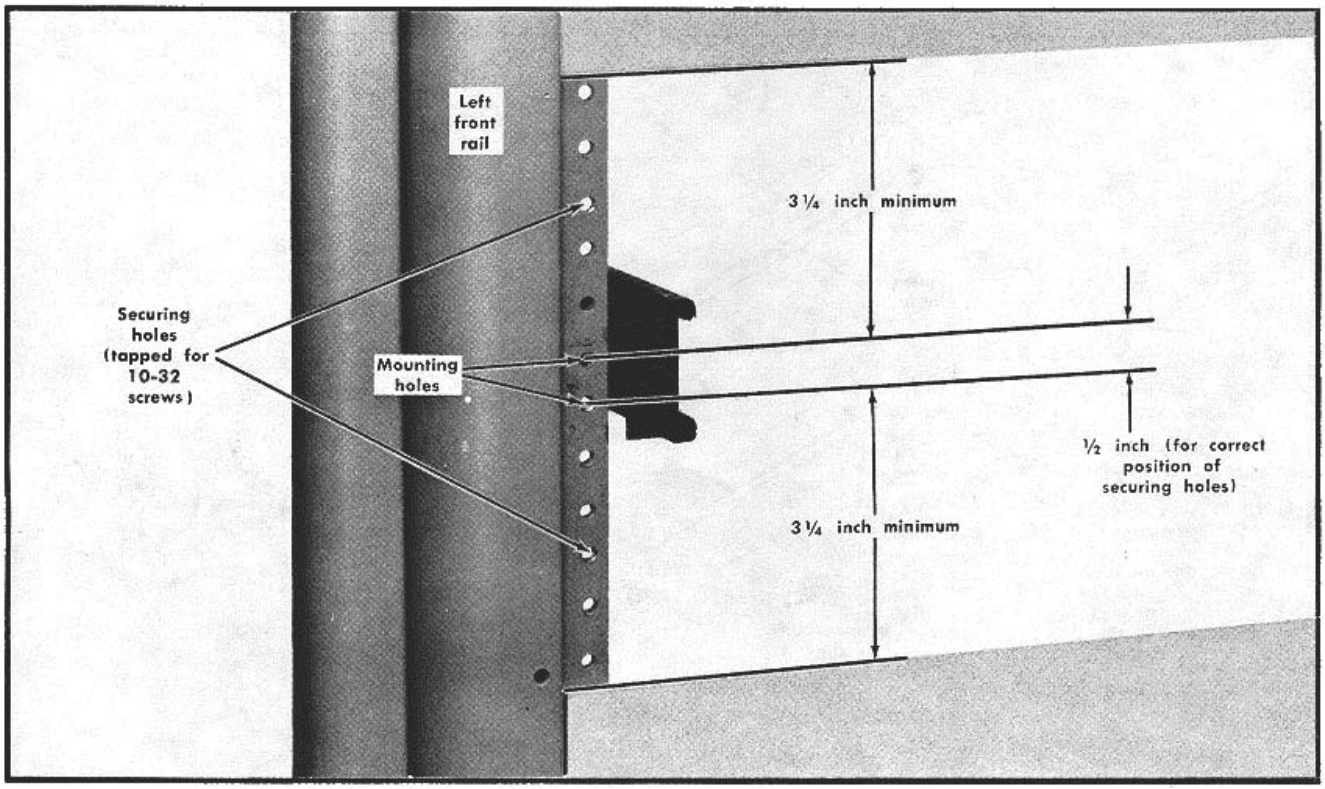


Fig. 6-5. Locating the mounting holes for the stationary sections. Same dimensions apply to right stationary section.

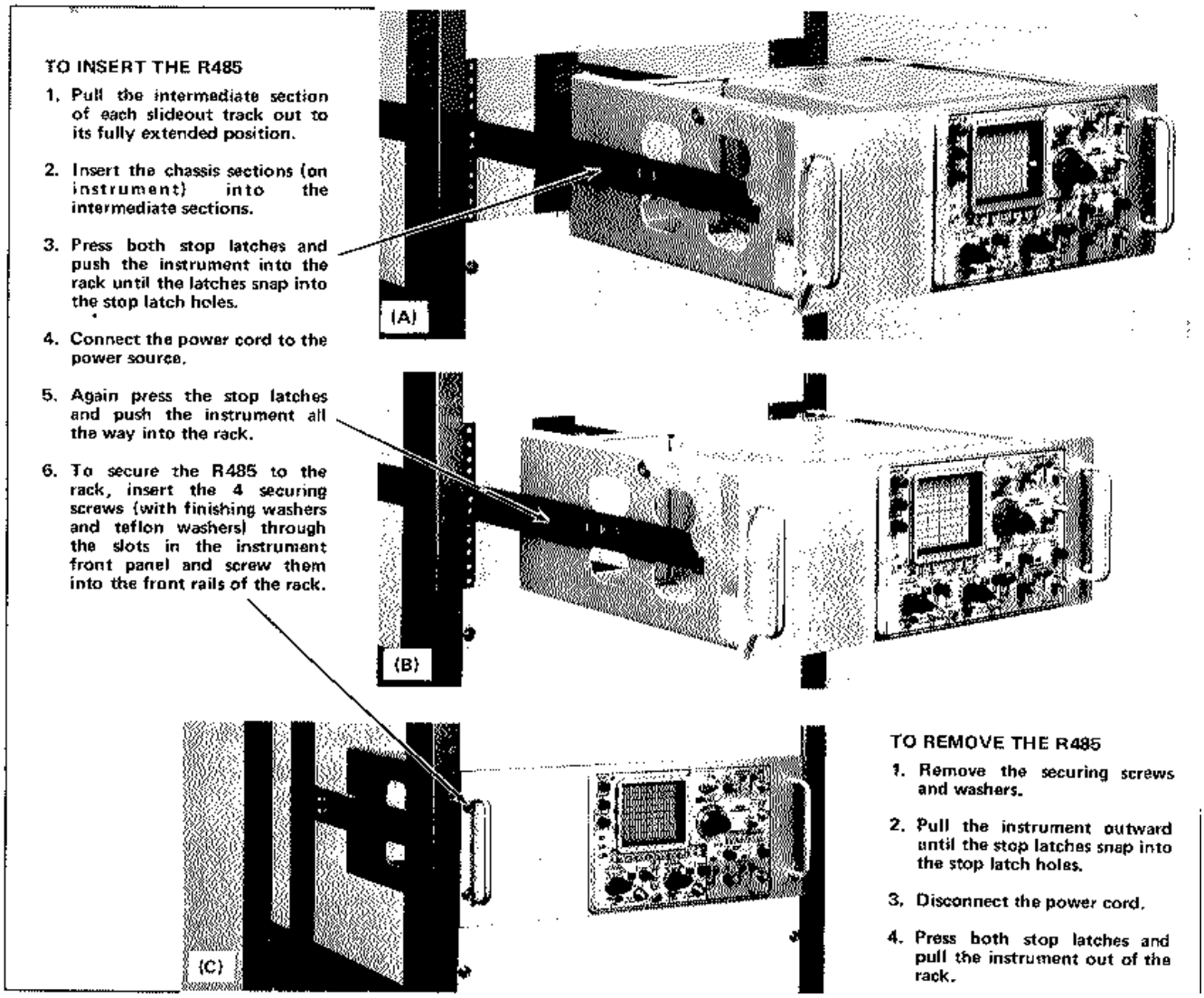


Fig. 6-6. Procedure for inserting or removing the instrument after the slideout tracks have been installed.

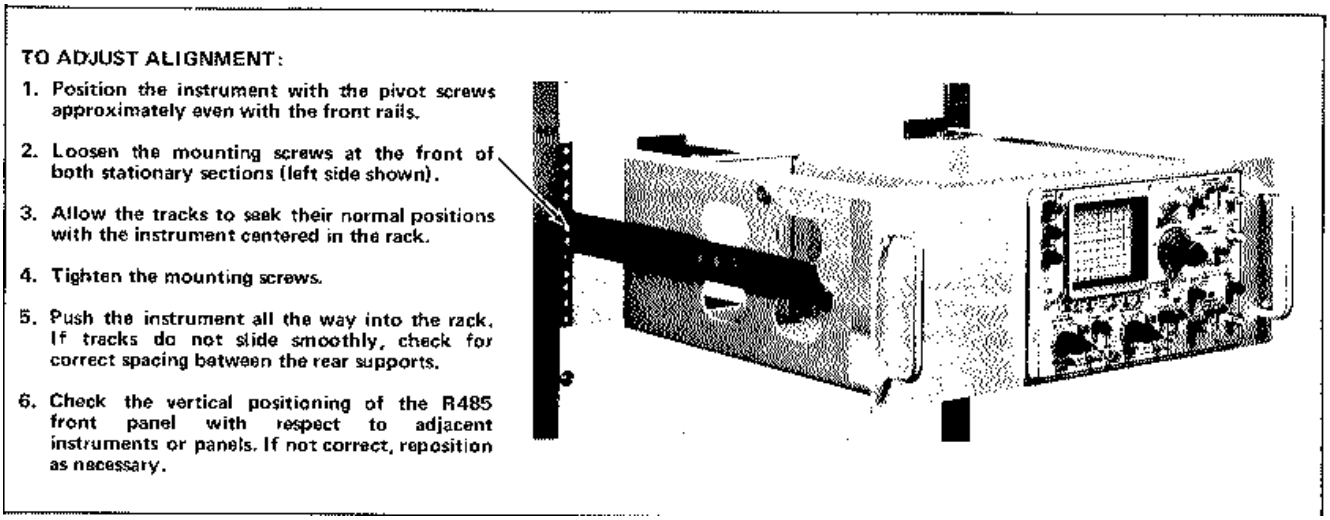


Fig. 6-7. Alignment adjustments for correct operation.

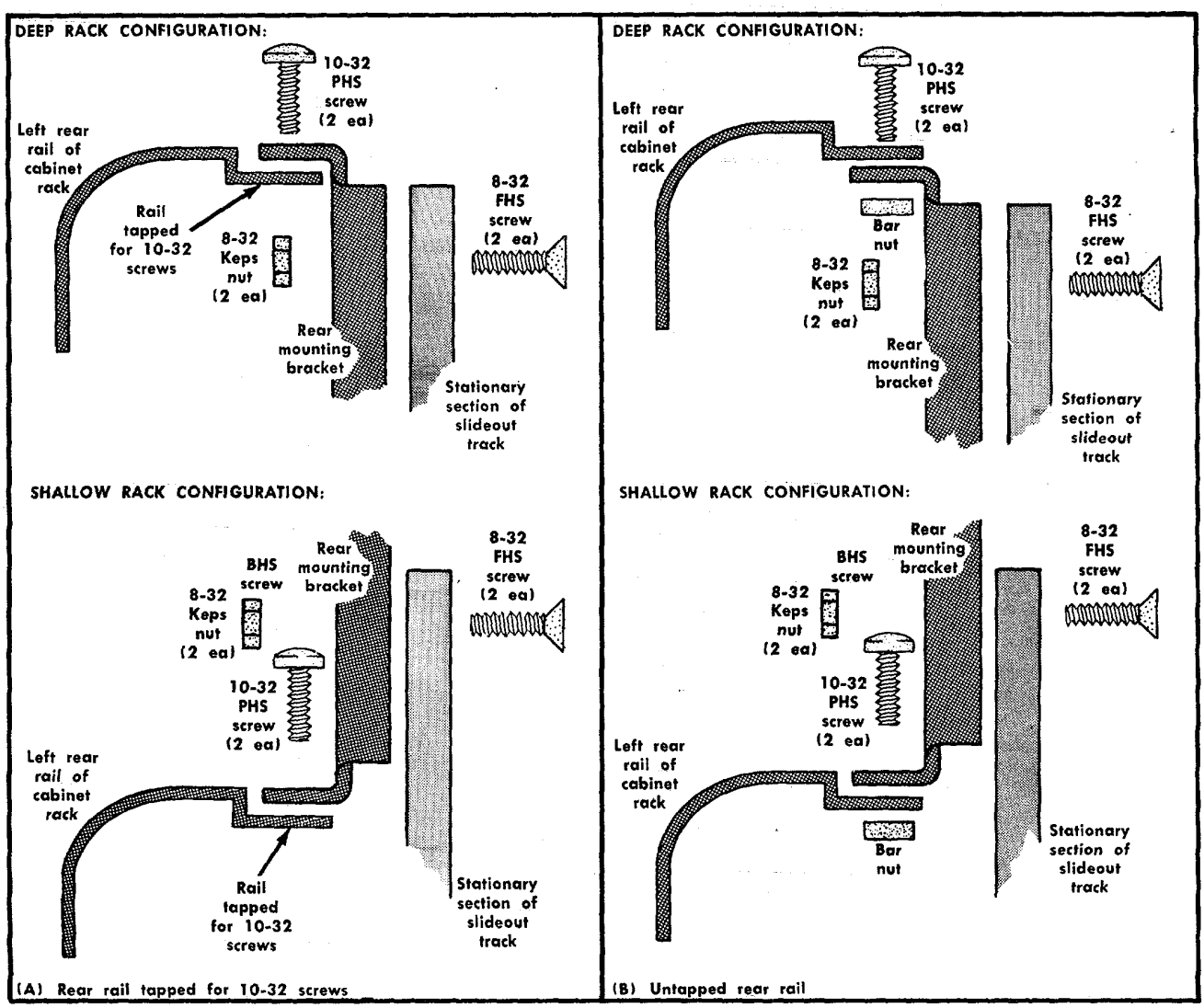


Fig. 6-8. Alternative method of installing the instrument using rear support brackets.

WARNING

During rackmount installation, interchanging the left and right slide-out track assemblies defeats the extension stop (safety latch) feature of the tracks. Equipment could, when extended, come out of the slides and fall from the rack, possibly causing personal injury and equipment damage.

When mounting the supplied slide-out tracks, inspect both assemblies to find the LH (left hand) and RH (right hand) designations to determine correct placement. Install the LH assembly to your left side as you face the front of the rack and install the RH assembly to your right side. Refer to the rackmounting instructions in this manual for complete information.

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.

SPECIAL NOTES AND SYMBOLS

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

ITEM NAME

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

ABBREVIATIONS

ACTR	ACTUATOR	PLSTC	PLASTIC
ASSY	ASSEMBLY	QTZ	QUARTZ
CAP	CAPACITOR	RECP	RECEPTACLE
CER	CERAMIC	RES	RESISTOR
CKT	CIRCUIT	RF	RADIO FREQUENCY
COMP	COMPOSITION	SEL	SELECTED
CONN	CONNECTOR	SEMICOND	SEMICONDUCTOR
ELCTLT	ELECTROLYTIC	SENS	SENSITIVE
ELEC	ELECTRICAL	VAR	VARIABLE
INCAND	INCANDESCENT	WW	WIREWOUND
LED	LIGHT EMITTING DIODE	XFMR	TRANSFORMER
NONWIR	NON WIREWOUND	XTAL	CRYSTAL

CROSS INDEX-MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
000L1	TOPTRON CORP		TOKYO, JAPAN
00779	AMP, INC.	P.O. BOX 3608	HARRISBURG, PA 17105
00853	SANGAMO ELECTRIC CO., S. CAROLINA DIV.	P.O. BOX 128	PICKENS, SC 29871
01121	ALLEN-BRADLEY COMPANY	1201 2ND STREET SOUTH	MILWAUKEE, WI 53204
01295	TEXAS INSTRUMENTS, INC. SEMICONDUCTOR GROUP	P.O. BOX 5012	DALLAS, TX 75222
02111	SPECTROL ELECTRONICS CORPORATION	17070 EAST GALE AVENUE	CITY OF INDUSTRY, CA 91745
02114	FERROXCUBE CORPORATION	PO BOX 359, MARION ROAD	SAUGERTIES, NY 12477
02735	RCA CORPORATION, SOLID STATE DIVISION	ROUTE 202	SOMERVILLE, NY 08876
03508	GENERAL ELECTRIC COMPANY, SEMI-CONDUCTOR PRODUCTS DEPARTMENT	ELECTRONICS PARK	SYRACUSE, NY 13201
03888	KDI PYROFILM CORPORATION	60 S JEFFERSON ROAD	WHIPPANY, NJ 07981
04222	AVX CERAMICS, DIVISION OF AVX CORP.	P O BOX 867	MYRTLE BEACH, SC 29577
04713	MOTOROLA, INC., SEMICONDUCTOR PROD. DIV.	5005 E MCDOWELL RD,PO BOX 20923	PHOENIX, AZ 85036
05397	UNION CARBIDE CORPORATION, MATERIALS SYSTEMS DIVISION	11901 MADISON AVENUE	CLEVELAND, OH 44101
05587	COUCH, S.H., DIVISION, ESB, INC.	36 RIVER STREET	BOSTON, MA 02126
05828	GENERAL INSTRUMENT CORP ELECTRONIC SYSTEMS DIV.	600 W JOHN ST.	HICKSVILLE LI, NY 11802
07263	FAIRCHILD SEMICONDUCTOR, A DIV. OF FAIRCHILD CAMERA AND INSTRUMENT CORP.	464 ELLIS STREET	MOUNTAIN VIEW, CA 94042
07716	TRW ELECTRONIC COMPONENTS, IRC FIXED RESISTORS, BURLINGTON DIV.	2850 MT. PLEASANT	BURLINGTON, IA 52601
08806	GENERAL ELECTRIC CO., MINIATURE LAMP PRODUCTS DEPARTMENT	NELA PARK	CLEVELAND, OH 44112
12697	CLAROSTAT MFG. CO., INC.	LOWER WASHINGTON STREET	DOVER, NH 03820
12954	SIEMENS CORPORATION, COMPONENTS GROUP	8700 E THOMAS RD, P O BOX 1390	SCOTTSDALE, AZ 85252
12969	UNITRODE CORPORATION	580 PLEASANT STREET	WATERTOWN, MA 02172
13511	AMPHENOL CARDRE DIV., BUNKER RAMO CORP.		LOS GATOS, CA 95030
14193	CAL-R, INC.	1601 OLYMPIC BLVD.	SANTA MONICA, CA 90404
14298	AMERICAN COMPONENTS, INC., AN INSILCO COMPANY	8TH AVE. AT HARRY STREET	CONSHOHOCKEN, PA 19428
14433	ITT SEMICONDUCTORS	3301 ELECTRONICS WAY P O BOX 3049	WEST PALM BEACH, FL 33402
14552	MICRO SEMICONDUCTOR CORP.	2830 E FAIRVIEW ST.	SANTA ANA, CA 92704
14752	ELECTRO CUBE INC.	1710 S. DEL MAR AVE.	SAN GABRIEL, CA 91776
15238	ITT SEMICONDUCTORS, A DIVISION OF INTER NATIONAL TELEPHONE AND TELEGRAPH CORP.	P.O. BOX 168, 500 BROADWAY	LAWRENCE, MA 01841
15454	RODAN INDUSTRIES, INC.	2905 BLUE STAR ST.	ANAHEIM, CA 92806
17856	SILICONIX, INC.	2201 LAURELWOOD DRIVE	SANTA CLARA, CA 95054
18583	CURTIS INSTRUMENTS, INC.	200 KISCO AVE.	MOUNT KISCO, NY 10549
22229	SOLITRON DEVICES, INC., SEMICONDUCTOR GROUP	8808 BALBOA AVENUE	SAN DIEGO OPERS, CA 92123
24546	CORNING GLASS WORKS, ELECTRONIC COMPONENTS DIVISION	550 HIGH STREET	BRADFORD, PA 16701
24931	SPECIALITY CONNECTOR CO., INC.	2620 ENDRESS PLACE	GREENWOOD, IN 46142
25088	SIEMENS CORP.	186 WOOD AVE. S	ISELIN, NJ 08830
27014	NATIONAL SEMICONDUCTOR CORP.	2900 SEMICONDUCTOR DR.	SANTA CLARA, CA 95051
32293	INTERSIL, INC.	10900 N. TANTAU AVE	CUPERTINO, CA 95014
32997	BOURNS, INC., TRIMPOT PRODUCTS DIV.	1200 COLUMBIA AVE.	RIVERSIDE, CA 92507
50157	MIDWEST COMPONENTS INC.	P.O. BOX 787 1981 PORT CITY BLVD.	MUSKEGON, MI 49443
50434	HEWLETT-PACKARD COMPANY	640 PAGE MILL ROAD	PALO ALTO, CA 94304
51406	MURATA CORPORATION OF AMERICA	2 WESTCHESTER PLAZA	ELMSFORD, NY 10523
51642	CENTRE ENGINEERING INC.	2820 E COLLEGE AVENUE	STATE COLLEGE, PA 16801
52306	HIGH VOLTAGE DEVICES, INC.	7485 AVENUE 304	VISALIA, CA 93277
53184	XCITON CORPORATION	5 HEMLOCK STREET	LATHAM, NY 12110
56289	SPRAGUE ELECTRIC CO.	87 MARSHALL ST.	NORTH ADAMS, MA 01247
57668	R-OHM CORP.	16931 MILLIKEN AVE.	IRVINE, CA 92713
59660	TUSONIX INC.	2155 N FORBES BLVD	TUCSON, AZ 85705
59821	CENTRALAB INC SUB NORTH AMERICAN PHILIPS CORP	7158 MERCHANT AVE	EL PASO, TX 79915
60705	CERA-MITE CORP.	1327 6TH AVE.	GRAFTON, WI 53024
71400	BUSSMAN MFG., DIVISION OF MCGRAW-EDISON CO.	2536 W. UNIVERSITY ST.	ST. LOUIS, MO 63107
71590	CENTRALAB ELECTRONICS, DIV. OF GLOBE-UNION, INC.	P.O. BOX 858	FORT DODGE, IA 50501
71744	CHICAGO MINIATURE LAMP WORKS	4433 RAVENSWOOD AVE.	CHICAGO, IL 60640

CROSS INDEX-MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
72982	ERIE TECHNOLOGICAL PRODUCTS, INC.	644 W. 12TH ST.	ERIE, PA 16512
73138	BECKMAN INSTRUMENTS, INC., HELIPOT DIV.	2500 HARBOR BLVD.	FULLERTON, CA 92634
73899	JFD ELECTRONICS COMPONENTS CORP.	PINETREE ROAD	OXFORD, NC 27565
74276	SIGNALITE DIV., GENERAL INSTRUMENT CORP.	1933 HECK AVE.	NEPTUNE, NJ 07753
74970	JOHNSON, E. F., CO.	299 10TH AVE. S. W.	WASECA, MN 56093
75042	TRW ELECTRONIC COMPONENTS, IRC FIXED RESISTORS, PHILADELPHIA DIVISION	401 N. BROAD ST.	PHILADELPHIA, PA 19108
76493	BELL INDUSTRIES, INC., MILLER, J. W., DIV.	19070 REYES AVE., P. O. BOX 5825	COMPTON, CA 90224
78488	STACKPOLE CARBON CO.		ST. MARYS, PA 15857
80009	TEKTRONIX, INC.	P. O. BOX 500	BEAVERTON, OR 97077
80031	ELECTRA-MIDLAND CORP., MEPCO DIV.	22 COLUMBIA ROAD	MORRISTOWN, NJ 07960
81073	GRAYHILL, INC.	561 HILLGROVE AVE., PO BOX 373	LA GRANGE, IL 60525
82104	STANDARD GRIGSBY CO., DIV. OF SUN CHEMICAL CORPORATION	920 RATHBONE AVENUE	AURORA, IL 60507
82389	SWITCHCRAFT, INC.	5555 N. ELSTON AVE.	CHICAGO, IL 60630
83003	VARO, INC.	P O BOX 411, 2203 WALNUT STREET	GARLAND, TX 75040
84411	TRW ELECTRONIC COMPONENTS, TRW CAPACITORS	112 W. FIRST ST.	OGALLALA, NE 69153
90201	MALLORY CAPACITOR CO., DIV. OF P.R. MALLORY AND CO., INC.	3029 E. WASHINGTON STREET P.O. BOX 372	INDIANAPOLIS, IN 46206
91418	RADIO MATERIALS COMPANY, DIV. OF P.R. MALLORY AND COMPANY, INC.	4242 W BRYN MAWR	CHICAGO, IL 60646
91637	DALE ELECTRONICS, INC.	P.O. BOX 609	COLUMBUS, NE 68601
91836	KINGS ELECTRONICS CO., INC.	40 MARBLEDALE ROAD	TUCKAHOE, NY 10707
93410	ESSEX INTERNATIONAL, INC., CONTROLS DIV. LEXINGTON PLANT	P.O. BOX 1007	MANSFIELD, OH 44903
93958	REPUBLIC ELECTRONICS CORPORATION	176 E 7TH STREET	PATERSON, NJ 07524
95275	VITRAMON, INC.	P O BOX 544	BRIDGEPORT, CT 06601
96733	SAN FERNANDO ELECTRIC MFG CO	1501 FIRST ST	SAN FERNANDO, CA 91341
99699	DEUTSCH RELAYS, INC.	65 DALY ROAD	EAST NORTHPORT, LI, NY 1173
S3629	PANEL COMPONENTS CORP.	2015 SECOND ST.	BERKELEY, CA 94170
S3774	OSHINO ELECTRIC LAMP WORKS LTD	5 2 MINAMI SHINAGAWA 2 CHORE SHINAGAWA KU	TOKYO, JAPAN
T0058	NEC ELECTRON INC.	252 HUMBOLT COURT	SUNNYVALE, CA 94086

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A1	670-1514-00	B010100	B166669	CKT BOARD ASSY:LIGHT BLOCK	80009	670-1514-00
A1				(485,485-1 ONLY)		
A1	670-1514-01	B166700		CKT BOARD ASSY:LIGHT BLOCK	80009	670-1514-01
A1				485,485-1 ONLY)		
A2	670-2599-00	B010100	B166669	CKT BOARD ASSY:LIGHT BLOCK	80009	670-2599-00
A2				(485-2 ONLY)		
A2	670-2599-01	B166700		CKT BOARD ASSY:LIGHT BLOCK	80009	670-2599-01
A2				(485-2 ONLY)		
A3	670-1512-00	B010100	B079999	CKT BOARD ASSY:HI Z ATTEN	80009	670-1512-00
A3				(485,485-1 ONLY)		
A3	670-1512-01	B080000	B155789	CKT BOARD ASSY:HI Z ATTEN	80009	670-1512-01
A3				(485,485-1 ONLY)		
A3	670-1512-02	B155790	B159999	CKT BOARD ASSY:HI Z ATTEN	80009	670-1512-02
A3				(485,485-1 ONLY)		
A3	670-1512-04	B160000	B166699	CKT BOARD ASSY:HI Z ATTEN	80009	670-1512-04
A3				(485,485-1 ONLY)		
A3	670-1512-05	B166700	B166999	CKT BOARD ASSY:HI Z ATTEN	80009	670-1512-05
A3				(485,485-1 ONLY)		
A3	670-1512-06	B167000	B191874	CKT BOARD ASSY:HI Z ATTEN	80009	670-1512-06
A3				(485,485-1 ONLY)		
A3	670-1512-07	B191875		CKT BOARD ASSY:HI Z ATTEN	80009	670-1512-07
A3				(485,485-1 ONLY)		
A4	670-2564-00	B010100	B159999	CKT BOARD ASSY:LOW Z ONLY CONTROL	80009	670-2564-00
A4				(485-2 ONLY)		
A4	670-2564-02	B160000	B166699	CKT BOARD ASSY:LOW Z ONLY CONTROL	80009	670-2564-02
A4				(485-2 ONLY)		
A4	670-2564-03	B166700		CKT BOARD ASSY:LOW Z ONLY CONTROL	80009	670-2564-03
A4				(485-2 ONLY)		
A5	670-1513-00			CKT BOARD ASSY:ATTENUATOR	80009	670-1513-00
A5				(485,485-1 ONLY)		
A6	670-2598-00			CKT BOARD ASSY:ATTENUATOR	80009	670-2598-00
A6				(485-2 ONLY)		
A7	670-1662-00	B010100	B159999	CKT BOARD ASSY:VERTICAL	80009	670-1662-00
A7	670-1662-01	B160000	B167779	CKT BOARD ASSY:VERTICAL	80009	670-1662-01
A7	670-1662-02	B167780	B169999	CKT BOARD ASSY:VERTICAL	80009	670-1662-02
A7	670-1662-03	B170000	B179999	CKT BOARD ASSY:VERTICAL	80009	670-1662-03
A7	670-1662-04	B180000	B190989	CKT BOARD ASSY:VERTICAL	80009	670-1662-04
A7	670-1662-05	B190990	B191677	CKT BOARD ASSY:VERTICAL	80009	670-1662-05
A7	670-1662-06	B191678		CKT BOARD ASSY:VERTICAL	80009	670-1662-06
A8	670-1660-00			CKT BOARD ASSY:A TRIGGER	80009	670-1660-00
A8				(485 ONLY)		
A9	670-2699-00			CKT BOARD ASSY:OPTION Z AXIS	80009	670-2699-00
A9				(485-1,485-2 ONLY)		
A10	670-1663-00	B010100	B129999	CKT BOARD ASSY:SWEEP	80009	670-1663-00
A10	670-1663-01	B130000	B191831	CKT BOARD ASSY:SWEEP	80009	670-1663-01
A10	670-1663-02	B191832		CKT BOARD ASSY:SWEEP	80009	670-1663-02
A11	670-1666-00	B010100	B167579	CKT BOARD ASSY:HORIZONTAL AMPLIFIER	80009	670-1666-00
A11	670-1666-01	B167580	B179999	CKT BOARD ASSY:HORIZONTAL AMPLIFIER	80009	670-1666-01
A11	670-1666-02	B180000		CKT BOARD ASSY:HORIZONTAL AMPLIFIER	80009	670-1666-02
A12	670-1664-00	B010100	B049999	CKT BOARD ASSY:TIMING SWITCH	80009	670-1664-00
A12	670-1664-01	B050000	B154999	CKT BOARD ASSY:TIMING SWITCH	80009	670-1664-01
A12	670-1664-02	B155000		CKT BOARD ASSY:TIMING SWITCH	80009	670-1664-02
A13	670-1665-00	B010100	B167319	CKT BOARD ASSY:POWER SUPPLY	80009	670-1665-00
A13	670-1665-01	B167320		CKT BOARD ASSY:POWER SUPPLY	80009	670-1665-01

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A14	670-1659-00			CKT BOARD ASSY.INVERTER	80009	670-1659-00
A15	670-1661-00			CKT BOARD ASSY:TRANSFORMER MULTIPLIER	80009	670-1661-00
A16	670-2352-00			CKT BOARD ASSY:LINE FILTER	80009	670-2352-00
B1480	147-0035-00			MOTOR,DC:BRUSHLESS,10-15VDC,145MA	25088	1AD3001-0A
C1	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C2	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C3	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C3				(485,485-1 ONLY)		
C4	283-0204-00	B010100	B155789	CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C4				(485,485-1 ONLY)		
C10	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C10				(485,485-1 ONLY)		
C11	281-0627-00	B160000		CAP.,FXD,CER DI:1PF,+/-0.25PF,500V	04222	77001-C0K-1R0C
C12	281-0138-00			CAP.,VAR,PLSTC:0.4-1.2PF,600V	74970	1890509075
C12				(485,485-1 ONLY)		
C16	285-0816-03			CAP.,FXD,PLSTC:	80009	285-0816-03
C16				(485,485-1 ONLY)		
C17	281-0580-00	B010100	B019999	CAP.,FXD,CER DI:470PF,10%,500V	04222	7001-1374
C17				(485,485-1 ONLY)		
C18	283-0181-00			CAP.,FXD,CER DI:1.8PF,10%,100V	59660	8101B121C0K0189B
C18				(485,485-1 ONLY)		
C20	307-1014-01	B010100	B143499	ATTENUATOR,FXD:100X	80009	307-1014-01
C22				(485,485-1 ONLY)		
C20	307-1014-03	B143500		ATTENUATOR,FXD:100X	80009	307-1014-03
C22				(485,485-1 ONLY)		
C24	307-1013-01	B010100	B143499	ATTENUATOR,FXD:10X	80009	307-1013-01
C24				(C24 & C26 FURN AS A UNIT. 485,485-1 ONLY)		
C24	307-1013-03	B143500		ATTENUATOR,FXD:10OX	80009	307-1013-03
C24				(C24 & C26 FURN AS A UNIT. 485,485-1 ONLY)		
C25	281-0615-00			CAP.,FXD,CER DI:3.9PF,+/-0.5PF,200V	59660	374018C0J0399D
C25				(485,485-1 ONLY)		
C26	307-1013-01	B010100	B143499	ATTENUATOR,FXD:10OX	80009	307-1013-01
C26				(C26 & C24 FURN AS A UNIT. 485,485-1 ONLY)		
C26	307-1013-03	B143500		ATTENUATOR,FXD:10X	80009	307-1013-03
C26				(C26 & C24 FURN AS A UNIT. 485,485-1 ONLY)		
C28	281-0722-00			CAP.,FXD,CER DI:7.5PF,+/-1PF,500V	59660	374 018C0H0 759B
C28				(485,485-1 ONLY)		
C29	283-0222-00			CAP.,FXD,CER DI:120PF,20%,50V	93958	51720-1
C29				(485,485-1 ONLY)		
C33	283-0141-00			CAP.,FXD,CER DI:200PF,10%,600V	14193	PD-0321-201K
C33				(485,485-1 ONLY)		
C34	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C34				(485,485-1 ONLY)		
C37	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C37				(485,485-1 ONLY)		
C38	290-0134-00	B010100	B019999	CAP.,FXD,ELCTLT:22UF,20%,15V	56289	150D226X0015B2
C38				(485,485-1 ONLY)		
C38	290-0140-00	B020000		CAP.,FXD,ELCTLT:120UF,20%,10V	05397	T110C127M010AS
C38				(485,485-1 ONLY)		
C41	283-0203-00			CAP.,FXD,CER DI:0.47UF,20%,50V	04222	5R305SE474MAA
C41				(485,485-1 ONLY)		

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
C43	283-0160-00			CAP.,FXD,CER DI:1.5PF,10%,50V	93958	1C15RB
C43				(485,485-1 ONLY)		
C44	283-0204-00	B020433	B020435	CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C44				(485,485-1 ONLY)		
C44	283-0191-00	B020436		CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C44				(485,485-1 ONLY)		
C45	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C45				(485,485-1 ONLY)		
C46	281-0160-00			CAP.,VAR,CER DI:7-25PF,350V	59660	538-011B7-25
C46				(485,485-1 ONLY)		
C47	283-0070-00	B010100	B020432	CAP.,FXD,CER DI:30PF,10%,50V	72982	8121-060C0G0300K
C47				(485,485-1 ONLY)		
C48	283-0065-00			CAP.,FXD,CER DI:0.001UF,5%,100V	59660	0835-591Y5E0102J
C48				(485,485-1 ONLY)		
C49	283-0330-00	B010100	B020432	CAP.,FXD,CER DI:100PF,5%,50V	51642	200-050-NP0-101J
C49				(485,485-1 ONLY)		
C49	283-0156-00	B020433		CAP.,FXD,CER DI:1000PF,+100-0%,200V	96733	R2670
C49				(485,485-1 ONLY)		
C50	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C50				(485,485-1 ONLY)		
C51	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C51				(485,485-1 ONLY)		
C52	283-0203-00			CAP.,FXD,CER DI:0.47UF,20%,50V	04222	5R305SE474MAA
C52				(485,485-1 ONLY)		
C55	281-0091-00			CAP.,VAR,CER DI:2-8PF,350V	59660	538-011 A2-8
C55				(485,485-1 ONLY)		
C57	283-0158-00	B010100	B188388	CAP.,FXD,CER DI:1PF,10%,50V	51642	100-050-NP0-109B
C57				(485,485-1 ONLY)		
C57	281-0218-00	B188389		CAP.,VAR,CER DI:1-5PF,+2-2.5%,100V	59660	513-013A1-5
C57				(485,485-1 ONLY)		
C59	283-0203-00			CAP.,FXD,CER DI:0.47UF,20%,50V	04222	5R305SE474MAA
C59				(485,485-1 ONLY)		
C60	283-0204-00	B030000		CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C61	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C61				(485,485-1 ONLY)		
C62	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	1C10Z5U503Z050B
C62				(485,485-1 ONLY)		
C67	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C67				(485,485-1 ONLY)		
C68	283-0260-00			CAP.,FXD,CER DI:5.6PF,5%,200V	51642	150 200NP0569C
C68				(485,485-1 ONLY)		
C69	283-0140-00			CAP.,FXD,CER DI:4.7PF,5%,50V	72982	8101E003A479C
C69				(485,485-1 ONLY)		
C70	281-0645-00	B010100	B020432	CAP.,FXD,CER DI:8.2PF,+/-0.25PF,500V	59660	374 018 C0H0829C
C70				(485,485-1 ONLY)		
C70	281-0161-00	B020433		CAP.,VAR,CER DI:5-15PF,350V	59660	518-000A5-15
C70				(485,485-1 ONLY)		
C72	283-0203-00			CAP.,FXD,CER DI:0.47UF,20%,50V	04222	5R305SE474MAA
C72				(485,485-1 ONLY)		
C73	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C73				(485,485-1 ONLY)		
C74	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C74				(485,485-1 ONLY)		

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
C76	281-0651-00			CAP.,FXD,CER DI:47PF,5%,200V	59660	0374018T2H0 470J
C76				(485,485-1 ONLY)		
C77	281-0651-00	B010100	B020432	CAP.,FXD,CER DI:47PF,5%,200V	59660	0374018T2H0 470J
C77				(485,485-1 ONLY)		
C77	281-0634-00	B020433		CAP.,FXD,CER DI:10PF,+/-0.25PF,500V	59660	374 011 C0G0100C
C77				(485,485-1 ONLY)		
C82	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	96733	R2632
C82				(485,485-1 ONLY)		
C84	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C86	290-0536-00	B010100	B109999	CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C86	290-0527-00	B110000		CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C87	283-0203-00			CAP.,FXD,CER DI:0.47UF,20%,50V	04222	5R305SE474MAA
C92	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C92				(485,485-1 ONLY)		
C93	290-0524-00			CAP.,FXD,ELCTLT:4.7UF,20%,10V	90201	TDC475M010EL
C94	283-0198-00			CAP.,FXD,CER DI:0.22UF,20%,50V	56289	1C10Z5U223M050B
C94				(485,485-1 ONLY)		
C95	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	96733	R2632
C101	283-0278-00			CAP.,FXD,CER DI:2.2UF,20%,100V	72982	8150-M100Z5U225M
C102	283-0277-00			CAP.,FXD,CER DI:	51642	UC1505100W5R103K
C104	283-0156-00			CAP.,FXD,CER DI:1000PF,+100-0%,200V	96733	R2670
C105	283-0277-00			CAP.,FXD,CER DI:	51642	UC1505100W5R103K
C201	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C204	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C211	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C213	283-0181-00	B170000		CAP.,FXD,CER DI:1.8PF,10%,100V	59660	8101B121C0K0189B
C214	281-0123-00			CAP.,VAR,CER DI:5-25PF,100V	59660	518-000A5-25
C215				(PART OF CIRCUIT BOARD)		
C216				(PART OF CIRCUIT BOARD)		
C217	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C223	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C240	281-0151-00			CAP.,VAR,CER DI:1-3PF,100V	59660	518 000 A 1.0 3
C242	290-0526-00			CAP.,FXD,ELCTLT:6.8UF,20%,6V	90201	TDC685M00NLE
C244				(PART OF CIRCUIT BOARD)		
C247				(PART OF CIRCUIT BOARD)		
C253	283-0198-00			CAP.,FXD,CER DI:0.22UF,20%,50V	56289	1C10Z5U223M050B
C254	283-0238-00			CAP.,FXD,CER DI:0.01UF,10%,50V	72982	8121N075X7R0103K
C262	290-0524-00			CAP.,FXD,ELCTLT:4.7UF,20%,10V	90201	TDC475M010EL
C266	290-0524-00			CAP.,FXD,ELCTLT:4.7UF,20%,10V	90201	TDC475M010EL
C272	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	71590	2DDU66B104Z
C282	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C290	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C310	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C311				(PART OF CIRCUIT BOARD)		
C312	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C313	283-0181-00	B170000		CAP.,FXD,CER DI:1.8PF,10%,100V	59660	8101B121C0K0189B
C314	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C315	281-0123-00			CAP.,VAR,CER DI:5-25PF,100V	59660	518-000A5-25
C316				(PART OF CIRCUIT BOARD)		
C317	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C319	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C323	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C333	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C334	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D2-6X0015KA1

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
C340	281-0151-00			CAP.,VAR,CER DI:1-3PF,100V	59660	518 000 A 1.0 3
C342	290-0526-00			CAP.,FXD,ELCTLT:6.8UF,20%,6V	90201	TDC685M00NLE
C344				(PART OF CIRCUIT BOARD)		
C347				(PART OF CIRCUIT BOARD)		
C356	283-0198-00			CAP.,FXD,CER DI:0.22UF,20%,50V	56289	1C10Z5U223M050B
C357	283-0238-00			CAP.,FXD,CER DI:0.01UF,10%,50V	72982	8121N075X7R0103K
C362	290-0524-00			CAP.,FXD,ELCTLT:4.7UF,20%,10V	90201	TDC475M010EL
C366	290-0524-00			CAP.,FXD,ELCTLT:4.7UF,20%,10V	90201	TDC475M010EL
C372	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	71590	2DDU66B104Z
C382	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C401				(PART OF CIRCUIT BOARD)		
C403	290-0512-00	B010100	B109999	CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C405				(PART OF CIRCUIT BOARD)		
C407	283-0154-00			CAP.,FXD,CER DI:22PF,5%,50V	72982	8111B061COG220J
C419	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C421				(PART OF CIRCUIT BOARD)		
C423	290-0512-00	B010100	B109999	CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C425				(PART OF CIRCUIT BOARD)		
C427	283-0154-00			CAP.,FXD,CER DI:22PF,5%,50V	72982	8111B061C0G220J
C428	283-0191-00	B010100	B039999	CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C430	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C432	283-0003-00	B190990		CAP.,FXD,CER DI:0.01UF, + 80-20%,150V	59821	2DDH66J103Z
C458	281-0613-00			CAP.,FXD,CER DI:10PF,+/-1PF,200V	59660	374018C0G0100
C466	281-0629-00			CAP.,FXD,CER DI:33PF,5%,600V	04222	7027-C0G-330J
C502				(PART OF CIRCUIT BOARD)		
C503	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C505				(PART OF CIRCUIT BOARD)		
C512	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C518	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C521				(PART OF CIRCUIT BOARD)		
C523	283-0191-00	B010100	B109999	CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C525				(PART OF CIRCUIT BOARD)		
C532	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C538	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C542	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C543	283-0156-00			CAP.,FXD,CER DI:1000PF,+100-0/%,200V	96733	R2670
C545	281-0700-00			CAP.,FXD,CER DI:3.3PF,10%,200V	59660	370018S3B0339K
C546	283-0181-00	B090000		CAP.,FXD,CER DI:1.8PF,10%,100V	59660	8101B121C0K0189B
C548	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C549	283-0156-00			CAP.,FXD,CER DI:1000PF,+100-0%,200V	96733	R2670
C556	283-0140-00			CAP.,FXD,CER DI:4.7PF,5%,50V	72982	8101 E003A479C
C557	283-0638-00			CAP.,FXD,MICA D:130PF,1%,100V	00853	D151F131F0
C563	281-0616-00	B010100	B089999	CAP.,FXD,CER DI:6.8PF,+/-0.5PF,200V	59660	374-018-C0H0689D
C563	281-0613-00	B090000	B149999	CAP.,FXD,CER DI:10PF,+/-1PF,200V	59660	374018C0G0100
C563	281-0650-00	B150000		CAP.,FXD,CER DI:18PF,10%,200V	59660	374-018-C0G0180K
C565	281-0616-00	B010100	B089999	CAP.,FXD,CER DI:6.8PF,+/-0.5PF,200V	59660	374-018-C0H0689D
C565	281-0613-00	B090000	B149999	CAP.,FXD,CER DI:10PF,+/-1PF,200V	59660	374018C0G0100
C565	281-0650-00	B150000		CAP.,FXD,CER DI:18PF,10%,200V	59660	374-018-C0G0180K
C568	281-0552-00			CAP.,FXD,CER DI:25PF,5%,500V	59660	301-000P2G0250J
C572	283-0604-00			CAP.,FXD,MICA D:304PF,2%,300V	00853	D155F3040G0
C579	281-0552-00			CAP.,FXD,CER DI:25PF,5%,500V	59660	301-000P2G0250J
C581	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C583	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C585	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1

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C601	283-0156-00			CAP.,FXD,CER DI:1000PF,+100-0%,200V	96733	R2670
C606	283-0177-00	B010100	191677	CAP.,FXD,CER DI:1UF,+80-20%,25V	04222	SR302E105ZAA
C607	283-0326-00			CAP.,FXD,CER DI:0.082UF,10%,50V	72982	8121N075X7R0823K
C608	283-0238-00			CAP.,FXD,CER DI:0.01UF,10%,50V	72982	8121N075X7R0103K
C609	283-0176-00			CAP.,FXD,CER DI:0.0022UF,20%,50V	56289	272C5
C613	283-0182-00			CAP.,FXD,CER DI:51PF,5%,400V	72982	8121N400A510J
C614	283-0182-00			CAP.,FXD,CER DI:51PF,5%,400V	72982	8121N400A510J
C615	281-0158-00			CAP.,VAR,CER DI:7-45PF,25V	73899	DVJ-5006
C617	281-0122-00			CAP.,VAR,CER DI:2.5-9PF,100V	59660	518-000A2.5-9
C621				(PART OF CIRCUIT BOARD)		
C624	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C625				(PART OF CIRCUIT BOARD)		
C633	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C642				(PART OF CIRCUIT BOARD)		
C644	283-0181-00			CAP.,FXD,CER DI:1.8PF,10%,100V	59660	8101B121C0K0189B
C647				(PART OF CIRCUIT BOARD)		
C648	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C649	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C651	283-0260-00	B170000	B190989	CAP.,FXD,CER DI:5.6PF,5%,200V	51642	150 200NP0569C
C651	281-0789-00	B190990		CAP.,FXD,CER DI:9PF,+/-0.1PF,500V	72982	374005C0H0909B
C652	283-0725-00			CAP.,FXD,MICA D:214PF,1%,500V	00853	D155F2140F0
C653	283-0260-00	B170000	B190989	CAP.,FXD,CER DI:5.6PF,5%,200V	51642	150 200NP0569C
C653	281-0789-00	B190990		CAP.,FXD,CER DI:9PF,+/-0.1PF,500V	72982	374005COH0909B
C654	283-0725-00			CAP.,FXD,MICA D.214PF,1%,500V	00853	D155F2140F0
C655	283-0647-00			CAP.,FXD,MICA D:70PF,1%,100V	00853	D155E700F0
C656	283-0647-00			CAP.,FXD,MICA D:70PF,1%,100V	00853	D155E700F0
C657				(PART OF CIRCUIT BOARD)		
C658				(PART OF CIRCUIT BOARD)		
C662				(PART OF CIRCUIT BOARD)		
C663	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C667	283-0191-00			CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C669				(PART OF CIRCUIT BOARD)		
C684	290-0534-00	B010100	B142339	CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C695	283-0178-00			CAP.,FXD,CER DI:0.1UF,+80-20%,100V	72982	8131N145651 104Z
C696	290-0517-00			CAP.,FXD,ELCTLT:6.8UF,20%,35V	56289	196D685X0035KA1
C697	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C698	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C699	283-0238-00	B030000		CAP.,FXD,CER DI:0.01UF,10%,50V	72982	8121N075X7R0103K
C701	283-0156-00			CAP.,FXD,CER DI:1000PF,+100-0%,200V	96733	R2670
C702	281-0578-00			CAP.,FXD,CER DI:18PF,5%,500V	59660	301-050C0G0180J
C703	283-0076-00	B020000		CAP.,FXD,CER DI:27PF,10%,500V	59660	831-500S2L270K
C704	283-0644-00			CAP.,FXD,MICA D:150PF,1%,500V	00853	D155F151F0
C705	283-0334-00	B010100	B059999	CAP.,FXD,CER DI:130PF,+1-2%,500V	04222	SR207A131GAA
C705	283-0618-00	B060000		CAP.,FXD,MICA D:130PF,2%,400V	00853	D155F131G0
C706	283-0068-00			CAP.,FXD,CER DI:0.01UF,+100-0%,500V	59660	871-533E103P
C707	283-0159-00			CAP.,FXD,CER DI:18PF,5%,50V	51642	T150-050NP0180J
C711	283-0140-00			CAP.,FXD,CER DI:4.7PF,5%,50V	72982	8101E003A479C
C714	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C715	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C728	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C731				(PART OF CIRCUIT BOARD)		
C733	283-0159-00			CAP.,FXD,CER DI:18PF,5%,50V	51642	T150-050NP0180J
C734	283-0108-00	B050000		CAP.,FXD,CER DI:220PF,10%,200V	56289	1C10C0G221K200B
C735				(PART OF CIRCUIT BOARD)		

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C744	283-0159-00			CAP.,FXD,CER DI:18PF,5%,50V	51642	T150-050NP0180J
C746				(PART OF CIRCUIT BOARD)		
C748				(PART OF CIRCUIT BOARD)		
C750	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C752	283-0025-00			CAP.,FXD,CER DI:500PF,5%,500V	91418	JE501 K501959
C756	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C761	283-0185-00			CAP.,FXD,CER DI:2.5PF,5%,50V	72982	8101B057C0K0295B
C762	283-0185-00			CAP.,FXD,CER DI:2.5PF,5%,50V	72982	8101B057C0K0295B
C763	283-0185-00			CAP.,FXD,CER DI:2.5PF,5%,50V	72982	8101B057C0K0295B
C768	283-0060-00			CAP.,FXD,CER DI:100PF,5%,200V	59660	855-535U2J101J
C769	281-0519-00			CAP.,FXD,CER DI:47PF, +/-4.7PF,500V	59660	308-000C0G0470K
C772	281-0519-00			CAP.,FXD,CER DI:47PF,+/-4.7PF,500V	59660	308-00C0G0470K
C785	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C787	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C811	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C821	283-0076-00	B010100	B010209	CAP.,FXD,CER DI:27PF,10%,500V	59660	831-500S2L270K
C821	281-0519-00	B010210		CAP.,FXD,CER DI:47PF,+/-4.7PF,500V	59660	308-000C0G0470K
C824	283-0076-00			CAP.,FXD,CER DI:27PF,10%,500V	59660	831-500S2L270K
C835	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C835				(485 ONLY)		
C837	283-0185-00	B010100	B069999	CAP.,FXD,CER DI:2.5PF,5%,50V	72982	8101B057C0K0295B
C837				(485 ONLY)		
C838	283-0156-00			CAP.,FXD,CER DI: 1000PF, + 100-0%,200V	96733	R2670
C838				(485 ONLY)		
C839	283-0156-00			CAP.,FXD,CER DI:1000PF,+100-0%,200V	96733	R2670
C839				(485 ONLY)		
C843	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C844	290-0527-00			CAP.,FXD,ELCTLT: 15UF,20%,20V	90201	TDC156M020FL
C845	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C846	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C847	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C848	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C848				(485 ONLY)		
C849	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C849				(485 ONLY)		
C853	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	96733	R2632
C856	281-0628-00	B010100	B010285	CAP.,FXD,CER DI:15PF,5%,500V	59660	301-000C0G0150J
C856	281-0564-00	B010286		CAP.,FXD,CER DI:24PF,5%,500V	59660	301-000C0G0240J
C861	290-0512-00	B010435		CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C862	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	2DDH66J103Z
C863	281-0512-00			CAP.,FXD,CER DI:27PF,+/-2.7PF,500V	59660	0301080C0G0270K
C867	281-0628-00			CAP.,FXD,CER DI:15PF,5%,500V	59660	301-000C0G0150J
C869	281-0589-00			CAP.,FXD,CER DI:170PF,5%,500V	72982	301000Z5D0171J
C874	281-0504-00			CAP.,FXD,CER DI:10PF,+/-1PF,500V	04222	7001-C0G-100F
C876	281-0550-00			CAP.,FXD,CER DI:120PF,10%,500V	59660	301000X5P121K
C877	281-0184-00			CAP.,VAR,PLSTC:2-18PF,500VDC	80031	2805D00218BN02F0
C878	283-0629-00			CAP.,FXD,MICA D:62PF,1%,500V	00853	D105E620F0
C879	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C881	283-0663-00			CAP.,FXD,MICA D:16.8PF,+/-0.5PF,500V	00853	D155C16R8D0
C882	281-0182-00			CAP.,VAR,PLSTC:1.8-10PF,500V	80031	2805D1R810BH02F0
C883	283-0239-00			CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8121N083X7R0223K
C894	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C900	281-0578-00			CAP.,FXD,CER DI:18PF,5%,500V	59660	301-050C0G0180J

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C902	283-0059-00	B010100	B010434	CAP.,FXD,CER DI:1UF,+80-20%,50V	51642	400050Z5U105Z
C902	290-0512-00	B010435		CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C911	283-0003-00	B010100	B010434	CAP.,FXD,CER DI:0.O01UF,+80-20%,150V	59821	2DDH66J103Z
C911	290-0512-00	B010435		CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C912	283-0003-00	B010100	B010434	CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	2DDH66J103Z
C917	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C921	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C932	281-0578-00			CAP.,FXD,CER DI:18PF,5%,500V	59660	301-050C0G0180J
C938	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C943	283-0059-00			CAP.,FXD,CER DI:1UF,+80-20%,50V	51642	400050Z5U105Z
C945	283-0059-00			CAP.,FXD,CER DI:1UF,+80-20%,50V	51642	400050Z5U105Z
C962	283-0004-00	B010100	8010434	CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C962	290-0512-00	B010435		CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C965	290-0519-00			CAP.,FXD,ELCTLT:100UF,20%,20V	90201	TDC107M020WLD
C1002	281-0578-00			CAP.,FXD,CER DI:18PF,5%,500V	59660	301-050C0G0180J
C1003	283-0076-00	B020000		CAP.,FXD,CER DI:27PF,10%,500V	59660	831-500S2L270K
C1004	283-0644-00			CAP ,FXD,MICA D:150PF,1%,500V	00853	D155F151F0
C1005	283-0334-00	B010100	B059999	CAP.,FXD,CER DI:130PF,+1-2%,500V	04222	SR207A131GAA
C1005	283-0618-00	8060000		CAP.,FXD,MICA D:130PF,2%,400V	00853	D155F131G0
C1006	283-0068-00			CAP.,FXD,CER DI:0.01UF,+100-0%,500V	59660	871-533E103P
C1007	283-0159-00			CAP.,FXD,CER DI:18PF,5%,50V	51642	T150-050NP0180J
C1011	283-0140-00			CAP.,FXD,CER DI:4.7PF,5%,50V	72982	8101E003A479C
C1012	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C1013	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C1014	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C1016	283-0260-00			CAP.,FXD,CER DI:5.6PF,5%,200V	51642	150 200NP0569C
C1027	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C1029	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C1030	283-0157-00	B010100	B179999	CAP.,FXD,CER DI:7PF,5%,500V	59660	8111B065C0H0709D
C1031				(PART OF CIRCUIT BOARD)		
C1034				(PART OF CIRCUIT BOARD)		
C1035	283-0108-00	B050000	B179999	CAP.,FXD,CER DI:220PF,10%,200V	56289	1C10C0G221K200B
C1040	283-0204-00			CAP.,FXD,CER DI:0.01UF,20%,50V	96733	R2676
C1041				(PART OF CIRCUIT BOARD)		
C1043	283-0191-00	B070000		CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C1044				(PART OF CIRCUIT BOARD)		
C1045	283-0159-00	B010100	B179999	CAP.,FXD,CER DI:18PF,5%,50V	51642	T150-050NP0180J
C1046	283-0191-00	B070000		CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8121N075Z5U0223M
C1052	283-0025-00			CAP.,FXD,CER DI:500PF,5%,500V	91418	JE501K501959
C1061	283-0185-00			CAP.,FXD,CER DI:2.5PF,5%,50V	72982	8101B057COK0295B
C1063	283-0185-00			CAP.,FXD,CER DI:2.5PF,5%,50V	72982	8101B057C0K0295B
C1064	283-0185-00			CAP.,FXD,CER DI:2.5PF,5%,50V	72982	8101B057COK0295B
C1071	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1072	283-0115-00			CAP.,FXD,CER DI:47PF,5%,200V	59660	805-519-COG0470J
C1079	283-0115-00			CAP.,FXD,CER DI:47PF,5%,200V	59660	805-519-COG0470J
C1099	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1101	290-0580-00			CAP.,FXD,ELCTLT:0.27UF,20%,50V	56289	196D274X0050HA1
C1121	283-0113-00			CAP.,FXD,CER DI:56PF,1%,500V	59660	0851560COG0560F
C1130	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1131	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1132	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	96733	R2632
C1133	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C1134	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C1136	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	96733	R2632

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C1137	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C1139	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1156	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1164	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1166	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1171	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1172	281-0604-00			CAP.,FXD,CER DI:2.2PF,+/-0.25PF,500V	04222	7001-C0-2R2C
C1174	283-0004-00			CAP.,FXD,CER DI.0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1177	281-0529-00			CAP.,FXD,CER DI:1.5PF,+/-0.25PF,500V	04222	7001-C0K1R5C
C1181	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1182	281-0604-00			CAP.,FXD,CER DI:2.2PF,+/-0.25PF,500V	04222	7001-C0J-2R2C
C1184	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1187	281-0619-00			CAP.,FXD,CER DI:1.2PF,+/-0.1PF,200V	59660	374 018 C0K0129B
C1190	281-0166-00			CAP.,VAR,AIR DI:1.9-15.7PF,250V	74970	187-0109-055
C1192	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1199	290-0135-00			CAP.,FXD,ELCTLT:15UF,20%,20V	56289	150D156X0020B2
C1204	281-0628-00			CAP.,FXD,CER DI:15PF,5%,500V	59660	301-000C0G0150J
C1206	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	96733	R2632
C1214	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	2DDH66J103Z
C1217	281-0601-00			CAP.,FXD,CER DI:7.5PF,500V	59660	301-000C0H0759D
C1219	281-0589-00			CAP.,FXD,CER DI:170PF,5%,500V	72982	301000Z5D0171J
C1229	281-0512-00			CAP.,FXD,CER DI:27PF,+/-2.7PF,500V	59660	0301080C0G0270K
C1232	283-0104-00			CAP.,FXD,CER DI:2000PF,S%,50W	59660	811-565B202J
C1235	281-0763-00	B144450		CAP.,FXD,CER DI:47PF,10%,100V	04222	GA101A470KAA
C1238	281-0528-00	B010100	B109999	CAP.,FXD,CER DI:B2PF,+/-8.2PF,500V	59660	301-000U2M0820K
C1241	281-0550-00			CAP.,FXD,CER DI:i20PF,10%,500V	59660	301000X5P121K
C1242	281-0184-00			CAP.,VAR,PLSTC:2-18PF,500V	80031	312805D0021BBN02F0
C1243	283-0633-00			CAP.,FXD,MICA D:77PF,1%,100V	00853	D155E770F0
C1247	281-0658-00			CAP.,FXD,CER Di:6.2PF,+1-0.2SPF,500V	59660	301-000C0H0629C
C1248	281-0178-00			CAP.,VAR,PLSTC:1-3.5PF,500V	80031	2805D013R5BH02F0
C1254	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1263	281-0564-00			CAP.,FXD,CER DI:24PF,5%,500V	59660	301-000C0G0240J
C1268	283-0000-00			CAP.,FXD,CER DI 0.001UF,+100-0%,500V	59660	831610Y5U0102P
C1301	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1335	281-0622-00			CAP.,FXD,CER DI:47PF,1%,500V	59660	0301080C0G0470F
C1336	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	96733	R2632
C1347	283-0647-00			CAP.,FXD,MICA D:70PF,1%,100V	00853	D155E700F0
C1364	281-0166-00			CAP.,VAR.AIR DI:1.9-15.7PF,250V	74970	187-0109-055
C1366	283-0156-00	B020000		CAP.,FXD,CER DI:1000PF,+100-0%,200V	96733	R2670
C1371	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1372	283-0168-00			CAP.,FXD,CER DI:12PF,5%,100V	72982	8101B121C0G0120J
C1374	283-0114-00			CAP.,FXD,CER DI:0.0015UF,5%,200V	59660	805534Y5D0152J
C1402	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1404	285-0908-02			CAP.,FXD,PLSTC:	80009	2B5-0908-02
C1405	285-0840-02			CAP.,FXD,PLSTC:	80009	285-0840-02
C1405				(AVAILABLE AS A MATCHED SET, PART NUMBER		
C1405				295-0147-00. THE LETTER SUFFIX AND THE		
C1405				TOLERANCE SHOULD BE THE SAME FOR ALL OF		
C1405				TIMING CAPACITORS IN THE ASSEMBLY)		
C1431	281-0580-00			CAP.,FXD,CER DI:470PF,10%,500V	04222	7001-1374
C1432	281-0589-00			CAP.,FXD,CER DI:170PF,5%,500V	72982	301000Z5D0171J
C1433	285-0651-01			CAP.,FXD,PLSTC 0;0017UF,5%,100V	84411	TEK44-172551
C1434	285-0566-00			CAP.,FXD,PLSTC:0.022UF,10%,200V	56289	192P22392
C1435	285-0919-00			CAP.,FXD,PLSTC:0.22UF,10%,100V	56289	LP66A1B224K002

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C1436	290-0523-00			CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0020HA1
C1437	290-0512-00			CAP.,FXD,ELCTU:22UF,20%,15V	56289	196D226X0015KA-1
C1442	285-0752-01			CAP.,FXD,PLSTC:	80009	285-0752-01
C1443	285-0753-04			CAP.,FXD,PLSTC:	80009	285-0753-04
C1443				(SEE FOOTNOTE ON C1405)		
C1482	290-0167-00			CAP.,FXD,ELCTLT:10UF,20%,15V	56289	150D106X0015B2
C1484	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C1522	281-0603-00			CAP.,FXD,CER DI:39PF,5%,500V	59660	0301080C0G0390
C1533	283-0003-00			CAP.FXD,CER DI:0.01UF,+80-20%,150V	59821	2DDH66J103Z
C1537	290-0580-00			CAP.FXD,ELCTLT:0.27UF,20%,50V	56289	196D274X0050HA1
C1538	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C1551	281-0512-00			CAP.,FXD,CER DI:27PF,+/-2.7PF,500V	59660	0301080C0G0270K
C1552	281-0549-00			CAP.,FXD,CER DI:68PF,10%,500V	59660	301-000U2J0680K
C1558	290-0523-00			CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0020HA1
C1562	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C1578	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C1579	290-0524-00			CAP.,FXD,ELCTLT:4.7UF,20%,10V	90201	TDC475M010EL
C1586	283-0668-00			CAP.,FXD,MICA D:184PF,1%,500V	00853	D155F1840F0
C1588	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C1600	283-0092-00			CAP.,FXD,CER DI:0.03UF,+80-20%,200V	59660	845-534Z5U0303Z
C1601	283-0105-00			CAP.,FXD,CER DI:0.01UF,+80-20%,2000V	60705	564CBA202IP203ZA
C1602	283-0013-00			CAP.,FXD,CERDI:0.01UF,+100-0%,1000V	59660	818-602ZSU0103P
C1603	283-0071-00			CAP.,FXD,CER DI:0.0068UF,+80-30%,5000V	59660	3905SF602Y5S682Z
C1611	283-0327-00			CAP.,FXD,CER DI:	51406	DHA12Y5S102Z-4KV
C1612	283-0071-00			CAP.,FXD,CER DI:0.0068UF,+80-30%,5000V	59660	3905SF602Y5S682Z
C1619	285-0572-00			CAP.,FXD,PLSTC:0.1UF,20%,200V	56289	192P10402
C1621	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C1622	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	2DDH66J103Z
C1627	283-0060-00			CAP.,FXD,CER DI:100PF,5%,200V	59660	855-535U2J101J
C1633	283-0327-00			CAP.,FXD,CER DI:	51406	DHA12Y5S102Z-4KV
C1646	283-0327-00			CAP.,FXD,CER DI:	51406	DHA12Y5S102Z-4KV
C1651	283-0327-00			CAP.,FXD,CER DI:	51406	DHA12Y5S102Z-4KV
C1652	283-0327-00			CAP.,FXD,CER DI:	51406	DHA12Y5S102Z-4KV
C1653	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C1656	283-0001-00			CAP.,FXD,CER DI:0.005UF,+100-0%,500V	59821	2DDH61L502P
C1660	285-0572-00			CAP.,FXD,PLSTC:0.1UF,20%,200V	56289	192P10402
C1663	283-0327-00			CAP.,FXD,CER DI:	51406	DHA12Y5S102Z-4KV
C1664	283-0327-00			CAP.,FXD,CER DI:	51406	DHA12Y5S102Z4KV
C1665	283-0041-00			CAP.,FXD,CER DI:0.0033UF,5%,500V	59660	841-542B332J
C1667	283-0327-00			CAP.,FXD,CER DI:	51406	DHA12Y5S102Z-4KV
C1681	283-0327-00			CAP.,FXD,CER DI:	51406	DHA12Y5S102Z-4KV
C1684	283-0327-00			CAP.,FXD,CER DI:.	51406	DHA12Y5S102Z-4KV
C1687	283-0327-00			CAP.,FXD,CER DI:	51406	DHA12Y5S102Z-4KV
C1723	281-0564-00			CAP.,FXD,CER DI:24PF,5%,500V	59660	301-000C0G0240J
C1725	283-0317-00			CAP.,FXD,CERDI:1PF,+/-0.1PF,500V	72982	861-518-C0K0109a
C1728	283-0317-00			CAP.,FXD,CER DI:1PF,+/-0.1PF,500V	72982	861-518-C0K0109B
C1729	281-0512-00			CAP.,FXD,CER DI:27PF,+/-2.7PF,500V	59660	0301080C0G0270K
C1732	283-0001-00			CAP.,FXD,CER DI:0.005UF,+100-0%,500V	59821	2DDH61L502P
C1738	281-0523-00			CAP.,FXD,CER DI:100PF,+/-20PF,500V	59660	301-000U2M0101M
C1739	283-0003-00	B010100	B010319	CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	2DDH66J103Z
C1739	283-0068-00	B010320		CAP.,FXD,CER DI:0.01UF,+100-0%,500V	59660	871-533E103P
C1742	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	2DDH69J203Z
C1743	281-0526-00	B010100	B139999	CAP.,FXD,CER DI:1.5PF,+/-0.5PF,500V	04222	7001-N330-1R5D
C1743	281-0609-00	B140000		CAP.,FXD,CER DI:1PF,+/-0.1PF,500V	59660	374-018COK0109B

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C1744	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1748	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1749	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1751	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1755	283-0004-00			CAP.,FXD,CER DI:0.02UF, + 80-20%,150V	59821	SDDH69J203Z
C1756	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1762	281-0153-00			CAP.,VAR,AIR DI:1.7-10PF,250V	74970	187-0106-005
C1764	281-0546-00			CAP.,FXD,CER DI:330PF,10%,500V	59660	301000X5P331K
C1765	281-0153-00			CAP.,VAR,AIR DI:1.7-10PF,250V	74970	187-0106-005
C1766	281-0661-00			CAP.,FXD,CER DI:0.8PF,+/-0.1PF,500V	04222	7001-COK-OR8B
C1771	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1774	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1775	281-0622-00			CAP.,FXD,CER DI:47PF,1%,500V	59660	0301080COG0470F
C1779	281-0550-00			CAP.,FXD,CER DI:120PF,10%,500V	59660	301000X5P121K
C1781	283-0317-00			CAP.,FXD,CER DI:1PF,+/-0.1PF,500V	72982	861-518-COK0109B
C1782	281-0627-00			CAP.,FXD,CER DI:1PF,+/-0.25PF,500V	04222	77001-COK-1ROC
C1786	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1787	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1788	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C1792	283-0068-00			CAP.,FXD,CER DI:0.01UF,+1 00-0%,500V	59660	871-533E103P
C1796	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C1812	283-0280-00			CAP.,FXD,CER DI:2200PF,10%,2000V	59660	0818590Y5500222K
C1813	283-0280-00			CAP.,FXD,CER DI:2200PF,10%,2000V	59660	0818590Y5500222K
C1814	283-0022-00			CAP.,FXD,CER DI:0.02UF,1400VDCAC	59660	3888017Z500203Z
C1822	290-0483-00			CAP.,FXD,ELCTLT:430UF,+50-10%,200V	56289	36D7762
C1823	290-0483-00			CAP.,FXD,ELCTLT:430UF, +50-10%,200V	56289	36D7762
C1824	283-0057-00			CAP.,FXD,CER DI:0.1UF,+80-20%,200V	56289	2C20Z5U104Z200B
C1825	283-0280-00			CAP.,FXD,CER DI:2200PF,10%,2000V	59660	0818590Y5500222K
C1826	285-0981-00			CAP.,FXD,PLSTC:2.0UF,10%,400V	14752	C-2585
C1827	283-0280-00			CAP.,FXD,CER DI:2200PF,10%,2000V	59660	0818590Y5500222K
C1829	283-0041-00			CAP.,FXD,CER DI:0.0033UF,5%,500V	59660	841-542B332J
C1834	290-0284-00			CAP.,FXD,ELCTLT:4.7UF,10%,35V	56289	150D475X9035B2
C1835	285-0980-00			CAP.,FXD,PLSTC:0.02UF,5%,1000V	56289	P192210
C1841	290-0284-00			CAP.,FXD,ELCTLT:4.7UF,10%,35V	56289	150D475X9035B2
C1848	290-0159-00			CAP.,FXD,ELCTLT:2UF,+50-10%,150V	56289	30D205F150BB9
C1849	283-0078-00			CAP.,FXD,CER DI:0.001UF,20%,500V	59660	0801 547X5F0102M
C1901	290-0573-00			CAP.,FXD,ELCTLT:2.7UF,20%,50V	56289	196D275X0050JA1
C1902	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	2DDH66J103Z
C1904	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	2DDH66J103Z
C1912	290-0524-00			CAP.,FXD,ELCTLT:4.7UF,20%,10V	90201	TDC475M010EL
C1914	281-0523-00			CAP.,FXD,CER DI:100PF,+/-20PF,500V	59660	301-000U2M0101M
C1915	281-0523-00			CAP.,FXD,CER DI:100PF,+/-20PF,500V	59660	301-000U2M0101M
C1918	290-0523-00	B010100	B029999	CAP.,FXD.ELCTLT:2.2UF,20%,20V	56289	196D225X0020HA1
C1918	290-0573-00	B030000		CAP.,FXD,ELCTLT:2.7UF,20%,50V	56289	196D275X0050JA1
C1919	283-0000-00	B010100	B139999	CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C1919	283-0594-00	B140000		CAP.,FXD,MICA D:0.001UF,1%,100V	00853	D151F102F0
C1921	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	1C10Z5U503Z050B
C1924	283-0178-00	B010100	B059999	CAP.,FXD,CER DI:0.1UF,+80-20%,100V	72982	8131N145651 104Z
C1924	290-0572-00	B060000	B167319	CAP.,FXD,ELCTLT:0.IUF,20%,50V	56289	196D104X0050HA1
C1924	290-0523-00	B167320		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0020HA1
C1940	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C1943	290-0572-00	B010100	B167319	CAP.,FXD,ELCTLT:0.1U F,20%,50V	56289	196D104X0050HA1
C1943	290-0523-00	B167320		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0020HA1
C1944	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	2DDH66J103Z

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C1951	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	2DDH66J103Z
C2001	290-0159-00			CAP.,FXD,ELCTLT:2UF, + 50-10%,150V	56289	30D205F150BB9
C2002	290-0480-00			CAP.,FXD,ELCTLT:0.5UF, + 50-10%,200V	80009	290-0480-00
C2005	290-0194-00			CAP.,FXD,ELCTLT:10UF,+50-10%,100V	56289	30D106F100C9
C2006	290-0312-00			CAP.,FXD,ELCTLT:47UF,10%,35V	56289	150D476X9035S2
C2007	290-0312-00			CAP.,FXD,ELCTLT:47UF,10%,35V	56289	150D476X9035S2
C2008	290-0194-00			CAP.,FXD,ELCTLT:10UF,+50-10%,100V	56289	30D106F100C9
C2009	290-0194-00			CAP.,FXD,ELCTLT:10UF,+50-10%,100V	56289	30D106F100C9
C2011	290-0528-00			CAP.,FXD,ELCTLT:15UF,20%,50V	56289	196D156X0050PE4
C2012	290-0528-00			CAP.,FXD,ELCTLT:15UF,20%,50V	56289	196D156X0050PE4
C2013	290-0528-00			CAP.,FXD,ELCTLT:15UF,20%,50V	56289	196D156X0050PE4
C2015	290-0425-00			CAP.,FXD,ELCTLT:100UF,20%,20V	90201	THFO07M020P1G
C2016	290-0425-00			CAP.,FXD,ELCTLT:100UF,20%,20V	90201	THF107M020P1G
C2018	290-0519-00			CAP.,FXD,ELCTLT:100UF,20%,20V	90201	TDC107M020WLD
C2019	290-0519-00			CAP.,FXD,ELCTLT:100UF,20%,20V	90201	TDC107M020WLD
C2021	290-0529-00			CAP.,FXD;ELCTLT:47UF,20%,20V	05397	T362C476M020AS
C2023	290-0517-00			CAP.,FXD,ELCTLT:6.8UF,20%,35V	56289	196D685X0035KA1
C2025	290-0517-00			CAP.,FXD,ELCTLT:6.8UF,20%,35V	56289	196D685X0035KA1
C2035	290-0425-00			CAP.,FXD,ELCTLT:100UF,20%,20V	90201	THF107M020P1G
C2036	290-0425-00			CAP.,FXD,ELCTLT:100UF,20%,20V	90201	THF107M020P1G
C2038	290-0519-00			CAP.,FXD,ELCTLT:100UF,20%,20V	90201	TDC107M020WLD
C2039	290-0519-00			CAP.,FXD,ELCTLT:100UF,20%,20V	90201	TDC107M020WLD
C2042	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C2043	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C2045	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C2046	290-0420-00			CAP.,FXD,ELCTLT:0.68UF,20%,75V	56289	150D684X0075A2
C2047	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	2DDH66J103Z
C2052	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C2055	290-0517-00			CAP.,FXD,ELCTLT:6.8UF,20%,35V	56289	196D685X0035KA1
C2056	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C2062	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C2066	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C2072	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C2075	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C2076	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C2085	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C2086	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C2087	290-0517-00			CAP.,FXD,ELCTLT:6.8UF,20%,35V	56289	196D685X0035KA1
C2091	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C2092	283-0004-00			CAP.,FXD,CER DI:0.02UF,+80-20%,150V	59821	SDDH69J203Z
C2101	290-0529-00	B010100	B010434	CAP.,FXD,ELCTLT:47UF,20%,20V	05397	T362C476M020AS
C2101	290-0519-00	B010435		CAP.,FXD,ELCTLT 100UF,20%,20V	90201	TDC107M020WLD
C2106	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C2108	285-0012-00	B010100	B167549	CAP.,FXD,GL DI:200PF,2%,500V	95275	VY13C201G
C2108	281-0809-00	B167550		CAP.,FXD,CER DI:200PF,5%,100V	04222	GC101A201J
C2109	285-1006-00			CAP.,FXD,PLSTC:0.22UF,2%,50V	80009	285-1006-00
C2111	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C2117	290-0512-00	B010100	B010434	CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C2117	290-0519-00	B010435		CAP.,FXD,ELCTLT:100UF,20%,20V	90201	TDC107M020WLD
C2139	283-0178-00			CAP.,FXD,CER DI:0.1UF,+80-20%,100V	72982	8131N145651 104Z
CR6	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR32	152-0323-01	B150000		SEMICOND DEVICE:SILICON,35V,0.1A	03508	DE101
CR32				(485,485-1 ONLY)		

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CR33	152-0367-00	B010100	B149999	SEMICOND DEVICE:SILICON,20V,20PA	80009	152-0367-00
CR33				(485,485-1 ONLY)		
CR33	152-0153-00	B150000	B155229	SEMICOND DVC,DI:SW,SI,10V,50MA,DO-7	07263	FD7003
CR33				(485,485-1 ONLY)		
CR33	152-0141-02	B155230		SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR33				(485,485-1 ONLY. ADDED AS REQUIRED)		
CR62	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR62				(485,485-1 ONLY)		
CR64	152-0075-00			SEMICOND DEVICE:SW,GE,22V,40MA	14433	G866
CR64				(485,485-1 ONLY)		
CR65	152-0075-00			SEMICOND DEVICE:SW,GE,22V,40MA	14433	G866
CR65				(485,485-1 ONLY)		
CR201	152-0061-00	B010100	B049999	SEMICOND DEVICE:SILICON,175V,100MA	07263	FDH2161
CR201	153-0051-00	B050000		SEMICOND DEVICE:SILICON,MATCHED SET	80009	153-0051-00
CR202	152-0061-00	B010100	B049999	SEMICOND DEVICE:SILICON,175V,100MA	07263	FDH2161
CR202	153-0051-00	B050000		SEMICOND DEVICE:SILICON,MATCHED SET	80009	153-0051-00
CR203	152-0061-00	B010100	B049999	SEMICOND DEVICE:SILICON,175V,100MA	07263	FDH2161
CR203	153-0051-00	B050000		SEMICOND DEVICE:SILICON,MATCHED SET	80009	153-0051-00
CR204	152-0061-00	B010100	B049999	SEMICOND DEVICE:SILICON,175V,100MA	07263	FDH2161
CR204	153-0051-00	B050000		SEMICOND DEVICE:SILICON,MATCHED SET	80009	153-0051-00
CR291	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR301	152-0061-00	B010100	B049999	SEMICOND DEVICE:SILICON,175V,100MA	07263	FDH2161
CR301	153-0051-00	B050000		SEMICOND DEVICE:SILICON,MATCHED SET	80009	153-0051-00
CR302	152-0061-00	B010100	B049999	SEMICOND DEVICE:SILICON,175V,100MA	07263	FDH2161
CR302	153-0051-00	B050000		SEMICOND DEVICE:SILICON,MATCHED SET	80009	153-0051-00
CR303	152-0061-00	B010100	B049999	SEMICOND DEVICE:SILICON,175V,100MA	07263	FDH2161
CR303	153-0051-00	B050000		SEMICOND DEVICE:SILICON,MATCHED SET	80009	153-0051-00
CR304	152-0061-00	B010100	B049999	SEMICOND DEVICE:SILICON,175V,100MA	07263	FDH2161
CR304	153-0051-00	B050000		SEMICOND DEVICE:SILICON,MATCHED SET	80009	153-0051-00
CR410	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR412	152-0141-02	B190990		SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR542	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR562	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR682	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR711	152-0246-00			SEMICOND DEVICE:SW,SI,40V,200MA	03508	DE140
CR718	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR732	152-0322-00	B070000	B099999	SEMICOND DEVICE:SILICON,15V,HOT CARRIER	50434	5082-2672
CR734	152-0322-00	B070000	B099999	SEMICOND DEVICE:SILICON,15V,HOT CARRIER	50434	5082-2672
CR751	152-0177-00	B010100	B049999	SEMICOND DEVICE:TUNNEL,10MA,4PF	80009	152-0177-00
CR751	152-0177-02	B050000		SEMICOND DEVICE:TUNNEL,10MA,+/-0.5MA,2PF	03508	SMTD998
CR762	152-0177-00			SEMICOND DEVICE:TUNNEL,10MA,4PF	80009	152-0177-00
CR772	152-0177-00			SEMICOND DEVICE:TUNNEL,10MA,4PF	80009	152-0177-00
CR781	152-0075-00			SEMICOND DEVICE:SW,GE,22V,40MA	14433	G866
CR784	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR785	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR816	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR838	152-0141-02			SEMICOND DVC,DI:SW,Si,30V,150MA,30V,DO-35	01295	1N4152R
CR838				(485 ONLY)		
CR839	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR839				(485 ONLY)		
CR853	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR856	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR864	152-0151-00			SEMICOND DEVICE:SILICON,SW,W/HT SK	80009	152-0151-00
CR867	152-0153-00			SEMICOND DVC,DI:SW,SI,10V,50MA,DO-7	07263	FD7003

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CR868	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR879	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR886	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR902	152-0307-00			SEMICOND DEVICE:SILICON,300V,0.13A	04713	SSD1150
CR935	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1011	152-0246-00			SEMICOND DEVICE:SW,SI,40V,200MA	03508	DE140
CR1052	152-0177-00	B010100	B049999	SEMICOND DEVICE:TUNNEL, 10MA,4PF	80009	152-0177-00
CR1052	152-0177-02	B050000		SEMICOND DEVICE:TUNNEL,10OMA,+/-0.5MA,2PF	03508	SMTD998
CR1062	152-0177-00			SEMICOND DEVICE:TUNNEL,10MA,4PF	80009	152-0177-00
CR1070	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1071	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1098	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1104	152-0177-00			SEMICOND DEVICE:TUNNEL,100MA,4PF	80009	152-0177-00
CR1108	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1121	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1152	152-0153-00			SEMICOND DVC,DI:SW,SI,10 V,50MA,DO-7	07263	FD7003
CR1153	152-0153-00			SEMICOND DVC,DI:SW,SI,10V,50MA,DO-7	07263	FD7003
CR1156	152-0333-00			SEMICOND DVC DI:SW,S1,55V,200MA,DO-35	03508	DJ2011
CR1166	152-0333-00			SEMICOND DVC DI:SW,SI,55V,200MA,DO-35	03508	DJ2011
CR1168	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1204	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1206	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1211	152-0153-00			SEMICOND DVC,DI:SW,SI,10V,50MA,DO-7	07263	FD7003
CR1214	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1215	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1217	152-0153-00			SEMICOND DVC,DI:SW,SI,10 V,50MA,DO-7	07263	FD7003
CR1221	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1234	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1237	152-0141-02			SEMICOND DVC,DI:SW,SI,30V, 150MA,30V,DO-35	01295	1N4152R
CR1238	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1239	152-0245-00			SEMICOND DEVICE:SILICON,10NA AT 5V	12969	NDP539
CR1242	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1272	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	IN4152R
CR1273	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1311	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1321	152-0141-02			SEMICOND DVC,DI.SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1336	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1356	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1358	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1359	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1366	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1400	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1431	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1482	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1491	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1492	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1494	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1495	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1504	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1526	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1530	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1531	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1532	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1533	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
CR1534	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1534	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1536	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1536	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1539	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1551	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1552	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1557	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1558	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1561	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1581	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1582	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1584	152-0075-00			SEMICOND DEVICE:SW,GE,22V,40MA	14433	G866
CR1585	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1601	152-0409-00			SEMICOND DEVICE:SILICON,12,000V,5MA	83003	VGI12X-1
CR1602	152-0409-00			SEMICOND DEVICE:SILICON,12,000V,5MA	83003	VG12X-1
CR1618	152-0066-00			SEMICOND DVC,DI:RECT,SI,400V,1A,DO-41	05828	GP1OG-020
CR1621	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1626	152-0242-00			SEMICOND DVC:SIG,SI,225V,0.2A,DO-7	07263	FDH5004
CR1627	152-0242-00			SEMICOND DVC:SIG,SI,225V,0.2A,DO-7	07263	FDH5004
CR1646	152-0242-00	B010100	B167579	SEMICOND DVC:SIG,SI,225V,0.2A,DO-7	07263	FDH5004
CR1646	152-0170-00	B167580		SEMICOND DEVICE:SILICON,1500V,10UA	52306	CX342
CR1651	152-0242-00	B010100	B167579	SEMICOND DVC:SIG,SI,225V,0.2A,DO-7	07263	FDH5004
CR1651	152-0170-00	B167580		SEMICOND DEVICE:SILICON,1500V,10UA	52306	CX342
CR1652	152-0242-00	B010100	B167579	SEMICOND DVC:SIG,SI,225V,0.2A,DO-7	07263	FDH5004
CR1652	152-0170-00	B167580		SEMICOND DEVICE:SILICON,1500V,10UA	52306	CX342
CR1656	152-0242-00	B010100	B167579	SEMICOND DVC:SIG,SI,225V,0.2A,DO-7	07263	FDH5004
CR1656	152-0170-00	B167580		SEMICOND DEVICE:SILICON,1500V,10UA	52306	CX342
CR1660	152-0242-00	B010100	B167579	SEMICOND DVC:SIG,SI,225V,0.2A,DO-7	07263	FDH5004
CR1660	152-0170-00	B167580		SEMICOND DEVICE:SILICON,1500V,10UA	52306	CX342
CR1663	152-0242-00	B010100	B167579	SEMICOND DVC:SIG,SI,225V,0.2A,DO-7	07263	FDH5004
CR1663	152-0170-00	B167580		SEMICOND DEVICE:SILICON,1500V,10UA	52306	CX342
CR1664	152-0242-00	B010100	B167579	SEMICOND DVC:SIG,SI,225V,0.2A,DO-7	07263	FDH504
CR1664	152-0170-00	B167580		SEMICOND DEVICE:SILICON,1500V,10UA	52306	CX342
CR1666	152-0242-00	B010100	B167579	SEMICOND DVC:SIG,SI,225V,0.2A,DO-7	07263	FDH5004
CR1666	152-0170-00	B167580		SEMICOND DEVICE:SILICON,1500V,10UA	52306	CX342
CR1710	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150OMA,30V,DO-35	01295	1N4152R
CR1735	152-0107-00			SEMICOND DEVICE:SILICON,400V,400MA	12969	G727
CR1737	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1738	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1739	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1752	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1766	152-0233-00			SEMICOND DEVICE:SILICON,85V,100MA	07263	FDH1986
CR1769	152-0061-00			SEMICOND DEVICE:SILICON,175V,100MA	07263	FDH2161
CR1775	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1776	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1777	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1821	152-0396-01			SEMICOND DEVICE:SILICON,400V,3A	12969	652-821
CR1832	152-0061-00			SEMICOND DEVICE:SILICON,175V,100MA	07263	FDH2161
CR1833	152-0061-00			SEMICOND DEVICE:SILICON,175V,150MA	07263	FDH2161
CR1834	152-0400-00			SEMICOND DEVICE:SILICON,400V,1A	80009	152-0400-00
CR1842	152-0107-00			SEMICOND DEVICE:SILICON,400V,400MA	12969	G727
CR1843	152-0107-00			SEMICOND DEVICE:SILICON,400V,400MA	12969	G727
CR1844	152-0400-00			SEMICOND DEVICE:SILICON,400V,1A	80009	152-0400-00

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CR1848	152-0107-00			SEMICOND DEVICE:SILICON,400V,400MA	12969	G727
CR1901	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1904	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1912	152-0141-02	B010100	B129999	SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1923	152-0333-00			SEMICOND DVC DI:SW,SI,55V,200MA,D0-35	03508	DJ2011
CR1924	152-0333-00			SEMICOND DVC DI:SW,SI,55V,200MA,D0-35	03508	DJ2011
CR1925	152-0333-00			SEMICOND DVC DI:SW,SI,55V,200MA,D0-35	03508	DJ2011
CR1931	152-0333-00			SEMICOND DVC DI:SW,SI,55V,200MA,D0-35	03508	DJ2011
CR1932	152-0333-00			SEMICOND DVC DI:SW,SI,55V,200MA,D0-35	03508	DJ2011
CR1933	152-0333-00			SEMICOND DVC DI:SW,SI,55V,200MA,D0-35	03508	DJ2011
CR1934	152-0333-00			SEMICOND DVC DI:SW,SI,55V,200MA,D0-35	03508	DJ2011
CR1943	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1958	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR1959	152-0141-02			SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR2001	152-0413-00			SEMICOND DEVICE:SILICON,400V,750MA	12969	UTR307
CR2002	152-0413-00			SEMICOND DEVICE:SILICON,400V,750MA	12969	UTR307
CR2004	152-0413-00			SEMICOND DEVICE:SILICON,400V,750MA	12969	UTR307
CR2005	152-0413-00			SEMICOND DEVICE:SILICON,400V,750MA	12969	UTR307
CR2006	152-0413-00			SEMICOND DEVICE:SILICON,400V,750MA	12969	UTR307
CR2007	152-0413-00			SEMICOND DEVICE:SILICON,400V,750MA	12969	UTR307
CR2011	152-0414-00			SEMICOND DEVICE:SILICON,200V,0.75A	12969	UTR308
CR2012	152-0414-00			SEMICOND DEVICE:SILICON,200V,0.75A	12969	UTR308
CR2014	152-0412-00			SEMICOND DEVICE: SILICON,50V,3A	80009	152-0412-00
CR2015	152-0412-00			SEMICOND DEVICE:SILICON,50V,3A	80009	152-0412-00
CR2016	152-0412-00			SEMICOND DEVICE:SILICON,50V,3A	80009	152-0412-00
CR2017	152-0412-00			SEMICOND DEVICE:SILICON,50V,3A	80009	152-0412-00
CR2034	152-0412-00			SEMICOND DEVICE:SILICON,50V,3A	80009	152-0412-00
CR2035	152-0412-00			SEMICOND DEVICE:SILICON,50V,3A	80009	152-0412-00
CR2036	152-0412-00			SEMICOND DEVICE:SILICON,50V,3A	80009	152-0412-00
CR2037	152-0412-00			SEMICOND DEVICE:SILICON,50V,3A	80009	152-0412-00
CR2042	152-0061-00			SEMICOND DEVICE:SILICON, 175V,100MA	07263	FDH2161
CR2047	152-0141-02	B010100	B139999	SEMICOND DVC,DI:SW,SI,30V,150MA,30V,DO-35	01295	1N4152R
CR2052	152-0141-02			SEMICOND DVC,DI:SW,SI,30V, 150MA,30V,DO-35	01295	1N4152R
CR2124	152-0322-00			SEMICOND DEVICE:SILICON,15V,HOT CARRIER	50434	5082-2672
CR2133	152-0322-00			SEMICOND DEVICE:SILICON,15V,HOT CARRIER	50434	5082-2672
DL1	119-0325-00			DELAY LINE,ELEC:	80009	119-0325-00
DL410	119-0302-00			DELAY LINE,ELEC:	80009	119-0302-00
DS96	150-0048-01			LAMP,INCAND:5V,0.06A,#683,AGED & SEL	S3774	OL683AS15 TPL
DS97	150-1004-00	B010100	B144079	LAMP,LED:RED,2.5V,15MA	08806	SSL-12
DS97	150-1040-03	B144080	B166699	LAMP,LED:RED,5MA,2.0V	80009	150-1040-03
DS97	150-1031-00	B166700		LT EMITTING DIO:RED,650NM,40MA MAX	53184	XC209R
DS98	150-1004-00	B010100	B144079	LAMP,LED:RED,2.5V,15MA	08806	SSL-12
DS98	150-1040-03	B144080	B166699	LAMP,LED:RED,5MA,2.0V	80009	150-1040-03
DS98	150-1031-00	B166700		LT EMITTING DIO:RED,650NM,40MA MAX	53184	XC209R
DS99	150-1004-00	B010100	B144079	LAMP,LED:RED,2.5V,15MA	08806	SSL-12
DS99	150-1040-03	B144080	B166699	LAMP,LED:RED,5MA,2.0V	80009	150-1040-03
DS99	150-1031-00	B166700		LT EMITTING DIO:RED,650NM,40MA MAX	53184	XC209R
DS125	150-0048-01			LAMP,INCAND:5V,0.06A,#683,AGED & SEL	S3774	OL683AS15 TPL
DS290	150-0128-00			LAMP,INCAND:	71744	CM 1784-120
DS291	150-0128-00			LAMP,INCAND:	71744	CM 1784-120
DS630	150-0048-01			LAMP,INCAND:5V,0.06A,#683,AGED & SEL	S3774	OL683AS15 TPL
DS780	150-0048-01			LAMP,INCAND:5V,0.06A,#683,AGED & SEL	S3774	OL683AS15 TPL

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DS781	150-0048-01			LAMP,INCAND:5V,0.06A,#683,AGED & SEL	S3774	OL683AS15 TPL
DS1668	150-0030-00			LAMP,GLOW:NEON,T-2,60 TO 90 VOLTS	74276	NE2V-T
DS1669	150-0030-00			LAMP,GLOW:NEON,T-2,60 TO 90 VOLTS	74276	NE2V-T
DS1684	150-0030-00			LAMP,GLOW:NEON,T-2,60 TO 90 VOLTS	74276	NE2V-T
DS1685	150-0030-00			LAMP,GLOW:NEON,T-2,60 TO 90 VOLTS	74276	NE2V-T
DS1687	150-0030-00			LAMP,GLOW:NEON,T-2,60 TO 90 VOLTS	74276	NE2V-T
DS1801	119-0181-00			ARSR,ELEC SURGE:230V,GAS FILLED	74276	CG230L
DS1802	119-0181-00			ARSR,ELEC SURGE:230V,GAS FILLED	74276	CG230L
DS1824	150-0035-00			LAMP,GLOW:90V,0.3MA,AID-T,WIRE LD	000LI	JH005/3011JA
F1801	159-0015-00			FUSE,CARTRIDGE:3AG,3A,250V,0.65 SEC	71400	AGC 3
F1802	159-0172-00	B189340		FUSE,CARTRIDGE:TYPE C,13 AMP	S3629	PCC-1089
F1802				(OPTION A2 ONLY)		
J1	131-0679-00	B010100	B131949	CONNECTOR,RCPT,:BNC,MALE,3 CONTACT	24931	28JR168-1
J1	131-0679-01	B131950		CONNECTOR,RCPT,:BNC,MALE,3 CONTACT	24931	28JR168-2
J5	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J70	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J70				(485,485-1 ONLY)		
J101	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J129	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J149	131-1003-00			CONN,RCPT,ELEC:CKT SD MT,3 PRONG	80009	131-1003-00
J200	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J300	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J410	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J415	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J430	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J435	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J566	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J568	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J572	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J620	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J625	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J701	131-0955-00			CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
J762	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J763	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J781	131-0955-00			CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
J813	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J814	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J816	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J842	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J842				(485 ONLY)		
J843	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J843				(485 ONLY)		
J948	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J949	131-0955-00			CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
J1001	131-0955-00			CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
J1063	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J1064	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J1116	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J1117	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J1119	131-0955-00			CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
J1346	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J1549	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
J1551	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J1554	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J1555	131-0861-00			TERM,QIK DISC:16-20 AWG,0.22 W X 0.02 THK	00779	42617-2
J1557	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J1785	131-0771-00			CONN,RCPT,ELEC:4 CONT,QUICK DISCONNECT	91836	1904-2M58
J1787	131-0771-00			CONN,RCPT,ELEC:4 CONT,QUICK DISCONNECT	91836	1904-2M58
J2134	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
J2135	131-0818-00			CONNECTOR,RCPT,:BNC,FEMALE	91836	KC-19-153
K1	148-0070-00	B010100	B159999	RELAY,ARMATURE:SPDT,21VDC,450MW,3.5A,30VDC	05587	A1558
K1				(485, 485-1, 485-2 ONLY)		
K1	650-0563-00	B160000	B166999	CKT BOARD ASSY:	80009	650-0563-00
K1				(485, 485-1 ONLY)		
K1	148-0129-01	B167000		RELAY ASSY:SPDT,1A,18VDC,1130 OHM	80009	148-0129-01
K1				(485, 485-1 ONLY)		
K1S1				(PART OF K1)		
K1	650-0563-00	B160000		CKT BOARD ASSY:	80009	650-0563-00
K1				(485-2 ONLY)		
K410	148-0071-00	B010100	B159999	RELAY,ARMATURE:PLUG-IN,DPDT	99699	2X-A1 538
K410				(485 ONLY)		
K410	650-0562-00	B160000	B167669	CKT BOARD ASSY:	80009	650-0562-00
K410				(485 ONLY)		
K410	148-0107-01	B167670		RELAY,ARMATURE:18VDC COIL	80009	148-0107-01
K410				(485 ONLY)		
K410S1				(PART OF K410)		
K410S2				(PART OF K410)		
K879	148-0034-01			RELAY,ARMATURE:DPDT,600 OHM,15VDC	80009	148-0034-01
K1242	148-0034-01			RELAY,ARMATURE:DPDT,600 OHM,15VDC	80009	148-0034-01
L5				(WIRE LEAD)		
L51	276-0507-00	B030000		SHIELDING BEAD,:FERRITE	78488	57-3443
L94	108-0598-00			COIL,RF:200UH	80009	108-0598-00
L101				(WIRE LEAD)		
L127				(PART OF CIRCUIT BOARD)		
L149	276-0581-00			CORE,EM:TOROID,FERRITE	78488	57-1307
L201	108-0245-00			COIL,RF:3.9UH	76493	86310-1
L204	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L211	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L240	108-0557-00	B010100	B190989	COIL,RF:35NH	80009	108-0557-00
L241	108-0557-00	B010100	B169999	COIL,RF:35NH	80009	108-0557-00
L242	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L245				(PART OF CIRCUIT BOARD)		
L248				(PART OF CIRCUIT BOARD)		
L262	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L266	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L290	276-0543-00	B130000		SHLD BEAD,ELEK:FERRITE	80009	276-0543-00
L310	108-0245-00			COIL,RF:3.9UH	76493	B631 0-1
L312	108-0245-00			COIL,RF:3.9UH	76493	86310-1
L340	108-0557-00	B010100	B169999	COIL,RF:35NH	80009	108-0557-00
L341	108-0557-00	B010100	B190989	COIL,RF:35NH	80009	108-0557-00
L342	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L345				(PART OF CIRCUIT BOARD)		
L348				(PART OF CIRCUIT BOARD)		
L362	108-0245-00			COIL,RF:3.9UH	76493	B6310-1

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
L366	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L401				(PART OF CIRCUIT BOARD)		
L405				(PART OF CIRCUIT BOARD)		
L409	108-0733-00			COIL,RF:FIXED,113NH	80009	108-0733-00
L411	276-0569-00	B190990		CORE,EM:TOROID,FERRITE,0.12 OD X 0.	78488	57-9660
L412				(PART OF L411)		
L419	108-0538-00			COIL,RF:FIXED,2.7UH	76493	JWM#B7059
L421				(PART OF CIRCUIT BOARD)		
L425				(PART OF CIRCUIT BOARD)		
L431				(PART OF L411)		
L432				(PART OF L411)		
L501				(PART OF CIRCUIT BOARD)		
L502				(PART OF CIRCUIT BOARD)		
L505				(PART OF CIRCUIT BOARD)		
L506				(PART OF CIRCUIT BOARD)		
L511	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L521				(PART OF CIRCUIT BOARD)		
L522				(PART OF CIRCUIT BOARD)		
L525				(PART OF CIRCUIT BOARD)		
L526				(PART OF CIRCUIT BOARD)		
L531	108-0245-00			COIL,RF:3.9UH	76493	B631 0-1
L548	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L559	108-0736-00			COIL,RF:810NH	80009	108-0736-00
L581	108-0245-00			COIL,RF:3.9UH	76493	B63i10-1
L583	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L584	108-0538-00			COIL,RF:FIXED,2.7UH	76493	JWM#B7059
L585	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L621				(PART OF CIRCUIT BOARD)		
L625				(PART OF CIRCUIT BOARD)		
L650	108-0182-00	B010100	B169999	COIL,RF:FIXED,285NH	80009	108-0182-00
L651(2)	276-0543-00			SHLD BEAD,ELEK:FERRITE	80009	276-0543-00
L652	108-0734-00			COIL,RF:FIXED,160NH	80009	108-0734-00
L653(2)	276-0543-00			SHLD BEAD,ELEK:FERRITE	80009	276-0543-00
L654	114-0289-00			COIL,RF:	80009	114-0289-00
L655	108-0735-00			COIL,RF:FIXED,560NH	80009	108-0735-00
L656	108-0735-00			COIL,RF:FIXED,660NH	80009	108-0735-00
L695	108-0215-00			COIL,RF:1.1UH	80009	108-0215-00
L697	108-0538-00			COIL,RF:FIXED,2.7UH	76493	JWM#B7059
L698	108-0538-00			COIL,RF:FIXED,2.7UH	76493	JWM#B7059
L731				(PART OF CIRCUIT BOARD)		
L732				(PART OF CIRCUIT BOARD)		
L735				(PART OF CIRCUIT BOARD)		
L736				(PART OF CIRCUIT BOARD)		
L746				(PART OF CIRCUIT BOARD)		
L747				(PART OF CIRCUIT BOARD)		
L748				(PART OF CIRCUIT BOARD)		
L749				(PART OF CIRCUIT BOARD)		
L753	108-0578-00			COIL,RF:FIXED,45NH	80009	108-0578-00
L757	108-0249-00			COIL,RF:12UH	76493	B-4992
L844	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L845	108-0249-00			COIL,RF:12UH	76493	B-4992
L846	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L847	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L848	108-0245-00			COIL,RF:3.9UH	76493	B6310-1

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
L851	276-0507-00			SHIELDING BEAD,:FERRITE	78488	57-3443
L853	276-0507-00			SHIELDING BEAD,:FERRITE	78488	57-3443
L883	276-0528-00			SHIELDING BEAD,:0.1UH	02114	56-0590-65C/3B
L884	276-0528-00			SHIELDING BEAD,:0.1UH	02114	56-0590-65C/3B
L891	108-0146-00			COIL,RF:5UH	80009	108-0146-00
L893	120-0285-00			XFMR,TOROID:	80009	120-0285-00
L942	276-0528-00			SHIELDING BEAD,:0.1UH	02114	56-0590-65C/3B
L943	276-0528-00			SHIELDING BEAD,:0.1UH	02114	56-0590-65C/3B
L1031				(PART OF CIRCUIT BOARD)		
L1032				(PART OF CIRCUIT BOARD)		
L1033				(PART OF CIRCUIT BOARD)		
L1034				(PART OF CIRCUIT BOARD)		
L1038	276-0528-00			SHIELDING BEAD,:0.1UH	02114	56-0590-65C/3B
L1041				(PART OF CIRCUIT BOARD)		
L1042				(PART OF CIRCUIT BOARD)		
L1043				(PART OF CIRCUIT BOARD)		
L1044				(PART OF CIRCUIT BOARD)		
L1055	108-0578-00			COIL,RF:FIXED,45NH	80009	108-0578-00
L1057	108-0249-00			COIL,RF:12UH	76493	B-4992
L1099	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L1130	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L1131	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L1133	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L1134	108-0249-00			COIL,RF:12UH	76493	B-4992
L1137	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
L1156	276-0507-00			SHIELDING BEAD,:FERRITE	78488	57-3443
L1157	276-0507-00			SHIELDING BEAD,:FERRITE	78488	57-3443
L1192	276-0507-00			SHIELDING BEAD,:FERRITE	78488	57-3443
L1202	276-0507-00			SHIELDING BEAD,:FERRITE	78488	57-3443
L1231	276-0528-00			SHIELDING BEAD,:0.1UH	02114	56-0590-65C/3B
L1232	276-0528-00			SHIELDING BEAD,:0.1UH	02114	56-0590-65C/3B
L1251	108-0146-00			COIL,RF:5UH	80009	108-0146-00
L1252	120-0285-00			XFMR,TOROID:	80009	120-0285-00
L1346	114-0222-00			COIL,RF:2-6UH,CORE 276-0568-00	80009	114-0222-00
L1578	108-0538-00			COIL,RF:FIXED,2.7UH	76493	JWM#B7059
L1748	108-0538-00			COIL,RF:FIXED,2.7UH	76493	JWM#B7059
L1790	108-0711-00			COIL,TUBE DEFLE:	80009	108-0711-00
L1794	108-0710-00			COIL,TUBE DEFLE:	80009	108-0710-00
L1812	108-0728-00			COIL,RF:116UF	80009	108-0728-00
L1813	108-0728-00			COIL,RF:116UF	80009	108-0728-00
L1825	108-0742-00			COIL,RF:83UH,TOROIDAL	80009	108-0742-00
L1835	108-0709-00			COIL,RF:1.6MH	80009	108-0709-00
L2008	108-0646-00			COIL,RF:80UH	80009	108-0646-00
L2009	108-0646-00			COIL,RF:80UH	80009	108-0646-00
L2018	108-0680-00			COIL,RF:27UH	80009	108-0680-00
L2019	108-0680-00			COIL,RF:27UH	80009	108-0680-00
L2038	108-0680-00			COIL,RF:27UH	80009	108-0680-00
L2039	108-0680-00			COIL,RF:27UH	80009	108-0680-00
L2101	120-0285-00			XFMR,TOROID:	80009	120-0285-00
L2117	108-0538-00			COIL,RF:FIXED,2.7UH	76493	JWM#B7059
LR202	108-0367-00			COIL,RF:FIXED,1.03UH	80009	108-0367-00
LR203	108-0367-00			COIL,RF:FIXED,1.03UH	80009	108-0367-00
LR239	108-0729-00			COIL,RF:195NH	80009	108-0729-00

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
LR261	108-0729-00	B010100	B169999	COIL,RF:195NH	80009	108-0729-00
LR264	108-0729-00	B010100	B169999	COIL,RF:195NH	80009	108-0729-00
LR302	108-0367-00			COIL,RF:FIXED,1.03UH	80009	108-0367-00
LR303	108-0367-00			COIL,RF:FIXED,1.03UH	80009	108-0367-00
LR339	108-0729-00			COIL,RF:195NH	80009	108-0729-00
LR361	108-0729-00	B010100	B169999	COIL,RF:195NH	80009	108-0729-00
LR364	108-0729-00	B010100	B169999	COIL,RF:195NH	80009	108-0729-00
LR652	108-0407-00	B010100	B169999	COIL,RF:FIXED,37NH	80009	108-0407-00
LR654	108-0407-00	B010100	B169999	COIL,RF:FIXED,37NH	80009	108-0407-00
LR655	108-0407-00	B010100	B169999	COIL,RF:FIXED,37NH	80009	108-0407-00
LR656	108-0407-00	B010100	B169999	COIL,RF:FIXED,37NH	80009	108-0407-00
LR690	108-0685-00			COIL,RF:62NH	80009	108-0685-00
LR692	108-0325-00			COIL,RF:0.5UH	80009	108-0325-00
LR694	108-0685-00			COIL,RF:62NH	80009	108-0685-00
LR902	108-0298-00			COIL,RF:235NH (WOUND ON A 36 OHM RE	80009	108-0298-00
M2089	149-0030-00	B010100	B069999	METER,T TOTAL:ELAPSED TIME,DC,CKT BD MT	18583	21985-000
Q1	151-0188-00	B155790		TRANSISTOR:PNP,SI,TO-92	T0058	2N3906
Q1				(485,485-1 ONLY)		
Q34	151-1032-00			TRANSISTOR:SILICON,FET,DUAL	17856	DN399
Q34				(485,485-1 ONLY)		
Q40	151-0367-00			TRANSISTOR:SILICON,NPN,SEL FROM 3571TP	04713	SPS 8811
Q40				(485,485-1 ONLY)		
Q50	151-0367-00			TRANSISTOR:SILICON,NPN,SEL FROM 3571TP	04713	SPS 8811
Q50				(485,485-1 ONLY)		
Q52	151-0271-00			TRANSISTOR:SILICON,PNP	04713	SPS8236
Q52				(485,485-1 ONLY)		
Q56	151-0212-00			TRANSISTOR:SILICON,NPN	04713	SRF 518
Q56				(485,485-1 ONLY)		
Q60	153-0604-00	B010100	B143554	TRANSISTOR:SILICON,NPN	80009	153-0604-00
Q60				(485,485-1 ONLY)		
Q60	153-0645-00	B143555	B149999	TRANSISTOR:MATCHED SET	80009	153-0645-00
Q60				(Q60,Q62,Q70 FURNISHED AS A MATCHED SET.		
Q60				(485,485-1 ONLY)		
Q60	151-0271-00	B150000		TRANSISTOR:SILICON,PNP	04713	SPS8236
Q60				(485,485-1 ONLY)		
Q62	153-0604-00	B010100	B143554	TRANSISTOR: SILICON,NPN	80009	153-0604-00
Q62				(485,485-1 ONLY)		
Q62	153-0645-00	B143555	B149999	TRANSISTOR:MATCHED SET	80009	153-0645-00
Q62				(Q62,Q60,Q70 FURNISHED AS A MATCHED SET.		
Q62				(485,485-1 ONLY)		
Q62	151-0271-00	B150000		TRANSISTOR: SILICON,PNP	04713	SPS8236
Q62				(485,485-1 ONLY)		
Q70	153-0604-00	B010100	B143554	TRANSISTOR: SILICON,NPN	80009	153-0604-00
Q70				(485,485-1 ONLY)		
Q70	153-0645-00	B143555	B149999	TRANSISTOR:MATCHED SET	80009	153-0645-00
Q70				(Q70,Q60,Q62 FURNISHED AS A MATCHED SET.		
Q70				485,485-1 ONLY)		
Q70	151-0271-00	B150000		TRANSISTOR: SILICON,PNP	04713	SPS8236
Q70				(485,485-1 ONLY)		
Q274	151-0224-00			TRANSISTOR: SILICON,NPN	07263	SA24850
Q284	151-0224-00			TRANSISTOR: SILICON,NPN	07263	SA24850
Q290	151-0260-00			TRANSISTOR: SILICON,NPN	04713	ST1083

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
Q374	151-0224-00			TRANSISTOR:SILICON,NPN	07263	SA24850
Q384	151-0224-00			TRANSISTOR:SILICON,NPN	07263	SA24850
Q416	151-0224-00			TRANSISTOR:SILICON,NPN	07263	SA24850
Q436	151-0224-00			TRANSISTOR:SILICON,NPN	07263	SA24850
Q440	151-0333-00			TRANSISTOR:SILICON,NPN,SEL FROM MPS918	04713	SPS1752
Q444	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q454	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q456	151-0333-00			TRANSISTOR:SILICON,NPN,SEL FROM MPS918	04713	SPS1752
Q460	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q462	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q518	151-0224-00			TRANSISTOR:SILICON,NPN	07263	SA24850
Q538	151-0224-00			TRANSISTOR:SILICON,NPN	07263	SA24850
Q544	151-0271-00			TRANSISTOR:SILICON,PNP	04713	SPS8236
Q546	151-0271-00			TRANSISTOR:SILICON,PNP	04713	SPS8236
Q552	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q556	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q564	151-0271-00			TRANSISTOR:SILICON,PNP	04713	SPS8236
Q572	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q576	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q682	151-0302-00			TRANSISTOR:SILICON,NPN	07263	S038487
Q686	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q688	151-0503-00			SCR:SILICON,TO-92	04713	SCR5138
Q712	151-1042-00			SEMICOND DVC SE:MATCHED PAIR FET	22229	S2089
Q716	151-0362-00			TRANSISTOR:SILICON,PNP,SEL FROM 2N4258	80009	151-0362-00
Q728	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q768	151-0223-00			TRANSISTOR:NPN,SI,TO-92	04713	SPS8026
Q778	151-0223-00			TRANSISTOR:NPN,SI,TO-92	04713	SPS8026
Q792	151-0367-00			TRANSISTOR:SILICON,NPN,SEL FROM 3571TP	04713	SPS 8811
Q794	151-0367-00			TRANSISTOR:SILICON,NPN,SEL FROM 3571TP	04713	SPS 8811
Q802	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q804	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q810	151-0367-00			TRANSISTOR:SILICON,NPN,SEL FROM 3571TP	04713	SPS 8811
Q816	151-0223-00			TRANSISTOR:NPN,SI,TO-92	04713	SPS8026
Q822	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q852	151-0367-00			TRANSISTOR:SILICON,NPN,SEL FROM 3571TP	04713	SPS 8811
Q854	151-0283-00			TRANSISTOR:SILICON,NPN	07263	S032790
Q856	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q858	151-0289-00			TRANSISTOR:SILICON,PNP	04713	SS106
Q862	151-0354-00			TRANSISTOR:SILICON,PNP,DUAL	32293	ITS1200A
Q866	151-0224-00			TRANSISTOR:SILICON,NPN	07263	SA24850
Q868	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q884	151-1042-00			SEMICOND DVC SE:MATCHED PAIR FET	22229	S2089
Q886	---- ----			(PART OF Q884)		
Q888	151-0223-00	B010100	B010299	TRANSISTOR:NPN,SI,TO-92	04713	SPS8026
Q888	151-0437-00	B010300		TRANSISTOR:SILICON,NPN,SEL FROM 2N5769	80009	151-0437-00
Q892	151-0133-00	B010100	B010299	TRANSISTOR:SILICON,PNP	80009	151-0133-00
Q892	151-0301-00	B010300		TRANSISTOR:SILICON,PNP	27014	2N2907A
Q896	151-0133-00	B010100	B010299	TRANSISTOR:SILICON,PNP	80009	151-0133-00
Q896	151-0301-00	B010300		TRANSISTOR:SILICON,PNP	27014	2N2907A
Q902	151-0139-00			TRANSISTOR:SILICON,NPN	80009	151-0139-00
Q904	151-0224-00			TRANSISTOR:SILICON,NPN	07263	SA24850
Q906	151-0302-00			TRANSISTOR:SILICON,NPN	07263	S038487
Q908	151-0302-00			TRANSISTOR:SILICON,NPN	07263	S038487
Q914	151-0302-00			TRANSISTOR:SILICON,NPN	07263	S038487

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
Q934	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q936	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q942	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q944	151-0224-00			TRANSISTOR:SILICON,NPN	07263	SA24850
Q1012	151-1042-00			SEMICOND DVC SE:MATCHED PAIR FET	22229	S2089
Q1016	151-0362-00			TRANSISTOR:SILICON,PNP,SEL FROM 2N4258	80009	151-0362-00
Q1028	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1068	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1070	151-0302-00			TRANSISTOR:SILICON,NPN	07263	S038487
Q1072	151-0223-00			TRANSISTOR:NPN,SI,TO-92	04713	SPS8026
Q1074	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q1078	151-0223-00			TRANSISTOR:NPN,SI,TO-92	04713	SPS8026
Q1082	151-0367-00			TRANSISTOR:SILICON,NPN,SEL FROM 3571TP	04713	SPS 8811
Q1084	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q1092	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q1096	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q1102	151-0219-00			TRANSISTOR:SILICON,PNP	07263	S022650
Q1106	151-0367-00			TRANSISTOR:SILICON,NPN,SEL FROM 3571TP	04713	SPS 8811
Q1108	151-0223-00			TRANSISTOR:NPN,SI,TO-92	04713	SPS8026
Q1110	151-0367-00			TRANSISTOR:SILICON,NPN,SEL FROM 3571TP	04713	SPS 8811
Q1114	151-0367-00			TRANSISTOR:SILICON,NPN,SEL FROM 3571TP	04713	SPS 8811
Q1121	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q1124	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q1154	151-0160-00	B010100	B189714	TRANSISTOR:SILICON,NPN	80009	151-0160-00
Q1154	151-0446-00	B189715		TRANSISTOR:SILICON,NPN	80009	151-0446-00
Q1164	151-0285-00			TRANSISTOR:SILICON,PNP	80009	151-0285-00
Q1168	151-0302-00			TRANSISTOR:SILICON,NPN	07263	S038487
Q1172	151-0124-00			TRANSISTOR:SILICON,NPN,SEL FROM 2N3501	04713	SM8138
Q1174	151-0270-00			TRANSISTOR:SILICON,PNP	04713	ORD BY DESCR
Q1182	151-0124-00			TRANSISTOR:SILICON,NPN,SEL FROM 2N3501	04713	SM8138
Q1184	151-0270-00			TRANSISTOR:SILICON,PNP	04713	ORD BY DESCR
Q1192	151-0127-00			TRANSISTOR:SILICON,NPN	07263	S006075
Q1196	151-0127-00			TRANSISTOR:SILICON,NPN	07263	S006075
Q1202	151-0367-00			TRANSISTOR:SILICON,NPN,SEL FROM 3571TP	04713	SPS 8811
Q1204	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q1206	151-0283-00			TRANSISTOR:SILICON,NPN	07263	S032790
Q1208	151-0289-00			TRANSISTOR:SILICON,PNP	04713	SS106
Q1212	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1218	151-0224-00			TRANSISTOR:SILICON,NPN	07263	SA24850
Q1222	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1232	151-1042-00			SEMICOND DVC SE:MATCHED PAIR FET	22229	S2089
Q1234	---------			(PART OF Q1232)		
Q1236	151-0223-00	B010100	B010299	TRANSISTOR:NPN,SI,TO-92	04713	SPS8026
Q1236	151-0437-00	B010300		TRANSISTOR:SILICON,NPN,SEL FROM 2N5769	80009	151-0437-00
Q1238	151-0224-00			TRANSISTOR:SILICON,NPN	07263	SA24850
Q1252	151-0133-00	B010100	B010299	TRANSISTOR:SILICON,PNP	80009	151-0133-00
Q1252	151-0301-00	B010300		TRANSISTOR:SILICON,PNP	27014	2N2907A
Q1266	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1268	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1272	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1302	151-0224-00			TRANSISTOR:SILICON,NPN	07263	SA24850
Q1304	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1306	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1312	151-0223-00			TRANSISTOR:NPN,SI,TO-92	04713	SPS8026

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
Q1318	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q1322	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1328	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1331	151-0224-00			TRANSISTOR:SILICON,NPN	07263	SA24850
Q1336	151-0223-00	B010100	B010301	TRANSISTOR:NPN,SI,TO-92	04713	SPS8026
Q1336	151-0127-00	B010302		TRANSISTOR:SILICON,NPN	07263	S006075
Q1338	151-0127-00			TRANSISTOR:SILICON,NPN	07263	S006075
Q1342	151-0224-00			TRANSISTOR:SILICON,NPN	07263	SA24850
Q1356	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1358	151-0223-00			TRANSISTOR:NPN,SI,TO-92	04713	SPS8026
Q1362	151-0223-00			TRANSISTOR:NPN,SI,TO-92	04713	SPS8026
Q1364	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q1366	151-0224-00			TRANSISTOR:SILICON,NPN	07263	SA24850
Q1372	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q1374	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q1378	151-0223-00			TRANSISTOR:NPN,SI,TO-92	04713	SPS8026
Q1482	151-0301-00			TRANSISTOR:SILICON,PNP	27014	2N2907A
Q1504	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1520	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1544	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
Q1546	151-0219-00			TRANSISTOR:SILICON,PNP	07263	S022650
Q1548	151-0302-00			TRANSISTOR:SILICON,NPN	07263	S038487
Q1566	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1568	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
Q1582	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1590	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1594	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1614	151-0279-00			TRANSISTOR:SILICON,NPN	07263	S25381
Q1618	151-0280-00			TRANSISTOR:SILICON,PNP	04713	SS8065
Q1716	151-0219-00			TRANSISTOR:SILICON,PNP	07263	S022650
Q1718	151-0219-00			TRANSISTOR:SILICON,PNP	07263	S022650
Q1728	151-0279-00			TRANSISTOR:SILICON,NPN	07263	S25381
Q1732	151-0280-00			TRANSISTOR:SILICON,PNP	04713	SS8065
Q1736	151-0192-00			TRANSISTOR:SELECTED	04713	SPS8801
Q1742	151-0220-00			TRANSISTOR:PNP,SI,TO-92	07263	S036228
Q1748	151-0160-00	B010100	B189714	TRANSISTOR:SILICON,NPN	80009	151-0160-00
Q1748	151-0451-00	B189715		TRANSISTOR:SILICON,NPN	04713	SRF503
Q1750	151-0271-00			TRANSISTOR:SILICON,PNP	04713	SPS8236
Q1752	151-0124-00			TRANSISTOR:SILICON,NPN,SEL FROM 2N3501	04713	SM8138
Q1772	151-0270-00			TRANSISTOR:SILICON,PNP	04713	ORD BY DESCR
Q1774	151-0192-00			TRANSISTOR:SELECTED	04713	SPS8801
Q1834	151-0368-00			TRANSISTOR:SILICON,NPN	04713	SJ2754
Q1840	151-0260-00			TRANSISTOR: SILICON,NPN	04713	ST1083
Q1844	151-0368-00			TRANSISTOR:SILICON,NPN	04713	SJ2754
Q1846	151-0519-00			SCR:SILICON	04713	SCR5016K
Q1900	151-0302-00			TRANSISTOR:SILICON,NPN	07263	S038487
Q1902	151-0302-00	B010100	B167319	TRANSISTOR:SILICON,NPN	07263	S038487
Q1902	151-0273-00	B167320		TRANSISTOR:SILICON,NPN	80009	151-0273-00
Q2046	151-0136-00			TRANSISTOR:SILICON,NPN	02735	35495
Q2056	151-0260-00			TRANSISTOR:SILICON,NPN	04713	ST1083
Q2066	151-0334-00			TRANSISTOR:SILICON,NPN	04713	SJE914
Q2076	151-0335-00	B010100	B143849	TRANSISTOR:SILICON,PNP	04713	SJE917
Q2076	151-0324-00	B143850		TRANSISTOR:SILICON,PNP	04713	SJE915
Q2086	151-0134-00			TRANSISTOR:SILICON,PNP	80009	151-0134-00

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
Q2106	151-0219-00	B010100	B142363	TRANSISTOR:SILICON,PNP	07263	S022650
Q2106	151-0410-00	B142364		TRANSISTOR:SILICON,PNP	80009	151-0410-00
Q2112	151-0219-00	B010100	B142363	TRANSISTOR:SILICON,PNP	07263	S022650
Q2112	151-0410-00	B142364		TRANSISTOR:SILICON,PNP	80009	151-0410-00
Q2114	151-0212-00			TRANSISTOR:SILICON,NPN	04713	SRF 518
02124	151-0212-00			TRANSISTOR:SILICON,NPN	04713	SRF 518
R1	317-0100-00	B010100	B155789	RES.,FXD,CMPSN:10 OHM,5%,0.125W	01121	BB1005
R1	----------			(485,485-1 ONLY)		
R1	317-0047-00	B155790		RES.,FXD,CMPSN:4.7 OHM,5%,0.125W	01121	BB47G5
R1	----------			(485,485-1 ONLY)		
R3	317-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.125W	01121	BB1005
R3	----------			(485,485-1 ONLY)		
R4	315-0681-00	B155790		RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
R4	----------			(485,485-1 ONLY)		
R5	315-0752-00	B155790		RES.,FXD,CMPSN:7.5K OHM,5%,0.25W	01121	CB7525
R5	----------			(485,485-1 ONLY)		
R6	317-0361-00			RES.,FXD,CMPSN:360 OHM,5%,0.125W	01121	BB3615
R12	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R12	----------			(485,485-1 ONLY)		
R14	317-0680-00			RES.,FXD,CMPSN:68 OHM,5%,0.125W	01121	BB6805
R14	----------			(485,485-1 ONLY)		
R16	317-0105-00			RES.,FXD,CMPSN:IM OHM,5%,0.125W	01121	BB1055
R16	----------			(485,485-1 ONLY)		
R17	307-0106-00			RES.,FXD,CMPSN:4.7 OHM,5%,0.25W	01121	CB47G5
R17	----------			(485,485-1 ONLY)		
R18	317-0620-00			RES.,FXD,CMPSN:62 OHM,5%,0.125W	01121	BB6205
R18	----------			(485,485-1 ONLY)		
R23	317-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.125W	01121	BB1005
R23	----------			(485,485-1 ONLY)		
R26	317-0240-00			RES.,FXD,CMPSN:24 OHM,5%,0.125W	01121	BB2405
R26	----------			(485,485-1 ONLY)		
R27	317-0120-00			RES.,FXD,CMPSN:12 OHM,5%,0.125W	01121	BB1205
R27	----------			(485,485-1 ONLY)		
R28	317-0120-00			RES.,FXD,CMPSN:12 OHM,5%,0.125W	01121	BB1205
R28	----------					
R29	317-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.125W	01121	BB1005
R29	----------			(485,485-1 ONLY)		
R31	322-0481-01			RES.,FXD,FILM:IM OHM,0.5%,0.25W	75042	CEBT0-1004D
R31	----------			(485,485-1 ONLY)		
R32	317-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.125W	01121	BB1005
R32	----------			(485,485-1 ONLY)		
R33	315-0474-00			RES.,FXD,CMPSN:470K OHM,5%/,0.25W	01121	CB4745
R33	----------			(485,485-1 ONLY)		
R36	325-0048-00			RES.,FXD,FILM:1M OHM,1%,0.2W	03888	PME 50 21.0OHM
R36	----------			(485,485-1 ONLY)		
R38	325-0048-00			RES.,FXD,FILM:1M OHM,1%,0.2W	03888	PME 50 21.0OHM
R38	----------			(485,485-1 ONLY)		
R40	317-0122-00			RES.,FXD,CMPSN:1.2K OHM,5%,0.125W	01121	BB1225
R40	----------			(485,485-1 ONLY)		
R42	317-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.125W	01121	BB3935
R42	----------			(485,485-1 ONLY)		
R43	317-0560-00			RES.,FXD,CMPSN:56 OHM,5%,0.125W	01121	BB5605
R43	----------			(485,485-1 ONLY)		

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R45	311-1035-00			RES.,VAR,NONWIR:50K OHM,10%,0.50W	73138	82-40-0
R45	----------			(485,485-1 ONLY)		
R46	315-0395-00			RES.,FXD,CMPSN:3.9M OHM,5%,0.25W	01121	CB3955
R46	----------			485,485-1 ONLY		
R47	317-0824-00			RES.,FXD,CMPSN:820K OHM,5%,0.125W	01121	BB245
	----------			(485,485-1 ONLY)		
R49	317-0390-00			RES.,FXD,CMPSN:39 OHM,5%,0.125W	01121	BB3905
R49	----------			(485,485-1 ONLY)		
R50	317-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
R50	----------			(485,485-1 ONLY)		
R51	317-0122-00			RES.,FXD,CMPSN:1.2K OHM,5%,0.125W	01121	BB1225
R51	----------			(485,485-1 ONLY)		
R53	311-0643-00			RES.,VAR,NONWIR:50 OHM,10%,0.50W	73138	82-33-2
R53	----------			(485,485-1 ONLY)		
R54	317-0910-00			RES.,FXD,CMPSN:91 OHM,5%,0.125W	01121	BB9105
R54	----------			(485,485-1 ONLY)		
R55	311-0605-00			RES.,VAR,NONWIR:TRMR,200 OHM,0.5W	73138	82-23-2
R55	----------			(485,485-1 ONLY)		
R56	317-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.125W	01121	BB1525
R56	----------			(485,485-1 ONLY)		
R57	317-0431-00	B010100	B188388	RES.,FXD,CMPSN:430 OHM,5%,0.125W	01121	BB4315
R57	----------			(485,485-1 ONLY)		
R57	317-0681-00	B188389		RES.,FXD,CMPSN:680 OHM,5%,0.125W	01121	BB6815
R57	----------			(485,485-1 ONLY)		
R59	317-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
R59	----------			(485,485-1 ONLY)		
R60	317-0390-00			RES.,FXD,CMPSN:39 OHM,5%,0.125W	01121	BB3905
R60	----------			(485,485-1 ONLY)		
R61	317-0027-00			RES.,FXD,CMPSN:2.7 OHM,5%,0.125W	01121	BB2R705
R61	----------			(485,485-1 ONLY)		
R62	317-0362-00			RES.,FXD,CMPSN:3.6K OHM,5%,0.125W	01121	BB3625
R62	----------			(485,485-1 ONLY)		
R63	317-0390-00			RES.,FXD,CMPSN:39 OHM,5%,0.125W	01121	BB3905
R63	----------			(485,485-1 ONLY)		
R64	317-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.125W	01121	BB5615
R64	----------			(485,485-1 ONLY)		
R65	317-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.125W	01121	BB3325
R65	---------			(485,485-1 ONLY)		
R66	317-0330-00	8010100	8020432	RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R66	---------			(485,485-1 ONLY)		
R66	317-0330-00	8020436	8167399	RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R66	---------			(R485,485-1 ONLY)		
R66	317-0330-00	8167400		RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R66	----------			(ADDED WHEN NEEDED)		
R67	317-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.125W	01121	BB5105
R67	----------			(485,485-1 ONLY)		
R68	317-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.125W	01121	BB1025
R68	---------			(485,485-1 ONLY)		
R69	317-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.125W	01121	BB4705
R69	---------			(485,485-1 ONLY)		
R70	317-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R70	---------			(485,485-1 ONLY)		
R71	317-0911-00			RES.,FXD,CMPSN:910 OHM,5%,0.125W	01121	BB9115
R71	----------			(485,485-1 ONLY)		

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R72	301-0820-00			RES.,FXD,CMPSN:82 OHM,5%,0.50W	01121	EB8205
R72	----------			(485,485-1 ONLY)		
R74	317-0047-00			RES.,FXD,CMPSN:4.7 OHM,5%,0.125W	01121	BB47G5
R74	----------			(485,485-1 ONLY)		
R75	317-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.125W	01121	BB3935
R75	----------			(485,485-1 ONLY)		
R76	315-0205-00			RES.,FXD,CMPSN:2M OHM,5%,0.25W	01121	CB2055
R76	----------			(485,485-1 ONLY)		
R77	317-0304-00			RES.,FXD,CMPSN:300K OHM,5%,0.125W	01121	BB3045
R77	----------			(485,485-1 ONLY)		
R78	311-0698-00			RES.,VAR,NONWIR:1M OHM,0.50W	73138	82PRIMEG-36B
R78	----------			485,485-1 ONLY)		
R81	321-0260-00			RES.,FXD,FILM:4.99K OHM,1%,0.125W	91637	MFF1816G49900F
R81	----------			(485,485-1 ONLY)		
R82	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R82	----------			(485,485-1 ONLY)		
R83	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R83	----------			(485,485-1 ONLY)		
R84	321-0094-00			RES.,FXD,FILM:93.1 OHM,1%,0.125W	91637	MFF1816G93R10F
R87	317-0201-00	B010100	B109999	RES.,FXD,CMPSN:200 OHM,5%,0.125W	01121	BB2015
R87	317-0181-00	B110000		RES.,FXD,CMPSN:180 OHM,5%,0.125W	01121	BB1815
R90	311-0566-00			RES.,VAR,NONWIR:PNL,5K OHM,0.5	12697	381-CM39672
R93	315-0621-00	B010100	B166699	RES.,FXD,CMPSN:620 OHM,5%,0.25W	01121	CB6215
R93	315-0331-00	B166700		RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
R96	317-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.125W	01121	BB2205
R101	317-0394-00			REs.,FXD,CMPSN:390K OHM,5%,0.125W	01121	BB3945
R102	317-0394-00			RES.,FXD,CMPSN:390K OHM,5%,0.125W	01121	BB3945
R104	317-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.125W	01121	BB5105
R107	321-0286-00			RES.,FXD,FILM:9.31K OHM,1%,0.125W	91637	MFF1816G93100F
R111	322-0692-03			RES.,FXD,FILM:122.2 OHM,0.25%,0.25W	91637	MFF1421D122R2C
R112	322-0692-03			RES.,FXD,FILM:122.2 OHM,0.25%,0.25W	91637	MFF1421D122R2C
R113	321-0938-03			RES.,FXD,FILM:247.5 OHM,0.25%,0.125W	91637	MFF1816D247R5C
R114	321-0939-03			RES.,FXD,FILM:122.2 OHM,0.25%,0.125W	91637	MFF1816D122R2C
R115	321-0939-03			RES.,FXD,FILM:122.2 OHM,0.25%,0.125W	91637	MFF1816D122R2C
R121	321-0939-03			RES.,FXD,FILM:122.2 OHM,0.25%,0.125W	91637	MFF1816D122R2C
R122	321-0939-03			RES.,FXD,FILM:122.2 OHM,0.25%,0.125W	91637	MFF1816D122R2C
R123	321-0938-03			RES.,FXD,FILM:247.5 OHM,0.25%,0.125W	91637	MFF1816D247R5C
R124	321-0939-03			RES.,FXD,FILM:122.2 OHM,0.25%,0.125W	91637	MFF1816D122R2C
R125	321-0939-03			RES.,FXD,FILM:122.2 OHM,0.25%,0.125W	91637	MFF1816D122R2C
R127	317-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.125W	01121	BB5105
R131	321-0808-03			RES.,FXD,FILM:300 OHM,0.25%,0.125W	07716	CEAC300ROC
R132	321-0808-03			RES.,FXD,FILM:300 OHM,0.25%,0.125W	07716	CEAC300ROC
R133	321-0085-03			RES.,FXD,FILM:75 OHM,0.25%,0.125W	24546	NC55C75ROC
R134	321-0085-03			RES.,FXD,FILM:75 OHM,0.25%,0.125W	24546	NC55C75ROC
R135	321-0114-03			RES.,FXD,FILM:150 OHM,0.25%,0.125W	91637	CMF55116D150ROC
R141	321-0940-03			RES.,FXD,FILM:116.7 OHM,0.25%,0.125W	91637	MFF1816D116R7C
R143	325-0108-00			RES.,FXD,FILM:105 OHM,0.5%,0.05W	14298	EE 120-0105ROD
R144	325-0108-00			RES.,FXD,FILM:105 OHM,0.5%,0.05W	14298	EE 120-0105ROD
R145	321-0940-03			RES.,FXD,FILM:116.7 OHM,0.25%,0.125W	91637	MFF1816D116R7C
R201	323-0172-06			RES.,FXD,FILM:604 OHM,0.25%,0.50W	91637	MFF1226C604ROC
R204	323-0172-06			RES.,FXD,FILM:604 OHM,0.25%,0.50W	91637	MFF1226C604ROC
R205	316-0101-00			RES.,FXD,CMPSN:100 OHM,10%,0.25W	01121	CB1011
R206	311-1228-00			RES.,VAR,NONWIR:10K OHM,20%,0.50W	32997	3386F-T04-103
R207	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535

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R208	311-0635-00			RES.,VAR,NONWW:TRMR,1K OHM,10%,0.5%,0.5W	02111	65Y102T010
R209	321-0073-00			RES.,FXD,FILM:56.2 OHM,1%,0.125W	91637	MFF1816G56R20F
R212	321-0136-00	B010100	B119999	RES.,FXD,FILM:255 OHM,1%,0.125W	91637	MFF1816G255R0F
R212	321-0139-00	B120000		RES.,FXD,FILM:274 OHM,1%,0.125W	91637	MFF1816G274R0F
R213	321-0136-00	B010100	B119999	RES.,FXD,FILM:255 OHM,1%,0.125W	91637	MFF1816G255R0F
R213	321-0139-00	B120000		RES.,FXD,FILM:274 OHM,1%,0.125W	91637	MFF1816G274R0F
R214	311-0605-00			RES.,VAR,NONWIR:TRMR,200 OHM,0.5W	73138	82-23-2
R215	311-0643-00	B010100	B119999	RES.,VAR,NONWIR:50 OHM,10%,0.50W	73138	82-33-2
R215	311-1007-00	B120000		RES.,VAR,NONWIR:20 OHM,20%,0.50W	73138	82-38-1
R217	315-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
R220	311-0091-00			RES.,VAR,NONWIR:1K OHM,10%,0.50W	01121	W-3083E
R221	315-0681-00	B010100	B144129	RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
R221	315-0621-00	B144130		RES.,FXD,CMPSN:620 OHM,5%,0.25W	01121	CB6215
R223	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R225	321-0273-00			RES.,FXD,FILM:6.81K OHM,1%,0.125W	91637	MFF1816G68100F
R226	321-0320-00			RES.,FXD,FILM:21K CHM,1%,0.125W	91637	MFF1816G21001F
R227	321-0273-00			RES.,FXD,FILM:6.81K OHM,1%,0.125W	91637	MFF1816G68100F
R228	321-0246-00			RES.,FXD,FILM:3.57K OHM,1%,0.125W	91637	MFF1816G35700F
R230	311-0091-00			RES.,VAR,NONWIR:1K OHM,10%,0.50W	01121	W-3083E
R240	311-0978-00			RES.,VAR,NONWIR:250 OHM,10%,0.50W	73138	82-4-2
R242	307-0115-00			RES.,FXD,CMPSN:7.5 OHM,5%,0.25W	01121	CB75G5
R244	325-0053-00			RES.,FXD,FILM:50 OHM,1%,0.05W	03888	PME50C50R00F
R247	325-0053-00			RES.,FXD,FILM:50 OHM,1%,0.05W	03888	PME50C50R00F
R250	311-0643-00			RES.,VAR,NONWIR:50 OHM,10%,0.50W	73138	82-33-2
R251	321-0124-00			RES.,FXD,FILM:191 OHM,1%,0.125W	91637	MFF1816G191R0F
R252	321-0124-00			RES.,FXD,FILM:191 OHM,1%,0.125W	91637	MFF1816G191R0F
R253	317-0112-00			RES.,FXD,CMPSN:1.1K OHM,5%,0.125W	01121	BB1125
R254	317-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.125W	01121	BB1025
R255	311-0635-00			RES.,VAR,NONWW:TRMR,1K OHM,10%,0.5%,0.5W	02111	65Y102T010
R257	317-0112-00			RES.,FXD,CMPSN:1.1K OHM,5%,0.125W	01121	BB1125
R261	317-0101-00	B170000		RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
R262	315-0243-00			RES.,FXD,CMPSN:24K OHM,5%,0.25W	01121	CB2435
R264	317-0101-00	B170000		RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
R265	321-0174-00			RES.,FXD,FILM:634 OHM,1%,0.125W	91637	MFF1816G634R0F
R266	321-0149-00			RES.,FXD,FILM:348 OHM,1%,0.125W	91637	MFF1816G348R0F
R267	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R268	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R269	315-0300-00	B010100	B049999	RES.,FXD,CMPSN:30 OHM,5%,0.25W	01121	CB3005
R269	315-0430-00	B050000		RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
R270	311-1197-00	B010100	B188329	RES.,VAR,NONWIR:PNL,20K OHM,1W	12697	381-CM39696
R270	311-1524-00	B188330		RES.,VAR,NONWIR:20K OHM,10%,1W	01121	73A1G040L203U
R271	321-0330-00	B010100	B049999	RE8.,FXD,FILM:26.7K OHM,1%,0.125W	91637	MFF1816G26701F
R271	321-0332-00	B050000		RES.,FXD,FILM:28K OHM,1%,0.125W	91637	MFF1816G28001F
R272	321-0220-00			RES.,FXD,FILM:1.91K OHM,1%,0.125W	91637	MFF1816G19100F
R273	315-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.25W	01121	CB7525
R274	321-0189-00			RES.,FXD,FILM:909 OHM,1%,0.125W	91637	MFF1816G909R0F
R275	311-0633-00			RES.,VAR,NONWIR:5K OHM,10%,0.50W	73138	82-30-1
R276	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	01121	ORD BY DESCR
R279	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
R282	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R284	321-0189-00			RES.,FXD,FILM:909 OHM,1%,0.125W	91637	MFF1816G909R0F
R286	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	01121	ORD BY DESCR
R287	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R289	315-0363-00			RES.,FXD,CMPSN:36K OHM,5%,0.25W	01121	CB3635

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R290	311-0702-00			RES.,VAR,NONWIR:250 OHM,10%,0.5W	12697	382-CM39823
R291	301-0431-00			RES.,FXD,CMPSN:430 OHM,5%,0.5W	01121	EB4315
R301	323-0172-06			RES.,FXD,FILM:604 OHM,0.25%,0.50W	91637	MFF1226C604R0C
R304	323-0172-06			RES.,FXD,FILM:604 OHM,0.25%,0.50W	91637	MFF1226C604R0C
R305	316-0101-00			RES.,FXD,CMPSN:100 OHM,10%,0.25W	01121	CB1011
R306	311-1228-00			RES.,VAR,NONWIR:10K OHM,20%,0.50W	32997	3386F-T04-103
R307	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R308	311-0635-00			RES.,VAR,NONWW:TRMR,1K OHM,10%,0.5%,0.5W	02111	65Y102T010
R309	321-0073-00			RES.,FXD,FILM:56.2 OHM,1%,0.125W	91637	MFF1816G56R20F
R310	311-0622-00	B010100	B119999	RES.,VAR,NONWIR:100 OHM,10%,0.50W	32997	3329H-G48-101
R310	311-0643-00	B120000		RES.,VAR,NONWIR:50 OHM,10%,0.50W	73138	82-33-2
R312	311-0622-00	B010100	B119999	RES.,VAR,NONWIR:100 OHM,10%,0.50W	32997	3329H-G48-101
R312	311-0643-00	B120000		RES.,VAR,NONWIR:50 OHM,10%,0.50W	73138	82-33-2
R313	321-0132-00	B010100	B119999	RES.,FXD,FILM:232 OHM,1%,0.125W	91637	MFF1816G232R0F
R313	321-0136-00	B120000		RES.,FXD,FILM:255 OHM,1%,0.125W	91637	MFF1816G255R0F
R314	321-0132-00	B010100	B119999	RES.,FXD,FILM:232 OHM,1%,0.125W	91637	MFF1816G232R0F
R314	321-0136-00	B120000		RES.,FXD,FILM:255 OHM,1%,0.125W	91637	MFF1816G255R0F
R315	311-0605-00			RES.,VAR,NONWIR:TRMR,200 OHM,0.5W	73138	82-23-2
R316	315-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
R317	321-0254-00			RES.,FXD,FILM:4.32K OHM,1%,0.125W	91637	MFF1816G43200F
R318	311-0660-00			RES.,VAR,NONWIR:TRMR,200K OHM,0.5W	73138	82-35-1
R319	321-0254-00			RES.,FXD,FILM:4.32K OHM,1%,0.125W	91637	MFF1816G43200F
R320	315-0224-00			RES.,FXD,CMPSN:220K OHM,5%,0.25W	01121	CB2245
R321	315-0681-00	B010100	B144129	RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
R321	315-0621-00	B144130		RES.,FXD,CMPSN:620 OHM,5%,0.25W	01121	CB6215
R323	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R325	321-0273-00			RES.,FXD,FILM:6.81K OHM,1%,0.125W	91637	MFF1816G68100F
R326	321-0320-00			RES.,FXD,FILM:21K OHM,1%,0.125W	91637	MFF1816G21001F
R327	321-0273-00			RES.,FXD,FILM:6.81K OHM,1%,0.125W	91637	MFF1816G68100F
R328	321-0320-00			RES.,FXD,FILM:21K OHM,1%,0.125W	91637	MFF1816G21001F
R332	321-0339-00			RES.,FXD,FILM:33.2K OHM,1%,0.125W	91637	MFF1816G33201F
R333	321-0308-00			RES.,FXD,FILM:15.8K OHM,1%,0.125W	91637	MFF1816G15801F
R340	311-0978-00			RES.,VAR,NONWIR:250 OHM,10%,0.50W	73138	82-4-2
R342	307-0115-00			RES.,FXD,CMPSN:7.5 OHM,5%,0.25W	01121	CB75G5
R344	325-0053-00			RES.,FXD,FILM:50 OHM,I%,0.05W	03888	PME50C50R00F
R347	325-0053-00			RES.,FXD,FILM:50 OHM,1%,0.05W	03888	PME50C50R00F
R350	311-0643-00			RES.,VAR,NONWIR:50 OHM,10%,0.50W	73138	82-33-2
R353	321-0124-00			RES.,FXD,FILM:191 OHM,1%,0.125W	91637	MFF1816G191R0F
R354	321-0124-00			RES.,FXD,FILM:191 OHM,1%,0.125W	91637	MFF1816G191R0F
R355	317-0112-00			RES.,FXD,CMPSN:1.1K OHM,5%,0.125W	01121	BB1125
R356	317-0112-00			RES.,FXD,CMPSN:1.IK OHM,5%,0.125W	01121	BB1125
R357	317-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.125W	01121	BB1025
R358	311-0635-00			RES.,VAR,NONWW:TRMR,1K OHM,10%,0.5%,0.5W	02111	65Y102T010
R361	317-0101-00	B170000		RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
R362	315-0243-00			RES.,FXD,CMPSN:24K OHM,5%,0.25W	01121	CB2435
R364	317-0101-00	B170000		RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
R365	321-0174-00			RES.,FXD,FILM:634 OHM,1%,0.125W	91637	MFF1816G634R0F
R366	321-0149-00			RES.,FXD,FILM:348 OHM,1%,0.125W	91637	MFF1816G348R0F
R367	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R368	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R369	315-0300-00	B010100	B049999	RES.,FXD,CMPSN:30 OHM,5%,0.25W	01121	CB3005
R369	315-0430-00	B050000		RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
R370	311-1197-00	B010100	B188329	RES.,VAR,NONWIR:PNL,20K OHM,1W	12697	381-CM39696
R370	311-1524-00	B188330		RES.,VAR,NONWIR:20K OHM,10%,1W	01121	73A1G040L203U

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R371	321-0330-00	B010100	B049999	RES.,FXD,FILM:26.7K OHM,1%,0.125W	91637	MFF1816G26701F
R371	321-0332-00	B050000		RES.,FXD,FILM:28K OHM,1%,0.125W	91637	MFF1816G28001F
R372	321-0220-00			RES.,FXD,FILM:1.91K OHM,1%,0.125W	91637	MFF1816G19100F
R373	315-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.25W	01121	CB7525
R374	321-0189-00			RES.,FXD,FILM:909 OHM,1%,0.125W	91637	MFF1816G909R0F
R375	311-0633-00			RES.,VAR,NONWIR:5K OHM,10%,0.50W	73138	82-30-1
R376	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	01121	ORD BY DESCR
R379	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
R382	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R384	321-0189-00			RES.,FXD,FILM:909 OHM,1%,0.125W	91637	MFF1816G909R0F
R386	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	01121	ORD BY DESCR
R387	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R389	315-0363-00			RES ,FXD,CMPSN:36K OHM,5%,0.25W	01121	CB3635
R402	321-0043-00	B170000		RES.,FXD,FILM:27.4 OHM,1%,0.125W	91637	MFF1816G27R40F
R403	321-0114-00	B010100	B169999	RES.,FXD,FILM:150 OHM,1%,0.125W	91637	MFF1816G150R0F
R403	321-0085-00	B170000		RES.,FXD,FILM:75 OHM,1%,0.125W	91637	MFF1816G75R00F
R404	321-0114-00	B010100	B169999	RES.,FXD,FILM:150 OHM,1%,0.125W	91637	MFF1816G150R0F
R404	321-0085-00	B170000		RES.,FXD,FILM:75 OHM,1%,0 125W	91637	MFF1816G75R00F
R407	317-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.125W	01121	BB1005
R408	317-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.125W	01121	BB1005
R409	317-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.125W	01121	BB2415
R410	317-0202-00	B190990		RES.,FXD,CMPSN:2K OHM,5%,0.125W	01121	BB2025
R411	321-0001-00			RES.,FXD,FILM:10 OHM,1%,0.125W	75042	CEAT0-10R00F
R412	321-0016-00			RES.,FXD,FILM:14.3 OHM,1%,0.125W	91637	CMF55116G14R30F
R413	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R414	321-0175-00			RES.,FXD,FILM:649 OHM,1%,0.125W	91637	CMF55116G649R0F
R415	321-0126-00			RES.,FXD,FILM:200 OHM,1%,0.125W	91637	MFF1816G200R0F
R416	321-0184-00			RES.,FXD,FILM:806 OHM,1%,0.125W	91637	MFF1816G806R0F
R417	321-0122-00			RES.,FXD,FILM:182 OHM,1%,0.125W	91637	MFF1816G182R0F
R418	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
R419	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
R420	315-0102-00	B170000		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R422	321-0043-00	B170000		RES.,FXD,FILM:27.4 OHM,1%,0.125W	91637	MFF1816G27R40F
R423	321-0114-00	B010100	B169999	RES.,FXD,FILM:150 OHM,1%,0.125W	91637	MFF1816G150R0F
R423	321-0085-00	B170000		RES.,FXD,FILM:75 OHM,1%,0.125W	91637	MFF1816G75R00F
R424	321-0114-00	B010100	B169999	RES.,FXD,FILM:150 OHM,1%,0.125W	91637	MFF1816G150R0F
R424	321-0085-00	B170000		RES.,FXD,FILM:75 OHM,1%,0.125W	91637	MFF1816G75R00F
R427	317-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.125W	01121	BB1005
R428	317-0100-00			RES.,FXD,CMPSN:10 OHM,5%,01125W	01121	BB1005
R432	315-0102-00	B170000		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R433	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R434	321-0175-00			RES.,FXD,FILM:649 OHM,1%,0.125W	91637	CMF55116G649R0F
R435	321-0126-00			RES.,FXD,FILM:200 OHM,1%,0.125W	91637	MFF1816G200R0F
R436	321-0184-00			RES.,FXD,FILM:806 OHM,1%,0.125W	91637	MFF1816G806R0F
R437	321-0122-00			RES.,FXD,FILM:182 OHM,1%,0.125W	91637	MFF1816G182R0F
R438	321-0101-00			RES.,FXD,FILM:110 OHM,1%,0.125W	91637	MFF1816G110R0F
R439	321-0101-00			RES.,FXD,FILM:110 OHM,1%,0.125W	91637	MFF1816G110R0F
R440	321-0197-00			RES.,FXD,FILM:1.1K OHM,1%,0.125W	91637	MFF1816G11000F
R441	321-0292-00	B010100	B179999	RES.,FXD,FILM:10.7K OHM,1%,0.125W	91637	MFF1816G10701F
R441	321-0295-00	B180000		RES.,FXD,FILM:11.5K OHM,1%,0.125W	91637	MFF1816G11501F
R442	321-0254-00			RES.,FXD,FILM:4.32K OHM,1%,0.125W	91637	MFF1816G43200F
R444	321-0260-00			RES.,FXD,FILM:4.99K OHM,1%,0.125W	91637	MFF1816G49900F
R446	321-0218-00			RES.,FXD,FILM:1.82K OHM,1%,0.125W	91637	MFF1816G18200F
R448	321-0260-00			RES.,FXD,FILM:4.99K OHM,1%,0.125W	91637	MFF1816G49900F

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R449	315-0164-00			RES.,FXD,CMPSN:160K OHM,5%,0.25W	01121	CB1645
R450	311-0642-00			RES.,VAR,NONWIR:20K OHM,20%,0.50W	12697	382-CM39820
R451	321-0300-00			RES.,FXD,FILM:13K OHM,1%,0.125W	91637	MFF1816G13001F
R452	321-0222-00			RES.,FXD,FILM:2K OHM,1%,0.125W	91637	MFF1816G20000F
R453	321-0218-00			RES.,FXD,FILM:1.82K OHM,1%,0.125W	91637	MFF1816G18200F
R454	321-0254-00			RES.,FXD,FILM:4.32K OHM,1%,0.125W	91637	MFF1816G43200F
R456	321-0197-00			RES.,FXD,FILM:1.1K OHM,1%,0.125W	91637	MFF1816G11000F
R457	321-0292-00	B010100	B179999	RES.,FXD,FILM:10.7K OHM,1%,0.125W	91637	MFF1816G10701F
R457	321-0295-00	B180000		RES.,FXD,FILM:11.5K OHM,1%,0.125W	91637	MFF1816G11501F
R458	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R461	321-0240-00			RES.,FXD,FILM:3.09K OHM,1%,0.125W	91637	MFF1816G30900F
R464	321-0293-00			RES.,FXD,FILM:11K OHM,1%,0.125W	91637	MFF1816G11001F
R465	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
R466	321-0289-00			RES.,FXD,FILM:10K OHM,1%,0.125W	91637	MFF1816G10001F
R468	315-0622-00			RES.,FXD,CMPSN:6.2K OHM,5%,0.25W	01121	CB6225
R503	321-0126-00			RES.,FXD,FILM:200 OHM,1%,0.125W	91637	MFF1816G200R0F
R504	321-0126-00			RES.,FXD,FILM:200 OHM,1%,0.125W	91637	MFF1816G200R0F
R505	311-0635-00			RES.,VAR,NONWW:TRMR,1K OHM,10%,0.5%,0.5W	02111	65Y102T010
R508	321-0068-00			RES.,FXD,FILM:49.9 OHM,1%,0.125W	91637	MFF1816G49R90F
R509	321-0068-00			RES.,FXD,FILM:49.9 OHM,1%,0.125W	91637	MFF1816G49R90F
R511	321-0051-00			RES.,FXD,FILM:33.2 OHM,1%,0.125W	91637	MFF1816G33R20F
R512	307-0109-00			RES.,FXD,CMPSN:8.2 OHM,5%,0.25W	01121	CB82G5
R513	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R514	321-0175-00			RES.,FXD,FILM:649 OHM,1%,0.125W	91637	CMF55116G649R0F
R515	321-0126-00			RES.,FXD,FILM:200 OHM,1%,0.125W	91637	MFF1816G200R0F
R516	321-0184-00			RES.,FXD,FILM:806 OHM,1%,0.125W	91637	MFF1816G806R0F
R517	321-0122-00			RES.,FXD,FILM:182 OHM,1%,0.125W	91637	MFF1816G182R0F
R518	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
R523	321-0126-00			RES.,FXD,FILM:200 OHM,1%,0.125W	91637	MFF1816G200R0F
R524	321-0126-00			RES.,FXD,FILM:200 OHM,1%,0.125W	91637	MFF1816G200R0F
R525	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
R528	321-0068-00			RES.,FXD,FILM:49.9 OHM,1%,0.125W	91637	MFF1816G49R90F
R529	321-0068-00			RES.,FXD,FILM:49.9 OHM,1%,0.125W	91637	MFF1816G49R90F
R531	321-0051-00			RES.,FXD,FILM:33.2 OHM,1%,0.125W	91637	MFF1816G33R20F
R532	307-0109-00			RES.,FXD,CMPSN:8.2 OHM,5%,0.25W	01121	CB82G5
R533	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R534	321-0175-00			RES.,FXD,FILM:649 OHM,1%,0.125W	91637	CMF55116G649R0F
R535	321-0126-00			RES.,FXD,FILM:200 OHM,1%,0.125W	91637	MFF1816G200R0F
R536	321-0184-00			RES.,FXD,FILM:806 OHM,1%,0.125W	91637	MFF1816G806R0F
R537	321-0122-00			RES.,FXD,FILM:182 OHM,1%,0.125W	91637	MFF1816G182R0F
R538	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
R541	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
R542	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
R543	315-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.25W	01121	CB3305
R544	321-0114-00			RES.,FXD,FILM:150 OHM,1%,0.125W	91637	MFF1816G150R0F
R545	317-0111-00			RES.,FXD,CMPSN:110 OHM,5%,0.125W	01121	BB1115
R546	321-0114-00			RES.,FXD,FILM:150 OHM,1%,0.125W	91637	MFF1816G150R0F
R547	321-0140-00			RES.,FXD,FILM:280 OHM,1%,0.125W	91637	MFF1816G280R0F
R549	321-0129-00			RES.,FXD,FILM:215 OHM,1%,0.125W	91637	MFF1816G215R0F
R550	317-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.125W	01121	BB3015
R552	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R553	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	01121	CB2235
R554	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	01121	CB2235
R555	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715

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R556	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R557	321-1087-01			RES.,FXD,FILM:79.6 OHM,0.5%,0.125W	91637	MFF1816G79R60D
R558	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
R559	321-1087-01			RES.,FXD,FILM:79.6 OHM,0.5%,0.125W	91637	MFF1816G79R60D
R560	311-1227-00			RES.,VAR,NONWIR:5K OHM,20%,0.50W	32997	3386F-T04-502
R562	321-0139-00			RES.,FXD,FILM:274 OHM,1%,0.125W	91637	MFF1816G274R0F
R563	315-0430-00	B010100	B089999	RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
R563	315-0470-00	B090000		RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R565	315-0430-00	B010100	B089999	RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
R565	315-0470-00	B090000		RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R566	321-0152-00			RES.,FXD,FILM:374 OHM,1%,0.125W	91637	MFF1816G374R0F
R567	321-0193-00			RES.,FXD,FILM:IK OHM,1%,0.125W	01121	ORD BY DESCR
R568	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R570	321-0222-00			RES.,FXD,FILM:2K OHM,1%,0.125W	91637	MFF1816G20000F
R571	321-0168-00			RES.,FXD,FILM:549 OHM,1%,0.125W	91637	MFF1816G549R0F
R572	307-0108-00			RES.,FXD,CMPSN:6.8 OHM,5%,0.25W	01121	CB68G5
R574	315-0620-00			RES.,FXD,CMPSN:62 OHM,5%,0.25W	01121	CB6205
R575	311-1222-00			RES.,VAR,NONWIR:100 OHM,20%,0.50W	32997	3386F-T04-101
R576	321-0168-00			RES.,FXD,FILM:549 OHM,1%,0.125W	91637	MFF1816G549R0F
R577	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
R578	321-0222-00			RES.,FXD,FILM:2K OHM,1%,0.125W	91637	MFF1816G20000F
R579	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	01121	ORD BY DESCR
R600	311-1007-00			RES.,VAR,NONWIR:20 OHM,20%,0.50W	73138	82-38-1
R601	315-0751-00			RES.,FXD,CMPSN:750 OHM,5%,0.25W	01121	CB7515
R602	322-0091-00			RES.,FXD,FILM:86.6 OHM,1%,0.25W	91637	CMF6042G86R60F
R603	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
R604	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
R606	311-0607-00	B010100	191677	RES.,VAR,NONWIR:10OK OHM,10%,0.50W	73138	82-25-2
R607	311-0633-00			RES.,VAR,NONWIR:5K OHM,10%,0.50W	73138	82-30-1
R608	311-1265-00			RES.,VAR,NONWIR:2K OHM,10%,0.50W	32997	3329P-L58-202
R609	311-1265-00			RES.;VAR,NONWIR:2K OHM,10%,0.50W	32997	3329P-L58-202
R610	321-0300-00			RES.,FXD,FILM:13K OHM,1%,0.125W	91637	MFF1816G13001F
R611	317-0200-00			RES.,FXD,CMPSN:20 OHM,5%,0.125W	01121	BB2005
R612	317-0200-00			RES.,FXD,CMPSN:20 OHM,5%,0.125W	01121	BB2005
R613	311-1265-00			RES.,VAR,NONWIR:2K OHM,10%,0.50W	32997	3329P-L58-202
R614	311-1265-00			RES.,VAR,NONWIR:2K OHM,10%,0.50W	32997	3329P-L58-202
R615	311-0605-00			RES.,VAR,NONWIR:TRMR,200 OHM,0.5W	73138	82-23-2
R616	321-0300-00			RES.,FXD,FILM:13K OHM,1%,0.125W	91637	MFF1816G13001F
R621	321-0068-00			RES.,FXD,FILM:49.9 OHM,1%,0.125W	91637	MFF1816G49R90F
R622	315-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
R623	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R624	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R625	321-0068-00			RES.,FXD,FILM:49.9 OHM,1%,0.125W	91637	MFF1816G49R90F
R626	316-0104-00	B010100	B039999	RES.,FXD,CMPSN:100K OHM,10%,0.25W	01121	CB1041
R627	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R629	311-0635-00			RES.,VAR,NONWW:TRMR,1K OHM,10%,0.5%,0.5W	02111	65Y102T010
R633	321-0160-00			RES.,FXD,FILM:453 OHM,1%,0.125W	91637	MFF1816G453R0F
R634	321-0168-00			RES.,FXD,FILM:549 OHM,1%,0.125W	91637	MFF1816G549R0F
R635	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
R636	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R637	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
R638	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R639	316-0470-00			RES.,FXD,CMPSN:47 OHM,10%,0.25W	01121	CB4701
R640	321-0280-00			RES.,FXD,FILM:8.06K OHM,1%,0.125W	91637	MFF1816G80600F

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R641	321-0280-00			RES.,FXD,FILM:8.06K OHM,1%,0.125W	91637	MFF1816G80600F
R642	321-0068-00			RES.,FXD,FILM:49.9 OHM,1%,0.125W	91637	MFF1816G49R90F
R643	323-0145-00			RES.,FXD,FILM:316 OHM,1%,0.50W	91637	MFF1226G316R0F
R645	317-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.125W	01121	BB1215
R646	323-0145-00			RES.,FXD,FILM:316 OHM,1%,0.50W	91637	MFF1226G316R0F
R647	321-0068-00			RES.,FXD,FILM:49.9 OHM,1%,0.125W	91637	MFF1816G49R90F
R649	316-0104-00			RES.,FXD,CMPSN:100K OHM,10%,0.25W	01121	CB1041
R650	315-0391-00			RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915
R651	317-0101-00	B170000	B190989	RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
R651	317-0430-00	B190990		RES.,FXD,CMPSN:43 OHM,5%,0.125W	01121	BB4305
R652	321-0068-03			RES.,FXD,FILM:49.9 OHM,0.25%,0.125W	24546	NC55C49R9C
R653	317-0101-00	B170000	B190989	RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
R653	317-0430-00	B190990		RES.,FXD,CMPSN:43 OHM,5%/,0.125W	01121	BB4305
R654	321-0068-03			RES.,FXD,FILM:49.9 OHM,0.25%,0.125W	24546	NC55C49R9C
R655	321-0068-03			RES.,FXD,FILM:49.9 OHM,0.25%,0.125W	24546	NC55C49R9C
R656	321-0068-03			RES.,FXD,FILM:49.9 OHM,0.25%,0.125W	24546	NC55C49R9C
R657	321-0025-00			RES.,FXD,FILM:17.8 OHM,1%,0.125W	91637	MFF1816G17R80F
R658	323-0055-00			RES.,FXD,FILM:36.5 OHM,1%,0.5W	75042	CECT0-35R50F
R663	322-0097-00			RES.,FXD,FILM:100 OHM,1%,0.25W	75042	CEBT0-1000F
R664	322-0097-00			RES.,FXD,FILM:100 OHM,1%,0.25W	75042	CEBT0-1000F
R666	322-0097-00			RES.,FXD,FILM:100 OHM,1%,0.25W	75042	CEBT0-1000F
R667	322-0097-00			RES.,FXD,FILM:100 OHM,1%,0.25W	75042	CEBT0-1000F
R672	321-0105-00			RES.,FXD,FILM:121 OHM,1%,0.125W	01121	ORD BY DESCR
R673	321-0189-00			RES.,FXD,FILM:909 OHM,1%,0.125W	91637	MFF1816G909R0F
R681	321-0336-00			RES.,FXD,FILM:30.9K OHM,1%,0.125W	91637	CMF55116G30901F
R682	321-0228-00			RES.,FXD,FILM:2.32K OHM,1%,0.125W	91637	MFF1816G23200F
R683	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R684	315-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.25W	01121	CB3305
R685	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R686	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R687	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R691	307-0292-00	B010100	B142299	RES.,FXD,FILM:182.5 OHM	80009	307-0292-00
R691	307-0292-09	B142300		RES.,FXD,FILM:	80009	3070292-09
R691	---- ----			(NOMINAL VALUE, SELECTED)		
R696	307-0113-00			RES.,FXD,CMPSN:5.1 OHM,5%,0.25W	01121	CB51G5
R701	315-0240-00			RES.,FXD,CMPSN:24 OHM,5%,0.25W	01121	CB2405
R702	317-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.125W	01121	BB4715
R703	322-0621-00			RES.,FXD,FILM:900K OHM,1%,0.25W	75042	CEBT0-9003F
R704	321-0389-00			RES.,FXD,FILM:110K OHM,1%,0.125W	91637	MFF1816G11002F
R705	301-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.5W	01121	EB1045
R706	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R707	317-0510-00	B020000		RES.,FXD,CMPSN:51 OHM,5%,0.125W	01121	BB5105
R708	301-0104-00			RES:,FXD,CMPSN:100K OHM,5%,0.5W	01121	EB1045
R709	322-0621-00			RES.,FXD,FILM:900K OHM,1%,0.25W	75042	CEBT0-9003F
R711	317-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
R714	315-0621-00			RES.,FXD,CMPSN:620 OHM,5%,0.25W	01121	CB6215
R717	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	C84715
R718	315-0153-00			RES.,FXD,CMPSN:1SK OHM,5%,0.25W	01121	CB1535
R718	---- ----			(485 ONLY)		
R719	321-0158-00			RES.,FXD,FILM:432 OHM,1%,0.125W	91637	MFF1816G432R0F
R720	311-1192-00			RES.,VAR,NONWIR:10K OHM,20%,1W,W/SW	71590	BA-232-001
R720	---- ----			(FURNISHED AS A UNIT WITH S720)		
R721	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R723	315-0390-00			RES.,FXD,CMPSN:39 OHM,5%,0.25W	01121	CB3905

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R724	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
R725	311-0644-00			RES.,VAR,NONWIR:20K OHM,10%,0.50W	73138	82-34-1
R727	317-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R728	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R729	317-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
R731	321-0082-00			RES.,FXD,FILM:69.8 OHM,1%,0.125W	91637	MFF1816G69R80F
R732	321-0147-00			RES.,FXD,FILM:332 OHM,1%,0.125W	91637	MFF1816G332R0F
R733	317-0240-00			RES.,FXD,CMPSN:24 OHM,5%,0.125W	01121	BB2405
R734	317-0390-00	B050000		RES.,FXD,CMPSN:39 OHM,5%,0.125W	01121	BB3905
R735	321-0147-00			RES.,FXD,FILM:332 OHM,1%,0.125W	91637	MFF1816G332R0F
R736	321-0082-00			RES.,FXD,FILM:69.8 OHM,1%,0.125W	91637	MFF1816G69R80F
R738	315-0431-00			RES.,FXD,CMPSN:430 OHM,5%,0.25W	01121	CB4315
R739	315-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
R741	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R742	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
R743	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R744	317-0300-00			RES.,FXD,CMPSN:30 OHM,5%,0.125W	01121	BB3005
R745	321-0079-00			RES.,FXD,FILM:64.9 OHM,1%,0.125W	91637	MFF1816G64R90F
R746	321-0082-00			RES.,FXD,FILM:69.8 OHM,1%,0.125W	91637	MFF1816G69R80F
R747	321-0177-00			RES.,FXD,FILM:681 OHM,1%,0.125W	01121	ORD BY DESCR
R748	321-0177-00			RES.,FXD,FILM:681 OHM,1%,0.125W	01121	ORD BY DESCR
R749	321-0082-00			RES.,FXD,FILM:69.8 OHM,1%,0.125W	91637	MFF1816G69R80F
R750	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R751	317-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R752	317-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R753	317-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.125W	01121	BB3925
R754	317-0300-00			RES.,FXD,CMPSN:30 OHM,5%,0.125W	01121	BB3005
R755	311-0643-00			RES.,VAR,NONWIR:50 OHM,10%,0.50W	73138	82-33-2
R756	317-0161-00			RES.,FXD,CMPSN:160 OHM,5%,0.125W	01121	BB1615
R757	317-0161-00			RES.,FXD,CMPSN:160 OHM,5%,0.125W	01121	BB1615
R760	317-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
R761	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R762	317-0910-00			RES.,FXD,CMPSN:91 OHM,5%,0.125W	01121	BB9105
R764	317-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
R765	311-0607-00			RES.,VAR,NONWIR:10OK OHM,10%,0.50W	73138	82-25-2
R766	321-0233-00	B010100	B049999	RES.,FXD,FILM:2.61K OHM,1%,0.125W	91637	MFF1816G26100F
R766	321-0229-00	B050000		RES.,FXD,FILM:2.37K OHM,1%,0.125W	91637	MFF1816G23700F
R767	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R768	321-0212-00			RES.,FXD,FILM:1.58K OHM,1%,0.125W	91637	MFF1816G15800F
R769	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R771	315-0182-00			RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	01121	CB1825
R772	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R773	317-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.125W	01121	BB2015
R774	317-0511-00			RES.,FXD,CMPSN.510 OHM,5%,0.125W	01121	BB5115
R775	311-0607-00	B010100	B129999	RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	82-25-2
R775	311-0633-00	B130000		RES.,VAR,NONWIR:5K OHM,10%,0.50W	73138	82-30-1
R776	321-0248-00	B010100	B129999	RES.,FXD,FILM:3.74K OHM,1%,0.125W	91637	MFF1816G37400F
R776	321-0232-00	B130000		RES.,FXD,FILM:2.55K OHM,1%,0.125W	91637	MFF1816G25500F
R778	321-0232-00	B010100	B129999	RES.,FXD,FILM:2.55K OHM,1%,0.125W	91637	MFF1816G25500F
R778	321-0239-00	B130000		RES.,FXD,FILM:3.01K OHM,1%,0.125W	91637	MFF1816G30100F
R781	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R782	315-0390-00			RES.,FXD,CMPSN:39 OHM,5%,0.25W	01121	CB3905
R783	315-0390-00			RES.,FXD,CMPSN:39 OHM,5%,0.25W	01121	CB3905
R784	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035

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R787	315-0184-00	B010100	B149999	RES.,FXD,CMPSN:180K OHM,5%,0.25W	01121	CB1845
R787	315-0224-00	B150000		RES.,FXD,CMPSN:220K OHM,5%,0.25W	01121	CB2245
R791	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
R792	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R793	321-0159-00			RES.,FXD,FILM:442 OHM,1%,0.125W	91637	MFF1816G442R0F
R796	321-0157-00			RES.,FXD,FILM:422 OHM,1%,0.125W	91637	MFF1816G422R0F
R799	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
R801	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R802	321-0225-00			RES.,FXD,FILM:2.15K OHM,1%,0.125W	91637	MFF1816G21500F
R803	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R811	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R812	315-0751-00			RES.,FXD,CMPSN:750 OHM,5%,0.25W	01121	CB7515
R813	315-0391-00	B010100	B010209	RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915
R813	315-0331-00	B010210		RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
R814	315-0911-00			RES.,FXD,CMPSN:910 OHM,5%,0.25W	01121	CB9115
R821	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R822	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R823	315-0132-00			RES.,FXD,CMPSN:1.3K OHM;5%,0.25W	01121	CB1325
R826	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R827	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R828	315-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
R830	311-0643-00			RES.,VAR,NONWIR:50 OHM,10%,0.50W	73138	82-33-2
R830	---- ----			(485 ONLY)		
R831	321-0155-00			RES.,FXD,FILM:402 OHM,1%,0.125W	91637	MFF1816G402R0F
R831	---- ----			(485 ONLY)		
R832	321-0155-00			RES.,FXD,FILM:402 OHM,1%,0.125W	91637	MFF1816G402R0F
R832	---- ----			(485 ONLY)		
R833A	321-0158-00			RES.,FXD,FILM:432 OHM,1%,0.125W	1637	MFF1816G432R0F
R833A	---- ----			(485 ONLY)		
R833B	321-0158-00			RES.,FXD,FILM:432 OHM,1%,0.125W	91637	MFF1816G432R0F
R833B	---- ----			(485-1,485-2 ONLY)		
R834A	317-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.125W	01121	BB3015
R834A	---- ----			(485 ONLY)		
R834B	317-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.125W	01121	BB3015
R834B	---- ----			(485-1,485-2 ONLY)		
R835	315-0911-00			RES.,FXD,CMPSN:910 OHM,5%,0.25W	01121	CB9115
R835	---- ----			(485 ONLY)		
R836	315-0911-00			RES.,FXD,CMPSN:910 OHM,5%,0.25W	01121	CB9115
R836	---- ----			(485 ONLY)		
R840	315-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
R840	---- ----			(485 ONLY)		
R841	321-0143-00			RES.,FXD,FILM:301 OHM,1%,0.125W	91637	MFF1816G301R0F
R841	---- ----			(485 ONLY)		
R842	321-0143-00			RES.,FXD,FILM:301 OHM,1%,0.125W	91637	MFF1816G301R0F
R842	---- ----			(485 ONLY)		
R843	315-0621-00			RES.,FXD,CMPSN:620 OHM,5%,0.25W	01121	CB6215
R844	315-0681-00			RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
R845	315-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
R851	321-0291-00			RES.,FXD,FILM:10.5K OHM,1%,0.125W	91637	MFF1816G10501F
R852	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
R853	321-0183-00			RES.,FXD,FILM:787 OHM,1%,0.125W	91637	MFF1816G787R0F
R854	315-0124-00			RES.,FXD,CMPSN:120K OHM,5%,0.25W	01121	CB1245
R856	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R857	315-0681-00			RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815

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R861	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R862	315-0182-00			RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	01121	CB1825
R863	311-1224-00	B010100	191831	RES.,VAR,NONWIR:500 OHM,20%,0.50W	32997	3386F-T04-501
R863	317-0241-00	B191832		RES.,FXD,CMPSN:240 OHM,5%,0.125W	01121	BB2415
R865	321-0149-00			RES.,FXD,FILM:348 OHM,1%,0.125W	91637	MFF1816G348R0F
R866	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R867	321-0201-00			RES.,FXD,FILM:1.21K OHM,1%,0.125W	91637	MFF1816G12100F
R868	321-0258-00			RES.,FXD,FILM:4.75K OHM,1%,0.125W	91637	MFF1816G47500F
R869	321-0379-00			RES.,FXD,FILM:86.6K OHM,1%,0.125W	91637	MFF1816G86601F
R873	323-0318-07			RES.,FXD,FILM:20K OHM,0.1%,00.50W	91637	CMF65116C20001B
R874	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R876	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
R877	317-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R878	317-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R891	321-0064-00			RES.,FXD,FILM:45.3 OHM,1%,0.125W	91637	MFF1816G45R30F
R892	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R894	321-0258-00			RES.,FXD,FILM:4.75K OHM,1%,0.125W	91637	MFF1816G47500F
R896	321-0152-00			RES.,FXD,FILM:374 OHM,1%,0.125W	91637	MFF1816G374R0F
R898	311-1216-00			RES.,VAR,NONWIR:	01121	23M810
R898	---- ----			(FURNISHED AS A UNIT WITH S898)		
R900	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R901	315-0151-00			RES.,FXD,CMPSN:150 OHM,5%,0.25W	01121	CB1515
R902	315-0151-00			RES.,FXD,CMPSN:150 OHM,5%,0.25W	01121	CB1515
R903	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R904	321-0205-00			RES.,FXD,FILM:1.33K OHM,1%,0.125W	91637	MFF1816G13300F
R905	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R906	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R908	315-0683-00			RES.,FXD,CMPSN:68K OHM,5%,0.25W	01121	CB6835
R909	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
R910	315-0243-00			RES.,FXD,CMPSN:24K OHM,5%,0.25W	01121	CB2435
R911	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	01121	CB2725
R912	315-0102-00			RES.,FXD,CMPSN.1K OHM,5%,0.25W	01121	CB1025
R913	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R914	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
R915	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R916	321-0309-00			RES.,FXD,FILM:16.2K OHM,1%,0.125W,TC=TO	91637	CMF55116G16201F
R917	321-0210-00			RES.,FXD,FILM:1.5K OHM,1%,0.125W	91637	MFF1816G15000F
R918	311-1268-00			RES.,VAR,NONWIR:10K OHM,10%,0.50W	32997	3329P-L58-103
R919	321-0382-00			RES.,FXD,FILM:93.1K OHM,1%,0.125W	91637	MFF1816G93101F
R920	311-1458-00			RES.,VAR,WW:50K OHM,5%	73138	7266-322-0
R925	311-1270-00			RES.,VAR,NONWIR:12K OHM,10%,0.5W	32997	3329P-L58-253
R926	321-0335-00			RES.,FXD,FILM:30.1K OHM,1%,0.125W	91637	CMF55116G30101F
R927	321-0308-00			RES.,FXD,FILM:15.8K OHM,1%,0.125W	91637	MFF1816G15801F
R929	321-0241-00			RES.,FXD,FILM:3.16K OHM,1%,0.125W	91637	MFF1816G31600F
R931	321-0304-00			RES.,FXD,FILM:14.3K OHM,1%,0.125W	91637	MFF1816G14301F
R932	321-0256-00			RES.,FXD,FILM:4.53K OHM,1%,0.125W	91637	MFF1816G45300F
R933	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R934	321-0262-00			RES.,FXD,FILM:5.23K OHM,1%,0.125W	91637	MFF1816G52300F
R935	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
R936	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R937	321-0254-00			RES.,FXD,FILM:4.32K OHM,1%,0.125W	91637	MFF1816G43200F
R938	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R939	321-0307-00			RES.,FXD,FILM:15.4K OHM,1%,0.125W	91637	MFF1816G15401F
R941	321-0288-00			RES.,FXD,FILM:9.76K OHM,1%,0.125W	91637	MFF1816G97600F

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R942	321-0323-00			RES.,FXD,FILM:22.6K OHM,1%,0.125W	91637	MFF1816G22601F
R944	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	01121	CB2235
R945	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R946	307-0106-00			RES.,FXD,CMPSN:4.7 OHM,5%,0.25W	01121	CB47G5
R947	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R948	321-0289-00			RES.,FXD,FILM:10K OHM,1%,0.125W	91637	MFF1816G1001F
R949	323-0192-00			RES.,FXD,FILM:976 OHM,I%,0.50W	24546	NA65D9760F
R961	321-0385-00			RES.,FXD,FILM:100K OHM,1%,0.125W	91637	MFF1816G1O002F
R962	321-0680-00			RES.,FXD,FILM:35.3K OHM,0.5%,0.125W	91637	MFF1816D35301D
R965	321-0091-00			RES.,FXD,FILM:86.6 OHM,1%,0.125W	91637	MFF1816G86R60F
R967	315-0100-00	B130000		RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R1001	315-0240-00			RES.,FXD,CMPSN:24 OHM,5%,0.25W	01121	CB2405
R1002	317-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.125W	01121	BB4715
R1003	322-0621-00			RES.,FXD,FILM:900K OHM,I%,0.25W	75042	CEBT0-9003F
R1004	321-0389-00			RES.,FXD,FILM:110K OHM,1%,0.125W	91637	MFF1816G11002F
R1005	301-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.5W	01121	EB1045
R1006	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R1007	317-0510-00	B020000		RES.,FXD,CMPSN:51 OHM,5%,0.125W	01121	BB5105
R1008	301-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.5W	01121	EB1045
R1009	322-0621-00			RES.,FXD,FILM:900K OHM,1%,0.25W	75042	CEBT0-9003F
R1011	315-0131-00			RES.,FXD,CMPSN:130 OHM,5%,0.25W	01121	CB1315
R1012	315-0621-00			RES.,FXD,CMPSN:620 OHM,5%,0.25W	01121	CB6215
R1013	315-0621-00			RES.,FXD,CMPSN:620 OHM,5%,0.25W	01121	CB6215
R1015	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R1016	317-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R1017	321-0158-00			RES.,FXD,FILM:432 OHM,1%,0.125W	91637	MFF1816G432R0F
R1018	321-0158-00			RES.,FXD,FILM:432 OHM,1%,0.125W	91637	MFF1816G432R0F
R1019	317-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
R1020	311-1192-00			RES.,VAR,NONWIR:10K OHM,20%,1W,W/SW	71590	BA-232-001
R1021	317-0150-00			RES.,FXD,CMPSN:15 OHM,5%,0.125W	01121	BB1505
R1022	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R1023	315-0390-00			RES.,FXD,CMPSN:39 OHM,5%,0.25W	01121	CB3905
R1024	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
R1025	311-1230-00			RES.,VAR,NONWIR:20K OHM,20%,0.50W	32997	3386F-T04-203
R1026	317-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R1027	315-0431-00			RES.,FXD,CMPSN:430 OHM,5%,0.25W	01121	CB4315
R1028	315-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
R1029	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R1030	315-0390-00	B010100	B179999	RES.,FXD,CMPSN:39 OHM,5%,0.25W	01121	CB3905
R1031	321-0082-00			RES.,FXD,FILM:69.8 OHM,1%,0.125W	91637	MFF1816G69R80F
R1032	321-0147-00			RES.,FXD,FILM:332 OHM,1%,0.125W	91637	MFF1816G332R0F
R1033	321-0147-00			RES.,FXD,FILM:332 OHM,1%,0.125W	91637	MFF1816G332R0F
R1034	321-0082-00			RES.,FXD,FILM:69.8 OHM,1%,0.125W	91637	MFF1816G69R80F
R1035	317-0390-00	B050000	B179999	RES.,FXD,CMPSN:39 OHM,5%,0.125W	01121	BB3905
R1037	315-0681-00			RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
R1038	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R1039	315-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
R1040	321-0079-00			RES.,FXD,FILM:64.9 OHM,1%,0.125W	91637	MFF1816G64R90F
R1041	321-0082-00			RES.,FXD,FILM:69.8 OHM,I%,0.125W	91637	MFF1816G69R80F
R1042	321-0177-00			RES.,FXD,FILM:681 OHM,1%,0.125W	01121	ORD BY DESCR
R1043	321-0177-00			RES.,FXD,FILM:681 OHM,1%,0.125W	01121	ORD BY DESCR
R1044	321-0082-00			RES.,FXD,FILM:69.8 OHM,1%,0.125W	91637	MFF1816G69R80F
R1045	315-0560-00	B010100	B179999	RES.,FXD,CMPSN:56 OHM,5%,0.25W	01121	CB5605
R1047	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225

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R1048	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,O.25W	01121	CB2015
R1049	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
R1050	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R1051	317-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	CB203315
R1052	317-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R1053	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	01121	CB3925
R1054	317-0300-00			RES.,FXD,CMPSN:30 OHM,5%,0.125W	01121	BB3005
R1055	311-0643-00			RES.,VAR,NONWIR:50 OHM,10%,0.50W	73138	82-33-2
R1056	317-0161-00			RES.,FXD,CMPSN:160 OHM,5%,0.125W	01121	BB1615
R1057	315-0161-00			RES.,FXD,CMPSN:160 OHM,5%,0.25W	01121	CB1615
R1061	317-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
R1062	317-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
R1063	317-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
R1064	317-0910-00			RES.,FXD,CMPSN:91 OHM,5%,0.125W	01121	BB9105
R1065	311-0607-00			RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	82-25-2
R1066	321-0239-00			RES.,FXD,FILM:3.01K OHM,1%,0.125W	91637	MFF1816G30100F
R1068	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R1068	321-0222-00			RES.,FXD,FILM:2K OHM,1%,0.125W	91637	MFF1816G20000F
R1069	317-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.125W	01121	BB5115
R1070	315-0103-00			RES.,FXD,CMPSN:10OK OHM,5%,0.25W	01121	CB1035
R1071	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1072	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R1073	321-0239-00			RES.,FXD,FILM:3.01K OHM,1%,0.125W	91637	MFF1816G30100F
R1074	321-0239-00	B010100	B049999	RES.,FXD,FILM:3.01K OHM,1%,0.125W	91637	MFF1816G30100F
R1074	321-0235-00	B050000		RES.,FXD,FILM:2.74K OHM,1%,0.125W	91637	MFF1816G27400F
R1075	311-0607-00			RES.,VAR,NONWIR:1OK OHM,10%,0.50W	73138	82-25-2
R1076	321-0235-00			RES.,FXD,FILM:2.74K OHM,1%,0.125W	91637	MFF1816G27400F
R1077	317-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.125W	01121	BB2015
R1078	321-0256-00			RES.,FXD,FILM:4.53K OHM,1%,0.125W	91637	MFF1816G45300F
R1079	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R1081	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1082	321-0185-00			RES.,FXD,FILM:825 OHM,1%,0.125W	91637	MFF1816G825R0F
R1083	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1084	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R1085	317-0512-00	B060000		RES.,FXD,CMPSN:5.1K OHM,5%,0.125	01121	BB5125
R1086	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1087	321-0240-00			RES.,FXD,FILM:3.09K OHM,1%,0.125W	91637	MFF1816G30900F
R1089	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1090	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1091	315-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
R1092	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R1093	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1094	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1096	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R1097	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1098	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R1101	315-0473-00			RES.,FXD,CMPSN:47K OHM,5%,0.25W	01121	CB4735
R1102	315-0473-00			RES.,FXD,CMPSN:47K OHM,5%,0.25W	01121	CB4735
R1103	321-0177-00			RES.,FXD,FILM:681 OHM,1%,0.125W	01121	ORD BY DESCR
R1104	321-0326-00			RES.,FXD,FILM:24.3K OHM,1%,0.125W	91637	CMF55116G24301F
R1105	317-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.125W	01121	BB2015
R1106	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1107	321-0159-00			RES.,FXD,FILM:442 OHM,1%,0.125W	91637	MFF1816G442R0F
R1108	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025

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R1111	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R1112	315-0151-00			RES.,FXD,CMPSN:150 OHM,5%,0.25W	01121	CB1515
R1114	321-0155-00			RES.,FXD,FILM:402 OHM,1%,0.125W	91637	MFF1816G402R0F
R1115	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R1116	315-0391-00	B010100	B010209	RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915
R1116	315-0331-00	B010210		RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
R1117	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R1119	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R1121	315-0751-00			RES.,FXD,CMPSN:750 OHM,5%,0.25W	01121	CB7515
R1123	321-0225-00			RES.,FXD,FILM:2.15K OHM,1%,0.125W	91637	MFF1816G21500F
R1126	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1127	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R1129	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1150	311-1223-00			RES.,VAR,NONWIR:TRMR,250 OHM,0.5W	73138	72-5-0
R1151	323-0164-00	B010100	B039999	RES.,FXD,FILM:499 OHM,1%,0.50W	75042	CECT0-4990F
R1151	323-0163-00	B040000	B143554	RES.,FXD,FILM:487 OHM,1%,0.50W	75042	CECT0-4870F
R1151	323-0166-00	B143555		RES.,FXD,FILM:523 OHM,1%,0.50W	75042	CECT0-5230F
R1152	323-0172-00	B010100	B039999	RES.,FXD,FILM:604 OHM,1%,0.50W	91637	MFF1226G604R0F
R1152	323-0183-00	B040000	B143554	RES.,FXD,FILM:787 OHM,1%,0.50W	91637	CMF65116G78700F
R1152	323-0177-00	B143555		RES.,FXD,FILM:680 OHM,1%,0.50W	91637	MFF1226G681R0F
R1154	315-0112-00			RES.,FXD,CMPSN:1.1K OHM,5%,0.25W	01121	CB1125
R1156	301-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.5W	01121	EB2715
R1161	323-0164-00	B010100	B039999	RES.,FXD,FILM:499 OHM,1%,0.50W	75042	CECT0-4990F
R1161	323-0163-00	B040000	B143554	RES.,FXD,FILM:487 OHM,1%,0.50W	75042	CECT0-4870F
R1161	323-0166-00	B143555		RES.,FXD,FILM:523 OHM,1%,0.50W	75042	CECT0-5230F
R1162	323-0172-00	B010100	B039999	RES.,FXD,FILM:604 OHM,1%,0.50W	91637	MFF1226G604R0F
R1162	323-0183-00	B040000	B143554	RES.,FXD,FILM:787 OHM,1%,0.50W	91637	CMF65116G78700F
R1162	323-0177-00	B143555		RES.,FXD,FILM:680 OHM,1%,0.50W	91637	MFF1226G681R0F
R1164	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1165	301-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.50W	01121	EB1015
R1166	301-0131-00			RES.,FXD,CMPSN:130 OHM,5%,0.5W	01121	EB1315
R1167	315-0362-00			RES.,FXD,CMPSN:3.6K OHM,5%,0.25W	01121	CB3625
R1168	315-0122-00			RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
R1169	301-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.5W	01121	EB3315
R1171	301-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.50W	01121	EB6825
R1172	301-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.50W	01121	EB6825
R1173	301-0182-00			RES.,FXD,CMPSN:1.8K OHM,5%,0.5W	01121	EB1825
R1174	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R1175	321-0279-00	B010100	B039999	RES.,FXD,FILM:7.87K OHM,1%,0.125W	91637	MFF1816G78700F
R1175	321-0275-00	B040000		RES.,FXD,FILM:7.15K OHM,1%,0.125W	91637	MFF1816G71500F
R1176	322-0297-00			RES.,FXD,FILM:12.1K OHM,1%,0.25W	91637	CMF6042G12101F
R1177	323-0302-00			RES.,FXD,FILM:13.7K OHM,I%,0.50W	75042	CECT0-1372F
R1178	321-0197-00			RES.,FXD,FILM:1.1K OHM,1%,0.125W	91637	MFF1816G11000F
R1179	315-0560-00			RES.,FXD,CMPSN:56 OHM,5%,0.25W	01121	CB5605
R1181	301-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.50W	01121	EB6825
R1182	301-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.50W	01121	EB6825
R1183	301-0182-00			RES.,FXD,CMPSN:1.8K OHM,5%,0.5W	01121	EB1825
R1184	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R1187	323-0302-00			RES.,FXD,FILM:13.7K OHM,1%,0.50W	75042	CECT0-1372F
R1188	321-0197-00			RES.,FXD,FILM:.1.1K OHM,1%,0.125W	91637	MFF1816G11000F
R1189	315-0560-00			RES.,FXD,CMPSN:56 OHM,5%,0.25W	01121	CB5605
R1192	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
R1193	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	01121	CB3925
R1194	322-0133-00			RES.,FXD,FILM:237 OHM,1%,0.25W	75042	CEBT0-2370F

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R1196	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
R1197	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	01121	CB3925
R1198	322-0133-00			RES.,FXD,FILM:237 OHM,1%,0.25W	75042	CEBT0-2370F
R1201	321-0291-00			RES.,FXD,FILM:10.5K OHM,1%,0.125W	91637	MFF1816G10501F
R1202	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
R1203	315-0681-00			RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
R1204	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R1206	321-0183-00			RES.,FXD,FILM:787 OHM,1%,0.125W	91637	MFF1816G787R0F
R1207	317-0560-00			RES.,FXD,CMPSN:56 OHM,5%,0.125W	01121	BB5605
R1209	315-0623-00			RES.,FXD,CMPSN:62K OHM,5%,0.25W	01121	CB6235
R1214	315-0182-00			RES.,FXD,CMPSN:t.8K OHM,5%,0.25W	01121	CB1825
R1216	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R1217	321-0149-00			RES.,FXD,FILM:348 OHM,1%,0.125W	91637	MFF1816G348R0F
R1218	321-0201-00			RES.,FXD,FILM:1.21K OHM,1%,0.125W	91637	MFF1816G12001F
R1219	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1221	321-0258-00			RES.,FXD,FILM:4.75K OHM,1%,0.125W	91637	MFF1816G47500F
R1222	321-0340-00			RES.,FXD,FILM:34K OHM,1%,0.125W	91637	CMF55116G34001F
R1223	323-0636-07			RES.,FXD,FILM:50K OHM,0.1%,0.50W	91637	MFF1226C50001B
R1226	311-1226-00			RES.,VAR,NONWIR:2.5K OHM,20%,0.50W	32997	3386F-T04-252
R1227	323-0280-00	B010100	B010285	RES.,FXD,FILM:8.06K OHM,1%,0.50W	75042	CECT0-8061F
R1227	323-0278-00	B010286		RES.,FXD,FILM:7.68K OHM,1%,0.50W	75042	CECT0-7681F
R1228	311-1226-00			RES.,VAR,NONWIR:2.5K OHM,20%,0.50W	32997	3386F-T04-252
R1229	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1235	315-0470-00	B143555	B144449	RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R1236	315-0472-00	B144450		RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R1237	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R1238	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R1239	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	01121	CB2725
R1240	317-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R1241	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
R1242	317-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R1251	321-0054-00			RES.,FXD,FILM:35.7 OHM,5%,0.125W	91637	MFF1816G35R70F
R1252	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R1254	321-0248-00			RES.,FXD,FILM:3.74K OHM,1%,0.125W	91637	MFF1816G37400F
R1257	321-0142-00			RES.,FXD,FILM:294 OHM,1%,0.125W	91637	MFF1816G294R0F
R1261	321-0304-00			RES.,FXD,FILM:14.3K OHM,1%,0.125W	91637	MFF1816G14301F
R1262	321-0256-00			RES.,FXD,FILM:4.53K OHM,1%,0.125W	91637	MFF1816G45300F
R1263	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R1264	321-0262-00			RES.,FXD,FILM:5.23K OHM,1%,0.125W	91637	MFF1816G52300F
R1266	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R1267	321-0307-00			RES.,FXD,FILM:15.4K OHM,1%,0.125W	91637	MFF1816G15401F
R1268	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R1269	321-0254-00			RES.,FXD,FILM:4.32K OHM,1%,0.125W	91637	MFF1816G43200F
R1271	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
R1272	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R1300	311-1197-00	B010100	B188329	RES.,VAR,NONWIR:PNL,20K OHM,1W	12697	381-CM39696
R1300	311-1524-00	B188330		RES.,VAR,NONWIR:20K OHM,100%,W	01121	73A1G040L203U
R1301	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R1302	315-0912-00			RES.,FXD,CMPSN:9.1K OHM,5%,0.25W	01121	CB9125
R1303	321-0216-00			RES.,FXD,FILM:1.74K OHM,1%,0.125W	91637	MFF1816G17400F
R1306	321-0216-00			RES.,FXD,FILM:1.74K OHM,1%,0.125W	91637	MFF1816G17400F
R1307	321-0228-00			RES.,FXD,FILM:2.32K OHM,1%,0.125W	91637	MFF1816G23200F
R1308	311-1224-00			RES.,VAR,NONWIR:500 OHM,20%,0.50W	32997	3386F-T04-501
R1313	321-0326-00			RES.,FXD,FILM:24.3K OHM,1%,0.125W	91637	CMF55116G24301F

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R1314	321-0250-00			RES.,FXD,FILM:3.92K OHM,1%,0.125W	91637	MFF1816G39200F
R1321	321-0230-00			RES.,FXD,FILM:2.43K OHM,1%,0.125W	91637	MFF1816G24300F
R1322	321-0231-00			RES.,FXD,FILM:2.49K OHM,1%,0.125W	91637	MFF1816G24900F
R1325	311-1228-00			RES.,VAR,NONWIR:10K OHM,20%,0.50W	32997	3386F-T04-103
R1326	321-0295-00			RES.,FXD,FILM:11.5K OHM,1%,0.125W	91637	MFF1816G11501F
R1327	321-0234-00			RES.,FXD,FILM:2.67K OHM,1%,0.125W	91637	MFF1816G26700F
R1328	321-0246-00			RES.,FXD,FILM:3.57K OHM,1%,0.125W	91637	MFF1816G35700F
R1329	321-0299-00			RES.,FXD,FILM:12.7K OHM,1%,0.125W	91637	MFF1816G12701F
R1331	315-0243-00			RES.,FXD,CMPSN:24K OHM,5%,0.25W	01121	CB2435
R1333	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R1335	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R1336	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R1338	315-0681-00			RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
R1341	315-0911-00			RES.,FXD,CMPSN:910 OHM,5%,0.25W	01121	CB9115
R1342	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
R1343	321-0250-00			RES.,FXD,FILM:3.92K OHM,1%,0.125W	91637	MFF1816G39200F
R1344	321-0326-00			RES.,FXD,FILM:24.3K OHM,1%,0.125W	91637	CMF55116G24301F
R1348	311-1222-00			RES.,VAR,NONWIR:100 OHM,20%,0.50W	32997	3386F-T04-101
R1354	321-0085-00			RES.,FXD,FILM:75 OHM,1%,0.125W	91637	MFF1816G75R00F
R1355	311-1225-00			RES.,VAR,NONWIR:1K OHM,20%,0.50W	32997	3386F-T04-102
R1356	315-0162-00			RES.,FXD,CMPSN:1.6K OHM,5%,0.25W	01121	CB1625
R1357	321-0225-00			RES.,FXD,FILM:2.15K OHM,1%,0.125W	91637	MFF1816G21500F
R1361	315-0820-00			RES.,FXD,CMPSN:82 OHM,5%,0.25W	01121	CB8205
R1362	315-0132-00			RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	01121	CB1325
R1364	321-0161-00	B010100	B049999	RES.,FXD,FILM:464 OHM,1%,0.125W	91637	MFF1816G464R0F
R1364	321-0164-00	B050000		RES.,FXD,FILM:499 OHM,1%,0.125W	91637	MFF1816G499R0F
R1365	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R1366	311-0605-00			RES.,VAR,NONWIR:TRMR,200 OHM,0.5W	73138	82-23-2
R1367	315-0122-00			RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
R1368	301-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.50W	01121	EB5115
R1369	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R1371	315-0110-00			RES.,FXD,CMPSN:11 OHM,5%,0.25W	01121	CB1105
R1372	321-0117-00			RES.,FXD,FILM:162 OHM,1%,0.125W	01121	ORD BY DESCR
R1373	323-0102-00			RES.,FXD,FILM:113 OHM,1%,0.50W	75042	CECT0-1130F
R1374	321-0117-00			RES.,FXD,FILM:162 OHM,1%,0.125W	01121	ORD BY DESCR
R1375	317-0680-00			RES.,FXD,CMPSN:68 OHM,5%,0.125W	01121	BB6805
R1400	311-0566-00			RES.,VAR,NONWIR:PNL,5K OHM,0.5	12697	381-CM39672
R1401	315-0681-00			RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
R1402	315-0303-00			RES.,FXD,CMPSN:30K OHM,5%,0.25W	01121	CB3035
R1407	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R1409	323-0793-07			RES.,FXD,FILM:2.5 MEG OHM,0.1%,0.5W	91637	HFF129C250003B
R1410	323-0498-07			RES.,FXD,FILM:1.5M OHM,0.1%,0.50W	91637	MFF1226C15003B
R1411	323-0740-07			RES.,FXD,FILM:500K OHM,0.1%,0.O50W	91637	MFF1226C50002B
R1412	323-0742-07			RES.,FXD,FILM:250K OHM,0.1%,0.50W	91637	MFF1226C25002B
R1413	323-0636-07			RES;,FXD,FILM:50K OHM,0.1%,0.50W	91637	MFF1226C50001B
R1414	323-0385-07			RES.,FXD,FILM:100K OHM,0.1%,0.50W	91637	MFF1226C1002B
R1415	323-0792-07			RES.,FXD,FILM:60K OHM,0.1%,0.50W	91637	MFF1226C60001B
R1416	323-0318-07			RES.,FXD,FILM:20K OHM,0.1%,00.50W	91637	CMF65116C20001B
R1418	323-0745-07			RES.,FXD,FILM:5M OHM,0.1%,0.50W	03888	PME-655MEG
R1419	325-0106-00			RES.,FXD,FILM:	80009	325-0106-00
R1421	321-0386-00			RES.,FXD,FILM:102K OHM,1%,0.125W	91637	MFF1816G10202F
R1422	315-0434-00			RES.,FXD,CMPSN:430K OHM,5%,0.25W	01121	CB4345
R1431	315-0244-00			RES.,FXD,CMPSN:240K OHM,5%,0.25W	01121	CB2445
R1437	321-0261-00			RES.,FXD,FILM:5.11K OHM,1%,0.125W	91637	MFF1816G51100F

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R1441	321-0181-00			RES.,FXD,FILM:750 OHM,1%,0.125W	91637	MFF1816G750R0F
R1450	323-0289-00	B010100	B010285	RES.,FXD,FILM:10K OHM,1%,0.50W	75042	CECTO-1002F
R1450	323-0292-00	B010286		RES.,FXD,FILM:	75042	CECTO-1072F
R1451	323-0793-07			RES.,FXD,FILM:2.5 MEG OHM,0.1%,0.5W	91637	HFF129C250003B
R1452	323-0498-07			RES.,FXD,FILM:1.5M OHM,O.1%,0.50W	91637	MFF1226C15003B
R1453	323-0740-07			RES.,FXD,FILM:500K OHM,0.1%,0.50W	91637	MFF1226C50002B
R1454	323-0742-07			RES.,FXD,FILM:250K OHM,0.1%,0.50W	91637	MFF1226C25002B
R1455	323-0402-07			RES.,FXD,FILM:150K OHM,0.1%,0.50W	91637	MFF1226C15002B
R1456	323-0636-07			RES.,FXD,FILM:50K OHM,0.1%,0.50W	91637	MFF1226C5
R1458	323-0745-07			RES.,FXD,FILM:5M OHM,0.1%,0.50W	03888	PME-655MEG
R1459	325-0106-00			RES.,FXD,FILM:	80009	325-0106-00
R1461	321-0347-00			RES.,FXD,FILM:40.2K OHM,1%,0.125W	91637	MFF1816G40201F
R1462	321-0393-00			RES.,FXD,FILM:121K OHM,1%,0.125W	91637	CMF55116G12102F
R1463	315-0204-00			RES.,FXD,CMPSN:200K OHM,5%,0.25W	01121	CB2045
R1481	323-0140-00			RES.,FXD,FILM:280 OHM,1%,0.50W	75042	CECT0-2800F
R1482	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R1484	323-0140-00			RES.,FXD,FILM:280 OHM,1%,0.50W	75042	CECT0-2800F
R1486	321-0216-00			RES.,FXD,FILM:1.74K OHM,1%,0.125W	91637	MFF1816G17400F
R1487	315-0363-00			RES.,FXD,CMPSN:36K OHM,5%,0.25W	01121	CB3635
R1488	321-0201-00			RES.,FXD,FILM:1.21K OHM,1%,0.125W	91637	MFF1816G12100F
R1497	321-0062-00			RES.,FXD,FILM:43.2 OHM,1%,0.125W	91637	CMF55-116G43R20F
R1499	301-0160-00			RES.,FXD,CMPSN:16 OHM,5%,0.50W	01121	EB1605
R1501	315-0473-00			RES.,FXD,CMPSN:47K OHM,5%,0.25W	01121	CB4735
R1503	315-0103-00			RES.,FXD,CMPSN:1OK OHM,5%,0.25W	01121	CB1035
R1506	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R1507	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R1509	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R1511	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R1512	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R1516	315-0434-00			RES.,FXD,CMPSN:430K OHM,5%,0.25W	01121	CB4345
R1517	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R1518	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R1519	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R1521	315-0361-00			RES.,FXD,CMPSN:360 OHM,5%,0.25W	01121	CB3615
R1522	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
R1523	315-0911-00			RES.,FXD,CMPSN:910 OHM,5%,0.25W	01121	CB9115
R1524	315-0623-00			RES.,FXD,CMPSN:62K OHM,5%,0.25W	01121	CB6235
R1526	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
R1531	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R1534	315-0684-00			RES.,FXD,CMPSN:680K OHM,5%,0.25W	01121	CB6845
R1536	316-0225-00			RES.,FXD,CMPSN:2.2M OHM,10%,0.25W	01121	CB2251
R1538	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R1539	315-0103-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1035
R1541	315-0683-00			RES.,FXD,CMPSN:68K OHM,5%,0.25W	01121	CB6835
R1542	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	01121	CB1545
R1544	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
R1545	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
R1546	315-0333-00			RES.,FXD,CMPSN:33K OHM,5%,0.25W	01121	CB3335
R1547	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	01121	CB3925
R1548	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
R1549	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
R1551	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R1552	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R1553	315-0622-00			RES.,FXD,CMPSN:6.2K OHM,5%,0.25W	01121	CB6225

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R1554	315-0300-00			RES.,FXD,CMPSN:30 OHM,5%,0.25W	01121	CB3005
R1555	315-0622-00			RES.,FXD,CMPSN:6.2K OHM,5%,0.25W	01121	CB6225
R1557	301-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.50W	01121	EB5115
R1558	321-0217-00			RES.,FXD,FILM:1.78K OHM,1%,0.125W	91637	MFF1816G17800F
R1559	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1560	311-0635-00			RES.,VAR,NONWW:TRMR,1K OHM,10%,0.5%,0.5W	02111	65Y102T010
R1561	321-0241-00	B010100	B146225	RES.,FXD,FILM:3.16K OHM,1%,0.125W	91637	MFF1816G31600F
R1561	321-0240-00	B142666		RES.,FXD,FILM:3.09K OHM,1%,0.125W	91637	MFF1816G30900F
R1563	321-0295-00			RES.,FXD,FILM: 1.5K OHM,1%,0.125W	91637	MFF1816G11501F
R1564	321-0253-00	B010100	B129999	RES.,FXD,FILM:4.22K OHM,1%,0.125W	91637	MFF1816G42200F
R1564	321-0250-00	B130000		RES.,FXD,FILM:3.92K OHM,1%,0.125W	91637	MFF1816G39200F
R1567	321-0206-00			RES.,FXD,FILM:1.37K OHM,1%,0.125W	91637	MFF1816G13700F
R1568	315-0823-00			RES.,FXD,CMPSN:82K OHM,5%,0.25W	01121	CB8235
R1569	311-0310-00			RES.,VAR,NONWIR:5K OHM,20%,0.50W	01121	W-7350A
R1570	311-0608-00			RES.,VAR,NONWIR:2K OHM,10%,0.75W	01121	W8156
R1571	315-0124-00			RES.,FXD,CMPSN:120K OHM,5%,0.25W	01121	CB1245
R1572	321-0243-00			RES.,FXD,FILM:3.32K OHM,1%,0.125W	91637	MFF1816G33200F
R1573	321-0243-00			RES.,FXD,FILM:3.32K OHM,1%,0.125W	91637	MFF1816G33200F
R1574	321-0254-00			RES.,FXD,FILM:4.32K OHM,1%,0.125W	91637	MFF1816G43200F
R1575	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R1576	315-0473-00			RES.,FXD,CMPSN:47K OHM,5%,0.25W	01121	CB4735
R1577	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R1579	307-0106-00	B010100	B139999	RES.,FXD,CMPSN:4.7 OHM,5%,0.25W	01121	CB47G5
R1579	317-0100-00	B140000		RES.,FXD,CMPSN:10 OHM,5%,0.125W	01121	BB1005
R1581	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R1582	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R1583	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R1584	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R1585	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	01121	CB2235
R1586	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R1587	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	01121	CB3925
R1588	315-0912-00			RES.,FXD,CMPSN:9.1K OHM,5%,0.25W	01121	CB9125
R1589	315-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.25W	01121	CB7525
R1590	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R1591	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R1592	315-0911-00			RES.,FXD,CMPSN:910 OHM,5%,0.25W	01121	CB9115
R1593	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R1594	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R1595	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R1596	315-0102-00			RES.;FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R1597	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R1598	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R1599	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R1600	316-0471-00			RES.,FXD,CMPSN:470 OHM,10%,0.25W	01121	CB4711
R1601	301-0102-00			RES.,FXD,CMPSN:11K OHM,5%,0.50W	01121	EB1025
R1602	301-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.5W	01121	EB1535
R1603	301-0624-00			RES.,FXD,CMPSN:620K OHM,5%,0.50W	01121	EB6245
R1604	301-0624-00			RES.,FXD,CMPSN:620K OHM,5%,0.50W	01121	EB6245
R1605	301-0155-00			RES.,FXD,CMPSN:1.5M OHM,5%,0.5W	01121	EB1555
R1606	301-0155-00			RES.,FXD,CMPSN:1.5M OHM,5%,0.5W	01121	EB1555
R1608	301-0155-00			RES.,FXD,CMPSN:1.5M OHM,5%,0.5W	01121	EB1555
R1609	301-0155-00			RES.,FXD,CMPSN:1.5M OHM,5%,0.5W	01121	EB1555
R1611	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	01121	CB3925
R1612	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	01121	CB3925

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R1613	301-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.5W	01121	EB4725
R1614	301-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.5W	01121	EB3315
R1616	315-0150-00			RES.,FXD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
R1618	315-0150-00			RES.,FXD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
R1619	321-0231-00			RES.,FXD,FILM:2.49K OHM,1%,0.125W	91637	MFF1816G24900F
R1621	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R1622	321-0294-00			RES.,FXD,FILM:11.3K OHM,1%,0.125W	91637	CMF55116G11301F
R1623	321-0419-00			RES.,FXD,FILM:226K OHM,1%,0.125W	91637	MFF1816G22602F
R1624	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R1625	311-1254-00			RES.,VAR,NONWIR:1M OHM,20%,0.50W	73138	72-18-0
R1626	315-0395-00			RES.,FXD,CMPSN:3.9M OHM,5%,0.25W	01121	CB3955
R1627	315-0474-00			RES.,FXD,CMPSN:470K OHM,5%,0.25W	01121	CB4745
R1633	301-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.5W	01121	EB2725
R1640	311-0254-00			RES.,VAR,NONWIR:5M OHM,10%,1W	12697	CM29709
R1641	301-0116-00			RES.,FXD,CMPSN:11M OHM,5%,0.5W	01121	EB1165
R1642	307-0386-00			RES.,FXD,FILM:HYBRID,HV	80009	307-0386-00
R1646	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R1651	315-0226-00			RES.,FXD,CMPSN:22M OHM,5%,0.25W	01121	CB2265
R1656	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R1660	311-1230-00			RES.,VAR,NONWIR:20K OHM,20%,0.50W	32997	3386F-T04-203
R1661	321-0306-00			RES.,FXD,FILM:15K OHM,1%,0.125W	91637	MFF1816G15001F
R1666	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R1667	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1668	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R1669	315-0226-00			RES.,FXD,CMPSN:22M OHM,5%,0.25W	01121	CB2265
R1681	301-0683-00			RES.,FXD,CMPSN:68K OHM,5%,0.50W	01121	EB6835
R1682	301-0225-00			RES.,FXD,CMPSN:2.2M OHM,5%,0.5W	01121	EB2255
R1684	301-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.50W	01121	EB1035
R1685	301-0105-00			RES.,FXD,CMPSN:1M OHM,5%,0.50W	01121	EB1055
R1687	316-0473-00			RES.,FXD,CMPSN:47K OHM,10%,0.25W	01121	CB4731
R1700	311-1035-00			RES.,VAR,NONWIR:50K OHM,10%,0.50W	73138	82-40-0
R1701	321-0352-00			RES.,FXD,FILM:45.3K OHM,1%,0.125W	91637	MFF1816G45301F
R1702	321-0352-00			RES.,FXD,FILM:45.3K OHM,1%,0.125W	91637	MFF1816G45301F
R1703	321-0283-00			RES.,FXD,FILM:8.66K OHM,1%,0.125W	91637	CMF55116G86600F
R1704	321-0295-00			RES.,FXD,FILM:11.5K OHM,1%,0.125W	91637	MFF1816G11501F
R1706	321-0294-00			RES.,FXD,FILM:11.3K OHM,1%,0.125W	91637	CMF55116G11301F
R1708	321-0272-00			RES.,FXD,FILM:6.65K OHM,1%,0.125W	91637	MFF1816G66500F
R1709	321-0314-00			RES.,FXD,FILM:18.2K OHM,1%,0.125W	91637	MFF1816G18201F
R1710	311-0633-00			RES.,VAR,NONWIR:5K OHM,10%,0.50W	73138	82-30-1
R1711	321-0281-00	B010100	B059999	RES.,FXD,FILM:8.25K OHM,1%,0.125W	91637	MFF1816G82500F
R1711	321-0272-00	B060000		RES.,FXD,FILM:6.65K OHM,1%,0.125W	91637	MFF1816G66500F
R1712	321-0310-00	B010100	B059999	RES.,FXD,FILM:16.5K OHM,1%,0.125W	91637	MFF1816G16501F
R1712	321-0301-00	B060000		RES.,FXD,FILM:13.3K OHM,1%,0.125W	91637	MFF1816G13301F
R1714	321-0289-00			RES.,FXD,FILM:10K OHM,1%,0.125W	91637	MFF1816G10001F
R1715	321-0294-00			RES.,FXD,FILM:11.3K OHM,1%,0.125W	91637	CMF55116G11301F
R1717	301-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.5W	01121	EB3015
R1718	315-0751-00			RES.,FXD,CMPSN:750 OHM,5%,0.25W	01121	CB7515
R1721	321-0340-00			RES.,FXD,FILM:34K OHM,1%,0.125W	91637	CMF55116G34001F
R1722	321-0307-00			RES.,FXD,FILM:15.4K OHM,1%,0.125W	91637	MFF1816G15401F
R1723	315-0182-00			RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	01121	CB1825
R1725	321-0432-00			RES.,FXD,FILM:309K OHM,1%,0.125W	91637	MFF1816G30902F
R1727	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R1728	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R1729	315-0275-00			RES.,FXD,CMPSN:2.7M OHM,5%,0.25W	01121	CB2755

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R1731	321-0305-00			RES.,FXD,FILM:14.7K OHM,1%,0.125W	91637	MFF1816G14701F
R1732	322-0609-00			RES.,FXD,FILM:33.3K OHM,1%,0.25W	91637	CMF6042G33302F
R1734	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	01121	CB2205
R1735	321-0154-00			RES.,FXD,FILM:392 OHM,1%,0.125W	91637	MFF1816G392R0F
R1737	321-0405-00			RES.,FXD,FILM:162K OHM,1%,0.125W	91637	MFF1816G16202F
R1738	321-0310-00			RES.,FXD,FILM:16.5K OHM,1%,0.125W	91637	MFF1816G16501F
R1741	315-0361-00			RES.,FXD,CMPSN:360 OHM,5%,0.25W	01121	CB3615
R1742	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R1745	315-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
R1746	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	01121	CB2205
R1749	315-0751-00			RES.,FXD,CMPSN:750 OHM,5%,0.25W	01121	CB7515
R1751	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	01121	CB2205
R1752	315-0240-00			RES.,FXD,CMPSN:24 OHM,5%,0.25W	01121	CB2405
R1754	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R1755	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R1761	315-0244-00			RES.,FXD,CMPSN:240K OHM,5%,0.25W	01121	CB2445
R1762	321-0222-00			RES.,FXD,FILM:2K OHM,1%,0.125W	91637	MFF1816G2000F
R1765	311-0609-00			RES.,VAR,NONWIR:2K OHM,10%,0.50W	73138	82-26-1
R1766	323-0314-00			RES.,FXD,FILM:18.2K OHM,1%,0.50W	75042	CECT0-1822F
R1768	315-0205-00			RES.,FXD,CMPSN:2M OHM,5%,0.25W	01121	CB2055
R1769	321-0350-00			RES.,FXD,FILM:43.2K OHM,1%,0.125W	91637	CMF55116G43201F
R1771	321-0303-00			RES.,FXD,FILM:14K OHM,1%,0.125W	91637	MFF1816G14001F
R1773	321-0164-00			RES.,FXD,FILM:499 OHM,1%,0.125W	91637	MFF1816G499R0F
R1774	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
R1776	321-0321-00			RES.,FXD,FILM:21.5K OHM,1%,0.125W	91637	MFF1816G21501F
R1777	321-0363-00			RES.,FXD,FILM:59K OHM,1%,0.125W	91637	MFF1816G59001F
R1778	322-0643-00			RES.,FXD,FILM:600K OHM,1%,0.25W	75042	CEBT0-6003F
R1779	315-0304-00			RES.,FXD,CMPSN:300K OHM,5%,0.25W	01121	CB3045
R1781	315-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.25W	01121	CB7525
R1782	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1790	311-0963-00			RES.,VAR,WW:PNL,5K OHM,0.25W	01121	W-7577A
R1792	311-1235-00			RES.,VAR,NONWIR:100K OHM,20%,0.50W	32997	3386F-T04-104
R1794	311-1227-00			RES.,VAR,NONWIR:5K OHM,20%,0.50W	32997	3386F-T04-502
R1796	311-1226-00			RES.,VAR,NONWIR:2.5K OHM,20%,0.50W	32997	3386F-T04-252
R1797	321-0297-00			RES.,FXD,FILM:12.1K OHM,1%,0.125W	91637	MFF1816G12101F
R1798	321-0352-00			RES.,FXD,FILM:45.3K OHM,1%,0.125W	91637	MFF1816G45301F
R1799	311-1099-00			RES.,VAR,NONWIR:100K OHM,0.5W	01121	WAIG04S104AZ
R1801	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	01121	CB7535
R1802	301-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.5W	01121	EB1545
R1803	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	01121	CB7535
R1804	315-0911-00			RES.,FXD,CMPSN:910 OHM,5%,0.25W	01121	CB9115
R1805	316-0471-00			RES.,FXD,CMPSN:470 OHM,10%,0.25W	01121	CB4711
R1806	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	01121	CB7535
R1811	301-0225-00			RES.,FXD,CMPSN:2.2M OHM,5%,0.5W	01121	EB2255
R1812	301-0431-00			RES.,FXD,CMPSN:430 OHM,5%,0.5W	01121	EB4315
R1813	301-0431-00			RES.,FXD,CMPSN:430 OHM,5%,0.5W	01121	EB4315
R1814	301-0151-00			RES.,FXD,CMPSN:150 OHM,5%,0.5W	01121	EB1515
R1822	301-0184-00			RES.,FXD,CMPSN:180K OHM,5%,0.5W	01121	EB1845
R1823	301-0184-00			RES.,FXD,CMPSN:180K OHM,5%,0.5W	01121	EB1845
R1824	302-0685-00			RES.,FXD,CMPSN:6.8M OHM,10%,0.5W	01121	EB6851
R1825	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R1828	303-0224-00			RES.,FXD,CMPSN:220K OHM,5%,1W	01121	GB2245
R1829	315-0433-00			RES.,FXD,CMPSN:43K OHM,5%,0.25W	01121	CB4335
R1831	307-0113-00			RES.,FXD,CMPSN:5.1 OHM,5%,0.25W	01121	CB51G5

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R1834	301-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.5W	01121	EB2205
R1836	302-0105-00			RES.,FXD,CMPSN:1M OHM,10%,0.50W	01121	EB1051
R1841	301-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.5W	01121	EB2205
R1846	316-0471-00			RES.,FXD,CMPSN:470 OHM,10%,0.25W	01121	CB4711
R1847	316-0471-00			RES.,FXD,CMPSN:470 OHM,10%,0.25W	01121	CB4711
R1848	316-0274-00			RES.,FXD,CMPSN:270K OHM,10%,0.25W	01121	CB2741
R1901	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	01121	CB3925
R1902	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	01121	CB7535
R1903	315-0273-00	B143850	B149999	RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R1903	315-0104-00	B150000		RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R1904	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R1905	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	01121	CB2235
R1916	315-0123-00			RES.,FXD,CMPSN:12K OHM,5%,0.25W	01121	CB1235
R1917	315-0224-00			RES.,FXD,CMPSN:220K OHM,5%,0.25W	01121	CB2245
R1918	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	01121	CB1545
R1919	321-0366-00			RES.,FXD,FILM:63.4K OHM,1%,0.125W	91637	CMF55116G63401F
R1921	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R1922	321-0313-00			RES.,FXD,FILM:17.8K OHM,1%,0.125W	91637	MFF1816G17801F
R1924	315-0560-00			RES.,FXD,CMPSN:56 OHM,5%,0.25W	01121	CB5605
R1925	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R1926	321-0035-00	B010100	B010289	RES.,FXD,FILM:22.6 OHM,1%,0.125W	91637	CMF1/10216G22R60
R1926	321-0038-00	B010290		RES.,FXD,FILM:24.3 OHM,1%,0.125W	91637	MFF1816G24R30F
R1940	311-1266-00			RES.,VAR,NONWIR:2.5K OHM,10%,0.50W	32997	3329P-L58-252
R1941	321-0393-00			RES.,FXD,FILM:121K OHM,1%,0.125W	91637	CMF55116G12102F
R1942	321-0283-00			RES.,FXD,FILM:8.66K OHM,1%,0.125W	91637	CMF55116G86600F
R1943	315-0201-00	B010100	B167319	RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R1943	315-0560-00	B167320		RES.,FXD,CMPSN:56 OHM,5%,0.25W	01121	CB5605
R1944	321-0282-00			RES.,FXD,FILM:8.45K OHM,1%,0.125W	91637	MFF1816G84500F
R1945	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R1951	321-0421-00			RES.,FXD,FILM:237K OHM,1%,0.125W	91637	MFF1816G23702F
R1952	321-0692-00			RES.,FXD,FILM:49.9K OHM,0.5%,0.125W	91637	MFF1816G49901D
R1953	321-0306-00			RES.,FXD,FILM:15K OHM,1%,0.125W	91637	MFF1816G15001F
R1954	321-0314-00			RES.,FXD,FILM:18.2K OHM,1%,0.125W	91637	MFF1816G18201F
R1955	321-0314-00			RES.,FXD,FILM:18.2K OHM,1%,0.125W	91637	MFF1816G18201F
R1956	321-0289-00			RES.,FXD,FILM:10K OHM,1%,0.125W	91637	MFF1816G10001F
R1957	321-0289-00			RES.,FXD,FILM:10K OHM,1%,0.125W	91637	MFF1816G10001F
R1958	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R1959	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R2006	315-0513-00			RES.,FXD,CMPSN:51K OHM,5%,0.25W	01121	CB5135
R2007	315-0513-00			RES.,FXD,CMPSN:51K OHM,5%,0.25W	01121	CB5135
R2013	301-0130-00			RES.,FXD,CMPSN:13 OHM,5%,0.5W	01121	EB1305
R2021	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R2023	315-0150-00			RES.,FXD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
R2025	315-0150-00			RES.,FXD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
R2041	321-0184-00			RES.,FXD,FILM:806 OHM,1%,0.125W	91637	MFF1816G806R0F
R2042	316-0682-00			RES.,FXD,CMPSN:6.8K OHM,10%,0.25W	01121	CB6821
R2043	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R2044	315-0182-00			RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	01121	CB1825
R2045	315-0182-00			RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	01121	CB1825
R2046	301-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.5W	01121	EB1815
R2047	321-0690-00			RES.,FXD,FILM:34.0K OHM,0.5%,0.125W	24546	NA55D3402D
R2048	311-1264-00			RES.,VAR,NONWIR:1.5K OHM,10%,0.50W	32997	3329P-L58-152
R2049	321-0779-03			RES.,FXD,FILM:7.020K OHM,0.25%,0.125W	91637	MFF1816D70200C
R2051	321-1331-02			RES.,FXD,FILM:27.2K OHM,0.5%,0.125W	91637	MFF1816D27701D

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R2052	321-0669-00			RES.,FXD,FILM:6.08K OHM,0.5%,0.125W	91637	MFF1816D60800D
R2056	308-0446-00			RES.,FXD,WW:15 OHM,5%,5W	91637	RS2A-K15R00J
R2061	321-0775-03			RES.,FXD,FILM:45K OHM,0.25%,0.125W	91637	MFF1816D45001C
R2062	321-0260-01			RES.,FXD,FILM:4.99K OHM,0.5%,0.125W	91637	MFF1816G49900D
R2071	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R2072	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
R2073	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R2074	321-0692-00			RES.,FXD,FILM:49.9K OHM,0.5%,0.125W	91637	MFF1816G49901D
R2075	321-0260-01			RES.,FXD,FILM:4.99K OHM,0.5%,0.125W	91637	MFF1816G49900D
R2083	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
R2084	321-0769-03			RES.,FXD,FILM:50.33K OHM,0.25%,0.125W	91637	MFF1816D50331C
R2085	321-0285-01			RES.,FXD,FILM:9.09K OHM,0.5%0.125W	91637	MFF1816G90900D
R2086	316-0682-00			RES.,FXD,CMPSN:6.8K OHM,10%,0.25W	01121	CB6821
R2087	304-0390-00	B010100	B143849	RES.,FXD,CMPSN:39 OHM,10%,IW	01121	GB3901
R2087	303-0200-00	B143850		RES.,FXD,CMPSN-20 OHM,5%,1W	01121	GB2005
R2089	315-0395-00	B010100	B069999	RES.,FXD,CMPSN:3.9M OHM,5%,0.25W	01121	CB3955
R2093	315-0390-00			RES.,FXD,CMPSN:39 OHM,5%,0.25W	01121	CB3905
R2094	307-0109-00			RES.,FXD,CMPSN:8.2 OHM,5%,03.25W	01121	CB82G5
R2096	323-0038-00			RES.,FXD,FILM:24.3 OHM,1%,.50W	91637	MFF1226G24R30F
R2100	311-1223-00	B010100	191831	RES.,VAR,NONWIR:TRMR,250 OHM,0.5W	73138	72-5-0
R2100	311-1224-00	B191832		RES.,VAR,NONWIR:500 OHM,20%,0.50W	32997	3386F-T04-501
R2101	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	01121	CB2205
R2102	321-0021-00	B010100	191831	RES.,FXD,FILM:16.2 OHM,1%,0.125W	91637	CMRF55116G16R20F
R2105	311-1223-00	B010100	191831	RES.,VAR,NONWIR:TRMR,250 OHM,0.5W	73138	72-5-0
R2105	311-1224-00	B191832		RES.,VAR,NONWIR:500 OHM,20%,0.50W	32997	3386F-T04-501
R2106	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R2107	321-0698-00	B010100	191831	RES.,FXD,FILM:1.89K OHM,0.25%,0.125W	91637	MFF1816C18900C
R2107	321-0217-03	B191832		RES.,FXD,FILM:1.78K OHM,0.25%,0.125W	91637	MFF1816D17800C
R2108	321-0249-09			RES.,FXD,FILM:3.83K OHM,1%,0.125W	91637	CMF55116C38300F
R2109	321-0321-07			RES.,FXD,FILM:21.5K OHM,0.1%,0.125W	91637	MFF1816C21501B
R2111	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
R2112	321-0321-07			RES.,FXD,FILM:21.5K OHM,0.1%,0.125W	91637	MFF1816C21501B
R2113	316-0152-00			RES.,FXD,CMPSN:1.5K OHM,10%,0.25W	01121	CB1521
R2116	321-0102-00			RES.,FXD,FILM:113 OHM,1%,0.125W	91637	MFF1816G113R0F
R2117	315-0150-00			RES.,FXD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
R2120	317-0181-00			RES.,FXD,CMPSN:180 OHM,5%;0.125W	01121	BB1815
R2122	317-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.125W	01121	BB2715
R2124	317-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.125W	01121	BB4305
R2130	311-1223-00			RES.,VAR,NONWIR:TRMR,250 OHM,0.5W	73138	72-5-0
R2131	323-0225-09			RES.,FXD,FILM:2.15K OHM,1%,0.50W	91637	MFF1226C21500F
R2132	323-0225-09			RES.,FXD,FILM:2.15K OHM,1%,0.50W	91637	MFF1226C21500F
R2133	321-0255-00			RES.,FXD,FILM:4.42K OHM,1%,0.125W	91637	MFF1816G44200F
R2134	321-0961-07			RES.,FXD,FILM:500.5 OHM,0.1%,0.125W	24546	NE55E500R5B
R2139	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
RT551	307-0127-00			RES.,THERMAL:1K OHM,10%	50157	2D1596
RT644	307-0126-00			RES.,THERMAL:100 OHM,10%	14193	2D21-101-D
RT1487	307-0124-00			RES.,THERMAL:SK OHM,10%	50157	1D1618
RT1821	307-0353-00			RES.,FXD,FILM:5 OHM,10%,DISC	15454	5DA5RO-K-270SS
RT1822	307-0353-00			RES.,FXD,FILM:5 OHM,10%,DISC	15454	5DA5RO-K-270SS
S15	----------			SWITCH,CAM:COUPLING		
S15	----------			(SEE MPL FOR REPLACEMENT PARTS)		

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
S90	---- ----			SWITCH,CAM:CAL IN		
S90	---- ----			(SEE MPL FOR REPLACEMENT PARTS)		
S95	---- ----			SWITCH,CAM:VOLTS/DIV		
S95	---- ----			(SEE MPL FOR REPLACEMENT PARTS)		
S125	260-1314-00			SWITCH,PUSH:1 BUTTON,50 OHM/1M OHM	80009	260-1314-00
S125	---- ----			(485,485-1 ONLY)		
S125	260-1492-00			SWITCH,PUSH:I BUTTON,4 POLE	80009	260-1492-00
S125	---- ----			(485-2 ONLY)		
S310	260-0816-01			SWITCH,SLIDE:DPDT,0.5A,125V	80009	260-0816-01
S600	260-1315-00			SWITCH,PUSH:	80009	260-1314-00
S630						
S700	260-1395-00			SWITCH,ROTARY:A SOURCE	82104	260-1395-00
S705	260-1312-00			SWITCH,LEVER: 1SECT,4 POSN,22.5 DEG	80009	260-1312-00
S710	260-0735-00			SWITCH,PUSH:T,NO CONTACT,RED BUTTON	81073	39-1
S710	---- ----			(485 ONLY)		
S720	----------			(PART OF R720)		
S780	260-1313-00			SWITCH,LEVER:I SECT,4 POSN 22.5 DEG	80009	260-1313-00
S898	---- ----			(PART OF R898)		
S1000	260-1311-00			SWITCH,LEVER:1 SECT,4 POSN,22.5 DEG	80009	260-1311-00
S1005	260-1312-00			SWITCH,LEVER:I SECT,4 POSN,22.5 DEG	80009	260-1312-00
S1020	---- ----			(PART OF R1020)		
S1400	---- ----			(SEE MPL FOR REPLACEMENT PARTS)		
S1420	105-0281-00	B010100	B049999	ACTR ASSY CAM S:TIME/CM,A SWP	80009	105-0281-00
S1420	105-0470-00	B050000		ACTR ASSY,CAM S:TIME/CM	80009	105-0470-00
S1460	105-0335-00	B010100	B049999	ACTR ASSY CAM S:TIME/CM,B SWP	80009	105-0335-00
S1460	105-0470-00	B050000		ACTR ASSY,CAM S:TIME/CM	80009	105-0470-00
S1500	260-1318-00			SWITCH,PUSH:4 BUTTON,2 POLE,INTERLOCK	80009	260-1318-00
S1580	260-1319-00			SWITCH,PUSH:6 BUTTON,INTERLOCK	80009	260-1319-00
S1590	260-1317-00			SWITCH,PUSH:3 BUTTON,2 POLE,INTERLOCK	80009	260-1317-00
S1801	260-1368-01			SWITCH,SENS:SPST,15A,250VAC	80009	260-1368-01
S1802	260-0638-00			SW,THERMOSTATIC:10A,240V,OPEN 75 DEG C	93410	430-364
S1803	260-1300-00			SWITCH,SLIDE:DPDT,3A,125VAC	82389	46206LFE
S2105	260-1208-00			SWITCH,PUSH: DPDT,28VDC,PUSH-PUSH	80009	260-1208-00
T205	276-0614-00			CORE,EM:TOROID,FERRITE	78488	57-1656
T205	---- ----			(WRAPPED WITH 198-2785-00 WIRE SET)		
T305	276-0614-00			CORE,EM:TOROID,FERRITE	78488	57-1656
T305	---- ----			(WRAPPED WITH 198-2785-00 WIRE SET)		
T719	120-0797-00			XFMR,TOROID:	80009	120-0797-00
T1015	120-0797-00			XFMR,TOROID:	80009	120-0797-00
T1801	120-0716-00			XFMR,PWR,STPDN:LINE TRIGGER	80009	120-0716-00
T1825	120-0640-00			XFMR,TOROID:18 TURNS,BIFILAR	80009	120-0640-00
T1831	120-0788-00			XFMR,TOROID:4 WINDINGS	80009	120-0788-00
T1848	120-0747-00			XFMR,TOROID:55 TURNS,SINGLE	80009	120-0747-00
T1960	120-0787-00			XFMR,PWR,SDN&SU:HV	80009	120-0787-00
U48	156-0105-00			MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	27014	LM301AN
U48	---- ----			(485,485-1 ONLY)		
U80	155-0076-00			MICROCIRCUIT,LI:INPUT PROTECTION	80009	155-0076-00
U210	155-0078-00	B010100	B143429	MICROCIRCUIT,LI:ML,VERT AMPL	80009	155-0078-00
U210	155-0078-10	B143430		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U250	155-0078-03	B010100	B144129	MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-03
U250	155-0078-13	B144130	B155949	MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-13
U250	155-0078-10	B155950		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
U310	155-0078-00	B010100	B143429	MICROCIRCUIT,LI:ML,VERT AMPL	80009	155-0078-00
U310	155-0078-10	B143430		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U332	156-0067-00			MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	01295	MICROA741CP
U350	155-0078-03	B010100	B144129	MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-03
U350	155-0078-13	B144130	B155949	MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-13
U350	155-0078-10	B155950		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U410	155-0078-01	B010100	B143429	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-01
U410	155-0078-11	B143430	B155949	MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER,SEL	80009	155-0078-11
U410	155-0078-10	B155950		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U430	155-0078-01	B010100	B143429	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-01
U430	155-0078-11	B143430	B155949	MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER,SEL	80009	155-0078-11
U430	155-0078-10	B155950		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U510	155-0078-01	B010100	B143429	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-01
U510	155-0078-11	B143430	B155949	MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER,SEL	80009	155-0078-11
U510	155-0078-10	B155950		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U530	155-0078-01	B010100	B143429	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-01
U530	155-0078-11	B143430	B155949	MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER,SEL	80009	155-0078-11
U530	155-0078-10	B155950		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U620	155-0078-01	B010100	B143429	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-01
U620	155-0078-11	B143430	B155949	MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER,SEL	80009	155-0078-11
U620	155-0078-10	B155950		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U650	155-0078-02	B010100	B143429	MICROCIRCUIT,LI:ML,VERT AMPL,SELECTED	80009	155-0078-02
U650	155-0078-03	B143430	B144129	MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-03
U650	155-0078-12	B144130	B155949	MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER,SEL	80009	155-0078-12
U650	155-0078-10	B155950		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U660	155-0064-00			MICROCIRCUIT,LI:OUTPUT AMPLIFIER	80009	155-0064-00
U730	155-0078-02	B010100	B143429	MICROCIRCUIT,LI:ML,VERT AMPL,SELECTED	80009	155-0078-02
U730	155-0078-03	B143430	B155949	MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-03
U730	155-0078-10	B155950		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U738	155-0078-02	B010100	B143429	MICROCIRCUIT,LI:ML,VERT AMPL,SELECTED	80009	155-0078-02
U738	155-0078-03	B143430	B155949	MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-03
U738	155-0078-10	B155950		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U740	155-0078-02	B010100	B143429	MICROCIRCUIT,LI:ML,VERT AMPL,SELECTED	80009	155-0078-02
U740	155-0078-03	B143430	B155949	MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-03
U740	155-0078-10	B155950		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U780	155-0049-00	B010100	B049999	MICROCIRCUIT,DI:SWEEP CONTROL	80009	155-0049-00
U780	155-0049-01	B050000	B144849	MICROCIRCUIT,DI:MONOLITHIC,SWEEP CONTROL	80009	155-0049-01
U780	155-0049-02	B144850		MICROCIRCUIT,DI:SWEEP CONTROL,W/LOCKOUT	80009	155-0049-02
U830	155-0078-02	B010100	B143429	MICROCIRCUIT,LI:ML,VERT AMPL,SELECTED	80009	155-0078-02
U830	---- ----			(485 ONLY)		
U830	155-0078-03	B143430	B155949	MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-03
U830	---- ----			(485 ONLY)		
U830	155-0078-10	B155950		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U830	---- ----			(485 ONLY)		
U910	156-0067-02	B010100	B149999	MICROCIRCUIT,LI:OPNL AMPLIFIER,SELECTED	80009	156-0067-02
U910	156-0067-00	B150000		MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	01295	MICROA741CP
U960	156-0067-00			MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	01295	MICROA741CP
U1030	155-0078-02	B010100	B143429	MICROCIRCUIT,LI:ML,VERT AMPL,SELECTED	80009	155-0078-02
U1030	155-0078-03	B143430	B155949	MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-03
U1030	155-0078-10	B155950		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U1038	155-0078-02	B010100	B143429	MICROCIRCUIT,LI:ML,VERT AMPL,SELECTED	80009	155-0078-02
U1038	155-0078-03	B143430	B155949	MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-03
U1038	155-0078-10	B155950		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
U1040	155-0078-02	B010100	B143429	MICROCIRCUIT,LI:ML,VERT AMPL,SELECTED	80009	155-0078-02
U1040	155-0078-03	B143430	B155949	MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-03
U1040	155-0078-10	B155950		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U1480	156-0281-00			MICROCIRCUIT,LI:4 TRANSISTOR ARRAY	02735	89164
U1530	156-0047-02			MICROCIRCUIT,DI:TP1 3 INP,NAND GATE	27014	DM7410NA+ OR JA+
U1535	156-0041-05			MICROCIRCUIT,DI:DUAL D-FLIP FLOP	01295	SN7474
U1560	155-0012-00			MICROCIRCUIT,LI:ML,Z-AXIS AND AMPLIFIER	80009	155-0012-00
U1580	156-0030-03			MICROCIRCUIT,DI:QUAD 2-INP NAND GATE,SCRN	01295	SN7400(NP3 OR JP
U1585	155-0011-00			MICROCIRCUIT,DI:ML,CLOCK AND CHOP BLANKING	80009	155-0011-00
U1600	152-0509-00			SEMICOND DEVICE:V MULTR,3KV IN,18KV OUT	52306	CMX115
U1624	156-0067-00			MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	01295	MICROA741CP
U1710	155-0012-00			MICROCIRCUIT,LI:ML,Z-AXIS AND AMPLIFIER	80009	155-0012-00
U1910	155-0067-02			MICROCIRCUIT,DI:ML,POWER SPLY RGLTR 16 DIP	80009	155-0067-02
U2042	156-0067-00			MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	01295	MICROA741CP
U2052	156-0067-00			MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	01295	MICROA741CP
U2062	156-0067-00			MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	01295	MICROA741CP
U2072	156-0067-00			MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	01295	MICROA741CP
U2086	156-0067-00			MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	01295	MICROA741CP
V1700	154-0652-00	B010100	B091499	ELECTRON TUBE:CRT,P31,INT SCALE	80009	154-0652-00
V1700	154-0652-05	B091500		ELECTRON TUBE:CRT,P31,1NT SCALE	80009	154-0652-05
V1700	154-0652-09			ELECTRON TUBE:	80009	154-0652-09
V1700	---- ----			(OPT 78 ONLY)		
VR71	152-0395-00			SEMICOND DEVICE:ZENER,0.4W,4.3V,5%	14552	TD332317
VR71	---- ----			(485,485-1 ONLY)		
VR838	152-0127-00			SEMICOND DEVICE:ZENER,0.4W,7.5V,5%	04713	SZG35009K2
VR838	----------			(485 ONLY)		
VR839	152-0127-00			SEMICOND DEVICE:ZENER,0.4W,7.5V,5%	04713	SZG35009K2
VR839	---- ----			(485 ONLY)		
VR844	152-0175-00			SEMICOND DEVICE:ZENER,0.4W,5.6V,5%	04713	SZG35008
VR1131	152-0175-00			SEMICOND DEVICE:ZENER,0.4W,5.6V,5%	04713	SZG35008
VR1549	152-0243-00			SEMICOND DEVICE:ZENER,0.4W,15V,5%	14552	TD3810983
VR1740	152-0280-00			SEMICOND DEVICE:ZENER,0.4W,6.2V,5%	80009	152-0280-00
VR1831	152-0401-00			SEMICOND DEVICE:SILICON,3-LAYER,TRIGGER	04713	SPT32K
VR1846	152-0287-00	B010100	B143554	SEMICOND DEVICE:ZENER,0.4W,110V,5%	12954	1N986B
VR1846	152-0657-00	B143555		SEMICOND DEVICE:ZENER,0.4W,108V,2%	80009	152-0657-00
VR1912	152-0288-00			SEMICOND DEVICE:ZENER,0.4W,140V,5%	12954	DZ720717C
VR1928	152-0243-00	B010100	B029999	SEMICOND DEVICE:ZENER,0.4W,15V,5%	14552	TD3810983
VR1928	152-0304-00	B030000		SEMICOND DEVICE:ZENER,0.4W,20V,5%	15238	Z5411
VR1945	152-0212-00			SEMICOND DEVICE:ZENER,0.SW,9V,5%	04713	SZ50646RL
VR2042	152-0411-00			SEMICOND DEVICE:ZENER,0.25W,9V,5%	04713	SZ12483KRL
VR2043	152-0283-00			SEMICOND DEVICE:ZENER,0.4W,43V,5%	12954	DZ750903B1N976B
W241	---- ----	B170000		#22 BARE WIRE STRAP		
W240	---- ----	B190990		#22 BARE WIRE STRAP		
W340	---- ----	B170000		#22 BARE WIRE STRAP		
W341	---- ----	B190990		#22 BARE WIRE STRAP		
W410	---- ----	B180000		0.5 INCH #22 BARE WIRE STRAP		
W430	---- ----	B180000		0.5 INCH #22 BARE WIRE STRAP		
W2102	131-0566-00	B191832		BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	57668	JWW-0200E0

DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS

Symbols

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

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

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

Abbreviations are based on ANSI Y1.1-1972.

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

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

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

Component Values

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

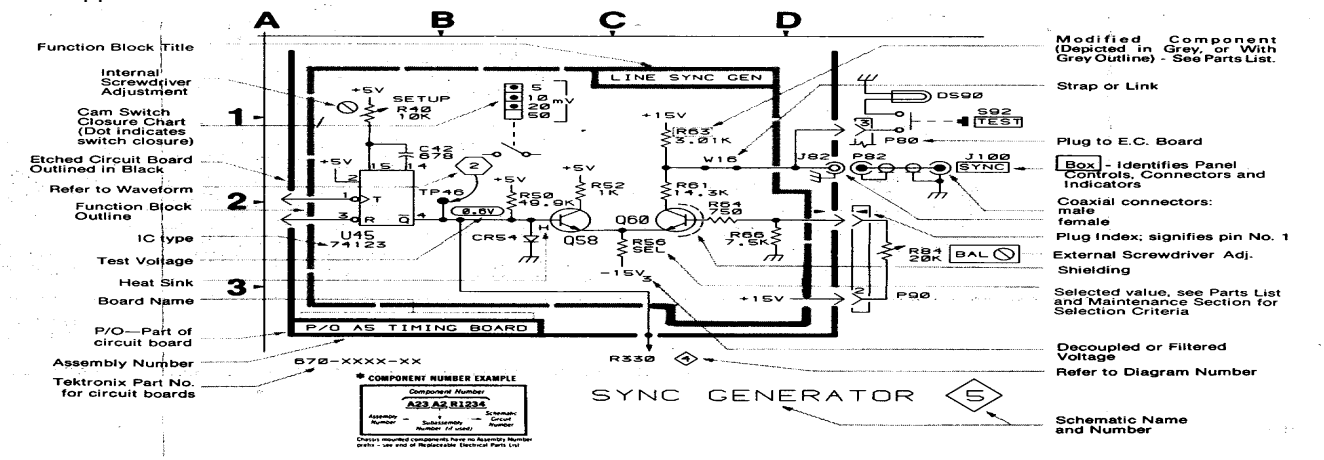
Capacitors = Values one or greater are in picofarads (pF).
Values less than one are in microfarads (µ F).
Resistors = Ohms (Ω).

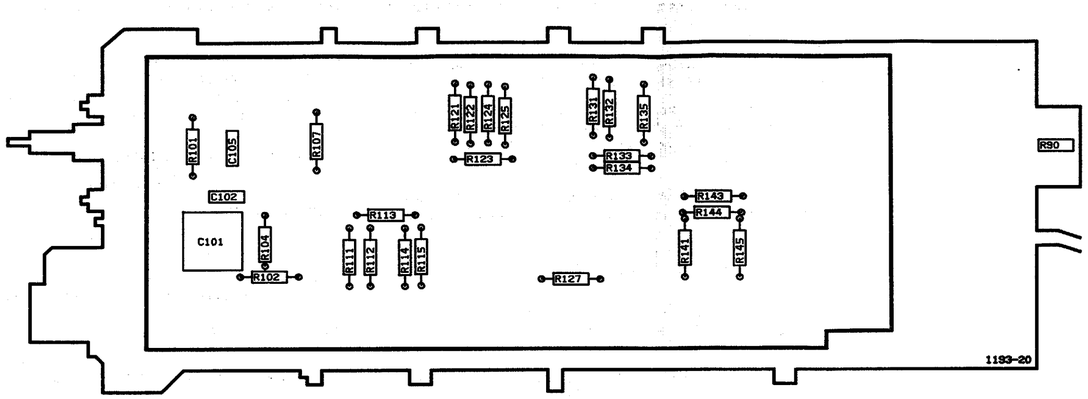
The information and special symbols below may appear in this manual.

Assembly Numbers and Grid Coordinates

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

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

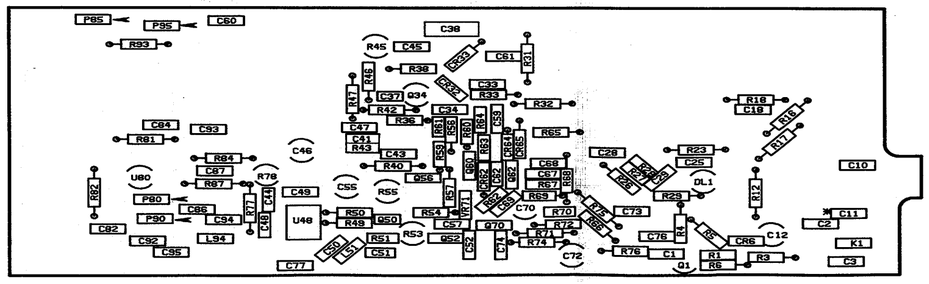




NOTE:
R127 NOT USED ON A6 BOARD

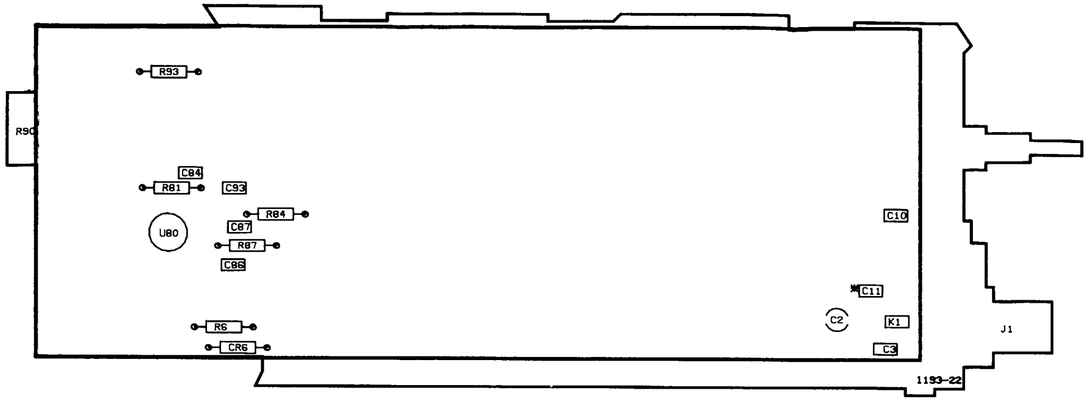
LOCATED ON BACK OF BOARD:
S125
C104

Fig. 8-1. A5 & A6 50 Ω Attenuator board.



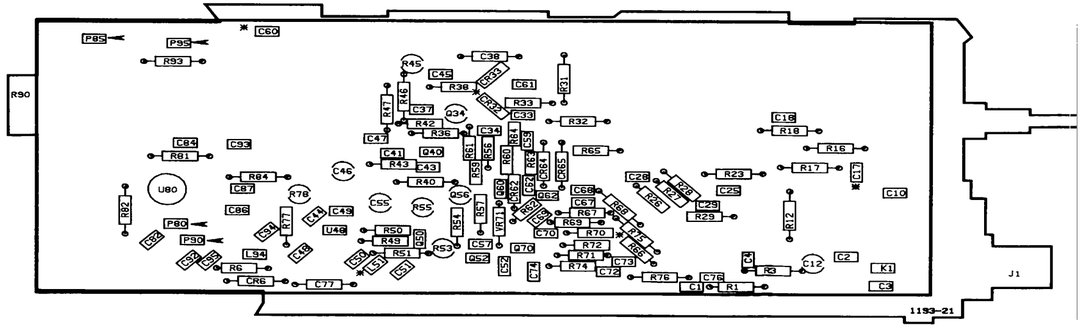
*SEE PARTS LIST FOR
SERIAL NUMBER RANGES

Fig. 8-2A. A3 Hi Z Attenuator board (485 & 485-1 only) SN B155790-up.



*SEE PARTS LIST FOR
SERIAL NUMBER RANGES

Fig. 8-2C. A4 Low Z control board (485-2 only)

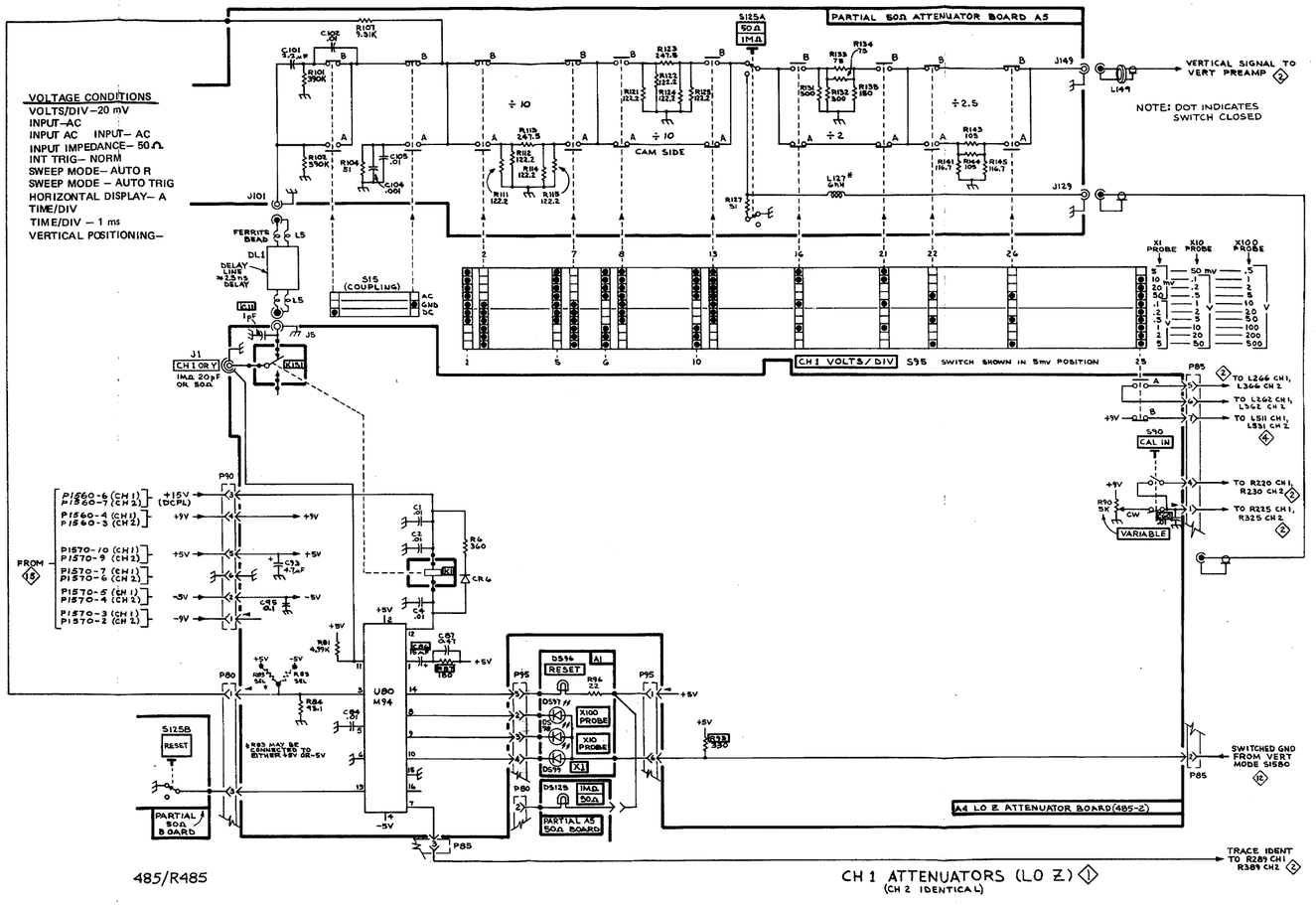


LOCATED ON BACK OF BOARD
C16 P80 P85
R14 P90 P95

*SEE PARTS LIST FOR
SERIAL NUMBER RANGES

MS011426

Fig. 8-2B. A3 Hi Z Attenuator board (485 & 485-1 only) SN B010100-B-155789.


PARTIAL 50Ω ATTENUATOR BOARD A5
VOLTAGE CONDITIONS
VOLTS/DIV–20 mV
INPUT–AC
INPUT AC INPUT– AC
INPUT IMPEDANCE– 50Ω
INT TRIG– NORM
SWEEP MODE– AUTO R
SWEEP MODE – AUTO TRIG
HORIZONTAL DISPLAY– A
TIME/DIV
TIME/DIV – 1 ms
VERTICAL POSITIONING–
VERTICAL SIGNAL TO VERT PREAMP
NOTE: DOT INDICATES SWITCH CLOSED
CAM SIDE
÷ 10
÷ 10
÷ 2
÷ 2.5
FERRITE BEAD
DELAY LINE ≈ 29 ns DELAY
515 (COUPLING)
AC GND DC
CH 1 OR Y
1MΩ 20pF OR 50Ω
X1 PROBE
X10 PROBE
X100 PROBE
50 mV
CH 1 VOLTS/DIV S95 SWITCH SHOWN IN 5mV POSITION
TO L266 CH 1, L366 CH 2
TO L262 CH 1, L362 CH 2
TO L511 CH 1, L531 CH 2
CAL IN
VARIABLE
TO R220 CH 1, R230 CH 2
TO R235 CH 1, R325 CH 2
FROM 15
+15V (DCPL)
+9V
+5V
-5V
-9V
U80 M94
RESET
X100 PROBE
X10 PROBE
X1
1MΩ
50Ω
PARTIAL A5 50Ω BOARD
S125B
PARTIAL 50Ω BOARD
A4 LO Z ATTENUATOR BOARD (485-2)
SWITCHED GND FROM VERT MODE S1580
TRACE IDENT TO R289 CH1 R389 CH2
485/R485
CH 1 ATTENUATORS (LO Z)
(CH 2 IDENTICAL)

1193-63

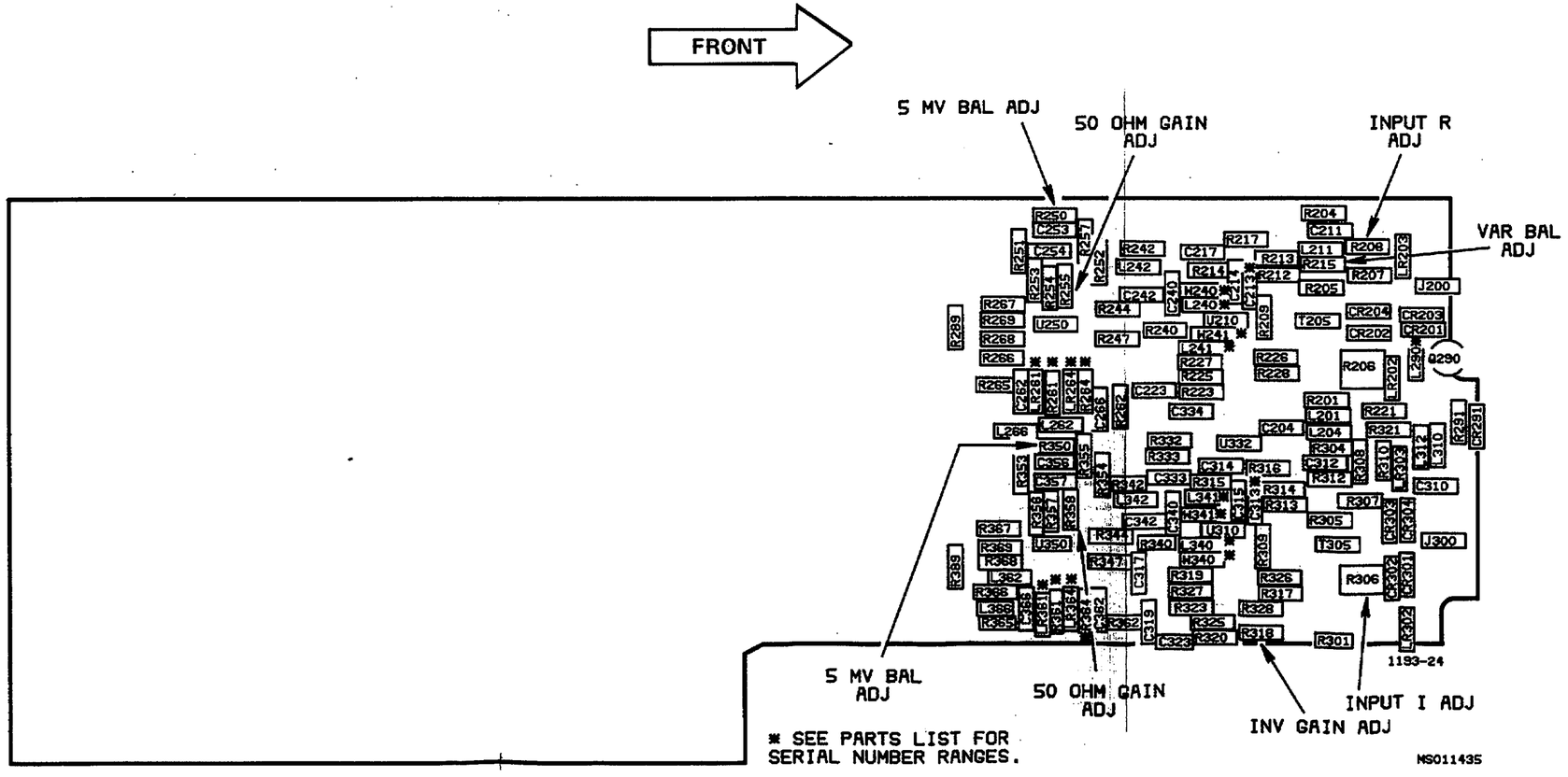
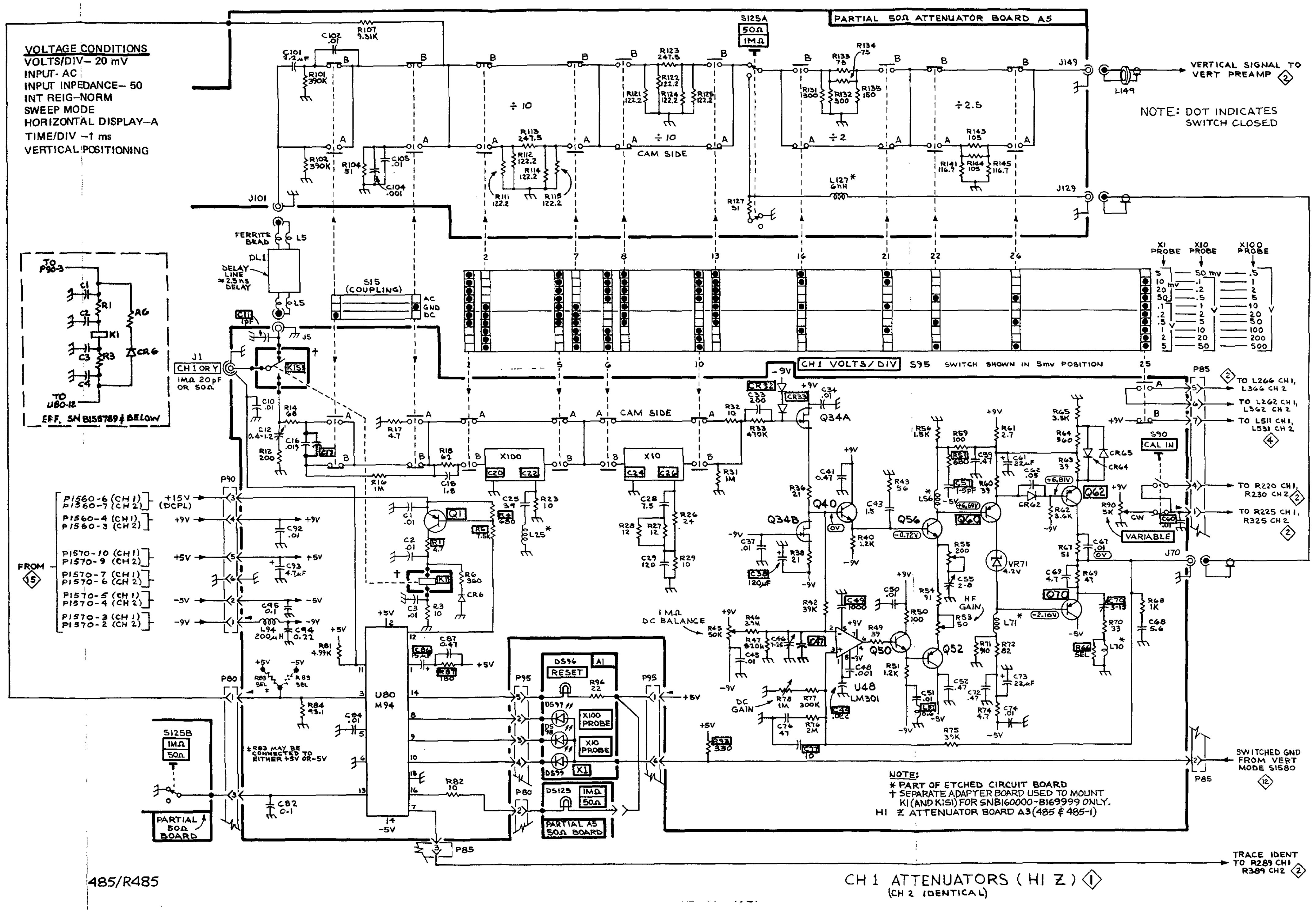
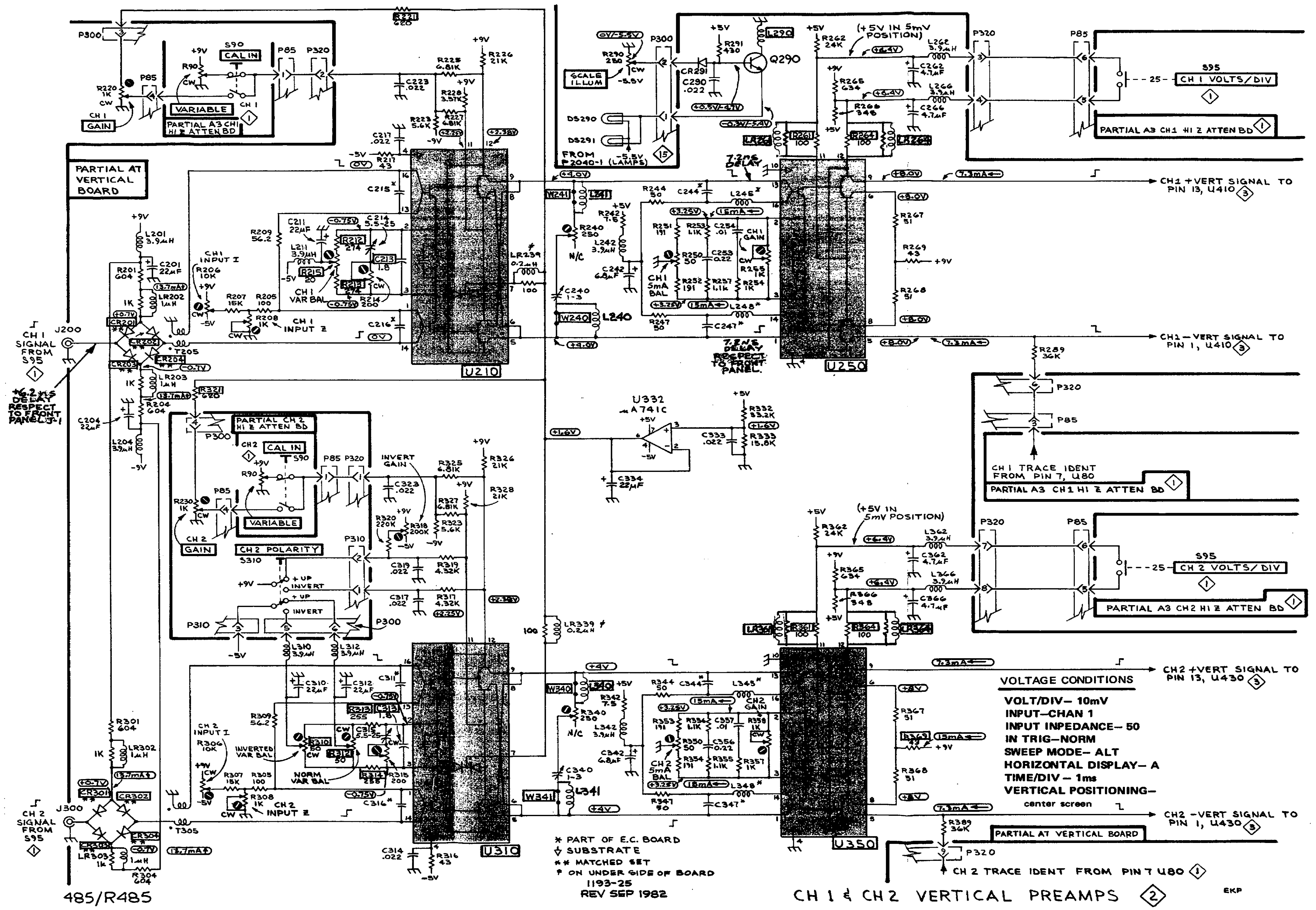


Fig. 8-3. A7 Partial Vertical Amplifier board.


VOLTAGE CONDITIONS
VOLTS/DIV– 20 mV
INPUT- AC
INPUT INPEDANCE– 50
INT REIG–NORM
SWEEP MODE
HORIZONTAL DISPLAY–A
TIME/DIV ~1 ms
VERTICAL POSITIONING
PARTIAL 50Ω ATTENUATOR BOARD A5
VERTICAL SIGNAL TO VERT PREAMP
NOTE: DOT INDICATES SWITCH CLOSED
CAM SIDE
CH1 VOLTS/DIV S95 SWITCH SHOWN IN 5mv POSITION
CH 1 OR Y
1MΩ 20pF OR 50Ω
EFF. SN B158789 & BELOW
S15 (COUPLING)
1MΩ DC BALANCE
DC GAIN
HF GAIN
VARIABLE
CAL IN
RESET
X100 PROBE
X10 PROBE
PARTIAL A5 50Ω BOARD
PARTIAL 50Ω BOARD
SWITCHED GND FROM VERT MODE S1580
TRACE IDENT TO R289 CH1 R389 CH2
NOTE:
* PART OF ETCHED CIRCUIT BOARD
† SEPARATE ADAPTER BOARD USED TO MOUNT K1 (AND K151) FOR SNB160000-B169999 ONLY.
HI Z ATTENUATOR BOARD A3 (485 & 485-1)
485/R485
CH 1 ATTENUATORS (HI Z) 1
(CH 2 IDENTICAL)
1193-23


CH 1 & CH 2 VERTICAL PREAMPS 2
VOLTAGE CONDITIONS
VOLT/DIV— 10mV
INPUT—CHAN 1
INPUT INPEDANCE— 50
IN TRIG—NORM
SWEEP MODE— ALT
HORIZONTAL DISPLAY— A
TIME/DIV — 1ms
VERTICAL POSITIONING—
center screen
485/R485
1193-25
REV SEP 1982

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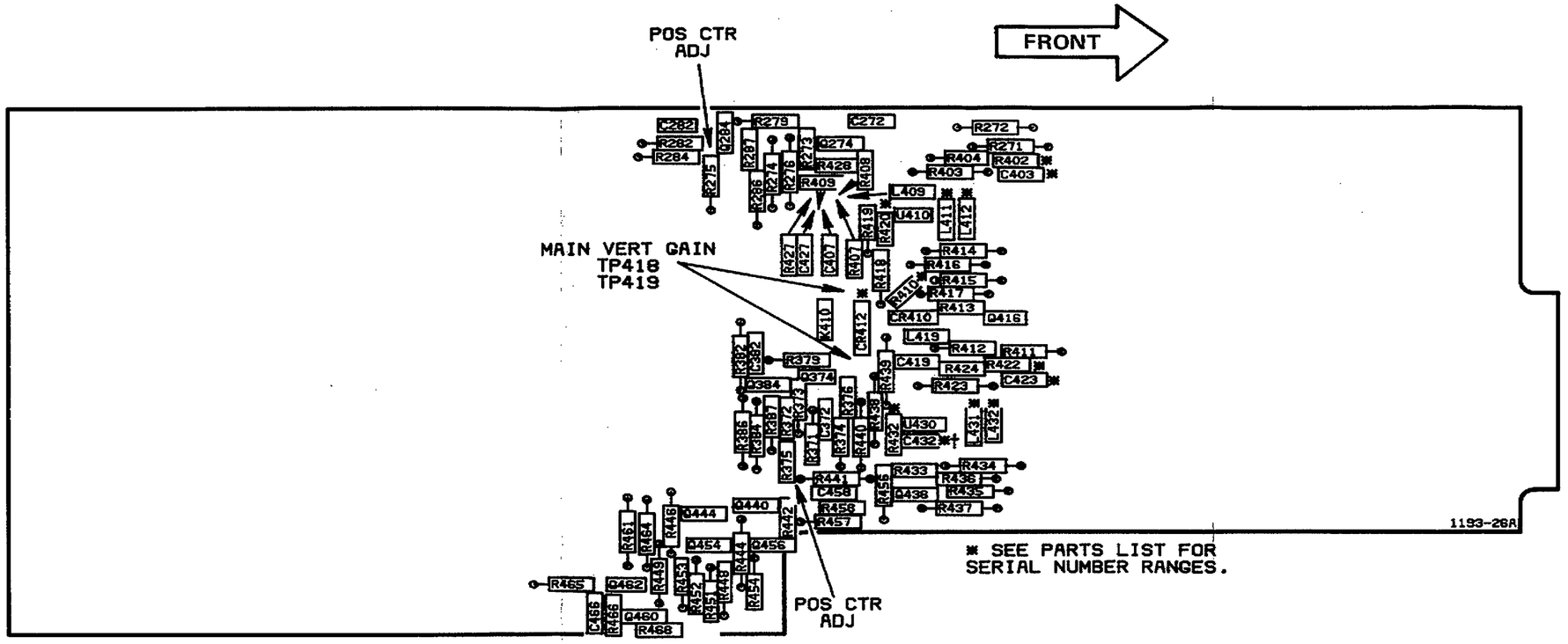
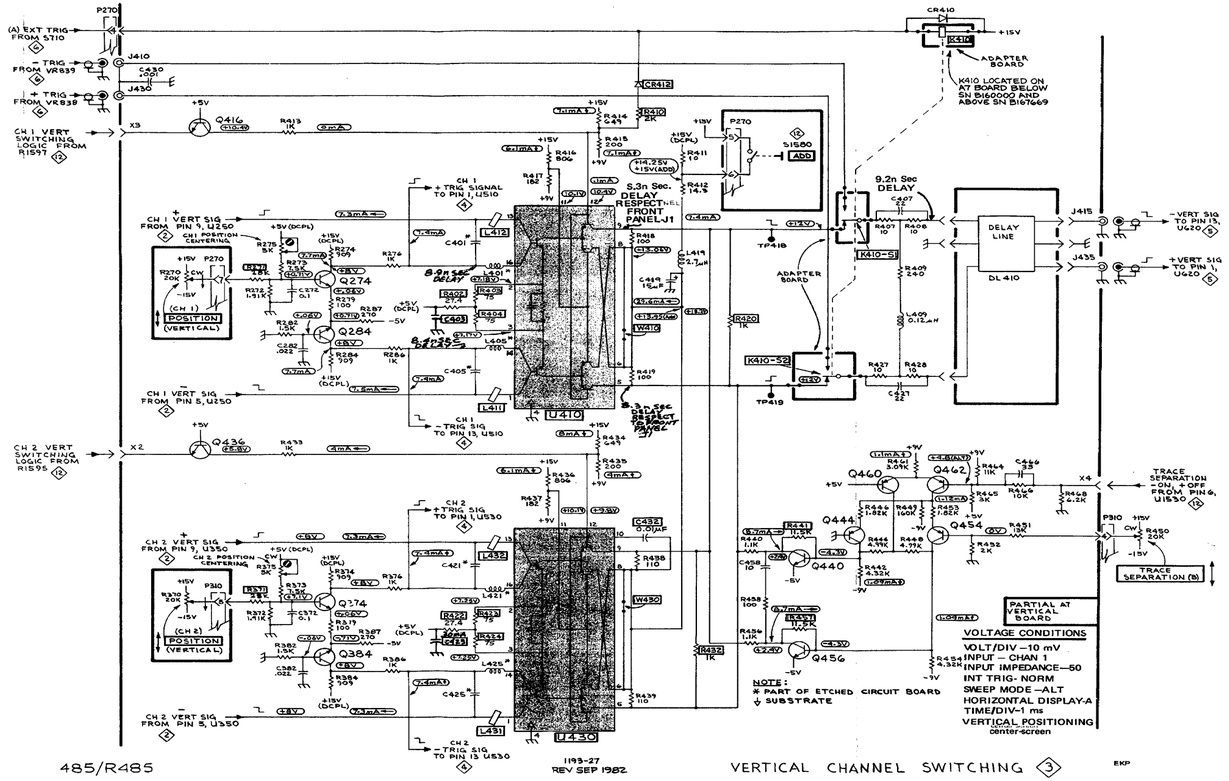


NOTE W410 IS ADDED ON BACK OF BOARD
FROM PIN 6N TO PIN 8 OF U410
W430 IS ADDED ON BACK OF BOARD
FROM PIN 6 TO PIN 8 OF U430

Fig. 8-4. A7 Partial Vertical amplifier board.


VOLTAGE CONDITIONS
VOLT/DIV – 10 mV
INPUT – CHAN 1
INPUT IMPEDANCE–50
INT TRIG- NORM
SWEEP MODE –ALT
HORIZONTAL DISPLAY-A
TIME/DIV–1 ms
VERTICAL POSITIONING
center-screen
NOTE:
* PART OF ETCHED CIRCUIT BOARD
⏚ SUBSTRATE
PARTIAL AT VERTICAL BOARD
ADAPTER BOARD
K410 LOCATED ON A7 BOARD BELOW SN B160000 AND ABOVE SN B167669
DELAY LINE
DL 410
9.2n Sec DELAY
S.3n Sec. DELAY RESPECTIVELY FROM FRONT PANEL J1
U410
U430
485/R485
1193-27
REV SEP 1982
VERTICAL CHANNEL SWITCHING 3
EKP

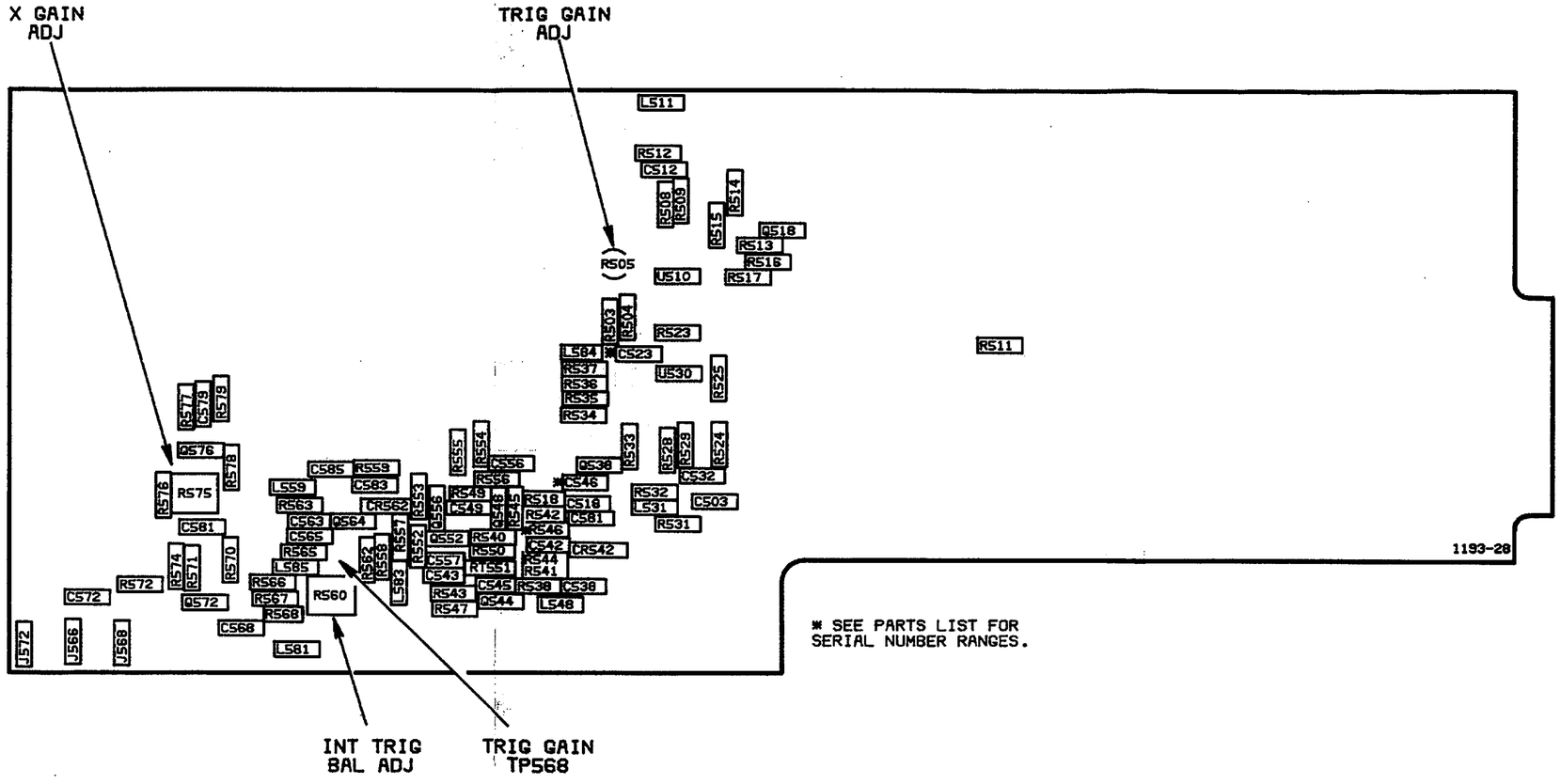
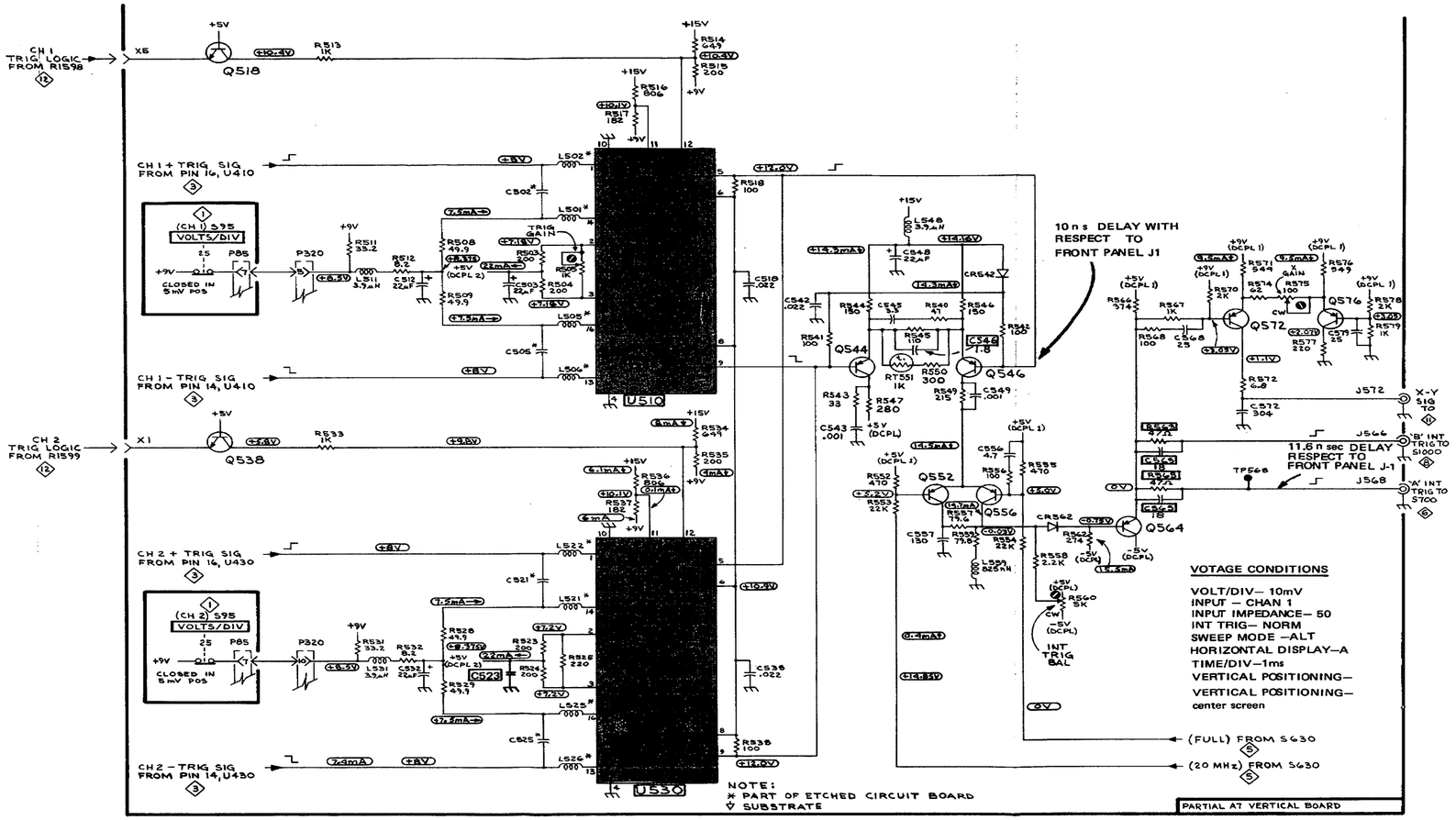


Fig. 8-5. A7 Partial Vertical amplifier board.

MS011436



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REV DEC 1981

TRIGGER AMPLIFIER & SWITCHING ④

EKP

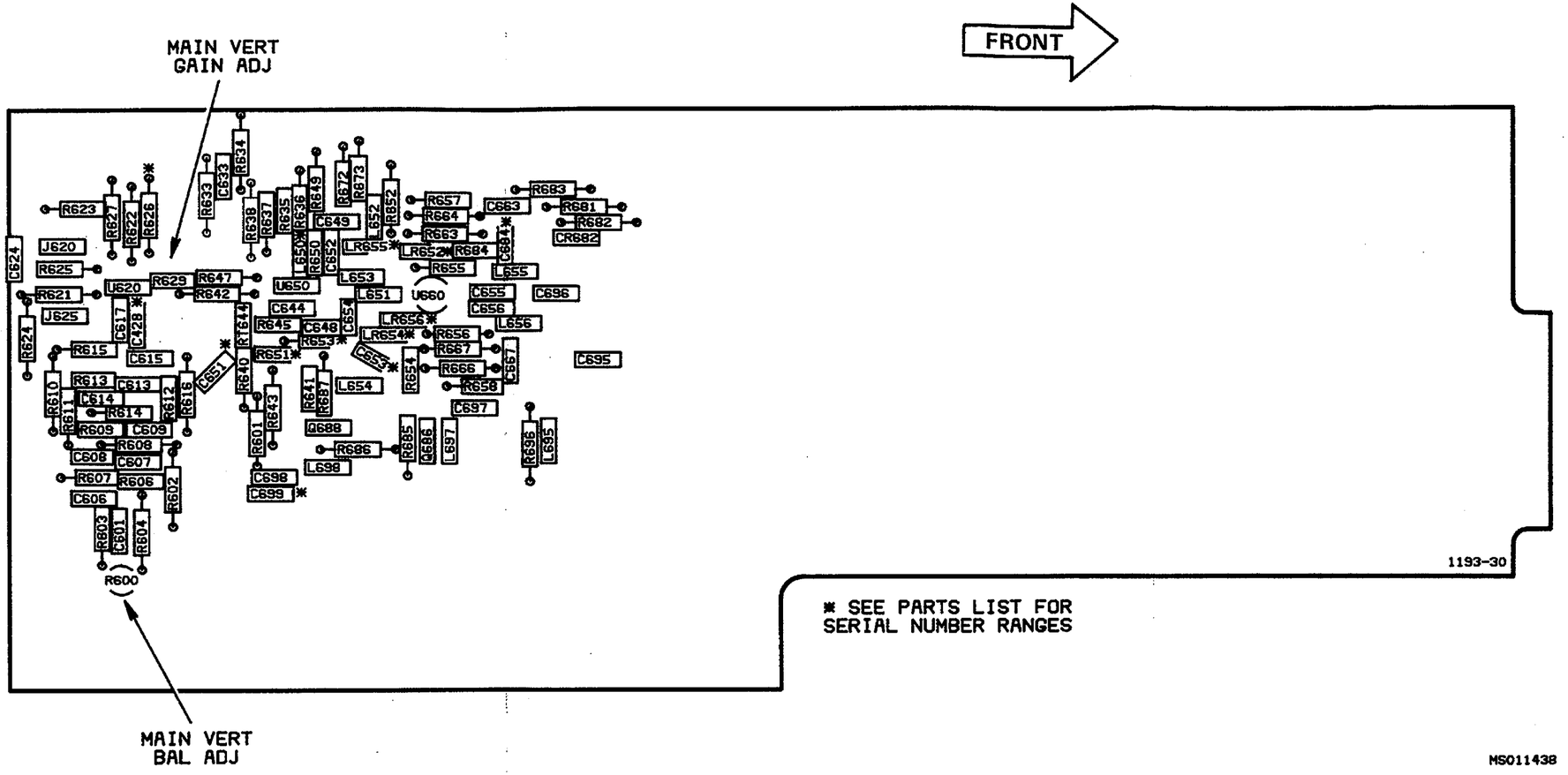
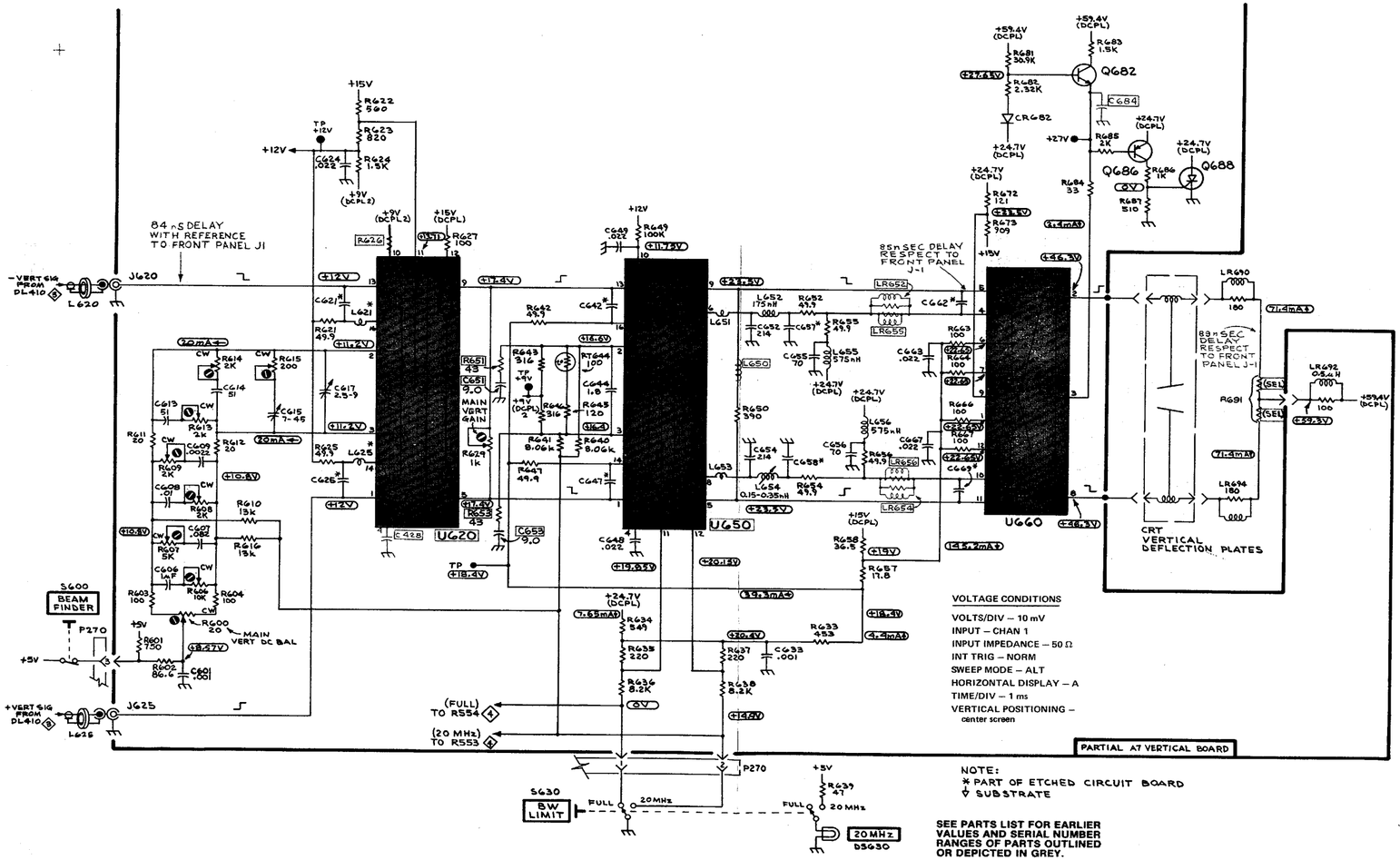


Fig. 8-6. A7 Partial Vertical amplifier board.


84 nS DELAY WITH REFERENCE TO FRONT PANEL J1
85nSEC DELAY RESPECT TO FRONT PANEL J-1
88nSEC DELAY RESPECT TO FRONT PANEL J-1
J620
J625
U620
U650
UG60
S600 BEAM FINDER
S630 BW LIMIT
P270
Q682
Q686
Q688
CRT VERTICAL DEFLECTION PLATES
MAIN VERT DC BAL
MAIN VERT GAIN
(FULL) TO RS54
(20 MHz) TO RS53
20 MHz DS630
PARTIAL A7 VERTICAL BOARD
VOLTAGE CONDITIONS
VOLTS/DIV – 10 mV
INPUT – CHAN 1
INPUT IMPEDANCE – 50 Ω
INT TRIG – NORM
SWEEP MODE – ALT
HORIZONTAL DISPLAY – A
TIME/DIV – 1 ms
VERTICAL POSITIONING – center screen
NOTE:
* PART OF ETCHED CIRCUIT BOARD
◊ SUBSTRATE
SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.

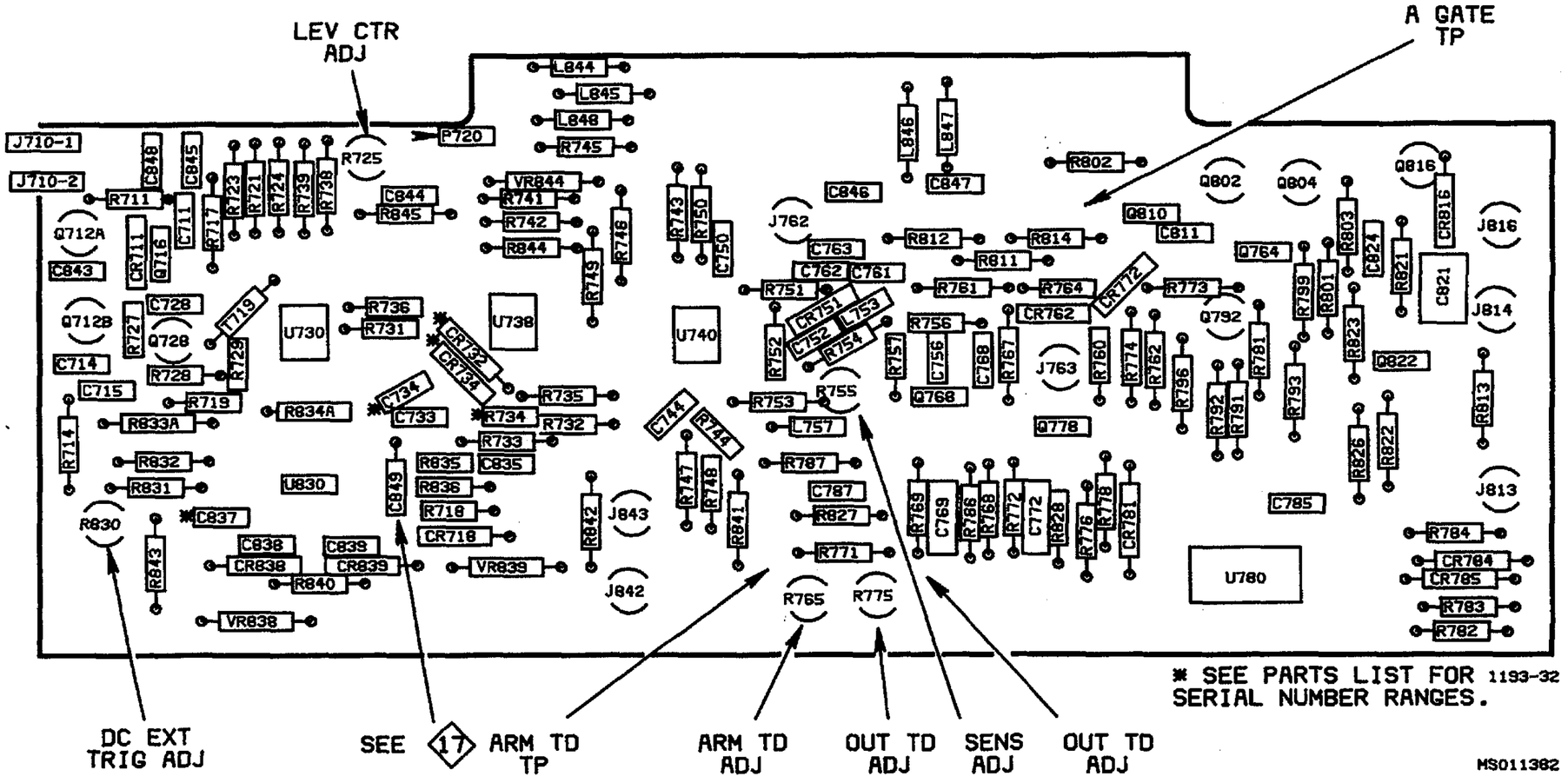


Fig. 8-7A. A8 A Trigger board (485 only).

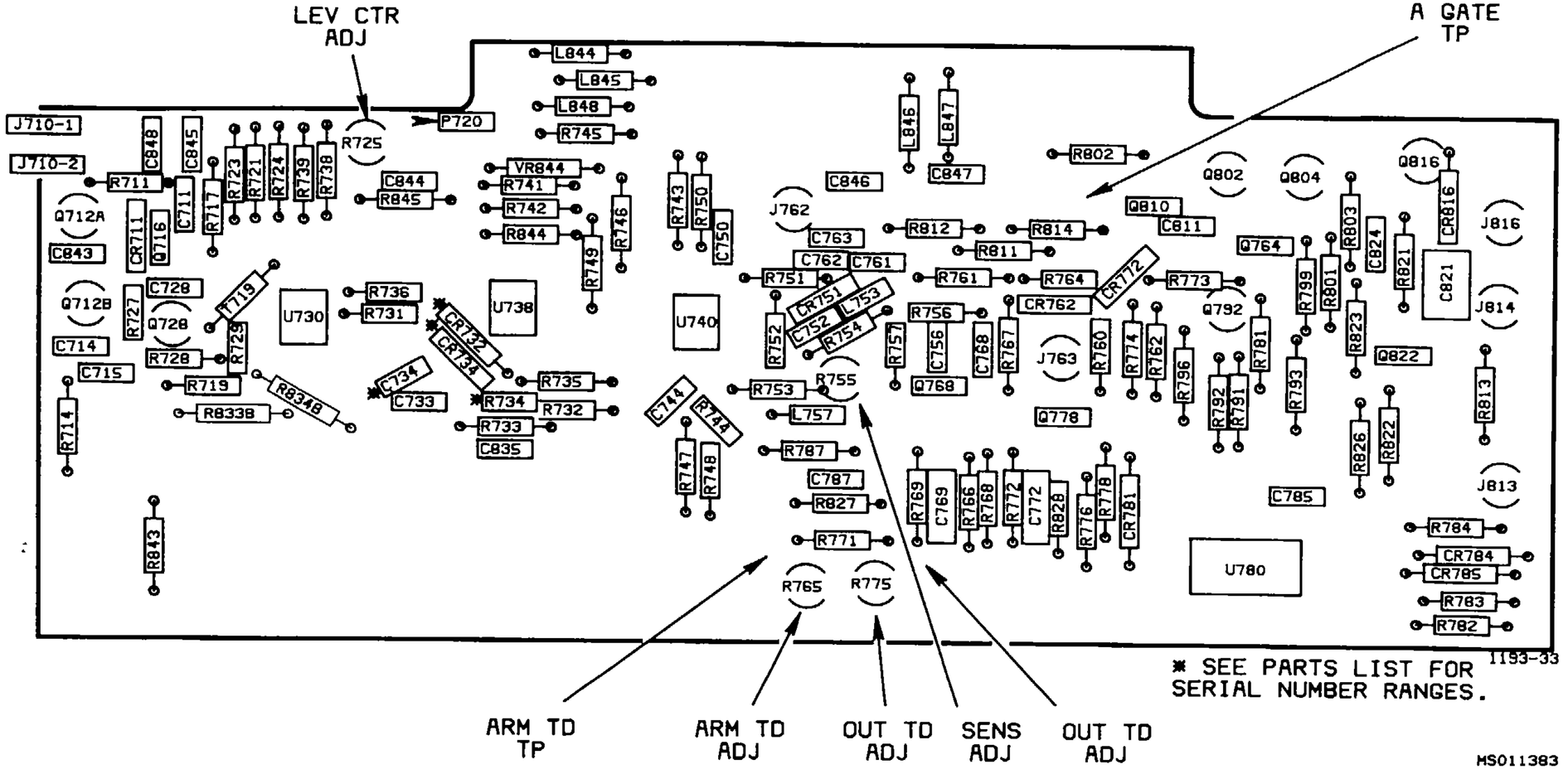
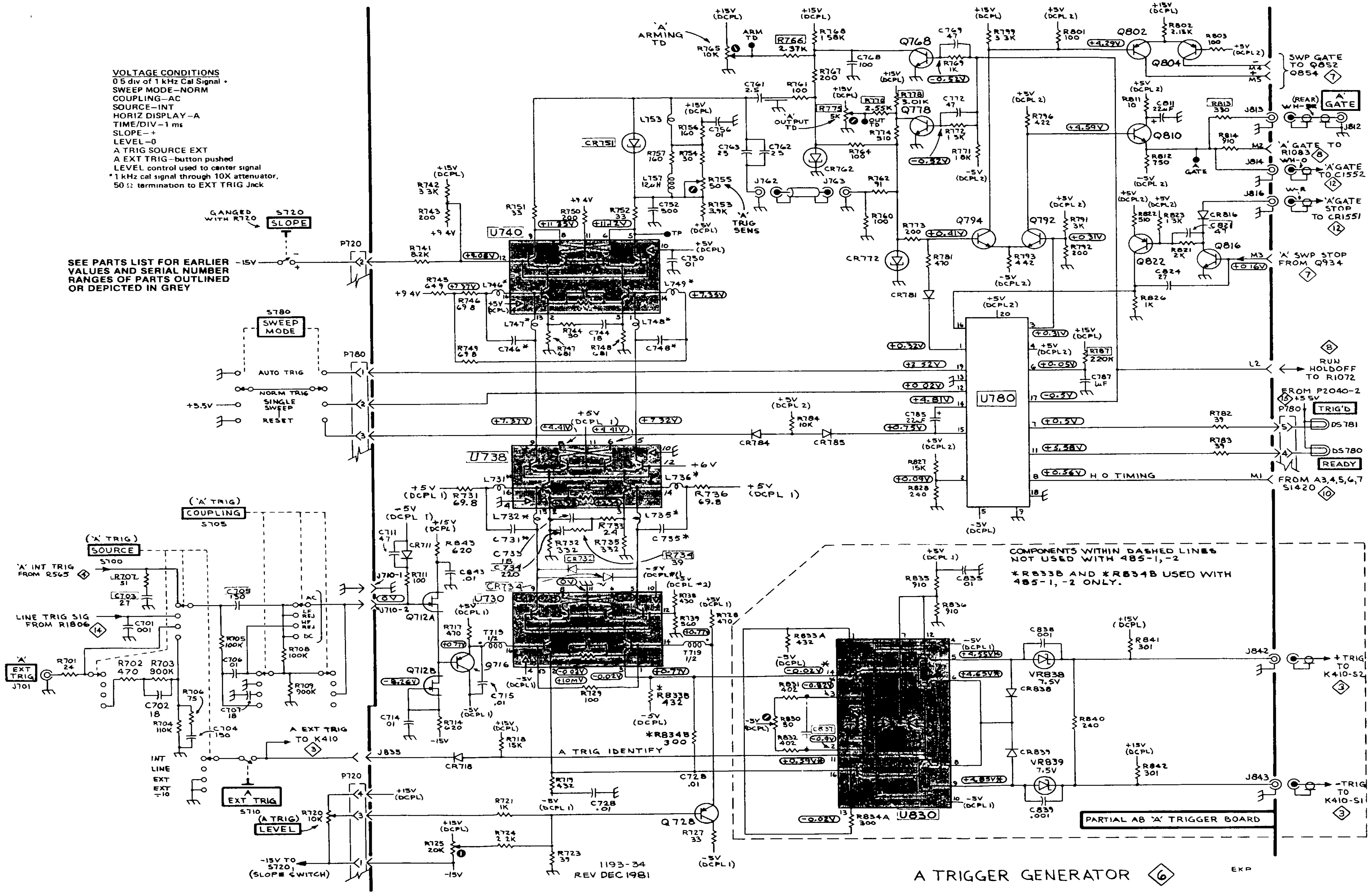
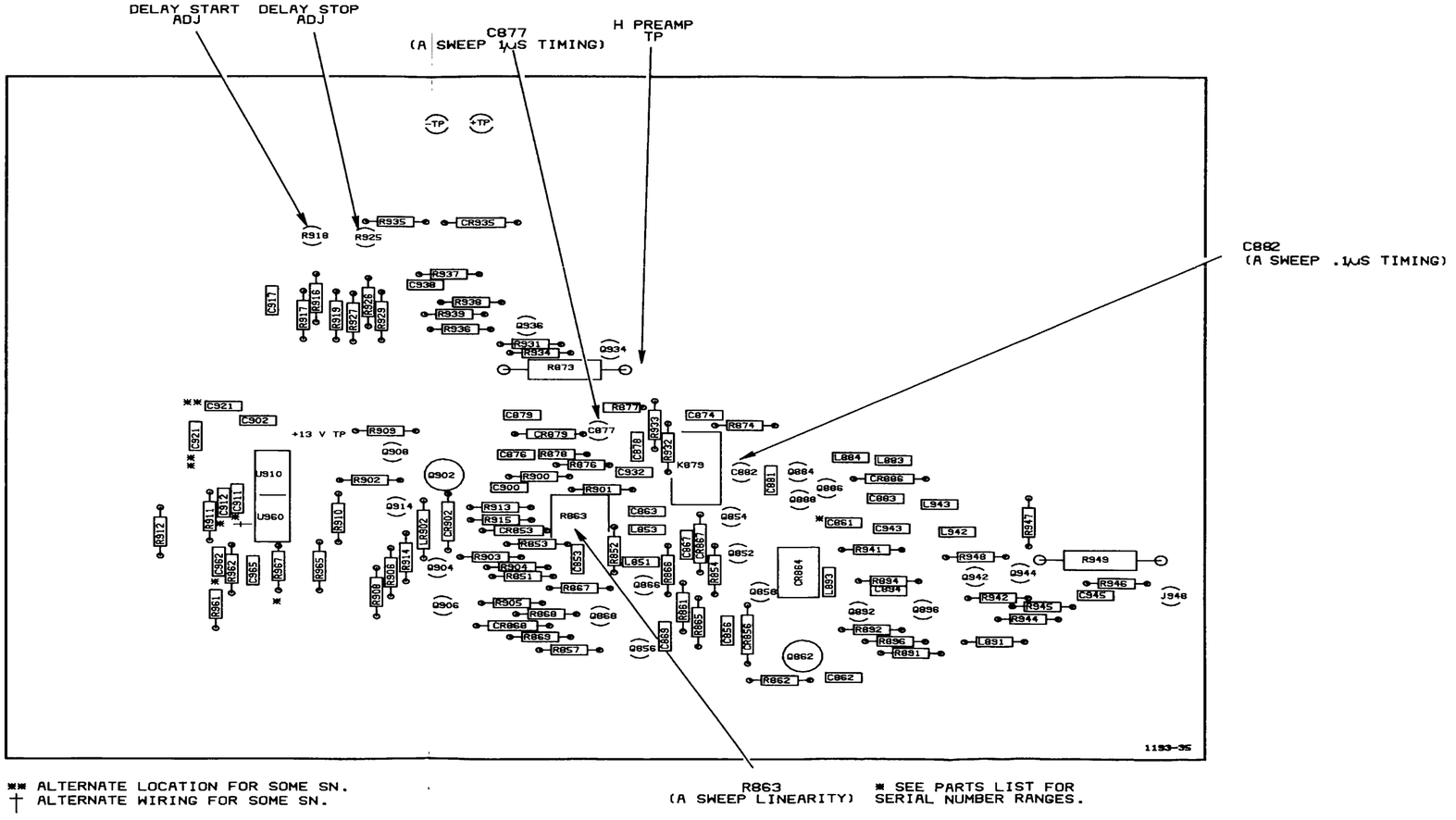


Fig. 8-7B. A8 A Trigger board (485-1, -2 only).


VOLTAGE CONDITIONS
0.5 div of 1 kHz Cal Signal *
SWEEP MODE—NORM
COUPLING—AC
SOURCE—INT
HORIZ DISPLAY—A
TIME/DIV—1 ms
SLOPE—+
LEVEL—0
A TRIG SOURCE EXT
A EXT TRIG—button pushed
LEVEL control used to center signal
*1 kHz cal signal through 10X attenuator, 50 Ω termination to EXT TRIG Jack
SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY
COMPONENTS WITHIN DASHED LINES NOT USED WITH 485-1, -2
*R833B AND *R834B USED WITH 485-1, -2 ONLY.
PARTIAL A8 'A' TRIGGER BOARD
1193-34
REV DEC 1981
A TRIGGER GENERATOR 6

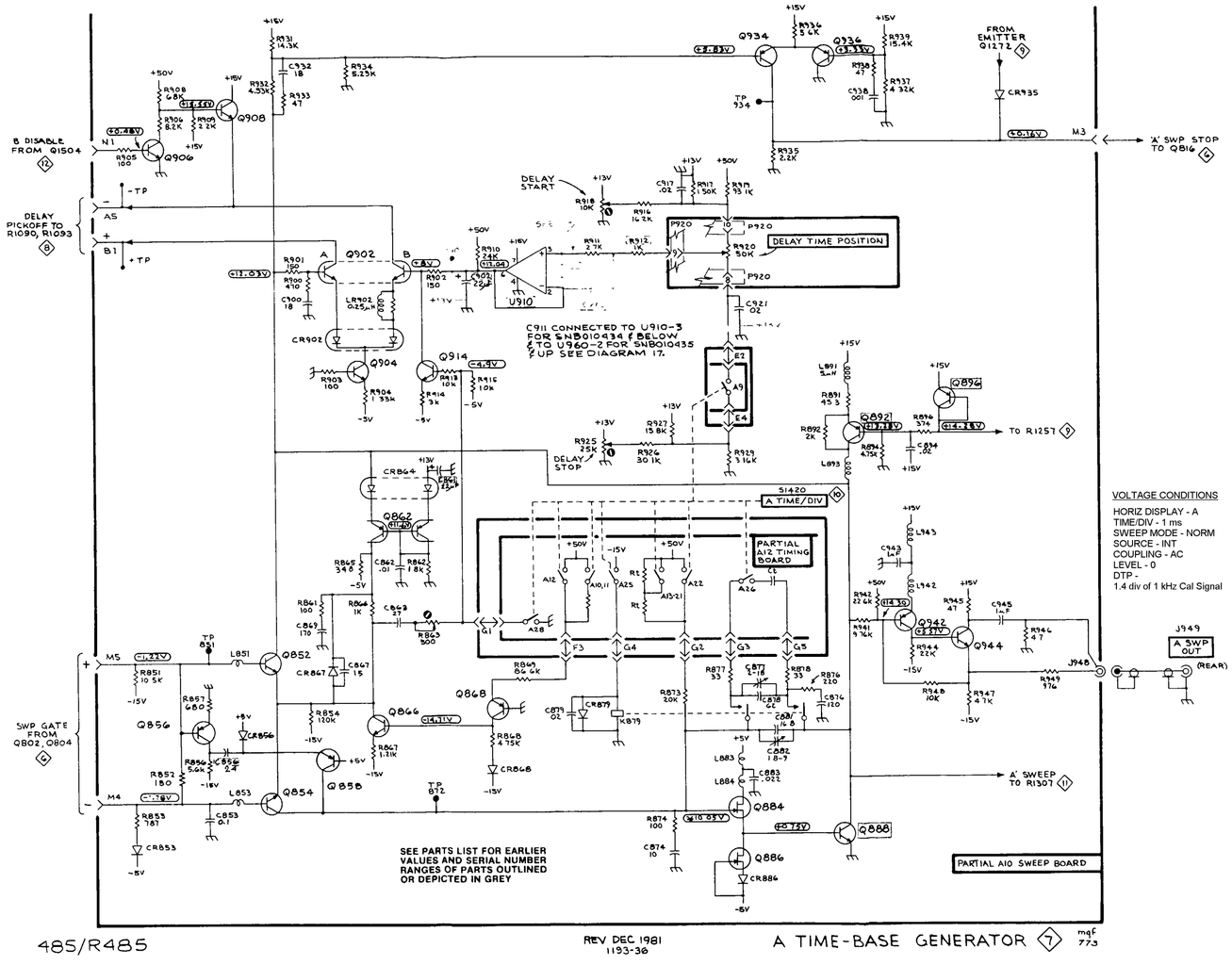


** ALTERNATE LOCATION FOR SOME SN.
† ALTERNATE WIRING FOR SOME SN.

* SEE PARTS LIST FOR SERIAL NUMBER RANGES.

Fig. 8-8. A10 Partial Sweep board
REV DEC 1981

MS011427



485/R485 REV DEC 1981 1193-36 A TIME-BASE GENERATOR 7 mgf 773

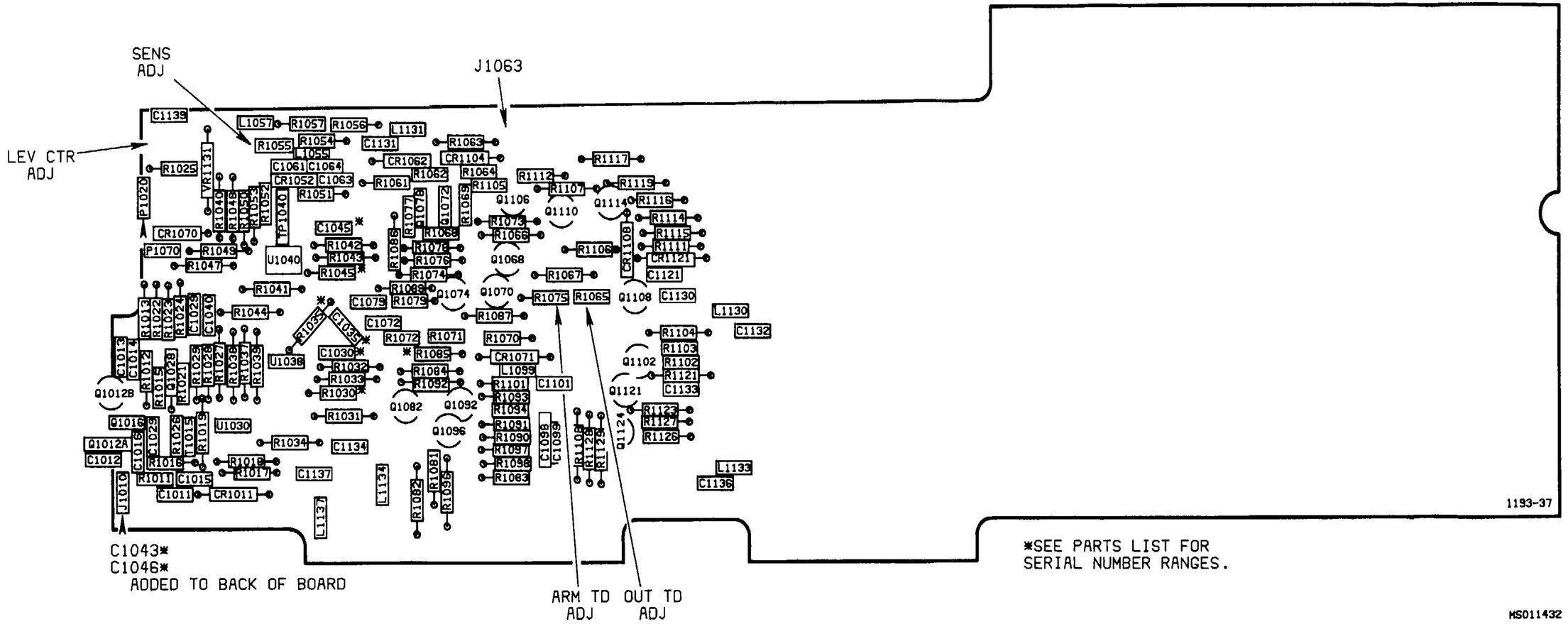
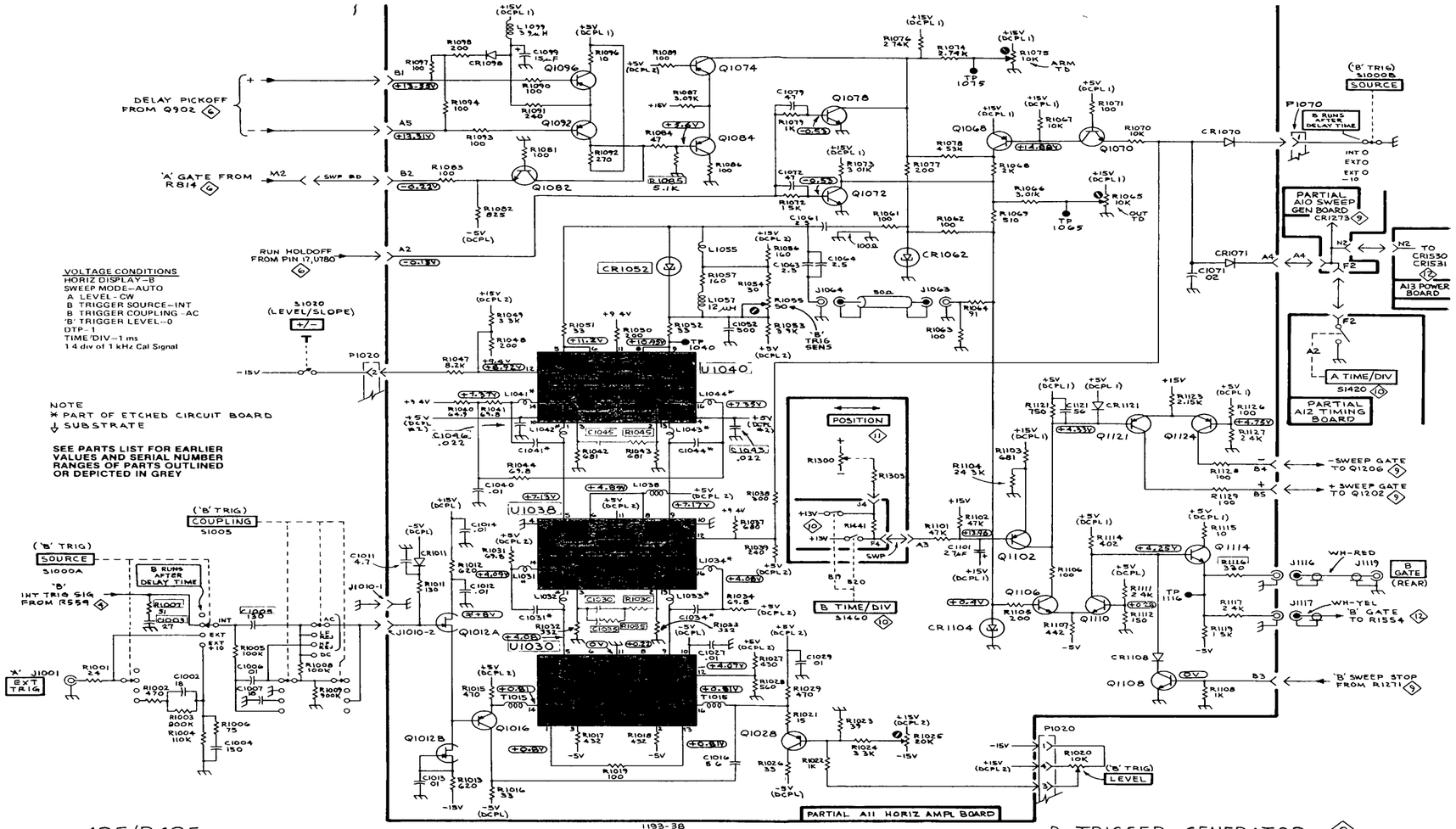
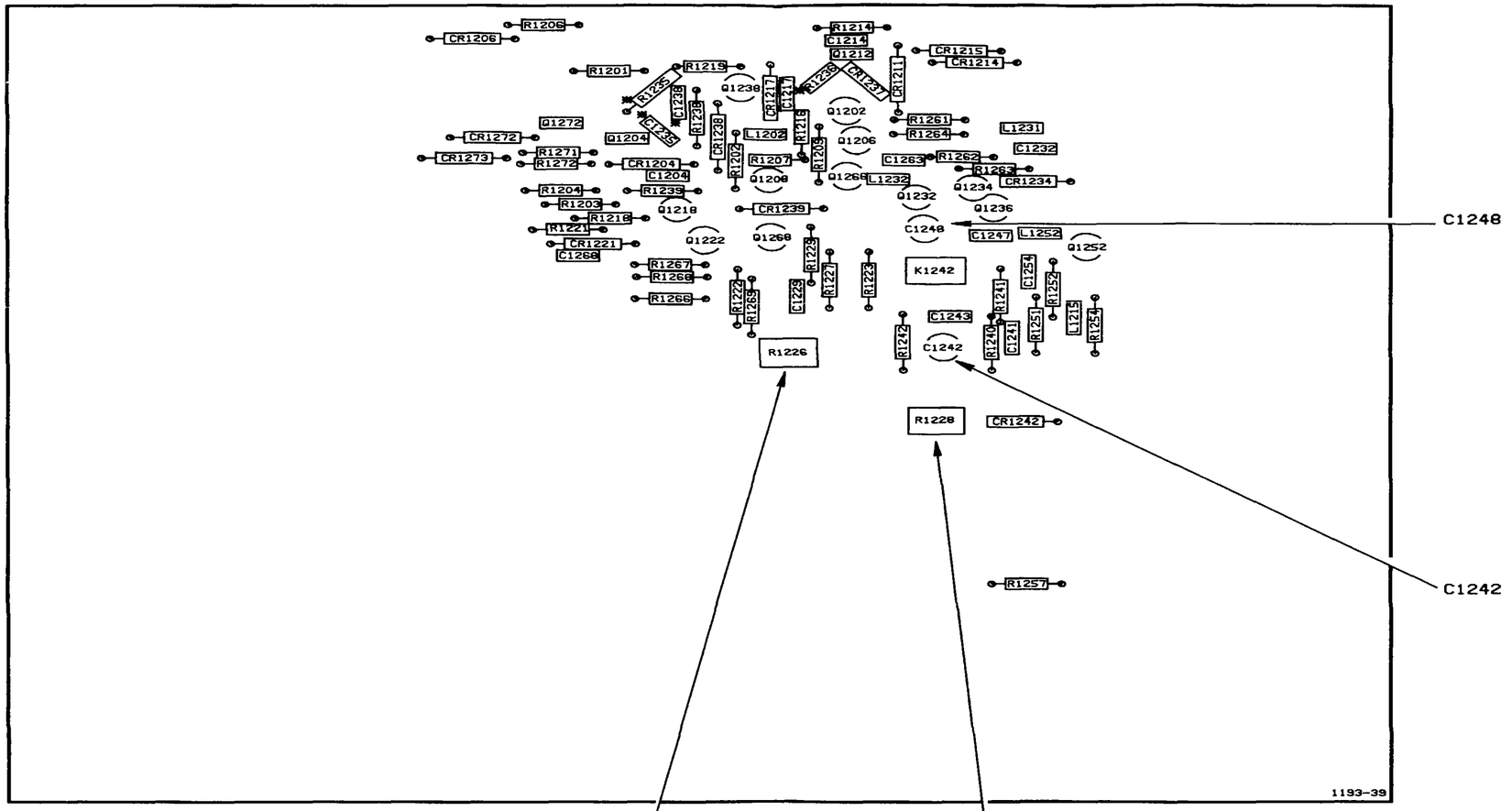


Fig. 8-9. A11 Partial Horizontal amplifier board.



485/R485

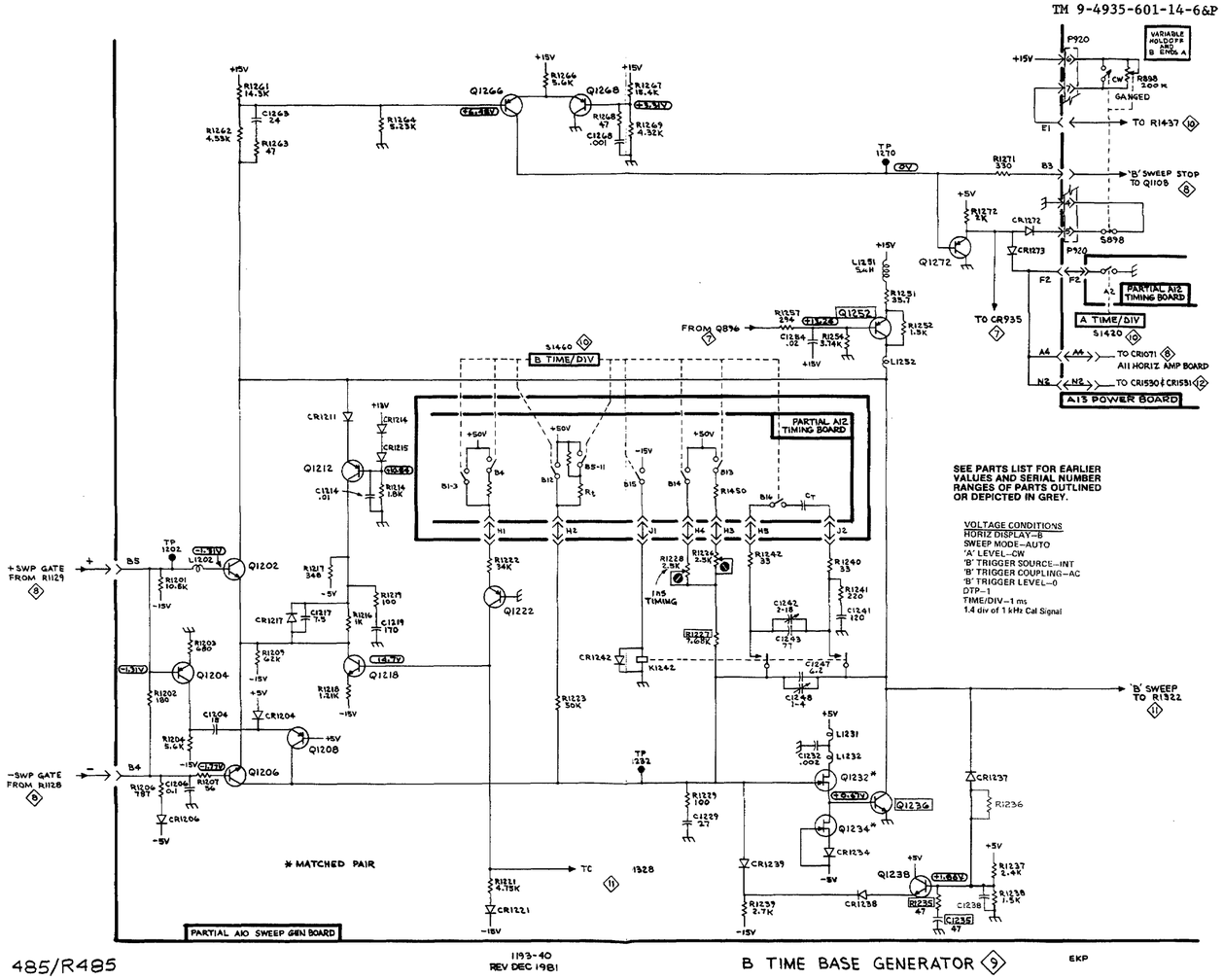
B TRIGGER GENERATOR (8)



* SEE PARTS LIST FOR SERIAL NUMBER RANGES.

Fig. 8-10. A10 Partial Sweep board
REV DEC 1981

TM 9-4935-601-14-6&P



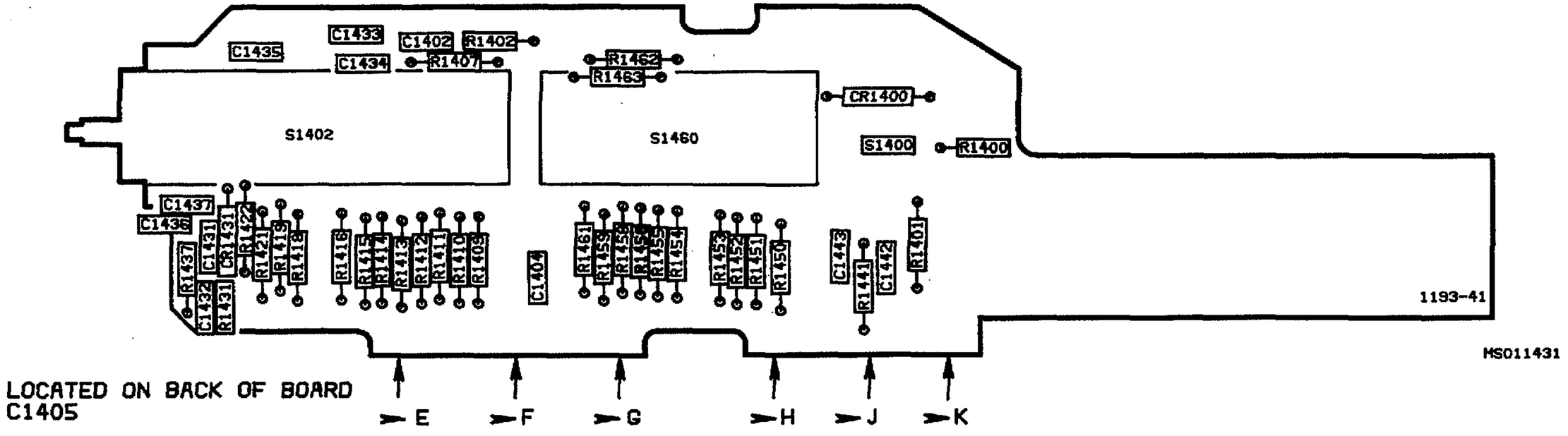
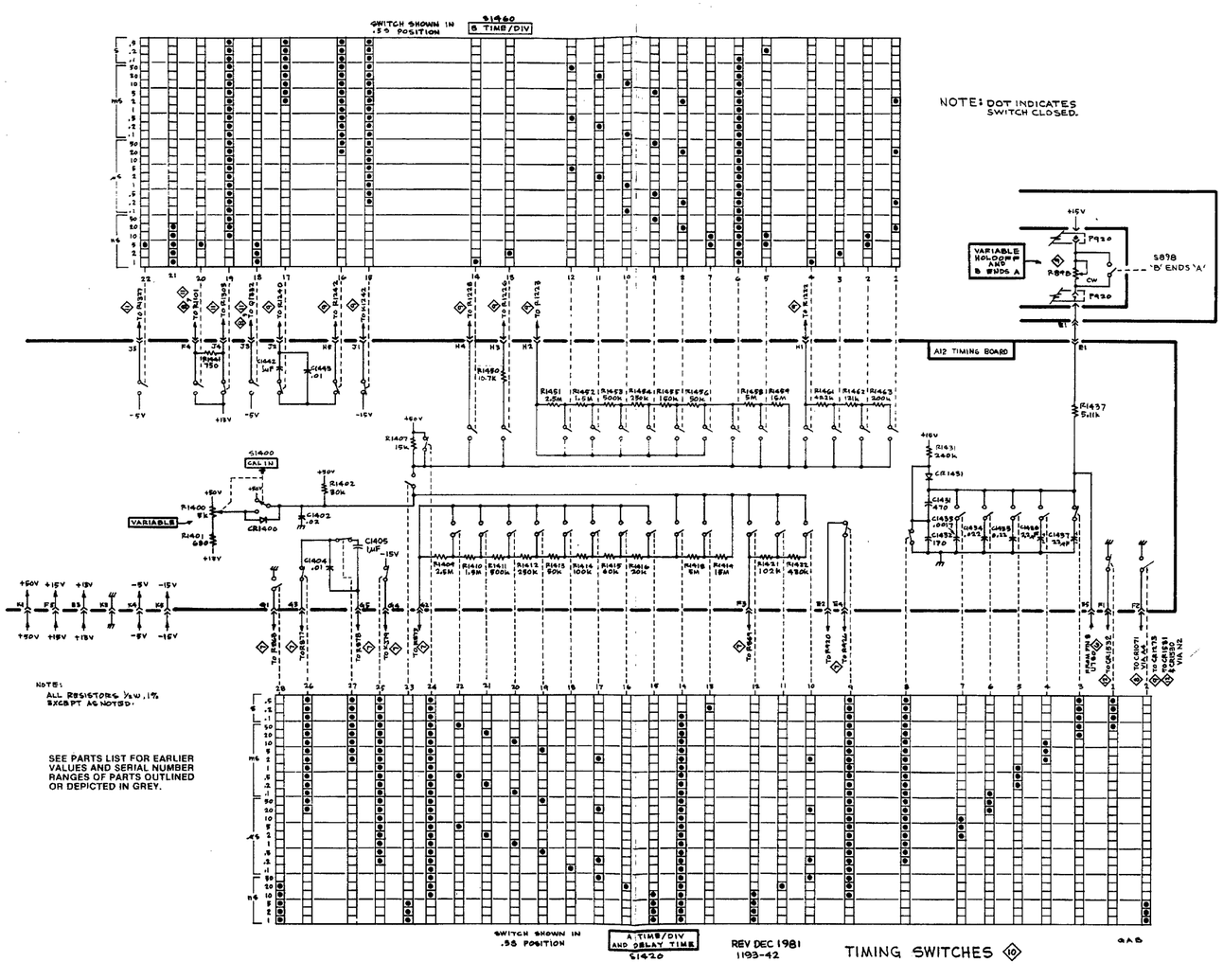


Fig. 8-11. A12 Partial Timing switch board.


SWITCH SHOWN IN .5 POSITION
S1460
B TIME/DIV
NOTE: DOT INDICATES SWITCH CLOSED.
VARIABLE HOLDOFF ADJ B ENDS A
S878 'B' ENDS 'A'
A12 TIMING BOARD
S1400 CAL IN
VARIABLE
ALL RESISTORS ½W, 1% EXCEPT AS NOTED.
SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.
SWITCH SHOWN IN .55 POSITION
A TIME/DIV AND DELAY TIME
S1420
REV DEC 1981
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TIMING SWITCHES 10

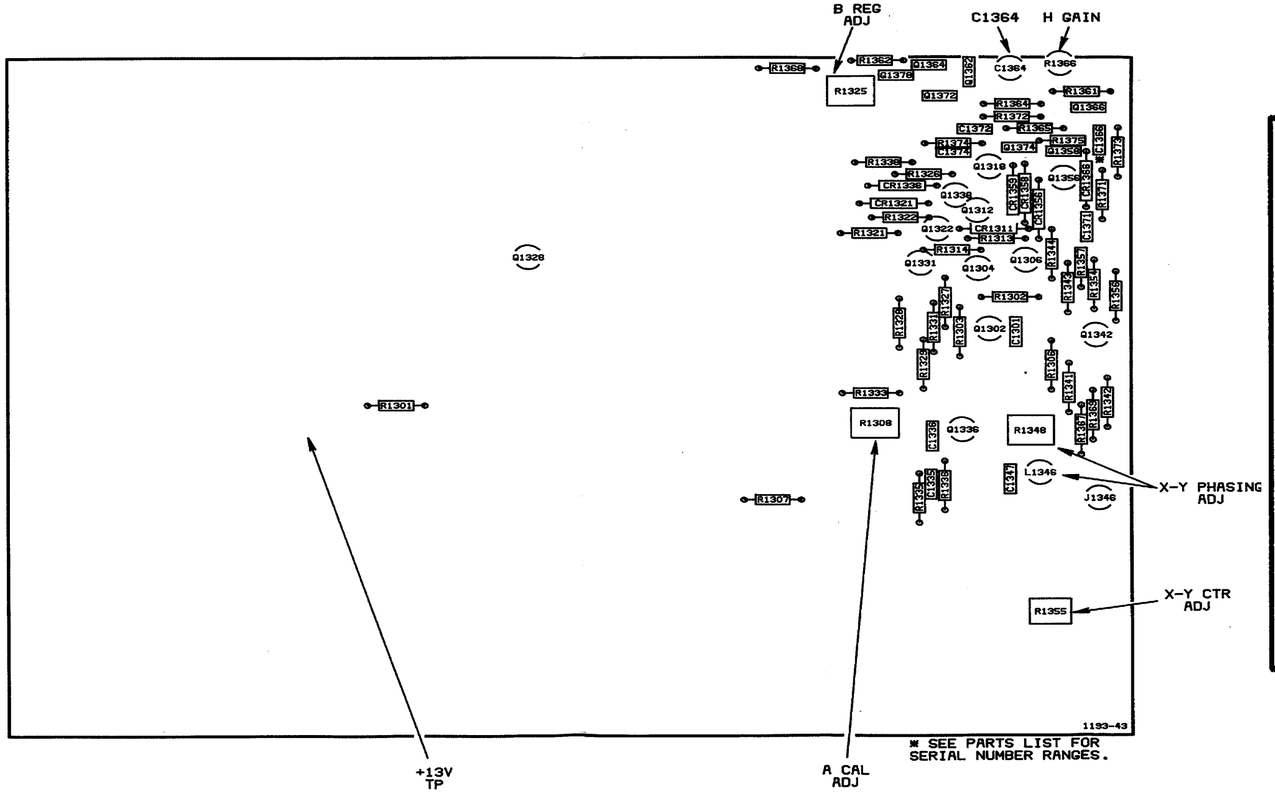


Fig. 8-12. A10 Partial Sweep board.

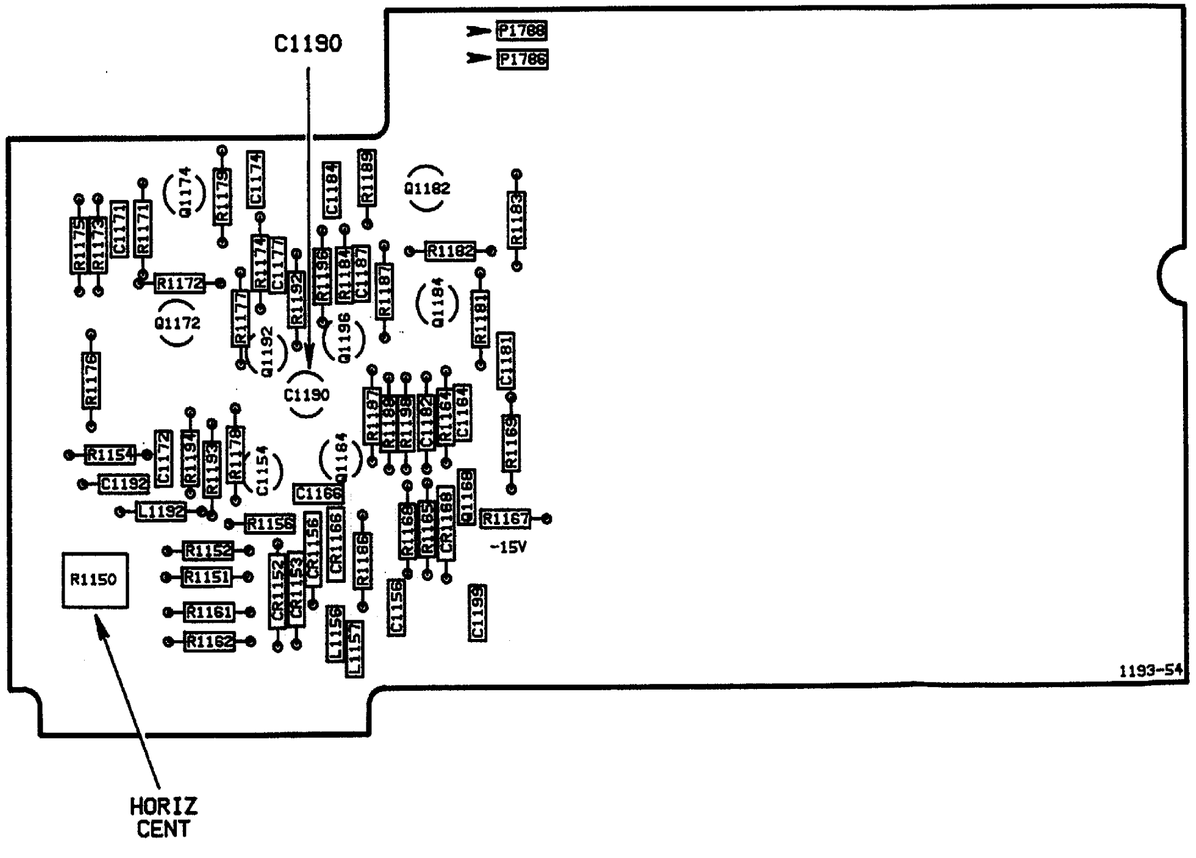
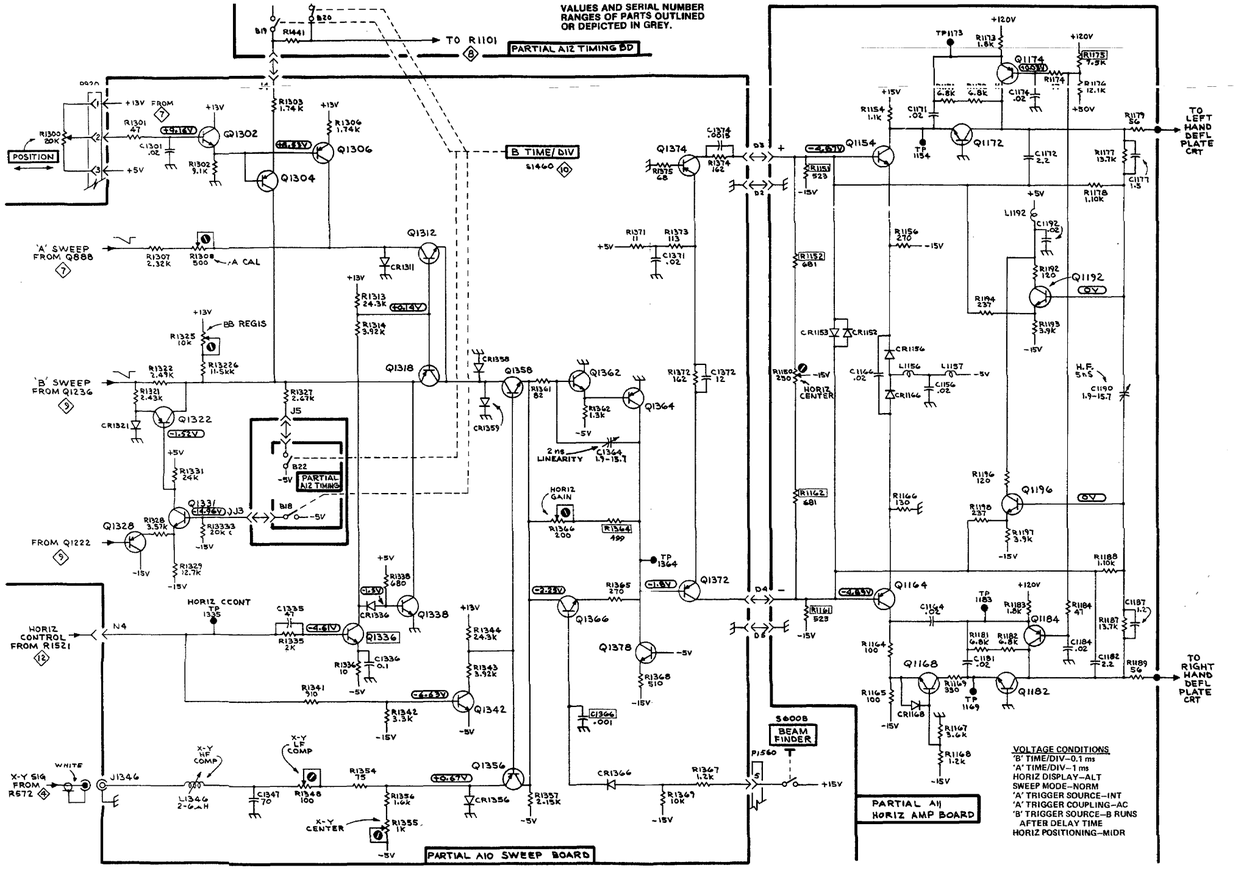


Fig. 8-13. A11 Partial Horizontal amplifier board.



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REV DEC 1981

HORIZONTAL AMPLIFIER 11 mgf

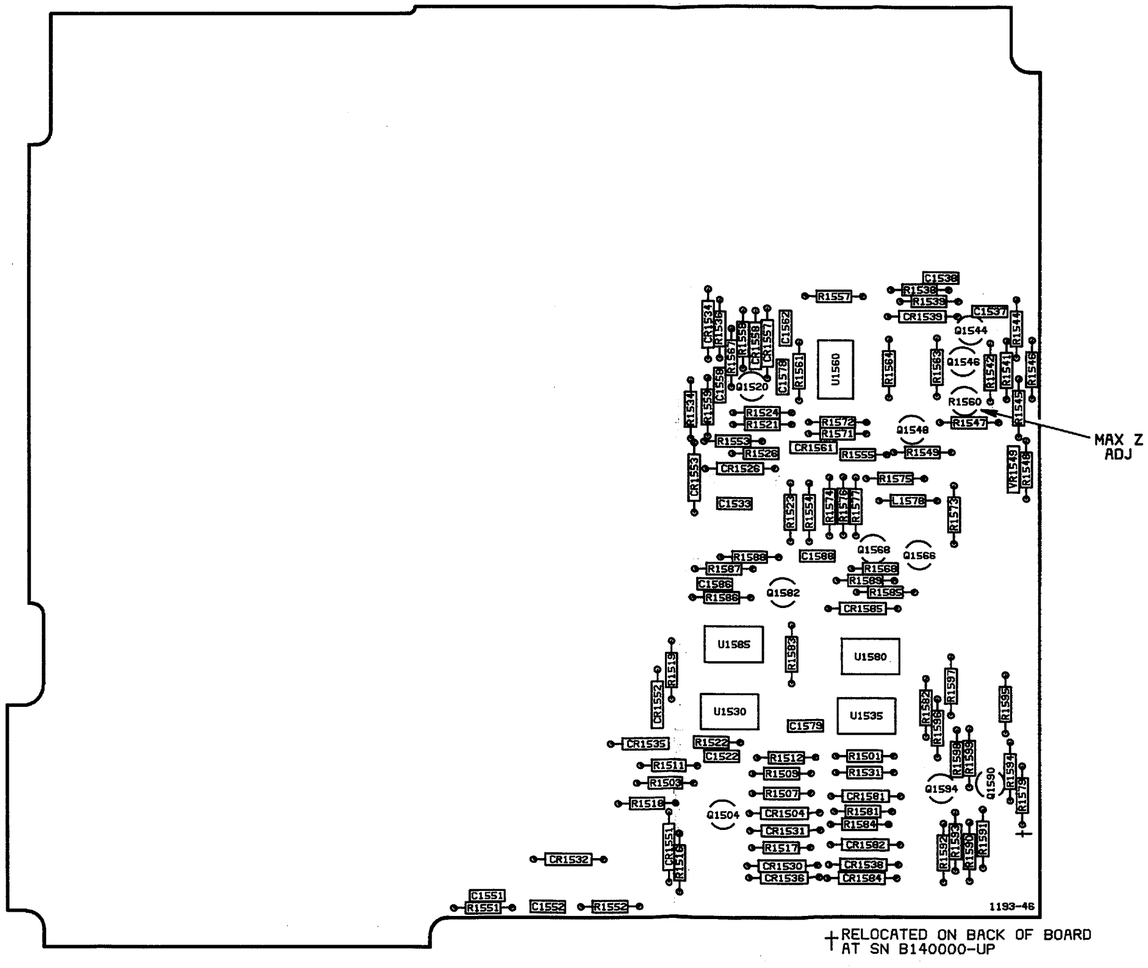
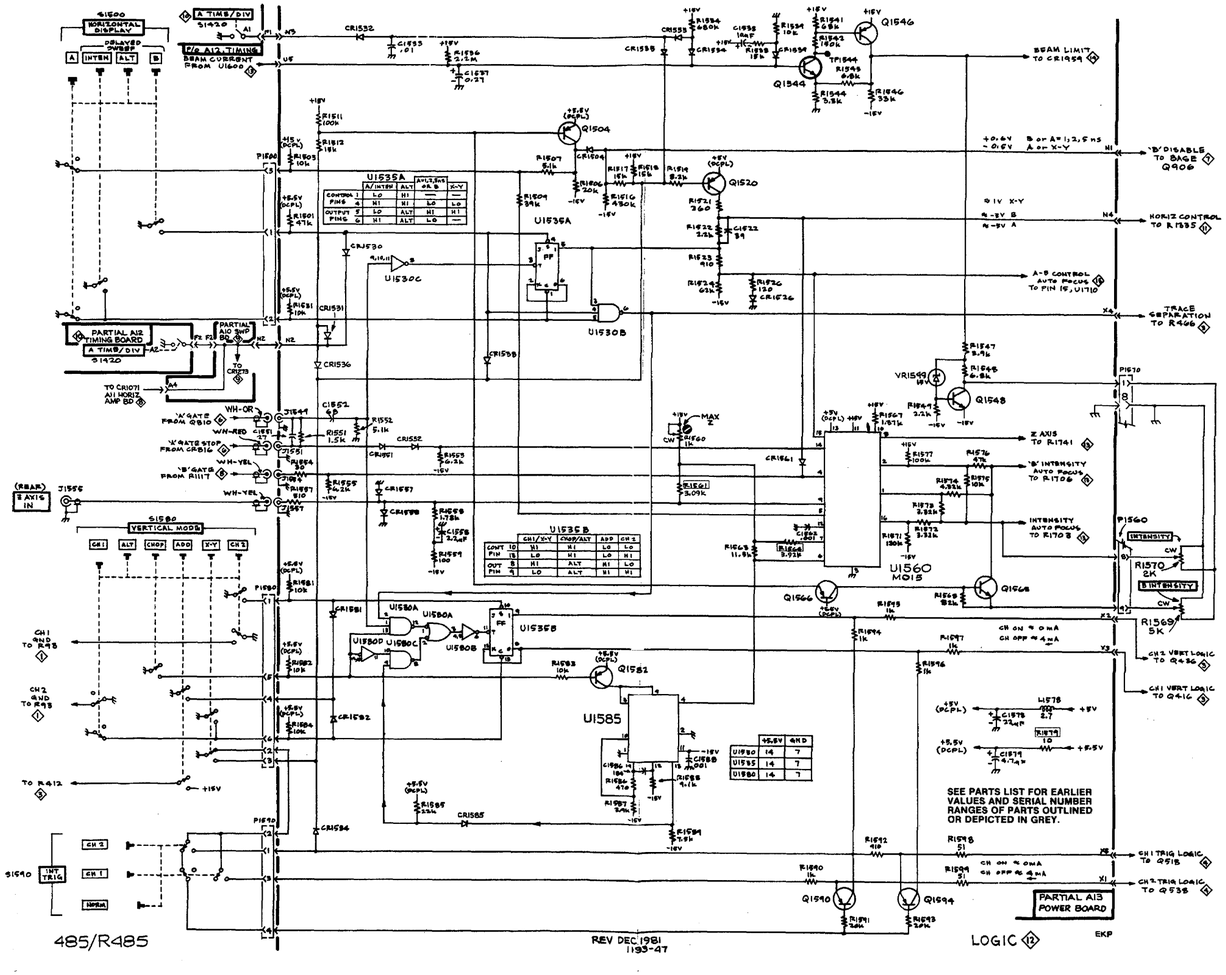


Fig. 8-14. A13 Partial Power supply board.


HORIZONTAL DISPLAY
DELAYED SWEEP
A
INTEN
ALT
B
A TIME/DIV
S1430
P/O A12 TIMING
BEAM CURRENT FROM U1600
PARTIAL A12 TIMING BOARD
A TIME/DIV
S1430
PARTIAL A12 SWP BD
TO CR1071 A11 HORIZ AMP BD
'A' GATE FROM QB10
'B' GATE FROM CR816
'B' GATE FROM A11I1
(REAR) Z AXIS IN
J1556
VERTICAL MODE
CH1
ALT
CHOP
ADD
X-Y
CH2
CH 1 AND R48
CH 2 AND R48
TO R412
S1540
INT TRIG
CH 2
CH 1
NORM
485/R485
U1535A
U1535B
U1530C
U1530B
U1580A
U1580B
U1580C
U1585
U1560
MOI5
Q1504
Q1520
Q1544
Q1546
Q1548
Q1566
Q1568
Q1582
Q1940
Q1944
BEAM LIMIT TO CR1954
'B' DISABLE TO BAGE Q906
HORIZ CONTROL TO R1535
A-B CONTROL AUTO FOCUS TO PIN 19, U1110
TRACE SEPARATION TO R466
Z AXIS TO R1141
'B' INTENSITY AUTO FOCUS TO R1706
INTENSITY AUTO FOCUS TO R1708
CH2 VERT LOGIC TO Q436
CH1 VERT LOGIC TO Q416
CH1 TRIG LOGIC TO Q915
CH2 TRIG LOGIC TO Q735
SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.
PARTIAL A13 POWER BOARD
LOGIC
EKP
REV DEC 1981
1193-47

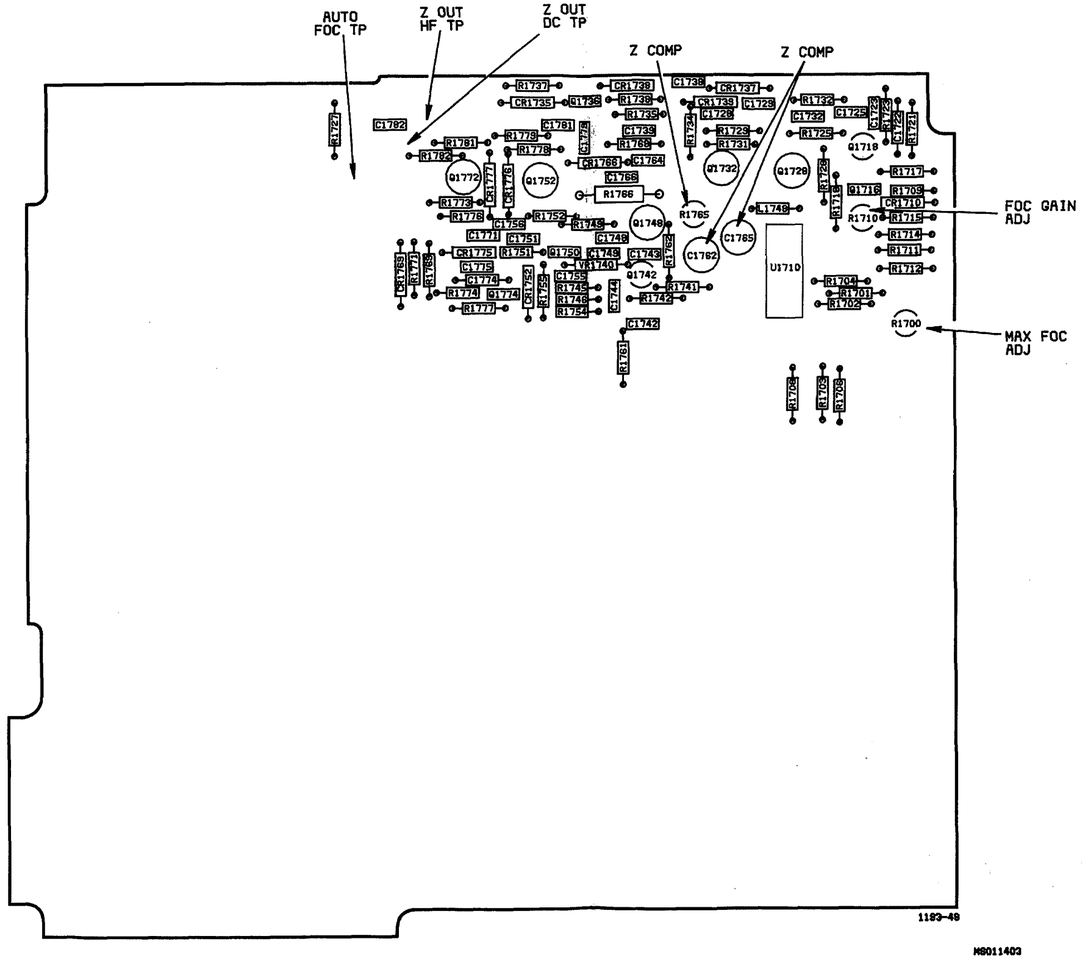


Fig. 8-15. A13 Partial Power Supply board.

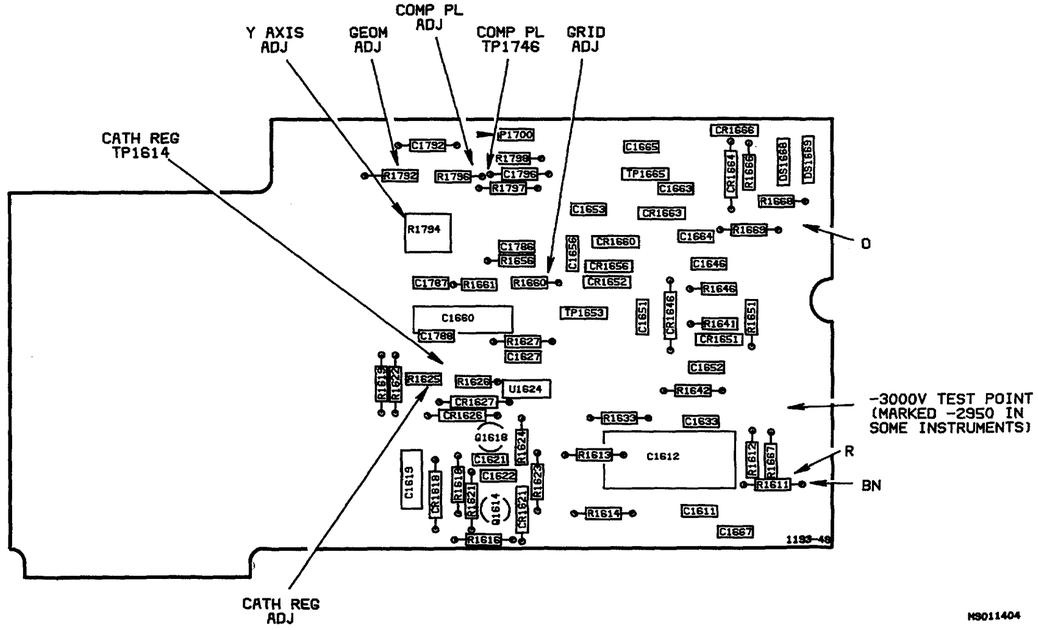


Fig. 8-16. A11 Partial Horizontal amplifier board.

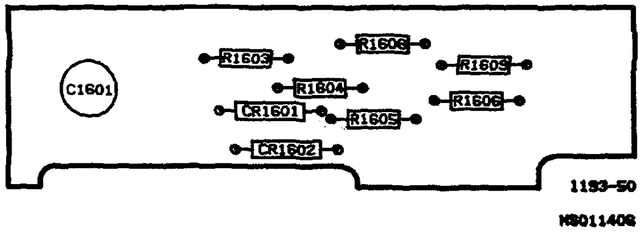


Fig. 8-17. A15 Partial Transformer board.

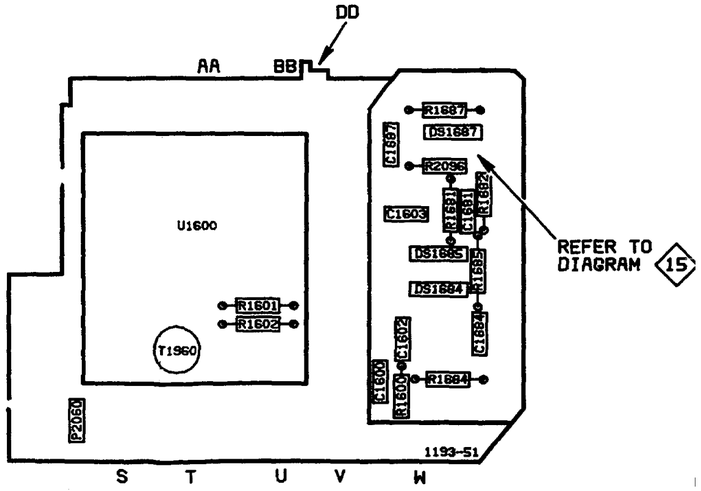
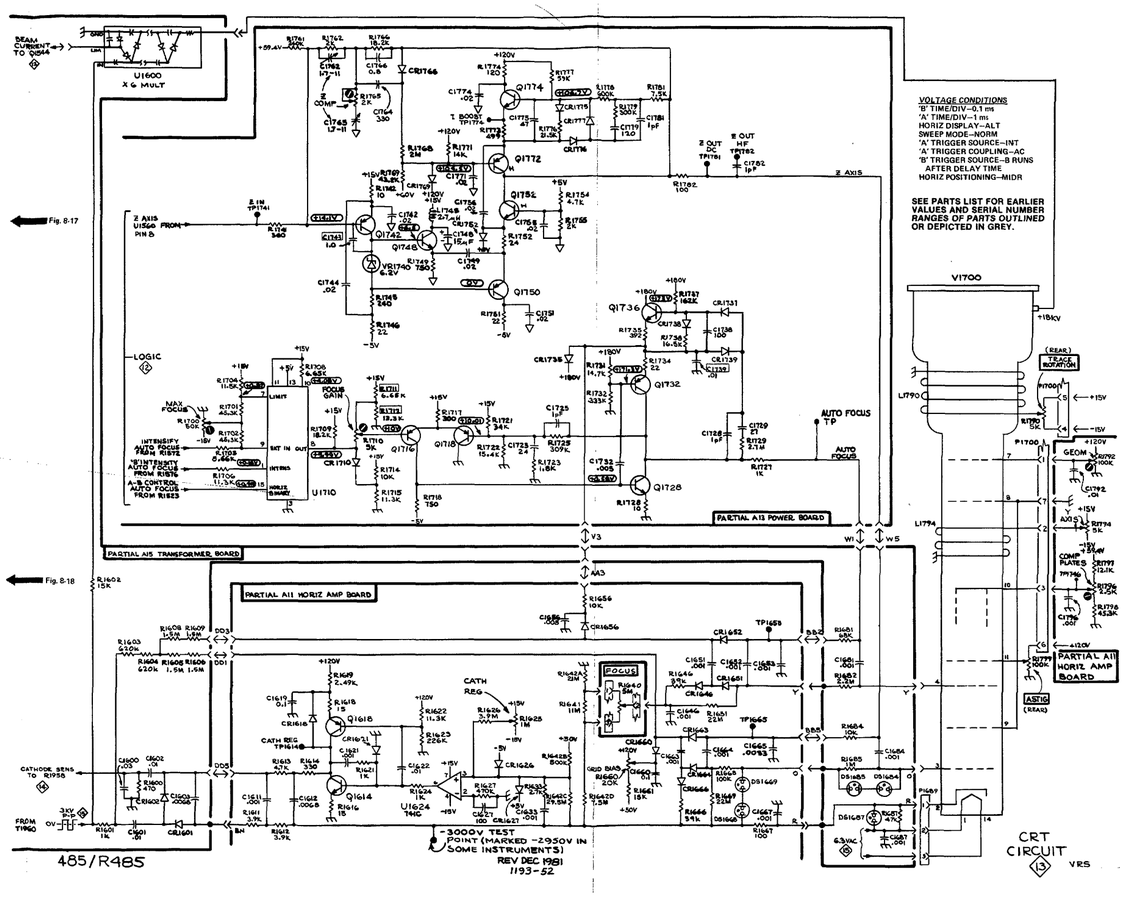


Fig. 8-18. A15 Transformer board.



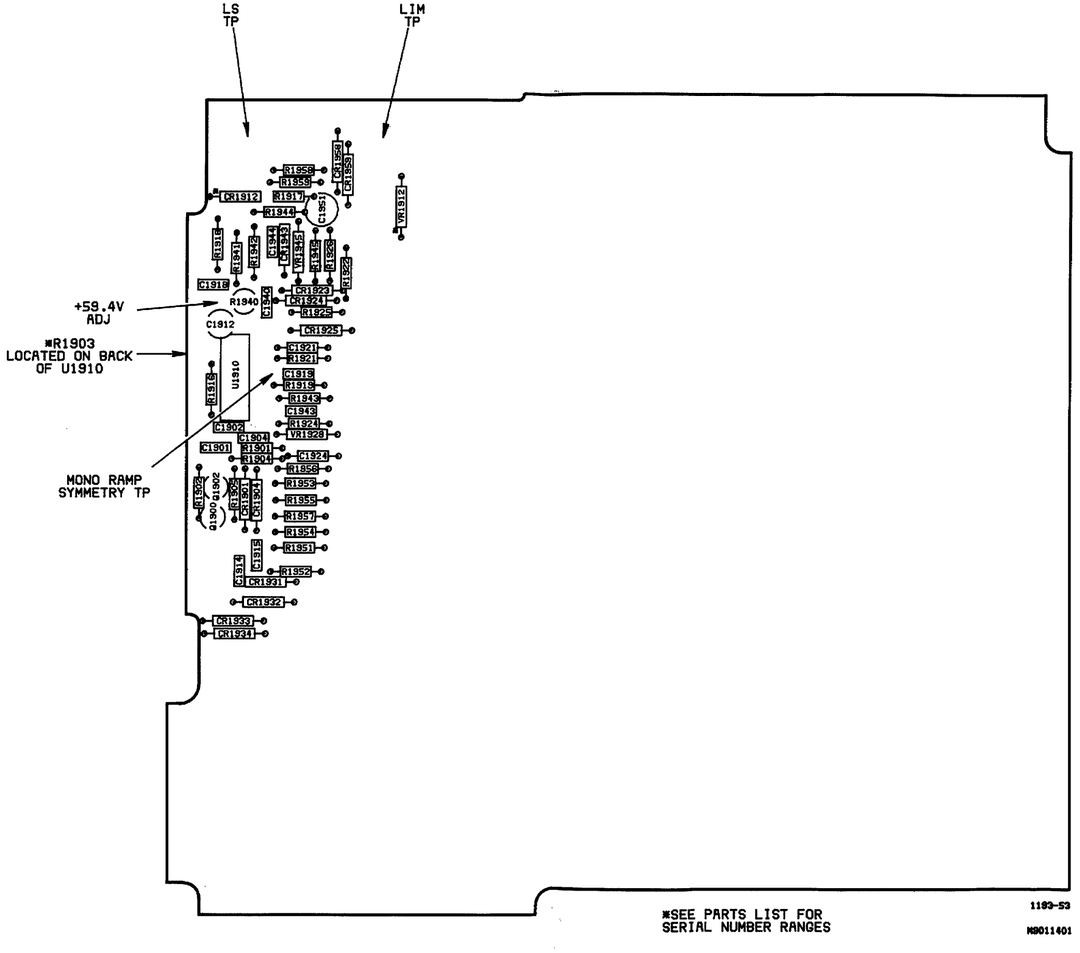


Fig. 8-19. A13 Partial Power Supply board.

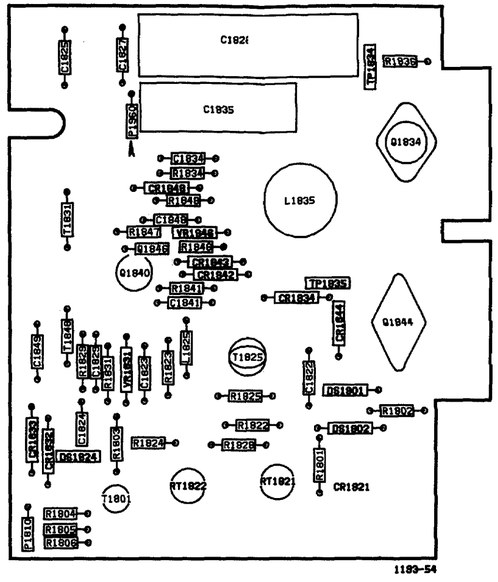


Fig. 8-20. A14 Inverter board.

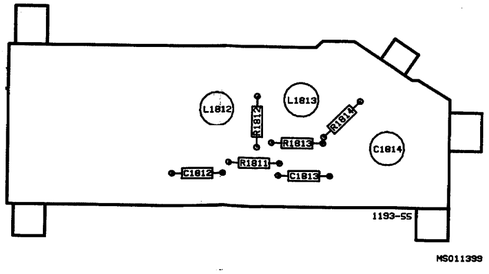
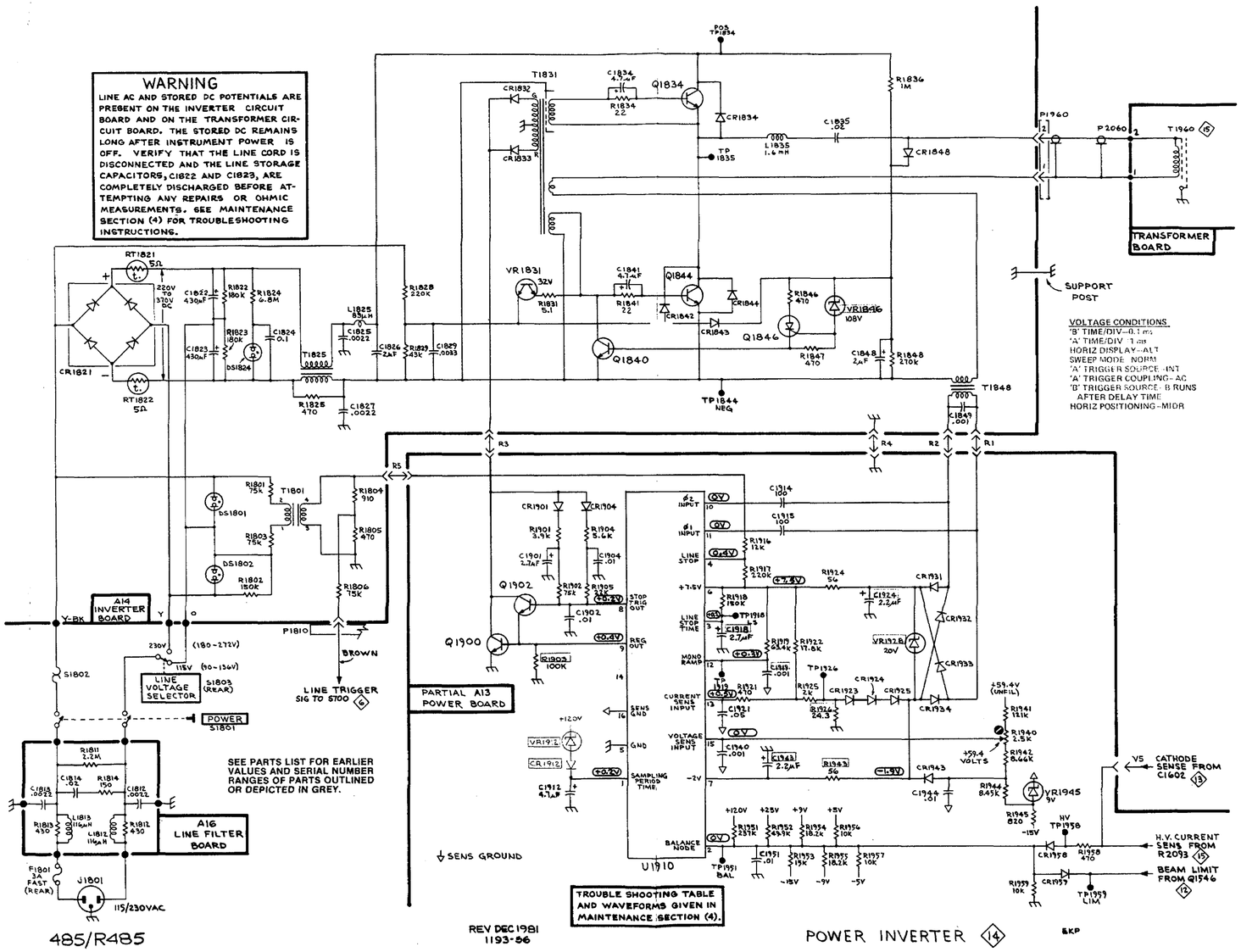


Fig. 8-21. A16 Line Filter board.


WARNING
LINE AC AND STORED DC POTENTIALS ARE PRESENT ON THE INVERTER CIRCUIT BOARD AND ON THE TRANSFORMER CIRCUIT BOARD. THE STORED DC REMAINS LONG AFTER INSTRUMENT POWER IS OFF. VERIFY THAT THE LINE CORD IS DISCONNECTED AND THE LINE STORAGE CAPACITORS, C1822 AND C1823, ARE COMPLETELY DISCHARGED BEFORE ATTEMPTING ANY REPAIRS OR OHMIC MEASUREMENTS. SEE MAINTENANCE SECTION (4) FOR TROUBLESHOOTING INSTRUCTIONS.
TRANSFORMER BOARD
SUPPORT POST
VOLTAGE CONDITIONS
'B' TIME/DIV—0.1 ms
'A' TIME/DIV—1 ms
HORIZ DISPLAY—ALT
SWEEP MODE—NORM
'A' TRIGGER SOURCE—INT
'A' TRIGGER COUPLING—AC
'B' TRIGGER SOURCE—B RUNS AFTER DELAY TIME
HORIZ POSITIONING—MIDR
A14 INVERTER BOARD
A16 LINE FILTER BOARD
PARTIAL A13 POWER BOARD
LINE VOLTAGE SELECTOR
POWER
LINE TRIGGER SIG TO 5700
BROWN
SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.
SENS GROUND
TROUBLE SHOOTING TABLE AND WAVEFORMS GIVEN IN MAINTENANCE SECTION (4).
H.V. CURRENT SENS FROM R2093
BEAM LIMIT FROM Q1546
CATHODE SENSE FROM C1602
115/230VAC
485/R485
REV DEC 1981
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POWER INVERTER
8KP

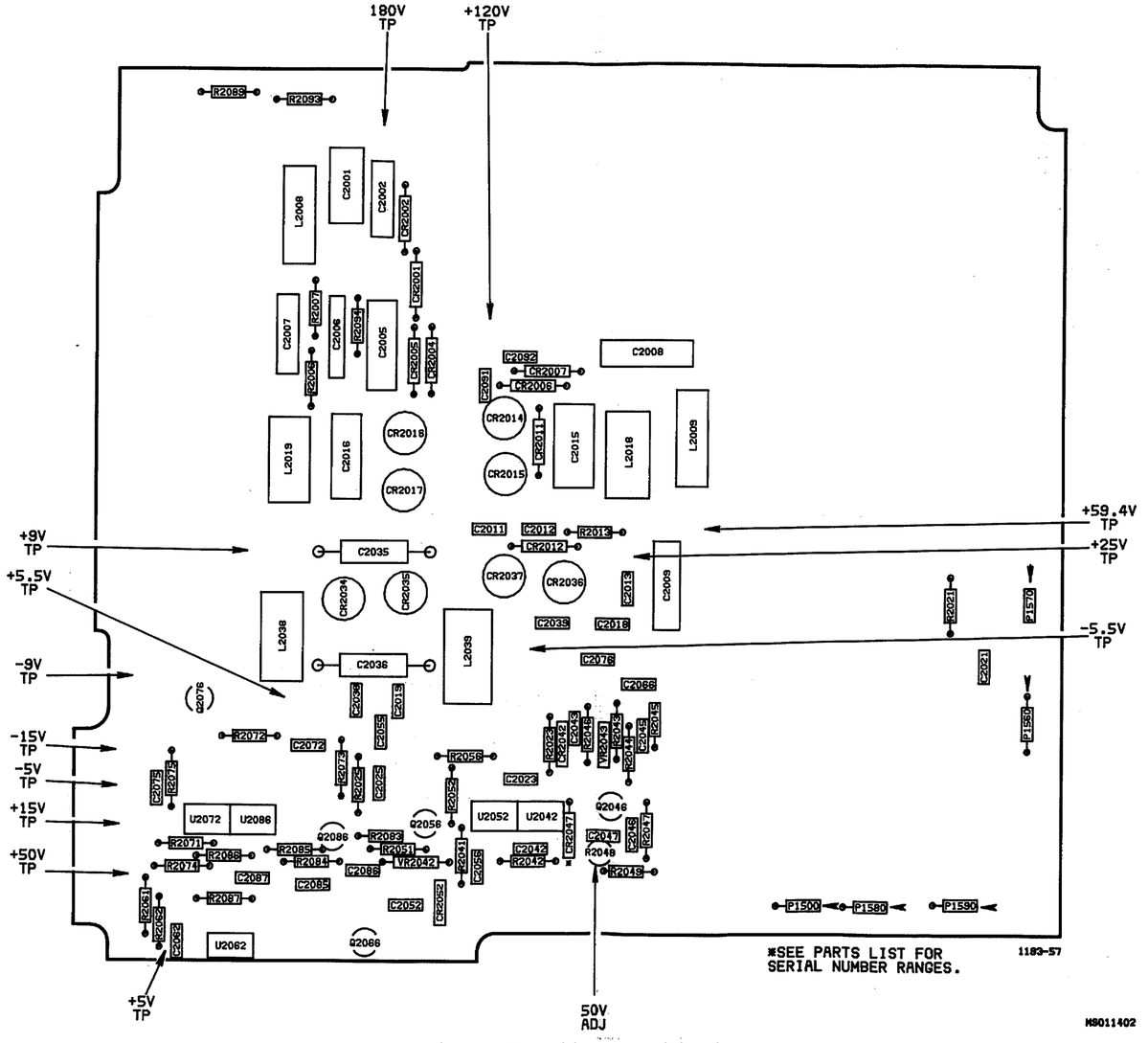

Fig. 8-22. A13 Partial Power supply board.

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POWER SUPPLY ⟨15⟩ 773

PARTIAL A15 TRANSFORMER BOARD

SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.

VOLTAGE CONDITIONS
B TIME/DIV=1 ms
X TRIGGER=A
HORIZ DISPLAY=ALT
SWEEP MODE=NORM
X TRIGGER SOURCE=INT
A TRIGGER COUPLING=AC
B TRIGGER SOURCE=B RUNS
B TRIGGERABLE=YES
HORIZ POSITIONING=MIDR

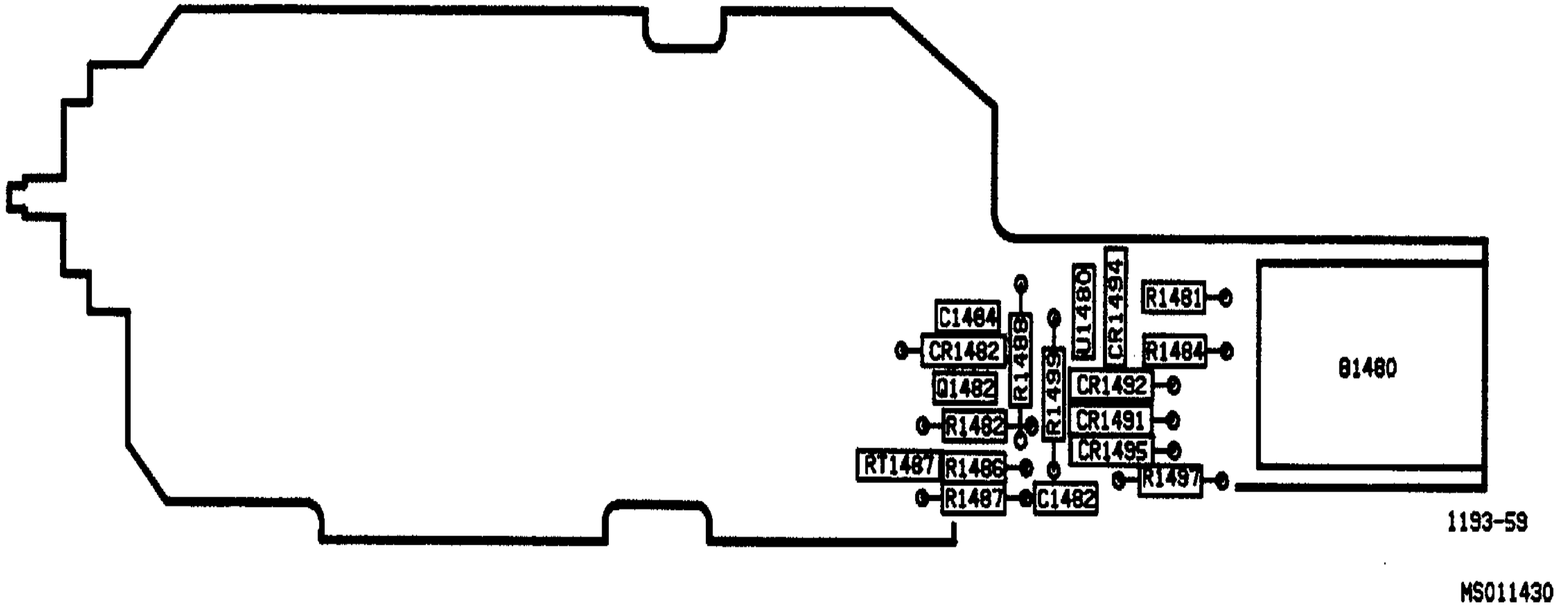


Fig. 8-23. A12 Partial Timing switch board

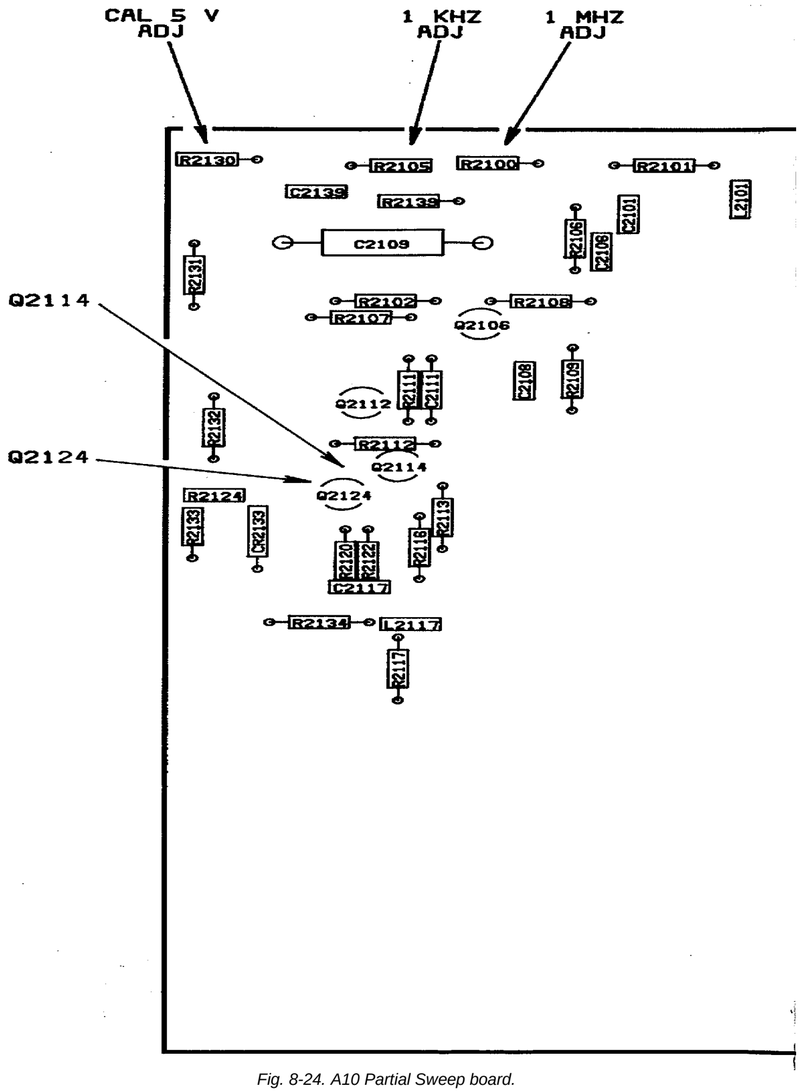
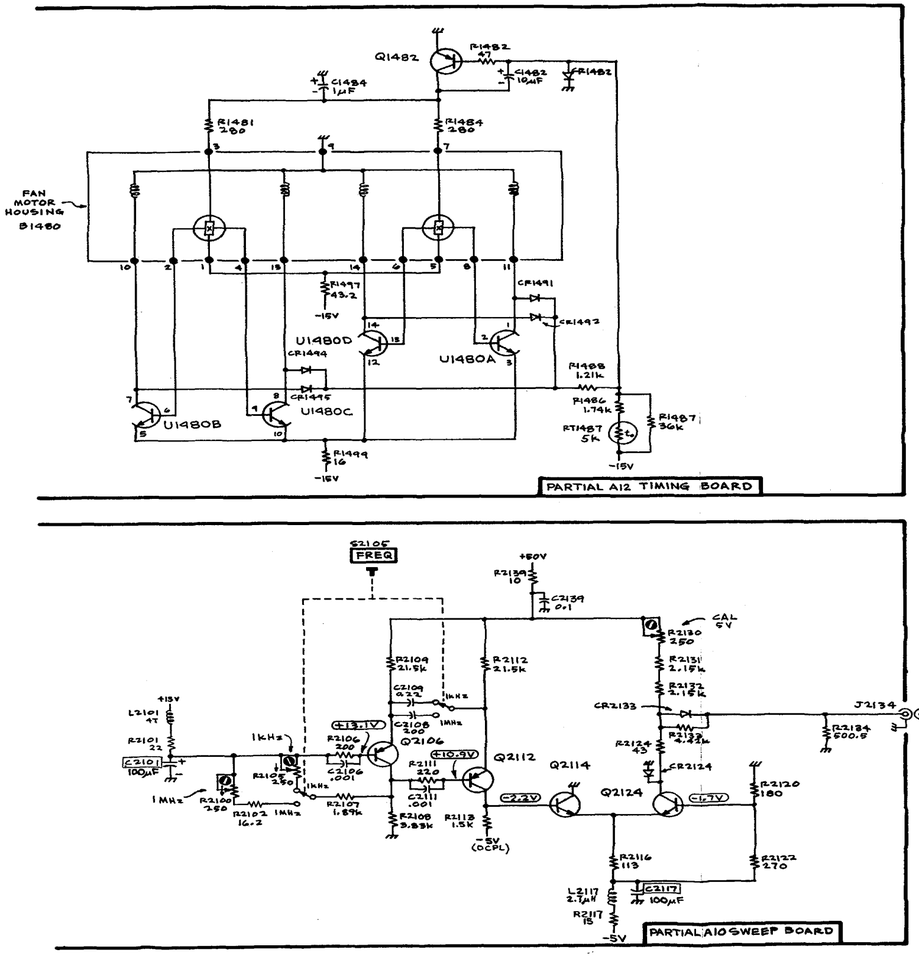


Fig. 8-24. A10 Partial Sweep board.



SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.

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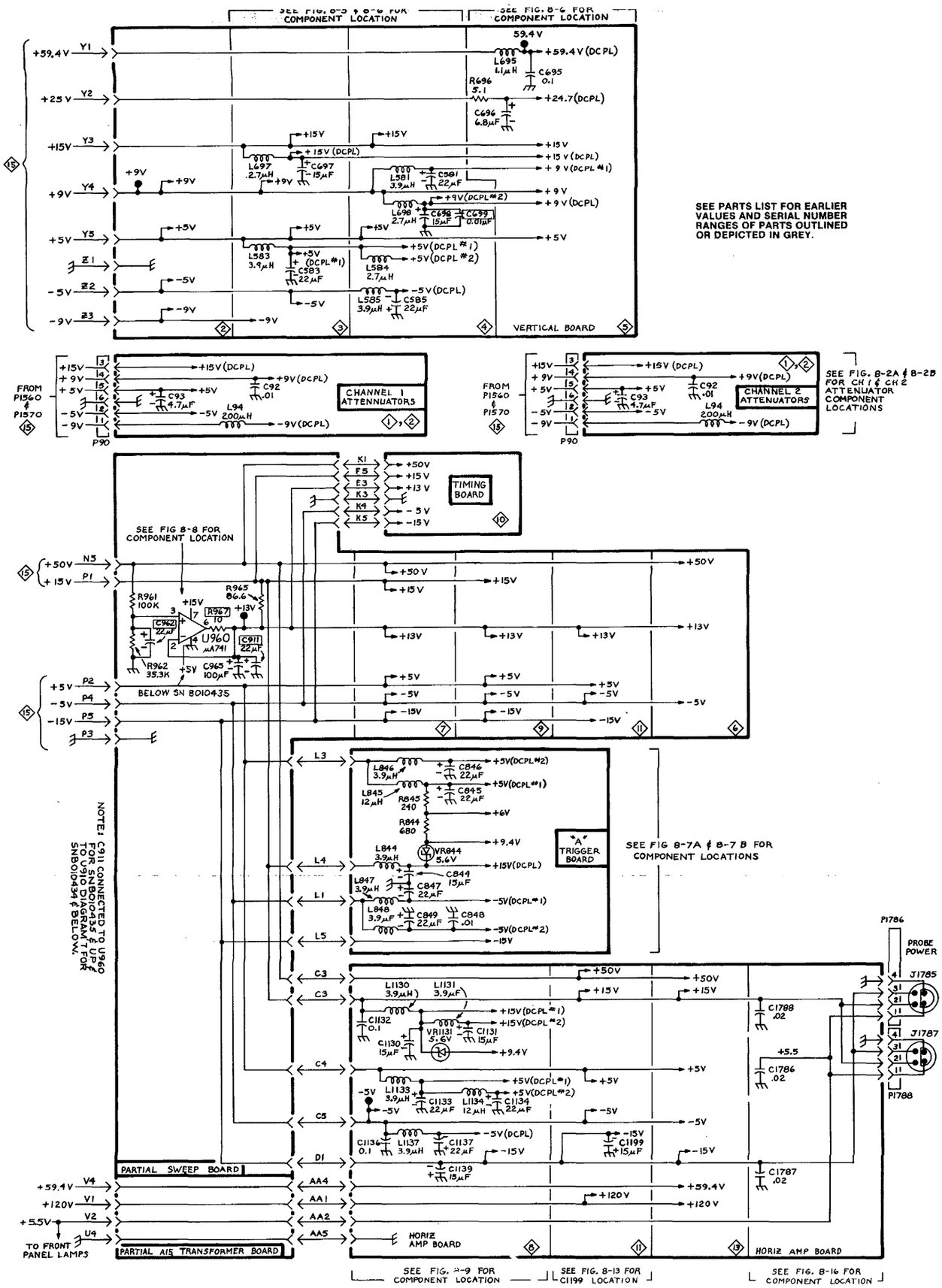
REV DEC 1981
1193-G1

CALIBRATOR AND FAN CIRCUIT ◈16



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REV DEC 1981
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POWER DISTRIBUTION 17

REPLACEABLE MECHANICAL PARTS

PARTS ORDERING INFORMATION

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

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

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

Change information, If any, Is located at the rear of this manual

SPECIAL NOTES AND SYMBOLS

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

FIGURE AND INDEX NUMBERS

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

INDENTATION SYSTEM

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

1 2 3 4 5 Name & Description

Assembly and/or Component
Attaching parts for Assembly and/or Component
Detail Part of Assembly and/or Component
Attaching parts for Detail Part
Parts of Detail Part
Attaching parts for Parts of Detail Part

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

Attaching parts must be purchased separately, unless otherwise specified.

ITEM NAME

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

ABBREVIATIONS

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

CROSS INDEX-MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
000BK	STAUFFER SUPPLY	105 SE TAYLOR	PORTLAND, OR 97214
000CY	NORTHWEST FASTENER SALES, INC.	7923 SW CIRRUS DRIVE	BEAVERTON, OR 97005
000DX	KADEE QUALITY PRODUCTS COMPANY	720 S GRAPE	MEDFORD, OR 97501
000EX	O'HARA METAL PRODUCT COMPANY	542 BRANNAN STREET	SAN FRANCISCO, CA 94107
000FW	WESTERN SINTERING CO INC.	2620 STEVENS DRIVE	RICHLAND, WA 99352
00779	AMP, INC.	P.O. BOX 3608	HARRISBURG, PA 17105
05006	TWENTIETH CENTURY PLASTICS, INC.	415 E WASHINGTON BLVD.	LOS ANGELES, CA 90015
05129	KILO ENGINEERING COMPANY	2015 D	LA VERNE, CA 91750
05820	WAKEFIELD ENGINEERING, INC.	AUDUBON ROAD	WAKEFIELD, MA 01880
06666	GENERAL DEVICES CO., INC.	525 S. WEBSTER AVE.	INDIANAPOLIS, IN 46219
08261	SPECTRA-STRIP CORP.	7100 LAMPSON AVE.	GARDEN GROVE, CA 92642
09922	BURNDY CORPORATION	RICHARDS AVENUE	NORWALK, CT 06852
12327	FREEWAY CORPORATION	9301 ALLEN DRIVE	CLEVELAND, OH 44125
12360	ALBANY PRODUCTS CO., DIV. OF PNEUMO DYNAMICS CORPORATION	145 WOODWARD AVENUE	SOUTH NORWALK, CT 06586
12697	CLAROSTAT MFG. CO., INC.	LOWER WASHINGTON STREET	DOVER, NH 03820
13511	AMPHENOL CARDRE DIV., BUNKER RAMO CORP.		LOS GATOS, CA 95030
18203	ENGELMANN MICROWAVE CO.	SKYLINE DR.	MONTVILLE, NJ 07045
18583	CURTIS INSTRUMENTS, INC.	200 KISCO AVE.	MOUNT KISCO, NY 10549
22526	BERG ELECTRONICS, INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
22670	G. M. NAMEPLATE, INC.	2040 15TH AVENUE WEST	SEATTLE, WA 98119
23050	PRODUCT COMPONENTS CORP	30 LORRAINE AVE.	MT VERNON, NY 10553
24931	SPECIALITY CONNECTOR CO., INC.	2620 ENDRESS PLACE	GREENWOOD, IN 46142
25088	SIEMENS CORP.	186 WOOD AVE. S	ISELIN, NJ 08830
26233	USM CORP NYLOC FASTENER DIV. P.O. BOX 3158	1501 W SEPULVEDA BLVD. TORRANCE, CA 90510	
27143	ATLAS SPRING AND MFG. CO.	1805 N. SPAULDING AVE.	CHICAGO, IL 60647
28520	HEYMAN MFG. CO.	147 N. MICHIGAN AVE.	KENILWORTH, NJ 07033
28817	CAL-METEX CORP., SUBSIDIARY OF METEX CORP.	509 HINDRY AVE.	INGLEWOOD, CA 90301
42838	NATIONAL RIVET AND MFG. CO.	1-21 EAST JEFFERSON ST.	WAUPUN, WI 53963
52306	HIGH VOLTAGE DEVICES, INC.	7485 AVENUE 304	VISALIA, CA 93277
57668	R-OHM CORP.	16931 MILLIKEN AVE.	IRVINE, CA 92713
59730	THOMAS AND BETTS COMPANY	36 BUTLER ST.	ELIZABETH, NJ 07207
63743	WARD LEONARD ELECTRIC CO., INC.	31 SOUTH ST.	MOUNT VERNON, NY 10550
70276	ALLEN MFG. CO.	P. O. DRAWER 570	HARTFORD, CT 06101
70278	ALLIED STEEL AND CONVEYORS, DIV. OF SPARTON CORP.	17333 HEALY	DETROIT, MI 48212
70318	ALLMETAL SCREW PRODUCTS CO., INC.	821 STEWART AVE.	GARDEN CITY, NY 11530
70485	ATLANTIC INDIA RUBBER WORKS, INC.	571 W. POLK ST.	CHICAGO, IL 60607
71159	BRISTOL SOCKET SCREW, DIV. OF AMERICAN CHAIN AND CABLE CO., INC.	P O BOX 2244, 40 BRISTOL ST.	WATERBURY, CT 06720
71279	CAMBRIDGE THERMIONIC CORP.	445 CONCORD AVE.	CAMBRIDGE, MA 02138
71400	BUSSMAN MFG., DIVISION OF MCGRAW-EDISON CO.	2536 W. UNIVERSITY ST.	ST. LOUIS, MO 63107
71590	CENTRALAB ELECTRONICS, DIV. OF GLOBE-UNION, INC.	P O BOX 858	FORT DODGE, IA 50501
71785	TRW, CINCH CONNECTORS	1501 MORSE AVENUE	ELK GROVE VILLAGE, IL 60007
73743	FISCHER SPECIAL MFG. CO.	446 MORGAN ST.	CINCINNATI, OH 45206
73803	TEXAS INSTRUMENTS, INC., METALLURGICAL MATERIALS DIV.	34 FOREST STREET	ATTLEBORO, MA 02703
74445	HOLO-KROME CO.	31 BROOK ST. WEST	HARTFORD, CT 06110
78189	ILLINOIS TOOL WORKS, INC. SHAKEPROOF DIVISION	ST. CHARLES ROAD	ELGIN, IL 60120
79136	WALDES, KOHINOOR, INC.	47-16 AUSTEL PLACE	LONG ISLAND CITY, NY 11101
79807	WROUGHT WASHER MFG. CO.	2100 S. O BAY ST.	MILWAUKEE, WI 53207
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
80126	PACIFIC ELECTRICORD CO.	747 W.REDONDO BEACH, PO BOX 10	GARDENA, CA 90247
80149	CALUMET PHOTOGRAPHIC, INC.	1590 TOUGHY AVENUE	ELK GROVE VILLAGE, IL 60007
82104	STANDARD GRIGSBY CO., DIV. OF SUN CHEMICAL CORPORATION	920 RATHBONE AVENUE	AURORA, IL 60507
83294	ARROW FASTENER CO., INC.	271 MAYHILL ST.	SADDLE BROOK, NJ 07662
83385	CENTRAL SCREW CO.	2530 CRESCENT DR.	BROADVIEW, IL 60153
83907	ACCURATE RUBBER PRODUCTS CO.	123 N. RACINE	CHICAGO, IL 60607
86445	PENN FIBRE AND SPECIALTY CO., INC.	2032 E. WESTMORELAND ST.	PHILADELPHIA, PA 19134
86928	SEASTROM MFG. COMPANY, INC.	701 SONORA AVENUE	GLENDALE, CA 91201
87308	N. L. INDUSTRIES, INC., SOUTHERN SCREW DIV.	P. O. BOX 1360	STATESVILLE, NC 28677

CROSS INDEX-MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
88245	LITTON SYSTEMS, INC., USECO DIV.	13536 SATICOY ST.	VAN NUYS, CA 91409
91838	KINGS ELECTRONICS CO., INC.	40 MARBLEDALE ROAD	TUCKAHOE, NY 10707
92101	SCHULZE MFG, 50 INGOLD RD BURLINGAME, CA 94010		
95987	WECKESSER CO., INC.	4444 WEST IRVING PARK RD.	CHICAGO, IL 60641
97464	INDUSTRIAL RETAINING RING CO.	57 CORDIER ST.	IRVINGTON, NJ 07111
98159	RUBBER TECK, INC.	19115 HAMILTON AVE., PO BOX 389	GARDENA, CA 90247
S3109	C/O PANEL COMPONENTS CORP.	P.O. BOX 6626	SANTA ROSA, CA 95406
T0435	LEWIS SCREW CO.	4114 SOUTH PERORIA AVE.	CHICAGO, IL 60609
T0858	STAUFFER SUPPLY CO	105 SE TAYLOR	PORTLAND, OR 97214

Fig. & Index No.	Tektronix Part No.	Serial/Model Eff	Dscont	No. Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
1-1	200-1268-01			1	ADAPTER,CAMERA	80009	200-1268-01
					*******(ATTACHING PARTS)*******		
-2	211-0195-00			4	SCREW,MACHINE:4-40 X 0.875 INCH,STL	83385	ORD BY DESCR
					******(END ATTACHING PARTS)******		
	337-1497-00	B010100	B010149	1	SHLD,IMPLOSION	80009	337-1479-00
-3	331-0295-00			1	MASK,CRT SCALE GRATICULE	80009	331-0295-00
-4	366-1166-00			1	KNOB:RED,0.127 ID X 0.392 OD	80009	366-1166-00
	213-0153-00			1	SETSCREW:5-40 X 0.125,STL BK OXD, HEX	000CY	ORD BY DESCR
-5	366-1338-00			1	KNOB:GY,VIDIV,0.252 OD X 1.125	80009	366-1338-00
	213-0153-00			2	SETSCREW:5-40 X 0.125,STL BK OXD, HEX	000CY	ORD BY DESCR
-6	366-1168-00			1	KNOB:BLACK CAP AND RED BODY	80009	366-1168-00
	213-0153-00			1	SETSCREW:5-40 X 0.125,STL BK OXD, HEX	000CY	ORD BY DESCR
-7	366-1385-00	B010100	B089999	1	KNOB:GY,1.215 OD X 0.89H	80009	366-1385-00
	366-1385-01	B090000	B142149	1	KNOB:GY,1.215 OD X	80009	366-1385-01
	366-1385-00	B142150		1	KNOB:GY,1.215 OD X 0.89H	80009	366-1385-00
	213-0890-00			2	SETSCREW:6-32 X 0.25 L,STL BLK OXD	83294	ORD BY DESCR
-8	354-0413-00			1	RING,KNOB SKIRT:1.75 INCH OD,PLASTIC	80009	354-0413-00
	213-0218-00			1	SETSCREW:6-32 X 0.25 INCH,HEX SOC ST	74445	ORD BY DESCR
-9	366-1166-00			1	KNOB:RED,0.127 ID X 0.392 OD	80009	366-1166-00
	213-0153-00			1	SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-10	366-1338-00			1	KNOB:GY,VIDIV,0.252 OD X 1.125	80009	366-1338-00
	213-0153-00			1	SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-11	366-0494-00			1	KNOB:GRAY WITH SETSCREW	80009	366-0494-00
	213-0153-00			1	SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-12	366-0494-00			1	KNOB:GRAY WITH SETSCREW	80009	366-0494-00
	213-0153-00			1	SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-13	366-0494-00			1	KNOB:GRAY WITH SETSCREW	80009	366-0494-00
	213-0153-00			1	SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-14	366-0215-02			7	KNOB:LEVER SWITCH	80009	366-0215-02
-15	366-0494-00			1	KNOB:GRAY WITH SETSCREW	80009	366-0494-00
	213-0153-00			1	SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-16	366-0494-00			1	KNOB:GRAY WITH SETSCREW	80009	366-0494-00
	213-0153-00			1	SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-17	366-1391-00			1	KNOB:GY,0.081 ID X 0.28 OD	80009	366-1391-00
	213-0239-00			1	SETSCREW:3-48 X 0.062 INCH,HEX SOC	71159	ORD BY DESCR
-18	366-1315-00			1	KNOB:GRAY	80009	366-1315-00
	213-0153-00			1	SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-19	366-0494-00			1	KNOB:GRAY WITH SETSCREW	80009	366-0494-00
	213-0153-00			1	SETSCREW:O5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-20	366-0392-00			1	KNOB:GY,0.125 ID X 0.375 H	80009	366-0392-00
-21	366-1391-00			1	KNOB:GY,0.081 ID X 0.28 OD	80009	366-1391-00
	213-0239-00			1	SETSCREW:3-48 X 0.062 INCH,HEX SOC	71159	ORD BY DESCR
-22	366-1315-00			1	KNOB:GRAY	80009	366-1315-00
	213-0153-00			1	SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-23	331-0328-00			1	DIAL,CONTROL:10 TURN FOR 0.25 DIA SHAFT	05129	461-S-70
	213-0048-00			1	SETSCREW:4-40 X 0.125 INCH,HEX SOC S	74445	ORD BY DESCR
-24	366-0494-00			1	KNOB:GRAY WITH SETSCREW	80009	366-0494-00
	213-0153-00			1	SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-25	426-0785-00			17	FR,PUSH BUTTON:GRAY PLASTIC	80009	426-0785-00
-26	378-0690-03			1	LENS,LIGHT:AMBER-20MHZ	80009	378-0690-03
-27	378-0690-04			2	LENS,LIGHT:AMBER-RESET	80009	378-0690-04
-28	378-0690-05			1	LENS,LIGHT:AMBER-READY	80009	378-0690-05
-29	378-0690-06			1	LENS,LIGHT:AMBER-TRIG'D	80009	378-0690-06
-30	358-0301-02			2	BUSHING,SLEEVE:GRAY PLASTIC	80009	358-0301-02
-31	358-0378-00			2	BUSHING,SLEEVE:0.131 ID X 0.125 L	80009	358-0378-00
	129-0053-00			1	POST,BDG,ELEC:UNINSULATED	80009	129-0053-00
-32	355-0507-00			1	STUD,SHOULDERED:BINDING POST	80009	355-0507-00
-33	200-0103-00			1	NUT,PLAIN,KNURL:0.25-28 X 0.375" OD,BRASS	80009	200-0103-00
					********(ATTACHING PARTS)******		
-34	210-0583-00			1	NUT,PLAIN,HEX:0.2532 X 0.312 INCH,BRS	73743	2X20317-402
-35	210-0046-00			1	WASHER,LOCK:0.261 ID,INTL,0.018 THK,BRS	78189	1214-05-00-0541C
					******(END ATTACHING PARTS)******		
-36	333-1476-00			1	PANEL,FRONT:	80009	333-1476-00

Fig. & Index No.	Tektronix Part No.	Serial/Model Eff	Dscont	No. Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
1-	333-1476-01			1	PANEL,FRONT:	80009	333-1476-01
	333-1476-02			1	PANEL,FRONT:	80009	333-1476-02
-37	352-0299-00			1	LAMPHOLDER:GRATICULE	80009	352-0299-00
-38	352-0277-00			3	LAMPHOLDER:(1)WIRE LEAD TYPE	80009	352-0277-00
-39	200-0935-00			3	BASE,LAMPHOLDER:0.29 OD X 0.19 CASE	80009	200-0935-00
-40	401-0080-00			1	BRG,KNOB SKIRT:0.789 ID X 0.866"OD PLASTIC	80009	401-0080-00
-41	----------			3	RES.,VAR:(R290,R1569,R1570 REPL)		
					*******(ATTACHING PARTS)*******		
-42	210-0583-00			3	NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-43	210-0046-00			3	WASHER,LOCK:0.261 ID,INTL,0.018 THK,BRS	78189	1214-05-0541C
					******(END ATTACHING PARTS)******		
-44	366-1351-01			1	PUSH BUTTON:--BW LIMIT	80009	366-1351-01
-45	366-1351-03			1	PUSH BUTTON:-BEAM FINDER	80009	366-1351-03
-46	----------			1	SWITCH,PUSH:(SEE S600 REPL)		
					*******(ATTACHING PARTS)*******		
-47	211-0022-00			2	SCREW,MACHINE:2-56 X 0.188,PNH,STL,CD PL	83385	ORD BY DESCR
-48	210-0405-00			1	NUT,PLAIN,HEX:2-56 X 0.188,BRS,CD PL	73743	12157-50
-49	210-0001-00			1	WASHER,LOCK:#2 INTL,0.013 X 0.18 OD,STL	78189	1202-00-00-541C
-50	386-2050-00			1	PLATE,SW MTG::PUSHBUTTON	80009	386-2050-00
					******(END ATTACHING PARTS)******		
-51	----------			2	RES.,VAR:(SEE R220,R230 REPL)		
					*******(ATTACHING PARTS)*******		
-52	358-0409-00			2	BSHG,MACH.THD:0.25-32 X 0.159 ID X 0.24	80009	358-0409-00
-53	210-0046-00			4	WASHER,LOCK:0.261 ID,INTL,0.018 THK,BRS	78189	1214-05-00-541C
-54	210-0471-00			2	NUT,SLEEVE:HEX.,0.312 X 0.594 INCH LON	80009	210-0471-00
-55	210-0223-00			2	TERMINAL,LUG:0.25 INCH DIA,SE	86928	5441-37
					******(END ATTACHING PARTS)******		
-56	----------			1	SWITCH,PUSH:(SEE S710 REPL)		
-57	----------			1	RES.,VAR:(SEE R920 REPL)		
	----------				(485 ONLY)		
-58	----------			1	RES.,VAR:(SEE R720 REPL)		
					*******(ATTACHING PARTS)*******		
-59	210-0583-00			1	NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
					******(END ATTACHING PARTS)******		
-60	----------			1	SWITCH,SLIDE:(SEE S310 REPL)		
					*******(ATTACHING PARTS)*******		
-61	210-0405-00			2	NUT,PLAIN,HEX:2-56 X 0.188,BRS,CD PL	73743	12157-50
-62	210-0001-00			2	WASHER,LOCK:#2 INTL,0.013 X 0.18 OD,STL	78189	1202-00-00-541C
					******(END ATTACHING PARTS)******		
-63	366-1381-01			1	PUSH BUTTON:-POWER	80009	366-1381-01
-64	384-1060-00			1	EXTENSION SHAFT:7.831 INCH LONG	80009	384-1060-00
-65	131-0955-00			2	CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
					*******(ATTACHING PARTS)*******		
-66	210-0590-00			2	NUT,PLAIN,HEX.:0.375-32 X 0.438- BRS	73743	2X28269-402
-67	210-0012-00			2	WASHER,LOCK:INTL,0.384 ID,INTL,0.022 TH	78189	1220-02-00-541C
-68	210-0207-00			2	TERMINAL,LUG:0.375 INCH DIAMETER	12697	01136902
					******(END ATTACHING PARTS)******		
	198-2445-00			1	WIRE SET,ELEC:FOR SUBPANEL ASSEMBLY	80009	198-2445-00
-69	131-0818-00			1	CONNECTOR,RCPT,:BNC,FEMALE	91836	KC-19-153
					*******(ATTACHING PARTS)*******		
-70	210-0590-00			1	NUT,PLAIN,HEX.:0.375-32 X 0.438" BRS	73743	2X28269-402
-71	210-0012-00			1	WASHER,LOCK:INTL,0.384 ID,INTL,0.022 TH	78189	1220-02-00-541C
					******(END ATTACHING PARTS)******		
-72	210-0774-00			1	EYELET,METALLIC:0.152 OD X 0.245 INCH L,	80009	210-0774-00
-73	210-0775-00			1	EYELET,META'LLIC:0.126 OD X 0.23 INCH L,	80009	210-0775-00
-74	----------			1	RES.,VAR:(SEE R450 REPL)		
					*******(ATTACHING PARTS)*******		
	213-0048-00			1	SETSCREW:4-40 X 0.125 INCH,HEX SOC S	74445	ORD BY DESCR
					******(END ATTACHING PARTS)******		
-75	----------			1	RES.,VAR:(SEE R898 REPL)		
					*******(ATTACHING PARTS)*******		
-76	210-0583-00			1	NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-77	210-0046-00			1	WASHER,LOCK:0.261 ID,INTL,0.018 THK,BRS	78189	1214-05-00-0541C
					******(END ATTACHING PARTS)******		

Fig. & Index No.	Tektronix Part No.	Serial/Model Eff	Dscont	No. Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
1-78	----------			1	RES,VAR (SEE R1300 REPL)		
					*******(ATTACHING PARTS)*******		
-79	210-0583-00			1	NUT,PLAIN,HEX:0 25-32 X 0 312 INCH,BRS	73743	2X20317-402
-80	210-0940-00			1	WASHER,FLAT 0 25 ID X 0 375 INCH OD,STL	79807	ORD BY DESCR
					******(END ATTACHING PARTS)******		
-81	366-1351-02			1	PUSH BUTTON-FREQ	80009	366-1351-00
-82	384-1099-00			1	EXTENSION SHAFT:PUSH BUTTON,1 54 INCH LONG	80009	384 1099-00
-83	----------			1	RES,VAR (SEE R1020 REPL)		
					*******(ATTACHING PARTS)*******		
-84	210-0583-00			1	NUT,PLAIN,HEX 0 25-32 X 0 312 INCH,BRS	73743	2X20317402
					******(END ATTACHING PARTS)******		
-85	366-1351-12			1	PUSH BUTTON -CH1	30009	366-1351-12
-86	366-1351-05			1	PUSH BUTTON:-ALT	80009	366-1351-05
-87	366-1351-13			1	PUSH BUTTON:-CHOP	80009	366-1351-13
-88	366-1351-14			1	PUSH BUTTON:-ADD	80009	366-1351-14
-89	366-1351-09			1	PUSH BUTTON:--X-Y	80009	366-1351-09
-90	366-1351-04			1	PUSH BUTTON:-CH2	80009	366-1351-04
-91	384-1101-00			6	EXTENSION SHAFT:4.14 INCH LONG	80009	384-1101-00
-92	----------			1	SWITCH,PUSH:(SEE S1580 REPL)		
					*******(ATTACHING PARTS)*******		
-93	213-0138-00			4	SCR,TPG,TF:4-24 X 0.188 INCH,PNH STL	83385	ORD BY DESCR
					******(END ATTACHING PARTS)******		
-94	366-1351-11			1	PUSH BUTTON:--NORM	80009	366-1351-11
-95	366-1351-12			1	PUSH BUTTON:-CH1	80009	366-1351-12
-96	366-1351-04			1	PUSH BUTTON:-CH2	80009	366-1351-04
-97	384-1100-00			3	EXTENSION SHAFT:0.13 SQ X 6.215" LONG,PLST	80009	384-1100-00
-98	----------			1	SWITCH,PUSH:(SEE S1590 REPL)		
					*******(ATTACHING PARTS)*******		
-99	220-0413-00			2	NUT,SLEEVE:440 X 0.312 HEX X 0.562	80009	220-0413-00
					******(END ATTACHING PARTS)******		
-100	366-1351-08			1	PUSH BUTTON:--A	80009	366-1351-08
-101	366-1351-06			1	PUSH BUTTON:-INTEN	80009	366-1351-06
-102	366-1351-05			1	PUSH BUTTON:-ALT	80009	366-1351-05
-103	366-1351-15			1	PUSH BUTTON:--B	80009	366-1351-15
-104	----------			1	SWITCH,PUSH:(SEE S1500 REPL)		
					*******(ATTACHING PARTS)*******		
-105	211-0159-00			1	SCREW,MACHINE:2-56 X 0.375 INCH,PNH STL	87308	ORD BY DESCR
-106	361-0407-00			1	SPACER,SLEEVE:0.125 OD X 0.193 INCH LONG	80009	361-0407-00
	211-0022-00			1	SCREW,MACHINE:2-56 X 0.188,PNH,STL,CD PL	83385	ORD BY DESCR
					******(END ATTACHING PARTS)******		
-107	348-0031-00			1	GROMMET,PLASTIC:0.127 ID,GRAY ACETAL	80009	348-0031-00
-108	220-0547-01			2	NUT,BLOCK:0.38 X 0.26 X 0.282 (2)4-40	000FW	ORD BY DESCR
					*******(ATTACHING PARTS)*******		
-109	211-0007-00			2	SCREW,MACHINE:4-40 X 0.188,PNH STL,CD PL	83385	ORD BY DESCR
					******(END ATTACHING PARTS)******		
-110	407-0972-00			1	BRACKET,CMPNT:ALUMINUM	80009	407-0972-00
					*******(ATTACHING PARTS)*******		
.111	211-0105-00			3	SCREW,MACHINE:4-40 X 0.188,100 DEG,FLH ST	83385	ORD BY DESCR
-112	210-0586-00			1	NUT,PL,ASSEM WA:4-40 X 0.25,STL,CD PL	78189	211-041800-00
					******(END ATTACHING PARTS)******		
-113	426-0805-01			1	FRAME PANEL,CAB:FRONT SUB	80009	426-0805-01
-114	260-1395-00			1	SWITCH,ROTARY:A SOURCE	82104	260-1395-00
					*******(ATTACHING PARTS)*******		
-115	210-0406-00			2	NUT,PLAIN,HEX:4-40 X 0.188,BRS,CD PL	73743	12161-50
-116	210-0004-00			2	WASHER,LOCK:#4 INTL,0.015 THK,STL CD PL	000BK	ORD BY DESCR
					******(END ATTACHING PARTS)******		
-117	260-1312-00			1	SWITCH,LEVER:1 SECT,4 POSN,22.5 DEG	80009	260-1312-00
					*******(ATTACHING PARTS)*******		
	210-0406-00			2	NUT,PLAIN,HEX:4-40 X 0.188,BRS,CD PL	73743	12161-50
	210-0004-00			2	WASHER,LOCK:#4 INTL,0.015 THK,STL CD PL	000BK	ORD BY DESCR
					******(END ATTACHING PARTS)******		

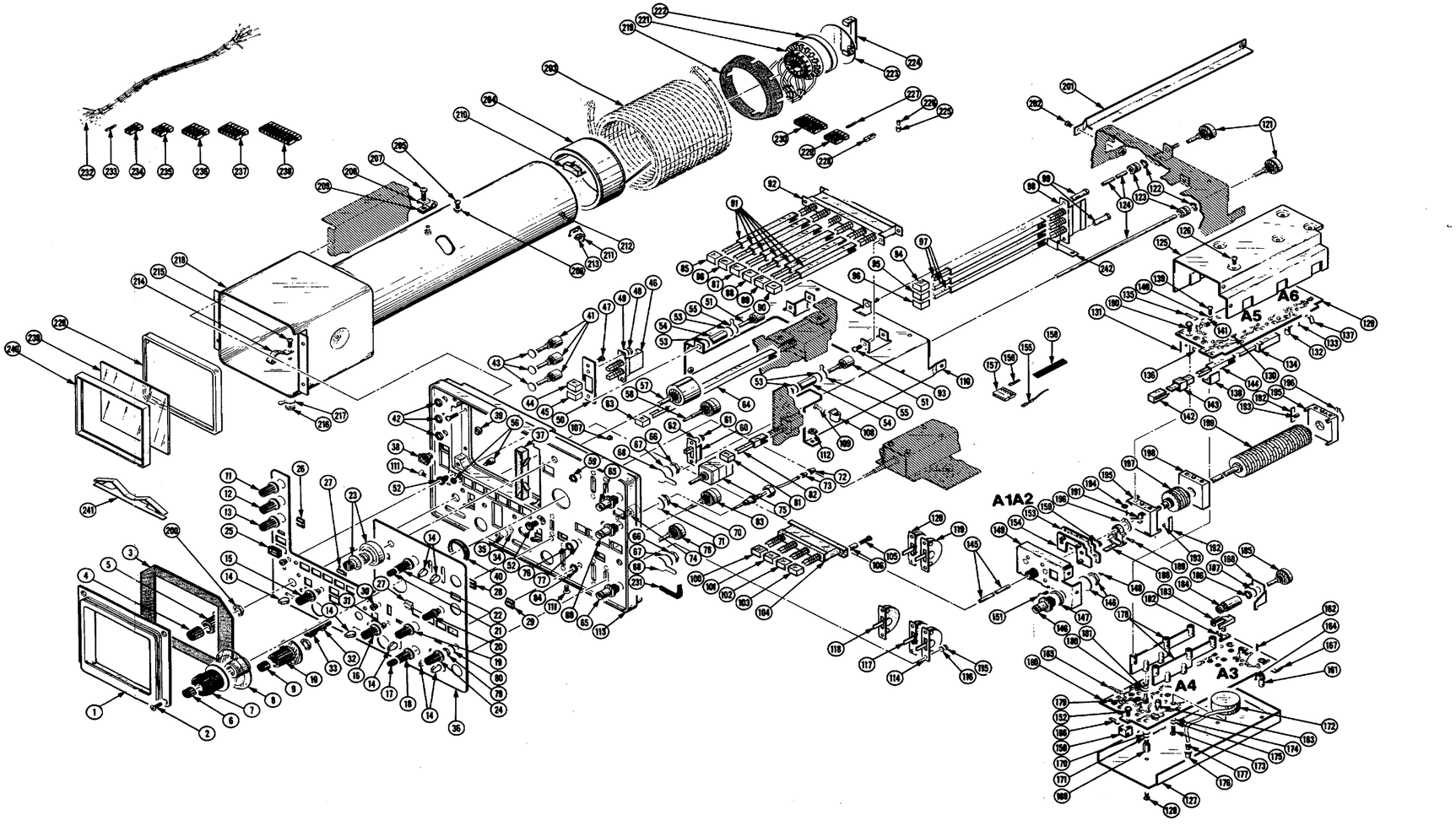
Fig. & Index No.	Tektronix Part No.	Serial/Model Eff	Dscont	No. Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
1-118	----------			1	SWITCH,LEVER:(SEE S780 REPL)		
					*******(ATTACHING PARTS)*******		
	210-0406-00			2	NUT,PLAIN,HEX:4-40 X 0.188,BRS,CD PL	73743	12161-50
	210-0004-00			2	WASHER,LOCK:#4 INTL,0.015 THK,STL CD PL	000BK	ORD BY DESCR
					******(END ATTACHING PARTS)******		
-119	----------			1	SWITCH:(SEE S1000 REPL)		
					*******(ATTACHING PARTS)*******		
	210-0406-00			2	NUT,PLAIN,HEX:4-40 X 0.188,BRS,CD PL	73743	12161-50
	210-0004-00			2	WASHER,LOCK:#4 INTL,0.015 THK,STL CD PL	000BK	ORD BY DESCR
					******(END ATTACHING PARTS)******		
-120	260-1312-00			1	SWITCH,LEVER:1 SECT,4 POSN,22.5 DEG	80009	260-1312-00
					*******(ATTACHING PARTS)*******		
	210-0406-00			2	NUT,PLAIN,HEX:4-40 X 0.188,BRS,CD PL	73743	12161-50
	210-0004-00			2	WASHER,LOCK:#4 INTL,0.015 THK,STL CD PL	000BK	ORD BY DESCR
					******(END ATTACHING PARTS)******		
-121	----------			2	RES.,VAR:(SEE R270,R370 REPL)		
					*******(ATTACHING PARTS)*******		
-122	210-0583-00			2	NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
					******(END ATTACHING PARTS)******		
	376-0051-00	B010100	B121859	2	CPLG,SHAFT,FLEX:0.127 ID X 0.375 ID DELRIN	80009	376-0051-00
-123	376-0051-01	B121860		2	CPLG,SHAFT,FLEX:0.127 ID X 0.375 OD	80009	376-0051-01
	195-0048-00			1	LEAD,ELECTRICAL:0.018 DIA X 0.75' MIN L	80009	195-0048-00
-124	384-0282-00			2	EXTENSION SHAFT:0.125 OD X 0.625 INCH LONG	80009	384-0282-00
	672-0036-00	B010100	B159999	2	ASSEMBLY,ATTEN:CH1 VOLTS/DIV,CH2 VOLTS DIV	80009	672-0036-00
	----------			-	(485,485-1 ONLY)		
	672-0036-02	B160000	B166999	2	ASSEMBLY,ATTEN:CH1 VOLTS/DIV,CH2 VOLTS DIV	80009	672-0036-02
					(485,485-1 ONLY)		
	672-0036-03	B167000		2	ASSEMBLY,ATTEN:CH1 VOLTS/DIV,CH2 VOLTS DIV	80009	672-0036-03
	----------			-	(485, 485-1 ONLY)		
	672-0055-00	B010100	B159999	2	ASSEMBLY,ATTEN:CH1 VOLTS/DIV,CH2 VOLTS/DIV	80009	672-0055-00
	----------				(485-2 ONLY)		
	672-0055-01	B160000		2	ASSEMBLY,ATTEN:CH1 VOLTS/DIV,CH2 VOLTS/DIV	80009	672-0055-01
					(485-2 ONLY)		
-125	337-1477-00	B010100	B019999	1	SHLD,ELECTRICAL:ATTEN TOP	80009	337-1477-00
	----------			-	(ADDED TO A3 AND A4 AT B020000 AND UP)		
					*******(ATTACHING PARTS)*******		
-126	211-0116-00	B010100	B019999	5	SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	ORD BY DESCR
	----------				(ADDED TO A3 AND A4 AT B020000 AND UP)		
					******(END ATTACHING PARTS)******		
-127	337-1478-00	B010100	B019999	1	SHLD,ELECTRICAL:ATTEN BOTTOM	80009	337-1478-00
	----------				(ADDED TO A3 AND A4 AT B020000 AND UP)		
					*******(ATTACHING PARTS)*******		
-128	211-0116-00	B010100	B019999	4	SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	ORD BY DESCR
	----------			-	(ADDED TO A3 AND A4 AT B020000 AND UP)		
					******(END ATTACHING PARTS)******		
-129	----------			1	CKT BOARD ASSY:50 OHM ATTEN(SEE A5,A6 REP		
	----------			-	(A6 REPLACES A5 IN 485-2 ONLY)		
-130	129-0317-00			5	POST,ELEC-MECH:4-40 X 0.187 X 0.125 INCH	80009	129-0317-00
-131	131-0589-00			1	TERMINAL,PIN:0.46 L X 0.025 SQ	22526	48283-029
-132	131-1003-00			3	CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
-133	136-0252-07			3	SOCKET,PIN CONN:W/O DIMPLE	22526	75060-012
-134	----------			1	SWITCH,PUSH:(SEE S125 REPL)		
	----------			-	(485,485-1 ONLY)		
	----------			1	SWITCH,PUSH:(SEE S125 REPL)		
	----------			-	(485-2 ONLY)		
-135	131-1031-00			10	CONTACT ASSY,EL:CAM SWITCH,TOP	80009	131-1031-00
-136	131-1030-00			10	CONT ASSY,ELEC:CAM SWITCH,BOTTOM	80009	131-1030-00
					*******(ATTACHING PARTS)*******		
	210-0779-00	B010100	B166649	10	RIVET,TUBULAR:0.051 OD X 0.115 INCH LONG	42838	RA-29952715
	210-3082-00	B166650		10	EYELET,METALLIC:0.047 OD X 0.133 L,BRASS	80009	210-3082-00
					******(END ATTACHING PARTS)******		
-137	131-1134-00			8	CONTACT,ELEC:CKT CARD TO SHIELD	80009	131-1134-00
-138	337-1479-00			1	SHIELD,GUIDE:PUSH BUTTON SWITCH	80009	337-1479-00
	198-2770-00			1	WIRE SET,ELEC:	80009	198-2770-00

Fig. & Index No.	Tektronix Part No.	Serial/Model Eff	Dscont	No. Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
1-	352-0161-00			2	HLDR,TERM CONN:3 WIRE,BLACK,0.1 SPACING	80009	352-0161-00
					*******(ATTACHING PARTS)*******		
-139	213-0277-00			6	SCR,TPG,THD FOR:2-56 X 0.312 INCH,PNH STL	83385	ORD BY DESCR
-140	210-0053-00			6	WASHER,LOCK:INTL,0.092 ID X 0.175'OD	83385	ORD BY DESCR
-141	210-1008-00			6	WASHER,FLAT:0.09 ID X 0.188" OD,BRS	12360	ORD BY DESCR
					******(END ATTACHING PARTS)******		
-142	366-1214-04			1	PUSH BUTTON:-MARK	80009	366-1214-04
-143	380-0200-00			1	HSG,PUSHBUTTON:POSN INDICATOR,BLK ACETAL	80009	380-0200-00
-144	384-1099-00			1	EXTENSION SHAFT:PUSH BUTTON,1.54 INCH LON	80009	384-1099-00
-145	384-1078-00			1	EXTENSION SHAFT:0.124 OD X 6.843 INCH LON	80009	384-1078-00
-146	131-0679-00	B010100	B131949	1	CONNECTOR,RCPT,:BNC,MALE,3 CONTACT	24931	28JR168-1
	131-0679-01	B131950		1	CONNECTOR,RCPT,:BNC,MALE,3 CONTACT	24931	28JR168-2
					*******(ATTACHING PARTS)*******		
-147	361-0424-00	B010100	B131949	1	SPACER,RING:0.515 ID X 0.625 OD X 0.85"	80009	361-0424-00
					******(END ATTACHING PARTS)******		
	210-1039-00	B131950		1	WASHER,LOCK:INT,0.521 ID X 0.625 INCH O	24931	ORD BY DESCR
	220-0497-00	B131950		1	NUT,PLAIN,HEX.:0.5-28 X 0.562 INCH HEX,BR	73743	ORD BY DESCR
.148	131-1135-00			1	CONTACT,ELEC:	80009	131-1135-00
-149	441-1017-00			1	CHASSIS,OSCP:ATTEN SWITCH	80009	441-1017-00
-150	220-0455-00			1	NUT,BLOCK:0.281 SQ,THREE 4-40 THRU TH	80009	220-0455-00
					*******(ATTACHING PARTS)*******		
-151	211-0007-00			1	SCREW,MACHINE:4-40 X 0.188,PNH STL,CD PL	83385	ORD BY DESCR
-152	211-0116-00			1	SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	ORD BY DESCR
					******(END ATTACHING PARTS)******		
-153				1	CKT BOARD ASSY:LIGHT BLOCK(SEE A1,A2 REPL		
					(A2 REPLACES AI IN 485-2 ONLY)		
-154	352-0300-00	B010100	B166699	1	HOLDER,LAMPS:VOLTS/DIV DIAL	80009	352-0300-00
	352-0300-01	B166700		1	HOLDER,LAMPS:	80009	352-0300-01
	198-2771-00			1	WIRE SET,ELEC:LIGHT BLOCK BOARD	80009	198-2771-00
-155	131-0621-00			2	CONNECTOR,TERM:22-26 AWG,BRS & CU BE GO	22526	46231
-156	131-0707-00			12	CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD	22526	47439
-157	352-0164-00			2	HLDR,TERM CONN:6 WIRE,BLACK	80009	352-0164-00
-158	175-0829-00			FT	WIRE,ELECTRICAL:6 WIRE RIBBON	08261	SS-0626-710610C
					*******(ATTACHING PARTS FOR CKT BD)*******		
-159	210-0405-00			2	NUT,PLAIN,HEX:2-56 X 0.188,BRS,CD PL7374312157-50		
					******(END ATTACHING PARTS)******		
-160				1	CKT BOARD ASSY:HI Z ATTEN(SEE A3,A4 REPL)		
					(A4 REPLACES A3 IN 485-2 ONLY)		
-161	129-0259-00			2	POST,ELEC-MECH:4-40 X 0.187 OD X 0.39" L	80009	129-0259-00
-162	131-0608-00	B010100	B188899	22	TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	48283-036
	131-1857-00	B188900		22	TERM. SET,PIN:36/0.025 SO PIN,ON 0.1 CTR	22526	65500136
-163	131-1003-00			2	CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
-164	136-0252-01			12	CONTACT,ELEC:0.178 INCH LONG	00779	1-332095-2
	136-0252-07			53	SOCKET,PIN CONN:W/O DIMPLE	22526	75060-012
-165	131-1031-00			8	CONTACT ASSY,EL:CAM SWITCH,TOP	80009	131-1031-00
-166	131-1030-00			8	CONT ASSY,ELEC:CAM SWITCH,BOTTOM	80009	131-1030-00
					*******(ATTACHING PARTS)*******		
	210-0779-00	B010100	B166649	8	RIVET,TUBULAR:0.051 OD X 0.115 INCH LONG	42838	RA-29952715
	210-3082-00	B166650		8	EYELET,METALLIC:0.047 OD X 0.133 L,BRASS	80009	210-3082-00
					******(END ATTACHING PARTS)******		
-167	131-1134-00			10	CONTACT,ELEC:CKT CARD TO SHIELD	80009	131-1134-00
-168	407-0803-00			1	BRACKET,ELEC SW:BRASS	80009	407-0803-00
	351-0180-00	B020000		1	SLIDE,GUIDE:SWITCH ACTUATOR	80009	351-0180-00
	337-1477-00	B020000		1	SHLD,ELECTRICAL:ATTEN TOP	80009	337-1477-00
					*******(ATTACHING PARTS)*******		
	211-0007-00	B020000		8	SCREW,MACHINE:4-40 X 0.188,PNH STL,CD PL	83385	ORD BY DESCR
					******(END ATTACHING PARTS)******		
	337-1478-00	B020000	B188388	1	SHLD,ELECTRICAL:ATTEN BOTTOM	80009	337-1478-00
	337-1478-03	B188389		1	SHLD,ELECTRICAL:ATTEN BOTTOM	80009	337-1478-03
					*******(ATTACHING PARTS)*******		
	211-0007-00	B020000		4	SCREW,MACHINE:4-40 X 0.188,PNH STL,CD PL	83385	ORD BY DESCR
					******(END ATTACHING PARTS)******		
	334-3448-00	B156050		1	MARKER,IDENT:MARKED NOTICE80009334-3448-00		

Fig. & Index No.	Tektronix Part No.	Serial/Model Eff	Dscont	No. Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-169	129-0299-00			2		POST,ELEC-MECH:HEX,0.333 INCH LONG	80009	129-0299-00
						*******(ATTACHING PARTS)*******		
-170	210-1002-00			2		WASHER,FLAT:0.125 ID X 0.25 INCH OD,BRS	12327	ORD BY DESCR
-171	210-0053-00			2		WASHER,LOCK:INTL,0.092 ID X 0.175"OD	83385	ORD BY DESCR
						******(END ATTACHING PARTS)******		
-172				1		DELAY LINE,ELEC:ATTEN(SEE DL1 REPL)		
						*******(ATTACHING PARTS)*******		
-173	213-0113-00			1		SCREW,TPG,TF:2-32 X 0.312,TYPE B,PNH,STL	T0435	ORD BY DESCR
-174	210-1008-00			1		WASHER,FLAT:0.09 ID X 0.188" OD,BRS	12360	ORD BY DESCR
-175	210-0054-00			1		WASHER,LOCK:#4 SPLIT,0.025 THK STL CD P	83385	ORD BY DESCR
						******(END ATTACHING PARTS)******		
-176	210-0774-00			4		EYELET,METALLIC:0.152 OD X 0.245 INCH L,	80009	210-0774-00
-177	210-0775-00			4		EYELET,METALLIC:0.126 OD X 0.23 INCH L,	80009	210-0775-00
-178	361-0425-01			2		SPACER,BAR:CKT BOARD STIFFENER	80009	361-0425-01
						*******(ATTACHING PARTS)*******		
-179	213-0277-00			2		SCR,TPG,THD FOR:2-56 X 0.312 INCH,PNH STL	83385	ORD BY DESCR
-180	210-0053-00			2		WASHER,LOCK:INTL,0.092 ID X 0.175"OD	83385	ORD BY DESCR
-181	210-1008-00			2		WASHER,FLAT:0.09 ID X 0.188" OD,BRS	12360	ORD BY DESCR
						******(END ATTACHING PARTS)******		
-182	214-1575-00			1		ACTUATOR,SL SW:DUAL SPDT,CKT BD MTG	80009	214-1575-00
				-		(ADDED TO A3 AND A4 AT B020000 AND UP)		
-183	351-0180-00			1		SLIDE,GUIDE:SWITCH ACTUATOR	80009	351-0180-00
				-		(ADDED TO A3 AND A4 AT B020000 AND UP)		
-184	214-1190-00			1		CPLG,SHAFT,RGD:0.125 OD TO 0.125 OD,AL	80009	214-1190-00
	213-0075-00			1		SETSCREW:4-40 X 0.094,STL BK OXD,HEX	000BK	ORD BY DESCR
	213-0140-00			1		SETSCREW:2-56 X 0.94 INCH,HEX SOC ST	70276	ORD BY DESCR
-185				1		RES.,VAR:(SEE R90 REPL)		
				-		(485,485-1 ONLY)		
						*******(ATTACHING PARTS)*******		
-186	210-0583-00			1		NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
				-		(ADDED TO A3 AND A4 AT B020000 AND UP)		
-187	210-0046-00			1		WASHER,LOCK:0.261 ID,INTL,0.018 THK,BRS	78189	1214-05-00-0541C
				-		(ADDED TO A3 AND A4 AT B020000 AND UP)		
						******(END ATTACHING PARTS)******		
	131-1314-00			1		CONTACT,ELEC:GROUNDING	80009	131-1314-00
				-		(485-2 ONLY)		
-188	105-0243-00			1		ACTUATOR,SWITCH:AC,DC	80009	105-0243-00
	105-0243-01			1		ACTUATOR,SWITCH:AC-DC	80009	105-0243-01
-189	213-0214-00			1		SCREW,CAP SCH:2-56 X 0.375'HEX HD STL	70278	ORD BY DESCR
	263-1156-00	B144460		1		SW CAM ACTR AS:ATTENUATOR	80009	263-1156-00
						*******(ATTACHING PARTS)*******		
-190	211-0116-00	B010100	B188649	12		SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	ORD BY DESCR
	211-0292-00	B188650		2		SCR,ASSEM WSHR:4-40 X 0.29,BRS NI PL	78189	ORD BY DESCR
-191	131-0963-00			2		CONTACT,ELEC:GROUNDING	000EX	ORD BY DESCR
						******(END ATTACHING PARTS)******		
				-		SWITCH ASSY INCLUDES:		
-192	214-1139-00			1		SPRING,FLAT:0.885 X 0.156 CU BE GLD CLR	80009	214-1139-00
	214-1139-02			1		SPRING,FLAT:GREEN COLORED	80009	214-1139-02
	214-1139-03			3		SPRING,FLAT:RED COLORED	80009	214-1139-03
-193	214-1127-00			4		ROLLER,DETENT:0.125 DIA X 0.125,SST	80009	214-1127-00
-194	210-0406-00			6		NUT,PLAIN,HEX:4-40 X 0.188,BRS,CD PL	73743	12161-50
-195	401-0081-02			2		BEARING,CAM SW:FRONT	80009	401-0081-02
						*******(ATTACHING PARTS)*******		
-196	354-0391-00			2		RING,RETAINING:0.395"FREE ID X 0.025' S	97464	3100-43CD
						******(END ATTACHING PARTS)******		
-197	105-0282-00			1		ACTUATOR,CAM SW:DC,GND,AC	80009	105-0282-00
	210-0406-00			4		NUT,PLAIN,HEX:4-40 X 0.188,BRS,CD PL	73743	12161-50
-198	401-0115-00			1		BEARING,CAM SW:CENTER	80009	401-0115-00
-199	105-0283-00			1		ACTUATOR,CAM SW:	80009	105-0283-00
	198-3047-00			1		WIRE SET ELEC:ATTENUATOR ASSEMBLY	80009	198-3047-00
	210-0774-00			3		EYELET,METALLIC:0.152 OD X 0.245 INCH L,	80009	210-0774-00

Fig. & Index No.	Tektronix Part No.	Serial/Model Eff	Dscont	No. Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-	210-0775-00			3		.EYELET,METALLIC:0.126 OD X 0.23 INCH L,	80009	210-0775-00
						*******(ATTACHING PARTS)*******		
-200	210-0590-00			6		NUT,PLAIN,HEX.:0.375-32 X 0.438' BRS	73743	2X28269-402
	211-0503-00			3		SCREW,MACHINE:6-32 X 0.188 INCH,PNH STL	83385	ORD BY DESCR
						******(END ATTACHING PARTS)******		
-201	337-1630-00			1		SHIELD,FUSE:PAINTED	80009	337-1630-00
						*******(ATTACHING PARTS)*******		
-202	211-0007-00			1		SCREW,MACHINE:440 X 0.188,PNH STL,CD PL	83385	ORD BY DESCR
	211-0105-00			1		SCREW,MACHINE:4-40 X 0.188,100 DEG,FLH ST	83385	ORD BY DESCR
	210-0801-00			1		WASHER,FLAT:0.14 ID X 0.025 THK,BRS NI	12327	ORD BY DESCR
						******(END ATTACHING PARTS)******		
-203				1		DELAY LINE,ELEC:(SEE DL410 REPL)		
-204				1		COIL:(SEE L1794 REPL)		
						*******(ATTACHING PARTS)*******		
-205	211-0147-00			1		SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	ORD BY DESCR
-206	210-0994-00			1		WASHER,FLAT:0.125 ID X 0.25' OD,STL	86928	5702-201-20
-207	211-0148-00			1		SCREW,MACHINE:4-40 X 0.312 INCH,PNH STL	83385	ORD BY DESCR
-208	210-0863-00			1		WSHR,LOOP CLAMP:0.187 ID U/W 0.5 W CLP,STL	95987	C191
-209	343-0002-00			1		CLAMP,LOOP:0.188 INCH DIA	95987	3-16-6B
-210	343-0217-00			1		CLAMP,COIL:Y-AXIS	80009	343-0217-00
						******(END ATTACHING PARTS)******		
-211	407-1045-00			2		BRACKET,ANGLE:CRT SHIELD,ALUMINUM	80009	407-1045-00
						*******(ATTACHING PARTS)*******		
-212	211-0590-00			2		SCREW,MACHINE:6-32 X 0.250,PNH,BRS,CD PL	83385	ORD BY DESCR
-213	210-0457-00			2		NUT,PL,ASSEM WA:6-32 X 0.312,STL CD PL	83385	ORD BY DESCR
						******(END ATTACHING PARTS)******		
-214	214-0291-00			1		CONTACT,SPRING:1.188 X 0.375 X 0.25 INCH	80009	214-0291-00
						*******(ATTACHING PARTS)*******		
-215	211-0590-00			1		SCREW,MACHINE:6-32 X 0.250,PNH,BRS,CD PL	83385	ORD BY DESCR
-216	210-0457-00			1		NUT,PL,ASSEM WA:6-32 X 0.312,STL CD PL	83385	ORD BY DESCR
-217	210-0202-00			1		TERMINAL,LUG:0.146 ID,LOCKING,BRZ,TIN PL	78189	2104-06-00-2520N
						******(END ATTACHING PARTS)******		
-218	337-1496-00			1		SHLD,ELECTRICAL:CRT	80009	337-1496-00
-219	386-2246-00			1		SUPPORT,CRT:REAR	80009	386-2246-00
-220	386-2188-00			1		SUPPORT,CRT:FRONT	80009	386-2188-00
	136-0489-00			1		SOCKET ASSY:CRT	80009	136-0489-00
-221	136-0304-02			1		SOCKET,PLUG-IN:CRT,14 PIN SOCKET,W/PINS	80009	136-0304-02
-222	200-0917-01			1		COV,CRT SKT:2.052 OD X 0.291 H,PLASTIC	80009	200-0917-01
-223	367-0117-00			1		PULL,SOCKET:CRT,PLASTIC	80009	367-0117-00
-224	343-0235-00			1		CLAMP,CRT SKT:DELRIN	80009	343-0235-00
-225	210-0774-00			4		EYELET,METALLIC:0.152 OD X 0.245 INCH L,	80009	210-0774-00
-226	210-0775-00			4		EYELET,METALLIC:0.126 OD X 0.23 INCH L,	80009	210-0775-00
-227	131-0707-00			14		.CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD	22526	47439
-228	352-0197-00			2		CONN BODY,PL,EL:1 WIRE BLACK	80009	352-0197-00
-229	352-0162-00			3		HLDR,TERM CONN:4 WIRE BLACK	80009	352-0162-00
-230	352-0165-00			1		HLDR,TERM CONN:7 WIRE,BLACK	80009	352-0165-00
	346-0133-00	B167580		1		STRAP,TIE DOWN:0.091 W X 14.0 L,PLASTIC	59730	TY-234M
	198-2786-00			1		WIRE SET,ELEC:HORIZONTAL OUTPUT AMP BOARD	80009	198-2786-00
	131-1119-00			4		CONTACT,ELEC:FOR NO. 22-26 AWG WIRE	22526	75374-001
						(THESE PINS ARE FOR THE CRT DEFL LEADS)		
-231	348-0276-00			FT		SHLD,GSKT,ELEK:0.026 OD NPRN W/WIRE NET CO	28817	01-0404-3719
-232	179-1737-00			1		WIRING HARNESS,:DELAY LINE	80009	179-1737-00
				-		(485 ONLY)		
-233	131-0621-00			2		CONNECTOR,TERM:22-26 AWG,BRS & CU BE GOLD	22526	46231
	210-0774-00			4		EYELET,METALLIC:0.152 OD X 0.245 INCH L,	80009	210-0774-00
	210-0775-00			4		EYELET,METALLIC:0.126 OD X 0.23 INCH L,	80009	210-0775-00
	352-0197-00			2		CONN BODY,PL,EL:1 WIRE BLACK	80009	352-0197-00
	179-1738-00			1		WIRING HARNESS,:POT CABLE	80009	179-1738-00
	131-0707-00			10		CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD	22526	47439
	352-0197-00			1		CONN BODY,PL,EL:1 WIRE BLACK	80009	352-0197-00
	179-1734-00			1		WIRING HARNESS,:MAIN	80009	179-1734-00
	131-0707-00			94		CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD	22526	47439
	131-0621-00			1		CONNECTOR,TERM:22-26 AWG,BRS & CU BE GOLD	22526	46231
	210-0774-00			4		EYELET,METALLIC:0.152 OD X 0.245 INCH L,	80009	210-0774-00

Fig. & Index No.	Tektronix Part No.	Serial/Model Eff	Dscont	No. Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
	210-0775-00			4		EYELET,METALLIC:0.126 OD X 0.23 INCH L,	80009	210-0775-00
-234	352-0169-00			1		HLDR,TERM CONN:2 WIRE,BLACK	80009	352-0169-00
-235	352-0161-00			1		HLDR,TERM CONN:3 WIRE,BLACK,0.1 SPACING	80009	352-0161-00
	352-0162-00			1		HLDR,TERM CONN:4 WIRE BLACK	80009	352-0162-00
-236	352-0163-00			2		HLDR,TERM CONN:5 WIRE BLACK,0.1 SPACING	80009	352-0163-00
-237	352-0164-00			4		HLDR,TERM CONN:6 WIRE,BLACK	80009	352-0164-00
	352-0165-00			3		HLDR,TERM CONN:7 WIRE,BLACK	80009	352-0165-00
-238	352-0168-00			3		HLDR,TERM CONN:10 WIRE,BLACK	80009	352-0168-00
	352-0197-00			1		CONN BODY,PL,EL:1 WIRE BLACK	80009	352-0197-00
-239	378-0664-00			1		FILTER,LT,CRT:	80009	378-0664-00
-240	354-0248-00			1		HOLDER,LT FIL:CRT	80009	354-0248-00
-241	214-0996-00			1		SPRING,FLAT:GROUNDING,CRT MESH FILTER	80009	214-0996-00
	198-2074-00			1		WIRE SET,ELEC:FINAL ASSY KIT	80009	198-2074-00
-242	407-1022-00			1		BRACKET,ANGLE:SWITCH MTG,ALUMINUM	80009	407-1022-00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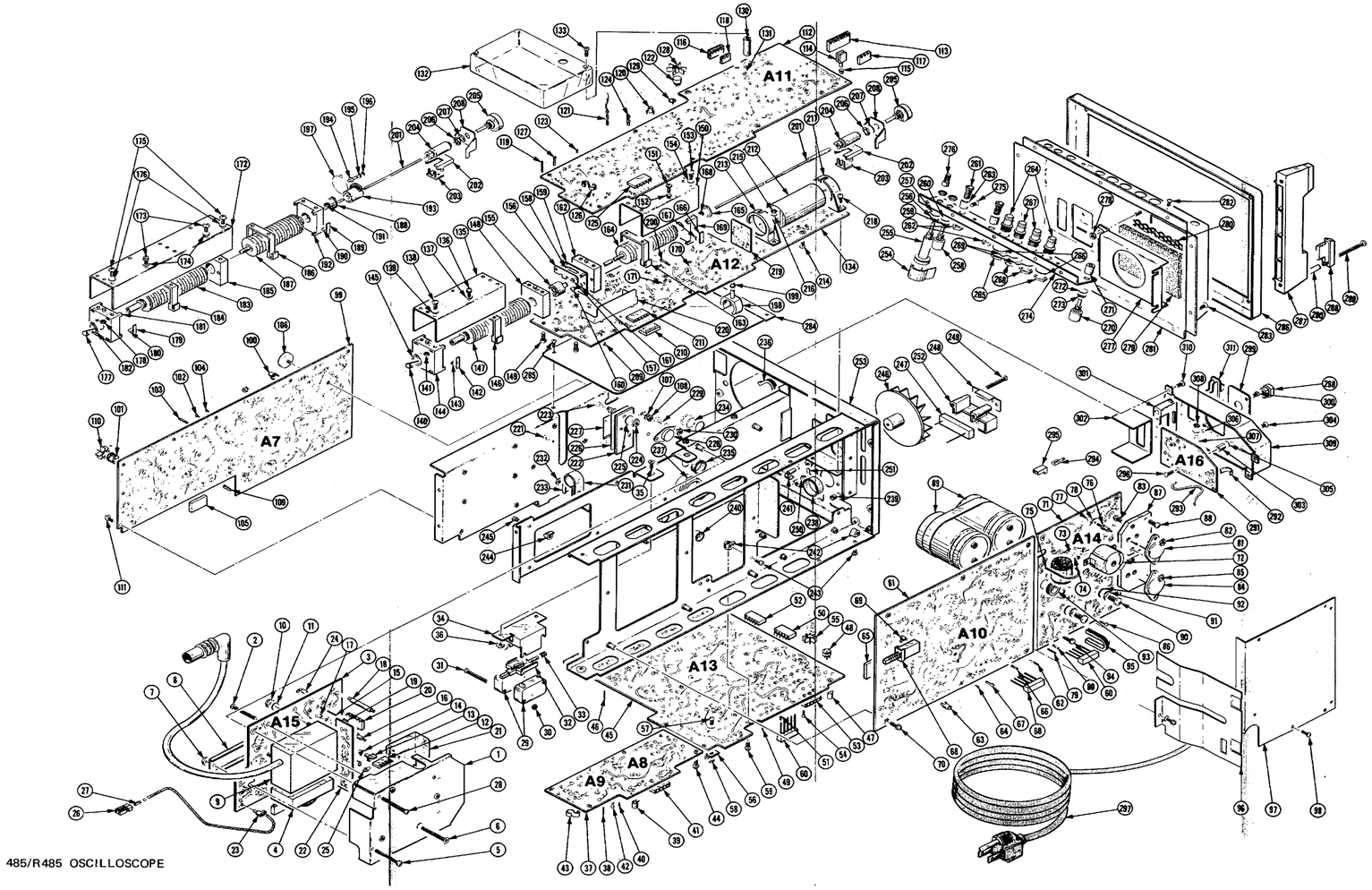


485/R485 OSCILLOSCOPE

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	Mfr 1 2 3 4 5	Name & Description	Code	Mfr Par Number
2-1	337-1495-00	B010100	B049999	1		SHIELD,ELEC HIGH VOLTAGE	80009	337-1495-00
	337-1495-01	B050000		1		SHIELD,ELEC HIGH VOLTAGE SUPPLY	80009	337-1495-01
						(ATTACHING PARTS)		
-2	211-0021-00			2		SCREW,MACHINE 4-40 X 1.25 INCH,PNH STL	83385	ORD BY DESCR
						(END ATTACHING PARTS)		
	348-0056-00	B050000		1		GROMMET,PLASTIC 0.375 INCH DIA	80009	348-0056-00
-3				1		CKT BOARD ASSY TRANSFORMER (SEE A15 REPL)		
-4	120-0787-00			1		XFMR,PWR SDN & SU HV	80009	120-0787-00
						(ATTACHING PARTS)		
-5	211-0553-00			1		SCREW,MACHINE 6-32 X 1.5 INCH,PNH STL	83385	ORD BY DESCR
-6	211-0619-00			1		SCREW,MACHINE 6-32 X 1.5 INCH FLH STL	83385	ORD BY DESCR
-7	210-0457-00			2		NUT,PL,ASSEM WA 6-32 X 0.312,STL CD PL	83385	ORD BY DESCR
-8	346-0095-00			1		STRAP,RETAINING XFMR	80009	346-0095-00
						(END ATTACHING PARTS)		
-9	152-0509-00			1		SEMICOND DEVICE V MULTR,3KV IN,18KV OUT	52306	CMX115
						(ATTACHING PARTS)		
-10	210-0458-00			3		NUT,PL,ASSEM WA 8-32 X 0.344,STL,CD PL	78189	511-081800-00
-11	210-0804-00			3		WASHER,FLAT 0.17 ID X 0.375 INCH OD,STL	12327	ORD BY DESCR
						(END ATTACHING PARTS)		
-12	124-0162-00			2		TERMINAL BOARD 4 NOTCH CERAMIC,STUD MTD	80009	124-0162-00
-13	355-0046-00			1		MOUNT,TERM BD 0.577 INCH H	80009	355-0046-00
						(ATTACHING PARTS)		
-14	361-0007-00			1		SPACER,SLEEVE 0.250 INCH DIA,PLASTIC	80009	361-0007-00
						(END ATTACHING PARTS)		
-15	131-0589-00			2		TERMINAL,PIN 0.46 L X 0.025 SO	22526	48283-029
-16	131-0809-00			1		TERMINAL,STUD 0.546L,4-40 TAP 1 END	71279	570-1510-01-0519
						(ATTACHING PARTS)		
-17	211-0005-00			1		SCREW,MACHINE 4-40 X 0125 INCH PNH STL	83385	ORD BY DESCR
						(END ATTACHING PARTS)		
-18	129-0072-00			1		INSULATOR,STDF 0 938 INCH LONG	80009	129-0072-00
	131-0309-00			1		TERMINAL,STUD 0.415 INCH LONG	88245	421572-02-9
	124-0119-00			1		TERMINAL BOARD 2 NOTCH,CERAMIC,CLIP MTD	80009	124-0119-00
	355-0046-00			1		MOUNT,TERM BD 0.577 INCH H	80009	355-0046-00
						(ATTACHING PARTS)		
	361-0007-00			1		SPACER,SLEEVE 0.250 INCH DIA,PLASTIC	80009	361-0007-00
						(END ATTACHING PARTS)		
	124-0092-00			1		TERMINAL BOARD 3 NOTCH CERAMIC,CLIP MTD	80009	124-0092-00
	355-0046-00			1		MOUNT,TERM BD 0.577 INCH H	80009	355-0046-00
						(ATTACHING PARTS)		
	361-0007-00			1		SPACER,SLEEVE 0.250 INCH DIA PLASTIC	80009	361-0007-00
						(END ATTACHING PARTS)		
-19	136-0328-02			2		SOCKET,PIN TERM U/W 0.025,SO PIN	00779	86282-2
-20	136-0461-00			8		SKT,PL-IN ELEC CIRCUIT BD,5 CONTACT	80009	136-0461-00
	343-0043-00			3		CLAMP,LOOP #20,NEON BULBS	80009	343-0043-00
-21	200-1485-00			1		COVER,CKT BD XFMR-MULT	80009	200-1485-00
						(ATTACHING PARTS)		
	213-0088-00			2		SCR,TPG,THD CTG 4-24 X 0.25 INCH,PNH STL	83385	ORD BY DESCR
						(END ATTACHING PARTS)		
-22	388-2476-00			1		CKT BOARD HV	80009	388-2476-00
-23	343-0144-00	B010100	B049999	1		CLAMP,LOOP 0.1251D,NYLON	95987	1-8-2
	343-0444-00	B050000		1		CLAMP,LOOP 0.1 DIA CABLE POLYCARBONATE	80009	343-0444-00
						(ATTACHING PARTS)		
	211-0008-00	B010100	B049999	1		SCREW,MACHINE 4-40 X 0.250 PNH,STL,POZ	83385	ORD BY DESCR
	210-0801-00	B010100	B049999	1		WASHER,FLAT 0.14 ID X 0.025 THK BRS NI	12327	ORD BY DESCR
	210-0586-00	B010100	8049999	1		NUT,PL,ASSEM WA 4-40 X 0.25,STL CD PL	78189	211-041800-00
						(END ATTACHING PARTS)		
	343-0088-00	B010100	B010126	4		CLAMP,LOOP 0.062 INCH DIA	80009	343-0088-00
-24	343-0088-00	B010127		3		CLAMP,LOOP 0.062 INCH DIA	80009	343-0088-00
	343-0213-00	B010127		1		CLAMP,LOOP 0.2 ID,PLASTIC	80009	343-0213-00
-25	386-1556-00			1		SUPPORT,CKT BD 0.215 H,ACETAL	80009	386-1556-00
	198-2784-00			1		WIRE SET ELEC TRANSFORMER MULTIPLIER BOAR	80009	198-2784-00
	352-0171-00			4		HLDR,TERM CONN 1 WIRE,BLACK	80009	352-0171-00

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	Mfr 1 2 3 4 5	Name & Description	Code	Mfr Par Number
2-26	352-0198-00			1		HLDR,TERM CONN 2 WIRE BLACK	80009	352-0198-00
-27	131-0707-00			4		CONTACT,ELEC 22-26 AWG,BRS & CU BE GOLD (ATTACHING PARTS)	22526	47439
-28	211-0021-00			2		SCREW,MACHINE 4-40 X 1 25 INCH,PNH STL	83385	ORD BY DESCR
	211-0207-00	B010100	B167675	2		SCR,ASSEM WSHR 4-40 X 0.312 DOUBLE SEMS	83385	ORD BY DESCR
	211-0244-00	B167676		2		SCR,ASSEM WSHR 4-40 X 0.312 INCH PNH STL (END ATTACHING PARTS)	78189	ORD BY DESCR
	644-0437-00			1		SWITCH ASSY,PWR	80009	644-0437-00
-29				2		SWITCH,SENS (SEE S1801 REPL) (ATTACHING PARTS)		
-30	220-0665-00			2		NUT,PLAIN,HEX SLFLKG,4-40 X 0.25",PLSTC	23050	ORD BY DESCR
-31	211-0020-00			2		SCREW,MACHINE 4-40 X 1.125 INCH,PNH STL (END ATTACHING PARTS)	83385	ORD BY DESCR
-32	214-1689-00			1		ACTUATOR,SWITCH POWER	80009	214-1689 00
-33	214-1226-01			1		SPRING,HLCPS 0.18 OD X 0.44 INCH LONG	80009	214-1226-01
-34	200-1318-00			1		COVER,SW ACTR (ATTACHING PARTS)	80009	200-1318-00
-35	211-0101-00			2		SCREW,MACHINE 4-40 X 0.25,FLH,100 DEG,STL	83385	ORD BY DESCR
-36	210-0586-00			2		NUT,PL,ASSEM WA 4-40 X 0.25,STL,CD PL (END ATTACHING PARTS)	78189	211-041800-00
-37				1		CKT BOARD ASSY A TRIGGER(SEE A8 AND A9 REP (A9 REPL A8 IN 485-1 AND 485-2 INSTRUMENTS		
-38	131-0589-00			1		TERMINAL,PIN 0.46 L X 0.025 SQ	22526	48283-029
	131-0608-00			9		TERMINAL,PIN 0.365 L X 0.025 PH BRZ GOLD	22526	48283-036
-39	131-1003-00			7		CONN,RCPT,ELEC CKT BD MT,3 PRONG	80009	131-1003-00
	136-0252-04	B010100	B091529	128		SOCKET,PIN TERM U/W 0.016-0.018 DIA PINS	22526	75060-007
-40	136-0252-04	B091530	B143774	125		SOCKET PIN TERM U/W 0.016-0.018 DIA PINS	22526	75060-007
	136-0252-07	B143775		105		SOCKET,PIN CONN W/O DIMPLE	22526	75060-012
	136-0252-07			2		SOCKET,PIN CONN W/O DIMPLE	22526	75060-012
	136-0514-00	B091530		1		SKT,PL-IN ELEC MICROCIRCUIT,8 DIP	09922	DILB8P-108
	136-0634-00	B143775	B191041	1		SOCKET,PLUG-IN 20 LEAD DIP,CKT BD MTG	73803	CS9002-20
	136-0752-00	B191042		1		SKT,PL-IN ELEK MICROCIRCUIT,20 DIP	09922	DILB20P-108
-41	136-0461-00			2		SKT,PL-IN ELEC CIRCUIT BD,5 CONTACT	80009	136-0461-00
-42	214-0579-00			3		TERM,TEST POINT BRS CD PL	80009	214-0579-00
-43	200-1167-00			1		COVER,XSTR TEMP STAB FOR 2 TO-18 CS S (ATTACHING PARTS FOR CKT BD)	80009	200-1167-00
-44	211-0007-00			4		SCREW,MACHINE 4-40 X 0.188,PNH STL,CD PL (END ATTACHING PARTS)	83385	ORD BY DESCR
-45				1		CKT BOARD ASSY POWER SUPPLY(SEE A13 REPL)		
-46	131-0608-00			35		TERMINAL,PIN 0.365 L X 0.025 PH BRZ GOLD	22526	48283-036
-47	131-1003-00			4		CONN,RCPT,ELEC CKT BD MT,3 PRONG	80009	131-1003-00
-48	136-0183-00			6		SOCKET,PLUG-IN 3 PIN,ROUND	80009	136-0183-00
-49	136-0252-04	B010100	B091529	69		SOCKET,PIN TERM U/W 0.016-0.018 DIA PINS	22526	75060-007
	136-0252-07	B091530		58		SOCKET,PIN CONN W/O DIMPLE	22526	75060-012
	136-0220-00	B091530		2		SKT,PL-IN ELEK TRANSISTOR 3 CONTACT,PCB M	71785	133-23-11-034
	136-0514-00	B091530	B191041	1		SKT,PL-IN ELEC MICROCIRCUIT,8 DIP	09922	DILB8P-108
	136-0727-00	B191042		1		SKT,PL-IN ELEK MICROCKT,8 CONTACT	09922	DILB8P-108
-50	136-0260-02	B010100	B191041	6		SKT,PL-IN ELEK MICROCIRCUIT 16 DIP LOW CL	09922	DILB16P-108T
	136-0729-00	B191041		6		SKT,PL-IN ELEK MICROCKT,16 CONTACT	09922	DILB16P-108T
-51	136-0263-04			35		SOCKET,PIN TERM FOR 0.025 INCH SO PIN	22526	75377-001
	136-0263-03			1		SOCKET,PIN TERM U/W 0.025 SQUARE PIN	00779	85864-2
-52	136-0269-02	B010100	B191041	3		SKT,PL-IN ELEK MICROCIRCUIT,14 DIP	09922	DILB149P-108
	136-0728-00	B191041		3		SKT,PL-IN ELEK MICROCKT,14 CONTACT	09922	DILB14P-108
-53	136-0461-00			3		SKT,PL-IN ELEC CIRCUIT BD,5 CONTACT	80009	136-0461-00
-54	214-0579-00			24		TERM,TEST POINT BRS CD PL	80009	214-0579-00
-55	214-1292-00			6		HEAT SINK,ELEC TRANSISTOR	05820	205SB
-56				2		TRANSISTOR (SEE Q2066,Q2076 REPL) (ATTACHING PARTS)		
-57	211-0097-00			2		SCREW,MACHINE 4-40 X 0.312 INCH,PNH STL	83385	ORD BY DESCR
-58	210-0406-00			2		NUT,PLAIN,HEX 4-40 X 0.188,BRS,CD PL (END ATTACHING PARTS)	73743	12161-50

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	Mfr 1 2 3 4 5	Name & Description	Code	Mfr Par Number
2-						(ATTACHING PARTS FOR CKT BD)		
-59	211-0007-00			7		SCREW,MACHINE 4-40 X 0.188,PNH STL CD PL	83385	ORD BY DESCR
						(END ATTACHING PARTS)		
-60	131-1143-00			26		CONNECTOR RCPT,:	80009	131-1143-00
-61	----------			1		CKT BOARD ASSY SWEEP GENERATOR(SEE A10 REP		
	131-0566-00	B020000		1		BUS CONDUCTOR DUMMY RES,2 375,22 AWG	57668	JWW-0200E0
-62	131-0589-00			1		TERMINAL,PIN 0.46 L X 0.025 SQ	22526	48283-029
	131-0608-00			10		TERMINAL PIN 0.365 L X 0.025 PH BRZ GOLD	22526	48283-036
-63	131-1003-00			3		CONN,RCPT,ELEC CKT BD MT,3 PRONG	80009	131-1003-00
	136-0252-04	B010100	B091529	196		SOCKET,PIN TERM U/W 0.016-0.018 DIA PINS	22526	75060-007
-64	136-0252-07	B091530		188		SOCKET,PIN CONN W/O DIMPLE	22526	75060-012
	136-0220-00	B091530		8		SKT,PL-IN ELEK TRANSISTOR 3 CONTACT,PCB M	71785	133-23-11-034
-65	136-0260-02	B010100	B191041	1		SKT,PL-IN ELEK MICROCIRCUIT,16 DIP,LOW CL	09922	DILB16P-108T
	136-0729-00	B191042		1		SKT,PL-IN ELEK MICROCKT 16 CONTACT	09922	DILB16P-108T
-66	136-0263-04			68		SOCKET,PIN TERM FOR 0.025 INCH SQ PIN	22526	75377-001
	214-0579-00	B010100	B019999	21		TERM,TEST POINT BRS CD PL	80009	214-0579-00
-67	214-0579-00	B020000		20		TERM,TEST POINT BRS CD PL	80009	214-0579-00
-68	----- -----			1		SWITCH,PUSH (SEE S2105 REPL)		
-69	361-0382-00			2		SPACER,PB SW BROWN,0.275 INCH LONG	80009	361-0382-00
						(ATTACHING PARTS FOR CKT BD)		
-70	211-0007-00			6		SCREW MACHINE 4-40 X 0.188 PNH STL,CD PL	83385	ORD BY DESCR
						(END ATTACHING PARTS)		
-71	----- -----			1		CKT BOARD ASSY INVERTER(SEE A14 REPL)		
72	----- -----			1		COIL,RF (SEE L1835 REPL)		
						(ATTACHING PARTS)		
-73	211-0008-00			2		SCREW,MACHINE 4-40 X 0.250,PNH,STL,POZ	83385	ORD BY DESCR
-74	210-0004-00			2		WASHER,LOCK #4 INTL,0 015 THK,STL CD PL	000BK	ORD BY DESCR
	.					(END ATTACHING PARTS)		
-75	346-0032-00			3		STRAP,RTNING 0.075 DIA X 4 0 L,MLD RBR	98159	2859-75-4
-76	131-0373-00			1		TERMINAL,STUD 0.593 L	71279	572-4894-01-0516
	.					(ATTACHING PARTS)		
-77	210-0405-00			1		NUT,PLAIN,HEX 2-56 X 0.188,BRS,CD PL	73743	12157-50
-78	210-0053-00			1		WASHER,LOCK INTL,0.092 ID X 0.175"OD	83385	ORD BY DESCR
	.					(END ATTACHING PARTS)		
-79	131-0589-00			1		TERMINAL,PIN 0.46 L X 0.025 SO	22526	48283-029
	131-0590-00			2		CONTACT,ELEC 0.71 INCH LONG	22526	47351
	136-0254-00			4		SOCKET PIN TERM U/W 0.031 TO 0.04	00779	1-331892-5
-80	136-0263-04			5		SOCKET PIN TERM FOR 0.025 INCH SQ PIN	22526	75377-001
-81	----- -----			1		TRANSISTOR (SEE 01834 REPL)		
						(ATTACHING PARTS)		
82	210-0586-00			1		NUT,PL,ASSEM WA 4-40 X 0.25 STL CD PL	78189	211-041800-00
-83	355-0518-02			1		STUD,PRESSMOUNT 4-40 X 0.625 INCH,BRASS	80009	355-0518-02
	.					(END ATTACHING PARTS)		
	337-1498-00	B010100	B091550	1		SHIELD,TSTR TO-3 TOP	80009	337-1498-00
.						(ATTACHING PARTS)		
	210-0586-00	B010100	B091550	1		NUT,PL,ASSEM WA 4-40 X 0.25,STL,CD PL	78189	211-041800-00
	211-0005-00	B010100	B091550	1		SCREW,MACHINE 4-40 X 0.125 INCH,PNH STL	83385	ORD BY DESCR
	355-0518-02	B010100	B091550	1		STUD,PRESSMOUNT 4-40 X 0.625 INCH,BRASS	80009	355-0518-02
						(END ATTACHING PARTS)		
-84	---- ----			1		TRANSISTOR (SEE 01844 REPL)		
						(ATTACHING PARTS)		
-85	210-0586-00			2		NUT,PL,ASSEM WA 4-40 X 0.25,STL,CD PL	78189	211-041800-00
	386-0978-00	B010100	B091550	1		INSULATOR PLATE TRANSISTOR,MICA	80009	386-0978-00
	355-0518-02			2		STUD,PRESSMOUNT 4-40 X 0.625 INCH,BRASS	80009	355-0518-02
						(END ATTACHING PARTS)		
-86	214-0579-00			3		TERM,TEST POINT BRS CD PL	80009	214-0579-00
-87	214-1581-00			2		HEAT SINK,XSTR TO-3 ALUMINA	80009	214-1581-00
	.					(ATTACHING PARTS)		
-88	211-0578-00			4		SCREW,MACHINE 6-32 X 0.438 INCH,PNH STL	83385	ORD BY DESCR
	.					(END ATTACHING PARTS)		
	337-1499-00	B010100	B091550	1		SHIELD,TSTR TO-3 BOTTOM	80009	337-1499-00

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	Mfr 1 2 3 4 5	Name & Description	Code	Mfr Par Number
2-89	----- -----			2		CAPACITOR (SEE C1822,C1823 REPL) (ATTACHING PARTS)		
-90	212-0507-00			4		SCREW,MACHINE 10-32 X 0.375 INCH,PNH STL	83385	ORD BY DESCR
-91	210-0009-00			2		WASHER,LOCK EXT,0.1931D X 0.40" OD,STL	78189	1110-00
-92	210-0805-00			2		WASHER,FLAT 0.204 ID X 0.438 INCH OD (END ATTACHING PARTS)	12327	ORD BY DESCR
-93	348-0005-00			1		GROMMET,RUBBER 0.50 INCH DIA	70485	23C
	198-2783-00			1		WIRE SET,ELEC INVERTER BOARD (ATTACHING PARTS FOR CKT BD)	80009	198-2783-00
-94	211-0207-00	B010100	B167675	3		SCR,ASSEM WSHR 4-40 X 0.312 DOUBLE SEMS	83385	ORD BY DESCR
	211-0244-00	B167676		3		SCR,ASSEM WSHR 4-40 X 0.312 INCH,PNH STL (END ATTACHING PARTS)"	78189	ORD BY DESCR
-95	348-0145-00	B050000		1		GROMMET,PLASTIC U-SHP,1.0 X 0.42 INCH	80009	348-0145-00
	337-1665-00	B010100	B049999	1		SHIELD ELEC INVERTER	80009	337-1665-00
-96	337-1850-00	B505000		1		SHIELD,ELEC INVERTER,SIDE	80009	337-1850-00
-97	337-1665-01	B050000		1		SHIELD,ELEC INVERTER,TOP (ATTACHING PARTS)	80009	337-1665-01
-98	211-0007-00			4		SCREW,MACHINE 4-40 X 0.188,PNH STL,CD PL (END ATTACHING PARTS)	83385	ORD BY DESCR
-99	----- -----			1		CKT BOARD ASSY VERTICAL(SEE A7 REPL)		
	131-0589-00			1		TERMINAL,PIN 0.46 L X 0.025 SQ	22526	48283-029
	131-0608-00			28		TERMINAL,PIN 0.365 L X 0.025 PH BRZ GOLD	22526	48283-036
-100	131-1003-00			11		CONN,RCPT,ELEC CKT D80 MT,3 PRONG	80009	131-1003-00
-101	136-0183-00			1		SOCKET,PLUG-IN 3 PIN,ROUND	80009	136-0183-00
	136-0252-04	B010100	B091529	256		SOCKET PIN TERM U/W 0.016-0.018 DIA PINS	22526	75060-007
-102	136-0252-07	B091530		212		SOCKET,PIN CONN W/O DIMPLE	22526	75060-012
	136-0220-00	B091530		14		SKT,PL-IN ELEK TRANSISTOR 3 CONTACT,PCB M	71785	133-23-11-034
	136-0514-00	B091530	B191041	1		SKT,PL-IN ELEC MICROCIRCUIT,8 DIP	09922	DILB8P-108
	136-0727-00	B191042		1		SKT,PL-IN ELEK MICROCKT,8 CONTACT	09922	DILB8P-108
	136-0263-03	B010100	B142799	1		SOCKET,PIN TERM UIW 0.025 SQUARE PIN	00779	85864-2
-103	136-0263-04	B142780	B191745	1		SOCKET,PIN TERM FOR 0.025 INCH SQ PIN	22526	75377-001
	136-0263-07	B191746		1		SOCKET,PIN TERM U/W 0.025 SQ PIN	22526	ORD BY DESCR
-104	136-0352-00			8		CONTACT,ELEC FOR 0.02 INCH DIAMETER PIN	00779	50462-7
-105	136-0461-00			3		SKT,PL-IN ELEC CIRCUIT BD,5 CONTACT	80009	136-0461-00
-106	----- -----			1		MICROCIRCUIT (SEE U332 REPL) (ATTACHING PARTS)		
-107	210-0551-00			1		NUT,PLAIN,HEX 4-40 X 0.25 INCH,STL	000BK	ORD BY DESCR
-108	210-1115-00			1		WASHER,FLAT 0.27 10 X 0.062 THK,0.37 OD (END ATTACHING PARTS)	86445	ORD BY DESCR
-109	214-0579-00	B010100	B167669	12		TERM,TEST POINT BRS CD PL	80009	214-0579-00
	214-0579-00	B167670		15		TERM,TEST POINT BRS CD PL	80009	214-0579-00
-110	214-1292-00			1		HEAT SINK,ELEC TRANSISTOR	05820	205SB
	198-2785-00			1		WIRE SET,ELEC VERTICAL BOARD (ATTACHING PARTS FOR CKT BD)	80009	198-2785-00
-111	211-0207-00	B010100	B167675	14		SCR,ASSEM WSHR 4-40 X 0.312 DOUBLE SEMS	83385	ORD BY DESCR
	211-0224-00	B167676		14		SCREW,CAP 4-40 X 0.500,SCH,SST (END ATTACHING PARTS)	000BK	ORD BY DESCR
-112	----- -----			1		CKT BOARD ASSY HORIZONTAL AMP(SEE All REPL		
-113	124-0158-00			1		TERMINAL BOARD 7 NOTCH,MINI	80009	124-0158-00
-114	355-0046-00			2		MOUNT,TERM BD 0.577 INCH H (ATTACHING PARTS)	80009	355-0046-00
-115	361-0007-00			2		SPACER,SLEEVE 0.250 INCH DIA,PLASTIC (END ATTACHING PARTS)	80009	361-0007-00
-116	124-0120-00			1		TERMINAL BOARD	80009	124-0120-00
	355-0046-00			2		MOUNT,TERM BD 0.577 INCH H (ATTACHING PARTS)	80009	355-0046-00
	361-0007-00			2		SPACER,SLEEVE 0.250 INCH DIA,PLASTIC (END ATTACHING PARTS)	80009	361-0007-00
-117	124-0092-00			1		TERMINAL BOARD 3 NOTCH,CERAMIC,CLIP MTD	80009	124-0092-00
	355-0046-00			1		MOUNT,TERM BD 0.577 INCH H (ATTACHING PARTS)	80009	355-0046-00
	361-0007-00			1		SPACER SLEEVE 0.250 INCH DIA,PLASTIC (END ATTACHING PARTS)	80009	361-0007-00

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	Mfr 1 2 3 4 5	Name & Description	Code	Mfr Par Number
2-118	124-0119-00			1		TERMINAL BOARD 2 NOTCH,CERAMIC,CLIP MTD	80009	124-0119-00
	355-0046-00			1		MOUNT,TERM BD 0.577 INCH H (ATTACHING PARTS)	80009	355-0046-00
	361-0007-00			1		SPACER,SLEEVE 0.250 INCH DIA,PLASTIC (END ATTACHING PARTS)	80009	361-0007-00
-119	131-0589-00			4		TERMINAL,PIN 0.46 L X 0.025 SQ	22526	48283-029
	131-0608-00			19		TERMINAL,PIN 0.365 L X 0.025 PH BRZ GOLD	22526	48283-036
	131-0787-00			2		TERMINAL,PIN 0.64L X 0.025 SQ	22526	47359
-120	131-1003-00			4		CONN,RCPT,ELEC CKT BD MT,3 PRONG	80009	131-1003-00
-121	131-1119-00			2		CONTACT,ELEC FOR NO 22-26 AWG WIRE	22526	75374-001
-122	136-0183-00			4		SOCKET,PLUG-IN 3 PIN,ROUND	80009	136-0183-00
	136-0252-04	B010100	B091529	139		SOCKET,PIN TERM U/W 0.016-0.018 DIA PINS	22526	75060-007
	136-0252-04	B091530	B142055	113		SOCKET PIN TERM U/W 0.016-0.018 DIA PINS	22526	75060-007
-123	136-0252-07	B142056		116		SOCKET PIN CONN W/O DIMPLE	22526	75060-012
	136-0220-00	B091530	B142055	6		SKT,PL-IN ELEK TRANSISTOR 3 CONTACT,PCB M	71785	133-23-11-034
	136-0220-00	B142056		5		SKT,PL-IN ELEK TRANSISTOR 3 CONTACT,PCB M	71785	133-23-11-034
	136-0514-00	B091530	B191041	1		SKT,PL-IN ELEC MICROCIRCUIT,8 DIP	09922	DILB8P-108
	136-0727-00	B191042		1		SKT,PL-IN ELEK MICROCKT,8 CONTACT	09922	DILB8P-108
-124	136-0327-01	B010100	B142799	12		SOCKET,PIN TERM 0.067 INCH DIA	00779	86281-2
	136-0263-04	B142800		12		SOCKET,PIN TERM FOR 0.025 INCH SQ PIN	22526	75377-001
-125	136-0461-00			4		SKT,PL-IN ELEC CIRCUIT BD,5 CONTACT	80009	136-0461-00
-126	200-1167-00			1		COVER XSTR TEMP STAB FOR 2 TO-18 CS S	80009	200-1167-00
-127	214-0579-00			23		TERM,TEST POINT BRS CD PL	80009	214-0579-00
-128	214-1292-00			4		HEAT SINK ELEC TRANSISTOR	05820	205SB
-129	343-0043-00			2		CLAMP,LOOP #20,NEON BULBS	80009	343-0043-00
-130	384-0531-00			2		ROD,SPACER 0.25 OD X 0.656 INCH LONG (ATTACHING PARTS)	80009	384-0531-00
-131	211-0097-00			2		SCREW MACHINE 4-40 X 0.312 INCH,PNH STL	83385	ORD BY DESCR
	210-0004-00			2		WASHER,LOCK #4 INTL,0.015 THK STL CD PL (END ATTACHING PARTS)	000BK	ORD BY DESCR
-132	337-1500-00			1		SHIELD,CKT BD Z AXIS ON B TRIG HORIZ (ATTACHING PARTS)	80009	337-1500-00
-133	211-0007-00			2		SCREW,MACHINE 4-40 X 0.188,PNH STL,CD PL (END ATTACHING PARTS)	83385	ORD BY DESCR
	672-0604-00	B155000		1		CKT BOARD ASSY TIME/CM	80009	672-0604-00
	334-3448-00	B156050		1		MARKER,IDENT MARKED NOTICE	80009	334-3448-00
-134	----- -----			1		CKT BOARD ASSY SWEEP TIMING(SEE A12 REPL)		
	105-0281-00	B010100	B049999	1		ACTR ASSY CAM S TIME/CM,A SWP	80009	105-0281-00
-135	200-1275-00	B010100	B049999	1		COVER,CAM SW (ATTACHING PARTS)	80009	200-1275-00
-136	211-0022-00	B010100	B049999	2		SCREW,MACHINE 2-56 X 0.188,PNH,STL,CD P	83385	ORD BY DESCR
-137	210-0001-00	B010100	B049999	2		WASHER,LOCK #2 INTL,0.013 X 0.18 OD,STL	78189	1202-00-00-0541C
-138	211-0008-00	B010100	B049999	4		SCREW,MACHINE 4-40 X 0.250,PNH,STL,POZ	83385	ORD BY DESCR
-139	210-0004-00	B010100	B049999	4		WASHER,LOCK #4 INTL 0.015 THK,STL CD PL (END ATTACHING PARTS)	000BK	ORD BY DESCR
-140	131-0963-00	B010100	B049999	1		CONTACT ELEC GROUNDING	000EX	ORD BY DESCR
-141	210-0406-00	B010100	B049999	3		NUT,PLAIN,HEX 4-40 X 0.188,BRS,CD PL	73743	12161-50
-142	214-1139-02	B010100	8049999	1		SPRING,FLAT GREEN COLORED	80009	214-1139-02
	214-1139-03	B010100	B049999	1		SPRING,FLAT RED COLORED	80009	214-1139-03
-143	214-1127-00	B010100	B049999	2		ROLLER,DETENT 0.125 DIA X 0.125,SST	80009	214-1127-00
-144	401-0081-02	B010100	B049999	1		BEARING,CAM SW FRONT (ATTACHING PARTS)	80009	401-0081-02
-145	354-0391-00	B010100	B049999	1		RING,RETAINING 0.395"FREE ID X 0.025" (END ATTACHING PARTS)	97464	3100-43-CD
-146	407-0926-00	B010100	B049999	1		BRACKET,COVER CAM SWITCH ALUMINUM	B0009	407-0926-00
-147	105-0277-00	B010100	B049999	1		ACTUATOR,CAM SW TIME/CM A	80009	105-0277-00
	210-0406-00	B010100	B049999	4		NUT,PLAIN,HEX 4-40 X 0.188,BRS CD PL	73743	12161-50
-148	401-0146-01	B010100	B049999	1		BEARING,CAM SW CENTER (ATTACHING PARTS FOR ASSY)	80009	401-0146-01
-149	211-0116-00	8010100	B049999	4		SCR,ASSEM WSHR 4-40 X 0.312 INCH,PNH BRS	83385	ORD BY DESCR
	211-0180-00	8010100	8049999	2		SCR,ASSEM WSHR 2-56 X 0.25 INCH,PNH BRS (END ATTACHING PARTS)	83385	ORD BY DESCR
	105-0335-00	B010100	B049999	1		ACTR ASSY CAM S:TIME/CM,B SWP	80009	105-0335-00

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	Mfr 1 2 3 4 5	Name & Description	Code	Mfr Par Number
2-150	200-1355-00	B010100	B049999	1		COVER,CAM SW	80009	200-1355-00
						(ATTACHING PARTS)		
-151	211-0022-00	B010100	B049999	2		SCREW,MACHINE 2-56 X 0.188,PNH,STL,CD P	83385	ORD BY DESCR
-152	210-0001-00	B010100	B049999	2		WASHER,LOCK #2 INTL,0O 013 X 0.18 OD,STL	78189	1202-00-00-0541C
-153	211-0008-00	B010100	B049999	4		SCREW,MACHINE 4-40 X 0.250,PNH,STL,POZ	83385	ORD BY DESCR
-154	210-0004-00	B010100	B049999	4		WASHER,LOCK #4 INTL,0O 015 THK,STL CD PL	000BK	ORD BY DESCR
						(END ATTACHING PARTS)		
-155	105-0280-01	B010100	B049999	1		STOP,KNOB PULL W/BUSHING	80009	105-0280-01
	213-0153-00	B010100	B049999	2		SETSCREW 5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-156	105-0279-00	B010100	B049999	1		STOP,KNOB PULL STATIONARY	80009	105-0279-00
						(ATTACHING PARTS)		
-157	354-0350-00	B010100	B049999	2		RING,RETAINING 0.073"FREE ID X0.015",	79136	5133-9MD
						(END ATTACHING PARTS)		
-158	214-1705-00	B010100	B049999	1		SPRING,FLAT STOP PLATE,CAM SWITCH	80009	214-1705-00
-159	386-2211-00	B010100	B049999	1		SPRT,STOP PLATE CAM SWITCH	80009	386-2211-00
						(ATTACHING PARTS)		
-160	211-0022-00	B010100	B049999	2		SCREW,MACHINE 2-56 X 0.188,PNH,STL,CD P	83385	ORD BY DESCR
-161	210-0001-00	B010100	B049999	2		WASHER,LOCK #2 INTL,0O 013 X 0.18 OD,STL	78189	1202-00-00-0541C
						(END ATTACHING PARTS)		
	210-0406-00	B010100	B049999	4		NUT,PLAIN,HEX 4-40 X 0.188,BRS CD PL	73743	12161-50
-162	401-0081-02	B010100	B049999	1		BEARING,CAM SW FRONT	80009	401-0081-02
-163	407-0926-00	B010100	B049999	1		BRACKET,COVER CAM SWITCH,ALUMINUM	80009	407-0926-00
-164	105-0278-00	B010100	B049999	1		DRUM,CAM SWITCH	80009	105-0278-00
						(ATTACHING PARTS)		
-165	354-0391-00	B010100	B049999	1		RING,RETAINING 0.395"FREE ID X 0.025"	97464	3100-43-CD
						(END ATTACHING PARTS)		
-166	214-1139-02	B010100	B049999	1		SPRING,FLAT GREEN COLORED	80009	214-1139-02
	214-1139-03	B010100	B049999	1		SPRING,FLAT RED COLORED	80009	214-1139-03
-167	214-1127-00	B010100	B049999	2		ROLLER,DETENT 0.125 DIA X 0.125,SST	80009	214-1127-00
-168	210-0406-00	B010100	B049999	4		NUT,PLAIN,HEX 4-40 X 0.188,BRS,CD PL	73743	12161-50
-169	401-0146-01	B010100	B049999	1		BEARING,CAM SW CENTER	80009	401-0146-01
						(ATTACHING PARTS FOR ASSY)		
-170	211-0116-00	B100100	B049999	4		SCR,ASSEM WSHR 4-40 X 0.312 INCH,PNH BRS	83385	ORD BY DESCR
-171	211-0180-00	B010100	B049999	2		SCR,ASSEM WSHR 2-56 X 0.25 INCH,PNH BRS	83385	ORD BY DESCR
						(END ATTACHING PARTS)		
	131-0963-00	B155000		1		CONTACT,ELEC GROUNDING	000EX	ORD BY DESCR
	105-0470-00	B050000	B154999	1		ACTR ASSY,CAM S TIME/CM	80009	105-0470-00
	263-1155-00	B155000		1		SW CAM ACTR AS	80009	263-1155-00
						(ATTACHING PARTS)		
	211-0116-00	B050000	B154999	6		SCR,ASSEM WSHR 4-40 X 0312 INCH,PNH BRS	83385	ORD BY DESCR
	211-0244-00	B155000	B188649	6		SCR,ASSEM WSHR 4-40 X 0.312 INCH,PNH STL	78189	ORD BY DESCR
	211-0292-00	B188650		6		SCR,ASSEM WSHR 4-40 X 0.29,BRS NI PL	78189	ORD BY DESCR
	211-0180-00	B050000		4		SCR,ASSEM WSHR 2-56 X 0.25 INCH,PNH BRS	83385	ORD BY DESCR
	211-0244-00	B155000		6		SCR,ASSEM WSHR 4-40 X 0.312 INCH,PNH STL	78189	ORD BY DESCR
						(END ATTACHING PARTS)		
	----- ------			-		ACTR ASSY INCLUDES		
-172	200-1551-00	B050000		1		COVER,CAM SW 28 & 26 ELEMENTS	80009	200-1551-00
						(ATTACHING PARTS)		
-173	211-0022-00	B050000		4		SCREW,MACHINE 2-56 X 0.188,PNH,STL,CD P	83385	ORD BY DESCR
-174	210-0001-00	B050000		4		WASHER,LOCK #2 INTL,0.013 X 0.18 OD,STL	78189	1202-00-00-0541C
-175	211-0008-00	B050000		6		SCREW,MACHINE 4-40 X 0.250,PNH,STL,POZ	83385	ORD BY DESCR
-176	210-0004-00	B050000		6		WASHER,LOCK #4 INTL,0.015 THK,STL CD PL	000BK	ORD BY DESCR
						(END ATTACHING PARTS)		
-177	131-0963-00	B050000		1		CONTACT,ELEC GROUNDING	000EX	ORD BY DESCR
-178	210-0406-00	B050000		3		NUT,PLAIN,HEX 4-40 X 0.188,BRS,CD PL	73743	12161-50
-179	214-1139-02	B050000		1		SPRING,FLAT GREEN COLORED	80009	214-1139-02
	214-1139-03	B050000		1		SPRING,FLAT RED COLORED	80009	214-1139-03
	214-1416-00	B155000		1		SPRING,HLCPS 0.176 OD X 0.835 INCH LONG	27143	OBD
-180	214-1127-00	B050000	B154999	2		ROLLER,DETENT 0.125 DIA X 0.125 SST	80009	214-1127-00
-181	401-0081-02	B050000	B154999	1		BEARING,CAM SW FRONT	80009	401-0081-02
	401-0204-00	B155000		1		BEARING,CAM SW FRONT,0.83 DIA CAM DOUBL	80009	401-0204-00

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	Mfr 1 2 3 4 5	Name & Description	Code	Mfr Par Number
2-	214-1752-00	B155000		2		ROLLER,DETENT: (ATTACHING PARTS)	80009	214-1752-00
-182	354-0391-00	B050000	B154999	1		RING,RETAINING :0.395"FREE ID X 0.025"	97464	3100-43-CD
	354-0390-00	B155000		1		RING,RETAINING:0.338 ID X 0.025" THK,ST (END ATTACHING PARTS)	79136	5100-37MD
-183	105-0277-00	B050000	B154999	1		ACTUATOR,CAM SW :TIME/CM A	80009	105-0277-00
	105-0277-01	B155000		1		ACTUATOR,CAM SW:TIME/CM A DRUM TYPE	80009	105-0277-01
-184	407-0926-00	B050000		1		BRACKET,COVER:CAM SWITCH,ALUMINUM	80009	407-0926-00
	210-0406-00	B050000		4		NUT,PLAIN,HEX:4-40 X 0.188,BRS,CD PL	73743	12161-50
-185	401-0115-00	B050000	B154999	1		BEARING,CAM SW:CENTER	80009	401-0115-00
	401-0178-01	B155000		1		BEARING,CAM SW:CENTER/REAR	80009	401-0178-01
-186	407-0926-00	B050000		1		BRACKET,COVER:CAM:SWITCH,ALUMINUM	80009	407-0926-00
-187	105-0471-00	B050000	B154999	1		ACTUATOR,CAM SW:B TIME/CM	80009	105-0471-00
	105-0471-01	B155000		1		ACTUATOR,CAM SW:TIMEICM B DRUM TYPE (ATTACHING PARTS)	80009	105-0471-01
-188	354-0391-00	B050000	B154999	1		RING,RETAINING:0.395"FREE ID X 0.025"	97464	3100-43-CD
	354-0392-00	B155000		1		RING,RETAINING: (END ATTACHING PARTS)	79136	5555-12MD
-189	214-1139-02	B050000		1		SPRING,FLAT:GREEN COLORED	80009	214-1139-02
	214-1139-03	B050000		1		SPRING,FLAT:RED COLORED	80009	214-1139-03
-190	214-1127-00	B050000	B154999	2		ROLLER,DETENT:0125 DIA X 0.125 SST	80009	214-1127-00
	214-1752-00	B155000		2		ROLLER,DETENT:	80009	214-1752-00
-191	210-0406-00	B050000		4		NUT,PLAIN,HEX:4-40 X 0.188,BRS CD PL	73743	12161-50
-192	401-0081-04	B050000	B154999	1		BEARING,CAM SW:W/INSERT	80009	401-0081-04
	401-0204-01	B155000		1		BEARING,CAM SW:W/INSERT	80009	401-0204-01
	401-0180-00	B155000		1		BEARING,CAM SW:FRONT & REAR	80009	401-0180-00
	105-0410-00	B050000	B154999	1		STOP,RTRY SHAFT:CAM SW DRUM	80009	105-0410-00
	105-0449-00	B155000		1		STOP ASSY,CAM:CAM SWITCH ACTUATOR	80009	105-0449-00
-193	352-0350-00	B050000	B154999	1		HOLDER,STOP PIN:	000DX	OBD
	352-0349-00	B155000		1		HOLDER,STOP PIN:ZAMAK	000DX	ORD BY DESCR
	213-0048-00	B050000		1		SETSCREW:4-40 X 0.125 INCH,HEX SOC S	74445	ORD BY DESCR
-194	105-0409-00	B050000		1		STOP,SHAFT:CAM SW DRUM	80009	105-0409-00
-195	361-0535-00	B050000		1		SPACER,RING:0.130 ID X 0.18 INCH OD	80009	361-0535-00
-196	354-0291-00	B050000		1		RING,RETAINING	97464	2000-12CD
-197	214-1812-00	B050000		1		SPR,HLCL,TRSN:0 832 OD,LOOP ENDS,MUW	80009	214-1812-00
	384-0878-16	B155000		1		SHAFT,CAM SW:OUTER CONC WIDRVR,TIME/CM	80009	384-0878-16
	384-0882-05	B155000		1		SHAFT,CAM SW:7 922 L,0.125 OD	80009	384-0882-05
-198	344-0244-00			2		CLIP,CMPNT MTG:U/W 0.75 DIA CMPNT (ATTACHING PARTS)	80009	344-0244-00
-199	361-0007-00			2		SPACER,SLEEVE:0.250 INCH DIA PLASTIC (END ATTACHING PARTS)	80009	361-0007-00
-200	131-0604-00			52		CONTACT,ELEC:CKT BD SW,SPR,CU BE	80009	131-0604-00
-201	384-0405-00			1		EXTENSION SHAFT:9 276 L X 0.125 OD STEEL	80009	384-0405-00
	384-1203-00	B155000		1		EXTENSION SHAFT:9 1 L X 0.081 OD SST	80009	384-1203-00
.202	351-0180-00			1		SLIDE,GUIDE;SWITCH ACTUATOR	80009	351-0180-00
-203	214-1136-00			1		ACTUATOR,SL SW:DUAL DPST	80009	214-1136-00
	214-1190-00	B010100	B049999	1		CPLG,SHAFT RGD:0.125 OD TO 0.125 OD,AL	80009	214-1190-00
-204	214-1190-02	B050000		1		CPLG,SHAFT,RGD:0125 OD TO 0.081 OD,AL	80009	214-1190-02
	213-0075-00			1		SETSCREW 4-40 X 0.094,STL BK OXD HEX	000BK	ORD BY DESCR
	213-0239-00			1		SETSCREW 3-48 X 0.062 INCH,HEX SOC	71159	ORD BY DESCR
-205				1		RES VAR (SEE R1400 REPL) (ATTACHING PARTS)		
-206	210-0583-00			1		NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-207	210-0046-00			1		WASHER,LOCK:0.261 ID INTL 0.018 THK,BRS (END ATTACHING PARTS)	78189	1214-05-00-0541C
-208	407-0803-00			1		BRACKET,ELEC SW BRASS	80009	407-0803-00
-209	136-0252-04			3		SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS	22526	75060-007
-210	136-0269-02	B010100	B191041	1		SKT,PL-IN ELEK:MICROCIRCUIT,14 DIP	09922	DILB149P-108
	136-0728-00	B191042		1		SKT,PL-IN ELEK:MICROCKT,14 CONTACT	09922	DILB14P-108
-211	136-0461-00			6		SKT,PL-IN ELEC:CIRCUIT BD,5 CONTACT	80009	136-0461-00
-212	147-0035-00			1		MOTOR,DC:BRUSHLESS,10-15VDC,145MA	25088	1AD3001-0A

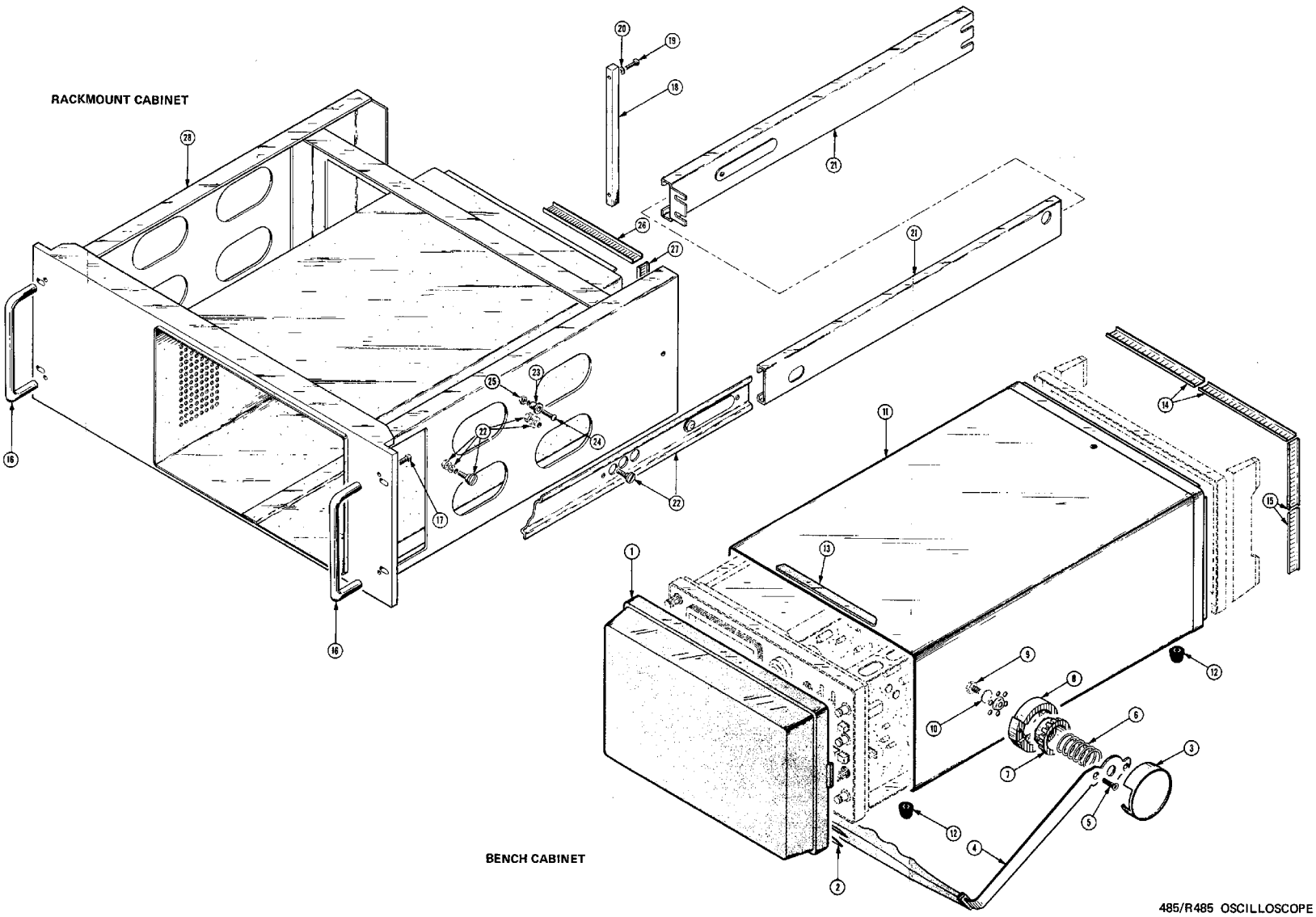
Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	Mfr 1 2 3 4 5	Name & Description	Code	Mfr Par Number
2-213	426-0781-00			1		MOUNT,MOTOR	80009	426-0781-00
						(ATTACHING PARTS)		
-214	211-0097-00			2		SCREW,MACHINE 4-40 X 0.312 INCH,PNH STL	83385	ORD BY DESCR
-215	210-0406-00			2		NUT,PLAIN,HEX 4-40 X 0.188,BRS,CD PL	73743	12161-50
-216	210-0004-00			2		WASHER,LOCK #4 INTL,0O 015 THK,STL CD PL	000BK	ORD BY DESCR
						(END ATTACHING PARTS)		
-217	426-0781-00			1		MOUNT,MOTOR	80009	426-0781-00
						(ATTACHING PARTS)		
-218	211-0008-00			2		SCREW,MACHINE 4-40 X 0.250,PNH,STL,POZ	83385	ORD BY DESCR
						(END ATTACHING PARTS)		
-219	388-2667-00			1		CIRCUIT BOARD MOTOR INTERCONNECT	80009	388-2667-00
-220	337-0717-00			1		SHIELD,ELEC HORIZ AMP BOARD	80009	337-0717-00
						(ATTACHING PARTS FOR CKT BD)		
	211-0207-00	B010100	B167675	6		SCR,ASSEM WSHR 4-40 X 0.312 DOUBLE SEMS	83385	ORD BY DESCR
	211-0224-00	B167676		6		SCREW,CAP 4-40 X 0.500,SCH,SST	000BK	ORD BY DESCR
						(END ATTACHING PARTS)		
-221	386-2228-00			16		SUPPORT,CKT BD DELRIN	80009	386-2228-00
-222				1		RES ,FXD (SEE R691 REPL)		
						(ATTACHING PARTS)		
-223	211-0559-00			2		SCREW,MACHINE 6-32 X 0.375”100 DEG,FLH ST	83385	ORD BY DESCR
-224	210-0457-00			2		NUT,PL,ASSEM WA 6-32 X 0.312,STL CD PL	83385	ORD BY DESCR
-225	210-0949-00			2		WASHER,FLAT 0.141 ID X 0.50 INCH OD,BRS	12327	ORD BY DESCR
						(END ATTACHING PARTS)		
-226	386-2499-00			1		SUPPORT SHIELD TERMINAL	80009	386-2499-00
-227	337-1764-00			1		SHIELD,ELEC TERMINAL	80009	337-1764-00
-228				1		SW,THERMOSTATIC (SEE S1802 REPL)		
						(ATTACHING PARTS)		
-229	211-0105-00			2		SCREW,MACHINE 4-40 X 0.188,100 DEG,FLH ST	83385	ORD BY DESCR
-230	210-0586-00			2		NUT,PL,ASSEM WA 4-40 X 0.25,STL,CD PL	78189	211-041800-00
						(END ATTACHING PARTS)		
-231	343-0006-001					CLAMP,LOOP 0.50 INCH DIAMETER,PLSTC	95987	1-2-68
						(485 ONLY)		
	343-0003-00			1		CLAMP,LOOP 0.25 ID, PLASTIC	95987	1-4-68
						(485-1,485-2 ONLY)		
						(ATTACHING PARTS)		
-232	210-0586-00			1		NUT,PL,ASSEM WA 4-40 X 0.25,STL,CD PL	78189	211-041800-00
-233	210-0863-00			1		WSHR,LOOP CLAMP 0.187 ID U/W 0.5 W CLP,STL	95987	C191
						(END ATTACHING PARTS)		
-234	348-0063-00			2		GROMMET,PLASTIC 0.50 INCH DIA	80009	348-0063-00
-235	348-0064-00			1		GROMMET,PLASTIC GRAY,ROUND,0.582 ID	80009	348-0064-00
-236	358-0215-00			1		GROMMET PLASTIC U SHAPED	80009	358-0215-00
-237	348-0051-00			1		GROMMET,RUBBER BLACK,ROUND,0.75 ID	83907	1107
-238	348-0050-00			1		GROMMET,PLASTIC 0.75 INCH DIA	80009	348-0050-00
-239	348-0031-00	B010100	B079999	2		GROMMET,PLASTIC 0.127 ID,GRAY ACETAL	80009	348-0031-00
-240	348-0056-00			1		GROMMET, PLASTIC 0.375 INCH DIA	80009	348-0056-00
-241	343-0213-00			3		CLAMP,LOOP 0.2 ID,PLASTIC	80009	343-0213-00
	343-0088-00			1		CLAMP,LOOP 0.062 INCH DIA	80009	343-0088-00
-242	220-0547-01			15		NUT,BLOCK 0.38 X 0.26 X 0.282 (2)4-40	000FW	ORD BY DESCR
						(ATTACHING PARTS)		
-243	211-0007-00			15		SCREW,MACHINE 4-40 X 0.188,PNH STL,CD PL	83385	ORD BY DESCR
						END ATTACHING PARTS)		
-244	220-0547-01			4		NUT,BLOCK 0.38 X 0.26 X 0.282 (2)4-40	000FW	ORD BY DESCR
						(ATTACHING PARTS)		
-245	211-0105-00			4		SCREW,MACHINE 4-40 X 0.188,100 DEG,FLH ST	83385	ORD BY DESCR
						(END ATTACHING PARTS)		
-246	369-0031-00	B010100	B079999	1		IMPLR,FAN,AXIAL 2 60 INCH OD,PLASTIC	80009	369-0031-00
	369-0031-01	B080000	B142989	1		IMPLR,FAN,CENTR	80009	369-0031-01
	369-0031-00	B142990		1		IMPLR,FAN,AXIAL 2 60 INCH OD,PLASTIC	80009	369-0031-00
-247	149-0030-00	B010100	B079999	1		METER,T TOTAL ELAPSED TIME,DC,CKT BD MT	18583	21985-000
-248				1		SWITCH,SLIDE (SEE S1803 REPL)		
						(ATTACHING PARTS)		
-249	211-0020-00			2		SCREW,MACHINE 4-40 X 1.125 INCH,PNH STL	83385	ORD BY DESCR
-250	210-0586-00			2		NUT PL,ASSEM WA 4-40 X 0.25,STL,CD PL	78189	211-041800-00

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	Mfr 1 2 3 4 5	Name & Description	Code	Mfr Par Number
2-251	210-0201-00			1		TERMINAL,LUG 0.12 ID LOCKING,BRZ TIN PL	86928	ORD BY DESCR
						(END ATTACHING PARTS)		
-252	380-0259-00			1		HSG,TIME METER GRAY POLYCARBONATE	80009	380-0259-00
-253	441-1051-00	B010100	B166649	1		CHASSIS SCOPE SUBPANEL	80009	441-1051-00
	441-1051-02	B166650		1		CHASSIS,SCOPE SUBPANEL	80009	441-1051-02
						(ATTACHING PARTS)		
	211-0012-00			2		SCREW,MACHINE 4-40 X 0.375 PNH STL CD PL	83385	ORD BY DESCR
	211-0541-00			2		SCREW,MACHINE 6-32 X 0.25"100 DEG,FLH STL	83385	ORD BY DESCR
						(END ATTACHING PARTS)		
	210-0659-01			8		EYELET,METALLIC 0.121 OD X 0.156 INCH LON	80009	210-0659-01
-254	200-0608-00			1		COVER,VAR RES PLASTIC	80009	200-0608-00
-255	----- -----			1		RES ,VAR (SEE R1640 REPL)		
						(ATTACHING PARTS)		
-256	210-0583-00			2		NUT,PLAIN,HEX 0.25-32 X 0.312 INCH BRS	73743	2X20317-402
-257	210-0223-00			1		TERMINAL,LUG 0.25 INCH DIA,SE	86928	5441-37
						(END ATTACHING PARTS)		
-258	----- -----			1		RES ,VAR (SEE R1799 REPL)		
						(ATTACHING PARTS)		
-259	210-0583-00			2		NUT,PLAIN,HEX 0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-260	210-0046-00			1		WASHER,LOCK 0.261 ID,INTL 0.018 THK,BRS	78189	1214-05-00-0541C
						(END ATTACHING PARTS)		
-261	131-0771-00			2		CONN,RCPT,ELEC 4 CONT QUICK DISCONNECT	91836	1904-2M58
						(ATTACHING PARTS)		
-262	220-0551-00			2		NUT,PLAIN,HEX 9 MM X 0.437 INCH	73743	ORD BY DESCR
-263	361-0428-00			2		SPACER,SLEEVE 0.3 L X 0.36 ID,AL	80009	361-0428-00
						(END ATTACHING PARTS)		
-264	131-0955-00			2		CONN,RCPT,ELEC BNC,FEMALE	13511	31-279
						(ATTACHING PARTS)		
-265	210-0590-00			2		NUT,PLAIN,HEX 0.375-32 X 0.438 BRS	73743	2X28269-402
-266	210-0012-00			2		WASHER,LOCK INTL,0O 384 ID,INTL,O 022 TH	78189	1220-02-00-0541C
						(END ATTACHING PARTS)		
-267	131-0955-00			2		CONN,RCPT,ELEC BNC,FEMALE	13511	31-279
						(ATTACHING PARTS)		
-268	210-0590-00			2		NUT,PLAIN,HEX 0.375-32 X 0.438" BRS	73743	2X28269-402
-269	210-0255-00			2		TERMINAL,LUG 0.391 ID,LOCKING,BRS CD PL	80009	210-0255-00
						(END ATTACHING PARTS)		
-270	----- -----			1		RES ,VAR (SEE R1790 REPL)		
						(ATTACHING PARTS)		
-271	358-0251-00			1		INSERT,SCR THD 0.25-32 X 0.424 INCH LONG	80009	358-0251-00
-272	210-0046-00			1		WASHER,LOCK 0.261 ID INTL,0O 018 THK,BRS	78189	1214-05-00-0541C
-273	210-0583-00			1		NUT,PLAIN,HEX 0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
						(END ATTACHING PARTS)		
-274	407-0971-00			1		BRACKET,CONN ALUMINUM	80009	407-0971-00
						(ATTACHING PARTS)		
-275	211-0105-00			2		SCREW,MACHINE 4-40 X 0.188,100 DEG,FLH ST	83385	ORD BY DESCR
						(END ATTACHING PARTS)		
-276	366-1398-00			2		KNOB AL,0.127 ID X 0.25 OD X 0.4	80009	366-1398-00
	213-0239-00			1		SETSCREW 3-48 X 0.062 INCH HEX SOC	71159	ORD BY DESCR
	380-0258-00	B010100	B079999	1		RTNR,AIR FILTER ALUMINUM	80009	380-0258-00
-277	380-0258-02	B080000		1		RTNR,AIR FILTER ALUMINUM	80009	380-0258-02
						(ATTACHING PARTS)		
-278	210-0586-00			4		NUT,PL,ASSEM WA 4-40 X 0.25,STL,CD PL	78189	211-041800-00
						(END ATTACHING PARTS)		
-279	378-0036-01			1		FILTER ELEM,AIR 3 063 X 2 25 X 0.25,FOAM	80009	378-0036-01
-280	378-0797-01			1		GRILLE,FAN 3 225 X 2 21 X 0.275	80009	378-0797-01
	210-0202-00	B166650		1		TERMINAL,LUG 0.146 ID,LOCKING BRZ,TIN PL	78189	2104-06-00-2520N
						(ATTACHING PARTS)		
	210-0457-00	B166650		1		NUT,PL,ASSEM WA 6-32 X 0.312,STL CD PL	83385	ORD BY DESCR
						(END ATTACHING PARTS)		
-281	386-2051-00	B010100	B166649	1		SUBPANEL,FRONT	80009	386-2052-00
	386-2051-01	B166650		1		PANEL,REAR	80009	386-2051-01
						(ATTACHING PARTS)		
-282	211-0007-00			3		SCREW,MACHINE 4-40 X 0.188 PNH STL,CD PL	83385	ORD BY DESCR

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	Mfr 1 2 3 4 5 Name & Description	Code	Mfr Par Number
2-283	211-0105-00			10	SCREW,MACHINE 4-40 X 0.188,100 DEG,FLH ST	83385	ORD BY DESCR
	198-2566-00			1	WIRE SET,ELEC	80009	198-2566-00
	131-1119-00			2	CONTACT,ELEC FOR NO 22-26 AWG WIRE	22526	75374-001
	131-0861-00			1	TERM,QIK DISC 16-20 AWG,0.22 W X 0.02 THK	00779	42617-2
	175-1050-00			FT	CABLE,SP,ELEC 2-COND,W/GRAY JACKET,120.0”	80009	175-1050-00
	175-1296-00			FT	CABLE,SP,ELEC 3,26 AWG STRD,POLYETHYLENE	80009	175-1296-00
	200-1075-00			2	COVER,TERM QUICK DISCONNECT	00779	1-480435-0
	352-0171-00			3	HLDR,TERM CONN 1 WIRE,BLACK	80009	352-0171-00
	352-0197-00			1	CONN BODY,PL,EL 1 WIRE BLACK	80009	352-0197-00
					(END ATTACHING PARTS)		
-284	337-1880-00	B030000	B169999	1	SHIELD,ELEC OSCILLATION	80009	337-1880-00
	337-1880-00	B180000	1		SHIELD,ELEC OSCILLATION	80009	337-1880-00
					(ATTACHING PARTS)		
-285	211-0101-00	B030000	B169999	8	SCREW,MACHINE 4-40 X 0.25,FLH,100 DEG,STL	83385	ORD BY DESCR
	211-0101-00	B180000		8	SCREW,MACHINE 4-40 X 0.25,FLH,100 DEG,STL	83385	ORD BY DESCR
					(END ATTACHING PARTS)		
-286	200-1269-00			1	COVER,REAR PNL RIM	80009	200-1269-00
-287	348-0298-00			2	FOOT,CABINET BLACK,NYLON	80009	348-0298-00
-288	348-0299-00			4	PAD,CAB FOOT BLACK POLYURETHANE	80009	348-0299-00
					(ATTACHING PARTS)		
-289	211-0631-00			4	SCREW,MACHINE 6-32 X 2 000,FLH,100 DEG,ST	83385	ORD BY DESCR
-290	166-0424-00			4	SPACER,SLEEVE 0.171 L X 0.18 ID,AL	80009	166-0424-00
					(END ATTACHING PARTS)		
	119-0346-00			1	FILTER,RFI	80009	119-0346-00
-291	----- -----			1	CKT BOARD ASSY LINE FILTER(SEE A16 REPL)		
-292	343-0088-00			1	CLAMP,LOOP 0.062 INCH DIA	80009	343-0088-00
-293	346-0032-00			3	STRAP,RTNING 0.075 DIA X 4 0 L,MLD RBR	98159	2859-75-4
	198-0689-00			1	WIRE SET,ELEC	80009	198-0689-00
	198-2873-00			1	WIRE SET,ELEC	80009	198-2873-00
-294	131-0861-00			2	TERM,QIK DISC 16-20 AWG,0.22 W X 0.02 T	00779	42617-2
-295	200-1075-00			2	COVER,TERM QUICK DISCONNECT	00779	1-480435-0
					(ATTACHING PARTS FOR CKT BD)		
-296	211-0007-00	B010100	B059999	3	SCREW,MACHINE 4-40 X 0.188,PNH STL,CD PL	83385	ORD BY DESCR
	129-0285-00	B060000		3	POST,ELEC-MECH 0.281 L X 0.188 HEX BRS	80009	129-0285-00
	210-0004-00	B060000		3	WASHER,LOCK #4 INTL,O 015 THK,STL CD PL	000BK	ORD BY DESCR
	210-0801-00	B060000		3	WASHER,FLAT 0.14 ID X 0.025 THK,BRS NI	12327	ORD BY DESCR
					(END ATTACHING PARTS)		
-297	161-0049-00			1	CABLE ASSY,PWR, 3,18 AWG,125V,80 0 L	80009	161-0049-00
	161-0049-06	B189340	B191763	1	CABLE ASSY,PWR 3,0.75MM SQ,220V,80 OL	S3109	OBD
	----- -----			-	(OPTION Al EUROPEAN ONLY)		
	161-0033-27	B191764		1	CABLE ASSY,PWR 3,0.75MM SQ,220V,98 0 L	S3109	ORD BY DESCR
	----- -----			-	(OPTION Al EUROPEAN ONLY)		
	161-0049-07	B189340	B191763	1	CABLE ASSY,PWR 3,0.75MM SQ,240V,80 0 L	S3109	OBD
	-----.-----			-	(OPTION A2 UNITED KINGDOM ONLY)		
	161-0033-28	B191764		1	CABLE ASSY,PWR 3 0.75MM SQ,240V,98 0 L	80126	ORD BY DESCR
	----- ----			-	(OPTION A2 UNITED KINGDOM ONLY)		
	161-0049-08	B189340	B191763	1	CABLE ASSY,PWR 3,0.75MM SQ,240V,80 0 L	S3109	OBD
	----- -----			-	(OPTION A3 AUSTRALIAN ONLY)		
	161-0033-29	B191764		1	CABLE ASSY,PWR 3,0.75MM,240V,98 0 L	S3109	ORD BY DESCR
	----- -----			-	(OPTION A3 AUSTRALIAN ONLY)		
	161-0049-09	B189340		1	CABLE ASSY,PWR 3,0.75MM SQ,240V,80 0 L	S3109	OBD
	----- -----			-	(OPTION A4 NORTH AMERICAN ONLY)		
-298	358-0161-00			1	BSHG,STRAIN RLF U/W 0.29 DIA CA,STRAIGHT	28520	1147 SR-5P-4
-299	386-2053-00			1	PL,STRAIN RLF	80009	386-2053-00
					(ATTACHING PARTS)		
-300	211-0007-00			2	SCREW,MACHINE 4-40 X 0.188,PNH STL,CD PL	83385	ORD BY DESCR
					(END ATTACHING PARTS)		
-301	204-0374-01			1	BODY,FUSEHOLDER	80009	204-0374-01
-302	407-1046-00			1	BRKT FUSEHOLDER ALUMINUM	80009	407-1046-00
-303	129-0285-00	B010100	B010499	3	POST,ELEC-MECH 0.281 L X 0.188 HEX BRS	80009	129-0285-00
					(ATTACHING PARTS)		
-304	211-0105-00	B010100	B010499	3	SCREW,MACHINE 4-40 X 0.188,100 DEG,FLH ST	83385	ORD BY DESCR

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	Mfr 1 2 3 4 5	Name & Description	Code	Mfr Par Number
-305	210-0004-00	B010100	B010499	3		WASHER,LOCK #4 INTL,0O 015 THK,STL CD PL	000BK	ORD BY DESCR
	210-0006-00	B010100	B010499	3		WASHER,LOCK #6 INTL,0.018 THK,STL CD PL (END ATTACHING PARTS)	78189	1206-00-00-0541C
	166-0026-00	B010500		3		SPACER,SLEEVE 0.375 L X 0.125 ID,AL	71590	P7610-1
-306	210-0201-00	B010100	B166649	1		TERMINAL,LUG 012 ID,LOCKING,BRZ TIN PL (ATTACHING PARTS)	86928	ORD BY DESCR
-307	211-0007-00			1		SCREW,MACHINE 4-40 X 0.188,PNH STL,CD PL	83385	ORD BY DESCR
-308	210-0406-00			1		NUT,PLAIN,HEX 4-40 X 0.188,BRS,CD PL (END ATTACHING PARTS)	73743	12161-50
-309	380-0252-00			1		HSG,RFI FILTER ALUMINUM (ATTACHING PARTS FOR ASSY)	80009	380-0252-00
-310	211-0007-00			5		SCREW.MACHINE 4-40 X 0.188,PNH STL,CD PL (END ATTACHING PARTS)	83385	ORD BY DESCR
-311	352-0326-00			1		FUSEHOLDER PLASTIC	80009	352-0326-00

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	Mfr 1 2 3 4 5	Name & Description	Code	Mfr Par Number
3-						(THE FOLLOWING PARTS ARE USED FOR A BENCH CABINET)		
-1	200-1251-00			1		COVER,SCOPE FRONT	80009	200-1251-00
	367-0193-02			1		HANDLE,CARRYING 11.7 L,BLK VINYL W/HARDWAR	80009	367-0193-02
-2	334-1934-00			1		PLATE,IDENT TELEQUIPMENT	22670	OBD
-3	200-0602-00			2		COVER,HDL LATCH 2.12 DIA X 0.7,ACETAL	80009	200-0602-00
-4	367-0153-00	B010100	B142694	1		HANDLE,CARRYING 11.7 L,BLK VINYL	80009	367-0153-00
	367-0193-00	B142695		1		HANDLE,CARRYING 11.7 L,BLACK VINYL	80009	367-0193-00
						(ATTACHING PARTS)		
-5	211-0512-00	B010100	B142694	4		SCREW,MACHINE 6-32 X 0.50" 100 DEG,FLH ST	83385	ORD BY DESCR
	213-0227-00	B142695		4		SCR,TPG THD FOR 6-32 X 0.50 DEG,FLH ST	83385	ORD BY DESCR
						(END ATTACHING PARTS)		
-6	214-0516-00			2		SPRING HLCPS 0 959 DIA X 1 250 INCH LONG	80009	214-0516-00
-7	214-0515-00	B010100	B081609	2		HUB,HDL INDEX 1.42 DIA X 0.565 THK,AL CD	80009	214-0515-00
	214-0515-02	B081610		2		HUB,HDL INDEX 1.42 DIA X 0.565 THK,AL CD	80009	214-0515-02
-8	214-0513-00	8010100	B081609	2		INDEX,HDL RING 2.0 DIA X 0.585 THK,AL CD	80009	214-0513-00
	214-0513-04	B081610	B142694	2		INDEX,HDL RING 2.0 DIA X 0.585 THK AL,CD	80009	214-0513-04
	214-1987-00	B142695		2		INDEX,HDL RING	80009	214-1987-00
						(ATTACHING PARTS)		
-9	213-0139-01			2		SCREW,SLFLKG 10-24 X 0.375 HEX HD,STL	26233	P38AS 1024 6C
-10	210-1182-00	B010100	B189099	2		WSHR,SPR TNSN 0.218 ID X 0.69 INCH OD	80009	210-1182-00
	210-0805-00	B189100		2		WASHER,FLAT 0.204 ID X 0.438 INCH OD	12327	ORD BY DESCR
						(END ATTACHING PARTS)		
-11	390-0224-00			1		CABINET SCOPE WRAPAROUND	80009	390-0224-00
-12	348-0080-01			4		FOOT,CABINET BOTTOM	80009	348-0080-01
-13	352-0263-00	B010100	B189409	1		HLDR,POUCH ASSY TEK BLUE POLYCARBONATE	80009	352-0263-00
	352-0263-01	B189410		1		HLDR,POUCH ASSY TEK BLUE POLYCARBONATE	80009	352-0263-01
-14	348-0235-00			4		SHLD GSKT,ELEC 4.734 INCH LONG	92101	ORD BY DESCR
-15	348-0304-00			4		SHLD GSKT,ELEK FINGER TYPE,3 018 L	80009	348-0304-00
						(THE FOLLOWING PARTS ARE USED FOR A RACKMOUNT CABINET)		
	016-0558-00			1		HDW KIT,ELEK EQ RACKMOUNTING	80009	016-0558-00
-16	367-0022-00			2		HANDLE,BOW 1.5 X 4.5 INCH	88245	15986
						(ATTACHING PARTS)		
-17	213-0090-00			4		SCREW,MACHINE 10-32 X 0.50,HEX HD,STL,CD	83385	ORD BY DESCR
						(END ATTACHING PARTS)		
-18	361-0528-00			2		SPACER,BAR 0.312 SQ X 6 4 L,AL	80009	361-0528-00
						(ATTACHING PARTS)		
-19	211-0517-00			4		SCREW,MACHINE 6-32 X 1 INCH,PNH,STL	83385	ORD BY DESCR
-20	210-0870-00			4		WASHER,FLAT 0.14 ID X 0.312 INCH OD STL	12327	ORD BY DESCR
						(END ATTACHING PARTS)		
-21	351-0101-00	B010100	B188096	1		SLIDE,DWR,EXT 18.0 X 1.69	80009	351-0101-00
	351-0101-02	B188097		1		SLIDE,DWR,EXT W/CLOSED MOUNTING SLOTS	80009	351-0101-02
-22	351-0104-00			1		SLIDE SECT,DWR 12.625 X 2.25	06666	C-1353
						(ATTACHING PARTS)		
	016-0099-00			1		HDW KIT,ELEK EQ RACKMOUNT HDW	80009	016-0099-00
	210-0833-00			4		WSHR,RECESSED 0.42 ID X 0.122 D,STL,NP	80149	ORD BY DESCR
	210-0917-00			4		WASHER,FLAT 0.191 ID X 0.25 THK,TEFLON	86445	ORD BY DESCR
	210-1061-00			4		WASHER,FLAT 0.203 ID X 0.062 THK,STL CD	12327	ORD BY DESCR
	210-0591-00			4		NUT,PLAIN,HEX 4-40 X 0.187,SST	70318	ORD BY DESCR
	213-0199-00			4		SCREW,MACHINE 12-24 X 0.75,OVH STL,NP,PO	T0858	ORD BY DESCR
						(END ATTACHING PARTS)		
-23	210-0808-00			2		EYELET METALLIC CENTERING	63743	25151.13-3
						(ATTACHING PARTS)		
-24	211-0507-00			2		SCREW,MACHINE 6-32 X 0.312,PNH STL,CD PL	83385	ORD BY DESCR
-25	210-0457-00			2		NUT,PL,ASSEM WA 6-32 X 0.312,STL CD PL	83385	ORD BY DESCR
						(END ATTACHING PARTS)		
-26	348-0235-00			4		SHLD GSKT,ELEC 4.734 INCH LONG	92101	ORD BY DESCR
-27	348-0304-00			4		SHLD GSKT ELEK FINGER TYPE,3 018 L	80009	348-0304-00
-28	437-0151-00			1		CABINET,SCOPE	80009	437-0151-00


RACKMOUNT CABINET
BENCH CABINET
485/R485 OSCILLOSCOPE

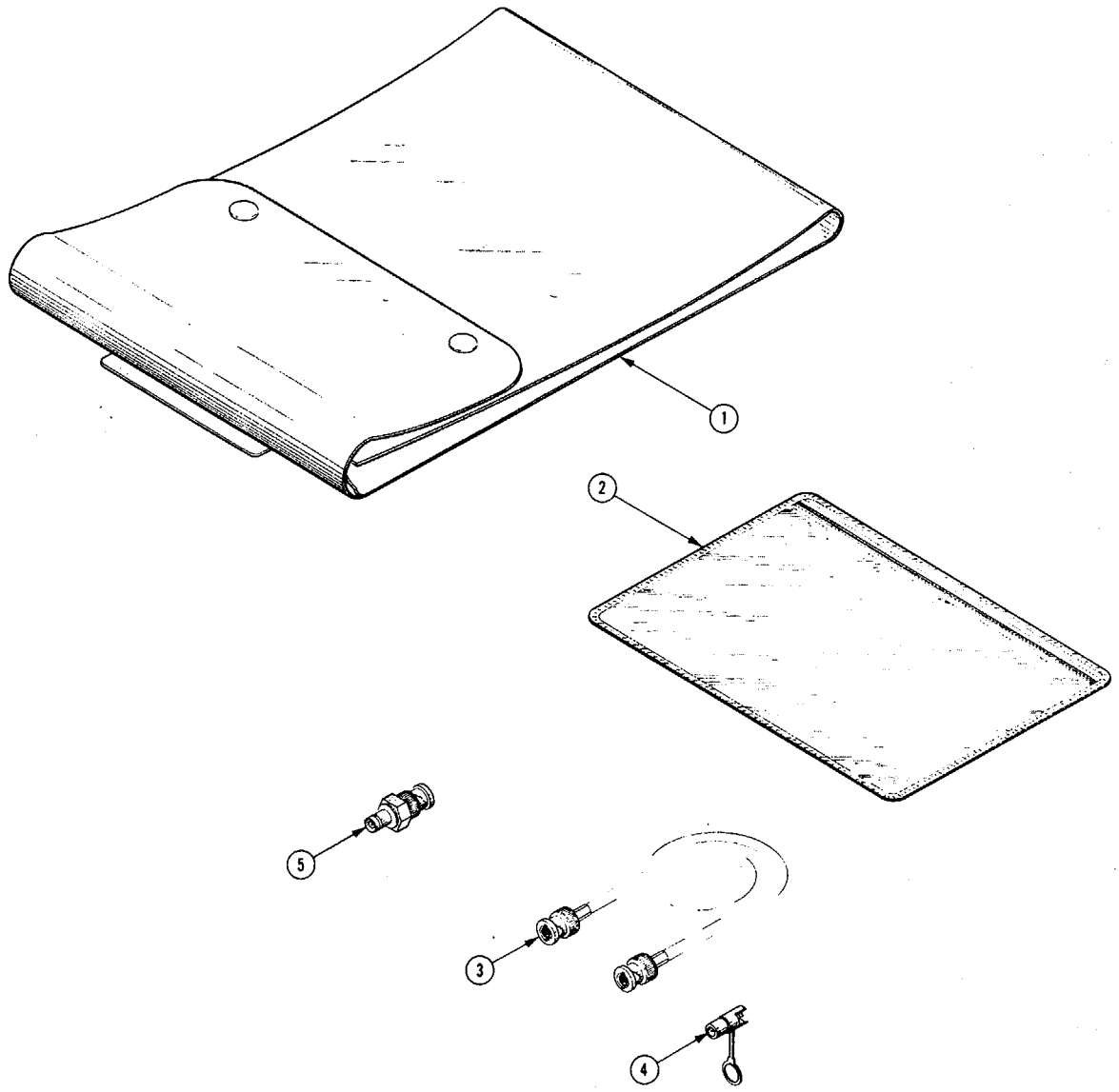


Fig & Index No	Tektronix Part No	Serial/Model No Eff	Dscont	Qty	1 2 3 4 5 Name & Description	Mlr Code	Mfr Part Number
4-1	016-0535-00			1	POUCH,ACCESSORY W/HARDWARE	80009	016-0535-00
-2	016-0537-00			1	POUCH,ACCESSORY VINYLE,W/ZIPPER	05006	OBD
-3	012-0076-00			1	CABLE ASSY,RF 50 OHW COAX,W/BNC EA FND,20" L	80009	012-0076-00
-4	012-0092-00			2	ADAPTER,CONN	80009	012-0092-00
-5	011-0049-01			2	NTWK,IMPD IAATC 50 OH4 FEEDTHRU	80009	011-0049-01
	070-1194-00			1	MANUAL,TECH OPERATORS	80009	070-1194-00
	070-1193-00			1	MANUAL,TECH INSTRUCTION	80009	070-1193-00
	386-0118-00			1	SHIELD,IMPLOSION	80009	386-0118-00
	159-0015-00			4	FUSE,CARTRIDGE:3AG,3A,250V,FAST BLOW	71400	AGC 3

APPENDIX A

MAINTENANCE ALLOCATION CHART

Information pertaining to Maintenance Allocation Chart (MAC) will be furnished at a later date.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

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