

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Visit our website - *Click HERE*

SCHNABEL

Tektronix®
COMMITTED TO EXCELLENCE

PLEASE CHECK FOR CHANGE INFORMATION AT THE REAR OF THIS MANUAL.

DC 503 UNIVERSAL COUNTER

INSTRUCTION MANUAL

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

070-1411-01
Product Group 75

Serial Number _____

First Printing SEP 1972
Revised AUG 1983

Copyright © 1972 , 1978 Tektronix, Inc. All rights reserved. Contents of this publication may not be reproduced in any form without the written permission of Tektronix, Inc.

Products of Tektronix, Inc. and its subsidiaries are covered by U.S. and foreign patents and/or pending patents.

TEKTRONIX, TEK, SCOPE-MOBILE, and  are registered trademarks of Tektronix, Inc. TELEQUIPMENT is a registered trademark of Tektronix U.K. Limited.

Printed in U.S.A. Specification and price change privileges are reserved.

INSTRUMENT SERIAL NUMBERS

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

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

TABLE OF CONTENTS

		Page
SECTION 1	OPERATING INSTRUCTIONS	1-1
SECTION 2	SPECIFICATION AND PERFORMANCE CHECK	2-1

WARNING

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

SECTION 3	ADJUSTMENT	3-1
SECTION 4	MAINTENANCE AND INTERFACING INFORMATION	4-1
SECTION 5	CIRCUIT DESCRIPTION	5-1
SECTION 6	OPTIONS	6-1
SECTION 7	REPLACEABLE ELECTRICAL PARTS	7-1
SECTION 8	DIAGRAM AND CIRCUIT BOARD ILLUSTRATION	8-1
SECTION 9	REPLACEABLE MECHANICAL PARTS AND EXPLODED VIEW	9-1

CHANGE INFORMATION

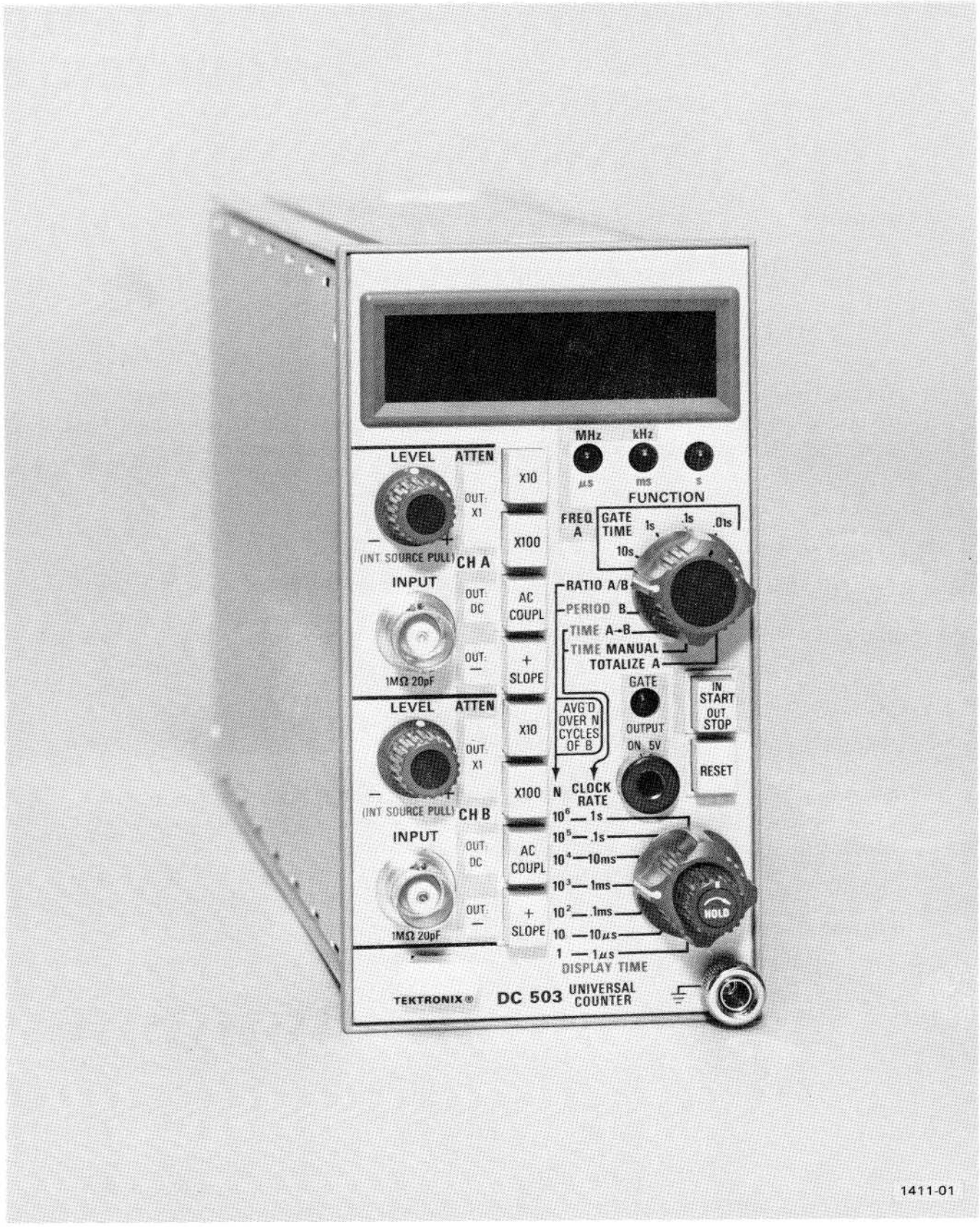


Fig. 1-1. DC 503 Universal Counter.

OPERATING INSTRUCTIONS

INTRODUCTION

Description

The DC 503 Universal Counter has six measurement functions: frequency counting, finding frequency ratios, period timing, interval timing, manual timing, and event counting.

The DC 503 operates in Tektronix TM 500-Series Power Modules only. It will operate in any compartment of a multiple-compartment power module. The DC 503 is fully compatible with other members of its digital measurement family.

The DC 503 has two channels (A & B), each having bnc inputs and separate triggering level, attenuators, and coupling mode controls. CH A has a 100 MHz capability, CH B 10 MHz. Seven-segment LED numerical display devices provide seven-digit readout with an automatically-positioned decimal point. Leading zeros to the left of the most significant digit or the decimal point are blanked. A flashing display indicates register overflow.

Installation and Removal

CAUTION

Turn the power module off before inserting the plug-in; otherwise, damage may occur to the plug-in circuitry. Because of the high current drawn by the DC 503 it is also recommended that the power module be turned off before removing the DC 503. Refer to Fig. 1-2. Check to see that the plastic barriers on the interconnecting jack of the selected power module compartment match the cut-outs in the DC 503 circuit board edge connector.

Align the DC 503 chassis with the upper and lower guides of the selected compartment. Push the module in and press firmly to seat the circuit board in the interconnecting jack.

To remove the DC 503, pull on the release latch (located in the lower left corner) until the interconnecting jack disengages and the DC 503 will slide out.

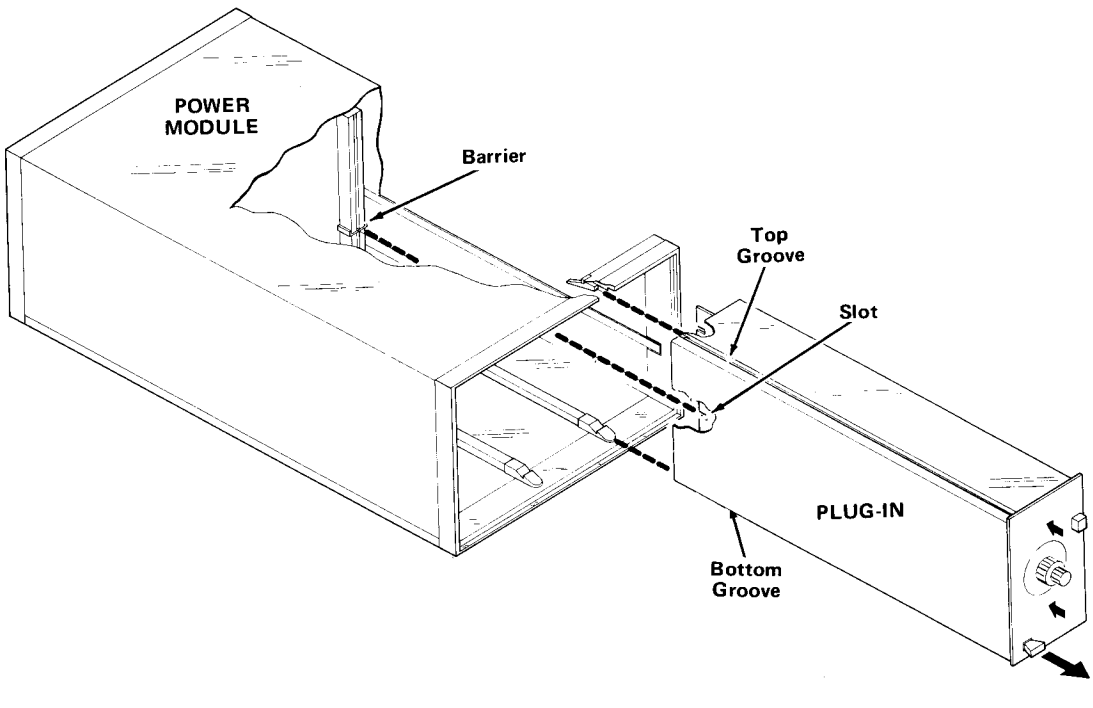


Fig. 1-2. Plug in Installation and Removal.

OPERATIONAL CHECK

Controls and Connectors

Refer to Fig. 1-3. Even though the DC 503 is fully calibrated and ready to use, the functions and actions of the controls and connectors should be reviewed before attempting to use it.

Display Tests

With no signal applied, test the DC 503 readout displays and Switching logic. The following checks will test most of the Counter's major circuits and ensure its readiness to make measurements. If any malfunctions are detected, first refer to the Adjustment Procedure in the Service section of this manual, then the System Maintenence section of the power module manual.

Readout Segment Test. Press the RESET button to check the seven-character segments of each digit. A row of 8's should be displayed. This check of the display devices and drivers can be done at any time.

FREQ A Displays. Using the FUNCTION switch, select a FREQ A GATE TIME of .01 s. Check the decimal point location, leading zero suppression, and units indicators according to Table 1-1.

Table 1-1

GATE TIME	Unit Indicators	Decimal Point
.01 s	MHz	.0000
.1 s	MHz	.00000
1 s	kHz	.000
10 s	kHz	.0000

With the DISPLAY TIME control in the full ccw position, observe that the GATE indicator flashes rapidly for short GATE TIMEs and more slowly for longer GATE TIMEs. Using a short GATE TIME, rotate the DISPLAY TIME control slowly cw. Observe that the GATE light will stay off for a longer and longer time, until the control clicks into the HOLD detent position, holding off the GATE indefinitely. Return the DISPLAY TIME control to the ccw position.

RATIO A/B Displays. Set the FUNCTION switch to RATIO A/B and the N/CLOCK RATE switch to 10^6. Check the readout display according to Table 1-2.

Table 1-2

N/CLOCK RATE Switch	Decimal Point
10^6	.000000
10^5	.00000
10^4	.0000
10^3	.000
10^2	.00
10	.0
1	0

The GATE and units indicators should remain off.

PERIOD B Displays. Set the FUNCTION Switch to PERIOD B and the N/CLOCK RATE switch to 1. Check the readout display according to Table 1-3.

Table 1-3

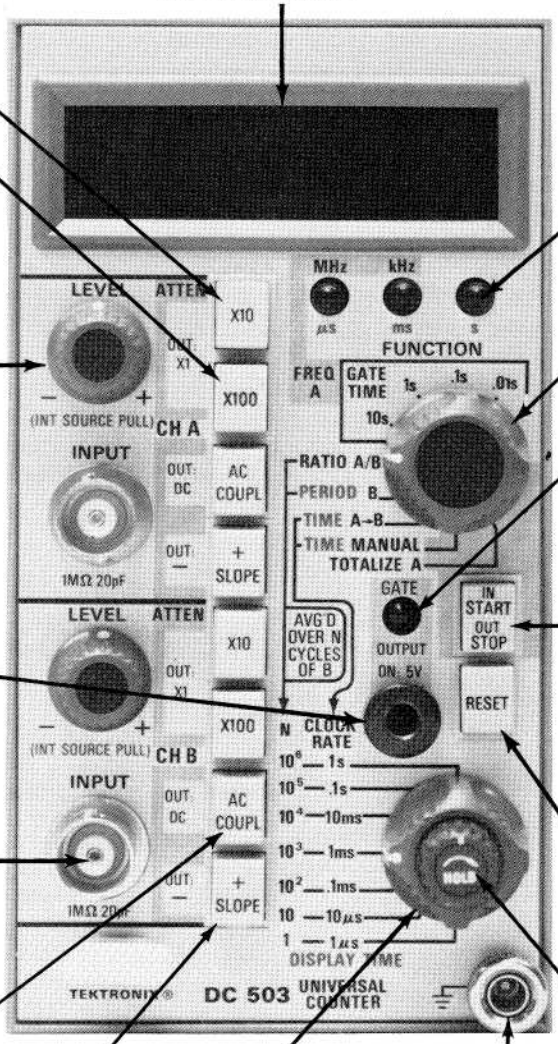
N/CLOCK RATE Switch	Units Indicator	Decimal Point
1	ms	.000
10	ms	.0000
10^2	ms	.00000
10^3	μs	.000
10^4	μs	.0000
10^5	μs	.00000
10^6	μs	.000000

TIME A→ B Displays. Set the FUNCTION switch to TIME A → B and the N/CLOCK RATE switch to 1 s. Check the readout displays according to Table 1-4.

Table 1-4

N/CLOCK RATE Switch	Units Indicators	Decimal Point
1 s	s	0
.1 s	s	.0
10 ms	s	.00
1 ms	s	.000
.1 ms	ms	.0
10 μs	ms	.00
1 μs	ms	.000

FRONT PANEL CONTROLS & CONNECTORS



Display Readout

LED readout, seven 7-segment digits with automatically placed decimal point. The leading zeroes are suppressed unless an overflow is indicated.

Attenuation Pushbuttons

Two self-canceling buttons select X1, X10, or X100 attenuation of the input signal.

Units Indicators

LED indicates that displayed number is MHz (10^6), or kHz (10^3) if in FREQ A modes, or μs (10^{-6}), ms (10^{-3}), or s (10^0) if in a time mode. In the RATIO A/B and TOTALIZE A modes, no units are indicated.

FUNCTION Switch

Selects measurement or time counting modes for counter. Also selects the gate (measurement) interval in the four FREQ A positions.

LEVEL Control

Selects the amplitude point on the input signal at which the triggering window is placed. Also selects signal input source. Pulled out selects the rear connector input. Pushed in selects the front-panel BNC connector input.

Gate Indicator

Lights during the active gating interval.

Manual Gate Pushbutton

Push-push switch operable when TIME MANUAL or TOTALIZE A is selected by the FUNCTION switch. Button in starts the measurement interval gate; button out terminates the gate.

Gate Output Connector

Provides a +5-volt pulse coinciding with the measurement interval.

RESET Pushbutton

Momentary pushbutton which manually resets (acts as a master reset) and provides a segment check of the 7 readout digits.

INPUT Connector

BNC connector for signal input.

Input Coupling Pushbutton

A push-push switch which selects whether the input signal is AC or DC coupled into the attenuators.

DISPLAY TIME Control

Variable control concentric with N/CLOCK RATE switch sets the length of time the reading will be displayed after the count is made and before the next measurement is taken. Display time can be varied from 0.1 s (ccw) to about 10 seconds (cw). HOLD position (detent) provides continuous display until reset by pressing the RESET button.

N/CLOCK RATE Switch

Selects the gate (measurement) interval for the RATIO A/B, PERIOD B, TIME A→B and TIME MANUAL modes of the FUNCTION switch.

Trigger Slope Pushbutton

A push-push switch which selects the slope of the input signal on which triggering will occur.

Ground Connector

Provides a chassis return for signals.

1411-03

Fig. 1-3. Front-panel controls, connectors, and indicators.

TIME MANUAL Displays. Set the FUNCTION Switch to TIME MANUAL and the N/CLOCK RATE switch to 1 μs. Check the readout display according to Table 1-5.

Table 1-5

N/CLOCK RATE Switch	Units Inidcators	Decimal Point
1 μs	ms	.000
10 μs	ms	.00
0.1 ms	ms	.0
1 ms	s	.000
10 ms	s	.00
.1 s	s	.0
1 s	s	0

The GATE light should turn on and an advancing count should be displayed when the START/STOP button is pushed in. The GATE light should turn off when the count is stopped by releasing the START/STOP button. Test the overflow display by setting N/CLOCK RATE to 1 μs, pressing START, letting the count advance until the last decade (seventh digit) reaches 9 and the display begins to flash. Release the START button and observe that the display still flashes but the numbers do not change. Pressing RESET clears the overflow condition, sets the count to zero, and stops the flashing display.

TOTALIZE A Display. Set the FUNCTION switch to TOTALIZE A. Observe a zero at the right of the readout display. The GATE light should turn on when the START button is pushed in, and turn off when START is released. The units indicators should remain off.

Channels A & B

The channel A & B input circuits, with the exception of the attenuators, can be checked in a no-signal-input condition by generating psuedo-triggers with the LEVEL controls.

Select + SLOPE for one channel and − SLOPE for the other channel. Set FUNCTION to TIME A → B and N/CLOCK RATE to 1 ms. Rotate CH A LEVEL back and forth through its selected slope until the GATE light turns on. Rotate CH B LEVEL back and forth through its selected slope until the GATE light turns off. The resultant display is the time interval between these two trigger events.

If the GATE light cannot be turned on or off with this method, consult the Service section of the manual for troubleshooting aids.

INPUT CONSIDERATIONS

Input Sources

The switch concentric with the LEVEL control of each channel selects either the front-panel bnc connector (external), or the rear interface connector (internal) pins; Channel A via pin 16A, and Channel B via pin 17B.

The external inputs present high impedances of approximately 1 MΩ, paralleled by about 20 pF. The internal input circuits present nominal 50 Ω impedances to match typical coaxial cable signal connections.

Input Coupling

Front Panel pushbuttons select ac (capacitive) or dc (direct) coupling for each channel input signal. This coupling takes place after the signals arrive from the selected source and before they are passed on to the attenuators of each channel.

Attenuators and Maximum Input Volts

Both front-panel pushbuttons, when out, provide no attenuation to the input signal (X1). In this mode, the maximum safe input voltage is 50 V (dc + peak ac), at 2 kHz or less. With either the 10X or 100X attenuator selected (buttons are self-cancelling), the maximum safe input voltage is 500 V (dc + peak ac) at 2 MHz or less for CH A; for CH B, 500 V at 350 kHz or less.

Sensitivity and Frequency Range

CH A will respond to signal amplitudes of at least 300 mV, peak-to-peak, up to 100 MHz.

CH B will respond to signal amplitudes of at least 300 mV, peak-to-peak, up to 10 MHz.

Depending on the coupling mode selected, the low frequency limit for each channel is either 0 Hz (dc-coupled) or 10 Hz (ac-coupled).

Slope and LEVEL

A front-panel pushbutton for each channel determines whether the trigger circuits will respond to either positive- or negative-going transitions of each input signal.

The LEVEL control for each channel allows the operator to move the hysteresis window of the trigger circuit to an optimum level on the input signal to ensure stable triggering. See Fig. 1-4. The LEVEL control adjusts over ±1.5 V of the input signal in the X1 ATTEN position.

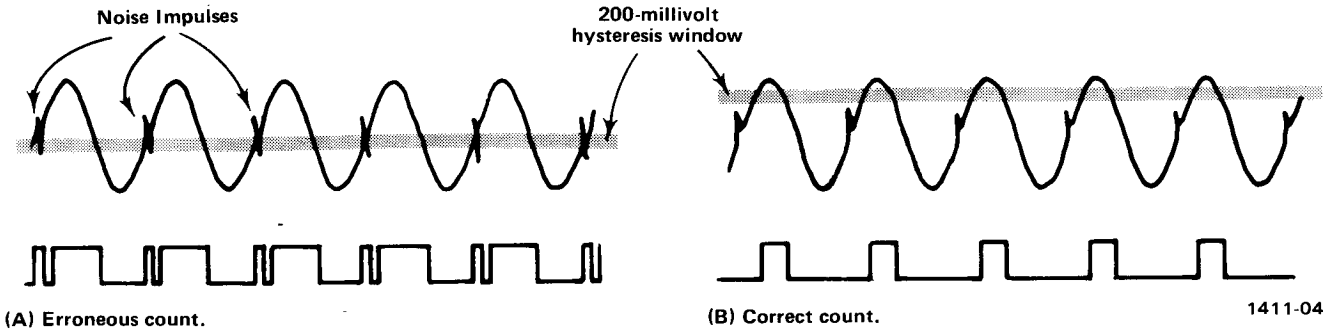


Fig. 1-4. Triggering circuit responses to improper (A) and proper (B) LEVEL settings.

FREQUENCY MEASUREMENTS

FREQ A

To measure and display the frequency of a signal up to 100 MHz, set the FUNCTION switch to one of the shorter GATE TIMEs bracketed under the heading of FREQ A. Make sure the LEVEL control is pushed in and connect the signal to the CH A INPUT. Set the DISPLAY TIME control ccw.

Triggering

The CH A LEVEL, SLOPE, COUPling, and ATTENuator controls all affect the ability to make a measurement. In general, the trigger controls are similar to oscilloscope controls, except that the end result is not a stable waveform graphic display, but a stable digital frequency display.

COUPling and SLOPE. Use ac-coupling for most frequency measurements to avoid re-adjusting the LEVEL control for changing dc levels. The repetitive nature of frequency signals makes SLOPE selection insignificant.

Attenuators and LEVEL. Signals between 300 mV and 5 V, peak-to-peak, should not be attenuated. For higher amplitude signals, select an attenuation factor such that the attenuated signal falls into the range of 500 mV to 5 V, peak-to-peak. The LEVEL control must be varied for a stable reading. Adjustment will not be difficult unless the signal amplitude and frequency are close to (or perhaps beyond) the specified limits.

A signal which looks stable on an oscilloscope may still show jitter when measured with seven-digit resolution. If the count varies from reading to reading, it is probably due to jitter in the signal source. If the count changes unreasonably, the DC 503 is not being triggered properly, either because the controls are not set right or the signal is beyond the Counter's capabilities.

For frequency measurements, all CH B trigger settings have no effect. "N" or "CLOCK RATE" settings are irrelevant.

Measurement Intervals

To adjust the trigger controls, choose a short GATE TIME such as .1 s or .01 s. This gives rapid feedback via the display as to whether the Counter is being triggered or not. If it is, numbers will appear in the display. (If the frequency is below 100 Hz, numbers may not appear during the shortest gate times. For such low frequencies, a PERIOD measurement is better suited.)

Final selection of GATE TIME depends on the frequency being measured, desired resolution, and willingness of the operator to wait for a measurement. Using short gate times, higher frequencies may be measured, but at the expense of the greater resolution capabilities of the longer gate times.

Resolution. A 10 s GATE TIME means the operator must wait 10 seconds for a measurement to be made and displayed. It is the only way to get best possible resolution and accuracy for signals below 1 MHz. Even then, a 10 second count will display fewer than the available 7 digits.

Overflow. Through intentional use of "overflow" displays, it is possible to improve the resolution of the counter. Choose a GATE TIME that displays the most significant number of the measurement as far to the left as possible. Note the numbers displayed to the right of the decimal. Move the decimal point to the left by choosing longer GATE TIMEs until the desired resolution is achieved. The display will flash when the most significant number overfolws the last storage register. Note that the increased resolution does not add to the accuracy of the measurement, except for quick A-B comparisons. The relationship between GATE TIME, measured frequency, displayed digits, and overflow is shown in Table 1-6.

Table 1-6

GATE TIME	≥100 MHz	10 MHz to 100 MHz	1 MHz to 10 MHz	≤1 MHz
.01 s	7 digits	6 digits	5 digits	4 digits
.1 s	Overflow	7 digits	6 digits	5 digits
1 s	Overflow	Overflow	7 digits	6 digits
10 s	Overflow	Overflow	Overflow	7 digits

Measurement Rate

Once a stable measurement is obtained, the rate at which measurements are made can be controlled by the DISPLAY TIME control. Turning the control cw holds off the gate and stores the display for a longer time before a new measurement is made and displayed. DISPLAY TIME and GATE TIME together complete a measurement-display cycle.

The DISPLAY TIME control is uncalibrated and variable from about 0.1 s at the ccw end to about 10 s at the cw end. At the cw end, there is a detent position called HOLD. In HOLD, the last count taken will be stored and displayed for an indefinite time. A new count and display may be initiated by pushing the RESET button, turning the DISPLAY TIME control ccw, or changing to another GATE TIME.

PERIOD MEASUREMENTS

Gating

Period measurement is provided in universal counter-timers primarily to overcome a basic limitation of counters, i.e., the long time required to make a high resolution high accuracy measurement of low frequency signals. For example, a 1 kHz signal requires 1,000 seconds of GATE TIME to accumulate a million counts. However, in only one second, a 1 kHz signal can gate a count of one million clock pulses from a 1 MHz clock.

Simply stated, the PERIOD B mode reverses the functions of signal and clock as compared to the FREQ A mode. In FREQ A, the gate is held open for some number of clock pulses while signal events are counted, then displayed. In PERIOD B, the gate is held open for some number of signal events (N), while 1 μs clock pulses are counted, then displayed.

Averaging

Resolution and accuracy is increased by averaging the signal value over a large number of signal events. Increasing the selected number of N (AVG'D OVER N CYCLES OF B) increases the total time to take a measurement, similar to selecting a longer GATE TIME in the FREQ A mode. In general, the product of the signal period and the selected N factor should be 1 to < 10 seconds. The maximum period capacity is 9,999,999 μs. Therefore, a period X N product ≥ 10 s will cause an overflow. This means that the lowest frequency practical for period measurement is 0.1 Hz, even with N = 1.

Low Frequencies

Period measurements of signals below 10 Hz, and particularly in the lowest decade from 0.1 Hz to 1.0 Hz, become rather sensitive to wave shape and amplitude. Since it is desirable for the signal to pass through the trigger hysteresis abruptly, square waves are preferred. Low-frequency sine and triangle waves can be measured accurately if the input amplitude is kept high so that the trigger input is driven hard. For repetitive signals below 0.1 Hz, use the TIME A → B mode.

CH B is the channel provided for period measurement; its bandwidth of 10 MHz is adequate for that purpose. For the higher frequencies, the frequency mode should be used. The CH B controls operate the same as the CH A controls. Because PERIOD B measurements may involve very low frequencies, the use of dc coupling will be more common than with CH A.

RATIO MEASUREMENTS

In the RATIO A/B mode, the frequency of the signal applied to CH A is divided by the frequency of the signal applied to CH B, and the resultant ratio is displayed. Note that the normal "frequency" mode is basically a ratio mode, in which the ratio of the unknown signal to the internal clock is displayed. (Decade scaling of the internal clock and decimal point positioning normalizes the display relative to kHz or MHz units.)

Bandwidth Limitations

Because CH B has a bandwidth of only 10 MHz, it is not feasible to make ratio measurements of two signals, both well above 10 MHz. However, CH B will respond to signals somewhat above 10 MHz if adequate signal amplitude is applied.

Triggering

The operation of CH A and CH B trigger controls is the same as for frequency and period measurement. In fact, since both channels must be triggered to obtain a display, it may be desirable to set the trigger controls independently. This may be accomplished as follows:

(1) Go to the FREQ A mode and adjust the CH A trigger controls for a normal frequency measurement.

(2) Go to the PERIOD B mode and adjust the CH B trigger controls for a normal period measurement.

(3) Leaving CH A and CH B trigger controls as they were, go to the RATIO A/B mode. The correct ratio should be displayed.

The N/CLOCK RATE control may now be operated to select maximum resolution. For most measurements, the smallest value of "N" which produces a useful number of digits will be best.

TIME INTERVAL MEASUREMENTS

Electronic Start/Stop

The TIME A → B mode measures and displays the elapsed time interval between the triggering of CH A and subsequent triggering of CH B. The triggering event does not have to be the same one for both channels. Separate events do not even have to be time related.

However, the most common application is to measure the width (duration) of a pulse, using opposite triggering slopes for each channel, rather than the frequency (or period) of a complete cycle. For example, consider the waveforms shown in Fig. 1-5. These represent the output ramp and coincident gate from an RG 501 Ramp Generator, which is being triggered by a 100 Hz signal. Setting the gate duration accurately to 5 ms may be accomplished as follows:

(1) Apply the RG 501 gate (the triggering event) to both CH A and CH B at the same time. Set CH A to trigger on the + SLOPE and CH B on the − SLOPE.

(2) Set the FUNCTION switch to FREQ A and adjust CH A LEVEL for a stable frequency display. Select PERIOD B and adjust CH B LEVEL for a stable time display. Do not change the SLOPE settings.

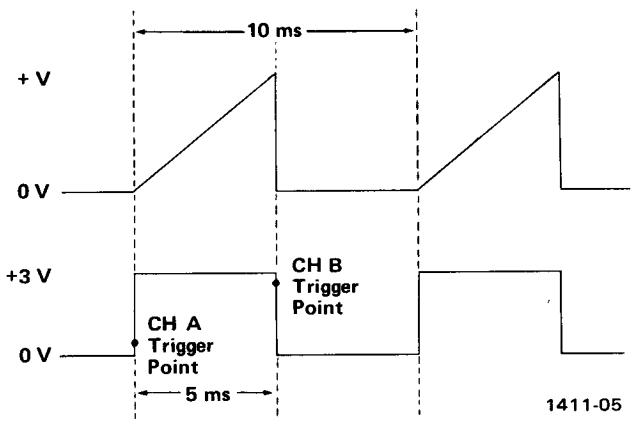


Fig. 1-5. Triggering for a pulse duration measurement. (Signal source, RG 501 Ramp Generator.)

(3) Set the FUNCTION switch to TIME A → B and select a CLOCK RATE for appropriate resolution. A CLOCK RATE of 1 μs will give three-decimal-place resolution for this measurement.

(4) When the RG 501 gate goes positive, CH A is triggered and the DC 503 gate opens, allowing internal clock pulses to be counted. When the RG 501 gate starts to return to zero, CH B is triggered, the DC 503 gate closes, and the accumulated count of clock pulses is displayed.

(5) If the count is off the desired time interval, the operator can adjust the RG 501 controls until the required accuracy is achieved.

Single-Shot Using HOLD

Single-shot time intervals can be measured by putting the DISPLAY TIME control in HOLD. This will lock out both channels after CH A and CH B have been triggered, respectively. Pushing RESET clears the display and re-arms the trigger channels for another measurement.

GATE Output

The internal gate of the DC 503 is available at the front-panel GATE OUTPUT jack. Since it is coincident with the time interval measurement, it may be used with an oscilloscope to graphically relate the digital measurement to the analog signal.

MANUAL TIMING MEASUREMENTS

The TIME MANUAL position is a manual analog of the TIME A → B electronic mode. In this mode, only the CLOCK RATE switch and START/STOP switch affect the display.

Starting and Stopping

The TIME MANUAL mode may be thought of as a "stop-watch" type of operation. With the FUNCTION switch in the TIME MANUAL position, the display starts counting time-base pulses when the START/STOP button is pressed. It will continue to count and display the accumulated total until the START/STOP button is released. The last count will then be held in the display until another START command is given (in which case the count will again advance), or other controls are actuated. Pushing RESET will return the display to zero. Changing the setting of the CLOCK RATE switch will change the frequency of the time-base pulses being counted, and return the display to zero.

Clocking Rate

When the CLOCK RATE switch is in the 1 s position, one-second pulses are being counted, and the display accumulation advances one count per second, and so on. On the 1 μs position, the count accumulates at the rate of one million counts per second.

Whenever the accumulated count is greater than 9,999,999, the display will flash to indicate overflow; however, the accumulation continues at the normal rate, except that the digits for decades above 10^7 are not displayed.

TOTALIZING

Purpose

In the TOTALIZE A mode, signal events applied to CH A INPUT are counted and the accumulated total is displayed during the time the START/STOP button is pushed in. This mode is a manual analog of the frequency mode. Its main application is to accumulate a count of relatively infrequent and irregular events.

Operation

Apply the signal to CH A and set the trigger controls the same as for frequency measurement.

Starting the Count. Press the START/STOP button in and adjust the CH A LEVEL control until a count begins to advance. The accumulated count is displayed in whole numbers. Only the CH A trigger controls, the RESET button, and the START/STOP button affect the display.

Stopping the Count. If the START/STOP button is released and no other controls are operated, the last total will continue to be displayed. No more incoming events will be added to the total.

Restarting and Resetting. When the START is again depressed, incoming events will advance the displayed total. Resetting the count to zero can be done at any time by pressing the RESET button or by moving the FUNCTION switch to some other position, then back to TOTALIZE A.

SPECIFICATION AND PERFORMANCE CHECK

SPECIFICATION

Performance Conditions

The electrical characteristics are valid only if the DC 503 has been calibrated at an ambient temperature between +20° C and +30° C and is operating at an ambient temperature between 0° C and +50° C unless otherwise noted.

Only those items listed in the Performance Requirements column of the Electrical Characteristics table are normally verified when doing the Performance Check procedure of this manual. Items listed in the Supplemental Information column are either explanatory notes or minimum performance characteristics for which no tolerance ranges are specified, and which normally require verification only after repairs or parts replacement.

Table 2-1

ELECTRICAL CHARACTERISTICS

Characteristics	Performance Requirements	Supplemental Information
	INPUT CHARACTERISTICS	
Frequency Ranges		
CH A		
DC Coupled	0.1 Hz to 100 MHz.	
AC Coupled	10 Hz to 100 MHz.	
CH B		
DC Coupled	0.1 Hz to 10 MHz.	
AC Coupled	10 Hz to 10 MHz.	
Signal Inputs		Front-panel bnc connectors and rear-interface.
Impedance		1 MΩ paralleled by approximately 20 pF.
Sensitivity	300 mV p-p sine-wave times attenuation to 100 MHz.	Sine-wave used for measurement.
Trigger Level Range	±1.5 V times attenuation.	
Slope	Either + or −.	

Table 2-1 (cont)

ELECTRICAL CHARACTERISTICS

Characteristics	Performance Requirements	Supplemental Information
Maximum Input Voltage (sine-waves or dc + ac peak)		
CH A 1X ATTEN		50 V at 2 kHz or less; derate −20 dB/decade to 10 kHz. 10 V 10 kHz to 25 MHz; derate −20 dB/decade to 50 MHz. 5 V 50 MHz to 100 MHz.
CH B 1X ATTEN		50 V at 2 kHz or less; derate −20 dB/decade to 10 kHz. 10 V 10 kHz to 10 MHz (frequency limit).
CH A 10X and 100X ATTEN		500 V at 2 MHz or less; derate −20 dB/decade to 100 MHz.
CH B 10 X and 100X ATTEN		500 V at 350 kHz or less; derate −20 dB/decade to 10 MHz.
DISPLAY CHARACTERISTICS		
Resolution		
Frequency A		0.1 Hz at 10 s GATE TIME.
RATIO A/B		$1/10^6$ averaged over 10^6 cycles.
PERIOD B		1 μs/cycle of B.
TIME A → B		1 μs.
TIME MANUAL		1 μs.
TOTALIZE A		1 μs.
Accuracy		
FREQ A	±1 count ± time base accuracy.	Signal to noise ratio at inputs must be ⩾ 40 dB.
RATIO A/B	±1 count of FREQ A ± trigger jitter error of channel B.	
PERIOD B	±1 count ± time base accuracy ± trigger jitter error of count B (see Note 1).	
TIME A → B	±1 count ± time base accuracy ± trigger jitter error of channel A ± trigger jitter error of CH B (see Note 1) ± chosen time base period for one cycle.	± LEVEL setting voltage difference dV/dt of CH B triggering edge + hysteresis error (see Note 2). There is no observable error difference or hysteresis if ⩽ 500 ns risetimes are used.

Table 2-1 (cont)

ELECTRICAL CHARACTERISTICS

Characteristics	Performance Requirements	Supplemental Information
Display Time		Variable from about 0.1 s to about 10 s. Detent position at cw position of DISPLAY TIME knob provides a HOLD mode.
Reset		Pushing the front-panel RESET pushbutton, or grounding pin 26A of the interface connector, resets the counter to zero and totally lights the display (except for the decimal points) for a lamp test.
Output GATE		0 to ≈ 5 V, TTL-compatible, coincident with counting interval.

INTERNAL TIME BASE

	Standard	Option 1	Standard	Option 1
Crystal Frequency	1 MHz.	5 MHz.		
Stability (0° C to +50° C) after 1/2 hour	1 part or less in 10^5.	Within 5 parts in 10^7.		
Long-Term Drift	1 part or less in 10^5 per mo.	1 part or less in 10^7 per mo.		
1 MHz Clock Signal			Adjustable to within 1 part in 10^7.	Adjustable to within 5 parts in 10^9.

Note 1. Trigger jitter error (Ratio, Period) $= \frac{5\text{ mV}}{\text{dV/dt of triggering edge}}$

To verify trigger jitter, the input should be a 300 mV 50 Hz sinewave with less than 40 dB distortion; Ratio A/B uncertainty should be ⩽ 0.3% with this specified input.

Note 2. Hysteresis error $= \frac{300\text{ mV}}{\text{dV/dt of stop edge}}$

but only if CH B SLOPE switch is set differently than the CH A SLOPE switch.

Table 2-2

ENVIRONMENTAL CHARACTERISTICS

Characteristics	Performance Requirements
Temperature	
Operating	Operating, 0° C to +40° C in static air; +40° C to +50° C with forced air ventilation (bottom to top) greater than 200 cfm.
Storage	−40° C to +75° C.
Altitude	
Operating	To 15,000 feet. Maximum operating temperature decreased by 1° C/1000 feet from 5,000 to 15,000 feet.
Storage	To 50,000 feet.
Vibration	
Operating and Non-operating	With the instrument complete and operating, vibration frequency swept from 10 to 55 to 10 Hz at 1 minute per sweep. Vibrate 15 minutes in each of the three major axes at 0.015 inch total displacement. Hold 10 minutes at any major resonance, or if none, at 55 Hz. Total time, 75 minutes.
Shock	
Operating and Non-operating	30 g 1/2 sine, 11 ms duration, 3 shocks in each direction along 3 major axes, for a total of 18 shocks.

Table 2-3

PHYSICAL

Characteristics	Information
Overall Dimensions	
Height	5.0 in. (12.7 cm).
Length	11.5 in. (29.2 cm).
Width	2.6 in. (6.6 cm).
Net Weight	Approximately 2.25 lbs. (1 kg).
Finish	Anodized aluminum panel and chassis.

PERFORMANCE CHECK

Introduction

This procedure checks the electrical characteristics of the DC 503 that appear in the Specification section of this manual. If the instrument fails to meet the requirements given in this performance check, the calibration procedure should be performed. This procedure can also be used by an incoming inspection facility to determine acceptability of performance.

The electrical characteristics in this section are valid only if the DC 503 is calibrated at an ambient temperature of +20°C to +30°C and is operated at an ambient temperature of 0°C to +50°C. Forced air circulation, bottom to top, is required for ambient temperature above +40°C.

Tolerances that are specified in this performance check procedure apply to the instrument under test and do not include test equipment error.

Test Equipment Required

The test equipment listed in Table 2-4, or equivalent, is required to perform the performance check. Test equipment characteristics listed are the minimum required to verify the performance of the equipment under test. Substitute equipment must meet or exceed the stated requirements. All test equipment is assumed to be operating within tolerance.

Special test devices are used where necessary to facilitate the procedure. Most of these are available from Tektronix, Inc., and can be ordered through your local Tektronix Field Office or representative.

Table 2-4

LIST OF TEST EQUIPMENT REQUIREMENTS

Description	Performance Requirements	Application	Example
Frequency Standard	Output 1 V or more into 50 Ω load, accurate within 1 part in 10^7, output frequencies to include 1 MHz.	Check time base.	WWV
Power Module	Three compartments or more.	All tests.	TEKTRONIX TM 503, TM 504, TM 506, or equivalent.
Sinewave Generator[a]	Adjustable output amplitude, frequency to 100 MHz.	Trigger sensitivity check, high end.	TEKTRONIX SG 503 or equivalent.
Low Frequency Sinewave Generator	Adjustable output.	Trigger sensitivity check, low end.	TEKTRONIX FG 501 or equivalent.
Oscilloscope	Low-end frequency response to 0.1 Hz.	Measure amplitude of signal input for low-end trigger sensitivity check.	TEKTRONIX SC 501 or equivalent.
1 ea 50-Ω feed-through termination	Bnc connectors.	As required.	Tektronix 011-0049-01 or equivalent.
1 ea bnc 'T' connector	Bnc connectors.	As required.	Tektronix 103-0030-00.
2 ea 50-Ω coaxial cables	Bnc connectors.	As required.	Tektronix 012-0057-01.

Table 2-4 (cont)

LIST OF TEST EQUIPMENT REQUIREMENTS

Description	Performance Requirements	Application	Example
1 ea adapter, bnc female to bnc female		As required.	Tektronix 103-0028-00.
1 ea precision 50-Ω coaxial cable	Bnc connectors.	Check input sensitivity.	Tektronix 012-0482-00.
1 ea adapter, bnc to banana plug jack		Check GATE output amplitude.	Tektronix 012-0091-00.

*Traceable to NBS.

Preliminary Procedure

1. Ensure that all power switches are off.

2. Ensure that all test equipment and the power module into which the DC 503 under test will be installed are suitably adapted to the line voltage to be applied.

3. Install the DC 503 into the power module, and if applicable, install all other TM 500-series test equipment into the power module.

4. Connect the power module(s) and test equipment to a suitable line voltage source. Turn all equipment on and allow at least 20 minutes for the equipment to warm up and stabilize.

Initial Control Settings

Set the following controls during warm-up time:

DC 503

All front-panel pushbuttons	out
DISPLAY TIME-HOLD	fully ccw
FUNCTION	.01 s
CLOCK RATE	1 s

100 MHz Sine-wave Generator (SG 503)

Frequency	100 MHz
Output Amplitude	.3 volt

Low-frequency Sine-wave Generator (FG 501)

Frequency	.1 Hz
Output Amplitude	.3 volt

PERFORMANCE CHECK PROCEDURE

1. Check Operation of the FUNCTION Switch

With no signal applied to the DC 503 and with the DISPLAY TIME-HOLD control extreme counterclockwise, rotate the FUNCTION switch to its various positions and check the readout display and various indicator lights in accordance with Table 2-5.

Table 2-5

FUNCTION Switch	DC 503 Display	MHz/μs Light	kHz/ms Light	S Light	GATE Light
.01	.0000	ON	OFF	OFF	Rapid blinking (≈ 10 Hz)
.1	.00000	ON	OFF	OFF	Blinking (≈ 5 Hz)
1	.000	OFF	ON	OFF	Blinking (≈ 1 Hz)
10	.0000	OFF	ON	OFF	Slow blinking (≈ .1 Hz)
RATIO A/B	.000000	OFF	OFF	OFF	OFF
Period B	.000000	ON	OFF	OFF	OFF
Time A → B	0	OFF	OFF	ON	OFF
TIME MANUAL	0	OFF	OFF	ON	OFF
TOTALIZE A	0	OFF	OFF	OFF	OFF

2. Check Operation of the Clock Rate Switch

a. Set the DC 503 FUNCTION switch to RATIO A/B.

b. Rotate the CLOCK RATE switch throughout its range and note that the readout display corresponds to Table 2-6 for each position of the switch.

Table 2-6

CLOCK RATE Switch	DC 503 Display
10^6 - 1 s	.000000
10^5 - .1 s	.00000
10^4 - 10 ms	.0000
10^3 - 1 ms	.000
10^2 - .1 ms	.00
10 - 10 μs	.0
1 - 1 μs	0

3. Check DISPLAY TIME Interval

a. Set the DC 503 FUNCTION switch to .01 s.

b. Turn the DISPLAY TIME-HOLD control fully counterclockwise and note that the GATE light blinks rapidly ($\approx$ 10 Hz).

c. Turn the DISPLAY TIME-HOLD control fully clockwise, but not yet in the detent, and note that the GATE light blinks about every 10 seconds.

d. Turn the DISPLAY TIME-HOLD control into the detent and note that the GATE light does not blink.

4. Check Readouts and TIME MANUAL Position of the FUNCTION Switch

a. Set the FUNCTION switch to TIME MANUAL, the CLOCK RATE switch to 1 s, and release all front-panel pushbuttons to their outward position.

b. Press the DC 503 RESET pushbutton and hold it in.

c. Note that the display reads 8888888.

d. Check—that all segments of each digit are lighted evenly.

e. Release the RESET pushbutton.

f. Press the START pushbutton to its inward position.

g. Check—that the least-significant digit (right most) counts from 0 to 9 and carries to the next higher digit.

h. Check—the remaining digits using the switch settings given in Table 2-7.

Table 2-7

CLOCK RATE Switch	Display digit
1 s	1st
.1 s	2nd
10 ms	3rd
1 ms	4th
.1 ms	5th
10 μs	6th
1 μs	7th

i. Press, then release, the RESET pushbutton.

j. Check—that the 6th digit starts counting and the display flashes (overflow condition) when the 7th digit counts through 9 and reaches 0.

k. Press and release the START pushbutton to its outward position, then press the RESET pushbutton.

5. Check Totalize A Function

Control Settings:

TG 501

Marker (Sec)	1
Variable Timing	in
All other pushbuttons	out

DC 503

FUNCTION	TOTALIZE A
CLOCK RATE	1 μs
CH A + SLOPE pushbutton	in
All other pushbuttons	out

a. Connect the TG 501 Marker Out to the DC 503 CH A INPUT via a 50-ohm coaxial cable and a 50-ohm terminator, both of which have bnc connectors.

b. Check—that the DC 503 GATE OUTPUT light is extinguished.

c. Press the START pushbutton in to its locked position and note that the GATE OUTPUT light comes on and stays lighted.

d. Adjust the CH A trigger LEVEL control until the DC 503 starts counting.

e. Press the RESET pushbutton in, then release it.

f. Check—that when the RESET pushbutton is in, the display shows all 8s, and when the pushbutton is released, the DC 503 starts counting again.

g. Release the START pushbutton to its outward position and note that the counting stops and the display holds steady.

h. Press the START pushbutton in again and note that the count continues.

i. Change the TG 501 Marker (Sec) control to 1 μs.

j. Check—that the last digit on the left counts to 9, then the display starts flashing, indicating an overflow condition.

k. Release the START pushbutton to its outward position and press the RESET pushbutton.

6. Check Clock Accuracy

a. Apply a 1 MHz signal from the frequency standard to the DC 503 CH A INPUT via a 50-ohm coaxial cable and a 50-ohm termination, both of which have bnc connectors.

b. Adjust the DC 503 CH A triggering LEVEL control for a stable display.

c. Set the DC 503 FUNCTION switch to 1 s.

d. Check—that the readout shows 1000.000±10 counts (999.990 to 1000.10).

e. Set the DC 503 FUNCTION switch to 10 s.

f. Check—that the DC 503 readout shows 000.0000±100 counts (999.9900 to 000.0100). Note that the display flashes, indicating overrange, when the three most significant digits are all zeros.

7. Check CH A INPUT Sensitivity at 100 MHz

Control Settings:

SG 503

Frequency Range (MHz)	50-100
Frequency Variable	100
Output Amplitude	3.0
Amplitude Multiplier	X.1

DC 503

FUNCTION	.01 s
DISPLAY TIME-HOLD	fully ccw
CH A LEVEL	midrange
CH A AC COUPL pushbutton	in
All other pushbuttons	out

a. Connect the SG 503 Output to the DC 503 CH A INPUT through a precision 50-ohm coaxial cable and a 50-ohm terminator, both of which have bnc connectors.

b. Adjust the DC 503 CH A Triggering LEVEL control for a stable readout of approximately 100.0000 (MHz).

c. Press the DC 503 CH A +SLOPE pushbutton in to its locked position.

d. Adjust the DC 503 CH A Triggering LEVEL control for a stable readout display of approximately 100.0000 (MHz).

e. Repeat parts b through d above using the frequency settings given in Table 2-8.

f. Disconnect the SG 503 from the DC 503.

Table 2-8

SG 503 Frequency Range MHz)	SG 503 Frequency Variable	DC 503 READOUT DISPLAY
50-100	100	Approx. 100.0000
20-50	50.0	Approx. 50.0000
10-25	25.0	Approx. 25.0000
5-10	10.0	Approx. 10.0000
2.5-5	5.00	Approx. 5.0000
1-2.5	2.50	Approx. 2.5000
.5-1	1.00	Approx. 1.0000

8. Check CH A INPUT Sensitivity at 0.1 Hz

Control Settings:

SC 501

Variable control	X1 (fully cw)
100 mV pushbutton	in
AC Couple pushbutton	out (dc)
Triggering Int/Ext switch	Int
ms pushbutton	in
X10 pushbutton	in

FG 501

Function	sinewave
Offset	Min
Output	Min
Multiplier	10^{1}
Frequency Hz	1
Frequency Vernier	cw (Cal)

DC 503

FUNCTION	1 s
All front-panel pushbuttons	out

a. Connect the 50-ohm termination to the output of the FG 501. Connect the T connector to the termination, then connect the SC 501 Vert Input and the DC 503 CH A INPUT connectors to the T with equal lengths of coaxial cable.

b. Turn both the Offset and Output controls of the FG 501 about 1 division (≈ 1 volt) away from the Min position.

c. Pull the SC 501 Trigger Level/Slope control to its outward position for Auto Sweep and obtain a display of the FG 501 output.

d. Turn the FG 501 Output control as necessary to obtain 3 divisions (300 mV) of vertical deflection on the SC 501. Turn the FG 501 Offset control as needed to keep the display on-screen.

e. Turn the LEVEL control on the DC 503 about its midpoint until the DC 503 starts counting; now rock the level control back and forth carefully until the upper and lower points of the triggering hysteresis range are located and leave the control set midway in the triggering range.

f. Set the DC 503 FUNCTION switch to 10 s. Set the FG 501 Multiplier switch to 10^{-1}. Press the DC 503 RESET pushbutton to reset the DC 503 display. Wait approximately 10 seconds and note that the least significant digit of the DC 503 display changes, indicating that the DC 503 has been triggered by the 300 mV, 0.1 Hz signal.

9. Check B Period

Control Settings

TG 501

Marker (Sec)	.1 μs
Variable Timing	in
All front-panel pushbuttons	out

DC 503

FUNCTION	PERIOD B
CLOCK RATE	.1 s
DISPLAY TIME	ccw
CH B LEVEL	midrange
CH B +SLOPE	in
All other pushbuttons	out

a. Connect the TG 501 Marker Out through a 50-ohm coaxial cable and a 50-ohm terminator to the DC 503 CH B INPUT connector.

b. Adjust the DC 503 CH B LEVEL control so the GATE light starts blinking and the readout stabilizes.

c. Check—that the DC 503 readout displays .10000.

d. Check the remaining positions of the CLOCK RATE switch against the figures given in Table 2-9.

Table 2-9

DC 503 CLOCK RATE	TG 501 MARKER (SEC)	DC 503 READOUT DISPLAY
1 s	.1 μ	.100000 ±2 counts
.1 s	1 μ	1.00000 ±2 counts
10 ms	10 μ	10.0000 ±2 counts
1 ms	.1 m	100.000 ±2 counts
.1 ms	1 m	1.00000 ±2 counts
10 μs	10 m	10.0000 ±2 counts
1 μs	.1	100.000 ±2 counts
1 μs	1	1000.000 ±20 counts

10. Check CH B INPUT Sensitivity at 10 MHz in the PERIOD Mode

Control Settings:

SG 503

Frequency Range (MHz)	5-10
Frequency Variable	10.0
Output Amplitude	3.0
Amplitude Multiplier	X.1

DC 503

FUNCTION	PERIOD B
CLOCK RATE	.1 s
DISPLAY TIME	ccw
CH B LEVEL	midrange
CH B +SLOPE	in
All other pushbuttons	out

a. Connect the SG 503 Output to the DC 503 CH B INPUT through a precision 50-ohm coaxial cable and a 50-ohm terminator.

b. Adjust the DC 503 CH B LEVEL control for a blinking GATE light.

c. Check—that the DC 503 readout displays approximately .1000 and that the μs (MHz) light is on.

d. Release the DC 503 CH B +SLOPE pushbutton to its outward position and again adjust the CH B LEVEL control for a steadily blinking GATE light.

e. Check—that the DC 503 readout displays approximately .1000 and that the μs (MHz) light is on.

f. Disconnect the 50-ohm cable and 50-ohm terminator from the SG 503 and DC 503.

11. Check CH B INPUT Sensitivity at 1 kHz and 10 Hz in the PERIOD Mode

Control Settings:

FG 501

Frequency Hz	1
Multiplier	10^3
Function	sinewave
Frequency Vernier	cw (Cal)
Output Level	≈ 1 volt
Offset	≈ midrange

SC 501

100 mV pushbutton	in
Variable controls	both cw
ms pushbutton	in
Int-Ext switch	Int
Level-slope control	pull out for Auto triggering
All other pushbuttons	out

DC 503

+SLOPE pushbutton	in
All other pushbuttons	out
FUNCTION switch	PERIOD B
CLOCK RATE	.1 ms
DISPLAY TIME	ccw
CH B LEVEL	≈ midrange

a. Connect the output of the FG 501 through a 50-ohm terminator, a bnc 'T' connector, and two coaxial cables to the Vert Input of the SC 501 and the CH B INPUT of the DC 503.

b. Obtain a display of the output of the FG 501 on the crt of the SC 501, then adjust the Output control of the FG 501 to give 3 divisions of vertical deflection (300 mV) on the crt.

c. Adjust the CH B LEVEL control of the DC 503 for a stable readout display of approximately 1.00000 with the GATE light blinking steadily and the ms (kHz) light on.

d. Change the FG 501 Multiplier switch to 10^1. Set the ms and X100 pushbuttons on the SC 501 to their inward positions. Change the DC 503 CLOCK RATE switch to 1 μs and press the CH B AC COUPL switch in to its locked position.

e. Adjust the DC 503 CH B LEVEL control for a stable readout display of approximately 100.000 with the ms (kHz) light on and the GATE light blinking steadily.

f. Check that the vertical deflection on the SC 501 is still 3 vertical divisions (300 mV). This completes the input sensitivity check.

12. Check the TIME A → B position of the FUNCTION Switch

Control Settings:

FG 501

Function	squarewave
Frequency	1
Frequency Vernier	cw (Cal)
Multiplier	10^3 (1 kHz)
Output	min
Offset	midrange

SC 501

100 mV pushbutton	in
ms pushbutton	out
X100 pushbutton	in
Variable (both controls)	cw
Int-Ext switch	Int
Trigger Level/Slope switch	midscale and pulled outward

DC 503

FUNCTION	TIME A → B
CLOCK RATE	1 ms
CH A LEVEL	midrange
CH B LEVEL	midrange
DISPLAY TIME	ccw
All front-panel pushbuttons	out

a. Turn CH A LEVEL control fully ccw and note that the GATE light does not come on.

b. Turn the CH A LEVEL control cw and note that the GATE light comes on and stays on.

c. Check—that the readout displays .000 with the s light on.

d. Turn CH B LEVEL control fully ccw; note that the GATE light stays on.

e. Turn the CH B LEVEL control cw and note that the GATE light goes off and a number is displayed.

f. Press the RESET pushbutton and note that the display returns to .000.

g. Connect the output of the FG 501 through a 50-ohm termination, a 'T' connector, and coaxial cables to the CH A INPUT of the DC 503 and the Vertical Input of the SC 501.

h. Turn the FG 501 Offset control to center the trace on the SC 501 crt. Adjust the FG 501 Output control for 4 divisions (400 mV) of vertical deflection.

i. Remove the coaxial cable from the input of the SC 501 and connect it to the CH B INPUT of the DC 503; i.e., apply a 400 mV, 1 kHz square-wave to both the CH A and CH B inputs of the DC 503.

j. Set the DC 503 FUNCTION switch to .1 s and adjust the CH A LEVEL control for a readout display of approximately .00100 with the MHz light on.

k. Set the DC 503 CLOCK RATE to 1 μs and the FUNCTION switch to PERIOD B. Turn the DC 503 CH B LEVEL control for a readout display of approximately 1.000 with the ms light on and the GATE light blinking.

l. Turn the DC 503 FUNCTION switch to TIME A → B. Adjust the CH A LEVEL control for a readout display of approximately 1.000 with the kHz light on.

m. Press the DC 503 CH A +SLOPE pushbutton in. Adjust the DC 503 CH A LEVEL control for a readout display of approximately .500 with the kHz light on and the GATE light blinking.

n. Press the CH B +SLOPE pushbutton in and note that the display changes to approximately .000.

o. Release the CH A +SLOPE pushbutton to its outward position and note that the display changes to approximately .500. Now release the CH B +SLOPE pushbutton and note that the reading changes to approximately 1.000 (it may be necessary to slightly readjust the CH A LEVEL control to obtain the 1.000 reading).

13. Check GATE OUTPUT Amplitude

The GATE OUTPUT amplitude may be measured by using a bnc to banana-plug adapter in the GATE OUTPUT jack and a coaxial cable from that to the input of the SC 501. The amplitude of the signal out should be approximately 5 volts from low level to high level.

This concludes the Performance Check Procedure for the DC 503 Universal Counter.

WARNING

THE FOLLOWING SERVICING INSTRUCTIONS ARE FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID PERSONAL INJURY, DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO. REFER TO OPERATORS SAFETY SUMMARY AND SERVICE SAFETY SUMMARY PRIOR TO PERFORMING ANY SERVICE.

ADJUSTMENT

Introduction

This adjustment procedure is to be used to restore the DC 503 to original performance specifications. Adjustment need not be performed unless the instrument fails to meet the Performance Requirements of the Electrical Characteristics listed in the Specification section, or the Performance Check cannot be completed satisfactorily.

Completion of all adjustment steps in this procedure ensures that the instrument will meet the performance requirements listed in the Specification section. However, to fully ensure satisfactory performance, it is recommended that the Performance Check be performed after any adjustment is made.

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.

Test Equipment Required

The test equipment listed in Table 3-1, or equivalent, is required for adjustment of the DC 503. Specifications given for the test equipment are the minimum necessary for accurate adjustment and measurement. All test equipment is assumed to be correctly calibrated and operating within specification.

If other test equipment is substituted, control settings or calibration setup may need to be altered to meet the requirements of the equipment used.

A flexible plug-in extender, Tektronix Part No. 067-0645-02, is useful for troubleshooting or adjusting the DC 503; however, the complete Adjustment Procedure can be performed without use of the extender.

Table 3-1

LIST OF TEST EQUIPMENT REQUIREMENTS

Description	Performance Requirements	Application	Example
Oscilloscope and 100X Probe	Step response time of oscilloscope/probe combination must be $\leq$ 2 ns.	Adjusting step response and setting time base on frequency.	TEKTRONIX 5440 mainframe and 5A38/5B40 with a TEKTRONIX P6057 100X probe for real time, and a TEKTRONIX 5S14N Sampling Unit for checking signals with $\leq$ 2 ns risetime. (Real-time oscilloscope/probe combinations with response time $\leq$ 2 ns may be used, so long as probe input impedance is $\geq$ 5 kΩ paralleled by $\leq$ 5 pF.)
Pulse Generator	Output $\geq$ 0.5 V square wave with risetime $\leq$ 1 ns.	Adjusting step response.	TEKTRONIX PG 502 in a TM 500-Series Power Module.
Power Module	Three compartments or more.	All tests.	TEKTRONIX TM 503 or TM 504.
Voltmeter	Accurate within 1%, range 0 to 50 volts dc.	Check and adjust power supply voltage.	TEKTRONIX DM 501 or equivalent.

Table 3-1 (cont)

LIST OF TEST EQUIPMENT REQUIREMENTS

Description	Performance Requirements	Application	Example
10X Probe	At least 1 MΩ input resistance paralleled by ⩽ 30 pF.	Checking and setting time base frequency.	TEKTRONIX P6006, P6060, or equivalent.
50-Ω Feedthrough Termination	Bnc connectors.	Step response adjustment.	Tektronix 011-0049-01 or equivalent.
50-Ω Coaxial Cable (2 ea)	Bnc connectors.	Checking and setting time base frequency and step response.	Tektronix 012-0057-01 or equivalent.
Bnc 'T' Connector		Adjust step response.	Tektronix 103-0030-00 or equivalent.
Frequency Standard[a]	Output 1 V or more into 50 Ω load, accurate within 1 part in 10^8, output frequencies to include 1 MHz.	Adjust time base.	WWV.

[a]Traceable to NBS.

Preparation

a. Remove the left side cover of the DC 503 to gain access to the adjustments inside. Remove the cover by pulling the rear end outward from the side of the instrument (the cover snaps into place).

b. Connect the DC 503 to the power module by means of the flexible plug-in extender. If an extender is not available, remove the cover from the power module and plug the DC 503 into the left compartment.

c. Be sure that the power switch on the power module is off. Set the power module for the line voltage to be applied (see power module manual).

d. Plug the power cord of the power module into the power source to be used and turn on the power module.

e. Connect all test equipment to a suitable line voltage source. Turn on all test equipment and allow at least 20 minutes for the equipment to warm up and stabilize.

Initial Control Settings

Set the following controls during warm-up time:

DC 503

FUNCTION	.01 s
CLOCK RATE	10^6—1 s
DISPLAY TIME	ccw
CH A LEVEL	midrange/in
CH B LEVEL	midrange/in
All front-panel pushbuttons	out

DM 501

Range/Function switch	20 DC Volts

1. Adjust +15 V Supply

a. Connect the DM 501 LO test lead to the DC 503 chassis ground (function of C502 and R506). Connect the DM 501 HI test lead to the DC 503 +15 V test point (the junction of R502, C502, and R504, see Fig. 3-1).

b. Adjust R505 for a reading of +15.000 on the DM 501 readout.

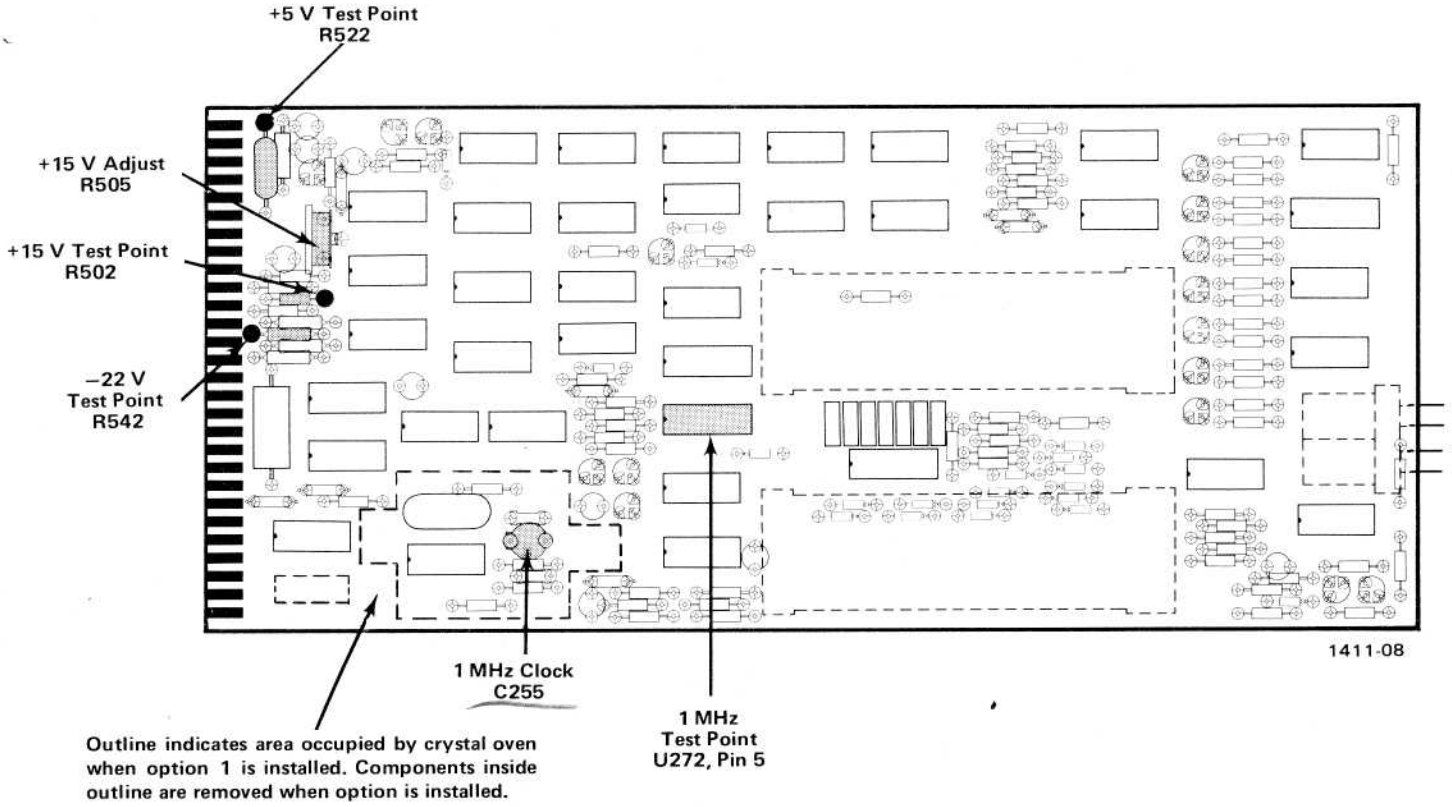


Fig. 3-1. Location of power supply test points and adjustment.

c. Check that the +5 V and −22 V supplies are both within ±5% of their specified outputs.

2. Adjust CH A Level Balance, R42

a. Remove any cables connected to the DC 503 front-panel input connectors.

b. Set the DC 503 FUNCTION switch to TOTALIZE A.

c. Press the DC 503 Totalize START/STOP (in for start, out for stop) pushbutton. Release all other pushbuttons.

d. Turn the CH A LEVEL control to its mechanical center (midscale).

e. Turn Level Bal control R42 (see Fig. 3-2) extreme clockwise.

f. Press the RESET pushbutton.

g. Turn R42 slowly counterclockwise while watching the display readout. The instant that the readout changes from 0 to 1, stop turning R42; the change indicates R42 has reached its correct setting.

h. Repeat this step a few times until you are confident that R42 is adjusted as directed.

3. Adjust CH B Level Balance, R142

a. Set the DC 503 FUNCTION switch to PERIOD B. Set the CLOCK RATE switch to 1—1 μs (extreme counterclockwise). Release the Totalize START/STOP pushbutton.

b. Set the CH B LEVEL control to its mechanical center (midscale). Turn CH B Level Bal control R142 (see Fig. 3-2) to its extreme counterclockwise position.

c. Press the RESET pushbutton, then turn R142 slowly clockwise. The instant that the GATE lamp illuminates, stop turning R142; the correct setting of R142 causes the GATE lamp to illuminate.

d. Repeat this step a few times until you are confident that R142 is adjusted as directed.

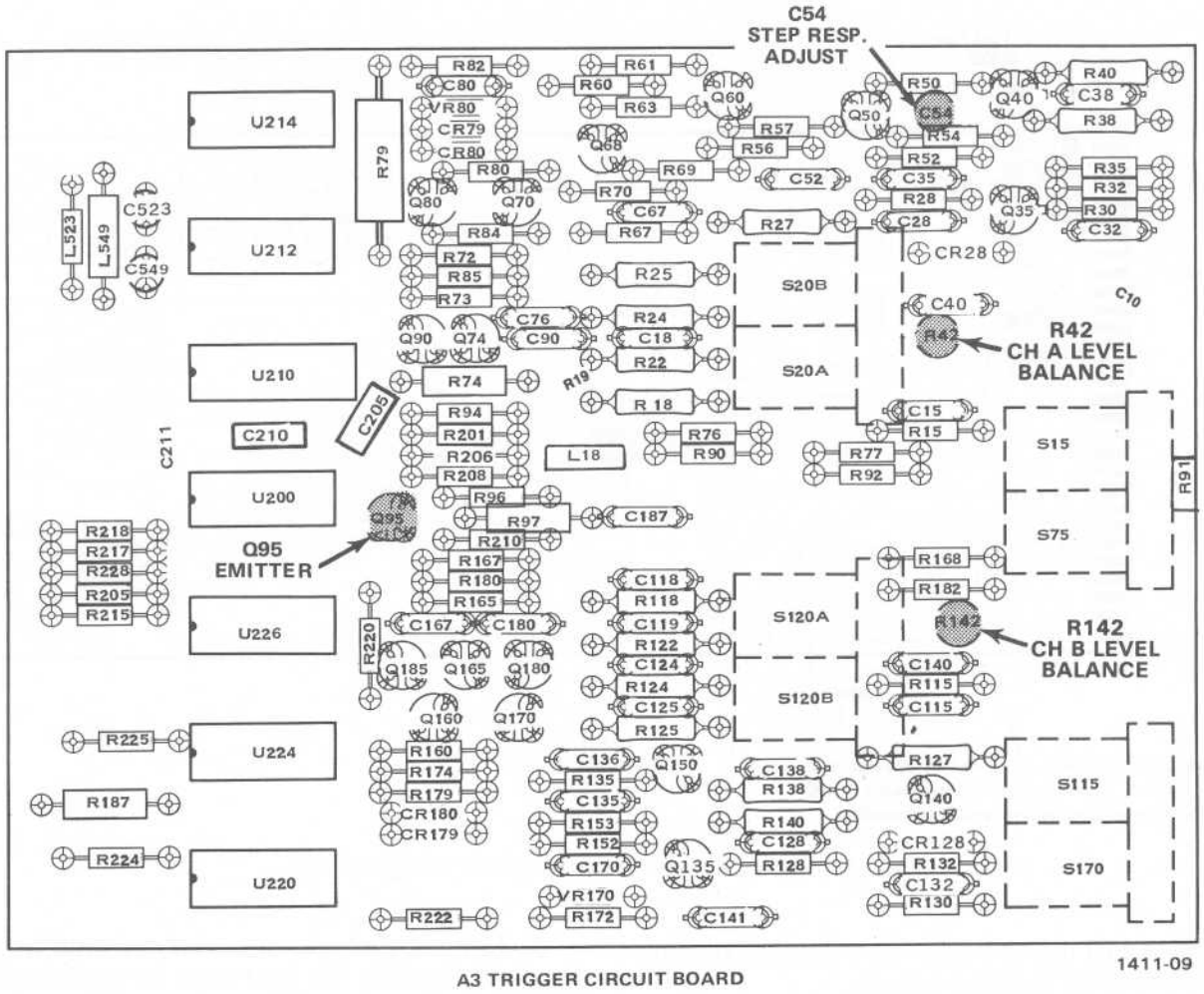


Fig. 3-2. Location of Level Balance and Step Response adjustments.

4. Adjust Time Base Frequency

Control Settings:

Test Oscilloscope

Volts/Div	1 V
Coupling	ac
Time/Div	.2 μs
Trigger Source	external

DC 503

FUNCTION	.1 s
CH A LEVEL	midrange
DISPLAY TIME	ccw
CH A AC COUPL pushbutton	in
All other pushbuttons	out

a. Connect a 10X probe from the vertical input of the test oscilloscope to pin 5 of U272 in the DC 503 (see Figs. 3-1 and 3-3).

b. Connect a 'T' connector to the output of the frequency standard. Connect a 50 Ω coaxial cable from one end of the 'T' connector to the external trigger input of the test oscilloscope. Connect the other end of the 'T' connector through a 50 Ω coaxial cable to the CH A INPUT of the DC 503.

c. Adjust the test oscilloscope triggering controls for stable triggering on the frequency standard signal. Adjust the DC 503 CH A LEVEL control for a stable readout display.

d. Adjust—capacitor C255 in the DC 503 (see Fig. 3-2) for minimum pulse drift across the screen of the test oscilloscope. At the conclusion of the adjustment, the drift should not exceed 1 division per second.

NOTE

The adjustment procedure for Option 1 instruments is the same except that the drift should be set for no more than 5 divisions drift in 20 seconds (5 parts in 10^7). The adjustment is located under the slotted plastic cover on the crystal oven.

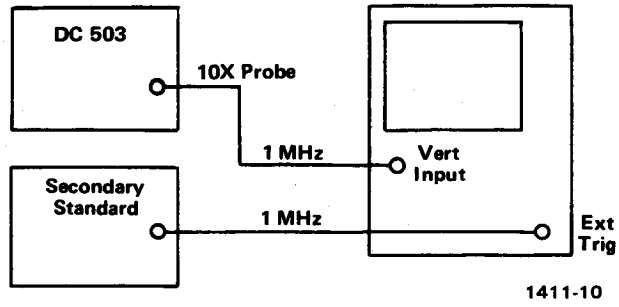


Fig. 3-3. Connections for Time Base frequency check.

e. Set the DC 503 FUNCTION switch to 10 s.

f. Check—that the DC 503 readout display is 000.0000 ±100 counts (999.9900 to 000.0100).

NOTE

For Option 1, the DC 503 readout should display 000.0000 (display flashing) ±5 counts (999.9995 to 000.0005).

5. Adjust Channel A Step Response

a. Install the sampling unit into the test oscilloscope (a real-time oscilloscope/probe combination may be used for this step, providing the risetime of the combination is ⩽ 2 ns).

b. Connect a 100X probe (P6057) from the emitter of Q95 (see Fig. 3-2) in the DC 503 to the CH 1 input of the sampling unit; connect the probe ground clip to chassis ground of the DC 503.

c. Set the fast-rise pulse generator for ≈ 1 volt output and connect it to the DC 503 CH A INPUT via a 50 Ω coaxial cable and a 50 Ω termination.

d. Obtain a test oscilloscope display of the waveform at the emitter of Q95. Set the test oscilloscope vertical deflection controls to give 5 major divisions of waveform display.

e. Adjust C54 in the DC 503 for the best front corner on the waveform. Aberrations on the front corner should not exceed 1 major division (±20%).

This concludes the adjustment procedure for the DC 503.

MAINTENANCE AND INTERFACING INFORMATION

Preventive Maintenance

There are no special preventive maintenance procedures that apply to the DC 503. Refer to the power module instruction manual for generao preventive maintenance procedures and instructions.

Corrective Maintenance

Refer to the power module instruction manual for general corrective maintenance procedures and instructions.

System Maintenance

System maintenance procedures are provided in the power module manual; i.e., preventive maintenance, troubleshooting aids, parts removal and replacement procedures, parts ordering information, etc.

Troubleshooting

Use the Performance Check, Adjustment Procedure, and Circuit Description as aids to locate trouble in the event of equipment failure. The test equipment listed in the Performance and Check Adjustment Procedure will prove useful in troubleshooting the DC 503.

Customizing the Interface

Input and output access to the DC 503 is available at the rear of the main circuit board. Fig. 4-1 identifies the contacts and their respective I/O assignments.

A Power Module mainframe option (Option 2) is available which provides a rear-panel, multi-pin connector to which I/O lines can be hard-wired for external access. Also possible are intra-compartment connections with other plug-in modules in multiple-compartment mainframes.

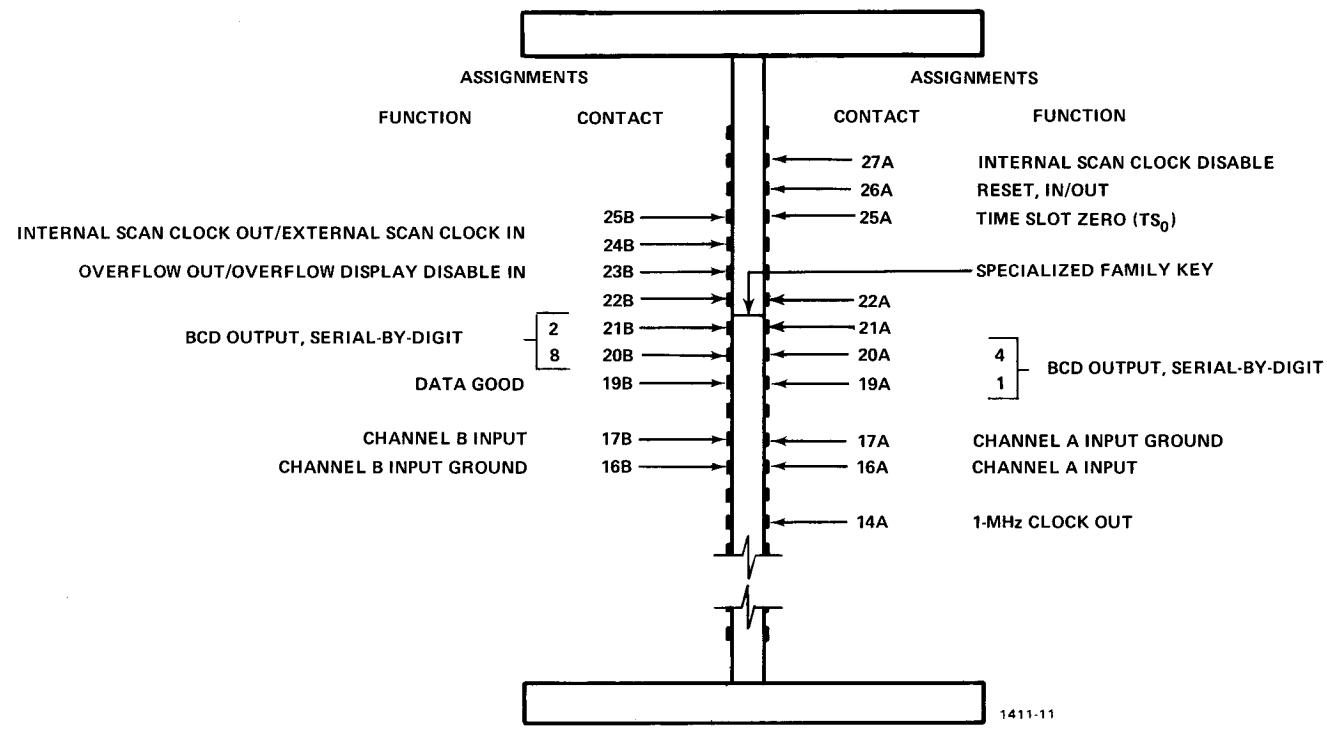


Fig. 4-1. Input/Output assignments at rear interface connector.

Control Lines

These lines allow the user to externally command the DC 503 to certain operating conditions.

A Reset input line, which doubles as an output signal line, clears the Counter to zero when a low is applied to it. An input line to disable the flashing overflow display also doubles as an output signal line during overflow. The internal scan clock can be shut off by the Internal Scan Clock Disable line, while using an external scan clock.

Signal Lines

These lines provide for signal input to each channel, external scan clock inputs, BCD data outputs, and status and clock signal outputs.

The Reset, Time-Slot Zero (TS0), Data Good, and Overflow lines report the status of the DC 503. BCD data lines report the count in an 8-4-2-1, serial-by-digit method.

As long as the Internal Scan Clock Disable line remains high, the Internal Scan Clock output signal is available. When the Disable line is pulled down, the Internal Scan Clock line becomes an input line for an External Scan Clock signal.

The DC 503 internal 1 MHz Clock signal is brought to the interface for possible synchronous applications.

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.

CIRCUIT DESCRIPTION

INPUT CIRCUIT

Attenuators, Channels A and (B) ①

Events to be counted are applied via front-panel INPUT connector J10 (J110) to the attenuators. The attenuators are frequency-compensated voltage dividers consisting of resistors R18, R19 and R22, capacitor C18, and coil L18 for the Channel A X100 attenuator. Resistors R24 and R25 form the Channel A X10 attenuator. Similar attenuator networks are used for Channel B. Switches S20A (S120A) and S20B (S120B) allow front-panel selection of X1, X10, or X100 attenuation of the input signal. C15 (C115) provides ac coupling.

Signal Shaping and Slope, Channels A and (B)

Field effect transistor (FET) Q35 (Q135) presents a high impedance to the input signal and a low impedance to the base of Q50 (Q150). FET Q40 (Q140) provides isolation between the LEVEL control R45 (R145) and the base of Q50 (Q150). Adjustment of the LEVEL control changes the bias on Q50 (Q150) and thus selects what portion of the input signal will trigger the DC 503.

Q60 and Q50 in the Channel A signal shaping circuitry comprise a high frequency, high gain amplifier. Q68 (Q150 in the Channel B signal shpaing circuitry) acts as an emitter follower.

Q70-Q80 (Q160) is a signal switched differential pair. +SLOPE switch S75 (S170) selects the triggering slope by biasing the desired slope to R74 (R165). The positive slope is passed through Q90 (Q165), while the negative slope is passed through Q74 (Q180). Emitter follower Q95 (Q185) couples the signal level to a TTL level and the slope-determined output signal to the appropriate DCU signal selection gate and the A start portion of the Time A → B circuit.

DCU Signal Selection Gates

The two separate bistable multivibrators produce sharp signal edges for the decade counter units (DCU). In TOTALIZE A, RATIO A/B, or one of the FREQ A positions, U200A-U200C is the active bistable multivibrator and is switched by the Channel A input signal. In TIME MANUAL, or TIME A → B, U200D-U200C is the active bistable multivibrator for the DCU drive and is controlled by the DDU (Decade Divider unit) output. In PERIOD B, U200D-U226C is the active bistable multivibrator. It receives a control signal from the 1 MHz clock.

The output signal from the active bistable multivibrator goes to NOR gate U200B. The output of U200B is used to toggle the decade counter units.

Time A → B (A Start-B Stop)

The two separate bistable multivibrators (U220C-U220D and U220A-U220B) produce sharp edges to toggle U224A and B.

In TIME A → B mode the FUNCTION switch puts a low at pin 1 of U226A, making pin 3 of NAND gate U226B high. Pin 4 of U226B goes low when CLEAR goes low at pin 4 of U224A. Pin 5 of U226B goes high due to a low at pin 13 of U224B. An "A trigger" causes U224A to toggle, which makes pin 4 of U226B high. This outputs a low to pin 14 of U272B, causing the gate to "open" (permits input of event to be counted). U224B simultaneously becomes "armed" by the high that occurs at its pins 12 and 13. The circuit now waits for a "B trigger" which will toggle U224B and put a low on pin 5 of U226B. When the B trigger arrives, U226B will output a high to pin 14 of U272B in the gate generator circuit closing the gate. When the gate closes, a CLEAR resets U224A, which in turn resets U224B.

TIME BASE AND CONTROL CIRCUITS

1 MHz Clock ◈2

A precise one-megahertz clock provides the reference for operation of the gate-generating and time-counting circuits. The output of crystal oscillator Y250 is adjustable by C255 to exactly one megahertz. The four parts of U250 form a shaper-buffer stage to produce square-wave clock pulses and to isolate the oscillator from the 1 MHz output line.

Optional 1 MHz Clock

An optional 1 MHz clock is available, using a very stable 5 MHz crystal oscillator and a divide-by-five counter. This combination is shown on the schematic as Y251 and U251.

Decade Divider Units (DDU)

The DDU consist of seven cascaded divide-by-ten counters, U260 through U266. They produce four gate times, 0.01 sec, 0.1 sec, 1 sec, and 10 sec, and seven decades of N or clock rates: 10^0 through 10^6 and 1 μs through 1 s. The four gate times are made available via the FUNCTION switch to the gate generator to establish the precise time interval the gate is open. The seven DDU decade outputs are available via the N/CLOCK RATE and FUNCTION switches and the DCU signal selection gates to the decade counter units.

The 1 MHz clock signal or Channel B shaped output signal is applied to pin 14 of U260, whose output is connected to the input of the subsequent decade. Each decade is clocked with a negative-going transition. The DDU are reset by a CLEAR pulse, which places a 0 count in U260 and a 9 count in each subsequent decade.

Gate Generator

The gate generator produces the GATE control signal and initiates the CLEAR, CLEAR, and LATCH pulses. The generating portion consists of U270A, U272A, U270B, and U272B. The display time control portion consists of Q280, Q288, and Q290. The circuit will be described first in the gate time mode (FUNCTION switch in one of the four FREQ A positions).

Assume that the T_0 conditions are as given in Fig. 5-1. The Q outputs of U270A, U272A, U270B, and U272B are all low. Q280 is off and the emitter of Q288 rises as C285 charges. At T_1, Q288 reaches its firing potential and discharges the capacitor. This results in a short-duration low pulse on the direct-set input (pin 2) of U270A, forcing its Q output high and its Q output low. With two high inputs on U280A, its output goes low and the output of U280D goes high, producing the CLEAR and CLEAR control signals. The next high-to-low transition from the 1 MHz clock (T_2) toggles U272A, causing its Q output to go high and its Q to go low. With a low applied to one of its inputs, U280A reverts to its original condition, terminating the CLEAR and CLEAR pulses. The DDU then start counting from the 0999999 reset condition.

At the end of a 10-microsecond delay (time for the DDU to count the first digit, plus a propagation delay), a negative transition from the DDU via either the FUNCTION or N/CLOCK RATE switch (depending on operating mode) toggles U270B. This event corresponds to T_3 in Fig. 2-1. U270B Q goes high and its Q output goes low. The next negative transition from the 1 MHz clock (T_4) toggles U272B, causing its Q output to go high (GATE open) and its Q output to go low (supplying current to front-panel GATE indicator LED DS275). The U272B Q output (GATE) is applied to the base of Q280, saturating the transistor and preventing C285 from charging. The U272B Q output (GATE) is also supplied to a front-panel connector via inverter and isolation transistor Q278.

The GATE remains open (high) for the time duration selected by either the FUNCTION or N/CLOCK RATE switch (depending on operating mode). At the end of this time, which corresponds to T_5 in Fig. 2-1, another negative transition from the DDU toggles U270B. U270B Q output goes low and its Q output goes high. The next negative transition from the 1 MHz clock (T_6) toggles U272B, causing its Q output to go low, closing the gate. Simultaneously, the Q output goes high, removing current from the GATE indicator LED.

When the U272B Q output goes low, the negative transition toggles U270A, switching Q low and Q high. Now U280B has two high inputs, placing a low at the output of U280B, terminating the LATCH signal.

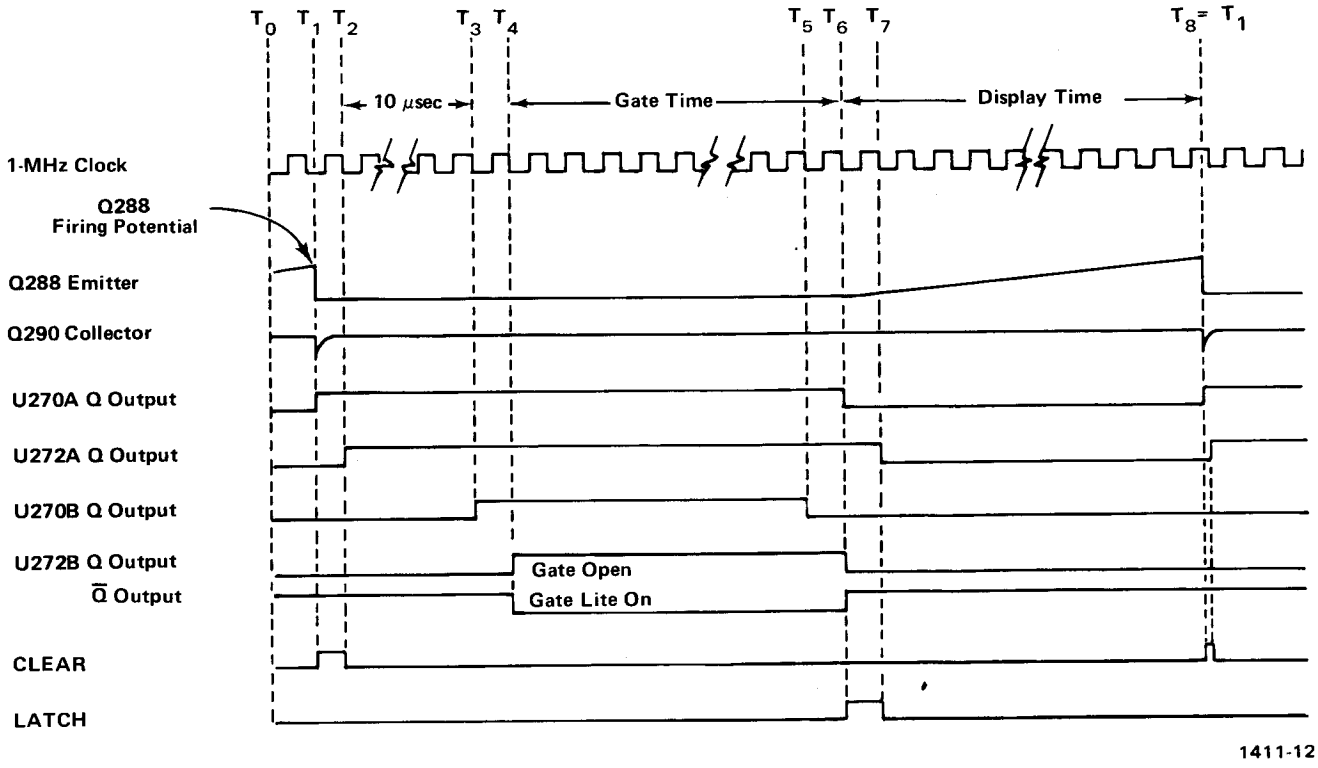


Fig. 5-1. Time Base generator normal gating mode ladder diagram.

The display time begins when the GATE signal ends (T_6). When Q280 turns off, C285 begins to charge through R282-R285 toward the V_{cc} supply. R285, DISPLAY TIME, provides an adjustable time constant to vary the display time from about 0.1 second to about 10 seconds. When the DISPLAY TIME control is fully clockwise (HOLD detent position), S285 opens, and C285 stops charging. When S285 is closed and C285 charges sufficiently to bring Q288 to its firing potential (T_1), the display time ends and the next GATE-opening sequence begins.

Q270 provides an automatic reset by grounding the RESET line for a short time after instrument turn-on. The FUNCTION and N/CLOCK RATE switches also provide a method of automatic reset. The two switches ground the RESET line between switch detent positions. The automatic reset insures that the readout has been cleared before the next measurement. The automatic reset can be seen by noting that the display goes to all eights (all LED segments lit) in between switch detent positions.

COUNTER CIRCUITS

Decade Counter Units (DCU) ◈3

The 10^0 through 10^6 DCU is seven cascaded divide-by-ten counters. The first decade counter is made up of four individual J-K flip-flops, located on the Trigger Amplifier circuit board, to accept the high-speed decade input (up to 100 MHz), and each subsequent DCU is a single IC. U210A, U210B, U212, and U214 compose the first (10^0) decade counter, and U305 through U310 make up the remaining six DCU.

When the J and K inputs of U210A are high (GATE open), the counter is enabled. The input signal is applied to the toggle input of U210A. On every tenth clock input counted by the first decade counter, the output of U214 goes low, providing a carry signal that becomes the clock input for the second decade counter. Each subsequent decade divides by ten in a similar manner. Four BCD output lines are connected from each DCU to its associated storage-register latch. When the CLEAR (high) and CLEAR (low) signals are activated, all of the decade counters are reset to the zero-count state.

Storage Register

The seven IC latches (U320 through U326) compose a storage register that stores the corresponding decade counter BCD output. The BCD output number is applied to the data inputs at pins 1, 5, 7, and 3 (2^0, 2^1, 2^2, and 2^3 bits respectively). The LATCH pulse is applied to the data-strobe input at pin 2 of each latch at the end of GATE (negative transition) or when the FUNCTION switch is placed in the TOTALIZE A, or TIME MANUAL, position. While the LATCH input is high, the logic levels at the data inputs are transferred to the associated BCD bit output to be scanned by the multiplexing circuit.

Overflow Register and Drive

When the decade counters have counted to 9,999,999, the counters are full. At the next count the 2^3 output of U310 goes low, providing a toggle input to U311A. When this occurs, a high is transferred from pin 14 to pin 12 of U311A. When the LATCH pulse ends (goes low), U311B is toggled and the high is transferred to pin 8. When pin 8 of U311B goes high, CR311 and CR314 are turned off. The high now at the input of U328B starts a multivibrator which causes the LED display to flash.

In the TIME MANUAL and TOTALIZE A counting modes, overflow indication is achieved via Q312 and CR314. The emitter of Q312 is grounded by a switch closure as is the clear input (pin 6) of U311B. When pin 13 of U311A goes low on the first overlfow count, Q312 and CR314 turn off. Since pin 8 of U311B is held high (CR311 off) by the clear input (pin 6), this first overflow count causes a flashing LED display. This difference in the overflow circuit is necessary in the "manual" modes, since the display is continuously read from the DCU (LATCH high).

U311A is reset by the CLEAR pulse. To prevent leading-zero suppression during the overflow condition, the display-controlling circuits are notified via U328A that the count is in excess of that displayed by the LED readout.

DECODING AND DISPLAY MULTIPLEXING

Scan Clock

The scan rate of the multiplexing circuit is determined by the scan clock. The scan clock is composed of U330B and U330C, which operate as a free-running multivibrator at an approximate 2-kilohertz rate. Input/output lines are provided for internal scan-clock disable, internal scan clock output, and external scan clock input. The scan clock output drives an eight-state counter and a storage register for zero suppression.

÷8 Counter and Time-Slot Decoder

The divide-by-eight counter is made up of U332B, U333A, and U333B. The output of this counter drives U335, A BCD-to-decimal decoder. U335 provides eight output lines (designated TS_0 through TS_7 in the schematic, and in Fig. 5-2) to simultaneously enable the output of each counter latch and its corresponding display LED sequentially. For example, when the TS_1 line goes low, Q360 is turned on to supply anode voltage to DS360 at the same time inverter U337A applies a high to pin 6 of latch U326, enabling its output. Operation in a time sequence allows the latches to share a common set of output lines.

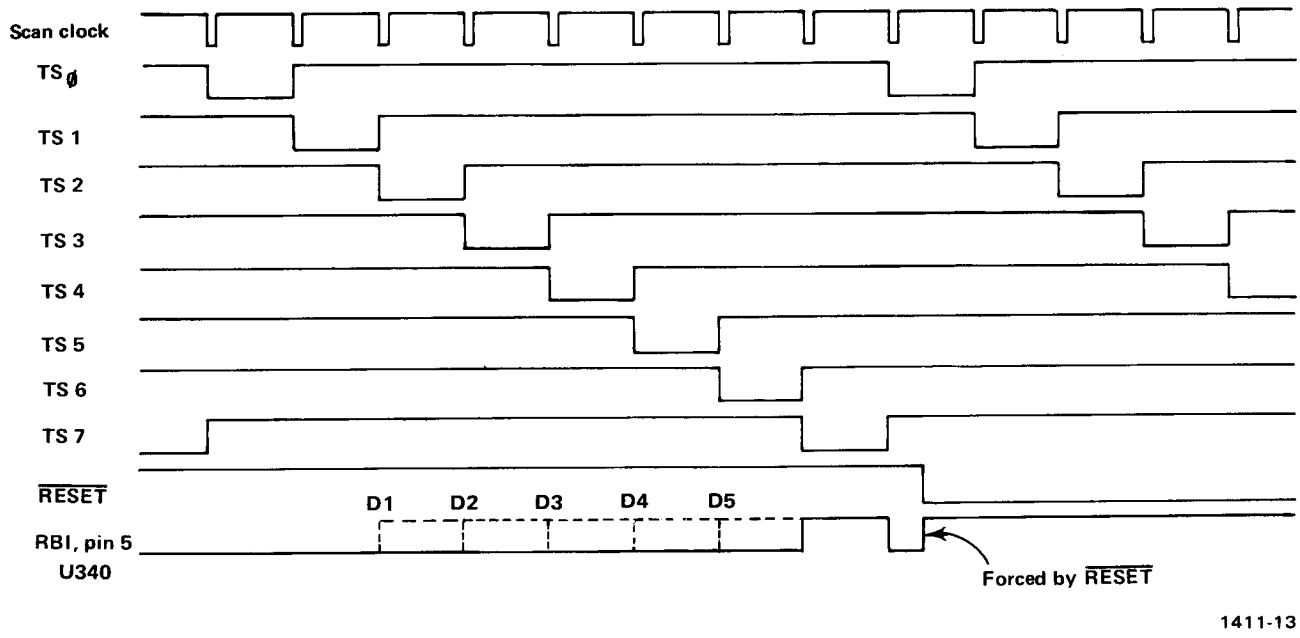


Fig. 5-2. Multiplexing circuit ladder diagram showing time with an all-zero display.

Seven-Segment Decoder and Driver, and Display and Parameter LED

U340 is a BCD-to-seven-segment decoder. It accepts the BCD output of the latches, then supplies current to the appropriate cathodes of the enabled LED to display the correct number. The display LED are DS360 through DS384. When looking at the front panel of the DC 503, DS360 controls the numerical digit displayed at the far left (10^6), DS364 controls the second (10^5), etc. Each LED has seven segments, arranged so that a combination of lighted segments forms a number. When all of the segments are lighted, an "8" is formed.

Leading Zero Suppression

Decoder driver U340 also has a zero-blanking feature that allows suppression of the zeros leading the most significant digit (MSD) in the display. At TS_0, a low is applied to the direct-clear input of U332A, the zero-suppression storage register. This sets U332A to the zero-suppress state (high at pin 6), allowing the Ripple-Blanking Input (RBI, pin 5) of U340 to be low. When the output of U335 advances to the next time slot (TS_1), the RBI of U340 remains low for a few nanoseconds due to propagation delays, which allows the first digit to arrive from the latches while RBI is low. If this first digit being decoded is a zero, the output to the display LED will be inhibited and the Ripple Blanking Output (RBO pin 4) will be low. If the digit is not a zero, the outputs are enabled and RBO goes high. The RBO is applied to the pin 2 input of U332A and is transferred to the output when the next scan-clock transition occurs. Thus if the first digit is a zero, pin 5 of U340 is held low, inhibiting the output until the first non-zero digit comes through the decoder. When the first non-zero digit arrives, the outputs of U340 are enabled and the digit is displayed. Also, the RBO output at pin 4 is set high, removing the RBI from pin 5 and allowing all succeeding digits to be displayed through the TS_7 sequence.

When the scan gets past the decimal point in the display, or if the display overflows, any zeroes arriving at the decoder are displayed. This is achieved as follows: TS_7 is inverted by U352A and applied through negative output OR gate U350B, NOR gate U330A, and inverter U354B. It is then applied to the direct-set input of U332A as a low. This holds pin 5 of U340 high, preventing zero-blanking during the TS_7 time slot.

The location of the decimal point in the display is determined by the FUNCTION or N/CLOCK rate switches. The proper information is applied via the closed contacts of the switches to NAND gates U352C, U352D, U352B, U354C or U354A. Time slot lines TS_2 through TS_6 enable the NAND gates to output to negative output OR gates U350A and U350B, NOR gate U330A and inverter U354B, setting U332A to the non-blank state at the appropriate time. In the case where the counter overflows, the high output from U311B or Q312 is applied to U350B, setting U332A to the non-blank state.

When the front-panel RESET button is pushed, RESET goes low, overriding the output of U332A, applying the non-blank and lamp-test functions to the decoder. This causes all seven segments in the display LED to be turned on.

Input and Output Data Lines

The following inputs and outputs are available via the plug-in connector for external access.

INT SCAN CLOCK DISABLE: A low applied to this line disables the internal scan clock.

INT-EXT SCAN CLOCK: This is a dual-function input/output line. It provides output for the internal scan clock or input of an external scan clock, provided the internal scan clock is disabled.

TS_0: A low is present on this output line in the TS_0 state.

DATA GOOD: A high is present on this output line when a new reading is being transferred into the storage register latches.

IN-OUT OVERFLOW DISPLAY DISABLE: This output alternates when the count overflows. It can also be forced low at any time to disable the display.

RESET IN-OUT: This is a dual-function input/output line. It provides a low output during reset or can be used as an external reset input.

BCD OUTPUTS: 1, 2, 4, 8 provide BCD output, serial by digit, from the currently enabled storage-register latch.

1 MHz CLOCK: Provides output for the internal 1 MHz clock.

REGULATED POWER SUPPLIES

The DC 503 operating power is obtained from the power module mainframe, then regulated to provide stable supplies of +15 volts, +5 volts, and −22 volts. The +15-volt supply, whose active device is U500, provides the reference for the remaining supplies. Its output is set to exactly +15 volts by adjustment of R505.

Integrated circuit U520 regulates the +5-volt supply, and transistors Q540, Q545 and Q548 regulate the −22 volt supply. The series-pass transistors for these supplies are located in the mainframe, where they can provide the proper heat dissipation.

OPTIONS

Option 1

This option provides a very stable 5 MHz oscillator and a divide-by-five counter that replaces the 1 MHz oscillator supplied in the standard DC 503 instruments. The Option 1 oscillator is shown on the circuit diagram as Y251 and U251.

REPLACEABLE ELECTRICAL PARTS

PARTS ORDERING INFORMATION

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

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

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

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

SPECIAL NOTES AND SYMBOLS

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

ITEM NAME

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

ABBREVIATIONS

ACTR	ACTUATOR	PLSTC	PLASTIC
ASSY	ASSEMBLY	QTZ	QUARTZ
CAP	CAPACITOR	RECP	RECEPTACLE
CER	CERAMIC	RES	RESISTOR
CKT	CIRCUIT	RF	RADIO FREQUENCY
COMP	COMPOSITION	SEL	SELECTED
CONN	CONNECTOR	SEMICOND	SEMICONDUCTOR
ELCTLT	ELECTROLYTIC	SENS	SENSITIVE
ELEC	ELECTRICAL	VAR	VARIABLE
INCAND	INCANDESCENT	WW	WIREWOUND
LED	LIGHT EMITTING DIODE	XFMR	TRANSFORMER
NONWIR	NON WIREWOUND	XTAL	CRYSTAL

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
00136	MC COY ELECTRONICS COMPANY	WATTS AND CHESTNUT STR.	MT. HOLLY SPRINGS, PA 17065
00779	AMP, INC.	P O BOX 3608	HARRISBURG, PA 17105
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
01295	TEXAS INSTRUMENTS, INC., SEMICONDUCTOR GROUP	P O BOX 5012, 13500 N CENTRAL EXPRESSWAY	DALLAS, TX 75222
04713	MOTOROLA, INC., SEMICONDUCTOR PROD. DIV.	5005 E MCDOWELL RD,PO BOX 20923	PHOENIX, AZ 85036
05397	UNION CARBIDE CORPORATION, MATERIALS SYSTEMS DIVISION	11901 MADISON AVENUE	CLEVELAND, OH 44101
07263	FAIRCHILD SEMICONDUCTOR, A DIV. OF FAIRCHILD CAMERA AND INSTRUMENT CORP.	464 ELLIS STREET	MOUNTAIN VIEW, CA 94042
13511	AMPHENOL CARDRE DIV., BUNKER RAMO CORP.		LOS GATOS, CA 95030
13571	ELECTRONIC RESEARCH CO.	P O BOX 913	SHAWNEE MISSION, KS 66201
14433	ITT SEMICONDUCTORS	3301 ELECTRONICS WAY	
		P O BOX 3049	WEST PALM BEACH, FL 33402
27014	NATIONAL SEMICONDUCTOR CORP.	2900 SEMICONDUCTOR DR.	SANTA CLARA, CA 95051
50522	MONSANTO CO., ELECTRONIC SPECIAL PRODUCTS	3400 HILLVIEW AVENUE	PALO ALTO, CA 94304
50579	LITRONIX INC.	19000 HOMESTEAD RD.	CUPERTINO, CA 95014
56289	SPRAGUE ELECTRIC CO.	87 MARSHALL ST.	NORTH ADAMS, MA 01247
71400	BUSSMAN MFG., DIVISION OF MCGRAW-EDISON CO.	2536 W. UNIVERSITY ST.	ST. LOUIS, MO 63107
71450	CTS CORP.	905 N. WEST BLVD	ELKHART, IN 46514
72982	ERIE TECHNOLOGICAL PRODUCTS, INC.	644 W. 12TH ST.	ERIE, PA 16512
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
78488	STACKPOLE CARBON CO.		ST. MARYS, PA 15857
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
80031	ELECTRA-MIDLAND CORP., MEPCO DIV.	22 COLUMBIA ROAD	MORRISTOWN, NJ 07960
90201	MALLORY CAPACITOR CO., DIV. OF P. R. MALLORY AND CO., INC.	3029 E. WASHINGTON STREET P. O. BOX 372	INDIANAPOLIS, IN 46206
91418	RADIO MATERIALS COMPANY, DIV. OF P.R. MALLORY AND COMPANY, INC.	4242 W BRYN MAWR	CHICAGO, IL 60646
91637	DALE ELECTRONICS, INC.	P. O. BOX 609	COLUMBUS, NE 68601

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A1	670-2255-00	B010100	B153959	CKT BOARD ASSY:DISPLAY (STANDARD ONLY)	80009	670-2255-00
A1	670-2255-01	B153960		CKT BOARD ASSY:DISPLAY (STANDARD ONLY)	80009	670-2255-01
A1	670-2255-00	B010100	B164039	CKT BOARD ASSY:DISPLAY (OPTION 01 ONLY)	80009	670-2255-00
A1	670-2255-01	B164040		CKT BOARD ASSY:DISPLAY (OPTION 01 ONLY)	80009	670-2255-01
A2	670-2253-00	B010100	B109999	CKT BOARD ASSY:MAIN (STANDARD ONLY)	80009	670-2253-00
A2	670-2253-01	B110000	B139999	CKT BOARD ASSY:MAIN (STANDARD ONLY)	80009	670-2253-01
A2	670-2253-02	B140000	B149999	CKT BOARD ASSY:MAIN (STANDARD ONLY)	80009	670-2253-02
A2	670-2253-03	B150000	B159999	CKT BOARD ASSY:MAIN (STANDARD ONLY)	80009	670-2253-03
A2	670-2253-04	B160000	B166269	CKT BOARD ASSY:MAIN (STANDARD ONLY)	80009	670-2253-04
A2	670-2253-05	B166270	B168529	CKT BOARD ASSY:MAIN (STANDARD ONLY)	80009	670-2253-05
A2	670-2253-06	B168530		CKT BOARD ASSY:MAIN (STANDARD ONLY)	80009	670-2253-06
A2	670-3411-00	B010100	B119999	CKT BOARD ASSY:MAIN (OPTION 01 ONLY)	80009	670-3411-00
A2	670-3411-01	B120000	B149999	CKT BOARD ASSY:MAIN (OPTION 01 ONLY)	80009	670-3411-01
A2	670-3411-02	B150000	B159999	CKT BOARD ASSY:MAIN (OPTION 01 ONLY)	80009	670-3411-02
A2	670-3411-03	B160000	B169999	CKT BOARD ASSY:MAIN (OPTION 01 ONLY)	80009	670-3411-03
A2	670-3411-04	B170000	B175029	CKT BOARD ASSY:MAIN (OPTION 01 ONLY)	80009	670-3411-04
A2	670-3411-05	B175030	B178739	CKT BOARD ASSY:MAIN (OPTION 01 ONLY)	80009	670-3411-05
A2	670-3411-06	B178740		CKT BOARD ASSY:MAIN (OPTION 01 ONLY)	80009	670-3411-06
A2	670-6247-00	XB168530		CKT BOARD ASSY:MAIN (OPTION 04 ONLY)	80009	670-6247-00
A3	670-2254-00	B010100	B059999	CKT BOARD ASSY:TRIGGER (STANDARD ONLY)	80009	670-2254-00
A3	670-2254-01	B060000	B109999	CKT BOARD ASSY:TRIGGER (STANDARD ONLY)	80009	670-2254-01
A3	670-2254-02	B110000	B149999	CKT BOARD ASSY:TRIGGER (STANDARD ONLY)	80009	670-2254-02
A3	670-2254-03	B150000	B159999	CKT BOARD ASSY:TRIGGER (STANDARD ONLY)	80009	670-2254-03
A3	670-2254-04	B160000	B167199	CKT BOARD ASSY:TRIGGER (STANDARD ONLY)	80009	670-2254-04
A3	670-2254-05	B167200		CKT BOARD ASSY:TRIGGER (STANDARD ONLY)	80009	670-2254-05
A3	670-2254-00	B010100	B059999	CKT BOARD ASSY:TRIGGER (OPTION 01 ONLY)	80009	670-2254-00
A3	670-2254-01	B060000	B119999	CKT BOARD ASSY:TRIGGER (OPTION 01 ONLY)	80009	670-2254-01
A3	670-2254-02	B120000	B159999	CKT BOARD ASSY:TRIGGER (OPTION 01 ONLY)	80009	670-2254-02
A3	670-2254-03	B160000	B169999	CKT BOARD ASSY:TRIGGER (OPTION 01 ONLY)	80009	670-2254-03

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A3	670-2254-04	B170000	B177189	CKT BOARD ASSY:TRIGGER (OPTION 01 ONLY)	80009	670-2254-04
A3	670-2254-05	B177190		CKT BOARD ASSY:TRIGGER (OPTION 01 ONLY)	80009	670-2254-05
A4	670-2708-00	XB010131		CKT BOARD ASSY:PROTECTION	80009	670-2708-00
A5	670-3300-00	XB060000	B109999X	CKT BOARD ASSY:DIVIDE BY 5 (STANDARD ONLY)	80009	670-3300-00
A5	670-3300-00	XB060000	B119999X	CKT BOARD ASSY:DIVIDE BY 5 (OPTION 01 ONLY)	80009	670-3300-00
C10	281-0549-00	XB040000	B149999X	CAP.,FXD,CER DI:68PF,10%,500V (STANDARD ONLY)	72982	301-000U2J0680K
C10	281-0549-00	XB040000	B159999X	CAP.,FXD,CER DI:68PF,10%,500V (OPTION 01 ONLY)	72982	301-000U2J0680K
C15	283-0002-00	B010100	B109999	CAP.,FXD,CER DI:0.01UF,+80-20%,500V (STANDARD ONLY)	91418	811-546E103Z
C15	283-0267-00	B110000	B165614	CAP.,FXD,CER DI:0.01UF,20%,500V (STANDARD ONLY)	72982	0841546Y5500103M
C15	283-0006-00	B165615		CAP.,FXD,CER DI:0.02UF,+80-20%,500V (STANDARD ONLY)	72982	0841545Z5V00203Z
C15	283-0002-00	B010100	B119999	CAP.,FXD,CER DI:0.01UF,+80-20%,500V (OPTION 01 ONLY)	91418	811-546E103Z
C15	283-0267-00	B120000	B174964	CAP.,FXD,CER DI:0.01UF,20%,500V (OPTION 01 ONLY)	72982	0841546Y5500103M
C15	283-0006-00	B174965		CAP.,FXD,CER DI:0.02UF,+80-20%,500V (OPTION 01 ONLY)	72982	0841545Z5V00203Z
C18	281-0589-00			CAP.,FXD,CER DI:170PF,5%,500V	72982	301000Z5D0171J
C28	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	91418	SP103Z151-4R9
C32	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
C35	283-0111-00	B010100	B119999	CAP.,FXD,CER DI:0.1UF,20%,50V (STANDARD ONLY)	72982	8121-N088Z5U104M
C35	283-0023-00	B120000		CAP.,FXD,CER DI:0.1UF,+80-20%,12V (STANDARD ONLY)	91418	MX0104Z1205R5
C35	283-0111-00	B010100	B129999	CAP.,FXD,CER DI:0.1UF,20%,50V (OPTION 01 ONLY)	72982	8121-N088Z5U104M
C35	283-0023-00	B130000		CAP.,FXD,CER DI:0.1UF,+80-20%,12V (OPTION 01 ONLY)	91418	MX0104Z1205R5
C38	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	91418	SP103Z151-4R9
C40	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
C52	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
C54	281-0564-00	B010100	B119999	CAP.,FXD,CER DI:24PF,5%,500V (STANDARD ONLY)	72982	301-000C0G0240J
C54	281-0542-00	B120000	B149999	CAP.,FXD,CER DI:18PF,10%,500V (STANDARD ONLY)	72982	301-002C0G0180K
C54	281-0205-00	B150000		CAP.,VAR,PLSTC:4-65PF,100V (STANDARD ONLY)	80031	2810C5R565QJ02F0
C54	281-0564-00	B010100	B129999	CAP.,FXD,CER DI:24PF,5%,500V (OPTION 01 ONLY)	72982	301-000C0G0240J
C54	281-0542-00	B130000	B159999	CAP.,FXD,CER DI:18PF,10%,500V (OPTION 01 ONLY)	72982	301-002C0G0180K
C54	281-0205-00	B160000		CAP.,VAR,PLSTC:4-65PF,100V (OPTION 01 ONLY)	80031	2810C5R565QJ02F0
C67	283-0111-00	B010100	B119999	CAP.,FXD,CER DI:0.1UF,20%,50V (STANDARD ONLY)	72982	8121-N088Z5U104M
C67	290-0532-00	B120000		CAP.,FXD,ELCTLT:150UF,20%,6V (STANDARD ONLY)	90201	TDC157M006WLC
C67	283-0111-00	B010100	B129999	CAP.,FXD,CER DI:0.1UF,20%,50V (OPTION 01 ONLY)	72982	8121-N088Z5U104M

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
C67	290-0532-00	B130000		CAP.,FXD,ELCTLT:150UF,20%,6V (OPTION 01 ONLY)	90201	TDC157M006WLC
C76	283-0111-00	B010100	B119999	CAP.,FXD,CER DI:0.1UF,20%,50V (STANDARD ONLY)	72982	8121-N088Z5U104M
C76	283-0023-00	B120000		CAP.,FXD,CER DI:0.1UF,+80-20%,12V (STANDARD ONLY)	91418	MX0104Z1205R5
C76	283-0111-00	B010100	B129999	CAP.,FXD,CER DI:0.1UF,20%,50V (OPTION 01 ONLY)	72982	8121-N088Z5U104M
C76	283-0023-00	B130000		CAP.,FXD,CER DI:0.1UF,+80-20%,12V (OPTION 01 ONLY)	91418	MX0104Z1205R5
C80	283-0111-00	B010100	B119999	CAP.,FXD,CER DI:0.1UF,20%,50V (STANDARD ONLY)	72982	8121-N088Z5U104M
C80	283-0023-00	B120000		CAP.,FXD,CER DI:0.1UF,+80-20%,12V (STANDARD ONLY)	91418	MX0104Z1205R5
C80	283-0111-00	B010100	B129999	CAP.,FXD,CER DI:0.1UF,20%,50V (OPTION 01 ONLY)	72982	8121-N088Z5U104M
C80	283-0023-00	B130000		CAP.,FXD,CER DI:0.1UF,+80-20%,12V (OPTION 01 ONLY)	91418	MX0104Z1205R5
C90	283-0111-00	B010100	B119999	CAP.,FXD,CER DI:0.1UF,20%,50V (STANDARD ONLY)	72982	8121-N088Z5U104M
C90	283-0023-00	B120000		CAP.,FXD,CER DI:0.1UF,+80-20%,12V (STANDARD ONLY)	91418	MX0104Z1205R5
C90	283-0111-00	B010100	B129999	CAP.,FXD,CER DI:0.1UF,20%,50V (OPTION 01 ONLY)	72982	8121-N088Z5U104M
C90	283-0023-00	B130000		CAP.,FXD,CER DI:0.1UF,+80-20%,12V (OPTION 01 ONLY)	91418	MX0104Z1205R5
C115	283-0002-00	B010100	B165614	CAP.,FXD,CER DI:0.01UF,+80-20%,500V (STANDARD ONLY)	91418	811-546E103Z
C115	283-0006-00	B165615		CAP.,FXD,CER DI:0.02UF,+80-20%,500V (STANDARD ONLY)	72982	0841545Z5V00203Z
C115	283-0002-00	B010100	B174964	CAP.,FXD,CER DI:0.01UF,+80-20%,500V (OPTION 01 ONLY)	91418	811-546E103Z
C115	283-0006-00	B174965		CAP.,FXD,CER DI:0.02UF,+80-20%,500V (OPTION 01 ONLY)	72982	0841545Z5V00203Z
C118	281-0504-00			CAP.,FXD,CER DI:10PF,+/-1PF,500V	72982	301-055C0G0100F
C119	281-0523-00			CAP.,FXD,CER DI:100PF,+/-20PF,500V	72982	301-000U2M0101M
C124	281-0504-00			CAP.,FXD,CER DI:10PF,+/-1PF,500V	72982	301-055C0G0100F
C125	281-0536-00			CAP.,FXD,CER DI:1000PF,10%,500V	72982	301000 X 5P0102K
C128	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	91418	SP103Z151-4R9
C132	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
C135	283-0111-00	B010100	B119999	CAP.,FXD,CER DI:0.1UF,20%,50V (STANDARD ONLY)	72982	8121-N088Z5U104M
C135	283-0023-00	B120000		CAP.,FXD,CER DI:0.1UF,+80-20%,12V (STANDARD ONLY)	91418	MX0104Z1205R5
C135	283-0111-00	B010100	B129999	CAP.,FXD,CER DI:0.1UF,20%,50V (OPTION 01 ONLY)	72982	8121-N088Z5U104M
C135	283-0023-00	B130000		CAP.,FXD,CER DI:0.1UF,+80-20%,12V (OPTION 01 ONLY)	91418	MX0104Z1205R5
C136	283-0111-00	B010100	B119999	CAP.,FXD,CER DI:0.1UF,20%,50V (STANDARD ONLY)	72982	8121-N088Z5U104M
C136	283-0023-00	B120000		CAP.,FXD,CER DI:0.1UF,+80-20%,12V (STANDARD ONLY)	91418	MX0104Z1205R5
C136	283-0111-00	B010100	B129999	CAP.,FXD,CER DI:0.1UF,20%,50V (OPTION 01 ONLY)	72982	8121-N088Z5U104M
C136	283-0023-00	B130000		CAP.,FXD,CER DI:0.1UF,+80-20%,12V (OPTION 01 ONLY)	91418	MX0104Z1205R5
C138	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	91418	SP103Z151-4R9
C140	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
C141	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
C167	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	91418	SP103Z151-4R9
C170	283-0111-00	B010100	B119999	CAP.,FXD,CER DI:0.1UF,20%,50V (STANDARD ONLY)	72982	8121-N088Z5U104M
C170	283-0023-00	B120000		CAP.,FXD,CER DI:0.1UF,+80-20%,12V (STANDARD ONLY)	91418	MX0104Z1205R5
C170	283-0111-00	B010100	B129999	CAP.,FXD,CER DI:0.1UF,20%,50V (OPTION 01 ONLY)	72982	8121-N088Z5U104M
C170	283-0023-00	B130000		CAP.,FXD,CER DI:0.1UF,+80-20%,12V (OPTION 01 ONLY)	91418	MX0104Z1205R5
C180	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	91418	SP103Z151-4R9
C187	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
C205	283-0010-00	XB110000		CAP.,FXD,CER DI:0.05UF,+100-20%,50V (STANDARD ONLY)	56289	273C20
C205	283-0010-00	XB120000		CAP.,FXD,CER DI:0.05UF,+100-20%,50V (OPTION 01 ONLY)	56289	273C20
C210	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
C211	283-0010-00	XB110000		CAP.,FXD,CER DI:0.05UF,+100-20%,50V (STANDARD ONLY)	56289	273C20
C211	283-0010-00	XB120000		CAP.,FXD,CER DI:0.05UF,+100-20%,50V (OPTION 01 ONLY)	56289	273C20
C252	281-0504-00			CAP.,FXD,CER DI:10PF,+/-1PF,500V (STANDARD ONLY)	72982	301-055C0G0100F
C254	281-0739-00			CAP.,FXD,CER DI:18PF,5%,500V (STANDARD ONLY)	72982	301-000T2H0 180J
C255	281-0166-00			CAP.,VAR,AIR DI:1.9-15.7PF,250V (STANDARD ONLY)	74970	187-0109-005
C270	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C285	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C290	283-0666-00			CAP.,FXD,MICA D:890PF,2%,100V	00853	D151F891G0
C322	290-0535-00			CAP.,FXD,ELCTLT:33UF,20%,10V	56289	196D336X0010KA1
C323	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C326	290-0535-00			CAP.,FXD,ELCTLT:33UF,20%,10V	56289	196D336X0010KA1
C330	283-0178-00			CAP.,FXD,CER DI:0.1UF,+80-20%,100V	72982	8131N145651 104Z
C332	281-0523-00	XB100000	B109999X	CAP.,FXD,CER DI:100PF,+/-20PF,500V (STANDARD ONLY)	72982	301-000U2M0101M
C332	281-0523-00	XB110000	B119999X	CAP.,FXD,CER DI:100PF,+/-20PF,500V (OPTION 01 ONLY)	72982	301-000U2M0101M
C334	281-0523-00	XB100000	B109999X	CAP.,FXD,CER DI:100PF,+/-20PF,500V (STANDARD ONLY)	72982	301-000U2M0101M
C334	281-0523-00	XB110000	B119999X	CAP.,FXD,CER DI:100PF,+/-20PF,500V (OPTION 01 ONLY)	72982	301-000U2M0101M
C335	283-0178-00			CAP.,FXD,CER DI:0.1UF,+80-20%,100V	72982	8131N145651 104Z
C336	281-0523-00	XB100000	B109999X	CAP.,FXD,CER DI:100PF,+/-20PF,500V (STANDARD ONLY)	72982	301-000U2M0101M
C336	281-0523-00	XB110000	B119999X	CAP.,FXD,CER DI:100PF,+/-20PF,500V (OPTION 01 ONLY)	72982	301-000U2M0101M
C338	281-0523-00	XB100000	B109999X	CAP.,FXD,CER DI:100PF,+/-20PF,500V (STANDARD ONLY)	72982	301-000U2M0101M
C338	281-0523-00	XB110000	B119999X	CAP.,FXD,CER DI:100PF,+/-20PF,500V (OPTION 01 ONLY)	72982	301-000U2M0101M
C341	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C342	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C343	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C344	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C345	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C346	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C347	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
C371	283-0000-00	XB010131		CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C502	290-0529-00			CAP.,FXD,ELCTLT:47UF,20%,20V	05397	T368C476M020AZ
C505	283-0060-00			CAP.,FXD,CER DI:100PF,5%,200V	72982	855-535U2J101J
C522	290-0529-00			CAP.,FXD,ELCTLT:47UF,20%,20V	05397	T368C476M020AZ
C523	290-0530-00			CAP.,FXD,ELCTLT:68UF,20%,6V	90201	TDC686M006NLF
C525	283-0150-00			CAP.,FXD,CER DI:650PF,5%,200V	72982	835-515B651J
C540	281-0523-00	XB070000	B166269X	CAP.,FXD,CER DI:100PF,+/-20PF,500V (STANDARD ONLY)	72982	301-000U2M0101M
C540	281-0523-00	XB080000	B175029X	CAP.,FXD,CER DI:100PF,+/-20PF,500V (OPTION 01 ONLY)	72982	301-000U2M0101M
C543	283-0177-00	XB166270		CAP.,FXD,CER DI:1UF,+80-20%,25V (STANDARD ONLY)	56289	273C5
C543	283-0177-00	XB175030		CAP.,FXD,CER DI:1UF,+80-20%,25V (OPTION 01 ONLY)	56289	273C5
C544	290-0525-00			CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KA1
C547	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C548	290-0528-00			CAP.,FXD,ELCTLT:15UF,20%,50V	90201	TDC156M050WLC
C549	290-0517-00			CAP.,FXD,ELCTLT:6.8UF,20%,35V	56289	196D685X0035KA1
CR28	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR79	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR80	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR128	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR179	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR180	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR260	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR270	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR271	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR290	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR311	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR314	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR320	152-0141-02	XB110000	B159999	SEMICOND DEVICE:SILICON,30V,150MA (STANDARD ONLY)	01295	1N4152R
CR320	152-0008-00	B160000		SEMICOND DEVICE:GERMANIUM,75V,60MA (STANDARD ONLY)	14433	G1409
CR320	152-0141-02	XB120000	B169999	SEMICOND DEVICE:SILICON,30V,150MA (OPTION 01 ONLY)	01295	1N4152R
CR320	152-0008-00	B170000		SEMICOND DEVICE:GERMANIUM,75V,60MA (OPTION 01 ONLY)	14433	G1409
CR322	152-0141-02	XB110000		SEMICOND DEVICE:SILICON,30V,150MA (STANDARD ONLY)	01295	1N4152R
CR322	152-0141-02	XB120000		SEMICOND DEVICE:SILICON,30V,150MA (OPTION 01 ONLY)	01295	1N4152R
CR364	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR368	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR372	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR378	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR379	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR380	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR384	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR385	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR386	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR391	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR395	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR396	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR399	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR545	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
CR546	152-0141-02	XB166270		SEMICOND DEVICE:SILICON,30V,150MA (STANDARD ONLY)	01295	1N4152R

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
CR546	152-0141-02	XB175030		SEMICOND DEVICE:SILICON,30V,150MA (OPTION 01 ONLY)	01295	1N4152R
DS275	150-1001-01	B010100	B089999	LAMP,LED:RED,2V,100MA (STANDARD ONLY)	80009	150-1001-01
DS275	150-1001-00	B099999		LT EMITTING DIO:RED,660NM,100MA MAX (STANDARD ONLY)	50522	MV5024
DS275	150-1001-01	B010100	B099999	LAMP,LED:RED,2V,100MA (OPTION 01 ONLY)	80009	150-1001-01
DS275	150-1001-00	B100000		LT EMITTING DIO:RED,660NM,100MA MAX (OPTION 01 ONLY)	50522	MV5024
DS360	150-1002-00	B010100	B153959	LAMP,LED RDOUT:NUMERICAL DISPLAY (STANDARD ONLY)	50579	DL8L
DS360	150-1024-00	B153960		LAMP,LED DSPL:2 DIGIT,7 SEGMENT,RED (STANDARD ONLY)	50579	DL882A
DS360	150-1002-00	B010100	B164039	LAMP,LED RDOUT:NUMERICAL DISPLAY (OPTION 01 ONLY)	50579	DL8L
DS360	150-1024-00	B164040		LAMP,LED DSPL:2 DIGIT,7 SEGMENT,RED (OPTION 01 ONLY)	50579	DL882A
DS364	150-1002-00	B010100	B153959X	LAMP,LED RDOUT:NUMERICAL DISPLAY (STANDARD ONLY)	50579	DL8L
DS364	150-1002-00	B010100	B164039X	LAMP,LED RDOUT:NUMERICAL DISPLAY (OPTION 01 ONLY)	50579	DL8L
DS368	150-1002-00	B010100	B153959	LAMP,LED RDOUT:NUMERICAL DISPLAY (STANDARD ONLY)	50579	DL8L
DS368	150-1025-00	B153960		LAMP,LED,DSPL:3 DIGIT,7 SEGMENT,RED (STANDARD ONLY)	50579	DL883A
DS368	150-1002-00	B010100	B164039	LAMP,LED RDOUT:NUMERICAL DISPLAY (OPTION 01 ONLY)	50579	DL8L
DS368	150-1025-00	B164040		LAMP,LED,DSPL:3 DIGIT,7 SEGMENT,RED (OPTION 01 ONLY)	50579	DL883A
DS372	150-1002-00	B010100	B153959X	LAMP,LED RDOUT:NUMERICAL DISPLAY (STANDARD ONLY)	50579	DL8L
DS372	150-1002-00	B010100	B164039X	LAMP,LED RDOUT:NUMERICAL DISPLAY (OPTION 01 ONLY)	50579	DL8L
DS376	150-1002-00	B010100	B153959X	LAMP,LED RDOUT:NUMERICAL DISPLAY (STANDARD ONLY)	50579	DL8L
DS376	150-1002-00	B010100	B164039X	LAMP,LED RDOUT:NUMERICAL DISPLAY (OPTION 01 ONLY)	50579	DL8L
DS380	150-1002-00	B010100	B153953	LAMP,LED RDOUT:NUMERICAL DISPLAY (STANDARD ONLY)	50579	DL8L
DS380	150-1024-00	B153960		LAMP,LED DSPL:2 DIGIT,7 SEGMENT,RED (STANDARD ONLY)	50579	DL882A
DS380	150-1002-00	B010100	B164039	LAMP,LED RDOUT:NUMERICAL DISPLAY (OPTION 01 ONLY)	50579	DL8L
DS380	150-1024-00	B164040		LAMP,LED DSPL:2 DIGIT,7 SEGMENT,RED (OPTION 01 ONLY)	50579	DL882A
DS384	150-1002-00	B010100	B153959X	LAMP,LED RDOUT:NUMERICAL DISPLAY (STANDARD ONLY)	50579	DL8L
DS384	150-1002-00	B010100	B164039X	LAMP,LED RDOUT:NUMERICAL DISPLAY (OPTION 01 ONLY)	50579	DL8L
DS390	150-1001-01			LAMP,LED:RED,2V,100MA	80009	150-1001-01
DS394	150-1001-01			LAMP,LED:RED,2V,100MA	80009	150-1001-01
DS398	150-1001-01			LAMP,LED:RED,2V,100MA	80009	150-1001-01
F520	159-0021-00	XB010131		FUSE,CARTRIDGE:3AG,2A,250V,FAST-BLOW	71400	AGC 2
J10	131-0955-00			CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
J110	131-0955-00			CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
J275	136-0491-00			JACK,TIP:BANANA JACK ASSY	80009	136-0491-00

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
P250	131-0993-00	XB110000		BUS,CONDUCTOR:2 WIRE BLACK	00779	530153-2
	----- -----			(STANDARD ONLY)		
P250	131-0993-00	XB120000		BUS,CONDUCTOR:2 WIRE BLACK	00779	530153-2
	----- -----			(OPTION 01 ONLY)		
L18	276-0569-00			CORE,TOROID:	78488	57-9660
L523	108-0538-00	B010100	B119999	COIL,RF:2.7UH	76493	70F276A1
	----- -----			(STANDARD ONLY)		
L523	120-0382-00	B120000		XFMR,TOROID:14 TURNS,SINGLE	80009	120-0382-00
	----- -----			(STANDARD ONLY)		
L523	108-0538-00	B010100	B129999	COIL,RF:2.7UH	76493	70F276A1
	----- -----			(OPTION 01 ONLY)		
L523	120-0382-00	B130000		XFMR,TOROID:14 TURNS,SINGLE	80009	120-0382-00
	----- -----			(OPTION 01 ONLY)		
L549	108-0146-00			COIL,RF:5UH	80009	108-0146-00
Q35	151-1022-00			TRANSISTOR:SILICON,JFE,SEL FROM 2N4392	80009	151-1022-00
Q40	151-1022-00			TRANSISTOR:SILICON,JFE,SEL FROM 2N4392	80009	151-1022-00
Q50	151-0225-00	B010100	B149999	TRANSISTOR:SILICON,NPN	07263	S39291
	----- -----			(STANDARD ONLY)		
Q50	151-0427-00	B150000		TRANSISTOR:SILICON,NPN	80009	151-0427-00
	----- -----			(STANDARD ONLY)		
Q50	151-0225-00	B010100	B159999	TRANSISTOR:SILICON,NPN	07263	S39291
	----- -----			(OPTION 01 ONLY)		
Q50	151-0427-00	B160000		TRANSISTOR:SILICON,NPN	80009	151-0427-00
	----- -----			(OPTION 01 ONLY)		
Q60	151-0325-00			TRANSISTOR:SILICON,PNP,SEL FROM 2N4258	80009	151-0325-00
Q68	151-0225-00	B010100	B149999	TRANSISTOR:SILICON,NPN	07263	S39291
	----- -----			(STANDARD ONLY)		
Q68	151-0427-00	B150000		TRANSISTOR:SILICON,NPN	80009	151-0427-00
	----- -----			(STANDARD ONLY)		
Q68	151-0225-00	B010100	B159999	TRANSISTOR:SILICON,NPN	07263	S39291
	----- -----			(OPTION 01 ONLY)		
Q68	151-0427-00	B160000		TRANSISTOR:SILICON,NPN	80009	151-0427-00
	----- -----			(OPTION 01 ONLY)		
Q70	151-0225-00			TRANSISTOR:SILICON,NPN	07263	S39291
Q74	151-0269-00	B010100	B079999	TRANSISTOR:SILICON,NPN,SEL FROM SE3005	07263	FMT5092
	----- -----			(STANDARD ONLY)		
Q74	151-0441-01	B080000		TRANSISTOR:SILICON,NPN	80009	151-0441-01
	----- -----			(STANDARD ONLY)		
Q74	151-0269-00	B010100	B089999	TRANSISTOR:SILICON,NPN,SEL FROM SE3005	07263	FMT5092
	----- -----			(OPTION 01 ONLY)		
Q74	151-0441-01	B090000		TRANSISTOR:SILICON,NPN	80009	151-0441-01
	----- -----			(OPTION 01 ONLY)		
Q80	151-0225-00			TRANSISTOR:SILICON,NPN	07263	S39291
Q90	151-0269-00	B010100	B079999	TRANSISTOR:SILICON,NPN,SEL FROM SE3005	07263	FMT5092
	----- -----			(STANDARD ONLY)		
Q90	151-0441-01	B080000		TRANSISTOR:SILICON,NPN	80009	151-0441-01
	----- -----			(STANDARD ONLY)		
Q90	151-0269-00	B010100	B089999	TRANSISTOR:SILICON,NPN,SEL FROM SE3005	07263	FMT5092
	----- -----			(OPTION 01 ONLY)		
Q90	151-0441-01	B090000		TRANSISTOR:SILICON,NPN	80009	151-0441-01
	----- -----			(OPTION 01 ONLY)		
Q95	151-0225-00	B010100	B149999	TRANSISTOR:SILICON,NPN	07263	S39291
	----- -----			(STANDARD ONLY)		
Q95	151-0427-00	B150000		TRANSISTOR:SILICON,NPN	80009	151-0427-00
	----- -----			(STANDARD ONLY)		
Q95	151-0225-00	B010100	B159999	TRANSISTOR:SILICON,NPN	07263	S39291
	----- -----			(OPTION 01 ONLY)		

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
Q95	151-0427-00	B160000		TRANSISTOR:SILICON,NPN	80009	151-0427-00
	----- -----			(OPTION 01 ONLY)		
Q135	151-1005-00			TRANSISTOR:SILICON,JFE,N-CHANNEL	80009	151-1005-00
Q140	151-1005-00			TRANSISTOR:SILICON,JFE,N-CHANNEL	80009	151-1005-00
Q150	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q160	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q165	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q170	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q180	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q185	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q270	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q278	151-0342-00			TRANSISTOR:SILICON,PNP	07263	S035928
Q280	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q288	151-0504-00	B010100	B165979	TRANSISTOR:SILICON,N-CHAN,UNIJUNCTION	04713	2N4851
	----- -----			(STANDARD ONLY)		
Q288	151-0504-01	B165980		TRANSISTOR:SILICON,N-CHAN,UNIJUNCTION	04713	SU309
	----- -----			(STANDARD ONLY)		
Q288	151-0504-00	B010100	B176089	TRANSISTOR:SILICON,N-CHAN,UNIJUNCTION	04713	2N4851
	----- -----			(OPTION 01 ONLY)		
Q288	151-0504-01	B176090		TRANSISTOR:SILICON,N-CHAN,UNIJUNCTION	04713	SU309
	----- -----			(OPTION 01 ONLY)		
Q290	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q312	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q360	151-0301-00			TRANSISTOR:SILICON,PNP	27014	2N2907A
Q364	151-0301-00			TRANSISTOR:SILICON,PNP	27014	2N2907A
Q368	151-0301-00			TRANSISTOR:SILICON,PNP	27014	2N2907A
Q372	151-0301-00			TRANSISTOR:SILICON,PNP	27014	2N2907A
Q376	151-0301-00			TRANSISTOR:SILICON,PNP	27014	2N2907A
Q380	151-0301-00			TRANSISTOR:SILICON,PNP	27014	2N2907A
Q384	151-0301-00			TRANSISTOR:SILICON,PNP	27014	2N2907A
Q520	151-0515-01	XB010131		SCR:SILICON	04713	2N4441
Q540	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q545	151-0342-00			TRANSISTOR:SILICON,PNP	07263	S035928
Q548	151-0342-00	B010100	B166269	TRANSISTOR:SILICON,PNP	07263	S035928
	----- -----			(STANDARD ONLY)		
Q548	151-0301-00	B166270		TRANSISTOR:SILICON,PNP	27014	2N2907A
	----- -----			(STANDARD ONLY)		
Q548	151-0342-00	B010100	B175029	TRANSISTOR:SILICON,PNP	07263	S035928
	----- -----			(OPTION 01 ONLY)		
Q548	151-0301-00	B175030		TRANSISTOR:SILICON,PNP	27014	2N2907A
	----- -----			(OPTION 01 ONLY)		
R10	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R15	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R15	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R18	322-0624-00			RES.,FXD,FILM:990K OHM,1%,0.25W	75042	CEBT0-9903F
R19	317-0101-00	XB150000		RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
	----- -----			(STANDARD ONLY)		
R19	317-0101-00	XB160000		RES.,FXD,CMPSN:100 OHM,5%,0.125W	01121	BB1015
	----- -----			(OPTION 01 ONLY)		
R22	321-0614-00			RES.,FXD,FILM:10.1K OHM,1%,0.125W	91637	MFF1816G10101F
R24	322-0621-00			RES.,FXD,FILM:900K OHM,1%,0.25W	75042	CEBT0-9003F
R25	321-0617-00			RES.,FXD,FILM:111K OHM,1%,0.125W	91637	MFF1816G11102F
R27	322-0481-00			RES.,FXD,FILM:1M OHM,1%,0.25W	75042	CEBT0-1004F
R28	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R30	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	01121	CB3925
R32	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R35	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R38	321-0222-00	B010100	B149999	RES.,FXD,FILM:2K OHM,1%,0.125W (STANDARD ONLY)	91637	MFF1816G20000F
R38	315-0511-00	B150000		RES.,FXD,CMPSN:510 OHM,5%,0.25W (STANDARD ONLY)	01121	CB5115
R38	321-0222-00	B010100	B159999	RES.,FXD,FILM:2K OHM,1%,0.125W (OPTION 01 ONLY)	91637	MFF1816G20000F
R38	315-0511-00	B160000		RES.,FXD,CMPSN:510 OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB5115
R40	321-0222-00	B010100	B149999	RES.,FXD,FILM:2K OHM,1%,0.125W (STANDARD ONLY)	91637	MFF1816G20000F
R40	315-0511-00	B150000		RES.,FXD,CMPSN:510 OHM,5%,0.25W (STANDARD ONLY)	01121	CB5115
R40	321-0222-00	B010100	B159999	RES.,FXD,FILM:2K OHM,1%,0.125W (OPTION 01 ONLY)	91637	MFF1816G20000F
R40	315-0511-00	B160000		RES.,FXD,CMPSN:510 OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB5115
R42	315-0823-00	B010100	B159999	RES.,FXD,CMPSN:82K OHM,5%,0.25W (STANDARD ONLY)	01121	CB8235
R42	311-1554-00	B160000		RES.,VAR,NONWIR:200K OHM,20%,0.50W (STANDARD ONLY)	73138	91-76-0
R42	315-0823-00	B010100	B169999	RES.,FXD,CMPSN:82K OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB8235
R42	311-1554-00	B170000		RES.,VAR,NONWIR:200K OHM,20%,0.50W (OPTION 01 ONLY)	73138	91-76-0
R45	311-1310-00			RES.,VAR,NONWIR:20K OHM,20%,1W (R45, FURNISHED AS A UNIT WITH S10)	01121	10M654
R50	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R52	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R54	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R56	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
R57	315-0150-00			RES.,FXD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
R60	315-0102-00	B010100	B149999	RES.,FXD,CMPSN:1K OHM,5%,0.25W (STANDARD ONLY)	01121	CB1025
R60	301-0102-00	B150000		RES.,FXD,CMPSN:1K OHM,5%,0.50W (STANDARD ONLY)	01121	EB1025
R60	315-0102-00	B010100	B159999	RES.,FXD,CMPSN:1K OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB1025
R60	301-0102-00	B160000		RES.,FXD,CMPSN:1K OHM,5%,0.50W (OPTION 01 ONLY)	01121	EB1025
R61	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R63	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R67	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R69	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R70	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R72	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R73	315-0150-00			RES.,FXD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
R74	301-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.50W	01121	EB2215
R76	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R77	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R79	303-0511-00			RES.,FXD,CMPSN:510 OHM,5%,1W	01121	GB5115
R80	307-0106-00			RES.,FXD,CMPSN:4.7 OHM,5%,0.25W	01121	CB47G5
R82	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R84	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R85	315-0150-00			RES.,FXD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
R90	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R91	315-0681-00	XB110000		RES.,FXD,CMPSN:680 OHM,5%,0.25W (STANDARD ONLY)	01121	CB6815
R91	315-0681-00	XB120000		RES.,FXD,CMPSN:680 OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB6815

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R92	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R94	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R96	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R97	301-0202-00	B010100	B149999	RES.,FXD,CMPSN:2K OHM,5%,0.50W	01121	EB2025
	----- -----			(STANDARD ONLY)		
R97	301-0152-00	B150000		RES.,FXD,CMPSN:1.5K OHM,5%,0.50W	01121	EB1525
	----- -----			(STANDARD ONLY)		
R97	301-0202-00	B010100	B159999	RES.,FXD,CMPSN:2K OHM,5%,0.50W	01121	EB2025
	----- -----			(OPTION 01 ONLY)		
R97	301-0152-00	B160000		RES.,FXD,CMPSN:1.5K OHM,5%,0.50W	01121	EB1525
	----- -----			(OPTION 01 ONLY)		
R110	315-0681-00			RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
R111	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R115	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R118	322-0621-00			RES.,FXD,FILM:900K OHM,1%,0.25W	75042	CEBT0-9003F
R122	321-0617-00			RES.,FXD,FILM:111K OHM,1%,0.125W	91637	MFF1816G11102F
R124	322-0624-00			RES.,FXD,FILM:990K OHM,1%,0.25W	75042	CEBT0-9903F
R125	321-0614-00			RES.,FXD,FILM:10.1K OHM,1%,0.125W	91637	MFF1816G10101F
R127	322-0481-00			RES.,FXD,FILM:1M OHM,1%,0.25W	75042	CEBT0-1004F
R128	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R130	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	01121	CB3925
R132	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R135	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R138	321-0289-00			RES.,FXD,FILM:10K OHM,1%,0.125W	91637	MFF1816G10001F
R140	321-0289-00			RES.,FXD,FILM:10K OHM,1%,0.125W	91637	MFF1816G10001F
R142	315-0433-00	B010100	B159999	RES.,FXD,CMPSN:43K OHM,5%,0.25W	01121	CB4335
	----- -----			(STANDARD ONLY)		
R142	311-1555-00	B160000		RES.,VAR,NONWIR:100K OHM,20%,0.5W	73138	91-77-0
	----- -----			(STANDARD ONLY)		
R142	315-0433-00	B010100	B169999	RES.,FXD,CMPSN:43K OHM,5%,0.25W	01121	CB4335
	----- -----			(OPTION 01 ONLY)		
R142	311-1555-00	B170000		RES.,VAR,NONWIR:100K OHM,20%,0.5W	73138	91-77-0
	----- -----			(OPTION 01 ONLY)		
R145	311-1310-00			RES.,VAR,NONWIR:20K OHM,20%,1W	01121	10M654
R152	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R153	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R160	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R165	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R167	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R168	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R172	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R174	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R179	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R180	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R182	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R187	301-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.50W	01121	EB2025
R201	315-0151-00	B010100	B079999	RES.,FXD,CMPSN:150 OHM,5%,0.25W	01121	CB1515
	----- -----			(STANDARD ONLY)		
R201	315-0750-00	B080000		RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
	----- -----			(STANDARD ONLY)		
R201	315-0151-00	B010100	B089999	RES.,FXD,CMPSN:150 OHM,5%,0.25W	01121	CB1515
	----- -----			(OPTION 01 ONLY)		
R201	315-0750-00	B090000		RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
	----- -----			(OPTION 01 ONLY)		
R205	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R206	315-0241-00	B010100	B109999X	RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
	----- -----			(STANDARD ONLY)		

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R206	315-0241-00	B010100	B119999X	RES.,FXD,CMPSN:240 OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB2415
R208	315-0511-00	B010100	B079999	RES.,FXD,CMPSN:510 OHM,5%,0.25W (STANDARD ONLY)	01121	CB5115
R208	315-0271-00	B080000		RES.,FXD,CMPSN:270 OHM,5%,0.25W (STANDARD ONLY)	01121	CB2715
R208	315-0511-00	B010100	B089999	RES.,FXD,CMPSN:510 OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB5115
R208	315-0271-00	B090000		RES.,FXD,CMPSN:270 OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB2715
R210	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R215	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R217	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R218	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
R220	315-0152-00	B010100	B049999	RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R220	315-0301-00	B050000		RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R222	315-0332-00	B010100	B049999	RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
R222	315-0102-00	B050000		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R224	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R225	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R228	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R250	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB2715
R251	315-0201-00	XB110000		RES.,FXD,CMPSN:200 OHM,5%,0.25W (STANDARD ONLY)	01121	CB2015
R251	315-0201-00	XB120000		RES.,FXD,CMPSN:200 OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB2015
R252	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W (STANDARD ONLY)	01121	CB1815
R254	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W (STANDARD ONLY)	01121	CB2425
R256	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W (STANDARD ONLY)	01121	CB3015
R270	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R271	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R272	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R274	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R275	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R276	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R278	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R280	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R282	315-0512-00	B010100	B149999	RES.,FXD,CMPSN:5.1K OHM,5%,0.25W (STANDARD ONLY)	01121	CB5125
R282	315-0752-00	B150000		RES.,FXD,CMPSN:7.5K OHM,5%,0.25W (STANDARD ONLY)	01121	CB7525
R282	315-0512-00	B010100	B159999	RES.,FXD,CMPSN:5.1K OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB5125
R282	315-0752-00	B160000		RES.,FXD,CMPSN:7.5K OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB7525
R283	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R285	311-1431-00			RES.,VAR,NONWIR:500K OHM,10%,0.25W (R285, FURNISHED AS A UNIT WITH S285)	01121	GH8032
R288	315-0100-00	B010100	B149999	RES.,FXD,CMPSN:10 OHM,5%,0.25W (STANDARD ONLY)	01121	CB1005
R288	315-0200-00	B150000		RES.,FXD,CMPSN:20 OHM,5%,0.25W (STANDARD ONLY)	01121	CB2005
R288	315-0100-00	B010100	B159999	RES.,FXD,CMPSN:10 OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB1005

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R288	315-0200-00	B160000		RES.,FXD,CMPSN:20 OHM,5%,0.25W	01121	CB2005
	----- -----			(OPTION 01 ONLY)		
R290	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R292	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R293	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R312	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R314	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R320	315-0102-00	B010100	B167079	RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
	----- -----			(STANDARD ONLY)		
R320	316-0102-00	B167080		RES.,FXD,CMPSN:1K OHM,10%,0.25W	01121	CB1021
	----- -----			(STANDARD ONLY)		
R320	316-0102-00	B010100	B177169	RES.,FXD,CMPSN:1K OHM,10%,0.25W	01121	CB1021
	----- -----			(OPTION 01 ONLY)		
R320	315-0102-00	B177170		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
	----- -----			(OPTION 01 ONLY)		
R321	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R322	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R323	315-0102-00	XB110000		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
	----- -----			(STANDARD ONLY)		
R323	315-0102-00	XB120000		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
	----- -----			(OPTION 01 ONLY)		
R324	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R326	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R330	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R331	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R332	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R333	315-0102-00	XB168530		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
	----- -----			(OPTION 04 ONLY)		
R334	315-0680-00	XB110000		RES.,FXD,CMPSN:68 OHM,5%,0.25W	01121	CB6805
	----- -----			(STANDARD ONLY)		
R334	315-0680-00	XB120000		RES.,FXD,CMPSN:68 OHM,5%,0.25W	01121	CB6805
	----- -----			(OPTION 01 ONLY)		
R335	315-0102-00	B010100	B178739	RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
	----- -----			(OPTION 01 ONLY)		
R335	315-0511-00	B178740		RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
	----- -----			(OPTION 01 ONLY)		
R335	315-0102-00	B010100	B168529	RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
	----- -----			(STANDARD AND OPTION 04 ONLY)		
R335	315-0511-00	B168530		RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
	----- -----			(STANDARD AND OPTION 04 ONLY)		
R336	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R341	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R342	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R343	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R344	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R345	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R346	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R347	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R349	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R354	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R360	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R361	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R364	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R365	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R366	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R368	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R369	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R370	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R371	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R372	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R373	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R374	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R376	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R377	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R378	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R380	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R381	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R382	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R384	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R385	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R386	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R390	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R502	307-0107-00			RES.,FXD,CMPSN:5.6 OHM,5%,0.25W	01121	CB56G5
R504	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
R505	311-1408-00			RES.,VAR,NONWIR1K OHM,0.25W	71450	X201R102B
R506	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
R508	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R510	305-0560-00	B010100	B109999	RES.,FXD,CMPSN:56 OHM,5%,2W (STANDARD ONLY)	01121	HB5605
R510	306-0181-00	B110000		RES.,FXD,CMPSN:180 OHM,10%,2W (STANDARD ONLY)	01121	HB1811
R510	305-0560-00	B010100	B079999	RES.,FXD,CMPSN:56 OHM,5%,2W (OPTION 01 ONLY)	01121	HB5605
R510	306-0181-00	B080000		RES.,FXD,CMPSN:180 OHM,10%,2W (OPTION 01 ONLY)	01121	HB1811
R520	316-0102-00	XB010131	B167079	RES.,FXD,CMPSN:1K OHM,10%,0.25W (STANDARD ONLY)	01121	CB1021
R520	315-0102-00	B167080		RES.,FXD,CMPSN:1K OHM,5%,0.25W (STANDARD ONLY)	01121	CB1025
R520	316-0102-00	B010100	B177169	RES.,FXD,CMPSN:1K OHM,10%,0.25W (OPTION 01 ONLY)	01121	CB1021
R520	315-0102-00	B177170		RES.,FXD,CMPSN:1K OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB1025
R522	308-0463-00			RES.,FXD,WW:0.3 OHM,1%,3W	91637	RS2B-KR3000F
R525	315-0162-00			RES.,FXD,CMPSN:1.6K OHM,5%,0.25W	01121	CB1625
R527	321-0260-00			RES.,FXD,FILM:4.99K OHM,1%,0.125W	91637	MFF1816G49900F
R528	321-0231-00			RES.,FXD,FILM:2.49K OHM,1%,0.125W	91637	MFF1816G24900F
R540	315-0203-00	B010100	B165614	RES.,FXD,CMPSN:20K OHM,5%,0.25W (STANDARD ONLY)	01121	CB2035
R540	315-0432-00	B165616	B166269	RES.,FXD,CMPSN:4.3K OHM,5%,0.25W (STANDARD ONLY)	01121	CB4325
R540	315-0272-00	B166270		RES.,FXD,CMPSN:2.7K OHM,5%,0.25W (STANDARD ONLY)	01121	CB2725
R540	315-0203-00	B010100	B174964	RES.,FXD,CMPSN:20K OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB2035
R540	315-0432-00	B174965	B175029	RES.,FXD,CMPSN:4.3K OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB4325
R540	315-0272-00	B175030		RES.,FXD,CMPSN:2.7K OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB2725
R541	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R542	321-0322-00	B010100	B149999	RES.,FXD,FILM:22.1K OHM,1%,0.125W (STANDARD ONLY)	91637	MFF1816G22101F
R542	321-0255-00	B150000		RES.,FXD,FILM:4.42K OHM,1%,0.125W (STANDARD ONLY)	91637	MFF1816G44200F
R542	321-0322-00	B010100	B159999	RES.,FXD,FILM:22.1K OHM,1%,0.125W (OPTION 01 ONLY)	91637	MFF1816G22101F
R542	321-0255-00	B160000		RES.,FXD,FILM:4.42K OHM,1%,0.125W (OPTION 01 ONLY)	91637	MFF1816G44200F

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R543	315-0201-00	XB166270		RES.,FXD,CMPSN:200 OHM,5%,0.25W (STANDARD ONLY)	01121	CB2015
R543	315-0201-00	XB175030		RES.,FXD,CMPSN:200 OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB2015
R544	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	01121	CB2725
R545	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	01121	CB2725
R546	307-0051-00			RES.,FXD,CMPSN:2.7 OHM,5%,0.50W	01121	EB27G5
R547	315-0301-00	XB166270		RES.,FXD,CMPSN:300 OHM,5%,0.25W (STANDARD ONLY)	01121	CB3015
R547	315-0301-00	XB175030		RES.,FXD,CMPSN:300 OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB3015
R548	321-0308-00	B010100	B149999	RES.,FXD,FILM:15.8K OHM,1%,0.125W (STANDARD ONLY)	91637	MFF1816G15801F
R548	321-0241-00	B150000	B166269	RES.,FXD,FILM:3.16K OHM,1%,0.125W (STANDARD ONLY)	91637	MFF1816G31600F
R548	321-0666-08	B166270		RES.,FXD,FILM:3.04K OHM,1%,0.125W (STANDARD ONLY)	91637	MFF1816D30400F
R548	321-0308-00	B010100	B159999	RES.,FXD,FILM:15.8K OHM,1%,0.125W (OPTION 01 ONLY)	91637	MFF1816G15801F
R548	321-0241-00	B160000	B175029	RES.,FXD,FILM:3.16K OHM,1%,0.125W (OPTION 01 ONLY)	91637	MFF1816G31600F
R548	321-0666-08	B175030		RES.,FXD,FILM:3.04K OHM,1%,0.125W (OPTION 01 ONLY)	91637	MFF1816D30400F
R549	315-0510-00	XB166270		RES.,FXD,CMPSN:51 OHM,5%,0.25W (STANDARD ONLY)	01121	CB5105
R549	315-0510-00	XB175030		RES.,FXD,CMPSN:51 OHM,5%,0.25W (OPTION 01 ONLY)	01121	CB5105
S10				(FURNISHED AS A UNIT WITH R45)		
S20A S20B	260-1365-00			SWITCH,PUSH:DPDT,2 STATION,INTERLOCK	80009	260-1365-00
S15 S75	260-1466-00			SWITCH,PUSH:DPDT,2 STA,NON-SHORT	80009	260-1466-00
S110				(FURNISHED AS A UNIT WITH R145)		
S120A S120B	260-1365-00			SWITCH,PUSH:DPDT,2 STATION,INTERLOCK	80009	260-1365-00
S115 S170	260-1466-00			SWITCH,PUSH:DPDT,2 STA,NON-SHORT	80009	260-1466-00
S250	105-0402-00			ACTR ASSY,CAM S:CLOCK RATE	80009	105-0402-00
S260	105-0403-00			ACTR ASSY,CAM S:FUNCTION	80009	105-0403-00
S270 S275	260-1465-00			SWITCH,PUSH:2 STA,NON-SHORT	80009	260-1465-00
S285				(FURNISHED AS A UNIT WTIH R285)		
U1	156-0118-00	XB060000	B119999X	MICROCIRCUIT,DI:J-K MASTER-SLAVE FLIP-FLOP (OPTION 01 ONLY)	80009	156-0118-00
U1	156-0118-00	XB060000	B109999X	MICROCIRCUIT,DI:J-K MASTER-SLAVE FLIP-FLOP (STANDARD ONLY)	80009	156-0118-00
U2	156-0180-00	XB060000	B119999X	MICROCIRCUIT,DI:QUAD 2-INPUT NAND GATE (OPTION 01 ONLY)	01295	SN74S00(N OR J)
U2	156-0180-00	XB060000	B109999X	MICROCIRCUIT,DI:QUAD 2-INPUT NAND GATE (STANDARD ONLY)	01295	SN74S00(N OR J)
U200	156-0180-00	B010100	B167199	MICROCIRCUIT,DI:QUAD 2-INPUT NAND GATE (STANDARD ONLY)	01295	SN74S00(N OR J)
U200	156-0180-03	B167200		MICROCIRCUIT,DI:QUAD 2 INP NAND GATE (STANDARD ONLY)	80009	156-0180-03
U200	156-0180-00	B010100	B177189	MICROCIRCUIT,DI:QUAD 2-INPUT NAND GATE (OPTION 01 ONLY)	01295	SN74S00(N OR J)

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
U200	156-0180-03	B177190		MICROCIRCUIT,DI:QUAD 2 INP NAND GATE	80009	156-0180-03
	----- -----			(OPTION 01 ONLY)		
U210	156-0118-00	B010100	B167199	MICROCIRCUIT,DI:J-K MASTER-SLAVE FLIP-FLOP	80009	156-0118-00
	----- -----			(STANDARD ONLY)		
U210	156-0118-02	B167200		MICROCIRCUIT,DI:DUAL J-K FLIP-FLOP	80009	156-0118-02
	----- -----			(STANDARD ONLY)		
U210	156-0118-00	B010100	B177189	MICROCIRCUIT,DI:J-K MASTER-SLAVE FLIP-FLOP	80009	156-0118-00
	----- -----			(OPTION 01 ONLY)		
U210	156-0118-02	B177190		MICROCIRCUIT,DI:DUAL J-K FLIP-FLOP	80009	156-0118-02
	----- -----			(OPTION 01 ONLY)		
U212	156-0100-00	B010100	B059999X	MICROCIRCUIT,DI:J-K EDGE TRIGGERED FF	80009	156-0100-00
U212	156-0180-00	XB110000	B167199	MICROCIRCUIT,DI:QUAD 2-INPUT NAND GATE	01295	SN74S00(N OR J)
	----- -----			(STANDARD ONLY)		
U212	156-0180-03	B167200		MICROCIRCUIT,DI:QUAD 2 INP NAND GATE	80009	156-0180-03
	----- -----			(STANDARD ONLY)		
U212	156-0180-00	XB120000	B177189	MICROCIRCUIT,DI:QUAD 2-INPUT NAND GATE	01295	SN74S00(N OR J)
	----- -----			(OPTION 01 ONLY)		
U212	156-0180-03	B177190		MICROCIRCUIT,DI:QUAD 2 INP NAND GATE	80009	156-0180-03
	----- -----			(OPTION 01 ONLY)		
U214	156-0100-00	B010100	B059999X	MICROCIRCUIT,DI:J-K EDGE TRIGGERED FF	80009	156-0100-00
U214	156-0118-00	XB110000	B167199	MICROCIRCUIT,DI:J-K MASTER-SLAVE FLIP-FLOP	80009	156-0118-00
	----- -----			(STANDARD ONLY)		
U214	156-0118-02	B167200		MICROCIRCUIT,DI:DUAL J-K FLIP-FLOP	80009	156-0118-02
	----- -----			(STANDARD ONLY)		
U214	156-0118-00	XB120000	B177189	MICROCIRCUIT,DI:J-K MASTER-SLAVE FLIP-FLOP	80009	156-0118-00
	----- -----			(OPTION 01 ONLY)		
U214	156-0118-02	B177190		MICROCIRCUIT,DI:DUAL J-K FLIP-FLOP	80009	156-0118-02
	----- -----			(OPTION 01 ONLY)		
U220	156-0030-00			MICROCIRCUIT,DI:QUAD 2-INPUT NAND GATE	01295	SN7400(N OR J)
U224	156-0041-00			MICROCIRCUIT,DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N
U226	156-0047-00			MICROCIRCUIT,DI:TPL 3-INPUT POS NAND GATE	80009	156-0047-00
U250	156-0030-00			MICROCIRCUIT,DI:QUAD 2-INPUT NAND GATE	01295	SN7400(N OR J)
	----- -----			(STANDARD ONLY)		
U251	156-0079-00			MICROCIRCUIT,DI:DECADE COUNTER,TTL	80009	156-0079-00
	----- -----			(OPTION 01 ONLY)		
U260	156-0079-00			MICROCIRCUIT,DI:DECADE COUNTER,TTL	80009	156-0079-00
U261	156-0079-00			MICROCIRCUIT,DI:DECADE COUNTER,TTL	80009	156-0079-00
U262	156-0079-00			MICROCIRCUIT,DI:DECADE COUNTER,TTL	80009	156-0079-00
U263	156-0079-00			MICROCIRCUIT,DI:DECADE COUNTER,TTL	80009	156-0079-00
U264	156-0079-00			MICROCIRCUIT,DI:DECADE COUNTER,TTL	80009	156-0079-00
U265	156-0079-00			MICROCIRCUIT,DI:DECADE COUNTER,TTL	80009	156-0079-00
U266	156-0079-00			MICROCIRCUIT,DI:DECADE COUNTER,TTL	80009	156-0079-00
U270	156-0042-00			MICROCIRCUIT,DI:J-K M/S FLIP-FLOP	80009	156-0042-00
U272	156-0174-00			MICROCIRCUIT,DI:DUAL J-K MS,FLIP-FLOP	80009	156-0174-00
U280	156-0150-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR	01295	SN7437N
U305	156-0079-00			MICROCIRCUIT,DI:DECADE COUNTER,TTL	80009	156-0079-00
U306	156-0079-00			MICROCIRCUIT,DI:DECADE COUNTER,TTL	80009	156-0079-00
U307	156-0079-00			MICROCIRCUIT,DI:DECADE COUNTER,TTL	80009	156-0079-00
U308	156-0079-00			MICROCIRCUIT,DI:DECADE COUNTER,TTL	80009	156-0079-00
U309	156-0079-00			MICROCIRCUIT,DI:DECADE COUNTER,TTL	80009	156-0079-00
U310	156-0079-00			MICROCIRCUIT,DI:DECADE COUNTER,TTL	80009	156-0079-00
U311	156-0039-00			MICROCIRCUIT,DI:DUAL J-K FLIP FLOP	80009	156-0039-00
U320	156-0198-00	B010100	B109999	MICROCIRCUIT,DI:QUAD LATCH	04713	MC4035P
	----- -----			(STANDARD ONLY)		
U320	156-0398-00	B110000		MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT	80009	156-0398-00
	----- -----			(STANDARD ONLY)		
U320	156-0198-00	B010100	B119999	MICROCIRCUIT,DI:QUAD LATCH	04713	MC4035P
	----- -----			(OPTION 01 ONLY)		

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
U320	156-0398-00	B120000		MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT (OPTION 01 ONLY)	80009	156-0398-00
U321	156-0198-00	B010100	B109999	MICROCIRCUIT,DI:QUAD LATCH (STANDARD ONLY)	04713	MC4035P
U321	156-0398-00	B110000		MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT (STANDARD ONLY)	80009	156-0398-00
U321	156-0198-00	B010100	B119999	MICROCIRCUIT,DI:QUAD LATCH (OPTION 01 ONLY)	04713	MC4035P
U321	156-0398-00	B120000		MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT (OPTION 01 ONLY)	80009	156-0398-00
U322	156-0198-00	B010100	B109999	MICROCIRCUIT,DI:QUAD LATCH (STANDARD ONLY)	04713	MC4035P
U322	156-0398-00	B110000		MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT (STANDARD ONLY)	80009	156-0398-00
U322	156-0198-00	B010100	B119999	MICROCIRCUIT,DI:QUAD LATCH (OPTION 01 ONLY)	04713	MC4035P
U322	156-0398-00	B120000		MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT (OPTION 01 ONLY)	80009	156-0398-00
U323	156-0198-00	B010100	B109999	MICROCIRCUIT,DI:QUAD LATCH (STANDARD ONLY)	04713	MC4035P
U323	156-0398-00	B110000		MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT (STANDARD ONLY)	80009	156-0398-00
U323	156-0198-00	B010100	B119999	MICROCIRCUIT,DI:QUAD LATCH (OPTION 01 ONLY)	04713	MC4035P
U323	156-0398-00	B120000		MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT (OPTION 01 ONLY)	80009	156-0398-00
U324	156-0198-00	B010100	B109999	MICROCIRCUIT,DI:QUAD LATCH (STANDARD ONLY)	04713	MC4035P
U324	156-0398-00	B110000		MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT (STANDARD ONLY)	80009	156-0398-00
U324	156-0198-00	B010100	B119999	MICROCIRCUIT,DI:QUAD LATCH (OPTION 01 ONLY)	04713	MC4035P
U324	156-0398-00	B120000		MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT (OPTION 01 ONLY)	80009	156-0398-00
U325	156-0198-00	B010100	B109999	MICROCIRCUIT,DI:QUAD LATCH (STANDARD ONLY)	04713	MC4035P
U325	156-0398-00	B110000		MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT (STANDARD ONLY)	80009	156-0398-00
U325	156-0198-00	B010100	B119999	MICROCIRCUIT,DI:QUAD LATCH (OPTION 01 ONLY)	04713	MC4035P
U325	156-0398-00	B120000		MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT (OPTION 01 ONLY)	80009	156-0398-00
U326	156-0198-00	B010100	B109999	MICROCIRCUIT,DI:QUAD LATCH (STANDARD ONLY)	04713	MC4035P
U326	156-0398-00	B110000		MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT (STANDARD ONLY)	80009	156-0398-00
U326	156-0198-00	B010100	B119999	MICROCIRCUIT,DI:QUAD LATCH (OPTION 01 ONLY)	04713	MC4035P
U326	156-0398-00	B120000		MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT (OPTION 01 ONLY)	80009	156-0398-00
U328	156-0057-00			MICROCIRCUIT,DI:QUAD 2-INPUT NAND GATE	01295	SN7401N OR J
U330	156-0057-00			MICROCIRCUIT,DI:QUAD 2-INPUT NAND GATE	01295	SN7401N OR J
U332	156-0041-00	B010100	B049999	MICROCIRCUIT,DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N
U332	156-0041-02	B050000		MICROCIRCUIT,DI:DUAL D-TYPE FLIP-FLOP	07263	7474PC
U333	156-0041-00	B010100	B049999	MICROCIRCUIT,DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N
U333	156-0041-02	B050000		MICROCIRCUIT,DI:DUAL D-TYPE FLIP-FLOP	07263	7474PC
U335	156-0111-00			MICROCIRCUIT,DI:SGL BCD-TO-DEC DEC/DRIVER	80009	156-0111-00

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
U337	156-0058-00 ----- -----	B010100	B109999X	MICROCIRCUIT,DI:HEX.INVERTER (STANDARD ONLY)	80009	156-0058-00
U337	156-0058-00 ----- -----	B010100	B119999X	MICROCIRCUIT,DI:HEX.INVERTER (OPTION 01 ONLY)	80009	156-0058-00
U340	156-0128-00			MICROCIRCUIT,DI:SGL BCD TO 7-SEG DCDR/DRVR	80009	156-0128-00
U350	156-0165-00			MICROCIRCUIT,DI:DUAL 4-INPUT POS NOR GATE	01295	SN7425N
U352	156-0043-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NOR GATE	80009	156-0043-00
U354	156-0043-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NOR GATE	80009	156-0043-00
U500	156-0071-00			MICROCIRCUIT,LI:VOLTAGE REGULATOR	04713	MC1723CL
U520	156-0071-00			MICROCIRCUIT,LI:VOLTAGE REGULATOR	04713	MC1723CL
VR80	152-0195-00			SEMICOND DEVICE:ZENER,0.4W,5.1V,5%	04713	SZ11755
VR170	152-0195-00			SEMICOND DEVICE:ZENER,0.4W,5.1V,5%	04713	SZ11755
VR520	152-0166-00	XB010131		SEMICOND DEVICE:ZENER,0.4W,6.2V,5%	04713	SZ11738
Y250	158-0079-00 ----- -----			XTAL UNIT,QTZ:1 MHZ,+/-0.001% (STANDARD ONLY)	00136	OBD
Y251	119-0262-00 ----- -----			OSCILLATOR,RF:XTAL CONTROLLED,5 MHZ ADJ (OPTION 01 ONLY)	13571	EROS-600-TK-9

DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS

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.

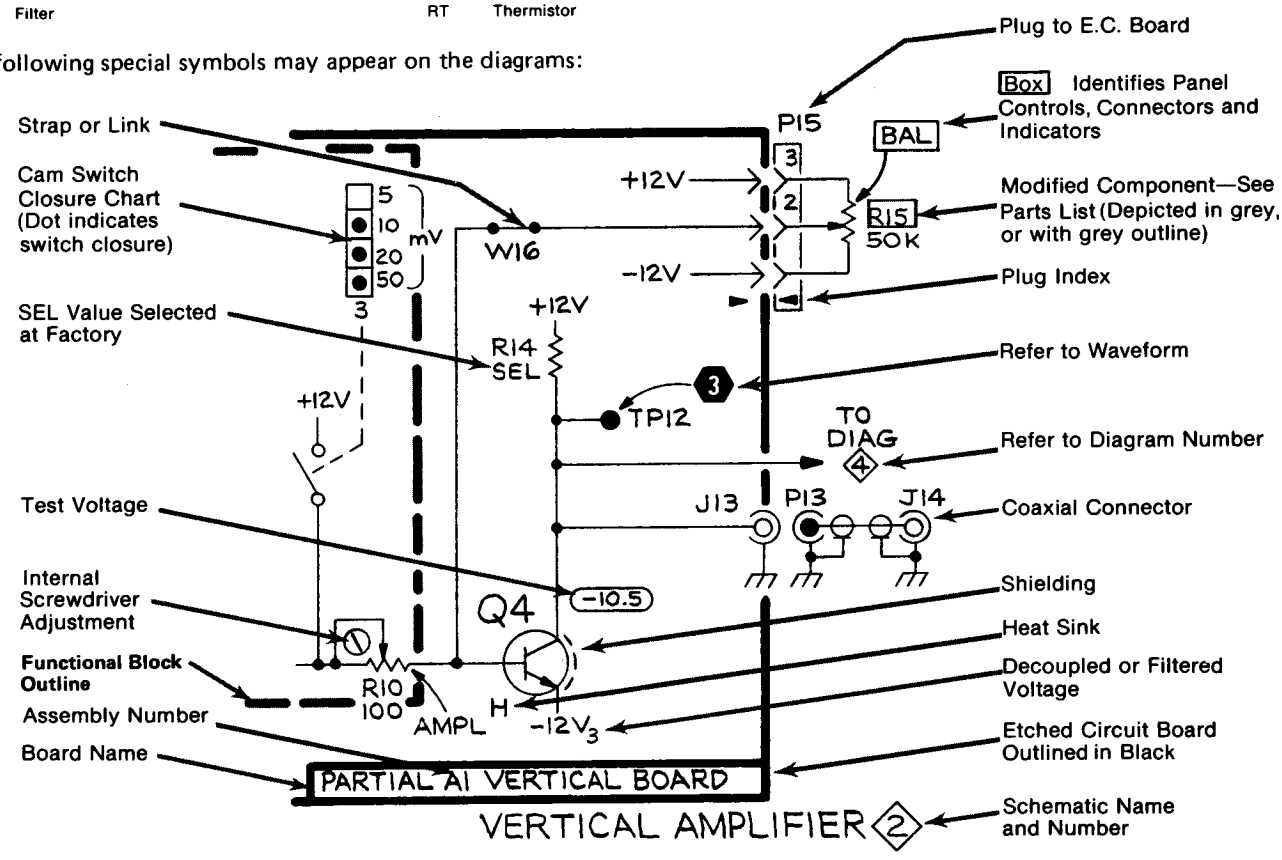
Other ANSI standards that are used in the preparation of diagrams by Tektronix, Inc. are:

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.

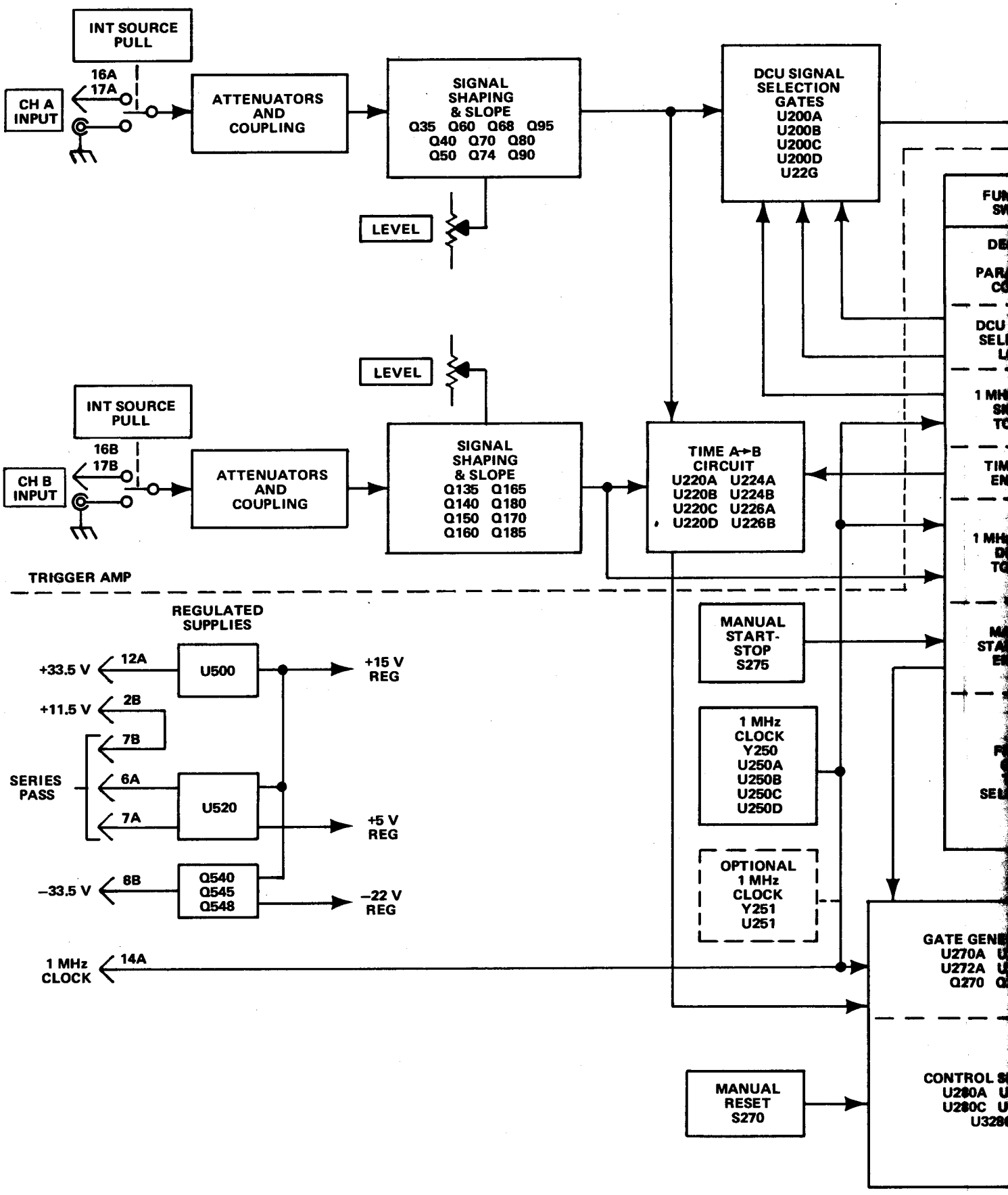
The following prefix letters are used as reference designators to identify components or assemblies on the diagrams.

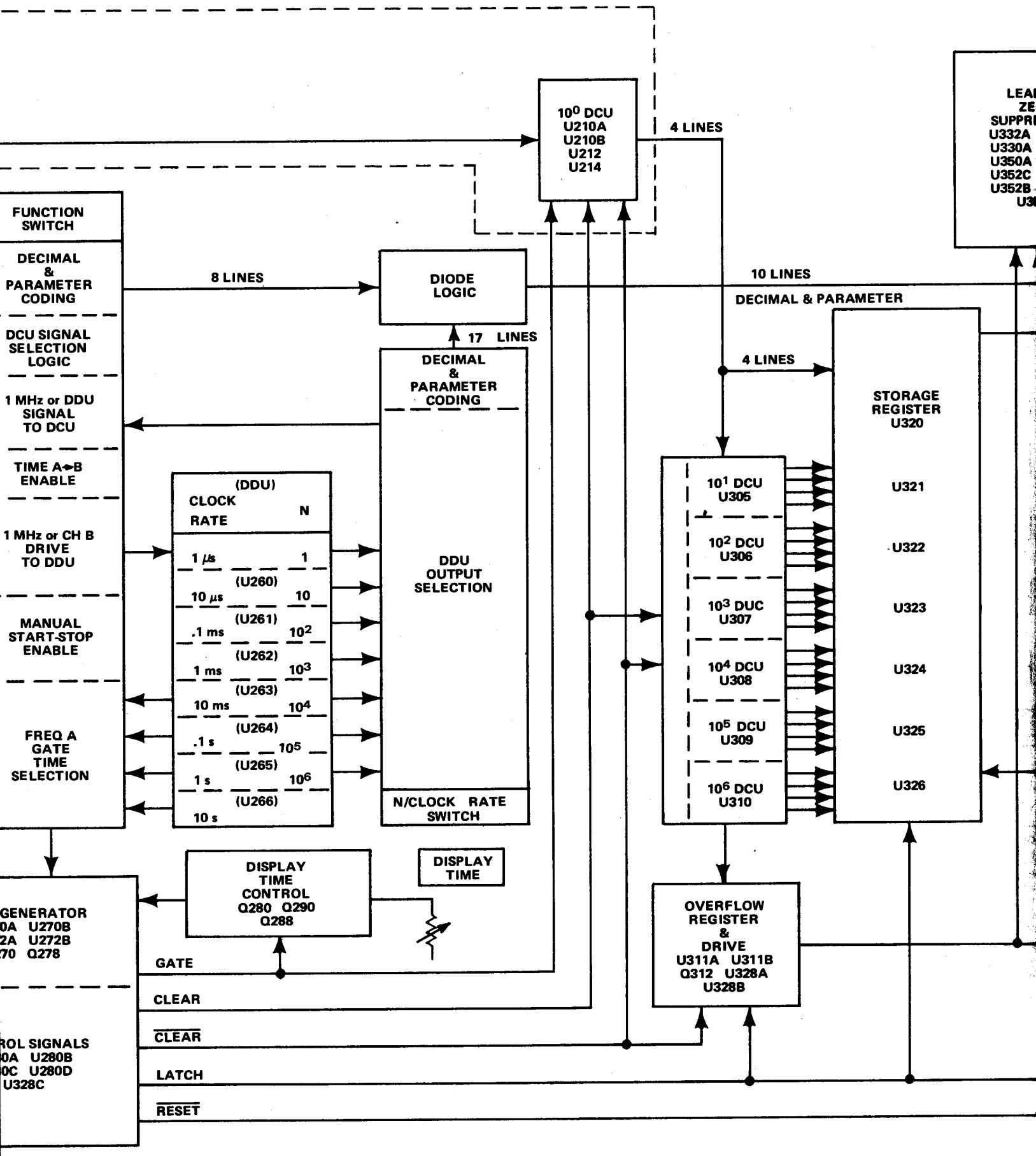
A	Assembly, separable or repairable (circuit board, etc)
AT	Attenuator, fixed or variable
B	Motor
BT	Battery
C	Capacitor, fixed or variable
CB	Circuit breaker
CR	Diode, signal or rectifier
DL	Delay line
DS	Indicating device (lamp)
E	Spark Gap, Ferrite bead
F	Fuse
FL	Filter
H	Heat dissipating device (heat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

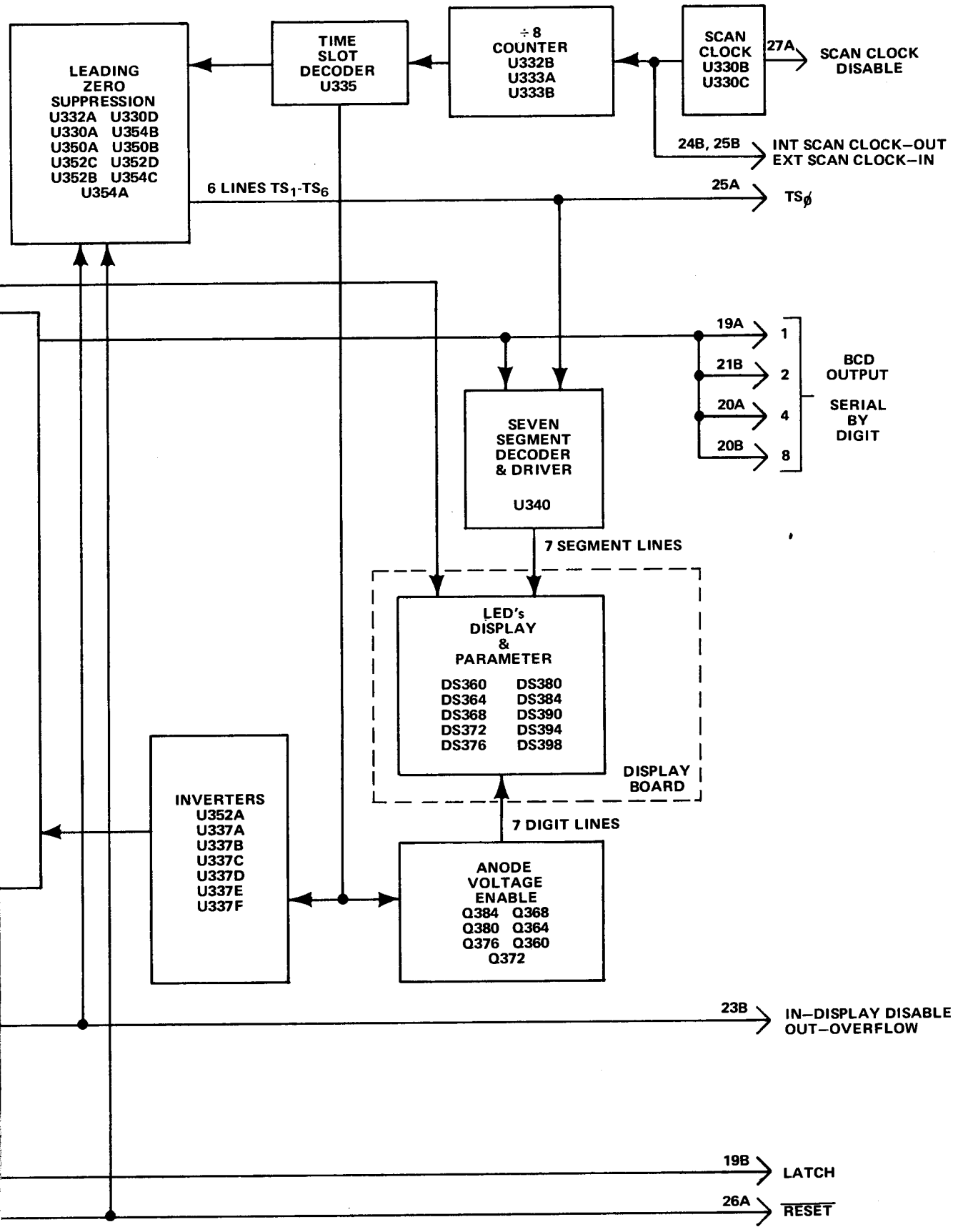
The following special symbols may appear on the diagrams:



@


INT SOURCE PULL
16A
17A
CH A INPUT
ATTENUATORS AND COUPLING
SIGNAL SHAPING & SLOPE
Q35 Q60 Q68 Q95
Q40 Q70 Q80
Q50 Q74 Q90
LEVEL
DCU SIGNAL SELECTION GATES
U200A
U200B
U200C
U200D
U22G
INT SOURCE PULL
16B
17B
CH B INPUT
ATTENUATORS AND COUPLING
LEVEL
SIGNAL SHAPING & SLOPE
Q135 Q165
Q140 Q180
Q150 Q170
Q160 Q185
TIME A→B CIRCUIT
U220A U224A
U220B U224B
U220C U226A
U220D U226B
TRIGGER AMP
REGULATED SUPPLIES
+33.5 V
12A
U500
+15 V REG
+11.5 V
2B
7B
SERIES PASS
6A
7A
U520
+5 V REG
–33.5 V
8B
Q540
Q545
Q548
–22 V REG
1 MHz CLOCK
14A
MANUAL START-STOP S275
1 MHz CLOCK Y250
U250A
U250B
U250C
U250D
OPTIONAL 1 MHz CLOCK Y251
U251
MANUAL RESET S270

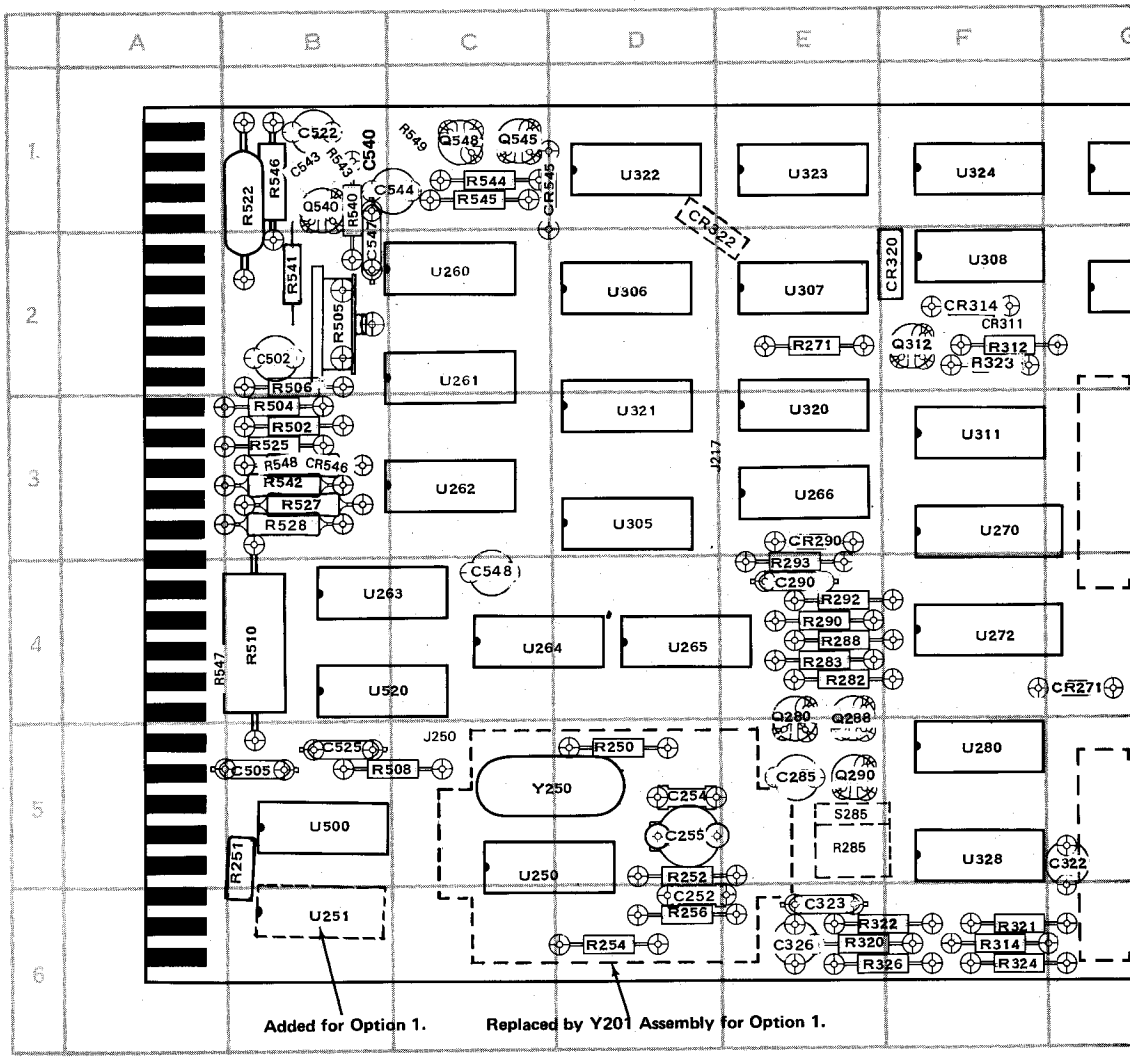

10^0 DCU
U210A
U210B
U212
U214
4 LINES
LEAD ZERO SUPPRESSION
U332A
U330A
U350A
U352C
U352B
U3
FUNCTION SWITCH
DECIMAL & PARAMETER CODING
8 LINES
DIODE LOGIC
10 LINES
DECIMAL & PARAMETER
DCU SIGNAL SELECTION LOGIC
17 LINES
DECIMAL & PARAMETER CODING
4 LINES
STORAGE REGISTER U320
1 MHz or DDU SIGNAL TO DCU
TIME A↔B ENABLE
(DDU) CLOCK RATE N
1 μs 1
(U260)
10 μs 10
(U261)
.1 ms 10^2
(U262)
1 ms 10^3
(U263)
10 ms 10^4
(U264)
.1 s 10^5
(U265)
1 s 10^6
(U266)
10 s
1 MHz or CH B DRIVE TO DDU
MANUAL START-STOP ENABLE
FREQ A GATE TIME SELECTION
DDU OUTPUT SELECTION
N/CLOCK RATE SWITCH
10^1 DCU U305
10^2 DCU U306
10^3 DUC U307
10^4 DCU U308
10^5 DCU U309
10^6 DCU U310
U321
U322
U323
U324
U325
U326
DISPLAY TIME CONTROL Q280 Q290 Q288
DISPLAY TIME
OVERFLOW REGISTER & DRIVE U311A U311B Q312 U328A U328B
GENERATOR
0A U270B
2A U272B
70 Q278
ROL SIGNALS
0A U280B
0C U280D
U328C
GATE
CLEAR
$\overline{\text{CLEAR}}$
LATCH
$\overline{\text{RESET}}$



BLOCK DIAGRAM

PARTS LOCATION GRID

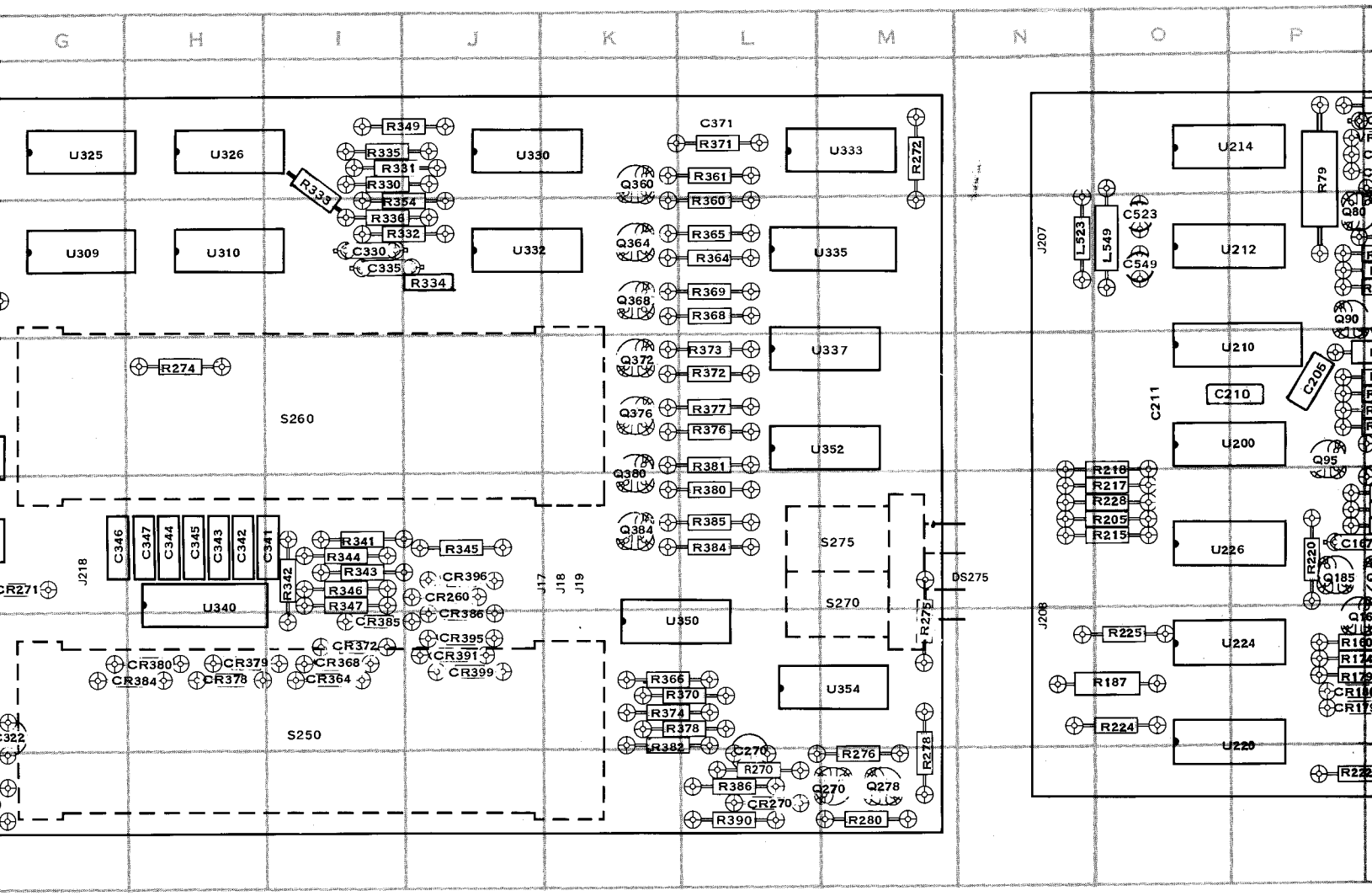
DC 503



A2 MAIN

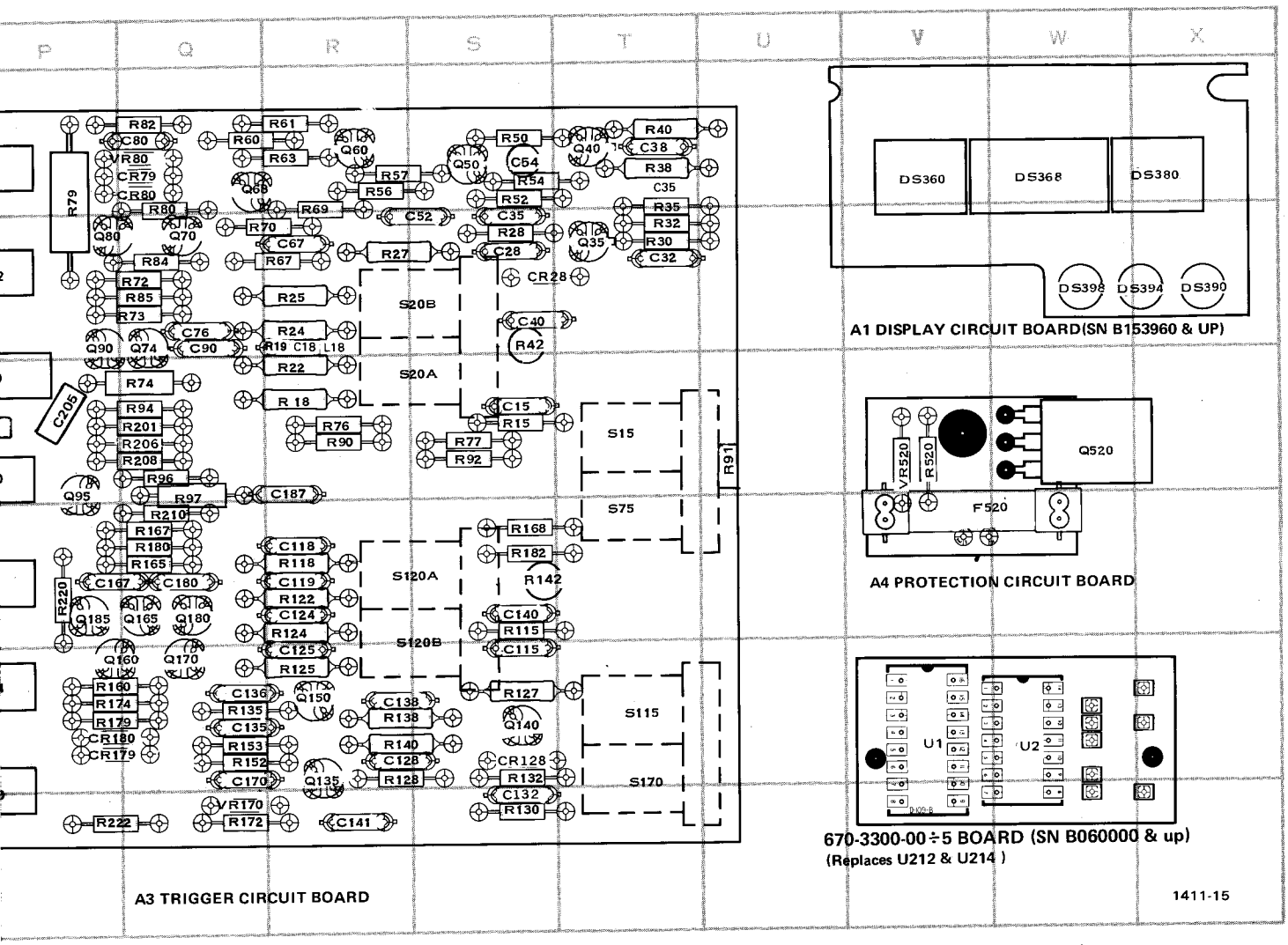
CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO
C15*	S3	C124	R4	C252	D6	C344	H4	CR28	S2	CR378	H5	DS380	X1	Q35
C18	R2	C125	R5	C254	D5	C345	H4	CR79	Q1	CR379	H5	DS390	X2	Q40
C28	S2	C128	R5	C255	D5	C346	G4	CR80	Q1	CR380	H5	DS394	X2	Q50
C32	T2	C132	S6	C270	L5	C347	H4	CR128	S5	CR384	H5	DS398	W2	Q60
C35††	S2	C135	Q5	C285	E5	C371	L1	CR179	P5	CR385	I5			Q68
C35	T1	C136	Q5	C290	E4	C502	B2	CR180	P5	CR386	J4	F520*	V4	Q70
C38	T1	C138	R5	C322	G5	C505	B5	CR260	J4	CR391	J5			Q74
C40	S2	C140	S4	C323	E6	C522	B1	CR270	L6	CR395	J5	J17	J4	Q80
C52	S2	C141	R6	C326	E6	C523	O2	CR271	G4	CR396	J4	J18	K4	Q90
C54*	S1	C167	P4	C330	I2	C525	B5	CR290	E3	CR399	J5	J19	K4	Q95
C67	R2	C170	Q5	C332**	†	C540**	B1	CR311	F2	CR545	C1	J207	N1	Q13
C76	Q2	C180	Q4	C334**	†	C543*†	B1	CR314	F2	CR546*	B3	J208	N4	Q14
C80	Q1	C187	R3	C335	I2	C544	C1	CR320*	D2	DS275	N4	J217	D3	Q15
C90	Q2	C205*	P3	C336**	†	C547	B2	CR322*†	D1	DS360	V1	J218	G4	Q16
C115	S5	C210	P3	C338**	†	C548	C4	CR364	I5	DS364**		J250	C5	Q16
C118	R4	C211*	O3	C341	H4	C549	O2	CR368	I5	DS368	W1	L18	Q3	Q17
C119	R4			C342	H4			CR372	I5	DS372**		L523	N2	Q18
				C343	H4					DS376**		L549	O2	

PARTS LOCATION GRID



A2 MAIN CIRCUIT BOARD

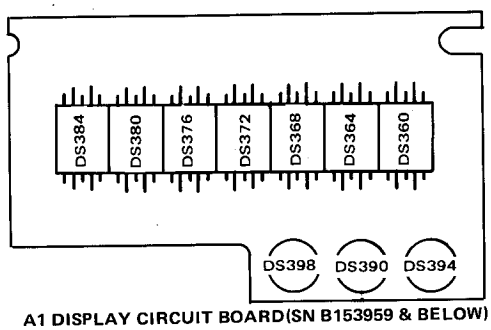
GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	G L
1	Q35	T2	Q185	P4	Q548	C1	R52	S1	R82	Q1	R132	S5	R187	O5	R252	D5	R293	E4	R342	I4	R371	L1	R505	E
2	Q40	T1	Q270	M6			R54	S1	R84	Q2	R135	Q5	R201	Q3	R254	D6	R312	F2	R343	I4	R372	L3	R506	E
2	Q50	S1	Q278	M6	R15	S3	R56	R1	R85	Q2	R138	R5	R205	O4	R256	D6	R314	F6	R344	I4	R373	L3	R508	C
2	Q60	R1	Q280	E4	R18	R3	R57	R1	R90	R3	R140	R5	R206**	Q3	R270	L6	R320	E6	R345	J4	R374	K5	R510	E
	Q68	Q1	Q288	E4	R19*	Q3	R60	Q1	R91*	U3	R142*	S4	R208	Q2	R271	E2	R321	F6	R346	I4	R376	L3	R520*	V
4	Q70	Q2	Q290	E5	R22	R3	R61	R1	R92	S3	R152	Q5	R210	Q4	R272	M1	R322	E6	R347	I4	R377	L3	R522	E
	Q74	Q2	Q312	F2	R24	R2	R63	R1	R94	Q3	R153	Q5	R215	O4	R274	H3	R323*	F2	R349	J1	R378	K5	R525	E
4	Q80	P2	Q360	K1	R25	R2	R67	R2	R96	Q3	R160	P5	R217	O4	R275	M5	R324	F6	R354	I1	R380	L4	R527	E
4	Q90	P2	Q364	K2	R27	R2	R69	R1	R97	Q3	R165	Q4	R218	O4	R276	M6	R326	E6	R360	L1	R381	L3	R528	E
4	Q95	P3	Q368	K2	R28	S2	R70	R2	R115	S4	R167	Q4	R220	P4	R278	M6	R330	I1	R361	L1	R382	K5	R540	E
4	Q135	R5	Q372	K3	R30	T2	R72	Q2	R118	R4	R168	S4	R222	P6	R280	M6	R331	I1	R364	L2	R384	L4	R541	E
3	Q140	S5	Q376	K3	R32	T2	R73	Q2	R122	R4	R172	Q6	R224	O5	R282	E4	R332	I2	R365	L2	R385	L4	R542	
4	Q150	R5	Q380	K3	R35	T1	R74	Q3	R124	R4	R174	P5	R225	O5	R283	E4	R333‡†	I1	R366	K5	R386	L6	R543*†	
5	Q160	P5	Q384	K4	R38	T1	R76	R3	R125	R5	R179	P5	R228	O4	R285†	E5	R334*	J2	R368	L2	R390	L6	R544	C
3	Q165	Q4	Q520*	W3	R40	T1	R77	S3	R127	S5	R180	Q4	R250	V3	R288	E4	R335	I1	R369	L2	R502	B3	R545	C
2	Q170	Q5	Q540	B1	R42*	S2	R79	P1	R128	R5	R182	S4	R251*	B5	R290	E4	R336	I2	R370	K5	R504	B3	R546	E
2	Q180	Q4	Q545	C1	R50	S1	R80	Q1	R130	S6					R292	E4	R341	I4						



GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
L1	R505	B2	R547*†	A4			U264	C4			VR80	Q1
L3	R506	B2	R548	B3	U1*	V5	U265	D4			VR170	Q6
L3	R508	C5	R549*	C1	U2*	W5	U266	E3			VR520*	V3
K5	R510	B4			U200	O3	U270	F3				
L3	R520*	V5	S20A	R3	U210	O3	U272	F4	U328	F5		
L3	R522	B1	S20B	R2	U212*	O2	U280	F5	U330	J1	Y250	C5
K5	R525	B3	S15	T3	U214*	O1	U305	D3	U332	J2	Y251	C5
L4	R527	B3	S75	T4	U220	O5	U306	D2	U333	M1		
L3	R528	B3	S120A	R4	U224	O5	U307	E2	U335	M2		
K5	R540	B1	S120B	R5	U226	O4	U308	F2	U337**	M3		
L4	R541	B2	S115	T5	U250	C5	U309	G2	U340	H4		
L4	R542	B3	S170	T5	U251	C5	U310	H2	U350	K5		
L6	R543*†	B1	S250†	I5	U260	C2	U311	F3	U352	M3		
L6	R544	C1	S260†	I3	U261	C2	U320	E3	U354	M5		
B3	R545	C1	S270†	M4	U262	C3	U321	D3	U500	B5		
B3	R546	B1	S275†	M4	U263	C4	U322	D1	U520	B4		
			S285†	E5								

* See Parts List for serial number ranges.
** Components deleted.
† Located on back of board.
†† Alternate location.

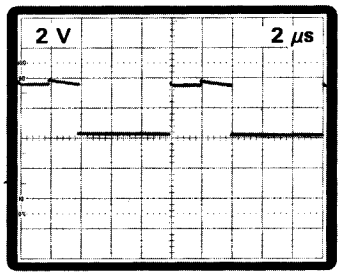
‡OPT 4 ONLY



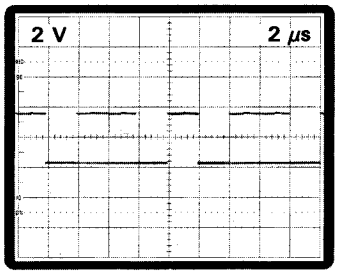
A1 DISPLAY CIRCUIT BOARD(SN B153959 & BELOW)

Waveform Conditions. 400 mV, 1 kHz squarewave applied to both Channel A and Channel B inputs. FUNCTION switch set to PERIOD B. CLOCK RATE switch set to 10 ms, all front-panel pushbuttons out, HOLD control counterclockwise, RESET pushbutton pressed and released.

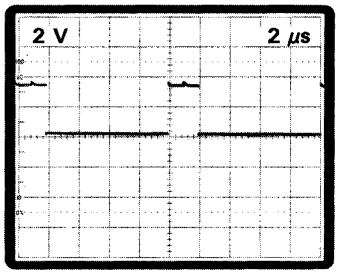
1



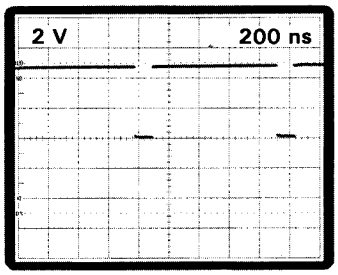
2



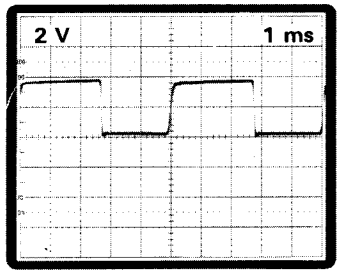
3



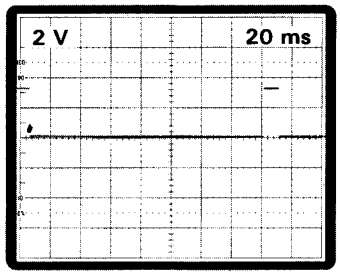
4



5

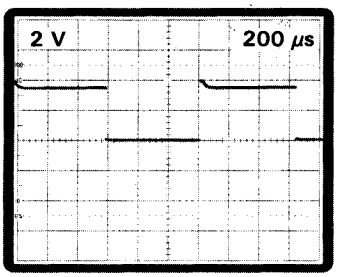


6

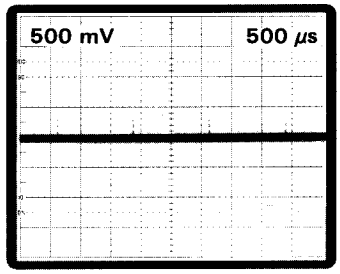


FUNCTION switch is set to .01 s.

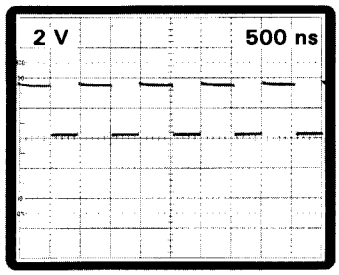
7



8

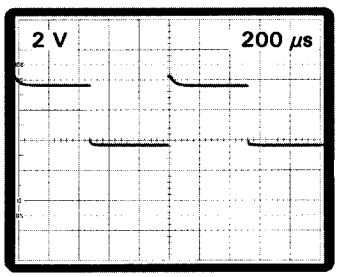


9

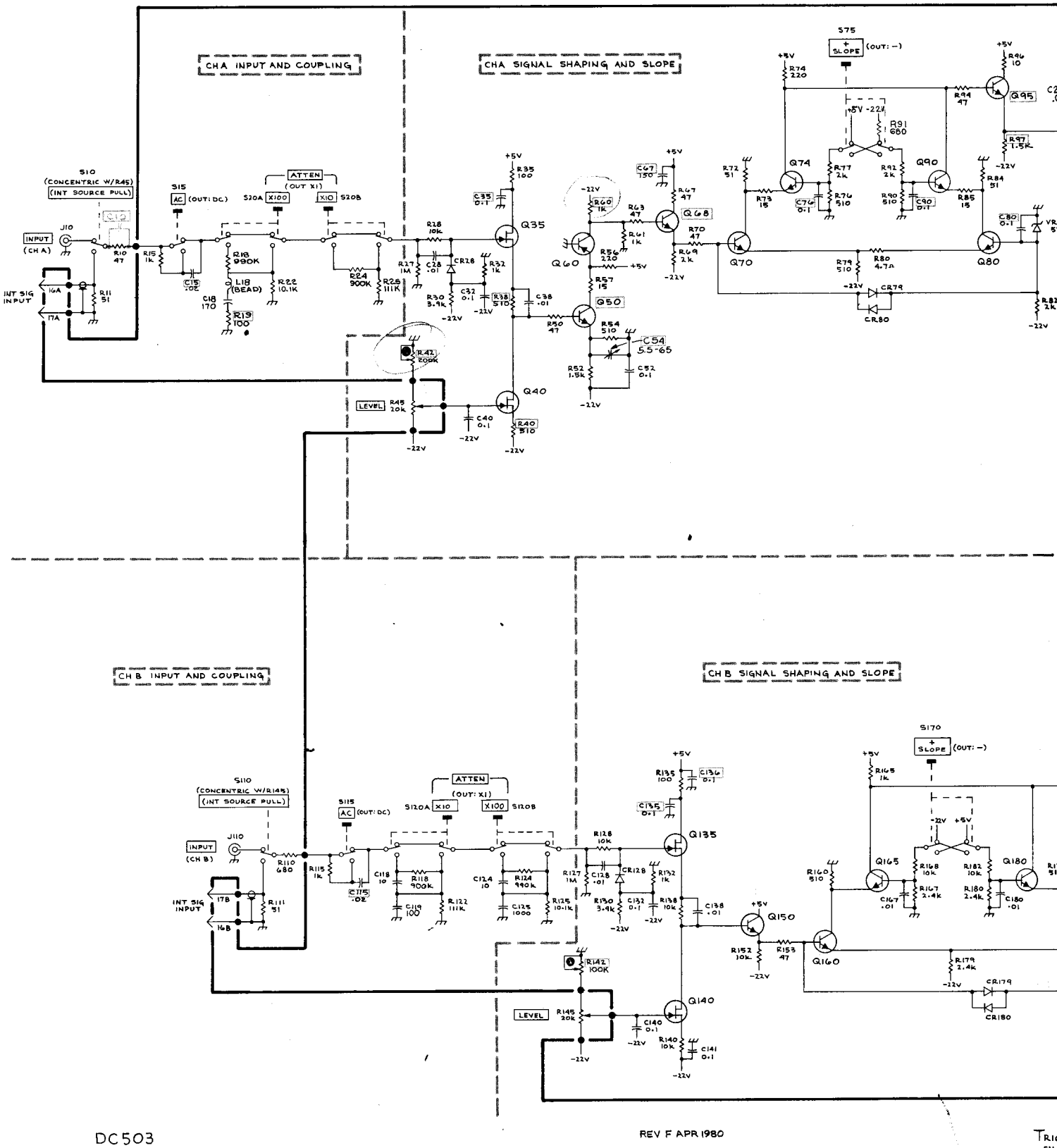


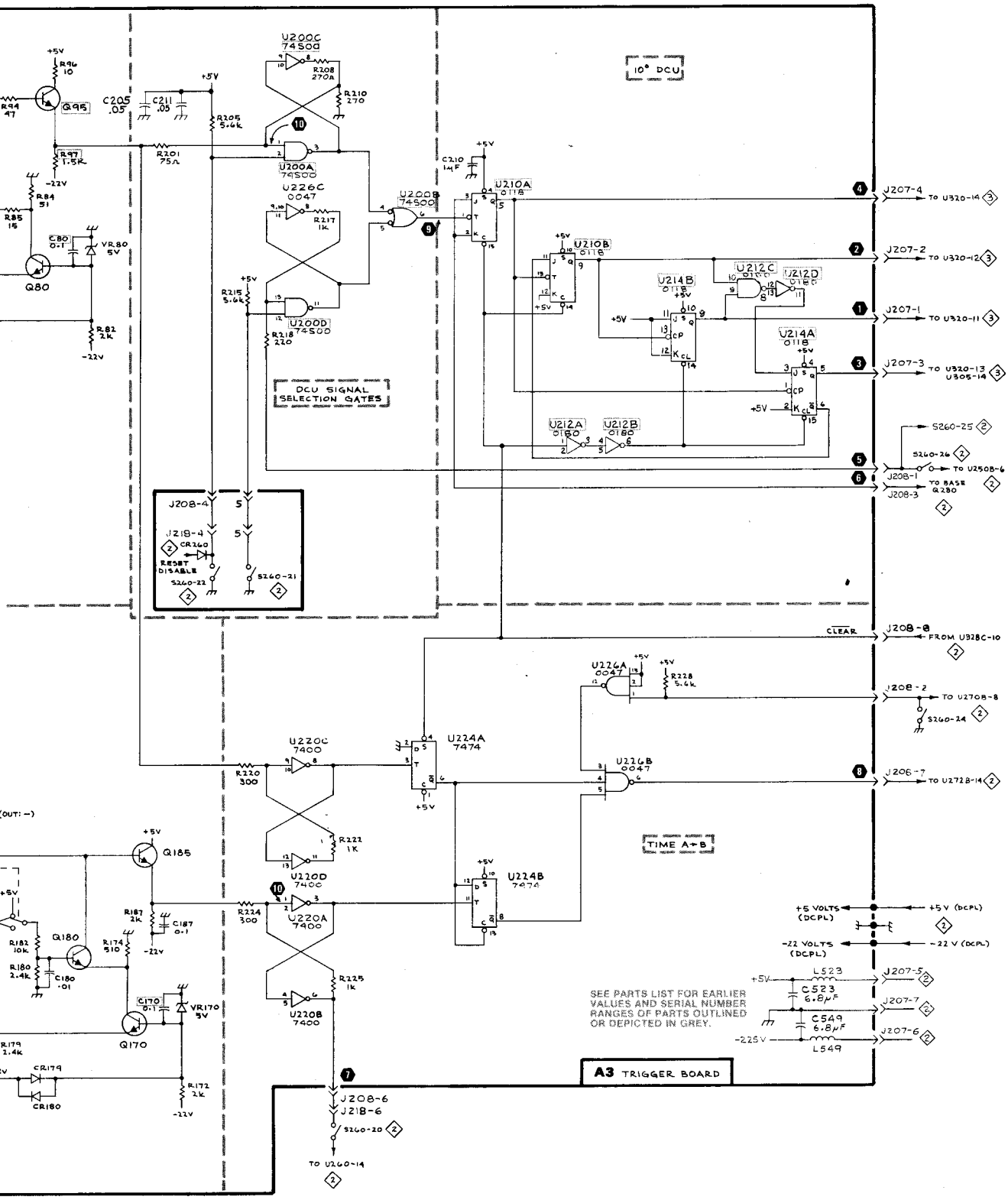
FUNCTION switch is set to .1 s.

10



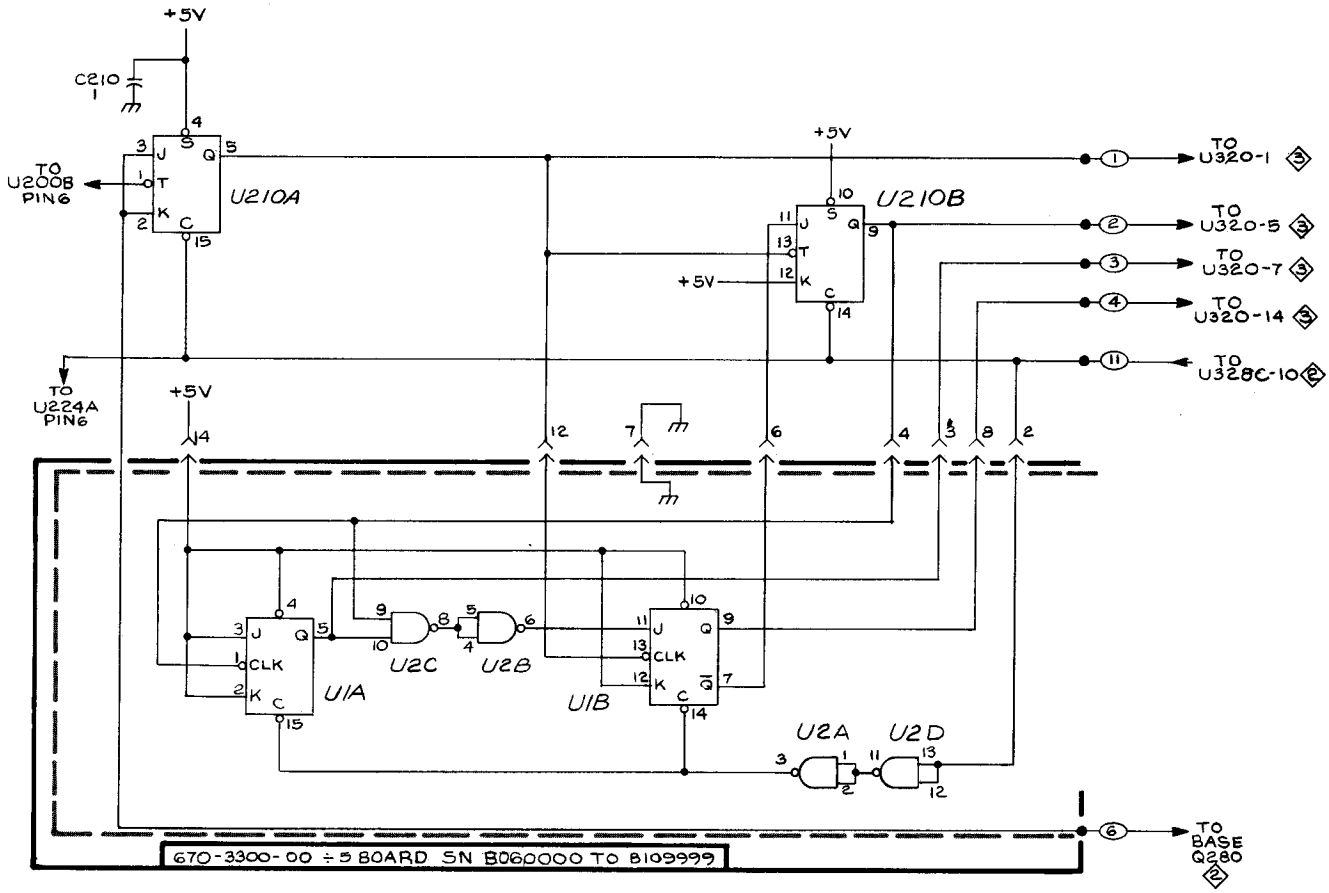
FUNCTION switch is changed to TIME A→B.


CH A INPUT AND COUPLING
CH A SIGNAL SHAPING AND SLOPE
S10 (CONCENTRIC W/R45) (INT SOURCE PULL)
S15 AC (OUT: DC)
ATTEN (OUT X1) S20A X100 X10 S20B
J10 INPUT (CH A)
INT SIG INPUT
16A
17A
R10 47
R11 51
R15 1k
C15 .02
R18 990K
L18 (BEAD)
C18 170
R19 100
R22 10.1K
R24 900K
R25 111K
R28 10K
R27 1M
C28 .01
CR28
R30 3.9K
C32 0.1
R32 1K
R38 510
C38 .01
R35 100
C35 0.1
Q35
R42 200K
LEVEL
R45 20K
C40 0.1
R40 510
Q40
R50 47
Q50
R54 510
C54 5.5-65
C52 0.1
R52 1.5K
R57 15
R56 220
R60 1K
R63 47
R61 1K
Q60
C67 150
R67 47
Q68
R69 2K
R70 47
Q70
S75 + SLOPE (OUT: −)
R74 220
R72 51
R73 15
Q74
C76 0.1
R77 2K
R76 510
R91 680
+5V -22V
R93 2K
Q90
R90 510
C90 0.1
R94 47
Q95
R96 10
R97 1.5K
R84 51
R85 15
R80 4.7A
R79 510
C80 0.1
CR79
CR80
R82 2K
CH B INPUT AND COUPLING
CH B SIGNAL SHAPING AND SLOPE
S110 (CONCENTRIC W/R145) (INT SOURCE PULL)
S115 AC (OUT: DC)
ATTEN (OUT: X1) S120A X10 X100 S120B
J110 INPUT (CH B)
INT SIG INPUT
17B
16B
R110 680
R115 1K
C115 .02
C118 10
R118 900K
C119 100
R122 111K
C124 10
R124 990K
C125 1000
R125 10-11K
R128 10K
R127 1M
C128 .01
CR128
R130 3.9K
C132 0.1
R132 1K
R138 10K
C138 .01
R135 100
C135 0.1
C136 0.1
Q135
R142 100K
LEVEL
R145 20K
C140 0.1
R140 10K
C141 0.1
Q140
S170 + SLOPE (OUT: −)
R165 1K
R160 510
Q165
C167 .01
R168 10K
R167 2.4K
R182 10K
R180 2.4K
Q180
C180 .01
Q150
R152 10K
R153 47
Q160
R179 2.4K
CR179
CR180
+5V
-22V

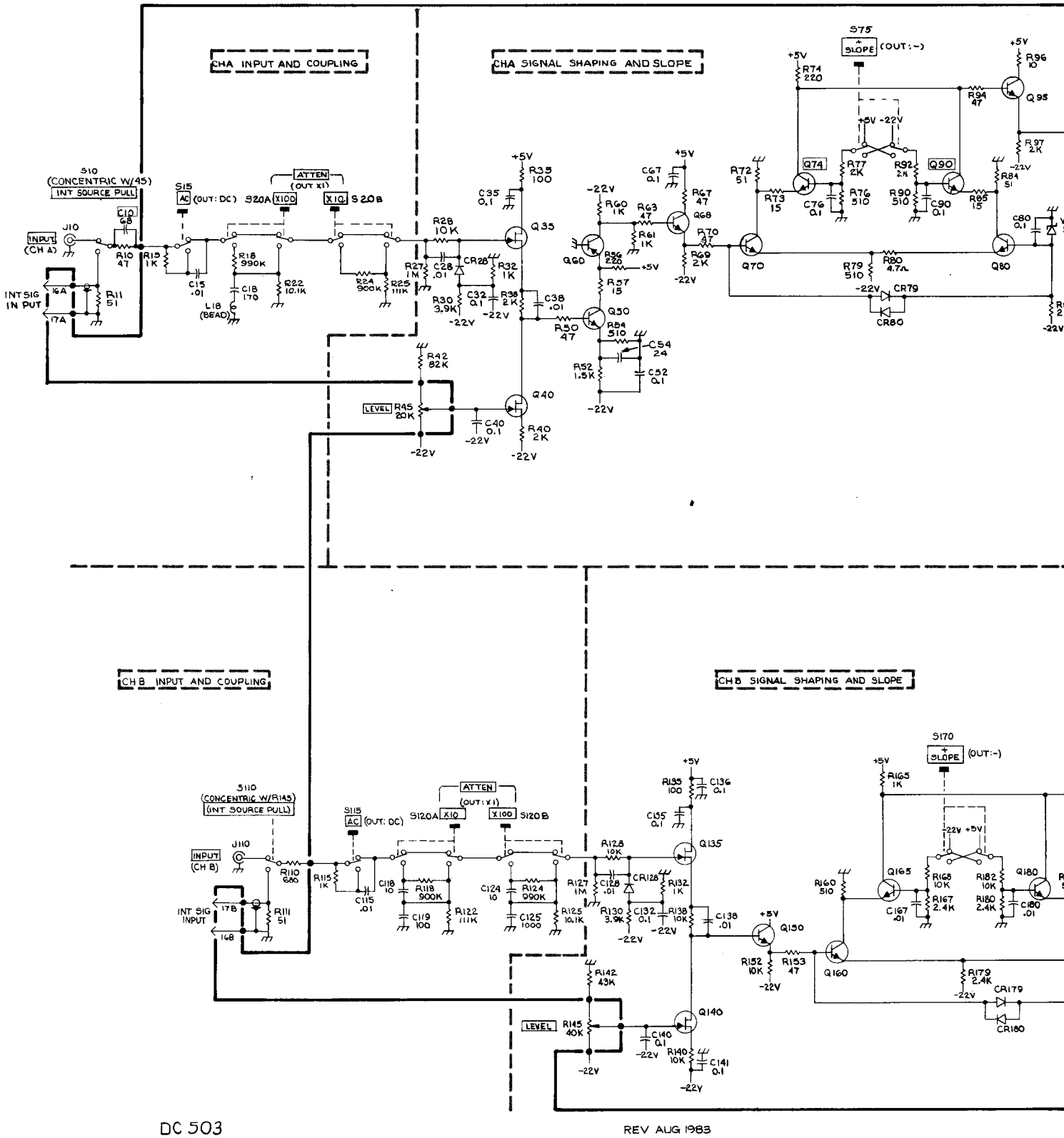


1411-16

TRIGGER AMPLIFIER ◇1 DEH
SN B110000-UP

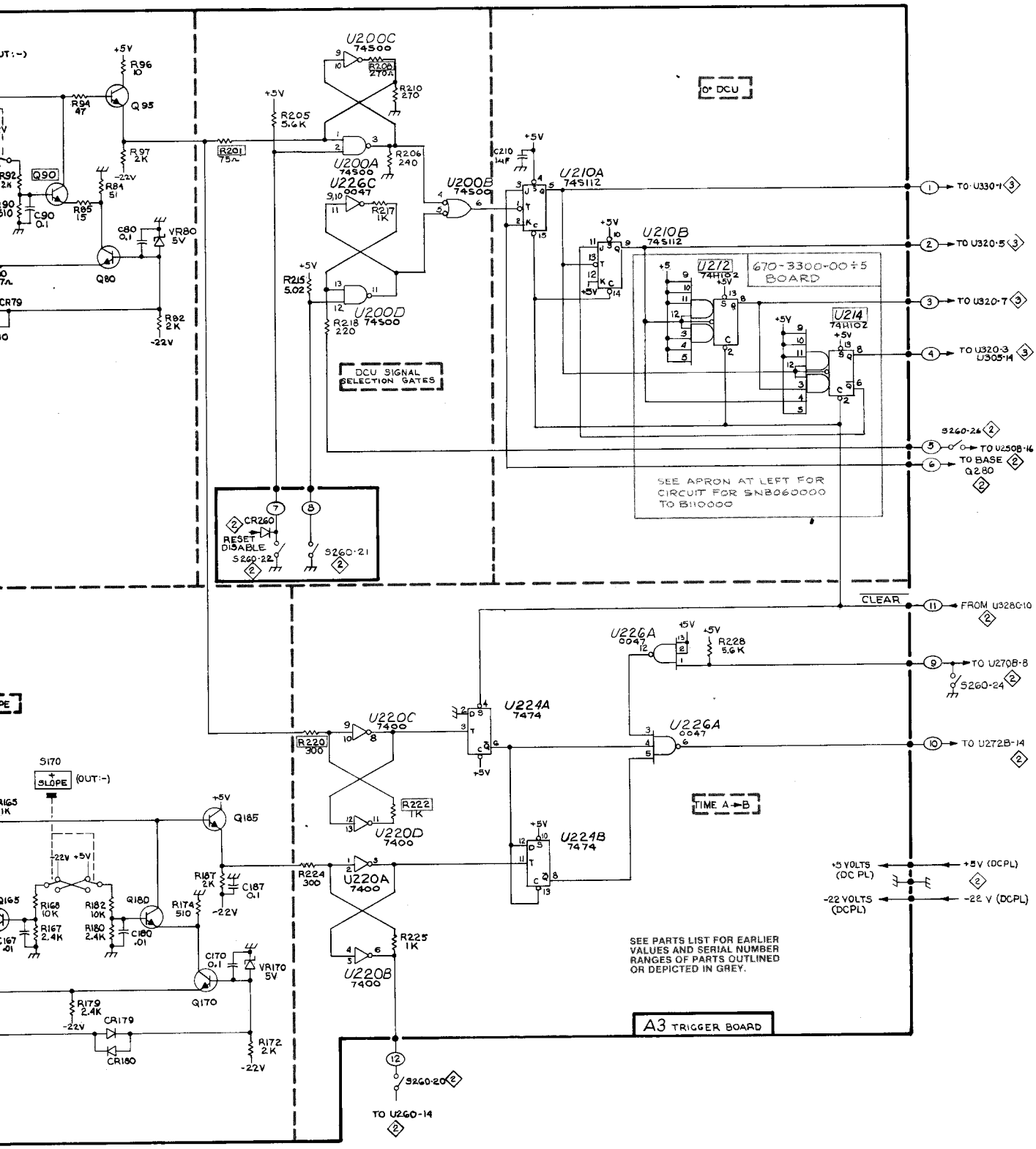


TRIGGER AMPLIFIER
SN B[illegible] R110000



DC 503

REV AUG 1983



1411-17

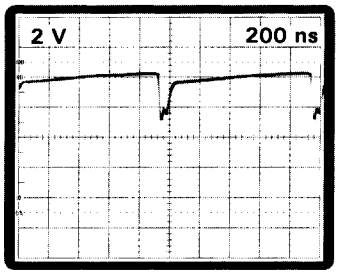
TRIGGER AMPLIFIER ◇1 NS 374
BELOW SNB110000

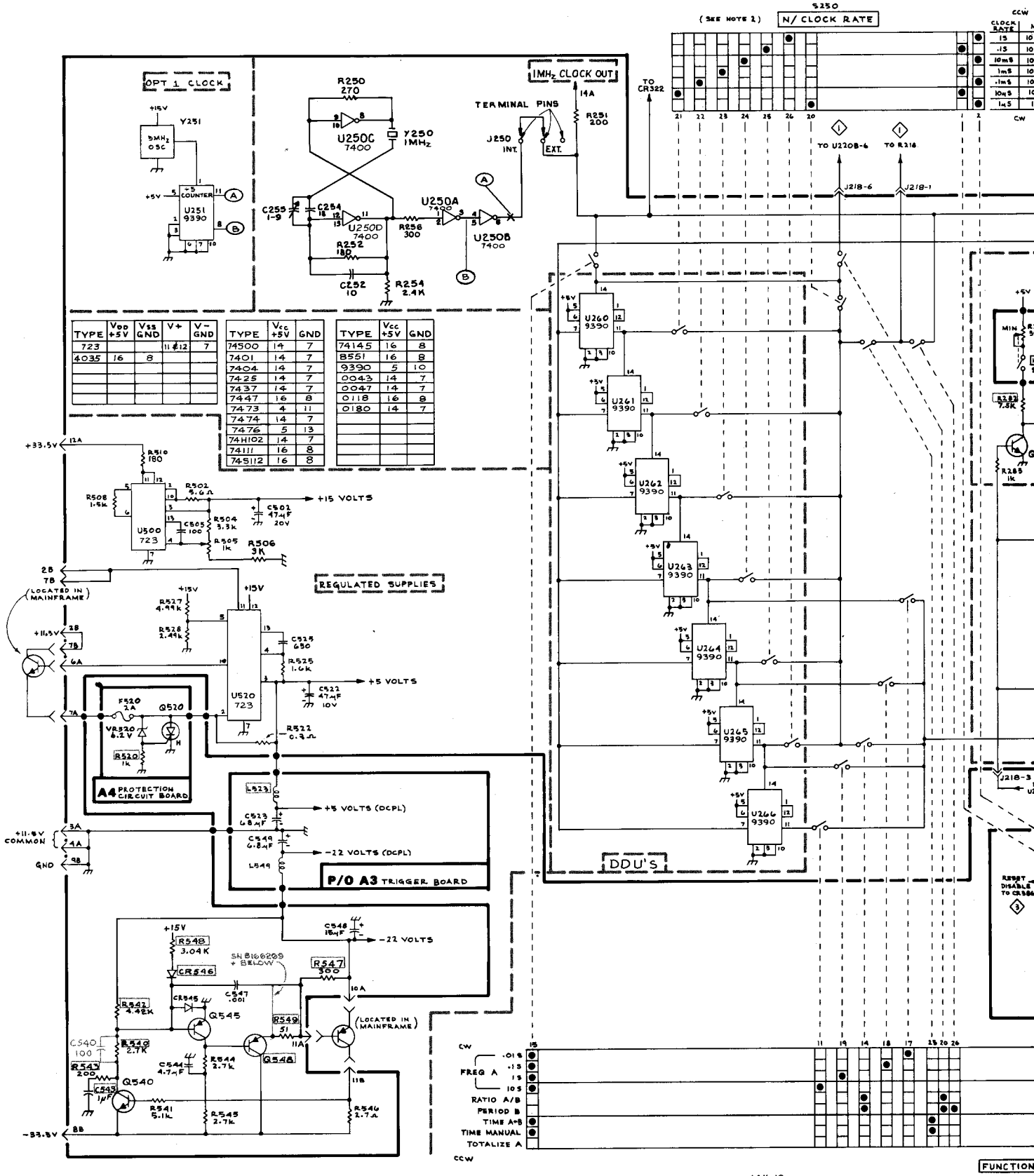
TRIGGER AMPLIFIER
SN BELOW B110000

◇1

Waveform Conditions. 400 mV, 1 kHz squarewave applied to both Channel A and Channel B inputs. FUNCTION switch set to PERIOD B. CLOCK RATE switch set to 10 ms, all front-panel pushbuttons out, HOLD control counterclockwise, RESET pushbutton pressed and released.

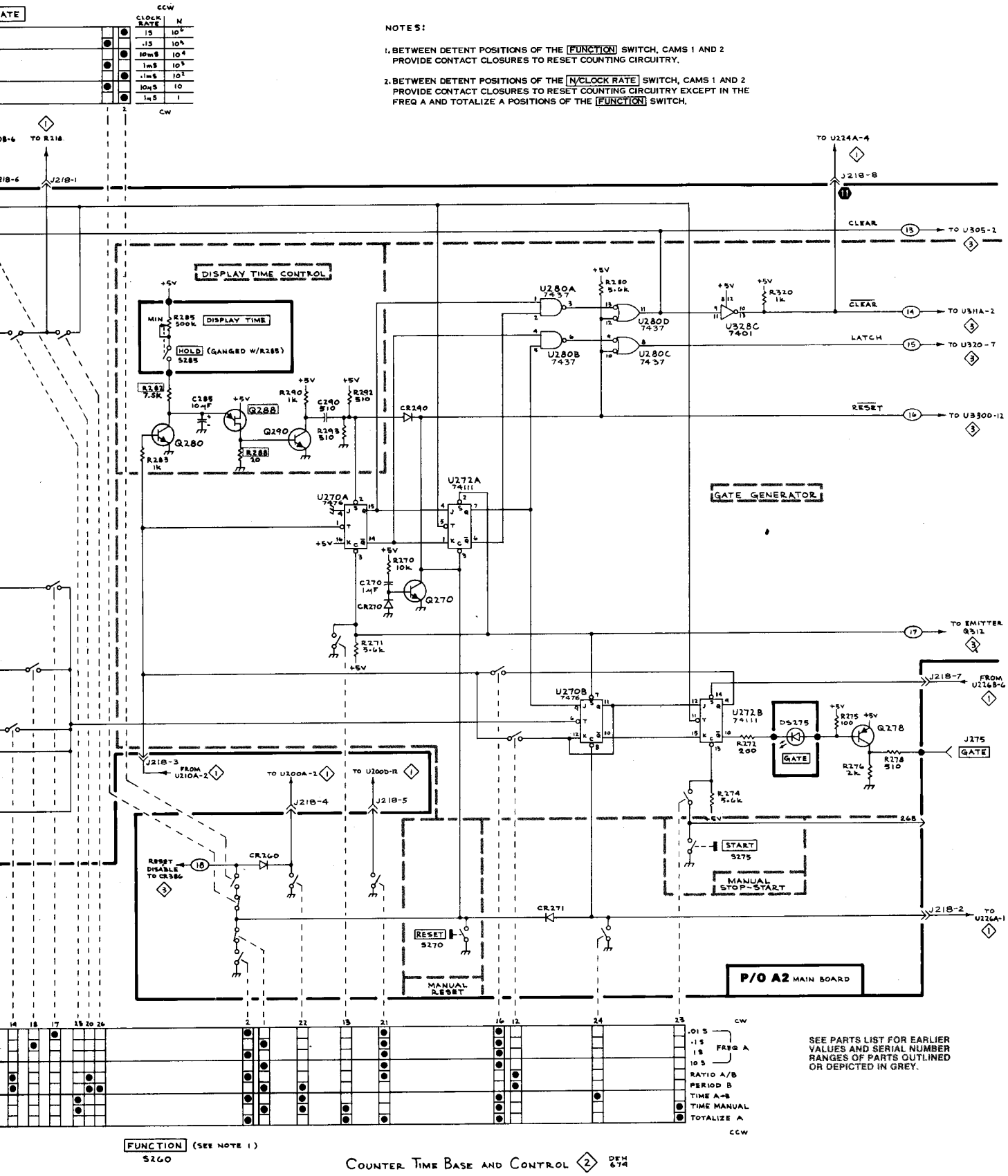
11





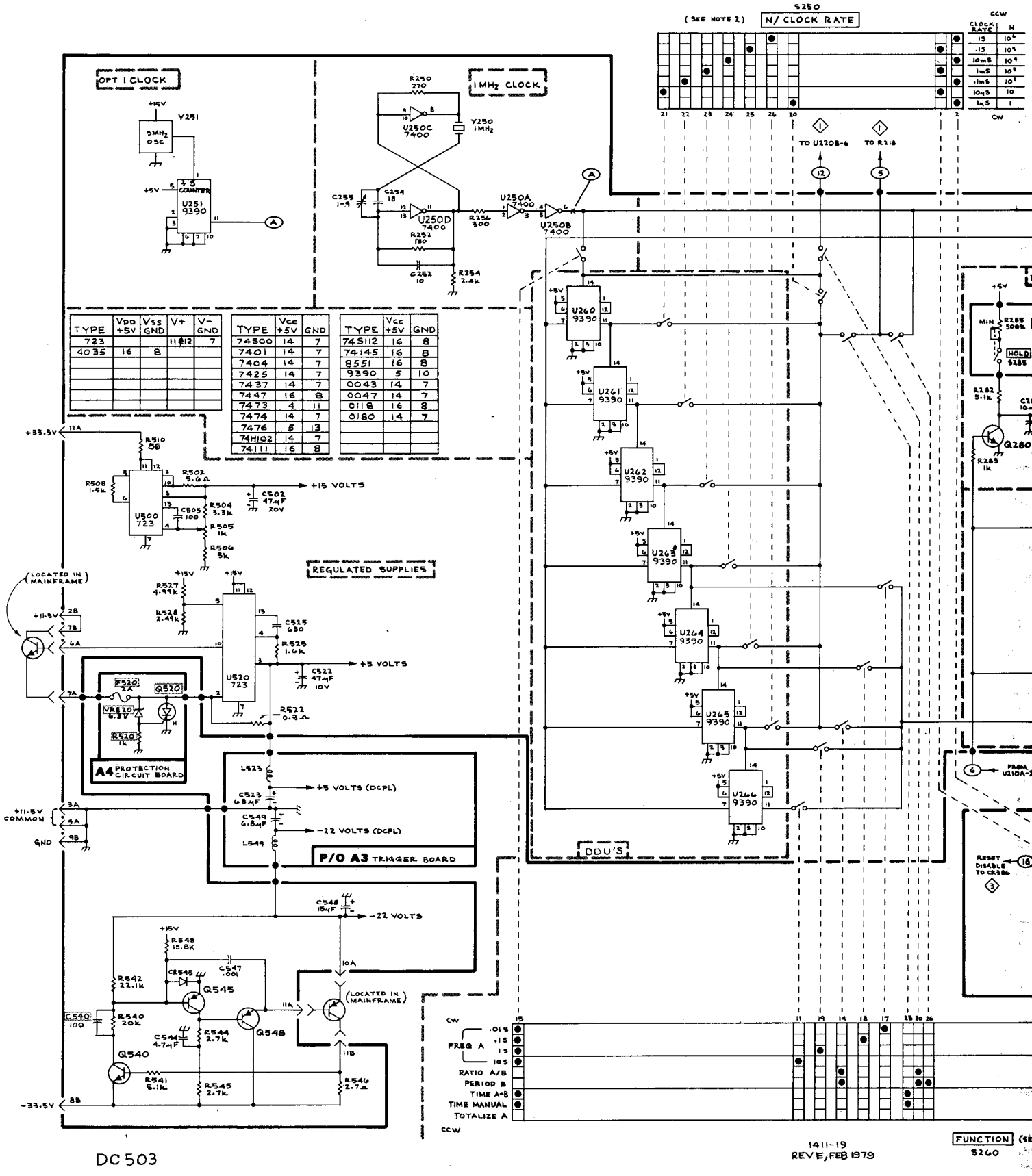
DC 503

1411-18
REV. E, FEB 1979



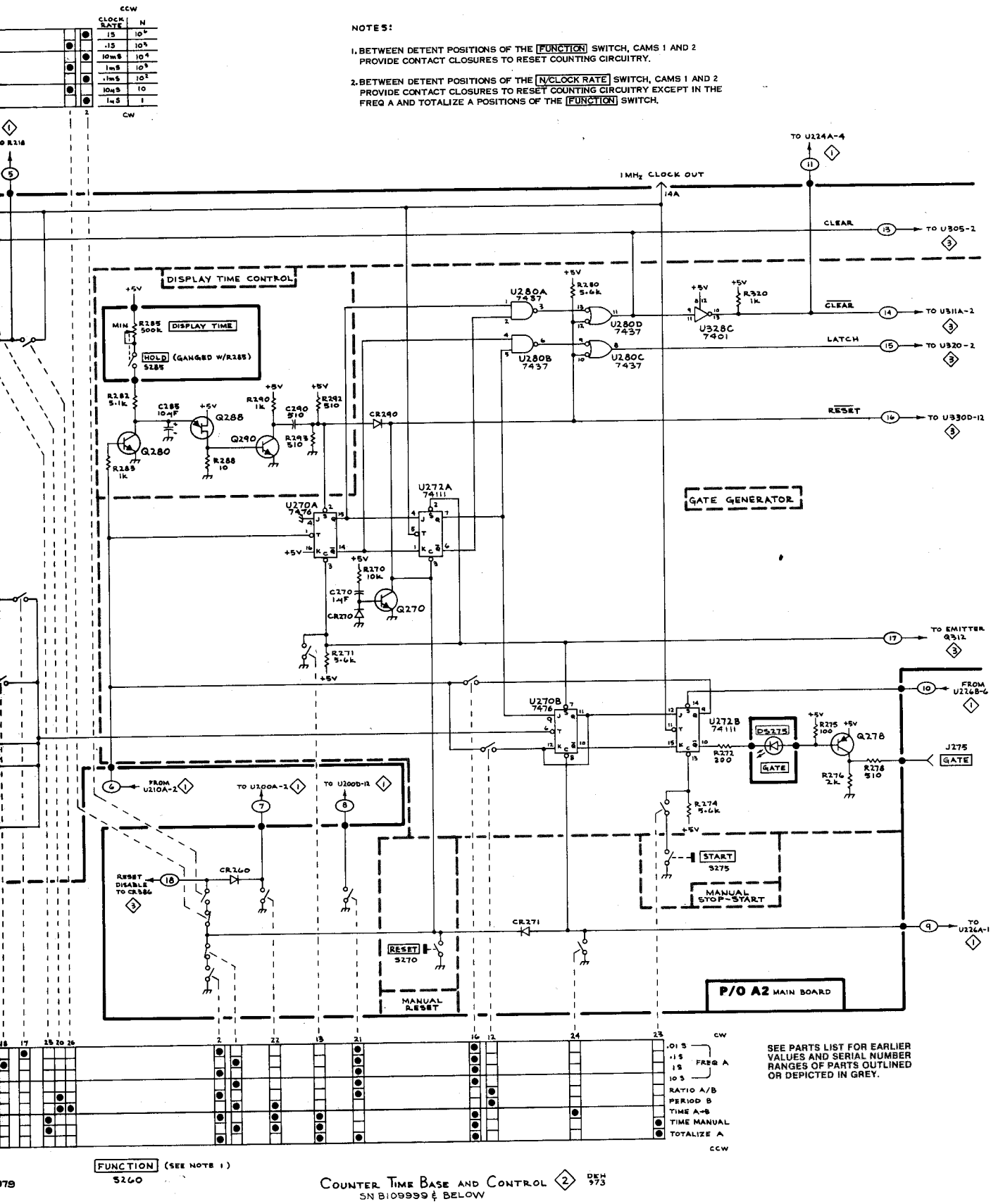
COUNTER TIME BASE AND CONTROL ◇2 DEM 674

SN B110000 - UP



DC 503

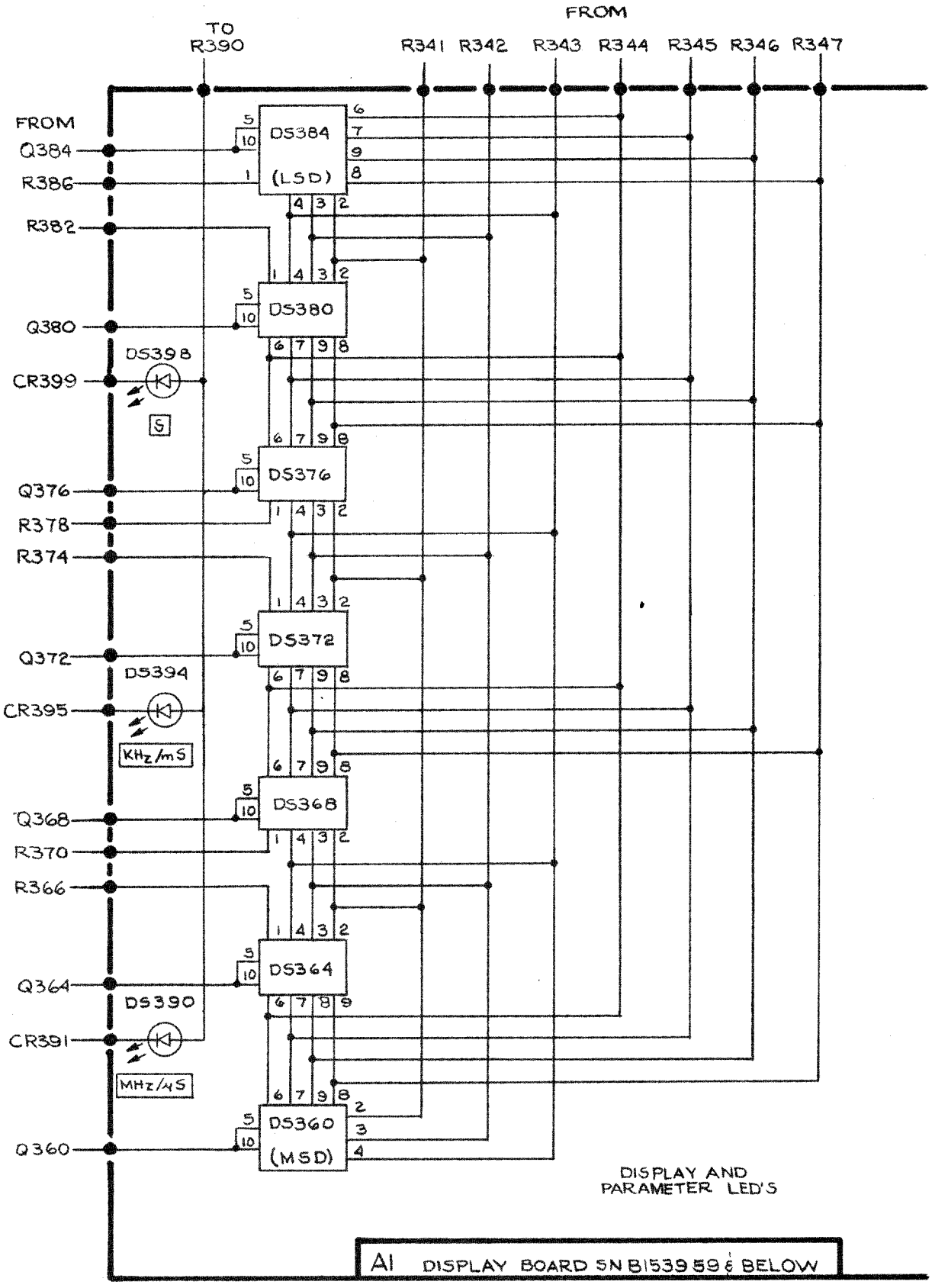
1411-19
REVE, FEB 1979



SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.

COUNTER TIME BASE AND CONTROL ② DEH 573
SN B109999 & BELOW

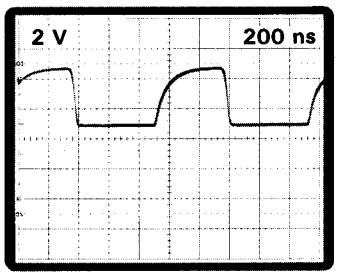
DC 503



DISPLAY BOARD SN B153959-BELOW

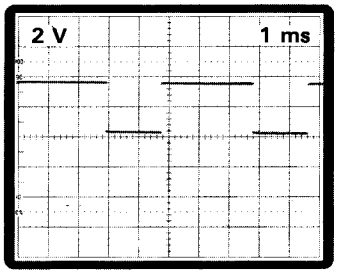
Waveform Conditions. 400 mV, 1 kHz squarewave applied to both Channel A and Channel B inputs. FUNCTION switch set to PERIOD B. CLOCK RATE switch set to 10 ms, all front-panel pushbuttons out, HOLD control counterclockwise, RESET pushbutton pressed and released.

12

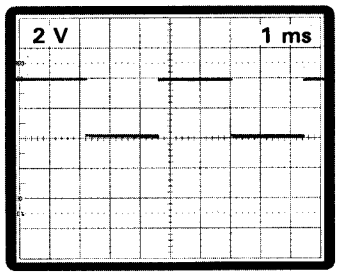


FUNCTION switch is set to TIME MANUAL.

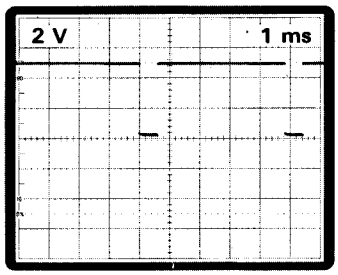
13



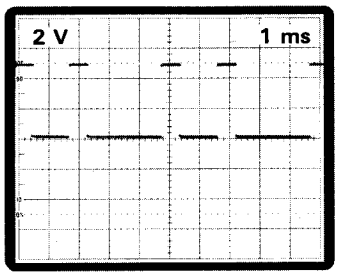
14



15

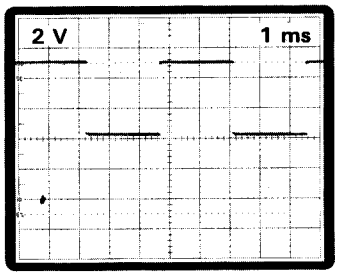


16

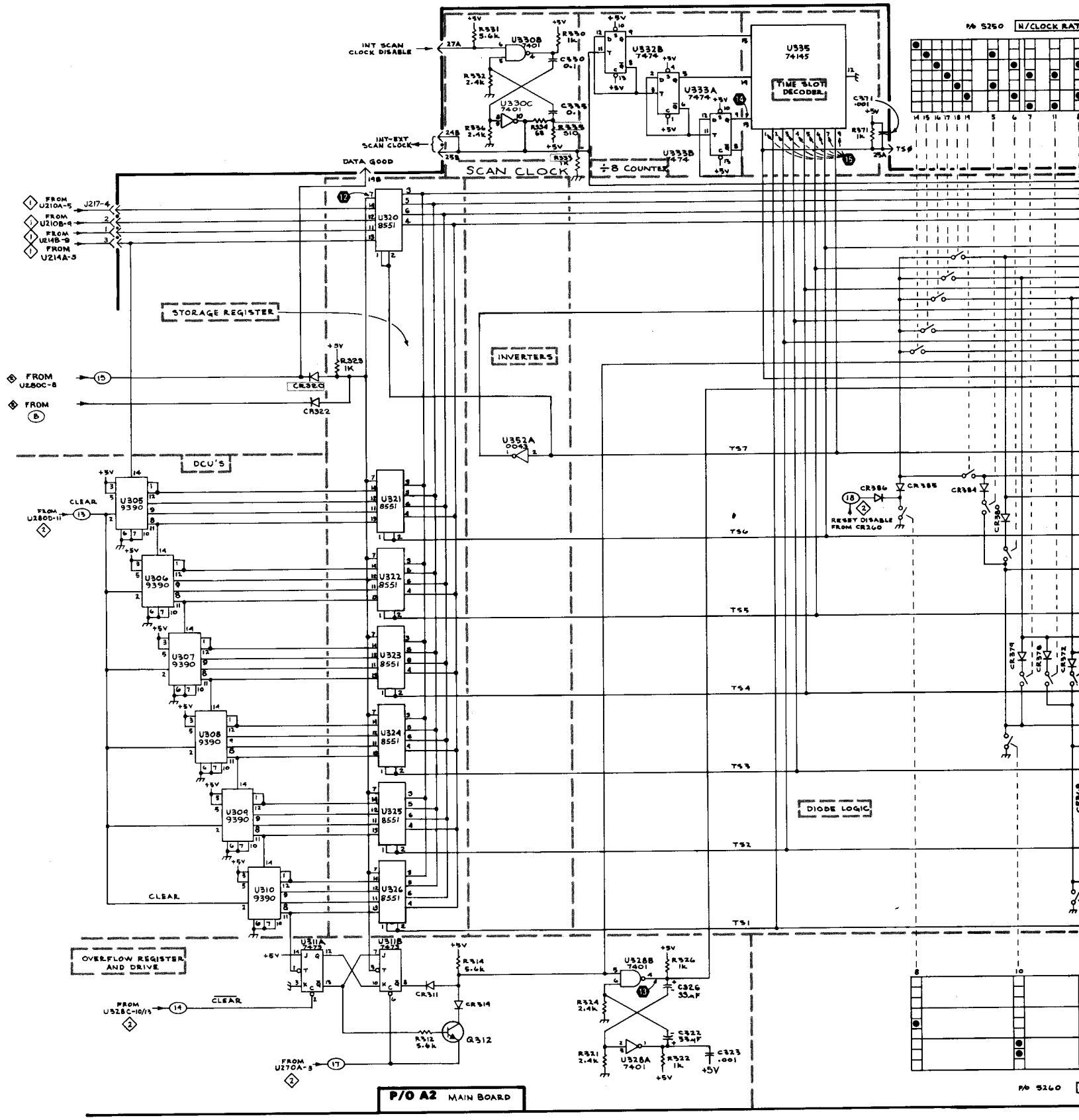


RESET BUTTON must be pressed.

17

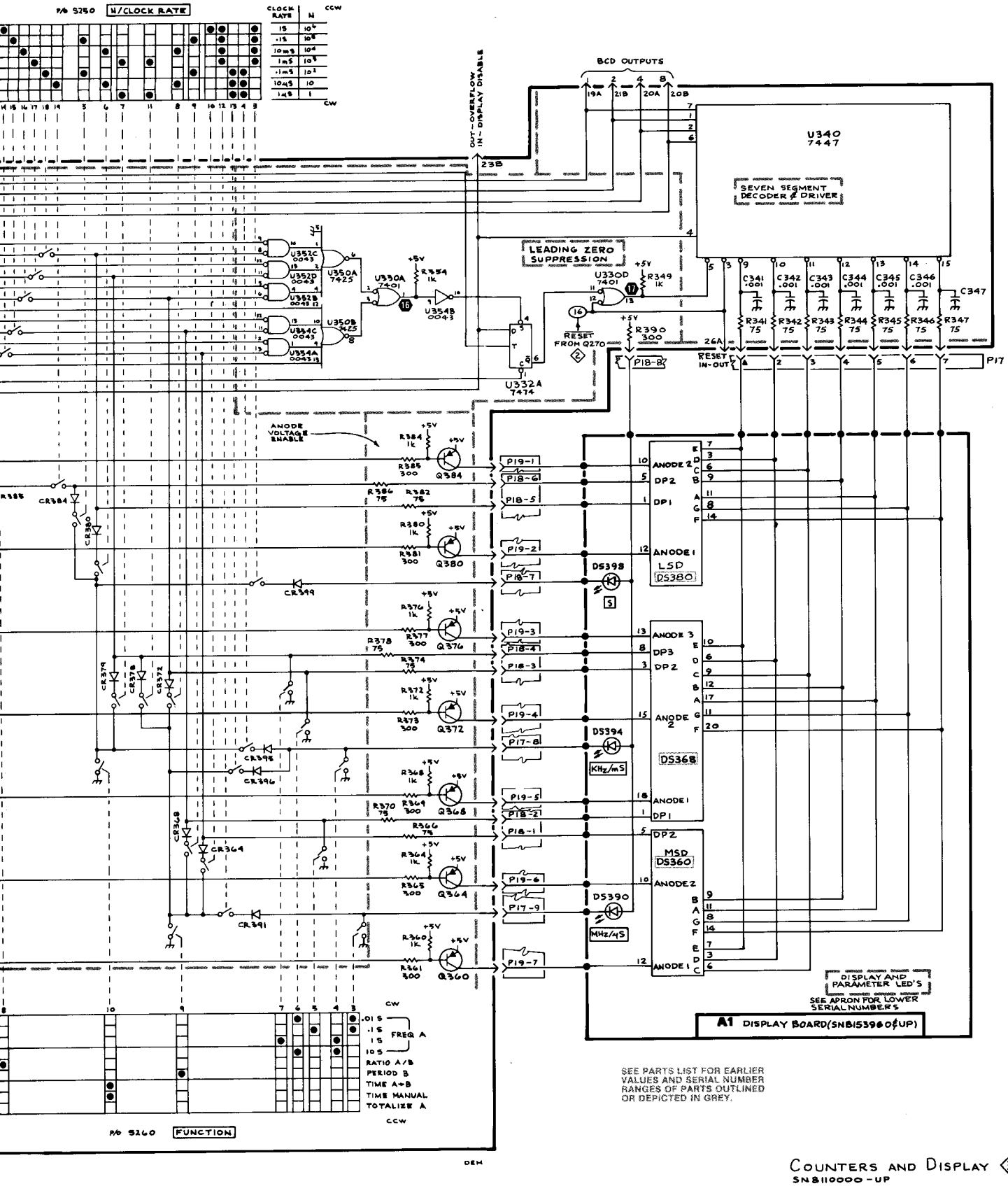


RESET BUTTON must be pressed.

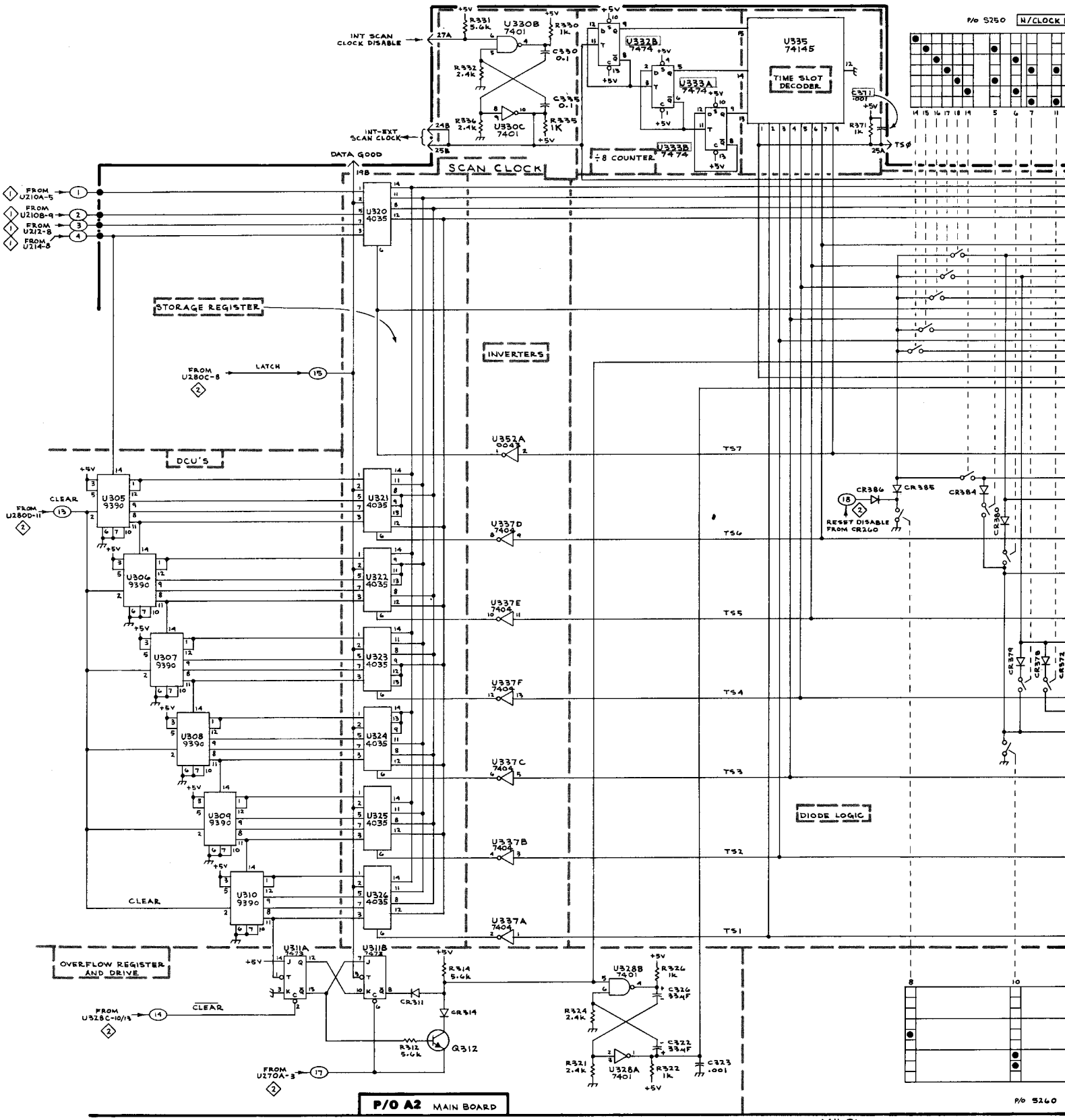


DC503

1411-20
REV JUN 1981

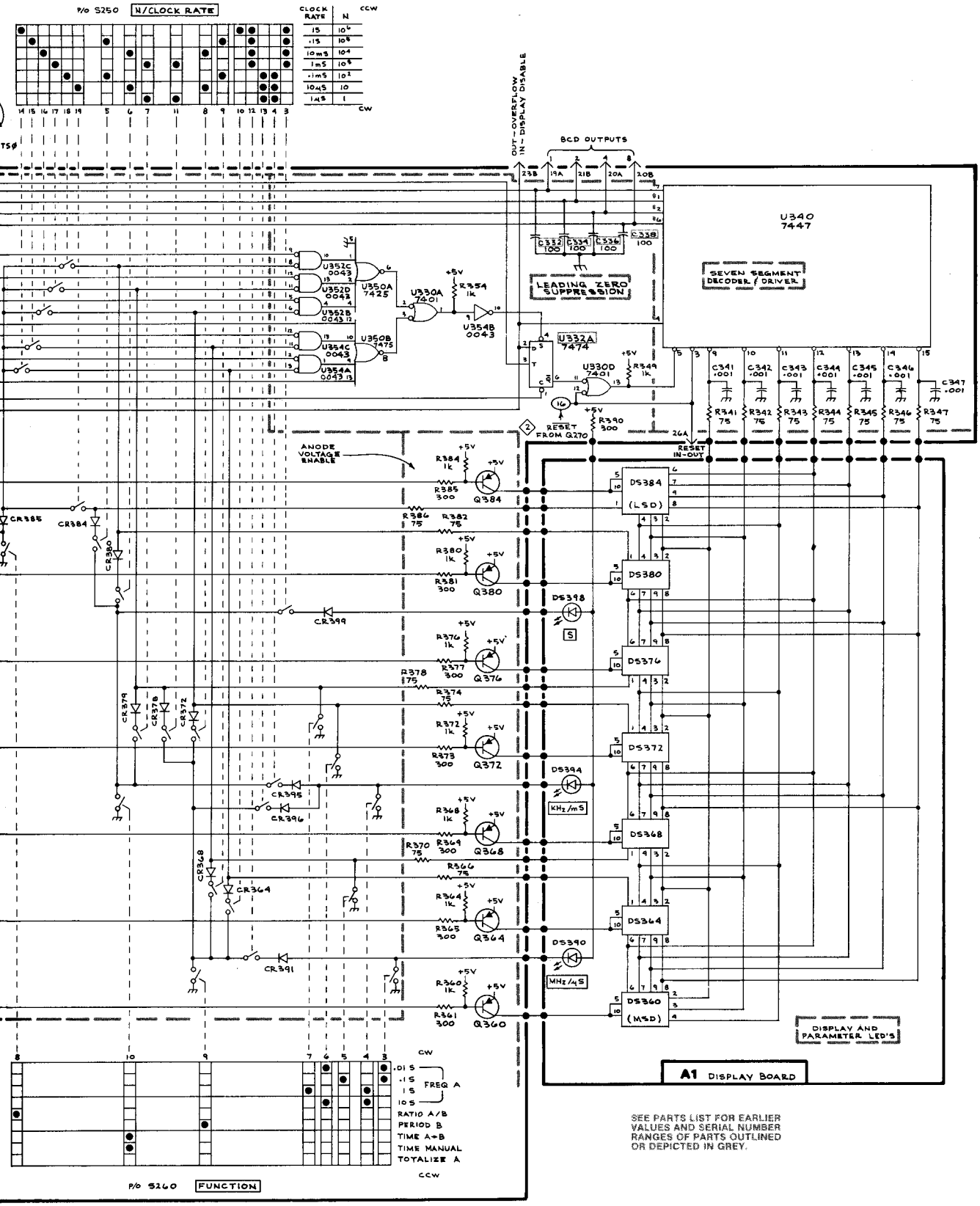


COUNTERS AND DISPLAY 3
SNB110000-UP



DC503

1411-21
REV JUN 1981



SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.

COUNTERS AND DISPLAY ③ DEH
SN B109999+ BELOW

REPLACEABLE MECHANICAL PARTS

PARTS ORDERING INFORMATION

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

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

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

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

SPECIAL NOTES AND SYMBOLS

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

FIGURE AND INDEX NUMBERS

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

INDENTATION SYSTEM

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

1 2 3 4 5 *Name & Description*

Assembly and/or Component
Attaching parts for Assembly and/or Component
- - - * - - -
Detail Part of Assembly and/or Component
Attaching parts for Detail Part
- - - * - - -
Parts of Detail Part
Attaching parts for Parts of Detail Part
- - - * - - -

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

Attaching parts must be purchased separately, unless otherwise specified.

ITEM NAME

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

ABBREVIATIONS

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

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
000BK	STAUFFER SUPPLY	105 SE TAYLOR	PORTLAND, OR 97214
000CY	NORTHWEST FASTENER SALES, INC.	7923 SW CIRRUS DRIVE	BEAVERTON, OR 97005
08261	SPECTRA-STRIP CORP.	7100 LAMPSON AVE.	GARDEN GROVE, CA 92642
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, CINCH CONNECTORS	1501 MORSE AVENUE	ELK GROVE VILLAGE, IL 60007
73743	FISCHER SPECIAL MFG. CO.	446 MORGAN ST.	CINCINNATI, OH 45206
73803	TEXAS INSTRUMENTS, INC., METALLURGICAL MATERIALS DIV.	34 FOREST STREET	ATTLEBORO, MA 02703
74445	HOLO-KROME CO.	31 BROOK ST. WEST	HARTFORD, CT 06110
78189	ILLINOIS TOOL WORKS, INC. SHAKEPROOF DIVISION	ST. CHARLES ROAD	ELGIN, IL 60120
78471	TILLEY MFG. CO.	900 INDUSTRIAL RD.	SAN CARLOS, CA 94070
78584	STEWART STAMPING CORP.	630 CENTRAL PARK AVE.	YONKERS, NY 10704
79136	WALDES, KOHINOOR, INC.	47-16 AUSTEL PLACE	LONG ISLAND CITY, NY 11101
79807	WROUGHT WASHER MFG. CO.	2100 S. O BAY ST.	MILWAUKEE, WI 53207
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
83385	CENTRAL SCREW CO.	2530 CRESCENT DR.	BROADVIEW, IL 60153
86113	MICRODOT MFG. INC., CENTRAL SCREW - KEENE DIV.	149 EMERALD ST.	KEENE, NH 03431
86928	SEASTROM MFG. COMPANY, INC.	701 SONORA AVENUE	GLENDALE, CA 91201
87308	N. L. INDUSTRIES, INC., SOUTHERN SCREW DIV.	P. O. BOX 1360	STATESVILLE, NC 28677
93907	TEXTRON INC. CAMCAR DIV	600 18TH AVE	ROCKFORD, IL 61101

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-1	337-1399-00	B010100	B050659	2		SHLD,ELECTRICAL:SIDE	80009	337-1399-00
	----- -----			-		(STANDARD ONLY)		
	337-1399-02	B050660	B149999	1		SHLD,ELECTRICAL:SIDE WITH INSULATOR	80009	337-1399-02
	----- -----			-		(STANDARD ONLY)		
	337-1399-04	B150000		2		SHIELD,ELEC:SIDE	80009	337-1399-04
	----- -----			-		(STANDARD ONLY)		
-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 SKT	000CY	OBD
-3	366-1190-00			1		KNOB:GRAY	80009	366-1190-00
	213-0153-00			2		. SETSCREW:5-40 X 0.125,STL BK OXD,HEX SKT	000CY	OBD
-4	366-1031-05			1		KNOB:RED--CAL	80009	366-1031-05
	213-0153-00			1		. SETSCREW:5-40 X 0.125,STL BK OXD,HEX SKT	000CY	OBD
-5	366-1170-01			1		KNOB:GRAY,4 SIDED	80009	366-1170-01
	213-0153-00			2		. SETSCREW:5-40 X 0.125,STL BK OXD,HEX SKT	000CY	OBD
-6	366-1422-00	B010100	B010151	1		KNOB:LATCH	80009	366-1422-00
	----- -----			-		(STANDARD ONLY)		
	366-1422-01	B010152	B166789	1		KNOB:LATCH	80009	366-1422-01
	----- -----			-		(STANDARD ONLY)		
	366-1690-00	B166790		1		KNOB:SIL GY,0.53 X0.23 X 1.059	80009	366-1690-00
	----- -----			-		(STANDARD ONLY)		
	366-1422-00	B010100	B010151	1		KNOB:LATCH	80009	366-1422-00
	----- -----			-		(OPTION 01 ONLY)		
	366-1422-01	B010152	B176849	1		KNOB:LATCH	80009	366-1422-01
	----- -----			-		(OPTION 01 ONLY)		
	366-1690-00	B176850		1		KNOB:SIL GY,0.53 X0.23 X 1.059	80009	366-1690-00
	----- -----			-		(OPTION 01 ONLY)		
	366-1422-00	B010100	B010151	1		KNOB:LATCH	80009	366-1422-00
	----- -----			-		(OPTION 04 ONLY)		
	366-1422-01	B010152	B166970	1		KNOB:LATCH	80009	366-1422-01
	----- -----			-		(OPTION 04 ONLY)		
	366-1690-00	B166971		1		KNOB:SIL GY,0.53 X0.23 X 1.059	80009	366-1690-00
	----- -----			-		(OPTION 04 ONLY)		
	214-1840-00	XB010152	B016789X	1		PIN,KNOB SECRG:0.094 OD X 0.120 INCH LONG	80009	214-1840-00
	----- -----			-		(STANDARD ONLY)		
	214-1840-00	XB010152	B176849X	1		PIN,KNOB SECRG:0.094 OD X 0.120 INCH LONG	80009	214-1840-00
	----- -----			-		(OPTION 01 ONLY)		
	214-1840-00	XB010152	B166970X	1		PIN,KNOB SECRG:0.094 OD X 0.120 INCH LONG	80009	214-1840-00
	----- -----			-		(OPTION 04 ONLY)		
-7	366-1257-87			2		PUSH BUTTON:SIL GY,X 10	80009	366-1257-87
-8	366-1402-41			2		PUSH BUTTON:SIL GY,X100	80009	366-1402-41
-9	366-1257-27			2		PUSH BUTTON:--AC COUPL	80009	366-1257-27
-10	366-1257-28			2		PUSH BUTTON:GRAY--+SLOPE	80009	366-1257-28
-11	366-1402-64			1		PUSH BUTTON:GRAY--IN START OUT	80009	366-1402-64
-12	366-1257-30			1		PUSH BUTTON:GRAY--RESET	80009	366-1257-30
-13	358-0029-00			2		BSHG,MACH.THD:HEX,0.375-32 X 0.438"LONG	80009	358-0029-00
						(ATTACHING PARTS)		
	210-0590-00			1		NUT,PLAIN,HEX.:0.375 X 0.438 INCH,STL	73743	2X28269-402
-14	210-0978-00			1		WASHER,FLAT:0.375 ID X 0.50 INCH OD,STL	78471	OBD
						- - - * - - -		
-15	220-0633-00			1		NUT,PLAIN,KNURL:0.25-28 X 0.25 INCH L,BRS	80009	220-0633-00
-16	355-0170-00			1		STUD,SHOULDERED:6-32 X 0.40 INCH LONG	80009	355-0170-00
-17	136-0491-00			1		JACK,TIP:BANANA JACK ASSY	80009	136-0491-00
						(ATTACHIHNG PARTS)		
-18	210-0583-00			1		NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-19	210-0269-00			1		TERMINAL,LUG:NON LOCKING,0.257" MTG HOLE	78584	905-020
	210-0895-00			1		WSHR,SHOULDERED:0.375 OD X 0.105 INCH THK	80009	210-0895-00
						- - - * - - -		
-20	131-0955-00			1		CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
-21	131-0955-00			1		CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
						(ATTACHING PARTS)		
	210-0255-00			1		TERMINAL,LUG:0.391" ID INT TOOTH	80009	210-0255-00
						- - - * - - -		
-22	----- -----			2		RES.,VAR,NONWIR:(SEE R45 & R145 REPL)		
						(ATTACHING PARTS)		
-23	210-0583-00			1		NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-24	210-0940-00			1		WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL	79807	OBD
						- - - * - - -		

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-25	333-1610-00			1		PANEL,FRONT:	80009	333-1610-00
-26	426-0681-00			10		FR,PUSH BUTTON:GRAY PLASTIC	80009	426-0681-00
-27	426-0916-00			1		FRAME,RDOUT WDO:	80009	426-0916-00
-28	331-0314-00			1		WINDOW,READOUT:RED	80009	331-0314-00
-29	214-1513-00	B010100	B010151	1		LCH,PL-IN RTNG:PLASTIC	80009	214-1513-00
	----- -----			-		(STANDARD ONLY)		
	214-1513-01	B010152	B166789	1		LCH,PLUG-IN RET:	80009	214-1513-01
	----- -----			-		(STANDARD ONLY)		
	105-0719-00	B166790		1		LATCH,RETAINING:PLUG-IN	80009	105-0719-00
	----- -----			-		(STANDARD ONLY)		
	214-1513-00	B010100	B010151	1		LCH,PL-IN RTNG:PLASTIC	80009	214-1513-00
	----- -----			-		(OPTION 01 ONLY)		
	214-1513-01	B010152	B176849	1		LCH,PLUG-IN RET:	80009	214-1513-01
	----- -----			-		(OPTION 01 ONLY)		
	105-0719-00	B176850		1		LATCH,RETAINING:PLUG-IN	80009	105-0719-00
	----- -----			-		(OPTION 01 ONLY)		
	214-1513-00	B010100	B010151	1		LCH,PL-IN RTNG:PLASTIC	80009	214-1513-00
	----- -----			-		(OPTION 04 ONLY)		
	214-1513-01	B010152	B166970	1		LCH,PLUG-IN RET:	80009	214-1513-01
	----- -----			-		(OPTION 04 ONLY)		
	105-0719-00	B166971		1		LATCH,RETAINING:PLUG-IN	80009	105-0719-00
	----- -----			-		(OPTION 04 ONLY)		
						(ATTACHING PARTS)		
	213-0254-00			1		SCREW,TPG,TF:2-32 X 0.250,100 DEG,FLH	45722	OBD
						- - - * - - -		
-30	105-0718-00	XB166790	B178749	1		BAR,LATCH RLSE:	80009	105-0718-00
	----- -----			-		(STANDARD ONLY)		
	105-0178-01	B178750		1		BAR,LATCH RLSE:	80009	105-0718-01
	----- -----			-		(STANDARD ONLY)		
	105-0718-00	XB176850	B178809	1		BAR,LATCH RLSE:	80009	105-0718-00
	----- -----			-		(OPTION 01 ONLY)		
	105-0718-01	B178810		1		BAR,LATCH RLSE:	80009	105-0718-01
	----- -----			-		(OPTION 01 ONLY)		
	105-0718-00	XB166971	B168599	1		BAR,LATCH RLSE:	80009	105-0718-00
	----- -----			-		(OPTION 04 ONLY)		
	105-0718-01	B168600		1		BAR,LATCH RLSE:	80009	105-0718-01
	----- -----			-		(OPTION 04 ONLY)		
-31	376-0051-00	B010100	B049999	1		CPLG,SHAFT,FLEX:0.127 ID X 0.375 ID DELRIN	80009	376-0051-00
	376-0051-01	B050000		1		CPLG,SHAFT,FLEX:0.127 ID X 0.375 OD	80009	376-0051-01
	213-0022-00	B010100	B049999	4		. SETSCREW:4-40 X 0.188 INCH,HEX SOC STL	74445	OBD
	213-0178-00	B050000		4		. SETSCREW:4-40 X 0.125 INCH,HEX,SOC STL	74445	OBD
	354-0251-00			2		. RING,COUPLING:0.251 ID X 0.375 INCH OD,AL	80009	354-0251-00
	376-0049-01			1		. CPLG,SHAFT,FLEX:0.127 ID X 0.375 OD,PP	80009	376-0049-01
-32	384-1127-00			1		EXTENSION SHAFT:7.5 INCH L X 0.125 INCH OD	80009	384-1127-00
-33	384-1099-00			4		EXTENSION SHAFT:PUSH BUTTON,1.54 INCH LONG	80009	384-1099-00
-34	386-2303-00			1		SUBPANEL,FRONT:	80009	386-2303-00
						(ATTACHING PARTS)		
-35	213-0227-00			2		SCR,TPG,THD FOR:6-32 X 0.50 DEG,FLH ST	83385	OBD
	213-0229-00	B010100	B178869	1		SCR,TPG,THD FOR:6-20 X0.375"100 DEG,FLH STL	93907	OBD
	213-0123-00	B178870		1		SCREW,TPG,TF:6-32 X 0.375,SPCL TYPE,FLH	93907	OBD
						- - - * - - -		
-36	337-1671-00	B010100	B159999	1		SHIELD,ELEC:REAR SUBPANEL	80009	337-1671-00
	----- -----			-		(STANDARD ONLY)		
	337-1671-01	B160000		1		SHIELD,ELEC:REAR SUBPANEL	80009	337-1671-01
	----- -----			-		(STANDARD ONLY)		
	337-1671-00	B010100	B169999	1		SHIELD,ELEC:REAR SUBPANEL	80009	337-1671-00
	----- -----			-		(OPTION 01 ONLY)		
	337-1671-01	B170000		1		SHIELD,ELEC:REAR SUBPANEL	80009	337-1671-01
	----- -----			-		(OPTION 01 ONLY)		
-37	----- -----			1		CKT BOARD ASSY:DISPLAY(SEE A1 REPL)		
	136-0252-04	XB010152		6		. SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS	22526	75060-007
-38	----- -----			-		CKT BOARD ASSY:TRIGGER(SEE A3 REPL)		
-39	----- -----			2		. SWITCH,PUSH:(SEE S120A AND B REPL)		
-40	----- -----			2		. SWITCH,PUSH:DPDT(SEE S115 S170 REPL)		
-41	361-0384-00			16		. SPACER,PB SW:0.133 INCH LONG	80009	361-0384-00
-42	136-0260-02			1		. SKT,PL-IN ELEK:MICROCIRCUIT,16 DIP,LOW CLE	71785	133-51-92-008

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-43	136-0269-02	B010100	B102099	6		. SKT,PL-IN ELEK:MICROCIRCUIT,14 DIP,LOW CLE	73803	CS9002-14
	136-0269-02	B102100		4		. SKT,PL-IN ELEK:MICROCIRCUIT,14 DIP,LOW CLE	73803	CS9002-14
	136-0252-04	XB010131	B059999	176		. SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS	22526	75060-007
	136-0252-04	B060000	B102099	144		. SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS	22526	75060-007
	136-0252-07	B102100	B180109	72		. SOCKET,PIN CONN:W/O DIMPLE	22526	75060-012
	136-0252-07	B180110		36		. SOCKET,PIN CONN:W/O DIMPLE	22526	75060-012
	----- -----			-		. CKT BOARD ASSY:DIVIDE BY 5(SEE A5 REPL)		
	131-0592-00			8		. . CONTACT,ELEC:0.885 INCH LONG	22526	47353
	136-0252-04			30		. . SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS	22526	75060-007
						(ATTACHING PARTS FOR CKT BD)		
-44	211-0504-00	B010100	B180109	1		SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL	83385	OBD
	----- -----			-		(STANDARD ONLY)		
	211-0534-00	B180110		1		SCR,ASSEM,WSHR:6-32 X 0.312 INCH,PNH STL	83385	OBD
	----- -----			-		(STANDARD ONLY)		
	211-0504-00	B010100	B180529	1		SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL	83385	OBD
	----- -----			-		(OPTION 01 ONLY)		
	211-0534-00	B180530		1		SCR,ASSEM,WSHR:6-32 X 0.312 INCH,PNH STL	83385	OBD
	----- -----			-		(OPTION 01 ONLY)		
	211-0504-00	B010100	B180049	1		SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL	83385	OBD
	----- -----			-		(OPTION 04 ONLY)		
	211-0534-00	B180050		1		SCR,ASSEM,WSHR:6-32 X 0.312 INCH,PNH STL	83385	OBD
	----- -----			-		(OPTION 04 ONLY)		
	210-0006-00	XB180110		2		WASHER,LOCK:#6 INTL,0.018THK,STL CD PL	78189	1206-00-00-0541C
	----- -----			-		(STANDARD ONLY)		
	210-0006-00	XB180530		2		WASHER,LOCK:#6 INTL,0.018THK,STL CD PL	78189	1206-00-00-0541C
	----- -----			-		(OPTION 01 ONLY)		
	210-0006-00	XB180050		2		WASHER,LOCK:#6 INTL,0.018THK,STL CD PL	78189	1206-00-00-0541C
	----- -----			-		(OPTION 04 ONLY)		
-45	384-0519-00			1		SPACER,POST:0.562 L,W/6-32 THD THRU	80009	384-0519-00
-46	211-0504-00			1		SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL	83385	OBD
-47	213-0206-00	B010100	B091899	2		SCR,TPG,THD FOR:6-32 X 1.25 INCH,PNH STL	86113	OBD
	213-0336-00	B091900		2		SCR,TPG,THD FOR:6-32 X 1.25 INCH,PNH STL	000BK	OBD
-48	361-0516-00			3		SPACER,SLEEVE:0.189 OD X 0.986"LONG BRS	80009	361-0516-00
	166-0038-00	XB010131		1		SPACER,SLEEVE:0.181ID X 0.250OD X 0.750" L	80009	166-0038-00
-49	211-0021-00			1		SCREW,MACHINE:4-40 X 1.25 INCH,PNH STL	83385	OBD
-50	211-0511-00			2		SCREW,MACHINE:6-32 X 0.500,PNH,STL,CD PL	83385	OBD
-51	214-1808-00			2		CONTACT,ELEC:GROUNDING	80009	214-1808-00
-52	166-0031-00			2		SPACER,SLEEVE:0.18 ID X 0.25 INCH LONG	80009	166-0031-00
-53	210-0457-00			2		NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-54	337-1718-00			1		SHIELD,ELEC:MAIN & TRIG CKT BD	80009	337-1718-00
-55	----- -----			1		CKT BOARD ASSY:MAIN(SEE A2 REPL)		
-56	131-0604-00			52		. CONTACT,ELEC:CKT BD SW,SPR,CU BE	80009	131-0604-00
-57	136-0252-04	XB010131	B102099	512		. SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS	22526	75060-007
-58	136-0260-02	B010100	B102099	2		. SKT,PL-IN ELEK:MICROCIRCUIT,16 DIP,LOW CLE	71785	133-51-92-008
	136-0260-02	B102100		12		. SKT,PL-IN ELEK:MICROCIRCUIT,16 DIP,LOW CLE	71785	133-51-92-008
-59	136-0269-02	B010100	B102099	6		. SKT,PL-IN ELEK:MICROCIRCUIT,14 DIP,LOW CLE	73803	CS9002-14
	136-0269-02	B102100		31		. SKT,PL-IN ELEK:MICROCIRCUIT,14 DIP,LOW CLE	73803	CS9002-14
-60	----- -----			1		. SWITCH,PUSH:(SEE S270 AND S275 REPL)		
-61	361-0382-00			4		. SPACER,PB SW:BROWN,0.275 INCH LONG	80009	361-0382-00
-62	337-1418-01	B010100	B179419	3		. SHIELD,ELEC:CAM SWITCH CASTING	80009	337-1418-01
	337-1418-02	B179420		3		. SHIELD,ELEC:CIRCUIT BOARD	80009	337-1418-02
						(ATTACHING PARTS)		
-63	211-0001-00			3		. SCREW,MACHINE:2-56 X 0.25 INCH,PNH STL	87308	OBD
-64	210-0001-00			3		. WASHER,LOCK:INTL,0.092 ID X 0.18"OD,STL	78189	1202-00-00-0541C
-65	210-1110-00			3		. WASHER,FLAT:0.092 ID X 0.14 OD BRS	86928	OBD
-66	342-0167-00			1		. INSULATOR,PLATE:2.45 INCH LONG	80009	342-0167-00
						- - - * - - -		
-67	----- -----			-		. RES.,VAR,NONWIR:(SEE R285 REPL)		
						(ATTACHING PARTS)		
-68	210-0583-00			1		. NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-68	210-0046-00			1		. WASHER,LOCK:0.261 ID,INTL,0.018 THK,BRS	78189	1214-05-00-0541C
-70	407-0579-00			1		. BRACKET,VAR RES:BRASS CD,PL	80009	407-0579-00
						- - - * - - -		

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-	105-0403-00			1		. ACTR ASSY,CAM S:FUNCTION	80009	105-0403-00
-71	200-1446-00			1		. . COVER,CAM SW:26 ELEMENTS	80009	200-1446-00
-72	354-0219-00			1		. . RING,RETAINING:FOR 0.25 INCH SHAFT	79136	5103-25-MD-R
-73	401-0155-00			1		. . BEARING,CAM SW:FRONT	80009	401-0155-00
-74	214-1704-00			-		. . SPRING,FLAT:CAM SW DETENT,0.006 INCH THK	80009	214-1704-00
	----- -----			-		. . (REPL ONLY WITH PART BEARING THE SAME		
	----- -----			-		. . COLOR CODE AS THE ORIGINAL PART IN		
	----- -----			-		. . YOUR INSTRUMENT.		
	214-1704-01			-		. . SPRING,FLAT:CAM SW DETENT,0.008 INCH THK	80009	214-1704-01
	----- -----			-		. . (SEE FOOTNOTE ON FIG.1-74)		
	214-1704-02			-		. . SPRING FLAT:0.52 X 0.125 X 0.01,CU BE	80009	214-1704-02
	----- -----			-		. . (SEE FOOTNOTE ON FIG.1-74)		
-75	214-1127-00			1		. . ROLLER,DETENT:0.125 DIA X 0.125 INCH L	80009	214-1127-00
-76	105-0395-00			1		. . INTL SPRT KIT:FUNCTION	80009	105-0395-00
-77	401-0156-00			1		. . BEARING,CAM SW:REAR	80009	401-0156-00
-78	210-0406-00			4		. . NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
						(ATTACHING PARTS FOR ACTR ASSY)		
-79	211-0116-00	B010100	B181378	3		. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
	----- -----			-		. (STANDARD ONLY)		
	211-0292-00	B181379		3		. SCR,ASSEM WSHR:4-40 X 0.29,BRS NI PL	78189	OBD
	----- -----			-		. (STANDARD ONLY)		
	211-0116-00	B010100	B181398	3		. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
	----- -----			-		. (OPTION 01 ONLY)		
	211-0292-00	B181399		3		. SCR,ASSEM WSHR:4-40 X 0.29,BRS NI PL	78189	OBD
	----- -----			-		. (OPTION 01 ONLY)		
						- - - * - - -		
	105-0402-00			1		. ACTR ASSY,CAM S:CLOCK RATE	80009	105-0402-00
-80	200-1446-00			1		. . COVER,CAM SW:26 ELEMENTS	80009	200-1446-00
-81	354-0219-00			1		. . RING,RETAINING:FOR 0.25 INCH SHAFT	79136	5103-25-MD-R
-82	401-0155-00			1		. . BEARING,CAM SW:FRONT	80009	401-0155-00
-83	214-1704-00			-		. . SPRING,FLAT:CAM SW DETENT,0.006 INCH THK	80009	214-1704-00
	----- -----			-		. . (SEE FOOTNOTE ON FIG.1-74)		
	214-1704-01			-		. . SPRING,FLAT:CAM SW DETENT,0.008 INCH THK	80009	214-1704-01
	----- -----			-		. . (SEE FOOTNOTE ON FIG.1-74)		
	214-1704-02			-		. . SPRING FLAT:0.52 X 0.125 X 0.01,CU BE	80009	214-1704-02
	----- -----			-		. . (SEE FOOTNOTE ON FIG.1-74)		
-84	214-1127-00			1		. . ROLLER,DETENT:0.125 DIA X 0.125 INCH L	80009	214-1127-00
-85	105-0396-00			1		. . INTL SPRT KIT:CLOCK RATE	80009	105-0396-00
-86	401-0156-00			1		. . BEARING,CAM SW:REAR	80009	401-0156-00
-87	210-0406-00			4		. . NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
						(ATTACHING PARTS)		
-88	211-0116-00	B010100	B181378	4		. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
	----- -----			-		. (STANDARD ONLY)		
	211-0292-00	B181379		4		. SCR,ASSEM WSHR:4-40 X 0.29,BRS NI PL	78189	OBD
	----- -----			-		. (STANDARD ONLY)		
	211-0116-00	B010100	B181398	4		. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
	----- -----			-		. (OPTION 01 ONLY)		
	211-0292-00	B181399		4		. SCR,ASSEM WSHR:4-40 X 0.29,BRS NI PL	78189	OBD
	----- -----			-		. (OPTION 01 ONLY)		
						- - - * - - -		
						(ATTACHING PARTS FOR CKT BD)		
-89	213-0146-00	B010100	B010130	2		SCR,TPG,THD FOR:6-20 X 0.313 INCH,PNH STL	83385	OBD
	213-0146-00	B010131		1		SCR,TPG,THD FOR:6-20 X 0.313 INCH,PNH STL	83385	OBD
						- - - * - - -		
-90	----- -----			1		CKT BOARD ASSY:PROTECTION(SEE A4 REPL)		
-91	344-0154-00			2		. CLIP,ELECTRICAL:FUSE,CKT BD MT	80009	344-0154-00
						(ATTACHING PARTS)		
-92	213-0206-00	XB010131		1		SCR,TPG,THD FOR:6-32 X 1.25 INCH,PNH STL	86113	OBD
-93	166-0038-00	XB010131		1		SPACER,SLEEVE:0.181ID X 0.250OD X 0.750" L	80009	166-0038-00
						- - - * - - -		

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-94	386-3657-00	XB166790	B179149	2		SUPPORT,PLUG-IN:	80009	386-3657-00
	----- -----			-		(STANDARD ONLY)		
	386-3657-01	B179150		2		SUPPORT,PLUG IN:	93907	OBD
	----- -----			-		(STANDARD ONLY)		
	386-3657-00	XB176850	B179249	2		SUPPORT,PLUG-IN:	80009	386-3657-00
	----- -----			-		(OPTION 01 ONLY)		
	386-3657-01	B179250		2		SUPPORT,PLUG IN:	93907	OBD
	----- -----			-		(OPTION 01 ONLY)		
	386-3657-00	XB165782		2		SUPPORT,PLUG-IN:	80009	386-3657-00
	----- -----			-		(OPTION 04 ONLY)		
-95	210-1270-00	XB166790		2		WASHER,FLAT:0.141 ID X 0.04 THK,AL	80009	210-1270-00
	----- -----			-		(STANDARD ONLY)		
	210-1270-00	XB176850		2		WASHER,FLAT:0.141 ID X 0.04 THK,AL	80009	210-1270-00
	----- -----			-		(OPTION 01 ONLY)		
	210-1270-00	XB165782		2		WASHER,FLAT:0.141 ID X 0.04 THK,AL	80009	210-1270-00
	----- -----			-		(OPTION 04 ONLY)		
-96	426-0724-01	B010100	B129999	1		FR SECT,PLUG-IN:BOTTOM	80009	426-0724-01
	426-0724-09	B130000		1		FR SECT,PLUG-IN:BOTTOM	80009	426-0724-09
-97	426-0725-00	B010100	B129999	1		FR SECT,PLUG-IN:TOP	80009	426-0725-00
	426-0725-05	B130000		1		FR SECT,PLUG-IN:TOP	80009	426-0725-05
	214-1061-00			1		SPRING,GROUND:FLAT	80009	214-1061-00
	198-2116-00			1		WIRE SET,ELEC:	80009	198-2116-00
-98	175-0826-00			FT		. WIRE,ELECTRICAL:3 WIRE RIBBON	80009	175-0826-00
-99	175-0830-00	B010100	B139999	FT		. WIRE,ELECTRICAL:7 WIRE RIBBON	08261	SS-0726-710610C
	175-0830-00	B140000		FT		. WIRE,ELECTRICAL:7 WIRE RIBBON	08261	SS-0726-710610C
-100	175-0831-00	B010100	B139999	FT		. WIRE,ELECTRICAL:8 WIRE RIBBON	08261	SS-0826-710610C
	175-0831-00	B140000		FT		. WIRE,ELECTRICAL:8 WIRE RIBBON	08261	SS-0826-710610C
-101	175-0832-00	B010100	B139999	FT		. WIRE,ELECTRICAL:9 WIRE RIBBON	08261	SS-0926(1061)0C
	175-0832-00	B140000		FT		. WIRE,ELECTRICAL:9 WIRE RIBBON	08261	SS-0926(1061)0C
	352-0165-07	XB140000		1		. CONN BODY,PL,EL:7 WIRE VIOLET	80009	352-0165-07
	352-0166-08	XB140000		1		. CONN BODY,PL,EL:8 WIRE GRAY	80009	352-0166-08
	352-0167-09	XB140000		1		. CONN BODY,PL,EL:9 WIRE WHITE	80009	352-0167-09
	131-0707-00	XB140000		24		. CONNECTOR,TERM.:22-26 AWG,BRS& CU BE GOLD	22526	47439

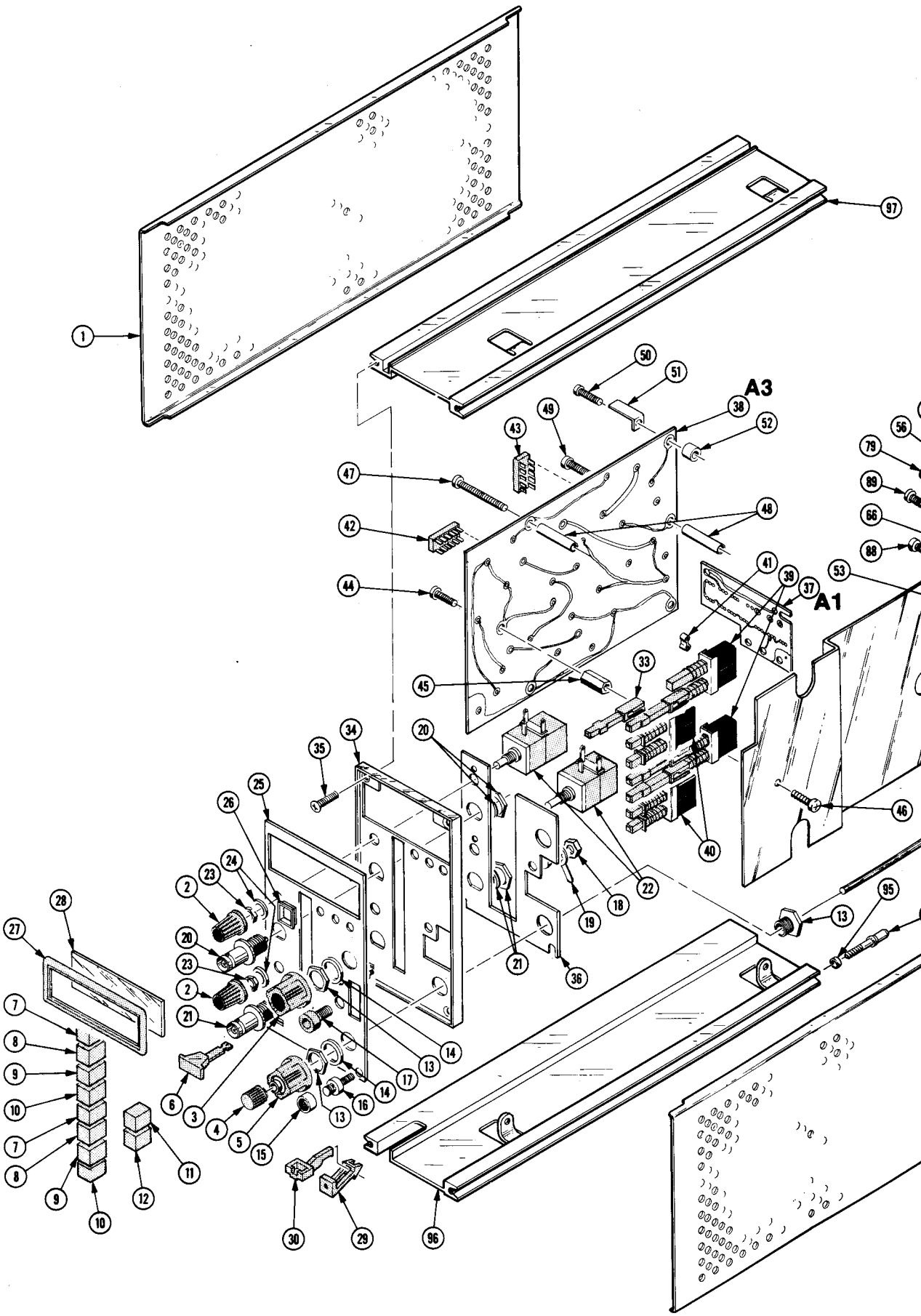

A3
A1

FIG. 1 EXPLODED

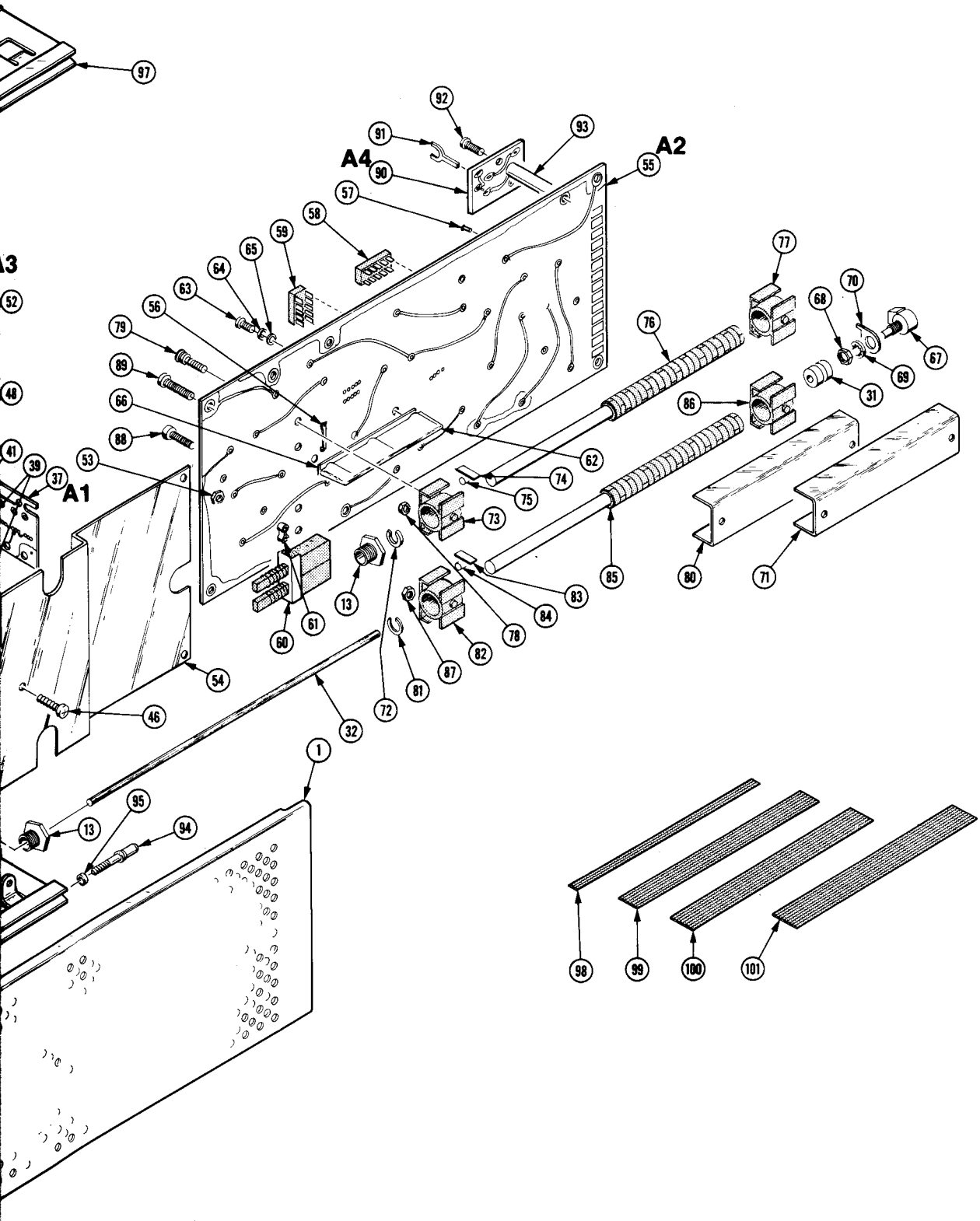


Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
	070-1411-01			1		MANUAL,TECH:INSTRUCTION	80009	070-1411-01

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP