

TEKTRONIX®

**J20/7J20
RAPID-SCANNING
SPECTROMETER**

INTERIM SERVICE

INSTRUCTION MANUAL

Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97005

Serial Number _____

WARRANTY

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

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

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RAPID-SCANNING SPECTROMETER SYSTEM

DESCRIPTION

The J20 Spectrometer with the 7J20 Spectrometer Plug-In form a Rapid-Scanning Spectrometer system capable of scanning the optical spectrum from 250 nm (ultraviolet) to 1100 nm (near infrared). The resulting spectral display is time-resolved spectral power (incident optical power versus wavelength) in calibrated absolute terms.

The J20 Spectrometer uses a Czerny-Turner grating monochromator without an exit slit. The spectral output of the monochromator is focused onto the target of a vidicon tube where the spectrum is stored as an electrical charge image. An electron beam periodically scans across the vidicon target converting the charge image into an electronic signal that is in turn processed by the 7J20 Spectrometer Plug-In. Design of the J20 Spectrometer features two switchable diffraction gratings, selection of entrance slit widths, and a choice of several optical filters any of which can be placed in front of the entrance slit. The two switchable gratings in the J20 Spectrometer allow scanning wide (400 nanometers) or narrow (approximately 40 nanometers) portions of the 250 to 1100 nanometer spectrum. (8)

The 7J20 Spectrometer Plug-In is a two-hole wide plug-in designed to operate in the Tektronix 7000-series family of oscilloscopes. It functions as an electronic signal-processor and controller between the J20 Spectrometer and the 7000-series oscilloscope mainframe. Design of the 7J20 Spectrometer Plug-In

features some controls that allow signal manipulation to provide a variety of meaningful displays.

The VERTICAL GAIN switch provides three types of vertical deflection: linear, logarithmic, and inverse logarithmic (absorbance). The GAIN position of the switch displays a ramp signal on the CRT to allow setting the output signal amplitude of the 7J20 to match the input sensitivity of the oscilloscope mainframe being used. The TIME/SCAN switch selects the mode and time of scanning the vidicon target to provide either repetitive scanning or integration modes of operation. The DISPLAY DISPERSION switch provides CRT display horizontal expansion to increase CRT display dispersion. Expansion occurs centered around the intensified wavelength marker. The MARKER control allows horizontal positioning of the intensified wavelength marker in the CRT display to permit wavelength identification of specific portions of a spectral display. The SPECTRAL NORMALIZER switch selects between normalized and un-normalized operation. Normalized operation provides radiometric calibration of the spectrometer system.

The 7J20 Spectrometer Plug-In, though it will operate in any 7000-series oscilloscope mainframe (even those without CRT readout), is primarily intended to be operated in a 7613. The 7613 offers adequate vertical amplifier bandpass to ensure optimum spectrometer performance, and CRT readout to take advantage of spectrometer operational features such as the wavelength MARKER control. Additionally, the bistable, split-screen storage capabilities of the 7613 allow retention of multiple displays to permit direct

waveform comparisons in real-time terms. Because the same signals used to scan the vidicon detector are used to provide horizontal deflection in the CRT display, no additional plug-ins are necessary for spectrometer operation.

The 7J20 Spectrometer Plug-In also features an Interface connector (located on the bottom of the plug-in) to facilitate signal interconnection between the spectrometer system and a recorder, a computer, or a digital signal processor such as the Tektronix 7000-series DPO system. Inquiries concerning specific applications of the Rapid-Scanning Spectrometer should be directed to the Marketing Group of Analytical Products at Tektronix, Inc.

SPECIFICATIONS

INTRODUCTION

The following is a list of spectrometer system specifications. These specifications apply over the ambient temperature range of +15°C to +35°C (unless specifically noted otherwise) after a minimum warmup time of 20 minutes. For additional specifications concerning individual elements of the spectrometer system, refer to the Specifications section of the J20/7J20 Rapid-Scanning Spectrometer Service Instruction Manual.

The specifications that follow are divided into three categories: Optical, General, and Normalized. Those characteristics having their limits listed in the Primary Limit column are instrument specifications. Data in the Secondary Limit column does not constitute instrument specifications and is provided for reference use only.

CATEGORY 1

OPTICAL SPECIFICATIONS

CHARACTERISTIC	PRIMARY LIMIT	SECONDARY LIMIT
Spectral Sensitivity Range	250 nm to 1100 nm inclusive. 300 nm to 1100 nm first order. 250 nm to 330 nm second order with internal first order blocking filter.	
Display Spectral Interval		
Grating A	400 nm, ± 4 nm ($\pm 1\%$) full scan 200 nm, ± 6 nm ($\pm 3\%$) expanded 100 nm, ± 3 nm ($\pm 3\%$) expanded 40 nm, ± 1.2 nm ($\pm 3\%$) "	
Grating B	<u>300 nm*</u> <u>650 nm*</u> <u>900 nm*</u> <u>1000 nm*</u>	
40 nm (Full Scan)	<u>46 nm</u> <u>40 nm</u> <u>34 nm</u> <u>30 nm</u>	
	<u>$\pm 2\%$</u> <u>$\pm 2\%$</u> <u>$\pm 2\%$</u> <u>$\pm 2\%$</u>	
20 nm (Expanded)	<u>23 nm</u> <u>20 nm</u> <u>17 nm</u>	
	<u>$\pm 4\%$</u> <u>$\pm 4\%$</u> <u>$\pm 4\%$</u>	
10 nm (Expanded)	<u>11.5 nm</u> <u>10 nm</u> <u>8.5 nm</u>	
	<u>$\pm 4\%$</u> <u>$\pm 4\%$</u> <u>$\pm$ %</u>	
4 nm (Expanded)	<u>4.6 nm</u> <u>4 nm</u> <u>3.4 nm</u>	
	<u>$\pm 4\%$</u> <u>$\pm 4\%$</u> <u>$\pm 4\%$</u>	
	*Display Center Wavelength	
Marker Wavelength Accuracy	Measured over the center two graticule divisions only.	
Grating A		
At $+25^\circ\text{C}$	<u>± 10 nm</u>	
From $+15^\circ\text{C}$ To $+35^\circ\text{C}$	<u>± 12 nm at 300 nm</u> <u>± 13 nm at 500 nm</u> <u>± 14 nm at 1100 nm</u>	
Grating B		
At $+25^\circ\text{C}$	<u>± 3 nm</u>	Typically <u>± 2 nm</u>
From $+15^\circ\text{C}$ To $+35^\circ\text{C}$	<u>± 5 nm from 300 nm to 500 nm</u> <u>± 6 nm from 500 nm to 900 nm</u> <u>± 7 nm from 900 nm to 1100 nm</u>	

CHARACTERISTIC	PRIMARY LIMIT	SECONDARY LIMIT
Wavelength Mechanical Repeatability**		**Fixed temperature, includes grating change and wavelength interval adjustment, not including digital readout.
Grating A	<u>+4</u> nm	
Grating B	<u>+0.4</u> nm	
Wavelength Repeatability***		***Fixed temperature, not including grating change or wavelength interval adjustment nor digital readout.
Grating A	<u>+1</u> nm	
Grating B	<u>+0.5</u> nm	
Resolution (Bandwidth At Half Amplitude)		
Grating A	<u><4</u> nm	
Grating B	<u><0.4</u> nm	
Stray Light	<u>≤1%</u> at 600 nm to a notch filter with tungsten illumination	
Steradiancy	0.02 steradians, <u>+0.006</u> steradians (<u>+3%</u>)	
Field of View (Full Angle)		
Horizontal	8.2 degrees	
Vertical	9.5 degrees	
Equivalent f-number	f/6.3	
Ambient Light	10,000 LUX (1000 foot candles) or less of sunlight	

CATEGORY 2

GENERAL SPECIFICATIONS
(UN-NORMALIZED)

CHARACTERISTIC	PRIMARY LIMIT	SECONDARY LIMIT
Display Vertical Drift (VERT GAIN 200)	≤ 1.5 major CRT graticule divs/minute at $+25^{\circ}\text{C}$ (0.75 nA/min)	≤ 3 major CRT graticule divs/ minute at $+25^{\circ}$
Display Baseline Flatness (VERT GAIN 200)	≤ 6 major CRT graticule divs p-p (≤ 3 nA p-p) at $+25^{\circ}\text{C}$.	
Display Noise (VERT GAIN 200)	≤ 0.4 major CRT graticule divs p-p (≤ 0.2 nA p-p) for 10 ms and 20 ms scan rates	
Vertical Linearity Using Switched Attenuation (Linear Gains)	$\pm 4\%$ of light level with oscilloscope CRT line- arity excluded.	$\pm 2-1/2\%$ CRT linearity addi- tive to Vertical Linearity spec.
Logarithmic Gains Accuracy (300 nA Reference Level)	Measured	
True Log I	Log I	Error %
-1.0 dB	-1.04 dB to -0.918 dB	$\pm 3-1/2$, -8.2
-2.0 dB	-2.07 dB to -1.58 dB	$\pm 3-1/2$, -21.1
-3.0 dB	-3.11 dB to -1.78 dB	$\pm 3-1/2$, -40.7
Absorbance Gains Accuracy (300 nA Zero Absorbance Reference Level)	Measured	
True Absorbance	Absorbance	Error %
0 A	0	0
0.3 A	0.311-0.284 A	$\pm 3-1/2$, -5.3
0.6 A	0.621-0.563 A	$\pm 3-1/2$, -6.2
1.0 A	1.04-0.918 A	$\pm 3-1/2$, -8.2
1.3 A	1.35-1.16 A	$\pm 3-1/2$, -10.8
1.6 A	1.66-1.37 A	$\pm 3-1/2$, -14.4
2.0 A	2.07-1.58 A	$\pm 3-1/2$, -21.1
3.0 A	3.11-1.78 A	$\pm 3-1/2$, -40.7

CHARACTERISTIC	PRIMARY LIMIT	SECONDARY LIMIT
Vertical Deflection Electrical Sensitivity (Linear Gains)	$\left(\frac{100 \text{ nA}}{\text{VERT GAIN}}\right)$ per div, $\pm 5\%$	Typically $\pm 3\%$
Typical Response Times (Lag) From Initial Signal Level I_o to $I_o - 0.9 \Delta i$ Signal Change (Δi)	SECONDARY LIMIT	
	Initial Signal Intensity Level, I_o	
	<u>500 nA</u>	<u>200 nA</u> <u>100 nA</u> <u>50 nA</u> <u>20 nA</u> <u>10 nA</u>
500 nA	40 ms ²	
200 nA	60 ms ²	
100 nA	43 ms	82 ms ²
50 nA	35 ms	46 ms 97 ms ²
20 nA	34 ms	44 ms 64 ms 250 ms ²
10 nA	36 ms	47 ms 65 ms 135 ms 350 ms ²
	² To full off.	

CATEGORY 3

NORMALIZED OPERATION

CHARACTERISTIC	PRIMARY LIMIT	SECONDARY LIMIT
	All normalized operation limits are specified with a 20 ms scan rate. All radiometric measurements are made to a ribbon filament radiance lamp traceable to NBS. Specification limits arrived at by quadrature (square root of sum of squares).	
Radiometric Spectral Range	400 nm to 967 nm for Grating A 367 nm to 900 nm for Grating B	
Vertical Scale Factor Readout	W/(nm·div) of CRT deflection	

CHARACTERISTIC	PRIMARY LIMIT		SECONDARY LIMIT
Radiant Power Accuracy	<u>Grating A</u>	<u>Grating B</u>	
400 nm-600 nm	<u>+20%</u>		
600 nm-967 nm	<u>+12%</u>		
367 nm-600 nm		<u>+12%</u>	
600 nm-900 nm		<u>+11%</u>	
Radiant Power Repeatability (To Individual Calibration Curve Available For Each Instrument)			
400 nm-600 nm	<u>+13%</u>		
600 nm-967 nm	<u>+3.5%</u>		
367 nm-600 nm		<u>+5.5%</u>	
600 nm-900 nm		<u>+3%</u>	
Spectral Flatness	<u>+15%</u>	<u>+15%</u>	
Noise Equivalent Power (20 μ m Slit, VERT GAIN 200)	50 pW/nm (0.4 div)	500 pW/nm (0.4 div)	
Linearity	<u>+6%</u> not including oscilloscope linearity error		Over the range of noise level to 0.7 of saturation current.
Dynamic Range	<u>>250:1</u>		Lower limit of dynamic range is Noise Equivalent Power Level for each grating.
Photometric Accuracy	All normalized photometric limits are specified using an external normalizer with the system normalized to 300 nA vidicon signal current over a wavelength interval using a quartz iodine lamp		
Linear Gains	<u>+4%</u> T un-normalized <u>+6%</u> T normalized		Not including linearity of oscilloscope

CHARACTERISTIC	PRIMARY LIMIT	SECONDARY LIMIT
Absorbance Gains Un-normalized	Refer to limits specified in General Operation section.	
Normalized	Random error of 2% additive to un-normalized tolerance	

J20/7J20 CALIBRATION

Calibration Interval

To assure continued instrument measurement accuracy, Tektronix, Inc., recommends that the calibration of the J20/7J20 Rapid-Scanning Spectrometer system be checked every 1000 hours of operation, or every six months if used infrequently. Prior to performing a recalibration procedure is a good time to accomplish normal preventive maintenance and any corrective maintenance deemed necessary.

Tektronix Field Service

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

Using This Procedure

The following calibration information is given in the form of two separate procedures. One procedure is given for the J20 Spectrometer, and the other for the 7J20 Spectrometer Plug-In. Because of the technical difficulties involved, Tektronix, Inc., recommends that calibration of certain portions of the J20 Spectrometer (such as optical component alignment and radiometric calibration) only be accomplished at Tektronix Field Service Centers or the Tektronix Factory Service Center. Therefore, the calibration procedure for the J20 Spectrometer provides calibration information only for those portions of the J20 that are

readily adjustable. Calibration of the J20 Spectrometer requires a correctly operating and calibrated 7J20 Spectrometer Plug-In. If the calibration status of the 7J20 to be used is unknown or suspect, a recalibration procedure should be performed on the 7J20 before attempting to calibrate the J20.

Test Equipment Required

There are two lists of test equipment required to accomplish the accompanying calibration procedures. The calibration procedures are based on the equipment recommended. When other equipment is substituted, control settings or calibration setups may need to be altered slightly to meet the requirements of the substitute equipment. Any test equipment substituted must meet the minimum requirements listed in the Equipment Required lists.

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

J20 SPECTROMETER

TEST EQUIPMENT

Description	Minimum Specifications	Usage	Example
1. Test-oscilloscope system	Bandwidth, DC to 10 megahertz; deflection factor, five millivolts to 20 volts/division; accuracy, <u>+3%</u> .	Check and adjust vidicon deflection signals.	Tektronix 7603 Oscilloscope with 7A18 Dual-Trace Amplifier, 7B50 Time-Base, and two P6053B Probes.
2. Precision DC Voltmeter	Range, 0-300 VDC; accuracy, <u>+0.1%</u> ; impedance, 20,000 Ω /volt.	Check and adjust a variety of DC levels in the J20.	Tektronix 7D13 Digital Multimeter.
3. Low-pressure mercury lamp		Wavelength alignment and checking	Pen-Ray Lamp Model 11 SC-1C with Pen-Ray Model SCT-1 Power Supply.
4. Screwdriver	Three-inch; 3/32-inch bit.	Used throughout procedure to adjust variable resistors.	Tektronix Part Number 003-0192-00.

7J20 SPECTROMETER PLUG-IN

TEST EQUIPMENT

Description	Minimum Specifications	Usage	Example
1. Test-oscilloscope system	Bandwidth, DC to 10 megahertz; deflection factor, 5 millivolts to 20 volts/div; accuracy, $\pm 3\%$.	Check and adjust various voltages and waveforms throughout the instrument.	Tektronix 7603 Oscilloscope with 7A18 Dual-Trace Amplifier, 7A22 Differential Amplifier, 7B50 Time-Base, and two P6053B Probes.
2. Precision DC Voltmeter	Range, 0-400 VDC; accuracy, $\pm 0.1\%$; impedance, 20,000 Ω /volt.	Check and adjust various DC levels in the instrument	Tektronix 7D13 Digital Multimeter.
3. Time-Mark Generator	Marker outputs, 2 milliseconds to 200 milliseconds; marker accuracy, $\pm 0.1\%$.	Checking and adjusting horizontal scanning rates.	Tektronix 184 Time-Mark Generator.
4. Pulse Generator	Repetition rate, 1 kHz; output amplitude, variable from +1 volt to +3 volt; signal risetime and falltime, 10 ns.	Checking and adjusting amplifier gains.	Tektronix 114 10-ns Pulse Generator.

Description	Minimum Specifications	Usage	Example
5. Standard Amplitude Calibrator	Amplitude accuracy, 0.25%; signal amplitude, 2 milli- volts to 1 volt; output signal, DC levels with Chopped Mode of operation.	Checking and adjusting amplifier gains.	Tektronix calibration fixture Part Number 067-0502-01.
6. Cable	Length, 42-inches; impedance, 50 Ω ; connectors, BNC on one end and special Tektronix, Inc., interconnect on other end.	Connecting signals to input to vertical amplifier system.	Tektronix calibration fixture Part Number 067-0709-00.
7. Adapter (two required)	BNC male to binding post.	Used for signal interconnection.	Tektronix Part Number 103-0033-00.
8. Adapter	BNC male to dual binding post.	Used for signal interconnection.	Tektronix Part Number 103-0035-00.
9. T Connector	Connectors, BNC.	Used for signal interconnection.	Tektronix Part Number 103-0030-00.

Description	Minimum Specifications	Usage	Example
10. Cable (two required)	Length, 42-inches; impedance, 50 Ω ; connectors, BNC.	Used for signal inter-connection	Tektronix Part Number 012-0057-01.
11. Termination	Impedance, 50 Ω ; accuracy, $\pm 3\%$; power rating, 5 watts; connectors, BNC.	Used for signal interconnect.	Tektronix Part Number 011-0099-00.
12. Termination	Impedance, 50 Ω , accuracy, $\pm 3\%$; connectors, BNC.	Used for signal interconnect	Tektronix Part Number 011-0049-01.
13. Attenuator	Attenuation ratio, 2X; impedance, 50 Ω ; connectors, BNC.	Checking and adjusting gains.	Tektronix Part Number 011-0069-01.
14. Attenuator	Attenuation ratio, 5X; impedance, 50 Ω ; connectors, BNC.	Checking and adjusting gains.	Tektronix Part Number 011-0060-01.

Description	Minimum Specifications	Usage	Example
15. Attenuator	Attenuation ratio, 10X; impedance, 50 Ω ; connectors, BNC.	Checking and adjusting gains.	Tektronix Part Number 011-0059-00.
16. Screwdriver	Three-inch shaft; 3/32-inch bit.	Used throughout procedure to adjust variable resistors.	Tektronix Part Number 003-0192-00.
17. Flexible Plug-In Extender (two required)		Use throughout procedure to connect 7J20 to oscilloscope.	Tektronix Part Number 067-0616-00.

Preliminary Procedure

NOTE

The J20/7J20 Rapid-Scanning Spectrometer system should be calibrated at an ambient temperature of $+25^{\circ}\text{C}$, $\pm 5^{\circ}\text{C}$ to achieve specified accuracies. For optimum results, the 7J20 Spectrometer Plug-In should be calibrated in the 7000-series oscilloscope in which it will primarily be operated.

1. Remove the side panels from the J20 Spectrometer.

CAUTION

The J20 Spectrometer side covers should be removed only in a completely darkened room having a clean atmosphere (no smoke, dust, etc.)

2. Connect the J20 Spectrometer to the 7J20 Spectrometer Plug-In using the cable provided as a standard accessory for this purpose.

3. If the 7J20 Spectrometer Plug-In is to be recalibrated, remove its side panels and install the plug-in in its oscilloscope using the 067-0616-00 Flexible Plug-In Extender calibration fixtures (two required). If the 7J20 is not being recalibrated, install it directly into the oscilloscope.

4. Preset the Rapid-Scanning Spectrometer controls as given under Preliminary Control Settings.

5. Connect the oscilloscope to an appropriate power source and turn the oscilloscope on. Allow a minimum of 20 minutes warmup before proceeding.

Preliminary Control Settings

Preset the instrument controls to the settings given below when starting the calibration procedure.

7J20

ATTEN BAL	As is
VERTICAL GAIN	5
TIME/SCAN	20 ms
MARKER	Centered
VERT POSITION	Centered
ABSORBANCE ZERO	Centered
OFFSET	Locked at 0.00
DISPLAY DISPERSION	A-40 /B-4
DISPLAY TRIGGER MODE	FREE RUN
SPECTRAL NORMALIZER	OFF
MARKER INTENSITY	Centered
HORIZ POS	As is
HORIZ CAL	As is

J20

SLIT WIDTH (μm)	200
WAVELENGTH SPAN	B 40 nm
FILTER	OPEN
GRATING A WAVELENGTH INTERVAL	300-700 nm
GRATING B WAVELENGTH	500 nm on indicator tape

J20 SPECTROMETER CALIBRATION

(1) Adjust Vidicon Horizontal Centering and Plate Potential

a. Connect the negative meter lead from the 7D13 Digital Multimeter to ground and the positive meter lead to H1 test point TP 1352 on the Horizontal Amplifier circuit board.

b. Note the meter reading at H1 test point TP 1352.

c. Remove the positive meter lead from H1 test point TP 1352 and attach it to H2 test point TP 1360. Note the meter reading at H2 test point TP 1360.

d. CHECK -- Meter readings taken at H1 test point TP 1352 and H2 test point TP 1360 should match within 0.5 volt.

e. ADJUST -- Horizontal Centering R1325 for equal voltage readings at H1 test point TP 1352 and H2 test point TP 1360.

Note

This is only a preliminary adjustment of Horizontal Centering and will be correctly adjusted in a subsequent step.

f. CHECK -- After adjusting for matching voltage readings, the voltage reading at either test point referenced to ground should be +250 V, ± 1 V.

g. ADJUST -- Plate Potential R1310 for a meter reading of +250 V, ± 1 V.

h. Move the positive meter lead to test point "A" (TP 1406) on the Vidicon Socket circuit board.

i. CHECK -- Meter reading of +265 V. ± 2 V.

j. Remove the meter leads from the J20.

(2) Check/Adjust Vidicon Deflection Signals

a. Connect a X10 probe from the test oscilloscope to H1 test point TP 1352 on the Horizontal Amplifier circuit board.

b. CHECK -- CRT display on the test oscilloscope for a positive-going ramp waveform approximately 96 V in amplitude.

c. Move the X10 probe from H1 test point TP 1352 to H2 test point TP 1360 on the Horizontal Amplifier circuit board.

d. CHECK -- CRT display on the test oscilloscope for a negative-going ramp waveform approximately 96 V in amplitude.

e. Move the X10 probe from H 2 test point TP 1360 to test point "C" (TP 1380) on the Vertical Oscillator circuit board.

f. CHECK -- CRT display on the test oscilloscope for a sinewave frequency of one megahertz, $\pm 25\%$, 64 V, ± 3 V in amplitude.

g. ADJUST -- Oscillator Amplitude R1390 for a test oscilloscope display 64 V in amplitude.

h. Move the X10 probe from test point "C" (TP 1380) to test point "D" (TP 1382) on the Vertical Oscillator circuit board.

i. CHECK -- CRT display on the test oscilloscope for a sinewave frequency of one megahertz, $\pm 25\%$, 64 V, ± 3 V in amplitude.

j. Remove the X10 probe from test point "D" (TP 1382).

(3) Adjust Vidicon Magnetic Focus And Cathode Current

a. Connect the meter leads of the 7D13 Digital Multimeter to the Mag Focus test points with the plus meter lead connected to the + test point TP 1497, and the minus lead to the - test point TP1498.

b. CHECK -- The vidicon has a tag on it that lists a value of current in milliamps for the focusing coil. This value, called I_F , is for that specific vidicon and is adjusted by measuring the voltage developed across a precision 100 Ω resistor. For example, 30 mA of focusing coil current would result in a voltage reading of 3 volts, 35 mA equals 3.5 volts, etc. Check for a meter reading equivalent to the recommended focusing current for the vidicon being used.

c. ADJUST -- Mag Focus R1495 for a meter reading exactly equal to the recommended focusing current.

d. Remove the 7D12 meter leads from the J20.

e. Connect the plus meter lead of the 7D13 to the I_K test point TP 1485 and the negative meter lead to ground.

f. CHECK -- The vidicon has a tag on it that lists a value of current in milliamps for vidicon cathode current. This value, called I_K , is for that specific vidicon and is adjusted by measuring the voltage developed across a precision 100 Ω resistor. For example, one milliamp of cathode current would result in a voltage reading of 100 mV, 1.3 milliamps equals 130 mV, 1.5 milliamps equals 150 mV, etc. Check for a meter reading equivalent to the recommended cathode current for the vidicon being used.

g. ADJUST -- Cathode Current R1481 for a meter reading exactly equal to the recommended cathode current.

h. Remove the 7D13 meter leads from the J20.

(4) Adjust 7J20 HORIZ CAL And HORIZ POS

a. Press the BASELINE RESTORE pushbutton on the 7J20 for three seconds and then release.

b. Rotate the MARKER Control on the 7J20 fully clockwise and then fully counterclockwise.

c. CHECK -- The CRT display for ten horizontal CRT major graticule divisions of movement of the intensified wavelength marker.

d. ADJUST -- HORIZ CAL R435 on the 7J20 for exactly ten horizontal CRT major graticule divisions of movement of the intensified wavelength marker.

e. CHECK -- When the MARKER control is rotated fully clockwise the intensified wavelength marker aligns with the extreme right vertical graticule line, and when the MARKER control is fully counterclockwise the intensified wavelength marker aligns with the extreme left vertical graticule line.

f. ADJUST -- HORIZ POS R385 on the 7J20 to align the wavelength marker with the graticule extremes when the MARKER control is rotated fully clockwise and counterclockwise.

g. INTERACTION -- There is interaction between the HORIZ CAL and HORIZ POS adjustments. Readjust as necessary to eliminate any noticeable interaction.

(5) Adjust 7J20 Vertical GAIN

a. Set the 7J20 MARKER control to the fully clockwise position.

b. Set the 7J20 VERTICAL GAIN switch to the GAIN position and the DISPLAY DISPERSION switch to one of the expanded display positions.

c. Using the Vertical POSITION control, align the intensified wavelength marker in the display with the horizontal CRT graticule line one major division up from the bottom.

d. Rotate the MARKER control fully counterclockwise.

e. CHECK -- The intensified wavelength marker should be one major division down from the top horizontal CRT graticule line (a total of six divisions of deflection) within 1% (0.06 major CRT graticule division).

f. ADJUST -- Vertical GAIN R275 on the 7J20 for exactly six major CRT graticule divisions of vertical deflection of the intensified wavelength marker when rotating the MARKER control from fully clockwise to fully counterclockwise.

(6) Adjust Grating A Display Wavelength Alignment

a. Set the 7J20 DISPLAY DISPERSION switch to the A40/B4 position and the VERTICAL GAIN switch to 5.

b. On the J20, set the WAVELENGTH SPAN control to A400 nm, the GRATING A WAVELENGTH INTERVAL switch to 400-800 nm, and the SLIT WIDTH switch to 20 μm .

c. Place a Low-Pressure Mercury lamp in front of the J20 Spectrometer entrance slit and turn on lamp power. Allow two minutes warm-up time for the lamp.

d. While observing the CRT display, position the mercury lamp to obtain maximum signal amplitude in the display.

e. Rotate the MARKER control to obtain a wavelength readout of 593 nm.

- f. CHECK -- The intensified wavelength marker in the CRT display is aligned with the peak of the 593 nm spectral line.
- g. ADJUST -- Horizontal Centering R1325 to align the peak of the 593 nm spectral line with the intensified wavelength marker in the display.
- h. Rotate the MARKER control counterclockwise to align the intensified wavelength marker in the display with the peak of the spectral line near the left edge of the CRT graticule (404.66 nm). Note the wavelength readout in the display.
- i. Rotate the MARKER control clockwise to align the intensified wavelength marker with the tallest spectral line near the right edge of the CRT graticule (761 nm). Note the wavelength readout in the display.
- j. CHECK -- There should be 356 nm, $\pm 1\%$ (3.6 nm) difference between the wavelength noted in step h and the readout noted in step i.
- k. ADJUST -- Horizontal gain R1315 for exactly 356 nm difference in wavelength readout between the 404.66 nm and 761 nm spectral lines.
- l. Rotate the MARKER control to align the intensified wavelength marker in the display with the 593 nm spectral line.
- m. CHECK -- The wavelength readout should read 593 nm, ± 10 nm.

n. ADJUST -- Rotate the MARKER control to attain a wavelength readout of exactly 593 nm. Adjust Horizontal Centering R1325 to align the peak of the 593 nm spectral line with the intensified wavelength marker in the display.

o. CHECK -- Refer to the following chart and check each position of the GRATING A WAVELENGTH INTERVAL switch for the given display spectral intervals.

Switch Position	Left Reference Line	Right Reference Line	Measured Interval
(1) 300 nm-700 nm	365 nm	626 nm	261 nm, ± 2.61 nm
(2) 400 nm-800 nm	436 nm	761 nm	325 nm, ± 3.25 nm
(3) 500 nm-900 nm	546 nm	872 nm	326 nm, ± 3.26 nm
(4) 600 nm-1000 nm	627 nm	983 nm	356 nm, ± 3.56 nm
(5) 700 nm-1100 nm	708 nm	1014 nm	306 nm, ± 3.06 nm

(7) Adjust Grating B Display Wavelength Alignment

- a. Set the WAVELENGTH SPAN control to B 40 nm.
- b. Rotate the GRATING B WAVELENGTH control until the 313 nm spectral line appears in the display. There should be a 90° angle between the grating pivot block and the side of the base plate.

- c. Rotate the MARKER control to obtain a wavelength readout of 313 nm.

d. CHECK -- The CRT display to see if the intensified wavelength marker is aligned with the peak of the 313 nm spectral line.

e. ADJUST -- Rotate the MARKER control to align the intensified wavelength marker in the display with the peak of the 313 nm spectral line. Loosen the setscrew in the gear on the rear of the ten-turn MARKER potentiometer R390 and move the gear away from the potentiometer to disengage the gear from the remainder of the gear train. Rotate the MARKER control to obtain a wavelength readout of exactly 313 nm. Move the gear back toward the MARKER potentiometer to reengage the gear with the gear train and tighten the gear setscrew.

f. Rotate the MARKER control to obtain a wavelength readout of 1014 nm.

g. CHECK -- CRT display to see if the intensified wavelength marker is aligned with the peak of the 1014 nm spectral line.

h. ADJUST -- Rotate the MARKER control to align the intensified wavelength marker with the peak of the 1014 nm spectral line. Adjust 40 nm Cal R1505 to obtain a wavelength readout of 1014 nm.

i. INTERACTION -- There is interaction between the readout adjustments at 313 nm and 1014 nm. Repeat as necessary to achieve correct calibration.

j. Rotate the GRATING B WAVELENGTH control to align the 730 nm spectral line with the center vertical CRT graticule line.

k. CHECK -- The Grating B indicator tape should read 730 nm.

l. ADJUST -- Loosen the setscrew on the coupler to the tape drive unit. Hold the grating drive side of the coupler while turning the GRATING B WAVELENGTH knob to make the indicator tape read 730 nm. Retighten the setscrew on the coupler to the tape drive unit.

7J20 SPECTROMETER PLUG-IN CALIBRATION

(1) Check/Adjust DC Power Supply Levels

a. Connect the 7D13 Digital Multimeter test leads between the +8 volt power supply and ground.

b. CHECK -- Meter reading of +8 volts, ± 0.04 volt.

c. ADJUST -- +8 volts Adjust (R1110) for a meter reading of exactly +8 volts.

d. CHECK -- Refer to the following chart and check the listed power supplies to be within the required tolerances.

<u>SUPPLY</u>	<u>TOLERANCE</u>
+350 V	± 3.5 V
+15 V	± 0.5 V
+6.3 V*	± 0.2 V
+5 V	± 0.2 V
-15 V	± 0.5 V
-50 V	± 1 V

*The J20 Spectrometer should be connected to the 7J20 to provide proper power supply loading.

e. Remove the 7D13 test leads from the 7J20.

(2) Adjust 20 ms Horizontal Time/Scan Rate

- a. Connect a 10X probe between the "Ramp" test point TP378 on the Horizontal Circuit Board and one of the vertical input connectors of the vertical plug-in in the test scope.
- b. Connect 5 ms time marks from the 184 Time Mark Generator to the second vertical input connector of the test scope vertical plug-in.
- c. Set the test scope vertical plug-in Trigger Mode switch to Mode and the Display Mode to Alt.
- d. Set the test scope time-base plug-in Trigger switches for AC coupling, Internal source, and Auto triggering.
- e. Set the test scope Trig Source switch and Vert Mode switch to select the vertical plug-in compartment containing the vertical plug-in being used.
- f. Adjust the vertical sensitivity for each vertical plug-in channel to obtain approximately equal amplitude displays.
- g. Adjust the time-base Level control for a display triggered on the negative-going slope of the scanning ramp waveform.
- h. Set the time-base plug-in Time/Div switch to 5 ms and turn on the X10 Magnifier.

- i. Set the 7J20 TIME/SCAN switch to 20 ms.
- j. CHECK -- Test scope CRT display for 20 ms, +1% (0.2 ms) between the positive peaks of the ramp waveforms.
- k. ADJUST -- Ramp Timing R345 for exactly 20 ms between the positive peaks of the ramp waveforms.
- l. Leave the test setup in place for the following step.

(3) Check Horizontal Time/Scan Rates

- a. Refer to the following chart and check each position of the TIME/SCAN switch for the indicated scan times between positive peaks of the ramp waveforms.

<u>TIME/SCAN</u>	<u>TIME MARKS</u>	<u>TOLERANCE</u>
10 ms	2 ms	<u>+0.1</u> ms
20 ms	5 ms	<u>+0.2</u> ms
50 ms*	10 ms	<u>+1.5</u> ms
100 ms*	20 ms	<u>+3</u> ms
200 ms*	50 ms	<u>+6</u> ms
500 ms*	100 ms	<u>+15</u> ms
1000 ms*	200 ms	<u>+30</u> ms

*Integrated scanning rates. Waveforms will be a 20 ms ramp with increasing amounts of holdoff time.

- b. Remove the test setup from the 7J20.

(4) Check VARIABLE TIME/SCAN Range And Display Dispersion

Accuracy

a. Connect one-millisecond time marks from the 2901 Time-Mark Generator to J10 on the Vertical Circuit Board in the 7J20. Use a 42-inch 50 ohm coaxial cable with a BNC male connector on one end and a special Tektronix, Inc., interconnect system on the other (Tektronix Part Number 067-0709-00).

b. Connect the Marker Amplifier output connector on the 184 to the "Scan Control" test point TP 447 on the Horizontal Circuit Board of the 7J20 via a 2X BNC 50-ohm attenuator, a 5-watt BNC feedthrough termination, a BNC to dual binding post adapter, and a pair of test leads such as those used on the 7D13. Connect the red post of the binding post adapter to the "Scan Control" test point and the black post of the adapter to a "Ground" test point adjacent to the "Scan Control" test point. Set the 184 Marker Amplifier switch to "+".

c. Set the VERTICAL GAIN switch on the 7J20 to the linear position 1 and the TIME/SCAN to 10 ms.

d. Briefly press the BASELINE RESTORE pushbutton and then release. Position the display to center screen with the VERT POSITION control.

e. Adjust HORIZ CAL for one time mark per major graticule division, and HORIZ POS so the time marks align with the graticule lines.

f. Set the VARIABLE TIME/SCAN control to the uncalibrated (button out) position. Rotate the control fully clockwise.

g. CHECK -- Spectrometer display for at least 2.5 major divisions between time marks. This indicates a control range of at least 2.5:1.

h. Set the VARIABLE TIME/SCAN control to the calibrated (button in) position.

i. Set the DISPLAY DISPERSION switch to the 20 (2) nm/div position, set the 184 for 0.5 ms time marks, and rotate the MARKER control on the 7J20 to align the second time mark in the display with the second vertical graticule line.

j. CHECK -- The tenth time mark in the CRT display aligns with the tenth vertical graticule line within 2% (0.16 major graticule division).

k. Set the DISPLAY DISPERSION switch to the 10 (1) nm/div position and rotate the MARKER control to align a time mark with the second vertical graticule line.

l. CHECK -- The fifth time mark in the CRT display aligns with the tenth vertical graticule line within 2% (0.16 major graticule division).

m. Set the DISPLAY DISPERSION switch to the 4 (0.4) nm/div position, set the 184 for 0.1 ms time marks, and rotate the MARKER control to align the second time mark in the display with

the second vertical graticule line.

n. CHECK -- The tenth time mark in the display aligns with the tenth vertical graticule line within 2% (0.16 major graticule division).

o. Set the DISPLAY DISPERSION switch to 40 (4) nm/div, remove the test probes from the "Scan Control" test point TP447 and the "Ground" test point, and remove the 50 ohm coaxial cable from the 184. Do not disconnect the cable from the 7J20. Install a BNC 50 ohm feedthrough termination on the BNC connector end of the cable.

(5) Check Scanning Ramp DC Levels

a. Connect a 10X probe between the vertical amplifier plug-in in the test scope and the "Ramp" test point TP378 on the Horizontal Circuit Board in the 7J20.

b. Set the vertical sensitivity of the test scope to 200 mV/div with the input coupling set to ground.

c. Position the free-running trace in the test scope display to the center horizontal graticule line.

d. Set the vertical input coupling to DC and adjust the triggering controls for a stable display.

e. CHECK -- Test scope CRT display to see that the most negative excursion of the scanning ramp waveform goes to a DC level between -0.1 volt and -0.3 volt.

f. Change the vertical sensitivity of the test scope to 1 V/div.

g. Remove the 10X probe from the "Ramp" test point and connect it to a 4 V calibrator signal from the test scope.

h. Vertically position the top of the 4 volt calibrator signal one major division up from the bottom of the test scope CRT graticule.

i. Remove the 10X probe from the calibrator signal and reconnect it to the "Ramp" test point TP378.

j. Adjust the test scope triggering controls for a stable display and horizontally position the display so the peak of the ramp waveform aligns with the center vertical graticule line.

k. CHECK -- Test scope CRT display to see that the peak of the ramp waveform rises to an amplitude of at least 5 divisions but no more than 5.5 divisions up from the bottom of the test scope CRT graticule. This indicates a peak DC level of +8 volts to +8.5 volts.

l. Leave the 10X probe connected to the "Ramp" test point for the following step.

(6) Check Ramp Reset Time And Holdoff-Reset Time

a. Connect a 10X probe from the unused input connector of the test scope vertical plug-in to the "Scan" test point TP445 on the 7J20 Horizontal Circuit Board.

- b. Set the vertical plug-in in the test scope for alternate operation with the trigger source switch set to the position that selects the channel connected to the "Scan" test point.
- c. Set the test scope time base for a 10 μ s/div sweep rate.
- d. Adjust the test scope triggering controls for a stable display triggered on the negative-going slope of the "Scan" pulse.
- e. Set the input coupling switch of the vertical channel connected to the "Ramp" waveform to ground and vertically position this channel's ground reference line to the center horizontal graticule line.
- f. Set the input coupling switch back to DC and set the vertical sensitivity for that channel to 1 V/div.
- g. CHECK -- The test scope CRT display to see that the negative-going slope of the "Ramp" waveform reaches a 0 V DC level in 25 μ s or less after the negative-going slope of the "Scan" waveform.
- h. CHECK -- Test scope CRT display to see that the "Scan" pulse is a negative-going rectangular pulse approximately 4 volts in amplitude with a pulse width of 57 μ s to 63 μ s.
- i. Leave the probes connected to the 7J20 for the following step.

<u>SWITCH POSITION</u>	<u>READOUT</u>
300 to 700 nm	500 nm
400 to 800 nm	600 nm
500 to 900 nm	700 nm
600 to 1000 nm	800 nm
700 to 1100 nm	900 nm

e. Leave the J20 connected to the 7J20 for the following step.

(11) Check Vertical Sensitivity Readout

a. Set the following controls to the positions indicated:

7J20

TIME/SCAN	20 ms
VERTICAL GAIN	500
SPECTRAL NORMALIZER	INT
DISPLAY DISPERSION	40 (4) nm/div

J20

SLIT WIDTH	10 μ m
FILTER	OPEN
WAVELENGTH SPAN	A 400

b. CHECK -- VERT UNCAL light is not on.

c. CHECK -- Refer to the following list of control settings and see that the proper vertical sensitivity readout is displayed:

(9) Adjust Digital Voltmeter Circuit Calibration

- a. Rotate the MARKER control fully counterclockwise.
- b. Set switch S964 to the ground position.
- c. CHECK -- Wavelength marker readout in the CRT display should read 100 nm.
- d. ADJUST -- Zero adjust R962 for a wavelength marker readout of 100 nm. Center the adjustment within the small range that provides 100 nm readout.
- e. Rotate the MARKER control fully clockwise and set switch S964 to the +8 V position.
- f. CHECK -- Wavelength marker readout in the CRT display should read 1300 nm.
- g. ADJUST -- DVM Cal R960 for a wavelength marker readout of 1300 nm.
- h. Rotate the MARKER control fully counterclockwise.
- i. CHECK -- Wavelength marker readout in the CRT display should read 900 nm.
- j. Rotate the MARKER control fully clockwise and set switch S964 to the ground position.
- k. CHECK -- Wavelength marker readout in the CRT display should read 500 nm.

(7) Check Restore Pulse

- a. Remove the 10X probe from the "Ramp" test point TP378 and connect it to pin 2 of P124 on the Vertical Circuit Board.
- b. CHECK -- Test scope CRT display to see that the positive-going slope of the "Restore" pulse occurs 24 μ s, ± 2.5 μ s after the negative-going edge of the "Scan" pulse. Duration of the "Restore" pulse must be 30 μ s, ± 3 μ s.
- c. Remove the test setup from the 7J20.

(8) Adjust Wavelength Marker Readout Reference Current

- a. Rotate the MARKER control so the last two digits in the wavelength marker readout displayed are 95 (i.e., 95, 195, 295, etc.)
- b. Connect a 7D13 Digital Multimeter between the GND and i CAL test points (TP901 and TP903, respectively) at the rear of the Readout Circuit Board. Set the 7D13 Mode/Range switch to 2 mA DC Current.
- c. Set switch S901 to the CAL position.
- d. CHECK -- 7D13 for a meter reading of 1 mA, ± 10 μ A.
- e. ADJUST -- Reference Current R925 for a meter reading of exactly 1 mA.
- f. Set switch S901 to the NORM position and remove the 7D13 test leads from the 7J20.

ℓ. If all of the readout checks were satisfactory, set switch S964 to the Norm position and proceed to the next step. If, however, all of the readout checks were not satisfactory, repeat the procedure as necessary to achieve calibrated operation.

Calibration Note

Once the DVM Cal adjust R960 is set to provide the 1300 nm readout correctly, it will probably not be necessary to readjust R960 to get the other readout checks to read correctly. If the 500 nm and 900 nm readouts are slightly off, adjust Zero R962 for correct readout.

(10) Check Display Center Wavelength Readout

a. Turn instrument power off and connect the J20 Spectrometer to the 7J20 Spectrometer Plug-In with the cable provided with the instrument for this purpose. Turn instrument power on.

b. Set the J20 switches to the following positions:

WAVELENGTH SPAN	A 400 nm
GRATING A WAVELENGTH INTERVAL	300 to 700 nm

c. Rotate the 7J20 MARKER control to obtain a marker wavelength readout of 500 nm.

d. CHECK -- Rotate the GRATING A WAVELENGTH interval switch through all of its positions and check to see that the readout indicates as follows:

<u>VERT GAIN</u>	<u>SLIT WIDTH</u>	<u>WAVELENGTH SPAN</u>	<u>FILTER</u>	<u>READOUT</u>
500	10 μm	A400	OPEN	40 pW
200	10 μm	A400	OPEN	100 pW
100	10 μm	A400	OPEN	200 pW
50	10 μm	A400	OPEN	400 pW
20	10 μm	A400	OPEN	1000 pW
10	10 μm	A400	OPEN	2000 pW
5	10 μm	A400	OPEN	4 nW
2	10 μm	A400	OPEN	10 nW
1	10 μm	A400	OPEN	20 nW
1	20 μm	A400	OPEN	10 nW
1	50 μm	A400	OPEN	4 nW
1	100 μm	A400	OPEN	2 nW
1	200 μm	A400	OPEN	1000 pW
1	500 μm	A400	OPEN	400 pW
1	1000 μm	A400	OPEN	200 pW
1	1000 μm	B40	OPEN	2 nW
1	1000 μm	B40	1	20 nW
1	1000 μm	B40	2	200 nW

d. Turn instrument power off and disconnect the J20 from the 7J20. Turn instrument power on.

(12) Adjust HORIZ CAL And HORIZ POS

a. Alternately rotate the MARKER control fully clockwise and then fully counterclockwise.

b. CHECK -- CRT display to see that the intensified marker aligns with the extreme right and left graticule edges when the

MARKER control is fully clockwise and fully counterclockwise, respectively.

c. ADJUST -- HORIZ CAL and HORIZ POS to align the intensified marker with the left and right graticule edges at the rotational extremes of the MARKER control.

(13) Check Wavelength Marker Balance And Width And Adjust Intensity

a. Rotate the MARKER control fully clockwise and set the DISPLAY DISPERSION switch to the 20 (2) nm/div position.

b. CHECK -- Rotate the DISPLAY DISPERSION switch from 20 (2) nm/div to 4 (.4) nm/div and check for no more than 0.2 major divisions of movement of the marker.

c. CHECK -- Marker width should be ≤ 0.3 major division with the DISPLAY DISPERSION switch set to 4 (.4) nm/div.

d. Set the DISPLAY DISPERSION switch to the 40 (4) nm/div position and rotate the MARKER control to the middle of its range.

e. ADJUST -- MARKER INTENSITY for a visible well focused spot that does not exhibit blooming.

(14) Check DISPLAY TRIGGER MODE Switch Operation

a. Set the DISPLAY TRIGGER MODE switch to the FREE RUN position.

b. CHECK -- There should be a CRT display and the TRIG'D light should be off.

c. Connect the center conductor of the DISPLAY TRIGGER IN connector to the outer shell (ground) of the connector via a short piece of bare wire.

d. CHECK -- There should still be a CRT display but additionally the TRIG'D light should be on.

e. Set the DISPLAY TRIGGER MODE switch to the TRIG'D position.

f. CHECK -- When the center conductor of the DISPLAY TRIGGER IN connector is not connected to ground there should be no CRT display and the READY light should be on.

When the center conductor of the connector is connected to ground, there should be a CRT display and the TRIG'D light should be on.

g. Set the DISPLAY TRIGGER MODE switch to the SINGLE SCAN position. Momentarily hold the switch in the RESET position and then allow it to return to the SINGLE SCAN position.

h. CHECK -- There should be no CRT display and the READY light should be on.

i. CHECK -- Momentarily connect the center conductor of the DISPLAY TRIGGER IN connector to ground and check to see that there

is one and only one scan presented in the display. The READY light should go out and the TRIG'D light should come on. When the center conductor of the connector is no longer connected to ground, both the TRIG'D and READY lights should be out.

j. Set the DISPLAY TRIGGER MODE switch to the FREE RUN position.

(15) Check Scan Control Pulse Operation

- a. Connect pin 10 of the INTERFACE connector to ground.
- b. CHECK -- There should be no CRT display.
- c. Remove the ground connection from pin 10 of the INTERFACE connector.
- d. CHECK -- There should again be a CRT display.

(16) Adjust Input Vertical Amplifier Balances

- a. Connect the + input connector of the 7A22 Differential Amplifier to the "I Out" test point TP33 via a BNC-to-binding post adapter and one of the test leads from the 7D13.
- b. Connect the - input connector of the 7A22 Differential Amplifier to the Ground test point TP125 via a BNC-to-binding post adapter and one of the test leads from the 7D13.
- c. Set the 7A22 controls as follows:

Volts/Div	0.5 mV
HF -3 dB Point	1 kHz

LF -3 dB Point	DC
Input Coupling (Both)	GND

d. Vertically position the free-running reference trace to the center horizontal graticule line in the test scope display.

e. Set both Input Coupling switches on the 7A22 to DC.

f. CHECK -- The test scope CRT display to see that the free-running trace aligns with the center horizontal graticule line within 4 major divisions. This indicates a DC level of 0 V, +2 mV.

g. ADJUST -- Balance R25 to align the free-running trace in the test scope display with the center horizontal graticule line.

h. Remove the test lead from "I Out" test point TP33 and connect it to "X" test point TP101.

i. CHECK -- Press the BASELINE RESTORE pushbutton and check the test scope display to see if the free-running trace aligns with the center horizontal graticule line within 0.4 major divisions. This indicates a DC level of 0 V, +200 μ V.

j. ADJUST -- X Zero R100 while pressing the BASELINE RESTORE pushbutton to align the free-running trace in the test scope display with the center horizontal graticule line.

k. Remove the test leads from the 7J20.

(17) Adjust Vertical Gain Switch Balances

- a. Set the VERTICAL GAIN switch to 100.
- b. CHECK -- CRT display for 0.4 major division or less trace shift as the VERTICAL GAIN switch is switched from 100 to 500.
- c. ADJUST -- ATTEN BAL R220 for no trace shift as the VERTICAL GAIN switch is switched from 100 to 500.
- d. CHECK -- CRT display for 0.4 major division or less trace shift as the VERTICAL GAIN switch is switched from 100 to 50.
- e. ADJUST -- X10 Bal R230 for no trace shift as the VERTICAL GAIN switch is switched from 100 to 50.

(18) Adjust Vertical Gain

- a. Set the VERTICAL GAIN switch to the GAIN position and the DISPLAY DISPERSION switch to the 20 (2) nm/div position.
- b. Rotate the MARKER control fully counterclockwise and vertically position the intensified marker spot to the graticule line one division down from the top edge of the graticule.
- c. Rotate the MARKER control fully clockwise.
- d. CHECK -- The intensified marker spot should have been vertically deflected downward six divisions, ± 0.06 division.

e. ADJUST -- Vertical GAIN R275 for exactly six divisions of vertical deflection of the intensified marker spot as the MARKER control is rotated from one extreme to the other.

f. Set the VERTICAL GAIN switch to 10 and the DISPLAY DISPERSION switch to the 40 (4) nm/div position.

(19) Check OFFSET Control Accuracy

a. Connect a 7D13 Digital Multimeter between test point TP211 and ground.

b. Set the OFFSET control to read 0.00 and the VERTICAL GAIN switch to 1.

c. CHECK -- Refer to the following list of control settings and meter readings and check the OFFSET control for correct operation.

<u>OFFSET</u>	<u>VOLTMETER READING</u>
2.00	-400 mV, <u>+12</u> mV
4.00	-800 mV, <u>+20</u> mV
6.00	-1.2 V, <u>+28</u> mV
8.00	-1.6 V, <u>+36</u> mV
10.00	-2.0 V, <u>+44</u> mV

d. Reset the OFFSET control to 0.00 and remove the 7D13 test leads from the 7J20.

(20) Adjust Vertical Input Amplifier Gain And Check VARIABLE Range

a. Connect the Output signal from the 114 Pulse Generator to the Unknown Input connector of the 067-0502-01 Calibration Fixture via a BNC 10X 50 ohm attenuator, a BNC 50 ohm feedthrough termination, a BNC T, and a 42-inch BNC 50 ohm coaxial cable.

b. Connect the unused output of the BNC T to J10 on the Vertical Circuit Board of the 7J20 via a 42-inch coaxial cable Calibration Fixture 067-0709-00.

c. Connect the Output signal from the 067-0502-01 Calibration Fixture to the "+" input of the 7A22 in the test scope via a 42-inch BNC coaxial cable.

d. Connect the Trigger Output signal from the 114 Pulse Generator to the "Scan Control" test point TP447 on the Horizontal Circuit Board in the 7J20 via a BNC-to-dual binding post adapter and the set of test leads from the 7D13 Digital Multimeter. Connect the red binding post to TP447 and the black binding post to one of the ground test points on the Horizontal Circuit Board.

e. Set the following listed controls as indicated:

114 PULSE GENERATOR

Period	1 ms
Width	1 ms

Amplitude	+1 to +3 V
Trigger	Leading Edge

067-0502-01

Amplitude	.1 Volt
Mode	+DC Chopped

Test Oscilloscope

Vertical Volts/Div	10 mV
Horizontal Time/Div	10 ms
Triggering	Auto Mode
	AC Coupling
	Line Source

f. Adjust the Variable Amplitude control on the 114 to obtain a 100 mV output signal amplitude. This is achieved by matching the amplitude of the 114 portion of the chopped signal displayed on the test scope with the Cal Fixture level portion of the chopped display.

g. CHECK -- Spectrometer display for a signal amplitude of 5 divisions, +0.05 division (+1%).

h. ADJUST -- Input Gain R75 for exactly 5 divisions of signal amplitude in the spectrometer display.

i. Set the 7J20 Vertical VARIABLE control to the uncalibrated (button out) position and rotate the control fully clockwise.

j. CHECK -- Spectrometer display for a signal amplitude of

two divisions or less. This indicates a variable range of at least 2.5:1.

k. Set the 7J20 Vertical VARIABLE control to the calibrated (button in) position.

l. Change the VERTICAL GAIN switch on the 7J20 to 100 and change the 067-0502-01 Amplitude switch to 10 mV. Adjust the 114 Pulse Generator Variable control for a 10 mV output signal in the same manner used in step c. Add attenuators to the 114 output signal as necessary to obtain the correct output signal amplitude.

m. CHECK -- Spectrometer display for a signal amplitude of 5 divisions, ± 0.05 division ($\pm 1\%$).

n. ADJUST -- X100 Gain R235 for exactly 5 divisions of signal amplitude in the spectrometer display.

o. Leave the test setup in place for the following step.

(21) Check VERTICAL GAIN Linear Deflection Accuracy

a. CHECK -- Use the test equipment setup given in the previous step and check each linear deflection gain position (1-500) of the VERTICAL GAIN switch for correct deflection accuracy. Refer to the following chart for required signal amplitudes and the resultant display deflections.

<u>VERTICAL GAIN</u>	<u>INPUT SIGNAL</u>	<u>DISPLAY DEFLECTION</u>	<u>TOLERANCE</u>
1	1 V	5 divisions	± 0.05 division
2	0.5 V	5 divisions	± 0.05 division
5	0.2 V	5 divisions	± 0.05 division
10	0.1 V	5 divisions	± 0.05 division
20	50 mV	5 divisions	± 0.05 division
50	20 mV	5 divisions	± 0.05 division
100	10 mV	5 divisions	± 0.05 division
200	5 mV	5 divisions	± 0.05 division
500	2 mV	5 divisions	± 0.05 division

b. Remove the test equipment setup from the 7J20.

(22) Adjust Log Amplifier Offset And Zero

a. Connect the 7D13 Digital Multimeter between the Log Offset test point TP164 and ground.

b. Remove jumper P165 from the Vertical Circuit Board.

c. Set the VERTICAL GAIN switch to the 5 dB/DIV LOG position, the TIME/SCAN to 10 ms, and the SPECTRAL NORMALIZER to OFF.

d. Press the BASELINE RESTORE pushbutton briefly and release.

e. CHECK -- 7D13 for a meter reading of 0 volts, ± 5 mV.

f. ADJUST -- Log Offset R160 for a meter reading of exactly 0 volts.

g. Move the 7D13 test lead from the Log Offset test point TP164 to the Log Zero test point TP166.

h. Press the BASELINE RESTORE pushbutton briefly and release.

i. CHECK -- 7D13 for a meter reading of 0 volts, +5 mV.

j. ADJUST -- Log Zero adjust R190 for a meter reading of exactly 0 volts.

k. Remove the 7D13 test leads from the 7J20 and replace jumper P165.

(23) Adjust Log Gain And Check Absorbance Gain

a. With the VERTICAL GAIN switch set to the 5 dB/DIV LOG position, remove jumper P165 from the Vertical Circuit Board and install the jumper on the square pins between +8 V and the end of R169 (7.5 k Ω).

b. Press the BASELINE RESTORE pushbutton briefly and release.

c. Using the OFFSET control, vertically position the trace in the spectrometer display to the center horizontal graticule line.

d. Remove the jumper from the end of R169 (7.5 k Ω) and install it on the square pins between +8 V and the end of R168 (75 k Ω).

e. CHECK -- Spectrometer CRT display to see that the trace has moved two divisions, ± 0.06 division ($\pm 3\%$).

f. ADJUST -- Log Gain R185 so there is exactly two divisions difference in trace location between jumper positions.

g. Set the VERTICAL GAIN switch to the .5 UNITS/DIV ABSORBANCE position.

h. CHECK -- Using the same procedure as that used to set LOG gain, check to see that there are two divisions of difference in trace location between jumper positions.

i. Replace jumper P165 on the original square pins from which it was removed in step a and set the VERTICAL GAIN switch to the 10 position.

(24) Adjust Multiplier Circuit Balances And Gain

a. Connect the 7D13 Digital Multimeter test leads between the "X" test point TP101 and ground on the Vertical Circuit Board.

b. Press the BASELINE RESTORE pushbutton and hold.

c. CHECK -- 7D13 for a meter reading of zero volts, ± 5 mV.

d. ADJUST -- X Zero R100 for a meter reading of exactly zero volts.

e. Release the BASELINE RESTORE pushbutton and remove the 7D13 test leads from the 7J20.

- f. Set the SPECTRAL NORMALIZER switch to the INT position and the VERTICAL GAIN switch to 200.
- g. CHECK -- The spectrometer display for no trace shift while intermittently shorting test points TP108 and TP109 together.
- h. ADJUST -- X Offset R105 for no trace shift in the CRT display while intermittently shorting test points TP108 and TP109 together.
- i. Connect the Output signal from the 114 Pulse Generator to the Unknown Input connector of the 067-0502-01 Calibration Fixture via a BNC 10X 50 Ω attenuator, a BNC 50 Ω feedthrough termination, a BNC T, and a 42-inch BNC 50 Ω coaxial cable.
- j. Connect the unused output of the BNC T to J10 on the Vertical Circuit Board of the 7J20 via a 42-inch coaxial cable Calibration Fixture 067-0709-00.
- k. Connect the Output signal from the 067-0502-01 Calibration Fixture to the "+" input of the 7A22 in the test scope via a 42-inch BNC coaxial cable.
- l. Connect the Trigger Output signal from the 114 Pulse Generator to the "Scan Control" test point TP447 on the Horizontal Circuit Board in the 7J20 via a BNC-to-dual binding post adapter and the set of test leads from the 7D13 Digital Multimeter. Connect the red binding post to TP447 and the black

binding post to one of the ground test points on the Horizontal Circuit Board.

- m. Set the following listed controls as indicated:

114 Pulse Generator

Period	1 ms
Width	1 ms
Amplitude	+1 to +3 V
Trigger	Leading Edge

067-0502-01

Amplitude	.1 Volt
Mode	+DC Chopped

Test Oscilloscope

Vertical Volts/Div	10 mV
Horizontal Time/Div	10 ms
Triggering	Auto Mode
	AC Coupling
	Line Source

n. Adjust the Variable Amplitude control on the 114 to obtain a 100 mV output signal amplitude. This is achieved by matching the amplitude of the 114 portion of the chopped signal displayed on the test scope with the Cal Fixture level portion of the chopped display.

- o. Short test points TP108 and TP109 together.

p. CHECK -- Spectrometer CRT display for no more than 0.5 major division of signal amplitude.

q. ADJUST -- Y Offset R110 for minimum signal amplitude in the spectrometer CRT display.

r. Remove the short circuit between test points TP108 and TP109.

s. Switch the SPECTRAL NORMALIZER switch back and forth between INT and OFF.

t. CHECK -- Spectrometer display for no more than 1% difference in displayed signal amplitude when switching the SPECTRAL NORMALIZER switch back and forth between INT and OFF.

u. ADJUST -- Mult Gain R120 so the displayed signal amplitudes match when switching the SPECTRAL NORMALIZER switch back and forth between INT and OFF.

v. Remove the input signal from J10 on the Vertical Circuit Board.

w. CHECK -- Spectrometer CRT display for no more than 0.5 major division of trace shift when switching the SPECTRAL NORMALIZER Switch back and forth between INT and OFF.

x. ADJUST -- Mult Offset R115 for no trace shift when switching the SPECTRAL NORMALIZER switch back and forth between INT and OFF.

y. There is interaction between the Mult Gain (R120) and the Mult Offset (R115) adjustments. Repeat their adjustment as necessary to minimize this interaction.

z. Remove the test setup completely from the 7J20. Do not reconnect the signal lead from the Spectrometer connector J100 to J10 yet.

(25) Check Displayed Noise

a. Set the VERTICAL GAIN switch to 200, the TIME/SCAN switch to 20 ms, and the SPECTRAL NORMALIZER switch to OFF.

b. Connect the Calibration Fixture Interconnect Cable 067-0709-00 to J10 on the Vertical Circuit Board with a BNC 50 Ω feedthrough termination connected to the BNC end of the cable.

c. CHECK -- Spectrometer CRT display for 0.4 division or less of displayed noise.

d. Set the SPECTRAL NORMALIZER switch to INT.

e. CHECK -- Spectrometer CRT display for 0.4 division or less of displayed noise.

f. Remove the Calibration Fixture Interconnect Cable 067-0709-00 from J10 on the Vertical Circuit Board. Connect the normal internal signal lead back to J10.

ELECTRICAL REPLACEABLE PARTS LIST

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	SEMICON	SEMICONDUCTOR
ELCTLT	ELECTROLYTIC	SENS	SENSITIVE
ELEC	ELECTRICAL	SEP	SEPARATELY
FXD	FIXED	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
0000A	Lemo USA	2015 2nd St.	Berkley, CA 94710
00853	Sangamo Electric Co., S. Carolina Div.	P. O. Box 128	Pickens, SC 29671
01121	Allen-Bradley Co.	1201 2nd St. South	Milwaukee, WI 53204
01295	Texas Instruments, Inc., Components Group	P. O. Box 5012	Dallas, TX 75222
01884	Sprague Electric Co., Dearborn Electronics	P. O. Box 1076	Longwood, FL 32750
03508	General Electric Co., Semi-Conductor Products Dept.	Electronics Park	Syracuse, NY 13201
04713	Motorola, Inc., Semiconductor Products Div.	5005 E. McDowell Rd.	Phoenix, AZ 85008
07263	Fairchild Semiconductor, A Div. of Fairchild Camera and Instrument Corp.	464 Ellis St.	Mountain View, CA 94040
07910	Teledyne Semiconductor	12515 Chadron Ave.	Hawthorne, CA 90250
08806	General Electric Co., Miniature Lamp Products Dept.	Nela PK.	Cleveland, OH 44112
11237	CTS Keene, Inc.	3230 Riverside Ave.	Paso Robles, CA 93446
12040	National Semiconductor Corp.	Commerce Drive	Danbury, CT 06810
14099	Semtech Corp.	652 Mitchell Rd.	Newbury Park, CA 91320
18324	Signetics Corp.	811 E. Arques	Sunnyvale, CA 94086
18583	Curtis Instruments, Inc.	200 Kisco Ave.	Mount Kisco, NY 10549
24731	General Supply and Machine Co.	208 19th Ave.	Meridian, MS 39301
27014	National Semi-Conductor Corp.	2900 San Ysidro Way	Santa Clara, CA 95051
50157	N. L. Industries, Inc., Electronics Dept.	P. O. Box 787	Muskegon, MI 49443
56289	Sprague Electric Co.		North Adams, MA 01247
72136	Electro Motive Mfg. Co., Inc., The	South Park and John Streets	Willimantic, CT 06226
72982	Erie Technological Products, Inc.	644 W. 12th St.	Erie, PA 16512
73138	Beckman Instruments, Inc., Helipot Div.	2500 Harbor Blvd.	Fullerton, CA 92634
75042	TRW Electronic Components, IRC Fixed Resistors, Philadelphia Division	401 N. Broad St.	Philadelphia, PA 19108
79727	Continental-Wirt Electronics Corp.		Warminster, PA 18974
80009	Tektronix, Inc.	P. O. Box 500	Beaverton, OR 97005
80294	Bourns, Inc., Instrument Div.	6135 Magnolia Ave.	Riverside, CA 92506
81483	International Rectifier Corp.	9220 Sunset Blvd.	Los Angeles, CA 90069
86684	RCA Corp., Electronic Components	415 S. 5th St.	Harrison, NJ 07029
90201	Mallory Capacitor Co., Div. of P. R. Mallory Co., Inc.	3029 E. Washington St.	Indianapolis, IN 46206
91637	Dale Electronics, Inc.	P. O. Box 609	Columbus, NB 68601
97979	Reon Resistor Corp.	420 Lincoln Hwy.	Fraser, PA 19355

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
7J20					
A1	670-2264-00		CKT BOARD ASSY:--VERTICAL	80009	670-2264-00
A2	670-2265-00		CKT BOARD ASSY:--HORIZONTAL	80009	670-2265-00
A3	670-2281-00		CKT BOARD ASSY:--READOUT	80009	670-2281-00
A4	670-2662-00		CKT BOARD ASSY:--HIGH VOLTAGE	80009	670-2662-00
C3	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C10	283-0670-00		CAP.,FXD,MICA D:375PF,1%,500V	00853	D15-5F3750F0
C14	283-0634-00		CAP.,FXD,MICA D:65PF,5%,500V	00853	D15-1E650F0
C15	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C16	283-0624-00		CAP.,FXD,MICA D:1300PF,2%,500V	72136	DM19E132G0
C17	283-0624-00		CAP.,FXD,MICA D:1300PF,2%,500V	72136	DM19E132G0
C18	285-0808-00		CAP.,FXD,PLSTC:0.1UF,10%,50V		
C19	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C28	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C52	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C73	283-0604-00		CAP.,FXD,MICA D:304PF,2%,300V	00853	D15-3F3040G0
C74	283-0625-00		CAP.,FXD,MICA D:220PF,1%,500V		
C83	285-0809-00		CAP.,FXD,PLSTC:1UF,10%,50V	01884	LP66A1A105K
C94	283-0094-00		CAP.,FXD,CER DI:27PF,10%,200V	56289	40C627
C101	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131-050651104M
C102	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C107	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C112	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131-050651104M
C114	283-0604-00		CAP.,FXD,MICA D:304PF,2%,300V	00853	D15-3F3040G0
C115	283-0630-00		CAP.,FXD,MICA D:110PF,1%,100V	00853	D15-1E111F0
C117	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C150	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C163	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C167	283-0094-00		CAP.,FXD,CER DI:27PF,10%,200V	56289	40C627
C177	283-0032-00		CAP.,FXD,CER DI:470PF,5%,500V	72982	831-000Z5D0471J
C178	283-0094-00		CAP.,FXD,CER DI:27PF,10%,200V	56289	40C627
C192	281-0501-00		CAP.,FXD,CER DI:4.7PF,+/-1PF,500V	72982	301-000S2H0479F
C198	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C211	283-0604-00		CAP.,FXD,MICA D:304PF,2%,300V	00853	D15-3F3040G0
C216	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C232	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C242	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C260	283-0630-00		CAP.,FXD,MICA D:110PF,1%,100V	00853	D15-1E111F0
C261	283-0604-00		CAP.,FXD,MICA D:304PF,2%,300V	00853	D15-3F3040G0
C281	283-0604-00		CAP.,FXD,MICA D:304PF,2%,300V	00853	D15-3F3040G0
C301	283-0000-00		CAP.,FXD,CER DI:0.001UF,+100-0%,500V	56289	40C626
C302	283-0000-00		CAP.,FXD,CER DI:0.001UF,+100-0%,500V	56289	40C626
C303	283-0000-00		CAP.,FXD,CER DI:0.001UF,+100-0%,500V	56289	40C626
C338	295-0168-00		CAP.SET,MTCHD:0.22UF AND 2UF		
C339					
C351	290-0534-00		CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C362	285-0919-00		CAP.,FXD,PLSTC:0.22UF,10%,100V	56289	LP66A1B224K002
C368	283-0666-00		CAP.,FXD,MICA D:890PF,2%,100V		
C369	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C390	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C396	283-0180-00		CAP.,FXD,CER DI:5600PF,20%,200V	72982	8121N204E562M
C440	283-0666-00		CAP.,FXD,MICA D:890PF,2%,100V		
C441	283-0666-00		CAP.,FXD,MICA D:890PF,2%,100V		
C442	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C446	283-0000-00		CAP.,FXD,CER DI:0.001UF,+100-0%,500V	56289	40C626
C507	283-0060-00		CAP.,FXD,CER DI:100PF,5%,200V	72982	855-535U2J101J
C533	283-0032-00		CAP.,FXD,CER DI:470PF,5%,500V	72982	831-000Z5D0471J
C546	283-0000-00		CAP.,FXD,CER DI:0.001UF,+100-0%,500V	56289	40C626
C558	283-0000-00		CAP.,FXD,CER DI:0.001UF,+100-0%,500V	56289	40C626

Electrical Parts List—J20/7J20

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
C562	283-0028-00		CAP.,FXD,CER DI:0.0022UF,20%,50V	56289	55C144
C565	283-0109-00		CAP.,FXD,CER DI:27PF,5%,1000V		
C710	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C713	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C728	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C736	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C773	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C914	290-0526-00		CAP.,FXD,ELCTLT:6.8UF,20%,6V	90201	TDC685M006EL
C918	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C920	283-0077-00		CAP.,FXD,CER DI:330PF,5%,500V	56289	40C94A3
C922	290-0526-00		CAP.,FXD,ELCTLT:6.8UF,20%,6V	90201	TDC685M006EL
C923	283-0000-00		CAP.,FXD,CER DI:0.001UF,+100-0%,500V	56289	40C626
C924	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C933	283-0077-00		CAP.,FXD,CER DI:330PF,5%,500V	56289	40C94A3
C934	283-0077-00		CAP.,FXD,CER DI:330PF,5%,500V	56289	40C94A3
C944	283-0077-00		CAP.,FXD,CER DI:330PF,5%,500V	56289	40C94A3
C951	283-0164-00		CAP.,FXD,CER DI:2.2UF,20%,25V		
C957	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1001	290-0312-00		CAP.,FXD,ELCTLT:47UF,10%,35V	56289	150D476X9035S2
C1004	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C1005	283-0010-00		CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C1008	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C1016	283-0010-00		CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C0122	283-0198-00		CAP.,FXD,CER DI:0.022UF,20%,50V	72982	8131N075E224M
C1023	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C1024	283-0008-00		CAP.,FXD,CER DI:1UF,500V	72982	8151N501E104M
C1025	283-0008-00		CAP.,FXD,CER DI:0.1UF,500V	72982	8151N501E104M
C1026	285-0919-00		CAP.,FXD,PLSTC:0.22UF,10%,100V	56289	LP66A1B224K002
C1028	283-0208-00		CAP.,FXD,CER DI:0.22UF,10%,200V	72982	8151N230C224K
C1029	283-0208-00		CAP.,FXD,CER DI:0.22UF,10%,200V	72982	8151N230C224K
C1032	290-0532-00		CAP.,FXD,ELCTLT:150VF,20%,6V	90201	TDC157M006CL
C1033	290-0524-00		CAP.,FXD,ELCTLT:4.7UF,20%,10V	90201	TDC475M010EL
C1034	290-0420-00		CAP.,FXD,ELCTLT:.68UF,20%,75V		
C1036	283-0008-00		CAP.,FXD,CER DI:0.1UF,500V	72982	8151N501E104M
C1039	283-0008-00		CAP.,FXD,CER DI:0.1UF,500V	72982	8151N501E104M
C1075	290-0527-00		CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1076	290-0530-00		CAP.,FXD,ELCTLT:68UF,20%,6V	90201	TDC686M006FL
C1077	290-0527-00		CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1079	290-0524-00		CAP.,FXD,ELCTLT:4.7UF,20%,10V	90201	TDC475M010EL
C1080	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1081	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1083	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C1084	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C1086	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1087	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1088	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C1089	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C1091	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1092	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1094	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1095	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1098	290-0524-00		CAP.,FXD,ELCTLT:4.7UF,20%,10V	90201	TDC475M010EL
C1101	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C1102	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1103	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1105	283-0000-00		CAP.,FXD,CER DI:0.001UF,+100-0%,500V	56289	40C626
C1106	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1121	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C1122	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C1131	290-0527-00		CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
C1132	290-0530-00		CAP.,FXD,ELCTLT:68UF,20%,6V	90201	TDC686M006FL
C1133	290-0527-00		CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1137	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1138	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1139	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1140	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1145	283-0080-00		CAP.,FXD,CER DI:0.022UF,+80-20%,25V	72982	5835-515E223Z
C1147	290-0532-00		CAP.,FXD,ELCTLT:150VF,20%,6V	90201	TDC157M006CL
C1201	290-0527-00		CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1202	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C1204	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1205	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1208	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1209	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1212	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1213	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1216	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1217	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1220	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1221	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1223	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1224	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1227	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1228	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1232	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1233	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1236	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1237	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1240	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1241	283-0239-00		CAP.,FXD,CER DI:0.022UF,10%,50V	72982	8131-050W5R223K
C1242	290-0527-00		CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1246	290-0572-00		CAP.,FXD,ELCTLT:0.1UF,20%,50V	56289	196D104X0050HA1
CR33	152-0333-00		SEMICON DEVICE:SILICON,55V,200MA	07263	FDH6012
CR34	152-0333-00		SEMICON DEVICE:SILICON,55V,200MA	07263	FDH6012
CR71	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR72	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR92	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR93	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR114	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR120	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR130	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR164	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR166	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR172	152-0333-00		SEMICON DEVICE:SILICON,55V,200MA	07263	FDH6012
CR173	152-0333-00		SEMICON DEVICE:SILICON,55V,200MA	07263	FDH6012
CR234	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR236	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR316	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR317	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR318	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR319	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR370	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR413	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR414	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR442	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR509	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR522	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR528	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR529	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
CR542	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR574	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR586	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR646	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR647	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR648	152-0322-00		SEMICON DEVICE:SILICON,15V	01295	A1108
CR653	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR657	152-0322-00		SEMICON DEVICE:SILICON,15V	01295	A1108
CR663	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR667	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR668	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR669	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR670	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR701	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR702	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR704	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR705	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR710	152-0322-00		SEMICON DEVICE:SILICON,15V	01295	A1108
CR726	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR736	152-0322-00		SEMICON DEVICE:SILICON,15V	01295	A1108
CR739	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR749	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR750	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR757	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR766	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR767	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR771	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR772	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR773	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR781	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR783	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR785	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR786	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR787	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR791	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR837	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR838	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR843	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR844	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR902	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR903	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR905	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR907	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR908	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR910	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR924	152-0322-00		SEMICON DEVICE:SILICON,15V	01295	A1108
CR946	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR947	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR950	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR954	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR1014	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR1015	152-0141-02		SEMICON DEVICE:SILICON,30V,150MA	07910	CD8220
CR1026	152-0107-03		SEMICON DEVICE:SILICON,400V,400MA	80009	152-0107-03
CR1027	152-0107-03		SEMICON DEVICE:SILICON,400V,400MA	80009	152-0107-03
CR1028	152-0107-03		SEMICON DEVICE:SILICON,400V,400MA	80009	152-0107-03
CR1029	152-0107-03		SEMICON DEVICE:SILICON,400V,400MA	80009	152-0107-03
CR1030	152-0333-00		SEMICON DEVICE:SILICON,55V,200MA	07263	FDH6012
CR1031	152-0333-00		SEMICON DEVICE:SILICON,55V,200MA	07263	FDH6012
CR1047	152-0107-03		SEMICON DEVICE:SILICON,400V,400MA	80009	152-0107-03
CR1075	152-0107-03		SEMICON DEVICE:SILICON,400V,400MA	80009	152-0107-03

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
CR1077	152-0107-03		SEMICON D DEVICE:SILICON,400V,400MA	80009	152-0107-03
DS312	150-0048-00		LAMP, INCAND:5V,60MA	08806	683
DS314	150-0048-00		LAMP, INCAND:5V,60MA	08806	683
DS500	150-0048-00		LAMP, INCAND:5V,60MA	08806	683
DS594	150-0048-00		LAMP, INCAND:5V,60MA	08806	683
DS674	150-0048-00		LAMP, INCAND:5V,60MA	08806	683
J130	131-1011-00		CONN,RCPT,ELEC:4 CONTACT,FEMALE	0000A	RA-1304TPX
J200	131-1461-00		CONN,RCPT,ELEC:50 FEMALE CONTACT		
J500	131-0955-00		CONN,RCPT,ELEC:BNC,FEMALE	24731	28JR200-1
K92	108-0499-00		COIL, FIXED: REED DRIVE, 6V SINGLE		
K120 ¹	148-0035-00		RELAY, ARMATURE: SPDT, 15VDC, 600 OHM	80009	148-0035-00
L1001	108-0473-00		COIL, RF: 150UH	80009	108-0473-00
L1002	108-0473-00		COIL, RF: 150UH	80009	108-0473-00
L1007	108-0245-00		COIL, RF: 3.9UH	80009	108-0245-00
L1031	108-0245-00		COIL, RF: 3.9UH	80009	108-0245-00
L1075	108-0245-00		COIL, RF: 3.9UH	80009	108-0245-00
L1076	108-0245-00		COIL, RF: 3.9UH	80009	108-0245-00
L1077	108-0245-00		COIL, RF: 3.9UH	80009	108-0245-00
L1078	108-0245-00		COIL, RF: 3.9UH	80009	108-0245-00
L1079	108-0245-00		COIL, RF: 3.9UH	80009	108-0245-00
L1131	108-0245-00		COIL, RF: 3.9UH	80009	108-0245-00
L1132	108-0245-00		COIL, RF: 3.9UH	80009	108-0245-00
L1133	108-0245-00		COIL, RF: 3.9UH	80009	108-0245-00
L1147	108-0245-00		COIL, RF: 3.9UH	80009	108-0245-00
L1201	108-0245-00		COIL, RF: 3.9UH	80009	108-0245-00
L1202	108-0245-00		COIL, RF: 3.9UH	80009	108-0245-00
L1242	108-0245-00		COIL, RF: 3.9UH	80009	108-0245-00
P10	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
P502	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
Q2	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q8	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q12	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q16	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q18	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q20	151-1025-00		TRANSISTOR:SILICON,JFE,N-CHANNEL	01295	SBA8129
Q22A,B	151-1049-00		TRANSISTOR:SL,JFE,N-CHAN,SEL FROM 2N3822	80009	151-1049-00
Q24	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q26	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q28	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q54	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q58	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q72A,B	151-0261-00		TRANSISTOR:SILICON,PNP,DUAL	12040	NS7410
Q74	151-1078-00		TRANSISTOR:SILICON,JFE,N-CHANNEL	80009	151-1078-00
Q82	151-1037-00		TRANSISTOR:SILICON,JFE,N CHANNEL		
Q86	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q92	151-1004-00		TRANSISTOR:SILICON,JFE,N-CHANNEL		
Q114	151-1078-00		TRANSISTOR:SILICON,JFE,N-CHANNEL	80009	151-1078-00
Q120	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q124	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q128	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q182A,B	151-0309-00		TRANSISTOR:SILICON,NPN,DUAL	80009	151-0309-00
Q244A,B	151-0261-00		TRANSISTOR:SILICON,PNP,DUAL	12040	NS7410
Q254	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q262	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q268	151-0192-00		TRANSISTOR:SILICON,NPN,SEL FROM MPS6521	80009	151-0192-00
Q282	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q284	151-0192-00		TRANSISTOR:SILICON,NPN,SEL FROM MPS6521	80009	151-0192-00

¹Furnished as a unit with S120.

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
Q310	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q312	151-0302-00		TRANSISTOR:SILICON,NPN	04713	2N2222A
Q314	151-0302-00		TRANSISTOR:SILICON,NPN	04713	2N2222A
Q316	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q318	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q328	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q330	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q332	151-0508-00		TRANSISTOR:SILICON,NPN,UNIUNCTION	03508	X13T520
Q344	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q362	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q364	151-0190-00		TRANSISTOR:SILICON,NPN	07263	2N3904
Q370	151-0254-00		TRANSISTOR:SILICON,NPN	03508	2N5308
Q398	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q400	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q420	151-1021-00		TRANSISTOR:SILICON,JFE,N CHANNEL		
Q424	151-1021-00		TRANSISTOR:SILICON,JFE,N CHANNEL		
Q426	151-1021-00		TRANSISTOR:SILICON,JFE,N CHANNEL		
Q436	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q502	151-0302-00		TRANSISTOR:SILICON,NPN	04713	2N2222A
Q504	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q510	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q514	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q518	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q524	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q534	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q538	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q550	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q554	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q570	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q572	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q576	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q582	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q586	151-0188-00		TRANSISTOR:SILICON,PNP	04713	2N3906
Q590	151-0301-00		TRANSISTOR:SILICON,PNP	04713	2N2907A
Q592	151-0302-00		TRANSISTOR:SILICON,NPN	04713	2N2222A
Q656	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q666	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q668	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q670	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q674	151-0302-00		TRANSISTOR:SILICON,NPN	04713	2N2222A
Q676	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q726	151-1021-00		TRANSISTOR:SILICON,JFE,N CHANNEL		
Q736	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q750	151-1021-00		TRANSISTOR:SILICON,JFE,N CHANNEL		
Q752	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q768	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q784	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q786	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q794	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q798	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q836	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q842	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q846	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q908	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q918	151-0301-00		TRANSISTOR:SILICON,PNP	04713	2N2907A
Q932	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q934	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q938	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q940	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q946	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
Q970	151-1021-00		TRANSISTOR:SILICON,JFE,N CHANNEL		
Q974	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q976	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q1002	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q1008	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q1012	153-0611-00		TRANSISTOR:SILICON,NPN,MATCHED PAIR		
Q1014					
Q1042					
Q1044					
Q1106	151-0302-00		TRANSISTOR:SILICON,NPN	04713	SPS6700
				04713	SPS6700
				04713	2N2222A
Q1246	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
R1	321-0277-03		RES.,FXD,FILM:7.5K OHM,0.25%,0.125W		
R2	321-0626-01		RES.,FXD,FILM:2.51K OHM,0.5%,0.125W	75042	CEAT0-2511D
R3	315-0272-00		RES.,FXD,COMP:2.7K OHM,5%,0.25W	01121	CB2725
R4	321-0251-00		RES.,FXD,FILM:4.02K OHM,1%,0.125W	75042	CEAT0-4021F
R6	321-0221-00		RES.,FXD,FILM:1.96K OHM,1%,0.125W	75042	CEAT0-1961F
R7	315-0201-00		RES.,FXD,COMP:200 OHM,5%,0.25W	01121	CB2015
R8	321-0234-00		RES.,FXD,FILM:2.67K OHM,1%,0.125W	75042	CEAT0-2671F
R9	321-0221-00		RES.,FXD,FILM:1.96K OHM,1%,0.125W	75042	CEAT0-1961F
R11	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R12	321-0251-00		RES.,FXD,FILM:4.02K OHM,1%,0.125W	75042	CEAT0-4021F
R13	321-0249-00		RES.,FXD,FILM:3.83K OHM,1%,0.125W	75042	CEAT0-3831F
R14	321-0249-00		RES.,FXD,FILM:3.83K OHM,1%,0.125W	75042	CEAT0-3831F
R16	321-0249-00		RES.,FXD,FILM:3.83K OHM,1%,0.125W	75042	CEAT0-3831F
R17	321-0249-00		RES.,FXD,FILM:3.83K OHM,1%,0.125W	75042	CEAT0-3831F
R18	315-0153-00		RES.,FXD,COMP:15K OHM,5%,0.25W	01121	CB1535
R19	315-0153-00		RES.,FXD,COMP:15K OHM,5%,0.25W	01121	CB1535
R21	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R22	321-0297-00		RES.,FXD,FILM:12.1K OHM,1%,0.125W	75042	CEAT0-1212F
R23	321-0297-00		RES.,FXD,FILM:12.1K OHM,1%,0.125W	75042	CEAT0-1212F
R25	311-1560-00		RES.,VAR,NONWIR:5K OHM,5%,0.50W	73138	91A-5000M
R26	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R27	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R28	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R32	321-0289-03		RES.,FXD,FILM:10K OHM,0.25%,0.125W	75042	CEAT2-1002C
R33	321-0626-01		RES.,FXD,FILM:2.51K OHM,0.5%,0.125W	75042	CEAT0-2511D
R34	321-0626-01		RES.,FXD,FILM:2.51K OHM,0.5%,0.125W	75042	CEAT0-2511D
R37	321-0289-03		RES.,FXD,FILM:10K OHM,0.25%,0.125W	75042	CEAT2-1002C
R38	315-0101-00		RES.,FXD,COMP:100 OHM,5%,0.25W	01121	CB1015
R50	321-0260-00		RES.,FXD,FILM:4.99K OHM,1%,0.125W	75042	CEAT0-4991F
R51	321-0260-00		RES.,FXD,FILM:4.99K OHM,1%,0.125W	75042	CEAT0-4991F
R52	315-0622-00		RES.,FXD,COMP:6.2K OHM,5%,0.25W	01121	CB6225
R53	315-0303-00		RES.,FXD,COMP:30K OHM,5%,0.25W	01121	CB3035
R54	315-0303-00		RES.,FXD,COMP:30K OHM,5%,0.25W	01121	CB3035
R57	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R58	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R71	321-0510-00		RES.,FXD,FILM:2M OHM,1%,0.125W	75042	CEAT0-2004F
R72	321-0510-00		RES.,FXD,FILM:2M OHM,1%,0.125W	75042	CEAT0-2004F
R73	321-0251-00		RES.,FXD,FILM:4.02K OHM,1%,0.125W	75042	CEAT0-4021F
R74	321-0262-00		RES.,FXD,FILM:5.23K OHM,1%,0.125W	75042	CEAT0-5231F
R75	311-1560-00		RES.,VAR,NONWIR:5K OHM,5%,0.50W	73138	91A-5000M
R76	321-0251-00		RES.,FXD,FILM:4.02K OHM,1%,0.125W	75042	CEAT0-4021F
R81	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R82	315-0303-00		RES.,FXD,COMP:30K OHM,5%,0.25W	01121	CB3035
R83	315-0471-00		RES.,FXD,COMP:470 OHM,5%,0.25W	01121	CB4715
R84	315-0471-00		RES.,FXD,COMP:470 OHM,5%,0.25W	01121	CB4715
R86	321-0234-00		RES.,FXD,FILM:2.67K OHM,1%,0.125W	75042	CEAT0-2671F
R87	315-0201-00		RES.,FXD,COMP:200 OHM,5%,0.25W	01121	CB2015
R88	321-0193-03		RES.,FXD,FILM:1K OHM,0.25%,0.125W	75042	CEAT2-1001C

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
R89	321-0193-03		RES.,FXD,FILM:1K OHM,0.25%,0.125W	75042	CEAT2-1001C
R92	315-0475-00		RES.,FXD,COMP:4.7M OHM,5%,0.25W	01121	CB4755
R93	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R94	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R96	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R97	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R100	311-1556-00		RES.,VAR,NONWIR:50K OHM,20%,0.50W	73138	91A-50001M
R101	321-0309-00		RES.,FXD,FILM:16.2K OHM,1%,0.125W	75042	CEAT0-1622F
R102	321-0182-09		RES.,FXD,FILM:768 OHM,1%,0.125W		
R103	321-0298-09		RES.,FXD,FILM:12.4K OHM,1%,0.125W		
R105	311-1336-00		RES.,VAR,NONWIR:100K OHM,10%,0.50W		
R106	321-0283-00		RES.,FXD,FILM:8.66K OHM,1%,0.125W	75042	CEAT0-8661F
R107	321-0289-03		RES.,FXD,FILM:10K OHM,0.25%,0.125W	75042	CEAT2-1002C
R108	321-0236-00		RES.,FXD,FILM:2.8K OHM,1%,0.125W	75042	CEAT0-2801F
R109	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R110	311-1560-00		RES.,VAR,NONWIR:5K OHM,5%,0.50W	73138	91A-5000M
R111	321-0344-00		RES.,FXD,FILM:37.4K OHM,1%,0.125W	75042	CEAT0-3742F
R112	321-0272-00		RES.,FXD,FILM:6.65K OHM,1%,0.125W	75042	CEAT0-6651F
R113	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R114	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R115	311-1336-00		RES.,VAR,NONWIR:100K OHM,10%,0.50W		
R116	321-0646-00		RES.,FXD,FILM:200K OHM,0.5%,0.125W	75042	CEAT2-2003D
R117	321-0298-09		RES.,FXD,FILM:12.4K OHM,1%,0.125W		
R118	321-0285-00		RES.,FXD,FILM:9.09K OHM,1%,0.125W	75042	CEAT0-9091F
R120	311-1560-00		RES.,VAR,NONWIR:5K OHM,5%,0.50W	73138	91A-5000M
R122	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R124	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R126	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R128	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R130	315-0153-00		RES.,FXD,COMP:15K OHM,5%,0.25W	01121	CB1535
R150	311-1685-00		RES.,VAR,WW:50K OHM,3%,2W		
R151	321-0318-02		RES.,FXD,FILM:20K OHM,0.5%,0.125W	75042	CEAT2-2002D
R152	321-0289-03		RES.,FXD,FILM:10K OHM,0.25%,0.125W	75042	CEAT2-1002C
R153	321-0289-03		RES.,FXD,FILM:10K OHM,0.25%,0.125W	75042	CEAT2-1002C
R154	321-0816-03		RES.,FXD,FILM:5K OHM,0.25%,0.125W		
R156	321-0992-01		RES.,FXD,FILM:33.33K OHM,0.5%,0.125W		
R157	321-0992-01		RES.,FXD,FILM:33.33K OHM,0.5%,0.125W		
R158	321-0755-03		RES.,FXD,FILM:65K OHM,0.25%,0.125W	75042	CEAT2-6502C
R159	315-0182-00		RES.,FXD,COMP:1.8K OHM,5%,0.25W	01121	CB1825
R160	311-1555-00		RES.,VAR,NONWIR:100K OHM,20%,0.5W	73138	91A-10002M
R161	321-0285-00		RES.,FXD,FILM:9.09K OHM,1%,0.125W	75042	CEAT0-9091F
R162	315-0475-00		RES.,FXD,COMP:4.7M OHM,5%,0.25W	01121	CB4755
R163	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R164	321-0285-00		RES.,FXD,FILM:9.09K OHM,1%,0.125W	75042	CEAT0-9091F
R165	315-0226-00		RES.,FXD,COMP:22M OHM,5%,0.25W	01121	CB2265
R166	321-0221-00		RES.,FXD,FILM:1.96K OHM,1%,0.125W	75042	CEAT0-1961F
R167	315-0203-00		RES.,FXD,COMP:20K OHM,5%,0.25W	01121	CB2035
R168	321-0373-03		RES.,FXD,FILM:75K OHM,0.25%,0.125W		
R169	321-0277-03		RES.,FXD,FILM:7.5K OHM,0.25%,0.125W		
R170	315-0275-00		RES.,FXD,COMP:2.7M OHM,5%,0.25W	01121	CB2755
R171	321-0280-00		RES.,FXD,FILM:8.06K OHM,1%,0.125W	75042	CEAT0-8061F
R172	321-0280-00		RES.,FXD,FILM:8.06K OHM,1%,0.125W	75042	CEAT0-8061F
R173	315-0101-00		RES.,FXD,COMP:100 OHM,5%,0.25W	01121	CB1015
R176	321-0277-03		RES.,FXD,FILM:7.5K OHM,0.25%,0.125W		
R177	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R178	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R185	311-1563-00		RES.,VAR,NONWIR:1K OHM,20%,0.50W	73138	91A-10000M
R186	321-0214-00		RES.,FXD,FILM:1.65K OHM,1%,0.125W	75042	CEAT0-1651F
R187	321-0193-00		RES.,FXD,FILM:1K OHM,1%,0.125W	75042	CEAT0-1001F
R188	321-0116-00		RES.,FXD,FILM:158 OHM,1%,0.125W	75042	CEAT0-1580F

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
R190	311-1563-00		RES.,VAR, NONWIR:1K OHM, 20%, 0.50W	73138	91A-10000M
R193	321-0745-03		RES.,FXD,FILM:25.05K OHM, 0.25%, 0.125W	75042	CEAT2-25051C
R194	321-0816-03		RES.,FXD,FILM:5K OHM, 0.25%, 0.125W		
R196	321-0816-03		RES.,FXD,FILM:5K OHM, 0.25%, 0.125W		
R197	321-0745-03		RES.,FXD,FILM:25.05K OHM, 0.25%, 0.125W	75042	CEAT2-25051C
R198	315-0222-00		RES.,FXD,COMP:2.2K OHM, 5%, 0.25W	01121	CB2225
R199	315-0223-00		RES.,FXD,COMP:220K OHM, 5%, 0.25W	01121	CB2235
R200	311-0580-00		RES.,VAR, NONWIR:50K OHM, 20%, 0.50W	11237	41695
R211	321-0816-07		RES.,FXD,FILM:5K OHM, 0.1%, 0.125W	75042	CEAT9-5001B
R212	321-0913-03		RES.,FXD,FILM:2.22K OHM, 0.25%, 0.125W		
R213	315-0201-00		RES.,FXD,COMP:200 OHM, 5%, 0.25W	01121	CB2015
R214	315-0103-00		RES.,FXD,COMP:10K OHM, 5%, 0.25W	01121	CB1035
R216	321-0234-00		RES.,FXD,FILM:2.67K OHM, 1%, 0.125W	75042	CEAT0-2671F
R217	321-0913-03		RES.,FXD,FILM:2.22K OHM, 0.25%, 0.125W		
R218	315-0220-00		RES.,FXD,COMP:22 OHM, 5%, 0.25W	01121	CB2205
R219	315-0153-00		RES.,FXD,COMP:15K OHM, 5%, 0.25W	01121	CB1535
R220	311-0580-00		RES.,VAR, NONWIR:50K OHM, 20%, 0.50W	11237	41695
R222	321-0193-03		RES.,FXD,FILM:1K OHM, 0.25%, 0.125W	75042	CEAT2-1001C
R223	315-0430-00		RES.,FXD,COMP:43 OHM, 5%, 0.25W	01121	CB4305
R224	321-1254-03		RES.,FXD,FILM:4.37K OHM, 0.25%, 0.125W	91637	MFF1816D43700C
R226	315-0914-00		RES.,FXD,COMP:910K OHM, 5%, 0.25W	01121	CB9145
R228	321-0222-03		RES.,FXD,FILM:2K OHM, 0.25%, 0.125W	75042	CEAT22KC
R229	321-0126-03		RES.,FXD,FILM:200 OHM, 0.25%, 0.125W	75042	CEAT2-200R0C
R230	311-1565-00		RES.,VAR, NONWIR:250 OHM, 20%, 0.50W	73138	91A250R0M
R231	321-0632-00		RES.,FXD,FILM:9.41K OHM, 0.5%, 0.125W	75042	CEAT2-9411C
R232	315-0102-00		RES.,FXD,COMP:1K OHM, 5%, 0.25W	01121	CB1025
R233	321-0632-00		RES.,FXD,FILM:9.41K OHM, 0.5%, 0.125W	75042	CEAT2-9411C
R234	315-0223-00		RES.,FXD,COMP:220K OHM, 5%, 0.25W	01121	CB2235
R235	311-1550-00		RES.,VAR, NONWIR:2M OHM, 20%, 0.50W		
R236	315-0244-00		RES.,FXD,COMP:240K OHM, 5%, 0.25W	01121	CB2445
R239	315-0223-00		RES.,FXD,COMP:220K OHM, 5%, 0.25W	01121	CB2235
R242	315-0182-00		RES.,FXD,COMP:1.8K OHM, 5%, 0.25W	01121	CB1825
R243	321-0272-00		RES.,FXD,FILM:6.65K OHM, 1%, 0.125W	75042	CEAT0-6651F
R244	321-0181-00		RES.,FXD,FILM:750 OHM, 1%, 0.125W	75042	CEAT0-7500F
R245 ¹	311-1158-00		RES.,VAR, NONWIR:2K OHM, 10%, 5W		
R246	321-0272-00		RES.,FXD,FILM:6.65K OHM, 1%, 0.125W	75042	CEAT0-6651F
R250	321-0229-00		RES.,FXD,FILM:2.37K OHM, 1%, 0.125W	75042	CEAT0-2371F
R251	321-0327-00		RES.,FXD,FILM:24.9K OHM, 1%, 0.125W	75042	CEAT0-2492F
R252	321-0385-00		RES.,FXD,FILM:100K OHM, 1%, 0.125W	75042	CEAT0-1003F
R253	321-0225-00		RES.,FXD,FILM:2.15K OHM, 1%, 0.125W	75042	CEAT0-2151F
R255	311-0095-00		RES.,VAR, NONWIR:500 OHM, 10%		
R256	321-0231-00		RES.,FXD,FILM:2.49K OHM, 1%, 0.125W	75042	CEAT0-2491F
R260	321-0272-00		RES.,FXD,FILM:6.65K OHM, 1%, 0.125W	75042	CEAT0-6651F
R262	315-0223-00		RES.,FXD,COMP:220K OHM, 5%, 0.25W	01121	CB2235
R264	322-0210-00		RES.,FXD,FILM:1.5K OHM, 1%, 0.25W	75042	CEBT0-1501F
R266	321-0097-00		RES.,FXD,FILM:100 OHM, 1%, 0.125W	75042	CEAT0-1000F
R267	321-0097-00		RES.,FXD,FILM:100 OHM, 1%, 0.125W	75042	CEAT0-1000F
R270	321-0097-00		RES.,FXD,FILM:100 OHM, 1%, 0.125W	75042	CEAT0-1000F
R271	322-0202-00		RES.,FXD,FILM:1.24K OHM, 1%, 0.25W	75042	CEBT0-1241F
R275	311-0169-00		RES.,VAR, NONWIR:100 OHM, 20%, 0.50W		
R280	321-0272-00		RES.,FXD,FILM:6.65K OHM, 1%, 0.125W	75042	CEAT0-6651F
R282	315-0223-00		RES.,FXD,COMP:220K OHM, 5%, 0.25W	01121	CB2235
R283	322-0202-00		RES.,FXD,FILM:1.24K OHM, 1%, 0.25W	75042	CEBT0-1241F
R284	321-0097-00		RES.,FXD,FILM:100 OHM, 1%, 0.125W	75042	CEAT0-1000F
R287	321-0097-00		RES.,FXD,FILM:100 OHM, 1%, 0.125W	75042	CEAT0-1000F
R288	321-0097-00		RES.,FXD,FILM:100 OHM, 1%, 0.125W	75042	CEAT0-1000F
R289	322-0210-00		RES.,FXD,FILM:1.5K OHM, 1%, 0.25W	75042	CEBT0-1501F
R301	315-0103-00		RES.,FXD,COMP:10K OHM, 5%, 0.25W	01121	CB1035
R302	315-0103-00		RES.,FXD,COMP:10K OHM, 5%, 0.25W	01121	CB1035
R303	315-0103-00		RES.,FXD,COMP:10K OHM, 5%, 0.25W	01121	CB1035

¹Furnished as a unit with S245A,B.

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
R304	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R310	315-0471-00		RES.,FXD,COMP:470 OHM,5%,0.25W	01121	CB4715
R314	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R315	315-0392-00		RES.,FXD,COMP:3.9K OHM,5%,0.25W	01121	CB3925
R316	321-0354-00		RES.,FXD,FILM:47.5K OHM,1%,0.125W	75042	CEAT0-4752F
R317	315-0302-00		RES.,FXD,COMP:3K OHM,5%,0.25W	01121	CB3025
R318	321-0333-00		RES.,FXD,FILM:28.7K OHM,1%,0.125W	75042	CEAT0-2872F
R320	311-1561-00		RES.,VAR, NONWIR:2.5K OHM,20%,0.50W	73138	91A-25000M
R322	315-0682-00		RES.,FXD,COMP:6.8K OHM,5%,0.25W	01121	CB6825
R323	315-0392-00		RES.,FXD,COMP:3.9K OHM,5%,0.25W	01121	CB3925
R325 ¹	311-1158-00		RES.,VAR, NONWIR:2K OHM,10%,5W		
R326	315-0162-00		RES.,FXD,COMP:1.6K OHM,5%,0.25W	01121	CB1625
R327	315-0133-00		RES.,FXD,COMP:13K OHM,5%,0.25W	01121	CB1335
R330	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R331	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R332	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R333	321-0481-00		RES.,FXD,FILM:1M OHM,1%,0.125W	75042	CEAT0-1004F
R334	321-0452-00		RES.,FXD,FILM:499K OHM,1%,0.125W	75042	CEAT0-4993F
R336	321-0452-00		RES.,FXD,FILM:499K OHM,1%,0.125W	75042	CEAT0-4993F
R338	315-0101-00		RES.,FXD,COMP:100 OHM,5%,0.25W	01121	CB1015
R339	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R342	315-0333-00		RES.,FXD,COMP:33K OHM,5%,0.25W	01121	CB3335
R343	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R344	315-0333-00		RES.,FXD,COMP:33K OHM,5%,0.25W	01121	CB3335
R345	311-1560-00		RES.,VAR, NONWIR:5K OHM,5%,0.50W	73138	91A-5000M
R346	315-0184-00		RES.,FXD,COMP:180K OHM,5%,0.25W	01121	CB1845
R348	315-0361-00		RES.,FXD,COMP:360 OHM,5%,0.25W	01121	CB3615
R349	321-1263-02		RES.,FXD,FILM:5.42K OHM,0.5%,0.125W	75042	CEAT2-5421D
R350	321-0603-00		RES.,FXD,FILM:15K OHM,0.25%,0.125W	75042	CEAT2-1502C
R351	321-0637-00		RES.,FXD,FILM:9.9K OHM,0.5%,0.125W	75042	CEAT2-9901D
R353	315-0752-00		RES.,FXD,COMP:7.5K OHM,5%,0.25W	01121	CB7525
R355	315-0101-00		RES.,FXD,COMP:100 OHM,5%,0.25W	01121	CB1015
R357	321-0643-00		RES.,FXD,FILM:22.1K OHM,0.25%,0.125W	75042	CEAT9-2212C
R358	315-0121-00		RES.,FXD,COMP:120 OHM,5%,0.25W	01121	CB1215
R360	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R361	315-0753-00		RES.,FXD,COMP:75K OHM,5%,0.25W	01121	CB7535
R363	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R364	315-0392-00		RES.,FXD,COMP:3.9K OHM,5%,0.25W	01121	CB3925
R365	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R367	321-0364-00		RES.,FXD,FILM:60.4K OHM,1%,0.125W	75042	CEAT0-6042F
R370	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R372	321-0289-00		RES.,FXD,FILM:10K OHM,1%,0.125W	75042	CEAT0-1002F
R373	321-0314-00		RES.,FXD,FILM:18.2K OHM,1%,0.125W	75042	CEAT0-1822F
R375	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R377	315-0101-00		RES.,FXD,COMP:100 OHM,5%,0.25W	01121	CB1015
R378	321-0289-03		RES.,FXD,FILM:10K OHM,0.25%,0.125W	75042	CEAT2-1002C
R379	321-0289-03		RES.,FXD,FILM:10K OHM,0.25%,0.125W	75042	CEAT2-1002C
R382	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R385	311-0546-00		RES.,VAR, NONWIR:10K OHM,20%,0.75W	97979	TK0546G
R386	315-0243-00		RES.,FXD,COMP:24K OHM,5%,0.25W	01121	CB2435
R387	321-0756-04		RES.,FXD,FILM:50K OHM,0.1%,0.125W	75042	CEAT2-5002B
R388	321-0756-04		RES.,FXD,FILM:50K OHM,0.1%,0.125W	75042	CEAT2-5002B
R390	311-1197-00		RES.,VAR, NONWIR:20K OHM,10%,1W		
R391	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R395	315-0133-00		RES.,FXD,COMP:13K OHM,5%,0.25W	01121	CB1335
R397	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R398	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R399	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R402	315-0302-00		RES.,FXD,COMP:3K OHM,5%,0.25W	01121	CB3025
R405	311-0580-00		RES.,VAR, NONWIR:50K OHM,20%,0.50W	11237	41695

¹Furnished as a unit with S325A,B.

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
R406	321-0290-00		RES.,FXD,FILM:10.2K OHM,1%,0.125W	75042	CEAT0-1022F
R408	321-0309-00		RES.,FXD,FILM:16.2K OHM,1%,0.125W	75042	CEAT0-1622F
R410	321-0193-00		RES.,FXD,FILM:1K OHM,1%,0.125W	75042	CEAT0-1001F
R412	321-0193-00		RES.,FXD,FILM:1K OHM,1%,0.125W	75042	CEAT0-1001F
R413	321-0251-00		RES.,FXD,FILM:4.02K OHM,1%,0.125W	75042	CEAT0-4021F
R414	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R416	321-0289-00		RES.,FXD,FILM:10K OHM,1%,0.125W	75042	CEAT0-1002F
R418	321-0272-00		RES.,FXD,FILM:6.65K OHM,1%,0.125W	75042	CEAT0-6651F
R420	315-0224-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2245
R421	315-0224-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2245
R423	315-0224-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2245
R425	315-0470-00		RES.,FXD,COMP:47 OHM,5%,0.25W	01121	CB4705
R428	321-0250-00		RES.,FXD,FILM:3.92K OHM,1%,0.125W	75042	CEAT0-3921F
R429	315-0180-00		RES.,FXD,COMP:18 OHM,5%,0.25W	01121	CB1805
R432	321-0221-00		RES.,FXD,FILM:1.96K OHM,1%,0.125W	75042	CEAT0-1961F
R435	311-0095-00		RES.,VAR, NONWIR:500 OHM,10%		
R436	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R437	315-0223-00		RES.,FXD,COMP:22K OHM,5%,0.25W	01121	CB2235
R438	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R440	315-0243-00		RES.,FXD,COMP:24K OHM,5%,0.25W	01121	CB2435
R441	315-0303-00		RES.,FXD,COMP:30K OHM,5%,0.25W	01121	CB3035
R445	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R446	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R447	315-0510-00		RES.,FXD,COMP:51 OHM,5%,0.25W	01121	CB5105
R455	315-0510-00		RES.,FXD,COMP:51 OHM,5%,0.25W	01121	CB5105
R456	315-0510-00		RES.,FXD,COMP:51 OHM,5%,0.25W	01121	CB5105
R502	315-0180-00		RES.,FXD,COMP:18 OHM,5%,0.25W	01121	CB1805
R504	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R506	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R507	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R508	302-0103-00		RES.,FXD,COMP:10K OHM,10%,0.50W	01121	EB1031
R510	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R511	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R514	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R516	315-0153-00		RES.,FXD,COMP:15K OHM,5%,0.25W	01121	CB1535
R518	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R521	315-0682-00		RES.,FXD,COMP:6.8K OHM,5%,0.25W	01121	CB6825
R522	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R524	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R531	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R533	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R534	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R535	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R538	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R542	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R546	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R550	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R552	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R553	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R554	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R556	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R557	315-0471-00		RES.,FXD,COMP:470 OHM,5%,0.25W	01121	CB4715
R561	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R562	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R563	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R564	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R565	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R566	315-0682-00		RES.,FXD,COMP:6.8K OHM,5%,0.25W	01121	CB6825
R567	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R571	315-0752-00		RES.,FXD,COMP:7.5K OHM,5%,0.25W	01121	CB7525

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
R573	315-0752-00		RES.,FXD,COMP:7.5K OHM,5%,0.25W	01121	CB7525
R576	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R578	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R582	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R583	315-0182-00		RES.,FXD,COMP:1.8K OHM,5%,0.25W	01121	CB1825
R584	315-0752-00		RES.,FXD,COMP:7.5K OHM,5%,0.25W	01121	CB7525
R586	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R587	315-0153-00		RES.,FXD,COMP:15K OHM,5%,0.25W	01121	CB1535
R588	315-0470-00		RES.,FXD,COMP:47 OHM,5%,0.25W	01121	CB4705
R591	315-0152-00		RES.,FXD,COMP:1.5K OHM,5%,0.25W	01121	CB1525
R592	315-0180-00		RES.,FXD,COMP:18 OHM,5%,0.25W	01121	CB1805
R632	315-0753-00		RES.,FXD,COMP:75K OHM,5%,0.25W	01121	CB7535
R634	321-0327-00		RES.,FXD,FILM:24.9K OHM,1%,0.125W	75042	CEAT0-2492F
R636	315-0513-00		RES.,FXD,COMP:51K OHM,5%,0.25W	01121	CB5135
R637	321-0344-00		RES.,FXD,FILM:37.4K OHM,1%,0.125W	75042	CEAT0-3742F
R638	321-0327-00		RES.,FXD,FILM:24.9K OHM,1%,0.125W	75042	CEAT0-2492F
R640	315-0513-00		RES.,FXD,COMP:51K OHM,5%,0.25W	01121	CB5135
R641	315-0513-00		RES.,FXD,COMP:51K OHM,5%,0.25W	01121	CB5135
R642	315-0513-00		RES.,FXD,COMP:51K OHM,5%,0.25W	01121	CB5135
R644	315-0154-00		RES.,FXD,COMP:150K OHM,5%,0.25W	01121	CB1545
R646	321-0356-00		RES.,FXD,FILM:49.9K OHM,1%,0.125W	75042	CEAT0-4992F
R647	315-0154-00		RES.,FXD,COMP:150K OHM,5%,0.25W	01121	CB1545
R648	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R649	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R650	321-0371-00		RES.,FXD,FILM:71.5K OHM,1%,0.125W	75042	CEAT0-7152F
R652	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R654	315-0123-00		RES.,FXD,COMP:12K OHM,5%,0.25W	01121	CB1235
R656	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R658	321-0325-00		RES.,FXD,FILM:23.7K OHM,1%,0.125W	75042	CEAT0-2372F
R660	321-0319-00		RES.,FXD,FILM:20.5K OHM,1%,0.125W	75042	CEAT0-2052F
R662	321-0371-00		RES.,FXD,FILM:71.5K OHM,1%,0.125W	75042	CEAT0-7152F
R664	315-0512-00		RES.,FXD,COMP:5.1K OHM,5%,0.25W	01121	CB5125
R666	315-0332-00		RES.,FXD,COMP:3.3K OHM,5%,0.25W	01121	CB3325
R667	315-0332-00		RES.,FXD,COMP:3.3K OHM,5%,0.25W	01121	CB3325
R668	321-0342-00		RES.,FXD,FILM:35.7K OHM,1%,0.125W	75042	CEAT0-3572F
R669	321-0333-00		RES.,FXD,FILM:28.7K OHM,1%,0.125W	75042	CEAT0-2872F
R670	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R672	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R674	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R676	315-0152-00		RES.,FXD,COMP:1.5K OHM,5%,0.25W	01121	CB1525
R678	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R680	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R682	315-0123-00		RES.,FXD,COMP:12K OHM,5%,0.25W	01121	CB1235
R686	321-0289-03		RES.,FXD,FILM:10K OHM,0.25%,0.125W	75042	CEAT2-1002C
R688	321-0318-02		RES.,FXD,FILM:20K OHM,0.5%,0.125W	75042	CEAT2-2002D
R701	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R706	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R708	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R710	321-0344-00		RES.,FXD,FILM:37.4K OHM,1%,0.125W	75042	CEAT0-3742F
R712,A-N	307-0387-00		RES.,FXD,FILM:13 RESISTOR NETWORK		
R714	321-0289-00		RES.,FXD,FILM:10K OHM,1%,0.125W	75042	CEAT0-1002F
R726	315-0153-00		RES.,FXD,COMP:15K OHM,5%,0.25W	01121	CB1535
R730	321-0356-00		RES.,FXD,FILM:49.9K OHM,1%,0.125W	75042	CEAT0-4992F
R732	315-0153-00		RES.,FXD,COMP:15K OHM,5%,0.25W	01121	CB1535
R736	321-0344-00		RES.,FXD,FILM:37.4K OHM,1%,0.125W	75042	CEAT0-3742F
R738	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R744	315-0682-00		RES.,FXD,COMP:6.8K OHM,5%,0.25W	01121	CB6825
R746	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R748	321-0333-00		RES.,FXD,FILM:28.7K OHM,1%,0.125W	75042	CEAT0-2872F
R752	315-0153-00		RES.,FXD,COMP:15K OHM,5%,0.25W	01121	CB1535

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
R754	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R756	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R760	321-0344-00		RES.,FXD,FILM:37.4K OHM,1%,0.125W	75042	CEATO-3742F
R762	321-0356-00		RES.,FXD,FILM:49.9K OHM,1%,0.125W	75042	CEATO-4992F
R764	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R765	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R766	315-0154-00		RES.,FXD,COMP:150K OHM,5%,0.25W	01121	CB1545
R768	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R770	315-0753-00		RES.,FXD,COMP:75K OHM,5%,0.25W	01121	CB7535
R771	315-0822-00		RES.,FXD,COMP:8.2K OHM,5%,0.25W	01121	CB8225
R772	315-0822-00		RES.,FXD,COMP:8.2K OHM,5%,0.25W	01121	CB8225
R773	315-0822-00		RES.,FXD,COMP:8.2K OHM,5%,0.25W	01121	CB8225
R774	321-0222-00		RES.,FXD,FILM:2K OHM,1%,0.125W	75042	CEATO-2001F
R776	321-0373-00		RES.,FXD,FILM:75K OHM,1%,0.125W	75042	CEATO-7502F
R778	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R780	321-0371-00		RES.,FXD,FILM:71.5K OHM,1%,0.125W	75042	CEATO-7152F
R782	315-0154-00		RES.,FXD,COMP:150K OHM,5%,0.25W	01121	CB1545
R784	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R785	315-0153-00		RES.,FXD,COMP:15K OHM,5%,0.25W	01121	CB1535
R786	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R787	315-0153-00		RES.,FXD,COMP:15K OHM,5%,0.25W	01121	CB1535
R788	315-0822-00		RES.,FXD,COMP:8.2K OHM,5%,0.25W	01121	CB8225
R789	315-0822-00		RES.,FXD,COMP:8.2K OHM,5%,0.25W	01121	CB8225
R790	321-0315-00		RES.,FXD,FILM:18.7K OHM,1%,0.125W	75042	CEATO-1872F
R792	321-0289-00		RES.,FXD,FILM:10K OHM,1%,0.125W	75042	CEATO-1002F
R794	321-0260-00		RES.,FXD,FILM:4.99K OHM,1%,0.125W	75042	CEATO-4991F
R795	321-0318-00		RES.,FXD,FILM:20K OHM,1%,0.125W	75042	CEATO-2002F
R796	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R798	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R801	321-0327-00		RES.,FXD,FILM:24.9K OHM,1%,0.125W	75042	CEATO-2492F
R804	315-0154-00		RES.,FXD,COMP:150K OHM,5%,0.25W	01121	CB1545
R805	321-0356-00		RES.,FXD,FILM:49.9K OHM,1%,0.125W	75042	CEATO-4992F
R806	321-0344-00		RES.,FXD,FILM:37.4K OHM,1%,0.125W	75042	CEATO-3742F
R807	315-0753-00		RES.,FXD,COMP:75K OHM,5%,0.25W	01121	CB7535
R809	315-0753-00		RES.,FXD,COMP:75K OHM,5%,0.25W	01121	CB7535
R810	315-0154-00		RES.,FXD,COMP:150K OHM,5%,0.25W	01121	CB1545
R812	315-0154-00		RES.,FXD,COMP:150K OHM,5%,0.25W	01121	CB1545
R813	315-0753-00		RES.,FXD,COMP:75K OHM,5%,0.25W	01121	CB7535
R816	321-0356-00		RES.,FXD,FILM:49.9K OHM,1%,0.125W	75042	CEATO-4992F
R817	321-0356-00		RES.,FXD,FILM:49.9K OHM,1%,0.125W	75042	CEATO-4992F
R818	321-0327-00		RES.,FXD,FILM:24.9K OHM,1%,0.125W	75042	CEATO-2492F
R820	315-0154-00		RES.,FXD,COMP:150K OHM,5%,0.25W	01121	CB1545
R821	321-0356-00		RES.,FXD,FILM:49.9K OHM,1%,0.125W	75042	CEATO-4992F
R822	315-0154-00		RES.,FXD,COMP:150K OHM,5%,0.25W	01121	CB1545
R823	315-0154-00		RES.,FXD,COMP:150K OHM,5%,0.25W	01121	CB1545
R825	315-0154-00		RES.,FXD,COMP:150K OHM,5%,0.25W	01121	CB1545
R826	321-0344-00		RES.,FXD,FILM:37.4K OHM,1%,0.125W	75042	CEATO-3742F
R827	315-0154-00		RES.,FXD,COMP:150K OHM,5%,0.25W	01121	CB1545
R830	321-0356-00		RES.,FXD,FILM:49.9K OHM,1%,0.125W	75042	CEATO-4992F
R831	315-0753-00		RES.,FXD,COMP:75K OHM,5%,0.25W	01121	CB7535
R832	321-0335-00		RES.,FXD,FILM:30.1K OHM,1%,0.125W	75042	CEATO-3012F
R833	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R835	315-0332-00		RES.,FXD,COMP:3.3K OHM,5%,0.25W	01121	CB3325
R836	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R837	321-0354-00		RES.,FXD,FILM:47.5K OHM,1%,0.125W	75042	CEATO-4752F
R840	315-0393-00		RES.,FXD,COMP:39K OHM,5%,0.25W	01121	CB3935
R841	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R842	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R843	315-0154-00		RES.,FXD,COMP:150K OHM,5%,0.25W	01121	CB1545
R901	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225

Electrical Parts List—J20/7J20

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
R902	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R903	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R905	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R906	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R907	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R908	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R909	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R910	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R912	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R914	315-0680-00		RES.,FXD,COMP:68 OHM,5%,0.25W	01121	CB6805
R915	315-0272-00		RES.,FXD,COMP:2.7K OHM,5%,0.25W	01121	CB2725
R917	302-0221-00		RES.,FXD,COMP:220 OHM,10%,0.50W	01121	EB2211
R920	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R921	315-0224-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2245
R922	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R924	321-0303-00		RES.,FXD,FILM:14K OHM,1%,0.125W	75042	CEAT0-1402F
R925	311-1561-00		RES.,VAR,NONWIR:2.5K OHM,20%,0.50W	73138	91A-25000M
R931	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R933	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R934	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R935	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R937	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R938	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R940	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R941	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R942	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R944	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R945	315-0153-00		RES.,FXD,COMP:15K OHM,5%,0.25W	01121	CB1535
R946	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R948	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R949	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R950	315-0101-00		RES.,FXD,COMP:100 OHM,5%,0.25W	01121	CB1015
R951	321-0281-06		RES.,FXD,FILM:8.25K OHM,0.25%,0.125W	75042	CEAT0-8251C
R952	321-0281-06		RES.,FXD,FILM:8.25K OHM,0.25%,0.125W	75042	CEAT0-8251C
R953	321-0281-06		RES.,FXD,FILM:8.25K OHM,0.25%,0.125W	75042	CEAT0-8251C
R954	321-0281-06		RES.,FXD,FILM:8.25K OHM,0.25%,0.125W	75042	CEAT0-8251C
R955	321-0644-00		RES.,FXD,FILM:100K OHM,0.25%,0.125W	75042	CEAT9-1003C
R956	321-0644-00		RES.,FXD,FILM:100K OHM,0.25%,0.125W	75042	CEAT9-1003C
R957	315-0683-00		RES.,FXD,COMP:68K OHM,5%,0.25W	01121	CB6835
R959	321-0720-03		RES.,FXD,FILM:60K OHM,0.25%,0.125W	91637	MFF1816D6002C
R960	311-1560-00		RES.,VAR,NONWIR:5K OHM,5%,0.50W	73138	91A-5000M
R962	311-1559-00		RES.,VAR,NONWIR:10K OHM,20%,0.50W	73138	91A-10001M
R963	321-0289-07		RES.,FXD,FILM:10K OHM,0.1%,0.125W	75042	CEAT9-1002B
R964	321-0289-07		RES.,FXD,FILM:10K OHM,0.1%,0.125W	75042	CEAT9-1002B
R965	321-0720-03		RES.,FXD,FILM:60K OHM,0.25%,0.125W	91637	MFF1816D6002C
R966	321-0604-00		RES.,FXD,FILM:30K OHM,0.25%,0.125W	75042	CEAT2-3002C
R967	321-1296-07		RES.,FXD,FILM:12K OHM,0.1%,0.125W	75042	CEAT9-1202B
R968	321-0184-00		RES.,FXD,FILM:806 OHM,1%,0.125W	75042	CEAT0-8060F
R971	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R973	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R975	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R976	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R977	321-0318-00		RES.,FXD,FILM:20K OHM,1%,0.125W	75042	CEAT0-2002F
R1002	307-0104-00		RES.,FXD,COMP:3.3 OHM,5%,0.25W	01121	CB33G5
R1003	315-0470-00		RES.,FXD,COMP:47 OHM,5%,0.25W	01121	CB4705
R1004	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R1006	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R1008	315-0224-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2245
R1009	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R1016	315-0101-00		RES.,FXD,COMP:100 OHM,5%,0.25W	01121	CB1015

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
R1017	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R1022	315-0473-00		RES.,FXD,COMP:47K OHM,5%,0.25W	01121	CB4735
R1023	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R1032	323-0481-03		RES.,FXD,FILM:1M OHM,0.25%,0.50W	75042	CECT2-1004C
R1033	321-0643-00		RES.,FXD,FILM:22.1K OHM,0.25%,0.125W	75042	CEAT9-2212C
R1034	315-0470-00		RES.,FXD,COMP:47 OHM,5%,0.25W	01121	CB4705
R1036	308-0421-00		RES.,FXD,WW:3K OHM,5%,3W		
R1038	321-0370-00		RES.,FXD,FILM:69.8K OHM,1%,0.125W	75042	CEAT0-6982F
R1039	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R1040	322-0481-00		RES.,FXD,FILM:1M OHM,1%,0.25W	75042	CEBT0-1004F
R1041	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R1047	315-0105-00		RES.,FXD,COMP:1M OHM,5%,0.25W	01121	CB1055
R1100	315-0122-00		RES.,FXD,COMP:1.2K OHM,5%,0.25W	01121	CB1225
R1101	315-0182-00		RES.,FXD,COMP:1.8K OHM,5%,0.25W	01121	CB1825
R1106	315-0471-00		RES.,FXD,COMP:470 OHM,5%,0.25W	01121	CB4715
R1108	321-0222-09		RES.,FXD,FILM:2K OHM,1%,0.125W		
R1110	311-1563-00		RES.,VAR,NONWIR:1K OHM,20%,0.50W	73138	91A-10000M
R1112	321-0278-09		RES.,FXD,FILM:7.68K OHM,1%,0.125W		
R1121	315-0470-00		RES.,FXD,COMP:47 OHM,5%,0.25W	01121	CB4705
R1122	315-0470-00		RES.,FXD,COMP:47 OHM,5%,0.25W	01121	CB4705
R1202	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R1236	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R1237	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R1240	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R1241	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R1244	321-0288-00		RES.,FXD,FILM:9.76K OHM,1%,0.125W	75042	CEAT0-9761F
R1245	321-0262-00		RES.,FXD,FILM:5.23K OHM,1%,0.125W	75042	CEAT0-5231F
R1246	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
RT187	307-0127-00		RES.,THERMAL:1K OHM,1%	50157	2D1596
S92	260-1237-00		SWITCH,REED:SPST		
S95	260-1548-00		SWITCH,PUSH:BASELINE RESTORE		
S120 ¹					
S130 ²	260-0931-00		SWITCH,LEVER:SPECTRAL NORMALIZER		
S190 ²	263-1034-00		ACTR ASSY,CAM S:VERTICAL GAIN	80009	263-1034-00
S245A,B ³					
S325A,B ⁴					
S350	263-1035-00		ACTR ASSY,CAM S:TIME/SCAN	80009	263-1035-00
S420	260-1549-00		SWITCH,ROTARY:DISPLAY DISPERSION		
S520	260-1550-00		SWITCH,LEVER:DISPLAY TRIGGER MODE		
S901	260-0723-00		SWITCH,SLIDE:DPDT,0.5A,125VAC	80009	260-0723-00
S964	260-0984-00		SWITCH,SLIDE:DP3POSN,0.5A,125VAC-DC	79727	G128S-PC/MOD7140
T1020	120-0896-00		XFMR POWER:		
U32	156-0158-00		MICROCIRCUIT LI:DUAL OPERATIONAL AMPLIFIER	18324	S5558V
U48	156-0067-00		MICROCIRCUIT LI:OPERATIONAL AMPLIFIER	07263	UA741
U98	156-0105-00		MICROCIRCUIT LI:OPERATIONAL AMPLIFIER	07263	U9T7101393
U102	156-0461-02		INTEGRATED CKT:4 QUAD ANALOG MULT		
U120	156-0158-00		MICROCIRCUIT LI:DUAL OPERATIONAL AMPLIFIER	18324	S5558V
U150	156-0158-00		MICROCIRCUIT LI:DUAL OPERATIONAL AMPLIFIER	18324	S5558V
U164	156-0158-00		MICROCIRCUIT LI:DUAL OPERATIONAL AMPLIFIER	18324	S5558V
U178	156-0105-00		MICROCIRCUIT LI:OPERATIONAL AMPLIFIER	07263	U9T7101393
U190	156-0060-00		INTEGRATED CKT:VOLTAGE FOLLOWER	12040	LM302H
U192	156-0105-00		MICROCIRCUIT LI:OPERATIONAL AMPLIFIER	07263	U9T7101393
U196	156-0158-00		MICROCIRCUIT LI:DUAL OPERATIONAL AMPLIFIER	18324	S5558V
U212	156-0259-00		MICROCIRCUIT LI:5 TRANSISTOR ARRAY	86684	CA3083
U346	156-0158-00		MICROCIRCUIT LI:DUAL OPERATIONAL AMPLIFIER	18324	S5558V
U360	156-0067-02		MICROCIRCUIT LI:OPNL AMPLIFIER,SELECTED	80009	156-0067-02
U368	156-0402-00		INTEGRATED CKT:TIMER,8 PIN DIP		

¹Furnished as a unit with K120.²See Mechanical Parts List for replacement parts.³Furnished as a unit with R245.⁴Furnished as a unit with R325.

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
U388	156-0158-00		MICROCIRCUIT LI:DUAL OPERATIONAL AMPLIFIER	18324	S5558V
U392	156-0096-00		MICROCIRCUIT LI:VOLTAGE COMPARATOR	27014	LM311H
U410	156-0067-00		MICROCIRCUIT LI:OPERATIONAL AMPLIFIER	07263	UA741
U416	156-0158-00		MICROCIRCUIT LI:DUAL OPERATIONAL AMPLIFIER	18324	S5558V
U440	156-0402-00		INTEGRATED CKT:TIMER,8 PIN DIP		
U448	156-0030-00		MICROCIRCUIT DI:QUAD 2-INPUT POS NAND GATE	01295	SN7400N
U450	156-0178-00		MICROCIRCUIT DI:TRIPLE 3-INPUT NOR GATE	01295	SN7427N
U540	156-0043-00		MICROCIRCUIT DI:2-INPUT NOR GATE	01295	SN7402N
U560	156-0041-00		MICROCIRCUIT DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N
U710	155-0104-00		INTEGRATED CKT:MONOLITHIC,LEGEND GEN	80009	155-0104-00
U712	155-0014-01		MICROCIRCUIT DI:ML,ANALOG TO DECIMAL CONV	80009	155-0014-01
U734	156-0047-00		MICROCIRCUIT DI:3-INPUT NAND GATE	01295	SN7410N
U736	155-0105-00		INTEGRATED CKT:MONOLITHIC,LEGEND GEN	80009	155-0105-00
U774	155-0014-01		MICROCIRCUIT DI:ML,ANALOG TO DECIMAL CONV	80009	155-0014-01
U920	155-0090-00		MICROCIRCUIT DI:MONOLITHIC,4 DECADE COUNTER	80009	155-0090-00
U942	156-0030-00		MICROCIRCUIT DI:QUAD 2-INPUT POS NAND GATE	01295	SN7400N
U950	156-0158-00		MICROCIRCUIT LI:DUAL OPERATIONAL AMPLIFIER	18324	S5558V
U962	156-0067-02		MICROCIRCUIT LI:OPNL AMPLIFIER,SELECTED	80009	156-0067-02
U1008	156-0402-00		INTEGRATED CKT:TIMER,8 PIN DIP		
U1022	156-0067-02		MICROCIRCUIT LI:OPNL AMPLIFIER,SELECTED	80009	156-0067-02
U1102	156-0067-02		MICROCIRCUIT LI:OPNL AMPLIFIER,SELECTED	80009	156-0067-02
VR57	152-0304-00		SEMICON D DEVICE:ZENER,0.4W,20V,5%	04713	1N968B
VR913	152-0175-00		SEMICON D DEVICE:ZENER,0.4W,5.6V,5%	04713	1N752A
VR1016	152-0280-00		SEMICON D DEVICE:ZENER,0.4W,6.2V,5%	04713	1N753A
VR1044	152-0295-00		SEMICON D DEVICE:ZENER,1W,82V,5%	04713	1N3042B
VR1046	152-0295-00		SEMICON D DEVICE:ZENER,1W,82V,5%	04713	1N3042B
VR1047	152-0295-00		SEMICON D DEVICE:ZENER,1W,82V,5%	04713	1N3042B
VR1100	152-0317-00		SEMICON D DEVICE:ZENER,0.25W,6.2V,5%	81483	1N3497
J20					
A5	670-2275-00		CKT BOARD ASSY:--INTERFACE	80009	670-2275-00
A6	670-3012-00		CKT BOARD ASSY:--HORIZONTAL AMPL	80009	670-3012-00
A7	670-3014-00		CKT BOARD ASSY:--VIDICON SOCKET	80009	670-3014-00
A8	670-3011-00		CKT BOARD ASSY:--VERTICAL OSCILLATOR	80009	670-3011-00
A9	670-2274-00		CKT BOARD ASSY:--PREAMPLIFIER	80009	670-2274-00
A10	670-3013-00		CKT BOARD ASSY:--VIDICON REGULATOR	80009	670-3013-00
A11	670-2271-00		CKT BOARD ASSY:--NORMALIZER DRIVER	80009	670-2271-00
A12	670-2270-00		CKT BOARD ASSY:--40NM NORMALIZER PROGRAMMER	80009	670-2270-00
A13	670-2270-00		CKT BOARD ASSY:--400NM NORMALIZER PROGRAMMER	80009	670-2270-00
C1325	290-0526-00		CAP.,FXD,ELCTLT:6.8UF,20%,6V	90201	TDC685M006EL
C1328	283-0180-00		CAP.,FXD,CER DI:5600PF,20%,200V	72982	8121N204E562M
C1331	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C1337	283-0180-00		CAP.,FXD,CER DI:5600PF,20%,200V	72982	8121N204E562M
C1340	281-0610-00		CAP.,FXD,CER DI:2.2PF,+/-0.1PF,500V	72982	374-001C0J0229B
C1342	281-0564-00		CAP.,FXD,CER DI:24PF,5%,500V	72982	301-000C0G0240J
C1344	281-0564-00		CAP.,FXD,CER DI:24PF,5%,500V	72982	301-000C0G0240J
C1346	281-0610-00		CAP.,FXD,CER DI:2.2PF,+/-0.1PF,500V	72982	374-001C0J0229B
C1351	283-0000-00		CAP.,FXD,CER DI:0.001UF,+100-0%,500V	56289	40C626
C1355	283-0187-00		CAP.,FXD,CER DI:0.047UF,10%,400V	72982	8131-400X5R473K
C1357	283-0187-00		CAP.,FXD,CER DI:0.047UF,10%,400V	72982	8131-400X5R473K
C1373	283-0008-00		CAP.,FXD,CER DI:1UF,500V	72982	8151N501E104M
C1378	283-0187-00		CAP.,FXD,CER DI:0.047UF,10%,400V	72982	8131-400X5R473K
C1383	283-0177-00		CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039E105Z
C1384	283-0060-00		CAP.,FXD,CER DI:100PF,5%,200V	72982	855-535U2J101J
C1385	281-0656-00		CAP.,FXD,CER DI:22PF,5%,500V	72982	374-000C0G0220J
C1388	283-0115-00		CAP.,FXD,CER DI:47PF,5%,200V		

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
C1390	283-0000-00		CAP.,FXD,CER DI:0.001UF,+100-0%,500V	56289	40C626
C1396	283-0268-00		CAP.,FXD,CER DI:0.015UF,10%,50V		
C1401	290-0135-00		CAP.,FXD,ELCTLT:15UF,20%,20V	56289	150D156X0020B2
C1403	283-0008-00		CAP.,FXD,CER DI:1UF,500V	72982	8151N501E104M
C1404	283-0008-00		CAP.,FXD,CER DI:1UF,500V	72982	8151N501E104M
C1406	283-0008-00		CAP.,FXD,CER DI:1UF,500V	72982	8151N501E104M
C1407	290-0397-00		CAP.,FXD,ELCTLT:1UF,+50-10%,450V		
C1408	283-0008-00		CAP.,FXD,CER DI:1UF,500V	72982	8151N501E104M
C1416	290-0534-00		CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C1430	290-0534-00		CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C1432	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C1447	281-0721-00		CAP.,FXD,CER DI:72PF,5%,500V	72982	301-000P3K720J
C1461	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131-050651104M
C1466	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131-050651104M
C1468	283-0177-00		CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039E105Z
C1471	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131-050651104M
C1476	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131-050651104M
C1478	283-0177-00		CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039E105Z
C1486	283-0203-00		CAP.,FXD,CER DI:0.47UF,20%,50V0V	72982	8131-0506511474M
C1488	281-0504-00		CAP.,FXD,CER DI:10PF,+/-1PF,500V	72982	301-000C0G0100F
C1495	283-0010-00		CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C1498	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C1587	283-0178-00		CAP.,FXD,CER DI:0.1UF,+80-20%,100V	72982	8131-100651104Z
C1627	283-0178-00		CAP.,FXD,CER DI:0.1UF,+80-20%,100V	72982	8131-100651104Z
C1650	290-0527-00		CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1651	290-0527-00		CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1653	290-0572-00		CAP.,FXD,ELCTLT:0.1UF,20%,50V	56289	196D104X0050HA1
C1654	290-0572-00		CAP.,FXD,ELCTLT:0.1UF,20%,50V	56289	196D104X0050HA1
C1656	290-0572-00		CAP.,FXD,ELCTLT:0.1UF,20%,50V	56289	196D104X0050HA1
C1657	290-0572-00		CAP.,FXD,ELCTLT:0.1UF,20%,50V	56289	196D104X0050HA1
C1659	290-0527-00		CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1661	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C1662	290-0523-00		CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0025HA1
C1664	290-0527-00		CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1666	290-0527-00		CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1667	290-0530-00		CAP.,FXD,ELCTLT:68UF,20%,6V	90201	TDC686M006FL
C1668	290-0527-00		CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1670	290-0527-00		CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1671	290-0527-00		CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C1673	290-0266-00		CAP.,FXD,ELCTLT:290UF,15V		
C1674	290-0266-00		CAP.,FXD,ELCTLT:290UF,15V		
CR1306	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	07910	CD8220
CR1374	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	07910	CD8220
CR1384	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	07910	CD8220
CR1390	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	07910	CD8220
CR1461	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	07910	CD8220
CR1466	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	07910	CD8220
CR1471	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	07910	CD8220
CR1476	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	07910	CD8220
CR1484	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	07910	CD8220
CR1532	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	07910	CD8220
CR1534	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	07910	CD8220
CR1538	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	07910	CD8220
CR1544	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	07910	CD8220
CR1672	152-0066-01		SEMICONV DEVICE:SILICON,400V,750MA	14099	SC4
CR1673	152-0066-01		SEMICONV DEVICE:SILICON,400V,750MA	14099	SC4
L1629	108-0775-00		COIL,FIXED:FOCUS		
L1630	108-0776-00		COIL,FIXED:ALIGNMENT		
L1661	108-0245-00		COIL,RF:3.9UH	80009	108-0245-00

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L1662	108-0245-00		COIL,RF:3.9UH	80009	108-0245-00
M1401	149-0030-00		METER,T TOTAL:CIRCUIT BOARD MOUNT,DC	18583	120-LC
P1405	131-1468-00		CONTACT,ELEC:VIDICON		
P1410	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
P1450	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
Q1302	151-0192-00		TRANSISTOR:SILICON,NPN,SEL FROM MPS6521	80009	151-0192-00
Q1312	151-0192-00		TRANSISTOR:SILICON,NPN,SEL FROM MPS6521	80009	151-0192-00
Q1334	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q1342	151-0347-00		TRANSISTOR:SILICON,NPN	04713	2N5551
Q1344	151-0347-00		TRANSISTOR:SILICON,NPN	04713	2N5551
Q1350	151-0347-00		TRANSISTOR:SILICON,NPN	04713	2N5551
Q1352	151-0347-00		TRANSISTOR:SILICON,NPN	04713	2N5551
Q1358	151-0347-00		TRANSISTOR:SILICON,NPN	04713	2N5551
Q1360	151-0347-00		TRANSISTOR:SILICON,NPN	04713	2N5551
Q1374	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q1378	151-0347-00		TRANSISTOR:SILICON,NPN	04713	2N5551
Q1382	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q1386	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q1388	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q1420A,B	151-1071-00		TRANSISTOR:SILICON,JFE,N CHANNEL,DUAL	04713	2N3904
Q1424	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q1426	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q1436	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q1438	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q1440	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q1446	151-0341-00		TRANSISTOR:SILICON,NPN	07263	2N3565
Q1448	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q1462	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q1466	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q1472	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q1476	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q1482	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q1484	151-1059-00		TRANSISTOR:SILICON,JFE,N CHANNEL		
Q1488	151-1059-00		TRANSISTOR:SILICON,JFE,N CHANNEL		
Q1490	151-0350-00		TRANSISTOR:SILICON,PNP	04713	SPS6700
Q1498	151-0254-00		TRANSISTOR:SILICON,NPN	03508	2N5308
Q1532	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q1534	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q1538	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q1544	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
R716	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R718	315-0511-00		RES.,FXD,COMP:510 OHM,5%,0.25W	01121	CB5115
R720	315-0511-00		RES.,FXD,COMP:510 OHM,5%,0.25W	01121	CB5115
R722	315-0511-00		RES.,FXD,COMP:510 OHM,5%,0.25W	01121	CB5115
R724	315-0511-00		RES.,FXD,COMP:510 OHM,5%,0.25W	01121	CB5115
R740	321-0297-00		RES.,FXD,FILM:12.1K OHM,1%,0.125W	75042	CEAT0-1212F
R742	321-0289-00		RES.,FXD,FILM:10K OHM,1%,0.125W	75042	CEAT0-1002F
R758	321-0289-00		RES.,FXD,FILM:10K OHM,1%,0.125W	75042	CEAT0-1002F
R1302	321-0603-07		RES.,FXD,FILM:15K OHM,0.1%,0.125W		
R1306	315-0272-00		RES.,FXD,COMP:2.7K OHM,5%,0.25W	01121	CB2725
R1308	321-0193-00		RES.,FXD,FILM:1K OHM,1%,0.125W	75042	CEAT0-1001F
R1310	311-1239-00		RES.,VAR,NONWIR:25K OHM,10%,0.50W	73138	72Y-26-0-252K
R1312	321-0603-07		RES.,FXD,FILM:15K OHM,0.1%,0.125W		
R1315	311-1198-00		RES.,VAR,NONWIR:20K OHM,20%,0.50W		
R1317	321-0346-00		RES.,FXD,FILM:39.2K OHM,1%,0.125W	75042	CEAT0-3922F
R1319	321-0648-04		RES.,FXD,FILM:500K OHM,0.1%,0.125W		
R1321	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R1322	315-0392-00		RES.,FXD,COMP:3.9K OHM,5%,0.25W	01121	CB3925

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R1324	321-0356-00		RES.,FXD,FILM:49.9K OHM,1%,0.125W	75042	CEAT0-4992F
R1325	311-1198-00		RES.,VAR,NONWIR:20K OHM,20%,0.50W		
R1327	321-0356-00		RES.,FXD,FILM:49.9K OHM,1%,0.125W	75042	CEAT0-4992F
R1328	315-0391-00		RES.,FXD,COMP:390 OHM,5%,0.25W	01121	CB3915
R1329	315-0752-00		RES.,FXD,COMP:7.5K OHM,5%,0.25W	01121	CB7525
R1331	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R1333	315-0123-00		RES.,FXD,COMP:12K OHM,5%,0.25W	01121	CB1235
R1335	315-0183-00		RES.,FXD,COMP:18K OHM,5%,0.25W	01121	CB1835
R1337	315-0391-00		RES.,FXD,COMP:390 OHM,5%,0.25W	01121	CB3915
R1338	315-0752-00		RES.,FXD,COMP:7.5K OHM,5%,0.25W	01121	CB7525
R1340	321-0648-04		RES.,FXD,FILM:500K OHM,0.1%,0.125W		
R1342	315-0152-00		RES.,FXD,COMP:1.5K OHM,5%,0.25W	01121	CB1525
R1344	315-0152-00		RES.,FXD,COMP:1.5K OHM,5%,0.25W	01121	CB1525
R1346	321-0648-04		RES.,FXD,FILM:500K OHM,0.1%,0.125W		
R1350	315-0334-00		RES.,FXD,COMP:330K OHM,5%,0.25W	01121	CB3345
R1351	315-0153-00		RES.,FXD,COMP:15K OHM,5%,0.25W	01121	CB1535
R1352	315-0334-00		RES.,FXD,COMP:330K OHM,5%,0.25W	01121	CB3345
R1355	315-0364-00		RES.,FXD,COMP:360K OHM,5%,0.25W	01121	CB3645
R1357	315-0364-00		RES.,FXD,COMP:360K OHM,5%,0.25W	01121	CB3645
R1359	315-0334-00		RES.,FXD,COMP:330K OHM,5%,0.25W	01121	CB3345
R1370	321-0481-01		RES.,FXD,FILM:1M OHM,0.5%,0.125W	75042	CEAT0-1004D
R1371	321-0481-01		RES.,FXD,FILM:1M OHM,0.5%,0.125W	75042	CEAT0-1004D
R1373	322-0524-01		RES.,FXD,FILM:2.8M OHM,0.5%,0.25W		
R1376	315-0185-00		RES.,FXD,COMP:1.8M OHM,5%,0.25W	01121	CB1855
R1377	315-0333-00		RES.,FXD,COMP:33K OHM,5%,0.25W	01121	CB3335
R1378	321-0481-01		RES.,FXD,FILM:1M OHM,0.5%,0.125W	75042	CEAT0-1004D
R1379	321-0364-00		RES.,FXD,FILM:60.4K OHM,1%,0.125W	75042	CEAT0-6042F
R1381	315-0203-00		RES.,FXD,COMP:20K OHM,5%,0.25W	01121	CB2035
R1382	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R1383	315-0101-00		RES.,FXD,COMP:100 OHM,5%,0.25W	01121	CB1015
R1385	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R1387	315-0331-00		RES.,FXD,COMP:330 OHM,5%,0.25W	01121	CB3315
R1388	315-0272-00		RES.,FXD,COMP:2.7K OHM,5%,0.25W	01121	CB2725
R1389	315-0752-00		RES.,FXD,COMP:7.5K OHM,5%,0.25W	01121	CB7525
R1390	311-1198-00		RES.,VAR,NONWIR:20K OHM,20%,0.50W		
R1392	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R1393	321-0356-00		RES.,FXD,FILM:49.9K OHM,1%,0.125W	75042	CEAT0-4992F
R1394	321-0376-00		RES.,FXD,FILM:80.6K OHM,1%,0.125W	75042	CEAT0-8062F
R1396	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R1401	315-0475-00		RES.,FXD,COMP:4.7M OHM,5%,0.25W	01121	CB4755
R1404	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R1408	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R1415	315-0105-00		RES.,FXD,COMP:1M OHM,5%,0.25W	01121	CB1055
R1420	321-0135-00		RES.,FXD,FILM:249 OHM,1%,0.125W	75042	CEAT0-2490F
R1421	323-0204-00		RES.,FXD,FILM:1.3K OHM,1%,0.50W	75042	CECT0-1301F
R1422	321-0135-00		RES.,FXD,FILM:249 OHM,1%,0.125W	75042	CEAT0-2490F
R1424	315-0512-00		RES.,FXD,COMP:5.1K OHM,5%,0.25W	01121	CB5125
R1426	315-0512-00		RES.,FXD,COMP:5.1K OHM,5%,0.25W	01121	CB5125
R1430	321-0248-00		RES.,FXD,FILM:3.74K OHM,1%,0.125W	75042	CEAT0-3741F
R1431	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R1432	315-0562-00		RES.,FXD,COMP:5.6K OHM,5%,0.25W	01121	CB5625
R1437	315-0331-00		RES.,FXD,COMP:330 OHM,5%,0.25W	01121	CB3315
R1438	315-0331-00		RES.,FXD,COMP:330 OHM,5%,0.25W	01121	CB3315
R1439	315-0362-00		RES.,FXD,COMP:3.6K OHM,5%,0.25W	01121	CB3625
R1440	315-0202-00		RES.,FXD,COMP:2K OHM,5%,0.25W	01121	CB2025
R1443	323-0512-01		RES.,FXD,FILM:2.1M OHM,0.5%,0.50W		
R1444	315-0163-00		RES.,FXD,COMP:16K OHM,5%,0.25W	01121	CB1635
R1446	315-0752-00		RES.,FXD,COMP:7.5K OHM,5%,0.25W	01121	CB7525
R1447	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R1448	315-0152-00		RES.,FXD,COMP:1.5K OHM,5%,0.25W	01121	CB1525

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R1461	315-0432-00		RES.,FXD,COMP:4.3K OHM,5%,0.25W	01121	CB4325
R1462	321-0129-00		RES.,FXD,FILM:215 OHM,1%,0.125W	75042	CEAT0-2150F
R1463	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R1465	311-1241-00		RES.,VAR,NONWIR:100K OHM,10%,0.50W		
R1466	315-0432-00		RES.,FXD,COMP:4.3K OHM,5%,0.25W	01121	CB4325
R1467	321-0129-00		RES.,FXD,FILM:215 OHM,1%,0.125W	75042	CEAT0-2150F
R1468	315-0151-00		RES.,FXD,COMP:150 OHM,5%,0.25W	01121	CB1515
R1471	315-0432-00		RES.,FXD,COMP:4.3K OHM,5%,0.25W	01121	CB4325
R1472	321-0129-00		RES.,FXD,FILM:215 OHM,1%,0.125W	75042	CEAT0-2150F
R1473	315-0223-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2235
R1475	311-1241-00		RES.,VAR,NONWIR:100K OHM,10%,0.50W		
R1476	315-0432-00		RES.,FXD,COMP:4.3K OHM,5%,0.25W	01121	CB4325
R1477	321-0129-00		RES.,FXD,FILM:215 OHM,1%,0.125W	75042	CEAT0-2150F
R1478	315-0151-00		RES.,FXD,COMP:150 OHM,5%,0.25W	01121	CB1515
R1480	315-0683-00		RES.,FXD,COMP:68K OHM,5%,0.25W	01121	CB6835
R1481	311-1237-00		RES.,VAR,NONWIR:1K OHM,10%,0.50W	80294	3386H-T07-102
R1482	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R1483	315-0272-00		RES.,FXD,COMP:2.7K OHM,5%,0.25W	01121	CB2725
R1484	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R1485	321-0097-07		RES.,FXD,FILM:100 OHM,0.1%,0.125W	75042	CEAT9-1000B
R1486	315-0101-00		RES.,FXD,COMP:100 OHM,5%,0.25W	01121	CB1015
R1487	315-0203-00		RES.,FXD,COMP:20K OHM,5%,0.25W	01121	CB2035
R1488	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R1489	315-0822-00		RES.,FXD,COMP:8.2K OHM,5%,0.25W	01121	CB8225
R1491	315-0272-00		RES.,FXD,COMP:2.7K OHM,5%,0.25W	01121	CB2725
R1492	315-0392-00		RES.,FXD,COMP:3.9K OHM,5%,0.25W	01121	CB3925
R1495	311-1339-00		RES.,VAR,NONWIR:5K OHM,10%,0.50W		
R1496	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R1497	321-0097-07		RES.,FXD,FILM:100 OHM,0.1%,0.125W	75042	CEAT9-1000B
R1505	311-1246-00		RES.,VAR,NONWIR:50K OHM,10%,0.50W		
R1506	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R1507	315-0471-00		RES.,FXD,COMP:470 OHM,5%,0.25W	01121	CB4715
R1521	321-0264-00		RES.,FXD,FILM:5.49K OHM,1%,0.125W	75042	CEAT0-5491F
R1523	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R1524	321-1296-07		RES.,FXD,FILM:12K OHM,1%,0.125W	75042	CEAT9-1202B
R1526	321-0289-00		RES.,FXD,FILM:10K OHM,1%,0.125W	75042	CEAT0-1002F
R1527	321-0268-00		RES.,FXD,FILM:6.04K OHM,1%,0.125W	75042	CEAT0-6041F
R1528	321-0268-00		RES.,FXD,FILM:6.04K OHM,1%,0.125W	75042	CEAT0-6041F
R1529	321-0322-00		RES.,FXD,FILM:22.1K OHM,1%,0.125W	75042	CEAT0-2212F
R1531	315-0224-00		RES.,FXD,COMP:220K OHM,5%,0.25W	01121	CB2245
R1532	321-0389-00		RES.,FXD,FILM:110K OHM,1%,0.125W	75042	CEAT0-1103F
R1533	321-0289-00		RES.,FXD,FILM:10K OHM,1%,0.125W	75042	CEAT0-1002F
R1535	311-1239-00		RES.,VAR,NONWIR:25K OHM,10%,0.50W	73138	72Y-26-0-252K
R1536	315-0302-00		RES.,FXD,COMP:3K OHM,5%,0.25W	01121	CB3025
R1540	311-1239-00		RES.,VAR,NONWIR:25K OHM,10%,0.50W	73138	72Y-26-0-252K
R1542	315-0302-00		RES.,FXD,COMP:3K OHM,5%,0.25W	01121	CB3025
R1550	311-1268-00		RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1552	311-1268-00		RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1554	311-1268-00		RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1556	311-1268-00		RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1558	311-1268-00		RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1560	311-1268-00		RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1562	311-1268-00		RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1564	311-1268-00		RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1566	311-1268-00		RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1568	311-1268-00		RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1570	311-1268-00		RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1572	311-1268-00		RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1574	311-1268-00		RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1576	311-1268-00		RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
R1578	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1580	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1582	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1584	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1586	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1587	315-0101-00		RES.,FXD,COMP:100 OHM,5%,0.25W	01121	CB1015
R1588	311-1267-00		RES.,VAR, NONWIR:5K OHM,10%,0.50W		
R1590	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1592	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1594	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1596	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1598	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1600	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1602	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1604	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1606	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1608	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1610	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1612	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1614	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1616	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1618	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1620	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1622	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1624	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1626	311-1268-00		RES.,VAR, NONWIR:10K OHM,10%,0.50W	73138	62PT-351-0-103K
R1627	315-0101-00		RES.,FXD,COMP:100 OHM,5%,0.25W	01121	CB1015
R1628	311-1267-00		RES.,VAR, NONWIR:5K OHM,10%,0.50W		
R1630	311-0342-00		RES.,VAR, WW:50K OHM,3%		
R1632	321-0289-07		RES.,FXD,FILM:10K OHM,0.1%,0.125W	75042	CEAT9-1002B
R1633	321-0816-07		RES.,FXD,FILM:5K OHM,0.1%,0.125W	75042	CEAT9-5001B
R1634	321-0816-07		RES.,FXD,FILM:5K OHM,0.1%,0.125W	75042	CEAT9-5001B
R1635	321-0816-07		RES.,FXD,FILM:5K OHM,0.1%,0.125W	75042	CEAT9-5001B
R1636	321-0816-07		RES.,FXD,FILM:5K OHM,0.1%,0.125W	75042	CEAT9-5001B
R1637	321-0289-07		RES.,FXD,FILM:10K OHM,0.1%,0.125W	75042	CEAT9-1002B
R1650	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R1651	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R1659	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R1664	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R1666	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R1668	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R1670	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R1671	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R1672	301-0331-00		RES.,FXD,COMP:330 OHM,5%,0.50W	01121	EB3315
S715A,B	260-1540-00		SWITCH,ROTARY:SLIT WIDTH		
S742	260-1541-00		SWITCH,ROTARY:FILTER		
S1632	260-1543-00		SWITCH,ROTARY:GRATING A		
S1640	260-1542-00		SWITCH,ROTARY:GRATING B		
TL380	120-0897-00		XFMR:POWER		
U1328	156-0095-00		INTEGRATED CKT:DUAL 20MHZ DIFF AMPL		
U1394	156-0067-00		MICROCIRCUIT LI:OPERATIONAL AMPLIFIER	07263	UA741
U1488	156-0105-00		MICROCIRCUIT LI:OPERATIONAL AMPLIFIER	07263	U977101393
U1496	156-0067-00		MICROCIRCUIT LI:OPERATIONAL AMPLIFIER	07263	UA741
U1522	156-0067-02		MICROCIRCUIT LI:OPNL AMPLIFIER,SELECTED	80009	156-0067-02
U1524	156-0158-00		MICROCIRCUIT LI:DUAL OPERATIONAL AMPLIFIER	18324	S5558V
U1534	156-0158-00		MICROCIRCUIT LI:DUAL OPERATIONAL AMPLIFIER	18324	S5558V
U1542	156-0158-00		MICROCIRCUIT LI:DUAL OPERATIONAL AMPLIFIER	18324	S5558V
U1550	155-0106-00		INTEGRATED CKT:MONOLITHIC,NORM CKT	80009	155-0106-00
U1590	155-0106-00		INTEGRATED CKT:MONOLITHIC,NORM CKT	80009	155-0106-00
V1405	154-0707-01		ELECTRON TUBE:CRT	80009	154-0707-01
VR1306	152-0411-00		SEMICOND DEVICE:ZENER,0.25W,9V,5%	04713	1N937
VR1341	152-0427-00		SEMICOND DEVICE:ZENER,0.4W,100V,5%	04713	1N985B
VR1345	152-0427-00		SEMICOND DEVICE:ZENER,0.4W,100V,5%	04713	1N985B
VR1490	152-0317-00		SEMICOND DEVICE:ZENER,0.25W,6.2V,5%	81483	1N3497

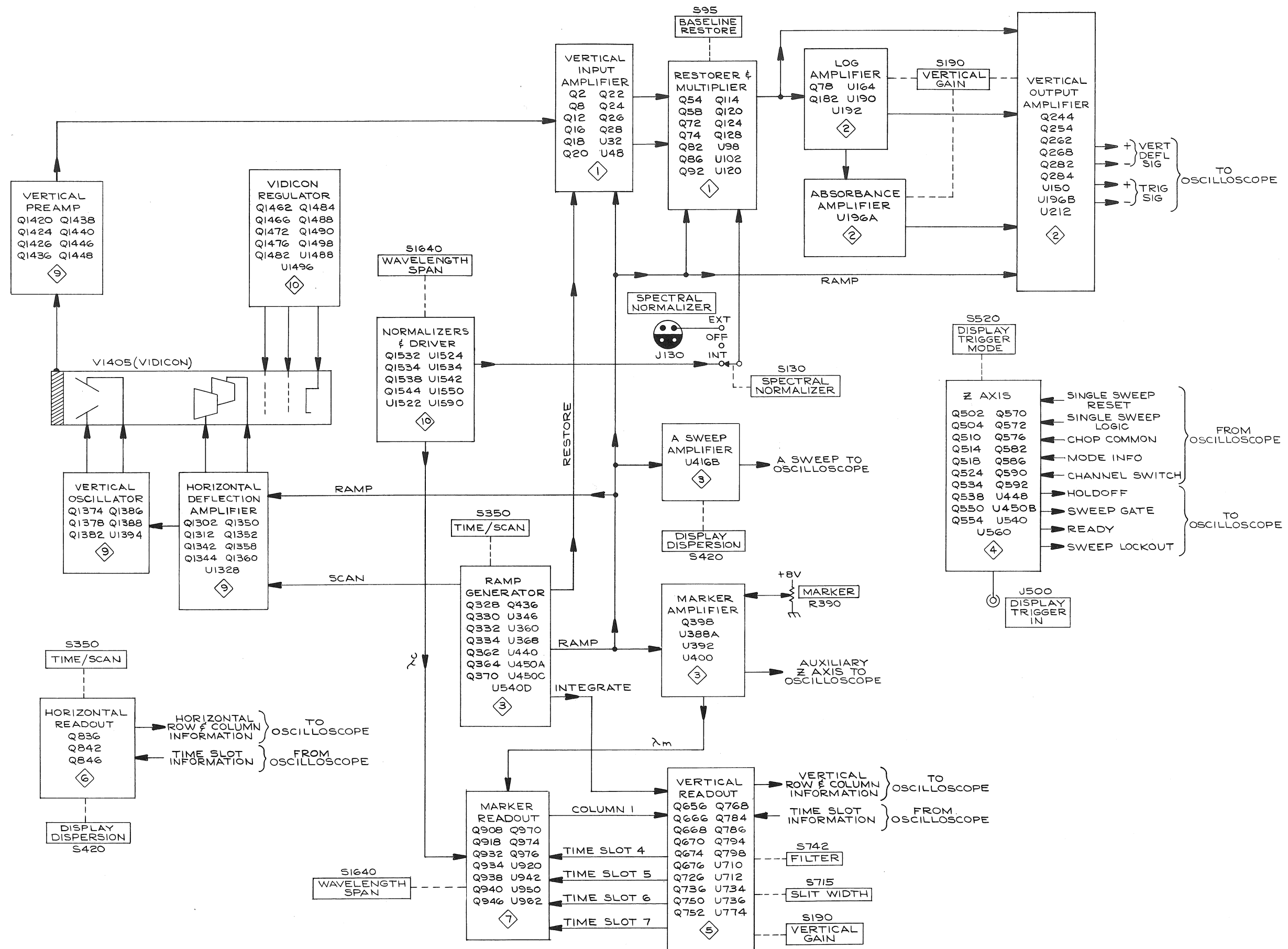
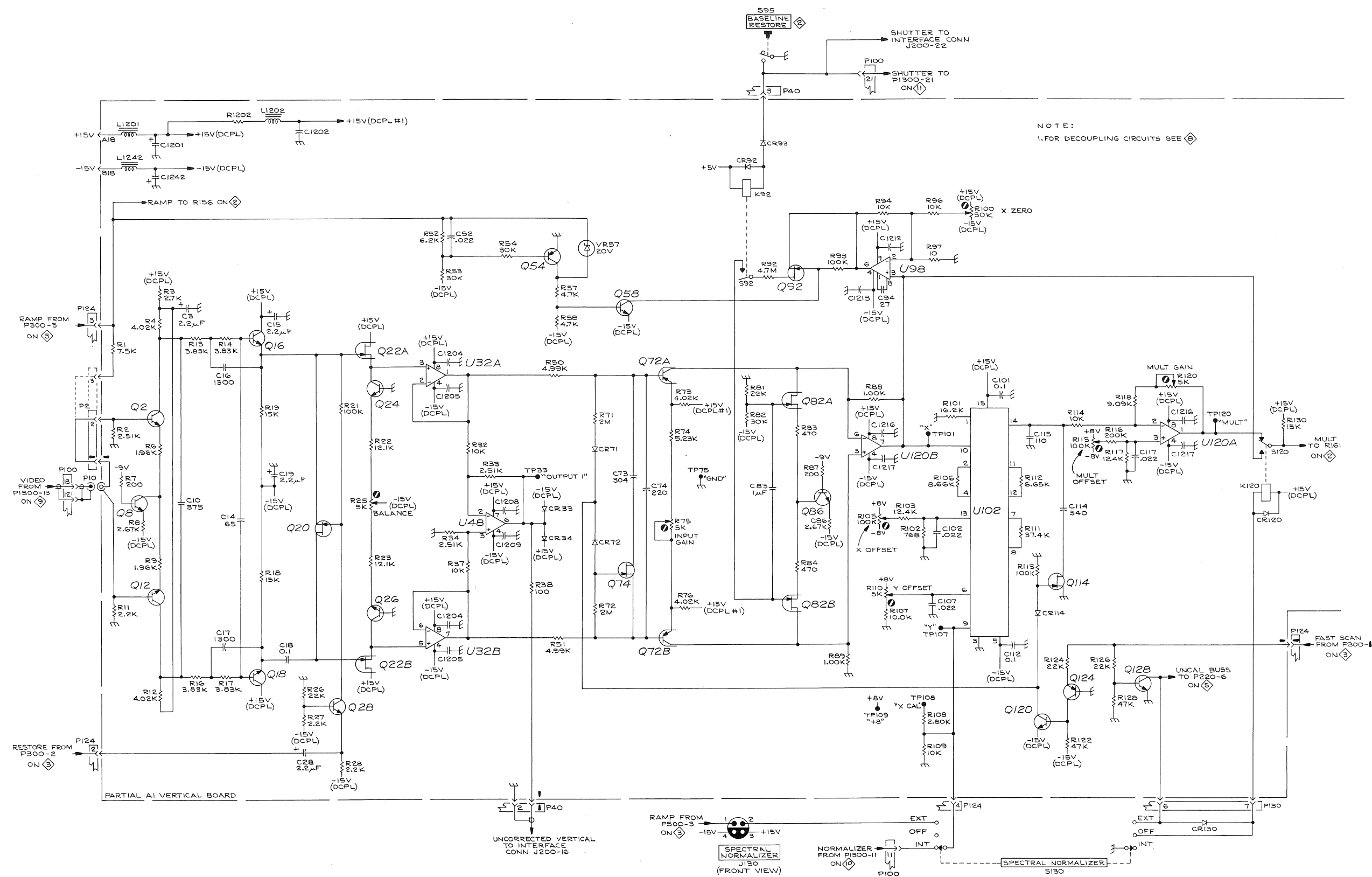


Fig. 6-1. P/O A1. Partial Vertical circuit board.



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VERTICAL AMPLIFIER 1273
GR5

FIG. 6-2 P/O A1 PARTIAL
VERTICAL CIRCUIT
BOARD

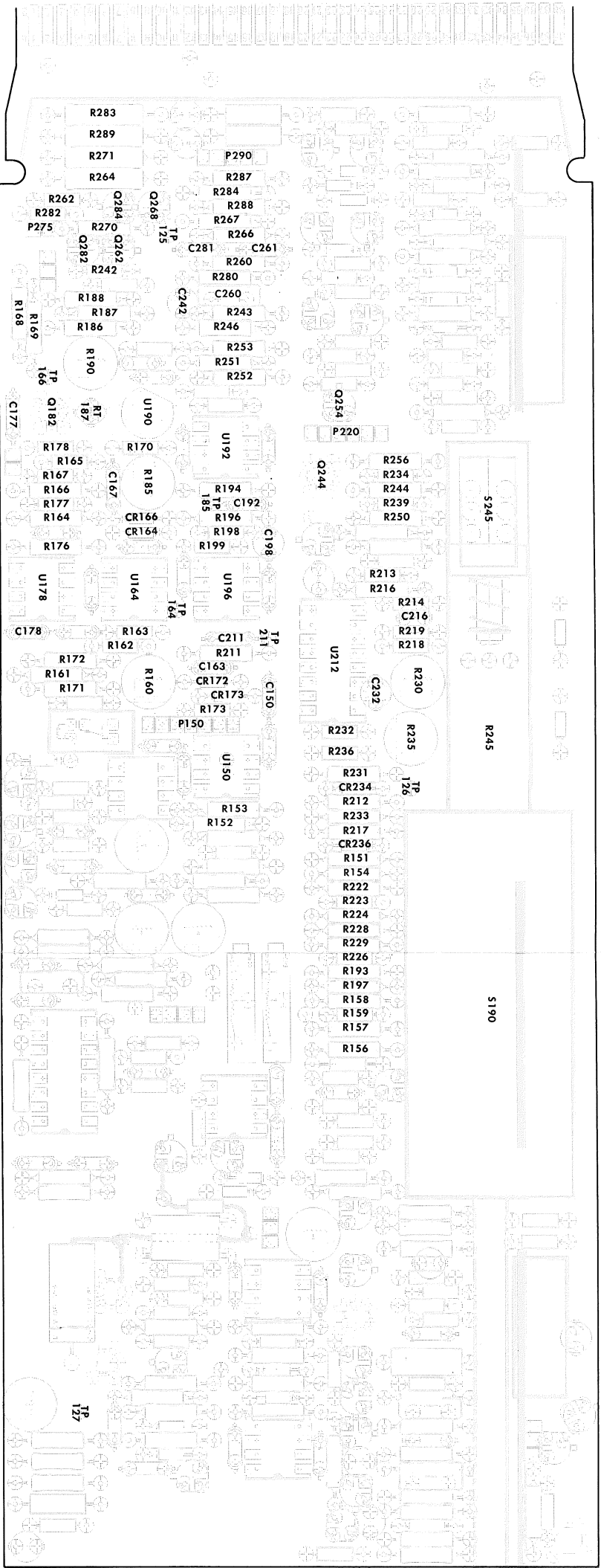


Fig. 6-2. P/O A1. Partial Vertical circuit board.



VERTICAL OUTPUT AMPLIFIER 2 ¹²⁷³ GRS

FIG. 6-3 P/O A2 PARTIAL
HORIZONTAL CIRCUIT
BOARD

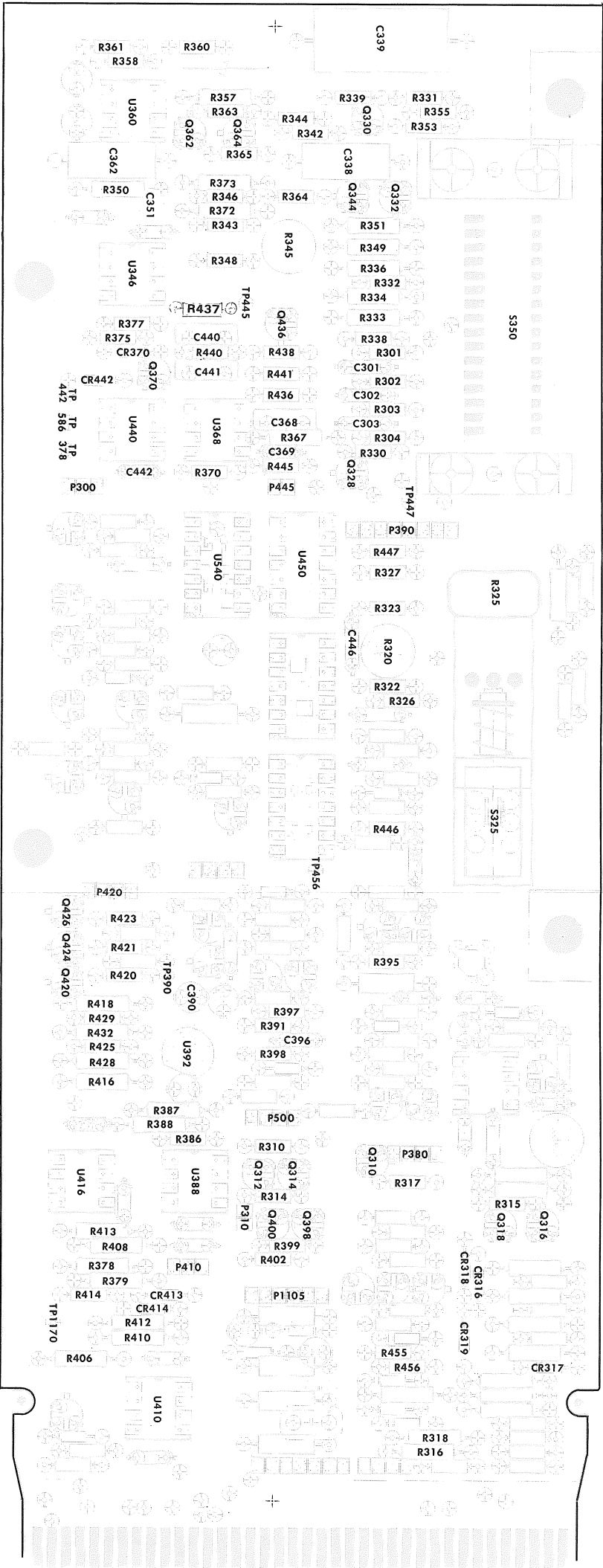
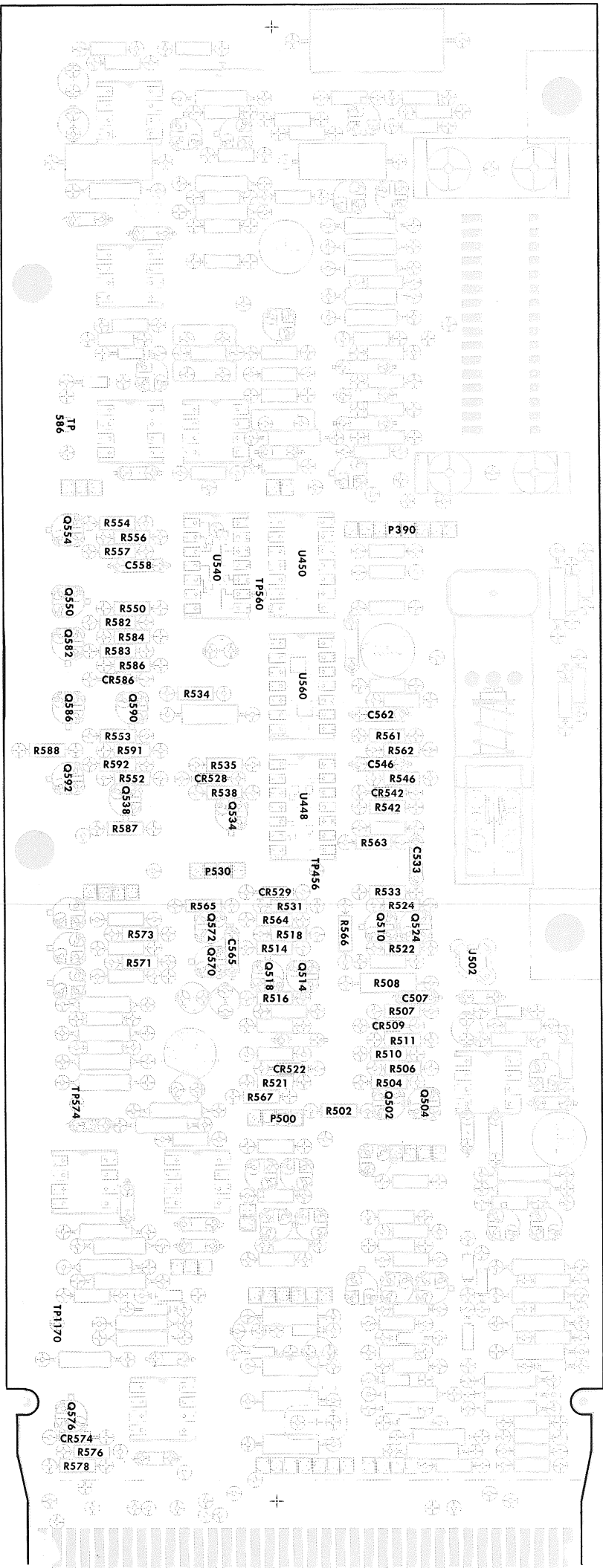
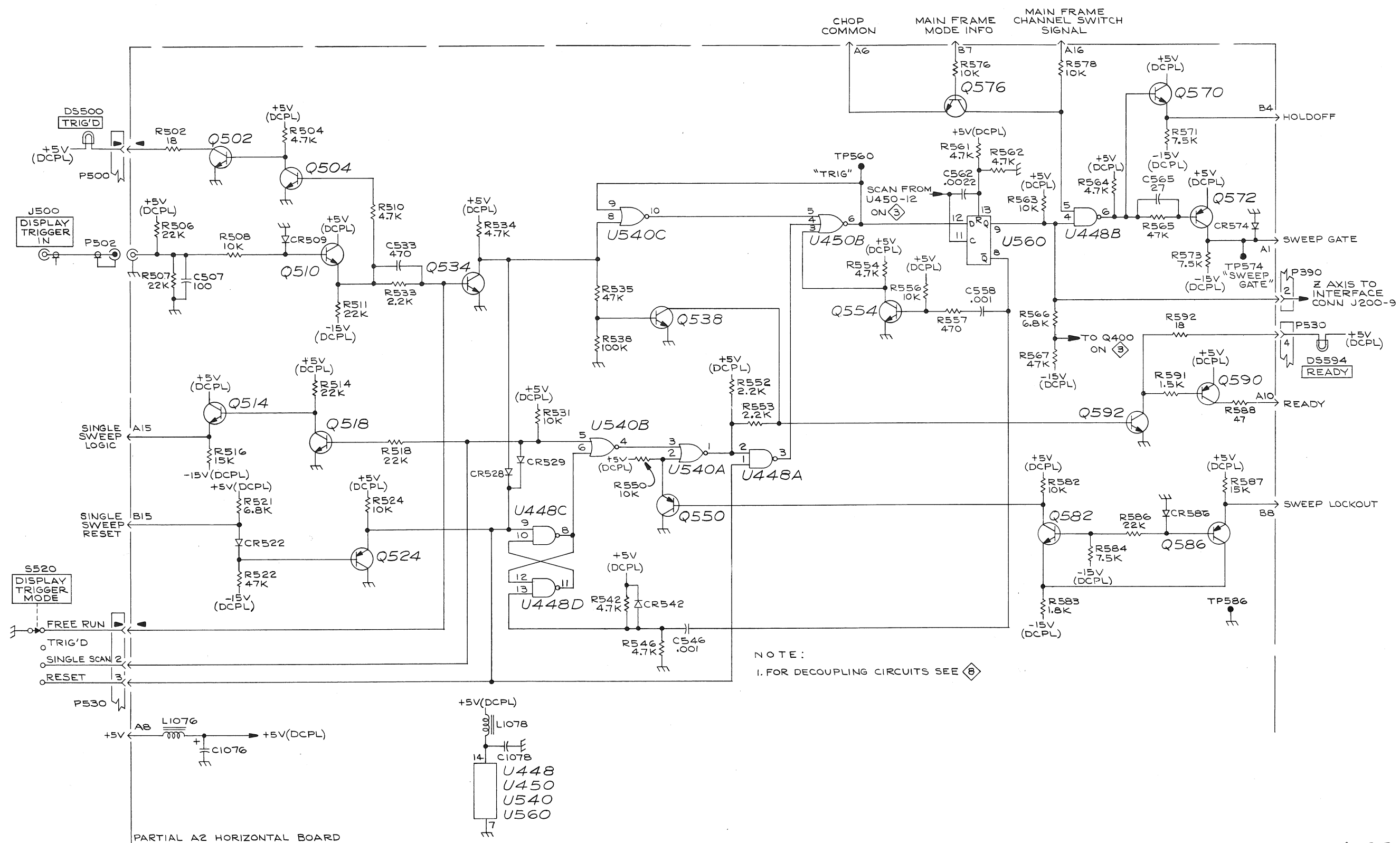


Fig. 6-3. P/O A2. Partial Horizontal circuit board.

FIG. 6-4 P/O A2 PARTIAL
HORIZONTAL CIRCUIT
BOARD

Fig. 6-4. P/O A2. Partial Horizontal circuit board.





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Z AXIS 4 1273
GR5

Fig. 6-6. P/O A3. Partial Readout circuit board.



FIG. 6-7 P/O PARTIAL
HORIZONTAL CIRCUIT
BOARD

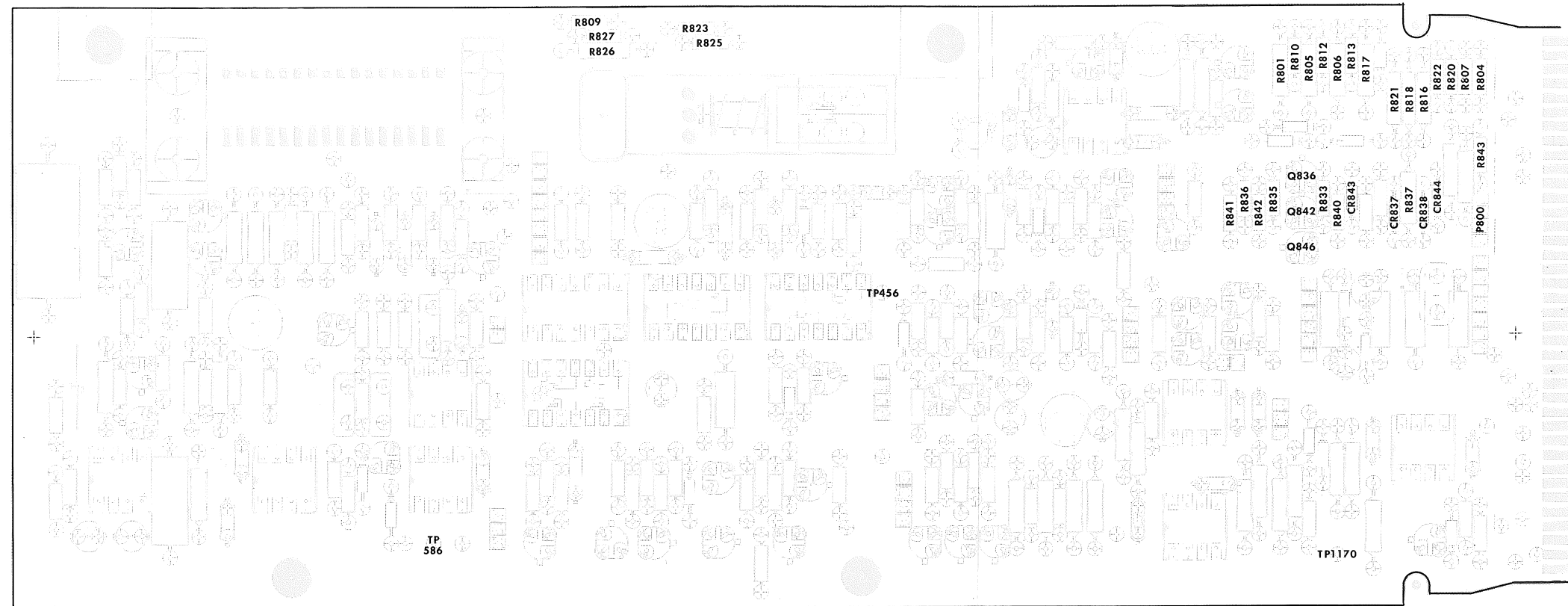


Fig. 6-7. P/O A2. Partial Horizontal circuit board.

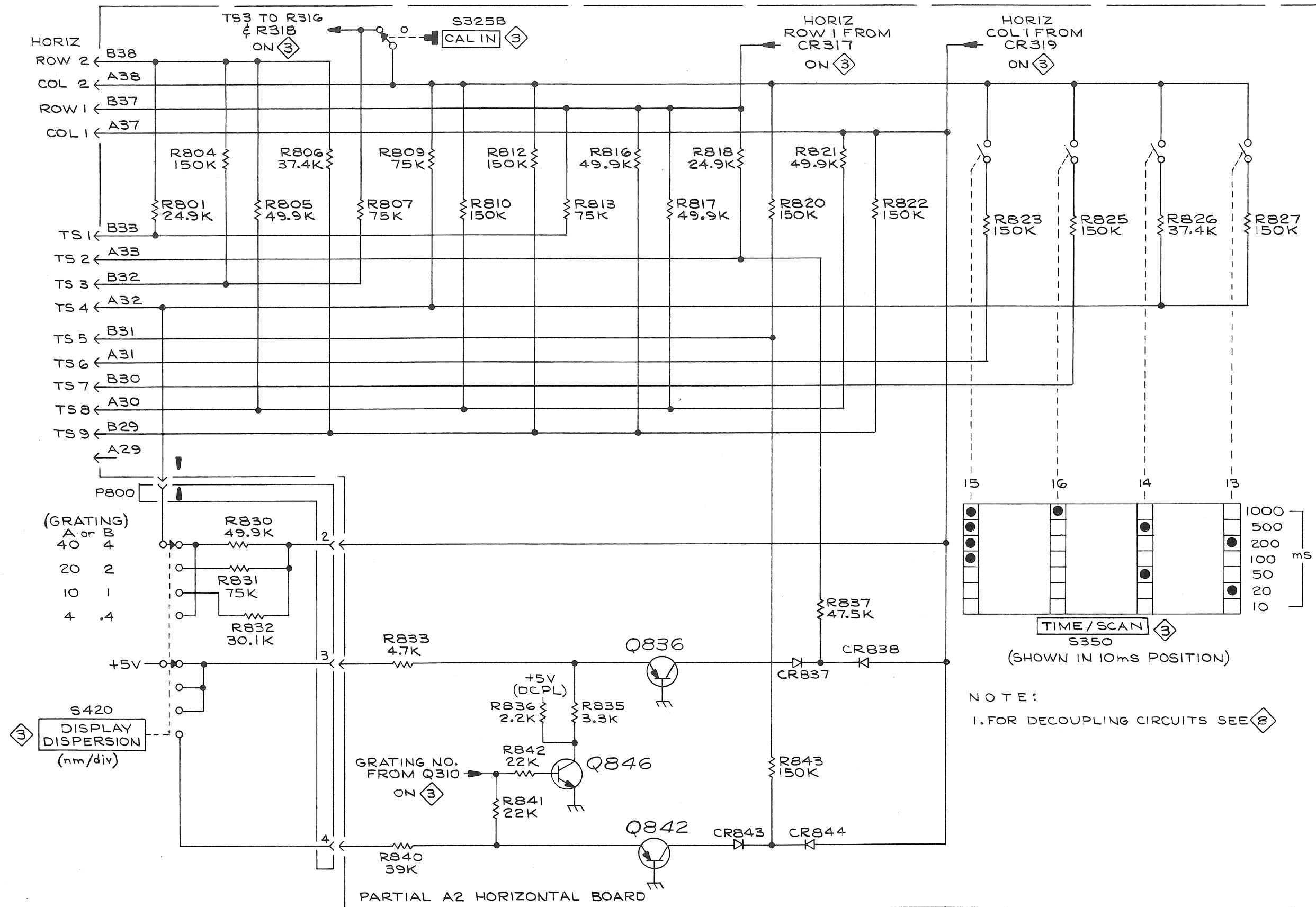


FIG. 6-8 P/O A3 PARTIAL
READOUT CIRCUIT
BOARD

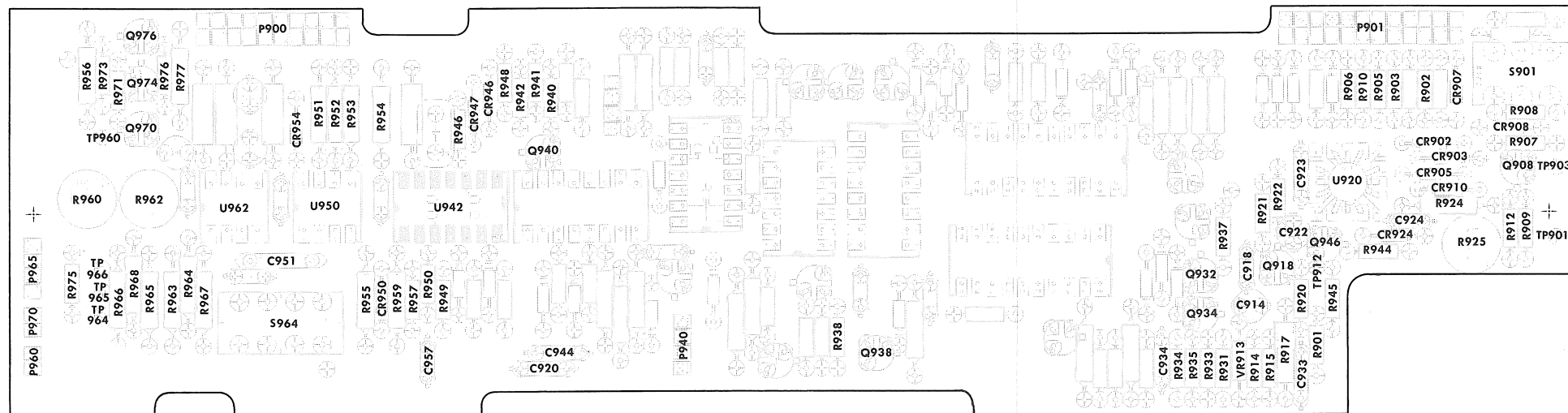
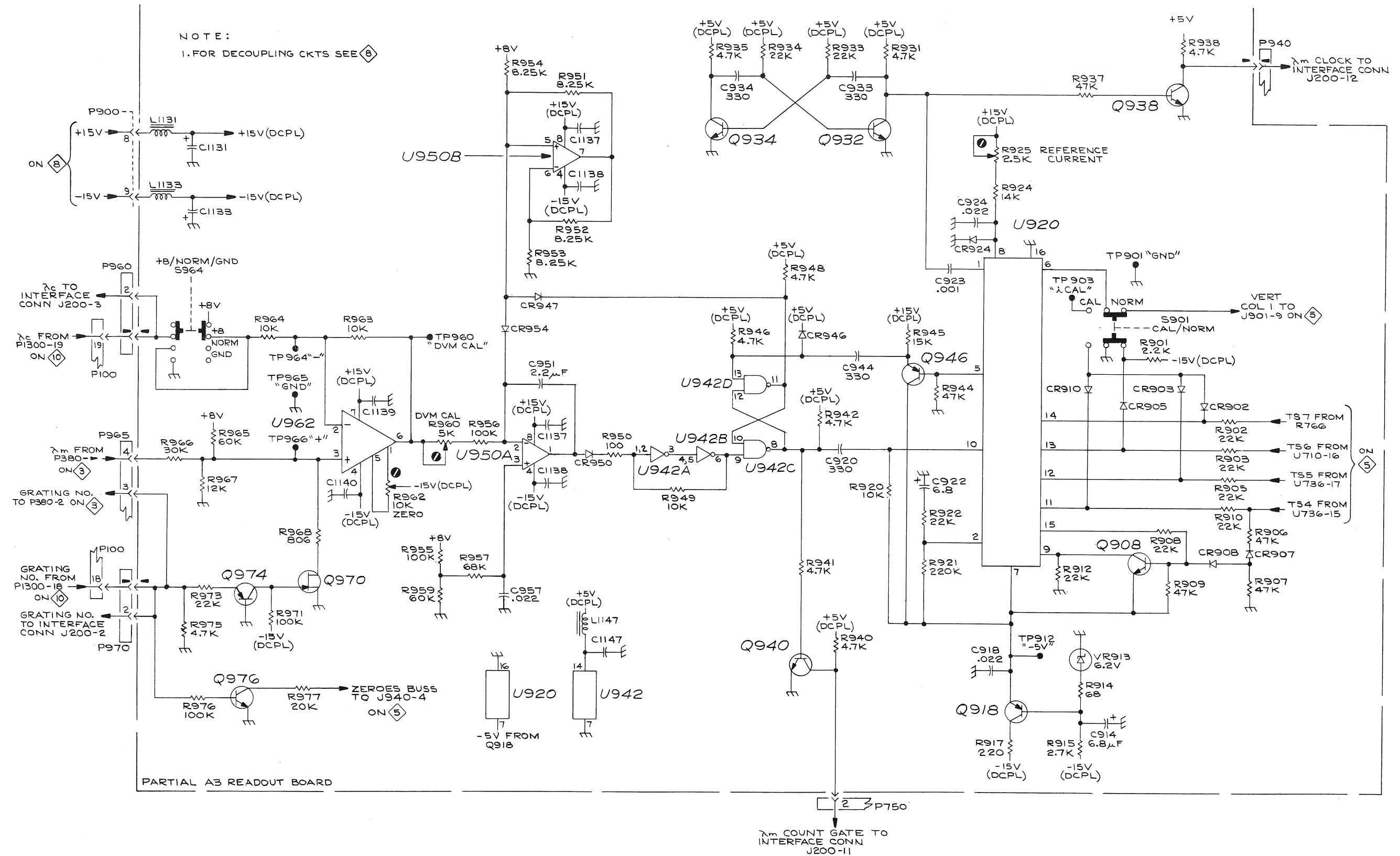


Fig. 6-8. P/O A3. Partial Readout circuit board.



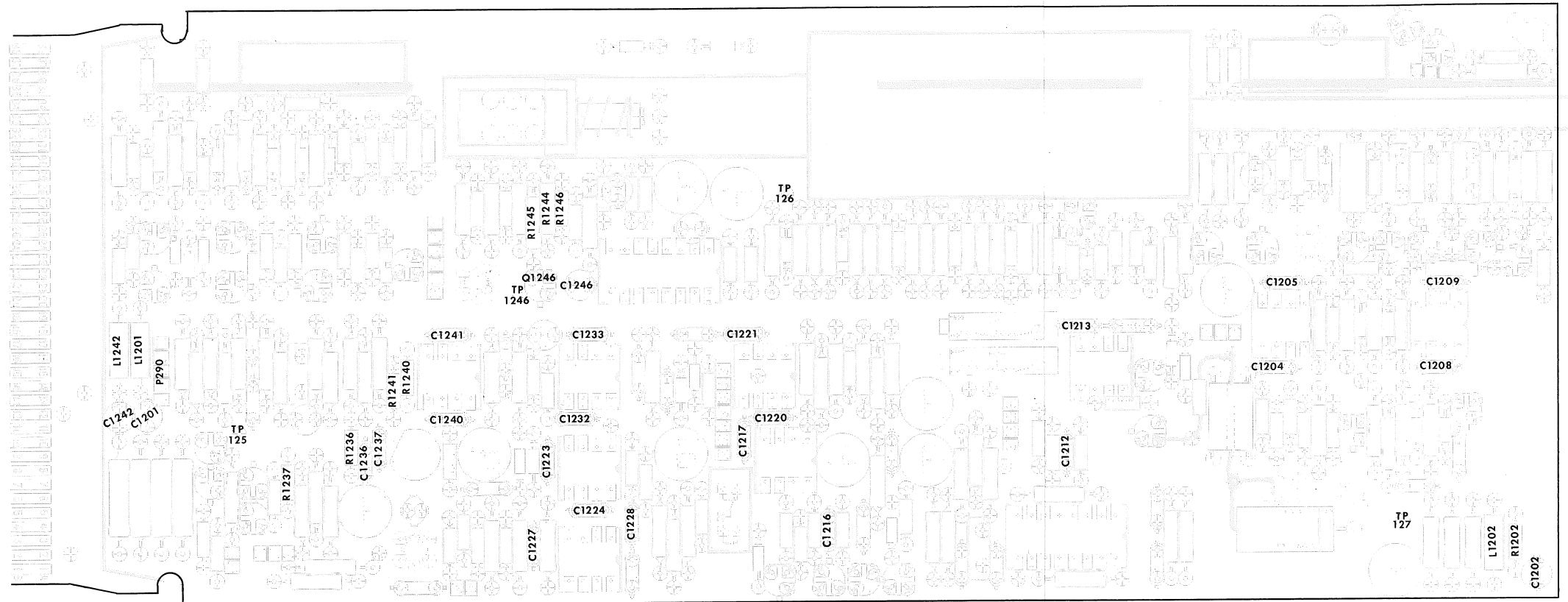


Fig. 6-9. P/O A1. Partial Vertical circuit board.

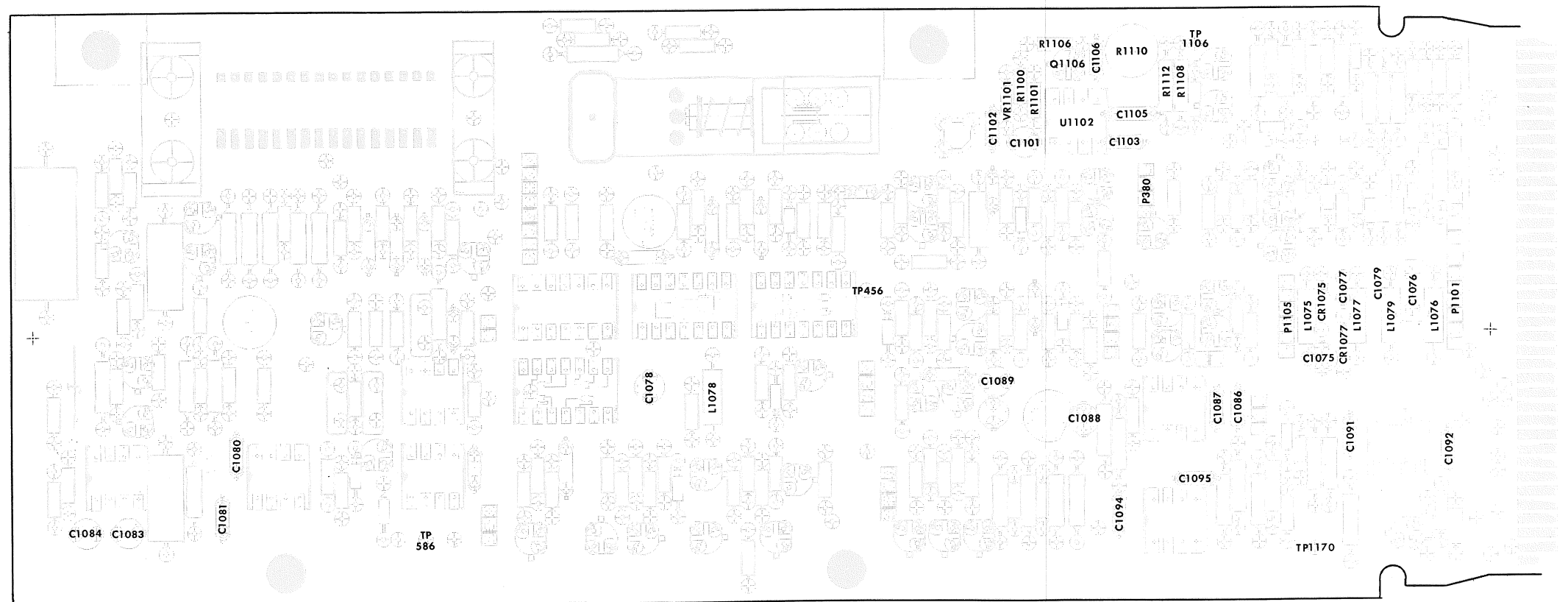
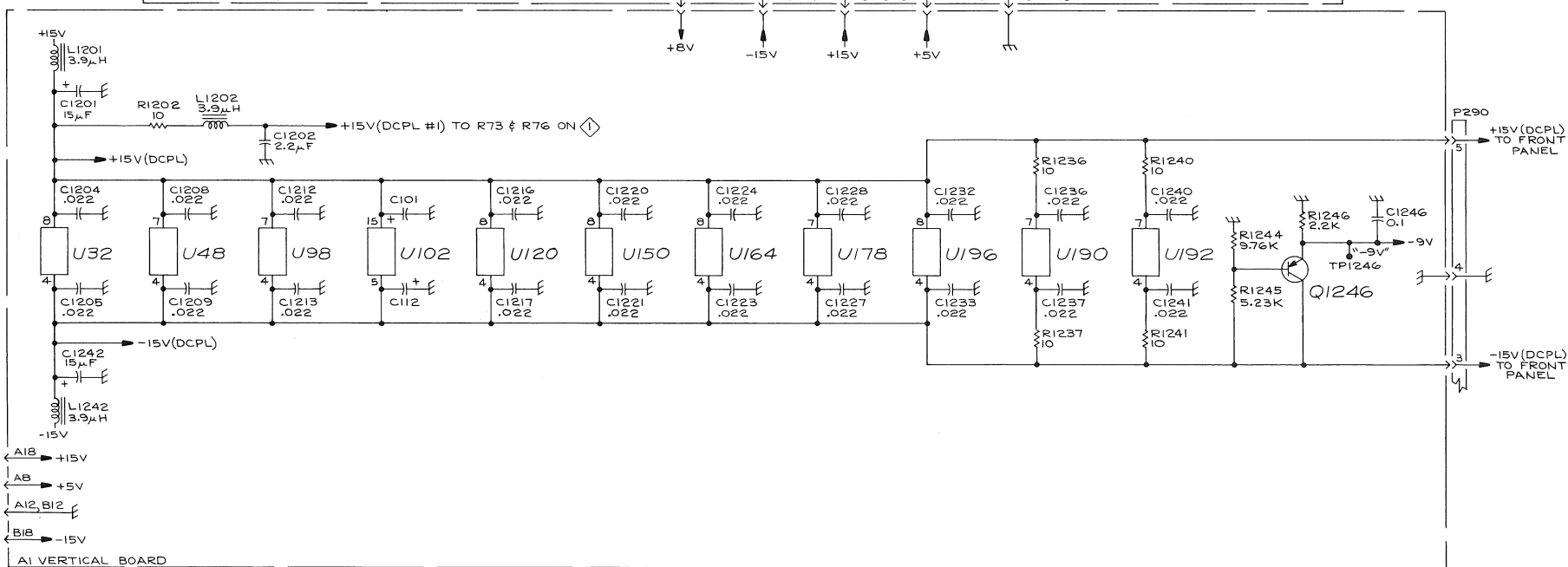
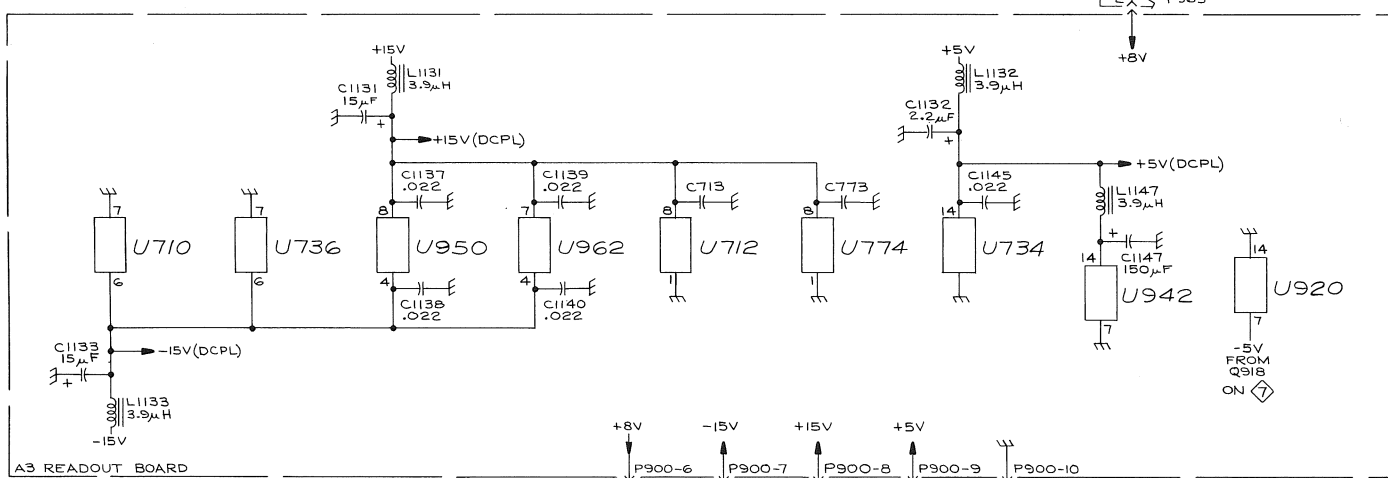
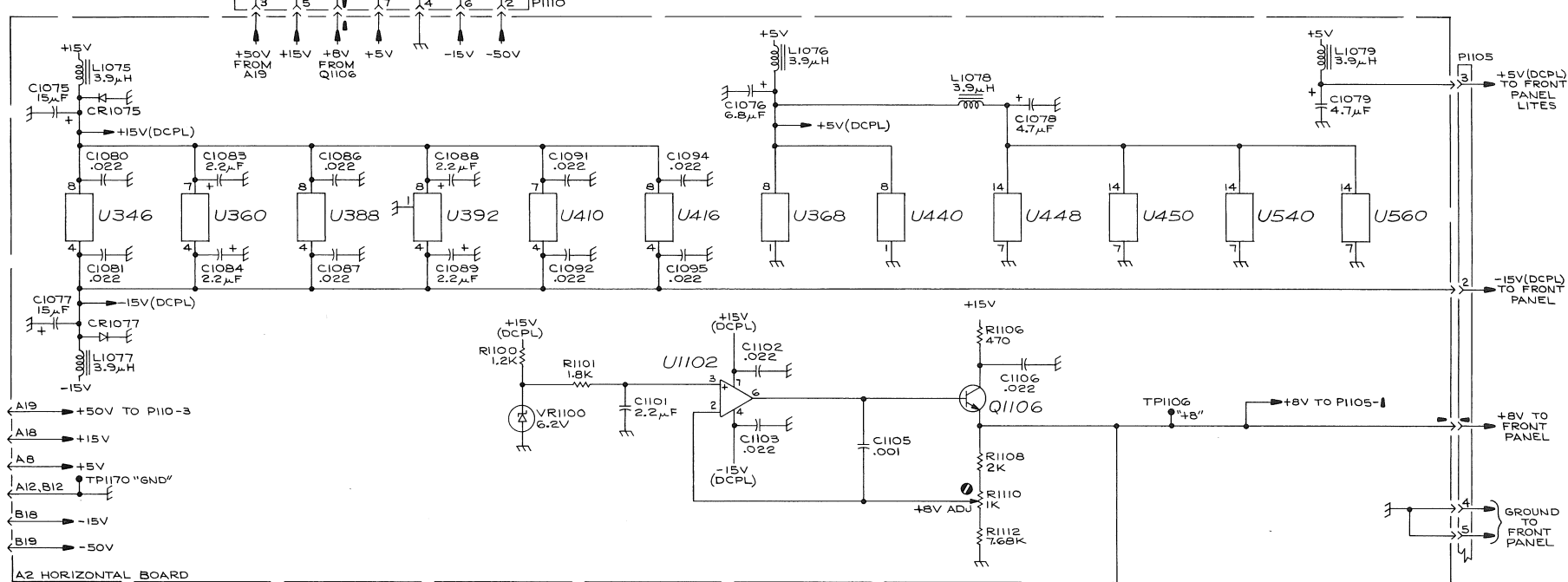
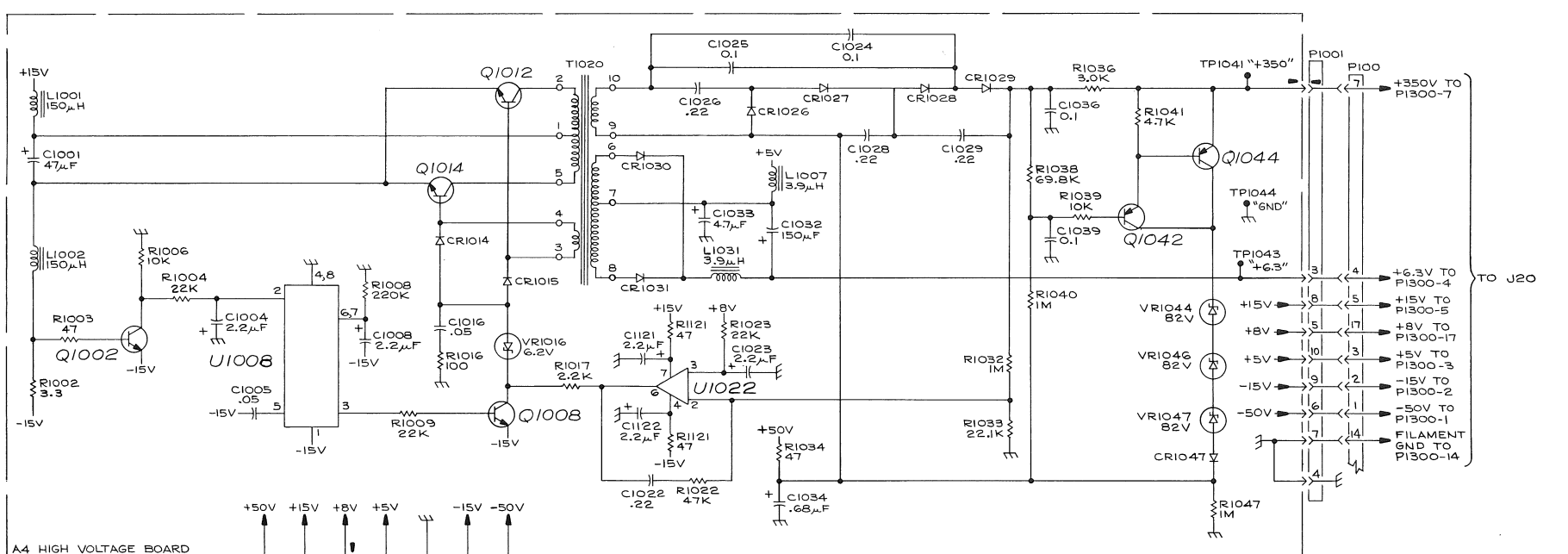


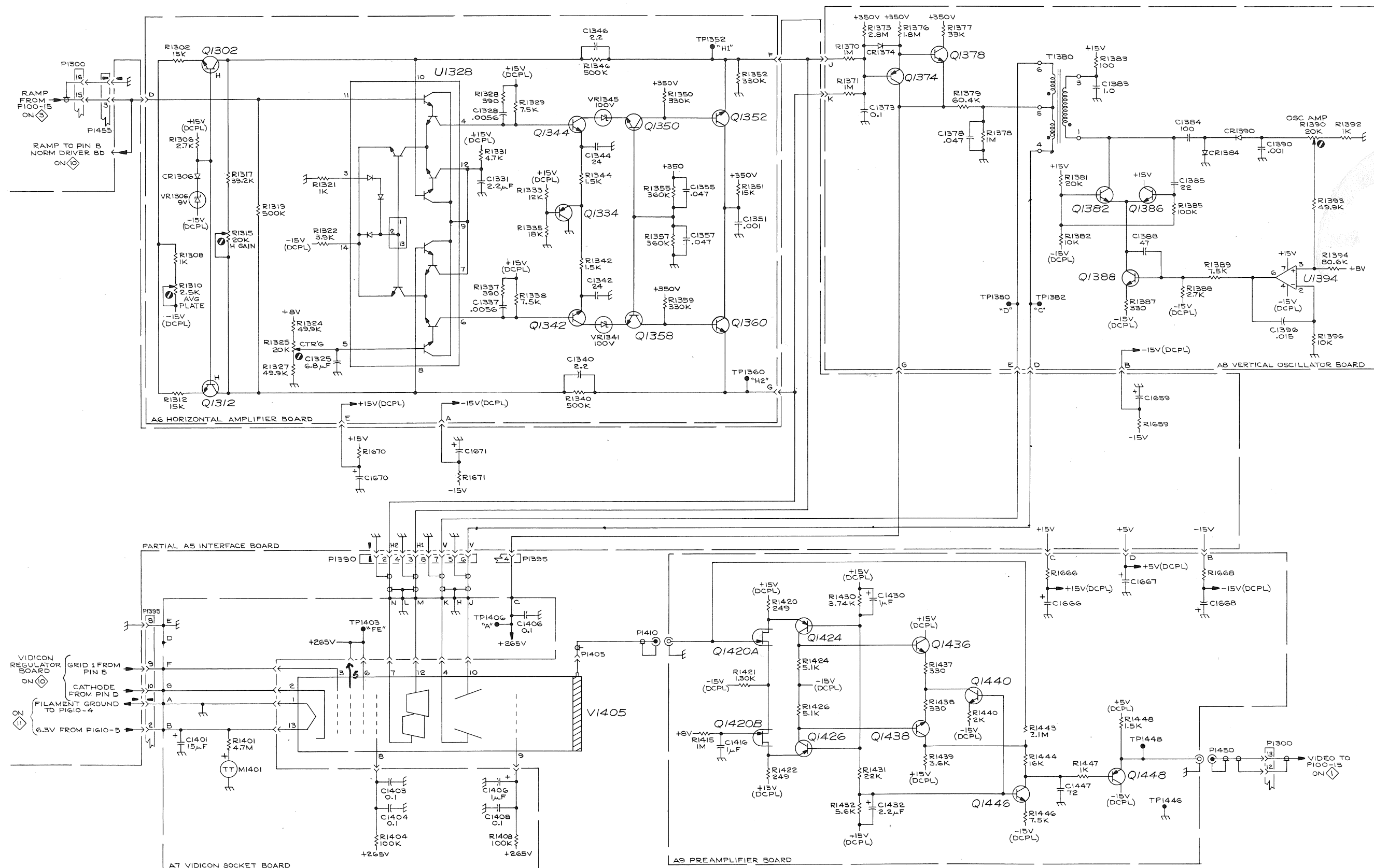
Fig. 6-10. P/O A2. Partial Horizontal circuit board.



The diagram illustrates the electrical circuitry for a vehicle, likely a truck or heavy-duty car, showing the power distribution from the battery and alternator to various components. Key components and their connections include:

- Power Sources:** The battery (P1410) and alternator (P1450) are the primary power sources.
- Relays and Switches:** Various relays (R1443, R1448, R1447, R1446, R1440, R1447, R1446, R1440) and switches (Q1436, Q1438, Q1424, Q1426, Q1431, Q1440, Q1446, Q1447, Q1420, Q1421, Q1422, Q1416, Q1415, Q1446, Q1440) are shown.
- Control Units:** The diagram includes control units like C1430, C1432, and C1416.
- Wiring:** The diagram shows the complex wiring connecting these components, including ground connections (indicated by the '+' symbol).

Fig. 6-16. P/O A9. Partial Preamplifier circuit board.



NOTE:
1. FOR DECOUPLING CIRCUITS SEE (11)

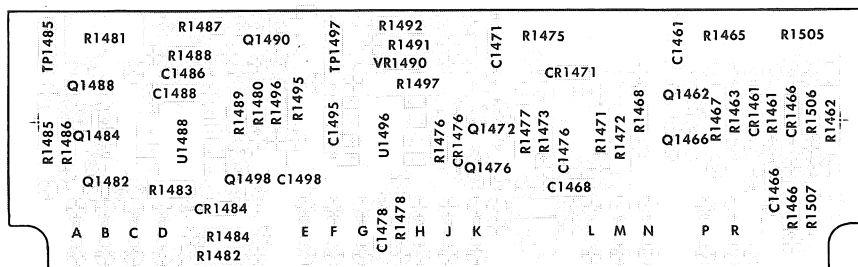


Fig. 6-17. P/O A10. Partial Vidicon Regulator circuit board.

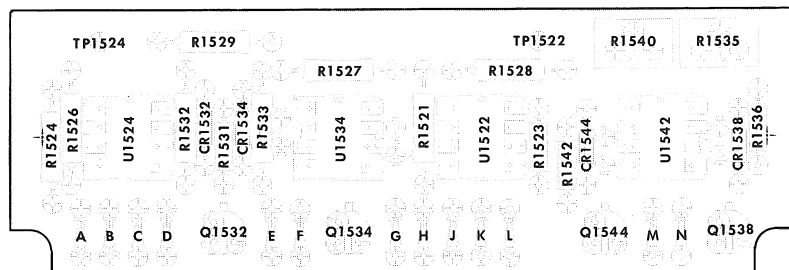


Fig. 6-18. P/O A11. Partial Normalizer Driver circuit board.

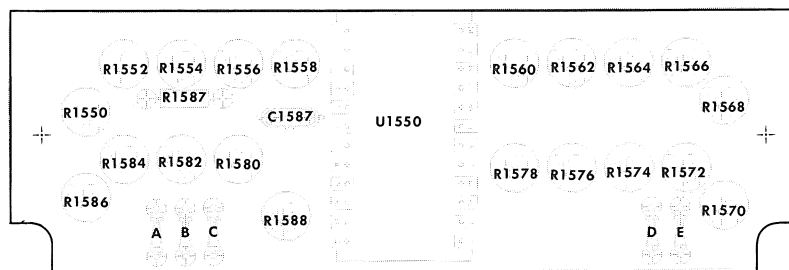


Fig. 6-19. A12. 40 nm Normalizer circuit board.

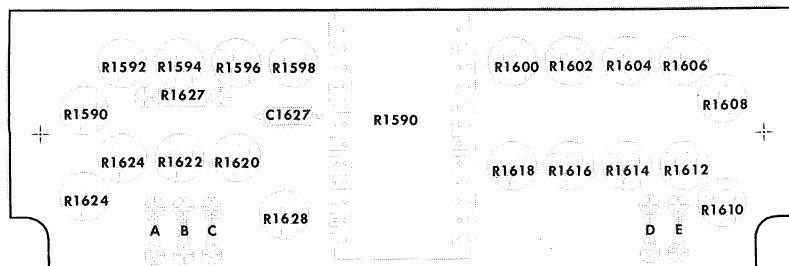


Fig. 6-20. A13. 400 nm Normalizer circuit board.

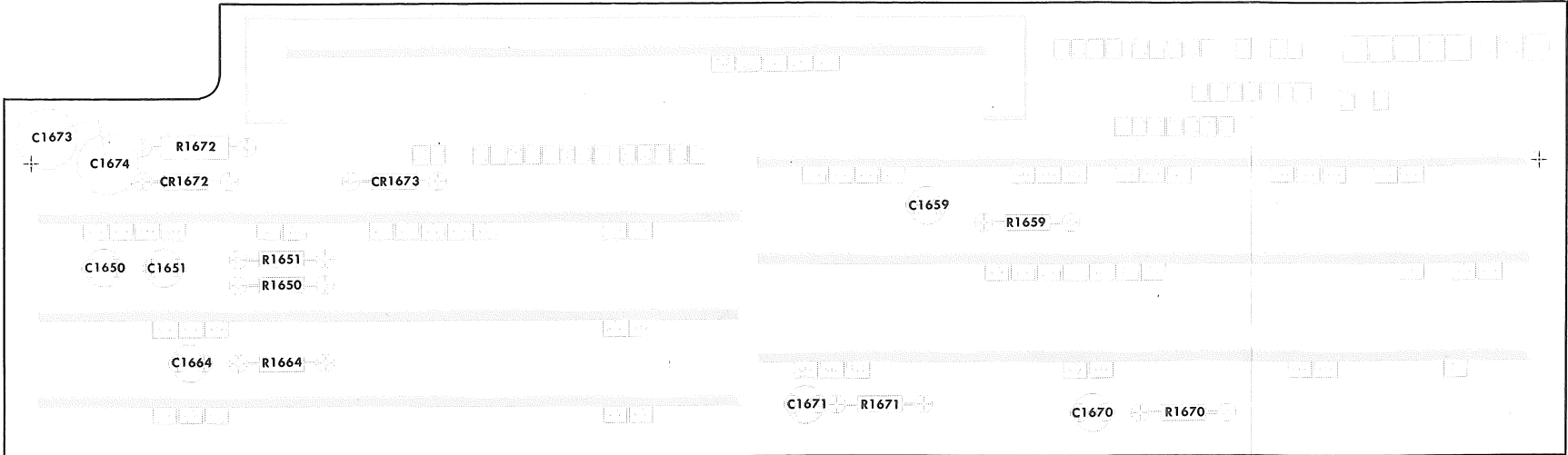


Fig. 6-21. A5. Interface circuit board.

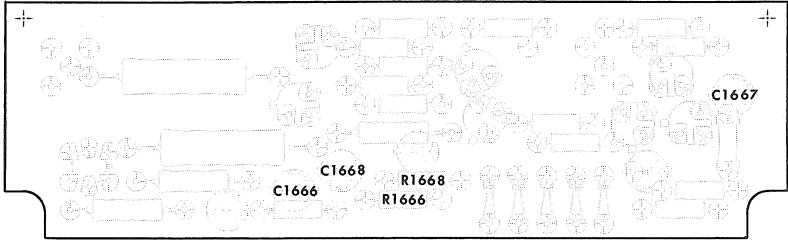


Fig. 6-22. P/O A9. Partial Preamplifier circuit board.

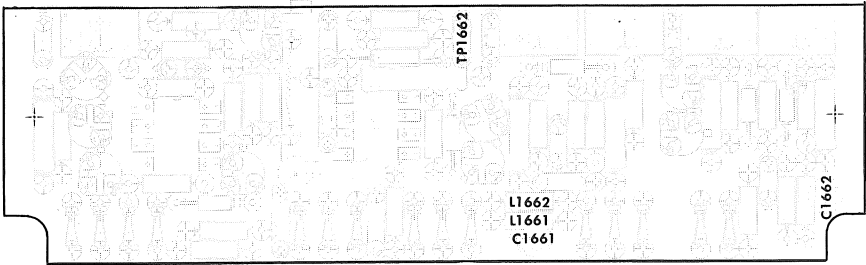


Fig. 6-23. P/O A10. Partial Vidicon Regulator circuit board.

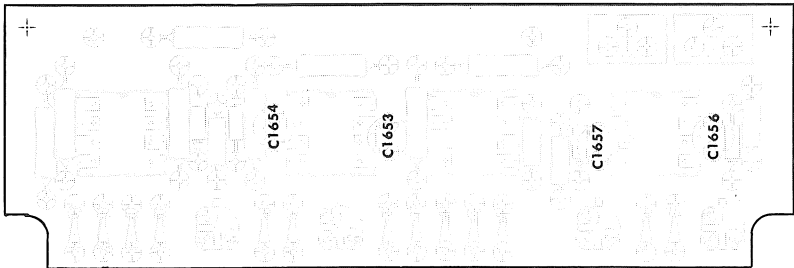
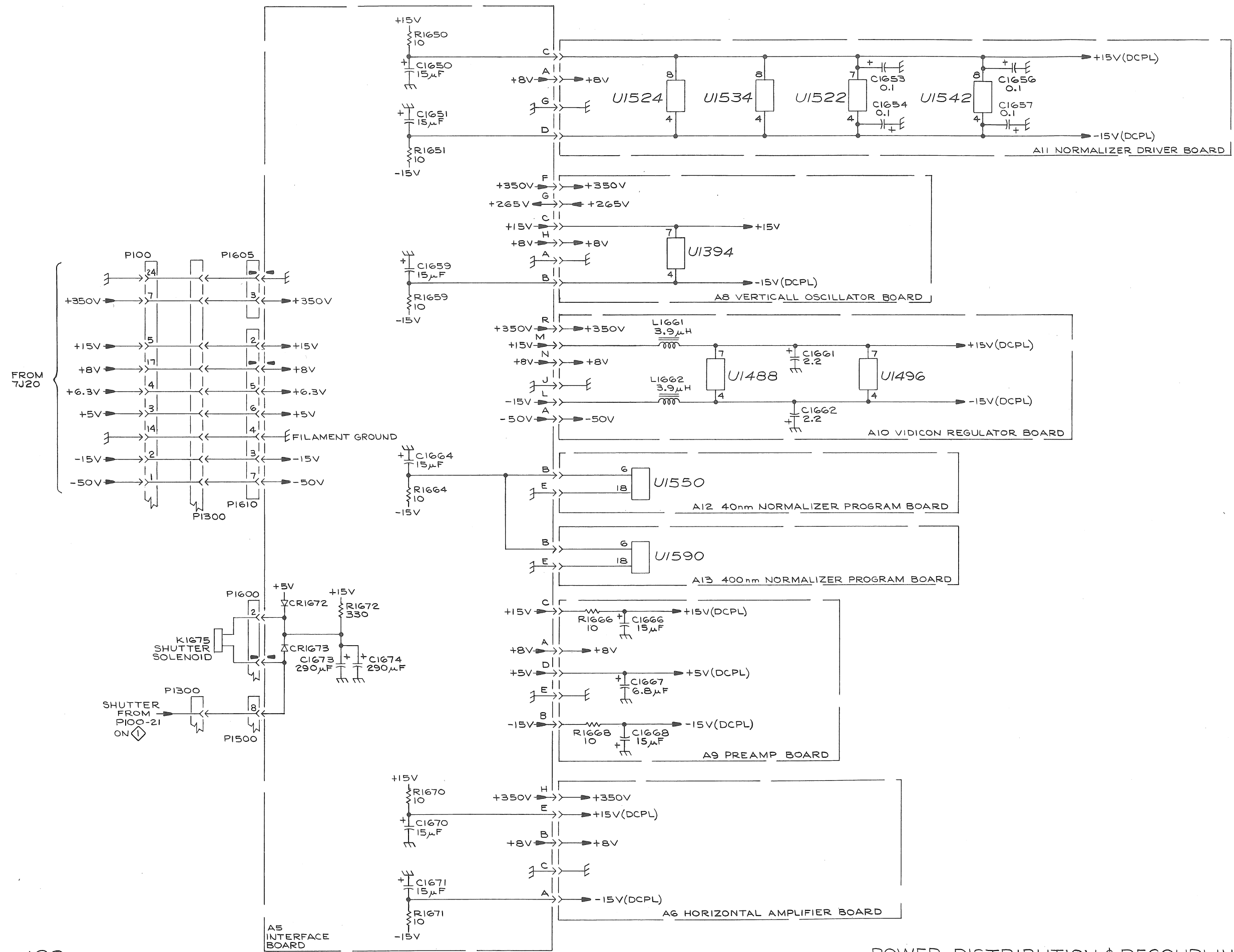


Fig. 6-24. P/O A11. Partial Normalizer Driver circuit board.



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