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Service

PG 507
50 MHz DUAL OUTPUT PULSE GENERATOR

Francais Deutsch 日本語

INSTRUCTION MANUAL

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

Serial Number _____

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LANGUAGES

INSTRUCTIONS D'UTILIZATION . . . . . .

BEDIENUNGSALLEITUNG . . . . . .

取 扱 説 明 . . . . . .

FRANCAIS

DEUTSCH

日本語

TABLE OF CONTENTS

	Page
LIST OF ILLUSTRATIONS	iv
LIST OF TABLES	v
OPERATORS SAFETY SUMMARY	vi
SERVICE SAFETY SUMMARY	vii

OPERATORS PART

Section 1 SPECIFICATION

Introduction	1-1
Performance Conditions	1-1
Electrical Characteristics	1-2
Miscellaneous	1-4
Environmental	1-5
Physical Characteristics	1-5

Section 2 OPERATING INSTRUCTIONS

Installation Instructions	2-1
Preparation for Use	2-1
Controls and Connectors	2-3

Section 2 OPERATING INSTRUCTIONS (cont)

Operators Familiarization	2-5
Period and Duration Selection	2-5
Duty Factors	2-5
Delayed and Paired Pulse Selection	2-5
Output Levels	2-5
External Triggering and Gating	2-5
Trigger Output	2-6
Manual Trigger	2-6
Control Error Light	2-6
Rear Interface Signals	2-6
Operating Considerations	2-7
Output Terminations and Connections	2-7
Risetime Measurements in Linear Systems	2-7
Counted Burst Using the DD 501 Digital Delay Unit	2-7
Definitions of Pulse Characteristics	2-9
Repackaging Information	2-10

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TABLE OF CONTENTS (cont)

Page

Chapitre 2 INSTRUCTIONS D'UTILISATION

Installation 2-1
Préparation 2-1
Commandes et bornes 2-3
Familiarisation de l'utilisateur avec l'appareil 2-4
Sélection de la période et de la durée 2-4
Rapports cycliques 2-4
Sélection du mode impulsion retardée ou impulsion double 2-4
Niveaux de sortie 2-4
Déclenchement et validation externes 2-4
Sortie de déclenchement 2-5
Déclenchement manuel 2-5
Indicateur d'erreur de commande . . 2-5
Signaux disponibles sur l'interface arrière 2-5
Instructions d'utilisation 2-6
Terminaisons et connecteurs de sortie 2-6
Mesures du temps de montée d'un système linéaire 2-6
Sélection du nombre d'impulsions dans un train d'impulsions en utilisant l'unité de retard numérique DD 501 2-6
Définition des caractéristiques d'une impulsion 2-7
Réemballage 2-9

Seite

Kapitel 2 BEDIENUNGSANLEITUNG

Einbau-Anleitung 2-1
Inbetriebnahme 2-1
Bedienungselemente und Anschlüsse 2-3
Bedienung 2-5
Wahl der Impulsbreite und Periodendauer 2-5
Tastverhältnis 2-5
Wahl verzögerter Impulse und Impulspaare 2-5
Ausgangspegel 2-5
Externe Triggerung und Tastung . . 2-5
Triggerausgang 2-6
Manuelle Triggerung 2-6
Fehlerlampe 2-6
Signale am rückwärtigen Interface-Stecker 2-6
Bedienungshinweise 2-7
Ausgangsabschlüsse und Anschlüsse 2-7
Messung der Anstiegzeit in linearen Systemen 2-7
Burstzählung mit der digitalen Verzögerungseinheit DD 501 2-9
Definition von Impulscharakteristiken 2-9
Verpackung des Gerätes 2-10

Seite

第2章 取扱説明

取付けおよび取はずし方法……2－1
操作の前に……2－1
コントロールとコネクタ……2－3
操作について……2－5
周期およびパルス幅の選択……2－5
デューティ・ファクタ……2－5
遅延パルスおよびペア・パルスの選択……2－5
出力レベル……2－5
外部トリガリングとゲーティング……2－5
トリガ信号出力……2－6
手動トリガ……2－6
コントロール・エラー・ランプ……2－6
後部インターフェイス信号……2－6
応用操作……2－7
出力の終端と接続方法……2－7
直線動作システムにおける立上り時間の測定……2－7
DD501型デジタル・ディレイ・ユニットを使用したカウンテッド・バーストの発生……2－7
パルス波形の定義……2－9
梱包方法……2－10

@

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TABLE OF CONTENTS (cont)

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.

Page

SERVICE PART

Section 3 THEORY OF OPERATION

Introduction 3-1
Input Circuitry 3-1
Trig'd/Gated Light Circuitry 3-1
Period Generator, Trig Amp and Generator 3-1
Delay Generator 3-2
Delay and Undly Pulse Generator 3-2
Duration Generator 3-2
Error Light Control 3-3
Output A Amplifier 3-3
Level Control Circuitry 3-5
High and Low Level Buffer and Risetime Control A 3-5
Output B Amplifier 3-5
High and Low Level Buffer and Risetime Control B 3-5
Power Supplies 3-6
Dual Tracking Supplies 3-6

Section 4 CALIBRATION

Performance Check Procedure 4-1
Introduction 4-1
Calibration Interval 4-1
Services Available 4-1
Test Equipment Required 4-1
Adjustment Procedure 4-16
Introduction 4-16
Test Equipment Required 4-16
Preparation 4-16
Preliminary Control Settings 4-16

Page

Section 5 MAINTENANCE

Internal Modifications 5-1
Custom Range Selection 5-1
Input Impedance Selection ⚠ 5-1
Trigger/Gate Input 5-2
Trigger Output 5-2
External Control Voltage Adjustment. 5-2
Setting the DD 501 Digital Delay Unit for Counted Burst Operation . . . 5-3
General Maintenance Information 5-3
Troubleshooting Aids 5-3
Diagrams 5-3
Circuit Board Illustrations 5-3
Adjustment Locations Illustrations 5-3
PG 507 Service Kit 5-3
Troubleshooting Equipment 5-3
Static-Sensitive Components 5-4
Circuit Board Removal 5-4
Output A and B Board Removal . . 5-4
Input and Timing Board Removal . 5-5
Front Panel Latch Removal 5-5
Cleaning 5-5
Obtaining Replacement Parts 5-6
Soldering Techniques 5-6
Semiconductors 5-6
Connector Replacement Procedures . 5-6
Multipin Connectors 5-6
Circuit Board Pins 5-7
Coaxial End-Lead Connectors 5-7
Square Pins 5-7

Section 6 OPTIONS

Section 7 REPLACEABLE ELECTRICAL PARTS

Section 8 DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS

Section 9 REPLACEABLE MECHANICAL PARTS

ACCESSORIES

CHANGE INFORMATION

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LIST OF ILLUSTRATIONS

Fig. No.		Page
	PG 507 50 MHz Dual Output Pulse Generator	xvi
2-1	PG 507 installation and removal	2-1
2-2	PG 507 front panel controls and connectors	2-2
2-3	PG 507—DD 501 interconnections for counted burst operation	2-8
2-4	Typical propagation delays using PG 507 with DD 501 in counted burst mode at 50 MHz repetition rate	2-8
2-5	Pulse characteristics	2-9
3-1	Partial simplified schematic for CONTROL ERROR indicator logic and control settings causing illumination	3-4
4-1	Check setup for performance check step 1	4-4
4-2	Check setup for performance check steps 2 and 8	4-4
4-3	Check setup for performance check steps 3 and 4	4-5
4-4	Pulse characteristics (idealized) for performance check steps 3 and 4	4-6
4-5	Check setup for performance check step 6	4-8
4-6	Check setup for performance check step 7	4-10
4-7	Check setup for performance check steps 9 and 10	4-12
4-8	Check setup for performance check step 11	4-13
5-1	Locations of period, delay, and duration custom timing capacitors and TRIG/GATE IN input impedance switch	5-2
5-2	Trigger cable connections	5-2
5-3	Equivalent circuit of external input for output voltage control	5-2
5-4	Back plate and cover removal	5-5
5-5	Orientation and disassembly of multipin connectors	5-7
5-6	Exploded view of circuit board pin and ferrule	5-7
5-6	Coaxial end-lead connector assembly	5-8

NOTE

The following illustrations are located in the diagrams foldout section at the rear of this manual.

Fig. No.		Page
8-1	Timing Board (A12).	
8-2	Adjustment setup for steps 6 and 7.	
8-3	Adjustment setup for steps 8, 9, and 10.	
8-4	Adjustment setup for steps 11 and 12.	
8-5	Adjustment setup for step 13.	
8-6	Output A Board (A13).	
8-7	Adjustment setup for steps 14 and 15.	
8-8	Output B board (A14).	
8-9	Pulse characteristics (idealized).	
8-10	Input Board (A11).	
8-11	Timing Board (A12).	
8-12	Output A Board (A13).	
8-13	Output B Board (A14).	
8-14	Auxiliary Board (A15).	
9-1	Exploded View.	

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LIST OF TABLES

Table No.		Page
1-1	Electrical Characteristics	1-2
1-2	Miscellaneous	1-4
1-3	Environmental	1-5
1-4	Physical Characteristics	1-5
2-1	Static Control Setting Errors	2-7
4-1	List of Test Equipment Requirements	4-2
4-2	Delay Ranges	4-9
4-3	Period Ranges	4-10
4-4	Duration Ranges	4-11
5-1	Relative Susceptibility to Static Discharge Damage	5-4

NOTE

The following tables are located in the diagrams foldout section at the rear of this manual.

8-1	Rear Interface Connector Assignments
8-2	Component Reference Chart
8-3	Component Reference Chart
8-4	Component Reference Chart
8-5	Component Reference Chart
8-6	Component Reference Chart
8-7	Component Reference Chart
8-8	Component Reference Chart
8-9	Component Reference Chart
8-10	Component Reference Chart
8-11	Component Reference Chart
8-12	Component Reference Chart

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OPERATORS SAFETY SUMMARY

The general safety information in this part of the summary is for both operating and servicing personnel. Specific warnings and cautions will be found throughout the manual where they apply, but may not appear in this summary.

TERMS

In This Manual

CAUTION statements identify conditions or practices that could result in damage to the equipment or other property.

WARNING statements identify conditions or practices that could result in personal injury or loss of life.

As Marked on Equipment

CAUTION indicates a personal injury hazard not immediately accessible as one reads the marking, or a hazard to property including the equipment itself.

DANGER indicates a personal injury hazard immediately accessible as one reads the marking.

SYMBOLS

In This Manual



This symbol indicates where applicable cautionary or other information is to be found.

As Marked on Equipment



DANGER — High voltage.



Protective ground (earth) terminal.



ATTENTION — refer to manual.

Power Source

This product is intended to operate from a power module connected to a power source that will not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Grounding the Product

This product is grounded through the grounding conductor of the power module power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. A protective ground connection by way of the grounding conductor in the power module power cord is essential for safe operation.

Danger Arising From Loss of Ground

Upon loss of the protective-ground connection, all accessible conductive parts (including knobs and controls that may appear to be insulating) can render an electric shock.

Use the Proper Fuse

To avoid fire hazard, use only the fuse of correct type, voltage rating and current rating as specified in the parts list for your product.

Refer fuse replacement to qualified service personnel.

Do Not Operate in Explosive Atmospheres

To avoid explosion, do not operate this product in an explosive atmosphere unless it has been specifically certified for such operation.

Do Not Operate Without Covers

To avoid personal injury, do not operate this product without covers or panels installed. Do not apply power to the plug-in via a plug-in extender.

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SERVICE SAFETY SUMMARY

FOR QUALIFIED SERVICE PERSONNEL ONLY

Refer also to the preceding Operators Safety Summary.

Do Not Service Alone

Do not perform internal service or adjustment of this product unless another person capable of rendering first aid and resuscitation is present.

Use Care When Servicing With Power On

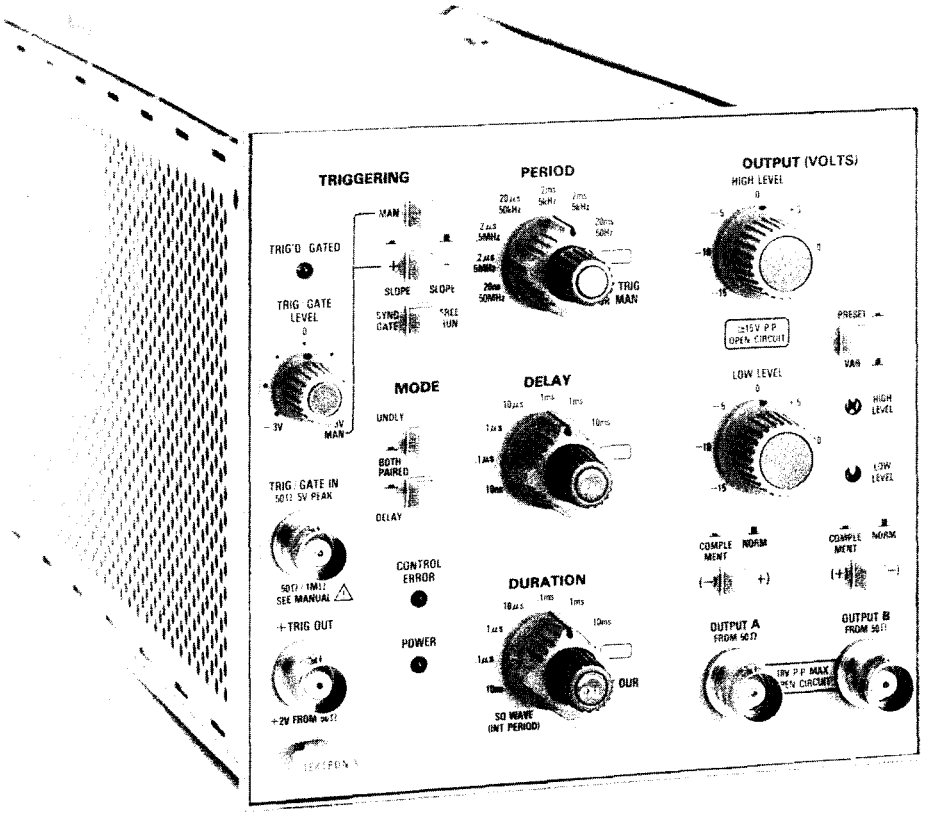
Dangerous voltages may exist at several points in this product. To avoid personal injury, do not touch exposed connections and components while power is on.

Disconnect power before removing protective panels, soldering, or replacing components.

Power Source

This product is intended to operate in a power moduleconnected to a power source that will not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

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PG 507 50 MHz Dual Output Pulse Generator.

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SPECIFICATION

Introduction

The TEKTRONIX PG 507 50 MHz Dual Output Pulse Generator is designed to operate in any two compartments of a TM 500-series power module. It is a general purpose, full function pulse generator, designed for digital logic applications.

Important features include dual simultaneous complementary pulse outputs with a maximum amplitude of 15 volts in a ±15 volt window from a low reactance 50 Ω source, 3.5 ns rise and fall times, and independent control of the high and low levels of the output pulse.

Front panel controls and connectors provide the capability to trigger or synchronously gate the PG 507 from an external signal with trigger/gate input level and slope controls. Delayed pulse, paired pulse, and manual trigger capabilities are included. Square-wave outputs and complementary rectangular pulse outputs can also be selected.

All inputs and outputs are internally terminated in 50 Ω except the trigger/gate input which is internally selectable for either 50 Ω or 1 MΩ, 20 pF input impedance. A control error warning light indicates incompatible control settings. Special positions on the period, duration, and delay controls permit customized control ranges.

The high and low level pulse amplitude controls are shared by both outputs, and a preset switch allows selection of adjustable preset output levels. Each of the outputs has an independent normal/complement switch.

The rear interface connector provides access to several internal signals and provides control lines that permit custom interconnecting of companion instruments.

Performance Conditions

The performance limits in this specification are valid with the following conditions:

1. The instrument must have been adjusted at an ambient temperature between +20°C and +30°C.

2. The instrument must be in a non-condensing environment whose limits are described under Environmental.

3. Allow thirty minutes warm-up time for operation to specified accuracy; sixty minutes after exposure to or storage in high humidity (condensing) environment.

Items listed in the Performance Requirements column of the Electrical Characteristics are verified by completing the Performance Check in the Calibration Section of this manual. Items listed in the Supplemental Information column are not verified in this manual. They are either explanatory notes or performance characteristics for which no limits are specified.

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Table 1-1

ELECTRICAL CHARACTERISTICS

Characteristics	Performance Requirements	Supplemental Information
PERIOD:		
Range	≤20 ns to ≥200 ms in seven decade steps plus variable, with overlap on all ranges.	Periods longer than 200 ms can be obtained in custom range position.
Jitter	≤0.1% +50 ps.	
DELAY or Time Between Leading Edges in Paired pulse mode.		
Range	≤10 ns to ≥100 ms in seven decade steps plus variable, with overlap on all ranges.	Delays longer than 100 ms can be obtained in custom range position.
Duty Factor	Delays to at least 70% for pulse periods of 0.2 μs to 20 ms, decreasing to at least 50% for a 20 ns period.	
Jitter	≤0.1% +50 ps.	
DURATION:		
Range	≤10 ns to ≥100 ms in seven decade steps plus variable, with overlap on all ranges.	Durations longer than 100 ms can be obtained in custom range position. An additional position provides duration of approximately 50% of the period setting for square-wave output. Output follows trigger input when in the EXT DUR mode.
Duty Factor	Pulse durations to at least 70% of pulse periods for periods of 0.2 μs to 20 ms, decreasing to at least 50% for a 20 ns period.	
Jitter	≤0.1% +50 ps.	
PULSE OUTPUTS:		
Amplitude	≥15 V p-p maximum into open circuit. ≤1 V p-p minimum into open circuit. ≥7.5 v p-p maximum into 50 Ω load. ≤0.5 V p-p minimum into 50 Ω load.	Dual simultaneous outputs each with an independent complement switch share the high and low level controls. Pulse high and low levels independently adjustable over a ±15 V range from a 50 Ω low reactance source. The preset level controls are adjustable over the same ranges.
Rise/Fall Time	≤3.5 ns fixed from 1 V to 5 V p-p into 50 Ω load. ≤4 ns fixed from 5 V to 7.5 V p-p into 50 Ω load.	
Aberrations (For signals ≥1 V p-p into a 50 Ω load.)	≤5% p-p +50 mV.	

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Table 1-1 (cont)

Characteristics	Performance Requirements	Supplemental Information
TRIGGER OUTPUTS:		
Amplitude	⩾+2 V squarewave.	
Source Impedance		50 Ω.
Duty Cycle		Internal triggering ≈50%. External triggering determined by duty cycle of triggering signal.
TRIGGER/GATE INPUT:		
Sensitivity	80 mV p-p to ⩾10 MHz; 250 mV p-p to 50 MHz at 50 Ω input impedance.	
Input Impedance		Internally selected, 50 Ω or 1 MΩ paralleled by ≈20 pF.
Maximum Input		±5 V peak into 50 Ω. ±20 V peak into 1 MΩ.
Minimum Input Pulse Width		10 ns.
Trigger Level:		
Range	⩾±3 V.	Adjustable.
Polarity		Front panel selectable, + or − slope.
TRIGGERED GATED LIGHT:		
Flashing		Input triggered at greater than ≈10 Hz repetition rate or following the input signal at slower repetition rates.
On (logic true)		TRIG/GATE IN input potential above TRIG/GATE LEVEL with + SLOPE selected or below TRIG/GATE LEVEL with − SLOPE selected.
OFF (logic false)		TRIG/GATE IN input potential below TRIG/GATE LEVEL with + SLOPE selected or above TRIG/GATE LEVEL with − SLOPE selected.
SYNCHRONOUS GATE		Rate generator starts synchronously with external gating signal and completes the last output pulse (or pulses in paired pulse mode) in progress at the end of the external gate signal.
PULSE DELAY MODES		Undelayed, delayed, and paired. Paired pulse mode limited to 25 MHz. Minimum pulse separation governed by duty factor specification.

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Table 1-1 (cont)

Characteristics	Performance Requirements	Supplemental Information
FIXED DELAYS		
+ TRIG OUT to Pulse out		≈35 ns internal duration, ≈23 ns EXT DUR or SQ WAVE mode.
TRIG/GATE IN to + TRIG OUT		≈25 ns.
CONTROL ERROR LIGHT		
Steady On		Indicates incompatible control settings. Output is undefined.
Flashing		Timing control settings selected do not properly define the output pulse because valid limits have been exceeded.
Steady Off		Indicates valid operation for most control settings.

Table 1-2

MISCELLANEOUS

Characteristics	Performance Requirements	Supplemental Information
Power Consumption		
Maximum		69.4 VA
Power Dissipation		
Maximum		28 W
Recommended Adjustment Interval		1000 hours or six months, whichever occurs first.
Warm-up Time		30 minutes.

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Table 1-3
ENVIRONMENTAL[a]

Characteristics	Description	
Temperature		Meets MIL-T-28800B, class 5.
Operating	0°C to +50°C	
Non-operating	−55°C to +75°C	
Humidity	95% RH, 0°C to 30°C 75% RH to 40°C 45% RH to 50°C	Exceeds MIL-T-28800B, class 5.
Altitude		Exceeds MIL-T-28800B, class 5.
Operating	4.6 Km (15,000 ft)	
Non-operating	15 Km (50,000 ft)	
Vibration	0.38 mm (0.015″) peak to peak, 5 Hz to 55 Hz, 75 minutes.	Meets MIL-T-28800B, class 5, when installed in qualified power modules.[b]
Shock	30 g's (1/2 sine), 11 ms duration, 3 shocks in each direction along 3 major axes, 18 total shocks.	Meets MIL-T-28800B, class 5, when installed in qualified power modules.[b]
Bench Handling[c]	12 drops from 45°, 4″ or equilibrium, whichever occurs first.	Meets MIL-T-28800B, class 5, when installed in qualified power modules.[b]
Transportation[c]	Qualified under National Safe Transit Association Preshipment Test Procedures 1A-B-1 and 1A-B-2.	
E.M.C.[d]	Within limits of FCC Regulations, Part 15, Subpart J, Class A; VDE 0871; and MIL-461A tests RE01, RE02, CE01, CE03, RS01, RS03,CS01, and CS02 with exceptions.[e]	
Electrical Discharge	20 kV maximum charge applied to instrument case.	

[a] **With power module.**
[b] **Refer to TM 500/5000 power module specifications.**
[c] **Without power module.**
[d] **System performance subject to exceptions of power module or other individual plug-ins.**
[e] **Instrument exceeds RE02 specifications at 100 MHz and between 300 MHz to 1 GHz when PERIOD control is set in 20 ns position. Closer than 55 cm, it also exceeds RE01, magnetic emissions specifications as set by MIL-461A/462.**

Table 1-4

PHYSICAL CHARACTERISTICS

Characteristics	Description
Enclosure Type and Style	MIL-T-28800B, type 3, style E package with power module. (Style F in rackmount power module.)
Finish (Front Panel)	Plastic/aluminum laminate.
Net Weight	1.59 kg (3.5 lbs).
Overall Dimensions	134.5 mm (5.294″)W x 307.4 mm (12.105″)D x 126.0 mm (4.961″)H.

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OPERATING INSTRUCTIONS

INSTALLATION INSTRUCTIONS

Preparation for Use

The PG 507 50 MHz Dual Output Pulse Generator is calibrated and ready for use when received. It is a plug-in designed to operate in any two compartments of a TM 500 series power module. Refer to the power module instruction manual for line voltage requirements and power module operation. A list of standard accessories (and part numbers) is located in the back of this manual.

Several internal changes are available to modify the PG 507's capabilities. Each item is described in the Operators Familiarization part of this section of the manual. Refer all internal changes to qualified service personnel. Qualified service personnel see the Maintenance section of this manual for more information. The following is a list of items that are affected by these internal changes.

Front Panel Functions/Controls

PERIOD and DURATION controls. One range can be custom selected for each control.

DELAY control. One range can be custom selected.

TRIG/GATE IN. Input impedance selection.

+ TRIG OUT − Can be internally set for normal or complement trigger.

Rear Interface Signals

External Voltage Control.

Trig/Gate Input.

Trigger Output.

CAUTION

Turn the power module off before inserting or removing the plug-in to prevent damage to the plug-in circuitry.

Check to see that the plastic barriers on the interconnecting jack of the selected power module compartment match the cutouts in the PG 507 circuit board edge connector. Align the PG 507 chassis with the upper and lower guides (see Fig. 2-1) of the selected compartments. Push the PG 507 chassis in and press firmly to seat the circuit board edge connector in the interconnecting jack. Pull out the power switch on the power module. The PG 507 POWER indicator light on the front panel should light.

To remove the PG 507, turn off the power module and pull on the release latch (located in the lower left corner) until the interconnecting jack disengages and the PG 507 slides out.

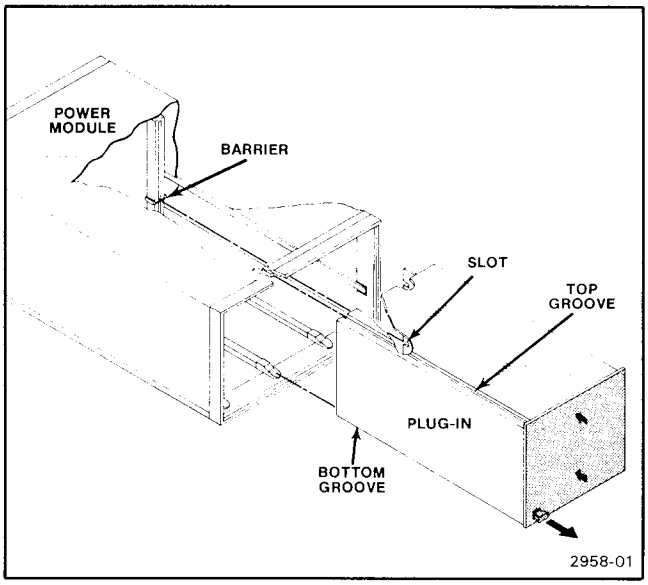
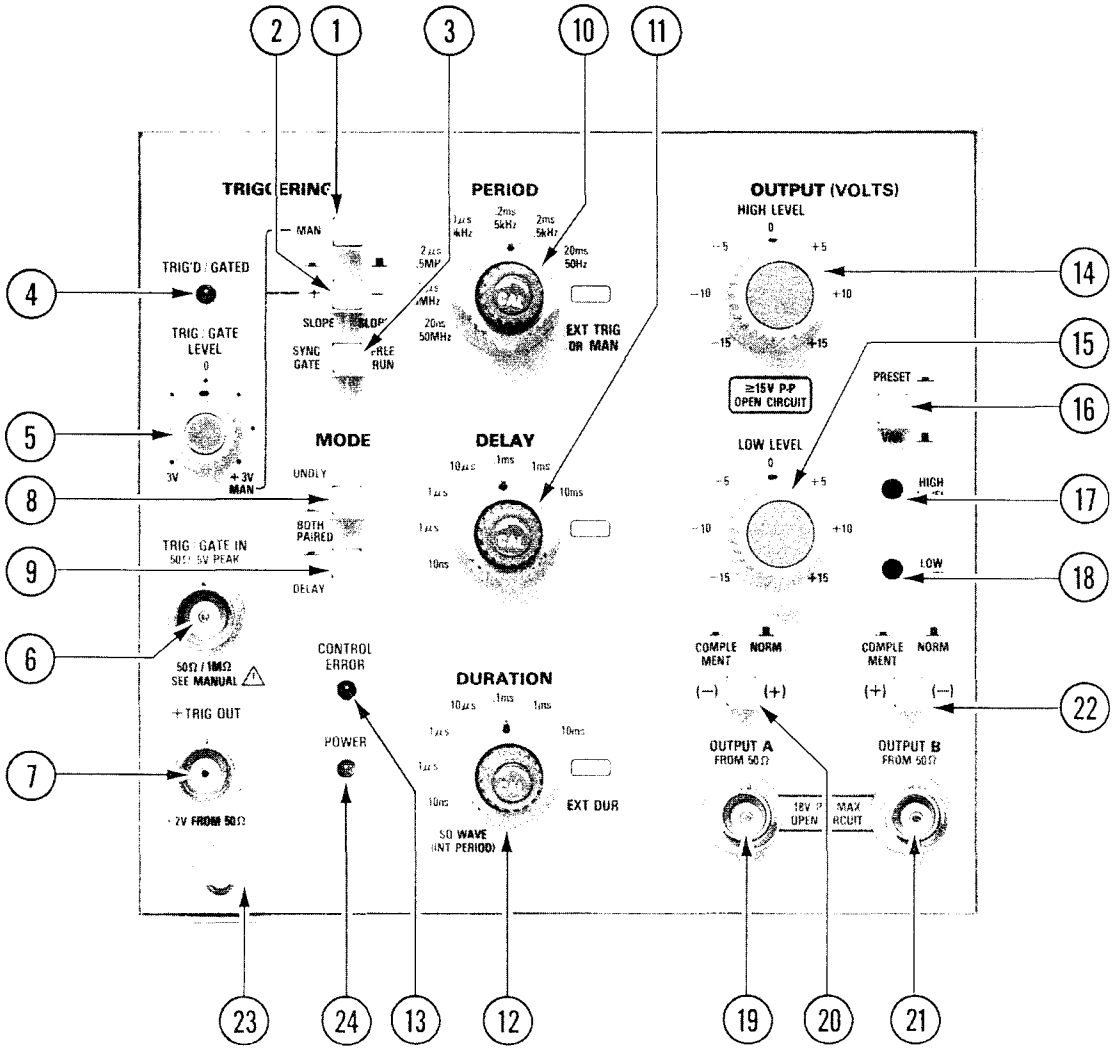


Fig. 2-1. PG 507 installation and removal.

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2962-01

Fig. 2-2. PG 507 front panel controls and connectors.

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CONTROLS AND CONNECTORS

TRIGGERING

(1) MAN Pushbutton

Push for manual trigger or gate.

(2) + SLOPE/ − SLOPE Pushbutton

Push for trigger or gate start on + slope; out for − slope start.

(3) SYNC GATE/FREE RUN Pushbutton

Button in for gated operation, out for free run.

(4) TRIG'D/GATE Indicator

Indicates when functioning in triggered or gated mode.

(5) TRIG/GATE LEVEL Control

Selects threshold level on trigger or gating waveform. Turn fully cw for manual trigger.

(6) TRIG/GATE IN Connector

Input connector for trigger or gate signals.

(7) + TRIG OUT Connector

Supplies positive-going waveform from the period generator for control of external circuitry.

MODE

(8) UNDLY Pushbutton

Push to disable DELAY function. Push with DLY button for paired pulses.

(9) DELAY Pushbutton

Push to enable DELAY function. Push with the UNDLY pushbutton for paired pulses.

TIMING

(10) PERIOD Control

Selects pulse period time.

(11) DELAY Control

Selects delay time.

(12) DURATION Control

Selects pulse duration time.

(13) CONTROL ERROR Indicator

Indicates improper control settings.

OUTPUT (Volts)

(14) HIGH LEVEL Control

Controls the pulse high level for both output signals in VARiable operation.

(15) LOW LEVEL Control

Controls the pulse low level for both output signals in VARiable operation.

(16) PRESET/VAR Pushbutton

Button out selects variable OUTPUT (VOLTS) HIGH LEVEL [14] and LOW LEVEL [15] controls for output amplitude selection; button in selects preset HIGH LEVEL [17] and LOW LEVEL [18] output amplitude.

(17) HIGH LEVEL Preset Control

Controls the pulse high level for both output signals in PRESET operation.

(18) LOW LEVEL Preset Control

Controls the pulse low level for both output signals in PRESET operation.

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(19) **OUTPUT A Connector**

Output A bnc connector.

(20) **COMPLEMENT (−) NORM (+) Pushbutton (Output A)**

Button out selects normal pulse at the OUTPUT A connector; button in provides the pulse complement.

(21) **OUTPUT B Connector**

Output B bnc connector.

(22) **COMPLEMENT (−) NORM (+) Pushbutton (Output B)**

Button out selects normal pulse at the OUTPUT B connector; button in provides the pulse complement.

(23) **Release Latch**

Pull to remove plug-in.

(24) **POWER Indicator**

Illuminates when power is applied via the power module.

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OPERATORS FAMILIARIZATION

Period and Duration Selection

For all PERIOD settings except EXT TRIG or MAN, the period generator operates at a rate set by the PERIOD range switch and variable control. The DURATION range switch and variable controls (except in the EXT DUR position) set the duration of the output pulses. When the DURATION control is set for a time greater than the PERIOD, the CONTROL ERROR lamp will light. When the DURATION control is set to the SQ WAVE position, the duration time is determined internally at approximately 50% of the period time. The blank range positions on the PERIOD and DURATION controls permit custom period and duration times. Refer custom range selection to qualified service personnel.

Duty Factors

Duty factors greater than those specified are obtainable on several ranges. When the duty factor is increased to the point that internal circuitry prevents completion of the pulse waveform, the CONTROL ERROR light will flash. To further increase the duty factor, switch to the complement mode. Set the DURATION control for a pulse width equal to the desired pulse off time and push the front panel COMPLEMENT (−) pushbutton.

Delayed and Paired Pulse Selection

In the pulse delay mode, the output pulse at each output connector is delayed from the + TRIG OUT signal by the DELAY time selected, plus a specified fixed delay. To use this feature, push the DELAY button and trigger the external device from the + TRIG OUT connector. Set the DELAY control for the desired delay time from trigger to pulse leading edge. Use the variable delay control labeled CAL for time adjustments between the delay time ranges.

Paired pulses are obtained at the output connectors by pushing both the DELAY and UNDLY buttons. The DELAY controls the time between the leading edges of the paired pulses for both output signals. An initial pulse occurs in the output signals at external trigger time, with the second or paired pulses delayed by the selected delay time.

The CONTROL ERROR light illuminates if the delay time is not compatible with the other pulse timing parameters. A custom range position on the DELAY control permits custom delay time selection. Refer custom range selection to qualified service personnel.

Output Levels

Amplitude and offset are selected for both output signals by independent LOW LEVEL and HIGH LEVEL controls. Use the front panel voltage calibration marks for an open circuit load. Divide the values by two for the specific output channel operating into a 50 Ω load. The OUTPUT (VOLTS) controls are electrically interlocked to prevent setting the HIGH LEVEL more negative than the LOW LEVEL. A clamp limits the output to 15 V peak-to-peak into an open circuit or 7.5 V into 50 Ω.

Pulse amplitude equals the pulse high level minus the pulse low level. Offset may be the high level or the low level, whichever is used as the base line reference level. The flexibility of this method is useful in certain applications such as logic testing. Either the high or low level can be varied without disturbing the other.

The pulse high and low levels can be preset. Push the PRESET button and adjust the HIGH LEVEL and the LOW LEVEL potentiometers with a screwdriver for the desired output levels.

External Triggering and Gating ⚠

The TRIG/GATE IN input impedance can be set for either 50 Ω or 1 MΩ by means of an internal switch. The PG 507 is shipped with the switch set for 50 Ω input impedance. Refer input impedance selection to qualified service personnel. In the 1 MΩ position the shunt capacitance is approximately 20 pF. A standard oscilloscope probe can be used to acquire the triggering signal from the external circuitry. If a compensated probe is used, calibrate the probe on the input of a 1 MΩ 20 pF oscilloscope first. A 10X probe allows triggering directly from high impedance sources such as MOS digital circuitry with an effective TRIG/GATE LEVEL range of ±30 V.

CAUTION

To avoid equipment damage, do not apply a voltage exceeding ±5 V peak with respect to chassis ground into 50 Ω or ±20 V peak into 1 MΩ to the TRIG/GATE IN connector.

For external gating select the desired period and duration. Press the SYNC GATE pushbutton. Select the desired trigger slope with the + or − SLOPE button. The OUTPUT now consists of pulses, described by the front panel controls, whenever the TRIG/GATE IN input exceeds the TRIG/GATE LEVEL control setting.

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To externally trigger the PG 507, connect the triggering signal to the TRIG/GATE IN connector. Select the slope on which triggering is desired with the + or − SLOPE button. Place the PERIOD switch in the EXT TRIG OR MAN position. Now adjust the TRIG/GATE LEVEL control for the desired triggering level. The output waveform begins about 46 ns after the triggering signal.

For external DURATION place the DURATION control in the EXT DUR position, and the PERIOD control in the EXT TRIG OR MAN position. The period and duration of the output waveform are now controlled by the triggering waveform. This is an extremely useful mode of operation for translating logic levels, etc. If the PERIOD is set for internal operation and the DURATION for external, the CONTROL ERROR light illuminates indicating an illegal mode of operation.

The TRIG'D/GATED indicator light functions as a TRIG/GATE level indicator. When the + SLOPE is selected and the external input level exceeds the threshold set by the TRIG/GATE LEVEL control, the light is on continuously. For input voltages below the threshold the light is continuously off. When the input passes through the threshold the light flashes. When the − SLOPE is selected the light behaves as for + SLOPE selection. However, the polarities are reversed.

The TRIG'D/GATED indicator light may be used as a logic level indicator for troubleshooting logic circuitry. Set the TRIG/GATE LEVEL control to a voltage equal to the midrange value of the logic voltage swing. If an attenuator probe is used for signal pickup, remember to consider the attenuation factor when setting the TRIG/GATE LEVEL voltage.

Trigger Output

The signal appearing at the connector is an approximate square wave. The leading edge (positive-going) precedes the output pulse by a specified fixed delay plus the delay as set by the DELAY control. In paired pulse operation, the leading edge precedes the first pulse by the fixed delay. The second pulse then appears after the set delay. A complement square wave (negative-going leading edge) is also available at the front panel by moving a connector on the timing circuit board. Refer internal connector changes to qualified service personnel.

Manual Trigger

To use this feature place the PERIOD switch in the EXT TRIG OR MAN position. Set the TRIG/GATE LEVEL control fully clockwise. If the + SLOPE is selected, the manual trigger will occur when the MAN button is depressed. If the − SLOPE is selected, the trigger occurs when the button is released. The manual trigger causes one output pulse, or a set of paired pulses if the DELAY and UNDLY buttons are depressed.

Control Error Light

The CONTROL ERROR light helps to solve setup problems by indicating most control errors. A steady glow indicates static control setting errors while a flashing light indicates dynamic errors. In either case, the control settings do not correctly indicate the output. Check the control settings for compatibility. See Table 2-1 for static control setting errors. Dynamic functions monitored are period, delay, and duration.

Rear Interface Signals

External Voltage Control. The output voltage high and low levels can be controlled via external control voltages applied to rear interface connector pins 22A and B. Before using this feature, internal adjustments must be made for the external control voltage supplied. Refer internal adjustment to qualified service personnel. To use this feature, depress the OUTPUT (VOLTS) PRESET pushbutton. The OUTPUT A and B voltage levels will vary linearly with the external control voltages (the output voltage high level is controlled by the external voltage applied to pin 22B and the low level by the voltage at 22A).

Amplitude Monitor. The front panel OUTPUT A and OUTPUT B signals are available at the rear interface Output A Amplitude Monitor (pin 24A) and the Output B Amplitude Monitor (pin 25A). Pin 26A is the Amplitude Monitor ground for these signals. The load for these signals must be >1 MΩ.

Trig/Gate Input. This signal may be applied to the rear interface connector instead of the front panel TRIG/GATE IN connector. To input the trigger/gate signal to the rear interface connector, an internal cable must be added to the instrument. Refer cable installation to qualified service personnel. With the cable installed, the trigger/gate signal is applied to rear interface connector pin 24B. Pin 25B is the trigger/gate input common.

Trigger Output. The trigger output signal is available at the rear interface connector pins 27B and 28B (common). This signal is the complement (180° out of phase) of the front panel + TRIG OUT signal. The rear interface trigger output may be used simultaneously with the front panel + TRIG OUT signal. Internal cable connections may be changed to route the normal trigger output to the rear interface connector and the trigger output complement to the + TRIG OUT connector. Refer cable connection changes to qualified service personnel.

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OPERATING CONSIDERATIONS

Output Terminations and Connections

The PG 507 operates as a voltage source in series with an internal 50 Ω impedance. Maximum pulse fidelity is obtained when the output operates into an external 50 Ω impedance. The output circuitry of the PG 507 is fully protected against any voltage transients when operating into passive loads.

Table 2-1 lists static control settings that illuminate the CONTROL ERROR light and their corresponding operating modes. Some of these modes may be useful.

If the load has a dc voltage across it, connect a blocking capacitor in series with the OUTPUT connector and the load. Make certain the time constant of the capacitor and load is large enough to maintain pulse top flatness.

Table 2-1

Static Control Setting Errors

Control Settings	Operation
EXT TRIG OR MAN and SYNC GATE	External Trigger Mode
EXT DUR and Internal Period	Square Wave Mode
EXT TRIG OR MAN and SQ WAVE (INT PERIOD)	External Duration Mode
SQ WAVE (INT PERIOD) and SYNC GATE	Truncated square wave when gate ends
SQ WAVE (INT PERIOD) and DELAY	No delay
EXT DUR and DELAY	No delay

Risetime Measurements in Linear Systems

Consider the rise and fall time of associated equipment when measuring the rise or fall time of a linear device. If the rise time of the device under test is at least ten times slower than the combined rise times of the PG 507, the monitoring oscilloscope, and associated cables, the error introduced will not exceed 1%, and usually may be ignored. If the rise or fall time of the test device is less than ten times slower than the combined rise times of the testing systems, determine the actual rise time of the device under test by using the following formula:

$$R_t = \sqrt{R^2_1 + R^2_2 + R^2_3 \ldots\ldots}$$

R_t equals the overall rise or fall time of the entire measurement system and R_1, R_2, R_3, etc., are the rise times or fall times of the individual components comprising the system.

Counted Burst Using the DD 501 Digital Delay Unit

This application permits preselecting the number of output pulses from the PG 507. The event is initiated by an externally applied signal or pulse, 5 ns or longer. The time duration of this signal or pulse has no effect on the output from the PG 507.

Before using this feature, internal changes must be made to the DD 501. Refer internal change to qualified service personnel. When these changes have been made, connect the PG 507 and the DD 501 as shown in Fig. 2-3. Use 10 inch (Tektronix Part Number 012-0208-00) or shorter cables for interconnecting the two units to reduce delays.

Initial Control Settings. Make certain the PG 507 TRIG/GATE IN input impedance is set for 50 Ω. Set the controls of the PG 507 for the desired output waveform with the PG 507 in FREE RUN. Do not use the SQ WAVE mode. Place the PG 507 in the + SLOPE, SYNC GATE mode and set the TRIG/GATE LEVEL control at the 2 o'clock position. Select EVENTS + SLOPE, START + SLOPE and place the EVENTS and START LEVEL controls at the 2 o'clock position on the DD 501. The three TRIG'D lights on the DD 501 and the TRIG'/GATED light on the PG 507 will be off until the DD 501 is triggered. Upon receipt of a trigger, all lights will illuminate. If not, check the setup and adjust the LEVEL controls as necessary.

Operation to 20 MHz. Set the EVENTS DELAY COUNT on the DD 501 for one less than the desired number of counts up to PG 507 repetition rate of about 20 MHz. See Fig. 2-4. If necessary, a single trigger may be obtained by rotating the DD 501 START LEVEL control through the 0 position, with no external trigger applied. A single trigger may also be obtained by using the TEKTRONIX manual (One Shot) Trigger Generator, Tektronix Part Number 016-0597-00. All other DD 601 and PG 507 operating controls function normally.

Operation from 20-50 MHz. Due to propagation delays in the PG 507, DD 501 and the interconnecting cables, one or more pulses, in addition to the desired number, are generated when the PG 507 repetition rates are set between 20 MHz and 50 MHz. These extra pulses are consistent for any frequency irrespective of the desired EVENTS DELAY COUNT setting. To determine the number of extra pulses for a given PG 507 period, set the

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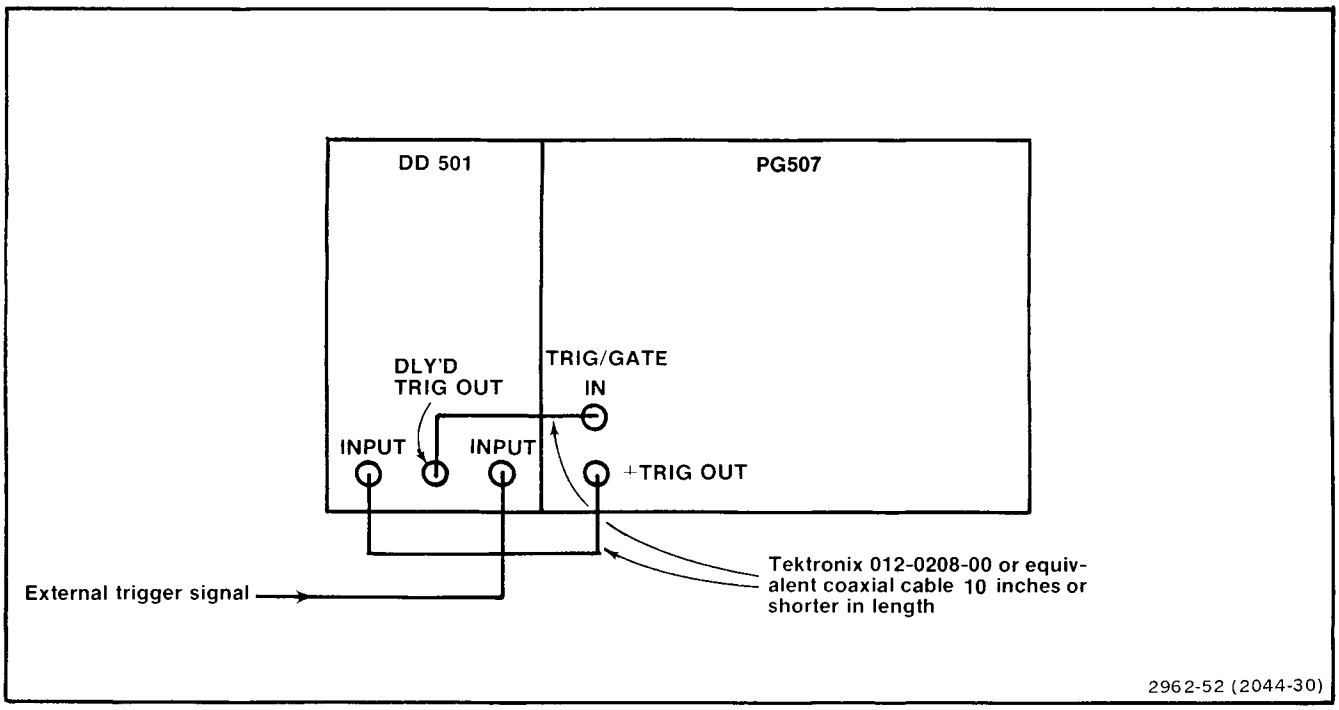


Fig. 2-3. PG 507-DD 501 interconnections for counted burst operation.

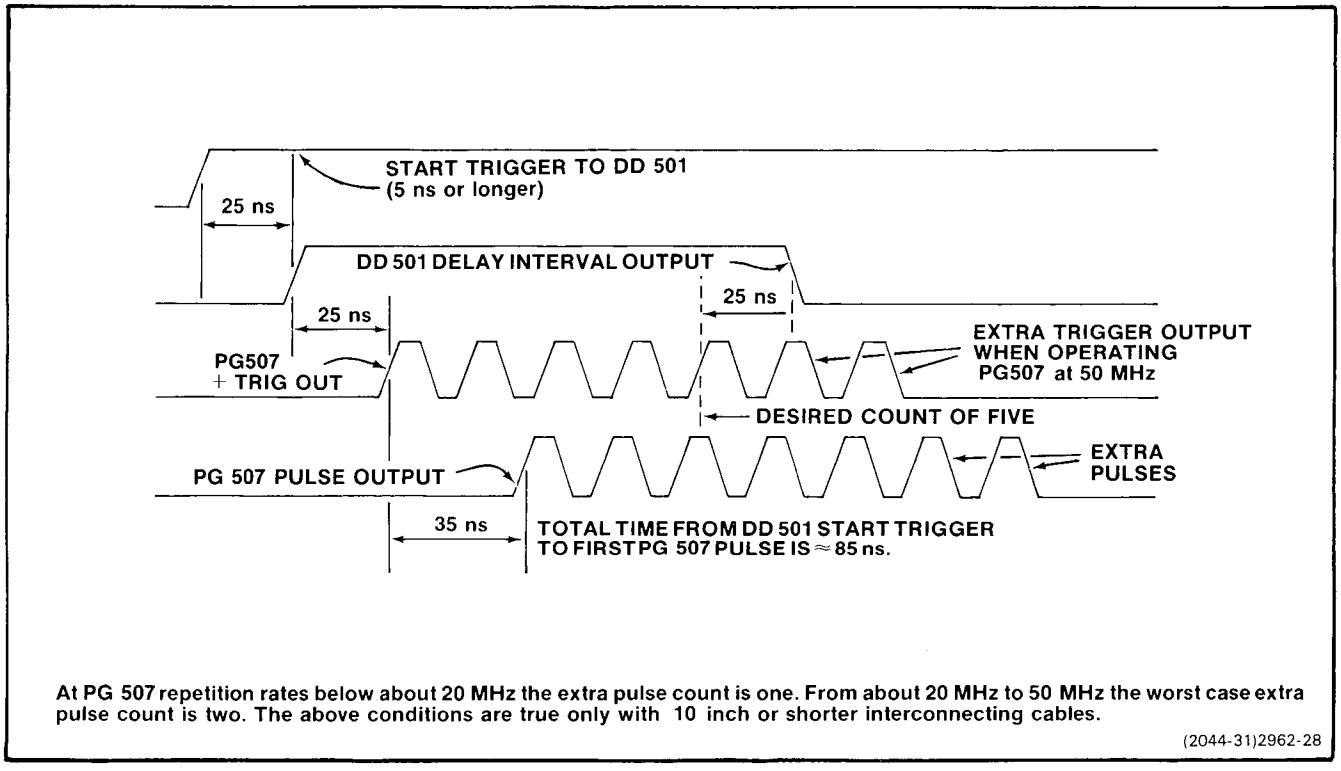


Fig. 2-4. Typical propagation delays using PG 507 with DD 501 in counted burst mode at 50 MHz repetition rate.

PG 507 and the DD 501 controls as described under Intiial Control Settings. Now adjust the PG 507 TRIG/GATE LEVEL or the DD 501 EVENTS LEVEL for the same number of extra pulses at DD 501 EVENTS DELAY COUNT settings of zero and nine.

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Definitions of Pulse Characteristics

The following is a glossary of common pulse characteristics used in this manual. They are illustrated in Fig. 2-5.

Amplitude. The maximum absolute peak value of a pulse measured from the baseline regardless of polarity, and excluding unwanted aberrations or overshoot. Measurement points are at 50% of the pulse duration time (pulse high level) and on the baseline (pulse low level) at 50% of the off time (the pulse period minus the pulse duration).

Aberrations. Unwanted deviations or excursions in the pulse shape from an ideal square corner and flat top, i.e., overshoot, undershoot or rounding, ringing, and tilt or slope.

Baseline. The quiescent dc voltage reference level of the pulse waveform.

Complementary Pulse. Normal pulse with high and low levels interchanged. Pulse on-time becomes pulse off-time.

Duty Factor. Sometimes referred to as duty cycle. The ratio of pulse duration to period, or the product of pulse duration and pulse repetition rate. Duty factor in % = Duration/Period X 100.

Falltime. The time interval, at the pulse trailing edge, for the pulse amplitude to fall from the 90% amplitude level to the 10% amplitude level.

Flatness. The absence of long term variations to the pulse top; excluding overshoot, ringing or pulse rounding. Sometimes referred to as tilt or slope.

High Level. The most positive value of a pulse, regardless of unwanted aberrations or overshoot, measured at a point that is located at 50% of the pulse duration.

Low Level. The most negative value of a pulse, regardless of unwanted aberrations or overshoot, measured at a point that is 50% of the off time.

Offset. A dc potential of either polarity applied to the waveform to bias the baseline to an amplitude other than zero.

Overshoot. The short term pulse excursion (or transient) above the pulse top or below the baseline, which is simultaneous to the leading or trailing edge of the pulse.

Period. The time interval for a full pulse cycle, the inverse of frequency or repetition rate, or the interval between corresponding pulse amplitudes of two con-

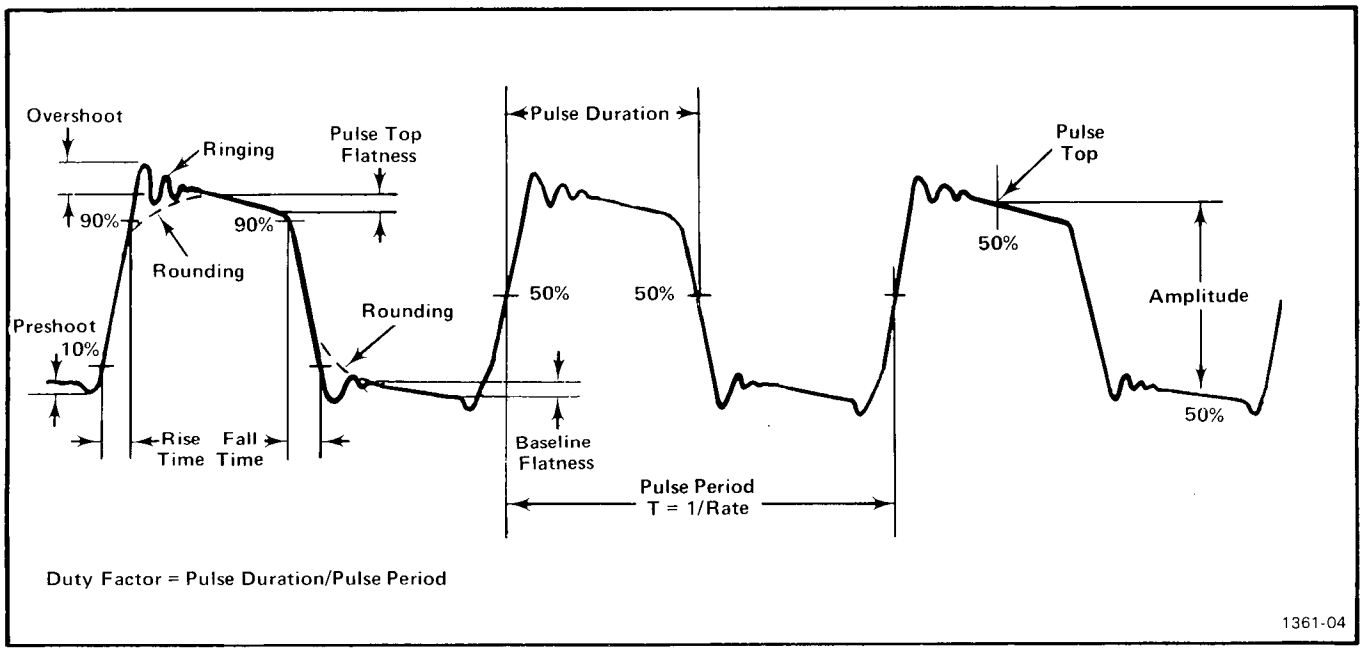


Fig. 2-5. Pulse characteristics.

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secutive undelayed or delayed pulses. Generally measured between the 50% amplitude levels of two consecutive pulses.

Preshoot. A transient excursion that precedes the step function. It may be of the same or opposite polarity as the pulse.

Pulse Duration. The time interval between the leading and trailing edge of a pulse at which the instantaneous amplitude reaches 50% of the peak pulse amplitude.

Polarity. The direction from the baseline of the pulse excursion, either positive-going (+) or negative-going (−).

Ringing. Periodic aberrations that dampen in time, following the overshoot.

Risetime. The time interval, at the step function leading edge, for the pulse to rise from the 10% to 90% amplitude levels.

Rounding or Undershoot. The rounding of the pulse corners at the edges of a step function.

Tilt or Slope. A distortion of an otherwise flat-topped pulse, characterized by either a decline or a rise of the pulse top (see Flatness).

Repackaging Information

If the Tektronix instrument is shipped to a Tektronix Service Center for service or repair, attach a tag identifying the owner (with address) and the name of an individual at your firm to contact. Include the instrument type, options, serial number, and a description of the service required.

Save and reuse 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 instrument finish. Obtain a carton of corrugated cardboard of the correct carton strength 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 the carton with shipping tape or an industrial stapler.

The carton test strength for this instrument is 200 pounds per square inch.

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THEORY OF OPERATION

Introduction

Refer to the block diagram and the schematics in the foldout pages at the rear of this manual as well as the following discussion to understand the operation of the PG 507.

Input Circuitry ◇1

This circuitry processes the external trigger or gating signal to provide triggering waveforms for the period circuit. The 50 Ω input impedance for this circuitry is provided by R1030, switched in or out by S1020. When R1030 is out of the circuit, the input impedance is 1 MΩ obtained by R1132 and R1130. Diodes CR1130 and CR1230 are protective diodes. The proper voltage at the drain of Q1224 is set by VR1230. The source voltage for Q1224 is set by VR1130. Impedance transformation, with no voltage shift, is obtained by source follower Q1224. Constant current for Q1224 is supplied by Q1226.

A differential comparator is formed by Q1220 and Q1222. This circuitry compares the trigger or gate input level with the level set by the front panel TRIG/GATE LEVEL control, R500. Constant current for this comparator is provided by Q1120. Level control voltage for the differential comparator is provided by operational amplifier U1330. The output, pin 6, swings over a range of ±3 V. The voltage at TP36 is the triggering level voltage, as set by the TRIG/GATE LEVEL control. If the triggering or gating voltage at the base of Q1220 is more positive than at TP36, Q1222 is conducting and Q1220 is off. This places the collector of Q1222 more positive than the collector of Q1220. When the gating or triggering waveform level drops below the voltage at TP36, Q1220 conducts and Q1222 turns off.

This switching waveform is applied to the bases of Q1210A and B, operating as a differential pair. The collector of Q1210A drives Q1210C in a cascode mode of operation. The collector of Q1210C drives the base of Q1210D which, as an emitter follower, drives the input of U1110B. This gate operates as a dual input Schmitt trigger shaper. When the emitter of Q1210D drops to about 3.8 V, pin 7 of U1110B drops to its low level. The inverting output terminal, pin 6, is always in an opposite state from pin 7. Positive feedback for this portion of the Schmitt is provided by R1114. If the unit is manually triggered, pin 10 of U1110B is momentarily connected to +5 V. Pin 10 of U1110B, along with R1201 and R1200 now acts as a Schmitt shaper for the manual trigger. This action holds the output, pin 7, high and the inverting output, pin 6, low as long as the MAN button is pressed.

When the plus slope is selected for triggering or gating, +5 V is applied to pin 4 of U1110A. This gate is now inhibited and the signal passes through U1110C. The outputs of U1110A and C are connected together and a high on either output overrides the low. Pin 13 of U1110C is low as long as the anodes of CR1401 and CR1400 are low. This occurs when the logic circuitry has enabled the input circuitry. When the control logic is set to disable the input circuitry, the anodes of these diodes are raised to +5 V. This disables gates U1110A and U1110C.

Pin 12 of U1110C now shifts between the high and the low state corresponding with the input gate or trigger. The output from U1110C, pin 14, is passed to the Period Generator circuit. A high at the output of U1110C turns the Period Generator off; a low starts the Period Generator.

TRIG'D/GATED Light Circuitry ◇1

Transistors Q1414, Q1412, Q1410 and their associated components compose the circuitry that operates the front panel TRIG'D/GATED light emitting diode. The pair Q1414 and Q1412 form a modified astable multivibrator, while Q1410 operates as a voltage source. When the output of U1110A or C is high (Period Generator off) or the logic circuitry has inhibited the input circuitry, the base of Q1414 is high. This causes the base of Q1412 to be low through R1415. The collector of Q1412 is now high and the light emitting diode is off. When the base of Q1414 goes low, the base of Q1412 goes high, the collector goes low and the light emitting diode turns on. The light emitting diode circuitry follows the triggering gate up to about a 5 Hz rate, i.e., about 100 ms on and 100 ms off. At faster gating frequencies, C1420 inhibits the changing states of this circuitry to about a 5 Hz rate.

Period Generator, Trig Amp & Generator ◇2

This circuitry generates the internal period timing waveform. Logic device U1120B operates as an astable multivibrator. When either input of U1120B is high, pin 7 is high and pin 6 low. The switch timing capacitances in the Period Generator are connected from pin 7 to pin 11. These timing capacitors are selected by the PERIOD switch, S1200. The period variable (CAL) control, R1004, varies the resistance in the negative feedback loop.

To start the period cycle, assume pin 7 of U1120B goes high and pin 6 low. This positive step, at pin 7, is coupled through the selected period timing capacitor to pin 11. As

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the timing capacitor discharges through the resistances connected between pins 11 and 6, the voltage at pin 11 decays. This decay is at a rate determined by the timing capacitor and these resistances. When the switching level (approximately 4 V) is reached, pin 7 goes low and pin 6 goes high. The negative step, at pin 7, is coupled through the timing capacitor and appears at pin 11. The capacitor now charges the resistances until the switching level is reached. The period cycle repeats. The symmetry adjustment, R1114, compensates for the bias current through pin 11.

When the PERIOD switch is in any position other than EXT TRIG OR MAN, switch S1200-2 is open. This lowers pin 10 of U1120B and permits the period generator to operate during the external gate on time. During the time of the external gating signal pins 4 and 2 of U1120A are low and pin 3 is high. As transistors Q1212 and Q1310 form a comparator, with their bases connected to pins 3 and 2 of U1120A respectively, the collector of Q1212 is low. This causes the emitter of Q1210 to be low, as well as pin 11 of U1120B. This allows the Period Generator to operate. During the gated off time this action reverses. Pin 11 of U1120B rises and inhibits the Period Generator.

Potentiometers R1112 and R1002 adjust the lock up voltage at pin 11 of U1120B so that, at turn on, the first period generated is identical in time with subsequent periods. Potentiometer R1002 is switched into the circuit only on the 20 ns range. Components R1214 and C1214 form a time constant to help compensate for first period error.

With the PERIOD switch in the EXT TRIG OR MAN position, S1200-2 is closed. This places a high on pin 10 of U1120B locking pin 7 high and pin 6 low, irrespective of the level on pin 11. This disables the Period Generator. Pin 15 of U1120C now follows pin 4 of U1120A, in phase with the input triggering signal. Pin 14 of U1120C drives Q1120 and pin 15 drives Q1122. The output from the collector of Q1122 is in phase with the trigger or gate input signal. This provides the + TRIG OUT signal. The phase of the waveform at the collector of Q1120 is inverted.

Delay Generator ◇3

This circuitry provides the delay for delayed or paired pulse operation. As the signal from the Period Generator or the external trigger input goes from high to low at pin 7 of U1420B, pin 3 goes high. This causes pin 5 of U1420A to go high and pin 2 low. Pin 13 of U1420D and pin 9 of U1410B go low. Pin 15 of U1420D goes high, but pin 10 of U1410B does not follow until about 10 ns later. This is due to the delaying action of R1424 and C1520. When pin 9 of U1410B goes low, pin 6 goes high, assuming pin 11 is already low. Pin 6 stays high until pin 10 goes high, as described above. This action provides the delay generator with about a 10 ns wide trigger pulse under all input conditions.

The positive-going trigger pulse, at pin 5 of U1410A, causes pin 3 to go low and pin 2 high. Positive feedback through R1512 and C1510 causes pin 4 to go high. The low at the base of Q1616 turns Q1616 off. The emitter of Q1616 goes negative at a rate determined by the selected timing capacitor and current source Q1614, with its variable emitter resistances. As the emitter of Q1616 goes negative, it pulls the base of Q1610 negative which lowers pin 4 of U1410A. When pin 4 reaches the switching threshold ($\approx$4 V) pin 2 goes low and pin 3 high. The timing capacitor discharges through Q1616. The monostable delay generator is now reset for the next trigger pulse. Transistor Q1612 provides a constant load for the power supplies irrespective of the current flowing through Q1610. The delay generator is disabled in the UNDLY mode by grounding the cathode of CR1510 through S1820B.

DELAY and UNDLY Pulse Generator ◇3

The output from the delay generator connects to pin 13 of U1410C. Pin 15 of U1410C is high during the delay time and pin 14 is low. Gates U1630B and U1530D provide a positive-going trigger at pin 15 of U1630D when the delay time ends. Gates U1630A and U1630C provide a positive-going trigger at pin 14 when the delay time starts. As the delay time starts, pin 4 of U1630A goes low as does pin 11 of U1630C. Pin 10 of U1630C is low as the anode of CR1640 is grounded through the UNDLY switch, S1820A. The low at pin 11 of U1630C allows pin 14 to go high. Pin 14 stays high until the propagation time through gate U1630A and the delaying action of R1640 and C1644 allow the high generated in U1630A, from pin 2, to reset U1630C through pin 10. This causes pin 14 to return to its low state. The width of the undelayed output trigger pulse is about 6 ns.

To obtain only the delayed trigger, the anode of CR1640 is connected to +5 V, disabling gate U1630C. The anode of CR1530 is grounded through the DELAY switch. Gates U1630B and U1630D now operate in exactly the same manner as U1630A and C. A positive trigger pulse appears on pin 15 of U1630D when the delay time ends (pin 6 of U1630B goes from high to low).

In the paired pulse mode both gates operate. Gate U1630C provides a positive-going trigger at the start of the delay time and U1630D provides a positive trigger at the end of the delay time.

Duration Generator ◇4

This circuitry generates the pulse duration times. Gate U1540B accepts the delayed or undelayed positive triggers from the delay generator. The result is a positive-going

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pulse at pin 5 of U1540A. This triggers the Duration Generator, which operates in the same manner as the Delay Generator. Refer to the discussion under the heading Delay Generator for a description of the Duration Generator operation. Gate U1540C is an output buffer. Pin 12 goes high during the pulse duration time. If pin 13 is low, pin 15 goes high and pin 14 low. Pin 13 controls U1540C in the squarewave and duration modes.

Error Light Control ◇4

This circuitry illuminates the CONTROL ERROR light when the duration or delay times are greater than the periods of their respective triggers. The positive pulse from the Duration Generator is fed into the D input, pin 10, of U1830A. The clock enable line pin 11 is low. If the duration time is set, so that a trigger pulse (connected to the clock in) for the next duration pulse occurs before the output of the duration generator goes low, the high on the D input, pin 10 of U1830A, is transferred to the output, pin 1. This high is connected to the set input, pin 5, of U1830B which causes the output, pin 2 of U1830B, to go high, illuminating the CONTROL ERROR light, DS500. When the output, pin 2, of U1830B goes high, the inputs to U1830A and B are disabled through the clock enable line. This prevents further trigger inputs until both flip-flops are reset. When the output, pin 2, of U1830B goes and stays high, C1740 starts to charge to the voltage on pin 2, through R1736. This takes approximately 100 ms. When the reset inputs to U1830A and B, pins 13 and 4, reach a high level (about 4 V) U1830A and B are reset and C1740 discharges through R1736. When these reset inputs return to the low level, both flip-flops are ready to accept triggers. The error cycle is now ready to repeat. If the delay time is set for a time greater than the period of the delay triggers, the high on pin 7 of U1830B transfers to pin 2 directly, and the light is illuminated. Reset takes place in the same manner as described above.

The CONTROL ERROR light is also illuminated for certain improper control settings. Fig. 3-1 shows a simplified schematic for the CONTROL ERROR indicator logic and control settings causing illumination.

Output A Amplifier ◇5

The Output A and Output B Amplifier (schematic 8) are basically identical. The positive and negative rise and fall circuits are also similar. Only the positive-going Output A Amplifier circuitry is described in detail.

An ECL signal with period and duration times selected by the operator is present at J1420. This waveform inputs to U1320A and B. The position of S1630, COMPLEMENT NORM, determines the phase relationship of the switching signals at pins 12 and 13 of U1320B to the input at pin 15. This switch shifts the output phase of U1320B 180°. The signal from U1320A drives the Output B Amplifier. The output squarewave is generated in two parts by parallel circuitry. The two parts are the rise and fall edges and the level holding currents. For a positive-going output signal, the base of Q1412 goes positive and Q1313 negative. These transistors form an emitter coupled amplifier. The current switched by these transistors, at their emitters, helps determine the risetime of the output waveform. The higher the current, the faster the risetime for a given amplitude.

A fast negative-going voltage spike is developed by L1400 at the base of Q1410 which drives the base of Q1413. This spike is of short duration and determines the risetime of the output waveform (L1430, Q1422 and Q1424 generate the falltimes). For a positive-going transition at the output, the voltage spike at the base of Q1410 translates to a current spike into the emitter of Q1414.

The level holding current switching signal is a positive-going voltage at the collector of Q1313 as it turns off by a negative-going signal at the base. A constant-voltage source for Q1313 is provided by Q1210. The collector of Q1313 is clamped by CR1310 preventing saturation. The rising voltage at the collector of Q1313 switches the constant current in R1311 away from Q1311 and R1410 to the emitter of Q1310. Because the base of Q1411 has a dc bias, the voltage at the emitter of Q1411 does not change when the current in Q1311 is turned off. However, the current into the emitter of Q1411 increases by the amount that Q1311 removed from R1410.

The level holding current from the collector of Q1411 and the rising edge current from the collector of Q1413 sum into the emitter of common base transistor Q1414. The sum of these two currents drive the output emitter followers Q1510, Q1513, Q1520, and Q1530 for a rising edge. The voltage at the bases of these four transistors will rise until CR1511 forward biases and clamps the output to the high level voltage reference.

Temperature compensation and bias is provided by CR1410, CR1420 and R1420. The +V Ref voltage determines the positive pulse level into an open circuit. This voltage is controlled by the OUTPUT (VOLTS) HIGH LEVEL control. The +8 V/+22 V is also adjusted by the OUTPUT (VOLTS) HIGH LEVEL control. The difference in voltage between the +8 V/+22 V supply and the +V Ref is sufficient to provide an ample operating window for the output amplifier while minimizing power dissipation.

The falling or negative edge circuitry operates in a manner similar to the rising or positive edge circuitry just described with the signal polarities inverted. The common emitter input transistors are Q1320 and Q1420. A voltage spike is generated across L1430. This becomes a current

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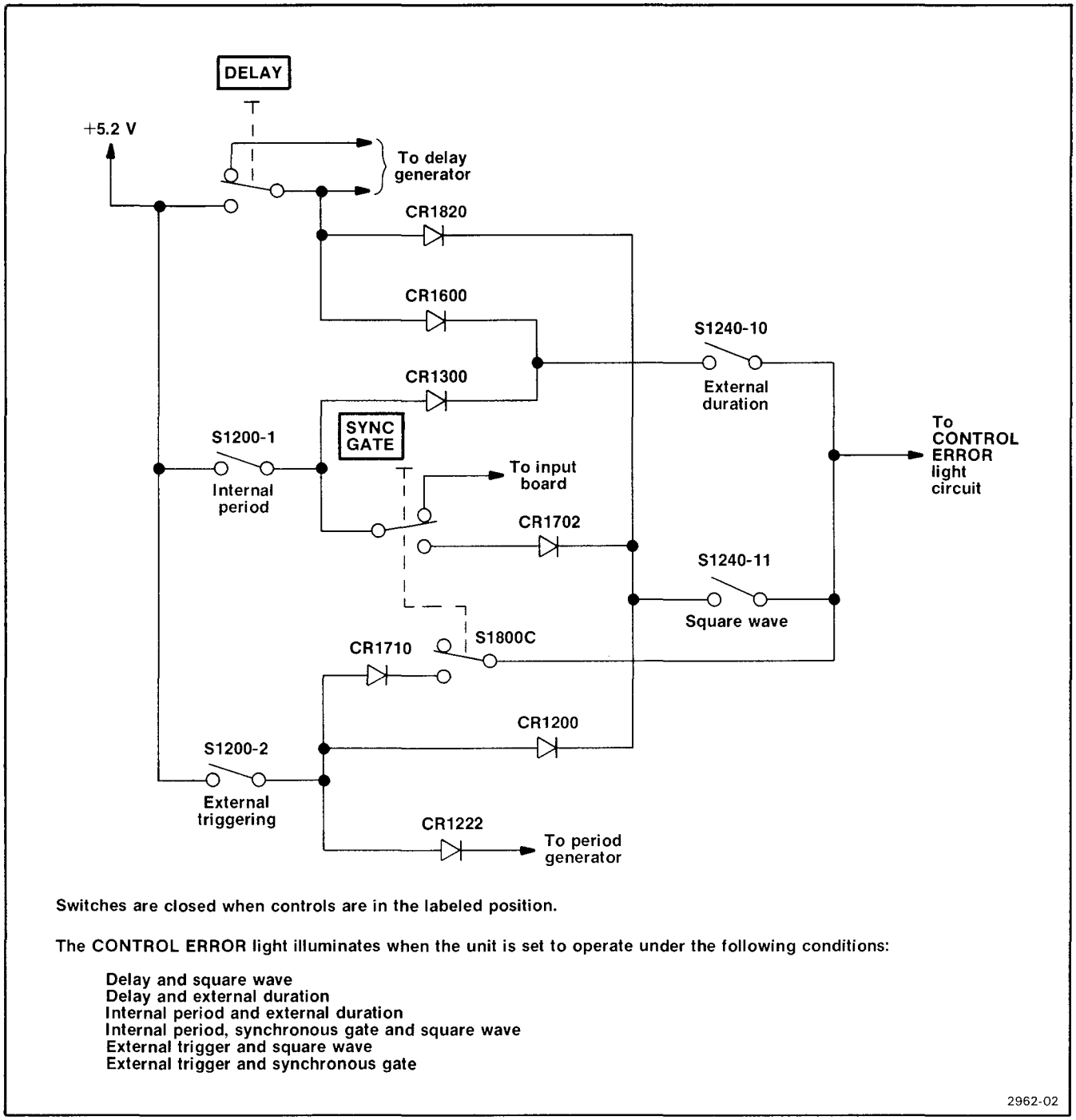


Fig. 3-1. Partial simplified schematic for CONTROL ERROR indicator logic and control settings causing illumination.

spike at the emitter of Q1423 and is mixed with the bias or level holding current from the collector of Q1424. The level holding or bias current change passes from the collector of Q1320 through Q1322, Q1323, and Q1421 to Q1423.

Proper output bias for the level holding current circuitry is provided by R1211 and R1212 in conjunction with Q1202, Q1201 and Q1421. High speed isolation for the base of Q1411 is provided by L1310. Bias for Q1323 is obtained through CR1330 and CR1331.

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Level Control Circuitry ⑥

This circuitry produces the output voltage references for the high and low pulse levels. It also supplies the input voltages that program the tracking supplies. Voltage to the plus inputs of U1130A and U1130B are provided from either an external source at rear interface connectors 22A or 22B, the high or low level preset controls R1010 and R1020 or the front panel high and low level controls, R501 and R502. R1013 and R1023 allow calibration for external control voltage inputs. See the Maintenance section of this manual.

The voltage at pins 3 and 5 of U1130A and B vary from ground to +5.2 V. A voltage difference of 2.6 V from pins 3 and 5 produces the maximum 15 V peak-to-peak open circuit output signal. Operational amplifiers U1130A and B are unity gain amplifiers. The output voltages at pins 1 and 7 of U1130 also vary from 0 to +5.2 V from ground. Should the low level voltage exceed the high level voltage, CR1123 turns on to clamp the high level program voltage more positive than the low level program voltage. In this situation the voltage drop across R1128 and CR1122, which is always conducting due to R1123, will exceed the voltage drop across CR1123. That is, the voltage at pin 7 of U1130B is about 0.6 V higher than the voltage at pin 6. This ensures that the high output level is always more positive than the low output level.

The low level program voltage at pin 6 of U1130B is sensed, through R1131 by U1030A pin 3. The output voltage at pin 1 of U1030A is about 2.0 V above the level at pin 6 of U1130B. Biasing is such that CR1031 is always conducting. If the voltage at pin 2 of U1130A exceeds the voltage at pin 6 of U1130B by about 2.6 V (representing a 15 V peak-to-peak output signal) diode CR1030 comes into conduction and clamps the high level program voltage to no more than 2.6 V above the low level program voltage. This action prevents a signal greater than 15 V peak-to-peak from appearing at the output.

The voltages at pin 2 of U1130A and pin 6 of U1130B are sensed by the Dual Tracking Power Supplies shown on schematic 11. The high and low level control voltages also are sensed by U1020A and U1020B, respectively. These operational amplifiers translate the program voltage (from 0 to 5.2 V) into the high and low output pulse levels (≈ ±16 V).

High and Low Level Buffer and Risetime Control A ⑦

The outputs from Q1220 and Q1221 provide the currents necessary for constant risetime versus amplitude. The outputs from Q1511 and Q1532 provide the buffered high and low reference level voltages for the Output A Amplifier.

The high and low level program voltages are applied to CR1110 and CR1120 respectively, and are sensed by the inputs of U1010A and B. A slight amount of current, enough necessary to keep CR1110 conducting during all conditions, is supplied by Q1330. The same function is provided by Q1301 for CR1120. Bias for these transistors is provided through Q1200 for Q1330 and Q1300 for Q1301.

Transistor pair Q1511 and Q1512 provide a low impedance output buffer for the +V Ref voltage. The same function is provided for the −V Ref by Q1532 and Q1531. Diodes CR1110 and CR1120 provide temperature compensation for Q1511 and Q1532 respectively. Q1302 is a current source providing bias current for the high level buffered voltage reference. Q1331 performs a similar function for the low level buffered voltage reference.

Higher peak-to-peak output pulse amplitudes require increased current. This current is supplied to the spiking inductors in the output stages, 5 and 8, to maintain risetime at the outputs. Peak-to-peak pulse amplitude is sensed by U1010A and B through R1110 and R1012. The voltage to ground at pin 7 of U1010B is inversely proportional to the peak-to-peak output pulse amplitude. Operational amplifier U1010A serves as an inverter for programming the rising edge current. For increasing output amplitude the voltage sensed at pin 2 of U1110A through R1100 and R1103 goes negative and pin 1 goes positive, increasing the current available through Q1220. Also the voltage sensed at pin 6 of U1110B goes high through the action of U1010A. This causes pin 7 of U1110B to go low increasing the current available to the Output A amplilfier.

As the amount of current for a constant risetime varies nonlinearily with the peak-to-peak amplitude of the output waveform, the feedback resistance changes for U1110A and B. The networks connected to the bases of Q1110 and Q1111 determine the bias with respect to the pulse amplitudes for these transistors. For example, as pin 7 of U1110B goes more negative, Q1111 turns on. This action places R1115 in parallel with R1114, thus, decreasing the amount of current available through Q1211. Q1110 operates with U1110A in the same manner.

Output B Amplifier ⑧

See the circuit description for the Output A Amplifier. With both the A and B output COMPLEMENT NORM switches in the same position, the B output signal will be the complement of the A output.

High and Low Level Buffer and Risetime Control B ⑨

See circuit description for High and Low Level Buffer and Risetime Control A.

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Power Supplies (10)

The +11.5 Vdc from the mainframe provides the raw supply voltage for the series regulated +5.2 Vdc supply. The precision voltage regulator, U1800, with voltage divider R1812, R1800, and R1811, provides the reference input to the noninverting input, pin 5. The output voltage is applied to the inverting input, pin 4, through R1813. Sensing differences in the two input potentials, the regulator amplifier provides base current drive from pin 10 to the mainframe series-pass transistor. Current limiting is provided by R1815. When the current from the supply exceeds approximately 1.1 A, the regulator provides no further base drive current to the series-pass element. This limits the output current.

The +33.5 Vdc from the mainframe supplies the regulated +15 Vdc. The three terminal voltage regulator, U500, performs the entire regulating and current limiting functions.

The −33.5 Vdc from the mainframe is the raw supply for the regulated −15 Vdc. A three terminal voltage regulator, U1830, provides the regulating and current limiting function. However, due to additional load considerations, the raw supply is preregulated to decrease power dissipated by the integrated circuit. A shunt current path to the load is furnished by VR1920 and R1820. The Zener voltage also maintains base drive to the series-pass mainframe transistor. This transistor drops the voltage across U1830 by approximately 3.6 V.

Dual Tracking Supplies (11)

These supplies provide the ±8 V and ±22 V power required by the output amplifiers. The voltage at the base of Q1622 varies from 0 V to +5.2 V, depending on the setting of the HIGH LEVEL control. When the voltage at the base of Q1622 varies from 0 V to +2.6 V, the + supply voltage remains fixed at +8 V. As the voltage at the base of Q1622 increases from +2.6 V to +5.2 V, the positive supply voltage increases from +8 V to +22 V.

Transistor Q1622 and Q1620 form a differential comparator. The voltage at the base of Q1620 is referenced between +5.2 V, ground and the output voltage. As the HIGH LEVEL control is increased above +2.6 V, the collector of Q1622 goes negative. This increases current flow through Q1625 and therefore, the series-pass transistor in the mainframe. This raises the plus tracking voltage to the output amplifiers. Feedback to this differential comparator is provided through R1526. Transistor Q1621 prevents the plus tracking voltage from going lower than about +8 V. The base of Q1621 is set at about 2.6 V. When the base of Q1622 goes more negative than about 2.6 V, Q1621 comes into conduction. This holds the common-emitter circuit one diode drop from the base of Q1621. If the base of Q1622 is lowered further, Q1622 loses control of the circuit and the supply voltage remains at the level determined by Q1621, +8 V.

Current limiters for this circuit are Q1623 and Q1626. A differential comparator is formed by these transistors. If the load on the positive supply exceeds the maximum current allowed for the voltage, the voltage drop across R1636 increases conduction in Q1626. This action increases conduction in Q1620 which in turn, allows the collector of Q1622 to go more positive. This action decreases conduction in Q1625 and in the series-pass transistor, limiting current to a safe value. The current source for Q1623 and Q1626 is Q1624. The current flowing through Q1630 is determined by the output voltage. As the output voltage increases the allowable current available from the supply increases. This occurs through the action of Q1630 and current mirror Q1631. These two transistors change the current limit by varying the current through Q1626 as previously described. Higher current with higher voltage is possible due to the reduced voltage drop across the series-pass transistor in the mainframe. Diode CR1530 conducts if the +V supply should go more negative than the ground.

The negative supply operates in the same manner as the positive supply, only the polarities are reversed. Transistors Q1600 and Q1700 form the basic comparator. The base of Q1600 varies between 0 V and +5.2 V. The negative output voltage is prevented from going more positive than about −8 V by Q1701. The series-pass transistor is driven by Q1702. The comparator transistors for current limiting are Q1610 and Q1710. The current source for the current comparator is Q1711. Voltage sensing for current increase is provided by Q1712; Q1713 is the current mirror. Diode CR1610 prevents the negative output voltage from going more positive than ground.

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CALIBRATION

PERFORMANCE CHECK PROCEDURE

Introduction

This procedure checks the electrical performance requirements as listed in the Specification section in this manual. Perform the Adjustment Procedure if the instrument fails to meet these checks. In some cases, recalibration may not correct the discrepancy; circuit troubleshooting is then indicated. Also, use this procedure to determine acceptability of performance in an incoming inspection facility.

Calibration Interval

To ensure instrument accuracy, check the calibration every 1000 hours of operation or at a minimum of every six months if used infrequently.

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 following test adjustment (or equivalent) listed in Table 4-1 is suggested to perform the Performance Check and Adjustment Procedure.

WARNING

Dangerous potentials exist at several points throughout this instrument. Caution must be exercised. When the instrument is operated with the covers removed, do not touch exposed connections or components.

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Table 4-1
LIST OF TEST EQUIPMENT REQUIREMENTS

Description	Performance Requirements	Application		Example
		Perf. Check	Adj. Procedure	
Power Module		X	X	TEKTRONIX TM 503 or TM 504
Oscilloscope Mainframe	Dc to 250 MHz bandwidth	X	X	TEKTRONIX 7704A
Vertical Plug-In	Dc to 150 MHz	X	X	TEKTRONIX 7A16
Sampling Unit Plug-In	Must accept S-1 sampling head	X	X	TEKTRONIX 7S11
Horizontal Plug-In (Time Base)	To 20 ns with X10 mag	X	X	TEKTRONIX 7B70
Horizontal Plug-In (Dual Time Base)	Delayed Sweep to .5 ns	X	X	TEKTRONIX 7B92A
Sampling Sweep Unit Plug-In	Maximum sweep rate 200 ps/div	X	X	TEKTRONIX 7T11
Plug-In Sampling Head	To 1 GHz	X	X	TEKTRONIX S-1
Leveled Sinewave Generator	50 kHz to 50 MHz	X	X	TEKTRONIX SG 503
Digital Multimeter	200 V dc range		X	TEKTRONIX DM 502
Digital Counter	100 MHz with TIME A-B measurement function	X	X	TEKTRONIX DC 503A
VARIAC		X	X	
Coaxial, 50 Ω Precision 36 inch	BNC connectors	X	X	Tektronix Part No. 012-0482-00
Extender Cable (2)			X	Tektronix Part No. 067-0645-02
Adapter, BNC Female to Dual Banana			X	Tektronix Part No. 103-0090-00
50 Ω 10X Attenuator	BNC connectors	X	X	Tektronix Part No. 011-0059-02
50 Ω 5X Attenuator	BNC connectors	X	X	Tektronix Part No. 011-0060-02
50 Ω Feedthrough Termination	BNC connectors	X	X	Tektronix Part No. 011-0049-01

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Preliminary Control Settings

7000 Series Oscilloscope

POWER	ON
FOCUS	as desired for a well-defined display
INTENSITY	
VERTICAL MODE	LEFT
HORIZONTAL MODE	B
A TRIGGER SOURCE	VERT MODE

Vertical Plug-In

VOLTS/DIV	.5 V
VARIABLE (CAL IN)	in
AC-GND-DC	GND

Horizontal Plug-In (Time Base)

Triggering	
MODE	P-P AUTO
COUPLING	AC
SOURCE	EXT
POSITION	displayed trace centered
TIME/DIV	.1 μs
VARIABLE (CAL IN)	in

PG 507 50 MHz Dual-Output Pulse Generator

TRIGGERING	
+ SLOPE/−SLOPE	−SLOPE (out)
SYNC GATE/FREE RUN	FREE RUN (out)
MODE	
UNDLY	in
DELAY	out
PERIOD	.2 μs
CAL	ccw
DELAY	10 ns
CAL	ccw
DURATION	SQ WAVE (INT PERIOD)
CAL	ccw
OUTPUT (VOLTS)	
HIGH LEVEL	+5
LOW LEVEL	−5
PRESET/VAR	VAR (out)
OUTPUT A	NORM (out)
OUTPUT B	NORM (out)
50 Ω/1 MΩ (internal switch)	50 Ω (switch changed by qualified personnel only)

1. Check the Trigger Output Amplitude (≥ +2 V Squarewave)

Refer to Fig. 4-1 for Check setup.

a. Connect a coaxial cable from the PG 507 +TRIG OUT to the vertical plug-in input.

b. Connect a coaxial cable with a 5X attenuator from the PG 507 OUTPUT A to the horizontal plug-in TRIG IN.

c. Change the vertical plug-in AC-GND-DC switch to DC and rotate the triggering level control for a stable display on the crt.

d. CHECK—that the crt displayed squarewave amplitude is equal to or greater than +2 V.

2. Check the Pulse Outputs Amplitude (Open Circuit)

≥15 V p-p maximum.
≤1 V p-p minimum.

Refer to Fig. 4-2 for Check setup and use the preliminary control settings with the following exceptions.

PG 507

OUTPUT (VOLTS)	
HIGH LEVEL	cw
LOW LEVEL	−10

Vertical Plug-In

VOLTS/DIV	5 V

Horizontal Plug-In (Time Base)

TRIGGERING	
SOURCE	INT

a. Connect a coaxial cable from the PG 507 OUTPUT A to the vertical plug-in INPUT.

b. CHECK—that the crt displayed square-wave amplitude is less than 18 V and greater than 15 V peak-to-peak (at least 3 major vertical graticule divisions).

c. Change the vertical plug-in VOLTS/DIV switch to .2 V.

d. Change the PG 507 LOW LEVEL control to 0 and the HIGH LEVEL control to −5.

e. Set the horizontal plug-in triggering level control for a stable display on the crt.

f. CHECK—the displayed signal for less than 1 V peak-to-peak amplitude (less than 5 major vertical graticule divisions).

g. Remove the PG 507 OUTPUT A connection and connect to OUTPUT B. Reset the HIGH LEVEL control fully clockwise and the LOW LEVEL control to −10.

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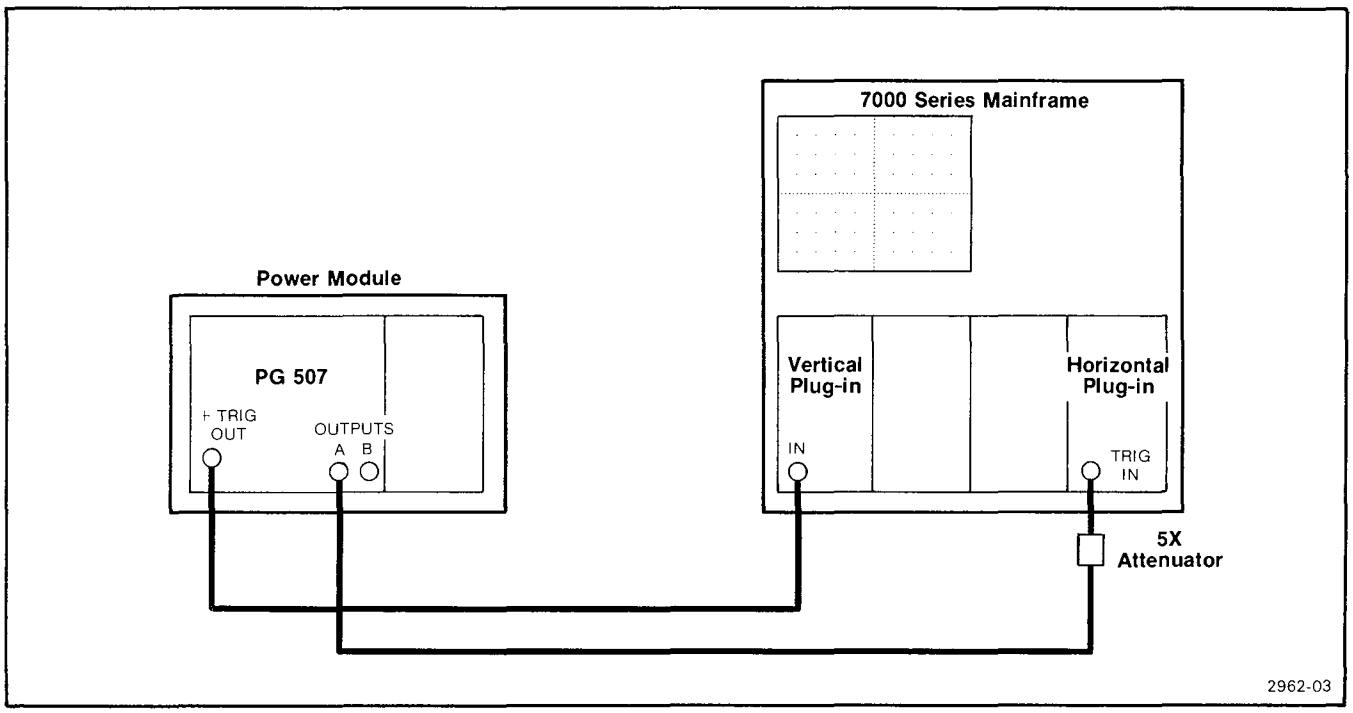


Fig. 4-1. Check setup for trigger output amplitude.

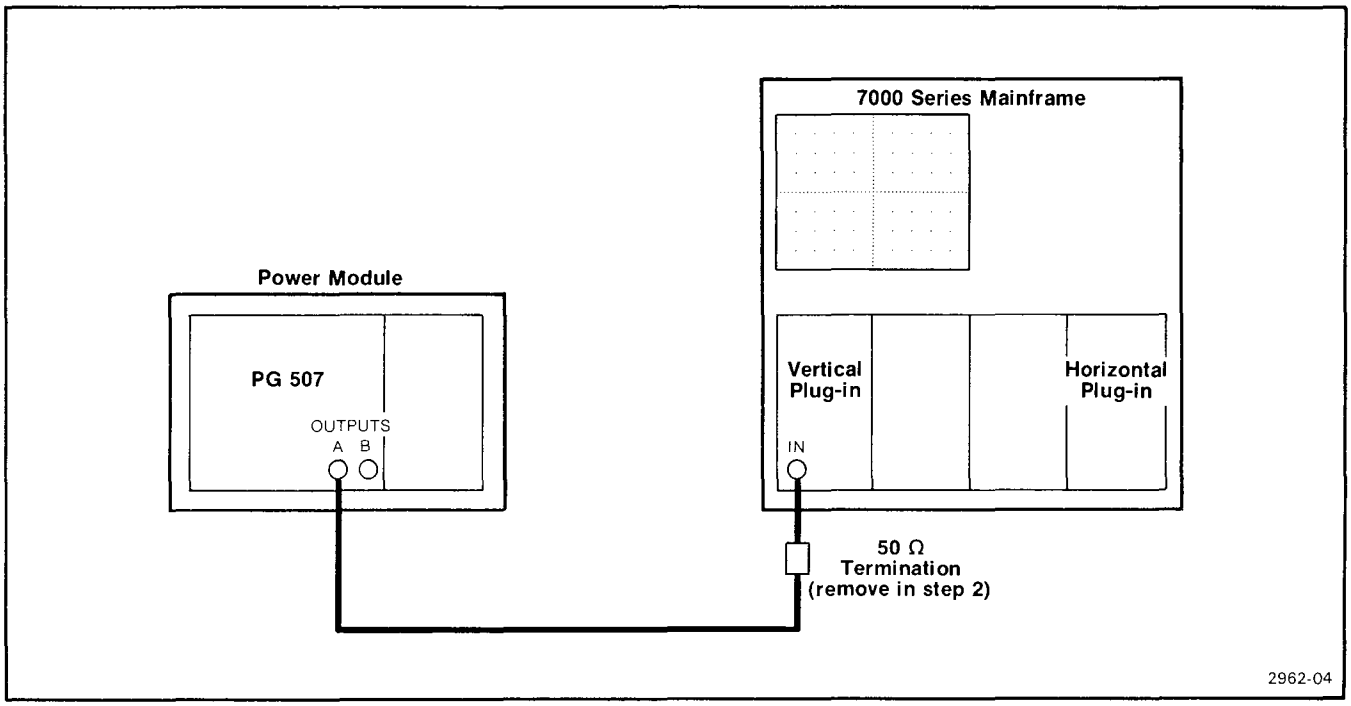


Fig. 4-2. Check setup for pulse outputs (open circuit) and duration ranges.

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h. Repeat steps 2b through 2f.

i. Remove all cables.

3. Check the Pulse Outputs Amplitude (50 Ω load)

≥7.5 p-p maximum.
≤0.5 V p-p minimum.

Refer to Fig. 4-3 for check setup, and use the following control settings.

Sampling Unit Plug-In with Plug-In Sampling Head

OFFSET	trace centered
mVOLTS/DIV	20
VARIABLE (CAL IN)	in
DOT RESPONSE	NORM

Sampling Sweep Unit Plug-In

TIME POSITION RANGE	5 μs
TIME/DIV	100 ns
SLOPE	+
SCAN	REP
TRIG AMP	X1
EXT TRIG	50 Ω, 2 V MAX

a. Connect a coaxial cable with a 10X attenuator from the PG 507 OUTPUT A to the sampling unit plug-in sampling head input.

b. Connect a coaxial cable with a 5X attenuator from the PG 507 + TRIG OUT to the sampling sweep unit plug-in TRIG IN.

c. Set the sampling sweep unit plug-in triggering level control for a stable crt display.

d. CHECK—the displayed signal for an amplitude of less than or equal to 0.5 V peak-to-peak (2.5 major vertical graticule divisions).

e. Change the sampling unit mVOLTS/DIV to 200.

f. Change the PG 507 HIGH LEVEL control to +10 and the LOW LEVEL control to −10.

g. Set the sampling unit OFFSET control to center the displayed waveform.

h. CHECK—the displayed signal for an amplitude equal to or more than 7.5 V peak-to-peak (3.75 major vertical graticule divisions).

i. Remove the PG 507 OUTPUT A connection and connect to the OUTPUT B. Reset the HIGH LEVEL control to −5 and the LOW LEVEL control to 0.

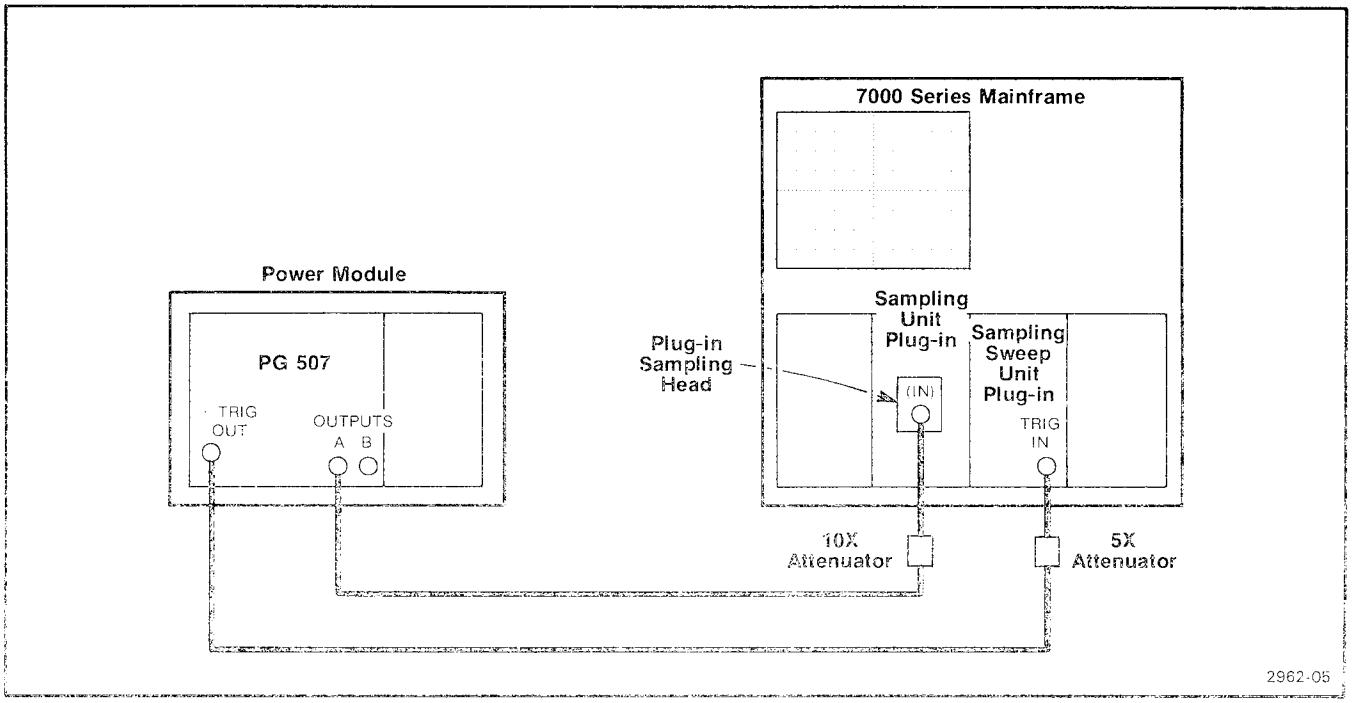


Fig. 4-3. Check setup for pulse outputs (50 Ω), aberrations, and rise/fall times.

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j. Repeat steps 3c and 3d.

4. Check OUTPUT A Rise Time, Fall Time, and Aberrations

≤3.5 ns fixed from 1 V to 5 V p-p into 50 Ω load.
≤4.0 ns fixed over 5 V into 50 Ω load.
Aberrations ≤5% +50 mV.

Refer to Fig. 4-3 for check setup and Fig. 4-4 for pulse characteristics. Use the preliminary control settings with following exceptions.

Sampling Unit Plug-In With Plug-In Sampling Head

OFFSET	displayed trace centered
mVOLTS/DIV	100
VARIABLE (CAL IN)	in
DOT RESPONSE	NORM

Sampling Sweep Unit Plug-In

TIME POSITION RANGE	5 μs
TIME/DIV	20 ns
SLOPE	+
TRIG AMP	X1
EXT TRIG	50 Ω, 2 V MAX

PG 507

HIGH LEVEL	+5
LOW LEVEL	−5
PERIOD	0.2 μs

a. Remove the PG 507 OUTPUT B connection and connect to the OUTPUT A.

b. Set the PG 507 PERIOD CAL control to display the signal with approximately 100 ns period (approximately 10 major horizontal graticule divisions).

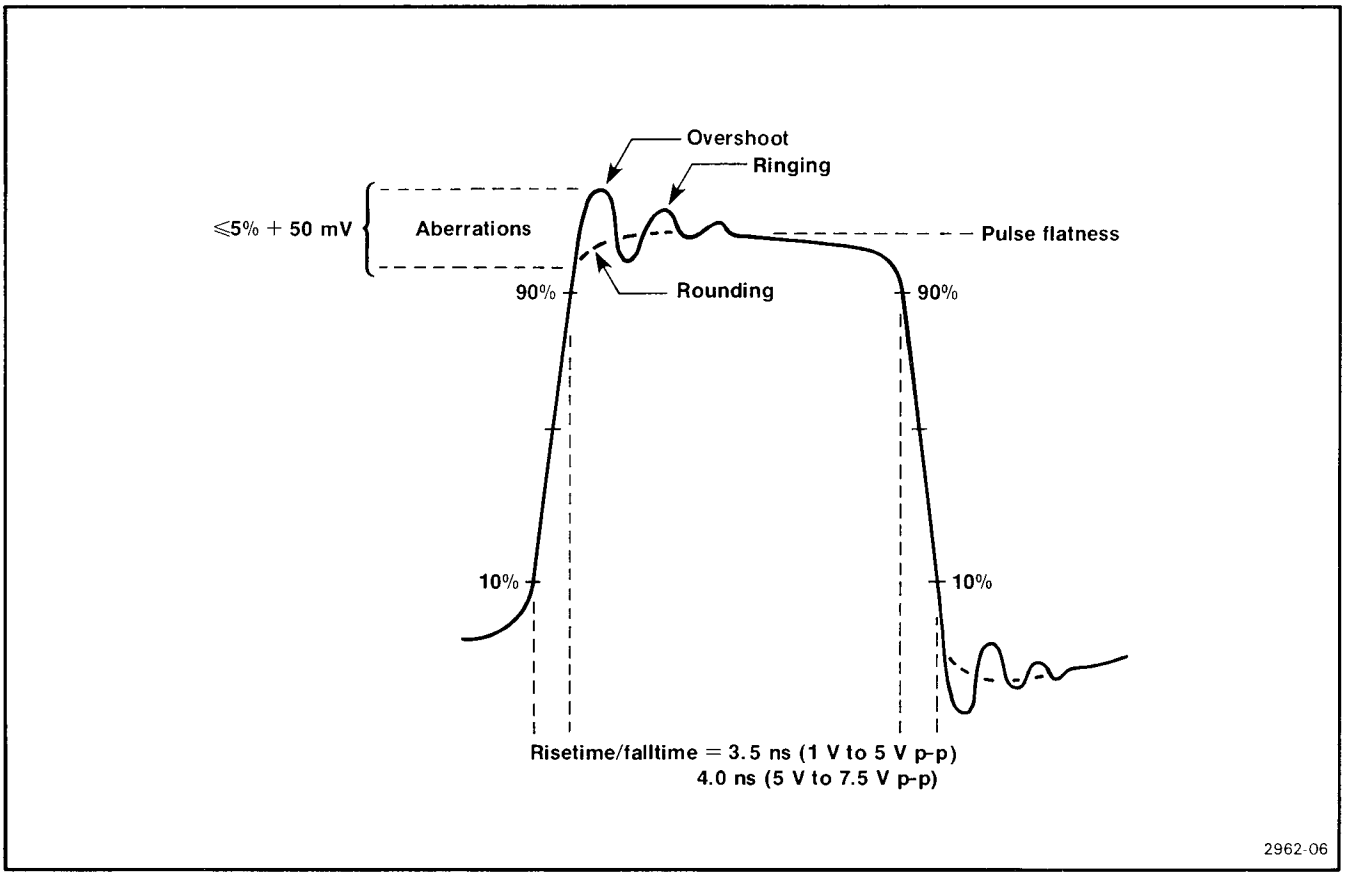


Fig. 4-4. Pulse characteristics (idealized).

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c. Adjust the PG 507 LOW LEVEL control for the bottom portion of the crt waveform display to appear 3.5 major graticule divisions below the graticule center line.

d. Adjust the PG 507 HIGH LEVEL control for the top portion of the crt waveform display to appear 3.5 major graticule divisions above the graticule center line.

e. Rotate the sampling unit OFFSET control to center the displayed waveform. Rotate the VARIABLE (out) control to display the waveform on 5 major graticule divisions.

f. Change the sampling sweep unit TIME/DIV switch to 1 ns.

g. Set the sampling unit TIME POSITION control so that the 10% point of the displayed signal amplitude appears on the second major vertical graticule line and the 90% point appearing on or before the sixth major vertical graticule line.

h. CHECK—the displayed waveform at the 10% and 90% graticule marks for risetime and falltime ≤4 ns (see Fig. 4-4).

i. Change the sampling sweep unit TIME/DIV switch to 20 ns.

j. CHECK—the displayed waveform for aberrations ≤5.7% (see Fig. 4-4).

k. Set the sampling unit VARIABLE control in.

l. Adjust the PG 507 LOW LEVEL control for the bottom portion of the crt waveform display to appear 2.5 major graticule divisions below the graticule center line.

m. Adjust the PG 507 HIGH LEVEL control for the top portion of the crt waveform display to appear 2.5 major graticule divisions above the graticule center line.

n. Repeat steps 4f and 4g.

o. CHECK—the displayed waveform at the 10% and 90% graticule marks for risetime and falltime ≤3.5 ns (see Fig. 4-4).

p. Change the sampling sweep unit TIME/DIV switch to 20 ns.

q. CHECK—the displayed waveform for aberrations ≤6% (see Fig. 4-4).

r. Change the sampling unit mVOLTS/DIV switch to 20.

s. Adjust the PG 507 LOW LEVEL control for the bottom portion of the crt waveform display to appear 2.5 major graticule divisions below the graticule center line.

t. Adjust the PG 507 HIGH LEVEL control for the top portion of the crt waveform display to appear 2.5 major graticule divisions above the graticule center line.

u. Repeat steps 4f and 4g.

v. CHECK—the displayed waveform at the 10% and 90% graticule marks for risetime and falltime ≤3.5 ns (see Fig. 4-4).

w. Change the sampling sweep unit TIME/DIV switch to 20 ns.

x. CHECK—the displayed waveform for aberrations ≤10% (see Fig. 4-4).

5. Check OUTPUT B Rise Time, Fall Time, and Aberrations

≤3.5 ns at 1 V to 5 V p-p into 50 Ω load.
≤4.0 ns at 5 V to 7.5 V p-p into 50 Ω load.
Aberrations ≤5% +50 mV.

Refer to Fig. 4-3 check setup and Fig. 4-4 pulse characteristics.

a. Remove the PG 507 OUTPUT A cable connection and connect to OUTPUT B. Repeat all items in step 4 of this procedure.

6. Check Delay Range (≤10 ns to ≥100 ms in seven decade steps plus variable, with overlap on all ranges) and Delay Duty Factor (delays to 70% for pulse periods ≥0.2 μs, decreasing to 50% for a 20 ns period).

Refer to Fig. 4-5 check setup and preliminary control settings with following exceptions.

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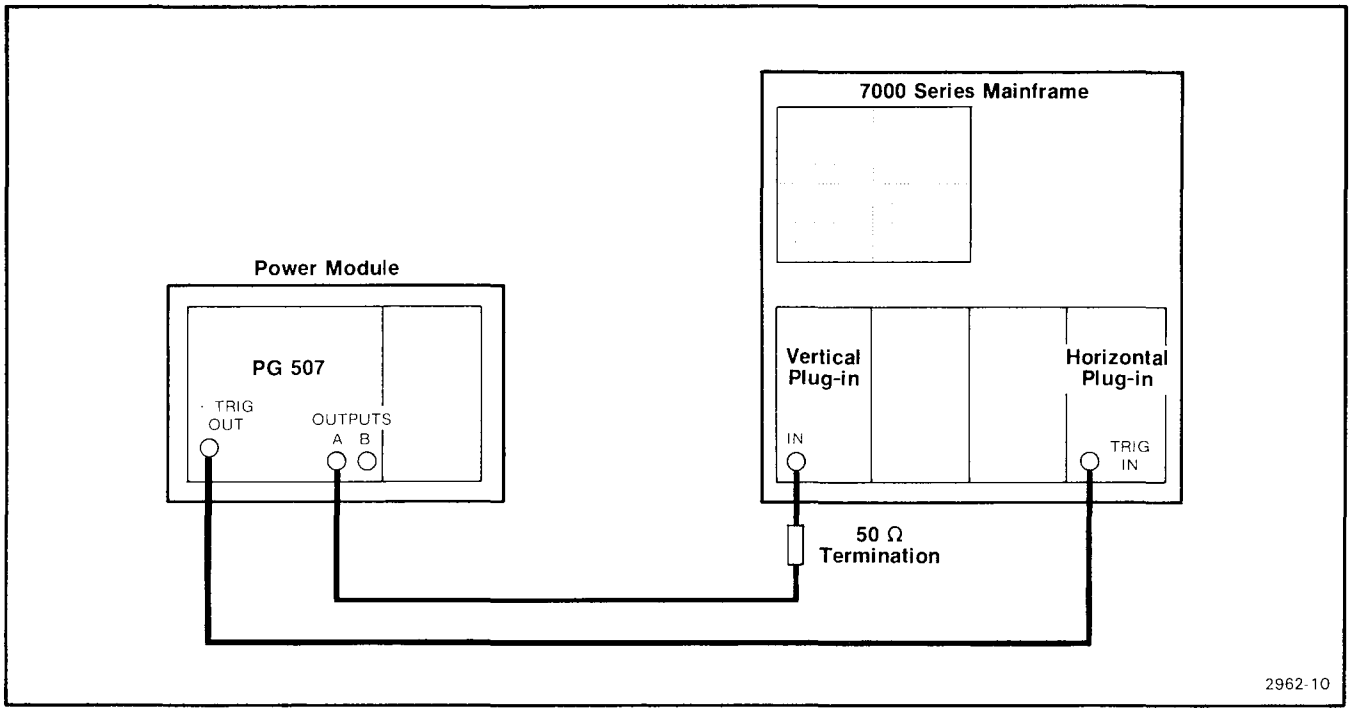


Fig. 4-5. Check setup for performance check step 6.

7000 Series Oscilloscope

VERTICAL MODE	LEFT
HORIZONTAL MODE	B

Vertical Plug-In

VOLTS/DIV	1 V
VARIABLE	(CAL IN) in
AC-GND-DC	GND
POSITION	trace centered

Horizontal Plug-In (Time Base)

TRIGGERING	
MODE	NORM
SLOPE	+
COUPLING	AC
SOURCE	EXT
TERM	OUT
DISPLAY MODE	TIME BASE (in)
TIME/DIV	.1 μs
VARIABLE (CAL IN)	in

PG 507

PERIOD	as listed
CAL	cw
DURATION	as listed
CAL	ccw
OUTPUT (VOLTS)	
HIGH LEVEL	+5
LOW LEVEL	-5
PRESET—VAR	VAR (out)

a. Connect a coaxial cable with a 50 Ω termination from the PG 507 OUTPUT A to the vertical plug-in INPUT.

b. Connect a coaxial cable from the PG 507 + TRIG OUT to the horizontal plug-in TRIG IN.

c. Change the vertical plug-in AC-GND-DC switch to DC.

d. Rotate the horizontal plug-in trigger LEVEL control for a stable display on the crt.

e. Press the PG 507 MODE DELAY pushbutton (in).

f. CHECK—that the displayed signal shifts less than 1 major graticule division.

g. Set the PG 507 to BOTH PAIRED (both pushbuttons in).

h. Set the horizontal plug-in MAGNIFIER to X1 (in).

i. CHECK—the DELAY ranges as noted with the following control settings and display results given in Table 4-2. Also check for smooth operation of the DELAY CAL control.

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Table 4-2

DELAY RANGES

PG 507				Horizontal Plug-In	PG 507 CAL range
PERIOD	DELAY	CAL (var.)	DURATION	TIME/DIV	CRT Display
2 μs	10 ns	cw	10 ns	.1 μs	1.2 to 2.5 div.
2 μs	.1 μs	ccw	10 ns	.1 μs	.9 to 1.1 div.
20 μs	.1 μs	cw	.1 μs	1 μs	1.2 to 2.5 div.
20 μs	1 μs	ccw	.1 μs	1 μs	.9 to 1.1 div.
20 μs	1 μs	cw	1 μs	10 μs	1.2 to 2.5 div.
20 μs	10 μs	ccw	1 μs	10 μs	.9 to 1.1 div.
.2 ms	10 μs	cs	10 μs	.1 ms	1.2 to 2.5 div.
.2 ms	.1 ms	ccw	10 μs	.1 ms	.9 to 1.1 div.
2 ms	.1 ms	cw	.1 ms	1 ms	1.3 to 2.5 div.
2 ms	1 ms	ccw	.1 ms	1 ms	.9 to 1.3 div.
20 ms	1 ms	cw	1 ms	10 ms	1.3 to 2.5 div.
20 ms	10 ms	ccw	1 ms	10 ms	.9 to 1.3 div.
20 ms	10 ms	cw	10 ms	50 ms	2.5 to 5 div.

NOTE

The blank front panel DELAY switch position is for customer installed components only.

7. Check Period Range
≤10 ns to 200 ms in seven decade steps plus variable, with overlap on all ranges.

Refer to Fig. 4-6 for check setup and use the following control settings.

Digital Counter Plug-In

DISPLAY TIME	ccw
FUNCTION	
FREQUENCY A	10s
COUPL	DC (out)
SOURCE	EXT (out)
ATTEN	X1 (out)
SLOPE	+ (out)

PG 507

TRIGGERING	
SLOPE +/−	− (out)
SYNC GATE/FREE RUN	FREE RUN (out)
MODE	
UNDLY	in
DELAY	out
PERIOD	as listed
CAL (variable)	as listed
DELAY	10 ns
CAL (variable)	ccw
DURATION	SQ WAVE (INT PERIOD)
CAL (variable)	ccw
OUTPUT (VOLTS)	
HIGH LEVEL	+10
LOW LEVEL	0
PRESET—VAR	VAR (out)
OUTPUT A	NORM (out)
OUTPUT B	NORM (out)

a. Connect a coaxial cable from the PG 507 + TRIG OUT through a 50 Ω termination to the counter plug-in INPUT.

b. Adjust the counter LEVEL control for a stable display readout on the counter.

c. CHECK—the PERIOD ranges as noted with the following control settings and readout results given in Table 4-3. Also check for smooth operation of the PERIOD CAL control.

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Table 4-3

PERIOD RANGES

PG 507		Digital Counter	
PERIOD	CAL (PERIOD)	Timing	Readout
20 ms	cw	10 s	<.0050
20 ms	ccw	10 s	.0400—.0600 (note reading)
2 ms	cw	10 s	< above reading
2 ms	ccw	1 s	.400—.600 (note reading)
.2 ms	cw	1 s	< above reading
.2 ms	ccw	1 s	4.500—5.500 (note reading)
20 μs	cw	1 s	< above reading
20 μs	ccw	100 ms	45.00—55.00 (note reading)
2 μs	cw	100 ms	< above reading
2 μs	ccw	100 ms	450.00—550.00 (note reading)
.2 μs	cw	100 ms	< above reading
.2 μs	ccw	10 ms	4.5000—5.5000 (note reading)
20 ns	cw	10 ms	< above reading
20 ns	ccw	10 ms	> 50.000

NOTE

The blank front panel PERIOD switch position is for customer installed components only.

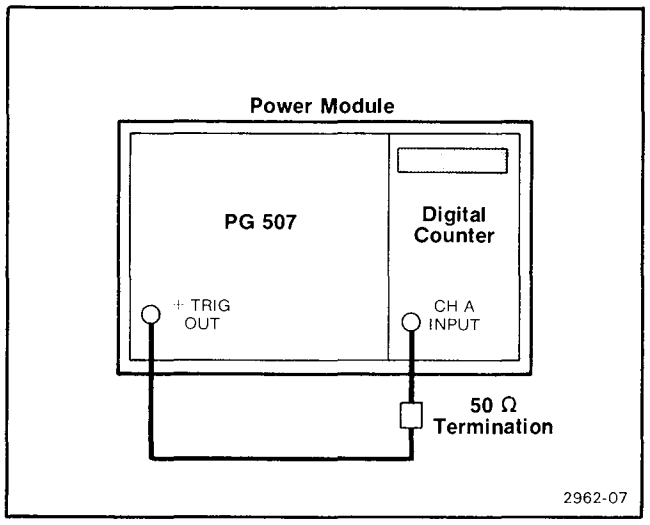


Fig. 4-6. Check setup for timing period ranges.

8. Check Duration Range (≤10 ns to ≥100 ms in seven decade steps plus variable, with overlap on all ranges) and Duration Duty Factor (durations to 70% for pulse periods ≥0.2 μs, decreasing to 50% for a 20 ns period).

Refer to Fig. 4-2 check setup and preliminary control settings with the following exceptions.

Vertical Plug-In

VOLTS/DIV	2 V
VARIABLE (CAL IN)	in
AC-GND-DC	DC

Horizontal Plug-In (Time Base)

TRIGGERING	
MODE	NORM
COUPLING	AC
SOURCE	INT
MAGNIFIER	X1
POSITION	trace centered
TIME/DIV	as listed

PG 507

PERIOD	as listed
CAL (variable)	ccw
DURATION	as listed
CAL (variable)	as listed

a. Rotate the vertical plug-in POSITION control to center the trace on the crt.

b. Connect a coaxial cable from the PG 507 OUTPUT A through a 50 Ω termination to the vertical plug-in INPUT.

c. Set the horizontal plug-in triggering level and slope controls for a stable positive crt display.

d. CHECK—the Duration ranges as noted with the following control settings and display results given in Table 4-4. Also check for smooth operation of the DURATION CAL control.

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Table 4-4

DURATION RANGES

PG 507			Horizontal Plug-In	Crt Display
PERIOD	DURATION	CAL (DURATION)	TIME/DIV	Duration at 50% Amplitude
20 ns	10 ns	ccw	.02 μs	≤.5 div
.2 μs	10 ns	cw	.02 μs	5.5 to 8 div.
.2 μs	.1 μs	ccw	.02μs	4.5 to 5.5 div.
2 μs	.1 μs	cw	.2 μs	6 to 10 div.
2 μs	1 μs	ccw	.2 μs	4.5 to 5.5 div.
20 μs	1 μs	cw	2 μs	6 to 10 div.
20 μs	10 μs	ccw	2 μs	4.5 to 5.5 div.
.2 ms	10 μs	cw	20 μs	6 to 10 div.
.2 ms	.1 ms	ccw	20 μs	4.5 to 6 div
2 ms	.1 ms	cw	.2 ms	6 to 10 div.
2 ms	1 ms	ccw	.2 ms	4.5 to 6 div.
20 ms	1 ms	cw	2 ms	6 to 10 div.
20 ms	10 ms	ccw	2 ms	4.5 to 6 div.
20 ms[a]	10 ms	cw	20 ms	≥6 div.

[a] with PERIOD CAL control cw.

NOTE

The blank front panel DURATION switch position is for customer installed components only.

9. Check Trigger/Gate Sensitivity 80 mV p-p to ≥10 MHz and 250 mV p-p to 50 MHz at 50 Ω input impedance.

Refer to Fig. 4-7 check setup and preliminary control settings with following exceptions.

Vertical Plug-In

VOLTS/DIV	1 V
AC-GND-DC	GND
POSITION	trace centered

Horizontal Plug-In (Time Base)

TRIGGERING	
MODE	AUTO
COUPLING	AC
POSITION	trace centered
SOURCE	INT
TIME/DIV	.02 μs
VARIABLE (CAL IN)	in

Sine-Wave Generator

FREQUENCY RANGE	25—50
AMPLITUDE MULT	X.1
OUTPUT AMPLITUDE	2.5
FREQUENCY VARIABLE	50.0

PG 507

TRIGGERING	
SLOPE +/−	− (out)
SYNC GATE/FREE RUN	FREE RUN (out)
TRIG/GATE LEVEL	ccw
MODE	
UNDLY	in
DELAY	out
PERIOD	EXT TRIG or MAN
CAL (variable)	ccw
DELAY	10 ns
CAL (variable)	ccw
DURATION	EXT DUR
CAL (variable)	ccw
OUTPUT (VOLTS)	
HIGH LEVEL	+5
LOW LEVEL	−5
PRESET—VAR	VAR (out)
OUTPUT A	NORM (out)
OUTPUT B	NORM (out)

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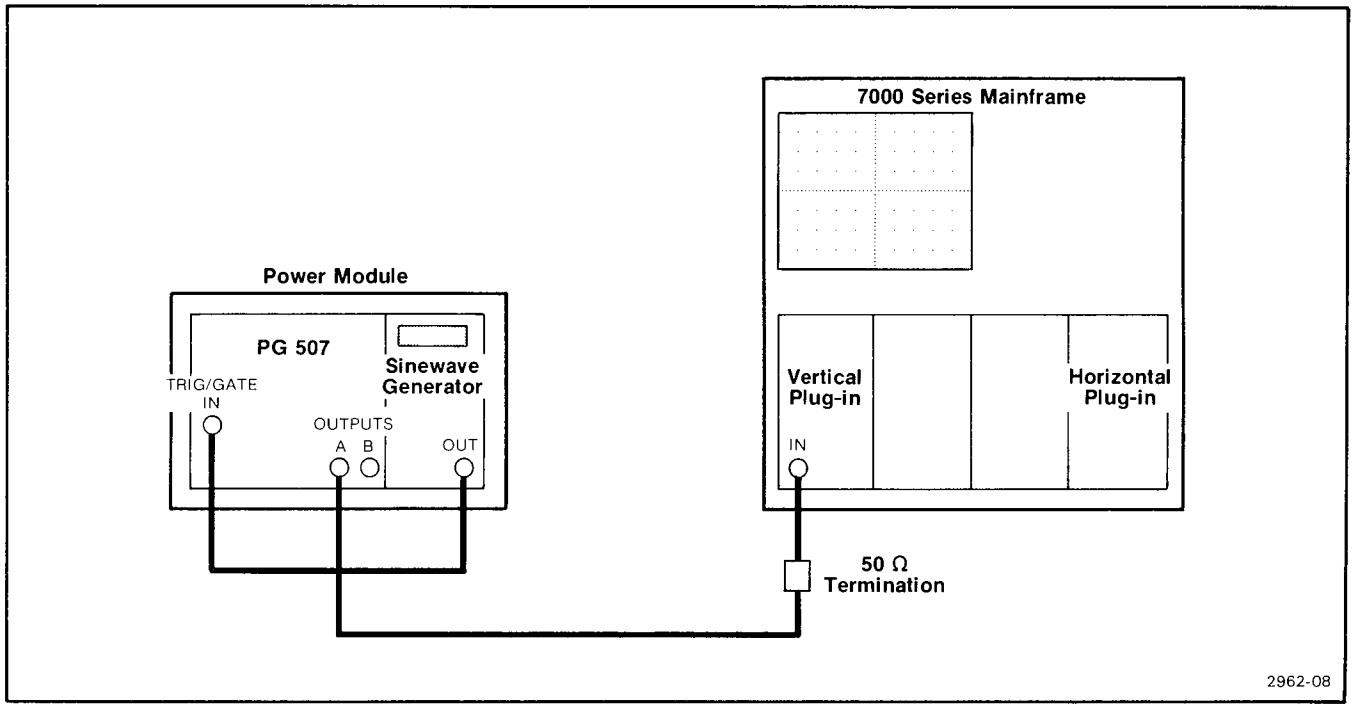


Fig. 4-7. Check setup for trigger level and TRIG/GATE sensitivity.

a. Connect a coaxial cable from the sine-wave generator OUT to the PG 507 TRIG/GATE IN.

b. Connect a coaxial cable from the PG 507 OUTPUT A through a 50 Ω termination to the vertical plug-in INPUT.

c. Change the vertical plug-in AC-GND-DC switch to DC.

d. Rotate the PG 507 TRIG/GATE LEVEL control clockwise until the TRIG'D/GATED light pulses on and off (flashing).

e. CHECK—that the PG 507 CONTROL ERROR light is off and a squarewave signal is displayed on the crt.

f. Rotate the sine-wave generator FREQUENCY VARIABLE control counterclockwise and note the square-wave period (display) tracks with this control.

g. Change the sine-wave generator FREQUENCY RANGE switch to 5-10 and the FREQUENCY VARIABLE control to 10.0.

h. Change the sine-wave generator OUTPUT AMPLITUDE to 0.8.

i. Set the PG 507 TRIG/GATE LEVEL control for a displayed pulse.

j. CHECK—for a stable pulse on the crt display.

k. Set the PG 507 TRIG/GATE LEVEL control to +3 V MAN.

l. CHECK—for no pulse display on crt and that displayed trace is approximately 2.5 graticule divisions above the center graticule line with the TRIG'D/GATED light on.

m. Press and hold the PG 507 MAN pushbutton switch.

n. CHECK—that the displayed trace shifts approximately 2.5 divisions below the graticule center line and the TRIG'D/GATED light is off.

o. Release the PG 507 MAN pushbutton switch and press the SLOPE +/− switch to + (in).

p. CHECK—that the TRIG'D/GATED light is off and the displayed trace is approximately 2.5 graticule divisions below the center graticule line.

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10. Check Trigger Level Range (≥±3 V)

Refer to Fig. 4-7 for check setup with the following exception.

PG 507	
SLOPE +/−	− (out)
Input Impedance (internal switch)	1 MΩ

WARNING

The PG 507 input impedance switch to be changed by qualified service personnel only.

a. Change the sine-wave generator FREQUENCY RANGE switch to read between 2.5 to 5 and the AMPLITUDE MULTIPLIER to X1.

b. Set the sine-wave generator OUTPUT AMPLITUDE to 3.0.

c. Rotate the PG 507 TRIG/GATE LEVEL control from clockwise to counterclockwise position.

d. CHECK—that the crt display changes from a lower level flat line through smooth durations to an upper level flat line.

e. Change the PG 507 SLOPE +/− switch to + (in).

f. Rotate the PG 507 TRIG/GATE LEVEL control from clockwise to counterclockwise position.

g. CHECK—that the display now changes from the lower level flat line through smooth durations to an upper level flat line.

h. Set the internal Input Impedance switch back to the 50 Ω position.

11. Check Period, Delay, and Duration Jitter (≤0.1% +50 ps)

Refer to Fig. 4-8 check setup and preliminary control control settings with the following exceptions.

PG 507	
PERIOD	20 ns
CAL	ccw
DELAY	10 ns
CAL	cw
DURATON	10 ns
CAL	ccw

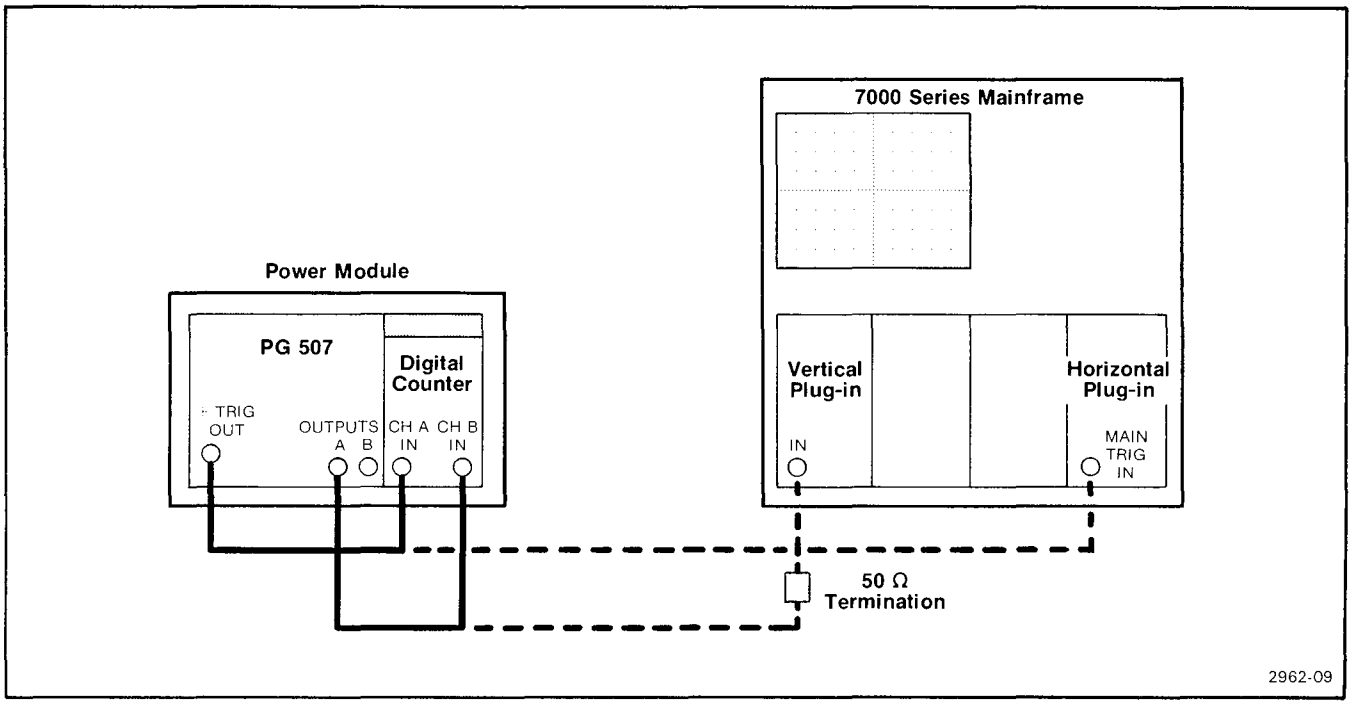


Fig. 4-8. Check setup for period, delay, and duration jitter.

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Vertical Plug-In

VOLTS/DIV	1 V
VARIABLE (CAL IN)	in
AC-GND-DC	DC

Horizontal Plug-In (Dual Time Base)

MAIN TRIGGERING	
SOURCE	INT
TERM OUT 50 OHM	out
ALT OFF	ccw
TIME/DIV or DLY TIME	50 ns
PULL FOR ALT	50 ns (in)
PUSH FOR DLY'D	in

Digital Counter

FUNCTION	PERIOD B
AVGS	1
DISPLAY TIME	ccw
CH A and CH B	
SLOPE	+ (out)
ATTEN	X1 (out)
COUPL	DC (out)
SOURCE	EXT (out)
LEVEL	midrange

Period Jitter

a. Connect a coaxial cable from the PG 507 OUTPUT A through a 50 Ω termination to the vertical plug-in CH 1 INPUT.

b. Adjust the PG 507 PERIOD CAL control to display 1 cycle of signal for each horizontal graticule division.

c. Set the horizontal plug-in PULL FOR ALT—PUSH FOR DLY'D out and in the .5 ns position.

d. Set the horizontal plug-in INTENSITY control for an intensified displayed waveform.

e. Adjust the horizontal plug-in DELAY TIME MULT control so that the intensified portion of the display is on the second cycle.

f. Set the horizontal plug-in PULL FOR ALT—PUSH FOR DLY'D switch in and set the DELAY TIME MULT control to display the rising edge of the waveform.

g. CHECK—that the period jitter measures less than 0.2 major horizontal graticule division.

h. Adjust the PG 507 PERIOD control to read 20 ms and rotate the PERIOD CAL control fully clockwise.

i. Detach the coaxial cable from the vertical plug-in INPUT and remove the 50 Ω termination. Re-attach cable to the digital counter CH B IN.

j. Rotate the digital counter CH B LEVEL control for a stable display readout. Note and record this readout.

k. Note the first four counter display readout digits (from left to right) and count 10 gate cycles (minimum,).

l. CHECK—the digital counter display for a readout change of less than 0.1% during 10 gate cycles.

Delay Jitter

a. Change the PG 507 PERIOD control to 20 ns and rotate the PERIOD CAL control clockwise.

b. Remove the coaxial cable from the digital counter CH B IN. Re-attach the 50 Ω termination to cable and connect to the vertical plug-in INPUT.

c. Connect a coaxial cable from the PG 507 +TRIG OUT to the horizontal plug-in MAIN TRIG IN.

d. Change the horizontal plug-in MAIN TRIGGERING SOURCE switch to EXT, set the PULL FOR ALT—PUSH FOR DLY'D switch out and in the .5 ns position. Rotate the POSITION control to display the leading edge of the first pulse on the second vertical graticule line.

e. Change the PG 507 MODE switch to DELAY (in) and set the DELAY CAL control to display the leading edge of the first pulse on the third vertical graticule line.

f. Adjust the horizontal plug-in DELAY TIME MULT control to intensify the first pulse.

g. Set the horizontal plug-in PULL FOR ALT—PUSH FOR DLY'D switch in and adjust the DELAY TIME MULT control to display the leading edge of the pulse.

h. CHECK—that the delay jitter measures less than 0.2 major horizontal graticule division.

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i. Change the PG 507 PERIOD control to 20 ms, the DELAY control to 10 ms, and rotate the DELAY CAL control clockwise.

j. Detach the coaxial cable from the horizontal plug-in MAIN TRIG IN and re-attach to the digital counter CH A IN.

k. Detach the coaxial cable from the vertical plug-in INPUT, remove the 50 Ω termination and re-attach cable to the digital counter CH B IN.

l. Change the digital counter FUNCTION switch to TIME A-B and set the CH A and CH B LEVEL controls for a stable count readout. Note and record this display readout.

m. Note the first four counter display readout digits (from left to right) and count 10 gate cycles (minimum).

n. CHECK—the digital counter display for a readout change of less than 0.1% during 10 gate cycles.

Duration Jitter

a. Change the PG 507 PERIOD control to 20 ns, and rotate the DELAY CAL control counterclockwise. Push the MODE UNDLY switch in.

b. Remove the coaxial cable from the digital counter CH B IN. Re-attach the 50 Ω termination to cable and connect to the vertical plug-in INPUT.

c. Change the horizontal plug-in MAIN TRIGGERING SOURCE switch to INT and set the PULL FOR ALT—PUSH FOR DLY'D switch out and in the .5 ns position.

d. Set the PG 507 DURATION CAL control to display a positive duration of 1 major horizontal graticule division.

e. Adjust the horizontal plug-in DELAY TIME MULT control to intensify the falling edge of the first pulse.

f. Reset the horizontal plug-in PULL FOR ALT—PUSH FOR DLY'D switch in and adjust the DELAY TIME MULT control to center the falling edge of the displayed pulse on the crt.

g. CHECK—that the duration jitter measures less than 0.2 major horizontal graticule division.

h. Detach the coaxial cable from the vertical plug-in INPUT and remove the 50 Ω termination. Re-attach cable to the digital counter CH B IN.

i. Change the PG 507 PERIOD control to 20 ms, the DURATION control to 10 ms and rotate the DURATION CAL control clockwise.

j. Change the digital counter FUNCTION switch to WIDTH B.

k. Rotate the digital counter CH B LEVEL control for a stable display. Note and record this display readout.

l. Note the first four counter display readout digits (from left to right) and count 10 gate cycles (minimum).

m. CHECK—the digital counter display for a readout change of less than 0.1% during 10 gate cycles.

n. Remove all connections.

This completes the performance check.

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ADJUSTMENT PROCEDURE

Introduction

Use this Adjustment Procedure to restore the PG 507 to original performance requirements. This Adjustment Procedure need not be performed unless the instrument fails to meet the Performance Requirements of the Electrical characteristics listed in the Specification section, or if the Performance Check procedure cannot be completed satisfactorily. If the instrument has undergone repairs, the Adjustment Procedure is recommended.

Satisfactory completion of all adjustment steps in this procedure assures that the instrument will meet the Performance Requirements.

Test Equipment Required

The test equipment (or equivalent) listed in Table 4-1 is required for adjustment of the PG 507. Specifications given for the test equipment are the minimum necessary for accurate adjustment. All test equipment is assumed to be correctly calibrated and operating within specifications.

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

Preparation

Access to the internal adjustments is achieved most easily when the PG 507 is connected to the power module with flexible plug-in extenders. Remove the left side cover of the PG 507 to reach the adjustments on the Timing board. Remove the right side cover to reach the adjustments on the Output B board. Remove the top cover for adjustments access on the Output A board. Refer to Adjustment Locations and Adjustment setups in the pull-out pages at the rear of this manual.

NOTE

Make adjustments at an ambient temperature between +20°C and +25°C.

Preliminary Control Settings

POWER MODULE

LINE SELECTOR	HI

VARIAC

Range Switch	300 W
AC VOLT meter	120

Digital Multimeter Plug-In

RANGE/FUNCTION	20 DC Volts
INPUT (pushbutton)	out

PG 507

TRIGGERING	
+ SLOPE/− SLOPE	+ SLOPE
SYNC GATE/FREE RUN	FREE RUN (out)
MODE	
UNDLY	in
DELAY	out
PERIOD	.2 μs
CAL	ccw
DELAY	10 ns
CAL	ccw
DURATION	SQ WAVE (INT PERIOD)
CAL	ccw
OUTPUT (VOLTS)	
HIGH LEVEL	0
LOW LEVEL	0
PRESET/VAR	VAR (out)
OUTPUT A	NORM (out)
OUTPUT B	NORM (out)
TRIG/GATE IN	
50 Ω/1 mΩ (internal switch)	50 Ω (switch changed by qualified personnel only)

1. Check the +15 V Supply Accuracy

a. Insert the PG 507 and digital multimeter into the power module.

b. Connect the power module power cord to the VARIAC and turn on the power module and VARIAC.

c. Connect the test leads to the digital multimeter HI and LO inputs.

d. Connect the digital multimeter HI test lead to the PG 507 +15 V test point (TP1800) located on the Output B board. Connect the LO test lead to the GND test point (TP1640).

e. The digital multimeter readout must indicate between +14.250 and +15.750.

f. Remove the HI test lead.

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2. Check the −15 V Supply Accuracy

a. Connect the digital multimeter HI test lead to the −15 V test point (TP1920) located on the Output B board.

b. The digital multimeter readout must indicate between −14.250 and −15.750.

c. Remove the HI test lead.

3. Adjust the +5.2 V ADJ, R1800

a. Connect the digital multimeter HI test lead to the +5 V test point (TP1910) located on the Output B board.

b. ADJUST—potentiometer R1800 located on the Output B board until the digital multimeter readout indicates +5.20.

c. Remove the HI test lead.

4. Check the + Variable Supply Accuracy

a. Connect the digital multimeter HI test lead to the positive lead of capacitor C1530 located on the Output B board.

b. Change the PG 507 OUTPUT (VOLTS) HIGH LEVEL and LOW LEVEL controls counterclockwise.

c. The digital multimeter readout must indicate between +8.00 and +9.00.

d. Change the digital multimeter RANGE/FUNCTION switch to 200 DC volts.

e. Set the PG 507 OUTPUT (VOLTS) HIGH LEVEL and LOW LEVEL controls clockwise.

f. The digital multimeter readout must indicate between +21.0 and +23.0.

g. Remove the HI test lead.

5. Check the − Variable Supply Accuracy

a. Rotate the PG 507 OUTPUT (VOLTS) HIGH LEVEL and LOW LEVEL controls counterclockwise.

b. Connect the digital multimeter HI test lead to the negative lead of capacitor C1511, located on the Output B board.

c. The digital multimeter readout must indicate between −21.0 and −23.0.

d. Set the PG 507 OUTPUT (VOLTS) HIGH LEVEL and LOW LEVEL controls clockwise.

e. Change the digital multimeter RANGE/FUNCTION switch to 20 DC volts.

f. The digital multimeter readout must indicate between −8.00 and −9.00.

g. Remove test leads.

6. Adjust PER, R1003

Refer to Fig. 8-2 adjustment setup in the pull-out pages and preliminary control settings with the following exceptions.

PG 507

TRIGGERING	
+ SLOPE/− SLOPE	- SLOPE (out)
PERIOD	2 μs
CAL	ccw
OUTPUT (VOLTS)	
HIGH LEVEL	+5
LOW LEVEL	−5

Digital Counter Plug-In

DISPLAY TIME	ccw
FUNCTION	FREQUENCY A
TIMING	1 ms
CH A	
COUPL	DC
SOURCE	EXT
ATTEN	X1
SLOPE	+

a. Connect a coaxial cable from the PG 507 +TRIG OUT through a 50 Ω termination to the digital counter INPUT.

b. Set the digital counter CH A TRIGGER LEVEL control for a stable display readout.

c. ADJUST—potentiometer R1003 located on the Timing board for a digital counter readout between .501 and .499.

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7. Adjust 20 ns PER, R1006

Refer to Fig. 8-2 adjustment setup in the pull-out pages.

a. Change the PG 507 PERIOD control to 20 ns. Rotate CAL control counterclockwise.

b. Set the digital counter TRIGGER LEVEL control for a stable display readout.

c. ADJUST—potentiometer R1006 located on the Timing board for a digital counter readout of 51.000 to 52.000.

d. Remove the digital counter CH A INPUT connection.

8. Adjust SYM, R1114

Refer to Fig. 8-3 adjustment setup in the pull-out pages and preliminary control settings with the following exceptions.

Vertical Plug-In

VOLTS/DIV	1
VARIABLE (CAL IN)	in
AC-GND-DC	GND

Horizontal Plug-In (Time Base)

TRIGGERING	
MODE	AUTO
COUPLING	AC
SOURCE	INT
TIME/DIV	2 μs
VARIABLE (CAL IN)	in
POSITION	displayed trace centered

7000 Series Oscilloscope

POWER	ON
FOCUS	as desired for a
INTENSITY	well-defined display
VERTICAL MODE	LEFT
HORIZONTAL MODE	B
A TRIGGER SOURCE	VERT MODE
B TRIGGER SOURCE	VERT MODE

a. Change the PG 507 PERIOD control to 2 μs and rotate the PERIOD CAL control fully clockwise.

b. Center the displayed trace with the vertical plug-in POSITION control and set the DC-GND-AC switch to DC.

c. Connect a coaxial cable from the PG 507 OUTPUT A through a 50 Ω termination to the vertical plug-in INPUT.

d. Set the PG 507 HIGH LEVEL control to display the signal higher level 2.5 major graticule divisions above the center graticule line.

e. Set the PG 507 LOW LEVEL control to display the signal lower level 2.5 major graticule divisions below the center graticule line.

f. Set the horizontal plug-in TRIGGERING LEVEL/SLOPE controls for a stable positive signal display. Set the VARIABLE (CAL IN) switch in the out position.

g. Rotate the horizontal plug-in VARIABLE and POSITION controls until one displayed period with ten divisions of signal period is graticule centered.

h. ADJUST—potentiometer R1114 located on the Timing board for a displayed signal duration of five graticule divisions.

9. Adjust DUR, R1047

Refer to Fig. 8-3 adjustment setup in the pull-out pages.

a. Rotate the PG 507 PERIOD CAL control fully counterclockwise.

b. Change the horizontal plug-in TIME/DIV control to .2 μs and set the TRIGGERING LEVEL/SLOPE controls for a stable positive signal display.

c. Rotate the PG 507 DURATION control to 1 μs and the CAL fully counterclockwise.

d. ADJUST—potentiometer R1047 located on the Timing board for a displayed signal duration of five graticule divisions.

10. Adjust DUR 10 ns, R1140 and 10 ns DUR COMP, C1430

Refer to Fig. 8-3 adjustment setup in the pull-out pages.

a. Change the PG 507 DURATION control to 10 ns with the DURATION CAL control counterclockwise and the PERIOD control to 20 ns with the PERIOD CAL control counterclockwise.

b. Change the horizontal plug-in TIME/DIV switch to .05 μs and the MAGNIFIER switch to X10.

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c. Set the horizontal plug-in LEVEL/SLOPE controls for a stable positive signal display.

d. ADJUST—variable capacitor C1430, located on the Timing board, for maximum positive duration of the displayed signal.

e. ADJUST—potentiometer R1140, located on the Timing board until 1.6 to 1.8 graticule divisions of positive signal duration is displayed at the 50% amplitude point.

f. Remove all cables.

11. Adjust 1 PER, R1112

Refer to Fig. 8-4 adjustment setup in the pull-out pages and preliminary control settings with the following exceptions.

PG 507

TRIGGERING	
SYNC GATE/FREE RUN	SYNC GATE
+ SLOPE/− SLOPE	− SLOPE
TRIG/GATE LEVEL	+3 V MAN
PERIOD	2 μs
CAL	ccw
DURATION	1 μs
CAL	ccw
OUTPUT (VOLTS)	
HIGH LEVEL	+5
LOW LEVEL	−5

Vertical Plug-In

VOLTS/DIV	1
VARIABLE (CAL IN)	in
AC-GND-DC	GND

Horizontal Plug-In (Time Base)

TRIGGERING	
MODE	AUTO
COUPLING	AC
SOURCE	INT
TIME/DIV	10 μs
VARIABLE (CAL IN)	in
POSITION	displayed trace centered
MAGNIFIER	X10

Sinewave Generator

FREQUENCY RANGE	REF
AMPLITUDE MULT	X.1
OUTPUT AMPLITUDE	1.5

a. Connect a coaxial cable from the sinewave generator OUTPUT to the PG 507 TRIG/GATE IN.

b. Connect a coaxial cable from the PG 507 OUTPUT A through a 50 Ω termination to the vertical plug-in INPUT.

c. Set the PG 507 TRIG/GATE LEVEL control for a flashing TRIG'D/GATED light and a stable crt display.

d. Rotate the horizontal plug-in POSITION control to line-up the rising edge of the second signal cycle on the center vertical graticule line.

e. Rotate the PG 507 PERIOD CAL control clockwise until the period of the second cycle is 4 major horizontal graticule divisions.

f. Set the PG 507 TRIG/GATE LEVEL control for 4 complete cycles per triggered signal.

g. ADJUST—potentiometer R1112, located on the Timing board, for equal first and second cycle period lengths.

12. Adjust 20 ns 1 PER, R1002

Refer to Fig. 8-4 adjustment setup in the pull-out pages.

a. Change the horizontal plug-in TIME/DIV switch to .5 μs.

b. Rotate the PG 507 PERIOD control to 20 ns and the PERIOD CAL control counterclockwise.

c. Rotate the PG 507 DURATION control to 10 ns.

d. Set the sine-wave generator FREQ RANGE to .5 to 1.

e. Set the PG 507 TRIG/GATE LEVEL control for a flashing TRIG'D/GATED light and a stable crt display.

f. Set the sine-wave generator FREQUENCY VARIABLE control for a stable synchronized display.

g. Rotate the horizontal plug-in POSITION control to line-up the second cycle rising edge of the displayed signal on the center vertical graticule line.

h. Rotate the PG 507 PERIOD CAL control clockwise until the period of the second cycle is 4 major horizontal graticule divisions.

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i. ADJUST—potentiometer R1002 located on the Timing board for equal first and second cycle period lengths.

j. Remove the sine-wave generator cable connections.

13. Adjust DEL, R1700

Refer to Fig. 8-5 adjustment setup in the pull-out pages (using dotted signal line connections) and preliminary control settings with following exceptions.

PG 507

TRIGGERING	
SYNC GATE/FREE RUN	FREE RUN
MODE	
UNDLY	in
DELAY	in
PERIOD	2 μs
CAL	cw
DELAY	1 μs
CAL	ccw
DURATION	.1 μs
CAL	ccw

Horizontal Plug-In (Time Base)

MAGNIFIER	X1
POSITION	displayed trace centered
TIME/DIV	.2 μs

a. Connect a coaxial cable with 50 Ω termination from the PG 507 OUTPUT A to the vertical plug-in INPUT.

b. Connect a coaxial cable from the PG 507 +TRIG OUT to the horizontal plug-in TRIG IN.

c. Set the vertical plug-in LEVEL/SLOPE controls for a stable positive signal display.

d. ADJUST—potentiometer R1700 located on the Timing board to display two pulses with their leading edges separated by 5 major graticule divisions.

e. Remove the vertical and horizontal plug-in cable connections.

14. Adjust OUTPUT A: Rising Max ΔV, R1001 Rising Min ΔV, R1000 Falling Max ΔV, R1101 Falling Min ΔV, R1100

Refer to Fig. 8-7 adjustment setup and Fig. 8-9 pulse characteristics in the pull-out pages. Use the preliminary control settings with following exceptions.

Sampling Unit Plug-In with Plug-In Sampling Head

OFFSET	displayed trace centered
mVOLTS/DIV	100
VARIABLE (CAL IN)	in
DOT RESPONSE	NORM

Sampling Sweep Unit Plug-In

TIME POSITION RANGE	5 μs
TIME/DIV	20 ns
SLOPE	+
SCAN	REP
TRIG AMP	X1
EXT TRIG	50 Ω, 2 V MAX

PG 507

OUTPUT (VOLTS)	
HIGH LEVEL	+5
LOW LEVEL	−5
PERIOD	0.2 μs

a. Connect a coaxial cable with a 10X attenuator from the sampling unit plug-in input connector (S-1 sampling head) to the PG 507 OUTPUT A.

b. Connect a coaxial cable with a 5X attenuator from the sampling sweep unit plug-in TRIG INPUT to the PG 507 + TRIG OUT.

NOTE

Perform steps 14c through 14y if A or B output boards have undergone major circuit repairs; otherwise, perform steps 14l through 14y only.

c. Center potentiometers R1001, R1000, R1101, and R1100 (located on the A Output board).

d. Rotate the sampling unit DC OFFSET control to center the trace on the crt graticule.

e. Set the sampling unit mVOLTS/DIV switch to 100.

f. ADJUST —potentiometers R1001 and R1101 for the best square-waveform presentation on the crt.

g. Change the PG 507 HIGH LEVEL control to 0 and the LOW LEVEL control to 0.

h. Change the sampling unit mVOLTS/DIV switch for the desired waveform resolution.

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i. Rotate the sampling unit OFFSET control to center the displayed waveform on the crt graticule.

j. ADJUST—potentiometers R1000 and R1100 for the best square-waveform presentation on the crt.

k. Repeat steps f through j if necessary for best waveform compromise.

Rising Max/Rising Min—R1001, R1000

l. Set the PG 507 HIGH LEVEL control fully clockwise.

m. Adjust the PG 507 LOW LEVEL control counterclockwise until the displayed waveform amplitude just stops changing (maximum signal with maximum offset condition).

n. Change the sampling unit mVOLTS/DIV switch to 100 and set the OFFSET control to center the displayed waveform. Rotate the VARIABLE (out) control to display the waveform within 8 major graticule divisions.

o. ADJUST—potentiometer R1001 for the best rising front corner of the displayed waveform.

p. Rotate the PG 507 LOW LEVEL control fully clockwise and set the sampling unit OFFSET control to center the displayed waveform. Change the mVOLT/DIV switch and rotate the VARIABLE (out) control to display the waveform within 8 major graticule divisions.

q. ADJUST—potentiometer R1000 for the best rising front corner of the displayed waveform.

r. Repeat steps 14m through 14q for the best waveform compromise throughout the (HIGH LEVEL) amplitude range within the risetime and aberrations specifications.

Falling Max/Falling Min—R1101, R1100

s. rotate the PG 507 LOW LEVEL control fully counterclockwise. Rotate the HIGH LEVEL control to 0.

t. Set the sampling unit OFFSET control to center the displayed waveform and the mVOLTS/DIV switch and VARIABLE (out) control to display the waveform within 8 major graticule divisions.

u. Rotate the HIGH LEVEL control clockwise until the displayed waveform amplitude just stops changing (maximum signal with maximum offset condition).

v. ADJUST—potentiometer R1101 for the best falling front corner of the displayed waveform.

w. Rotate the HIGH LEVEL control fully counterclockwise. Set the sampling unit OFFSET control to center the displayed waveform. Set the mVOLTS/DIV switch and VARIABLE (out) control to display the waveform within 8 major graticule divisions.

x. ADJUST—potentiometer R1100 for the best falling front corner of the displayed waveform.

y. Repeat steps 14s through 14x for the best waveform compromise throughout the (LOW LEVEL) amplitude range within the falltime and aberrations specifications.

15. Adjust OUTPUT B: (following internal controls located on the B Output board)
Rising Max ΔV, R1514
Rising Min ΔV, R1513
Falling Max ΔV, R1404
Falling Min ΔV, R1405

Refer to Fig. 8-7 adjustment setup and Fig. 8-9 pulse characteristics in the pull-out pages.

a. Disconnect the PG 507 OUTPUT A cable connection and connect to the OUTPUT B. Repeat all items in step 14 of this procedure.

REAR INTERFACE ADJUSTS

16. Adjust EXT HIGH LEVEL, R1013 and EXT LOW LEVEL, R1023

NOTE

These adjustments are covered in the Maintenance section of this manual.

This completes the Adjustment Procedure.

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MAINTENANCE

INTERNAL MODIFICATIONS

This section of the manual describes internal cables and switch settings and provides general maintenance information. Several internal changes are available to modify the PG 507's capabilities. Each item is described below.

Custom Range Selection

The custom range positions on the PERIOD, DURATION and DELAY controls permit selection of period, duration, and delay times. Selection for each is made by installing a capacitor on the Timing board (Assy A12).

To determine the approximate capacitor value for the desired period, multiply the period time in seconds by 5×10^{-3}. For example, a 50 ms period times 5×10^{-3} equals 250×10^{-6} or 250 μF. This capacitor must be non-polarized and have at least a 6 V rating. Solder this capacitor in the position labeled Period in Fig. 5-1.

To determine the capacitor value for the duration or delay time desired, multiply the time in seconds by 1×10^{-2}. For example, a 50 ms duration or delay time requires 50 ms times 1×10^{-2}, or a 500 μF capacitor. If a polarized capacitor is used, observe the correct polarity. Use at least a 6 V rated capacitor. For a custom duration time, solder this capacitor in the position labeled Duration in Fig. 5-1. For a custom DELAY time, remove the Input board (Assy A11) to gain access to the pads marked Delay in Fig. 5-1.

Input Impedance Selection

To change the TRIG/GATE IN input impedance, remove the plug-in from the power module. Remove the left side

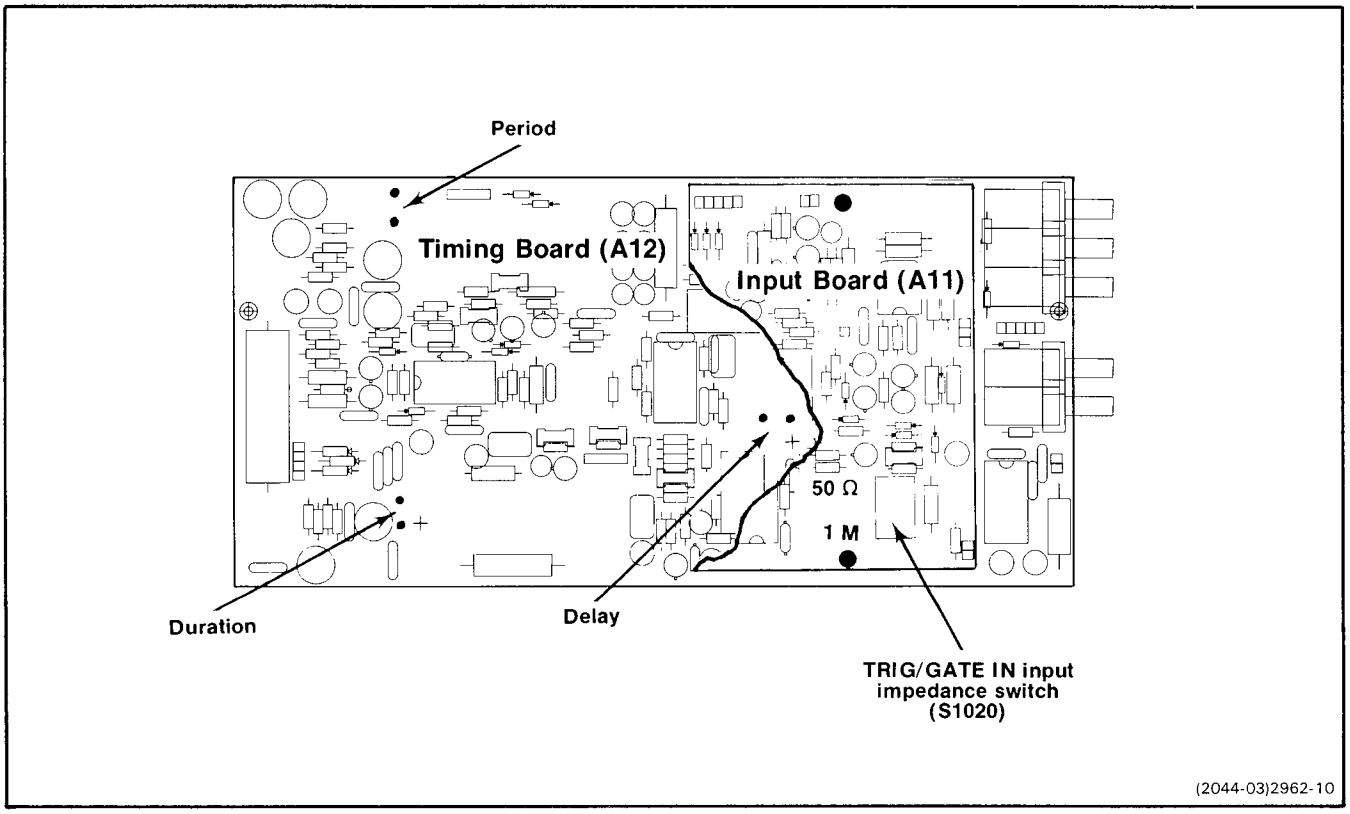


Fig. 5-1. Locations of period, delay, and duration custom timing capacitors and TRIG/GATE IN input impedance switch.

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cover. Set the slide switch (R1020), located on the Input board (Assy A11), to either the 50 Ω or 1 MΩ position. See Fig. 5-1.

Trigger/Gate Input

These assignments provide rear interface input for a trigger/gate signal in place of front panel input. The signal lead (24B) must be user installed, but the ground (25B) is factory wired. To make the proper connections, remove the cable extending from the TRIG/GATE IN connector to the Input board (A11) by pulling the cable end from the socket. Install a twelve-inch cable with the proper connectors (Tektronix Part Number 175-1827-00), from the connector on the Input board (A11) labeled Trig/Gate In to the connector labeled Trig In on the Output B board (A14). Refer to Fig. 5-2.

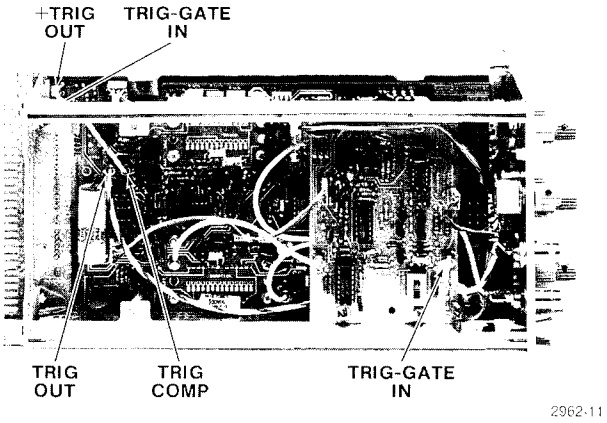


Fig. 5-2. Trigger cable connections.

Trigger Output

The signal lead (27B) and ground connection (28B) are factory wired. The signal available at pin 27B is the complement of the front panel + TRIG OUT. To route the front panel + TRIG OUT signal to the rear interface connector and the rear complement signal to the front panel + TRIG OUT connector, interchange the cable connections to the Trig Out and Trig Comp (TC) coaxial connectors on the Timing board (A12). Refer to Fig. 5-2.

External Control Voltage Adjustment

The output pulse high and low levels can be controlled externally through pins 22B and A at the rear interface connector. Refer to Fig. 5-3 before making these adjustments.

NOTE

Rear interface connector pin assignments are located in the pullout pages in the back of this manual.

To make the internal adjustments for this feature, follow these steps:

High Level Control Voltage Adjustment

1. Set the front panel controls as follows:

PRESET-VAR	in
PERIOD	EXT TRIG or MAN
DURATION	EXT DUR
COMPLEMENT-NORM	both out

2. Using an insulated screwdriver, center the internal Ext Hi (R1013) and the front panel preset HIGH LEVEL controls.

3. Supply a voltage equal to the lowest external input control voltage desired (−15 to +15 V) to pin 22B.

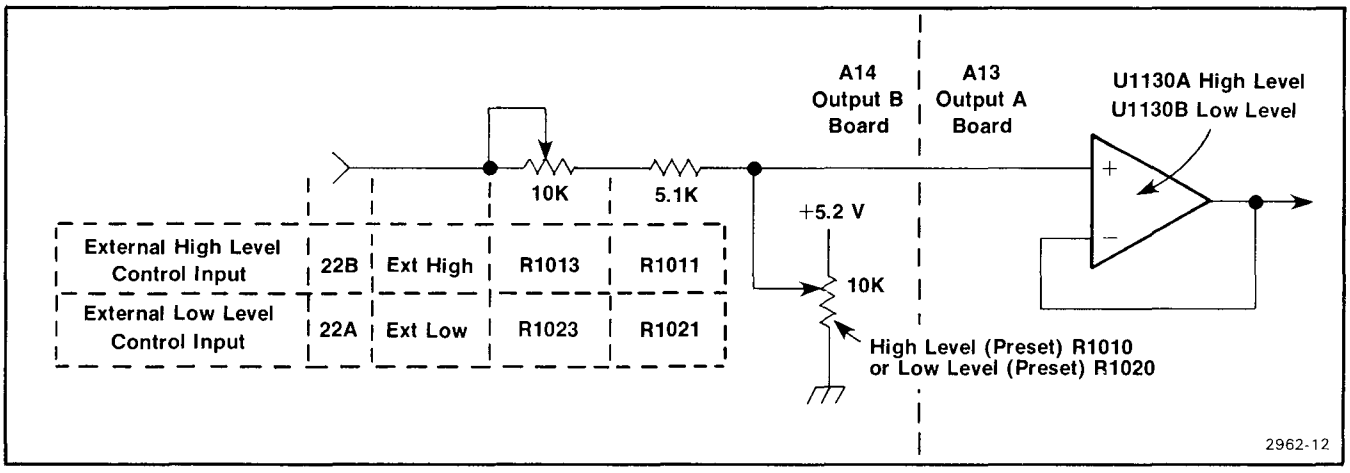


Fig. 5-3. Equivalent circuit of external input for output voltage control.

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4. Adjust the front panel preset HIGH LEVEL control for an output voltage equal to the minimum desired output voltage. It may be necessary to adjust the front panel preset LOW LEVEL control since the high level output voltage is clamped by the low level output voltage.

5. Now supply a voltage to equal the highest external control voltage.

6. Adjust the Ext Hi (R1013) for the maximum desired output voltage. It may be necessary to adjust the front panel preset LOW LEVEL control to obtain the desired output. The Ext Hi and the preset HIGH LEVEL controls interact. It may be necessary to repeat steps 3, 4, 5, and 6 until the desired results are obtained.

Low Level Control Voltage Adjustment

7. Push the COMPLEMENT-NORM switch.

8. Center the Ext Lo (R1023) and the front panel preset LOW LEVEL controls.

9. Supply a voltage at pin 22A of the rear interface equal to the lowest control voltage desired (−15 to +15 V).

10. Adjust the preset LOW LEVEL control for an output voltage equal to the lowest output voltage desired.

11. Now supply a voltage equal to the highest desired external voltage.

12. Adjust the Ext Lo potentiometer (R1023) for the highest output voltage desired. As the Ext Lo and preset LOW LEVEL controls interact, readjustment may be necessary. Do not readjust the preset HIGH LEVEL or Ext Hi potentiometers. When adjustments are complete, the output voltages vary linearly and independently with the external control voltages.

Setting the DD 501 Digital Delay Unit For Counted Burst Operation

Refer to the DD 501 Digital Delay instruction manual for information related to setting the DD 501 internal trigger jumpers.

GENERAL MAINTENANCE INFORMATION

Troubleshooting Aids

Diagrams. Complete circuit diagrams are located in the foldout pages in the Diagrams and Illustrations section. The portions of the circuit mounted on circuit boards are enclosed by a solid line. The circuit number of each component in this instrument is shown on a diagram. See the first page of the Diagrams and Illustrations section for definitions of the symbols and reference designators used on the diagrams. Waveforms and voltages are provided with the diagrams for selected circuit locations. A pictorial cabling diagram is also located in the Diagrams and Illustrations section.

Circuit Board Illustrations. Circuit board illustrations are provided in conjunction with the circuit diagrams. Each component shown on a diagram is also identified on the circuit board illustration by its circuit number. A table is provided with each diagram listing components by assembly and circuit number. The table also lists the component grid locations on both the diagram and circuit board illustrations.

Adjustment Locations Illustrations. To aid in locating test points and adjustable components, the adjustment locations pullout page (normally used with the Adjustment procedure) permits rapid location of test points and adjustments.

PG 507 Service Kit. An optional service kit (067-1038-00) is available from Tektronix, Inc. The kit contains the cable assemblies necessry to lengthen connections between the Output A (A13) and Output B (A14) board set and the rest of the instrument. It allows these boards to be removed and then electrically connected to the instrument for easy access to troubleshooting points. Contact your nearest Tektronix representative for ordering information.

Troubleshooting Equipment

Before using any test equipment to make measurements on static sensitive components or assemblies, be certain that any voltage or current supplied by the test equipment does not exceed the limits of the component to be tested.

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Static-Sensitive Components

CAUTION

Static discharge can damage any semiconductor component in this instrument.

This instrument contains electrical components that are susceptible to damage from static discharge. See Table 5-1 for relative susceptibility of various classes of semiconductors. Static voltages of 1 kV to 30 kV are common in unprotected environments.

Observe the following precautions to avoid damage:

1. Minimize handling of static sensitive components.

2. Transport and store static-sensitive components or assemblies in their original containers, on a metal rail, or on conductive foam. Label any package that contains static-sensitive assemblies or components.

3. Discharge the static voltage from your body by wearing a wrist strap while handling these components. Servicing static-sensitive assemblies or components should be performed only at a static-free work station by qualified service personnel.

4. Nothing capable of generating or holding a static charge should be allowed on the work station surface.

5. Keep the component leads shorted together whenever possible.

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

7. Do not slide the components over any surface.

8. Avoid handling components in areas that have a floor or work surface covering capable of generating a static charge.

9. Use a soldering iron that is connected to earth ground.

10. Use only special antistatic suction type or wick type desoldering tools.

Table 5-1

RELATIVE SUSCEPTIBILITY TO STATIC DISCHARGE DAMAGE

Semiconductor Classes	Relative Susceptibility Levels[a]
MOS or CMOS microcircuits or discretes, or linear microcircuits with MOS inputs (Most Sensitive)	1
ECL	2
Schottky signal diodes	3
Schottky TTL	4
High-frequency bipolar transistors	5
JFETs	6
Linear microcircuits	7
Low-power Schottky TTL	8
TTL (Least Sensitive)	9

[a] **Voltage equivalent for levels:**
1 = 100 to 500 V 4 = 500 V 7 = 400 to 1000 V (est.)
2 = 200 to 500 V 5 = 400 to 600 V 8 = 900 V
3 = 250 V 6 = 600 to 800 V 9 = 1200 V

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

Circuit Board Removal

For access to the boards, pry off the instrument side covers. Next, remove the four screws attaching the top and bottom covers and remove covers.

Also remove the four Phillips screws and two bullet screws attaching the instrument back plate. See Fig. 5-4.

Output A and B Board Removal. Disconnect all cables connecting the Output A and B boards to the rest of the instrument. Remove the four screws holding the Output B board to the side rails. Carefully slide the Output A and B boards back and out of the chassis.

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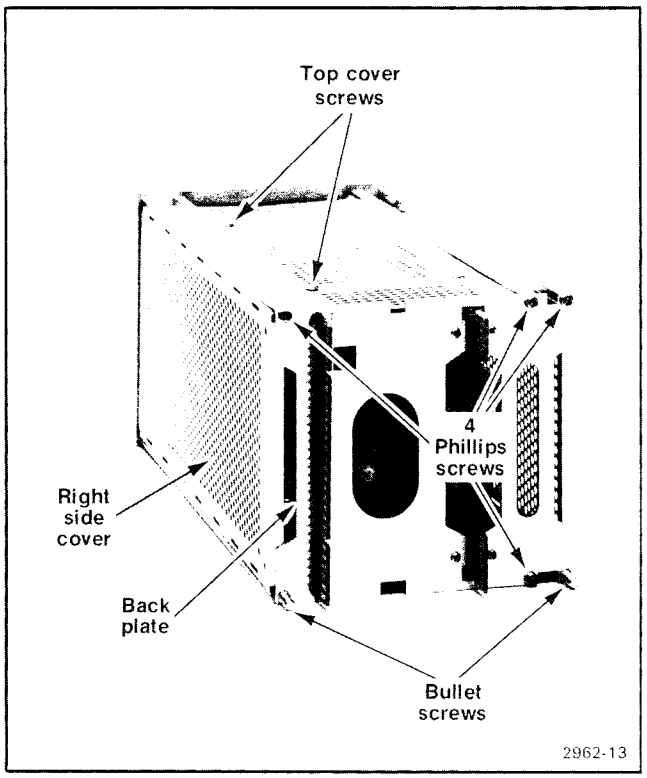


Fig. 5-4. Back plate and cover removal.

To disassemble the Output A and B boards, disconnect the four interconnecting cables. Remove the four screws connecting the two boards via spacers. Carefully pull the boards apart to disengage the three interconnecting square pins.

Input and Timing Board Removal. Remove all cables to the Input and Timing boards. Next remove the PERIOD, DELAY, and DURATION knobs. Loosen the nuts holding the spring clips against the control shafts on the back of the front panel. Remove the four screws attaching the boards to the side rails via spacers. Carefully slide the boards back and out of the chassis.

Reverse the above procedures to reassemble the instrument. When connecting the cables, carefully match the connector index pins.

Front Panel Latch Removal

To disassemble the latch, pry up on the pull tab bar attached to the latch assembly. The latch components can now be removed from the instrument.

Cleaning

This instrument should be cleaned as often as operating conditions require. Loose dust accumulated on the outside of the instrument can be removed with a soft cloth or small brush. Remove dirt that remains with a soft cloth dampened in a mild detergent and water solution. Do not use abrasive cleaners.

CAUTION

To clean the front panel use freon, isopropyl alocohol, or denatured ethyl alcohol. Do not use petroleum based cleansing agents. Before using any other type of cleaner, consult your Tektronix Service Center or representative.

To clean the interior, blow off accumulated dust with dry, low-velocity air (approximately 5 lb/in^2). If further board cleaning is required, use a soft brush or lint-free cloth and one of the following cleaning solutions:

1. A 20:1 solution of distilled water and Kelite Spray White[1]. Flush cleaned area well with clean isopropyl alcohol.

2. A phosphate-free, pH normal detergent and water solution. Flush cleaned area well with distilled water, then with clean isopropyl alcohol.

3. Isopropyl alcohol. Flush the area with clean isopropyl alcohol.

CAUTION

Do not use petroleum based cleansing agents or cleaning solutions that leave a residue on the circuit boards. Before using any other type of cleaner, consult your Tektronix Service Center or representative.

Do not scrape or use an eraser to clean the edge connector contacts. Abrasive cleaning can remove the gold plating.

CAUTION

To prevent damage, circuit boards and components must be dry before applying power.

Drying can be accomplished by placing boards in an oven at 40°C to 60°C for approximately four hours.

[1] Allied-Kelite Products Division of the Richardson Co.; Los Angeles, Calif.

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Obtaining Replacement Parts

Electrical and mechanical parts can be obtained through your local Tektronix Field Office or representative. However, it may be possible to obtain many of the standard electronic components from a local commercial source. Before purchasing or ordering a part from a source other than Tektronix, Inc., check the Replaceable Electrical Parts list for the proper value, rating, tolerance, and description.

NOTE

When selecting replacement parts, remember that the physical size and shape of the component may affect its performance in the instrument.

Some parts are manufactured or selected by Tektronix, Inc., to satisfy particular requirements or are manufactured for Tektronix, Inc., to our specifications. Most of the mechanical parts used in this instrument have been manufactured by Tektronix, Inc. To determine the manufacturer, refer to the Replaceable Parts list and the Cross Reference index, Mfr. Code Number to Manufacturer.

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

1. Instrument type (include modification or option number).
2. Instrument serial number.
3. A description of the part (if electrical, include complete circuit number).
4. Tektronix part number.

Soldering Techniques

WARNING

To avoid electric-shock hazard, disconnect the instrument from the power source before soldering.

The reliablility and accuracy of this instrument can be maintained only if proper soldering techniques are used when repairing or replacing parts. General soldering techniques which apply to maintenance of any precision electronic equipment should be used when working on this instrument. Use only 60/40 rosin-core, electronic grade solder. The choice of soldering iron is determined by the repair to be made.

CAUTION

The PG 507 Output A and B boards (A13, A14) are multilayer type boards with a conductive path laminated between the top and bottom board layers. All soldering on these boards should be done with extreme care to prevent breaking the connections to this conductive path.

Do not allow solder or solder flux to flow under printed circuit board switches. The printed circuit board is part of the switch contacts; intermittent switch operation can occur if the contacts are contaminated.

When soldering on circuit boards or small wiring, use only a 15 watt, pencil type soldering iron. A higher wattage soldering iron can cause the etched circuit wiring to separate from the board base material and melt the insulation from small wiring. Always keep the soldering iron tip properly tinned to ensure the best head transfer to the solder joint. Apply only enough heat to remove the component or to make a good solder joint. To protect heat sensitive components, hold the component lead with a pair of long-nose pliers between the component body and the solder joint. Use a solder removing wick to remove excess solder from connections or to clean circuit board pads.

Semiconductors

To remove in-line integrated circuits use an extracting tool. This tool is available from Tektronix, Inc.; order Tektronix Part Number 003-0619-00. If an extracting tool is not available, use care to avoid damaging the pins. Pull slowly and evenly on both ends of the integrated circuit. Try to avoid disengaging one end before the other end.

Connector Replacement Procedures

Several methods of interconnection are used in the PG 507. These include coaxial end-lead connector assemblies, multipin connector to circuit board pins, and square pins. The following information provides replacement procedures for each method.

Multipin Connectors. The pin connectors used to connect the wires to the interconnecting pins are clamped to the end of the wires. Refer to Fig. 5-5. To replace damaged multipin connectors, remove the damaged pin from the holder. To do this, insert a scribe between the connector and the holder and pry the connector from the holder. Clamp the replacement pin to the wire. Reinstall the connector in the holder.

If the individual end lead pin connectors are removed from the plastic holder, note the order of the individual wires for correct replacement in the holder.

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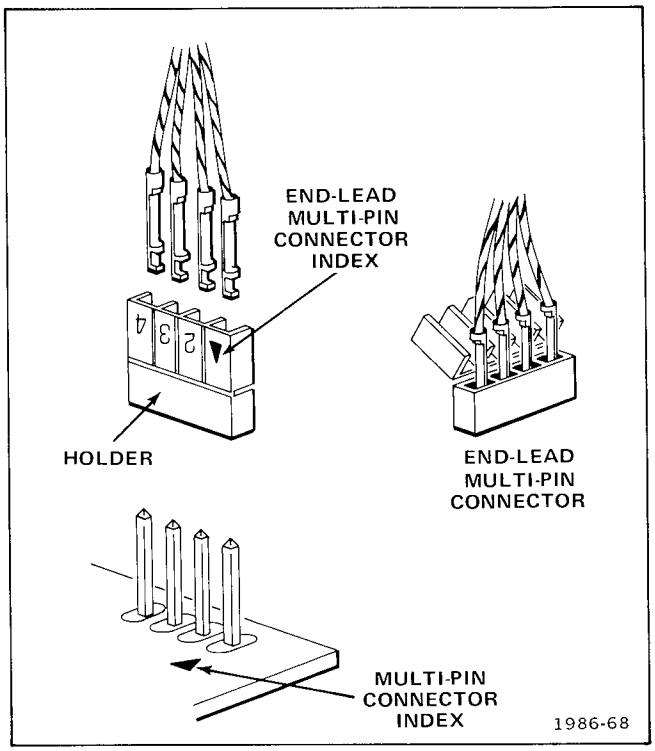


Fig. 5-5. Orientation and disassembly of multipin connectors.

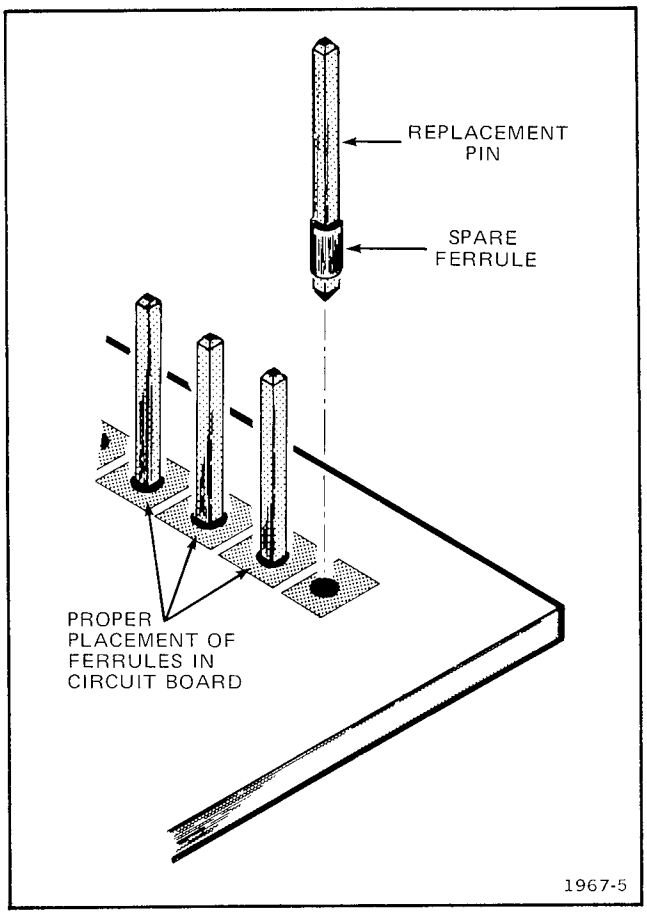


Fig. 5-6. Exploded view of circuit board pin and ferrule.

Circuit Board Pins. A circuit board pin replacement kit (including necessary tools, instructions, and replacement pins with attached ferrules) is available from Tektronix, Inc.; order Tektronix Part Number 040-0542-00. Replacing circuit board pins on multilayer boards is not recommended. (The multilayer boards in this instrument are listed under Soldering Techniques in this section.)

To replace a damaged pin, first disconnect any pin connectors. Then unsolder the damaged pin and pull it from the board with pliers, leaving the ferrule in the circuit board, if possible. See Fig. 5-6. If the ferrule remains in the circuit board, remove the spare ferrule from the replacement pin and press the new pin into the circuit board hole. If the ferrule is removed with the damaged pin, clean out the hole using a solder removing wick and a scribe. Then press the replacement pin, with attached spare ferrule, into the circuit board.

Coaxial End-Lead Connectors. Replacement of coaxial end-lead connectors requires special tools. Repair is best made by replacing the cable as a unit. Refer to the replaceable parts list in the back of the manual for part numbers. Fig. 5-7 shows an exploded view of a coaxial end-lead connector assembly.

Square Pins. The three square pins which connect the Output A and B boards and their sockets are replaced by unsoldering and removing the defective item. Position the replacement part in the board and resolder.

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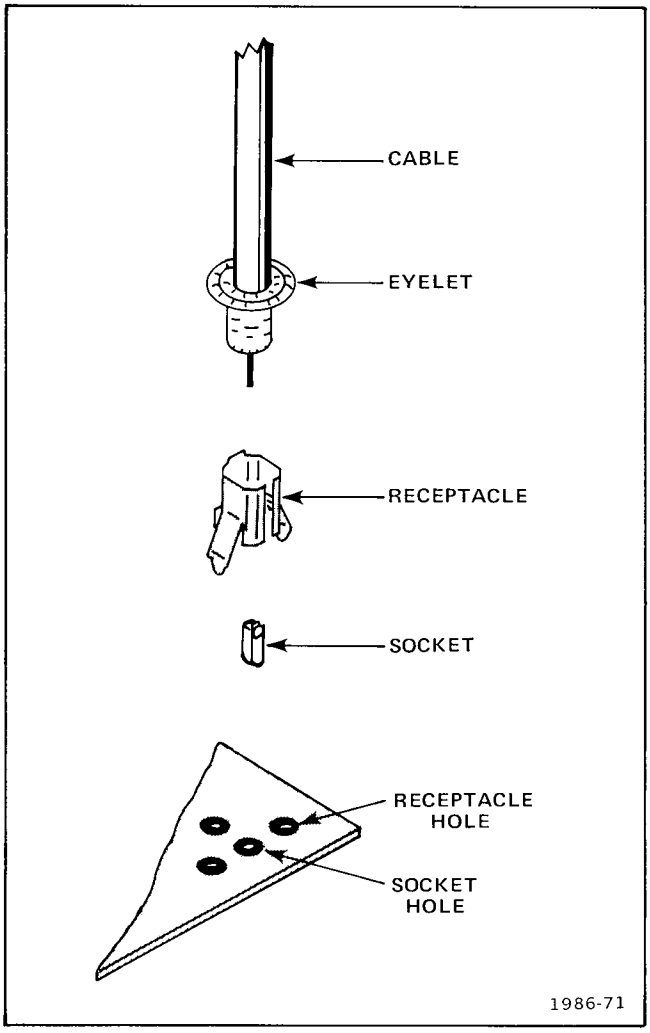


Fig. 5-7. Coaxial end-lead connector assembly.

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OPTIONS

None available at this time.

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REPLACEABLE ELECTRICAL PARTS

PARTS ORDERING INFORMATION

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

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

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

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

LIST OF ASSEMBLIES

A list of assemblies can be found at the beginning of the Electrical Parts List. The assemblies are listed in numerical order. When the complete component number of a part is known, this list will identify the assembly in which the part is located.

CROSS INDEX-MFR. CODE NUMBER TO MANUFACTURER

The Mfr. Code Number to Manufacturer index for the Electrical Parts List is located immediately after this page. The Cross Index provides codes, names and addresses of manufacturers of components listed in the Electrical Parts List.

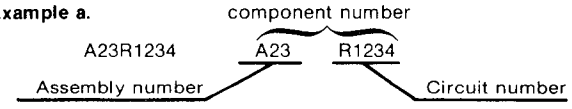
ABBREVIATIONS

Abbreviations conform to American National Standard Y1.1.

COMPONENT NUMBER (column one of the Electrical Parts List)

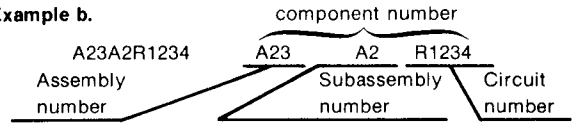
A numbering method has been used to identify assemblies, subassemblies and parts. Examples of this numbering method and typical expansions are illustrated by the following:

Example a.



Read: Resistor 1234 of Assembly 23

Example b.



Read: Resistor 1234 of Subassembly 2 of Assembly 23

Only the circuit number will appear on the diagrams and circuit board illustrations. Each diagram and circuit board illustration is clearly marked with the assembly number. Assembly numbers are also marked on the mechanical exploded views located in the Mechanical Parts List. The component number is obtained by adding the assembly number prefix to the circuit number.

The Electrical Parts List is divided and arranged by assemblies in numerical sequence (e.g., assembly A1 with its subassemblies and parts, precedes assembly A2 with its subassemblies and parts).

Chassis-mounted parts have no assembly number prefix and are located at the end of the Electrical Parts List.

TEKTRONIX PART NO. (column two of the Electrical Parts List)

Indicates part number to be used when ordering replacement part from Tektronix.

SERIAL/MODEL NO. (columns three and four of the Electrical Parts List)

Column three (3) indicates the serial number at which the part was first used. Column four (4) indicates the serial number at which the part was removed. No serial number entered indicates part is good for all serial numbers.

NAME & DESCRIPTION (column five of the Electrical Parts List)

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

MFR. CODE (column six of the Electrical Parts List)

Indicates the code number of the actual manufacturer of the part. (Code to name and address cross reference can be found immediately after this page.)

MFR. PART NUMBER (column seven of the Electrical Parts List)

Indicates actual manufacturers part number.

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CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
000DN	FUSES UNLIMITED	9740 COZYCRAFT AVENUE	CHATSWORTH, CA 91311
00853	SANGAMO ELECTRIC CO., S. CAROLINA DIV.	P O BOX 128	PICKENS, SC 29671
01002	GENERAL ELECTRIC COMPANY, INDUSTRIAL AND POWER CAPACITOR PRODUCTS DEPARTMENT	JOHN STREET	HUDSON FALLS, NY 12839
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
02735	RCA CORPORATION, SOLID STATE DIVISION	ROUTE 202	SOMERVILLE, NY 08876
04713	MOTOROLA, INC., SEMICONDUCTOR PROD. DIV.	5005 E MCDOWELL RD,PO BOX 20923	PHOENIX, AZ 85036
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
14433	ITT SEMICONDUCTORS	3301 ELECTRONICS WAY P O BOX 3049	WEST PALM BEACH, FL 33402
14552	MICRO SEMICONDUCTOR CORP.	2830 F FAIRVIEW ST.	SANTA ANA, CA 92704
14752	ELECTRO CUBE INC.	1710 S. DEL MAR AVE.	SAN GABRIEL, CA 91776
18324	SIGNETICS CORP.	811 E. ARQUES	SUNNYVALE, CA 94086
22526	BERG ELECTRONICS, INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
24931	SPECIALITY CONNECTOR CO., INC.	2620 ENDRESS PLACE	GREENWOOD, IN 46142
27014	NATIONAL SEMICONDUCTOR CORP.	2900 SEMICONDUCTOR DR.	SANTA CLARA, CA 95051
50157	MIDWEST COMPONENTS INC.	P. O. BOX 787 1981 PORT CITY BLVD.	MUSKEGON, MI 49443
50434	HEWLETT-PACKARD COMPANY	640 PAGE MILL ROAD	PALO ALTO, CA 94304
53184	XCITON CORPORATION	5 HEMLOCK STREET	LATHAM, NY 12110
55210	GETTIG ENG. AND MFG. COMPANY	PO BOX 85, OFF ROUTE 45	SPRING MILLS, PA 16875
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
72982	ERIE TECHNOLOGICAL PRODUCTS, INC.	644 W. 12TH ST.	ERIE, PA 16512
73138	BECKMAN INSTRUMENTS, INC., HELIPOT DIV.	2500 HARBOR BLVD.	FULLERTON, CA 92634
75915	LITTELFUSE, INC.	800 E. NORTHWEST HWY	DES PLAINES, IL 60016
79727	C-W INDUSTRIES	550 DAVISVILLE RD.,P O BOX 96	WARMINISTER, PA 18974
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
90201	MALLORY CAPACITOR CO., DIV. OF P. R. MALLORY AND CO., INC.	3029 E. WASHINGTON STREET P. O. BOX 372	INDIANAPOLIS, IN 46206
91637	DALE ELECTRONICS, INC.	P. O. BOX 609	COLUMBUS, NE 68601
95275	VITRAMON, INC.	P O BOX 544	BRIDGEPORT, CT 06601

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Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A11	670-4273-01			CKT BOARD ASSY:INPUT	80009	670-4273-01
A12	670-4274-03			CKT BOARD ASSY:TIMING	80009	670-4274-03
A13	670-6938-00			CKT BOARD ASSY:OUTPUT A	80009	670-6938-00
A14	670-6939-00			CKT BOARD ASSY:OUTPUT B	80009	670-6939-00
A15	670-4272-00			CKT BOARD ASSY:AUXILIARY	80009	670-4272-00
A11	----- -----			CKT BOARD ASSY:INPUT		
A11C1010	283-0178-00			CAP.,FXD,CER DI:0.1UF,+80-20%,100V	72982	8131N145651 104Z
A11C1130	281-0518-00			CAP.,FXD,CER DI:47PF,+/-9.4PF,500V	72982	301-000U2J0470M
A11C1200	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
A11C1300	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
A11C1302	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
A11C1304	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
A11C1320	283-0178-00			CAP.,FXD,CER DI:0.1UF,+80-20%,100V	72982	8131N145651 104Z
A11C1330	283-0178-00			CAP.,FXD,CER DI:0.1UF,+80-20%,100V	72982	8131N145651 104Z
A11C1332	283-0178-00			CAP.,FXD,CER DI:0.1UF,+80-20%,100V	72982	8131N145651 104Z
A11C1400	283-0178-00			CAP.,FXD,CER DI:0.1UF,+80-20%,100V	72982	8131N145651 104Z
A11C1410	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
A11C1420	290-0535-00			CAP.,FXD,ELCTLT:33UF,20%,10V	56289	196D336X0010KA1
A11CR1130	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A11CR1220	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A11CR1222	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A11CR1230	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A11CR1300	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A11CR1302	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A11CR1304	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A11CR1400	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A11CR1401	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A11CR1402	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A11J1031	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QTY 2)	22526	47357
A11J1100	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A11J1130	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A11J1210	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QTY 5)	22526	47357
A11J1300	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QTY 4)	22526	47357
A11J1330	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QTY 3)	22526	47357
A11J1410	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QTY 2)	22526	47357
A11Q1120	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A11Q1210	156-0197-00			MICROCIRCUIT,LI:5 TRANSISTOR ARRAY	80009	156-0197-00
A11Q1220	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
A11Q1222	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
A11Q1224 A11Q1226	151-1042-00			SEMICOND DVC SE:MATCHED PAIR FET	27014	SF50031
A11Q1410	151-0424-00			TRANSISTOR:SILICON,NPN	04713	SPS8246
A11Q1412	151-0333-00			TRANSISTOR:SILICON,NPN,SEL FROM MPS918	04713	SPS1752
A11Q1414	151-0333-00			TRANSISTOR:SILICON,NPN,SEL FROM MPS918	04713	SPS1752
A11R1000	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A11R1002	315-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
A11R1030	301-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.50W	01121	EB5105
A11R1032	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
A11R1110	315-0391-00			RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915

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Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A11R1111	315-0391-00			RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915
A11R1113	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A11R1114	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
A11R1115	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	01121	CB3925
A11R1120	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A11R1121	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
A11R1122	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
A11R1125	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A11R1130	315-0914-00			RES.,FXD,CMPSN:910K OHM,5%,0.25W	01121	CB9145
A11R1132	315-0913-00			RES.,FXD,CMPSN:91K OHM,5%,0.25W	01121	CB9135
A11R1200	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A11R1201	315-0151-00			RES.,FXD,CMPSN:150 OHM,5%,0.25W	01121	CB1515
A11R1210	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
A11R1220	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A11R1222	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A11R1227	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A11R1230	301-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.50W	01121	EB4715
A11R1232	301-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.50W	01121	EB4715
A11R1301	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A11R1312	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	01121	CB2205
A11R1313	315-0182-00			RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	01121	CB1825
A11R1314	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
A11R1315	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	01121	CB2205
A11R1320	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A11R1322	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A11R1330	321-0302-00			RES.,FXD,FILM:13.7K OHM,1%,0.125W	91637	MFF1816G13701F
A11R1332	321-0290-00			RES.,FXD,FILM:10.2K OHM,1%,0.125W	91637	MFF1816G10201F
A11R1410	301-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.50W	01121	EB1525
A11R1411	315-0161-00			RES.,FXD,CMPSN:160 OHM,5%,0.25W	01121	CB1615
A11R1412	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
A11R1413	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
A11R1415	321-0322-00			RES.,FXD,FILM:22.1K OHM,1%,0.125W	91637	MFF1816G22101F
A11R1420	321-0217-00			RES.,FXD,FILM:1.78K OHM,1%,0.125W	91637	MFF1816G17800F
A11R1422	321-0269-00			RES.,FXD,FILM:6.19K OHM,1%,0.125W	91637	MFF1816G61900F
A11R1430	321-0289-00			RES.,FXD,FILM:10K OHM,1%,0.125W	91637	MFF1816G10001F
A11R1432	321-0327-00			RES.,FXD,FILM:24.9K OHM,1%,0.125W	91637	MFF1816G24901F
A11S1020	260-0723-00			SWITCH,SLIDE:DPDT,0.5A,125VAC	79727	GF126-0028
A11TP36	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A11U1110	156-0182-00			MICROCIRCUIT,DI:TRIPLE 2-3-2 INPUT GATE	80009	156-0182-00
A11U1330	156-0067-00			MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	02735	85145
A11VR1130	152-0127-00			SEMICOND DEVICE:ZENER,0.4W,7.5V,5%	04713	SZG35009K2
A11VR1200	152-0217-00			SEMICOND DEVICE:ZENER,0.4W,8.2V,5%	04713	SZG20
A11VR1230	152-0127-00			SEMICOND DEVICE:ZENER,0.4W,7.5V,5%	04713	SZG35009K2

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Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A12	----- -----			CKT BOARD ASSY:TIMING		
A12C1020	285-0576-00			CAP.,FXD,PLSTC:1UF,10%,100V	56289	410P10591
A12C1030	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1040	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1110	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1112	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1114	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1120	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1130	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1132	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1134	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1140	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1200	283-0645-00			CAP.,FXD,MICA D:790PF,1%,100V	00853	D151E791F0
A12C1210	281-0540-00			CAP.,FXD,CER DI:51PF,5%,500V	72982	301-000U2J0510J
A12C1214	283-0663-00			CAP.,FXD,MICA D:16.8PF,+/-0.5PF,500V	00853	D155C16.8D0
A12C1220	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
A12C1230	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1231	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
A12C1232	290-0722-00			CAP.,FXD,ELCTLT:100UF,20%,10V	56289	196D107X0010PE3
A12C1234	285-1049-00			CAP.,FXD,PLSTC:0.01UF,1%,200V	14752	230B1C103F
A12C1236	283-0634-00			CAP.,FXD,MICA D:65PF,1%,100V	00853	D151E650F0
A12C1240	285-0703-00			CAP.,FXD,PLSTC:0.1UF,5%,100V	56289	410P10451
A12C1310	285-0598-00			CAP.,FXD,PLSTC:0.01UF,5%,100V	01002	61F10AC103
A12C1314	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1320	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1330	281-0504-00			CAP.,FXD,CER DI:10PF,+/-1PF,500V	72982	301-055C0G0100F
A12C1332	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
A12C1334	281-0513-00			CAP.,FXD,CER DI:27PF,+/-5.4PF,500V	72982	301-000P2G0270M
A12C1336	283-0594-00			CAP.,FXD,MICA D:0.001UF,1%,100V	00853	D151F102F0
A12C1400	290-0722-00			CAP.,FXD,ELCTLT:100UF,20%,10V	56289	196D107X0010PE3
A12C1401	290-0722-00			CAP.,FXD,ELCTLT:100UF,20%,10V	56289	196D107X0010PE3
A12C1402	290-0722-00			CAP.,FXD,ELCTLT:100UF,20%,10V	56289	196D107X0010PE3
A12C1403	290-0722-00			CAP.,FXD,ELCTLT:100UF,20%,10V	56289	196D107X0010PE3
A12C1404	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
A12C1405	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
A12C1406	285-0703-00			CAP.,FXD,PLSTC:0.1UF,5%,100V	56289	410P10451
A12C1410	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
A12C1411	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
A12C1420	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1422	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
A12C1424	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
A12C1430	281-0167-00			CAP.,VAR,CER DI:9-45PF,200V	72982	538-011-D 9-45
A12C1432	281-0509-00			CAP.,FXD,CER DI:15PF,+/-1.5PF,500V	72982	301-000C0G0150K
A12C1445	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
A12C1500	285-0576-00			CAP.,FXD,PLSTC:1UF,10%,100V	56289	410P10591
A12C1504	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1506	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1510	281-0509-00			CAP.,FXD,CER DI:15PF,+/-1.5PF,500V	72982	301-000C0G0150K
A12C1512	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1515	281-0516-00			CAP.,FXD,CER DI:39PF,+/-3.9PF,500V	72982	301-000U2J0390K
A12C1520	283-0634-00			CAP.,FXD,MICA D:65PF,1%,100V	00853	D151E650F0
A12C1521	290-0722-00			CAP.,FXD,ELCTLT:100UF,20%,10V	56289	196D107X0010PE3
A12C1522	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
A12C1530	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
A12C1540	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
A12C1600	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1610	281-0504-00			CAP.,FXD,CER DI:10PF,+/-1PF,500V	72982	301-055C0G0100F

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Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A12C1612	283-0677-00			CAP.,FXD,MICA D:82PF,1%,500V	00853	D155E820F0
A12C1620	283-0594-00			CAP.,FXD,MICA D:0.001UF,1%,100V	00853	D151F102F0
A12C1630	285-0703-00			CAP.,FXD,PLSTC:0.1UF,5%,100V	56289	410P10451
A12C1640	283-0634-00			CAP.,FXD,MICA D:65PF,1%,100V	00853	D151E650F0
A12C1642	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1644	283-0634-00			CAP.,FXD,MICA D:65PF,1%,100V	00853	D151E650F0
A12C1700	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1720	285-1049-00			CAP.,FXD,PLSTC:0.01UF,1%,200V	14752	230B1C103F
A12C1722	285-0576-00			CAP.,FXD,PLSTC:1UF,10%,100V	56289	410P10591
A12C1740	290-0530-00			CAP.,FXD,ELCTLT:68UF,20%,6V	90201	TDC686M006NLF
A12C1742	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
A12C1830	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
A12C1840	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12C1842	283-0081-00			CAP.,FXD,CER DI:0.1UF,+80-20%,25V	56289	36C600
A12CR1120	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A12CR1130	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A12CR1132	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A12CR1134	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A12CR1200	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A12CR1220	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A12CR1222	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A12CR1300	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A12CR1510	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A12CR1530	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A12CR1600	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A12CR1640	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A12CR1700	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A12CR1702	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A12CR1710	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A12CR1730	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A12CR1732	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A12CR1820	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A12J1010	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A12J1012	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A12J1030A,B	131-0827-00			CONTACT,ELEC:0.55 INCH LONG	22526	47349
	----- -----			(QTY 4)		
A12J1230	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A12J1400	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A12J1440	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A12J1640	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A12J1642	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A12J1740	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A12J1742	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
A12J1810	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 5)		
A12J1830	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 2)		
A12J1840	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A12L1120	276-0569-00			CORE,TOROID:	80009	276-0569-00
	----- -----			(NOMINAL VALUE, TEST SELECTED)		
A12Q1120	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
A12Q1122	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
A12Q1210	151-0333-00			TRANSISTOR:SILICON,NPN,SEL FROM MPS918	04713	SPS1752
A12Q1212	151-0424-00			TRANSISTOR:SILICON,NPN	04713	SPS8246
A12Q1214	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
A12Q1310	151-0424-00			TRANSISTOR:SILICON,NPN	04713	SPS8246
A12Q1330	151-0427-00			TRANSISTOR:SILICON,NPN	80009	151-0427-00

Scan by Zenith

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A12Q1440	151-0225-00			TRANSISTOR:SILICON,NPN	80009	151-0225-00
A12Q1442	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
A12Q1540	151-0424-00			TRANSISTOR:SILICON,NPN	04713	SPS8246
A12Q1610	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
A12Q1612	151-0424-00			TRANSISTOR:SILICON,NPN	04713	SPS8246
A12Q1614	151-0225-00			TRANSISTOR:SILICON,NPN	80009	151-0225-00
A12Q1616	151-0424-00			TRANSISTOR:SILICON,NPN	04713	SPS8246
A12R1002	311-1561-00			RES.,VAR,NONWIR:2.5K OHM,20%,0.50W	73138	91-83-0
A12R1003	311-1567-00			RES.,VAR,NONWIR:TRMR,100 OHM,0.50W	73138	91-89-0
A12R1006	311-1566-00			RES.,VAR,NONWIR:200 OHM,20%,0.50W	73138	91-88-0
A12R1007	315-0112-00			RES.,FXD,CMPSN:1.1K OHM,5%,0.25W	01121	CB1125
A12R1008	315-0432-00			RES.,FXD,CMPSN:4.3K OHM,5%,0.25W	01121	CB4325
A12R1009	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A12R1010	315-0123-00			RES.,FXD,CMPSN:12K OHM,5%,0.25W	01121	CB1235
A12R1011	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
A12R1016	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A12R1020	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A12R1022	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A12R1023	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A12R1025	301-0431-00			RES.,FXD,CMPSN:430 OHM,5%,0.50W	01121	EB4315
A12R1026	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	01121	CB2205
A12R1027	301-0431-00			RES.,FXD,CMPSN:430 OHM,5%,0.50W	01121	EB4315
A12R1042	315-0184-00			RES.,FXD,CMPSN:180K OHM,5%,0.25W	01121	CB1845
A12R1043	315-0391-00			RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915
A12R1044	315-0391-00			RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915
A12R1045	315-0162-00			RES.,FXD,CMPSN:1.6K OHM,5%,0.25W	01121	CB1625
A12R1047	311-1562-00			RES.,VAR,NONWIR:2K OHM,20%,0.50W	73138	91-84-0
A12R1112	311-1560-00			RES.,VAR,NONWIR:5K OHM,20%,0.50W	73138	91-82-0
A12R1114	311-1560-00			RES.,VAR,NONWIR:5K OHM,20%,0.50W	73138	91-82-0
A12R1116	315-0683-00			RES.,FXD,CMPSN:68K OHM,5%,0.25W	01121	CB6835
A12R1117	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
A12R1120	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A12R1122	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A12R1124	315-0820-00			RES.,FXD,CMPSN:82 OHM,5%,0.25W	01121	CB8205
A12R1140	311-1561-00			RES.,VAR,NONWIR:2.5K OHM,20%,0.50W	73138	91-83-0
A12R1210	315-0180-00			RES.,FXD,CMPSN:18 OHM,5%,0.25W	01121	CB1805
A12R1212	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
A12R1213	315-0362-00			RES.,FXD,CMPSN:3.6K OHM,5%,0.25W	01121	CB3625
A12R1214	315-0680-00			RES.,FXD,CMPSN:68 OHM,5%,0.25W	01121	CB6805
A12R1215	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
A12R1216	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A12R1220	315-0431-00			RES.,FXD,CMPSN:430 OHM,5%,0.25W	01121	CB4315
A12R1225	315-0131-00			RES.,FXD,CMPSN:130 OHM,5%,0.25W	01121	CB1315
A12R1226	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A12R1227	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A12R1228	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A12R1229	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A12R1310	307-0113-00			RES.,FXD,CMPSN:5.1 OHM,5%,0.25W	01121	CB51G5
A12R1314	315-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
A12R1316	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A12R1320	301-0132-00			RES.,FXD,CMPSN:1.3K OHM,5%,0.50W	01121	EB1325
A12R1322	315-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
A12R1326	315-0184-00			RES.,FXD,CMPSN:180K OHM,5%,0.25W	01121	CB1845
A12R1330	315-0270-00			RES.,FXD,CMPSN:27 OHM,5%,0.25W	01121	CB2705
A12R1332	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A12R1334	317-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.125W	01121	BB1005
A12R1412	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715

Scan by Zenith

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A12R1416	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A12R1420	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A12R1422	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
A12R1424	315-0680-00			RES.,FXD,CMPSN:68 OHM,5%,0.25W	01121	CB6805
A12R1426	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A12R1430	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A12R1432	315-0390-00			RES.,FXD,CMPSN:39 OHM,5%,0.25W	01121	CB3905
A12R1433	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
A12R1435	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
A12R1440	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
A12R1441	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A12R1512	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
A12R1513	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
A12R1514	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A12R1516	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A12R1517	315-0390-00			RES.,FXD,CMPSN:39 OHM,5%,0.25W	01121	CB3905
A12R1520	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A12R1540	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A12R1542	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
A12R1543	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
A12R1544	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
A12R1545	315-0111-00			RES.,FXD,CMPSN:110 OHM,5%,0.25W	01121	CB1115
A12R1604	315-0111-00			RES.,FXD,CMPSN:110 OHM,5%,0.25W	01121	CB1115
A12R1610	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
A12R1612	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	01121	CB2205
A12R1614	315-0270-00			RES.,FXD,CMPSN:27 OHM,5%,0.25W	01121	CB2705
A12R1620	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A12R1630	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
	----- -----			(NOMINAL VALUE,SELECTED)		
A12R1631	315-0680-00			RES.,FXD,CMPSN:68 OHM,5%,0.25W	01121	CB6805
A12R1634	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A12R1640	315-0680-00			RES.,FXD,CMPSN:68 OHM,5%,0.25W	01121	CB6805
A12R1642	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
	----- -----			(NOMINAL VALUE,SELECTED)		
A12R1644	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A12R1700	311-1560-00			RES.,VAR,NONWIR:5K OHM,20%,0.50W	73138	91-82-0
A12R1702	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
A12R1703	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A12R1704	315-0621-00			RES.,FXD,CMPSN:620 OHM,5%,0.25W	01121	CB6215
A12R1708	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A12R1710	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A12R1730	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A12R1732	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A12R1733	315-0151-00			RES.,FXD,CMPSN:150 OHM,5%,0.25W	01121	CB1515
A12R1734	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A12R1736	315-0751-00			RES.,FXD,CMPSN:750 OHM,5%,0.25W	01121	CB7515
A12R1737	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A12R1740	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A12R1742	315-0131-00			RES.,FXD,CMPSN:130 OHM,5%,0.25W	01121	CB1315
A12R1743	315-0820-00			RES.,FXD,CMPSN:82 OHM,5%,0.25W	01121	CB8205
A12R1744	315-0131-00			RES.,FXD,CMPSN:130 OHM,5%,0.25W	01121	CB1315
A12R1745	315-0820-00			RES.,FXD,CMPSN:82 OHM,5%,0.25W	01121	CB8205
A12R1830	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A12R1840	315-0131-00			RES.,FXD,CMPSN:130 OHM,5%,0.25W	01121	CB1315
A12R1841	315-0820-00			RES.,FXD,CMPSN:82 OHM,5%,0.25W	01121	CB8205
A12S1800A-C	260-1723-00			SWITCH,PUSH:3 BUTTON,2 POLE	80009	260-1723-00
A12S1820A,B	260-1801-00			SWITCH,PUSH:DPDT,2 BUTTON	80009	260-1801-00

Scan by Zenith

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A12U1120	156-0182-00			MICROCIRCUIT,DI:TRIPLE 2-3-2 INPUT GATE	80009	156-0182-00
A12U1410	156-0182-00			MICROCIRCUIT,DI:TRIPLE 2-3-2 INPUT GATE	80009	156-0182-00
A12U1420	156-0205-00			MICROCIRCUIT,DI:QUAD 2-INPUT NOR GATE	80009	156-0205-00
A12U1540	156-0182-00			MICROCIRCUIT,DI:TRIPLE 2-3-2 INPUT GATE	80009	156-0182-00
A12U1630	156-0205-00			MICROCIRCUIT,DI:QUAD 2-INPUT NOR GATE	80009	156-0205-00
A12U1830	156-0880-00			MICROCIRCUIT,DI:DUAL D MASTER SLAVE FF	80009	156-0880-00
A12VR1120	152-0279-00			SEMICOND DEVICE:ZENER,0.4W,5.1V,5%	80009	152-0279-00
A12W1400	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A12W1420	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A12W1430	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A12W1440	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A12W1840	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1

Scan by Zenith

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A13	----- -----			CKT BOARD ASSY:OUTPUT A		
A13C1020	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1021	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1100	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A13C1101	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A13C1110	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1120	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1130	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1131	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1132	281-0773-00			CAP.,FXD,CER DI:0.01UF,10%,100V	72982	8005H9AADW5R103K
A13C1133	281-0773-00			CAP.,FXD,CER DI:0.01UF,10%,100V	72982	8005H9AADW5R103K
A13C1200	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A13C1210	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A13C1211	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1220	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1230	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1231	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1300	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A13C1301	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1310	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1330	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1332	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A13C1401	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A13C1402	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A13C1403	283-0077-00			CAP.,FXD,CER DI:330PF,5%,500V	56289	40C94A3
A13C1410	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1414	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1415	283-0154-00			CAP.,FXD,CER DI:22PF,5%,50V	72982	8111B061C0G220J
A13C1430	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A13C1431	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1510	283-0353-00			CAP.,FXD,CER DI:0.1UF,10%,50V	95275	VJ1210Y104K-H
A13C1511	283-0353-00			CAP.,FXD,CER DI:0.1UF,10%,50V	95275	VJ1210Y104K-H
A13C1530	283-0353-00			CAP.,FXD,CER DI:0.1UF,10%,50V	95275	VJ1210Y104K-H
A13C1531	283-0353-00			CAP.,FXD,CER DI:0.1UF,10%,50V	95275	VJ1210Y104K-H
A13C1532	283-0077-00			CAP.,FXD,CER DI:330PF,5%,500V	56289	40C94A3
A13C1610	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13C1620	281-0718-00			CAP.,FXD,CER DI:15.8PF,1%,500V	72982	374005C0G01589F
A13C1630	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13CR1030	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13CR1031	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13CR1100	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A13CR1101	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A13CR1110	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13CR1111	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13CR1112	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13CR1120	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13CR1121	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13CR1122	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13CR1123	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13CR1200	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A13CR1210	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A13CR1220	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13CR1221	152-0322-00			SEMICOND DEVICE:SILICON,15V,HOT CARRIER	50434	5082-2672
A13CR1230	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13CR1231	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13CR1310	152-0153-00			SEMICOND DEVICE:SILICON,15V,50MA	07263	FD7003
A13CR1320	152-0153-00			SEMICOND DEVICE:SILICON,15V,50MA	07263	FD7003

Scan by Zenith

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A13CR1330	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13CR1331	152-0322-00			SEMICOND DEVICE:SILICON,15V,HOT CARRIER	50434	5082-2672
A13CR1400	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A13CR1401	152-0536-00			SEMICOND DEVICE:SILICON,HOT CARRIER,4V	80009	152-0536-00
A13CR1410	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13CR1420	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13CR1430	152-0536-00			SEMICOND DEVICE:SILICON,HOT CARRIER,4V	80009	152-0536-00
A13CR1510	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13CR1511	152-0725-00			SEMICOND DEVICE:SILICON,20V,1.2PF	80009	152-0725-00
A13CR1512	152-0333-00			SEMICOND DEVICE:SILICON,55V,200MA	07263	FDH-6012
A13CR1520	152-0725-00			SEMICOND DEVICE:SILICON,20V,1.2PF	80009	152-0725-00
A13CR1521	152-0333-00			SEMICOND DEVICE:SILICON,55V,200MA	07263	FDH-6012
A13CR1530	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13J1020	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A13J1200	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QTY 2)	22526	47357
A13J1401	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QTY 4)	22526	47357
A13J1420	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A13J1520	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A13J1530	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QTY 2)	22526	47357
A13J1531	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
A13J1532	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QTY 2)	22526	47357
A13J2030	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
A13L1310	108-0408-00			COIL,RF:100NH	80009	108-0408-00
A13L1320	108-0408-00			COIL,RF:100NH	80009	108-0408-00
A13L1400	108-0734-00			COIL,RF:FIXED,160NH	80009	108-0734-00
A13L1430	108-0734-00			COIL,RF:FIXED,160NH	80009	108-0734-00
A13L1620	108-0455-00			COIL,RF:FIXED,40NH	80009	108-0455-00
A13P1220	131-0595-00			CONTACT,ELEC:1.37 INCH LONG	22526	47355
A13P1222	131-0595-00			CONTACT,ELEC:1.37 INCH LONG	22526	47355
A13P1224	131-0595-00			CONTACT,ELEC:1.37 INCH LONG	22526	47355
A13Q1110	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A13Q1111	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A13Q1200	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A13Q1201	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A13Q1202	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A13Q1210	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A13Q1211	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A13Q1220	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A13Q1300	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A13Q1301	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A13Q1302	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A13Q1310	151-0427-00			TRANSISTOR:SILICON,NPN	80009	151-0427-00
A13Q1311	151-0720-00			TRANSISTOR:SILICON,NPN	04713	SPS8232
A13Q1312	151-0720-00			TRANSISTOR:SILICON,NPN	04713	SPS8232
A13Q1313	151-0127-00			TRANSISTOR:SILICON,NPN	07263	S006075
A13Q1320	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
A13Q1321	151-0719-00			TRANSISTOR:SILICON,PNP	04713	SPS8226
A13Q1322	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
A13Q1323	151-0719-00			TRANSISTOR:SILICON,PNP	04713	SPS8226
A13Q1330	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A13Q1331	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A13Q1410	151-0719-00			TRANSISTOR:SILICON,PNP	04713	SPS8226
A13Q1411	151-0719-00			TRANSISTOR:SILICON,PNP	04713	SPS8226

Scan by Zenith

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A13Q1412	151-0127-00			TRANSISTOR:SILICON,NPN	07263	S006075
A13Q1413	151-0450-00			TRANSISTOR:SILICON,PNP,SEL FROM 2N5583	80009	151-0450-00
A13Q1414	151-0450-00			TRANSISTOR:SILICON,PNP,SEL FROM 2N5583	80009	151-0450-00
A13Q1420	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
A13Q1421	151-0720-00			TRANSISTOR:SILICON,NPN	04713	SPS8232
A13Q1422	151-0720-00			TRANSISTOR:SILICON,NPN	04713	SPS8232
A13Q1423	151-0411-00			TRANSISTOR:SILICON,NPN	80009	151-0411-00
A13Q1424	151-0288-00			TRANSISTOR:SILICON,NPN	80009	151-0288-00
A13Q1510	151-0411-00			TRANSISTOR:SILICON,NPN	80009	151-0411-00
A13Q1511	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A13Q1512	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A13Q1513	151-0411-00			TRANSISTOR:SILICON,NPN	80009	151-0411-00
A13Q1520	151-0450-00			TRANSISTOR:SILICON,PNP,SEL FROM 2N5583	80009	151-0450-00
A13Q1530	151-0450-00			TRANSISTOR:SILICON,PNP,SEL FROM 2N5583	80009	151-0450-00
A13Q1531	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A13Q1532	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A13R1000	311-1240-00			RES.,VAR,NONWIR:25K OHM,10%,0.50W	73138	72-30-0
A13R1001	311-1245-00			RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	72-28-0
A13R1002	321-0297-00			RES.,FXD,FILM:12.1K OHM,1%,0.125W	91637	MFF1816G12101F
A13R1003	321-0318-00			RES.,FXD,FILM:20K OHM,1%,0.125W	91637	MFF1816G20001F
A13R1004	321-0318-00			RES.,FXD,FILM:20K OHM,1%,0.125W	91637	MFF1816G20001F
A13R1010	321-0311-00			RES.,FXD,FILM:16.9K OHM,1%,0.125W	91637	MFF1816G16901F
A13R1011	321-0350-00			RES.,FXD,FILM:43.2K OHM,1%,0.125W	91637	MFF1816G43201F
A13R1012	321-0318-00			RES.,FXD,FILM:20K OHM,1%,0.125W	91637	MFF1816G20001F
A13R1013	321-0231-00			RES.,FXD,FILM:2.49K OHM,1%,0.125W	91637	MFF1816G24900F
A13R1014	321-0216-00			RES.,FXD,FILM:1.74K OHM,1%,0.125W	91637	MFF1816G17400F
A13R1015	321-0260-00			RES.,FXD,FILM:4.99K OHM,1%,0.125W	91637	MFF1816G49900F
A13R1016	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A13R1017	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A13R1020	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A13R1021	321-0260-00			RES.,FXD,FILM:4.99K OHM,1%,0.125W	91637	MFF1816G49900F
A13R1022	321-0213-00			RES.,FXD,FILM:1.62K OHM,1%,0.125W	91637	MFF1816G16200F
A13R1023	321-0235-00			RES.,FXD,FILM:2.74K OHM,1%,0.125W	91637	MFF1816G27400F
A13R1024	315-0754-00			RES.,FXD,CMPSN:750K OHM,5%,0.25W	01121	CB7545
A13R1030	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A13R1031	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A13R1100	311-1240-00			RES.,VAR,NONWIR:25K OHM,10%,0.50W	73138	72-30-0
A13R1101	311-1245-00			RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	72-28-0
A13R1102	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
A13R1103	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
A13R1104	315-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
A13R1105	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
A13R1106	315-0123-00			RES.,FXD,CMPSN:12K OHM,5%,0.25W	01121	CB1235
A13R1107	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
A13R1110	321-0318-00			RES.,FXD,FILM:20K OHM,1%,0.125W	91637	MFF1816G20001F
A13R1111	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
A13R1112	315-0683-00			RES.,FXD,CMPSN:68K OHM,5%,0.25W	01121	CB6835
A13R1113	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
A13R1114	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
A13R1115	315-0683-00			RES.,FXD,CMPSN:68K OHM,5%,0.25W	01121	CB6835
A13R1116	315-0473-00			RES.,FXD,CMPSN:47K OHM,5%,0.25W	01121	CB4735
A13R1117	315-0123-00			RES.,FXD,CMPSN:12K OHM,5%,0.25W	01121	CB1235
A13R1118	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
A13R1119	315-0303-00			RES.,FXD,CMPSN:30K OHM,5%,0.25W	01121	CB3035
A13R1120	315-0820-00			RES.,FXD,CMPSN:82 OHM,5%,0.25W	01121	CB8205
A13R1121	315-0131-00			RES.,FXD,CMPSN:130 OHM,5%,0.25W	01121	CB1315
A13R1122	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035

Scan by Zenith

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A13R1123	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
A13R1124	315-0132-00			RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	01121	CB1325
A13R1125	315-0132-00			RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	01121	CB1325
A13R1126	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
A13R1127	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
A13R1128	307-0112-00			RES.,FXD,CMPSN:4.3 OHM,5%,0.25W	01121	CB43G5
A13R1129	315-0362-00			RES.,FXD,CMPSN:3.6K OHM,5%,0.25W	01121	CB3625
A13R1130	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
A13R1131	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A13R1132	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	01121	CB2235
A13R1133	315-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
A13R1134	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A13R1135	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A13R1210	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A13R1211	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
A13R1212	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
A13R1213	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
A13R1214	315-0361-00			RES.,FXD,CMPSN:360 OHM,5%,0.25W	01121	CB3615
A13R1215	321-0175-00			RES.,FXD,FILM:649 OHM,1%,0.125W	91637	MFF1816G649R0F
A13R1216	315-0243-00			RES.,FXD,CMPSN:24K OHM,5%,0.25W	01121	CB2435
A13R1220	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
A13R1221	315-0820-00			RES.,FXD,CMPSN:82 OHM,5%,0.25W	01121	CB8205
A13R1222	315-0131-00			RES.,FXD,CMPSN:130 OHM,5%,0.25W	01121	CB1315
A13R1223	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
A13R1300	315-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
A13R1301	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A13R1302	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
A13R1303	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
A13R1304	315-0681-00			RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
A13R1306	315-0361-00			RES.,FXD,CMPSN:360 OHM,5%,0.25W	01121	CB3615
A13R1310	315-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
A13R1311	315-0122-00			RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
A13R1312	321-0132-00			RES.,FXD,FILM:232 OHM,1%,0.125W	91637	MFF1816G232R0F
A13R1313	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A13R1314	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A13R1315	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
A13R1316	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
A13R1317	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13R1318	301-0431-00			RES.,FXD,CMPSN:430 OHM,5%,0.50W	01121	EB4315
A13R1319	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
A13R1320	315-0200-00			RES.,FXD,CMPSN:20 OHM,5%,0.25W	01121	CB2005
A13R1321	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A13R1322	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A13R1323	317-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.125W	01121	BB1035
A13R1325	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
A13R1326	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13R1327	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A13R1328	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A13R1329	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13R1330	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13R1331	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A13R1332	301-0431-00			RES.,FXD,CMPSN:430 OHM,5%,0.50W	01121	EB4315
A13R1333	315-0112-00			RES.,FXD,CMPSN:1.1K OHM,5%,0.25W	01121	CB1125
A13R1334	315-0162-00			RES.,FXD,CMPSN:1.6K OHM,5%,0.25W	01121	CB1625
A13R1335	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	01121	CB2725
A13R1336	315-0361-00			RES.,FXD,CMPSN:360 OHM,5%,0.25W	01121	CB3615
A13R1337	315-0681-00			RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815

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Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A13R1338	317-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.125W	01121	BB1035
A13R1400	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
A13R1401	315-0150-00			RES.,FXD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
A13R1402	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
A13R1403	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
A13R1404	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
A13R1405	307-0113-00			RES.,FXD,CMPSN:5.1 OHM,5%,0.25W	01121	CB51G5
A13R1406	307-0113-00			RES.,FXD,CMPSN:5.1 OHM,5%,0.25W	01121	CB51G5
A13R1407	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13R1408	315-0680-00			RES.,FXD,CMPSN:68 OHM,5%,0.25W	01121	CB6805
A13R1409	315-0162-00			RES.,FXD,CMPSN:1.6K OHM,5%,0.25W	01121	CB1625
A13R1410	317-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.125W	01121	BB1215
A13R1411	315-0680-00			RES.,FXD,CMPSN:68 OHM,5%,0.25W	01121	CB6805
A13R1412	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13R1413	315-0200-00			RES.,FXD,CMPSN:20 OHM,5%,0.25W	01121	CB2005
A13R1414	315-0200-00			RES.,FXD,CMPSN:20 OHM,5%,0.25W	01121	CB2005
A13R1416	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	01121	CB2205
A13R1420	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A13R1421	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13R1422	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13R1423	315-0680-00			RES.,FXD,CMPSN:68 OHM,5%,0.25W	01121	CB6805
A13R1430	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
A13R1431	317-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.125W	01121	BB1215
A13R1432	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
A13R1433	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
A13R1434	307-0113-00			RES.,FXD,CMPSN:5.1 OHM,5%,0.25W	01121	CB51G5
A13R1435	307-0113-00			RES.,FXD,CMPSN:5.1 OHM,5%,0.25W	01121	CB51G5
A13R1436	315-0150-00			RES.,FXD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
A13R1437	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
A13R1510	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A13R1511	301-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.50W	01121	EB4305
A13R1512	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13R1520	305-0560-00			RES.,FXD,CMPSN:56 OHM,5%,2W	01121	HB5605
A13R1521	301-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.50W	01121	EB4305
A13R1522	301-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.50W	01121	EB4305
A13R1523	305-0560-00			RES.,FXD,CMPSN:56 OHM,5%,2W	01121	HB5605
A13R1524	301-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.50W	01121	EB4305
A13R1525	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13R1530	315-0680-00			RES.,FXD,CMPSN:68 OHM,5%,0.25W	01121	CB6805
A13R1531	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13R1532	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A13R1610	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
A13R1620	321-0068-00			RES.,FXD,FILM:49.9 OHM,1%,0.125W	91637	MFF1816G49R90F
A13R1621	321-0068-00			RES.,FXD,FILM:49.9 OHM,1%,0.125W	91637	MFF1816G49R90F
A13RT1400	307-0122-00			RES.,THERMAL:50 OHM,10%	50157	3D1515
A13RT1430	307-0122-00			RES.,THERMAL:50 OHM,10%	50157	3D1515
A13S1630	260-1453-00			SWITCH,PUSH:1 BUTTON	80009	260-1453-00
A13TP1200	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A13TP1400	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A13TP1500	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A13U1010	156-0158-00			MICROCIRCUIT,LI:DUAL OPERATIONAL AMPLIFIER	18324	MC1458V
A13U1020	156-0158-00			MICROCIRCUIT,LI:DUAL OPERATIONAL AMPLIFIER	18324	MC1458V
A13U1030	156-0158-00			MICROCIRCUIT,LI:DUAL OPERATIONAL AMPLIFIER	18324	MC1458V
A13U1110	156-0158-00			MICROCIRCUIT,LI:DUAL OPERATIONAL AMPLIFIER	18324	MC1458V
A13U1130	156-0158-00			MICROCIRCUIT,LI:DUAL OPERATIONAL AMPLIFIER	18324	MC1458V
A13U1320	156-0295-00			MICROCIRCUIT,DI:TRIPLE EXCL OR EXCL NOR	80009	156-0295-00
A13VR1100	152-0693-00			SEMICOND DEVICE:ZENER,0.4W,4V,5%	80009	152-0693-00

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Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A13VR1120	152-0279-00			SEMICOND DEVICE:ZENER,0.4W,5.1V,5%	80009	152-0279-00
A13VR1220	152-0278-00			SEMICOND DEVICE:ZENER,0.4W,3V,5%	04713	SZG35009K20
A13VR1420	152-0278-00			SEMICOND DEVICE:ZENER,0.4W,3V,5%	04713	SZG35009K20
A13W1320	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1

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Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A14	----- -----			CKT BOARD ASSY:OUTPUT B		
A14C1010	281-0718-00			CAP.,FXD,CER DI:15.8PF,1%,500V	72982	374005C0G01589F
A14C1100	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1101	283-0077-00			CAP.,FXD,CER DI:330PF,5%,500V	56289	40C94A3
A14C1110	283-0353-00			CAP.,FXD,CER DI:0.1UF,10%,50V	95275	VJ1210Y104K-H
A14C1111	283-0353-00			CAP.,FXD,CER DI:0.1UF,10%,50V	95275	VJ1210Y104K-H
A14C1130	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1131	283-0353-00			CAP.,FXD,CER DI:0.1UF,10%,50V	95275	VJ1210Y104K-H
A14C1132	283-0077-00			CAP.,FXD,CER DI:330PF,5%,500V	56289	40C94A3
A14C1133	283-0353-00			CAP.,FXD,CER DI:0.1UF,10%,50V	95275	VJ1210Y104K-H
A14C1200	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1201	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A14C1223	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1224	283-0154-00			CAP.,FXD,CER DI:22PF,5%,50V	72982	8111B061C0G220J
A14C1230	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A14C1300	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A14C1330	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1331	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A14C1332	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1333	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1400	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1411	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1412	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1430	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1510	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1511	290-0117-00			CAP.,FXD,ELCTLT:50UF,+75-10%,50V	56289	30D506G050DD9
A14C1520	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1530	290-0117-00			CAP.,FXD,ELCTLT:50UF,+75-10%,50V	56289	30D506G050DD9
A14C1610	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1611	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1620	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1621	281-0768-00			CAP.,FXD,CER DI:470PF,20%,100V	72982	8035D9AADW5R471M
A14C1622	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1630	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1700	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1710	281-0768-00			CAP.,FXD,CER DI:470PF,20%,100V	72982	8035D9AADW5R471M
A14C1730	290-0786-00			CAP.,FXD,ELCTLT:1500UF,+50-10%,75VDC	56289	39D793
A14C1800	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
A14C1810	290-0136-00			CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	162D225X0020CD2
A14C1811	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
A14C1812	290-0136-00			CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	162D225X0020CD2
A14C1830	290-0786-00			CAP.,FXD,ELCTLT:1500UF,+50-10%,75VDC	56289	39D793
A14C1900	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
A14C1910	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1911	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14C1930	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A14CR1020	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A14CR1110	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A14CR1130	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A14CR1200	152-0536-00			SEMICOND DEVICE:SILICON,HOT CARRIER,4V	80009	152-0536-00
A14CR1210	152-0725-00			SEMICOND DEVICE:SILICON,20V,1.2PF	80009	152-0725-00
A14CR1211	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A14CR1212	152-0333-00			SEMICOND DEVICE:SILICON,55V,200MA	07263	FDH-6012
A14CR1220	152-0725-00			SEMICOND DEVICE:SILICON,20V,1.2PF	80009	152-0725-00
A14CR1221	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A14CR1222	152-0333-00			SEMICOND DEVICE:SILICON,55V,200MA	07263	FDH-6012
A14CR1230	152-0536-00			SEMICOND DEVICE:SILICON,HOT CARRIER,4V	80009	152-0536-00

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Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A14CR1310	152-0153-00			SEMICOND DEVICE:SILICON,15V,50MA	07263	FD7003
A14CR1320	152-0153-00			SEMICOND DEVICE:SILICON,15V,50MA	07263	FD7003
A14CR1321	152-0322-00			SEMICOND DEVICE:SILICON,15V,HOT CARRIER	50434	5082-2672
A14CR1330	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A14CR1331	152-0322-00			SEMICOND DEVICE:SILICON,15V,HOT CARRIER	50434	5082-2672
A14CR1410	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A14CR1420	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A14CR1421	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A14CR1430	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A14CR1431	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A14CR1432	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A14CR1530	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A14CR1531	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A14CR1610	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A14CR1611	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A14CR1620	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A14CR1630	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A14CR1700	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A14CR1710	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A14CR1810	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A14CR1820	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A14CR1821	152-0488-00			SEMICOND DEVICE:SILICON,200V,1500MA	04713	3N55 FAMILY
A14CR1830	152-0488-00			SEMICOND DEVICE:SILICON,200V,1500MA	04713	3N55 FAMILY
A14CR1831	152-0488-00			SEMICOND DEVICE:SILICON,200V,1500MA	04713	3N55 FAMILY
A14CR1910	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A14F1720	159-0019-00			FUSE,CARTRIDGE:3AG,1A,250V,SLOW BLOW	71400	MDL1
A14F1721	159-0019-00			FUSE,CARTRIDGE:3AG,1A,250V,SLOW BLOW	71400	MDL1
A14F1820	159-0019-00			FUSE,CARTRIDGE:3AG,1A,250V,SLOW BLOW	71400	MDL1
A14F1821	159-0019-00			FUSE,CARTRIDGE:3AG,1A,250V,SLOW BLOW	71400	MDL1
A14F1920	159-0102-00			FUSE,CARTRIDGE:WIRE LEAD,0.4A,FAST-BLOW	75915	273.400
A14F1930	159-0102-00			FUSE,CARTRIDGE:WIRE LEAD,0.4A,FAST-BLOW	75915	273.400
A14F1931	159-0153-00			FUSE,WIRE LEAD:1.5A,125V,FAST BLOW	000DN	BUSSGFA 11/2
A14J1040	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 3)		
A14J1110	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A14J1140	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 3)		
A14J1142	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 3)		
A14J1220	136-0263-04			SOCKET,PIN TERM:FOR 0.025 INCH SQUARE PIN	22526	75377-001
A14J1222	136-0263-04			SOCKET,PIN TERM:FOR 0.025 INCH SQUARE PIN	22526	75377-001
A14J1224	136-0263-04			SOCKET,PIN TERM:FOR 0.025 INCH SQUARE PIN	22526	75377-001
A14J1320	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 2)		
A14J1340	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 2)		
A14J1441	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 2)		
A14J1500	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 2)		
A14J1502	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 2)		
A14J1540	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 2)		
A14J1542	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 2)		
A14J1620	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 2)		

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Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A14J1641	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 6)		
A14J1800	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 4)		
A14J1802	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 4)		
A14J1820	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 2)		
A14J1900	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A14J1902	131-1003-00			CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A14J1910	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
A14L1020	108-0455-00			COIL,RF:FIXED,40NH	80009	108-0455-00
A14L1200	108-0734-00			COIL,RF:FIXED,160NH	80009	108-0734-00
A14L1230	108-0734-00			COIL,RF:FIXED,160NH	80009	108-0734-00
A14L1314	108-0408-00			COIL,RF:100NH	80009	108-0408-00
A14L1324	108-0408-00			COIL,RF:100NH	80009	108-0408-00
A14Q1100	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A14Q1110	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A14Q1111	151-0411-00			TRANSISTOR:SILICON,NPN	80009	151-0411-00
A14Q1112	151-0411-00			TRANSISTOR:SILICON,NPN	80009	151-0411-00
A14Q1120	151-0450-00			TRANSISTOR:SILICON,PNP,SEL FROM 2N5583	80009	151-0450-00
A14Q1130	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A14Q1131	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A14Q1132	151-0450-00			TRANSISTOR:SILICON,PNP,SEL FROM 2N5583	80009	151-0450-00
A14Q1210	151-0450-00			TRANSISTOR:SILICON,PNP,SEL FROM 2N5583	80009	151-0450-00
A14Q1211	151-0719-00			TRANSISTOR:SILICON,PNP	04713	SPS8226
A14Q1212	151-0719-00			TRANSISTOR:SILICON,PNP	04713	SPS8226
A14Q1213	151-0450-00			TRANSISTOR:SILICON,PNP,SEL FROM 2N5583	80009	151-0450-00
A14Q1214	151-0127-00			TRANSISTOR:SILICON,NPN	07263	S006075
A14Q1220	151-0411-00			TRANSISTOR:SILICON,NPN	80009	151-0411-00
A14Q1221	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
A14Q1222	151-0720-00			TRANSISTOR:SILICON,NPN	04713	SPS8232
A14Q1230	151-0288-00			TRANSISTOR:SILICON,NPN	80009	151-0288-00
A14Q1231	151-0720-00			TRANSISTOR:SILICON,NPN	04713	SPS8232
A14Q1300	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A14Q1301	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A14Q1302	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A14Q1303	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A14Q1310	151-0720-00			TRANSISTOR:SILICON,NPN	04713	SPS8232
A14Q1311	151-0720-00			TRANSISTOR:SILICON,NPN	04713	SPS8232
A14Q1312	151-0427-00			TRANSISTOR:SILICON,NPN	80009	151-0427-00
A14Q1313	151-0127-00			TRANSISTOR:SILICON,NPN	07263	S006075
A14Q1320	151-0719-00			TRANSISTOR:SILICON,PNP	04713	SPS8226
A14Q1321	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
A14Q1330	151-0719-00			TRANSISTOR:SILICON,PNP	04713	SPS8226
A14Q1331	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
A14Q1332	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A14Q1333	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A14Q1400	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A14Q1401	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A14Q1410	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A14Q1411	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A14Q1420	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A14Q1421	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A14Q1510	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A14Q1600	151-0350-00			TRANSISTOR:SILICON,PNP	04713	SPS6700

Scan by Zenith

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A14Q1610	151-0432-00			TRANSISTOR:SILICON,NPN	80009	151-0432-00
A14Q1620	151-0432-00			TRANSISTOR:SILICON,NPN	80009	151-0432-00
A14Q1621	151-0432-00			TRANSISTOR:SILICON,NPN	80009	151-0432-00
A14Q1622	151-0432-00			TRANSISTOR:SILICON,NPN	80009	151-0432-00
A14Q1623	151-0350-00			TRANSISTOR:SILICON,PNP	04713	SPS6700
A14Q1624	151-0350-00			TRANSISTOR:SILICON,PNP	04713	SPS6700
A14Q1625	151-0463-00			TRANSISTOR:SILICON,PNP	80009	151-0463-00
A14Q1626	151-0350-00			TRANSISTOR:SILICON,PNP	04713	SPS6700
A14Q1630	151-0432-00			TRANSISTOR:SILICON,NPN	80009	151-0432-00
A14Q1631	151-0453-00			TRANSISTOR:SILICON,PNP	80009	151-0453-00
A14Q1700	151-0350-00			TRANSISTOR:SILICON,PNP	04713	SPS6700
A14Q1701	151-0350-00			TRANSISTOR:SILICON,PNP	04713	SPS6700
A14Q1702	151-0439-00			TRANSISTOR:SILICON,NPN	80009	151-0439-00
A14Q1710	151-0432-00			TRANSISTOR:SILICON,NPN	80009	151-0432-00
A14Q1711	151-0432-00			TRANSISTOR:SILICON,NPN	80009	151-0432-00
A14Q1712	151-0453-00			TRANSISTOR:SILICON,PNP	80009	151-0453-00
A14Q1713	151-0432-00			TRANSISTOR:SILICON,NPN	80009	151-0432-00
A14R1000	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
A14R1010	311-1245-00			RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	72-28-0
A14R1011	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A14R1012	315-0105-00			RES.,FXD,CMPSN:1M OHM,5%,0.25W	01121	CB1055
A14R1013	311-1559-00			RES.,VAR,NONWIR:10K OHM,20%,0.50W	73138	91-81-0
A14R1020	311-1245-00			RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	72-28-0
A14R1021	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A14R1022	315-0105-00			RES.,FXD,CMPSN:1M OHM,5%,0.25W	01121	CB1055
A14R1023	311-1559-00			RES.,VAR,NONWIR:10K OHM,20%,0.50W	73138	91-81-0
A14R1024	321-0068-00			RES.,FXD,FILM:49.9 OHM,1%,0.125W	91637	MFF1816G49R90F
A14R1025	321-0068-00			RES.,FXD,FILM:49.9 OHM,1%,0.125W	91637	MFF1816G49R90F
A14R1100	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A14R1101	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A14R1102	315-0680-00			RES.,FXD,CMPSN:68 OHM,5%,0.25W	01121	CB6805
A14R1110	305-0560-00			RES.,FXD,CMPSN:56 OHM,5%,2W	01121	HB5605
A14R1111	301-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.50W	01121	EB4305
A14R1112	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	01121	CB2205
A14R1120	301-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.50W	01121	EB4305
A14R1121	301-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.50W	01121	EB4305
A14R1122	305-0560-00			RES.,FXD,CMPSN:56 OHM,5%,2W	01121	HB5605
A14R1130	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A14R1132	315-0680-00			RES.,FXD,CMPSN:68 OHM,5%,0.25W	01121	CB6805
A14R1133	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A14R1200	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
A14R1201	315-0150-00			RES.,FXD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
A14R1202	307-0113-00			RES.,FXD,CMPSN:5.1 OHM,5%,0.25W	01121	CB51G5
A14R1203	307-0113-00			RES.,FXD,CMPSN:5.1 OHM,5%,0.25W	01121	CB51G5
A14R1204	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
A14R1205	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
A14R1210	315-0680-00			RES.,FXD,CMPSN:68 OHM,5%,0.25W	01121	CB6805
A14R1211	317-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.125W	01121	BB1215
A14R1212	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A14R1213	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A14R1214	315-0620-00			RES.,FXD,CMPSN:62 OHM,5%,0.25W	01121	CB6205
A14R1220	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A14R1221	301-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.50W	01121	EB4305
A14R1222	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A14R1223	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A14R1224	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A14R1225	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015

Scan by Zenith

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A14R1226	315-0680-00			RES.,FXD,CMPSN:68 OHM,5%,0.25W	01121	CB6805
A14R1228	315-0200-00			RES.,FXD,CMPSN:20 OHM,5%,0.25W	01121	CB2005
A14R1230	307-0113-00			RES.,FXD,CMPSN:5.1 OHM,5%,0.25W	01121	CB51G5
A14R1231	307-0113-00			RES.,FXD,CMPSN:5.1 OHM,5%,0.25W	01121	CB51G5
A14R1232	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
A14R1233	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
A14R1234	315-0150-00			RES.,FXD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
A14R1235	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
A14R1236	317-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.125W	01121	BB1215
A14R1300	315-0361-00			RES.,FXD,CMPSN:360 OHM,5%,0.25W	01121	CB3615
A14R1301	315-0681-00			RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
A14R1302	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
A14R1303	315-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
A14R1304	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
A14R1305	315-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
A14R1306	317-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.125W	01121	BB1035
A14R1310	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
A14R1311	321-0132-00			RES.,FXD,FILM:232 OHM,1%,0.125W	91637	MFF1816G232R0F
A14R1312	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A14R1313	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A14R1315	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
A14R1316	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
A14R1317	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A14R1318	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A14R1319	315-0122-00			RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
A14R1320	315-0200-00			RES.,FXD,CMPSN:20 OHM,5%,0.25W	01121	CB2005
A14R1321	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A14R1322	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A14R1323	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A14R1325	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
A14R1326	301-0391-00			RES.,FXD,CMPSN:390 OHM,5%,0.50W	01121	EB3915
A14R1330	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
A14R1331	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A14R1332	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A14R1333	315-0681-00			RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
A14R1334	315-0361-00			RES.,FXD,CMPSN:360 OHM,5%,0.25W	01121	CB3615
A14R1335	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	01121	CB2725
A14R1336	315-0112-00			RES.,FXD,CMPSN:1.1K OHM,5%,0.25W	01121	CB1125
A14R1337	315-0162-00			RES.,FXD,CMPSN:1.6K OHM,5%,0.25W	01121	CB1625
A14R1338	317-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.125W	01121	BB1035
A14R1400	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A14R1401	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
A14R1402	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
A14R1403	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A14R1404	311-1559-00			RES.,VAR,NONWIR:10K OHM,20%,0.50W	73138	91-81-0
A14R1405	311-1557-00			RES.,VAR,NONWIR:25K OHM,20%,0.50W	73138	91-79-00
A14R1406	315-0162-00			RES.,FXD,CMPSN:1.6K OHM,5%,0.25W	01121	CB1625
A14R1407	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
A14R1410	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A14R1411	301-0431-00			RES.,FXD,CMPSN:430 OHM,5%,0.50W	01121	EB4315
A14R1412	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
A14R1413	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
A14R1414	321-0318-00			RES.,FXD,FILM:20K OHM,1%,0.125W	91637	MFF1816G20001F
A14R1415	321-0175-00			RES.,FXD,FILM:649 OHM,1%,0.125W	91637	MFF1816G649R0F
A14R1416	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
A14R1417	315-0473-00			RES.,FXD,CMPSN:47K OHM,5%,0.25W	01121	CB4735
A14R1418	315-0361-00			RES.,FXD,CMPSN:360 OHM,5%,0.25W	01121	CB3615

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Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A14R1419	315-0243-00			RES.,FXD,CMPSN:24K OHM,5%,0.25W	01121	CB2435
A14R1421	315-0683-00			RES.,FXD,CMPSN:68K OHM,5%,0.25W	01121	CB6835
A14R1422	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
A14R1423	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
A14R1424	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
A14R1425	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
A14R1426	315-0303-00			RES.,FXD,CMPSN:30K OHM,5%,0.25W	01121	CB3035
A14R1430	301-0431-00			RES.,FXD,CMPSN:430 OHM,5%,0.50W	01121	EB4315
A14R1431	321-0311-00			RES.,FXD,FILM:16.9K OHM,1%,0.125W	91637	MFF1816G16901F
A14R1432	321-0318-00			RES.,FXD,FILM:20K OHM,1%,0.125W	91637	MFF1816G20001F
A14R1433	315-0123-00			RES.,FXD,CMPSN:12K OHM,5%,0.25W	01121	CB1235
A14R1500	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
A14R1501	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
A14R1502	315-0123-00			RES.,FXD,CMPSN:12K OHM,5%,0.25W	01121	CB1235
A14R1510	321-0297-00			RES.,FXD,FILM:12.1K OHM,1%,0.125W	91637	MFF1816G12101F
A14R1511	321-0318-00			RES.,FXD,FILM:20K OHM,1%,0.125W	91637	MFF1816G20001F
A14R1512	321-0318-00			RES.,FXD,FILM:20K OHM,1%,0.125W	91637	MFF1816G20001F
A14R1513	311-1557-00			RES.,VAR,NONWIR:25K OHM,20%,0.50W	73138	91-79-00
A14R1514	311-1559-00			RES.,VAR,NONWIR:10K OHM,20%,0.50W	73138	91-81-0
A14R1515	321-0232-00			RES.,FXD,FILM:2.55K OHM,1%,0.125W	91637	MFF1816G25500F
A14R1516	321-0232-00			RES.,FXD,FILM:2.55K OHM,1%,0.125W	91637	MFF1816G25500F
A14R1517	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A14R1518	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A14R1520	315-0683-00			RES.,FXD,CMPSN:68K OHM,5%,0.25W	01121	CB6835
A14R1521	315-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
A14R1522	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
A14R1523	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
A14R1524	321-0197-00			RES.,FXD,FILM:1.1K OHM,1%,0.125W	91637	MFF1816G11000F
A14R1525	321-0240-00			RES.,FXD,FILM:3.09K OHM,1%,0.125W	91637	MFF1816G30900F
A14R1526	321-0246-00			RES.,FXD,FILM:3.57K OHM,1%,0.125W	91637	MFF1816G35700F
A14R1527	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A14R1530	321-0350-00			RES.,FXD,FILM:43.2K OHM,1%,0.125W	91637	MFF1816G43201F
A14R1531	315-0182-00			RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	01121	CB1825
A14R1532	315-0182-00			RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	01121	CB1825
A14R1600	321-0232-00			RES.,FXD,FILM:2.55K OHM,1%,0.125W	91637	MFF1816G25500F
A14R1601	321-0232-00			RES.,FXD,FILM:2.55K OHM,1%,0.125W	91637	MFF1816G25500F
A14R1602	321-0357-00			RES.,FXD,FILM:51.1K OHM,1%,0.125W	91637	MFF1816G51101F
A14R1603	321-0219-00			RES.,FXD,FILM:1.87K OHM,1%,0.125W	91637	MFF1816G18700F
A14R1604	321-0279-00			RES.,FXD,FILM:7.87K OHM,1%,0.125W	91637	MFF1816G78700F
A14R1605	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A14R1610	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
A14R1611	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A14R1612	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A14R1613	321-0190-00			RES.,FXD,FILM:931 OHM,1%,0.125W	91637	MFF1816G931R0F
A14R1614	321-0246-00			RES.,FXD,FILM:3.57K OHM,1%,0.125W	91637	MFF1816G35700F
A14R1615	321-0181-00			RES.,FXD,FILM:750 OHM,1%,0.125W	91637	MFF1816G750R0F
A14R1616	321-0290-00			RES.,FXD,FILM:10.2K OHM,1%,0.125W	91637	MFF1816G10201F
A14R1617	308-0739-00			RES.,FXD,WW:40 OHM,1%,3W	91637	RS2B4R00F
A14R1620	315-0432-00			RES.,FXD,CMPSN:4.3K OHM,5%,0.25W	01121	CB4325
A14R1621	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A14R1622	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
A14R1623	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A14R1624	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
A14R1625	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A14R1626	315-0243-00			RES.,FXD,CMPSN:24K OHM,5%,0.25W	01121	CB2435
A14R1630	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A14R1631	321-0190-00			RES.,FXD,FILM:931 OHM,1%,0.125W	91637	MFF1816G931R0F

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Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A14R1632	321-0250-00			RES.,FXD,FILM:3.92K OHM,1%,0.125W	91637	MFF1816G39200F
A14R1633	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A14R1634	321-0143-00			RES.,FXD,FILM:301 OHM,1%,0.125W	91637	MFF1816G301R0F
A14R1635	321-0189-00			RES.,FXD,FILM:909 OHM,1%,0.125W	91637	MFF1816G909R0F
A14R1636	308-0739-00			RES.,FXD,WW:40 OHM,1%,3W	91637	RS2B4R00F
A14R1700	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
A14R1710	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A14R1711	315-0243-00			RES.,FXD,CMPSN:24K OHM,5%,0.25W	01121	CB2435
A14R1712	321-0189-00			RES.,FXD,FILM:909 OHM,1%,0.125W	91637	MFF1816G909R0F
A14R1713	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
A14R1714	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A14R1715	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
A14R1716	315-0911-00			RES.,FXD,CMPSN:910 OHM,5%,0.25W	01121	CB9115
A14R1717	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
A14R1718	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A14R1719	321-0210-00			RES.,FXD,FILM:1.5K OHM,1%,0.125W	91637	MFF1816G15000F
A14R1720	321-0210-00			RES.,FXD,FILM:1.5K OHM,1%,0.125W	91637	MFF1816G15000F
A14R1721	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
A14R1722	315-0911-00			RES.,FXD,CMPSN:910 OHM,5%,0.25W	01121	CB9115
A14R1723	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
A14R1730	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A14R1731	321-0210-00			RES.,FXD,FILM:1.5K OHM,1%,0.125W	91637	MFF1816G15000F
A14R1732	321-0210-00			RES.,FXD,FILM:1.5K OHM,1%,0.125W	91637	MFF1816G15000F
A14R1800	311-1562-00			RES.,VAR,NONWIR:2K OHM,20%,0.50W	73138	91-84-0
A14R1810	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A14R1811	321-0265-00			RES.,FXD,FILM:5.62K OHM,1%,0.125W	91637	MFF1816G56200F
A14R1812	321-0209-00			RES.,FXD,FILM:1.47K OHM,1%,0.125W	91637	MFF1816G14700F
A14R1813	315-0182-00			RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	01121	CB1825
A14R1814	301-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.50W	01121	EB1015
A14R1815	308-0245-00			RES.,FXD,WW:0.6 OHM,5%,2W	91637	CW-2B30.60HM 5%
A14R1816	308-0446-01			RES.,FXD WW:15 OHM,5%,5W	91637	CW2A-15R00J
A14R1820	305-0471-00			RES.,FXD,CMPSN:470 OHM,5%,2W	01121	HB4715
A14R1910	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A14RT1200	307-0122-00			RES.,THERMAL:50 OHM,10%	50157	3D1515
A14RT1230	307-0122-00			RES.,THERMAL:50 OHM,10%	50157	3D1515
A14S1010	260-1453-00			SWITCH,PUSH:1 BUTTON	80009	260-1453-00
A14S1030	260-1453-00			SWITCH,PUSH:1 BUTTON	80009	260-1453-00
A14TP1640	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A14TP1800	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A14TP1910	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A14TP1920	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
A14U1500	156-0158-00			MICROCIRCUIT,LI:DUAL OPERATIONAL AMPLIFIER	18324	MC1458V
A14U1520	156-0158-00			MICROCIRCUIT,LI:DUAL OPERATIONAL AMPLIFIER	18324	MC1458V
A14U1800	156-0071-00			MICROCIRCUIT,LI:VOLTAGE REGULATOR	04713	MC1723CL
A14U1830	156-0527-00			MICROCIRCUIT,LI:NEG VOLTAGE REGULATOR,15V	04713	MC7915CT
A14VR1210	152-0278-00			SEMICOND DEVICE:ZENER,0.4W,3V,5%	04713	SZG35009K20
A14VR1320	152-0278-00			SEMICOND DEVICE:ZENER,0.4W,3V,5%	04713	SZG35009K20
A14VR1400	152-0693-00			SEMICOND DEVICE:ZENER,0.4W,4V,5%	80009	152-0693-00
A14VR1420	152-0279-00			SEMICOND DEVICE:ZENER,0.4W,5.1V,5%	80009	152-0279-00
A14VR1920	152-0395-00			SEMICOND DEVICE:ZENER,0.4W,4.3V,5%	14552	TD332317
A14W1320	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A15	----- -----			CKT BOARD ASSY:AUXILIARY		
A15J1643	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QTY 6)		

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Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
				CHASSIS PARTS		
DS500	150-1031-00			LT EMITTING DIO:RED,650NM,40MA MAX	53184	XC209R
DS501	150-1029-00			LT EMITTING DIO:GREEN,565NM,35A	53184	XC209G
DS502	150-1029-00			LT EMITTING DIO:GREEN,565NM,35A	53184	XC209G
J500	131-0955-00			CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
J501	131-0955-00			CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
J520	131-1315-01			CONN,RCPT,ELEC:BNC,FEMALE	24931	28JR 306-1
J530	131-1315-01			CONN,RCPT,ELEC:BNC,FEMALE	24931	28JR 306-1
R500	311-1484-00			RES.,VAR,NONWIR:PNL,2.5K OHM,1W	01121	11M110
R501	311-0310-00			RES.,VAR,NONWIR:5K OHM,20%,0.50W	01121	W-7350A
R502	311-0310-00			RES.,VAR,NONWIR:5K OHM,20%,0.50W	01121	W-7350A
R1004	311-1832-00			RES.,VAR,NONWIR:5K OHM,10%,0.50W	01121	14M395
R1040	311-1834-00			RES.,VAR,NONWIR:50K OHM,10%,0.50W	01121	73M4G040L503A
R1324	311-1834-00			RES.,VAR,NONWIR:50K OHM,10%,0.50W	01121	73M4G040L503A
S1200	263-1142-00			SW CAM ACTR AS:PERIOD	80009	263-1142-00
S1240	263-1144-00			SW CAM ACTR AS:DURATION	80009	263-1144-00
S1620	263-1141-00			SW CAM ACTR AS:DELAY	80009	263-1141-00
U500	156-0312-00			MICROCIRCUIT,LI:VOLTAGE REGULATOR,15V,1A	27014	LM340T-15

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DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS

Symbols

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

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

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

Abbreviations are based on ANSI Y1.1-1972.

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

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

American National Standard Institute
1430 Broadway
New York, New York 10018

Component Values

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

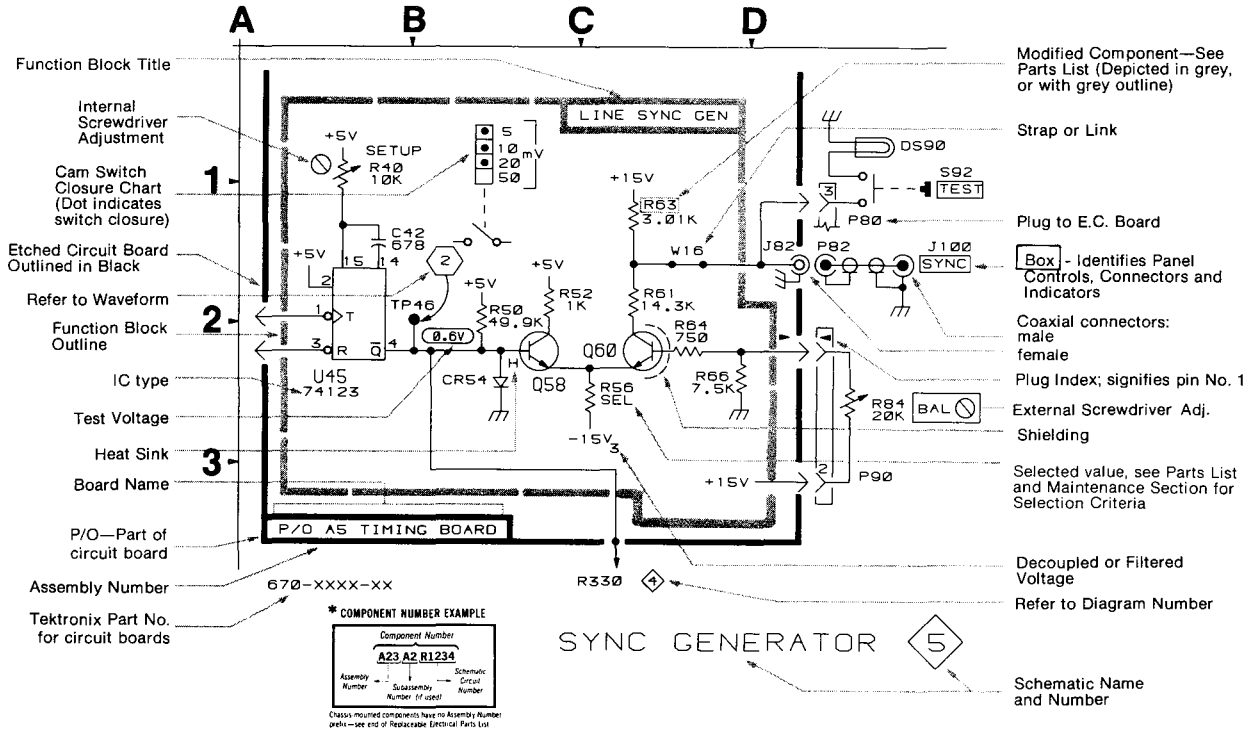
Capacitors = Values one or greater are in picofarads (pF). Values less than one are in microfarads (μF).
Resistors = Ohms (Ω).

The information and special symbols below may appear in this manual.

Assembly Numbers and Grid Coordinates

Each assembly in the instrument is assigned an assembly number (e.g., A20). The assembly number appears on the circuit board outline on the diagram, in the title for the circuit board component location illustration, and in the lookup table for the schematic diagram and corresponding component locator illustration. The Replaceable Electrical Parts list is arranged by assemblies in numerical sequence; the components are listed by component number *(see following illustration for constructing a component number).

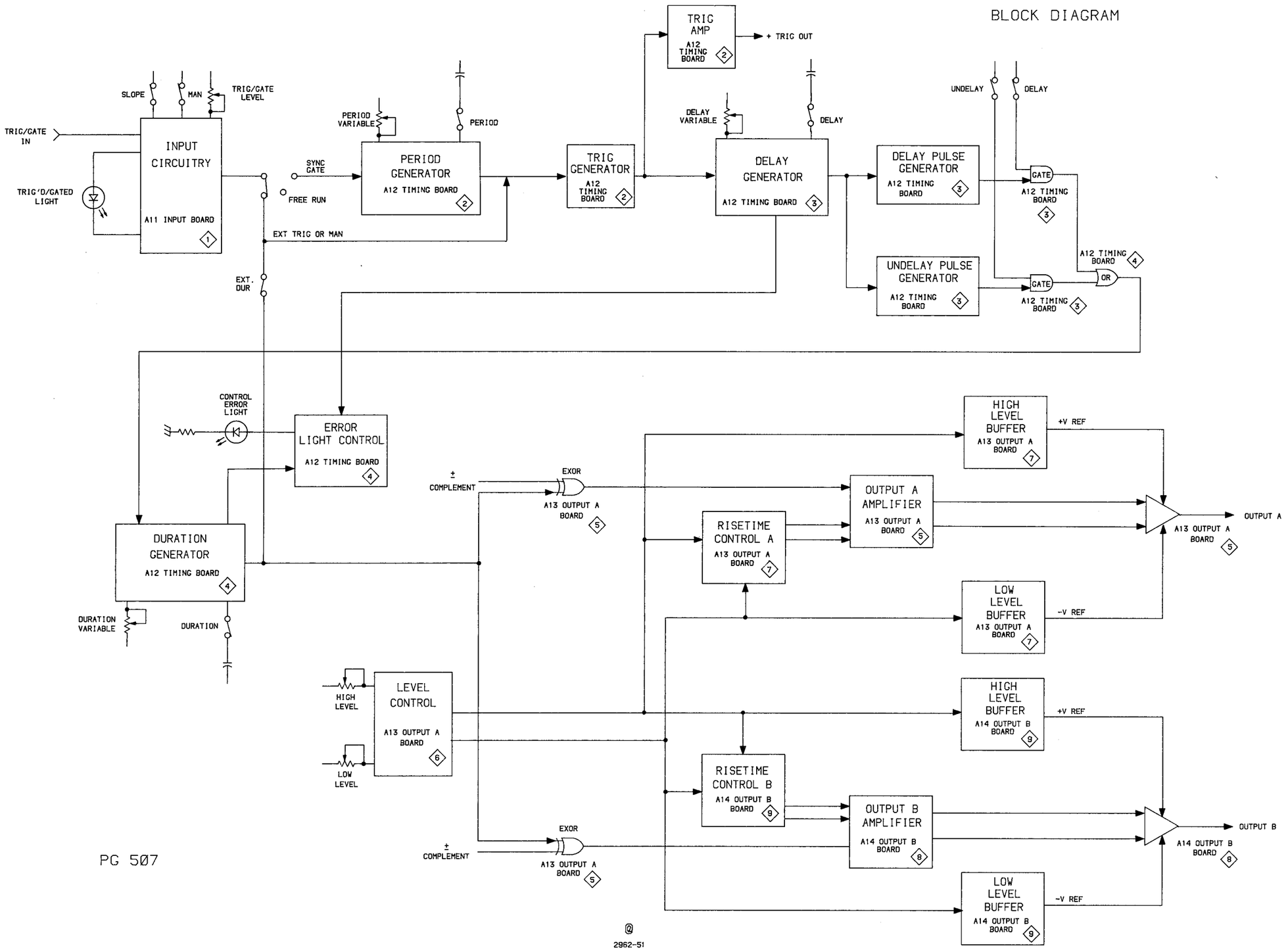
The schematic diagram and circuit board component location illustration have grids. A lookup table with the grid coordinates is provided for ease of locating the component. Only the components illustrated on the facing diagram are listed in the lookup table. When more than one schematic diagram is used to illustrate the circuitry on a circuit board, the circuit board illustration may only appear opposite the first diagram on which it was illustrated; the lookup table will list the diagram number of other diagrams that the circuitry of the circuit board appears on.



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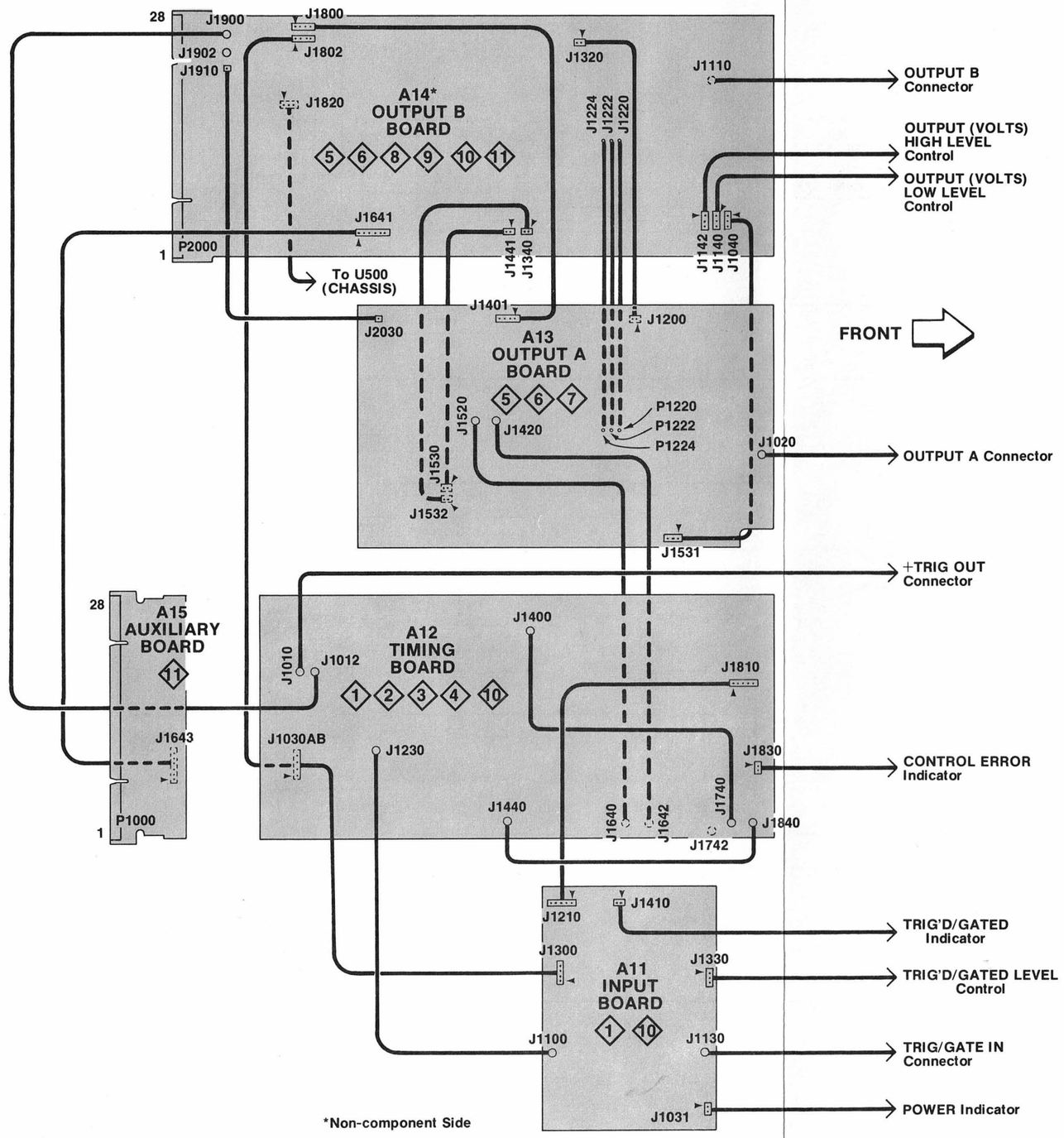
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BLOCK DIAGRAM



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CABLE INTERCONNECTION DIAGRAM



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ADJUSTMENT LOCATIONS & SETUPS

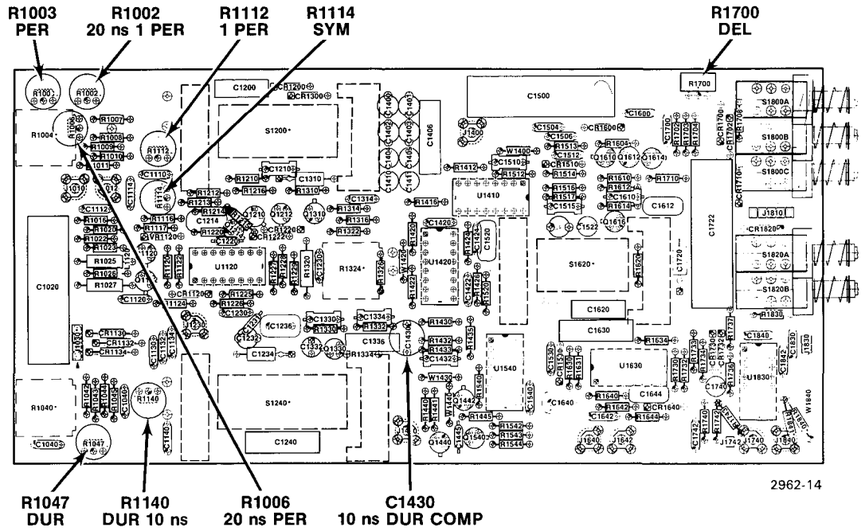


Fig. 8-1. Timing Board (A12).

Fig. 8-2. Adjustment setup for steps 6 and 7.

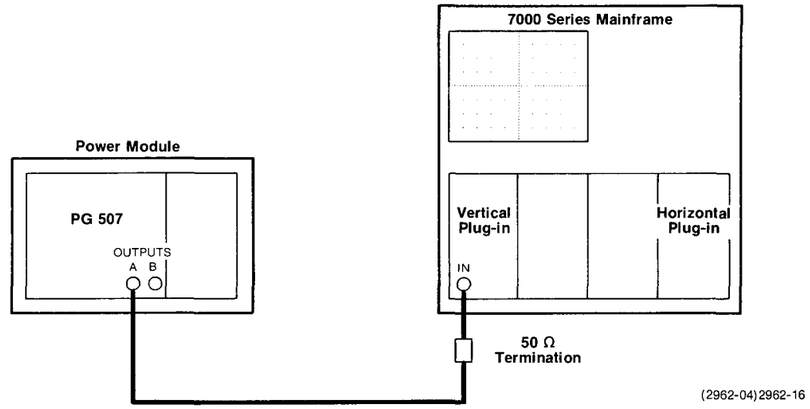


Fig. 8-3. Adjustment setup for steps 8, 9, and 10.

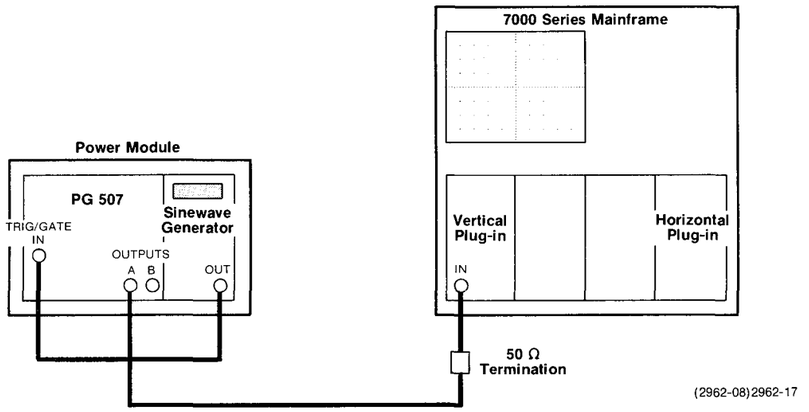


Fig. 8-4. Adjustment setup for steps for 11 and 12.

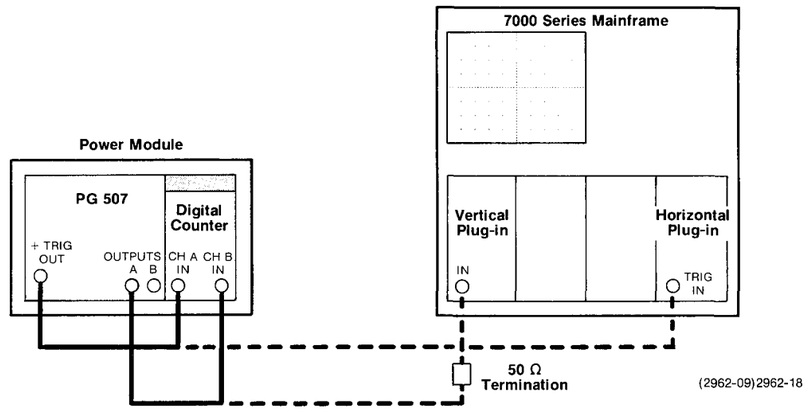


Fig. 8-5. Adjustment setup for step 13.

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Table 8-1
REAR INTERFACE CONNECTOR ASSIGNMENTS

Remarks	Recommended Loads	Output or Input	Pin B		Pin A	Output or Input	Recommended Loads	Remarks
Factory Wired		Trigger Output Common	*28		28			
Factory Wired	50Ω	Trigger Output	*27		27			
			26		*26	Amplitude Monitor Ground		Factory Wired
Factory Wired		Trig/Gate Input Common	*25	PG 507 Barrier Slot	*25	Output B Amplitude Monitor	>1 MΩ	Factory Wired
User Installed		Trig/Gate Input	*24		*24	Output A Amplitude Monitor	>1 MΩ	Factory Wired
			23		23			
Factory Wired		External High Level Control Input	*22		*22	External High Level Control Input		Factory Wired
			21		21			
			20		20			
			19		19			
			18		18			
			17		17			
			16		16			
			15		15			
			14		14			
	25 V ac winding		*13		*13	25 V ac winding		
	+33.5 V filtered dc		*12		*12	+33.5 V filtered dc		
	Collector lead of pnp series-pass		**11		**11	Base lead of pnp series-pass		
			10		**10	Emitter lead of pnp series-pass		
	±33.5 V common return		*9		*9	±33.5 V common return		
	-33.5 V filtered dc		*8	TM 500 Barrier Slot	*8	-33.5 V common return		
	Collector lead of npn series-pass		**7		**7	Emitter lead of npn series-pass		
			6		**6	Base lead of npn series-pass		
	17.5 V ac winding		*5		*5	17.6 V ac winding		
			4		4			
	+11.5 V common return		*3		*3	+11.5 V common return		
	+11.5 V filtered dc		*2	Rear View of Plug-In	*2	+11.5 V filtered dc		
	25 V ac winding		*1		*1	25 V ac winding		
			B		A			

Pins 1A-13A and 1B-13B are available in all power modules; however, only those pins marked with an asterisk (*) are used by the PG 507 Output B board (A14). Those connections marked with a double asterisk (**) are connections also used on the Auxillary board (A15).

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ADJUSTMENT LOCATIONS & SETUPS

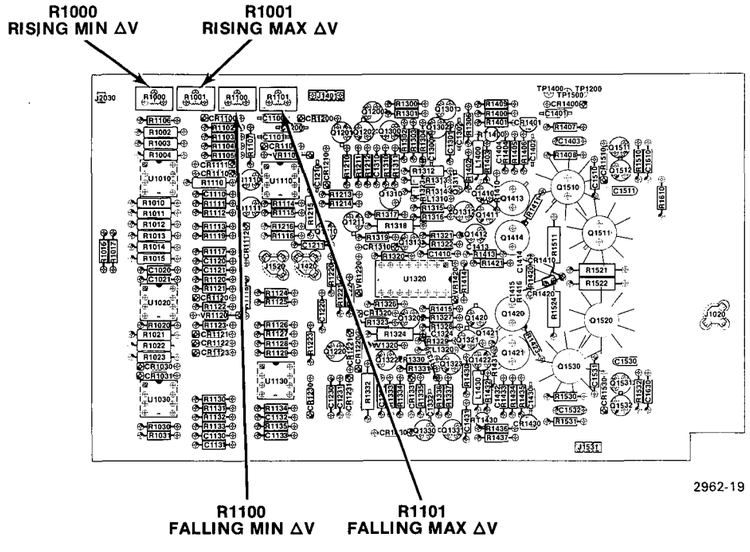


Fig. 8-6. Output A Board (A13).

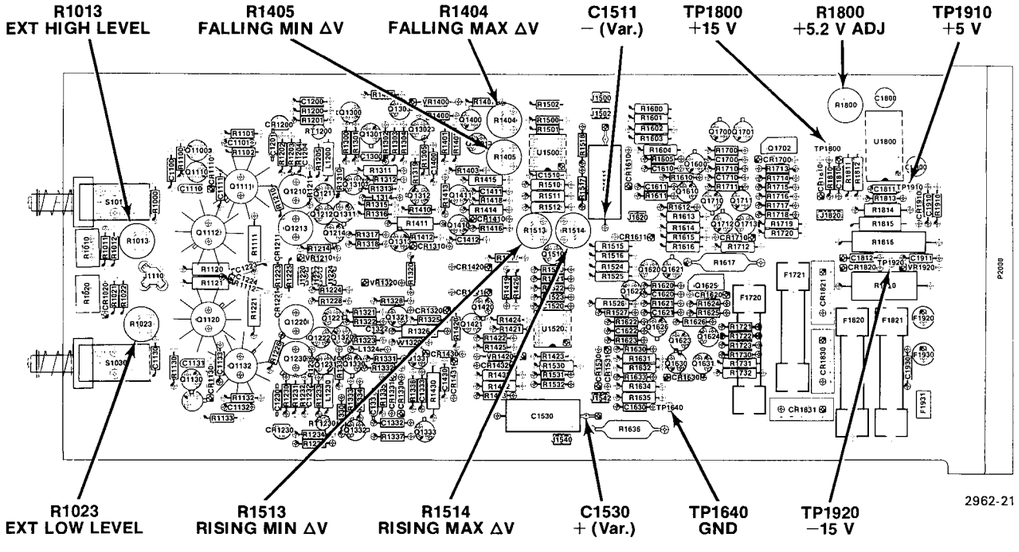


Fig. 8-8. Output B Board (A14).

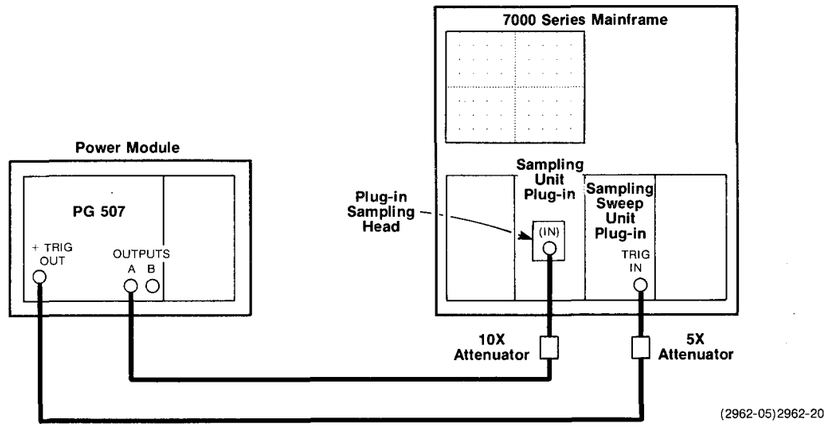


Fig. 8-7. Adjustment setup for steps 14 and 15.

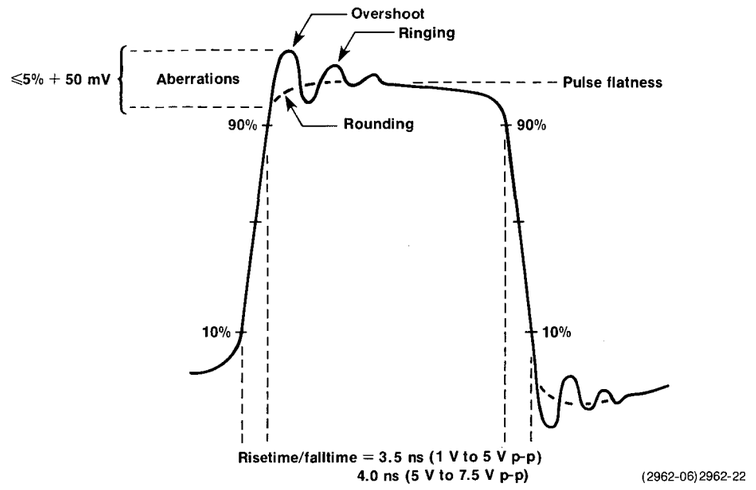
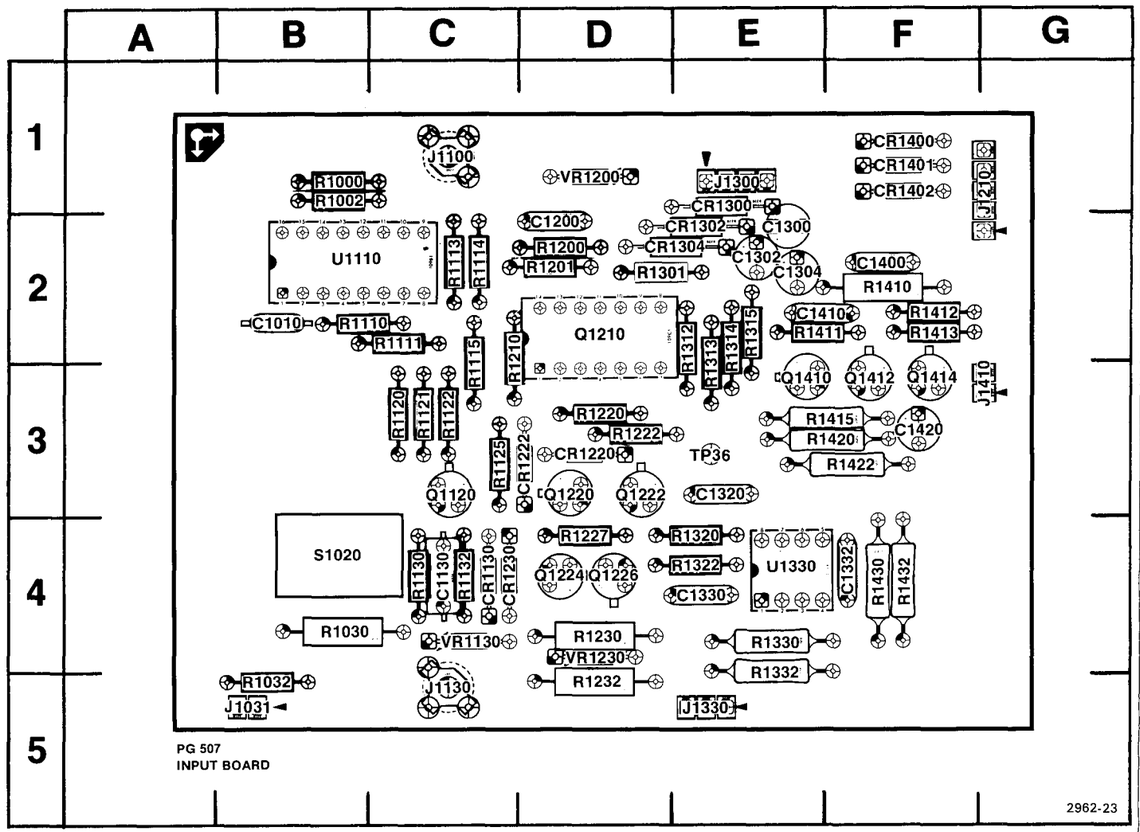


Fig. 8-9. Pulse characteristics (idealized).

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PARTS LOCATION GRID



PG 507
INPUT BOARD

2962-23

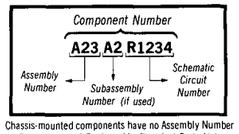
ASSY A11

Fig. 8-10. Input Board (A11).

INPUT BOARD (A11)
COMPONENT REFERENCE CHART ①

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

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Table 8-2
COMPONENT REFERENCE CHART
(see Fig. 8-10, 8-11)

P/O A11 ASSY — INPUT BOARD ①

Circuit Number	Schematic Location	Board Location	Circuit Number	Schematic Location	Board Location
C1010	D7	B2	R1113	J6	C2
C1130	B3	C4	R1114	J7	C2
C1200	J6	D2	R1115	E8	C3
C1320	E8	E3	R1120	E2	C3
C1330	F3	E4	R1121	E2	C3
C1332	C7	F4	R1122	E1	C3
C1400	L1	F2	R1125	E2	C3
C1410	L2	E2	R1130	B3	C4
C1420	L3	F3	R1132	B3	C4
			R1200	J6	D2
CR1130	C3	C4	R1201	J7	D2
CR1220	E3	D3	R1210	F8	C2
CR1222	E3	D3	R1220	E8	D3
CR1230	C3	C4	R1222	E8	D3
CR1400	L6	F1	R1227	D3	D4
CR1401	K6	F1	R1230	D2	D4
CR1402	L6	F1	R1232	D4	D5
			R1301	H7	D2
DS501	K2	CHASSIS	R1312	H7	E2
DS502	M5	CHASSIS	R1313	E8	E2
			R1314	F7	E2
J1100	M7	C1	R1315	F7	E2
J1130	A3	C5	R1320	F3	E4
J1210	J5	G1	R1322	F3	E4
J1330	J3	E5	R1330	F3	E4
J1410	L2	G3	R1332	H3	E5
J1500	A3	CHASSIS	R1410	L3	F2
			R1411	L2	E2
J500	A3	CHASSIS	R1412	L1	F2
			R1413	L2	F2
Q1120	E2	C3	R1415	L3	F3
Q1210A	F7	D2	R1420	K3	F3
Q1210B	F7	D2	R1422	K3	F3
Q1210C	F7	D2	R1430	H3	F4
Q1210D	H7	D2	R1432	H2	F4
Q1210E	D8	D2	R500	J3	CHASSIS
Q1220	D3	D3			
Q1222	E3	D3	S1020	B3	B4
Q1224	C2	D4			
Q1226	C3	D4	TP36	F3	E3
Q1410	K1	E3			
Q1412	L3	F3	U1110A	L6	B2
Q1414	L3	F3	U1110B	J7	B2
			U1110C	L7	B2
R1000	L7	B1	U1330	H3	E4
R1002	M6	B1			
R1030	B4	B4	VR1130	D3	C4
R1110	K7	B2	VR1200	H6	D1
R1111	K7	C2	VR1230	D2	D4

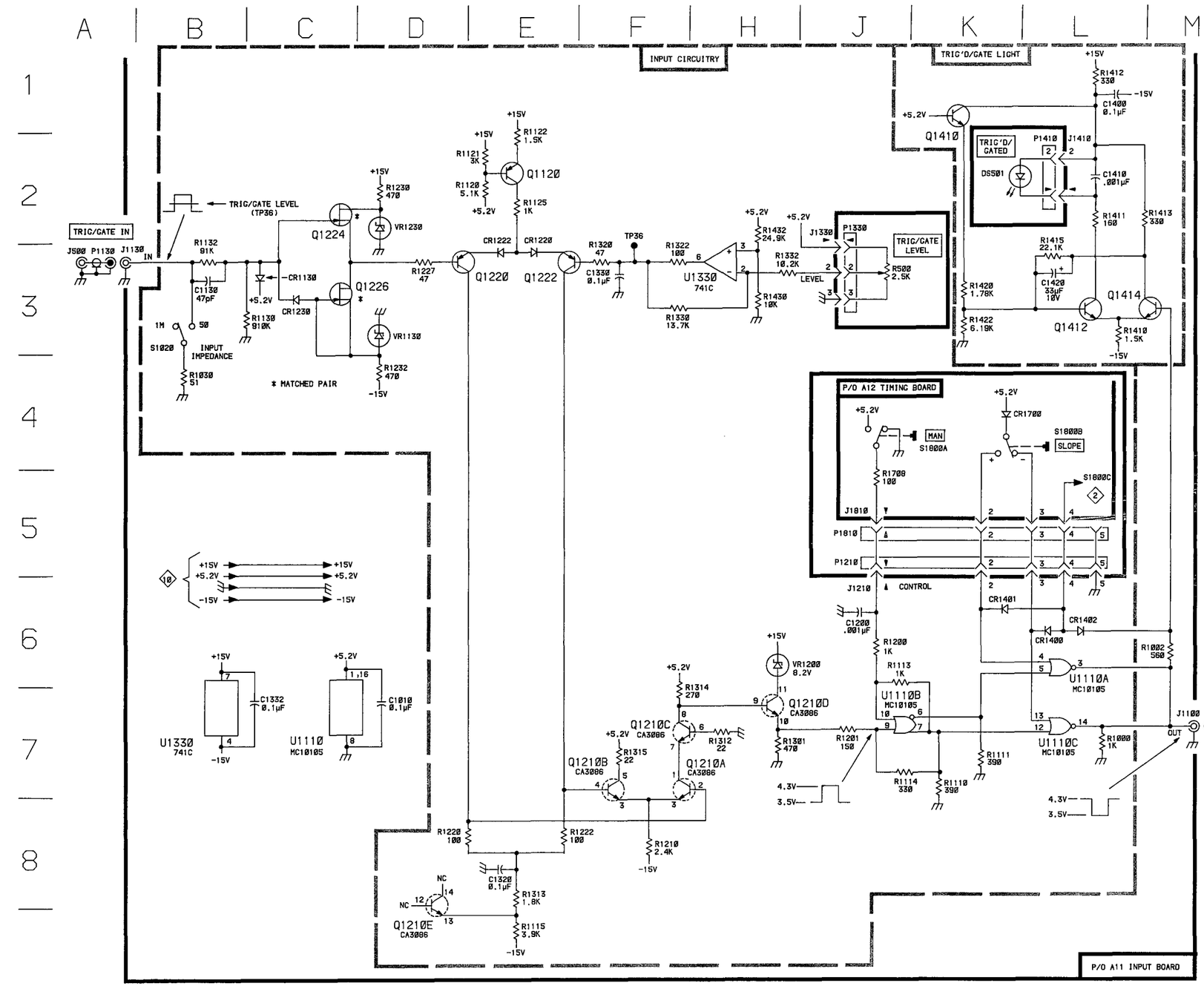
P/O A11 ASSY also shown on ⑩

P/O A12 ASSY — TIMING BOARD

CR1700	K4	J2	R1708	J5	J2
J1810	J5	K3	S1800A	J4	K1
			S1800B	K4	K2

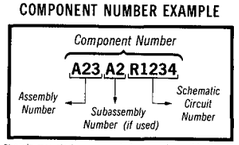
P/O A12 ASSY also shown on ② ③ ④ ⑩

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Static Sensitive Devices
See Maintenance Section

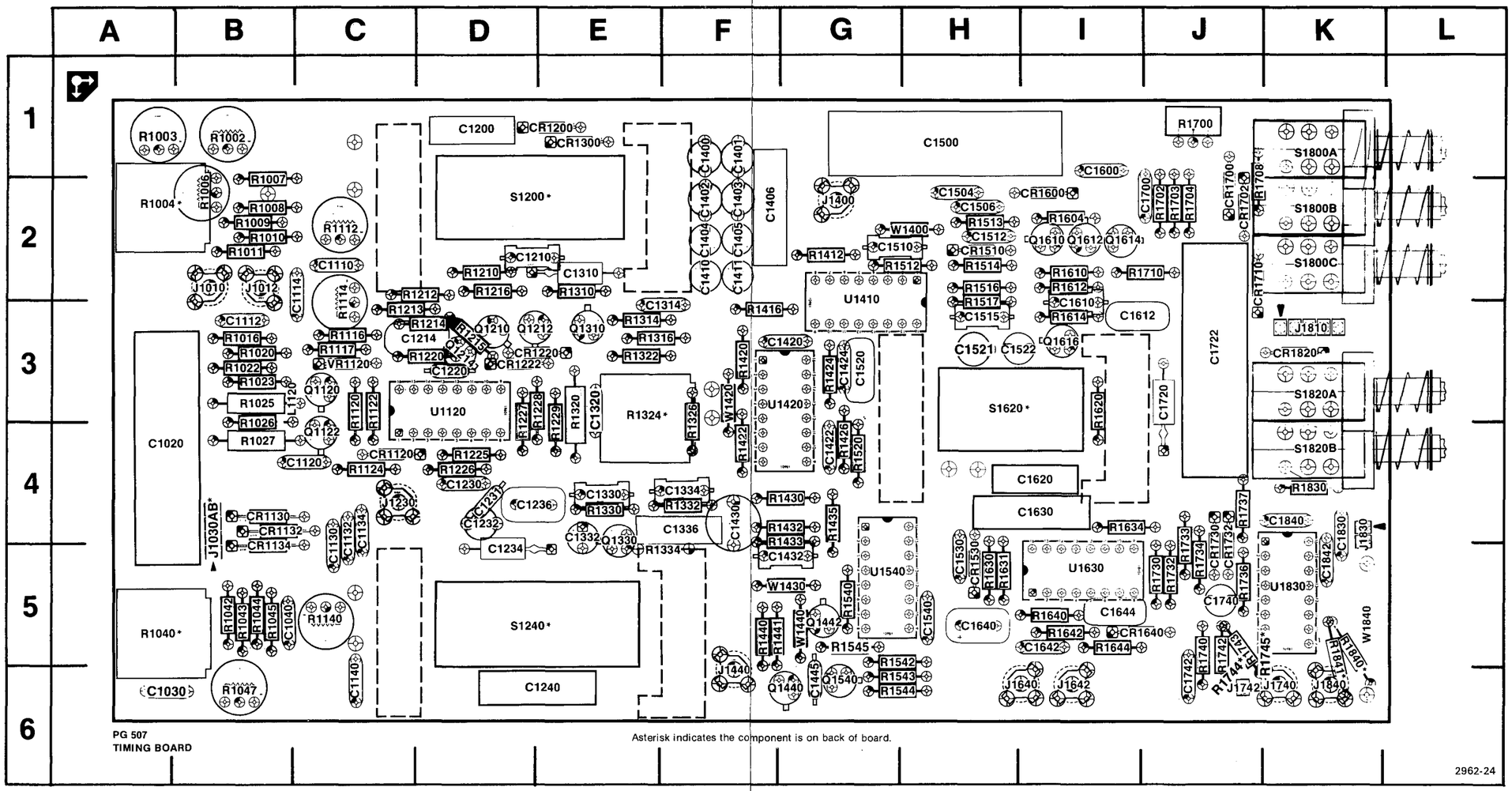
COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

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PARTS LOCATION GRID



PG 507
TIMING BOARD

Asterisk indicates the component is on back of board.

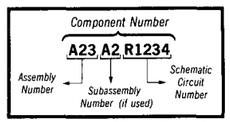
2962-24

ASSY A12

Fig. 8-11. Timing Board (A12).

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

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Table 8-3
COMPONENT REFERENCE CHART
(see Fig. 8-11)

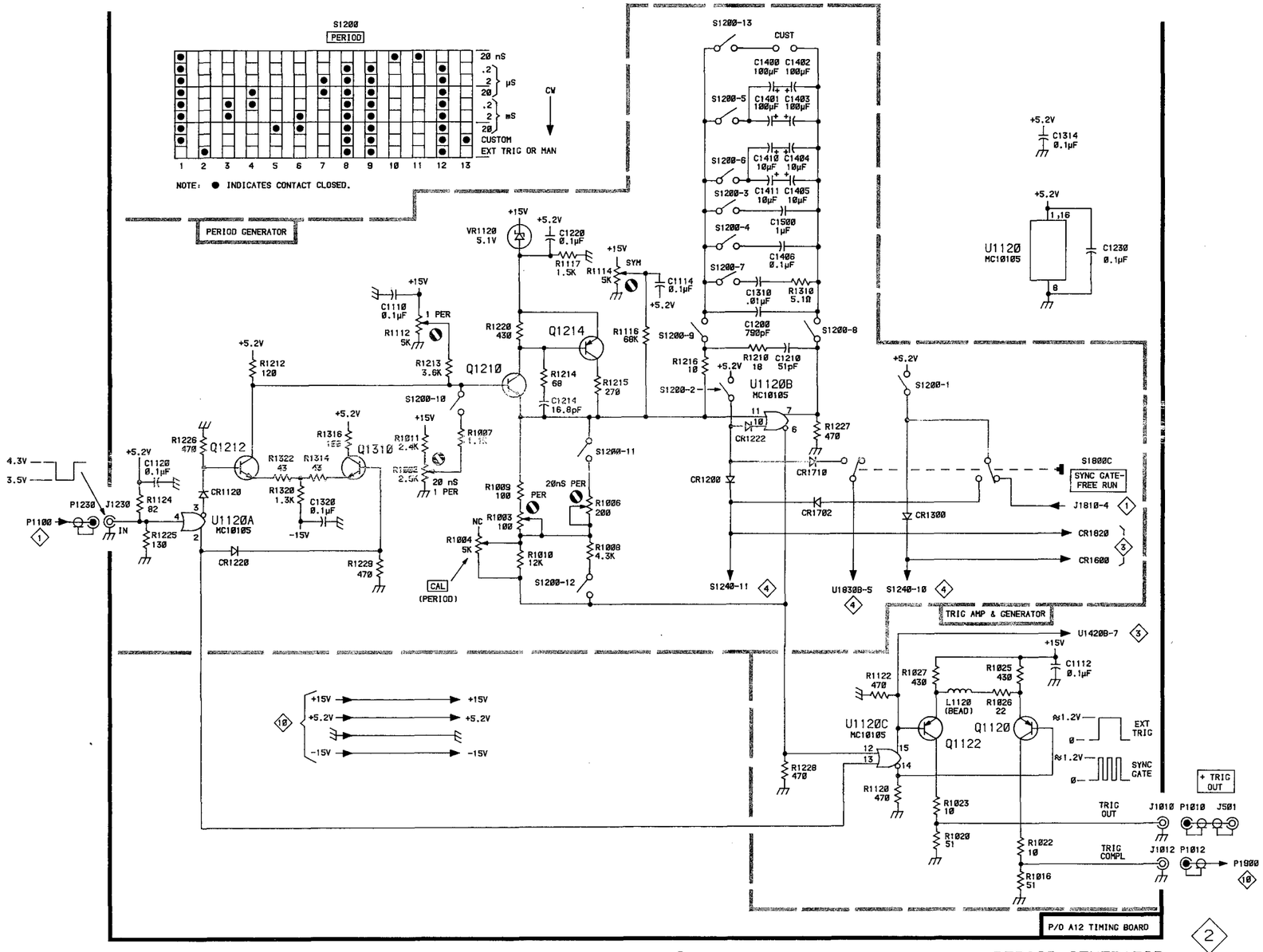
P/O A12 ASSY — TIMING BOARD ◇2◇

Circuit Number	Schematic Location	Board Location
C1110	D3	C2
C1112	L6	B3
C1114	F3	C2
C1120	B5	C4
C1200	H3	D1
C1210	H4	D2
C1214	E4	D3
C1220	E3	D3
C1230	L3	D4
C1310	H3	E2
C1314	L2	F3
C1320	C5	E3
C1400	H1	F1
C1401	H2	F1
C1402	H1	F2
C1403	H2	F2
C1404	H2	F2
C1405	H2	F2
C1406	H3	F2
C1410	H2	F2
C1411	H2	F2
C1500	H2	H1
C1500	H3	H1
CR1120	B5	C4
CR1200	H5	E1
CR1220	C5	D3
CR1222	H4	D3
CR1300	J5	E1
CR1702	J5	J2
CR1710	J5	K2
J501	M8	CHASSIS
J1010	L8	B2
J1012	L8	B2
J1230	B5	C4
L1120	K6	B3
Q1120	K7	C3
Q1122	K7	C4
Q1210	E4	D3
Q1212	C5	D3
Q1214	F4	D3
Q1310	D5	E3
R1002	D5	B1
R1003	E5	A1
R1004	E5	A2
R1006	F5	B2
R1007	E4	B2
R1008	F5	B2
R1009	E5	B2
R1010	E5	B2
R1011	D4	B2
R1016	K8	B3
R1020	K8	B3
R1022	K8	B3
R1023	K7	B3
R1025	K6	B3
R1026	K6	B4
R1027	K6	B4
R1112	D3	C2
R1114	F3	C3
R1116	F3	C3
R1117	F3	C3
R1120	J7	C3
R1122	J6	C3
R1124	B5	C4
R1210	H4	D2
R1212	C4	D2
R1213	E4	C3
R1214	E4	D3
R1215	F4	D3
R1216	H4	D2
R1220	E3	D3
R1225	B5	D4
R1226	B4	D4
R1228	H7	D3
R1229	D5	E3
R1310	H3	E2
R1314	C5	E3
R1316	D4	E3
R1320	C5	E3
R1322	C5	E3
S1200-1*	J4	D2
S1200-10*	E4	D2
S1200-11*	F4	D2
S1200-12*	F6	D2
S1200-13*	H1	D2
S1200-2*	H4	D2
S1200-3*	H2	D2
S1200-4*	H3	D2
S1200-5*	H2	D2
S1200-6*	H2	D2
S1200-7*	H3	D2
S1200-8*	J3	D2
S1200-9*	H3	D2
S1800C	K5	K2
U1120A	B5	D3
U1120B	H4	D3
U1120C	J7	D3
VR1120	E3	C3

P/O A12 ASSY also shown on ◇1◇ ◇3◇ ◇4◇ ◇10◇

* Component on back of board

Scan by Zenith



Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE

Component Number
A23 A2 R1234
Assembly Number — *Subassembly Number (if used)* — *Schematic Circuit Number*

Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

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Table 8-4
COMPONENT REFERENCE CHART
(see Fig. 8-11)

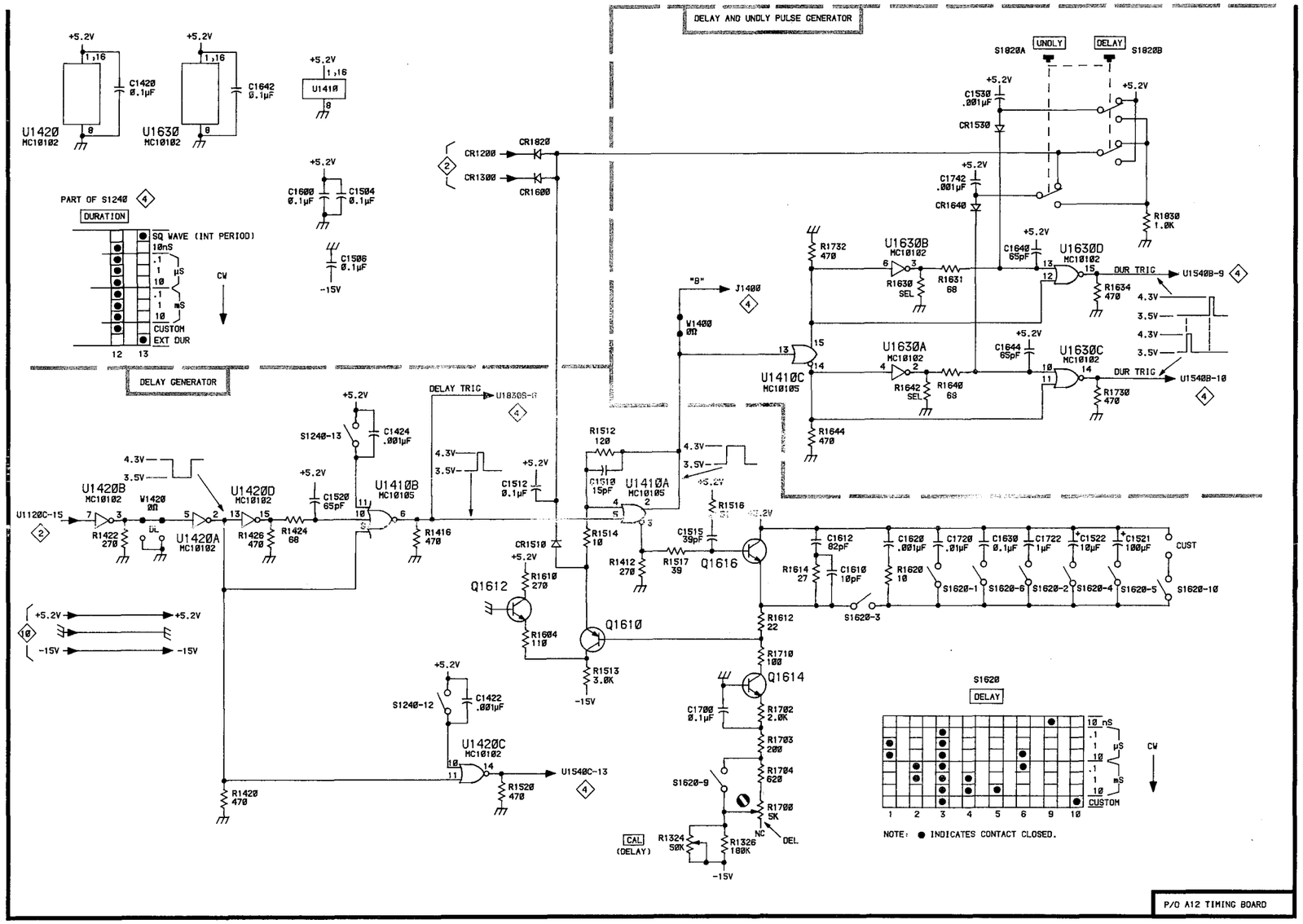
P/O A12 ASSY — TIMING BOARD ◇3

Circuit Number	Schematic Location	Board Location	Circuit Number	Schematic Location	Board Location
C1420	B2	G3	R1516	H5	H2
C1422	E7	G4	R1517	H5	H3
C1424	D4	G3	R1520	E7	G4
C1504	D2	H2	R1604	E6	I2
C1506	D3	H2	R1610	E6	I2
C1510	F5	G2	R1612	H6	I2
C1512	E5	H2	R1614	J6	I3
C1515	H5	H3	R1620	J6	I3
C1520	D5	G3	R1630	K3	H5
C1521	L5	H3	R1631	K3	H5
C1522	L5	H3	R1634	L3	I4
C1530	K2	H5	R1640	K4	I5
C1600	D2	I1	R1642	K4	I5
C1610	J6	I3	R1644	J4	I5
C1612	J5	I3	R1700	H7	J1
C1620	J5	I4	R1702	H7	J2
C1630	K5	I4	R1703	H7	J2
C1640	K3	H5	R1704	H7	J2
C1642	C2	I5	R1710	H6	J2
C1644	K4	I5	R1730	L4	J5
C1700	H7	J2	R1732	J3	J5
C1720	K5	J3	R1830	L3	K4
C1722	K5	J3			
C1742	K2	J6	S1620-1*	K6	H3
			S1620-10*	L6	H3
CR1510	E5	H2	S1620-2*	K6	H3
CR1530	K2	H5	S1620-3*	J6	H3
CR1600	E2	I2	S1620-4*	L6	H3
CR1640	K3	I5	S1620-5*	L6	H3
CR1820	E2	K3	S1620-6*	K6	H3
			S1620-9*	H7	H3
Q1610	F6	I2	S1820A	L2	K3
Q1612	E6	I2	S1820B	L2	K4
Q1614	H6	I2			
Q1616	H5	I3	U1410A	F5	G2
			U1410B	D5	G2
R1227	J4	D3	U1410C	J4	G2
R1324*	H8	E3	U1420A	C5	G3
R1326	H8	F3	U1420B	B5	G3
R1412	F5	G2	U1420C	E7	G3
R1416	D5	F3	U1420D	C5	G3
R1420	C7	F3	U1630A	J4	I5
R1422	B5	F4	U1630B	J3	I5
R1424	C5	G3	U1630C	L4	I5
R1426	C5	G4	U1630D	L3	I5
R1512	F5	G2			
R1513	F6	H2	W1400	H3	H2
R1514	F5	H2	W1420	B5	F3

P/O A12 ASSY also shown on ◇1 ◇2 ◇4 ◇10

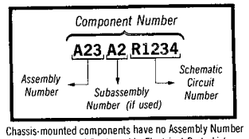
* Component on back of board

Scan by Zenith



Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Scan by Zenith

Table 8-5
COMPONENT REFERENCE CHART
(see Fig. 8-11)

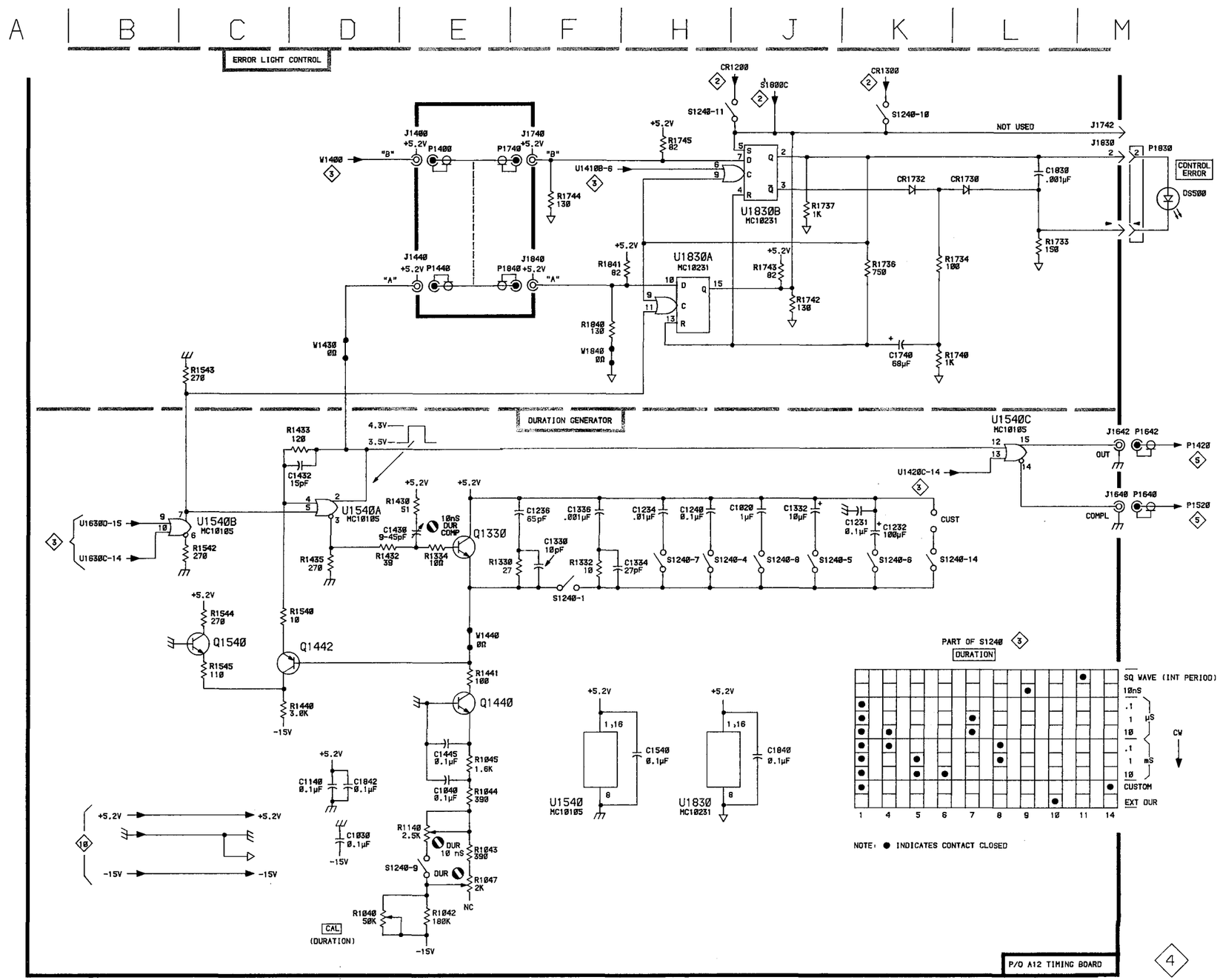
P/O A12 ASSY — TIMING BOARD ◇4

Circuit Number	Schematic Location	Board Location
C1020	J5	A4
C1030	D8	A6
C1040	E7	B5
C1140	D7	C6
C1231	K5	D4
C1232	K5	D4
C1234	H5	D5
C1236	F5	D4
C1240	H5	E6
C1330	F5	E4
C1332	J5	E4
C1334	F5	F4
C1336	F5	F4
C1430	E5	F4
C1432	D4	G5
C1445	E7	G6
C1540	H7	H5
C1740	K3	J5
C1830	L2	K4
C1840	J5	K4
C1842	D7	K5
CR1730	L2	J5
CR1732	K2	J5
DS500	M2	CHASSIS
J1400	E2	J2
J1440	E3	F6
J1640	M5	I6
J1642	M4	I6
J1740	F2	K6
J1742	M1	J6
J1830	M2	K4
J1840	F3	K6
Q1330	E5	E4
Q1440	E7	G6
Q1442	D6	G5
Q1540	C6	G6
R1040*	D8	A5
R1042	E8	B5
R1043	E8	B5
R1044	E7	B5
R1045	E7	B5
R1047	E8	B6
R1140	E8	C5
R1330	F5	E4
R1332	F5	F4
R1334	E5	F5
R1430	E5	G4
R1432	D5	G4
R1433	D4	G4
R1435	D5	G4
R1440	C7	F5
R1441	E6	G5
R1540	C6	G5
R1542	C5	G5
R1543	C4	G6
R1544	C6	G6
R1545	C6	G5
R1733	L2	J5
R1734	K3	J5
R1736	K3	J5
R1737	J2	J4
R1740	K3	J5
R1742	J3	J5
R1743	J3	J5
R1744*	F2	J5
R1745*	H2	K5
R1840	F3	K5
R1841	H3	K5
S1240-1*	F6	D5
S1240-10*	K1	D5
S1240-11*	J1	D5
S1240-12*	E7	D5
S1240-13*	D4	D5
S1240-14*	K5	D5
S1240-4*	H5	D5
S1240-5*	J5	D5
S1240-6*	K5	D5
S1240-7*	H5	D5
S1240-8*	J5	D5
S1240-9*	E8	D5
U1540A	D5	G5
U1540B	C5	G5
U1540C	L4	G5
U1830A	H3	K5
U1830B	J2	K5
W1430	D3	G5
W1440	E6	G5
W1840	F3	K5

P/O A12 ASSY also shown on ◇1 ◇2 ◇3 ◇10

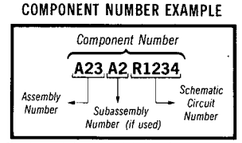
* Component on back of board

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Static Sensitive Devices
See Maintenance Section

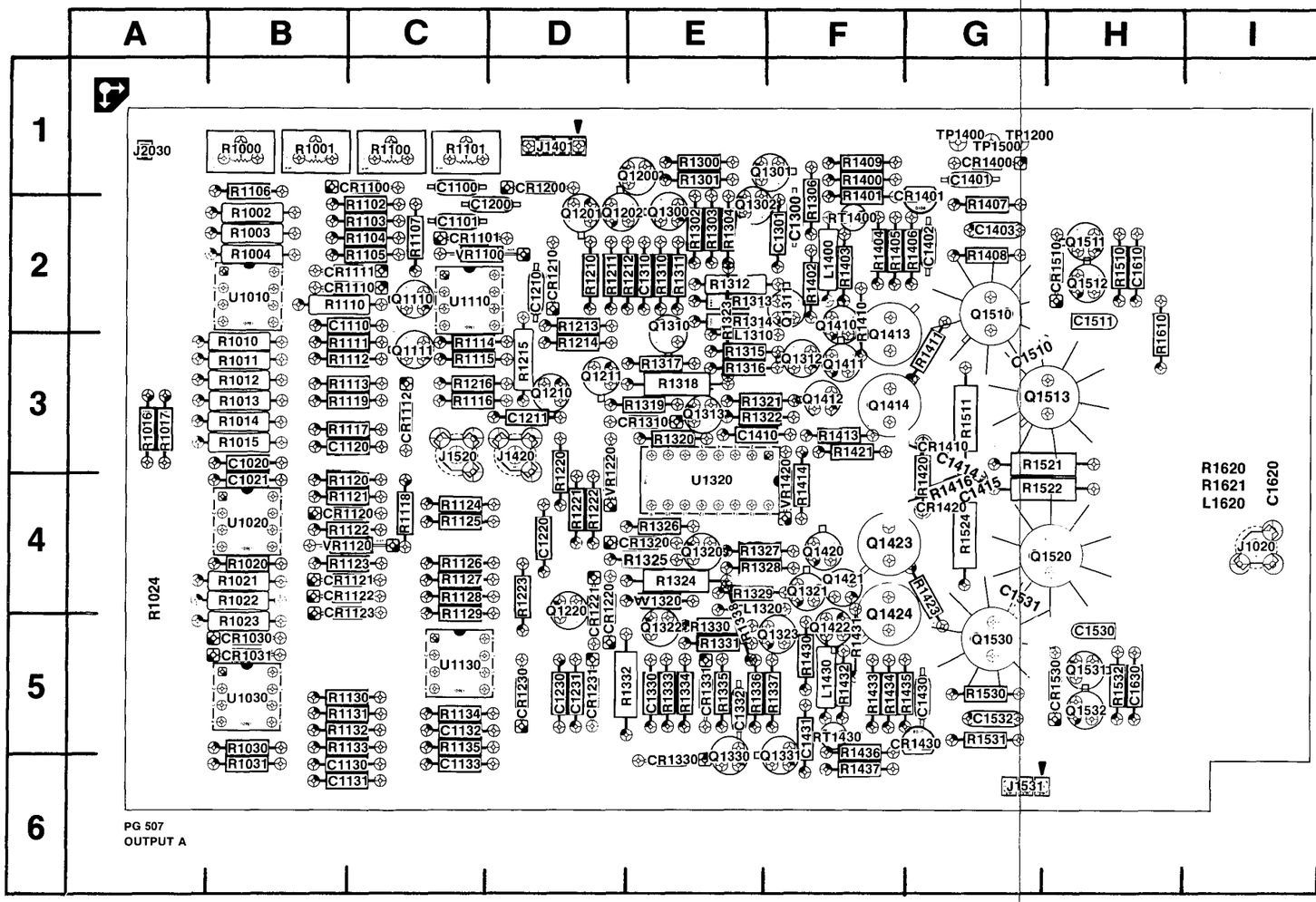
COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

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PARTS LOCATION GRID



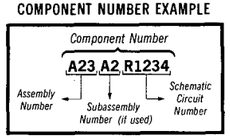
PG 507
OUTPUT A

Fig. 8-12. Output A Board (A13).

OUTPUT A BOARD (A13)

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE

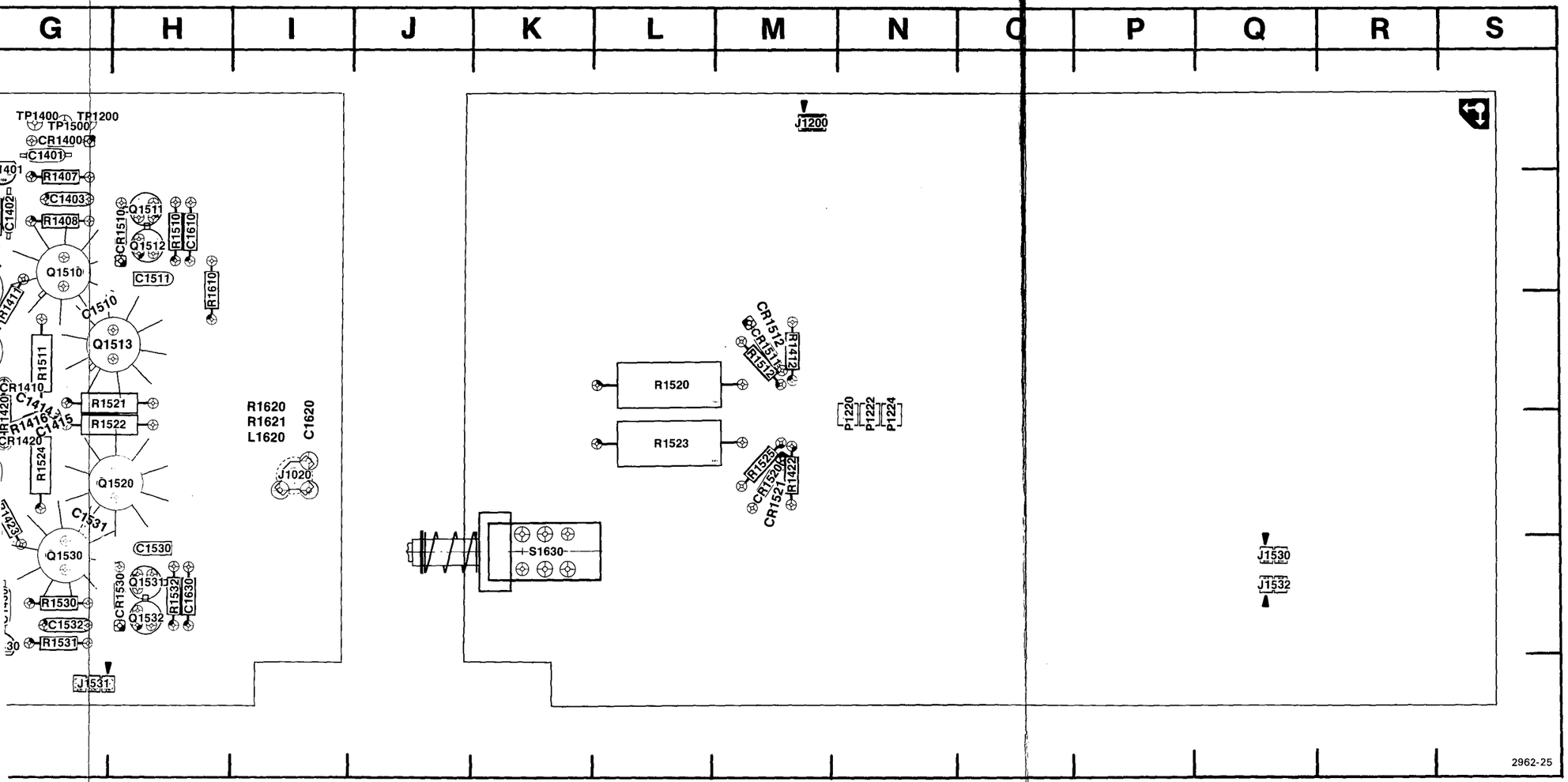


Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

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PARTS LOCATION GRID



ASSY A13

Fig. 8-12. Output A Board (A13).

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Table 8-6
COMPONENT REFERENCE CHART
(see Fig. 8-12, 8-13)

P/O A13 ASSY — OUTPUT A BOARD ◇5

Circuit Number	Schematic Location	Board Location	Circuit Number	Schematic Location	Board Location	Circuit Number	Schematic Location	Board Location
C1211	D2	D3	Q1310	F2	E2	R1330	H7	E5
C1220	B5	D4	Q1311	F2	F2	R1331	H7	E5
C1230	E5	D5	Q1312	H3	F3	R1332	F7	E5
C1231	D7	D5	Q1313	E4	E3	R1333	F7	E5
C1300	H1	E2	Q1320	E5	E4	R1335	H6	E5
C1310	E3	E2	Q1321	H5	F4	R1338	F5	E5
C1330	D6	E5	Q1322	F7	E5	R1400	F3	F1
C1332	H7	E5	Q1323	H7	F5	R1401	F3	F2
C1402	K2	G2	Q1410	H3	F2	R1402	J1	F2
C1410	C2	E3	Q1411	J1	F3	R1403	F3	F2
C1414	J4	G3	Q1412	H4	F3	R1404	H2	F2
C1415	J4	F4	Q1413	J2	F2	R1405	J2	F2
C1430	J7	G5	Q1414	J3	F3	R1406	J2	G2
C1510	K4	G2	Q1420	H5	F4	R1410	F1	F2
C1511	L3	H2	Q1421	K6	F4	R1411	J3	G3
C1530	L6	H5	Q1422	H6	F5	R1412*	K3	M3
C1531	J5	G5	Q1423	J5	F4	R1413	H4	F3
C1620	M5	I3	Q1424	J6	F4	R1414	H5	F4
			Q1510	L3	G2	R/416	J4	F4
CR1220	E7	D4	Q1513	L4	H3	R1420	J4	G4
CR1221	D7	D4	Q1520	L5	H4	R1421	D5	F3
CR1230	B4	D5	Q1530	L5	G5	R1422*	L5	M4
CR1231	D7	D5				R1423	H5	G4
CR1310	E2	E3	R1120	B3	C4	R1430	K6	F5
CR1320	E7	E4	R1121	B3	C4	R1431	H7	F5
CR1330	H5	E6	R1124	B8	C4	R1432	F6	F5
CR1331	H5	E5	R1125	C4	C4	R1433	H6	F5
CR1401	F2	G2	R1126	C4	C4	R1434	J7	F5
CR1410	J4	G3	R1127	B8	C4	R1435	J7	G5
CR1420	J4	G4	R1210	K2	D2	R1436	F6	F5
CR1430	F6	G5	R1211	L1	D2	R1437	F6	F6
CR1511*	K4	M3	R1212	L2	E2	R1511	L4	G3
CR1512*	K4	M3	R1214	D1	D3	R1512*	K4	M3
CR1520*	J5	M4	R1215	D2	D3	R1520*	L4	L3
CR1521*	J5	M4	R1220	D2	D4	R1521	L4	H3
			R1221	C5	D4	R1522	L4	H4
J1020	M4	I4	R1222	C6	D4	R1523*	L4	L4
J1420	A5	D3	R1301	K2	E1	R1524	L5	G4
J1520	A3	C3	R1311	F2	E2	R1525*	K5	M4
J1531	A8	G5	R1312	H2	E2	R1610	M4	H2
J2030	M5	A1	R1313	H2	E2	R1620	L4	I3
J530	M4	CHASSIS	R1314	F2	E2	R1621	M4	I3
			R1315	H3	E3			
L1310	K1	E3	R1316	H3	E3	RT1400	F3	F2
L1320	K6	E4	R1317	E2	E3	RT1430	H6	F5
L1400	F2	F2	R1319	E2	E3			
L1430	F6	F5	R1320	E4	E3	S1630*	B4	K5
L1620	M4	I4	R1321	H4	E3			
			R1322	E4	E3	U1320A	B8	E4
P1220*	J8	N4	R1323	F4	E2	U1320B	C4	E4
P1222*	J8	N4	R1325	E7	E4			
P1224*	J8	N4	R1326	D4	E4	VR1220	D4	D4
			R1327	E5	E4	VR1420	D4	F4
Q1201	K2	D2	R1328	H5	E4			
Q1202	K1	D2	R1329	H5	E4	W1320	E7	E4
Q1210	D1	D3						

P/O A13 ASSY also shown on ◇6 ◇7

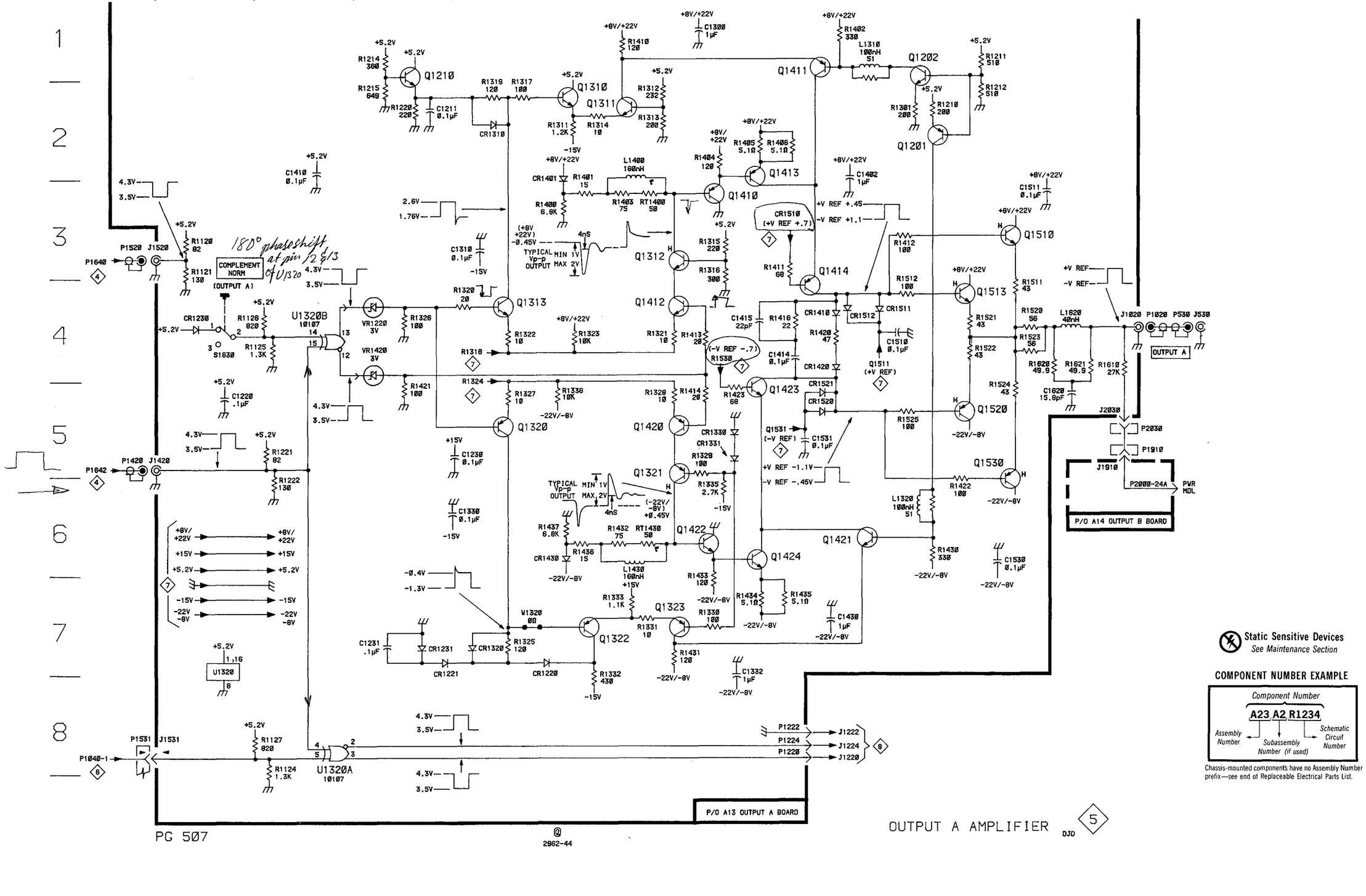
P/O A14 ASSY — OUTPUT B BOARD

J1910*	M5	O2						
P2000	M6	N3						

P/O A14 ASSY also shown on ◇6 ◇8 ◇9 ◇10 ◇11

* Component on back of board

Scan by Zenith



Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE

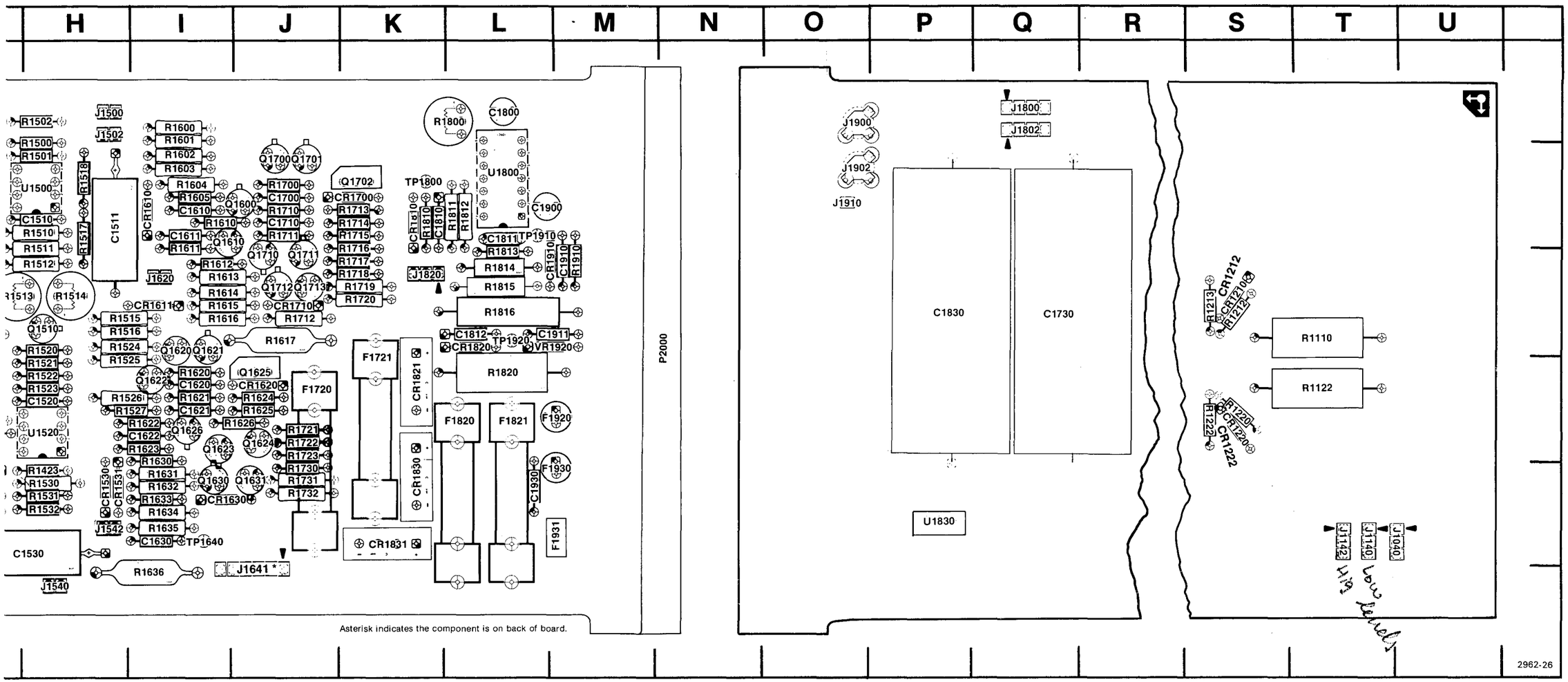
Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

@ 2962-44

OUTPUT A AMPLIFIER DJD 5

Scan by Zenith

PARTS LOCATION GRID

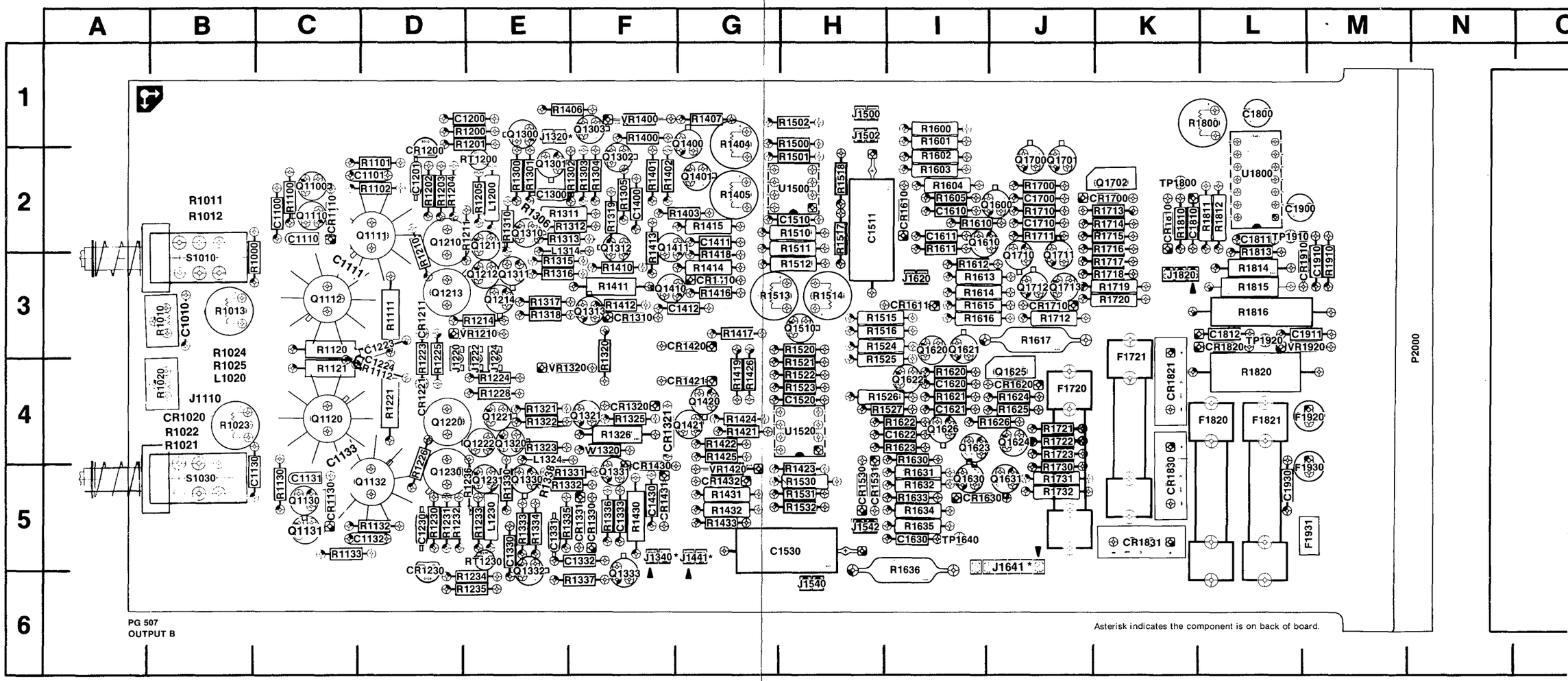


ASSY A14

Fig. 8-13. Output B Board (A14).

Scan by Zenith

PARTS LOCATION GRID



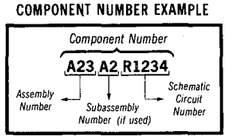
PG 507
OUTPUT B

Asterisk indicates the component is on back of board.

Fig. 8-13. Output B Board (A14).

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

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Scan by Zenith

Table 8-7
COMPONENT REFERENCE CHART
(see Fig. 8-12, 8-13)

P/O A13 ASSY — **OUTPUT A BOARD** ◇6◇

Circuit Number	Schematic Location	Board Location	Circuit Number	Schematic Location	Board Location
C1021	J8	B4	R1022	L7	B4
C1120	K8	C3	R1023	L8	B5
C1130	L8	C6	R1024	L8	A4
C1131	K8	C6	R1030	K5	B5
C1132	H4	C5	R1031	K5	B6
C1133	H6	C6	R1122	L7	C4
			R1123	H7	C4
CR1030	L3	B5	R1128	J6	C4
CR1031	L4	B5	R1129	J4	C4
CR1121	J7	C4	R1130	K4	C5
CR1122	H6	C4	R1131	J5	C5
CR1123	J5	C4	R1132	J4	C5
			R1133	J4	C5
J1530*	M5	Q5	R1134	H4	C5
J1531	F4	G5	R1135	H6	C5
R1013	L2	B3	U1020A	L3	B4
R1014	L1	B3	U1020B	L7	B4
R1015	L2	B3	U1030	K4	B5
R1020	L3	B4	U1130A	H4	C5
R1021	L8	B4	U1130B	H6	C5

P/O A13 ASSY also shown on ◇5◇ ◇7◇

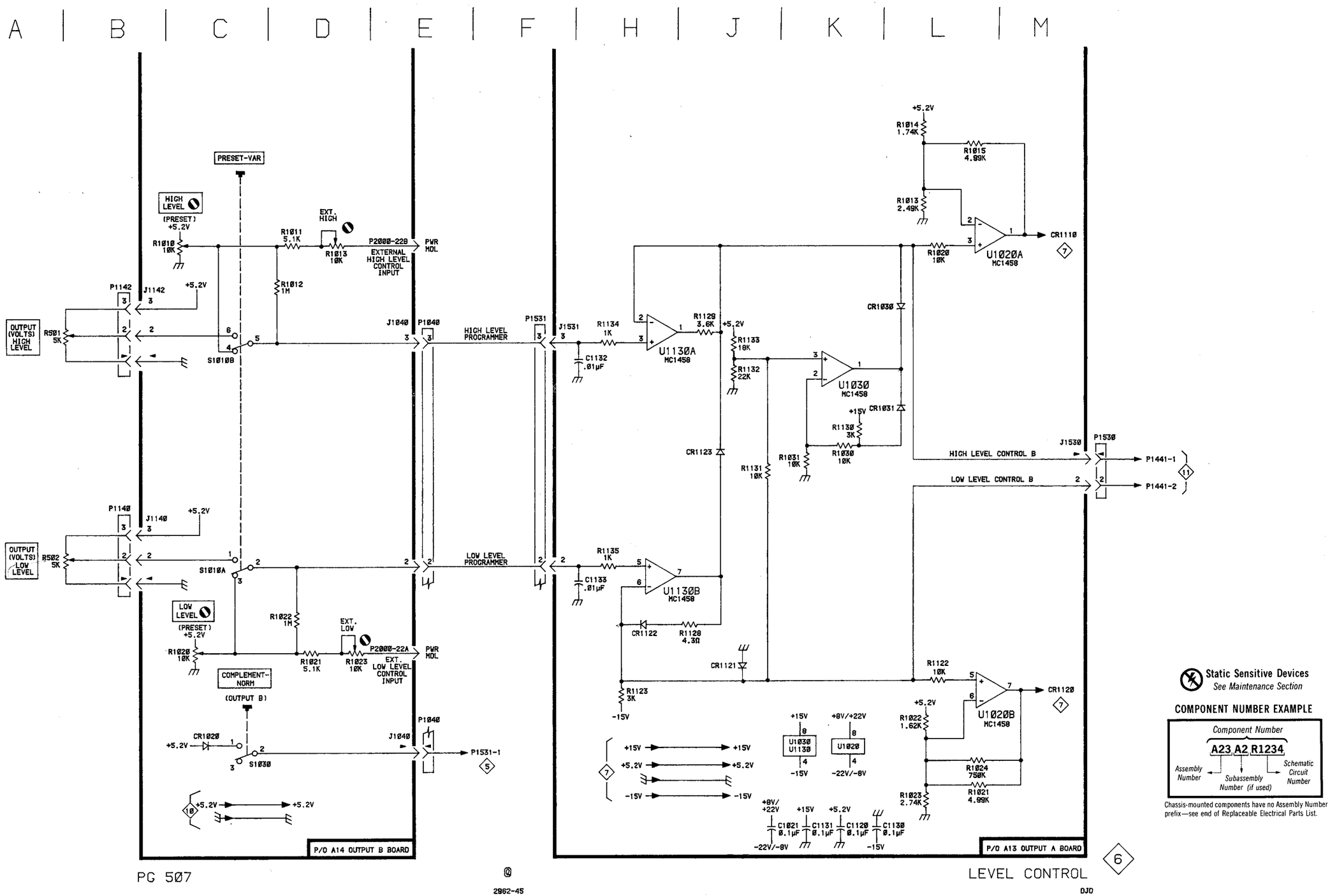
P/O A14 ASSY — **OUTPUT B BOARD**

CR1020	C8	B4	R1012	D3	B3
			R1013	D3	B3
J1040*	E4	T5	R1020	C7	B4
J1040*	E8	T5	R1021	D7	B4
J1140*	B5	T5	R1022	D6	B4
J1142*	B3	T5	R1023	D7	B4
			R501	A4	CHASSIS
P2000	E7	N3	R502	A6	CHASSIS
P2000	E3	N3			
			S1010A	C6	B3
R1010	B3	B3	S1010B	C4	B3
R1011	D3	B3	S1030	C8	B5

P/O A14 ASSY also shown on ◇5◇ ◇8◇ ◇9◇ ◇10◇ ◇11◇

* Component on back of board

Scan by Zenith



PG 507

2962-45

LEVEL CONTROL

DJD

LEVEL CONTROL
COMPONENT REFERENCE CHART 6

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE

Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Scan by Zenith

Table 8-8
COMPONENT REFERENCE CHART
(see Fig. 8-12)

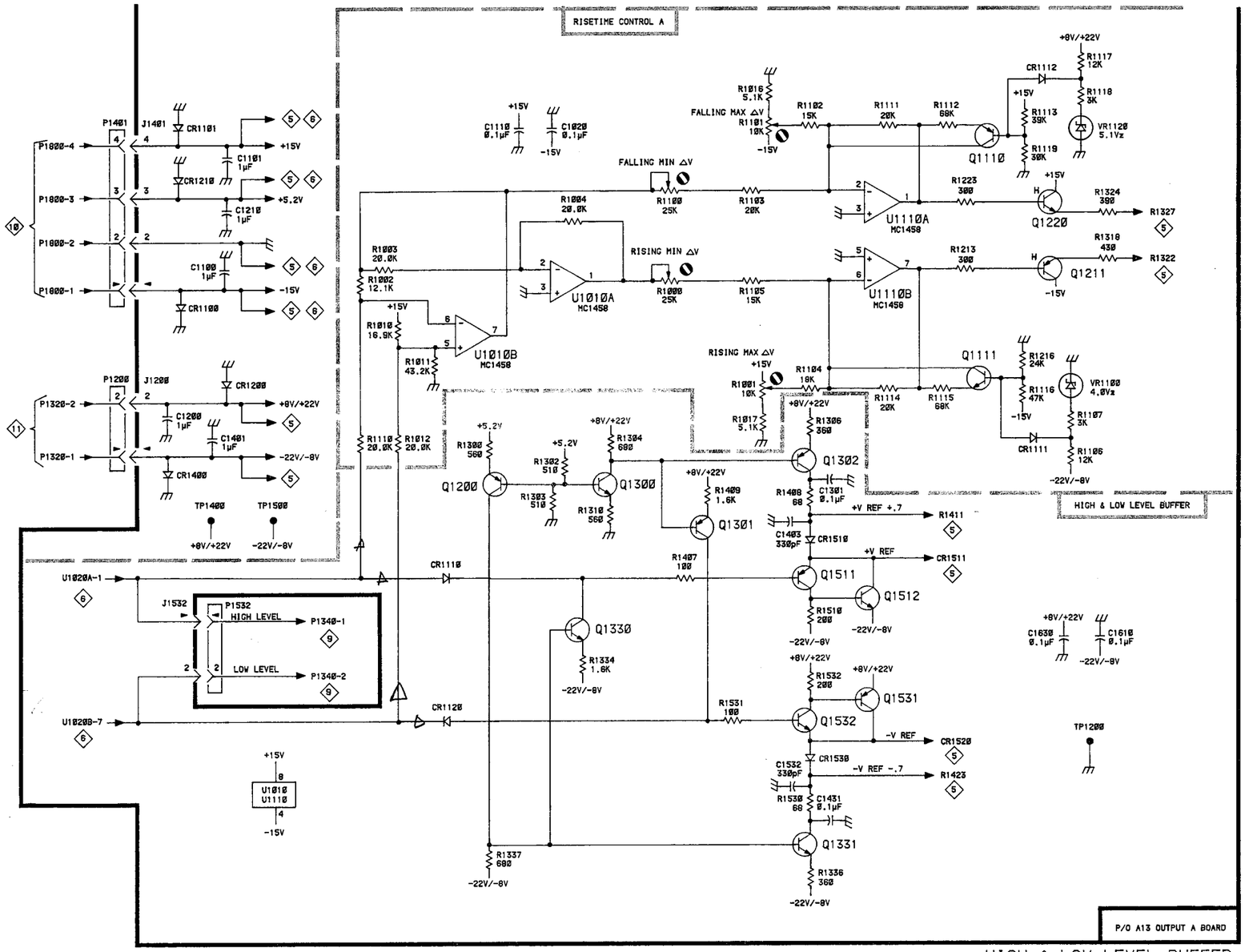
P/O A13 ASSY — OUTPUT A BOARD 7

Circuit Number	Schematic Location	Board Location
C1020	F2	B3
C1100	C3	C1
C1101	C2	C2
C1110	E2	C2
C1200	B4	D2
C1210	C2	D2
C1301	J5	F2
C1401	C4	G1
C1403	J5	G2
C1431	J8	F5
C1532	J7	G5
C1610	L6	H2
C1630	L6	H5
CR1100	C3	C1
CR1101	B2	C2
CR1110	E6	C2
CR1111	L4	C2
CR1112	L1	C3
CR1120	E7	C4
CR1200	C4	D1
CR1210	B2	D2
CR1400	B5	G1
CR1510	J5	H2
CR1530	J7	H5
J1200*	B4	M1
J1401	B2	D1
J1532*	C6	Q5
Q1110	K2	C2
Q1111	K4	C3
Q1200	E5	E1
Q1211	L3	D3
Q1220	L2	D4
Q1300	F5	E2
Q1301	H5	F1
Q1302	J4	E2
Q1330	F6	E6
Q1331	J8	F6
Q1510	J6	G2
Q1511	J6	H2
Q1512	J6	H2
Q1531	J7	H5
Q1532	J7	H5
R1000	H3	B1
R1001	H4	B1
R1002	D3	B2
R1003	D3	B2
R1004	F3	B2
R1010	D3	B3
R1011	E4	B3
R1012	D4	B3
R1016	H1	A3
R1017	H4	A3
R1100	H2	C1
R1101	H2	C1
R1102	J2	C2
R1103	H2	C2
R1104	J4	C2
R1105	H3	C2
R1106	L4	B1
R1107	L4	C2
R1110	D4	C2
R1111	J2	C3
R1112	K2	C3
R1113	L2	C3
R1114	J4	C3
R1115	K4	C3
R1116	L4	C3
R1117	L1	C3
R1118	L1	C4
R1119	L2	C3
R1213	K3	D2
R1216	L4	C3
R1223	K2	D4
R1300	E4	E1
R1302	F5	E2
R1303	F5	E2
R1304	F4	E2
R1306	J4	F2
R1310	F5	E2
R1318	L3	E3
R1324	L2	E4
R1334	F6	E5
R1336	J8	E5
R1337	E8	F5
R1407	H6	G2
R1408	J5	G2
R1409	H5	F1
R1510	J6	H2
R1530	J7	G5
R1531	H7	G5
R1532	J6	H5
TP1200	L7	G1
TP1400	C5	G1
TP1500	C5	G1
U1010A	F3	B2
U1010B	E4	B2
U1110A	J2	C2
U1110B	J3	C2
VR1100	L4	C2
VR1120	L2	D1

P/O A13 ASSY also shown on 5 6

* Component on back of board

Scan by Zenith



PG 507

2962-46

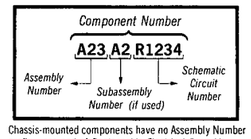
HIGH & LOW LEVEL BUFFER & RISETIME CONTROL A

DD

HIGH & LOW LEVEL BUFFER & RISETIME CONTROL A ⑦

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Scan by Zenith

Table 8-9
COMPONENT REFERENCE CHART
(see Fig. 8-13)

P/O A14 ASSY — OUTPUT B BOARD ◇8

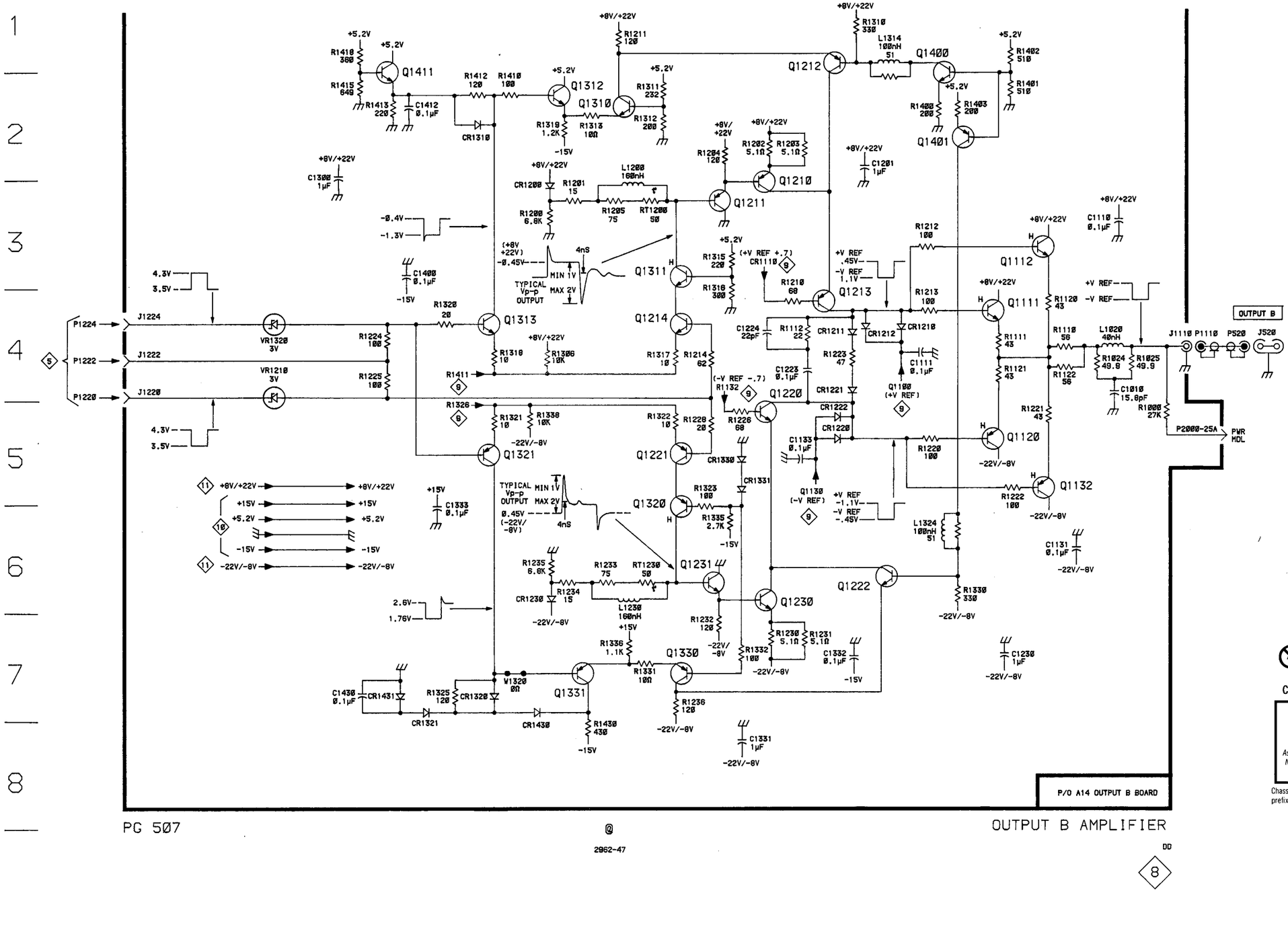
Circuit Number	Schematic Location	Board Location
C1010	M4	B3
C1110	M3	C2
C1111	K4	C2
C1131	L6	C5
C1133	J5	C5
C1201	J2	D2
C1223	J4	D3
C1224	H4	D4
C1230	L7	D5
C1300	D2	E2
C1331	H7	E5
C1332	J7	F5
C1333	D6	F5
C1400	D3	F2
C1412	D2	G3
C1430	D7	F5
CR1200	E3	D2
CR1210*	K4	S3
CR1211	J4	D3
CR1212*	J4	S3
CR1220*	J5	S4
CR1221	J4	D4
CR1222*	J5	S4
CR1230	F6	D5
CR1310	E2	F3
CR1320	E7	F4
CR1321	D7	F4
CR1330	H5	F5
CR1331	H5	F5
CR1430	E7	F5
CR1431	D7	F5
CR1730*	D8	Q3
J1110	M4	B4
J1220	B4	D3
J1222	B4	E4
J1224	B4	E4
J520	M4	CHASSIS
L1020	M4	B4
L1200	F3	E2
L1230	F6	E5
L1314	K1	E3
L1324	K6	E4
P2000	M5	N3
Q1111	L4	D2
Q1112	L3	C3
Q1120	L5	C4
Q1132	L5	D5
Q1210	H3	D2
Q1211	H3	E2
Q1212	J1	E3
Q1213	J4	D3
Q1214	H4	E3
Q1220	H5	D4
Q1221	H5	E4
Q1222	K6	E4
Q1230	H6	D5
Q1231	H6	E5
Q1310	F2	E2
Q1311	H3	E3
Q1312	F2	F2
Q1313	E4	F3
Q1320	H5	E4
Q1321	E5	F4
Q1330	H7	E5
Q1331	F7	F5
Q1400	K1	G1
Q1401	K2	G2
Q1411	D1	F2
R1000	M5	B3
R1024	L4	B3
R1025	M4	B4
R1110*	L4	T3
R1111	L4	D3
R1112	J4	D4
R1120	L4	C3
R1121	L4	C4
R1122*	L4	T4
R1200	E3	E1
R1201	F3	E1
R1202	J2	D2
R1203	J2	D2
R1204	H2	D2
R1205	F3	E2
R1210	J4	D3
R1211	F1	E2
R1212*	K3	S3
R1213*	K4	S3
R1214	H4	E3
R1220*	K5	S4
R1221	L5	D4
R1222*	L5	S4
R1223	J4	D3
R1224	D4	E4
R1225	D4	D3
R1226	H5	D4
R1228	H5	E4
R1230	J7	D5
R1231	J7	D5
R1232	H7	D5
R1233	F6	E5
R1234	F6	E6
R1235	F6	E6
R1236	H7	E5
R1306	E4	E2
R1310	J1	E2
R1311	H2	E2
R1312	H2	E2
R1313	F2	E2
R1315	H3	E3
R1316	H3	E3
R1317	H4	E3
R1318	E4	E3
R1319	F2	F2
R1320	E4	F4
R1321	E5	E4
R1322	H5	E4
R1323	H5	E4
R1325	E7	F4
R1330	K6	E5
R1331	F7	E5
R1332	H7	E5
R1335	H6	E5
R1336	F7	F5
R1338	E5	E5
R1400	K2	F1
R1401	L2	F2
R1402	L1	F2
R1403	K2	G2
R1410	E2	F3
R1412	E2	F3
R1413	D2	F2
R1415	D2	G2
R1418	D1	G3
R1430	F7	F5
RT1200	F3	E2
RT1230	F6	E5
VR1210	C4	E3
VR1320	C4	E4
W1320	E7	F4

P/O A14 ASSY also shown on ◇5 ◇6 ◇9 ◇10 ◇11

* Component on back of board

◇8 COMPONENT REFERENCE CHART

Scan by Zenith



Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE

Component Number
A23 A2 R1234
Assembly Number — *Subassembly Number (if used)* — *Schematic Circuit Number*

Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

PG 507

2962-47

OUTPUT B AMPLIFIER

DD

8

OUTPUT B AMPLIFIER 8

Scan by Zenith

Table 8-10
COMPONENT REFERENCE CHART
(see Fig. 8-13)

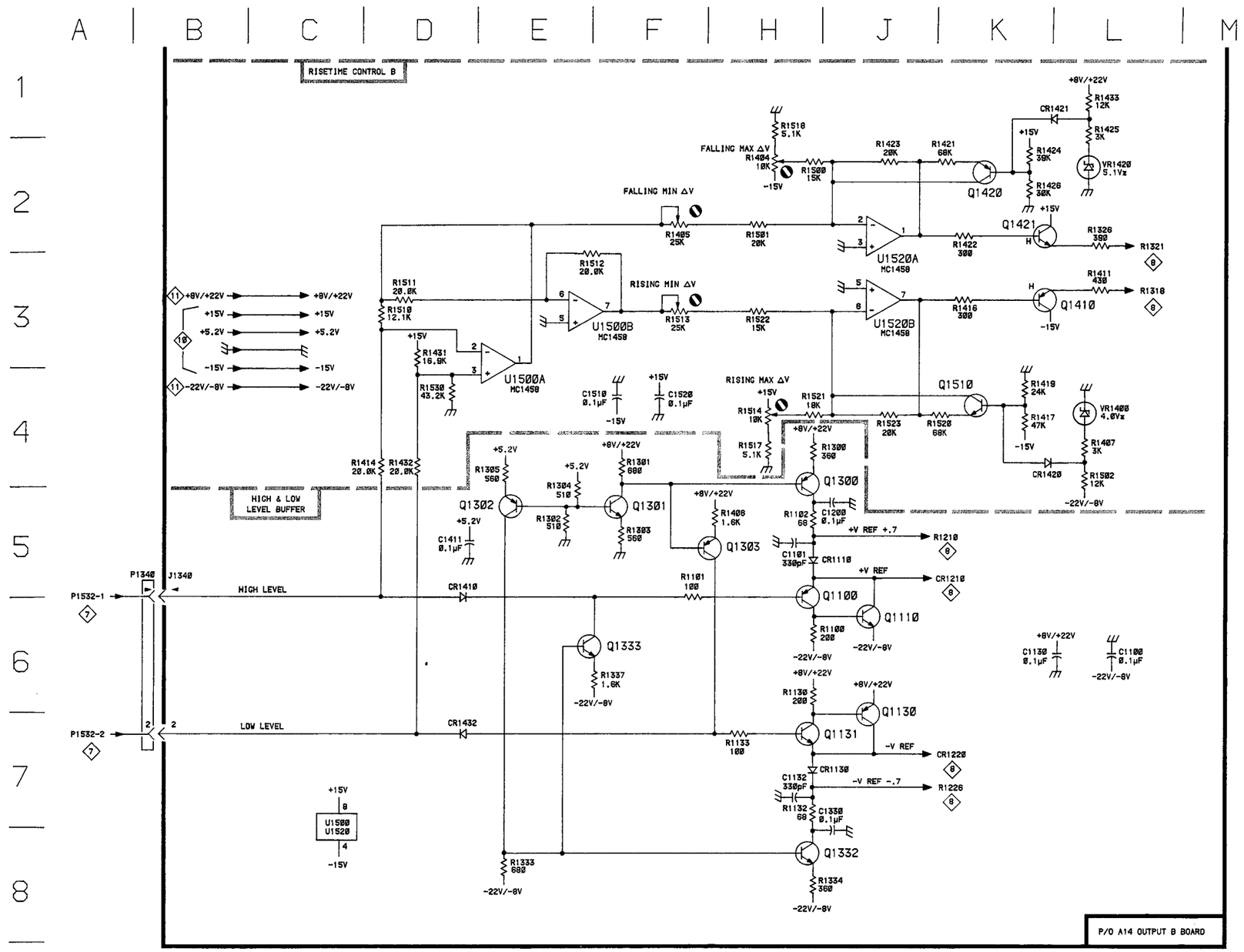
P/O A14 ASSY — OUTPUT B BOARD ◇9◇

Circuit Number	Schematic Location	Board Location
C1100	L6	C2
C1101	H5	D2
C1130	L6	B5
C1132	H7	D5
C1200	J5	E1
C1330	J7	E5
C1411	J4	G2
C1510	F4	H2
C1520	F4	H4
CR1110	H5	C2
CR1130	H7	C5
CR1410	D5	G3
CR1420	K4	G3
CR1421	L1	G4
CR1432	D7	G5
J1340*	B5	F5
Q1100	H5	C2
Q1110	J6	C2
Q1130	J6	C5
Q1131	H7	C5
Q1300	H4	E1
Q1301	F5	E2
Q1302	E5	F2
Q1303	H5	F1
Q1332	H8	E5
Q1333	F6	F6
Q1410	K3	F3
Q1420	K2	G4
Q1421	K2	G4
Q1510	K4	H3
R1100	H6	C2
R1101	F5	D2
R1102	H5	D2
R1130	H6	C5
R1132	H7	D5
R1133	H7	C5
R1300	H4	E2
R1301	F4	E2
R1302	E5	E2
R1303	F5	F2
R1304	E5	F2
R1305	E4	F2
R1326	L2	F4
R1333	E8	E5
R1334	H8	E5
R1337	F6	F6
R1404	H2	G1
R1405	F2	G2
R1406	H5	E1
R1407	L4	G1
R1411	L3	F3
R1414	D4	G3
R1416	K3	G3
R1417	K4	G3
R1419	K4	G4
R1421	K2	G4
R1422	K2	G4
R1423	J2	H5
R1424	K2	G4
R1425	L1	G4
R1426	K2	G4
R1431	D3	G5
R1432	D4	G5
R1433	L1	G5
R1500	H2	H1
R1501	H2	H2
R1502	L4	H1
R1510	D3	H2
R1511	D3	H2
R1512	E3	H3
R1513	F3	G3
R1514	H4	H3
R1517	H4	H2
R1518	H1	H2
R1520	K4	H3
R1521	H4	H4
R1522	H3	H4
R1523	J4	H4
R1530	D4	H5
U1500	E3	H2
U1520	J2	H4
VR1400	L4	F1
VR1420	L2	G5

P/O A14 ASSY also shown on ◇5◇ ◇6◇ ◇8◇ ◇10◇ ◇11◇

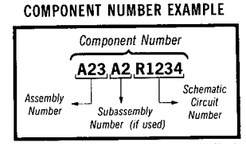
* Component on back of board

Scan by Zenith



Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Scan by Zenith

Table 8-11
COMPONENT REFERENCE CHART
(see Fig. 8-13, 8-10, 8-11)

P/O A14 ASSY — OUTPUT B BOARD 10

Circuit Number	Schematic Location	Board Location	Circuit Number	Schematic Location	Board Location
C1800	E4	L1	P2000	B3	N3
C1810	D3	K2	P2000	L8	N3
C1811	E5	L2	P2000	B7	N3
C1812	E7	L3	P2000	C4	N3
C1900	D6	L2	P2000	C3	N3
C1910	E6	M3	P2000	B8	N3
C1911	C3	M3	P2000	C8	N3
C1930	C7	L5	P2000	C7	N3
CR1810	D3	K2	R1800	D4	L1
CR1820	E7	L3	R1810	D3	K2
CR1910	F6	L3	R1811	D4	L2
			R1812	E3	L2
F1920	B3	M4	R1813	E5	L3
F1930	B8	M5	R1814	E6	L3
F1931	B3	M5	R1815	D5	L3
			R1816	C3	L3
J1500	E2	H1	R1820	D8	L3
J1540	H7	H6	R1910	E6	M3
J1620	F6	I3			
J1800*	L7	O2	TP1640	C6	I5
J1802*	H1	Q1	TP1800	E3	K2
J1820	C2	K3	TP1910	F6	L2
J1900*	K8	O1	TP1920	D7	L3
J1902*	B5	Q1			
			U1800	E4	L2
P1500	E2	H1	U1830*	C7	P5
P1540	H7	H6	U500	C2	CHASSIS
P1620	F6	I3			
P2000	B5	N3	VR1920	D8	M3

P/O A14 ASSY also shown on 5 6 8 9 11

P/O A11 ASSY — INPUT BOARD

C1300	L4	E2	CR1304	L5	E2
C1302	L4	E2			
C1304	L5	E2	J1031	M5	B5
			J1300	K4	E1
CR1300	L4	E1			
CR1302	L4	E2	R1032	L4	B5

P/O A11 ASSY also shown on 1

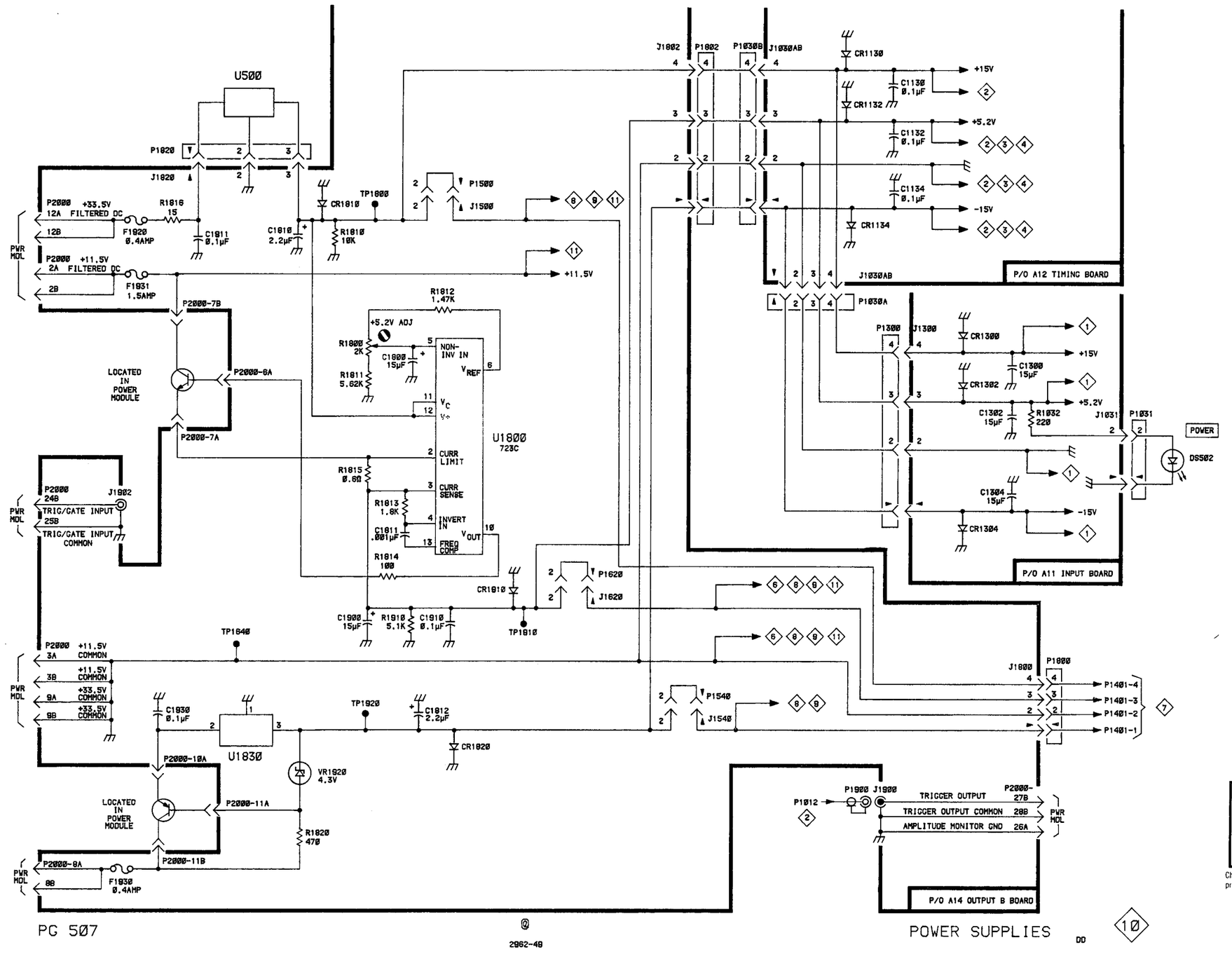
P/O A12 ASSY — TIMING BOARD

C1130	K1	C5	CR1132	K2	B4
C1132	K2	C4	CR1134	K3	B5
C1134	K2	C4			
			J1030AB	K3	B4
CR1130	K1	B4	J1030AB	J1	B4

P/O A12 ASSY also shown on 2 3 4

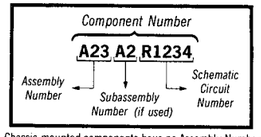
* Component on back of board

Scan by Zenith



Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE

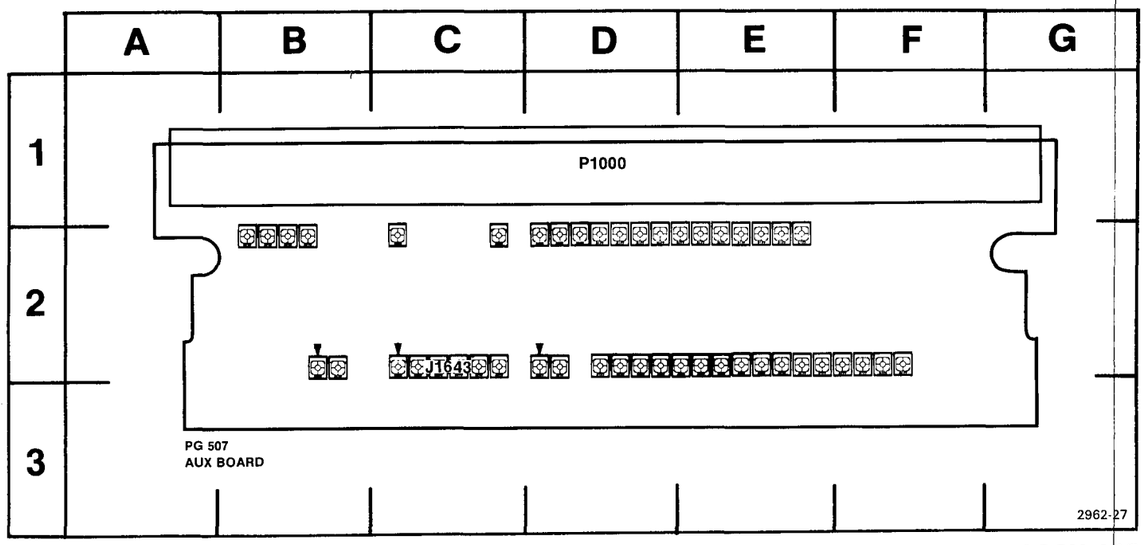


Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Scan by Zenith

AUXILIARY BOARD (A15) COMPONENT REFERENCE CHART ◇11

PARTS LOCATION GRID

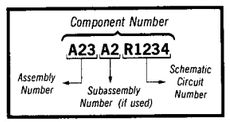


ASSY A15

Fig. 8-14. Auxiliary Board (A15).

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

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Table 8-12
COMPONENT REFERENCE CHART
(see Fig. 8-13, 8-14)

P/O A14 ASSY — **OUTPUT BOARD** ◇11

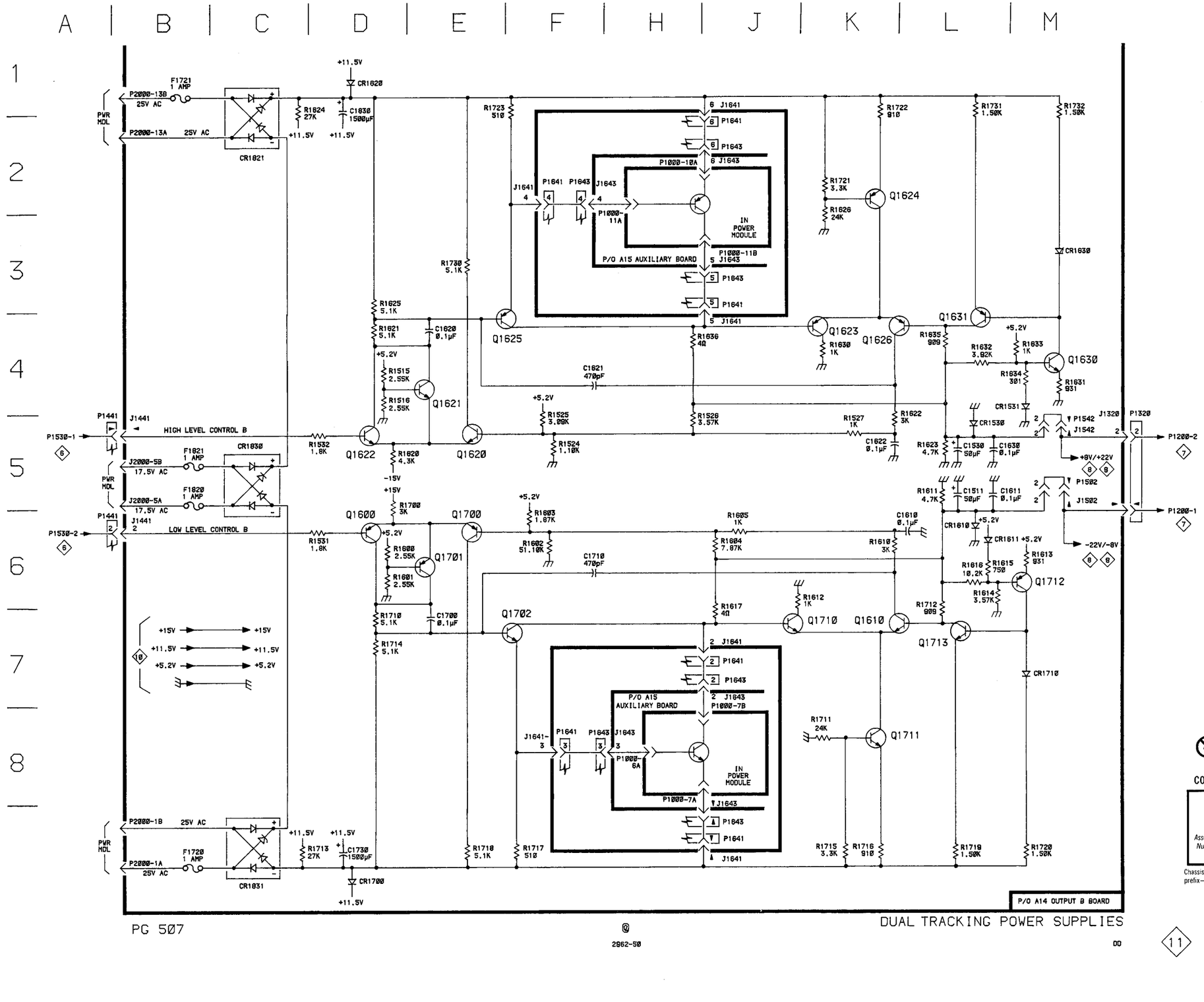
Circuit Number	Schematic Location	Board Location	Circuit Number	Schematic Location	Board Location
C1511	L5	H2	Q1702	F7	K2
C1530	L5	H5	Q1710	K7	J3
C1610	L6	I2	Q1711	K8	J3
C1611	L5	I2	Q1712	M6	J3
C1620	E4	I4	Q1713	L7	J3
C1621	F4	I4			
C1622	K5	I4	R1515	D4	H3
C1630	L5	I5	R1516	D4	H3
C1700	E7	J2	R1524	F5	H3
C1710	F6	J2	R1525	F4	H4
C1730*	D8	Q3	R1526	H4	I4
C1830*	D1	P3	R1527	K5	I4
			R1531	D6	H5
CR1530	L5	H5	R1532	D5	H5
CR1531	M4	H5	R1600	D6	I1
CR1610	L6	I2	R1601	D6	I1
CR1611	L6	I3	R1602	F6	I2
CR1620	D1	J4	R1603	F6	I2
CR1630	M3	I5	R1604	J6	I2
CR1700	D8	K2	R1605	J6	I2
CR1710	M7	J3	R1610	K6	I2
CR1821	C2	K4	R1611	L5	I2
CR1830	C5	K5	R1612	K6	I3
CR1831	C8	K5	R1613	M6	I3
			R1614	L6	I3
F1720	B8	J4	R1615	L6	I3
F1721	B1	K4	R1616	L6	I3
F1820	B5	L4	R1617	J6	J3
F1821	B5	L4	R1620	D5	I4
			R1621	D4	I4
J1320	M5	E1	R1622	L4	I4
J1441	B6	G5	R1623	L5	I4
J1441	B5	G5	R1624	C1	J4
J1502	M5	H1	R1625	D3	J4
J1542	M5	H5	R1626	K2	J4
J1641	J7	J5	R1630	K4	I4
J1641	F8	J5	R1631	M4	I5
J1641	J1	J5	R1632	L4	I5
J1641	J4	J5	R1633	M4	I5
J1641	J8	J5	R1634	M4	I5
J1641	F2	J5	R1635	L4	I5
			R1636	H4	I6
P1502	M5	H1	R1700	D5	J2
P1542	M5	H5	R1710	D7	J2
P2000	B8	N3	R1711	K8	J2
P2000	B1	N3	R1712	L6	J3
			R1713	C8	K2
Q1600	D6	J2	R1714	D7	K2
Q1610	K7	I2	R1715	K8	K2
Q1620	E5	I3	R1716	K8	K2
Q1621	E4	I3	R1717	F8	K3
Q1622	D5	I4	R1718	E8	K3
Q1623	K4	I4	R1719	L8	K3
Q1624	K2	J4	R1720	M8	K3
Q1625	F4	J4	R1721	K2	J4
Q1626	K4	I4	R1722	K1	J4
Q1630	M4	I5	R1723	F1	J4
Q1631	L4	J5	R1730	E3	J5
Q1700	E6	J2	R1731	L1	J5
Q1701	E6	J2	R1732	M1	J5

P/O A14 ASSY also shown on ◇5 ◇6 ◇8 ◇9 ◇10

A15 ASSY			AUXILIARY BOARD		
J1643	J7	C2	P1000	H2	D1
J1643	F2	C2	P1000	J7	D1
J1643	H8	C2	P1000	J3	D1
J1643	J8	C2	P1000	H8	D1
J1643	J3	C2			
J1643	J2	C2			

* Component on back of board

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PG 507

2962-50

DUAL TRACKING POWER SUPPLIES

00

DUAL TRACKING POWER SUPPLIES 11

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE

Component Number
A23 A2 R1234
Assembly Number — *Subassembly Number (if used)* — *Schematic Circuit Number*

Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

11

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REPLACEABLE MECHANICAL PARTS

PARTS ORDERING INFORMATION

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

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

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

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

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
ELCT_T	ELECTROLYTIC
ELEM	ELEMENT
EPL	ELECTRICAL PARTS LIST
EQPT	EQUIPMENT
EXT	EXTERNAL
FIL	FILLISTER HEAD
FLEX	FLEXIBLE
FLH	FLAT HEAD
FLTR	FILTER
FR	FRAME or FRONT
FSTNR	FASTENER
FT	FOOT
FXD	FIXED
GSKT	GASKET
HDL	HANDLE
HEX	HEXAGON
HEX HD	HEXAGONAL HEAD
HEX SOC	HEXAGONAL SOCKET
HLCPS	HELICAL COMPRESSION
HLEXT	HELICAL EXTENSION
HV	HIGH VOLTAGE
IC	INTEGRATED CIRCUIT
ID	INSIDE DIAMETER
IDENT	IDENTIFICATION
IMPLR	IMPELLER
IN	INCH
INCAND	INCANDESCENT
INSUL	INSULATOR
INTL	INTERNAL
LPHLDR	LAMPHOLDER
MACH	MACHINE
MECH	MECHANICAL
MTG	MOUNTING
NIP	NIPPLE
NON WIRE	NOT WIRE WOUND
OBD	ORDER BY DESCRIPTION
OD	OUTSIDE DIAMETER
OVH	OVAL HEAD
PH BRZ	PHOSPHOR BRONZE
PL	PLAIN or PLATE
PLSTC	PLASTIC
PN	PART NUMBER
PNH	PAN HEAD
PWR	POWER
RCPT	RECEPTACLE
RES	RESISTOR
RGD	RIGID
RLF	RELIEF
RTNR	RETAINER
SCH	SOCKET HEAD
SCOPE	OSCILLOSCOPE
SCR	SCREW
SE	SINGLE END
SECT	SECTION
SEMICOND	SEMICONDUCTOR
SHLD	SHIELD
SHLDR	SHOULDERED
SKT	SOCKET
SL	SLIDE
SLFLKG	SELF-LOCKING
SLVG	SLEEVING
SPR	SPRING
SQ	SQUARE
SST	STAINLESS STEEL
STL	STEEL
SW	SWITCH
T	TUBE
TERM	TERMINAL
THD	THREAD
THK	THICK
TNSN	TENSION
TPG	TAPPING
TRH	TRUSS HEAD
V	VOLTAGE
VAR	VARIABLE
W/	WITH
WSHR	WASHER
XFMR	TRANSFORMER
XSTR	TRANSISTOR

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CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
000EX	O'HARA METAL PRODUCT COMPANY	542 BRANNAN STREET	SAN FRANCISCO, CA 94107
00779	AMP, INC.	P O BOX 3608	HARRISBURG, PA 17105
01295	TEXAS INSTRUMENTS, INC., SEMICONDUCTOR GROUP	P O BOX 5012, 13500 N CENTRAL EXPRESSWAY	DALLAS, TX 75222
05820	WAKEFIELD ENGINEERING, INC.	AUDUBON ROAD	WAKEFIELD, MA 01880
11897	PLASTIGLIDE MFG. CORPORATION	P O BOX 867, 1757 STANFORD ST.	SANTA MONICA, CA 90406
13103	THERMALLOY COMPANY, INC.	2021 W VALLEY VIEW LANE P O BOX 34829	DALLAS, TX 75234
22526	BERG ELECTRONICS, INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
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
75915	LITTELFUSE, INC.	800 E. NORTHWEST HWY	DES PLAINES, IL 60016
78189	ILLINOIS TOOL WORKS, INC. SHAKEPROOF DIVISION	ST. CHARLES ROAD	ELGIN, IL 60120
78471	TILLEY MFG. CO.	900 INDUSTRIAL RD.	SAN CARLOS, CA 94070
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
93907	TEXTRON INC. CAMCAR DIV	600 18TH AVE	ROCKFORD, IL 61101

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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	337-1399-04			2		SHIELD,ELEC:SIDE	80009	337-1399-04
-2	200-1837-02			2		COVER,PLUG-IN:TOP & BOTTOM	80009	200-1837-02
						(ATTACHING PARTS)		
-3	211-0503-00			4		SCREW,MACHINE:6-32 X 0.188 INCH,PNH STL	83385	OBD
						- - - * - - -		
-4	366-0494-05			1		KNOB:GRAY,0.127 IDX 0.5 OD,0.531H	80009	366-0494-05
-5	----- -----			1		RES.,VAR,NONWW:(SEE R500 REPL)		
						(ATTACHING PARTS)		
-6	210-0583-00			1		NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-7	210-0940-00			1		WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL	79807	OBD
-8	210-0046-00			1		WASHER,LOCK:0.261 ID,INTL,0.018 THK,BRS	78189	1214-05-00-0541C
						- - - * - - -		
-9	----- -----			2		CONN,RCPT,ELEC:(SEE J500,J501 REPL)		
-10	210-0255-00			2		TERMINAL,LUG:0.391" ID INT TOOTH	80009	210-0255-00
-11	366-1559-00			8		PUSH BUTTON:SIL GY,0.18 SQ X 0.43	80009	366-1559-00
-12	426-1072-00			8		FRAME,PUSH BTN:PLASTIC	80009	426-1072-00
-13	366-1690-00			1		KNOB,LATCH:SIL GY,0.53 X0.23 X 1.059	80009	366-1690-00
-14	366-1464-01			3		KNOB:GRAY	80009	366-1464-01
-15	366-1170-03			3		KNOB:GRAY,0.25 ID X 0.706 OD,0.6H	80009	366-1170-03
-16	358-0029-00			3		BSHG,MACH.THD:HEX,0.375-32 X 0.438"LONG	80009	358-0029-00
						(ATTACHING PARTS)		
-17	210-0413-00			3		NUT,PLAIN,HEX.:0.375-32 X 0.50 INCH,STL	73743	3145-402
-18	344-0195-01			3		CLIP,ELECTRICAL:CAM SHAFT	80009	344-0195-01
-19	210-0978-00			3		WASHER,FLAT:0.375 ID X 0.50 INCH OD,STL	78471	OBD
						- - - * - - -		
-20	----- -----			2		CONN,RCPT,ELEC:(SEE J520,J530 REPL)		
-21	366-0497-02			1		KNOB:GY,0.127 ID X 0.706 OD X 0.6	80009	366-0497-02
-22	----- -----			2		RES.,VAR,NONWW:(SEE R501,R502 REPL)		
						(ATTACHING PARTS)		
-23	210-0583-00			2		NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-24	210-0940-00			2		WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL	79807	OBD
-25	210-0046-00			2		WASHER,LOCK:0.261 ID,INTL,0.018 THK,BRS	78189	1214-05-00-0541C
						- - - * - - -		
-26	358-0378-00			2		BUSHING,SLEEVE:PRESS MOUNT	80009	358-0378-00
-27	333-2654-00			1		PANEL,FRONT:	80009	333-2654-00
-28	200-0935-00			3		BASE,LAMPHOLDER:0.29 OD X 0.19 CASE	80009	200-0935-00
-29	352-0157-00			3		LAMPHOLDER:WHITE PLASTIC	80009	352-0157-00
-30	105-0719-00			1		LATCH,RETAINING:PLUG-IN	80009	105-0719-00
						(ATTACHING PARTS)		
-31	213-0113-00			1		SCR,TPG,THD FOR:2-32 X 0.312 INCH,PNH STL	93907	OBD
						- - - * - - -		
-32	105-0718-01			1		BAR,LATCH RLSE:	80009	105-0718-01
-33	386-4425-00			1		SUBPANEL,FRONT:	80009	386-4425-00
						(ATTACHING PARTS)		
-34	213-0229-00			8		SCR,TPG,THD FOR:6-20 X0.375"100 DEG,FLH STL	93907	OBD
						- - - * - - -		
-35	----- -----			1		CKT BOARD ASSY:INPUT(SEE A11 REPL)		
						(ATTACHING PARTS)		
-36	211-0504-00			2		SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL	83385	OBD
						- - - * - - -		
	----- -----			-		. CKT BOARD ASSY INCLUDES:		
-37	----- -----			16		. TERMINAL PIN:(SEE A11J1031,J1210,J1300,		
	----- -----			-		. J1330 REPL)		
-38	----- -----			1		. SWITCH,SLIDE;(SEE A11S1020 REPL)		
-39	136-0514-00			1		. SKT,PL-IN ELEC:MICROCIRCUIT,8 DIP	73803	CS9002-8
-40	----- -----			1		. TEST POINT:(SEE A11TP36 REPL)		
-41	136-0269-02			1		. SKT,PL-IN ELEK:MICROCIRCUIT,14 DIP,LOW CLE	73803	CS9002-14
-42	136-0260-02			1		. SKT,PL-IN ELEK:MICROCIRCUIT,16 DIP,LOW CLE	71785	133-51-92-008
-43	----- -----			2		. CONN,RCPT,ELEC:(SEE A11J1100,J1130 REPL)		
-44	136-0252-07			2		. SOCKET,PIN CONN:W/O DIMPLE	22526	75060-012
	672-0557-01			1		CKT BOARD ASSY:TIMING W/CAM SWITCH	80009	672-0557-01
						(ATTACHING PARTS)		
-45	211-0507-00			6		SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
-46	385-0160-00			4		SPACER,POST:0.812 L W/6-32 THD THRU,AL	80009	385-0160-00
						- - - * - - -		

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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-	----- -----			-		. CKT BOARD ASSY W/CAM SW INCLUDES:		
-47	384-1415-00			2		. EXTENSION SHAFT:8.905 L X 0.125 DIA,AL,CRM	80009	384-1415-00
-48	384-1416-00			1		. EXTENSION SHAFT:5.58 L X 0.125 DIA,AL,CRM	80009	384-1416-00
-49	----- -----			1		. RES.,VAR,NONWW:(SEE R1004 REPL)		
-50	----- -----			2		. RES.,VAR,NONWW:(SEE R1040,R1324 REPL)		
-51	361-0515-00			3		. SPACER,SWITCH:PLASTIC	80009	361-0515-00
-52	376-0051-01			3		. CPLG,SHAFT,FLEX:0.127 ID X 0.375 OD	80009	376-0051-01
	131-0963-00			1		. CONTACT,ELEC:GROUNDING	000EX	OBD
	----- -----			1		. SW CAM ACTR AS:(SEE S1200 REPL)		
						(ATTACHING PARTS)		
-53	211-0244-00			4		. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH STL	78189	OBD
						- - - * - - -		
	----- -----			-		. . ACTR ASSY INCLUDES:		
-54	200-1935-00			1		. . COVER,CAM SW:1.85 L X 0.876 H,AL	80009	200-1935-00
						(ATTACHING PARTS)		
-55	211-0008-00			4		. . SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
-56	210-0004-00			4		. . WASHER,LOCK:#4 INTL,0.015THK,STL CD PL	78189	1204-00-00-0541C
						- - - * - - -		
-57	131-0963-00			1		. . CONTACT,ELEC:GROUNDING	000EX	OBD
-58	210-0406-00			6		. . NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-59	214-1139-02			1		. . SPRING,FLAT:GREEN COLORED	80009	214-1139-02
	214-1139-03			1		. . SPRING,FLAT:RED COLORED	80009	214-1139-03
-60	214-1752-00			2		. . ROLLER,DETENT:	80009	214-1752-00
-61	401-0180-00			1		. . BEARING,CAM SW:FRONT & REAR	80009	401-0180-00
						(ATTACHING PARTS)		
-62	354-0390-00			1		. . RING,RETAINING:0.338 ID X 0.025" THK,STL	79136	5100-37MD
-63	105-0710-00			1		. . ACTUATOR,SWITCH:CAM SWITCH	80009	105-0710-00
-64	384-0878-10			1		. . SHAFT,CAM SW:OUTER CONCENTRIC,W/DRIVER	80009	384-0878-10
-65	401-0178-01			1		. . BEARING,CAM SW:CENTER/REAR	80009	401-0178-01
	----- -----			1		. SW CAM ACTR AS:(SEE S1620 REPL)		
						(ATTACHING PARTS)		
-66	211-0244-00			4		. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH STL	78189	OBD
						- - - * - - -		
	----- -----			-		. . ACTR ASSY INCLUDES:		
-67	200-1934-00			1		. . COVER,CAM SW:1.55 L X 0.876 H,AL	80009	200-1934-00
						(ATTACHING PARTS)		
-68	211-0008-00			4		. . SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
-69	210-0004-00			4		. . WASHER,LOCK:#4 INTL,0.015THK,STL CD PL	78189	1204-00-00-0541C
						- - - * - - -		
-70	131-0963-00			1		. . CONTACT,ELEC:GROUNDING	000EX	OBD
-71	210-0406-00			6		. . NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-72	214-1139-02			1		. . SPRING,FLAT:GREEN COLORED	80009	214-1139-02
	214-1139-03			1		. . SPRING,FLAT:RED COLORED	80009	214-1139-03
-73	214-1752-00			2		. . ROLLER,DETENT:	80009	214-1752-00
-74	401-0180-00			1		. . BEARING,CAM SW:FRONT & REAR	80009	401-0180-00
						(ATTACHING PARTS)		
-75	354-0390-00			1		. . RING,RETAINING:0.338 ID X 0.025" THK,STL	79136	5100-37MD
						- - - * - - -		
-76	105-0708-00			1		. . ACTUATOR,SWITCH:CAM SWITCH	80009	105-0708-00
-77	384-0878-00			1		. . SHAFT,CAM SW:W/DRIVER	80009	384-0878-00
-78	401-0178-01			1		. . BEARING,CAM SW:CENTER/REAR	80009	401-0178-01
	----- -----			1		. SW CAM ACTR AS:(SEE S1240 REPL)		
						(ATTACHING PARTS)		
-79	211-0244-00			4		. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH STL	78189	OBD
						- - - * - - -		
	----- -----			-		. . ACTR ASSY INCLUDES:		
-80	200-1936-00			1		. . COVER,CAM SW:1.95 L X 0.876 H,AL	80009	200-1936-00
						(ATTACHING PARTS)		
-81	211-0008-00			4		. . SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
-82	210-0004-00			4		. . WASHER,LOCK:#4 INTL,0.015THK,STL CD PL	78189	1204-00-00-0541C
						- - - * - - -		
-83	131-0963-00			1		. . CONTACT,ELEC:GROUNDING	000EX	OBD
-84	210-0406-00			6		. . NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-85	214-1139-02			1		. . SPRING,FLAT:GREEN COLORED	80009	214-1139-02
	214-1139-03			1		. . SPRING,FLAT:RED COLORED	80009	214-1139-03
-86	214-1752-00			2		. . ROLLER,DETENT:	80009	214-1752-00

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Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-87	401-0180-00			1		. . BEARING,CAM SW:FRONT & REAR	80009	401-0180-00
						(ATTACHING PARTS)		
-88	354-0390-00			1		. . RING,RETAINING:0.338 ID X 0.025" THK,STL	79136	5100-37MD
-89	105-0711-00			1		. . ACTUATOR,SWITCH:CAM SWITCH	80009	105-0711-00
-90	384-0878-11			1		. . SHAFT,CAM SW:OUTER CNCTRC,W/DRIVER	80009	384-0878-11
-91	401-0178-01			1		. . BEARING,CAM SW:CENTER/REAR	80009	401-0178-01
-92	----- -----			1		. CKT BOARD ASSY:TIMING B(SEE A12 REPL)		
-93	----- -----			1		. . SWITCH,PUSH;(SEE A12S1820A,B REPL)		
-94	----- -----			1		. . SWITCH,PUSH:(SEE A12S1800A,B REPL)		
-95	361-0382-00			8		. . SPACER,PB SW:BROWN,0.275 INCH LONG	80009	361-0382-00
-96	136-0260-02			6		. . SKT,PL-IN ELEK:MICROCIRCUIT,16 DIP,LOW CLE	71785	133-51-92-008
-97	136-0252-07			9		. . SOCKET,PIN CONN:W/O DIMPLE	22526	75060-012
-98	----- -----			9		. . CONN,RCPT,ELEC:(SEE A12J1010,J1012,J1230,		
	----- -----			-		. . J1400,J1440,J1640,J1642,J1740,J1840 REPL)		
-99	----- -----			4		. . TERMINAL,PIN:(SEE A12J1030 REPL)		
-100	----- -----			8		. . TERMINAL,PIN:(SEE A12J1742,J1810,J1830 REPL)		
-101	131-0604-00			37		. CONTACT,ELEC:CKT BD SW,SPR,CU BE	80009	131-0604-00
-102	351-0449-00			2		GUIDE,CKT BOARD:	80009	351-0449-00
						(ATTACHING PARTS)		
-103	211-0062-00			4		SCREW,MACHINE:2-56 X 0.312 INCH,RDH STL	83385	OBD
-104	210-0405-00			4		NUT,PLAIN,HEX.:2-56 X 0.188 INCH,BRS	73743	2X12157-402
-105	210-0053-00			4		WASHER,LOCK:INTL,0.092 ID X 0.175"OD,STL	83385	OBD
						- - - * - - -		
-106	334-2208-00			1		MARKER,IDENT:WARNING	80009	334-2208-00
-107	----- -----			1		CKT BOARD ASSY:AUXILIARY(SEE A15 REPL)		
-108	----- -----			6		. TERMINAL,PIN:(SEE A15J1643 REPL)		
-109	255-0334-00			1		PLASTIC CHANNEL:12.75 X 0.175X 0.155,NYL	11897	122-37-2500
-110	333-2380-00			1		PANEL,REAR:	80009	333-2380-00
						(ATTACHING PARTS)		
-111	213-0868-00			4		SCREW,TPG,TF:6-32 X 0.375 L,FILM,STEEL	93907	OBD
-112	386-3657-01			2		SUPPORT,PLUG IN:	93907	OBD
-113	----- -----			1		MICROCIRCUIT,LI:(SEE U500 REPL)		
						(ATTACHING PARTS)		
-114	211-0008-00			1		SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
-115	210-0586-00			1		NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL	83385	OBD
-116	342-0202-00			1		INSULATOR,PLATE:TRANSISTOR	01295	10-21-023-106
						- - - * - - -		
-117	----- -----			1		CKT BOARD ASSY:OUTPUT B(SEE A14 REPL)		
						(ATTACHING PARTS)		
-118	211-0678-00			4		SCR,ASSEM WSHR:4-40 X 0.281 L,PNH STEEL	78189	OBD
						- - - * - - -		
	----- -----			-		. CKT BOARD ASSY INCLUDES:		
-119	----- -----			2		. SWITCH,PUSH:(SEE A14S1010,S1030 REPL)		
-120	361-0685-00			2		. SPACER,SWITCH:0.365 INCH LONG	80009	361-0685-00
-121	361-0899-00			2		. SPACER,PB SW:0.144 L,ORANGE	80009	361-0899-00
-122	214-1967-00			1		. HEAT SINK,DIODE:FINGER TYPE	13103	6107B-14
						(ATTACHING PARTS)		
-123	211-0007-00			1		. SCREW,MACHINE:4-40 X 0.188 INCH,PNH STL	83385	OBD
-124	210-0406-00			1		. NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
						- - - * - - -		
-125	----- -----			1		. MICROCIRCUIT,LI:(SEE A14U1830 REPL)		
-126	343-0149-00			2		. CLAMP,LOOP:NYLON	80009	343-0149-00
-127	----- -----			3		. SOCKET,PIN TERM:(SEE A14J1220,J1222,		
	----- -----			-		. J1224 REPL)		
-128	----- -----			4		. TEST POINT:(SEE A14TP1640,TP1800,TP1910,		
	----- -----			-		. TP1920 REPL)		
-129	----- -----			43		. TERMINAL,PIN:(SEE A14J1040,J1140,J1142,J1320,		
	----- -----			-		. J1340,J1441,J1500,J1502,J1540,J1542,J1620,		
	----- -----			-		. J1640,J1800,J1802,J1820,J1910 REPL)		
-130	136-0252-07			3		. SOCKET,PIN CONN:W/O DIMPLE	22526	75060-012
-131	----- -----			3		. CONN,RCPT,ELEC:(SEE A14J1110,J1900,J1902 REPL)		
-132	344-0326-00			8		. CLIP,ELECTRICAL:FUSE,BRASS	75915	102071
-133	131-0993-00			5		. BUS,CONDUCTOR:2 WIRE BLACK	00779	530153-2
-134	342-0324-00			4		. INSULATOR,DISC:TO-5 TRANSISTOR	13103	7717-5N-BLUE
-135	136-0261-00			4		. SOCKET,PIN TERM:FOR 0.22 INCH PIN	00779	1-331677-6
-136	214-1291-00			4		. HEAT SINK,ELEC:XSTR,0.72 OD X 0.375"H	05820	207-AB
-137	214-3057-00			4		. HEAT SINK,XSTR:TO-5,SIL BRZ PTD BLACK	13103	6024U SPECIAL

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Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-138	----- -----			1		CKT BOARD ASSY:OUTPUT A(SEE A13 REPL)		
						(ATTACHING PARTS)		
-139	211-0678-00			4		SCR,ASSEM WSHR:4-40 X 0.281 L,PNH STEEL	78189	OBD
-140	129-0080-00			4		SPACER,POST:0.875 L,W/4-40 THD,NYLON	80009	129-0080-00
						- - - * - - -		
	----- -----			-		. CKT BOARD ASSY INCLUDES:		
-141	----- -----			1		. SWITCH,PUSH:(SEE A13S1630 REPL)		
-142	361-0685-00			2		. SPACER,SWITCH:0.365 INCH LONG	80009	361-0685-00
-143	----- -----			3		. TEST POINT:(SEE A13TP1200,TP1400,TP1500 REPL)		
-144	----- -----			3		. CONN,RCPT,ELEC:(SEE A13J1020,J1532,J2030 REPL)		
-145	214-3057-00			4		. HEAT SINK,XSTR:TO-92,PHOSPHOR BRONZE	13103	6024U SPECIAL
-146	214-1292-00			2		. HEAT SINK,ELEC:TRANSISTOR	05820	205-AB
-147	214-1291-00			2		. HEAT SINK,ELEC:XSTR,0.72 OD X 0.375"H	05820	207-AB
-148	342-0324-00			4		. INSULATOR,DISC:TO-5 TRANSISTOR	13103	7717-5N-BLUE
-149	136-0252-07			3		. SOCKET,PIN CONN:W/O DIMPLE	22526	75060-012
-150	----- -----			14		. TERMINAL,PIN:(SEE A13J1200,J1401,J1530,J1531,		
	----- -----			-		. J1532,J2030 REPL)		
-151	----- -----			3		. TERMINAL,PIN:(SEE A13P1220,P1222,P1224 REPL)		
-152	426-1246-01			1		FR SECT,PLUG-IN:RIGHT SIDE,TOP AND BOTTOM	80009	426-1246-01
-153	426-1246-00			1		FR SECT,PLUG-IN:RIGHT SIDE,TOP AND BOTTOM	80009	426-1246-00
-154	407-1693-00			4		BRACKET,COVER:ALUMINUM	80009	407-1693-00
-155	214-1061-00			1		SPRING,GROUND:FLAT	80009	214-1061-00
-156	426-1245-01			1		FR SECT,PLUG-IN:TOP LEFT	80009	426-1245-01
-157	426-1245-00			1		FR SECT,PLUG-IN:LEFT SIDE,TOP AND BOTTOM	80009	426-1245-00

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Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
						WIRE ASSEMBLIES		
	175-3170-00			2		CABLE ASSY,RF:50 OHM,5.5 L,9-4	80009	175-3170-00
	----- -----			-		(FROM A11J1100 TO A12J1230)		
	----- -----			-		(FROM A12J1012 TO A14J1900)		
	175-3169-00			1		CA ASSY,SP,ELEC:4,26 AWG,6.0 L	80009	175-3169-00
	----- -----			-		(FROM A11J1300 TO A12J1030)		
	352-0162-04			2		. CONN BODY,PL,EL:4 WIRE YELLOW	80009	352-0162-04
	175-3061-00			1		CA ASSY,SP,ELEC:5,26 AWG,6.0 L RIBBON	80009	175-3061-00
	----- -----			-		(FROM A11J1400 TO A12J1810)		
	352-0163-05			2		. CONN BODY,PL,EL:5 WIRE GREEN	80009	352-0163-05
	175-3071-00			1		CA ASSY,SP,ELEC:4,26 AWG,4.5 L RIBBON	80009	175-3071-00
	----- -----			-		(FROM A12J1030 TO A14J1802)		
	352-0162-05			2		. CONN BODY,PL,EL:4 WIRE GREEN	80009	352-0162-05
	175-3075-00			1		CABLE ASSY,RF:50 OHM COAX,4.5 L,9-1	80009	175-3075-00
	----- -----			-		(FROM A12J1640 TO A13J1520)		
	175-3073-00			1		CABLE ASSY,RF:50 OHM COAX,4.5 L,9-2	80009	175-3073-00
	----- -----			-		(FROM A12J1642 TO A13J1420)		
	175-3060-00			3		CA ASSY,SP,ELEC:2,26 AWG,5.0 L RIBBON	80009	175-3060-00
	----- -----			-		(FROM A13J1200 TO A14J1300)		
	----- -----			-		(FROM A13J1530 TO A14J1440)		
	----- -----			-		(FROM A13J1532 TO A14J1340)		
	352-0169-04			2		. CONN BODY,PL,EL:2 WIRE YELLOW	80009	352-0169-04
	175-3068-00			1		CABLE ASSY,RF:50 OHM COAX,5.5 L,9-4	80009	175-3068-00
	----- -----			-		(FROM A13J1400 TO A14J1800)		
	352-0162-09			2		. CONN BODY,PL,EL:4 WIRE WHITE	80009	352-0162-09
	175-3077-00			1		CA ASSY,SP,ELEC:3,26 AWG,4.0 L RIBBON	80009	175-3077-00
	----- -----			-		(FROM A13J1640 TO A14J1040)		
	352-0161-03			2		. CONN BODY,PL,EL:3 WIRE ORANGE	80009	352-0161-03
	195-0693-00			1		LEAD ELECTRICAL:26 AWG,3.5 L,9-1	80009	195-0693-00
	----- -----			-		(FRON A13J2030 TO A14J1910)		
	352-0171-01			2		. CONN BODY,PL,EL:1 WIRE BROWN	80009	352-0171-01
	175-3072-00			1		CA ASSY,SP,ELEC:6,26 AWG,4.5 L RIBBON	80009	175-3072-00
	----- -----			-		(FRON A14J1640 TO A15J1643)		
	352-0164-06			2		. CONN BODY,PL,EL:6 WIRE BLUE	80009	352-0164-06
	175-3062-00			2		CA ASSY,SP,ELEC:2,26 AWG,3.0 L RIBBON	80009	175-3062-00
	----- -----			-		(FROM DS500 TO A12J1830)		
	----- -----			-		(FROM DS502 TO A11J1030)		
	352-0169-02			1		. CONN BODY,PL,EL:2 WIRE RED	80009	352-0169-00
	175-3063-00			1		CA ASSY,SP,ELEC:2,26 AWG,3.5 L RIBBON	80009	175-3063-00
	----- -----			-		(FROM DS501 TO A11J1410)		
	352-0169-02			1		. CONN BODY,PL,EL:2 WIRE RED	80009	352-0169-00
	175-5116-00			1		CABLE ASSY,RF:50 OHM COAX,3.0 L,9-1	80009	175-5116-00
	----- -----			-		(FROM J500 TO A11J1130)		
	175-3066-00			1		CABLE ASSY,RF:50 OHM COAX,11.0 L,9-2	80009	175-3066-00
	----- -----			-		(FROM J501 TO A12J1010)		
	175-3059-00			1		CABLE ASSY,RF:50 OHM COAX,4.5 L,9-3	80009	175-3059-00
	----- -----			-		(FROM J520 TO A14J1110)		
	175-3074-00			1		CA ASSY,RF:50 OHM COAX,3.5 L,9-1	80009	175-3074-00
	----- -----			-		(FROM J530 TO A13J1020)		
	175-3064-00			2		CA ASSY,SP,ELEC:3,26 AWG,3.0 L,RIBBON	80009	175-3064-00
	----- -----			-		(FROM R500 TO A11J1330)		
	----- -----			-		(FROM R502 TO A14J1140)		
	352-0161-06			1		. CONN BODY,PL,EL:3 WIRE BLUE	80009	352-0161-06
	175-2101-00			2		CA ASSY,SP,ELEC:3,26 AWG,35 L	80009	175-2101-00
	----- -----			-		(FROM R501 TO A14J1142)		
	----- -----			-		(FROM U500 TO A14J1820)		
	352-0161-03			2		. CONN BODY,PL,EL:3 WIRE ORANGE	80009	352-0161-03

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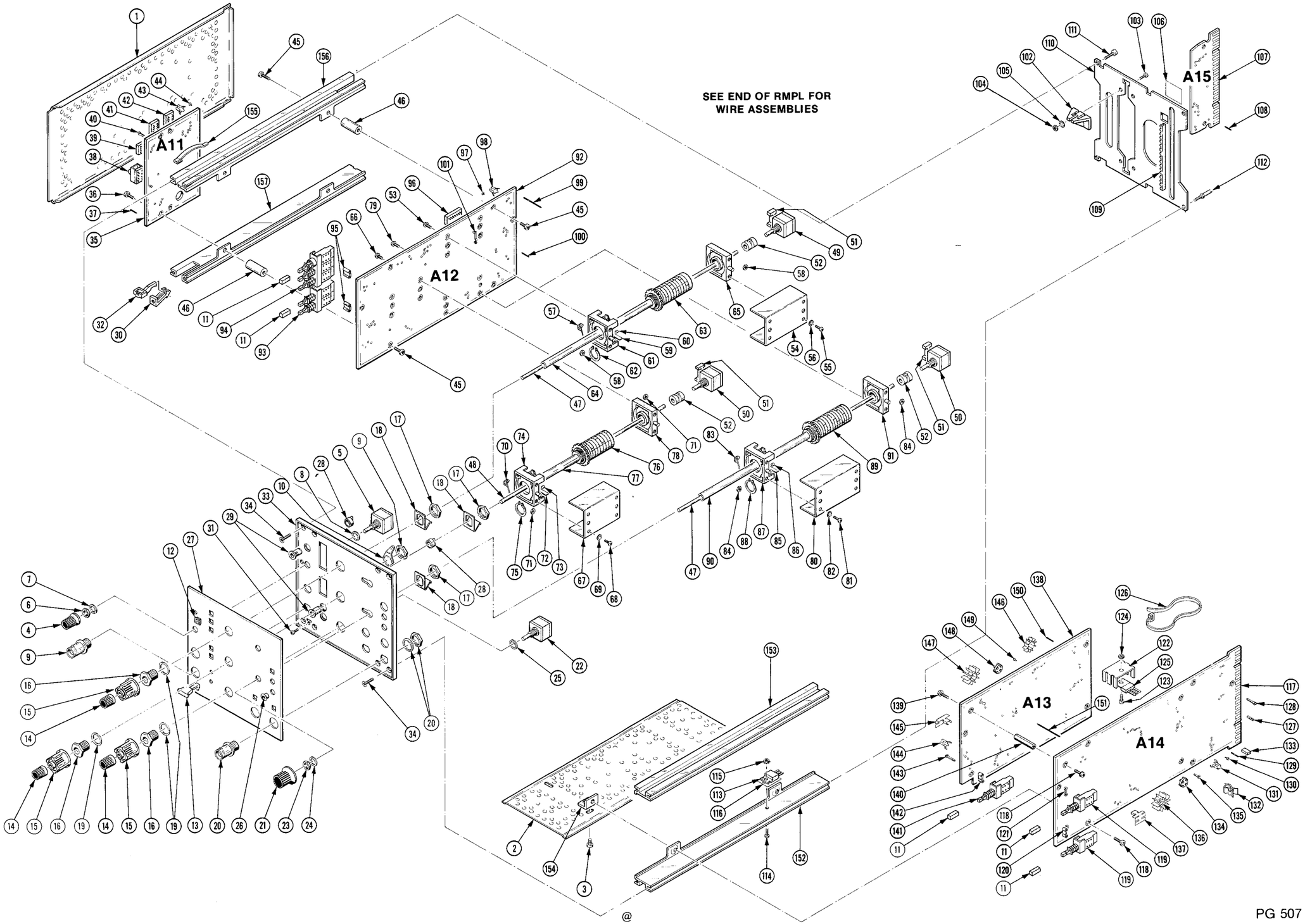


FIG. 1 EXPLODED

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Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
	070-2962-00			1		MANUAL,TECH:INSTRUCTION	80009	070-2962-00

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MANUAL CHANGE INFORMATION

At Tektronix, we continually strive to keep up with latest electronic developments by adding circuit and component improvements to our instruments as soon as they are developed and tested.

Sometimes, due to printing and shipping requirements, we can't get these changes immediately into printed manuals. Hence, your manual may contain new change information on following pages.

A single change may affect several sections. Since the change information sheets are carried in the manual until all changes are permanently entered, some duplication may occur. If no such change pages appear following this page, your manual is correct as printed.

SERVICE NOTE

Because of the universal parts procurement problem, some electrical parts in your instrument may be different from those described in the Replaceable Electrical Parts List. The parts used will in no way alter or compromise the performance or reliability of this instrument. They are installed when necessary to ensure prompt delivery to the customer. Order replacement parts from the Replaceable Electrical Parts List.

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CALIBRATION TEST EQUIPMENT REPLACEMENT

Calibration Test Equipment Chart

This chart compares TM 500 product performance to that of older Tektronix equipment. Only those characteristics where significant specification differences occur, are listed. In some cases the new instrument may not be a total functional replacement. Additional support instrumentation may be needed or a change in calibration procedure may be necessary.

Comparison of Main Characteristics

DM 501 replaces 7D13		
PG 501 replaces 107	PG 501 - Risetime less than 3.5 ns into 50 Ω.	107 - Risetime less than 3.0 ns into 50 Ω.
108	PG 501 - 5 V output pulse; 3.5 ns Risetime	108 - 10 V output pulse 1 ns Risetime
PG 502 replaces 107		
108	PG 502 - 5 V output	108 - 10 V output
111	PG 502 - Risetime less than 1 ns; 10 ns Pretrigger pulse delay	111 - Risetime 0.5 ns; 30 to 250 ns Pretrigger pulse delay
PG 508 replaces 114	Performance of replacement equipment is the same or better than equipment being replaced.	
115		
2101		
PG 506 replaces 106	PG 506 - Positive-going trigger output signal at least 1 V; High Amplitude output, 60 V.	106 - Positive and Negative-going trigger output signal, 50 ns and 1 V; High Amplitude output, 100 V.
067-0502-01	PG 506 - Does not have chopped feature.	0502-01 - Comparator output can be alternately chopped to a reference voltage.
SG 503 replaces 190, 190A, 190B	SG 503 - Amplitude range 5 mV to 5.5 V p-p.	190B - Amplitude range 40 mV to 10 V p-p.
191		
067-0532-01	SG 503 - Frequency range 250 kHz to 250 MHz.	0532-01 - Frequency range 65 MHz to 500 MHz.
SG 504 replaces 067-0532-01	SG 504 - Frequency range 245 MHz to 1050 MHz.	0532-01 - Frequency range 65 MHz to 500 MHz.
067-0650-00		
TG 501 replaces 180, 180A	TG 501 - Trigger output-slaved to marker output from 5 sec through 100 ns. One time-mark can be generated at a time.	180A - Trigger pulses 1, 10, 100 Hz; 1, 10, and 100 kHz. Multiple time-marks can be generated simultaneously.
181		181 - Multiple time-marks
184	TG 501 - Trigger output-slaved to market output from 5 sec through 100 ns. One time-mark can be generated at a time.	184 - Separate trigger pulses of 1 and 0.1 sec; 10, 1, and 0.1 ms; 10 and 1 μs.
2901	TG 501 - Trigger output-slaved to marker output from 5 sec through 100 ns. One time-mark can be generated at a time.	2901 - Separate trigger pulses, from 5 sec to 0.1 μs. Multiple time-marks can be generated simultaneously.

NOTE: All TM 500 generator outputs are short-proof. All TM 500 plug-in instruments require TM 500-Series Power Module.

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MANUAL CHANGE INFORMATION

Date: 2-5-81 Change Reference: C1/281

Product: PG 507 50 MHz DUAL OUTPUT PULSE GENERATOR Manual Part No.: 070-2962-00

DESCRIPTION

TEXT, ELECTRICAL PARTS LIST AND SCHEMATIC DIAGRAM CHANGES

Section 1-SPECIFICATION

Page 1-2, Table 1-1 ELECTRICAL CHARACTERISTICS

UNDER:

Characteristics	Performance Requirements	Supplemental Information
Rise/Fall Time	≤4 ns fixed from 5 V to 7.5 V p-p into 50 Ω load.	
ADD:		
Leading and trailing pulse coincidence	≤1.5 ns	Typically less than 1 ns

Section 4 - CALIBRATION

Page 4-7, 5. Check OUTPUT B Rise Time, Fall Time, and Aberrations

ADD, step 5.5:

5.5 Check Output Leading and Trailing Edge pulse coincidence. ≤1.5 ns

Refer to Fig 4-3 check setup.

a. With the output cable connected to OUTPUT B, position the rising 50% point of the waveform to the center graticule line.

b. Remove the PG 507 OUTPUT B cable connection and connect to OUTPUT A.

c. Check-The rising 50% points of the output pulses must coincide within 1.5 ns.

d. Repeat steps a, b, and c for the falling 50% points of the output pulses.

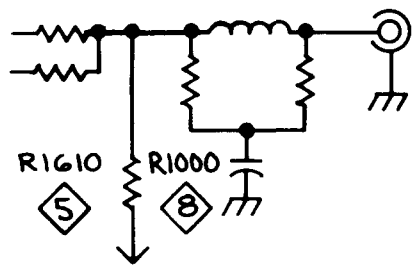
ELECTRICAL PARTS LIST AND SCHEMATIC DIAGRAM CHANGES

CHANGE:

F1931 159-0059-00 FUSE, WIRE LEAD:5A, 125V, 18 SEC.

The above part is located on the A14 OUTPUT B circuit board assembly and shown on the POWER SUPPLIES diagram 10.

CHANGE the connection of R1610 and R1000 as shown:



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