

# OPERATING INSTRUCTIONS

## INSTRUMENT DESCRIPTION

The 5B40 Time Base provides a fully triggerable sweep and external horizontal input for the 5400 series oscilloscopes. It features an edge-lighted main SECONDS/DIV selector switch. When used in a main-frame with readout capabilities, the SECONDS/DIV information is displayed on the crt face. All front-panel controls are conveniently grouped and color coded for ease of identification and operation. Pushbuttons select various trigger modes from either vertical plug-in compartment. Although designed for use in the right hand or sweep

compartment of the oscilloscope, the 5B40 will operate in the vertical compartments to produce vertical sweeps.

## PREPARATION FOR USE

Your 5B40 is calibrated and ready for use when received. Fig. 1-1 shows installation-removal procedure. Refer to the Front Panel Controls illustration in the foldout pages for a complete description of the front panel. Color patterns printed on the front panel help to identify functionally grouped controls. Blue surrounds controls associated with the display mode; green, the triggering functions.

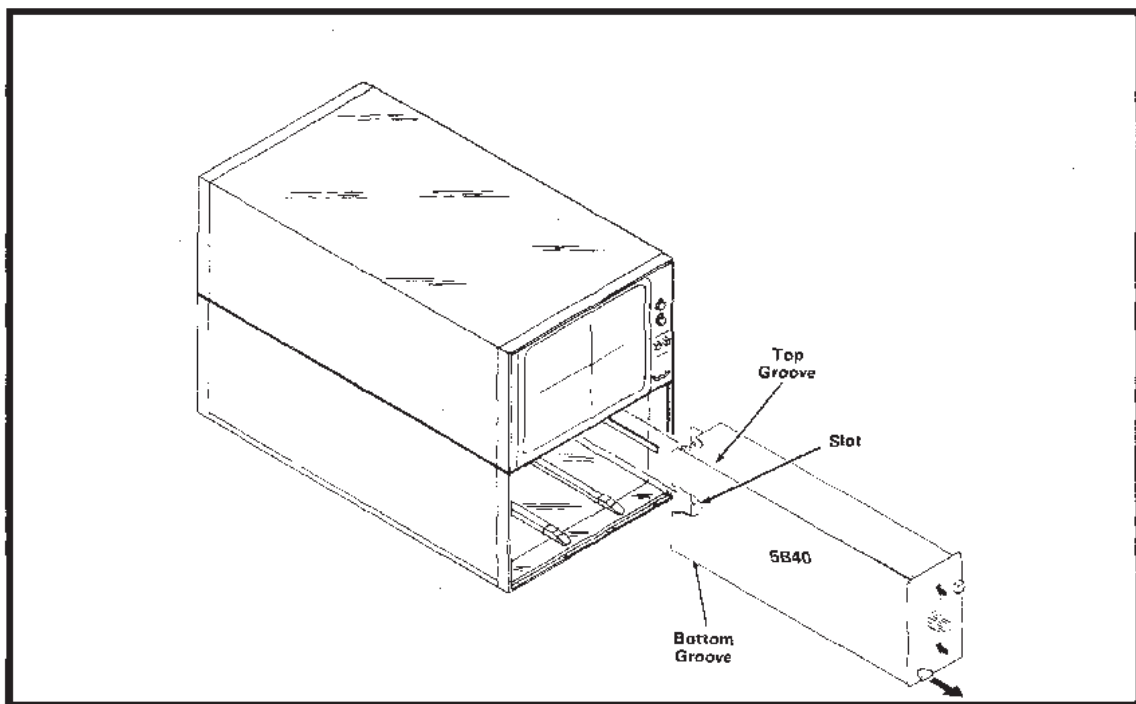


Fig. 1-1. 5B40 Installation-Removal Procedure.

## BASIC OPERATION

### TRIGGERED DISPLAY

With the 5B40 Time Base properly installed in the horizontal plug-in compartment, apply power to the mainframe. Connect the CALIBRATOR output on the display module to the vertical plug-in. Adjust the vertical plug-in gain for a two-division display. Set the SECONDS/DIV switch to the 1 m position and push the LEFT or RIGHT TRIGGERING SOURCE button, depending on which compartment contains the vertical plug-in. Push the AUTO TRIG button in the green TRIGGERING area. Rotate the position controls for the vertical plug-in and 5B40 until a trace is visible. Adjust the TRIGGERING LEVEL control until the display stabilizes. The TRIG'D READY light is now on. Now rotate the TRIGGERING LEVEL control from stop to stop. Notice that the trace free runs over most of the control rotation. The TRIG'D READY light is off when the sweep free runs. Release the AUTO TRIG button and rotate the TRIGGERING LEVEL control from stop to stop. Notice that the trace appears, and the TRIG'D READY light is on, only when it is triggered, and disappears over most of the control rotation.

### SINGLE SWEEP MODE

Obtain a stable display, positioning the sweep so that the start is visible. If the sweep is starting on the negative-going portion of the square wave, push the - SLOPE button. The trace will now start on a positive-going waveform. Remove the jumper from the calibrator to the vertical plug-in. Depress the button labeled SINGLE SWP, then depress the RESET button. The TRIG'D READY light is now visible. Watch the crt, and touch the jumper to the vertical plug-in input. If the intensity is high enough, a fast single trace will be visible and the TRIG'D READY light will extinguish. Remove the signal to the vertical, and depress the RESET button. The TRIG'D READY light will be visible again, and the sweep is rearmed. Release the SINGL SWP button, reconnect the calibrator jumper and obtain a stable display by pushing the AUTO TRIG button (and adjusting the TRIGGERING LEVEL control, if necessary).

### DUAL TRACE DISPLAY SWITCHING

The button labeled CHOP in the blue DISPLAY MODE section of the front panel selects the switching mode for

dual sweep vertical plug-ins. With the button out, the switching is done in the alternate mode, i.e., one channel is displayed for one full sweep, then the other channel is displayed. This can be demonstrated by using the dual channel vertical plug-in and slowing the 5B40 sweep speed to about 10 ms/div. Pushing the button in selects the chopped mode.

Use the chopped mode for viewing slower dual-trace displays and the alternate mode for faster displays. Return the vertical plug-in to a single channel display.

### MAGNIFIED SWEEP

Press the SWP MAG button and notice the sweep speed increase, by an order of magnitude. This is shown on the SECONDS/DIV dial and the crt readout, if the mainframe is so equipped.

### LINE AND EXTERNAL TRIGGERING

If the waveform viewed is line-frequency related, push the button labeled LINE in the green TRIGGERING SOURCE column. The signal activating the trigger circuits in this mode is taken from the power line.

External triggers may be applied to the EXT TRIG INPUT connector. Push the button labeled EXT in the green TRIGGERING SOURCE column.

### EXTERNAL HORIZONTAL AMPLIFIER

To use the 5B40 as an amplifier, rotate the SECONDS/DIV switch fully ccw to the AMPL position and push the EXT button in the green area. Apply the calibrator waveform to the BNC connector marked EXT HORIZ AMPL. Two dots, approximately eight divisions apart, are visible. The AC COUPL pushbutton must be out. There is no front-panel gain adjustment for the external horizontal amplifier. If an attenuator probe is used, adjust the compensation of the probe for minimum horizontal overshoot or undershoot on the two dots. When the AC COUPL pushbutton is in, the signal to the external horizontal amplifier is ac coupled.

## REPACKAGING FOR SHIPMENT

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

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

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

The carton test strength for your instrument is 200 pounds.

## SPECIFICATIONS

### SWEEP ACCURACY:

(Measured in a 5400 series oscilloscope over the center eight: graticule divisions. Valid for 100 div of the magnified sweep after the first 30 ns.)

	+15°C to 35°C		0°C to +50°C	
	Unmag	Mag	Unmag	Mag
1 s/div to 0.5 μs/div	3%	4%	4%	5.5%
5 s/div and 2 s/div 0.2 μs/div and 0.1 μs/div	4%	5%	5%	6.5%
Any two divisions within the center 8 divisions	6.5%	6.5%	8%	8%

TRIGGERING:			
Coupling	Frequency Range <sup>1</sup>	Minimum Signal Required	
		Intl	Ext
DC	DC to 10 MHz	0.4 div	60 mV
	10 MHz to 60 MHz	1.0 div	150 mV
	DC to 2 MHz	0.4 div	
AC	Requirements increase below 50 Hz		
LF REJ	Requirements increase below 20kHz		
HF REJ	Requirements increase above 30 kHz		

<sup>1</sup>On internal triggering only, frequency range is limited to the specified bandwidth of the vertical amplifier plug-in used.

### VARIABLE RANGE:

Continuously variable between calibrated sweep rates. Extends sweep rate to at least 12.5 s/div.

### INTERNAL TRIGGER LEVEL RANGE:

≥ ±8 div.

### SINGLE SWEEP:

Same requirements as main sweep.

### EXTERNAL TRIGGER INPUT:

Maximum input voltage: 350 V dc + peak ac, 350 V p-p ac at ≤ 1 kHz.

Input R and C: 1 MΩ ±2%, paralleled by ≈24 pF.

Trigger Level Range: ≥ ±1.5 V.

### EXTERNAL HORIZONTAL INPUT:

Deflection Factor: 50 mV/div ±3%.

Input R and C: 1 MΩ ±2% paralleled by ≈24 pF.

### Bandwidth:

dc Coupled: dc to ≥ 2 MHz.

ac Coupled: ≤ 50 Hz to ≥ 2 MHz.

Maximum Input Voltage: 350 V dc + peak ac, 350 V p-p ac at ≤ 1 kHz.

# THEORY OF OPERATION

## INTRODUCTION

Use the schematic diagrams, block diagram, waveform diagrams, all in the pull-out pages in the rear of this manual, and this discussion to understand the operation of the 5B40.

## TRIGGER AND EXTERNAL HORIZONTAL INPUT AMPLIFIER

Trigger signals from the left and right vertical compartments in the main frame pass through their appropriate switches (S100) to the input of fet Q120. R109 and R110 combine with resistors in the mainframe to provide fifty-ohm terminations for the trigger lines. R105 and R107 are dividers for the ac line voltage used in the line trigger mode. C105 acts as a low-pass filter, keeping noise from affecting the triggering. The external horizontal input is applied through a compensated attenuator, (R100, R102, R116, C100, C115 and C116) to the gate of fet Q120 when S100 is in the proper position. All of the inputs are grounded when not in use.

S110A provides ac coupling by placing C112 and C114 in series with the gate of Q120 in the AC COUPL mode. R125 provides dc balance for the amplifier circuit through Q124. VR120, VR122, CR120 and CR122 provide over-voltage protection for this circuitry. CR124 shifts the voltage level at the base of Q130, causing its emitter to rest at approximately zero voltage with no signal. The signal is fed to Q130, an emitter follower. The emitter of Q130 drives the trigger comparator amplifier through S280-1. This switch opens when the external horizontal amplifier is used. Output is then taken from R130 and fed directly to Q310. In the LF REJ position, C130 is placed in series with Q130 and Q135. This capacitor, in conjunction with R132, acts as a high-pass filter above about 7.5 kHz.

## TRIGGER COMPARATOR

This circuitry selects the voltage level on the waveform where triggering takes place. Q135 and Q140 serve as a voltage comparator. The triggering signal is applied to the base of Q135. The dc level at the base of Q140 is set by R160, the TRIGGERING LEVEL control. If the voltage at the base of Q135 is higher, current flows through Q135 and the collector of Q140 is high. The opposite is true if the base voltage of Q135 is lower, and the collector of Q140 is low. C133 and C140 are switched in the circuit in the HF REJ position. C133 prevents signals above about 50 kHz from reaching the base of Q135, while C140 attenuates the triggering signal between the collectors of the comparator transistors.

## TRIGGER GENERATOR

U165, an integrated circuit, converts the trigger signal from the trigger comparator to a gate waveform used for sweep control. With pin 1 connected to ground (+ SLOPE), a positive going waveform (3 to 4 V) on the input (pin 13) causes pin 3 (output) to rise to about 4.1 V and pin 4 (output) to drop to about 3.2 V. Pin 14 is negative going under the above conditions. The output gate occurs when pins 13 and 14 are within about 20 mV of each other. Placing pin 1 at +5 V (- SLOPE) causes a gate output at pins 3 and 4 when pin 13 is negative going and pin 14 positive going. After completion of the sweep, during holdoff time, pins 6 and 10 are high (about -4.2 V). This inhibits the trigger generator until these pins drop to about 3.2 V after holdoff time.

## SWEEP CONTROL

U175, with additional external circuitry, controls the sweep generator. In the automatic triggering mode, pin 19 of U175 is grounded. If pins 1 and 2 of U175 receive no trigger gates from the trigger generator for a period of time determined by R214 and C214, circuitry in U175 outputs a negative-going square-wave. This negative-going square-wave from pin 3 drives the base of Q218 negative. The collector goes positive and stays positive for the duration of the sweep.

When the sweep operates in the triggered mode, a negative pulse from the trigger generator to the base of Q218 also causes the collector of Q218 to go positive. This starts the sweep. In the single sweep mode, pin 12 is connected to +5 V and pin 19 is ungrounded. When the sweep is armed, pins 7 and 11 of U175 are low. This causes the collector of Q190 to rest near -5 V, lighting the TRIG'D READY lamp. This action at pins 7 and 11 also occurs when the sweep is in the triggered mode. The current through DS186 and R186 is not sufficient to allow DS186 to emit visible light, but enough to prevent high currents at turn on.

When pin 18 is at +5 V, -1 V, the sweep is disabled. When the voltage is at 0 V, -1 V, the sweep is enabled. This occurs through action at the anode of CR182 from the mainframe, through CR184 and the RESET button or in the external horizontal amplifier mode, through S280-9 and CR230. The sweep is disabled when the RESET button is held closed to prevent transients from falsely triggering the sweep in the single sweep mode.

## Theory of Operation—5B40

Pin 17 outputs the lockout waveform. This connects to the trigger generator preventing this circuit from generating sweep gating waveforms during holdoff times or after a single sweep has occurred. The trigger generator must be disabled as the triggering waveform, in the triggered mode, passes through R225 and C225 to the base of Q218. U175 controls Q218 only in the automatic mode of operation.

Holdoff time begins at the peak of the sweep ramp. It is necessary to allow the sweep circuits to return completely to quiescent conditions before the next sweep starts. The capacitors and resistors connected to pin 8 of U175 determine the holdoff time. They are switched depending on the sweep speed. Holdoff time starts when pin 16 of U175 reaches about 2.4 V.

### SWEEP GENERATOR

The sweep ramp is generated in U260 during the time pin 1 is high. The ramp is fed to the horizontal amplifiers from pin 8. Timing capacitors C, and timing resistors R, determine the rate of rise. R270 and R272 set the voltage (10 V) at one half of a comparator in U260. The other half is connected internally to the sweep ramp. When the ramp voltage reaches the voltage on pin 6, pin 4 goes high, providing end of sweep information for U175, pin 16, through CR267.

The waveform at the collector of Q218 also operates the unblanking circuitry through CR252 and Q245 during sweep time. When pin 4 of U260 goes high at the end of the sweep, Q290 conducts. This assures that the crt is blanked at the start of retrace. The crt is also unblanked by connecting the anode of CR255 to +5 V via S280-9 in the external horizontal operating mode. Under these conditions, the sweep is also disabled through CR230 and pin 18 of U175, as described previously. The pulse at the collector of Q218, through Q250, provides end of sweep information to vertical multi-trace plug-ins when used in the alternate sweep modes.

### OUTPUT BUFFER

The sweep ramp is applied to the base of Q360. Q360 and Q335 compose an emitter-coupled paraphase buffer amplifier for the sweep ramp. In the magnified mode, emitter degeneration is reduced, resulting in a ten times

increase in gain. The collectors of Q335 and Q360 are current starved so that their voltage excursions are limited to about 1.2 V maximum. Q340 is a constant current source. Sweep positioning is accomplished by varying the current balance in the amplifier at the base of Q335. When the plug-in is operated in the external amplifier mode, the junction of R329 and R330 is grounded, thus eliminating the effect of the position control on the base of Q335.

### EXTERNAL HORIZONTAL AMPLIFIER

Q300, Q310, and Q312 form the external horizontal amplifier. This configuration is an operational amplifier. The base of Q310 is the + input, the base of Q312 is the - input. R320 is  $R_f$ , and R315 and R317 make up R. Output is taken from the collector of Q300 to the + sweep output terminal. Positioning voltage is applied to the - input. When the 5B40 is not operating in the external horizontal mode Q310 and Q312 are disabled by raising their emitters to about 2.5 V through CR310 and S280-2.

### READOUT

The SECONDS/DIV, CAL and SWP MAG switches have contacts wired into the readout circuitry. A zero to -15 V pulse, approximately 125  $\mu$ s in length, is applied at different times to all of the rear interface connectors associated with the readout circuitry, except the two column and row lines. These are the output lines. The readout circuitry, in the 5B40, sets the correct amount of current, to the appropriate channel row and column lines during the pulse time, for the particular character desired. See the mainframe manual for more details on the time slot and current required for each character. Opening S280-10 in the AMPL mode disables the sweep readout. When the MAG button is depressed, the readout shows the time per division reduced by an order of magnitude. When the CAL knob is not in its detent position, the uncalibrated sign > appears in front of the sweep rate information. Diodes CR370 through CR376, and CR378 connected to the time slot lines, decouple noise pulses generated in the mainframe readout circuitry.

### TIMING SWITCH DETAILS

Timing capacitors and resistors are connected according to the switching chart shown on Schematic 4. The CAL potentiometer varies the timing resistance in any position of the SECONDS/DIV switch. Neons DS390 and DS391 illuminate the SECONDS/DIV knob skirt.

# SERVICE INFORMATION

## Symbols and Reference Designators

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

- Capacitors = Values one or greater are in picofarads (pF).  
Values less than one are in microfarads (μF).
- Resistors = Ohms (Ω).

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

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

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

Abbreviations are based on ANSI Y1.1-1972.

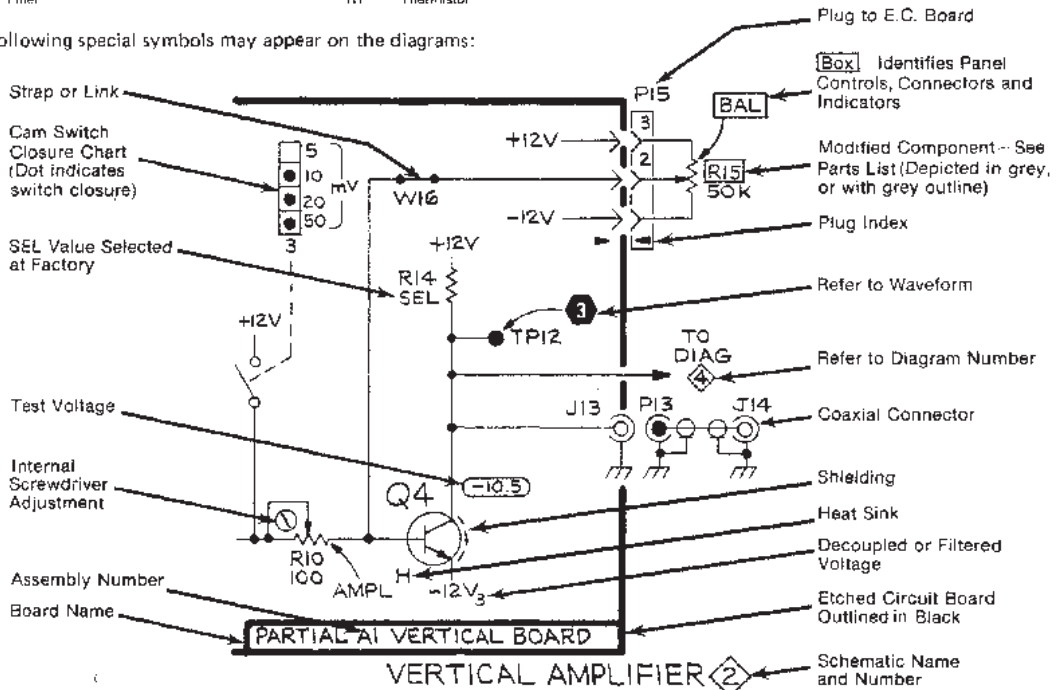
Other ANSI standards that are used in the preparation of diagrams by Tektronix, Inc. are:

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

The following prefix letters are used as reference designators to identify components or assemblies on the diagrams.

A	Assembly, separable or repairable (circuit board, etc)	H	Heat dissipating device (heat sink, heat radiator, etc)	S	Switch or contactor
AT	Attenuator, fixed or variable	HR	Heater	T	Transformer
B	Motor	HY	Hybrid circuit	TC	Thermocouple
B <sup>-</sup>	Battery	J	Connector, stationary portion	TP	Test point
C	Capacitor, fixed or variable	K	Relay	U	Assembly, inseparable or non-repairable (integrated circuit, etc.)
CB	Circuit breaker	L	Inductor, fixed or variable	V	Electron tube
CP	Diode, signal or rectifier	M	Meter	VR	Voltage regulator (zener diode, etc.)
DL	Delay line	P	Connector, movable portion	W	Wirestrap or cable
DS	Indicating device (lamp)	Q	Transistor or silicon-controlled rectifier	Y	Crystal
E	Spark Gap, Ferrite bead	R	Resistor fixed or variable	Z	Phase shifter
F	Fuse	RT	Thermistor		
FL	Filter				

The following special symbols may appear on the diagrams:



# REPLACEABLE ELECTRICAL PARTS

## PARTS ORDERING INFORMATION

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

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

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

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

## SPECIAL NOTES AND SYMBOLS

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

### ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H8-1 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	SEMIGOND	SEMICONDUCTOR
ELECTLT	ELECTROLYTIC	SENS	SENSITIVE
ELEC	ELECTRICAL	VAR	VARIABLE
INCAND	INCANDESCENT	WW	WIREWOUND
LED	LIGHT EMITTING DIODE	XFMR	TRANSFORMER
NONWIR	NON WIREWOUND	XTAL	CRYSTAL



Replaceable Electrical Parts—5B40

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
00853	SANGAMO ELECTRIC CO., S. CAROLINA DIV.	P.O. BOX 128	PICKENS, SC 29671
01121	ALLEN-BRADLEY COMPANY	1201 2ND STREET SOUTH	MILWAUKEE, WI 53204
04713	MOTOROLA, INC., SEMICONDUCTOR PROD. DIV.	5005 E MCDOWELL RD. PO BOX 20923	PHOENIX, AZ 85038
07253	FAIRCHILD SEMICONDUCTOR, A DIV. OF FAIRCHILD CAMERA AND INSTRUMENT CORP.	464 ELLIS STREET	MOUNTAIN VIEW, CA 94042
12697	CLAROSTAT MFG. CO., INC.	LOWER WASHINGTON STREET	DOVER, NH 03820
12969	UNITRODE CORPORATION	580 PLEASANT STREET	WATERTOWN, MA 02172
13511	AMPHENOL CARDRE DIV., BUNKER RAMO CORP.		LOS GATOS, CA 95030
14552	MICRO SEMICONDUCTOR CORP.	2830 E FAIRVIEW ST.	SANTA ANA, CA 92704
19701	ELECTRA-MIDLAND CORP., MEPCO ELECTRA INC.	P O BOX 760	MINERAL WELLS, TX 76067
22229	SOLITRON DEVICES, INC., SEMICONDUCTOR GROUP	8808 BALBOA AVENUE	SAN DIEGO OPERS, CA 92123
24546	CORNING GLASS WORKS, ELECTRONIC COMPONENTS DIVISION	550 HIGH STREET	BRADFORD, PA 16701
31918	IEE/SCHADOW INC.	8081 WALLACE ROAD	EDEN PRAIRIE, MN 55343
32997	BOURNS, INC., TRIMPOT PRODUCTS DIV.	1200 COLUMBIA AVE.	RIVERSIDE, CA 92507
50434	HEWLETT-PACKARD COMPANY	540 PAGE MILL ROAD	PALO ALTO, CA 94304
52769	SPRAGUE GOODMAN ELEC., INC.	134 FULTON AVENUE	GARDEN CITY PARK, NY 11040
53944	ELT INC., GLOW LITE DIVISION	BOX 698	PAULS VALLEY, OK 73075
56289	SPRAGUE ELECTRIC CO.	87 MARSHALL ST.	NORTH ADAMS, MA 01247
57668	R-OHM CORP.	16931 MILLIKEN AVE.	IRVINE, CA 92713
53660	TUSONIX INC.	2155 N FORBES BLVD	TUCSON, AZ 85705
59821	CENTRALAB INC SUB NORTH AMERICAN PHILIPS CORP	7158 MERCHANT AVE	EL PASO, TX 79915
71590	CENTRALAB ELECTRONICS, DIV. OF GLOBE-UNION, INC.	P O BOX 858	FORT DODGE, IA 50501
71744	CHICAGO MINIATURE LAMP WORKS	4433 RAVENSWOOD AVE.	CHICAGO, IL 60640
73138	BECKMAN INSTRUMENTS, INC., HELIPOT DIV.	2500 HARBOR BLVD.	FULLERTON, CA 92634
74970	JOHNSON, E. F., CO.	299 10TH AVE. S. W.	WASECA, MN 56093
75042	TRW ELECTRONIC COMPONENTS, IRC FIXED RESISTORS, PHILADELPHIA DIVISION	401 N. BROAD ST.	PHILADELPHIA, PA 19108
76493	BELL INDUSTRIES, INC., MILLER, J. W., DIV.	19070 REYES AVE., P O BOX 5825	COMPTON, CA 90224
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
90201	MALLORY CAPACITOR CO., DIV. OF P. R. MALLORY AND CO., INC.	3029 E. WASHINGTON STREET P. O. BOX 372	INDIANAPOLIS, IN 46206
91637	DALE ELECTRONICS, INC.	P. O. BOX 609	COLUMBUS, NE 68601
92956	SYLVANIA MINIATURE LIGHTING PRODUCTS, INC., SUB OF GTE SYLVANIA, LIGHT. PROD.	525 ELM STREET	KEARNY, NJ 07032
T0058	NEC ELECTRON INC.	252 HUMBOLT COURT	SUNNYVALE, CA 94086

Replaceable Electrical Parts—5B40

Ckt No.	Tektronix	Serial/Model No		Name & Description	Mfr Code	Mfr Part Number
	Part No.	Eff	Discont			
A1	670-2543-00	B010100	B021634	CKT BOARD ASSY:MAIN	80009	670-2543-00
A1	670-2543-01	9021635	B029999	CKT BOARD ASSY:MAIN	80009	670-2543-01
A1	670-2543-02	B030000	B039999	CKT BOARD ASSY:MAIN	80009	670-2543-02
A1	670-2543-03	B040000	B044252	CKT BOARD ASSY:MAIN	80009	670-2543-03
A1	670-2543-04	B044253	B044468	CKT BOARD ASSY:MAIN	80009	670-2543-04
A1	670-2543-05	B044469		CKT BOARD ASSY:MAIN	80009	670-2543-05
C100	281-0511-00			CAP.,FXD,CER DI:22PF,+/-2.2PF,500V	59660	301-000C0G022DK
C105	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCCEX
C112	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCCEX
C114	283-0001-00			CAP.,FXD,CER DI:0.005UF,+100-0%,500V	59821	2DDH61L502P
C115	281-0504-00			CAP.,FXD,CER DI:10PF,+/-1PF,500V	59660	301000C0G0100F
C116	281-0207-00			CAP.,VAR,PLSTC:2-18PF,100V	52769	GXA 18000
C118	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C124	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C130	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCCEX
C133	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCCEX
C135	281-0524-00			CAP.,FXD,CER DI:150PF,+/-30PF,500V	59660	301000X5U151M
C137	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C140	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCCEX
C145	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCCEX
C146	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C152	281-0524-00			CAP.,FXD,CER DI:150PF,+/-30PF,500V	59660	301000X5U151M
C154	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCCEX
C165	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C167	281-0605-00			CAP.,FXD,CER DI:200PF,10%,500V	59660	301000Y5D201K
C169	281-0528-00			CAP.,FXD,CER DI:82PF,+/-8.2PF,500V	59660	301-000U2M0820K
C190	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C195	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C197	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C200	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C205	281-0523-00			CAP.,FXD,CER DI:100PF,+/-20PF,500V	59660	301-000U2M0101M
C208	281-0605-00			CAP.,FXD,CER DI:200PF,10%,500V	59660	301000Y5D201K
C210	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C212	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCCEX
C214	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C220	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C225	281-0546-00			CAP.,FXD,CER DI:330PF,10%,500V	59660	301000X5P331K
C232	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCCEX
C240	281-0516-00			CAP.,FXD,CER DI:39PF,+/-3.9PF,500V	59660	301-000U2J0390K
C248	281-0546-00			CAP.,FXD,CER DI:330PF,10%,500V	59660	301000X5P331K
C260	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCCEX
C262	281-0523-00			CAP.,FXD,CER DI:100PF,+/-20PF,500V	59660	301-000U2M0101M
C263	281-0523-00			CAP.,FXD,CER DI:100PF,+/-20PF,500V	59660	301-000U2M0101M
C272	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCCEX
C275	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C280	295-0143-00			CAP.,SET,MTCHD:10UF,0.1UF,0.001UF	80009	295-0143-00
C282	-----			(PART OF C280)		
C283	-----			(PART OF C280)		
C285	283-0631-00			CAP.,FXD,MICA D:95PF,1%,500V	00853	D155F950F0
C286	281-0080-00			CAP.,VAR,AIR DI:1.7-11PF,800V	74970	189-0505-075
C304	281-0546-00			CAP.,FXD,CER DI:330PF,10%,500V	59660	301000X5P331K
C310	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCCEX
C312	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C320	281-0516-00			CAP.,FXD,CER DI:39PF,+/-3.9PF,500V	59660	301-000U2J0390K

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Ckt No.	Tektronix Part No.	Serial/Model No.		Name & Description	Mfr Code	Mfr Part Number
		Eff	Discont			
C329	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C345	281-0546-00	B021635		CAP.,FXD,CER DI:330PF,10%,500V	59660	301000X5P331K
C348	281-0504-00			CAP.,FXD,CER DI:10PF,+/-1PF,500V	59660	301000C0G0100F
C390	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDC6X
CR120	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR121	152-0141-02	B044469		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR122	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR124	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR178	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR180	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR182	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR184	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR195	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR205	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR216	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR230	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR240	152-0141-02	B010100	B044252	SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR240	152-0322-00	B044253		SEMICON DEVICE:SILICON,15V,HOT CARRIER	50434	5082-2672
CR248	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR252	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR253	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR255	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR267	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR310	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR370	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR371	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR372	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR373	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR374	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR375	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR376	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR378	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
DS186	150-0046-00			LAMP,INCAND:10V,0.04A	71744	CM2107
DS390	150-0111-00	B010100	B029999	LAMP,GLOW:NEON,1.2MA	53944	A1B-3
DS390	150-0130-00	B030000		LAMP,INCAND:5V,60MA	92966	34254-TINNED
DS391	150-0111-00	B010100	B029999	LAMP,GLOW:NEON,1.2MA	53944	A1B-3
DS391	150-0130-00	B030000		LAMP,INCAND:5V,60MA	92966	34254-TINNED
J100	131-0955-00			CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
LR137	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
LR146	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
LR165	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
LR200	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
LR275	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
LR312	108-0245-00			COIL,RF:3.9UH	76493	B6310-1
Q120	151-1042-00			SEMICON DVC SE:MATCHED PAIR FET	22229	S2089
Q124	-----			(PART OF Q120)		
Q130	151-0188-00			TRANSISTOR:PNP,SI,TO-92	T0058	2N3906
Q135	151-0190-00			TRANSISTOR:NPN,SI,TO-92	04713	SPS7969
Q140	151-0190-00			TRANSISTOR:NPN,SI,TO-92	04713	SPS7969
Q190	151-0342-00			TRANSISTOR:SILICON,PNP	07263	S035928
Q218	151-0188-00			TRANSISTOR:PNP,SI,TO-92	T0058	2N3906
Q240	151-0190-00			TRANSISTOR:NPN,SI,TO-92	04713	SPS7969
Q245	151-0195-00			TRANSISTOR:SILICON,NPN	04713	SPS8800
Q250	151-0188-00			TRANSISTOR:PNP,SI,TO-92	T0058	2N3906
Q300	151-0342-00			TRANSISTOR:SILICON,PNP	07263	S035928

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Ckt No.	Tektronix Part No.	Serial/Model No.		Name & Description	Mfr Code	Mfr Part Number
		Eff	Dscont			
Q310	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SP56919
Q312	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SP56919
Q335	151-0188-00			TRANSISTOR:PNP,SI,TO-92	T0058	2N3906
Q340	151-0188-00			TRANSISTOR:PNP,SI,TO-92	T0058	2N3906
Q360	151-0188-00			TRANSISTOR:PNP,SI,TO-92	T0058	2N3906
R100	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	57668	NTR25J-E220E
R102	322-0464-00			RES.,FXD,FILM:665K OHM,1%,0.25W	75042	CEBT0-6653F
R105	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	57668	NTR25J-E06K8
R107	315-0513-00			RES.,FXD,CMPSN:51K OHM,5%,0.25W	57668	NTR25J-E51K0
R109	321-0078-00			RES.,FXD,FILM:63.4 OHM,1%,0.125W	91637	MFF1816G63R40F
R110	321-0078-00			RES.,FXD,FILM:63.4 OHM,1%,0.125W	91637	MFF1816G63R40F
R116	321-0435-00			RES.,FXD,FILM:332K OHM,1%,0.125W	91637	MFF1816G33202F
R118	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	57668	NTR25J-E 100E
R120	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	57668	NTR25J-E 22E
R125	311-1568-00			RES.,VAR,NONWIR:50 OHM,20%,0.50W	73138	91-90-0
R126	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	57668	NTR25J-E 100E
R130	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	57668	NTR25J-E02K7
R132	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
R133	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	57668	NTR25J-E 100E
R135	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	57668	NTR25J-E 22E
R137	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	57668	NTR25J-E03K0
R139	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	57668	NTR25J-E 22E
R142	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	57668	NTR25J-E 120E
R144	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	57668	NTR25J-E 120E
R146	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	57668	NTR25J-E200E
R150	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	57668	NTR25J-E 100E
R152	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
R154	315-0513-00			RES.,FXD,CMPSN:51K OHM,5%,0.25W	57668	NTR25J-E51K0
R160	311-0580-00	B010100	B020591	RES.,VAR,NONWIR:50K OHM,20%,0.50W	01121	W-6155
R160	311-1782-00	B020592		RES.,VAR,NONWIR:50K OHM,10%,0.50W	12697	388-CM40914
R162	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	57668	NTR25J-E 22E
R163	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	57668	NTR25J-E 22E
R165	315-0362-00			RES.,FXD,CMPSN:3.6K OHM,5%,0.25W	57668	NTR25J-E 3K6
R167	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	57668	NTR25J-E01K0
R169	315-0182-00			RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	57668	NTR25J-E1K8
R175	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	19701	5043ED1K00F
R176	321-0253-00			RES.,FXD,FILM:4.22K OHM,1%,0.125W	91637	MFF1816G42200F
R180	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	19701	5043ED1K00F
R181	321-0253-00			RES.,FXD,FILM:4.22K OHM,1%,0.125W	91637	MFF1816G42200F
R184	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
R185	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R187	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	57668	NTR25J-E 22E
R190	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	57668	NTR25J-E 22K
R192	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
R193	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	57668	NTR25J-E 15K
R195	315-0913-00			RES.,FXD,CMPSN:91K OHM,5%,0.25W	57668	NTR25J-E 91K
R197	315-0473-00			RES.,FXD,CMPSN:47K OHM,5%,0.25W	57668	NTR25J-E47K0
R200	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	57668	NTR25J-E180E
R205	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	57668	NTR25J-E150K
R208	315-0163-00			RES.,FXD,CMPSN:16K OHM,5%,0.25W	57668	NTR25J-E16K0
R214	315-0334-00			RES.,FXD,CMPSN:330K OHM,5%,0.25W	01121	CB3345
R216	315-0473-00			RES.,FXD,CMPSN:47K OHM,5%,0.25W	57668	NTR25J-E47K0
R218	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	57668	NTR25J-E01K0
R220	301-0391-00			RES.,FXD,CMPSN:390 OHM,5%,0.5W	01121	EB3915

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Ckt No.	Tektronix Part No.	Serial/Model No.		Name & Description	Mfr Code	Mfr Part Number
		Eff	Discont			
R225	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R230	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	57668	NTR25J-E06K8
R232	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
R235	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	57668	NTR25J-E01K0
R236	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	57668	NTR25J-E02K7
R240	315-0911-00			RES.,FXD,CMPSN:910 OHM,5%,0.25W	57668	NTR25J-E910E
R242	315-0271-00	B010100	B044252	RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R242	315-0680-00	B044253		RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	57668	NTR25J-E68E0
R243	315-0751-00	B010100	B044252	RES.,FXD,CMPSN:750 OHM,5%,0.25W	57668	NTR25J-E750E
R243	315-0911-00	B044253		RES.,FXD,CMPSN:910 OHM,5%,0.25W	57668	NTR25J-E910E
R245	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R248	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
R250	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	57668	NTR25J-E03K0
R255	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	57668	NTR25J-E06K8
R260	315-0621-00			RES.,FXD,CMPSN:620 OHM,5%,0.25W	57668	NTR25J-E620E
R262	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	57668	NTR25J-E 100E
R265	315-0362-00			RES.,FXD,CMPSN:3.6K OHM,5%,0.25W	57668	NTR25J-E 3K6
R267	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	57668	NTR25J-E 22K
R270	321-0368-00			RES.,FXD,FILM:107K OHM,1%,0.125W	91637	MFF1816G10702F
R272	321-0358-00	B010100	B021514	RES.,FXD,FILM:52.3K OHM,1%,0.125W	91637	MFF1816G52301F
R272	321-0365-00	B021515		RES.,FXD,FILM:61.9K OHM,1%,0.125W	91637	MFF1816G61901F
R275	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	57668	NTR25J-E06K8
R278	315-0473-00			RES.,FXD,CMPSN:47K OHM,5%,0.25W	57668	NTR25J-E47K0
R279	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	57668	NTR25J-E01K0
R280	315-0330-00	B021515		RES.,FXD,CMPSN:33 OHM,5%,0.25W	57668	NTR25J-E 33E
R283	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	57668	NTR25J-E 10E0
R285	323-0498-03			RES.,FXD,FILM:1.5M OHM,0.25%,0.50W	91637	HFF12915003C
R286	323-0498-03			RES.,FXD,FILM:1.5M OHM,0.25%,0.50W	91637	HFF12915003C
R287	321-0917-03			RES.,FXD,FILM:27.2K OHM,0.25%,0.125W	91637	CMF55116D27201C
R288	321-0856-03			RES.,FXD,FILM:330K OHM,0.25%,0.125W	91637	CMF55116D33002C
R289	321-0200-00			RES.,FXD,FILM:1.19K OHM,1%,0.125W	91637	CMF55116G11800F
R290	321-0830-03			RES.,FXD,FILM:2.41K OHM,0.25%,0.125W	91637	MFF1816D24100C
R291	321-0827-03			RES.,FXD,FILM:3.61K OHM,0.25%,0.125W	91637	MFF1816D36100C
R292	321-0268-03			RES.,FXD,FILM:6.04K OHM,0.25%,0.125W	91637	MFF1816D60400C
R293	321-0234-00			RES.,FXD,FILM:2.67K OHM,1%,0.125W	91637	MFF1816G26700F
R294	315-0124-00			RES.,FXD,CMPSN:120K OHM,5%,0.25W	57668	NTR25J-E 120K
R295	311-1402-00			RES.,VAR, NONWIR:20K OHM,20%,0.50W	01121	10M921
R295	—			(PART OF S378)		
R296	321-0289-00			RES.,FXD,FILM:10K OHM,1%,0.125W	91637	MFF1816G10001F
R297	321-0164-00			RES.,FXD,FILM:499 OHM,1%,0.125W	91637	CMF55116G499R0F
R300	315-0911-00			RES.,FXD,CMPSN:910 OHM,5%,0.25W	57668	NTR25J-E910E
R302	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	57668	NTR25J-E220E
R304	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	57668	NTR25J-E 120E
R308	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	57668	NTR25J-E 22K
R310	315-0621-00			RES.,FXD,CMPSN:620 OHM,5%,0.25W	57668	NTR25J-E620E
R312	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
R314	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
R315	311-1566-00			RES.,VAR, NONWIR:200 OHM,20%,0.50W	73138	91-88-0
R317	321-0172-00			RES.,FXD,FILM:504 OHM,1%,0.125W	91637	CMF55116G604R0F
R320	321-0208-00			RES.,FXD,FILM:1.43K OHM,1%,0.125W	91637	MFF1816G14300F
R323	321-0342-00			RES.,FXD,FILM:35.7K OHM,1%,0.125W	91637	MFF1816G35701F
R325	311-0310-00	B010100	8020591	RES.,VAR, NONWIR:5K OHM,20%,0.50W	01121	W-7350A
R325	311-1783-00	B020592		RES.,VAR, NONWIR:5K OHM,10%,0.50W	12697	388-CM40915
R329	321-0269-00			RES.,FXD,FILM:5.19K OHM,1%,0.125W	91637	MFF1816G61900F

Replaceable Electrical Parts—5B40

Ckt No.	Tektronix Part No.	Serial/Model No.		Name & Description	Mfr Code	Mfr Part Number
		Eff	Discont			
R330	321-0172-00			RES.,FXD,FILM:604 OHM,1%,0.125W	91637	CMF55116G604R0F
R332	321-0210-00			RES.,FXD,FILM:1.5K OHM,1%,0.125W	91637	MFF1816G15000F
R334	321-0283-00			RES.,FXD,FILM:8.68K OHM,1%,0.125W	91637	CMF55116G86800F
R335	321-0259-00			RES.,FXD,FILM:4.87K OHM,1%,0.125W	91637	MFF1816G48700F
R337	321-0098-00			RES.,FXD,FILM:102 OHM,1%,0.125W	91637	MFF1816G102R0F
R340	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	57668	NTR25J-E 100E
R341	322-0229-00			RES.,FXD,FILM:2.37K OHM,1%,0.25W	75042	CEBT0-2371F
R342	321-0222-00			RES.,FXD,FILM:2K OHM,1%,0.125W	91637	MFF1816G20000F
R344	321-0231-00			RES.,FXD,FILM:2.49K OHM,1%,0.125W	91637	MFF1816G24900F
R345	311-1562-00			RES.,VAR, NONWIR:TRMR,2K OHM,0.5W	32997	3352T-1-202
R346	315-0512-00	B021635		RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
R348	321-0108-00			RES.,FXD,FILM:130 OHM,1%,0.125W	91637	CMF55116G13000F
R350	311-1568-00			RES.,VAR, NONWIR:50 OHM,20%,0.50W	73138	91-90-0
R352	321-0222-00			RES.,FXD,FILM:2K OHM,1%,0.125W	91637	MFF1816G20000F
R355	321-0230-00			RES.,FXD,FILM:2.43K OHM,1%,0.125W	24546	CT552431F
R356	321-0331-00			RES.,FXD,FILM:27.4K OHM,1%,0.125W	91637	MFF1816G27401F
R357	321-0230-00			RES.,FXD,FILM:2.43K OHM,1%,0.125W	24546	CT552431F
R360	321-0259-00			RES.,FXD,FILM:4.87K OHM,1%,0.125W	91637	MFF1816G48700F
R362	321-0098-00			RES.,FXD,FILM:102 OHM,1%,0.125W	91637	MFF1816G102R0F
R370	315-0513-00			RES.,FXD,CMPSN:51K OHM,5%,0.25W	57668	NTR25J-E51K0
R371	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	57668	NTR25J-E75K0
R372	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	57668	NTR25J-E150K
R373	321-0344-00			RES.,FXD,FILM:37.4K OHM,1%,0.125W	91637	MFF1816G37401F
R374	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	57668	NTR25J-E150K
R375	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	57668	NTR25J-E150K
R376	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	57668	NTR25J-E75K0
R377	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	57668	NTR25J-E150K
R378	315-0133-00			RES.,FXD,CMPSN:13K OHM,5%,0.25W	57668	NTR25J-E 13K
R379	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	57668	NTR25J-E75K0
R380	315-0134-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	57668	NTR25J-E150K
R381	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	57668	NTR25J-E150K
R382	321-0344-00			RES.,FXD,FILM:37.4K OHM,1%,0.125W	91637	MFF1816G37401F
R383	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	57668	NTR25J-E75K0
R384	315-0513-00			RES.,FXD,CMPSN:51K OHM,5%,0.25W	57668	NTR25J-E51K0
R390	315-0913-00	B010100	B029999	RES.,FXD,CMPSN:91K OHM,5%,0.25W	57668	NTR25J-E 91K
R390	315-0270-00	B030000		RES.,FXD,CMPSN:27 OHM,5%,0.25W	57668	NTR25J-E 27E
R391	315-0102-00	B040000		RES.,FXD,CMPSN:1K OHM,5%,0.25W	57668	NTR25JEC1K0
S100	260-1381-00			SWITCH,PUSH:4 STA, NON-SHORT,INTLK	71590	2KBC040000-618
S110	260-1618-00			SWITCH,PUSH:4 STA,2 POLE,PUSH-PUSH & MO	71590	2KBM040000-XXX
S130	260-1448-00			SWITCH,PUSH:3 STA, NON-SHORT	59821	2KBB030000-638
S280	263-1083-00			ACTR ASSY,CAM S:ATTENUATOR	80009	263-1083-00
S340	260-1209-00			SWITCH,PUSH:4PDT,1A,25VDC	31918	601347
S378	-----			(PART OF R295)		
S395	260-1211-00			SWITCH,PUSH:1A,28VDC	31918	601348
U165	155-0109-00	B010100	B021739	MICROCIRCUIT,LI:MONOLITHIC,TRIG	80009	155-0109-00
U165	155-0109-01	B021740		MICROCIRCUIT,LI:MONOLITHIC TRIGGER	80009	155-0109-01
U175	155-0049-01	B010100	B032162	MICROCIRCUIT,DI:MONOLITHIC,SWEEP CONTROL	80009	155-0049-01
U175	155-0049-02	B032163		MICROCIRCUIT,DI:SWEEP CONTROL,W/LOCKOUT	80009	155-0049-02
U260	155-0042-03	B010100	B042714	MICROCIRCUIT,LI:MILLER INTEGRATOR	80009	155-0042-03
U260	155-0028-00	B042715		MICROCIRCUIT,LI:ML,MILLER INTEGRATOR	80009	155-0028-00
VR120	152-0278-00			SEMICOND DEVICE,ZENER,0.4W,3V,5%	04713	SZG35009K20
VR122	152-0278-00			SEMICOND DEVICE,ZENER,0.4W,3V,5%	04713	SZG35009K20
VR220	152-0226-00	B010100	B010130	SEMICOND DEVICE,ZENER,0.4W,5.1V,5%	14552	TD3810980
VR220	153-0059-00	B010131		SEMICOND DVC,SE:ZENER,0.4W,4.75V,5%,SEL	80009	153-0059-00

# REPLACEABLE MECHANICAL PARTS

## PARTS ORDERING INFORMATION

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

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

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

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

## SPECIAL NOTES AND SYMBOLS

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

## FIGURE AND INDEX NUMBERS

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

## INDENTATION SYSTEM

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

```

1 2 3 4 5           Name & Description
Assembly and/or Component
Attaching parts for Assembly and/or Component
    - - - * - - -
Detail Part of Assembly and/or Component
Attaching parts for Detail Part
    - - - * - - -
Parts of Detail Part
Attaching parts for Parts of Detail Part
    - - - * - - -
  
```

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

Attaching parts must be purchased separately, unless otherwise specified.

## ITEM NAME

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

## ABBREVIATIONS

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

Replaceable Mechanical Parts—5B40

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
000CY	NORTHWEST FASTENER SALES, INC.	7923 SW CIRRHUS DRIVE	BEAVERTON, OR 97003
05820	WAKEFIELD ENGINEERING, INC.	AUDUBON ROAD	WAKEFIELD, MA 01880
09922	BURNDY CORPORATION	RICHARDS AVENUE	NORWALK, CT 06852
12327	FREEMAN CORPORATION	9301 ALLEN DRIVE	CLEVELAND, OH 44125
13511	AMPHENOL CARDRE DIV., BUNKER RAMO CORP.		LOS GATOS, CA 95030
22526	BERG ELECTRONICS, INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
45722	USM CORP., PARKER-KALON FASTENER DIV.		CAMPBELLSVILLE, KY 42718
71785	TRW, CINGH CONNECTORS	1501 MORSE AVENUE	ELK GROVE VILLAGE, IL 60007
73743	FISCHER SPECIAL MFG. CO.	446 MORGAN ST.	CINCINNATI, OH 45206
73803	TEXAS INSTRUMENTS, INC., METALLURGICAL MATERIALS DIV.	34 FOREST STREET	ATTLEBORO, MA 02703
77900	SHAKEPROOF		
	DIV OF ILLINOIS TOOL WORKS	SAINT CHARLES RD	ELGIN, IL 60120
78189	ILLINOIS TOOL WORKS, INC.		
	SHAKEPROOF DIVISION	ST. CHARLES ROAD	ELGIN, IL 60120
79136	WALDES KOHINCOR, INC.	47-16 AUSTEL PLACE	LONG ISLAND CITY, NY 11101
79807	WROUGHT WASHER MFG. CO.	2100 S. O BAY ST.	MILWAUKEE, WI 53207
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
83309	ELECTRICAL SPECIALITY CO., SUBSIDIARY OF BELDEN CORP.	213 E. HARRIS AVE. SOUTH	SAN FRANCISCO, CA 94080
83385	CENTRAL SCREW CO.	2530 CRESCENT DR.	BROADVIEW, IL 60153
90484	ITT, SURPRENANT DIV.	172 STERLING STREET	CLINTON, MA 01510
93807	TEXTRON INC. CAMCAR DIV	600 18TH AVE	ROCKFORD, IL 61101



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Fig. & Index No.	Tektronix Part No.	Serial/Model No.		Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number	
		Eff	Dscort										
1-1	337-1399-00			2						SHLD,ELECTRICAL:SIDE	80009	337-1399-00	
-2	366-0494-00			2						KNOB:GRAY WITH SETSCREW	80009	366-0494-00	
	213-0153-00			1						.SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR	
-3	366-1445-00	B010100	B044427	1						KNOB:GY,SEC/DIV,0.252 ID X 1.562	80009	366-1445-00	
	366-1445-01	B044428		1						KNOB:CLEAR,SEC/DIV,0.252 ID X 1	80009	366-1445-01	
	213-0153-00			2						.SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR	
-4	366-1317-00			1						KNOB:RED	80009	366-1317-00	
	213-0153-00			1						.SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR	
-5	366-1257-23			1						PUSH BUTTON:LINE	80009	366-1257-23	
-6	366-1257-24			1						PUSH BUTTON:GRAY-EXT	80009	366-1257-24	
-7	366-1257-57			1						PUSH BUTTON:GRAY-LEFT	80009	366-1257-57	
-8	366-1257-58			1						PUSH BUTTON:GRAY-RIGHT	80009	366-1257-58	
-9	366-1257-25			1						PUSH BUTTON:SWP MAG	80009	366-1257-25	
-10	366-1257-26			1						PUSH BUTTON:GRAY-AUTO TRIG	80009	366-1257-26	
-11	366-1257-27			1						PUSH BUTTON:--AC COUPL	80009	366-1257-27	
-12	366-1257-28			1						PUSH BUTTON:GRAY--+ SLOPE	80009	366-1257-28	
-13	366-1257-29			1						PUSH BUTTON:SIL GY,SINGL SWP	80009	366-1257-29	
-14	366-1257-30			1						PUSH BUTTON:GRAY-RESET	80009	366-1257-30	
-15	366-1257-31			1						PUSH BUTTON:SIL GRAY,CHOP	80009	366-1257-31	
-16	366-1402-58			1						PUSH BUTTON:SIL GY,HF REJ	80009	366-1402-58	
-17	366-1402-75			1						PUSH BUTTON:SIL GY,LF REJ	80009	366-1402-75	
-18	366-1286-02	B010100	B032382	1						KNOB:LATCH	80009	366-1286-02	
	366-1690-00	B032383		1						KNOB:SIL GY,0.53 X 0.23 X 1.059 *****[ATTACHING PARTS]*****	80009	366-1690-00	
-19	214-1840-00	B010100	B032382	1						PIN,KNOB SEC RG:0.094 OD X 0.120 INCH LONG *****[ATTACHING PARTS]*****	80009	214-1840-00	
-20	426-0681-00			13						FR.PUSH BUTTON:	80009	426-0681-00	
-21	131-0955-00			1						CONN,RCPT,ELEC:BNC,FEMALE *****[ATTACHING PARTS]*****	13511	31-279	
-22	210-0255-00			1						TERMINAL,LUG:0.391 ID,LOCKING,BRS CD PL *****[ATTACHING PARTS]*****	80009	210-0255-00	
-23	-----			1						RES.,VAR:(SEE R160 REPL) *****[ATTACHING PARTS]*****			
-24	210-0583-00			1						NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402	
-25	210-0940-00			1						WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL *****[ATTACHING PARTS]*****	79807	ORD BY DESCR	
-26	-----			1						RES.,VAR:(SEE R325 REPL) *****[ATTACHING PARTS]*****			
	210-0583-00			1						NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402	
	210-0940-00			1						WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL *****[ATTACHING PARTS]*****	79807	ORD BY DESCR	
-27	358-0029-00			1						BSHG,MACH,THD:HEX:0.375-32 X 0.438" LONG *****[ATTACHING PARTS]*****	80009	358-0029-00	
-28	210-0590-00			1						NUT,PLAIN,HEX:0.375-32 X 0.438" BRS	73743	2X28289-402	
-29	210-0978-00			1						WASHER,FLAT:0.375 ID X 0.50 INCH OD,STL	12327	ORD BY DESCR	
-30	344-0195-01	B010100	B021336	1						CLIP,ELECTRICAL:CAM SHAFT	80009	344-0195-01	
	210-0012-00			1						WASHER,LOCK:INTL:0.384 ID,INTL:0.022 TH *****[ATTACHING PARTS]*****	78189	1220-02-00-0541C	
-31	333-1662-00	B010100	B044317	1						PANEL,FRONT:	80009	333-1662-00	
	333-1662-01	B044318		1						PANEL,FRONT:	80009	333-1662-01	
-32	214-1513-01	B010100	B032382	1						LCH,PLUG-IN RET:	80009	214-1513-01	
	105-0719-00	B032383		1						LATCH,RETAINING:PLUG-IN *****[ATTACHING PARTS]*****	80009	105-0719-00	
-33	213-0254-00			1						SCREW,TPG,TF:2-32 X 0.250,100 DEG,FLH *****[ATTACHING PARTS]*****	45722	ORD BY DESCR	
	105-0718-00	B032383	B042818	1						BAR,LATCH RLSE:	80009	105-0718-00	
	105-0718-01	B042819		1						BAR,LATCH RLSE:	80009	105-0718-01	
-34	386-1915-00			1						SUBPANEL,FRONT: *****[ATTACHING PARTS]*****	80009	386-1915-00	
-35	213-0229-00			4						SCR,TPG,THD FOR:6-20 X0.375"100 DEG,FLH ST *****[ATTACHING PARTS]*****	93907	ORD BY DESCR	
-36	337-1395-00			1						SHIELD,ELEC:SUBPANEL	80009	337-1395-00	
-37	337-1430-00			2						SHIELD,LIGHT:LAMP	80009	337-1430-00	
-38	136-0431-00			2						LIGHT,INDICATOR:UW 0.244 OD LAMP	80009	136-0431-00	

Replaceable Mechanical Parts—5B40

Fig. & Index No.	Tektronix Part No.	Serial/Model No.		Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
		Eff	Dscont									
1-39	384-1060-00			1						EXTENSION SHAFT:7.831 INCH LONG	80009	384-1060-00
-40	384-1136-00			4						EXTENSION SHAFT:0.95 INCH LONG	80009	384-1136-00
-41	384-1099-00			3						EXTENSION SHAFT: PUSH BUTTON,1.54 INCH LONG	80009	384-1099-00
-42	376-0541-00			1						LENS,LIGHT:FROSTED	80009	376-0541-00
-43	162-0055-00			IN						INSUL SLVG,ELEC:0.268 ID,VINYL,0.303 OD	83309	ORD BY DESCR
	334-3448-00	B042939		1						MARKER.IDENT:MARKED NOTICE	80009	334-3448-00
-44	672-0448-00	B010100	B029999	1						CKT BOARD ASSY:TIME/CM	80009	672-0448-00
	672-0448-01	B030000		1						CKT BOARD ASSY:TIME/CM	80009	672-0448-01
										*****ATTACHING PARTS*****		
-45	213-0146-00			4						SCR,TPG,THD FOR:6-20 X 0.313 INCH,PNH STL	83385	ORD BY DESCR
										*****END ATTACHING PARTS*****		
										CKT BOARD ASSY INCLUDES:		
-46	384-0271-00			1						EXTENSION SHAFT:9.751 L X 0.125 OD STL	80009	384-0271-00
-47	376-0051-00			1						CPLG,SHAFT,FLEX:0.127 ID X 0.375 OD	80009	376-0051-00
										COUPLING SHAFT,FLEXIBLE INCLUDES:		
	354-0251-00			2						RING,COUPLING:0.251 ID X 0.375 INCH OD,A	80009	354-0251-00
-48				1						RES.,VAR.:(SEE R295 REPL)		
-49	131-0504-00			27						CONTACT,ELEC:CKT BD SW,SPR,CU BE	80009	131-0504-00
-50	136-0241-00			1						SKT,PL-IN ELEK:MICROCIRCUIT,10 CONT,PCB M	71785	133-99-12-064
-51	136-0252-04	B010100	B020829	20						SOCKET,PIN TERM:U/W 0.018-0.018 DIA PINS	22528	75060-007
	136-0634-00	B020800	B044222	1						SOCKET,PLUG-IN:20 LEAD DIP,CKT BD MTG	73803	CS9002-20
	136-0752-00	B044223		1						SKT,PL-IN ELEK:MICROCIRCUIT,20 DIP	09922	D1LB20P-108
-52	136-0260-02	B010100	B044222	1						SKT,PL-IN ELEK:MICROCIRCUIT,16 DIP,LOW CL	09922	D1LB18P-108T
	136-0729-00	B044223		1						SKT,PL-IN ELEK:MICROCKT,16 CONTACT	09922	D1LB18P-108T
-53	214-1291-00			1						HEAT SINK,ELEC:XSTR,0.72 OD X 0.375"H	05820	2075B
-54				1						SWITCH,PUSH:(SEE S340 REPL)		
-55				1						SWITCH,PUSH:(SEE S130 REPL)		
-56				1						SWITCH,PUSH:(SEE S110 REPL)		
-57	361-0382-00			10						SPACER,PB SW:BROWN,0.275 INCH LONG	80009	361-0382-00
-58				1						SWITCH,PUSH:(SEE S100 REPL)		
-59	361-0384-00			4						SPACER,PB SW:0.133L,RED POLYCARBONATE	80009	361-0384-00
-60				1						SWITCH,PUSH:(SEE S395 REPL)		
-61	361-0383-00			2						SPACER,PB SW:CHARCOAL,0.33 INCH LONG	80009	361-0383-00
	263-1083-00			1						ACTR ASSY,CAM S:ATTENUATOR	80009	263-1083-00
										*****ATTACHING PARTS*****		
-62	211-0116-00			6						SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	ORD BY DESCR
										*****END ATTACHING PARTS*****		
-63	105-0416-00			1						ACTUATOR,CAM SW:TIME/CM	80009	105-0416-00
-64	354-0219-00			1						RING,RETAINING:FOR 0.25 INCH SHAFT	79136	5103-25-MD-R
-65	131-1219-00			1						CONTACT,ELEC:GROUNDING	80009	131-1219-00
-66	214-1139-00			1						SPRING,FLAT:0.885 X 0.156 CU BE GLD CLR	80009	214-1139-00
	214-1139-02			1						SPRING,FLAT:GREEN COLORED	80009	214-1139-02
-67	214-1127-00			1						ROLLER,DETENT:0.125 DIA X 0.125,5ST	80009	214-1127-00
-68	401-0056-00			1						BEARING,CAM SW:REAR	80009	401-0056-00
-69	401-0057-00			1						BEARING,CAM SW:FRONT	80009	401-0057-00
-70	407-0653-00			1						BRACKET,COVER:CAM SWITCH,DEL/RIN	80009	407-0653-00
-71	210-0406-00			6						NUT,PLAIN,HEX:4-40 X 0.188,BRS,CD PL	73743	12161-50
-72	200-1695-00			1						COVER,CAM SW:27 ELEMENT	80009	200-1695-00
										*****ATTACHING PARTS*****		
-73	211-0022-00			4						SCREW,MACHINE:2-56 X 0.188,PNH,STL,CD PL	83385	ORD BY DESCR
-74	210-0001-00			3						WASHER,LOCK:#2 INTL,0.013 X 0.18 OD,STL	77900	1202-00-00-0541C
-75	210-0259-00			1						TERMINAL,LUG:0.099 ID,LOCKING,BRS,CD PL	80009	210-0259-00
	210-0405-00			4						NUT,PLAIN,HEX:2-56 X 0.188,BRS,CD PL	73743	12157-50
										*****END ATTACHING PARTS*****		
-76	131-1372-00	B010100	B033142	2						CONTACT,ELEC:PLUG-IN GND,CU BE BRT DIP	80009	131-1372-00
	131-1372-01	B033143		2						CONTACT,ELEC:PLUG-IN GND,CU BE BRT DIP	80009	131-1372-01
-77	426-0724-02			1						FR SECT,PLUG-IN:BOTTOM	80009	426-0724-02
-78	426-0725-02			1						FR SECT,PLUG-IN:TOP	80009	426-0725-02
-79	175-0826-00			FT						WIRE,ELECTRICAL:3 WIRE RIBBON	80009	175-0826-00
-80	175-1020-00			FT						CABLE,RF:50 OHM COAX,WHT POLYTHN JKT	90484	DAB70JAAWHITE

## INTERNAL ADJUSTMENT PROCEDURE

### SERVICES AVAILABLE

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

### MAINTENANCE

Refer to the mainframe manual for general service information.

### TEST EQUIPMENT

For calibration, and a complete accuracy check of the 5B40 the following equipment is required:

Tektronix Type TG 501 Time Mark Generator or equivalent.

Tektronix FG 506 Calibrator or Generator or equivalent.

5400 series oscilloscope.

Vertical plug-in for the 5400 series oscilloscope, such as the 5A45 Single Trace Amplifier.

50  $\Omega$  coaxial cable with BNC connectors, Tektronix Part No. 012-0057-01.

50  $\Omega$  feed-through termination, Tektronix Part No. 011-0049-01 or equivalent.

### PREPARATION

Remove the right side cover from the 5B40 and the right side cabinet panel from the 5400 series oscilloscope. Insert the 5B40 in the right hand plug-in compartment, and the vertical plug-in in one of the left hand compartments. See the Adjustments for Out page for the test point and adjustment locations. Make adjustments at an ambient temperature between  $-20^{\circ}\text{C}$  and  $+30^{\circ}\text{C}$  ( $-68^{\circ}\text{F}$  and  $+86^{\circ}\text{F}$ ) for best accuracy.

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### 2. ADJUST EXTERNAL HORIZONTAL GAIN

Apply a 0.5 V, 1 kHz square wave from the calibration generator through the coaxial cable to the EXT HORIZ AMPL connector. Adjust R315, Ext Horiz Gain, for ten divisions of horizontal deflection. Use the 5B40 POSITION control to position the dots to the extreme right and left vertical graticule lines while making this adjustment.

### 1. ADJUST EXTERNAL HORIZONTAL BALANCE

Set the SECONDS/DIV switch to 1 m, and push the AUTO TH G, and EXT buttons. All other buttons should be out. Obtain a visible free running trace, that is vertically centered in the graticule area, by adjusting the vertical and horizontal POSITION controls and the display module INTENSITY control. Using the 5B40 POSITION control, position the start of the trace at the extreme left vertical graticule line. Switch the SECONDS/DIV switch to the AMPL position. Reduce the INTENSITY control, if necessary, to prevent burning the phosphor. Move the spot horizontally to the graticule center by adjusting R125, Ext Horiz Bal.

### 3. ADJUST INPUT ATTENUATOR COMPENSATION

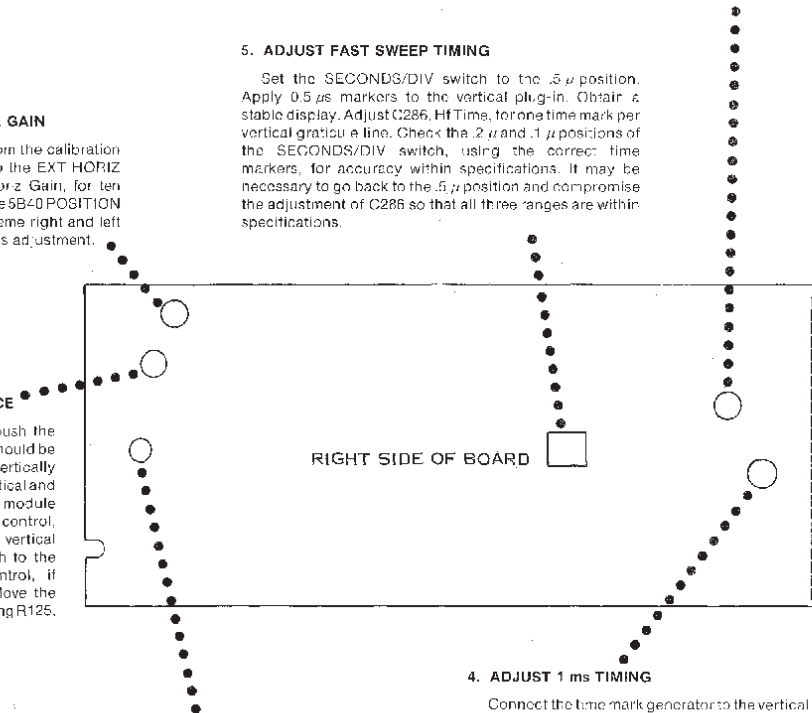
Connect a 0.05 V, 1 kHz square wave with a  $\leq 20$  ns risetime through a terminated coaxial cable to the EXT HORIZ AMPL connector. Adjust C116, Atten Comp, for minimum horizontal overshoot or undershoot on the two dots referred to in the previous step.

### 5. ADJUST FAST SWEEP TIMING

Set the SECONDS/DIV switch to the .5  $\mu$  position. Apply 0.5  $\mu\text{s}$  markers to the vertical plug-in. Obtain a stable display. Adjust C286, HFTime, for one time mark per vertical graticule line. Check the .2  $\mu$  and .1  $\mu$  positions of the SECONDS/DIV switch, using the correct time markers, for accuracy within specifications. It may be necessary to go back to the .5  $\mu$  position and compromise the adjustment of C286 so that all three ranges are within specifications.

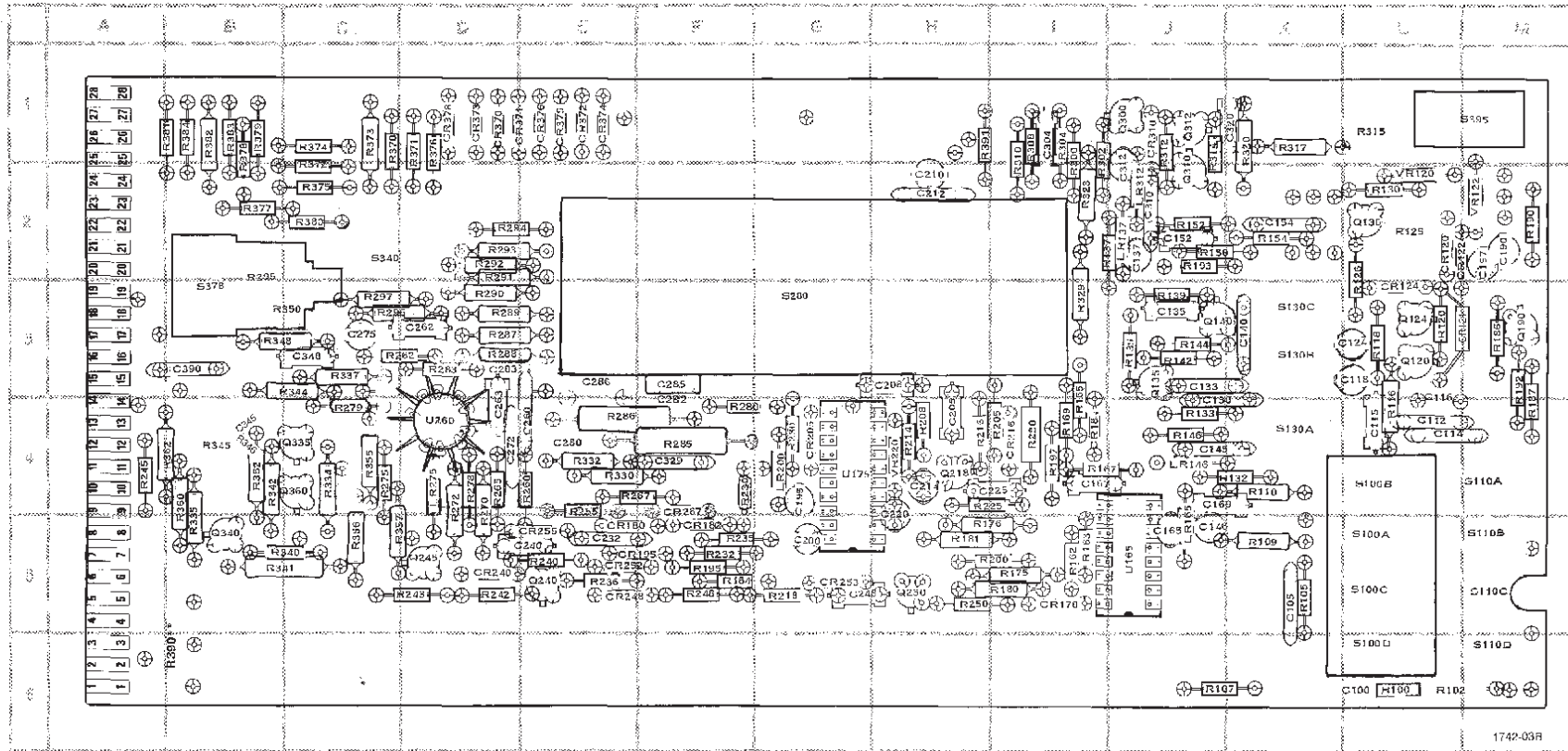
### 6. ADJUST MAGNIFIER GAIN

Change the SECONDS/DIV switch to position 1 m. Apply 0.1 ms markers to the vertical plug-in. Obtain a stable display. Center the trace horizontally in the graticule area. Press the SWP MAG button. Adjust R350, Mag Gain, for one time mark per vertical graticule line.



INTERNAL ADJUSTMENT PROCEDURE

# PARTS LOCATION GRID

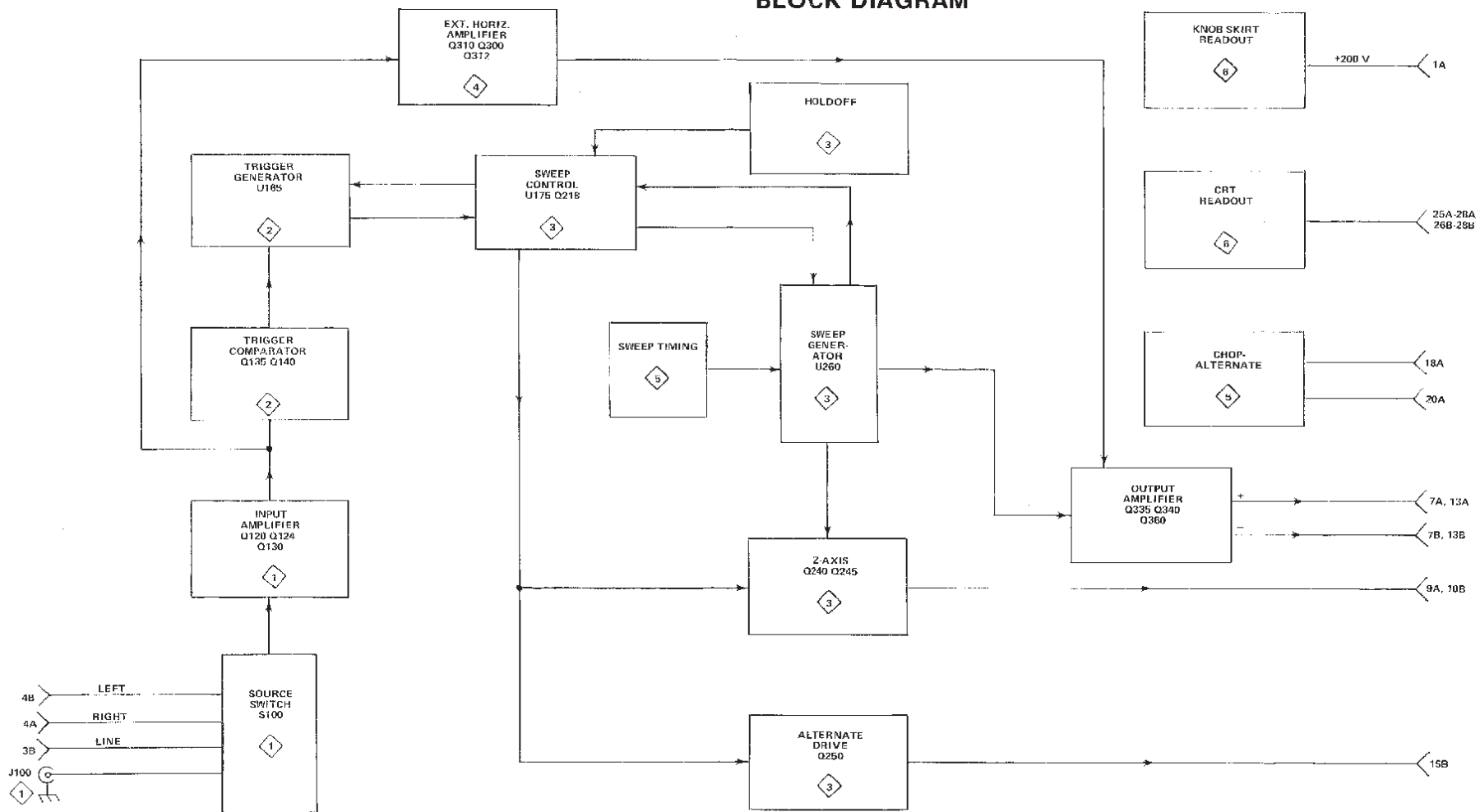


\*See parts list for serial number ranges.  
 †Located on back of board.  
 \*\*Earlier location.

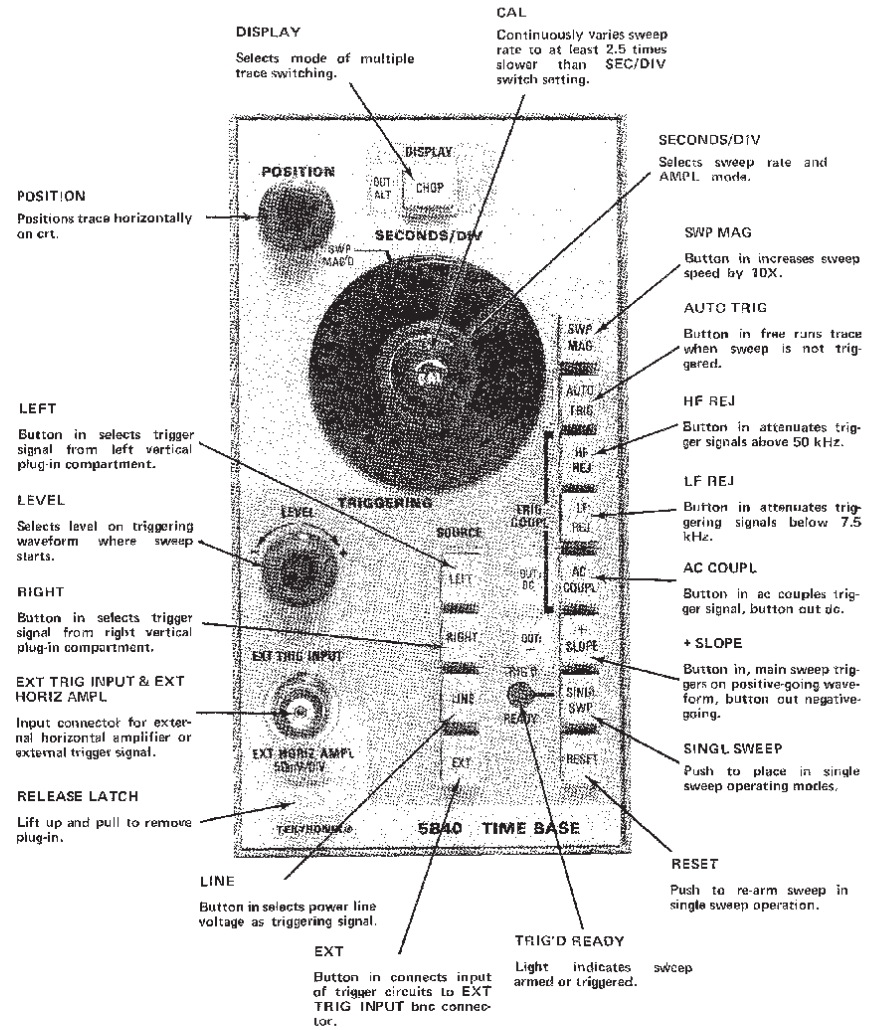




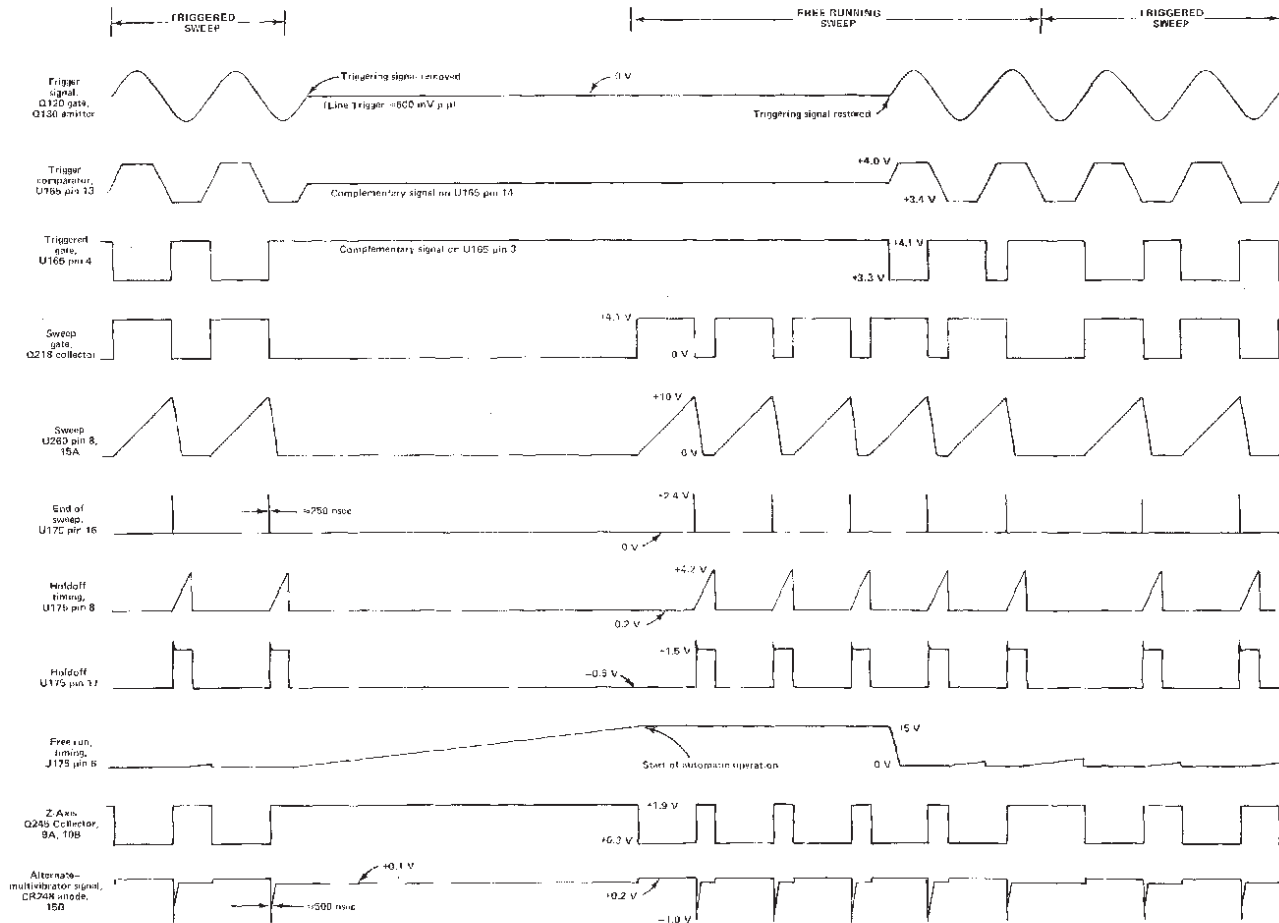
# BLOCK DIAGRAM



# CONTROL AND CONNECTORS

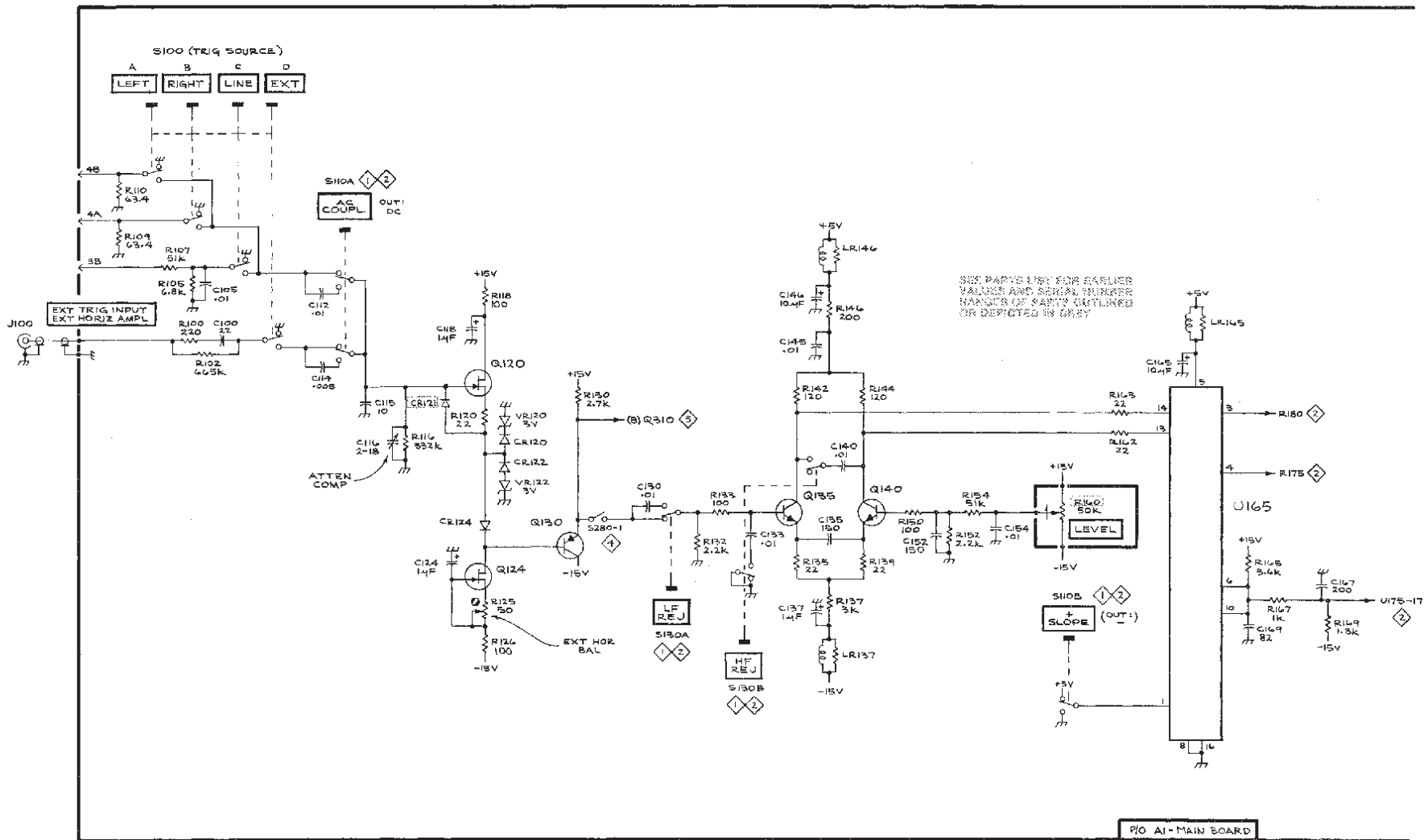


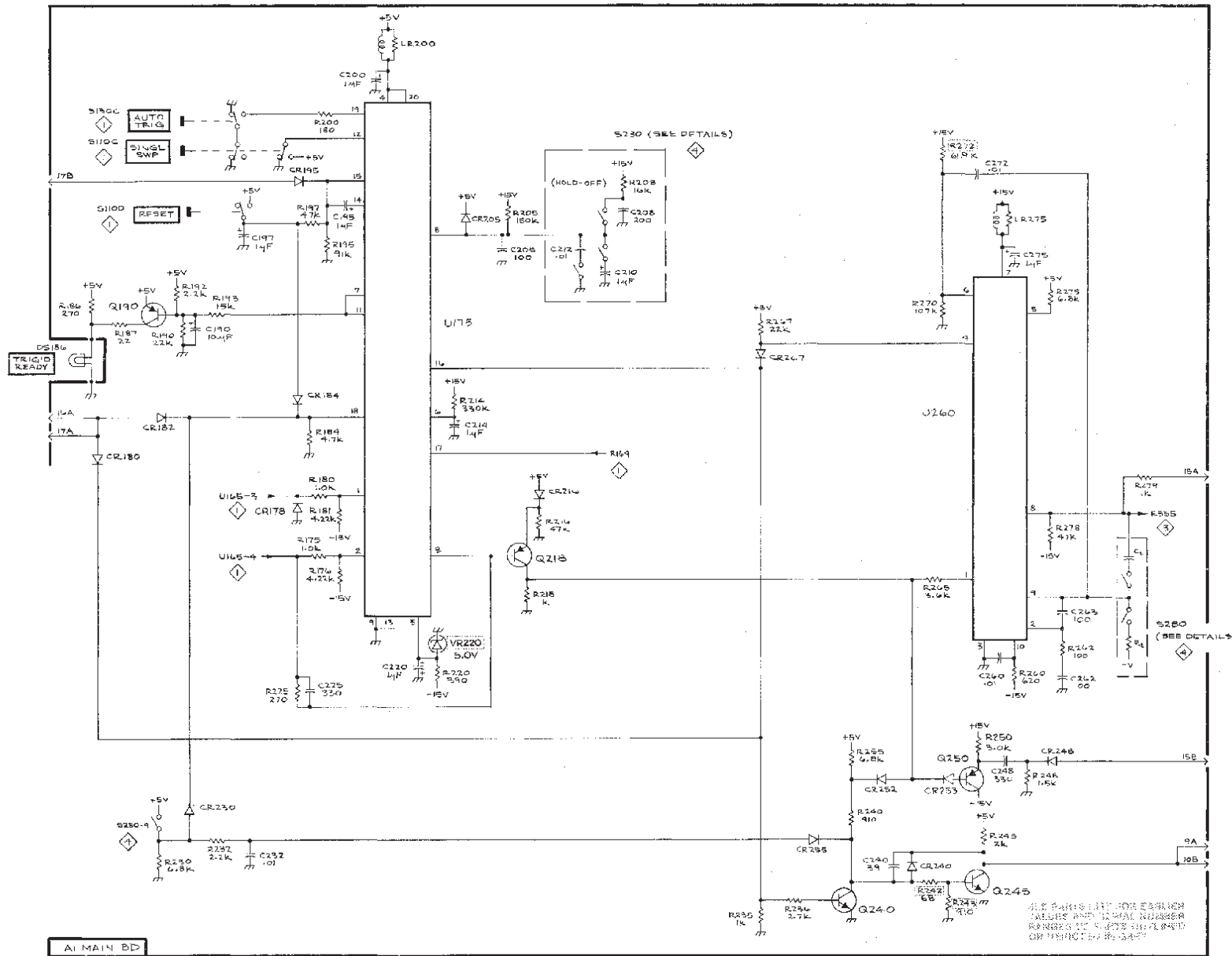
### WAVEFORM DIAGRAMS

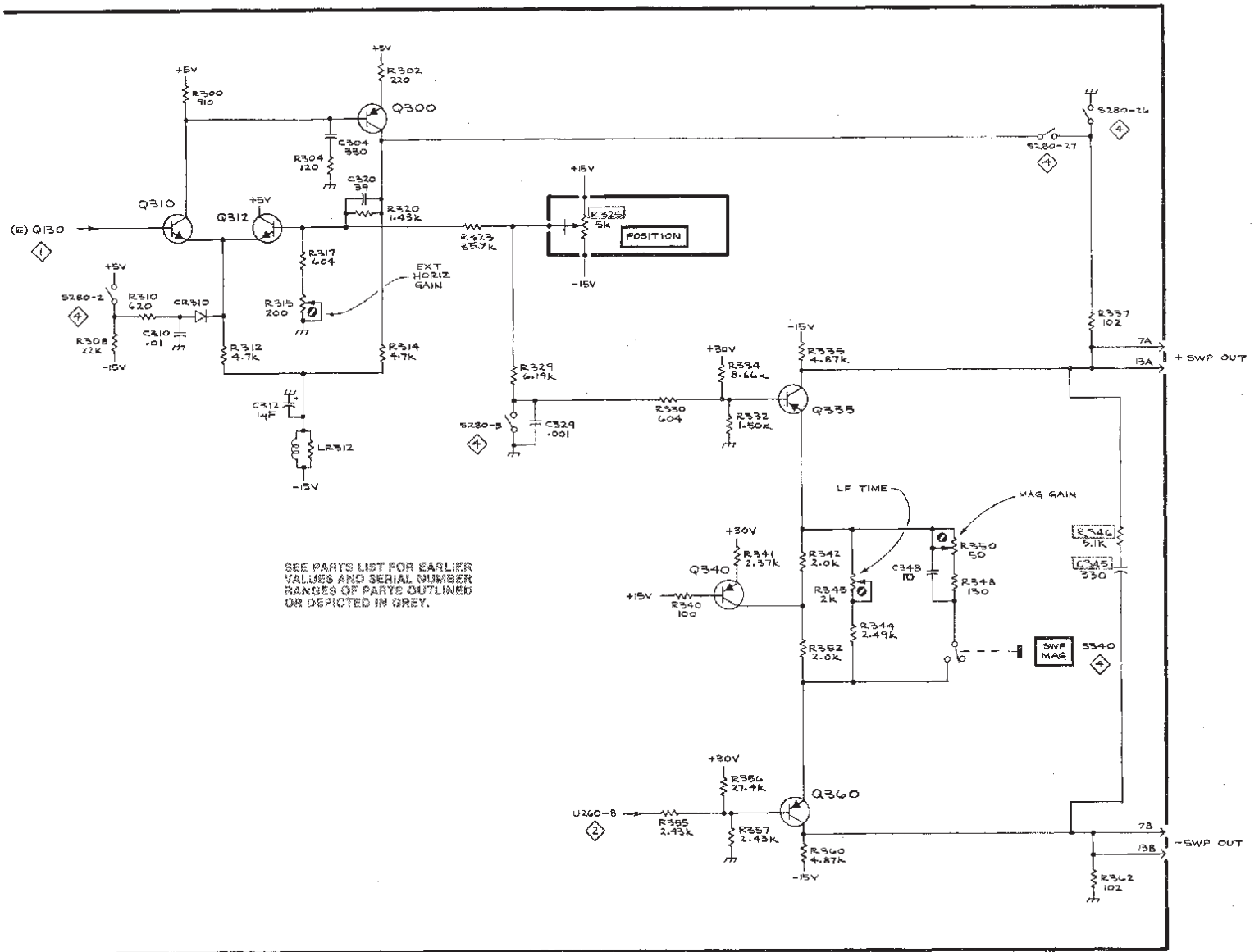


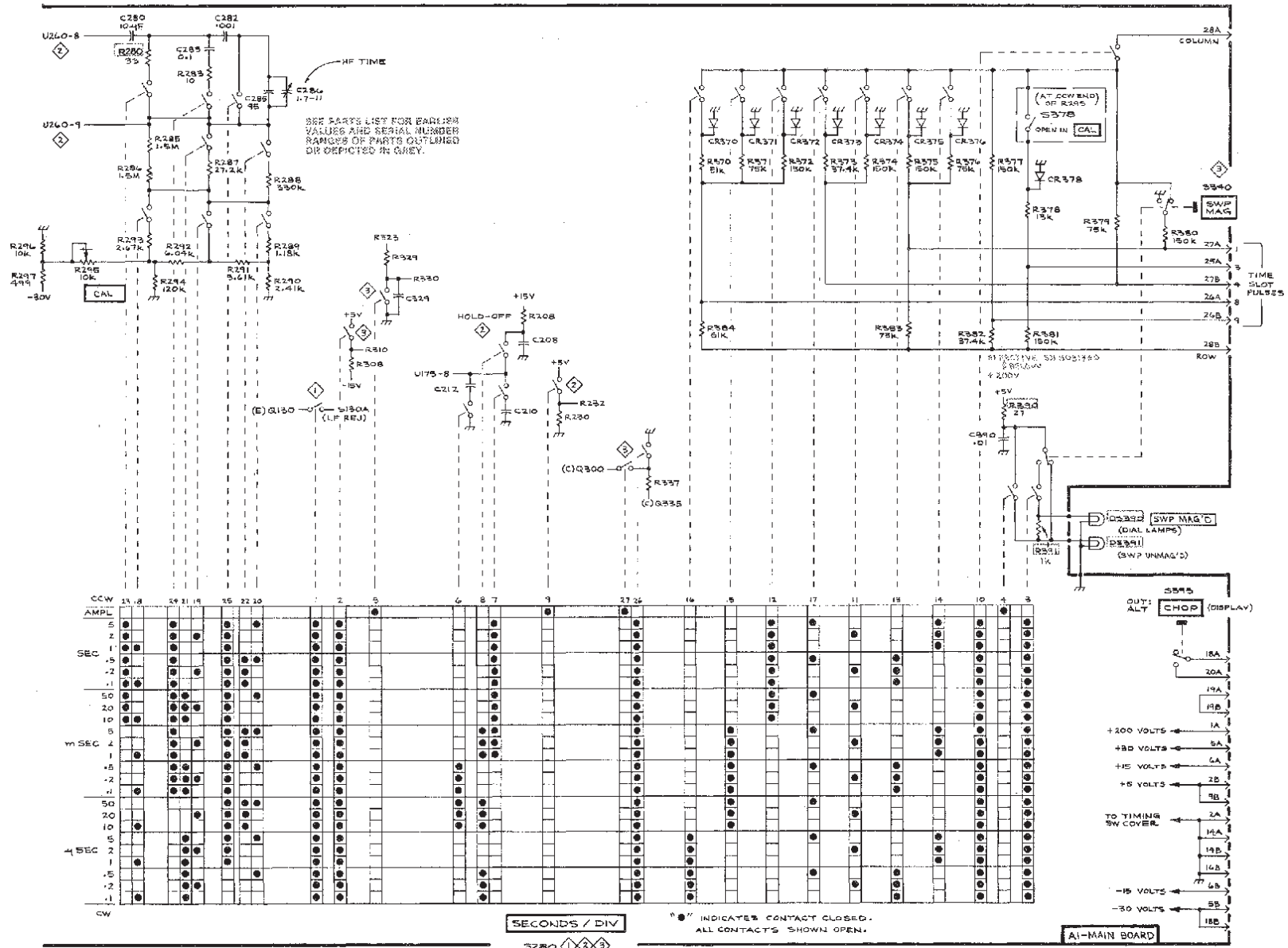
**CONDITIONS** All buttons out except LINE, - SLOPE and AUTO TRIG. Set SECONDS/DIV to 1 m and CAL in the detent position. Waveform voltages are accurate within ten percent. Time relationships with respect to line frequencies are approximate.









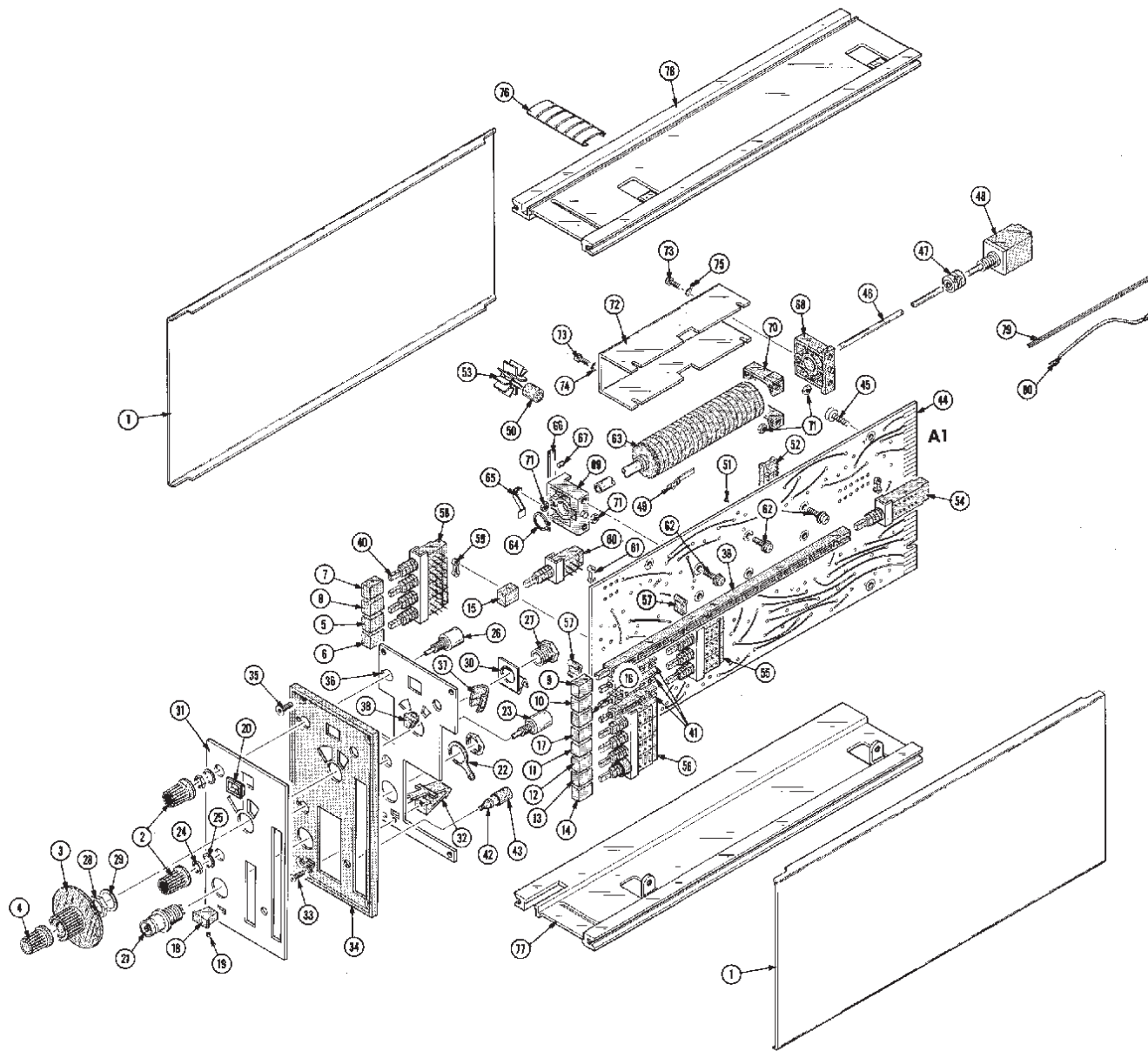


5840

1742-10  
REV. C, APR. 1978

SWITCH DETAILS AND VOLTAGE SOURCE

SEH  
0274



5B40 STANDARD SWEEP

Index No.	Tektronix Part No.	Serial/Model No.		Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
		Eff	Discont									
	070-1742-00			1						MANUAL,TECH:INSTRUCTION	86009	070-1742-00