

Tektronix[®]
COMMITTED TO EXCELLENCE

**DC 508A
1.3 GHz COUNTER**

INSTRUCTION MANUAL



**DC 508A
1.3 GHz COUNTER**

INSTRUCTION MANUAL

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

Serial Number _____

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WARNING

The remaining portion of this Table of Contents lists servicing instructions that expose personnel to hazardous voltages. These instructions are for qualified service personnel only.

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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.

Terms 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.

Symbols 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 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 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 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 Power Cord

Use only the power cord and connector specified for your product.

Use only a power cord that is in good condition.

For detailed information on power cords and connectors, see maintenance section.

Refer cord and connector changes to qualified service personnel.

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 Remove Covers or Panels

To avoid personal injury, do not remove the product covers or panels. Do not operate the product without the covers and panels properly installed.

Do Not Operate Without Covers (for TM 500 plug-ins only)

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.

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 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 from 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.

RECAPITULATIF DES CONSIGNES DE SECURITE

Le texte ci-dessous, divisé en deux parties, résume les consignes de sécurité qui doivent être observées à toutes les phases de l'utilisation, de la maintenance et des réparations de l'appareil.

Consignes de sécurité destinées aux utilisateurs. Les consignes générales de sécurité s'adressent à la fois aux utilisateurs et au personnel de maintenance. Avertissements et précautions à respecter sont annotés au long de ce manuel, à chaque fois que l'utilisation du DC 508A l'exige.

TERMES

Dans ce manuel

Les nota dénommés «Attention» indiquent les circonstances ou les manipulations pouvant provoquer des détériorations de l'appareil ou de tout autre équipement associé.

Les nota dénommés «Avertissement» indiquent les circonstances ou les manipulations pouvant entraîner blessures corporelles, éventuellement mortelles.

Gravés sur l'appareil

CAUTION (attention). Ce mot identifie les zones de risque de blessure, non immédiatement perceptibles ou un risque éventuel de détérioration de l'appareil.

DANGER. Ce mot indique les zones de risque immédiat pouvant entraîner blessures ou mort.

SYMBOLES

Dans ce manuel



Ce symbole de sécurité signifie : se reporter au manuel.

Gravés sur l'appareil



DANGER – Haute tension



Protection à la masse



ATTENTION – se reporter au manuel

Utiliser le cordon d'alimentation approprié

N'utiliser que le cordon d'alimentation et la prise recommandés pour votre appareil. N'utiliser qu'un cordon d'alimentation en bon état. Pour effectuer les changements de cordons d'alimentation et de prises, faire appel à un personnel qualifié.

Utiliser le fusible approprié

Pour éviter tout risque d'accident (incendie...) n'utiliser que le fusible recommandé pour votre appareil. Les remplacements de fusible doivent toujours être en harmonie avec le type, la vitesse de tension et la vitesse de courant. Seul, un personnel compétent peut procéder à un changement de fusible.

Ne pas utiliser l'appareil en atmosphères explosives

Pour éviter toute explosion, ne pas utiliser cet appareil dans une atmosphère de gaz explosifs à moins qu'une telle utilisation n'ait été spécifiquement reconnue possible.

Ne pas ôter les capots ou panneaux

Pour éviter tout incident corporel grave, ne pas ôter les panneaux ou capots de protection de l'appareil. Celui-ci ne doit pas fonctionner tant que les panneaux et capots n'ont pas correctement été mis en place.

Ne pas faire fonctionner l'appareil sans les capots et panneaux (pour les tiroirs de la série TM 500 uniquement)

Pour éviter tout incident corporel grave, ne pas utiliser l'appareil alors que les capots ou panneaux ne sont pas remis en place. N'appliquer aucune tension au tiroir par l'intermédiaire d'un cordon d'extension.

CONSIGNES DE SECURITE
*UNIQUEMENT DESTINEES AU PERSONNEL
DE MAINTENANCE*

Il est indispensable de se référer également aux consignes de sécurité à l'attention des utilisateurs.

Ne jamais être seul pour procéder à l'entretien de l'appareil.

Agir avec précaution si l'on effectue une réparation alors que l'appareil est sous tension

Des tensions dangereuses existent en divers points de l'appareil. Pour éviter tout risque de blessure corporelle, ne touchez ni aux connexions exposées ni aux composants alors que l'appareil est sous tension.

Couper l'alimentation avant d'enlever les panneaux de protection, d'effectuer des soudures ou de remplacer des composants.

Source d'alimentation

Ce produit est conçu pour fonctionner à partir d'une source d'alimentation qui n'appliquera pas plus de 250 V efficaces entre les conducteurs d'alimentation ou entre chaque conducteur d'alimentation et la terre. Pour utiliser l'appareil en toute sécurité, une connexion à la masse au moyen d'un conducteur de masse dans le cordon d'alimentation est indispensable.

SICHERHEITSANGABEN

Der folgende Text enthält in zwei Teilen Angaben über Sicherheitsvorkehrungen, die jederzeit bei Betrieb, Service und Reparatur des Gerätes beachtet werden müssen.

SICHERHEITSANGABEN FÜR DEN ANWENDER

Die allgemeinen Sicherheitsinformationen in diesem Teil der Angaben dienen dem Anwender- und Servicepersonal. Spezielle Warnungen und Hinweise sind überall im Handbuch zu finden, müssen jedoch in diesen Angaben nicht erscheinen.

BEGRIFFE

In diesem Handbuch

VORSICHTSHINWEISE erläutern Bedingungen, die zur Zerstörung des Gerätes oder anderer Gegenstände führen könnten.

WARNUNGSHINWEISE erläutern Bedingungen, die zu Personenschäden führen können oder lebensgefährlich sind.

Markierungen auf dem Gerät

CAUTION – VORSICHT weist darauf hin, daß durch zufälliges Berühren an einer nicht unmittelbar zugänglichen Stelle Personenschaden entstehen kann, oder Schaden am Gerät selbst.

DANGER – GEFAHR weist darauf hin, daß durch zufälliges Berühren an einer zugänglichen Stelle Personenschaden entstehen kann.

SYMBOLE

In diesem Handbuch



Dieses Symbol zeigt an, wo Vorsicht walten zu lassen ist, oder wo Informationen zu finden sind.

Markierungen auf dem Gerät



GEFAHR – Hochspannung.



Schutzerdungskontakt



ACHTUNG – beziehen Sie sich auf das Handbuch

Netzspannungsversorgung

Die Betriebsspannung für dieses Gerät darf $250 V_{\text{eff}}$ nicht überschreiten und ist an die Versorgungsleitungen bzw. an eine Versorgungsleitung und Masse anzulegen. Ein Schutzerder innerhalb des Netzanschlußkabels ist mit der Gerätemasse verbunden und dient der sicheren Arbeitsweise.

Masseanschluß des Gerätes

Das Gerät wird über den Schutzleiter des Netzkabels mit Erdpotential verbunden. Zur Vermeidung von elektrischen Schlägen ist der Netzstecker nur in korrekt verdrahtete Steckdosen einzustecken und zur sicheren Arbeitsweise für eine gute Schutzpotential-Verbindung zwischen Gerät und Schutzpotential zu sorgen.

Verwendung eines korrekten Netzanschlußkabels

Verwenden Sie nur Netzkabel, die für dieses Gerät geeignet sind und die sich in gutem Zustand befinden.

Für detaillierte Informationen über Kabel und Stecker beziehen Sie sich auf Abbildungen innerhalb des Handbuches.

Ein Austausch von Kabeln und Steckern ist nur von geschultem Personal vorzunehmen.

Arbeiten Sie nicht in explosiver Umgebung

Zur Vermeidung von Explosionen ist die Inbetriebnahme dieses Gerätes in explosiver Umgebung zu unterlassen, wenn das Gerät nicht dafür geeignet ist.

Entfernen Sie keine Gehäuseabdeckungen

Zur Vermeidung von Personenschaden sind keine Gehäuseteile zu entfernen. Auch ist das Gerät ohne Gehäuse nicht in Betrieb zu nehmen.

Arbeiten Sie nicht ohne Gehäuseabdeckung

Zur Vermeidung von Personenschäden ist das Gerät nicht ohne Gehäuse in Betrieb zu nehmen. Der Einschub sollte nicht über einen Verlängerungsadapter betrieben werden.

SICHERHEITSAANGABEN FÜR DEN SERVICE

NUR FÜR GESCHULTES PERSONAL

Beziehen Sie sich auch auf die vorangehenden Sicherheitsangaben für den Anwender.

Führen Sie keine Servicetätigkeiten alleine durch

Nehmen Sie an dem Gerät keine Service- oder Einstellarbeiten vor, wenn nicht eine andere Person verfügbar ist, um im Bedarfsfall Erste Hilfe oder Wiederbelebungsversuche zu leisten.

Lassen Sie besondere Vorsicht walten, wenn Sie an einem unter Spannung stehenden Gerät arbeiten

An verschiedenen Stellen im Gerät liegen hohe und damit gefährliche Spannungen. Zur Vermeidung von Personenschäden sind solche Stellen und Bauteile nicht zu berühren, während Betriebsspannung anliegt.

Vor dem Entfernen von Gehäuseteilen, Löten oder Ersetzen von Bauteilen ist immer die Betriebsspannung zu entfernen.

Netzspannungsversorgung

Die Betriebsspannung für dieses Gerät darf $250 V_{\text{eff}}$ nicht überschreiten und ist an die Versorgungsleitungen bzw. an eine Versorgungsleitung und Masse anzulegen. Ein Schutzleiter innerhalb des Netzanschlußkabels ist mit Gerätemasse verbunden und dient der sicheren Arbeitsweise.

ご使用前に

機器の操作、保守、修理のすべての面で安全にご使用いただくため次の2項の注意および手順をお守り下さい。

安全なご使用のために

この項目では操作する人およびサービス・エンジニアの方に安全にお取扱いいただくための注意事項が述べられています。

記号

この取扱説明書に出てくる記号



このマークは適切な注意、または他の項目を参照する必要がある場合を指示しています。

機器に記された記号



危険——高電圧



保護用接地ターミナル



注意——取扱説明書参照

電源

本機器は電源コードの線間、あるいは電源コードとグラウンド間が250Vrms以内の範囲の電源で作動します。安全のために電源コードのアース線で接地して下さい。

機器の接地

本機器は電源コードのアース線で接地されます。電気的ショックを避けるために、電源コードをコンセントに差し込んでから、機器の入、出力端子への接続を行って下さい。電源コード中のアース線は必ず接地して下さい。

電源コード

電源コードとコネクタは機器に適合するものをお使い下さい。

電源コードに損傷がないことをお確かめ下さい。

電源コードとコネクタに関する詳細は本体取扱説明書をご参照下さい。

電源コードとコネクタの交換については当社エンジニアにおたずね下さい。

ヒューズ

危険防止のため、本機器のパーツ・リストに記載されている、形状、定格電圧、定格電流が同等のヒューズをご使用下さい。

ヒューズ交換については当社エンジニアにおたずね下さい。

危険防止

危険防止のため、爆発性のガスが周囲にあるような所では作動させないで下さい。

カバー、パネルの取りはずし

機器内部には高電圧の部分があります。電気的ショックを避けるため、カバーを取りはずさないで下さい。

機器使用に際して(TM500シリーズ・プラグインのみ)

人体への危険を防止するため、カバーやパネルを取りはずしたまま作動させないで下さい。またプラグイン・エクステンダでプラグインと電源を接続しないで下さい。

サービス・エンジニアの方へ

“安全なご使用のために”の項もご参照下さい。

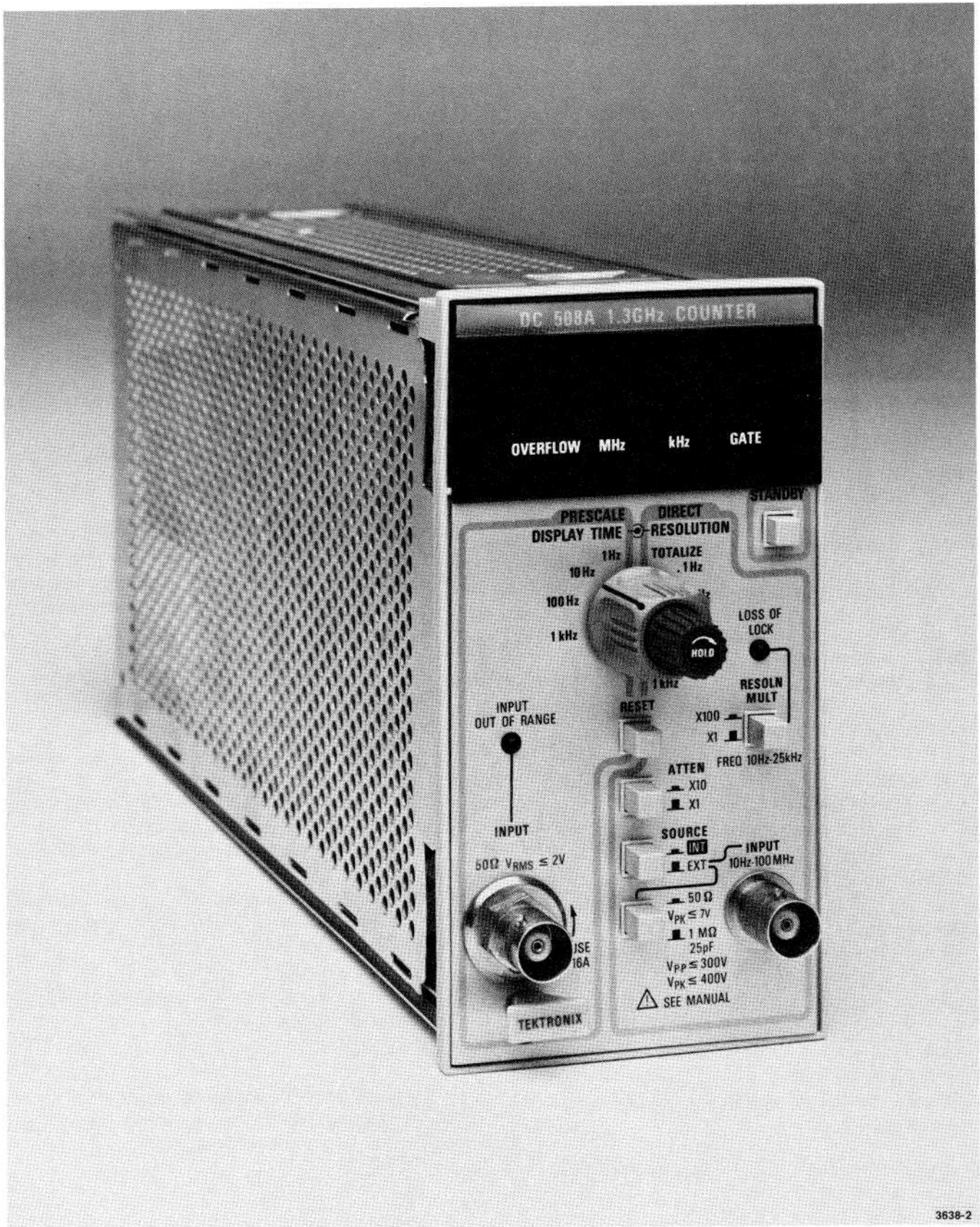
機器の内部調整または修理は、事故が起きた場合に応急手当、および処理のできる人がそばにいない時には行わないで下さい。電源を入れて修理する際は特に気をつけて下さい。

機器内部には高電圧の部分があります。人体への危険を防止するため、電源がはいっている時は、露出している接続部分や部品には手を触れないで下さい。

パネルの取りはずし、ハンダ付、部品の交換を行う前に電源を必ず切って下さい。

電源

本機器は電源コードの線間あるいは電源コードとグラウンド間が250Vrms以内の範囲の電源で作動します。安全のために電源コードのアース線で接地して下さい。



DC 508A 1.3 GHz Counter.

SPECIFICATION

Description

The DC 508A 1.3 GHz Counter measures frequency from 10 Hz to 1.3 GHz. Frequencies from 10 Hz to 100 MHz are measured using the direct input and from 100 MHz to 1.3 GHz using the prescaler input. The counter also totalizes events from 0 to 000,000,000. Nine 7-segment light emitting diodes (LED) provide a visual numerical display which allows resolutions of 1 kHz to 1 Hz (0.1 Hz when using the direct input). The decimal point is automatically positioned and leading zeros to the left of the most significant digit or decimal point are blanked. Digit overflow is indicated by a front panel LED.

The 50 Ω prescale input has a vswr of 2.2:1 or less and is protected by an easily replaced front-panel fuse which opens at approximately 9 V rms. A wide-band limiting amplifier with automatic gain control allows an input sensitivity of 20 mV rms over the frequency range of the prescaler input. If the input signal falls below the minimum level allowable for error-free prescale counting, the LED display is blanked and an input error light is lit.

Direct input signals can be applied to either a front-panel bnc connector or to the rear interface connector.

The DC 508A operates in Tektronix TM 500-Series power modules only. It will operate in any compartment of a multiple-compartment power module.

Performance Conditions

The electrical characteristics are valid only if the DC 508A has been calibrated at an ambient temperature between +20°C and +30°C and is operating at an ambient temperature between 0°C and +50°C, unless otherwise noted.

Items listed in the Performance Requirements column of the Electrical Characteristics are verified by completing the Performance Check in the Service 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.

Table 1-1

ELECTRICAL CHARACTERISTICS

Characteristics	Performance Requirements	Supplemental Information
PRESCALE INPUT		
Frequency Range	≤ 100 MHz to at least 1.3 GHz	Prescale divides input frequency by 8.
Gate Times (resolution)		8 ms, 80 ms, 800 ms, and 8 s (1 kHz, 100 Hz, 10 Hz, and 1 Hz).
Sensitivity (measured from a 50 Ω source)	≤ 20 mV rms (-21 dBm) from ≤ 100 MHz to ≥ 1.1 GHz. ≤ 40 mV rms (-15 dBm) from 1.1 GHz to 1.3 GHz.	A two-pole high pass filter at about 100 MHz prevents erroneous counting if frequency is too low.
Impedance		50 Ω ac coupled
VSWR		$\leq 2.2:1$
Maximum Operating Input Voltage	≤ 2 V rms (+19 dBm) over the specified operating frequency range.	$V_{pk} \leq 15$ V
Input Protection Voltage		Input fuse opens at ≈ 9 V rms (+30 dBm).

Table 1-1 (cont)

Characteristics	Performance Requirements	Supplemental Information
Input OUT OF RANGE light		Lights when input voltage is below safe level for error-free counting. Indicates input voltage is too low or frequency is too high or too low. Display is blanked after the gate time when the signal has not met the minimum input requirements.
DIRECT INPUT		
Frequency Range	≤ 10 Hz to at least 100 MHz.	
Gate Times (resolution)		1 ms, 10 ms, 100 ms, 1 s, 10 s, and totalize (1 kHz, 100 Hz, 10 Hz, 1 Hz, and .1 Hz).
External Sensitivity	≤ 15 mV rms from ≤ 10 Hz to ≥ 100 MHz.	
External Impedance		Input is ac coupled. On 50 Ω range termination is dc connected.
50 Ω		50 $\Omega \pm 10\%$.
1 M Ω		Approximately 1 M Ω in parallel with approximately 25 pF.
External Maximum Input Voltage		
50 Ω		$V_{pk} \leq 7$ V.
1 M Ω , 1X Attenuation		$V_{pk} \leq 400$ V, $V_{p-p} \leq 300$ V from dc to 0.75 MHz. $V_{p-p} \leq 400$ V, $V_{p-p} \leq 225 \div f_{MHz}$ from 0.75 MHz to 22 MHz. $V_p \leq 400$ V, $V_{p-p} \leq 10$ V above 22 MHz. Pulse: $V_{p-p} \leq 400$ V, $\frac{dV}{dt} \leq 5$ V/ns.
1 M Ω , 10X Attenuation		$V_{pk} \leq 400$ V, $V_{p-p} \geq 300$ V from dc to 1 MHz. $V_{p-p} \leq 400$ V, $V_{p-p} \leq 300 \div f_{MHz}$ from 1 MHz to 6 MHz. $V_{p-p} \leq 400$ V, $V_{p-p} \leq 100$ V above 6 MHz.
Rear Interface Internal Input		
Sensitivity		≤ 125 mV rms from ≤ 10 Hz to ≥ 50 MHz.
Impedance		50 $\Omega \pm 10\%$, dc coupled termination.
Maximum Input Voltage		$V_{p-p} \leq 4$ V.

Table 1-1 (cont)

Characteristics	Performance Requirements	Supplemental Information
Resolution Multiplier		
Frequency Range	≤ 10 Hz to ≥ 25 kHz.	
Multiplication	X100.	
Lock Time	≤ 5 s.	
COUNTER ACCURACY		
Accuracy	The overall DC 508A Counter accuracy is: Accuracy (% of reading) = \pm [time base accuracy + (1 \div total displayed counts)] X 100.	
	Time base accuracy = \pm [calibration accuracy + temperature stability + (aging rate X time since calibration) + short term stability].	
	Calibration accuracy = \pm (calibrating standard accuracy + adjustment resolution).	
STANDARD INTERNAL TIME BASE		
Frequency		10 MHz.
Temperature Stability (0°C to +50°C)	5 ppm.	
Aging		≤ 1 ppm/year.
OPTION 1 INTERNAL TIME BASE		
Frequency		10 MHz with proportional oven.
Temperature Stability (0°C to +50°C)	± 0.2 ppm after warmup.	
Warm-up Time	Within ± 0.2 ppm of final frequency in less than 10 minutes when cold started at 25°C ambient.	STANDBY switch allows power to oven to remain on while power is removed from remainder of instrument.
Aging		
At time of shipping		1×10^{-8} /day maximum.
After 30 days of continuous operation		4×10^{-8} /week maximum.
After 60 days of continuous operation		< 1 ppm/year.
Short Term Stability		$\leq 1 \times 10^{-9}$ rms based on 60 consecutive 1 second measurements.
Adjustment Resolution		± 2 parts in 10^8 or better.
Adjustment Range		Sufficient for 8 years of aging.

Table 1-1 (cont)

Characteristics	Performance Requirements	Supplemental Information
POWER CONSUMPTION		
Standard Instrument		≈15 W
With Option 1		≈17 W

Table 1-2

ENVIRONMENTAL CHARACTERISTICS

Characteristics	Information
Temperature	Test to procedures of MIL-STD-810C Methods 502.1 and 501.1 using Procedure I as specified in MIL-T-28800B paragraph 4.5.5.1.3 and 4.5.5.1.4.
Operating	0°C to +50°C.
Non-operating	-55°C to +75°C.
Humidity	
Operating	+50°C to 95% relative humidity.
Non-operating	+60°C to 95% relative humidity. Test to MIL-STD-810C Method 507.1 Procedure IV, modified as specified in MIL-T-28800B paragraph 4.5.5.1.1.2.
Altitude	Test to MIL-STD-810C Method 500.1 Procedure I as specified in MIL-T-28800B paragraph 4.5.5.2.
Operating	To 15,000 feet.
Non-operating	To 50,000 feet.
Vibration	
Operating and Non-operating	With the instrument operating, the vibration frequency is swept from 10 to 55 to 10 Hz. Vibrate 15 minutes in each of the three major axes at 0.015" total displacement. Hold 10 minutes at any major resonance, or if none, at 55 Hz. Total time, 75 minutes.
Shock	
Non-operating	30 g's 1/2 sine, 11 ms duration, 3 shocks in each direction along 3 major axes, for a total of 18 shocks.
Transportation	Qualified under National Safe Transit Committee Test Procedure 1A, Category II.



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Table 1-3
PHYSICAL CHARACTERISTICS

Characteristics	Information
Maximum Overall Dimensions	
Height	4.969 inches (12.621 cm).
Width	2.638 inches (6.701 cm).
Length	12.088 inches (30.704 cm).
Front Panel	
Finish	Anodized aluminum.
Net Weight	Standard instrument ≈2 lbs. 2 oz. (0.964 kg). Instrument with Options 1 and 7 ≈2 lbs. 5 oz. (1.5 kg).

OPERATING INSTRUCTIONS

Installation and Removal

CAUTION

Turn the power module off before inserting the plug-in; otherwise, damage may occur to the plug-in circuitry. Because of the high current drawn by the DC 508A it is also recommended that the power module be turned off before removing the DC 508A. Refer to Fig. 2-1. Check to see that the plastic barriers on the interconnecting jack of the selected power module compartment match the cut-outs in the DC 508A circuit board edge connector.

Align the upper and lower groove of the DC 508A chassis with the upper and lower guides of the selected compartment. Push the module in and press firmly to seat the circuit board in the interconnecting jack.

To remove the DC 508A, pull on the release latch located in the lower left corner, until the interconnecting jack disengages and the DC 508A will slide out.

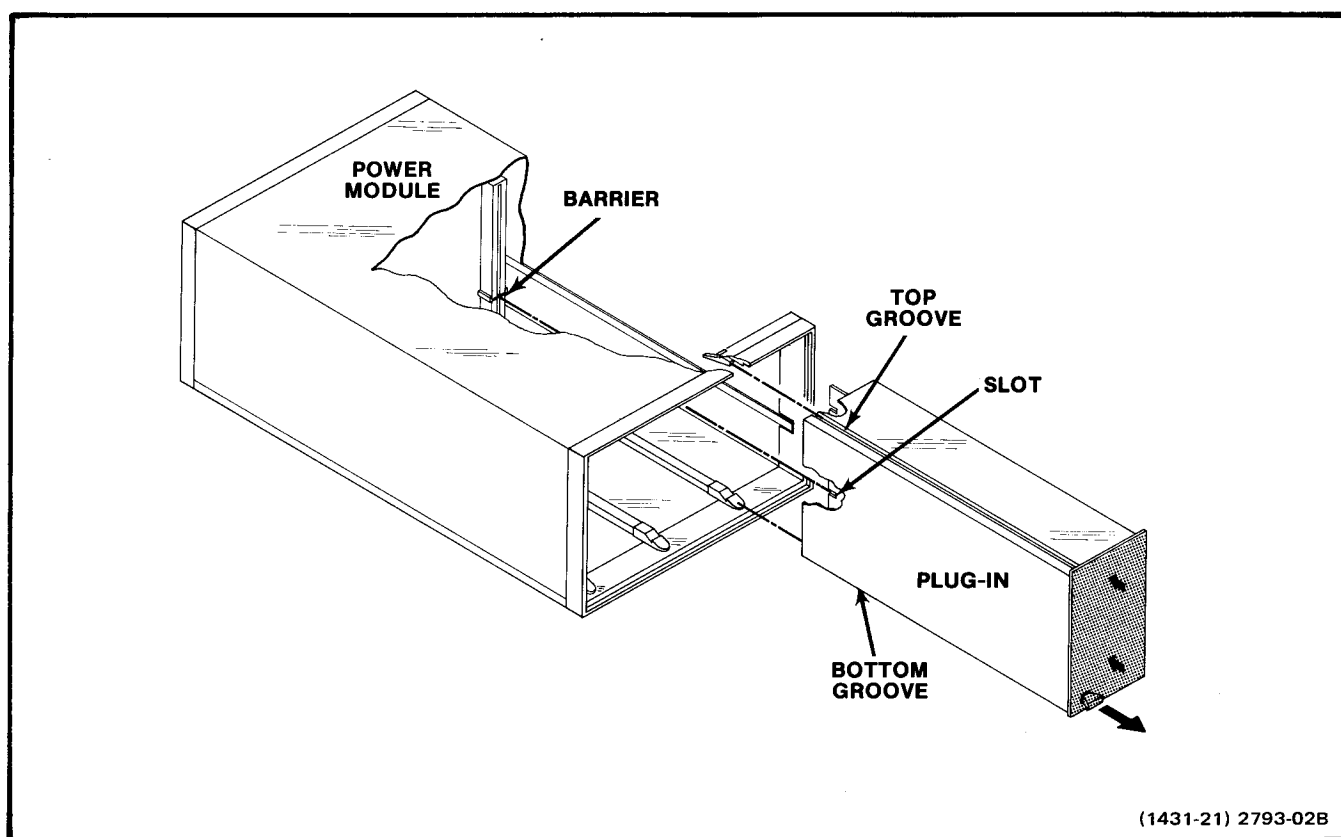


Fig. 2-1. Plug-in installation and removal.

OPERATING CONSIDERATIONS

Introduction

The remainder of this section contains the operating information required to obtain the most effective performance from the instrument. This includes the function and actions of the controls and connectors, input connections, and some general description of the operating modes, which also describe procedures for making basic measurements.

Controls and Connectors

All of the major controls and connectors for operation of the DC 508A are located on the front panel of the unit. A brief functional description of each control and connector is included in Fig. 2-2.

Input Connections



To avoid instrument damage, make certain the voltages applied to the INPUT bnc connectors do not exceed the maximum peak or peak-to-peak voltages, as stated on the front panel. Refer to Fig. 2-3.

Direct Input

For input frequencies from 10 Hz to 100 MHz use the DIRECT INPUT. To use the front-panel input bnc connector, make certain the SOURCE pushbutton is released. Depress the SOURCE pushbutton if the rear interface connector input is used. Select either the 50 Ω (pushbutton depressed) or the 1 M Ω input impedance (pushbutton released). Use the maximum practical attenuation to improve triggering and reduce the possibility of noise on the input signal causing erroneous triggering. See Fig. 2-4.

Another way to couple signals into the DIRECT INPUT is through a 10X probe. Use a probe capable of compensating for the input capacitance of the DC 508A (≈ 25 pF).

Prescale Input

This input is terminated internally into 50 Ω . It is also fused to protect the input circuitry.

When using this input of the DIRECT INPUT terminated into 50 Ω for high frequency signals, use high quality 50 Ω

cable, components, attenuators, etc., to prevent reflections or ringing causing false counting. If the input amplitude or frequency at the PRESCALE INPUT drops below useable levels, the INPUT OUT OF RANGE light illuminates.

Frequency Measurements

Set the RESOLUTION control to the desired resolution for either the DIRECT or PRESCALE inputs. Note that a light appears under either the MHz or kHz nomenclature on the display. Make certain the STANDBY switch is depressed. Adjust the DISPLAY TIME control as desired. When this control is fully clockwise, the display is held and no further measurements are made. The lower the resolution, the faster the count sampling rate as indicated by the GATE light. The counter is accurate even though the OVERFLOW light is illuminated if the digits to the left of the most significant displayed digit are known. For greater resolution, operate the counter with the most significant digits dropped from the display and the OVERFLOW light illuminated. To reset the counter, push the RESET button.

When measuring frequencies from 10 Hz to 25 kHz, select the X1 or X100 resolution multiplication factor. The X100 position of the RESOLN MULT provides two additional digits to the right of the decimal point for additional resolution. In either the X1 or X100 position of the RESOLN MULT, the LOSS OF LOCK light illuminates when the multiplier is no longer locked to the incoming signal. This may be caused by either the input signal having insufficient amplitude, a frequency outside the specified range, or too much deviation if frequency modulated.

Totalize Mode

Place the RESOLUTION switch in the TOTALIZE mode. Connect the events signal to be counted to the INPUT connector, observing the same operating conditions, with respect to the input as in the counter mode.

NOTE

Make certain the RESOLN MULT pushbutton is out.

Ignore the LOSS OF LOCK light. The GATE light remains on continuously. With no count, the least significant digit in the display always displays zero. To reset the counter to zero, press the RESET button.

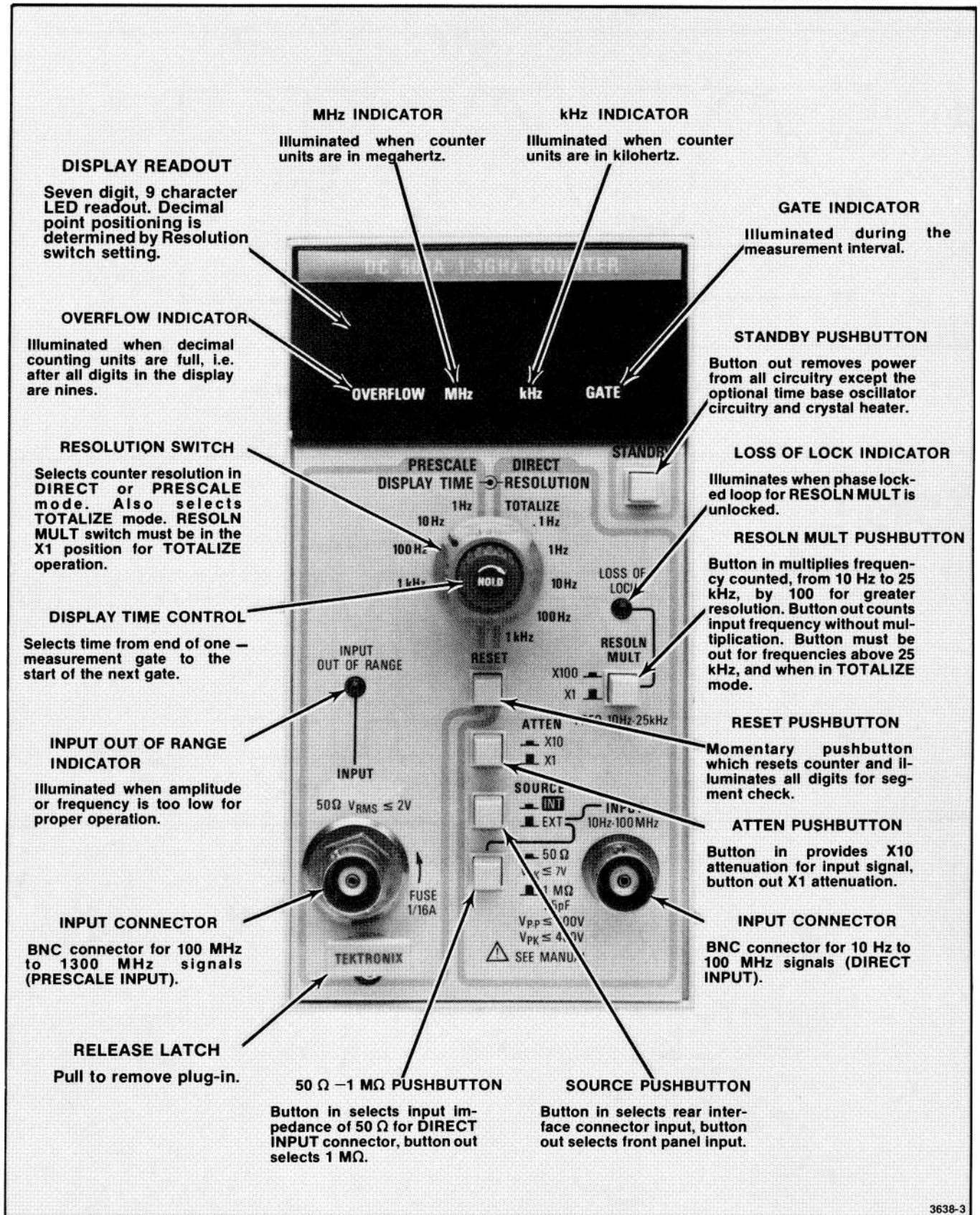


Fig. 2-2. Controls and connectors.

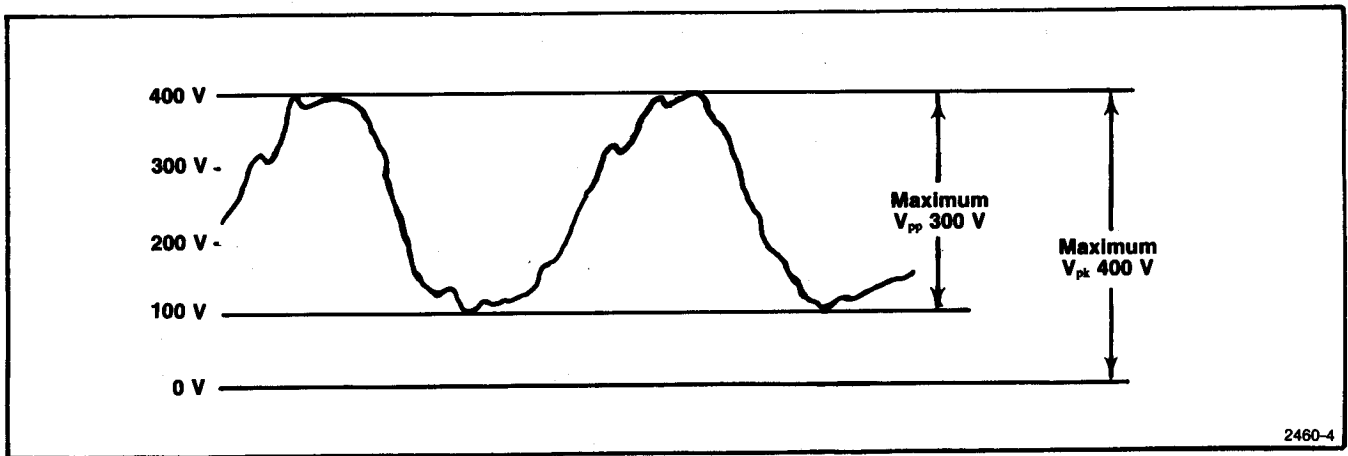


Fig. 2-3. Illustration of maximum voltage allowed to input connectors.

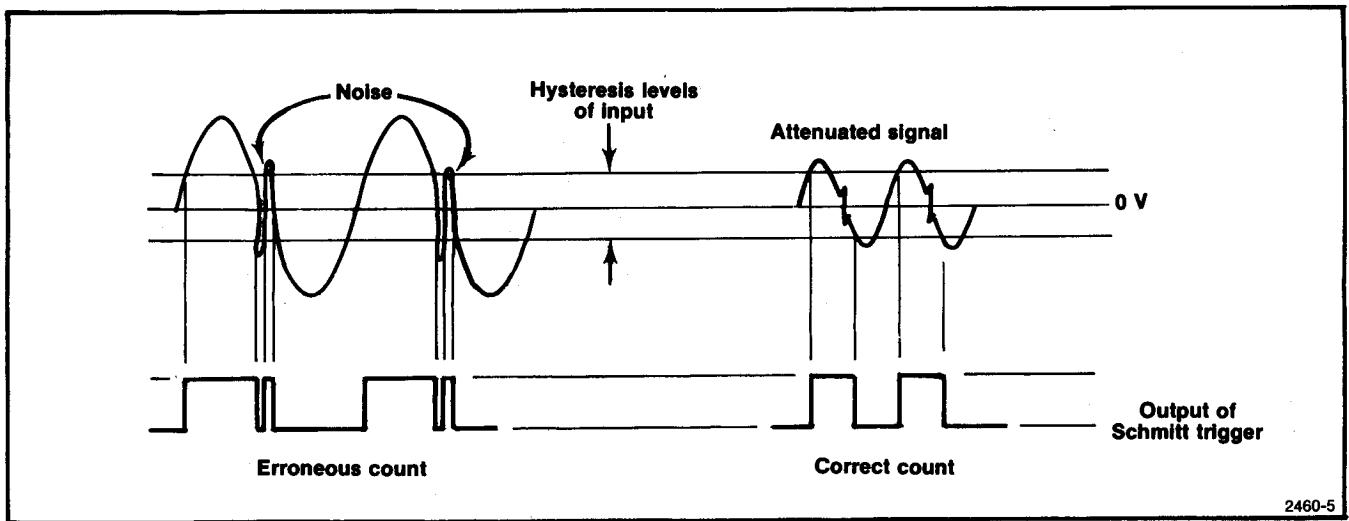


Fig. 2-4. Illustration comparing attenuation-to-triggering advantages.

BEDIENUNGSANLEITUNG

Beschreibung

Der Zähler DC 508A mißt Frequenzen im Bereich 10 Hz bis 1.3 GHz. Bis zu 100 MHz wird über den direkten Eingang gemessen, während Frequenzen oberhalb 100 MHz bis 1.3 GHz über den Vorteiler-Eingang gemessen werden. Der DC 508A zählt auch Ereignisse von 0 bis 000 000 000. Als Ziffern-Anzeige dient ein 9-stelliges Siebensegment-Leuchtdioden-Display, wodurch Auflösungen von 1 kHz bis 1 Hz (0,1 Hz bei Verwendung des direkten Eingangs) erreicht werden. Der Dezimalpunkt wird automatisch positioniert, führende Nullen werden unterdrückt. Ein Überlauf im Display wird durch eine Leuchtdiode angezeigt.

Der 50 Ohm-Vorteilereingang verfügt über ein Stehwellenverhältnis (VSWR) von $\leq 2,2:1$ und wird durch eine leicht austauschbare Sicherung geschützt, die bei Spannungen $> 9 V_{\text{eff}}$ anspricht.

Durch eine automatische Verstärkungsregelung wird in dem Breitbandverstärker des Vorteilers über den gesamten Frequenzbereich eine Empfindlichkeit von 20mV_{eff} erreicht. Liegt das Eingangssignal unterhalb des Pegels bei dem fehlerfrei gemessen wird, wird die Ziffern-Anzeige dunkel gehalten, wobei eine Lampe den Eingangsfehler signalisiert.

Zu messende Frequenzen können bei direktem Eingang sowohl in den Fronteingang als auch in den rückseitigen Interfaceeingang eingespeist werden.

Der Zähler DC 508A arbeitet nur in Verbindung mit Tektronix TM 500-Versorgungseinheiten und hier in jedem beliebigen Fach bei Mehrfachversorgungseinheiten.

Ein- und Ausbau des Einschubes.

VORSICHT

Vor dem Einsetzen des Einschubs ist die Netzspannung abzuschalten, da sonst Beschädigungen an der Einschubelektronik entstehen könnten. Da der DC 508A relativ viel Strom aufnimmt, muß auch vor dem Entnehmen des Einschubes die Netzspannungsversorgung abgeschaltet werden. Überprüfen Sie, ob die Plastik-Isolierstege auf der Steckverbindungsleiste in der gewählten Versorgungseinheit mit den Ausschnitten in der Platinenkontaktleiste übereinstimmen. Siehe Bild 2-1.

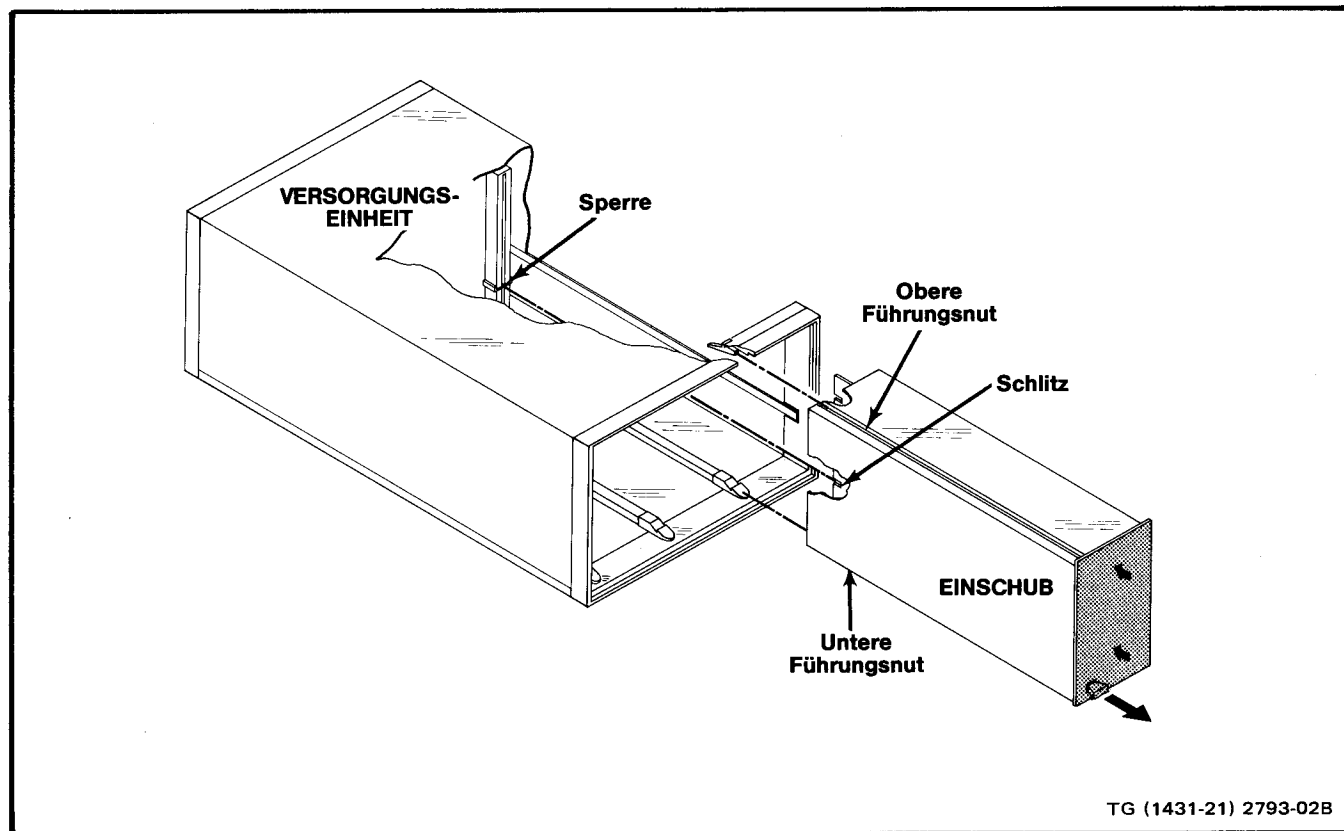


Abb. 2-1. Ein- und Ausbau des Einschubs.

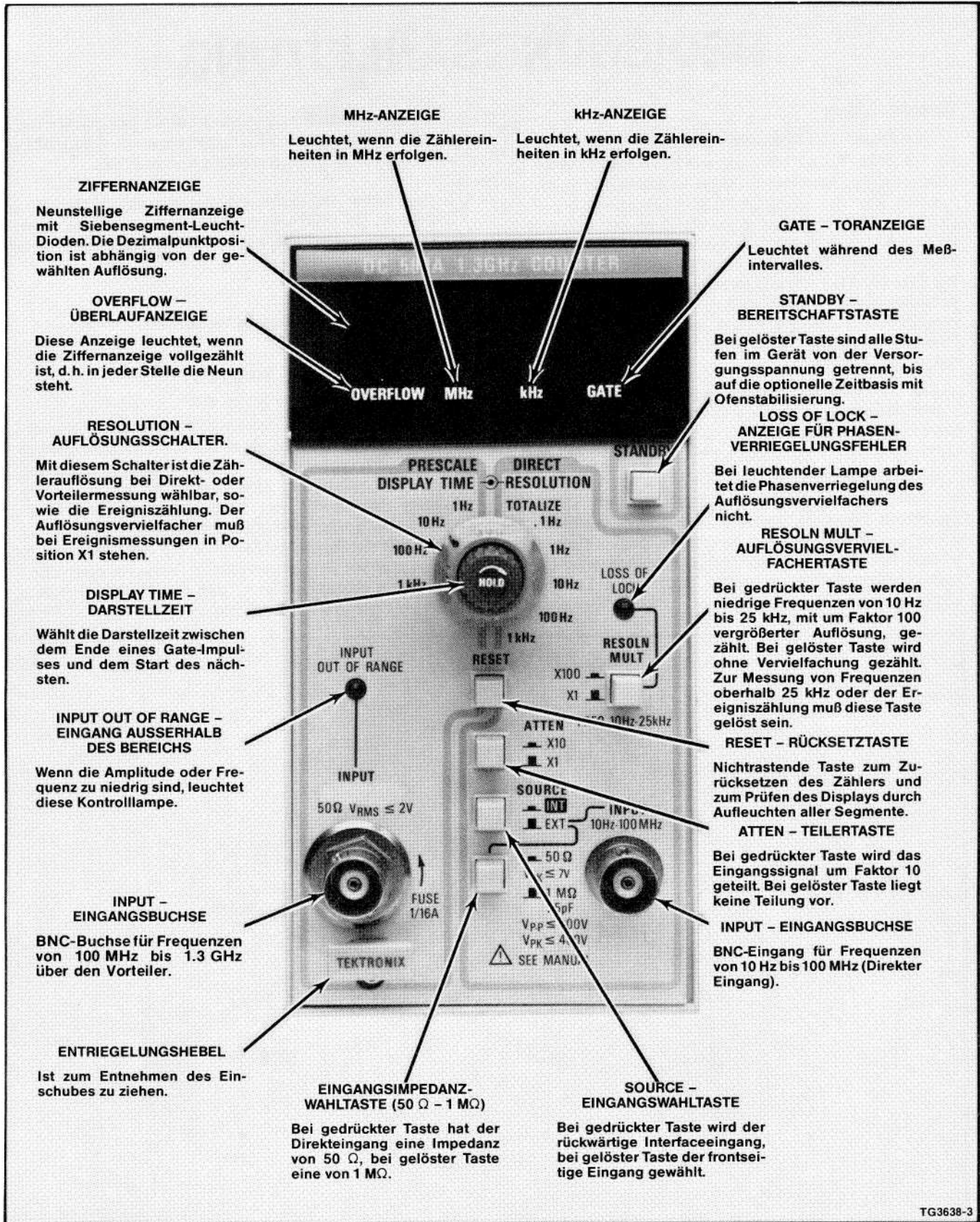


Abb 2-2. Bedienungselemente und Verbindungsbuchsen am DC 508A.

Setzen Sie die obere und untere Nute des DC 508A in die Führungen des gewählten Einschubfaches der Versorgungseinheit und schieben Sie den Einschub hinein, bis die hintere Steckerleiste einrastet.

Zum Entnehmen des DC 508A ist der in der linken unteren Ecke befindliche Entriegelungshebel zu ziehen, bis der Einschub aus der Steckerleiste ausrastet.

ANWENDUNGSBEISPIELE

Einführung

Der Zweck dieses Kapitels ist, dem Anwender Informationen zu geben, damit er die volle Leistungsfähigkeit des DC 508A ausschöpfen kann. Es enthält darüberhinaus Hinweise über die Funktion von Bedienelementen und Verbindungsbuchsen und eine allgemeine Beschreibung der Arbeitsweise des Gerätes, sowie die Durchführung von Grundmessungen.

Bedienelemente und Verbindungsbuchsen

Die Hauptbedienelemente und Eingänge des DC 508A befinden sich auf der Frontseite des Gerätes. Eine kurze Funktionsbeschreibung darüber ist Bild 2-2 zu entnehmen.

Eingangsbuchsen

VORSICHT

Zur Vermeidung von Schäden am Gerät ist vor dem Anlegen von Signalen deren Amplitude zu überprüfen und sicherzustellen, daß diese nicht die höchstzulässigen Werte (wie auf der Frontplatte vermerkt) überschreiten. Beziehen Sie sich auf Bild 2-3.

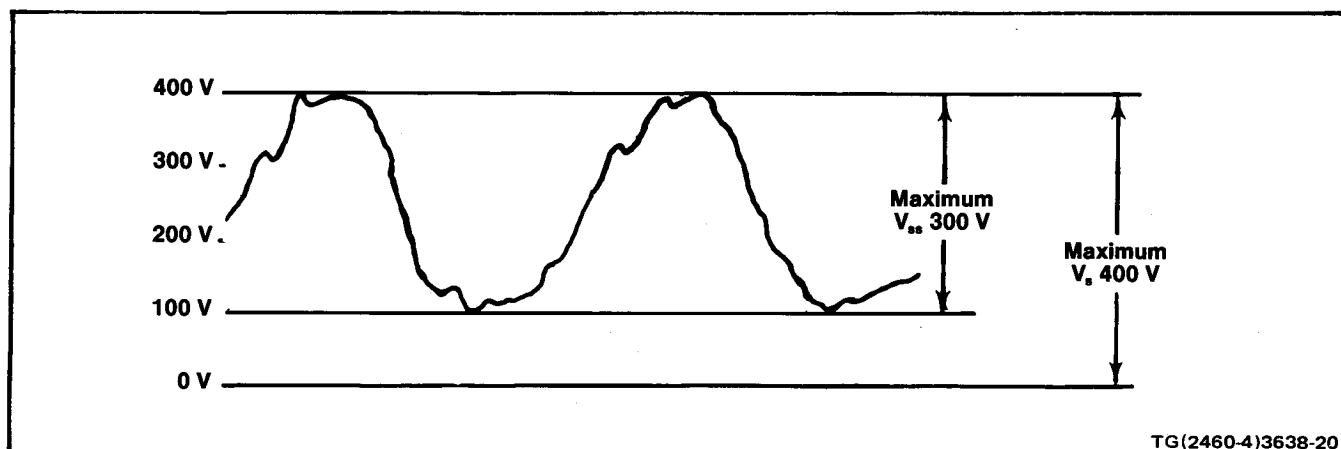


Abb 2-3. Darstellung der Spannungsgrenzen an den Eingangsbuchsen.

Direkter Eingang

Zur Messung von Frequenzen im Bereich von 10 Hz bis 100 MHz ist der direkte Eingang zu verwenden. Bei Einspeisung des Signals in den Fronteingang ist die Signalquellentaste zu lösen, bei Einspeisung in den hinteren Interfaceingang ist sie zu drücken. Dann ist die Eingangsimpedanz zu wählen. Bei gelöster Taste liegen 1 MΩ vor, bei gedrückter Taste 50 Ω. Zur Erreichung einer einwandfreien Messung ist das beste Teilverhältnis zu wählen. Man erreicht hierdurch eine gute Triggerung und eine Reduzierung von evtl. Störspannungen auf dem Signal. Siehe Bild 2-4.

Das Signal kann auch über einen ×10-Tastkopf an den direkten Eingang eingespeist werden. Es ist hierzu ein Tastkopf zu verwenden, dessen Kompensationsbereich der Eingangskapazität des DC 508A von ca. 25 pF entspricht.

Vorteilereingang

Dieser Eingang ist intern mit 50 Ω abgeschlossen und zum Schutz des Eingangskreises abgesichert.

Bei der Messung von Signalen mit hoher Frequenz über den 50 Ω-Eingang sind nur hochwertige Kabel, Bauteile, Abschwächer usw. mit 50 Ω-Impedanz zu verwenden, um Reflexionen zu vermeiden, die zu Fehlmessungen führen könnten.

Bei zu niedriger Signalamplitude am Vorteilereingang leuchtet als Hinweis eine Lampe.

Frequenzmessungen

Stellen Sie den Auflösungswahlknopf (RESOLUTION) auf die gewünschte Auflösung für den Direkt- oder Vorteilereingang. Beachten Sie, daß im Display die entsprechende Einheit in MHz oder kHz aufleuchtet. Überprüfen

Sie, ob die Bereitschaftstaste gedrückt ist. Stellen Sie die gewünschte Display-Zeit ein. Bei Rechtsanschlag dieses Einstellers bleibt der letzte Meßwert im Display erhalten und es erfolgt keine weitere Messung. Je geringer die Auflösung, desto schneller ist die Meßrate, die durch die Toranzeige (GATE) dargestellt wird. Der Zähler arbeitet auch dann korrekt, wenn die Ziffern links vor den im Display dargestellten, bekannt sind. Man erreicht durch diese Meßweise eine erhöhte Auflösung. Zum Rücksetzen des Zählers ist die Reset-Taste zu betätigen.

Die Messung von Frequenzen im Bereich 10 Hz bis 25 kHz kann wahlweise mit einem Auflösungsvervielfachungsfaktor von ×1 oder ×100 durchgeführt werden. In der ×100-Position werden zur Erhöhung der Auflösung zwei zusätzliche Ziffern in der Anzeige dargestellt. Bei Auftreten eines Phasenverriegelungsfehlers in dieser Betriebsart, wird das durch Aufleuchten einer Signallampe angezeigt. Gründe hierfür können die zu geringe Signalamplitude, die Frequenz außerhalb des Bereichs oder ein zu großer Hub bei Frequenzmodulationen sein.

Ereigniszählung

Der Auflösungswahlknopf (RESOLUTION) ist in die Position TOTALIZE zu bringen und die Signalleitung mit den zu zählenden Ereignissen an den Eingang, unter Beachtung der gleichen Bedingungen wie beim Frequenzmessen, anzuschließen.

BEACHT E

Vergewissern Sie sich, daß die Auflösungsvervielfachungstaste gelöst ist.

Ignorieren Sie die Signallampe für Phasenverriegelungsfehler sowie das ständige Leuchten der Meßtorlampe. Zum Zurücksetzen des Zählers ist die Taste RESET zu betätigen.

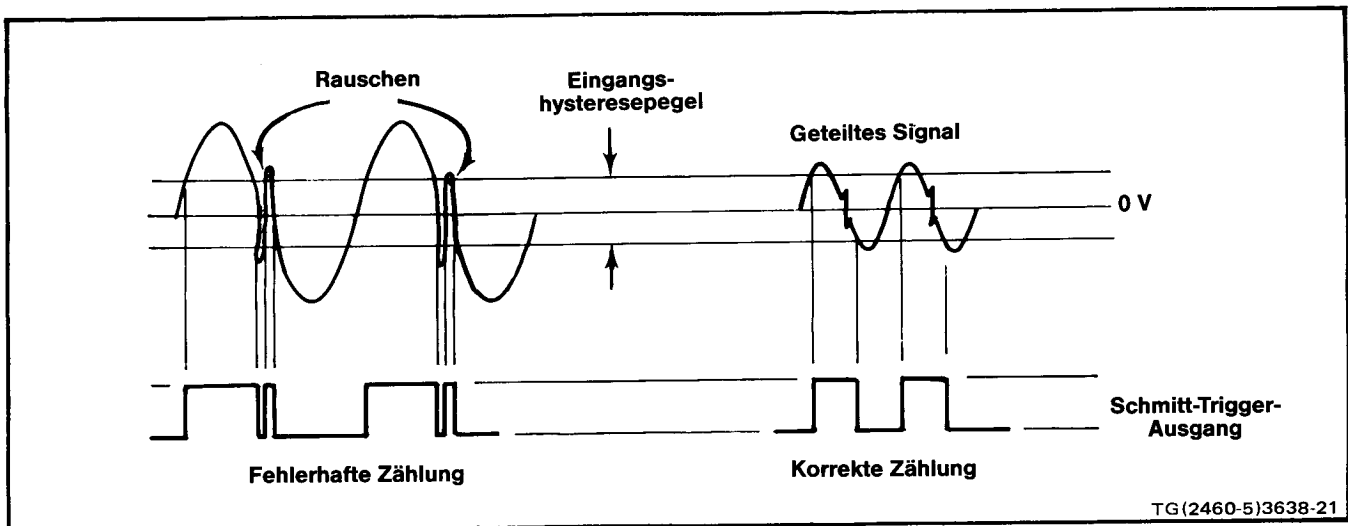


Abb. 2-4. Vergleich von Triggervorteilen bei geteiltem und nichtgeteiltem Eingangssignal.

取扱説明

はじめに

DC508A 型は、10Hzから1.3GHzの周波数測定用の1.3GHzカウンタです。プリスケール入力では100MHzから1.3GHzまで、直接入力では10Hzから100MHzまでの周波数測定ができます。9桁LED表示は、0～999、999、999までの周波数を表示し、イベントの数を加算計数します。分解能は1KHz～1Hzです。（直接入力では0.1Hzまで。）小数点は自動的に位置決めされ、最上桁が0の場合はブランクのままとなります。入力が大き過ぎる時にはオーバーフローのLEDによって指示されます。

50Ωプリスケール入力はVSWR2.2:1以下で、約9Vrmsで切れ、交換が簡単に行える前面パネルのヒューズによって保護されています。自動ゲイン・コントロール付の広帯域増幅器は、プリスケール入力の全帯域にわたり20mVrmsの入力感度を持っています。入力信号のレベルが低くカウント・エラーが起きている場合にはLED表示は消え、入力エラー・ライトが点灯します。

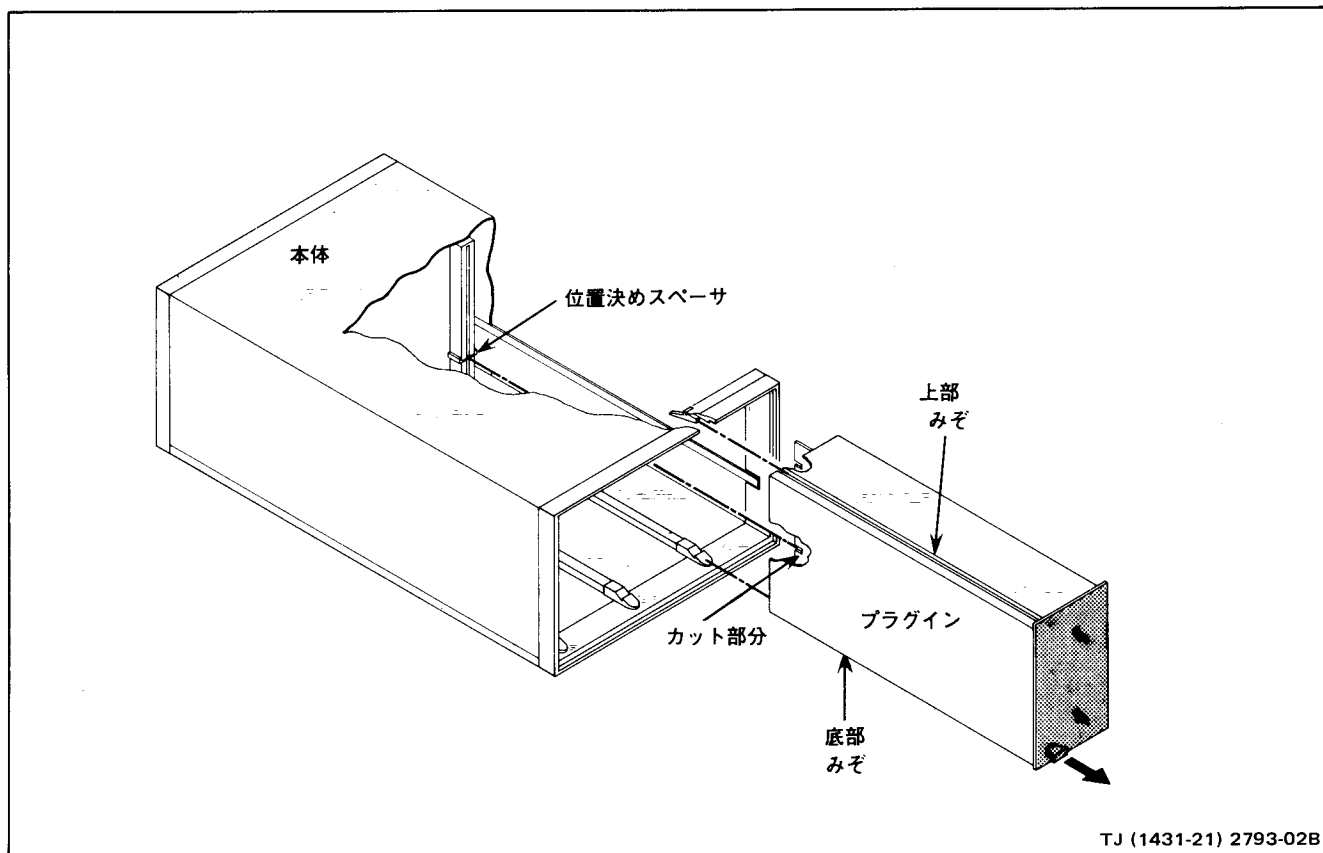
直接入力信号は前面パネルのBNCコネクタか後部インターフェイスのコネクタで接続します。

DC508A 型はTM500シリーズの電源本体と共に使用されます。電源本体のいずれのプラグイン・ホールでも使用可能です。

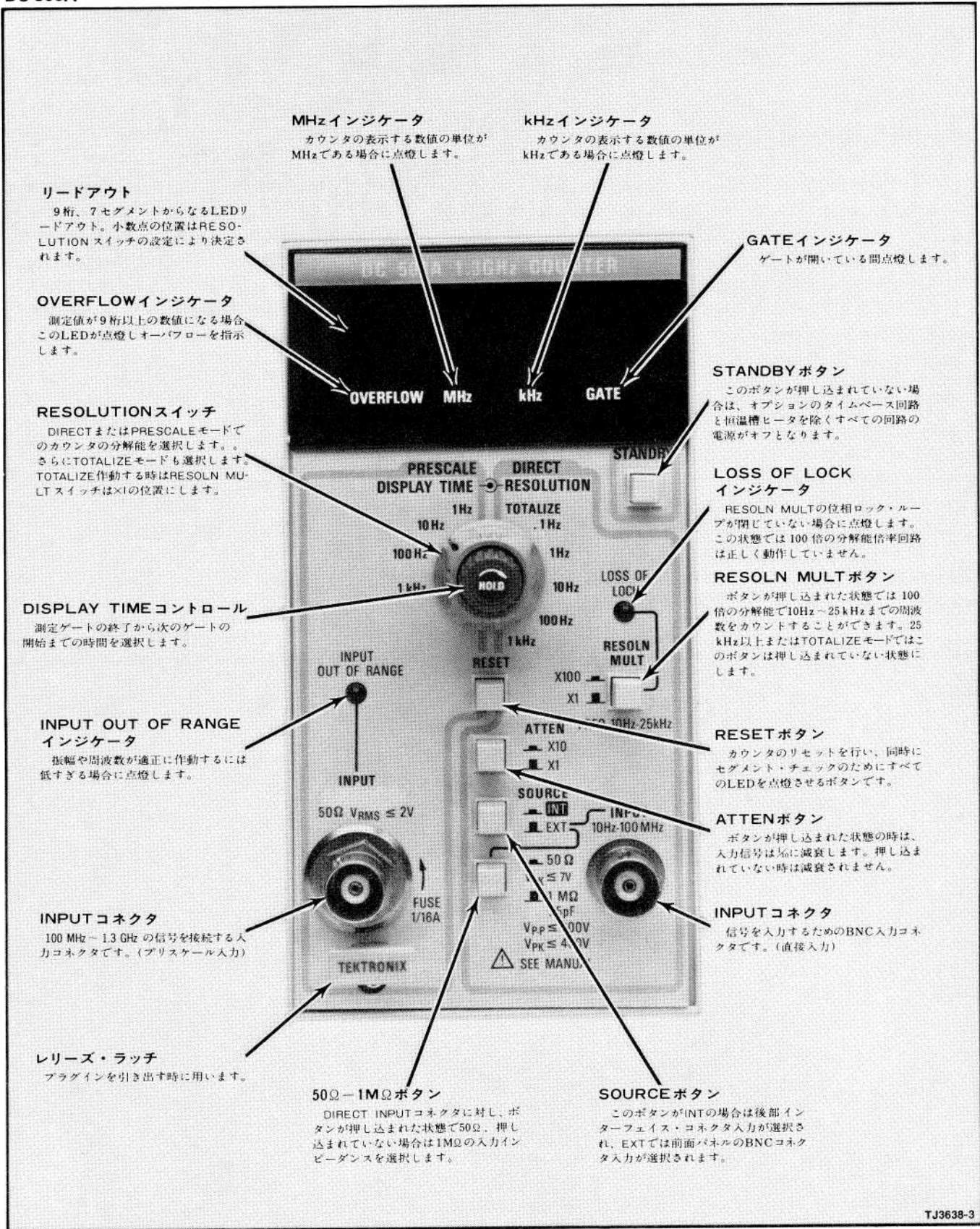
取付および取はずし方法

注意

プラグインを抜き差しする場合には本体の電源を切ってから行って下さい。切らずに抜き差ししますとDC508A型に大電流が流れてプラグインの回路に悪影響を与えます。2-1図を参照して、本体のコネクタ内に入っているプラスチックの位置決めスペーサとDC508A型のエッジ・コネクタのカット部分とが一致していることを確認します。



2-1 図 取付および取はずし方法



MHz インジケータ
カウンタの表示する数値の単位が MHz である場合に点灯します。

kHz インジケータ
カウンタの表示する数値の単位が kHz である場合に点灯します。

リードアウト
9桁、7セグメントからなるLEDリードアウト。小数点の位置はRESOLUTION スイッチの設定により決定されます。

OVERFLOW インジケータ
測定値が9桁以上の数値になる場合このLEDが点灯しオーバーフローを指示します。

RESOLUTION スイッチ
DIRECT または PRESCALE モードでのカウンタの分解能を選択します。さらにTOTALIZE モードも選択します。TOTALIZE 作動する時はRESOLN MULT スイッチはX1の位置にします。

DISPLAY TIME コントロール
測定ゲートの終了から次のゲートの開始までの時間を選択します。

INPUT OUT OF RANGE インジケータ
振幅や周波数が適正に動作するには低すぎる場合に点灯します。

INPUT コネクタ
100 MHz ~ 1.3 GHz の信号を接続する入力コネクタです。(プリスケール入力)

リリース・ラッチ
プラグインを引き出す時に用います。

50Ω - 1MΩ ボタン
DIRECT INPUT コネクタに対し、ボタンが押し込まれた状態で50Ω、押し込まれていない場合は1MΩの入力インピーダンスを選択します。

500 Hz - 25 kHz
RESOLN MULT ボタン

RESET ボタン
カウンタのリセットを行い、同時にセグメント・チェックのためにすべてのLEDを点灯させるボタンです。

ATTN ボタン
ボタンが押し込まれた状態の時は、入力信号は $\frac{1}{10}$ に減衰します。押し込まれていない時は減衰されません。

INPUT コネクタ
信号を入力するためのBNC入力コネクタです。(直接入力)

SOURCE ボタン
このボタンがINTの場合は後部インターフェイス・コネクタ入力を選択され、EXTでは前面パネルのBNCコネクタ入力を選択されます。

STANDBY ボタン
このボタンが押し込まれていない場合は、オプションのタイムベース回路と恒温槽ヒータを除くすべての回路の電源がオフとなります。

LOSS OF LOCK インジケータ
RESOLN MULTの位相ロック・ループが閉じていない場合に点灯します。この状態では100倍の分解能倍率回路は正しく動作していません。

RESOLN MULT ボタン
ボタンが押し込まれた状態では100倍の分解能で10Hz ~ 25kHzまでの周波数をカウントすることができます。25kHz以上またはTOTALIZEモードではこのボタンは押し込まれていない状態にします。

GATE インジケータ
ゲートが開いている間点灯します。

Fig. 2-2. DC 508A コントロールとコネクタ

本体のコネクタ内に入っているプラスチックの位置決めスペーサと DC508A 型のエッジ・コネクタのカット部分が一致していることを確認します。差し込もうとする本体のコンパートメントの上下のガイド(1-2. 図)に沿って DC508A 型を押し込み、さらに本体のコネクタに DC508A 型のエッジ・コネクタがしっかりと固定されるまで押して下さい。DC508A 型を取りはずす場合には、左下隅にあるつまみを引っ張りそのまま引き抜きます。

操作について

はじめに

機能、コントロールやコネクタの働き、入力接続操作モード、基本的な測定方法についての解説です。

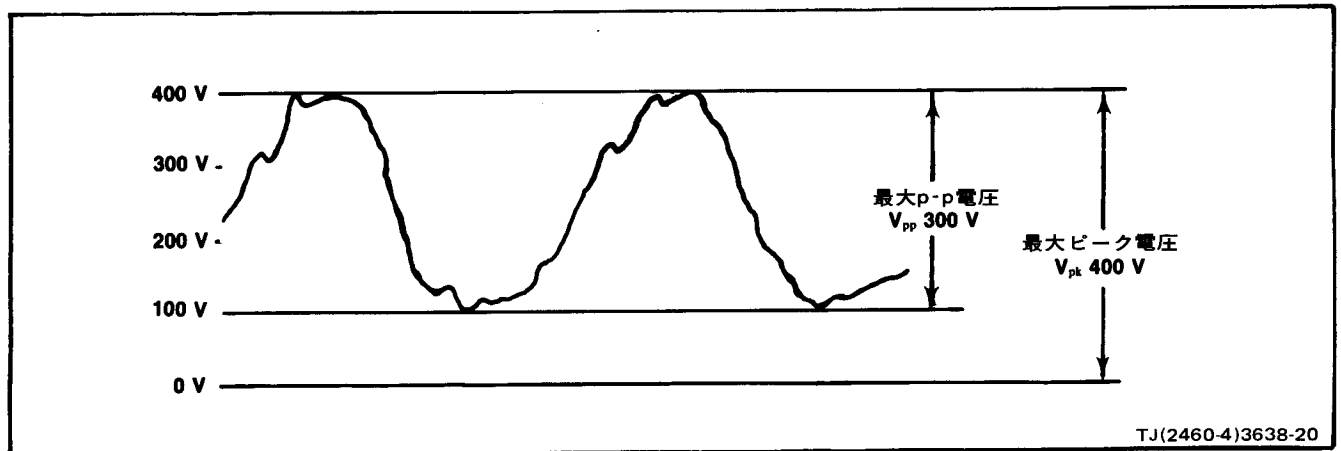
コントロールとコネクタ

DC 508A 型の操作に関係するコントロールやコネクタは前面パネルにあります。各コントロールやコネクタに関する説明は 2-2 図をご覧ください。

入力接続

注意

機器の損傷を防ぐため、INPUT BNCコネクタに入力される電圧が、前面パネルに記されている最大ピーク電圧または最大p-p電圧を超えていないことを確認して下さい。1-3図をご参照下さい。



2-3 図 最大ピーク電圧と最大p-p電圧

DC 508A

直接入力

10Hz～100MHzの入力周波数に対してはDIRECT INPUTコネクタを使用します。前面パネルの入力BNCコネクタを使用するにはSOURCEボタンが解除されているかお確かめ下さい。後部インターフェイス・コネクタ入力をご使用になる場合は、SOURCEボタンを押し込んだ状態にしてください。次に入力インピーダンスを、50Ω(ボタンを押し込む)か1MΩ(ボタンを解除)のいずれかに設定します。正確にトリガされるように入力信号を減衰させ、ノイズを除去してトリガによるエラーを防止します。2-4図をご参照下さい。

DIRECT INPUTに信号を結合する他の方法は10:1プローブを使用することです。DC 508A型の入力容量(約25pF)に対して補正されているプローブをご使用下さい。

プリスケール入力

この入力はい内部的に50Ωで終端されています。また入力回路はヒューズで保護されています。

高周波信号において50Ω終端のPRESCALE INPUT入力をご使用になる時は高品質の50Ωケーブル、アッテネータ等を使い、カウント・エラーをひき起こす反射やリングングを防止します。PRESCALE INPUTで入力信号の振幅と周波数が必要レベル以下になった場合は、INPUT OUT OF RANGEのランプが点灯します。

周波数測定

DIRECTまたはPRESCALE入力のいずれかに対して、RESOLUTIONコントロールで希望の分解能に設定します。機器の表示部に記されたMHzまたはkHzの部分が点灯します。STANDBYスイッチが押されていることを確認します。DISPLAY TIMEコントロールを適切な位置に設定します。このコントロールが右回しいっぱいになっている場合は、測定値の表示は保持され、次の測定は行われません。分解能が低ければ低いほど、GATEランプで指示されるサ

ンプリング・レートは速くなります。もっとも左に表示された最上位の桁が既知であれば、OVERFLOWインジケータが点灯してもカウンタの精度は維持されます。より高い分解能を得るには、最上位桁をリードアウトからオーバーフローさせ、OVERFLOWランプが点灯するようにカウンタを操作して下さい。カウンタをリセットするには、RESETボタンを押して下さい。

測定周波数が10Hz～25kHzの範囲の場合には、×1または×100の分解能倍率機能を選択します。RESOLN MULTを×100に設定すると最下位桁にもう2桁追加され、分解能が上がります。

RESOLN MULTを×1または×100のいずれかに設定して、分解能倍率回路が入力信号に対してロックしていない時には、LOSS OF LOCKランプが点灯します。これは入力信号の振幅が不十分な場合、周波数が10Hz～25kHzの範囲からはずれている場合、または周波数変調がかかっている、その偏移が大きい場合に起こります。

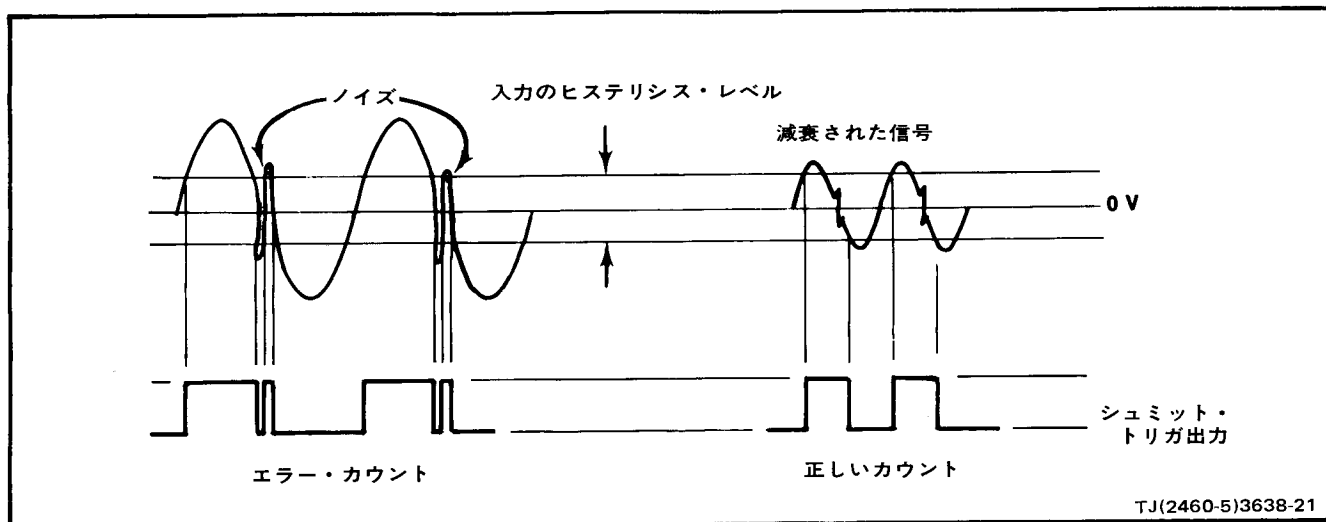
加算計数モード

RESOLUTIONスイッチをTOTALIZEの位置に設定します。カウントすべきイベント信号を周波数カウント・モードと同様な方法で、INPUTコネクタに接続します。

注

RESOLN MULTボタンが押し込まれていないことを確認します。

LOSS OF LOCKランプは無視します。GATEランプは連続的に点灯します。カウントされない場合、リードアウトの最下位桁が0と表示されます。カウンタを0にリセットしたい場合はRESETボタンを押します。



2-4 図 取付および取はずし方法

INSTRUCTIONS D'UTILISATION

Description de l'appareil

Le compteur DC 508A 1.3 GHz mesure les fréquences de 10 Hz à 1.3 GHz. Une entrée directe mesure les fréquences de 10 Hz à 100 MHz et une entrée à diviseur mesure les fréquences de 100 MHz à 1.3 GHz. Le compteur peut également totaliser des événements de 0 à 000.000.000. Un affichage à neuf chiffres, composés chacun de sept segments électroluminescents, permet d'obtenir des résolutions de 1 kHz à 1 Hz (0,1 Hz lorsque l'on utilise l'entrée directe). La virgule se cadre automatiquement et les zéros à gauche du chiffre le plus significatif ou de la virgule sont supprimés. Une diode électroluminescente sur le panneau avant indique le dépassement de capacité.

L'entrée 50 Ω du diviseur a un taux d'ondes stationnaires $\leq 2,2 : 1$. Elle est protégée, à partir de 9 V efficaces par un fusible, aisément remplaçable, situé sur le panneau avant. Un amplificateur à large bande pourvu d'une commande de gain automatique permet d'obtenir une sensibilité d'entrée de 20 mV efficaces sur toute la plage de fréquence de l'entrée du diviseur.

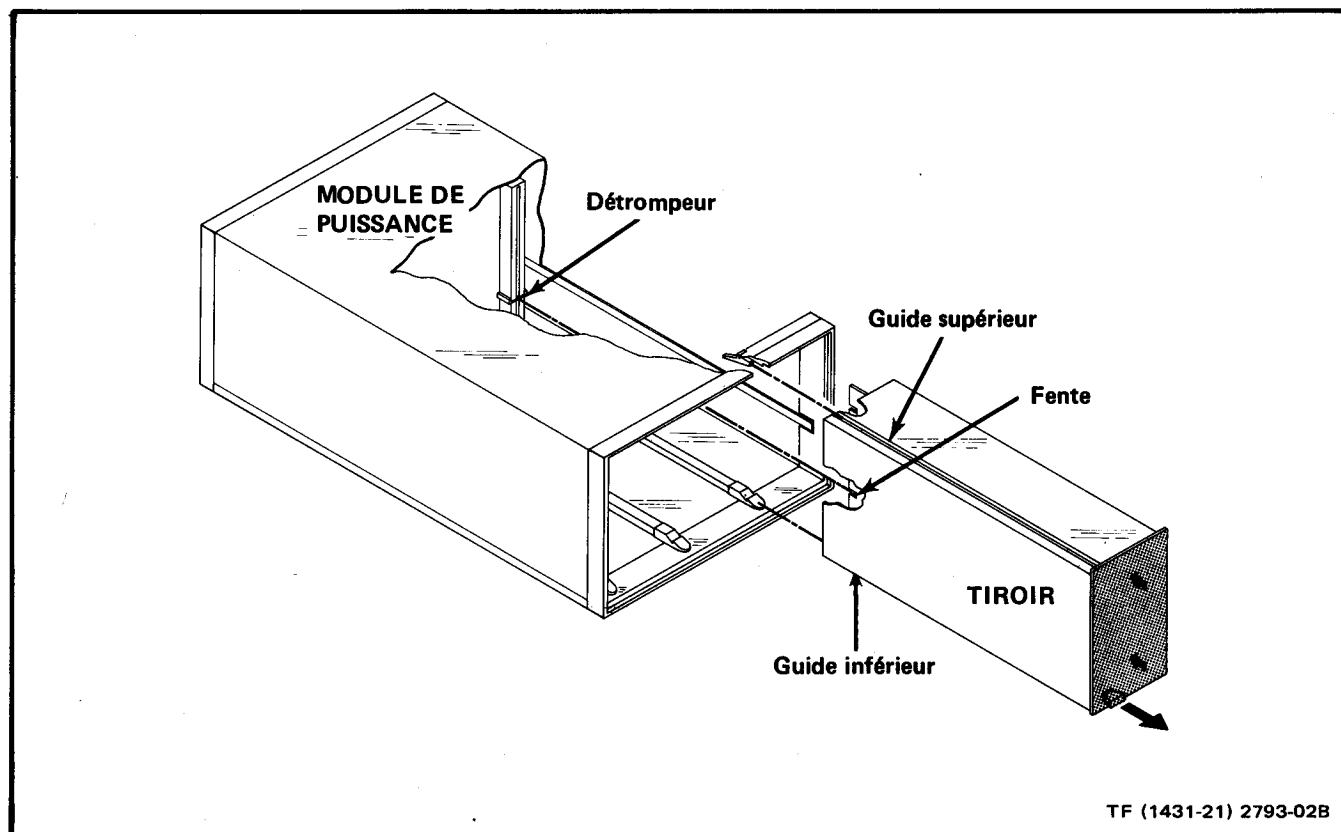
Si le signal d'entrée descend au-dessous du niveau minimal admissible pour éviter toute erreur de comptage, l'affichage à diodes électroluminescentes est supprimé et un témoin lumineux d'erreur à l'entrée s'allume.

Il est possible d'appliquer les signaux d'entrée soit par l'intermédiaire d'une prise BNC du panneau avant soit par l'intermédiaire du connecteur de l'interface arrière. Le DC 508A est conçu pour être utilisé exclusivement dans un châssis d'alimentation de la série TM 500.

Installation et extraction de l'appareil

ATTENTION

Couper l'alimentation du châssis avant d'insérer ou d'extraire le DC 508A ; car il nécessite un fort courant d'alimentation. Dans le cas contraire, les circuits du tiroir pourraient être endommagés. Vérifier que les détrompeurs en plastique situés sur le connecteur du châssis d'alimentation choisi s'adaptent aux encoches situées sur le connecteur arrière du circuit imprimé du DC 508A.



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Fig. 2-1. Installation et extraction du tiroir.

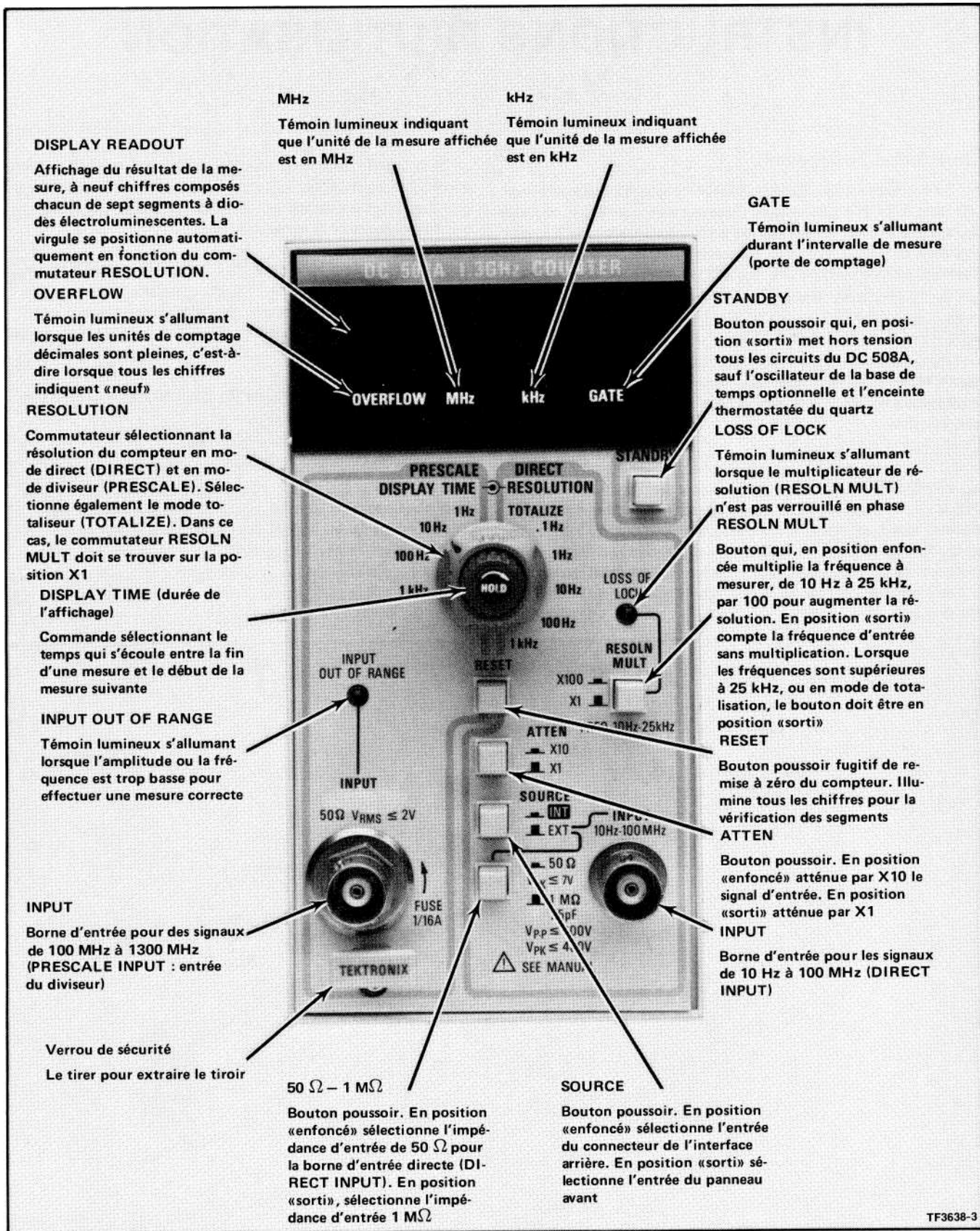


Fig. 2-2. Commandes et prises du DC 508A.

Aligner les rainures supérieure et inférieure du DC 508A avec les guides du châssis d'alimentation sélectionné (voir Fig. 2-1) et insérer à fond le tiroir pour que le circuit imprimé se place correctement dans le connecteur.

Pour extraire le DC 508A, tirer le loquet de verrouillage (situé au coin inférieur gauche) jusqu'à ce que le connecteur arrière soit libéré. Faire ensuite glisser l'appareil.

UTILISATION DE L'APPAREIL

Introduction

Le reste de ce chapitre contient les informations nécessaires pour permettre à l'utilisateur d'exploiter au mieux l'appareil. Il contient également une description des commandes, prises et connexions d'entrées ainsi que des indications générales sur les modes d'utilisation de l'appareil pour réaliser les mesures de base.

Commandes et prises

Les commandes et prises principales nécessaires à l'utilisation du DC 508A se trouvent sur le panneau avant de l'appareil. La figure 2-2 fournit une brève description de chaque commande et prise.

Connexions à l'entrée

ATTENTION

Pour éviter toute détérioration de l'appareil, s'assurer que les tensions appliquées aux bornes d'entrée BNC ne dépassent pas les maxima crête ou crête-à-crête selon les indications du panneau avant. Se référer à la figure 2-3.

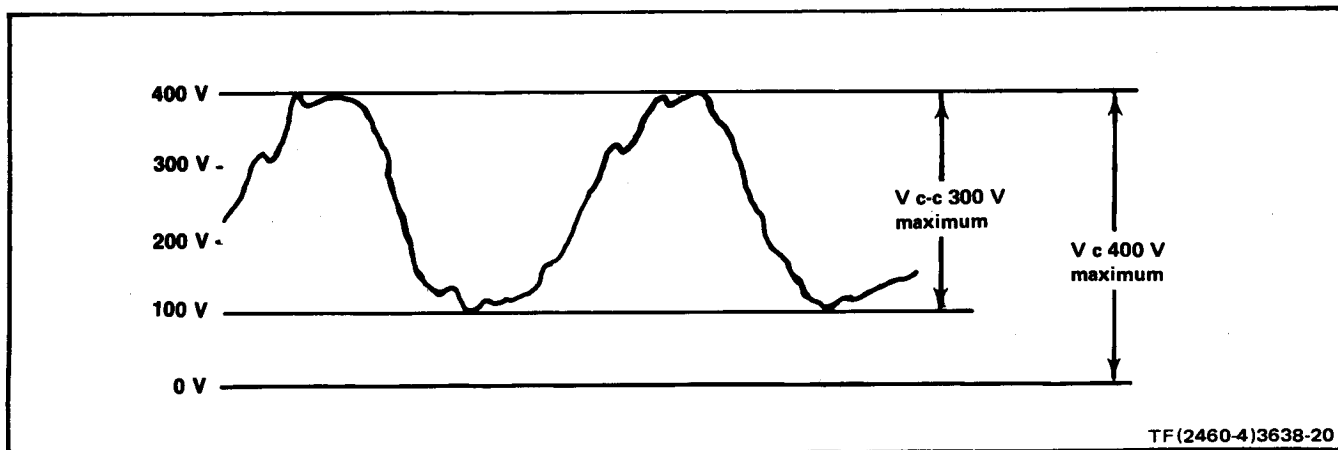


Fig. 2-3. Illustrations des limites des tensions maximales admissibles à l'entrée.

Entrée directe (DIRECT INPUT)

Pour les fréquences d'entrée de 10 Hz à 100 MHz, utiliser l'entrée directe (DIRECT INPUT). Pour utiliser la prise BNC du panneau avant, s'assurer que le bouton poussoir SOURCE est en position « sorti ». Appuyer sur le bouton poussoir SOURCE si l'entrée par le connecteur de l'interface arrière est utilisée. Sélectionner l'impédance d'entrée 50 Ω (bouton enfoncé) ou 1 M Ω (bouton libéré). Utiliser l'atténuation maximale afin d'améliorer le déclenchement et réduire le bruit éventuel du signal d'entrée pouvant provoquer un déclenchement erroné, voir Fig. 2-4.

L'utilisation d'une sonde 10X permet également de coupler les signaux à l'entrée directe. Dans ce cas, il faut utiliser une sonde pouvant se compenser sur la capacité d'entrée du DC 508A (environ 25 pF).

Entrée du diviseur (PRESCALE)

Cette entrée est pourvue d'une terminaison interne de 50 Ω . Le circuit d'entrée est également pourvu d'un fusible de protection.

Lorsque l'on utilise cette entrée directe (DIRECT INPUT) munie d'une terminaison 50 Ω pour les signaux à haute fréquence, il est nécessaire d'utiliser des câbles 50 Ω , des composants et atténuateurs de haute qualité. Ceci permet d'éviter les réflexions ou les oscillations provoquant un comptage erroné. Si l'amplitude ou la fréquence à l'entrée du diviseur (PRESCALE INPUT) descend au-dessous des niveaux admissibles, le témoin d'entrée hors gamme (INPUT OUT OF RANGE) s'allume.

Mesures de fréquence

Que ce soit pour l'entrée directe ou l'entrée du diviseur, régler la commande de résolution (RESOLUTION) pour

obtenir la résolution souhaitée. Noter qu'un voyant s'allume sur la position kHz ou MHz afin d'indiquer l'unité de mesure affichée. S'assurer que le commutateur d'attente (STANDBY) est en position enfoncée. Régler la commande de durée de l'affichage (DISPLAY TIME) selon la nécessité. Lorsque cette commande est sur la position extrême dans le sens horaire, l'affichage est figé et aucune autre mesure n'est effectuée. Plus basse est la résolution, plus rapide est la cadence de comptage comme l'indique le témoin de la porte de comptage (GATE).

La mesure effectuée par le compteur est valable, même lorsque le témoin lumineux de dépassement de capacité (OVERFLOW) est allumé, si les chiffres à gauche du chiffre le plus significatif affichés sont connus. Pour augmenter la résolution, les chiffres les plus significatifs doivent déborder à gauche de l'affichage et le témoin lumineux de dépassement de capacité (OVERFLOW) s'allume. Pour remettre le compteur à zéro, appuyer sur le bouton de remise à zéro (RESET).

Lorsque l'on mesure des fréquences de 10 Hz à 25 kHz, sélectionner l'un des deux facteurs de multiplication de la résolution : X1 ou X100. La position X100 de la commande RESOLN MULT fournit deux chiffres supplémentaires à la droite de la virgule pour obtenir une meilleure résolution. Que ce soit sur la position X1 ou X100 de la commande RESOLN MULT, le témoin lumineux de perte de verrouillage (LOSS OF LOCK) s'allume lorsque le circuit du multiplicateur n'est plus verrouillé sur le signal d'entrée. Ceci peut être provoqué soit par le signal d'entrée ayant une amplitude insuffisante, une fréquence hors de la gamme spécifiée ou une déviation trop importante si la fréquence est modulée.

Mode de totalisation

Placer le commutateur de résolution (RESOLUTION) dans le mode de totalisation (TOTALIZE). Connecter le si-

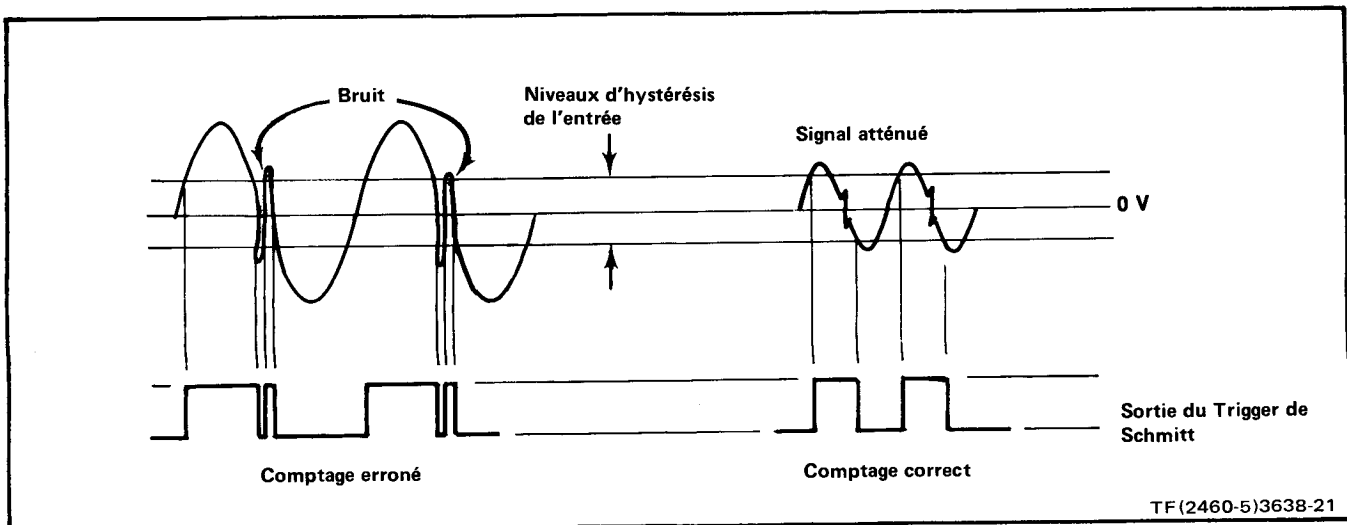


Fig. 2-4. Avantage produit par l'atténuation du signal d'entrée.

signal à compter à la borne d'entrée INPUT en respectant les mêmes conditions à l'entrée qu'en mode fréquencemètre.

NOTA

S'assurer que le bouton poussoir RESOLN MULT est en position «sorti».

Ne pas tenir compte du témoin lumineux de perte de verrouillage. Le voyant de comptage GATE reste allumé constamment. En l'absence de comptage, le chiffre le moins significatif de l'affichage est toujours un zéro. Pour remettre le compteur à zéro, appuyer sur le bouton RESET.

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.

CIRCUIT DESCRIPTION

Introduction

This section of the manual contains a description of the circuitry used in the DC 508A 1.3 GHz Counter. The description begins with a discussion of the instrument, using the block diagrams shown in the Diagrams section.

Block Diagram

The block diagram shows the stages and the basic interconnections of each major circuit in the instrument. Each circuit is described in detail, using the block diagram and detailed schematics as reference. The number by each title on the Block Diagram and circuit description refers to the corresponding circuit diagram in the Diagrams section of this manual.

Direct Input

The signal applied to the DIRECT INPUT connector passes through the SOURCE switch to the gate of Q1790. Switch S1790 places a 47 Ω resistor in parallel with the input in the 50 Ω position. The 1 M Ω input impedance in the 1 M Ω position is determined by R1596. SOURCE switch S1690 selects either the front panel EXT input or the rear interface connector input (INT), which always has a 50 Ω input impedance. Ten times attenuation is provided by R1593 and R1594, and compensated by C1592 and C1594. The attenuator is switched in or out of the circuit by S1590. Diodes CR1690 and CR1790 provide over-voltage protection for Q1790. MOSFET Q1790 operates as a phase splitter. Constant current to Q1790 is supplied by Q1792 and associated circuitry. The 180° out of phase signals from the drain and source of Q1790 feed the inputs of U1670B at pins 9 and 10. This integrated component is a triple line receiver and operates as a differential amplifier. The output of the first unit drives the second unit at pins 4 and 5. Each of the first two stages of the line receiver have gains of about five. The third line receiver, U1670C, is configured as a Schmitt trigger circuit. Input peaking for the high frequencies is accomplished by C1673. Output from the Schmitt trigger is taken at pin 15 at ECL logic levels (3.4 V to 4.2 V) and fed to the resolution multiplier and RESOLN MULT switch. The output of this switch goes to the electronic switch which selects either the prescale or direct inputs.

Resolution Multiplier

Transistor Q4310 operates as an ECL to TTL converter. The signal, at the same frequency as the DIRECT INPUT, is inverted and buffered for a 10 V swing by U4220C and fed to pin 14 of U4230. This integrated circuit consists of a

phase comparator and voltage controlled oscillator; only the phase comparator is used. The dc voltage at the gate of U4130, pin 3, determines the oscillator frequency.

To understand the operation of oscillator circuitry, assume that the emitter of Q4242 is at about 10 V. Current flows through U4130A and R4334 charging capacitor C4130. Pin 10 of U4130C is at about 10 V, pin 12 at about 0 V and the base of Q4242 at about 10 V. Transistor Q4242 is off. The drain of U4130A goes negative at a rate determined by the current through U4130A. When the voltage at the drain of U4130A drops to about 5 V, pin 12 of U4130C switches to about 10 V and pin 8 goes low turning Q4242 on. As current flows through Q4242, the voltage drop across R4334 increases turning on Q4240. Current flow through Q4240 is much greater than through U4130A and pin 10 of U4130C rises rapidly until U4130C and B change state turning off Q4242 and repeating the cycle. The output waveform at the collector of Q4242 is a fast spike from 0 V to about +5 V. The frequency of this circuit varies from about 500 Hz to about 3.5 MHz. This is accomplished by varying the current through U4130A and consequently the charge time of C4130.

The positive-going 0 V to about +5 V spike at varying frequencies is fed to U4220A, buffered and inverted and then fed to the input of U4322 at pin 4. This integrated circuit divides the output signal frequency by 100. The output of U4322 at pin 13 is fed to U4220B at pins 4 and 5, a TTL to MOS converter. The output (0 V to +10 V signal) of U4220B is fed to the second input, pin 3, of the phase comparator.

In summary, if the frequency of the waveform at the collector of Q4242 goes higher than exactly 100 times the frequency of the input waveform at pin 14 of U4230, the output voltage at pin 13 of U4230 goes more negative, reducing the frequency of the oscillator until both frequencies are in lock. When the circuit is out of lock, pin 1 of U4230 goes low turning Q4120 and Q4110 on. This illuminates the LOSS OF LOCK light and places a low on pin 13 of U4220D. This action prevents the 100 times frequency from passing through U4220D to the X1—X100 switch.

The signal from the direct input circuitry or the resolution multiplier passes to pin 10, U1570C. When the counter operates in the direct input mode, switch S1380-13 is open. This places pin 11, U1570C, low and the signal at pin 10 is inverted and sent to pin 13 of U1570D. Pins 6

Circuit Description—DC 508A

and 7, U1570B, are also low causing a high at pin 3. This disables U1570A so that no signals from the prescaler pass through U1570A. When the prescaler is used, S1380-13 is closed; this disables U1570C and enables U1570A. The output signal from the prescaler now passes through U1570D to the counting circuitry.

Prescaler

The block diagram for the DC 508A prescaler can be broken into several sections. These sections are: input protection, automatic gain control, wide band amplifier, peak detector, and prescaling dividers. See the Prescaler Block Diagram in the pullout pages at the rear of this manual.

Input signals to the prescaler pass through a 1/16 A fuse used for input protection (the fuse blows with about 9 V rms applied to the input). The signals then pass through C2110 and associated resistors. A 3.5 dB attenuator (R2210, R2212 and R2214) limits the current in the clamp diodes under transient conditions. This attenuator maintains the vswr at or below 2.2:1 when the PIN diodes offer maximum attenuation. The signal passes through PIN diode CR2213, capacitors C2215, C2213, and PIN diode CR2214, then to clamp diodes CR2216 and CR2218 that limit the peak signal excursions into the amplifier.

At low signal levels, current through CR2213 and CR2211 is relatively high and the agc voltage at pin 7 of U2330B is above 0.5 V. If the amplitude of the prescaler input signal decreased, the agc voltage decreases from a positive level toward ground. When the voltage reaches about 0.5 V, CR2213 and CR2211 are at maximum resistance, with maximum series signal attenuation. If further attenuation is required, the agc line rapidly switches to -0.5 V, at which time Q2321 comes into conduction. This action causes current flow through CR2211, which shorts any further capacitively-coupled signal to ground. This attenuator provides about 40 dB of attenuation.

The uhf amplifier consists of four identical stages with about 9 dB gain each. These amplifiers are designed for gain flatness to above 1300 MHz. The input and output impedance of each stage is approximately 50 Ω .

The gain stages are common emitter amplifiers using uhf transistors. Impedance matching between stages is accomplished by microstrip transmission lines. At high frequencies the gain is almost entirely determined by these transmission lines. The bias of each transistor is controlled by active bias supplies. These transistors are: Q2125 biasing Q2226, Q2135 supplying bias for Q2236; Q2145 biasing Q2246, and Q2155 biasing Q2256. These

bias supplies provide constant collector current and maintain the collector-to-emitter voltage independent of the rf transistors' current gain. This circuit configuration maximizes the high frequency gain of each transistor.

A peak detector consisting of CR2462, C2460, and U2330A monitors the output of the amplifier to sense when enough signal exists to drive U2350 properly. A high pass filter consisting of L2362, C2362, R2368, and R2466 rolls off frequencies below about 100 MHz. The purpose of this filter is to prevent false counting if the frequency of the applied signal is too low. If too low a frequency or too little amplitude is applied to the prescale input, the peak detector applies a high to the reset of the second divider, U2345, to inhibit its output. Transistor Q2436 inverts and buffers the inhibit signal to provide a blank signal to the main board. Diode CR2460 provides temperature compensation for the peak detector. Adjustment R2422 simultaneously sets the thresholds of the peak detector and the agc. Operational amplifier U2330B provides automatic gain control current for PIN diode attenuation circuitry. As the output amplitude increases at the anode of CR2462, pin 6 of U2330B goes more positive. This causes pin 7 to go more negative reducing current flow to the attenuator circuitry.

The second prescaling divider, U2345, divides by two. The input is ac coupled through C2350 to improve the temperature tracking with U2350. The output of U2345, which equals the input frequency divided by eight, is coupled to the Main board through R2440. This resistor improves the impedance match between the output of U2345 and the switching gates on the Main board.

Standard Time Base

The clock frequency is generated by Q1422 operating as a Colpitts oscillator; the frequency is determined by Y1410. A small frequency change is accomplished by C1310 used for precise adjustment. Zener diode VR1310 provides +12 V at the junction of R1312 and R1424. The output is fed to the base of amplifier Q1420. Diode CR1420 prevents C1426 from charging due to rectification of the 10 MHz signal by the base-emitter junction of Q1420. The 10 MHz clock frequency is fed to pin 1 of J1432.

Optional Time Base

The 25 V ac from the power module is bridge rectified by CR1210, filtered by C1230, C1132 and C1112, and applied to the input of regulator U1110. This regulator provides +24 V dc output and is protected internally from overloads. The +24 V is applied to the oscillator and crystal oven for precise crystal temperature control. When the counter is equipped with the optional time base, all standard time base components are removed. The signal is fed to pin 1 of J1432.

External Clock 3

An external clock can be fed through terminal 14A of the rear interface connector. This signal passes to the base of Q1290, which amplifies the signal and delivers it to the internal-external selection jumpers. Diode CR1290 prevents capacitor C1290 from charging due to rectification of the external clock signal by the base-emitter junction of Q1290. This diode also protects Q1290 from negative transients.

When the internal clock is used, jumper P1290 must be connected between pins 4 and 5. This allows U1190 to operate as a divide-by-ten counter feeding 1 MHz clock signals to U1170 and S1380-5. If the external clock signal is a frequency other than 10 MHz, change the jumper on J1290 to either the 1 MHz or 5 MHz position, depending on the frequency of the external clock. Changing the jumper on J1290 to the 5 MHz position takes the output from U1190, after passing through the divide-by-five counter. The divider, U1190, is bypassed when the shorting strap for J1290 is between pins 1 and 2.

Gate Generating Circuitry 3

This circuitry provides the proper gating waveforms for timing the counting and display cycles. In the direct mode of operation, the 1 MHz clock signal passes through S1380-5 to the external input of U1280, a programmed divider. In the prescale mode of operation, the 1 MHz clock signal is divided by eight to 125 kHz by U1170. This is done because the prescaler also divides the incoming signal by eight. This keeps the display in the correct units. In the prescale mode, the output of U1170 is fed to the input of U1280 through S1380-6. The clear pulse, at pin 3, resets U1170 to all nines. Pin 2 of U1170 and pin 13 of U1270B are held high by R1385 connected to +5 V.

The 1 MHz or 125 kHz clock signal is fed to the external input terminal of U1280. The clock frequency is divided by U1280 so that the frequency of the signal at pin 1 is the clock frequency divided by the selected divider ratio. See Table 3-1. Pin 1 of U1280 connects to the D input of U1270B. The clock is inverted by Q1182 and fed to the clock input of U1270B. Pin 1 of U1280 goes low at the end of the selected clock division. On the next negative-going clock pulse, pin 8 of U1270B goes high. The purpose of U1270 is to prevent any time jitter on the pulse at pin 1 of U1280 from transferring to pin 8 of U1270B.

Refer to Fig. 3-1. The clear pulse goes high at the beginning of the gate-latch-display cycle. Pin 1 of U1280 goes to the high state. The clear at pin 10 of U1270B goes low when the clear to pin 6 of U1280 goes high, causing pin 8 of U1270B to go low. The clear pulse also causes pin 2 of U1740A to go high, which causes pin 14 of U1740B to go low, because of the high on the set (pin 12) of U1740B. This action causes a high on pin 11 and a low on pin 10 of

U1760A. Pin 14 of U1760A is now low. In the non-totalize modes, pin 12 of U1760B is low, and S1380-1 is open. Pin 15 of U1760B is in the high state and the base of Q1660 is in the low state. The collector of Q1660 is high and neither of the gate waveforms are asserted. Counter U1280 pin 1 output is now at a high state.

Table 3-1

CLOCK FREQUENCY AND DIVIDER RATIO CODE

DC 508A Resolution Switch Setting	Clock Divider Ratio, U1280	Input Code for U1280				Gate Times
		Pin 11	Pin 12	Pin 13	Pin 14	
		2^3	2^2	2^1	2^0	
.1 Hz	10^7	0	1	1	1	10 s
1 Hz	10^6	0	1	1	0	1 s
10 Hz	10^5	0	1	0	1	.1 s
100 Hz	10^4	0	1	0	0	10 ms
1 kHz	10^3	0	0	1	1	1 ms
100 kHz ^a	10^1	0	0	0	1	1 μ s

^a Option 7 instruments only.

The positive-going clear pulse is approximately 60 μ s wide. On the next negative-going 1 MHz clock transition, pin 1 of U1280 goes low. The counter is now in its low state. This action sets the D terminal, pin 12, of U1270B low. The next negative-going 1 MHz clock transition causes a high on pin 8 of U1270B. This low-to-high transition causes pin 2 of U1740A to go low, which causes pin 15 of U1760A to go low and pin 9 to go high, asserting the gate signal.

If the selected resolution is 1 Hz, U1280 will divide by 10^6 . After one half (10^3) of the counts are completed, the time-out connection, pin 1, of U1280 goes high. On the next negative-going 1 MHz clock pulse, pin 8 of U1270B goes low and stays low until the end of the gate cycle. After the last half of the counts are completed by U1280, the time-out goes low. On the next negative-going 1 MHz clock transition pin 8 of U1270B goes high. This action causes pin 14 of U1740B to go high which causes the gate to go high completing the gate cycle.

Display Timer 4

Refer to Fig. 3-2. During the time the gate is low, pin 11 of U1533D is high and unijunction transistor Q1732 is not

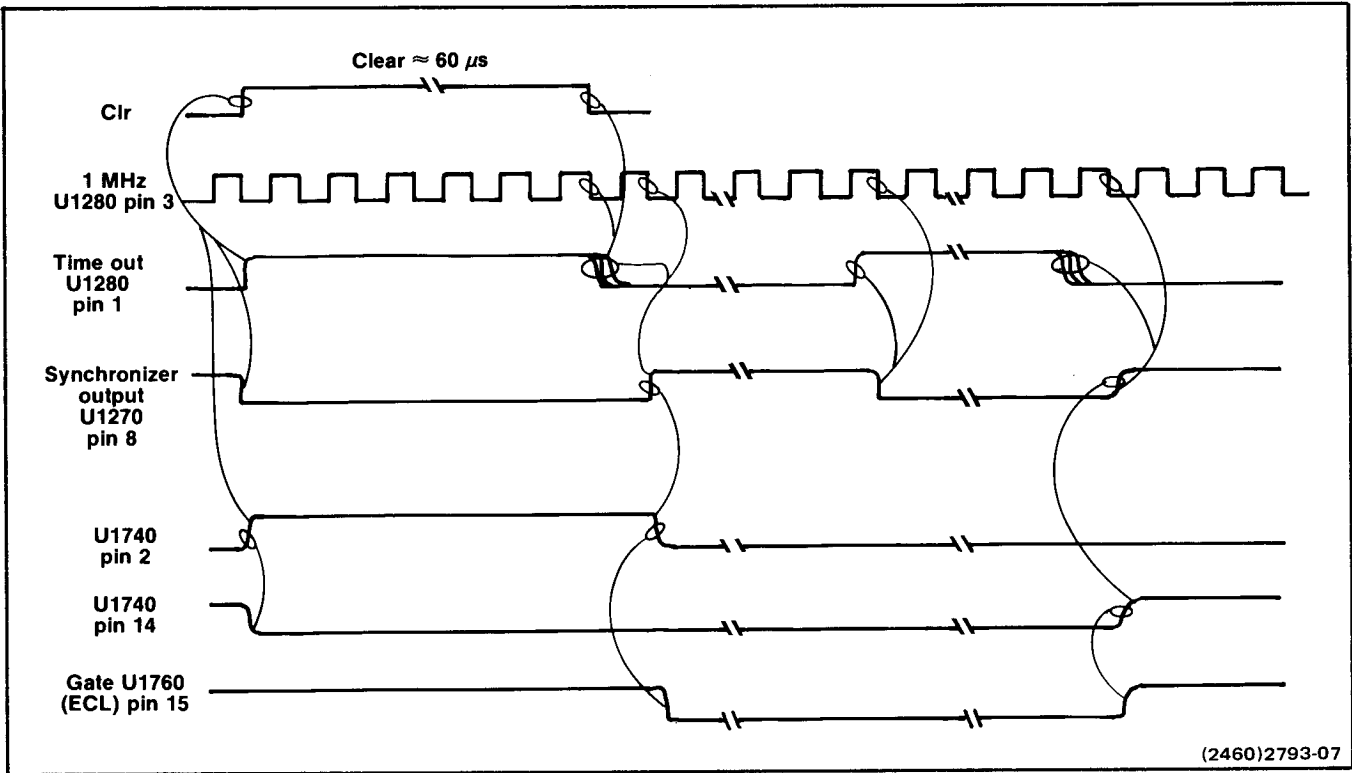


Fig. 3-1. Gate generator pulse relationships.

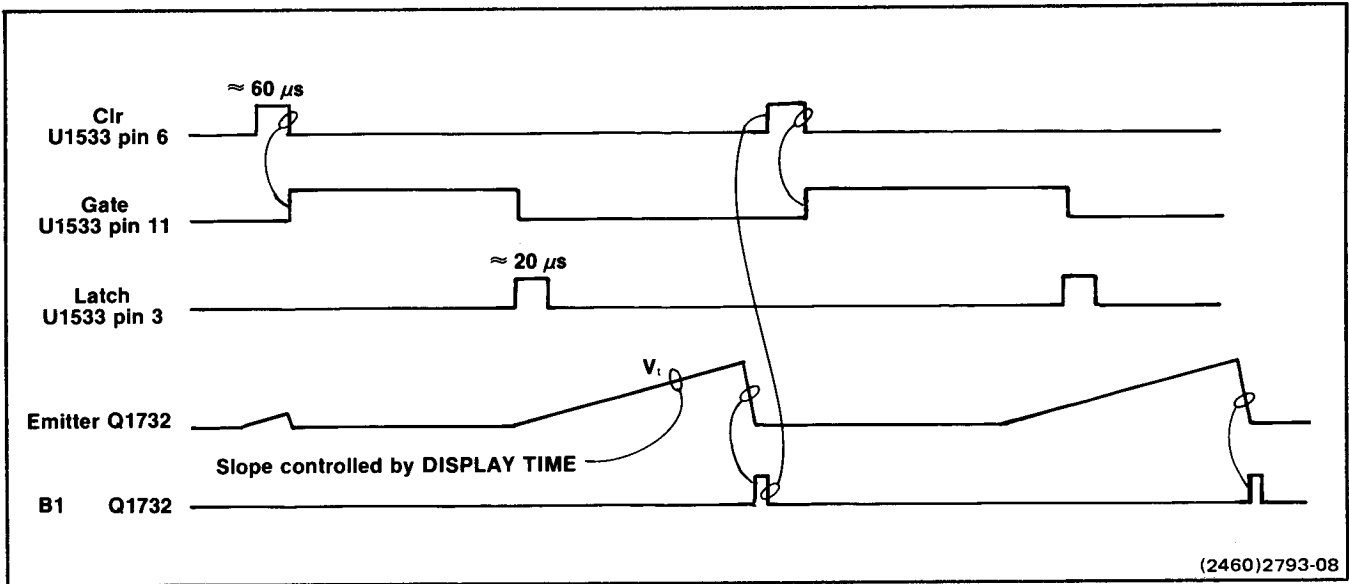


Fig. 3-2. Measurement cycle timing pulse relationship.

conducting. When pin 11 of U1533D is high, Q1632 conducts turning on the front panel GATE light. Transistor Q1640, in conjunction with C1640, serves as a pulse stretcher so that the GATE light is visible even for very short gate times.

During the gate time, Q1733 conducts. At the end of the gate time, Q1733 ceases conduction and the emitter of unijunction transistor Q1732 goes positive at a rate determined by the setting of the DISPLAY TIME control and the value of C1630. When the emitter of Q1732 reaches about 7.5 V, Q1732 conducts, discharging C1630 through R1739. This action causes a positive-going short pulse at the base of Q1630 and a corresponding negative-going pulse at the collector of Q1630. This negative-going signal, at the collector of Q1630, is also duplicated by pushing the front panel RESET pushbutton or by the closure of switch contact S1380-12 when switching between the various resolution ranges. The low at pins 11 and 12 of U1532D causes a high at pin 13 and a low at pin 1 of U1532A. The signal at pin 1 of U1532A stays low for the time required for C1630 to discharge and then returns to the high state. On the low-to-high transition at pin 12 of U1530B, pin 9 of U1530B outputs a TTL low lasting about 60 μ s. This action also causes pin 6 of U1533B to output a 60 μ s high TTL pulse which is the clear pulse.

As mentioned earlier, when the RESET button is pressed or contact S1380-12 closes, clear is asserted. Pushing the RESET button lowers pin 5 of U1533B causing pin 6 to go high. When the RESET line goes high, U1530B triggers through diode CR1550.

The power-up reset provides a clear pulse upon power up and increases the duration of the clear pulse initiated by the manual reset. When voltage is first applied to the instrument, C1160 charges toward +5 V. This causes Q1160 to conduct, lowering the voltage at the anode of Q1160. This negative voltage at the anode of Q1160 couples to the base of Q1152 through C1168. Q1152 and Q1154 conduct and pull the RESET line low. Feedback to the base of Q1152 through C1250 causes Q1152 and Q1154 to remain in conduction for about 100 ms.

Count Processing Circuitry

The $\overline{\text{GATE}}$ appears at pin 7 of U1660A. The clock signal appears at pin 9. When the gate signal is low, the negative to positive-going clock transition causes a low at pin 2 of U1660A. In the totalize mode, the U1660A reset (pin 4) is held high by switch S1380-1 continuously enabling the input of U1660B. The clear pulse at pin 5 of U1660A causes the Q output to go high and remain high for the duration of the clear signal. When pin 11 of U1660B is low, the low to high input signal transitions at pin 9 are counted by U1660B. This action effectively divides the input signal at the clock terminal by two during gate-on time. The Q

output signal, from U1660B, passes to the emitter of Q1642 which converts from ECL to TTL logic levels. The signal passes to pin 26 of U1330 as the least significant bit for the least significant digit of the display.

Integrated circuit U1330 is a bcd counter and nine digit display multiplexer. The ninth (lsd), eighth, seventh and sixth digits are counted and converted to bcd format by counters external to U1330. For the fifth through the first (msd) digits, U1330 counts and seven-segment decodes the appropriate information. The sixth and seventh digits are counted by U1440 and the eighth digit by U1430. Integrated circuit U1330 also contains nine decades of latches which latch the output of the external and internal bcd counters. Integrated circuit U1330 also contains a nine digit multiplexer. The input signal for U1430, at pin 14, comes from the collector (most significant bit) of Q1643 as a TTL signal. This signal is the most significant bit from the least significant digit of the display. The clear signal inputs at pin 2. The most significant bit from the eighth decade at pin 11 of U1430 drives the input of a dual decade counter, U1440. The input to the A section divide-by-two is pin 1. The output of this divide-by-two section is the least significant bit of the seventh decade and drives the input of the B section divide-by-five counter. These outputs form the second, third, and fourth binary lines for the seventh decade. The most significant bit line, pin 7, connects to the input of the A2 section divide-by-two counter at pin 15. The output of the second section divide-by-two counter, pin 13, connects to the second section divide-by-five counter which inputs bcd information for the sixth digit to U1330. The most significant bit for the sixth decade drives the base of Q1460, a TTL to MOS converter. The signal feeds the remaining five decades of bcd counters, contained in U1330, through pin 5. The clear pulse resets all counters to 0 and inputs to U1430 at pin 2, U1440 at pins 14 and 2 and U1330 at pin 6.

When the $\overline{\text{GATE}}$ goes high, at the end of the measurement interval, pin 10 of U1533C goes high. This causes pin 8 to go low which fires U1530A, a one-shot multivibrator. Pin 7 of U1530A goes low for about 20 μ s causing, when S1380-7 is open, pin 3 of U1533A to go high for the same period. When pin 3 goes low again, after 20 μ s, the falling edge at pin 11 of U1330 stores the accumulated bcd count in the latches contained in U1330.

The scan clock, an astable multivibrator composed of Q1350 and Q1352, runs continuously. On each negative-going excursion at pin 8 of U1330, the bcd output data from the latches in U1330 changes for the next digit displayed. This bcd data is present at pins 13, 14, 16, and 17 of U1330. Integrated circuit U1130 decodes this bcd information for the seven segment LED displays.

The respective digit line, $\overline{\text{D1}}$ through $\overline{\text{D9}}$, is low while the bcd information is present. The appropriate seven

Circuit Description—DC 508A

lines to the segments of the display modules connect to the cathodes of the light emitting diodes in the modules. The respective digit line for the digit to be displayed, D1 through D9, then goes low. This action raises the collectors of one of the nine transistors connected to the anodes of the appropriate segments of the digit. This illuminates the digit.

The D4 through D8 digit select lines also activate the decimal points in the corresponding digits through portions of S1380 RESOLUTION and S1570 RESOLN MULT switches. When the digit select lines for the respective digit goes low, depending on the resolution chosen, pin 9 of U1230D goes low. Pin 8 then goes low, activating the decimal point for that digit.

Leading Zero Blanking

The digits are scanned from the most significant digit to the least significant digit (left to right). Time slot zero, \overline{DX} , at pin 20 of U1330 precedes the most significant digit. This pin goes low before $\overline{D1}$. Flip flop U1230C buffers \overline{DX} and resets pin 9 of U1360B low. Pin 5 of U1130, the ripple blanking input of U1130, is set low, blanking the display. If there are zeros on the bcd lines from U1330 to pin 4 of U1130, the blanking-input-ripple-blanking-output line (pin 4) goes low. The low (for leading zeros) goes to pin 12 of U1360B. On the next rising edge from Q1352 (scan clock), the low is clocked to the Q output (pin 9, which remains low) and passes to pin 5 of U1130 keeping the displayed digit blanked. This action continues as long as leading zeros are present, until a decimal point is needed, or D9 is enabled in the totalize mode.

If a decimal point is required after the leading zeros are blanked, pin 11 of U1260C goes low. This creates a high on pin 9 which in turn ensures a low on pin 6 of U1260B. This action causes pin 9 to go high unblanking the display for the decimal point and all digits to the right of the decimal point. If a non-zero digit follows the leading zero(s), pin 4 of U1130 is internally driven high. This places a high on the D input to U1360B. The next rising edge from the scan clock transfers this high to the Q output and unblanks the display through internal action in U1130.

The D9 digit is never blanked except when the unit is operating in the prescale mode and the input signal is out of range. (INPUT OUT OF RANGE light is illuminated.) This is ensured through the D9 strobe line at pin 13 of U1260A. When pin 13 of U1260A goes low, pin 12 goes high ensuring a low at pin 6 of U1260B. This sets pin 9 of U1360 high, unblanking the display through U1130.

In the case of overflow it is necessary to ensure that no blanking occurs. When overflow occurs, pin 19 of U1330 goes low. The collector of Q1172 goes high, illuminating

the OVERFLOW light through Q1170, placing a high on pin 5 of U1260B. This ensures a low on pin 6 of U1260B and pin 10 of U1360B. This action causes a high on pin 9, which unblanks the display.

Prescaler Unblanking

When the prescaler input is out of range, pin 4 of U1270A goes low. This illuminates the INPUT OUT OF RANGE light through CR1362 and sets U1270A placing a high on the Q output, pin 5. On the rising edge of the latch pulse Q, pin 6 of U1360A, is clocked low blanking the display through diode CR1360 and U1130. This action also causes the data good line to remain low, indicating that the data in the latches in U1330 and present on the bcd lines from U1330 to U1130 and at the rear interface is not valid data.

Power Supplies

Integrated circuit U1510 supplies the reference voltage for the +5 V and -15 V supplies. The +15 V operates from U1112, which provides its own reference voltage. The -2 V supply is referenced to the -15 V supply.

The reference voltage from U1510 appears internally from U1510 at pin 6. This is divided by R1612 and R1714 to pin 5. Current flows from the +11.5 V mainframe supply, through the npn series-pass transistor in the mainframe, and through R1710 (the current sensing resistor) to the +5 V load. The +5 V load voltage is regulated within design limits by varying the voltage on the base of the series-pass transistor in the mainframe through U1510. Should current to the +5 V load exceed about 2 A, voltage drop across R1710 becomes great enough to limit the current by reducing the voltage on the base of the series-pass transistor in the mainframe. This over-current voltage is sensed at pins 2 and 3 of U1510. Feedback input from +5 V for voltage regulation occurs at pin 4. Capacitor C1522 is used to frequency compensate U1510.

The -15 V supply is referenced, at the base of Q1522, from the voltage at pin 6 of U1510. Should the voltage across the -15 V load go slightly more positive, the voltage at the base of Q1522 goes more positive. This action increases conduction in Q1624, which increases conduction in the series-pass transistor located in the mainframe. More current now flows through the series-pass transistor lowering the -15 V until the correct voltage is reached. If the current drawn from this supply exceeds about 200 mA, the voltage drop across R1726 becomes large enough to cause Q1623 to conduct. This action limits the current through the series-pass transistor.

Reference voltage for the -2 V supply comes from the -15 V supply, at pin 3 of U1520. Should the -2 V go more

positive, pin 6 of U1520 goes more negative, increasing conduction through Q1620, and lowering the -2 V to the correct level. Excessive current through R1729 reduces conduction through Q1620 by increasing conduction through Q1730. This action limits the current to about 150 mA.

The $+15$ V supply operates from a three-terminal regulator, U1112.

Clamp diodes CR1120, CR1710, CR1722, and CR1720 are connected to the voltage output buses to prevent component damage due to reverse polarity.

CALIBRATION PROCEDURE

PERFORMANCE CHECK PROCEDURE

Introduction

This procedure checks the electrical characteristics of the DC 508A that appear in the Specification section of this manual. If the instrument fails to meet the requirements given in this performance check, the calibration procedure should be performed. This procedure can also be used by incoming inspection facility to determine acceptability of performance.

The electrical characteristics in Section 2 are valid only if the DC 508A is calibrated at an ambient temperature of +20°C to +30°C and operated at an ambient temperature of 0°C to +50°C. Forced air circulation is required for ambient temperature above +40°C.

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

Test Equipment Required

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

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

Services Available

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

Test Equipment Required

The test equipment listed in Table 4-1, or equivalent, is required for adjustment of the DC 508A. Specifications given for the test equipment are the minimum necessary for accurate adjustment and measurement. All test equipment is assumed to be correctly calibrated and operating within specification.

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

A flexible plug-in extender, Tektronix Part No. 067-0645-02, is useful for troubleshooting or adjusting the DC 508A; however, the complete Adjustment Procedure can be performed without use of the extender.

Table 4-1

LIST OF TEST EQUIPMENT REQUIREMENTS

Description	Performance Requirements	Applications	Example
Oscilloscope	0.1 μ s sweep rate, external triggering; vertical sensitivity with 10X probe, at least 2 V/div.	Frequency check.	TEKTRONIX 7603 mainframe and 7A15A/7B50A with TEKTRONIX P6056 probe.
Sampling System	Capable of displaying 300 MHz; amplitude of ≥ 100 mV.	Prescale threshold adjustment	TEKTRONIX 7603 mainframe, 7S14, with TEKTRONIX P6056 probe.
Digital Voltmeter	Range, 0 to 20 V; accuracy, within 2%.	Power supply voltage check	TEKTRONIX DM 501A Digital Multimeter.*

**Calibration—DC 508A
Performance Check**

Table 4-1 (cont)

Description	Performance Requirements	Application	Example
Power Module	Three compartments or more.	All tests.	TEKTRONIX TM 503 or TM 504.
Frequency Standard, 1 MHz	1 MHz with 1×10^7 accuracy (10^9 accuracy required for optional time base).	Internal time base accuracy adjustment.	Hewlett-Packard 105A.
Sine Wave Generator	Sine-wave output, 100 MHz to 1 GHz; amplitude at least 2.0 V; accuracy, 2%.	Prescale threshold adjustment.	TEKTRONIX SG 504 ^a and SG 503. ^a
Coupling capacitor	0.047 μ Fd, ≥ 5 Vdc.	Prescale threshold adjustment.	Tektronix Part No. 015-0221-00.
Attenuator	BNC 50 Ω , 10X.	Prescale threshold adjustment.	Tektronix Part No. 011-0059-02.
Bayonet ground assy.	Fit P6056 probe tip.	Prescale threshold adjustment.	Tektronix Part No. 013-0057-01.
Coaxial cable	Impedance, 50 Ω ; length, 42 inches; connectors, bnc.	Provides signal interconnections.	Tektronix Part No. 012-0057-01.
Sine Wave Generator	Sine-wave output, 10 Hz, to 25 kHz; amplitude, at least 25 mV; accuracy, 2%.	Resolution and multiplier frequency check. Frequency range check.	TEKTRONIX SG 502 Oscillator. ^a
Sine Wave Generator	Sine-wave output, 100 MHz to 1.3 GHz; amplitude, at least 800 mV; accuracy, 2%.	Frequency range and sensitivity check.	Wavetek Model 2001
Power Module	Three compartments or more.	All tests.	TEKTRONIX TM 503 or TM 504.
Frequency Standard, 1 MHz.	1 MHz with 1×10^7 accuracy (10^9 accuracy required for optional time base).	Internal time base temperature stability check.	Hewlett-Packard Frequency standard 105A.
Coaxial cable	Impedance, 50 Ω ; length, 42 inches; connectors, bnc.	Provides signal interconnection.	Tektronix Part No. 012-0057-01.
Precision 50 Ω coaxial cable	Impedance, 50 Ω ; length, 42 inches, connectors, bnc.	Provides signal interconnection.	Tektronix Part No. 012-0482-00. (Furnished with SG 503.)
Attenuator, 5X 2 required	Impedance, 50 Ω ; connectors, bnc; accuracy, within 2%.	Frequency range and sensitivity check.	Tektronix Part No. 011-0059-02.
Attenuator, 10X	Impedance, 50 Ω ; connectors, bnc; accuracy, within 2%.	Frequency range and sensitivity check.	Tektronix Part No. 011-0060-02.

^a Requires TM 500-Series power module.

Preliminary Procedure

1. Ensure that all power switches are off.
2. Ensure that all test equipment and the power module into which the DC 508A under test will be installed are suitably adapted to the line voltage to be applied.
3. Install the DC 508A into the power module, and if applicable, install all other TM 500-Series test equipment into the power module.
4. Connect the power module(s) and test equipment to a suitable line voltage source. Turn all equipment on and allow at least 20 minutes for the equipment to warm up and stabilize.

Initial Control Settings

Set the following controls during warm-up time:

DC 508A

STANDBY	Pushbutton in
RESOLUTION	1 Hz PRESCALE
DISPLAY TIME	Fully counterclockwise
RESOLN MULT	Pushbutton out
RESET	Pushbutton out
ATTEN	Pushbutton out
SOURCE	Pushbutton out
50 Ω —1 M Ω	Pushbutton in

PERFORMANCE CHECK PROCEDURE

NOTE

A signal generator with frequency range capability of 10 Hz to 1.3 GHz is required for completion of step 1 and 10 Hz to 100 MHz for step 2. Separate signal generator units may also be used, such as TEKTRONIX SG 502, SG 503, and Wavetek 2001.

1. Check Frequency Range and Sensitivity

- a. Set the amplitude of the signal generator for an output of 566 mV peak-to-peak (200 mV rms into 50 Ω or -1 dBm) at the signal generator output connector.
- b. Connect the signal generator (100 MHz to 1.3 GHz) sine wave output to the DC 508A PRESCALE INPUT connector, using a 50 Ω cable and a 10X attenuator.
- c. Adjust the signal generator output frequency from 100 MHz to 1.1 GHz. (May require changing signal generator units.)

- d. Check that the readout display coincides with the signal generator over the entire frequency range.
- e. Set the amplitude of the signal generator for an output of 1132 mV peak-to-peak. (400 mV rms into 50 Ω or +5 dBm).
- f. Adjust the signal generator output frequency from 1.1 GHz to 1.3 GHz.
- g. Check that the readout display coincides with the signal generator reading over the frequency range.
- h. Disconnect the 50 Ω cable and 10X attenuator from the PRESCALE INPUT connector.
- i. Set the amplitude of the signal generator (10 Hz to 100 MHz) for an output of 2.1 V peak-to-peak (0.75 V rms into 50 Ω) at the signal generator output connector.

- j. Connect the signal generator (10 Hz to 100 MHz) sine-wave output to the DC 508A DIRECT INPUT connector, using a 50 Ω cable, 5X, and 10X attenuators.

- k. Set the DC 508A RESOLUTION switch to DIRECT 1 Hz; set the remaining controls as listed in the initial control settings.

- l. Adjust the signal generator output frequency from 10 Hz to 100 MHz (may require changing signal generator units).

- m. Check—that the readout display coincides with the signal generator reading over the entire frequency range.

- n. Disconnect the 50 Ω cable from the DC 508A.

2. Check Maximum Operating Input Voltages

- a. Set the amplitude of the signal generator (100 MHz to 1.3 GHz) for maximum output or no more than 5.65 V peak-to-peak (2 V rms into 50 Ω) at the signal generator output connector.
- b. Connect the signal generator (100 MHz to 1.3 GHz) sine-wave output to the DC 508A PRESCALE INPUT connector, using a 50 Ω cable.

Calibration—DC 508A
Performance Check

c. Set the DC 508A RESOLUTION switch to 1 Hz PRESCALE; set the remaining controls as listed in the initial control settings.

d. Adjust the signal generator output frequency from 100 MHz to 1.3 GHz (may require changing signal generator units).

e. Check—that the readout display coincides with the signal generator reading over the entire frequency range.

f. Disconnect the 50 Ω cable from the DC 508A.

3. Check Resolution Multiplier Frequency Range

a. Set the DC 508A RESOLUTION switch to DIRECT 1 Hz; set the remaining controls as listed in the initial control settings.

b. Connect the signal generator (10 Hz to 25 kHz) sine-wave output to the DC 508A DIRECT INPUT connector, using a 50 Ω cable. Set the output amplitude to at least 15 mV rms.

c. Adjust the signal generator output frequency from 10 Hz to 25 kHz.

d. Check—that the LOSS OF LOCK indicator light remains off over the entire frequency range.

4. Check Resolution Multiplication Factor

a. Obtain a stable readout display at any frequency between 10 Hz and 25 kHz.

b. Press in the RESOLN MULT pushbutton.

c. Check—that the most significant digit shifts two places to the left and the count remains stable. Press in and release the pushbutton.

5. Check Resolution Multiplier Lock Time

a. Set the signal generator output frequency to approximately 25 kHz, and obtain a stable readout display.

b. Rapidly change the signal generator frequency to 10 Hz. Note that the LOSS OF LOCK indicator light illuminates.

c. Check—that the LOSS OF LOCK indicator light goes out in less than 5 seconds.

d. Disconnect the 50 Ω cable from the DC 508A.

6. Check Time Base Temperature Stability

a. Connect the 1 MHz frequency standard to the DC 508A DIRECT INPUT connector.

b. Check—that the least significant digit in the readout display changes less than 5 digits (5 ppm) as the ambient temperature surrounding the instrument is changed from 0°C to +50°C.

c. Disconnect all cables from the DC 508A.

7. Check Optional Time Base Temperature Stability

a. Connect the 1 MHz frequency standard to the DC 508A DIRECT INPUT connector.

b. Set the DC 508A RESOLUTION switch to DIRECT 0.1 Hz.

c. Check—that the least significant digit in the readout display changes no more than 2 digits (0.2 ppm) as the ambient temperature surrounding the instrument is changed from 0°C to +50°C.

8. Check Optional Time Base Warmup Time

a. Set the DC 508A RESOLUTION switch to DIRECT .1 Hz.

b. After allowing at least 20 minutes warm-up time in the power module, note the readout display reading.

c. Turn off the power module and remove the DC 508A from the compartment, and allow the instrument to cool for at least two hours to approximately +25°C ambient.

d. Insert the DC 508A into the power module compartment and turn on the power to the power module.

e. Check—that within 10 minutes after power up of the power module, the least significant digit is within two counts of the reading noted in part b of this step.

f. Disconnect all cables.

This completes the Performance procedure of the DC 508A.

ADJUSTMENT

Introduction

This adjustment procedure is to be used to restore the DC 508A to original performance specifications. Adjustment need not be performed unless the instrument fails to meet the Performance Requirements of the Electrical Characteristics listed in the Specification section, or the Performance Check cannot be completed satisfactorily.

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

Adjustment Instructions

The alphabetical instructions under each step (a, b, c, etc.) may contain Check, Examine, or Adjust as the first word of the instruction. These terms are defined as follows:

1. Check—indicates that the instruction accomplishes a performance requirement check. Each performance requirement is derived from the instrument specification as listed in Table 1-1, Electrical Characteristics.

2. Examine—usually precedes an Adjust instruction and describes how to determine whether the adjustment is necessary. Measurement limits following the word Examine are not to be interpreted as performance limits derived from the instrument specifications. They are provided as indicators of a properly functioning instrument and to aid in the adjustment process.

3. Adjust—describes which adjustment to use to make the desired result. We recommend that adjustments not be made if a previous Check or Examine instruction indicates that no adjustment is necessary.

Adjustment Interval

To maintain instrument accuracy, check the performance of the 1.3 GHz Counter every 1000 hours of operation, or every six months if used infrequently.

Preparation

a. Remove the left side cover of the DC 508A to gain access to the adjustments. Pull the rear end of the side cover outward from the side of the instrument (the cover snaps into place).

b. Install the DC 508A into the left power module compartment, or if applicable, connect the DC 508A to the power module by means of the flexible plug-in extender.

c. Set the power module for the line voltage to be applied and connect it to the line voltage source. Be sure that the power switch is off.

d. Install the TM 500-Series equipment, including the DC 508A into the power module.

e. Connect all test equipment to a suitable line voltage source.

f. Turn on all test equipment and allow at least 20 minutes for the equipment to warm up and stabilize.

DC 508A

STANDBY	Pushbutton in
RESOLUTION	1 Hz PRESCALE
DISPLAY TIME	Fully counterclockwise
RESOLN MULT	Pushbutton out
RESET	Pushbutton out
ATTEN	Pushbutton out
SOURCE	Pushbutton out
50 Ω—1 MΩ	Pushbutton in

DM 501

Range Function switch	20 DC Volts
Input	EXT (pushbutton out)

Oscilloscope Mainframe

Intensity	Visible display
Focus	Well defined display

ADJUSTMENT PROCEDURE

1. Check Power Supply Voltages

a. Connect the digital voltmeter between each voltage test point and ground for the supplies listed in Table 4-2. See Fig. 4-1 for test point locations.

b. Check—each supply voltage for a meter reading within the output voltage limits specified for that supply in Table 4-2.

**Calibration—DC 508A
Adjustment Procedure**

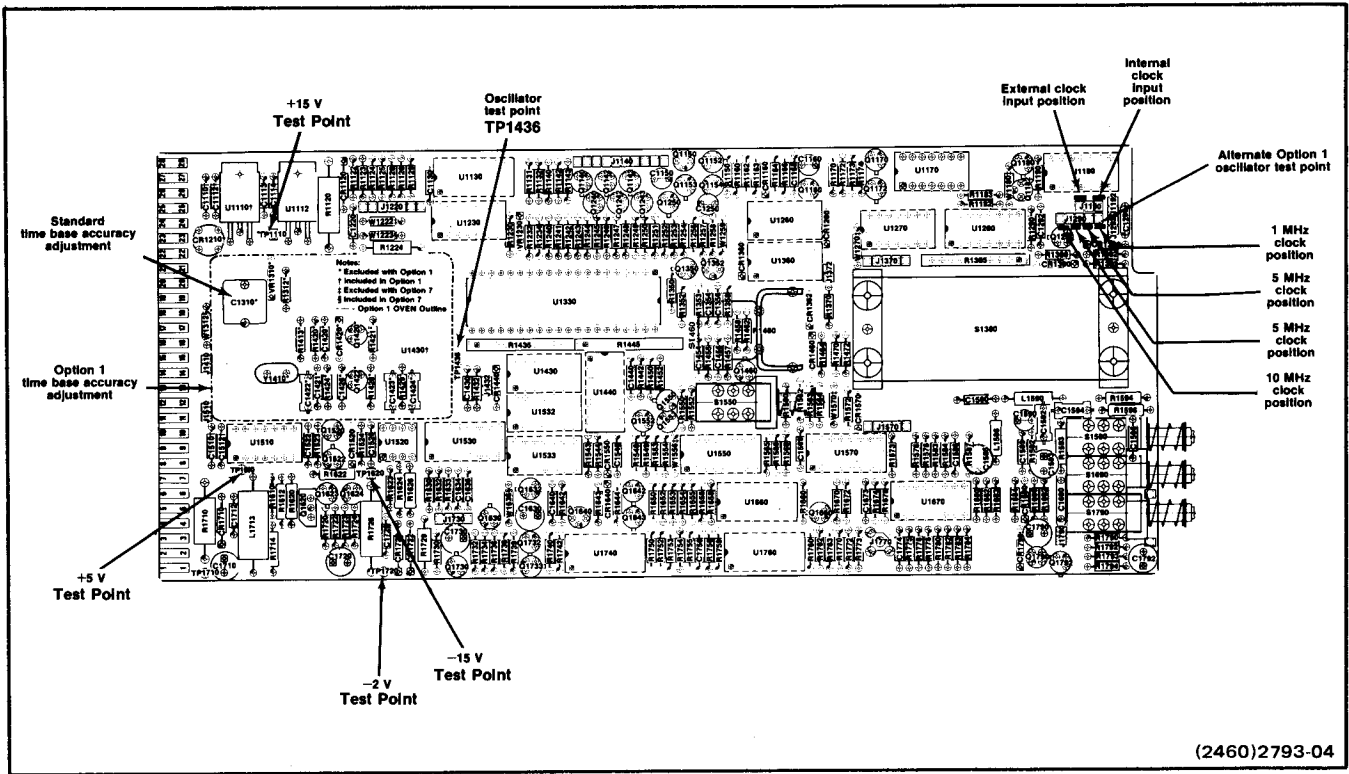


Fig. 4-1. Location of test points and adjustments on Main circuit board.

Table 4-2

POWER SUPPLY VOLTAGE LIMITS

Supply	Output Voltage Limits
+15 V	+14.25 V to +15.75 V
-15 V	-13.95 V to -16.05 V
-2 V	-1.8 V to -2.2 V
+5 V	+4.75 V to +5.25 V

2. Adjust Time Base Accuracy

a. Connect the 10X probe to the vertical amplifier (real time) input connector; connect the probe tip to the oscillator test point, TP1436. See Fig. 4-1 for test point location.

b. Set the vertical amplifier (real time) deflection factor for 0.2 V/div.

c. Set the time-base (real time) sweep rate for 0.1 μ s/div, externally triggered.

d. Connect the frequency standard to the time-base (real time) external input connector, using an appropriate cable.

e. Adjust the time-base unit triggering controls for a stable display.

f. Examine—that the displayed time marks remain stable, horizontally.

g. Adjust—C1310, time base accuracy adj, slowly until the displayed time marks remain stable, horizontally. See Fig. 4-1 for adjustment location.

h. Disconnect the cables and probe from the DC 508A.

3. Adjust Prescaler Threshold

a. Note that the STANDBY pushbutton is in and the RESOLUTION switch is set to any PRESCALE position.

b. Connect the leveling head to the SG 504 OUTPUT HEAD connection.

c. Connect the leveling head output through a 10X attenuator to the DC 508A PRESCALE INPUT.

**Calibration—DC 508A
Adjustment Procedure**

d. Connect a coaxial cable from the SG 504 FREQUENCY MONITOR OUT to the External Trigger Input of the sampling oscilloscope.

e. Set the SG 504 AMPLITUDE VOLTS PEAK TO PEAK to 1.9, FREQUENCY MHz to approximately 300 MHz, and RANGE to LOW.

f. Connect the 10X, 50 Ω probe and coupling capacitor to the vertical input of the sampling oscilloscope.

g. Place the Bayonet ground assembly on the probe tip.

h. Connect the probe to pin 4 of U2350 and the ground to the nearest ground point (left side of C2264).

i. Adjust R2422, Threshold Adj. for probetip amplitude of approximately 600 mV peak-to-peak.

j. Rotate the SG 504 FREQUENCY control from 250 MHz to 1 GHz.

k. Examine—that the DC 508A display does not blank or count incorrectly.

l. Adjust—R2422, Threshold Adj., for 600 mV to 1200 mV peak to peak probe tip voltage without display blanking or an erroneous count (800 mV peak to peak is usually optimum).

m. Connect the SG 503 OUTPUT through a coaxial cable and 50 Ω termination to the DC 508A 100-1300 MHz INPUT.

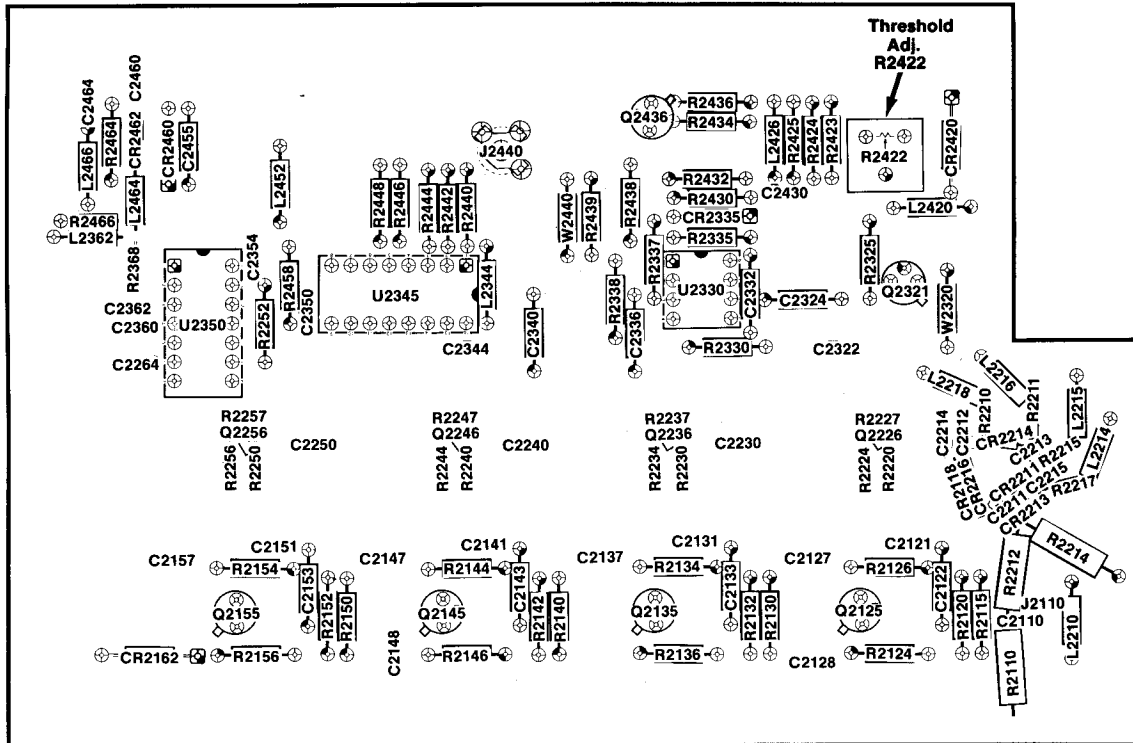
n. Set the generator output level for approximately 2 V.

o. Rotate the generator frequency control from 100 MHz to 250 MHz.

p. Repeat steps k and l.

q. Disconnect all cables and equipment from the DC 508A.

This completes the Adjustment procedure of the DC 508A.



(2460)2793-05

Fig. 4-2. Location of Threshold adjustment on Prescaler circuit board.

MAINTENANCE AND INTERFACING INFORMATION

Preventive Maintenance

There are no special preventive maintenance procedures that apply to the DC 508A. Refer to the power module instruction manual for general preventive maintenance procedures and instructions.

Corrective Maintenance

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

Prescaler Fuse Replacement

To replace the fuse, unscrew the bnc connector using a 7/16" wrench. Remove the connector shell and the metal spacer surrounding the fuse. If the fuse doesn't come out with the connector, grasp the fuse lead with pliers and pull. Notice the small insulating washers on the fuse leads. Make certain the washers, with the flanges toward the fuse, are reinstalled on the leads before reassembly. If the washer remains in the instrument when the fuse is removed, the fuse lead can be installed back into the instrument without removing the insulator. See Fig. 5-1.

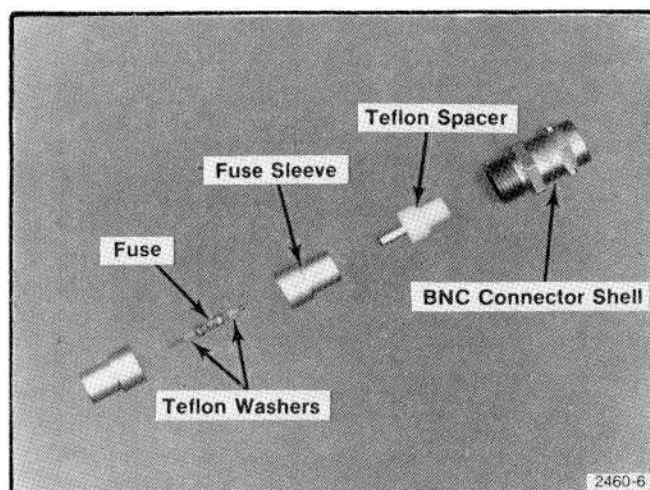


Fig. 5-1. Front panel fuse assembly.

Prescaler Removal

To remove the Prescaler, first remove the flat-head screw and nut attaching the angle bracket to the top of the

plug-in. Then remove the recessed screw on the left side of the Prescaler. Next, remove the screw attaching the lower rear mounting post, for the Prescaler board, to the Main board. This screw is accessed through a hole in the Resolution Multiplier board. Next, remove capacitor C1230 (Option 1 and 7 instruments only) to gain access to the screw attaching the upper rear mounting post to the Main board. Remove the screw attaching this post to the Main board. Finally, remove the two coaxial connections to the Prescaler, and remove the plug attaching the four wires to the Main board.

Prescaler Troubleshooting




Transistor failures can often be determined by voltage measurements. When the unit is operating, measure the voltage from the collector of the rf transistor to ground. The collector is the large pad nearest to this transistor. This voltage should be approximately 7 V dc. The prescaler waveform can also be viewed by using a 500 Ω ac coupled sampling probe. Connect the sampling probe to the collector pads described above.

Functions Available at Rear Connector

A slot between pins 21 and 22 on the rear connector identifies the DC 508A as a member of the counter family. Insert a barrier in the corresponding position of the power module jack to prevent other than signal source plug-ins from being used in that compartment. This protects the plug-in if specialized connections are made to that compartment. Consult the Building a System section of the power module manual for further information. Signal outputs, or other specialized connections, may be made to the rear interface connectors as shown in the input-output assignments in Fig. 5-2. The following connections apply to the DC 508A.

BCD Output Data (contacts 20B, 20A, 21B, and 19A)

These contacts provide bcd data (8, 4, 2, 1, code) directly to the power module interface. The count (front-panel display) is transmitted in serial-by-decimal digit sequences. The decimal-digit sequence is from left to right (msd to lsd) as observed on the front-panel display. The binary levels are positive-true logic. Each output data line is capable of driving five TTL loads (8 mA). During time slot zero, all four bcd lines are high.

Remarks	Maximum Recommended Loads	Active Level	Output or Input	PIN B	Rear view	PIN A	Output or Input	Active Level	Maximum Recommended Loads	Remarks
	5TTL	HI	Gate Output	28	Measurement Barrier Slot	28				
	9TTL	HI	Decimal Point Scanned Output	27		27				
				26		26	Reset Input/Output	Low	2TTL	Input 24 mA Output 3.2 mA
				25		25	TS-O Output	Low	5TTL	
	2TTL		Internal Scan Clock Output	24		24				
	2TTL	HI	Overflow Output	23		23	Counter Identify Output	Low	10TTL	Low=Counter Present
				22		22				
	5TTL	HI	BCD (2) Output	21		21				
	5TTL	HI	BCD (8) Output	20		20	BCD (4) Output	HI	5TTL	
	1TTL		Data Good (Latch) Output	19		19	BCD (1) Output	HI	5TTL	
HI=Continuous Count	1TTL		Start Count Input	18		18	Gate Output—Option 7	Low	5TTL	
Ground		Low	Counter Identify Output—Option 7	17		17	Internal Input Ground			
	1TTL	Low	100 kHz Resolution Input—Option 7	16		16	Direct Internal Input		50Ω	Direct Input Only
		Low	Sweep Input—Option 7	15		15				
		Low	Source Identify Input—Option 7	14		14	External Clock Input		Rin=1 kΩ	TTL
			25 Vac winding	13		13	25 Vac 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			
			Transformer/shield lead	10		10*	Emitter Lead of PNP Series-Pass			
			33.5 V common return	9*		9	33.5 V common return			
			33.5 filtered dc	8*		8	33.5 V filtered dc			
			Collector Lead of NPN Series-Pass	7*		7*	Emitter Lead of NPN Series-Pass			
			No connection	6		TM 500 Barrier Slot	6*	Base Lead of NPN Series-Pass		
			17.5 Vac winding	5	5		17.5 Vac winding			
			11.5 V common return	4	4*		11.5 V common return			
			11.5 V common return	3	3*		11.5 V common return			
			11.5 V filtered dc	2*	2		11.5 V filtered dc			
			25 Vac winding	1	1		25 Vac winding			
				B	Rear-View of plug-in		A			

Assignments listed for pins 1A—13A and 1B—13B are available in all power modules; however only those pins marked with an asterisk (*) are used by the DC 508.

(2460)2793-06

Fig. 5-2. Input/output assignments for plug-in rear interface connector contacts.

Decimal Point Scanned Output (contact 27B)

A decimal point to the left of a selected digit is scanned (made active) during its particular time slot. Contact 27B goes high and remains high for one scan-clock period indicating that a decimal point is scanned. This data line will drive nine TTL loads (15 mA).

Time Slot Zero Output (contact 25A)

This line provides a reference time indication for proper demultiplexing of the display bcd information. This pulse is negative-going and equal in width to one scan-clock period. The negative-going leading edge is time-coincident with the rising edge of the scan-clock line. The next rising edge of the scan clock line places the first (msd) digit of bcd information on the four bcd output lines. This connection will drive five TTL loads (8 mA).

Scan Clock Output (contact 24B)

This output line provides about a 5 kHz square-wave signal at the rear interface. A different front-panel digit is displayed on each rising edge of the scan-clock waveform. The display scans from time slot zero to the most significant digit, and then through the digits in sequence to the least significant digit on succeeding scan clock cycles.

The corresponding bcd information is transferred to the output on each scan clock positive-going edge. To allow for propagation delays, the data should be transferred to external memory on the following negative-going edge. This output data line will drive two TTL loads (3.2 mA).

Data Good Output (contact 19B)

This output line provides a low data good (latch) pulse. The pulse duration is determined by the measurement interval plus the display time and occurs after each updating of the display storage latches. The accumulated count is transferred to the latches when this line is high and is actually latched on the falling edge. Data should not be acquired until after the falling edge to avoid errors. This data line will drive one TTL load (1.6 mA).

Overflow Output (contact 23B)

Contact 23B is normally at a low level and goes high to indicate that the counter is in an overflow condition. Contact 23B is at a high level any time the front-panel OVERFLOW light is on. This output data line will drive two TTL loads (3.2 mA).

Reset Input-Output (contact 26A)

The counter is cleared to zero when a low is applied to 26A. This is accomplished from the front-panel by pushing the RESET button or moving the RESOLUTION control between detents. When used as an output, this line will drive two loads (3.2 mA). Contact 26A also goes low momentarily during power-up reset, when the counter prepares itself for operation. This contact does not go low when the internal circuitry clears itself for another count. This output will drive two TTL loads (3.2 mA).

When contact 26A is used as a reset input function, the external circuit must be able to drive 15 TTL loads; a discrete transistor capable of 24 mA can be used.

Gate Out (contact 28B)

This contact provides a gate out signal that is high during the time that the internal gate is open (while an input signal is gated into the decade counter units). This output line will drive five TTL loads (8 mA).

Internal Signal Input (contacts 16A and 17A)

Input signals can be applied through the rear interface via contact 16A, with 17A serving as a ground reference (coaxial-cable shield connection). To select input signals via contact 16A, depress the front-panel SOURCE switch, to the INT position. The input signals are ac coupled. Contact 16A is terminated in a nominal 50 Ω load impedance. Connections should be made using 50 Ω coaxial cable with leads as short as possible for full bandwidth operation.

External Clock Input (contacts 14A and 17A)

An external clock signal can be used instead of the internal 10 MHz clock by applying the input to 14A and using 17A to ground a coaxial-cable shield. To use the external clock signal, set the internal jumper to the EXT position. The internal frequency selection jumper should be properly placed for 1, 5, or 10 MHz depending on the external clock frequency. The input signal should be a TTL level signal capable of driving an ac-coupled 1 k Ω load.

Start Count Input (contact 18B)

For instruments without Option 7, this line initiates the DC 508A measurement cycle by an external trigger signal. When the SOURCE switch is depressed and a signal is present on the rear interface (pins 16A and 17A), a measurement may be initiated by bringing this line high. A single measurement is made if the line is pulled low before the gate and display times have elapsed. If the line is held high, the counter makes continuous readings. The load is one TTL (1.6 mA). See the Options section for functions with Option 7 equipped instruments.

Counter Identify Output (contact 23A)

This line is low when the SOURCE switch is depressed (Internal) for instruments without Option 7. This indicates that the instrument is in the count on command mode as explained in the Start Count description. This output provides 16 mA, equivalent to 10 TTL loads. This contact is disconnected in Option 7 equipped instruments.

Counter Identify Output—Option 7 (contact 17B)

This contact is grounded internally in the DC 508A. There is no connection to this pin in instruments without Option 7.

100 kHz Resolution Input—Option 7 (contact 16B)

When this contact is low and the instrument is equipped with Option 7, the counter goes to a 10 μ s gate time for a resolution of 100 kHz. When this line is high, the counter operates normally. This input requires 3.2 mA, equivalent to two TTL loads. This contact has no function in instruments without Option 7.

Sweep Input—Option 7 (contact 15B)

When this contact is low and the instrument is equipped with Option 7, the counter operates continuously; when high, the instrument counts only when contact 18B, start count, goes high. This contact outputs 1.6 mA, equivalent to one TTL load. This contact is unwired in instruments without Option 7.

Source Identify Input—Option 7 (contact 14B)

When this contact is low, all Option 7 functions are enabled; when this contact is high, the counter operates normally. This contact requires 4.8 mA, equivalent to three TTL loads. This contact is unwired in instruments without Option 7.

Gate Output—Option 7 (contact 18A)

This contact goes low during the measurement interval in instruments equipped with Option 7. It outputs 15 mA, equivalent to nine TTL loads. There is no connection to this contact in instruments without Option 7.

Cam Switches

Use care when cleaning or repairing cam switches. Shaft alignment and spring tension of the contacts must be carefully maintained for proper operation of the switch. For assistance, contact your local Tektronix Field Office or representative.

NOTE

A cam-type switch repair kit including necessary tools, instructions, and replacement contacts is available from Tektronix, Inc. Order Tektronix Part No. 040-0541-00.

The cam switches consist of rotating cam drums which are turned by front-panel knobs, and sets of spring-leaf contacts mounted on adjacent circuit boards. The contacts are actuated by lobes on the cams. These switches can be disassembled for inspection, cleaning, repair, or replacement as follows:

1. Pull the metal cover off the switch. The switch is now open for inspection or cleaning.
2. To completely remove a switch from the circuit board, first remove any knobs or shaft extensions. Loosen the coupling at the potentiometer at the rear of the switch, and pull the long shaft out of the switch assembly.
3. Remove the screws (from the opposite side of the circuit board) that hold the cam drum to the board.
4. To remove the cam drum from the front support block, remove the retaining ring from the shaft on the front of the switch and slide the cam drum out of the support block. Be careful not to lose the small detent roller.
5. To replace defective switch contacts, follow the instructions given in the switch repair kit.
6. To reinstall the switch assembly, reverse the above procedure.

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.

Component Checking

If a component cannot be disconnected from its circuit, then the effects of the associated circuitry must be considered when evaluating the measurement. Except for soldered-in transistors and integrated circuits, most components can be lifted at one end from the circuit board.

Transistors and IC's. Turn the power switch off before removing or replacing any semiconductor.

A good check of transistor operation is actual performance under operating conditions. A transistor can most effectively be checked by substituting a new component for it (or one which has been checked previously). However, be sure that circuit conditions are not such that a replacement transistor might also be damaged. If substitute transistors are not available, use a dynamic tester. Static-type testers are not recommended, since they do not check operation under simulated operating conditions. An anti-static suction-type desoldering tool must be used to remove soldered-in transistors; see component replacement procedure for details.

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

Diodes. Do not use an ohmmeter that has a high internal current. High currents may damage a diode.

A diode may be checked for an open or shorted condition by measuring the resistance between terminals. With an ohmmeter scale having an internal source of between 8 mV, and 3 V, the resistance should be very high in one direction and very low when the leads are reversed. (A few diode types may even be damaged by 3 V.)

Resistors. Check the resistors with an ohmmeter. Resistor tolerances are given in the Replaceable Electrical Parts list in every manual. Resistors do not normally need to be replaced unless the measured value varies widely from the specified value.

Capacitors. A leaky or shorted capacitor can be detected by checking resistance with an ohmmeter on the highest scale. Use an ohmmeter that will not exceed the voltage rating of the capacitor. The resistance reading should be high after initial charge of the capacitor. An open capacitor can best be detected with a capacity meter, or by checking whether it passes ac signals.

PARTS ORDERING AND REPLACING

Ordering

Obtaining Replacement Parts. Most electrical and mechanical parts can be obtained through your local

Tektronix field office or representative. However, you should be able to obtain many of the standard electronic components from a local commercial source in your area. Before you purchase or order a part from a source other than Tektronix, Inc., please check the Replaceable Electrical Parts list for the proper value, rating tolerance and description.

Special Parts. 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 system have been manufactured by Tektronix, Inc. Order all special parts directly from the local Tektronix Field Office or representative.

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

1. Instrument Type (PS 501, SG 502, DC 501, etc.).
2. Instrument Serial Number (For example, B010251).
3. A description of the part (if electrical include the circuit number).
4. Tektronix part number

Please do not return any instruments or parts before receiving directions from Tektronix, Inc.

A listing of Tektronix Field Offices, Service Centers and Representatives can be found in the Tektronix Product Catalog and Supplements.

Replacing

The exploded view drawings associated with the Replaceable Mechanical Parts list, located to the rear of most manuals, may be especially helpful when disassembling or reassembling individual components or sub-assemblies.

Circuit Boards. If a circuit board is damaged beyond repair, either the entire assembly including all soldered-on components, or the board only, can be replaced.

To remove or replace a board, proceed as follows:

1. Disconnect all leads connected to the board (both soldered lead connections and solderless pin connections).

Maintenance—DC 508A

2. Remove all screws holding the board to the chassis or other mounting surface. Some boards may be held fast by plastic mounting clips around the board edges. For these, push the mounting clips away from the circuit board edges to free the board. Also, remove any knobs, etc, that would prevent the board from being lifted out of the instrument.

3. Lift the circuit board out of the unit. Do not force or bend the board.

4. To replace the board, reverse the order of removal. Use care when replacing pin connectors. If forced into place incorrectly positioned, the pin connectors may be damaged.

Transistors and IC's. Transistors and IC's should not be replaced unless they are actually defective. If removed from their sockets during routine maintenance, return them to their original sockets. Unnecessary replacement or switching of semiconductor devices may affect the calibration of the instruments. When a transistor is replaced, check the operation of the part of the instrument that may be affected.

Replacement semiconductors should be of the original type or a direct replacement. Figure 5-1 shows the lead configurations of the semiconductors used in this instrument system. When removing soldered-in transistors, use a suction-type desoldering tool to remove the solder from the holes in the circuit board.

An extracting tool should be used to remove the 14- and 16-pin integrated circuits to prevent damage to the pins. This tool is available from Tektronix, Inc. If an extracting tool is not available, use care to avoid damaging the pins. Pull slowly and evenly on both ends of the IC. Try to avoid having one end of the IC disengage from the socket before the other end.

Static-Sensitive Components



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.

Test 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.

Interconnecting Pins. To replace a pin that is mounted on a circuit board, first disconnect any pin connectors. Then, unsolder the damaged pin and pull it out of the board with a pair of pliers. Be careful not to damage the wiring on the board with too much heat. Ream out the hole in the circuit board with a 0.031-inch drill. Remove the ferrule from the new interconnecting pin and press the new pin into the hole in the circuit board. Position the pin

in the same manner as the old pin and solder it in. If the old pin was bent at an angle to mate with a connector, bend the new pin to match the associated pins.

NOTE

A pin replacement kit including necessary tools, instructions, and replacement pins is available from Tektronix, Inc.

REPACKAGING FOR SHIPMENT

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

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

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

The carton test strength for your instrument is 200 pounds.

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 ohms.)

Table 5-2
MAINTENANCE AIDS

The following maintenance aids include items required for some maintenance procedures in this instrument. Equivalent products may be substituted for examples given providing characteristics are similar.

Description	Specifications	Use	Example
1. Soldering Iron	15 Watt	General soldering and unsoldering	ANTEX PRECISION Model C
2. Screwdriver	Phillips #1 tip	Assembly and Disassembly	Xcelite Model X108
3. Screwdriver	Phillips #2 tip	Assembly and Disassembly	Xcelite Model X102
4. Screwdriver	Three-inch shaft; 3/32 inch flat bit	General	Xcelite R3323
5. Torque Screwdriver	1.5 inch-pounds	FUNCTION switch assembly	Sturtevant-Richmont Torque Products Model PM-5-Roto-Torq
6. Nutdrivers	1/4 inch, 5/16 inch 3/8 inch, 7/16 inch	General	Xcelite #8, #10, #12 and #14
7. Open End Wrench	11/16 inch	General	
8. Solder Wick		Unsoldering	Hex Wik #887-10
9. Lubricant	Versilube	FUNCTION switch lubrication	Tektronix Part No. 006-1353-00
10. Spray Cleaner	No Noise	FUNCTION switch pad cleaning	Tektronix Part No. 006-0442-02
11. Vacuum Desoldering Tool	Antistatic	General	Tektronix Part No. 003-0795-00
12. I.C. Extracting Tool		General	Tektronix Part No. 003-0619-00
13. Cam Switch Repair Kit		Cam switches	Tektronix Part No. 040-0541-00
14. Extender Cables		General	Tektronix Part No. 067-0645-02

OPTIONS

Your instrument may be equipped with one or more instrument options. These options are factory-installed additions or changes to the standard instrument. If so equipped, details of instrument-equipped options are incorporated into the appropriate section of the manual.

A brief description of each available option is given in the following discussion. For further information on instrument options, see your Tektronix catalog or contact your local Tektronix representative.

OPTION 1

This option provides a more accurate time base for the DC 508A. The specification, adjustment instructions, circuit description, and schematic diagrams are included in the respective sections of this manual. In instruments

equipped with this option, for proper operation, make certain the power module line-voltage selector is set correctly for the line voltage used.

OPTION 7

Introduction

The DC 508A Option 7 operates with a spectrum analyzer and a tracking generator, or other suitable device, to provide an accurate readout of a selected frequency. During the DC 508A frequency measurement interval, a dot on the swept frequency display shows the location of the frequency being measured. At the conclusion of the count, the sweep is resumed. The accuracy of the count is 100 kHz when the spectrum analyzer is not phase locked, and manually selected by the RESOLUTION control when the phase lock is on.

The DC 508A Option 7 also includes the higher accuracy and stability for the counter's internal time base described under Option 1. The specification, adjustment instructions, and schematic diagrams are included in the respective sections of this manual. The installation, operating instructions, and circuit description follow.

Installation

The DC 508A Option 7 Digital Counter and signal source must be installed in specific compartments of a TM 500-Series power module equipped with Option 7. This option adds the wires necessary to interface the two units via their rear panel connectors. If Option 7 is not ordered with the power module, it can be field-installed by ordering Field Modification Kit 040-0789-00.

Connect the DC 508A input (either direct or prescale INPUT) to the signal source output with a coaxial cable (standard accessory).

The operation of the DC 508A Option 7 in a system without a tracking generator or sweep generator, or in a power module without Option 7, is the same as a standard DC 508A with Option 1 installed.

Sweeping Mode Operation

In any of the sweeping modes, operation of the DC 508A Option 7 is as follows:

1. The DISPLAY TIME control is inoperative.
2. The RESOLUTION control is set for the resolution desired when the spectrum analyzer is phase locked.
3. When the spectrum analyzer is not phase locked, the counter resolution is automatically set for 100 kHz.

The spectrum analyzer will sweep until it reaches the level set by the TR 502 Sweep Trigger Level adjustment. The trigger output then turns the spectrum analyzer sweep off, which causes the spectrum analyzer to stay at mid-frequency. After a short settling time, the tracking

Options—DC 508A

generator sends a count command to the counter, which returns a gate signal to the spectrum analyzer for the count duration. This causes an intensified dot to be displayed on the crt showing the location of the frequency count on the display. At the end of the count, the sweep continues from the dot frequency.

Operation of the DC 508A with the SW 503 is similar except the sweep is stopped when the generator reaches the point defined by the DOT POSITION control.

NOTE

When the signal source is operating in the swept mode, the first DC 508A count after the RESOLUTION control is changed or the RESET button is pushed may be erroneous and should be disregarded.

Nonsweeping Mode Operation

In this mode, the spectrum analyzer sweep (and hence the tracking generator frequency) is controlled either manually or by an external signal. The DC 508A Option 7 gate time will be determined in the same manner as above (either automatically or specifically set). The gate cycles continuously at a frequency determined by the DISPLAY TIME control. The gate can also be initiated by the RESET button. Further details of operation are included in the TR 502 and SW 503 Instruction manuals.

Circuit Description

The LATCH pulse (pin 7, U1530A) from the DC 508A sets the Q output, pin 11 of U4330, high. A start count high is received at rear interface pin 18B. This transfers to pin 5 of U4240C, is inverted, and clears U4330, through pin 6.

This causes pin 5 of U4340B to go low producing a GATE signal to the external equipment and also causes pin 4 of U4340B to go high. The gate generator is started for another measurement cycle. If rear interface connector pin 15B is held low, pin 4 of U4340B is held high and the DC 508A counts continuously.

When rear interface pins 14B and 16B are both low, the DC 508A is held to a gate time of 10 μ s with a resolution of 100 kHz. Lows on pins 8 and 9 of U1532C cause a high on pin 10. This translates to a low on pin 10 of U4240E. This in turn causes lows on pin 3 of U4140A, 12 of U4340D and 9 of U4340C. The low on pin 3 of U4140A ensures a high on pin 14 of U1280. The high on pin 10 of U1532C ensures lows on pins 9 and 11 of U4140C and D, respectively. This action, irrespective of the RESOLUTION switch setting, sets the divider ratio of U1280 to 10¹, which results in a gate time of 10 μ s. If either rear interface pin 14B or 16B is not low, the logic of the circuit just described is reversed and the RESOLUTION switch controls the divider ratio of U1280. In this case inverter U4240F ensures that pin 14 of U1280 is low or high as determined by the RESOLUTION switch. The high on pin 10 of U1532C ensures a low on pin 4 of U4140B, which illuminates the MHz light on the front panel. The low on pin 9 of U4340C ensures a high on pin 10, turning off the front panel kHz light. Inverter U4240D causes the kHz light to operate properly when the unit is not operating in the 100 kHz resolution mode.

In the 10 μ s gate mode, the decimal point is fixed in the least significant digit module (time slot 9). Pin 2 of U4340A is high and pin 3 goes high when the D9 digit strobe appears. This action causes pin 1 to go low, illuminating the decimal point. When the 100 kHz resolution mode is deactivated, U4340A deactivates and pin 13 of U4340D goes low as determined by the decimal point select switches, activated through U4240B and U4340D.

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

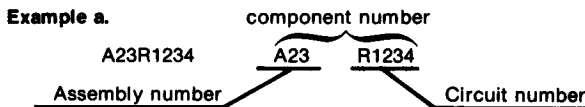
The Mfr. Code Number to Manufacturer index for the Electrical Parts List is located immediately after this page. The Cross Index provides codes, names and addresses of manufacturers of components listed in the Electrical Parts List.

ABBREVIATIONS

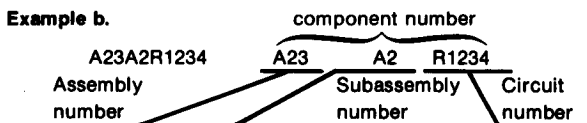
Abbreviations conform to American National Standard Y1.1.

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:



Read: Resistor 1234 of Assembly 23



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.

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
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
04222	AVX CERAMICS, DIVISION OF AVX CORP.	P O BOX 867, 19TH AVE. SOUTH	MYRTLE BEACH, SC 29577
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.	3301 ELECTRONICS WAY	LOS GATOS, CA 95030
14433	ITT SEMICONDUCTORS	P O BOX 3049	WEST PALM BEACH, FL 33402
16546	GLOBE UNION INC. USCC/CENTRALAB ELECTRONICS DIV.	4561 COLORADO	LOS ANGELES, CA 90039
18324	SIGNETICS CORP.	811 E. ARQUES	SUNNYVALE, CA 94086
24546	CORNING GLASS WORKS, ELECTRONIC COMPONENTS DIVISION	550 HIGH STREET	BRADFORD, PA 16701
24931	SPECIALITY CONNECTOR CO., INC.	2620 ENDRESS PLACE	GREENWOOD, IN 46142
27014	NATIONAL SEMICONDUCTOR CORP.	2900 SEMICONDUCTOR DR.	SANTA CLARA, CA 95051
31918	IEE/SCHADOW INC.	8081 WALLACE ROAD	EDEN PRAIRIE, MN 55343
32159	WEST-CAP ARIZONA	2201 E. ELVIRA ROAD	TUCSON, AZ 85706
32997	BOURNS, INC., TRIMPOT PRODUCTS DIV.	1200 COLUMBIA AVE.	RIVERSIDE, CA 92507
33096	COLORADO CRYSTAL CORPORATION	2303 W 8TH STREET	LOVELAND, CO 80537
50088	MOSTEK CORP.	1400 UPFIELD DR.	CARROLLTON, TX 75006
50434	HEWLETT-PACKARD COMPANY	640 PAGE MILL ROAD	PALO ALTO, CA 94304
50579	LITRONIX INC.	19000 HOMESTEAD RD.	CUPERTINO, CA 95014
52262	B AND H ELECTRONICS, INC., DBA MICRO COMPONENTS ASSOCIATES	202 E STEVENS ST., SUITE 6	SANTA ANA, CA 92707
55210	GETTIG ENG. AND MFG. COMPANY	PO BOX 85, OFF ROUTE 45	SPRING MILLS, PA 16875
55680	NICHICON/AMERICA/CORP.	6435 N PROESEL AVENUE	CHICAGO, IL 60645
56289	SPRAGUE ELECTRIC CO.	87 MARSHALL ST.	NORTH ADAMS, MA 01247
72982	ERIE TECHNOLOGICAL PRODUCTS, INC.	644 W. 12TH ST.	ERIE, PA 16512
74970	JOHNSON, E. F., CO.	299 10TH AVE. S. W.	WASECA, MN 56093
75378	CTS KNIGHTS, INC.	400 REIMANN AVE.	SANDWICH, IL 60548
75915	LITTELFUSE, INC.	800 E. NORTHWEST HWY	DES PLAINES, IL 60016
76493	BELL INDUSTRIES, INC., MILLER, J. W., DIV.	19070 REYES AVE., P O BOX 5825	COMPTON, CA 90224
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
91637	DALE ELECTRONICS, INC.	P. O. BOX 609	COLUMBUS, NE 68601
95275	VITRAMON, INC.	P O BOX 544	BRIDGEPORT, CT 06601

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A1	670-5102-01		CKT BOARD ASSY:MAIN	80009	670-5102-01
A1	670-5345-01		CKT BOARD ASSY:MAIN	80009	670-5345-01
	-----		(OPTION 01)		
A1	670-5427-01		CKT BOARD ASSY:MAIN	80009	670-5427-01
	-----		(OPTION 07)		
A2	670-5352-00		CKT BOARD ASSY:RESOLUTION MULTIPLIER	80009	670-5352-00
	-----		(OPTION 07)		
A2	670-5103-00		CKT BOARD ASSY:RESOLUTION MULTIPLIER	80009	670-5103-00
A3	670-5101-00		CKT BOARD ASSY:DISPLAY	80009	670-5101-00
A4	670-5104-03		CKT BOARD ASSY:PRESCALER	80009	670-5104-03
A1	-----		CKT BOARD ASSY:MAIN		
A1C1110	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
	-----		(OPTION 01 AND OPTION 07)		
A1C1112	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
	-----		(OPTION 01 AND OPTION 07)		
A1C1113	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A1C1114	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A1C1130	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A1C1132	290-0667-00		CAP.,FXD,ELCTLT:330UF,+75-10%,50V	56289	500D158
	-----		(OPTION 01 AND OPTION 07)		
A1C1150	290-0776-00		CAP.,FXD,ELCTLT:22UF,+50-10%,10V	55680	10ULA22V-T
A1C1160	290-0776-00		CAP.,FXD,ELCTLT:22UF,+50-10%,10V	55680	10ULA22V-T
A1C1168	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A1C1220	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A1C1230	290-0667-00		CAP.,FXD,ELCTLT:330UF,+75-10%,50V	56289	500D158
	-----		(OPTION 01 AND OPTION 07)		
A1C1250	290-0776-00		CAP.,FXD,ELCTLT:22UF,+50-10%,10V	55680	10ULA22V-T
A1C1290	283-0000-00		CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
A1C1292	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A1C1310	281-0081-00		CAP.,VAR,AIR DI:1.8-13PF,375VDC	74970	189-7506-005
A1C1354	281-0772-00		CAP.,FXD,CER DI:0.0047UF,10%,100V	04222	GC701C472K
A1C1356	281-0772-00		CAP.,FXD,CER DI:0.0047UF,10%,100V	04222	GC701C472K
A1C1420	281-0811-00		CAP.,FXD,CER DI:10PF,10%,100V	72982	8035D2AADC1G100K
A1C1421	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A1C1422	281-0564-00		CAP.,FXD,CER DI:24PF,5%,500V	72982	301-000C0G0240J
A1C1423	281-0630-00		CAP.,FXD,CER DI:390PF,5%,500V	72982	630000Y5D391J
A1C1424	281-0630-00		CAP.,FXD,CER DI:390PF,5%,500V	72982	630000Y5D391J
A1C1426	281-0773-00		CAP.,FXD,CER DI:0.01UF,10%,100V	04222	GC70-1C103K
A1C1430	281-0772-00		CAP.,FXD,CER DI:0.0047UF,10%,100V	04222	GC701C472K
A1C1440	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A1C1454	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A1C1456	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A1C1510	281-0773-00		CAP.,FXD,CER DI:0.01UF,10%,100V	04222	GC70-1C103K
A1C1512	281-0773-00		CAP.,FXD,CER DI:0.01UF,10%,100V	04222	GC70-1C103K
A1C1522	281-0812-00		CAP.,FXD,CER DI:1000PF,10%,100V	72982	8035D9AADX7R102K
A1C1526	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A1C1546	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A1C1558	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A1C1569	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A1C1580	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A1C1585	290-0718-00		CAP.,FXD,ELCTLT:22UF,20%,35V	56289	196D226X0035PE4
A1C1586	281-0773-00		CAP.,FXD,CER DI:0.01UF,10%,100V	04222	GC70-1C103K
A1C1589	281-0785-00		CAP.,FXD,CER DI:68PF,10%,100V	72982	8035D2AADC0G680K
A1C1590	290-0804-00		CAP.,FXD,ELCTLT:10UF,+50-10%,25V	55680	25ULA10V-T
A1C1592	281-0662-00		CAP.,FXD,CER DI:10PF,+/-0.5PF,500V	72982	301-000H3M0100D

Replaceable Electrical Parts—DC 508A

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A1C1593	290-0720-00		CAP., FXD, ELCTLT: 68UF, 20%, 15V	56289	196D686X0015PE3
A1C1594	281-0574-00		CAP., FXD, CER DI: 82PF, 10%, 500V	72982	308000S2H820K
A1C1596	281-0775-00		CAP., FXD, CER DI: 0.1UF, 20%, 50V	72982	8005D9AABZ5U104M
A1C1630	290-0804-00		CAP., FXD, ELCTLT: 10UF, +50-10%, 25V	55680	25ULA10V-T
A1C1634	281-0775-00		CAP., FXD, CER DI: 0.1UF, 20%, 50V	72982	8005D9AABZ5U104M
A1C1636	281-0772-00		CAP., FXD, CER DI: 0.0047UF, 10%, 100V	04222	GC701C472K
A1C1640	281-0775-00		CAP., FXD, CER DI: 0.1UF, 20%, 50V	72982	8005D9AABZ5U104M
A1C1673	281-0785-00		CAP., FXD, CER DI: 68PF, 10%, 100V	72982	8035D2AADCOG680K
A1C1690	283-0189-00		CAP., FXD, CER DI: 0.1UF, 20%, 400V	72982	8151N401X5R0104M
A1C1710	290-0746-00		CAP., FXD, ELCTLT: 47UF, +50-10%, 16V	55680	16U-47V-T
A1C1712	281-0775-00		CAP., FXD, CER DI: 0.1UF, 20%, 50V	72982	8005D9AABZ5U104M
A1C1720	290-0779-00		CAP., FXD, ELCTLT: 10UF, +50-10%, 50VDC	56289	502D237
A1C1728	281-0773-00		CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	GC70-1C103K
A1C1730	290-0776-00		CAP., FXD, ELCTLT: 22UF, +50-10%, 10V	55680	10ULA22V-T
A1C1756	281-0775-00		CAP., FXD, CER DI: 0.1UF, 20%, 50V	72982	8005D9AABZ5U104M
A1C1774	281-0775-00		CAP., FXD, CER DI: 0.1UF, 20%, 50V	72982	8005D9AABZ5U104M
A1C1790	290-0720-00		CAP., FXD, ELCTLT: 68UF, 20%, 15V	56289	196D686X0015PE3
A1C1792	290-0804-00		CAP., FXD, ELCTLT: 10UF, +50-10%, 25V	55680	25ULA10V-T
A1CR1120	152-0066-00		SEMICONV DEVICE: SILICON, 400V, 750MA	14433	LG4016
A1CR1160	152-0141-02		SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
A1CR1210	152-0585-00		SEMICONV DEVICE: SILICON, BRIDGE, 200V, 1A (OPTION 01 AND OPTION 07)	80009	152-0585-00
A1CR1260	152-0008-00		SEMICONV DEVICE: GERMANIUM, 75V, 60MA	14433	G1409
A1CR1290	152-0141-02		SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
A1CR1360	152-0008-00		SEMICONV DEVICE: GERMANIUM, 75V, 60MA	14433	G1409
A1CR1362	152-0141-02		SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
A1CR1390	152-0141-02		SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
A1CR1420	152-0141-02		SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
A1CR1440	152-0008-00		SEMICONV DEVICE: GERMANIUM, 75V, 60MA	14433	G1409
A1CR1460	152-0008-00		SEMICONV DEVICE: GERMANIUM, 75V, 60MA	14433	G1409
A1CR1520	152-0141-02		SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
A1CR1550	152-0333-00		SEMICONV DEVICE: SILICON, 55V, 200MA	07263	FDH-6012
A1CR1570	152-0141-02		SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
A1CR1640	152-0141-02		SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
A1CR1680	152-0141-02		SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
A1CR1710	152-0066-00		SEMICONV DEVICE: SILICON, 400V, 750MA	14433	LG4016
A1CR1720	152-0066-00		SEMICONV DEVICE: SILICON, 400V, 750MA	14433	LG4016
A1CR1722	152-0066-00		SEMICONV DEVICE: SILICON, 400V, 750MA	14433	LG4016
A1CR1790	152-0141-02		SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
A1L1588	108-0240-00		COIL, RF: FIXED, 820UH	76493	B5147
A1L1590	108-0317-00		COIL, RF: FIXED, 15UH	32159	71501M
A1L1713	108-0422-00		COIL, RF: FIXED, 82UH	80009	108-0422-00
A1Q1140	151-0301-00		TRANSISTOR: SILICON, PNP	27014	2N2907A
A1Q1142	151-0301-00		TRANSISTOR: SILICON, PNP	27014	2N2907A
A1Q1143	151-0301-00		TRANSISTOR: SILICON, PNP	27014	2N2907A
A1Q1150	151-0301-00		TRANSISTOR: SILICON, PNP	27014	2N2907A
A1Q1152	151-0188-00		TRANSISTOR: SILICON, PNP	04713	SPS6868K
A1Q1153	151-0301-00		TRANSISTOR: SILICON, PNP	27014	2N2907A
A1Q1154	151-0302-00		TRANSISTOR: SILICON, NPN	07263	S038487
A1Q1160	151-0503-00		SCR: SILICON, TO-92	04713	SCR5138
A1Q1170	151-0341-00		TRANSISTOR: SILICON, NPN	07263	S040065
A1Q1172	151-0341-00		TRANSISTOR: SILICON, NPN	07263	S040065
A1Q1180	151-0424-00		TRANSISTOR: SILICON, NPN	04713	SPS8246
A1Q1182	151-0424-00		TRANSISTOR: SILICON, NPN	04713	SPS8246
A1Q1240	151-0301-00		TRANSISTOR: SILICON, PNP	27014	2N2907A
A1Q1242	151-0301-00		TRANSISTOR: SILICON, PNP	27014	2N2907A
A1Q1243	151-0301-00		TRANSISTOR: SILICON, PNP	27014	2N2907A

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A1Q1250	151-0301-00		TRANSISTOR: SILICON, PNP	27014	2N2907A
A1Q1290	151-0190-00		TRANSISTOR: SILICON, NPN	07263	S032677
A1Q1350	151-0341-00		TRANSISTOR: SILICON, NPN	07263	S040065
A1Q1352	151-0341-00		TRANSISTOR: SILICON, NPN	07263	S040065
A1Q1420	151-0190-00		TRANSISTOR: SILICON, NPN	07263	S032677
A1Q1422	151-0190-00		TRANSISTOR: SILICON, NPN	07263	S032677
A1Q1460	151-0188-00		TRANSISTOR: SILICON, PNP	04713	SPS6868K
A1Q1520	151-0188-00		TRANSISTOR: SILICON, PNP	04713	SPS6868K
A1Q1522	151-0188-00		TRANSISTOR: SILICON, PNP	04713	SPS6868K
A1Q1550	151-0341-00		TRANSISTOR: SILICON, NPN	07263	S040065
A1Q1552	151-0188-00		TRANSISTOR: SILICON, PNP	04713	SPS6868K
A1Q1553	151-0188-00		TRANSISTOR: SILICON, PNP	04713	SPS6868K
A1Q1620	151-0463-00		TRANSISTOR: SILICON, PNP	80009	151-0463-00
A1Q1623	151-0302-00		TRANSISTOR: SILICON, NPN	07263	S038487
A1Q1624	151-0302-00		TRANSISTOR: SILICON, NPN	07263	S038487
A1Q1630	151-0341-00		TRANSISTOR: SILICON, NPN	07263	S040065
A1Q1632	151-0341-00		TRANSISTOR: SILICON, NPN	07263	S040065
A1Q1640	151-0342-00		TRANSISTOR: SILICON, PNP	07263	S035928
A1Q1642	151-0188-00		TRANSISTOR: SILICON, PNP	04713	SPS6868K
A1Q1643	151-0188-00		TRANSISTOR: SILICON, PNP	04713	SPS6868K
A1Q1660	151-0188-00		TRANSISTOR: SILICON, PNP	04713	SPS6868K
A1Q1730	151-0301-00		TRANSISTOR: SILICON, PNP	27014	2N2907A
A1Q1732	151-0504-00		TRANSISTOR: SILICON, N-CHAN, UNIJUNCTION	04713	2N4851
A1Q1733	151-0302-00		TRANSISTOR: SILICON, NPN	07263	S038487
A1Q1790	151-1103-00		TRANSISTOR: SILICON, FE, N-CHANNEL	18324	SD210EE
A1Q1792	151-0190-00		TRANSISTOR: SILICON, NPN	07263	S032677
A1R1120	308-0240-00		RES., FXD, WW: 2 OHM, 5%, 3W	91637	RS2B-D2R000J
A1R1122	315-0750-00		RES., FXD, CMPSN: 75 OHM, 5%, 0.25W	01121	CB7505
A1R1123	315-0750-00		RES., FXD, CMPSN: 75 OHM, 5%, 0.25W	01121	CB7505
A1R1124	315-0750-00		RES., FXD, CMPSN: 75 OHM, 5%, 0.25W	01121	CB7505
A1R1125	315-0750-00		RES., FXD, CMPSN: 75 OHM, 5%, 0.25W	01121	CB7505
A1R1126	315-0750-00		RES., FXD, CMPSN: 75 OHM, 5%, 0.25W	01121	CB7505
A1R1128	315-0750-00		RES., FXD, CMPSN: 75 OHM, 5%, 0.25W	01121	CB7505
A1R1129	315-0750-00		RES., FXD, CMPSN: 75 OHM, 5%, 0.25W	01121	CB7505
A1R1131	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1132	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1140	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1142	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1143	315-0151-00		RES., FXD, CMPSN: 150 OHM, 5%, 0.25W	01121	CB1515
A1R1150	315-0361-00		RES., FXD, CMPSN: 360 OHM, 5%, 0.25W	01121	CB3615
A1R1160	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
A1R1162	315-0202-00		RES., FXD, CMPSN: 2K OHM, 5%, 0.25W	01121	CB2025
A1R1163	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1164	315-0512-00		RES., FXD, CMPSN: 5.1K OHM, 5%, 0.25W	01121	CB5125
A1R1166	315-0202-00		RES., FXD, CMPSN: 2K OHM, 5%, 0.25W	01121	CB2025
A1R1170	315-0123-00		RES., FXD, CMPSN: 12K OHM, 5%, 0.25W	01121	CB1235
A1R1172	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1173	315-0512-00		RES., FXD, CMPSN: 5.1K OHM, 5%, 0.25W	01121	CB5125
A1R1174	315-0301-00		RES., FXD, CMPSN: 300 OHM, 5%, 0.25W	01121	CB3015
A1R1182	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1183	315-0512-00		RES., FXD, CMPSN: 5.1K OHM, 5%, 0.25W	01121	CB5125
A1R1190	315-0512-00		RES., FXD, CMPSN: 5.1K OHM, 5%, 0.25W	01121	CB5125
A1R1224	301-0271-00		RES., FXD, CMPSN: 270 OHM, 5%, 0.50W	01121	EB2715
A1R1230	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
A1R1232	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1234	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1240	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025

Replaceable Electrical Parts—DC 508A

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A1R1241	315-0272-00		RES., FXD, CMPSN: 2.7K OHM, 5%, 0.25W	01121	CB2725
A1R1242	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1243	315-0272-00		RES., FXD, CMPSN: 2.7K OHM, 5%, 0.25W	01121	CB2725
A1R1244	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1245	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1246	315-0272-00		RES., FXD, CMPSN: 2.7K OHM, 5%, 0.25W	01121	CB2725
A1R1247	315-0272-00		RES., FXD, CMPSN: 2.7K OHM, 5%, 0.25W	01121	CB2725
A1R1248	315-0272-00		RES., FXD, CMPSN: 2.7K OHM, 5%, 0.25W	01121	CB2725
A1R1249	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1250	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1251	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1252	315-0272-00		RES., FXD, CMPSN: 2.7K OHM, 5%, 0.25W	01121	CB2725
A1R1253	315-0272-00		RES., FXD, CMPSN: 2.7K OHM, 5%, 0.25W	01121	CB2725
A1R1254	315-0272-00		RES., FXD, CMPSN: 2.7K OHM, 5%, 0.25W	01121	CB2725
A1R1256	315-0512-00		RES., FXD, CMPSN: 5.1K OHM, 5%, 0.25W	01121	CB5125
A1R1257	315-0272-00		RES., FXD, CMPSN: 2.7K OHM, 5%, 0.25W	01121	CB2725
A1R1258	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1290	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1312	315-0201-00		RES., FXD, CMPSN: 200 OHM, 5%, 0.25W	01121	CB2015
A1R1350	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1352	315-0512-00		RES., FXD, CMPSN: 5.1K OHM, 5%, 0.25W	01121	CB5125
A1R1353	315-0333-00		RES., FXD, CMPSN: 33K OHM, 5%, 0.25W	01121	CB3335
A1R1358	315-0333-00		RES., FXD, CMPSN: 33K OHM, 5%, 0.25W	01121	CB3335
A1R1370	315-0301-00		RES., FXD, CMPSN: 300 OHM, 5%, 0.25W	01121	CB3015
A1R1385	307-0445-00		RES, NTWK, FXD, FI: 4.7K OHM, 20%, (9) RES	91637	MSP10A01-472M
A1R1390	315-0271-00		RES., FXD, CMPSN: 270 OHM, 5%, 0.25W	01121	CB2715
A1R1392	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1393	315-0202-00		RES., FXD, CMPSN: 2K OHM, 5%, 0.25W	01121	CB2025
A1R1410	301-0560-00		RES., FXD, CMPSN: 56 OHM, 5%, 0.50W	01121	EB5605
A1R1412	315-0361-00		RES., FXD, CMPSN: 360 OHM, 5%, 0.25W	01121	CB3615
A1R1413	315-0183-00		RES., FXD, CMPSN: 18K OHM, 5%, 0.25W	01121	CB1835
A1R1420	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
A1R1421	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1424	315-0152-00		RES., FXD, CMPSN: 1.5K OHM, 5%, 0.25W	01121	CB1525
A1R1428	315-0562-00		RES., FXD, CMPSN: 5.6K OHM, 5%, 0.25W	01121	CB5625
A1R1429	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1432	315-0393-00		RES., FXD, CMPSN: 39K OHM, 5%, 0.25W	01121	CB3935
A1R1435	307-0445-00		RES, NTWK, FXD, FI: 4.7K OHM, 20%, (9) RES	91637	MSP10A01-472M
A1R1442	315-0470-00		RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
A1R1445	307-0445-00		RES, NTWK, FXD, FI: 4.7K OHM, 20%, (9) RES	91637	MSP10A01-472M
A1R1450	315-0332-00		RES., FXD, CMPSN: 3.3K OHM, 5%, 0.25W	01121	CB3325
A1R1452	315-0152-00		RES., FXD, CMPSN: 1.5K OHM, 5%, 0.25W	01121	CB1525
A1R1455	315-0222-00		RES., FXD, CMPSN: 2.2K OHM, 5%, 0.25W	01121	CB2225
A1R1457	315-0512-00		RES., FXD, CMPSN: 5.1K OHM, 5%, 0.25W	01121	CB5125
A1R1458	315-0512-00		RES., FXD, CMPSN: 5.1K OHM, 5%, 0.25W	01121	CB5125
A1R1462	315-0222-00		RES., FXD, CMPSN: 2.2K OHM, 5%, 0.25W	01121	CB2225
A1R1464	315-0301-00		RES., FXD, CMPSN: 300 OHM, 5%, 0.25W	01121	CB3015
A1R1470	315-0301-00		RES., FXD, CMPSN: 300 OHM, 5%, 0.25W	01121	CB3015
A1R1472	315-0301-00		RES., FXD, CMPSN: 300 OHM, 5%, 0.25W	01121	CB3015
A1R1523	315-0472-00		RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
A1R1524	315-0362-00		RES., FXD, CMPSN: 3.6K OHM, 5%, 0.25W	01121	CB3625
A1R1543	315-0512-00		RES., FXD, CMPSN: 5.1K OHM, 5%, 0.25W	01121	CB5125
A1R1544	315-0512-00		RES., FXD, CMPSN: 5.1K OHM, 5%, 0.25W	01121	CB5125
A1R1548	315-0561-00		RES., FXD, CMPSN: 560 OHM, 5%, 0.25W	01121	CB5615
A1R1549	315-0221-00		RES., FXD, CMPSN: 220 OHM, 5%, 0.25W	01121	CB2215
A1R1550	315-0561-00		RES., FXD, CMPSN: 560 OHM, 5%, 0.25W	01121	CB5615
A1R1552	315-0300-00		RES., FXD, CMPSN: 30 OHM, 5%, 0.25W	01121	CB3005

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A1R1553	315-0300-00		RES., FXD, CMPSN: 30 OHM, 5%, 0.25W	01121	CB3005
A1R1554	315-0561-00		RES., FXD, CMPSN: 560 OHM, 5%, 0.25W	01121	CB5615
A1R1560	315-0561-00		RES., FXD, CMPSN: 560 OHM, 5%, 0.25W	01121	CB5615
A1R1562	315-0511-00		RES., FXD, CMPSN: 510 OHM, 5%, 0.25W	01121	CB5115
A1R1563	315-0561-00		RES., FXD, CMPSN: 560 OHM, 5%, 0.25W	01121	CB5615
A1R1564	315-0561-00		RES., FXD, CMPSN: 560 OHM, 5%, 0.25W	01121	CB5615
A1R1565	315-0302-00		RES., FXD, CMPSN: 3K OHM, 5%, 0.25W	01121	CB3025
A1R1566	315-0561-00		RES., FXD, CMPSN: 560 OHM, 5%, 0.25W	01121	CB5615
A1R1568	315-0561-00		RES., FXD, CMPSN: 560 OHM, 5%, 0.25W	01121	CB5615
A1R1572	315-0681-00		RES., FXD, CMPSN: 680 OHM, 5%, 0.25W	01121	CB6815
A1R1573	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1576	315-0271-00		RES., FXD, CMPSN: 270 OHM, 5%, 0.25W	01121	CB2715
A1R1578	315-0271-00		RES., FXD, CMPSN: 270 OHM, 5%, 0.25W	01121	CB2715
A1R1583	315-0271-00		RES., FXD, CMPSN: 270 OHM, 5%, 0.25W	01121	CB2715
A1R1584	315-0181-00		RES., FXD, CMPSN: 180 OHM, 5%, 0.25W	01121	CB1815
A1R1587	315-0121-00		RES., FXD, CMPSN: 120 OHM, 5%, 0.25W	01121	CB1215
A1R1592	315-0104-00		RES., FXD, CMPSN: 100K OHM, 5%, 0.25W	01121	CB1045
A1R1593	321-0807-00		RES., FXD, FILM: 900K OHM, 1%, 0.125W	91637	HFF1104F90002F
A1R1594	321-0617-00		RES., FXD, FILM: 111K OHM, 1%, 0.125W	91637	MFF1816G11102F
A1R1596	321-0481-00		RES., FXD, FILM: 1M OHM, 1%, 0.125W	24546	NA4D1004F
A1R1610	315-0162-00		RES., FXD, CMPSN: 1.6K OHM, 5%, 0.25W	01121	CB1625
A1R1612	321-0225-00		RES., FXD, FILM: 2.15K OHM, 1%, 0.125W	91637	MFF1816G21500F
A1R1620	321-0260-00		RES., FXD, FILM: 4.99K OHM, 1%, 0.125W	91637	MFF1816G49900F
A1R1622	321-0291-00		RES., FXD, FILM: 10.5K OHM, 1%, 0.125W	91637	MFF1816G10501F
A1R1623	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1624	321-0300-00		RES., FXD, FILM: 13K OHM, 1%, 0.125W	91637	MFF1816G13001F
A1R1626	321-0222-00		RES., FXD, FILM: 2K OHM, 1%, 0.125W	91637	MFF1816G20000F
A1R1630	315-0202-00		RES., FXD, CMPSN: 2K OHM, 5%, 0.25W	01121	CB2025
A1R1632	315-0123-00		RES., FXD, CMPSN: 12K OHM, 5%, 0.25W	01121	CB1235
A1R1633	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1642	315-0474-00		RES., FXD, CMPSN: 470K OHM, 5%, 0.25W	01121	CB4745
A1R1643	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
A1R1644	315-0512-00		RES., FXD, CMPSN: 5.1K OHM, 5%, 0.25W	01121	CB5125
A1R1650	315-0511-00		RES., FXD, CMPSN: 510 OHM, 5%, 0.25W	01121	CB5115
A1R1652	315-0240-00		RES., FXD, CMPSN: 24 OHM, 5%, 0.25W	01121	CB2405
A1R1653	315-0300-00		RES., FXD, CMPSN: 30 OHM, 5%, 0.25W	01121	CB3005
A1R1654	315-0561-00		RES., FXD, CMPSN: 560 OHM, 5%, 0.25W	01121	CB5615
A1R1655	315-0391-00		RES., FXD, CMPSN: 390 OHM, 5%, 0.25W	01121	CB3915
A1R1656	315-0561-00		RES., FXD, CMPSN: 560 OHM, 5%, 0.25W	01121	CB5615
A1R1658	315-0561-00		RES., FXD, CMPSN: 560 OHM, 5%, 0.25W	01121	CB5615
A1R1660	315-0151-00		RES., FXD, CMPSN: 150 OHM, 5%, 0.25W	01121	CB1515
A1R1670	315-0561-00		RES., FXD, CMPSN: 560 OHM, 5%, 0.25W	01121	CB5615
A1R1672	315-0561-00		RES., FXD, CMPSN: 560 OHM, 5%, 0.25W	01121	CB5615
A1R1674	315-0390-00		RES., FXD, CMPSN: 39 OHM, 5%, 0.25W	01121	CB3905
A1R1676	315-0101-00		RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
A1R1680	315-0561-00		RES., FXD, CMPSN: 560 OHM, 5%, 0.25W	01121	CB5615
A1R1682	315-0162-00		RES., FXD, CMPSN: 1.6K OHM, 5%, 0.25W	01121	CB1625
A1R1683	315-0162-00		RES., FXD, CMPSN: 1.6K OHM, 5%, 0.25W	01121	CB1625
A1R1684	315-0221-00		RES., FXD, CMPSN: 220 OHM, 5%, 0.25W	01121	CB2215
A1R1690	315-0101-00		RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
A1R1692	315-0221-00		RES., FXD, CMPSN: 220 OHM, 5%, 0.25W	01121	CB2215
A1R1710	308-0244-00		RES., FXD, WW: 0.3 OHM, 10%, 2W	91637	RS2B162ER3000K
A1R1714	321-0260-00		RES., FXD, FILM: 4.99K OHM, 1%, 0.125W	91637	MFF1816G49900F
A1R1720	315-0152-00		RES., FXD, CMPSN: 1.5K OHM, 5%, 0.25W	01121	CB1525
A1R1722	315-0132-00		RES., FXD, CMPSN: 1.3K OHM, 5%, 0.25W	01121	CB1325
A1R1723	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A1R1724	315-0101-00		RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015

Replaceable Electrical Parts—DC 508A

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
AIR1726	308-0441-00		RES., FXD, WW:3 OHM, 5%, 3W	91637	CW2B-3R00J
AIR1729	307-0023-00		RES., FXD, CMPSN:4.7 OHM, 10%, 0.50W	01121	EB47G1
AIR1730	315-0102-00		RES., FXD, CMPSN:1K OHM, 5%, 0.25W	01121	CB1025
AIR1732	315-0102-00		RES., FXD, CMPSN:1K OHM, 5%, 0.25W	01121	CB1025
AIR1734	315-0102-00		RES., FXD, CMPSN:1K OHM, 5%, 0.25W	01121	CB1025
AIR1736	315-0102-00		RES., FXD, CMPSN:1K OHM, 5%, 0.25W	01121	CB1025
AIR1738	315-0512-00		RES., FXD, CMPSN:5.1K OHM, 5%, 0.25W	01121	CB5125
AIR1739	315-0200-00		RES., FXD, CMPSN:20 OHM, 5%, 0.25W	01121	CB2005
AIR1740	315-0153-00		RES., FXD, CMPSN:15K OHM, 5%, 0.25W	01121	CB1535
AIR1742	315-0300-00		RES., FXD, CMPSN:30 OHM, 5%, 0.25W	01121	CB3005
AIR1750	315-0561-00		RES., FXD, CMPSN:560 OHM, 5%, 0.25W	01121	CB5615
AIR1752	315-0561-00		RES., FXD, CMPSN:560 OHM, 5%, 0.25W	01121	CB5615
AIR1753	315-0302-00		RES., FXD, CMPSN:3K OHM, 5%, 0.25W	01121	CB3025
AIR1754	315-0681-00		RES., FXD, CMPSN:680 OHM, 5%, 0.25W	01121	CB6815
AIR1755	315-0391-00		RES., FXD, CMPSN:390 OHM, 5%, 0.25W	01121	CB3915
AIR1758	315-0391-00		RES., FXD, CMPSN:390 OHM, 5%, 0.25W	01121	CB3915
AIR1759	315-0681-00		RES., FXD, CMPSN:680 OHM, 5%, 0.25W	01121	CB6815
AIR1760	315-0561-00		RES., FXD, CMPSN:560 OHM, 5%, 0.25W	01121	CB5615
AIR1762	315-0561-00		RES., FXD, CMPSN:560 OHM, 5%, 0.25W	01121	CB5615
AIR1763	315-0561-00		RES., FXD, CMPSN:560 OHM, 5%, 0.25W	01121	CB5615
AIR1770	315-0561-00		RES., FXD, CMPSN:560 OHM, 5%, 0.25W	01121	CB5615
AIR1772	315-0302-00		RES., FXD, CMPSN:3K OHM, 5%, 0.25W	01121	CB3025
AIR1773	315-0561-00		RES., FXD, CMPSN:560 OHM, 5%, 0.25W	01121	CB5615
AIR1775	315-0271-00		RES., FXD, CMPSN:270 OHM, 5%, 0.25W	01121	CB2715
AIR1776	315-0162-00		RES., FXD, CMPSN:1.6K OHM, 5%, 0.25W	01121	CB1625
AIR1778	315-0162-00		RES., FXD, CMPSN:1.6K OHM, 5%, 0.25W	01121	CB1625
AIR1780	315-0221-00		RES., FXD, CMPSN:220 OHM, 5%, 0.25W	01121	CB2215
AIR1782	315-0221-00		RES., FXD, CMPSN:220 OHM, 5%, 0.25W	01121	CB2215
AIR1783	315-0561-00		RES., FXD, CMPSN:560 OHM, 5%, 0.25W	01121	CB5615
AIR1784	315-0391-00		RES., FXD, CMPSN:390 OHM, 5%, 0.25W	01121	CB3915
AIR1790	315-0510-00		RES., FXD, CMPSN:51 OHM, 5%, 0.25W	01121	CB5105
AIR1792	315-0182-00		RES., FXD, CMPSN:1.8K OHM, 5%, 0.25W	01121	CB1825
AIR1793	315-0681-00		RES., FXD, CMPSN:680 OHM, 5%, 0.25W	01121	CB6815
AIR1794	315-0272-00		RES., FXD, CMPSN:2.7K OHM, 5%, 0.25W	01121	CB2725
AIR1796	305-0470-00		RES., FXD, CMPSN:47 OHM, 5%, 2W	01121	HB4705
AIS1320	260-1849-01		SWITCH, PUSH:DPDT, 4A, 250VAC	31918	OBD
AIS1550	260-1421-00		SWITCH, PUSH:1 STA, MOMENTARY, NON-SHORT	80009	260-1421-00
AIS1570	260-1208-00		SWITCH, PUSH:DPDT, 28VDC, PUSH-PUSH	80009	260-1208-00
AIS1590A-C	260-1448-00		SWITCH, PUSH:3 STA, NON-SHORT	80009	260-1448-00
AIU1110	156-0926-00		MICROCIRCUIT, LI:VOLTAGE REGULATOR (OPTION 01)	07263	MICROA7824UC
AIU1112	156-0988-00		MICROCIRCUIT, LI:REGULATOR	27014	LM340T-15
AIU1130	156-0128-00		MICROCIRCUIT, DI:SGL BCD TO 7-SEG DCDR/DRV	80009	156-0128-00
AIU1170	156-0032-00		MICROCIRCUIT, DI:4-BIT BINARY COUNTER	80009	156-0032-00
AIU1190	156-0079-00		MICROCIRCUIT, DI:DECADE COUNTER, TTL	80009	156-0079-00
AIU1230A-D	156-0140-00		MICROCIRCUIT, DI:HEX BFR, 15V, TTL	80009	156-0140-00
AIU1260A-C	156-0178-00		MICROCIRCUIT, DI:TRIPLE 3-INPUT NOR GATE	01295	SN7427N
AIU1270A, B	156-0041-00		MICROCIRCUIT, DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N
AIU1280	156-0410-00		MICROCIRCUIT, DI:COUNTER TIME BASE	50088	MK5009P
AIU1330	155-0119-00		MICROCIRCUIT, DI:BCD COUNTER	80009	155-0119-00
AIU1360A, B	156-0041-00		MICROCIRCUIT, DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N
AIU1430	156-0079-00		MICROCIRCUIT, DI:DECADE COUNTER, TTL	80009	156-0079-00
AIU1440A, B	156-0910-00		MICROCIRCUIT, DI:DUAL DECADE COUNTER	80009	156-0910-00
AIU1510	156-0071-00		MICROCIRCUIT, LI:VOLTAGE REGULATOR	04713	MC1723CL
AIU1520	156-0067-00		MICROCIRCUIT, LI:OPERATIONAL AMPLIFIER	02735	85145
AIU1530A, B	156-0405-00		MICROCIRCUIT, DI:DUAL RETRIG MONOSTABLE MV	07263	9602 (PC OR DC)
AIU1532A-C	156-0043-00		MICROCIRCUIT, DI:QUAD 2-INPUT POS NOR GATE	80009	156-0043-00

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A1U1533A-D	156-0150-00		MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR	01295	SN7437N
A1U1550	156-0642-00		MICROCIRCUIT,DI:BI-QUINARY CNTR	04713	MC10138L
A1U1570A-D	156-0205-00		MICROCIRCUIT,DI:QUAD 2-INPUT NOR GATE	80009	156-0205-00
A1U1660A,B	156-0880-00		MICROCIRCUIT,DI:DUAL D MASTER SLAVE FF	80009	156-0880-00
A1U1670A-C	156-0369-00		MICROCIRCUIT,DI:TRIPLE LINE RECEIVER	80009	156-0369-00
A1U1740A,B	156-0230-00		MICROCIRCUIT,DI:DUAL D MA-SLAVE FLIP-FLOP	80009	156-0230-00
A1U1760A-D	156-0205-00		MICROCIRCUIT,DI:QUAD 2-INPUT NOR GATE	80009	156-0205-00
A1VR1230	152-0279-00		SEMICONV DEVICE:ZENER,0.4W,5.1V,5%	04713	SZG35010RL
A1VR1310	152-0168-00		SEMICONV DEVICE:ZENER,0.4W,12V,5%	04713	SZG35009K4
A1W1180	131-0566-00		BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A1W1222	131-0566-00		BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A1W1223	131-0566-00		BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A1W1259	131-0566-00		BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A1W1312	131-0566-00		BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A1W1566	131-0566-00		BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A1W1638	131-0566-00		BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A1Y1410	158-0129-00		XTAL UNIT,QTZ:10MHZ,0.001%,PARALLEL	33096	PB1109
A1Y1430	119-0894-00		OSCILLATOR,RF:10MHZ,24VDC	75378	970-1937-0
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Replaceable Electrical Parts—DC 508A

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A2	-----		CKT BOARD ASSY:RESOLUTION MULTIPLIER		
A2C4120	283-0194-00		CAP.,FXD,CER DI:4.7UF,20%,50V	72982	8151N057Z5U0475M
A2C4122	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A2C4130	281-0638-00		CAP.,FXD,CER DI:240PF,5%,500V	72982	301000Z5D241J
A2C4132	281-0814-00		CAP.,FXD,CER DI:100PF,10%,100V	04222	GC70-1-A101K
A2C4320	290-0255-00		CAP.,FXD,ELCTLT:20UF,50V	56289	30D206G050CC9
A2C4321	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A2C4322	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A2C4330	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A2C4330	-----		(OPTION 07)		
A2C4340	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A2Q4110	151-0190-00		TRANSISTOR:SILICON,NPN	07263	S032677
A2Q4120	151-0188-00		TRANSISTOR:SILICON,PNP	04713	SPS6868K
A2Q4240	151-0301-00		TRANSISTOR:SILICON,PNP	27014	2N2907A
A2Q4242	151-0301-00		TRANSISTOR:SILICON,PNP	27014	2N2907A
A2Q4310	151-0188-00		TRANSISTOR:SILICON,PNP	04713	SPS6868K
A2Q4312	151-0190-00		TRANSISTOR:SILICON,NPN	07263	S032677
A2R4110	315-0512-00		RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A2R4112	315-0471-00		RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A2R4114	315-0393-00		RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
A2R4120	315-0103-00		RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A2R4122	315-0682-00		RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
A2R4124	315-0154-00		RES.,FXD,CMPSN:150K OHM,5%,0.25W	01121	CB1545
A2R4134	315-0162-00		RES.,FXD,CMPSN:1.6K OHM,5%,0.25W	01121	CB1625
A2R4140	315-0107-00		RES.,FXD,CMPSN:100M OHM,5%,0.25W	01121	CB1075
A2R4142	315-0102-00		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A2R4150	315-0512-00		RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A2R4210	315-0271-00		RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
A2R4212	315-0821-00		RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
A2R4214	315-0181-00		RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
A2R4216	315-0102-00		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A2R4218	315-0201-00		RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A2R4220	315-0103-00		RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A2R4222	315-0103-00		RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A2R4224	315-0224-00		RES.,FXD,CMPSN:220K OHM,5%,0.25W	01121	CB2245
A2R4230	315-0561-00		RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
A2R4240	315-0270-00		RES.,FXD,CMPSN:27 OHM,5%,0.25W	01121	CB2705
A2R4250	315-0512-00		RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A2R4310	315-0361-00		RES.,FXD,CMPSN:360 OHM,5%,0.25W	01121	CB3615
A2R4332	315-0201-00		RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A2R4334	315-0101-00		RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A2R4342	315-0102-00		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A2R4344	315-0102-00		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A2U4130	156-0352-00		MICROCIRCUIT,DI:DUAL COMPL PAIR PLUS INVER	02735	CD4007AE
A2U4140A-D	156-0057-00		MICROCIRCUIT,DI:QUAD 2-INPUT NAND GATE	01295	SN7401N OR J
A2U4220	156-0112-00		MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND GATE	80009	156-0112-00
A2U4230	156-0704-00		MICROCIRCUIT,LI:PHASE LOCK LOOP	04713	MC14046CP
A2U4240A-F	156-0058-00		MICROCIRCUIT,DI:HEX. INVERTER	80009	156-0058-00
A2U4322	156-0910-00		MICROCIRCUIT,DI:DUAL DECADE COUNTER	80009	156-0910-00
A2U4330	156-0731-00		MICROCIRCUIT,DI:DUAL J-K FF W/PRESET & CLR	01295	SN74LS76A
A2U4340A-D	156-0057-00		MICROCIRCUIT,DI:QUAD 2-INPUT NAND GATE	01295	SN7401N OR J
A2VR4310	152-0055-00		SEMICOND DEVICE:ZENER,0.4W,11V,5%	04713	SZG35009K1

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A3	-----		CKT BOARD ASSY:DISPLAY		
A3DS3210	150-1036-00		LAMP,LED:RED,3.0V,40MA	01295	TIL 209A
A3DS3220	150-1036-00		LAMP,LED:RED,3.0V,40MA	01295	TIL 209A
A3DS3224	150-1036-00		LAMP,LED:RED,3.0V,40MA	01295	TIL 209A
A3DS3230	150-1036-00		LAMP,LED:RED,3.0V,40MA	01295	TIL 209A
A3U3110	150-1025-00		LAMP,LED,DSPL:3 DIGIT,7 SEGMENT,RED	50579	DL883A
A3U3120	150-1025-00		LAMP,LED,DSPL:3 DIGIT,7 SEGMENT,RED	50579	DL883A
A3U3130	150-1025-00		LAMP,LED,DSPL:3 DIGIT,7 SEGMENT,RED	50579	DL883A
A4	-----		CKT BOARD ASSY:PRESCALER		
A4C2110	283-0324-00		CAP.,FXD,CER DI:0.01UF,+80-20%,50V	72982	A01AA9AZLW5R103Z
A4C2121	283-0324-00		CAP.,FXD,CER DI:0.01UF,+80-20%,50V	72982	A01AA9AZLW5R103Z
A4C2122	281-0812-00		CAP.,FXD,CER DI:1000PF,10%,100V	72982	8035D9AADX7R102K
A4C2127	283-0252-00		CAP.,FXD,CER DI:1000PF,10%,50V	72982	A01ALOAZLW5R102K
A4C2128	283-0353-00		CAP.,FXD,CER DI:0.1UF,10%,50V	95275	VJ1210Y104K-H
A4C2131	283-0324-00		CAP.,FXD,CER DI:0.01UF,+80-20%,50V	72982	A01AA9AZLW5R103Z
A4C2133	281-0812-00		CAP.,FXD,CER DI:1000PF,10%,100V	72982	8035D9AADX7R102K
A4C2137	283-0252-00		CAP.,FXD,CER DI:1000PF,10%,50V	72982	A01ALOAZLW5R102K
A4C2141	283-0324-00		CAP.,FXD,CER DI:0.01UF,+80-20%,50V	72982	A01AA9AZLW5R103Z
A4C2143	281-0812-00		CAP.,FXD,CER DI:1000PF,10%,100V	72982	8035D9AADX7R102K
A4C2147	283-0252-00		CAP.,FXD,CER DI:1000PF,10%,50V	72982	A01ALOAZLW5R102K
A4C2148	283-0353-00		CAP.,FXD,CER DI:0.1UF,10%,50V	95275	VJ1210Y104K-H
A4C2151	283-0324-00		CAP.,FXD,CER DI:0.01UF,+80-20%,50V	72982	A01AA9AZLW5R103Z
A4C2153	281-0812-00		CAP.,FXD,CER DI:1000PF,10%,100V	72982	8035D9AADX7R102K
A4C2157	283-0252-00		CAP.,FXD,CER DI:1000PF,10%,50V	72982	A01ALOAZLW5R102K
A4C2211	283-0252-00		CAP.,FXD,CER DI:1000PF,10%,50V	72982	A01ALOAZLW5R102K
A4C2212	283-0252-00		CAP.,FXD,CER DI:1000PF,10%,50V	72982	A01ALOAZLW5R102K
A4C2213	283-0252-00		CAP.,FXD,CER DI:1000PF,10%,50V	72982	A01ALOAZLW5R102K
A4C2214	283-0252-00		CAP.,FXD,CER DI:1000PF,10%,50V	72982	A01ALOAZLW5R102K
A4C2215	283-0252-00		CAP.,FXD,CER DI:1000PF,10%,50V	72982	A01ALOAZLW5R102K
A4C2230	283-0252-00		CAP.,FXD,CER DI:1000PF,10%,50V	72982	A01ALOAZLW5R102K
A4C2240	283-0252-00		CAP.,FXD,CER DI:1000PF,10%,50V	72982	A01ALOAZLW5R102K
A4C2250	283-0252-00		CAP.,FXD,CER DI:1000PF,10%,50V	72982	A01ALOAZLW5R102K
A4C2264	283-0324-00		CAP.,FXD,CER DI:0.01UF,+80-20%,50V	72982	A01AA9AZLW5R103Z
A4C2322	283-0324-00		CAP.,FXD,CER DI:0.01UF,+80-20%,50V	72982	A01AA9AZLW5R103Z
A4C2324	281-0773-00		CAP.,FXD,CER DI:0.01UF,10%,100V	04222	GC70-1C103K
A4C2332	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A4C2336	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A4C2340	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A4C2344	283-0353-00		CAP.,FXD,CER DI:0.1UF,10%,50V	95275	VJ1210Y104K-H
A4C2350	283-0324-00		CAP.,FXD,CER DI:0.01UF,+80-20%,50V	72982	A01AA9AZLW5R103Z
A4C2354	283-0324-00		CAP.,FXD,CER DI:0.01UF,+80-20%,50V	72982	A01AA9AZLW5R103Z
A4C2360	283-0324-00		CAP.,FXD,CER DI:0.01UF,+80-20%,50V	72982	A01AA9AZLW5R103Z
A4C2362	283-0265-00		CAP.,FXD,CER DI:3.35PF,+/-1.5PF	72982	A02BL9A4LCOG339B
A4C2430	283-0324-00		CAP.,FXD,CER DI:0.01UF,+80-20%,50V	72982	A01AA9AZLW5R103Z
A4C2455	281-0773-00		CAP.,FXD,CER DI:0.01UF,10%,100V	04222	GC70-1C103K
A4C2460	283-0324-00		CAP.,FXD,CER DI:0.01UF,+80-20%,50V	72982	A01AA9AZLW5R103Z
A4C2464	283-0324-00		CAP.,FXD,CER DI:0.01UF,+80-20%,50V	72982	A01AA9AZLW5R103Z
A4C5030	281-0649-00		CAP.,FXD,CER DI:1000PF,+80-20%,500V	72982	2404039X5V102Z
A4C5032	281-0649-00		CAP.,FXD,CER DI:1000PF,+80-20%,500V	72982	2404039X5V102Z
A4C5034	281-0649-00		CAP.,FXD,CER DI:1000PF,+80-20%,500V	72982	2404039X5V102Z
A4C5038	281-0649-00		CAP.,FXD,CER DI:1000PF,+80-20%,500V	72982	2404039X5V102Z
A4CR2162	152-0066-00		SEMICONV DEVICE:SILICON,400V,750MA	14433	LG4016
A4CR2211	152-0524-00		SEMICONV DEVICE:SILICON,100V,100MA	80009	152-0524-00

Replaceable Electrical Parts—DC 508A

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscnt	Name & Description	Mfr Code	Mfr Part Number
A4CR2213	152-0524-00		SEMICON D DEVICE: SILICON, 100V, 100MA	80009	152-0524-00
A4CR2214	152-0524-00		SEMICON D DEVICE: SILICON, 100V, 100MA	80009	152-0524-00
A4CR2216	152-0322-00		SEMICON D DEVICE: SILICON, 15V, HOT CARRIER	50434	5082-2672
A4CR2218	152-0322-00		SEMICON D DEVICE: SILICON, 15V, HOT CARRIER	50434	5082-2672
A4CR2335	152-0141-02		SEMICON D DEVICE: SILICON, 30V, 150MA	01295	1N4152R
A4CR2420	152-0066-00		SEMICON D DEVICE: SILICON, 400V, 750MA	14433	LG4016
A4CR2460	152-0322-00		SEMICON D DEVICE: SILICON, 15V, HOT CARRIER	50434	5082-2672
A4CR2462	152-0322-00		SEMICON D DEVICE: SILICON, 15V, HOT CARRIER	50434	5082-2672
A4CR4210	152-0333-00		SEMICON D DEVICE: SILICON, 55V, 200MA	07263	FDH-6012
A4CR4330	152-0333-00		SEMICON D DEVICE: SILICON, 55V, 200MA	07263	FDH-6012
A4L2210	108-0509-00		COIL, RF: 2.45UH	80009	108-0509-00
A4L2214	108-0245-00		COIL, RF: 3.9UH	76493	B6310-1
A4L2215	108-0245-00		COIL, RF: 3.9UH	76493	B6310-1
A4L2216	108-0245-00		COIL, RF: 3.9UH	76493	B6310-1
A4L2218	108-0245-00		COIL, RF: 3.9UH	76493	B6310-1
A4L2344	108-0509-00		COIL, RF: 2.45UH	80009	108-0509-00
A4L2362	108-0170-01		COIL, RF: FIXED, 36ONH	80009	108-0170-01
A4L2420	108-0509-00		COIL, RF: 2.45UH	80009	108-0509-00
A4L2426	108-0509-00		COIL, RF: 2.45UH	80009	108-0509-00
A4L2452	108-0509-00		COIL, RF: 2.45UH	80009	108-0509-00
A4L2464	108-0455-00		COIL, RF: FIXED, 40NH	80009	108-0455-00
A4L2466	108-0509-00		COIL, RF: 2.45UH	80009	108-0509-00
A4Q2125	151-0190-00		TRANSISTOR: SILICON, NPN	07263	S032677
A4Q2135	151-0188-00		TRANSISTOR: SILICON, PNP	04713	SPS6868K
A4Q2145	151-0188-00		TRANSISTOR: SILICON, PNP	04713	SPS6868K
A4Q2155	151-0188-00		TRANSISTOR: SILICON, PNP	04713	SPS6868K
A4Q2226	151-0636-00		TRANSISTOR: SILICON, NPN	80009	151-0636-00
A4Q2236	151-0636-00		TRANSISTOR: SILICON, NPN	80009	151-0636-00
A4Q2246	151-0636-00		TRANSISTOR: SILICON, NPN	80009	151-0636-00
A4Q2256	151-0636-00		TRANSISTOR: SILICON, NPN	80009	151-0636-00
A4Q2321	151-0188-00		TRANSISTOR: SILICON, PNP	04713	SPS6868K
A4Q2436	151-0190-00		TRANSISTOR: SILICON, NPN	07263	S032677
A4R2110	301-0181-00		RES., FXD, CMPSN: 180 OHM, 5%, 0.50W	01121	EB1815
A4R2115	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
A4R2120	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
A4R2124	315-0331-00		RES., FXD, CMPSN: 330 OHM, 5%, 0.25W	01121	CB3315
A4R2126	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A4R2130	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
A4R2132	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
A4R2134	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A4R2136	315-0331-00		RES., FXD, CMPSN: 330 OHM, 5%, 0.25W	01121	CB3315
A4R2140	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
A4R2142	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
A4R2144	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A4R2146	315-0331-00		RES., FXD, CMPSN: 330 OHM, 5%, 0.25W	01121	CB3315
A4R2150	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
A4R2152	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
A4R2154	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
A4R2156	315-0331-00		RES., FXD, CMPSN: 330 OHM, 5%, 0.25W	01121	CB3315
A4R2210	317-0820-00		RES., FXD, CMPSN: 82 OHM, 5%, 0.125W	01121	BB8205
A4R2211	317-0101-00		RES., FXD, CMPSN: 100 OHM, 5%, 0.125W	01121	BB1015
A4R2212	301-0200-00		RES., FXD, CMPSN: 20 OHM, 5%, 0.50W	01121	EB2005
A4R2214	301-0131-00		RES., FXD, CMPSN: 130 OHM, 5%, 0.50W	01121	EB1315
A4R2215	317-0620-00		RES., FXD, CMPSN: 62 OHM, 5%, 0.125W	01121	BB6205
A4R2217	317-0101-00		RES., FXD, CMPSN: 100 OHM, 5%, 0.125W	01121	BB1015
A4R2220	317-0470-00		RES., FXD, CMPSN: 47 OHM, 5%, 0.125W	01121	BB4705
A4R2224	317-0510-00		RES., FXD, CMPSN: 51 OHM, 5%, 0.125W	01121	BB5105

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscnt	Name & Description	Mfr Code	Mfr Part Number
A4R2227	307-0552-00		RES.,FXD,FILM:5 OHM,5%,0.075 W	52262	MCRA5R0JZ
A4R2230	317-0470-00		RES.,FXD,CMPSN:47 OHM,5%,0.125W	01121	BB4705
A4R2234	317-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.125W	01121	BB5105
A4R2237	307-0552-00		RES.,FXD,FILM:5 OHM,5%,0.075 W	52262	MCRA5R0JZ
A4R2240	317-0470-00		RES.,FXD,CMPSN:47 OHM,5%,0.125W	01121	BB4705
A4R2244	317-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.125W	01121	BB5105
A4R2247	307-0552-00		RES.,FXD,FILM:5 OHM,5%,0.075 W	52262	MCRA5R0JZ
A4R2250	317-0470-00		RES.,FXD,CMPSN:47 OHM,5%,0.125W	01121	BB4705
A4R2252	315-0431-00		RES.,FXD,CMPSN:430 OHM,5%,0.25W	01121	CB4315
A4R2256	317-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.125W	01121	BB5105
A4R2257	307-0552-00		RES.,FXD,FILM:5 OHM,5%,0.075 W	52262	MCRA5R0JZ
A4R2325	315-0103-00		RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A4R2330	315-0182-00		RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	01121	CB1825
A4R2335	315-0102-00		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A4R2337	315-0226-00		RES.,FXD,CMPSN:22M OHM,5%,0.25W	01121	CB2265
A4R2338	315-0273-00		RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
A4R2368	317-0151-00		RES.,FXD,CMPSN:150 OHM,5%,0.125W	01121	BB1515
A4R2422	311-1227-00		RES.,VAR, NONWIR:5K OHM,20%,0.50W	32997	3386F-T04-502
A4R2423	315-0513-00		RES.,FXD,CMPSN:51K OHM,5%,0.25W	01121	CB5135
A4R2424	315-0182-00		RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	01121	CB1825
A4R2425	315-0393-00		RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
A4R2430	315-0361-00		RES.,FXD,CMPSN:360 OHM,5%,0.25W	01121	CB3615
A4R2432	315-0102-00		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A4R2434	315-0512-00		RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A4R2436	315-0512-00		RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A4R2438	315-0101-00		RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A4R2439	315-0241-00		RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
A4R2440	315-0390-00		RES.,FXD,CMPSN:39 OHM,5%,0.25W	01121	CB3905
A4R2442	315-0271-00		RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
A4R2444	315-0271-00		RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
A4R2446	315-0102-00		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A4R2448	315-0102-00		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A4R2458	315-0431-00		RES.,FXD,CMPSN:430 OHM,5%,0.25W	01121	CB4315
A4R2464	315-0164-00		RES.,FXD,CMPSN:160K OHM,5%,0.25W	01121	CB1645
A4R2466	317-0201-00		RES.,FXD,CMPSN:200 OHM,5%,0.125W	01121	BB2015
A4U2330	156-0853-00		MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER,DUAL	27014	LM358N
A4U2345	156-0377-00		MICROCIRCUIT,DI:750 MHZ D-TYPE,FLIP-FLOP	80009	156-0377-00
A4U2350	156-1302-01		MICROCIRCUIT,DI:DC TO 1.5GHZ DIV BY 4 PRESC	80009	156-1302-01
A4W2320	131-0566-00		BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A4W2440	131-0566-00		BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1

Replaceable Electrical Parts—DC 508A

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
CHASSIS PARTS					
DS5023	150-1036-00		LAMP, LED: RED, 3.0V, 40MA	01295	TIL 209A
DS5028	150-1036-00		LAMP, LED: RED, 3.0V, 40MA	01295	TIL 209A
F5020	159-0148-00		FUSE, WIRE LEAD: 0.062A, 125V, 5SEC	75915	275.062
J5001	131-0955-00		CONN, RCPT, ELEC: BNC, FEMALE	13511	31-279
J5021	103-0194-00		ADAPTER, CONN: BNC TO SMB, W/OUT FUSE	24931	29JJ120-1
R1460	311-1342-00		RES., VAR, NONWIR: PNL, 500K OHM, 0.5W, W/SW (FURNISHED AS A UNIT WITH S1460)	16546	BA206-014
R5002	317-0027-00		RES., FXD, CMPSN: 2.7 OHM, 5%, 0.125W	01121	BB2R705
S1380	263-1168-00		SW CAM ACTR AS: DISPLAY	80009	263-1168-00
S1460	-----		(PART OF R1460)		

DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS

Symbols

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

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

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

Abbreviations are based on ANSI Y1.1-1972.

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

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

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

Component Values

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

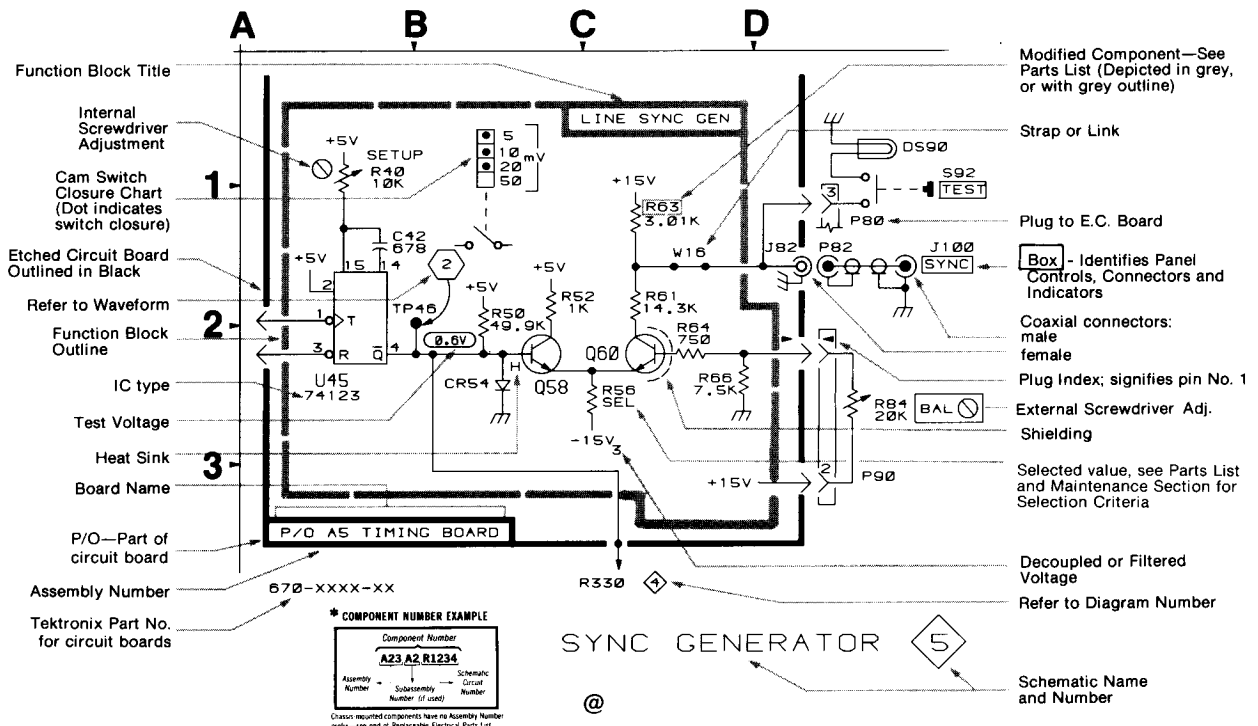
- Capacitors = Values one or greater are in picofarads (pF).
Values less than one are in microfarads (μ F).
- Resistors = Ohms (Ω).

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

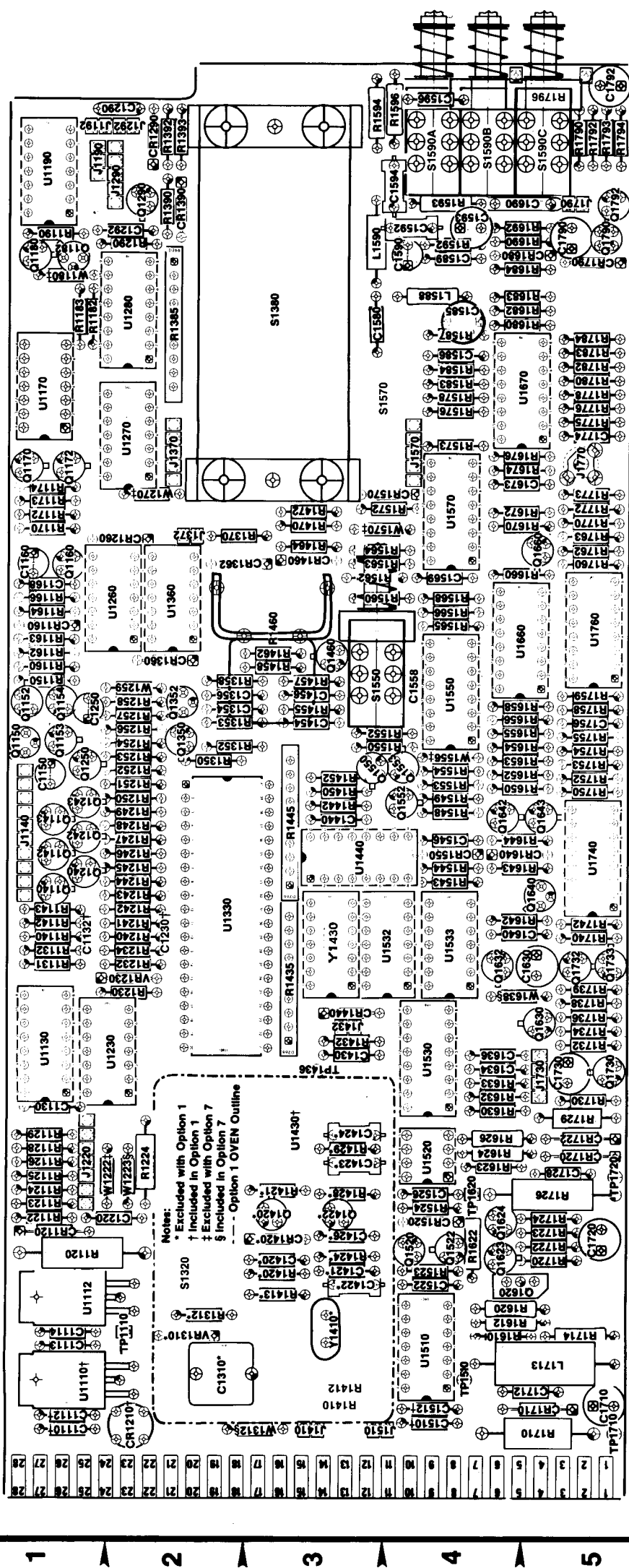
Assembly Numbers and Grid Coordinates

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

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

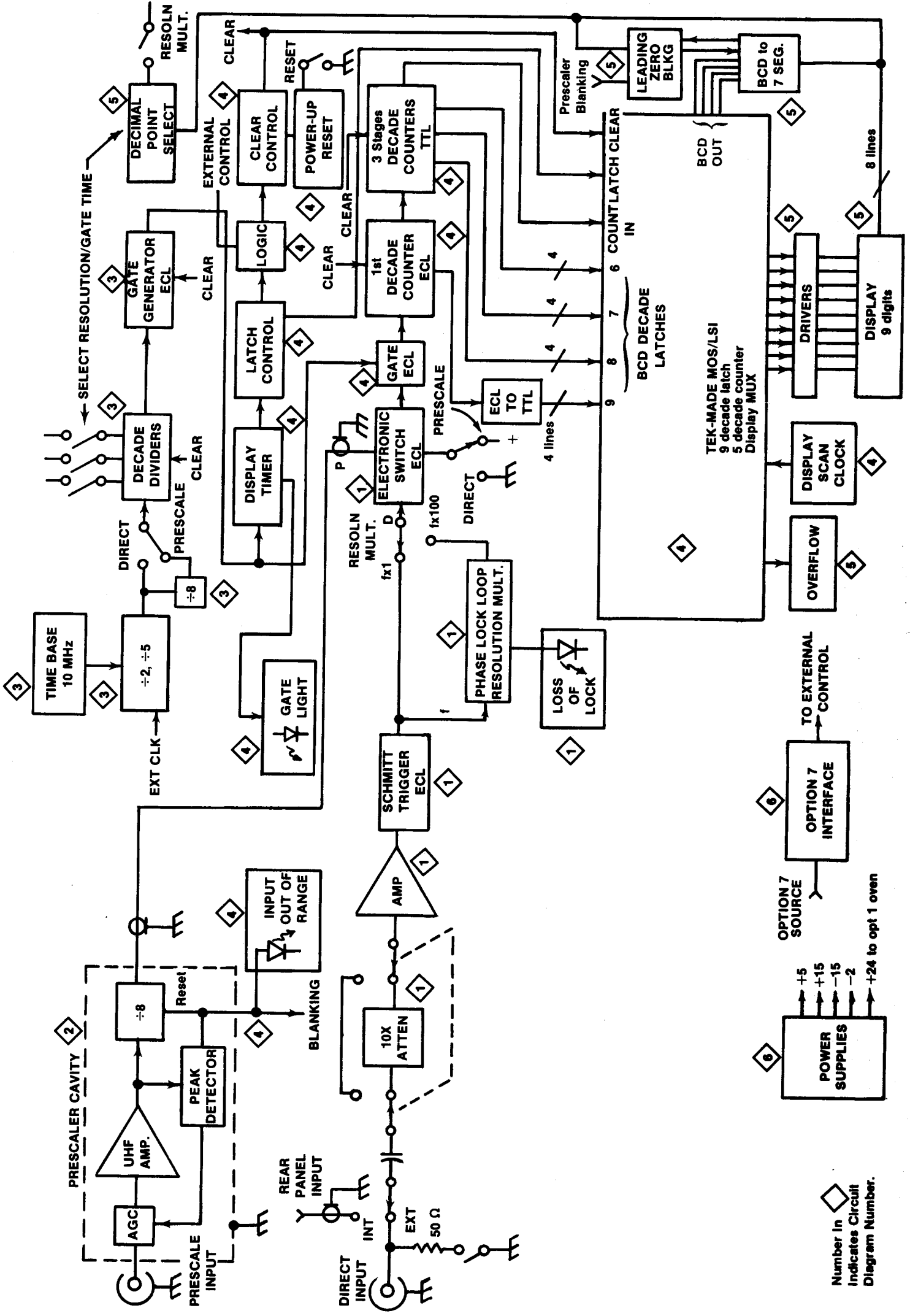


A Y B Y C Y D Y E Y F Y G Y H Y J Y K Y L Y



3638-10

A1 Main circuit board.



Number in
Indicates Circuit
Diagram Number.

VOLTAGE CONDITIONS

WARNING

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

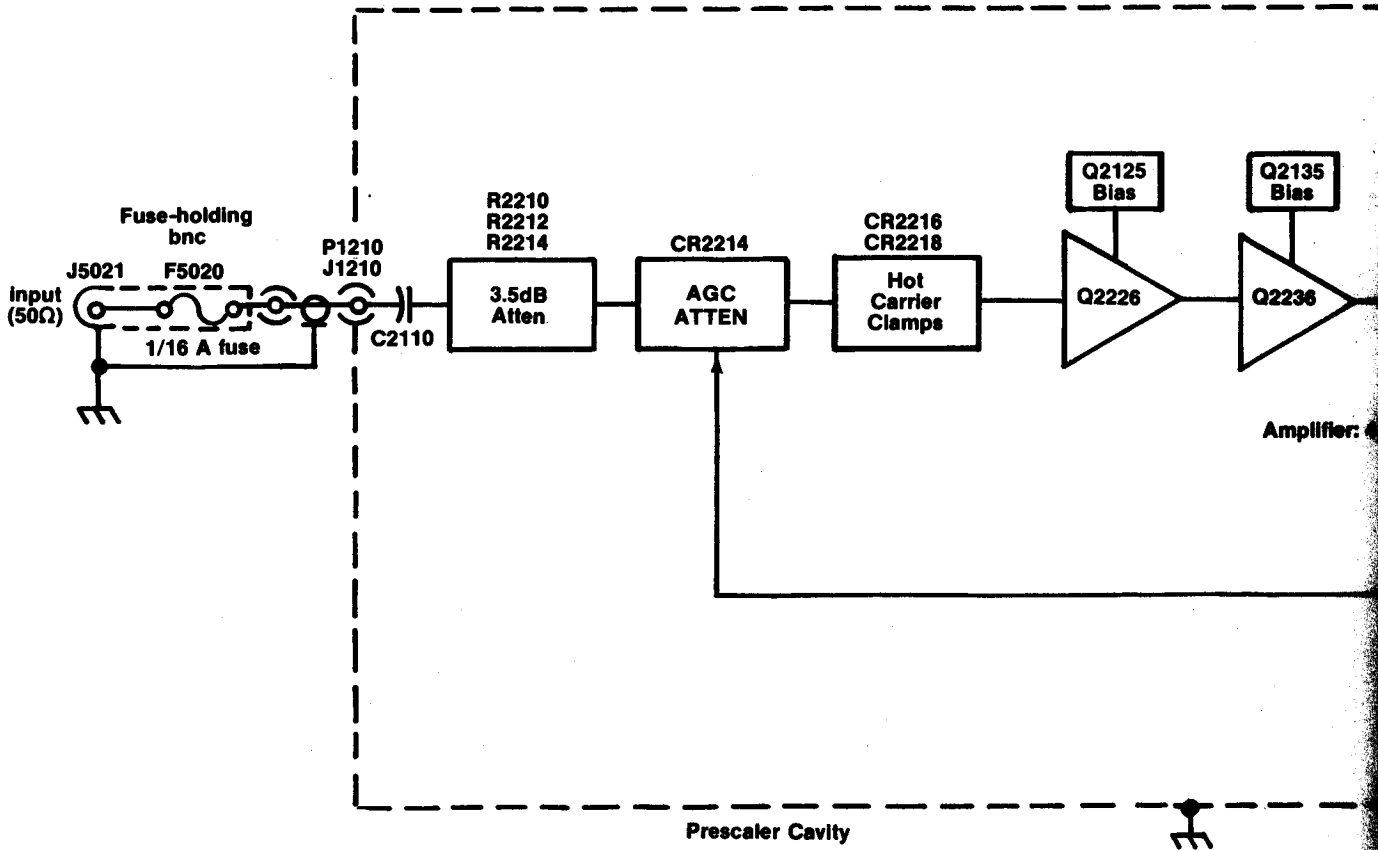
The voltages shown on diagrams 1 through 6 were taken with the DC 508A front-panel controls set as follows:

STANDBY	Pushbutton in
50 Ω —1 M Ω	Pushbutton in
RESOLN MULT	Pushbutton out
RESET	Pushbutton out
ATTEN	Pushbutton out
SOURCE	Pushbutton out
RESOLUTION	TOTALIZE 1 Hz
HOLD	Fully counterclockwise

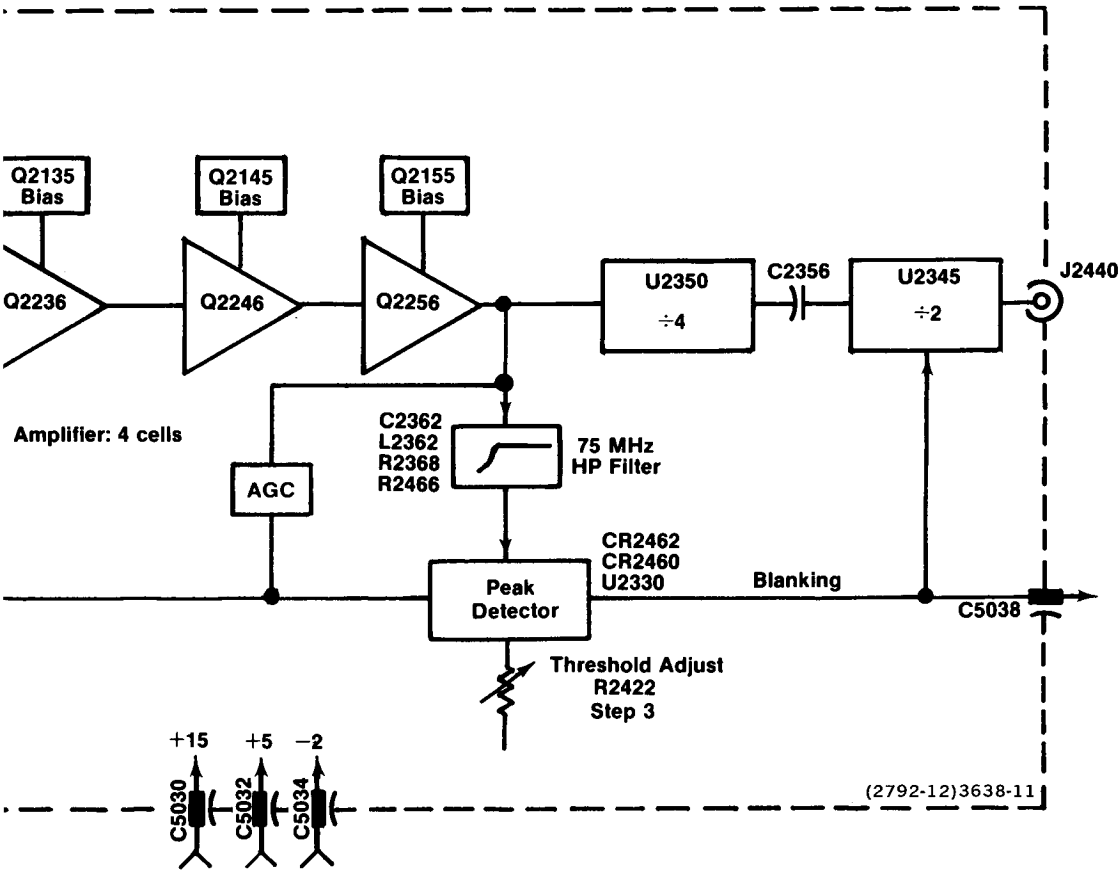
The voltages shown were taken with no input signal applied to the input connectors. The prescale assembly was removed from the main interface board location, and moved aside to gain access to the component side of the circuit board; all connections to the prescale board remain intact.

The voltages shown were obtained using a digital multimeter with a 10 megohm input impedance (TEKTRONIX DM 501A Digital Multimeter or TEKTRONIX Digital Multimeter used with readout equipped, 7000-series Oscilloscope).





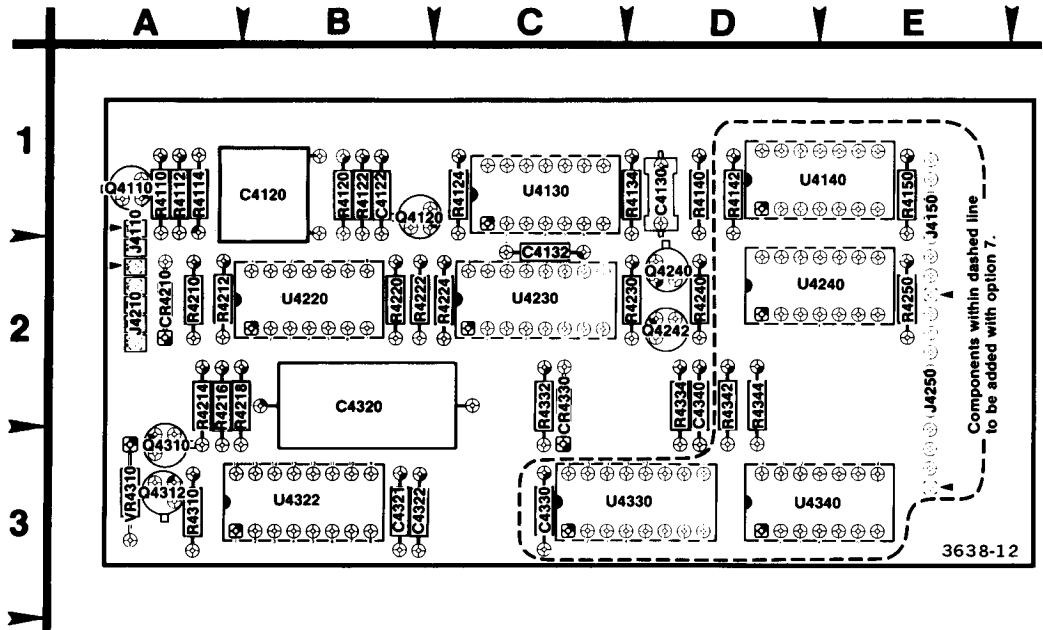
DC 508A



PRESCALE BLOCK DIAGRAM - - -

PRESCALE BLOCK DIAGRAM

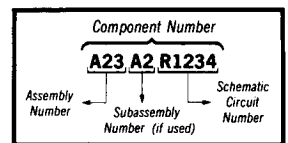
PARTS LOCATION GRID
RESOLUTION MULTIPLIER BOARD



A2 Resolution Multiplier circuit board.

 Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE

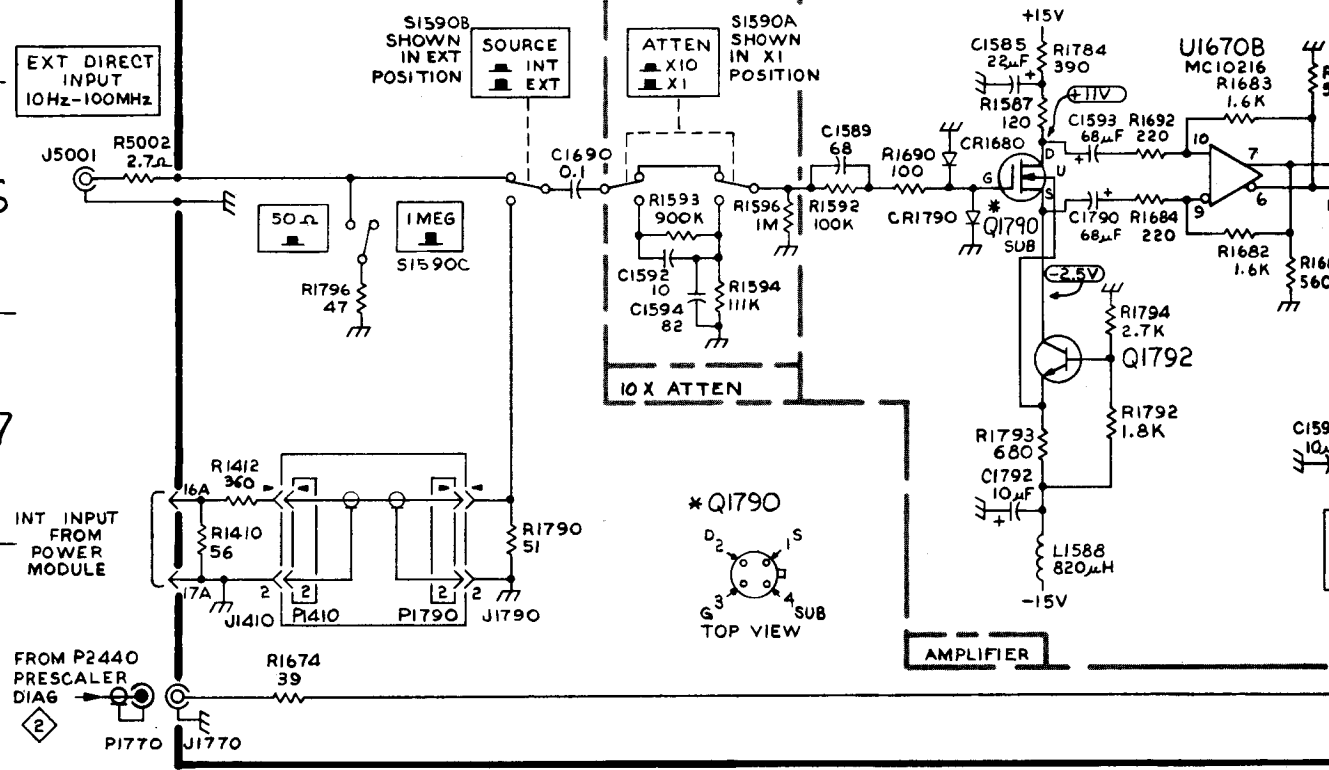
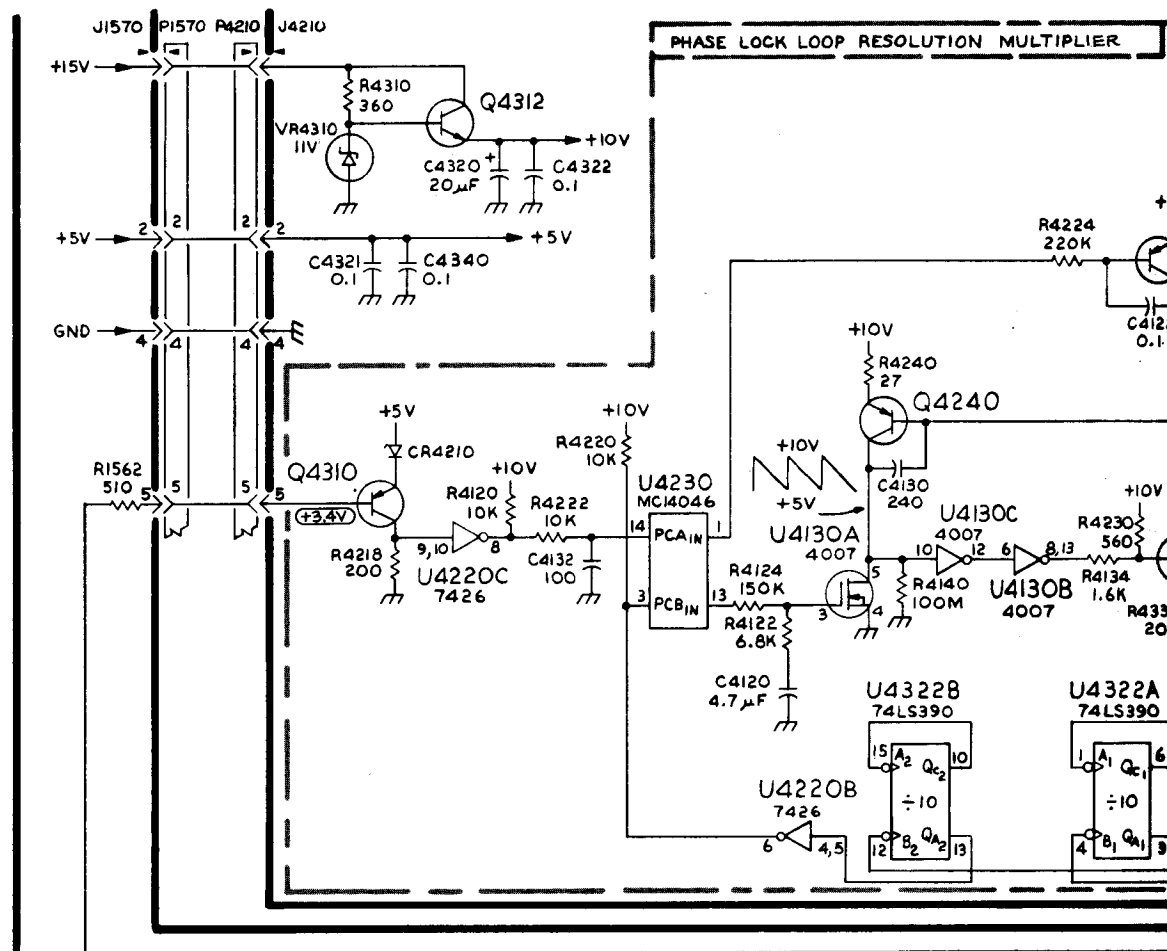


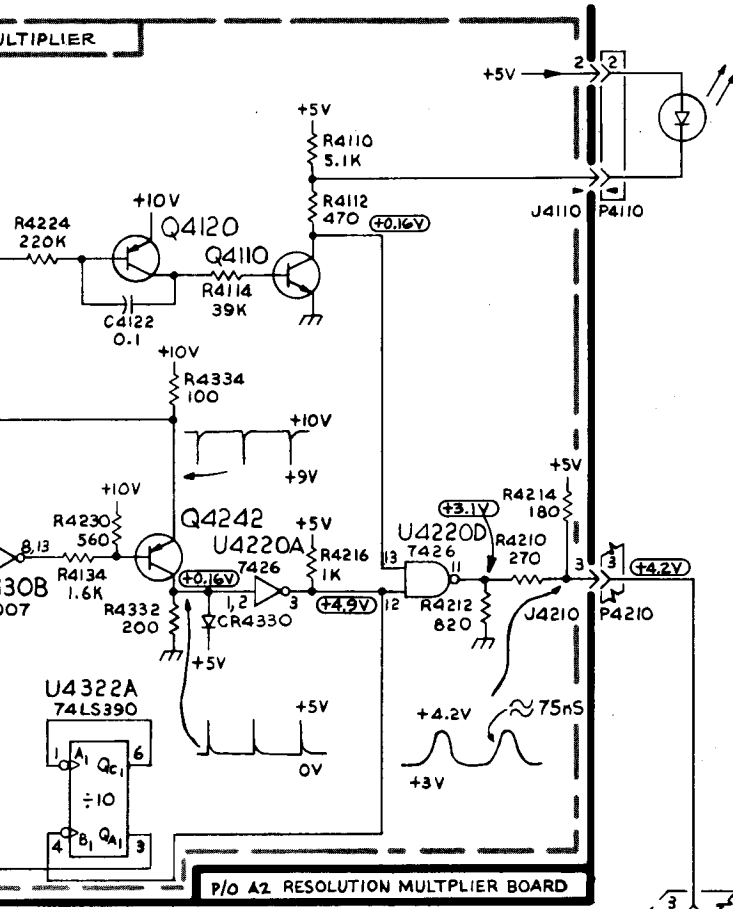
Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

P/O A1 ASSY			DIRECT INPUT & RESOLUTION MULTIPLIER 1					
Circuit Number	Schematic Location	Board Location	Circuit Number	Schematic Location	Board Location	Circuit Number	Schematic Location	Board Location
C1580	H7	J3	R1410**	B7	A3	R1782	F6	J5
C1585	E6	J4	R1412**	B7	B3	R1783	F6	J5
C1586	J6	J4	R1562	B3	G3	R1784	E5	J5
C1589	D6	K4	R1563	L6	H3	R1790	C7	L5
C1590	F7	K4	R1564	L6	H3	R1792	E7	L5
C1592	D6	K4	R1573	J8	H4	R1793	E7	L5
C1593	E6	K4	R1576	J6	J4	R1794	E7	L5
C1594	D6	K4	R1578	J6	J4	R1796**	B6	L5
C1673	J6	H5	R1583	H6	J4			
C1690	C6	K5	R1584	J6	J4	S1380	J7	J3
C1774	H7	H5	R1587	E6	J4	S1570**	K5	J3
C1790	E6	K5	R1592	D6	K4	S1590A	D5	L4
C1792	E7	L5	R1593	D6	K4	S1590B	C5	L4
			R1594	D6	L3	S1590C	B6	L5
CR1570	J7	H4	R1596	D6	L4			
CR1680	E6	K5	R1670	L8	H5	TP1710	A6	A5
CR1790	E6	K5	R1672	K8	H5			
			R1674	B8	H5	U1570A	L7	H4
J1410	B8	A3	R1676	J6	H5	U1570B	K7	H4
J1570	B1	H4	R1680	F6	J5	U1570C	K6	H4
J1570	K5	H4	R1682	F6	J5	U1570D	L6	H4
J1770	B8	H5	R1683	F6	J5	U1670	H8	J5
J1790	C8	K5	R1684	F6	K5	U1670A	H6	J5
			R1690	E6	K5	U1670B	F6	J5
L1588	E8	J4	R1692	F6	K5	U1670C	J6	J5
L1590	H7	K3	R1775	H5	J5			
			R1776	H6	J5			
Q1790	E6	K5	R1778	H6	J5			
Q1792	E7	K5	R1780	H6	J5			
P/O A1 ASSY also shown on 3 4 5 & 6								
P/O A2 ASSY			DIRECT INPUT & RESOLUTION MULTIPLIER 1					
C4120	E4	B1	Q4310	C3	A3	R4230	F3	D2
C4122	F2	B1	Q4312	C1	A3	R4240	E3	D2
C4130	E3	D1				R4310	C1	A3
C4132	D3	C2	R4110	H2	A1	R4332	H3	C2
C4320	C2	B2	R4112	H2	A1	R4334	H3	D2
C4321	C2	B3	R4114	H2	A1			
C4322	D2	B3	R4120	D3	B1	U4130A	E3	C1
C4340	C2	D2	R4122	E4	B1	U4130B	F3	C1
			R4124	E4	C1	U4130C	E3	C1
CR4210	C3	A2	R4134	F3	D1	U4220A	H3	B2
CR4330	H3	C2	R4140	E3	D1	U4220B	E5	B2
			R4210	J3	A2	U4220C	C3	B2
J4110	J2	A1	R4212	J4	A2	U4220D	J3	B2
J4210	J4	A2	R4214	J3	A2	U4230	D3	C2
J4210	C1	A2	R4216	H3	A2	U4322A	F4	B3
			R4218	C3	A2	U4322B	E4	B3
Q4110	H2	A1	R4220	D3	B2			
Q4120	F2	B1	R4222	D3	B2	VR4310	C2	A3
Q4240	E3	D2	R4224	F2	C2			
Q4242	H3	D2						
P/O A2 ASSY also shown on 6								
CHASSIS			DIRECT INPUT & RESOLUTION MULTIPLIER 1					
DS5023	K1	CHASSIS						
R5002	A6	CHASSIS						

**Located on back of board

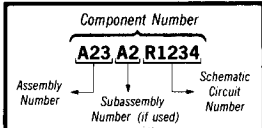
1
2
3
4
5
6
7
8





P/O A2 RESOLUTION MULTIPLIER BOARD

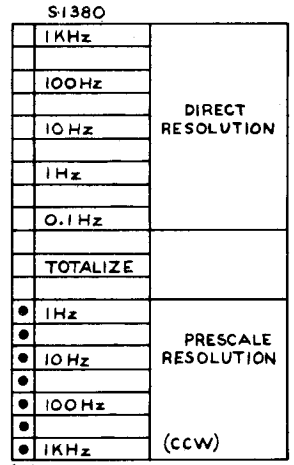
COMPONENT NUMBER EXAMPLE



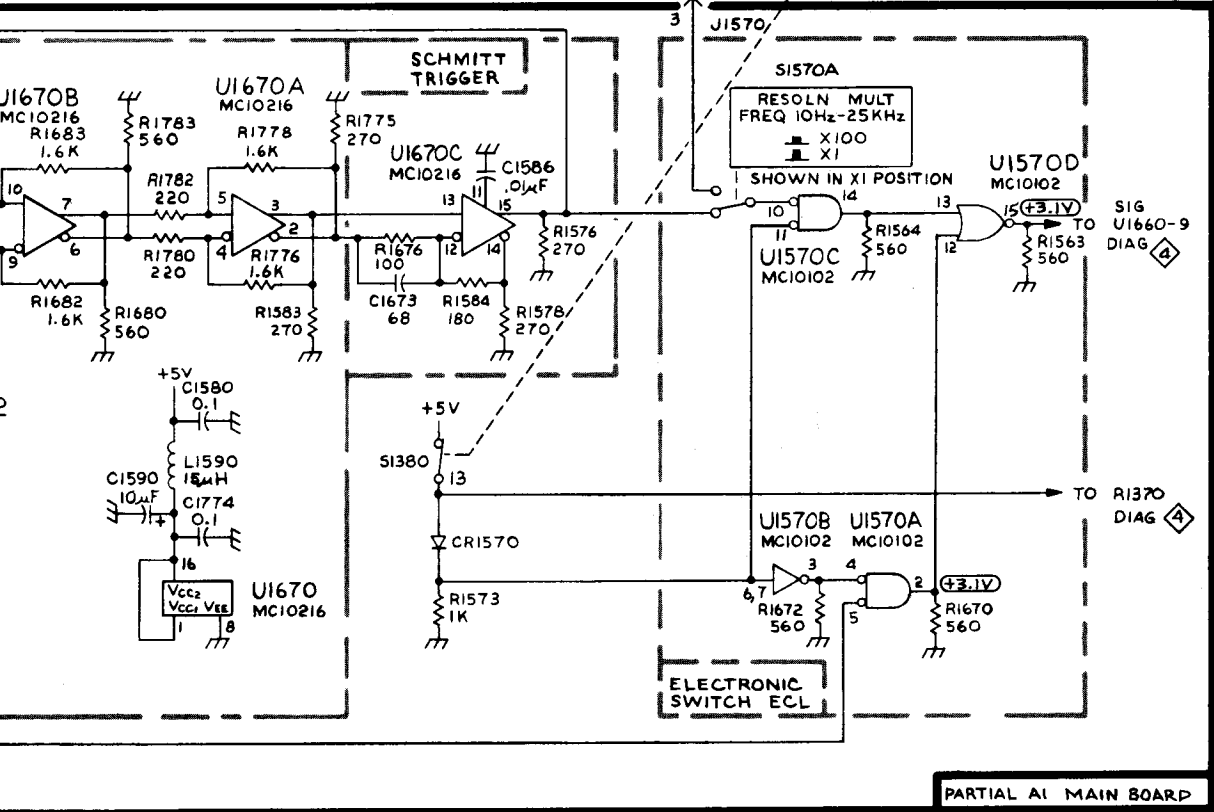
LOSS OF LOCK
DS5023

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

TYPE	+10V	+5V	GND
MC10102		1, 16	8
MC14046	5, 16		6, 9
74226		14	7
74LS390		16	2, 8, 14
4007	11, 14		4, 7, 9



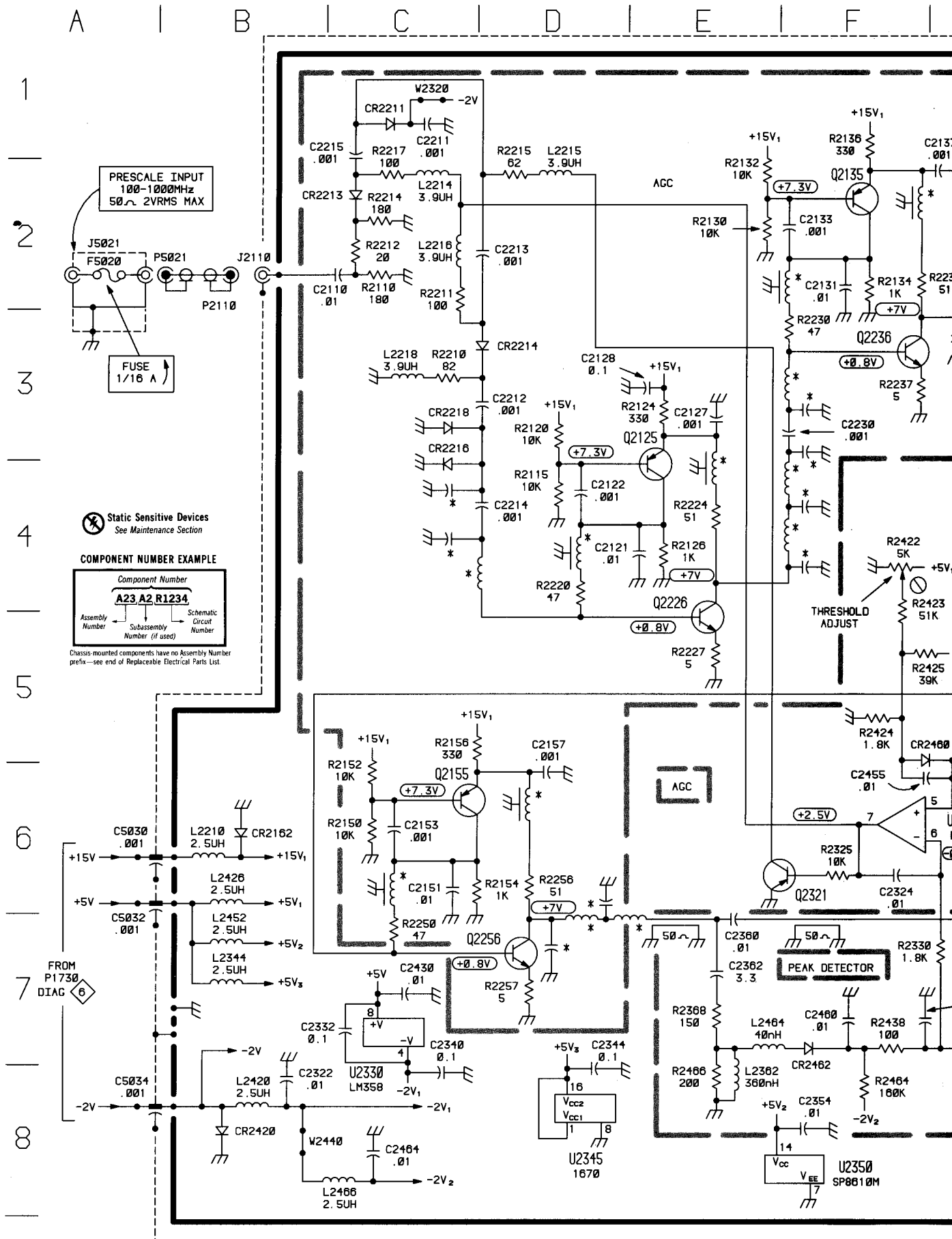
Static Sensitive Devices
See Maintenance Section



PARTIAL A1 MAIN BOARD

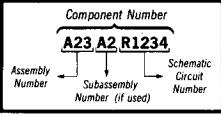
DIRECT INPUT & RESOLUTION MULTIPLIER

DIRECT INPUT & RESOLUTION MULTIPLIER

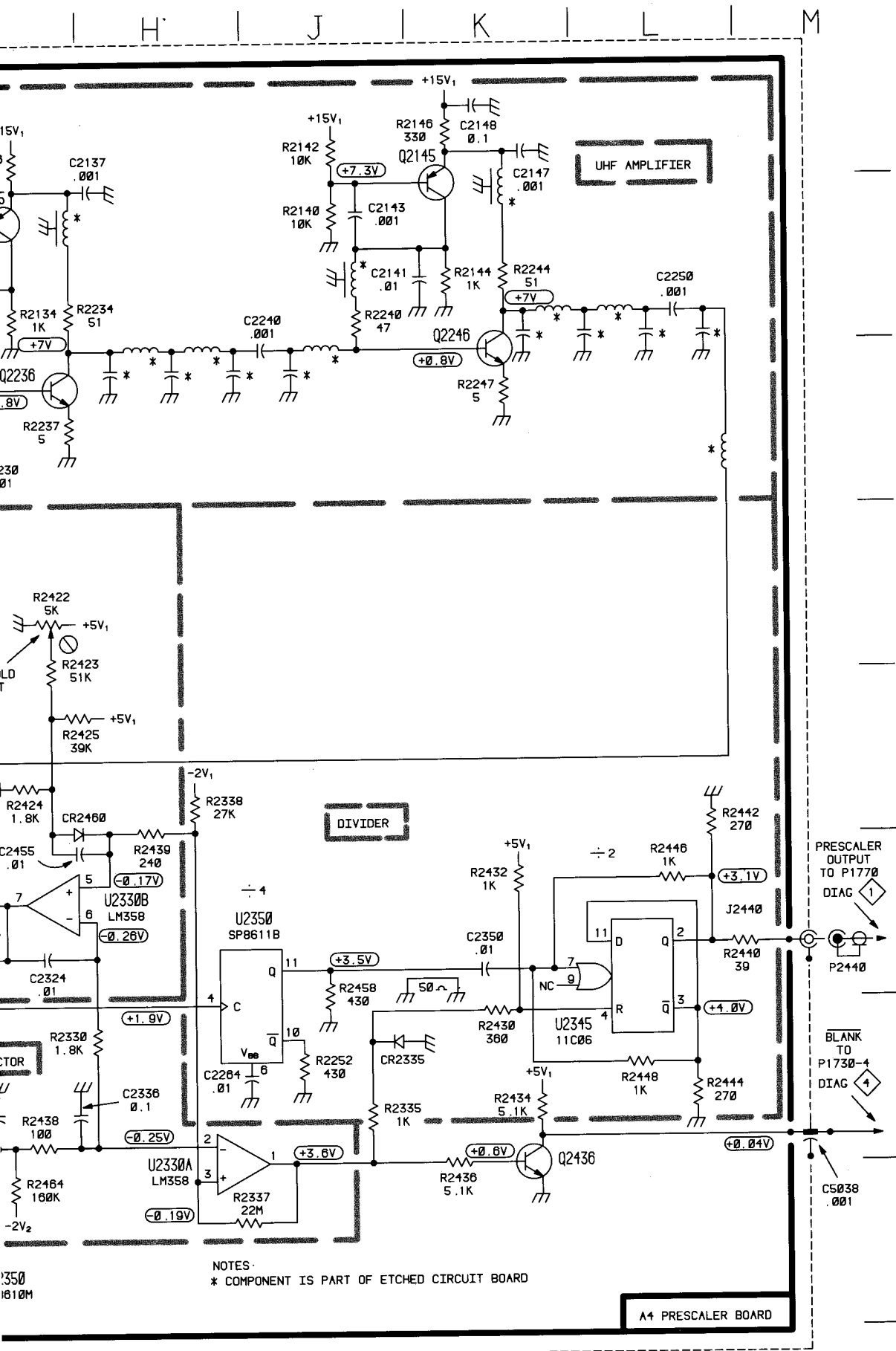


⚡ Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE





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



NOTES:
 * COMPONENT IS PART OF ETCHED CIRCUIT BOARD

A4 PRESCALER BOARD

A4 ASSY			PRESCALE BOARD 		
Circuit Number	Schematic Location	Board Location	Circuit Number	Schematic Location	Board Location
C2110	C2	F4	Q2256	D7	B3
C2121	D4	E4	Q2321	F6	E2
C2122	D4	F4	Q2436	K7	D1
C2127	E3	E4			
C2128	E3	E4	R2110	C2	F4
C2131	F2	D4	R2115	D4	F4
C2133	F2	E4	R2120	D3	F4
C2137	H2	D4	R2124	E3	E4
C2141	K2	C4	R2126	E4	E4
C2143	J2	C4	R2130	E2	E4
C2147	K1	C4	R2132	E2	E4
C2148	K1	C4	R2134	F2	D4
C2151	C6	B4	R2136	F1	D4
C2153	C6	B4	R2140	J2	D4
C2157	D6	B4	R2142	J1	D4
C2211	C1	F3	R2144	K2	C4
C2212	D3	F3	R2146	K1	C4
C2213	D2	F3	R2150	C6	C4
C2214	D4	F3	R2152	C6	B4
C2215	C1	F3	R2154	D6	B4
C2230	F3	E3	R2156	C5	B4
C2240	J3	C3	R2210	C3	F3
C2250	L2	B3	R2211	C2	F3
C2264	H7	A3	R2212	C2	F4
C2322	B8	E3	R2214	C2	F4
C2324	F6	C3	R2215	D2	F3
C2332	C7	E2	R2217	C2	F3
C2336	H7	E2	R2220	D4	E3
C2340	C8	D3	R2224	E4	E3
C2344	D7	D3	R2227	E5	E3
C2350	K6	C3	R2230	F3	D3
C2354	F8	B2	R2234	F2	D3
C2360	E7	A2	R2237	F3	D3
C2362	E7	E2	R2240	J2	C3
C2430	C7	B2	R2244	K2	C3
C2455	F6	A1	R2247	K3	C3
C2460	F7	A1	R2250	C7	B3
C2464	C8	B4	R2252	J7	B2
			R2256	D6	B3
CR2162	B6	A4	R2257	D7	B3
CR2211	C1	F3	R2325	F6	E2
CR2213	C2	F3	R2330	H7	E3
CR2214	D3	F3	R2335	J7	D2
CR2216	C4	F3	R2337	H8	D2
CR2218	C3	F3	R2338	H5	D2
CR2335	J7	D2	R2368	E7	A2
CR2420	B8	F2	R2422	F4	E2
CR2460	F5	B2	R2423	F4	E2
CR2462	F7	A2	R2424	F5	E2
			R2425	F5	E2
J2110	B2	F4	R2430	K7	D2
J2440	M6	C2	R2432	K6	D2
			R2434	K7	D1
L2210	B6	F4	R2436	K8	D1
L2214	C2	F3	R2438	F7	D2
L2215	D2	F3	R2439	H5	D2
L2216	C2	F3	R2440	M6	C2
L2218	C3	F3	R2442	L5	C2
L2344	B7	C2	R2444	L7	C2
L2362	E8	A2	R2446	L6	C2
L2420	B8	F2	R2448	L7	C2
L2426	B6	E2	R2458	J6	B2
L2452	B7	B2	R2464	F8	A2
L2464	E7	A2	R2466	E8	A2
L2466	C8	A2			
Q2125	E3	E4	U2330	C7	D2
Q2135	F2	D4	U2330A	H7	D2
Q2145	K1	C4	U2330B	F6	D2
Q2155	C6	B4	U2345	L6	C2
Q2226	E4	E3	U2350	H6	B2
Q2236	F3	D3			
Q2246	K2	C3	W2320	C1	F2
			W2440	B8	D2
CHASSIS			PRESCALE BOARD 		
C5030	A6	CHASSIS	C5038	M8	CHASSIS
C5032	A6	CHASSIS	F5020	A2	CHASSIS
C5034	A8	CHASSIS			

Static Sensitive Devices
See Maintenance Section

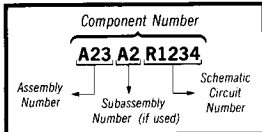
NOTES:

- † CONNECTION FOR USE WITH OPTION 7, DIAG 6
- * REMOVE FOR OPTION 7
- ✕ JUMPER CONNECTIONS FOR J1290 ARE AS FOLLOWS:
- § 1MΩ 1.5pF PROBE
- ** U1110



FREQ	PINS
1MHz	1&2
5MHz	2&3
5MHz	3&4
10MHz	4&5

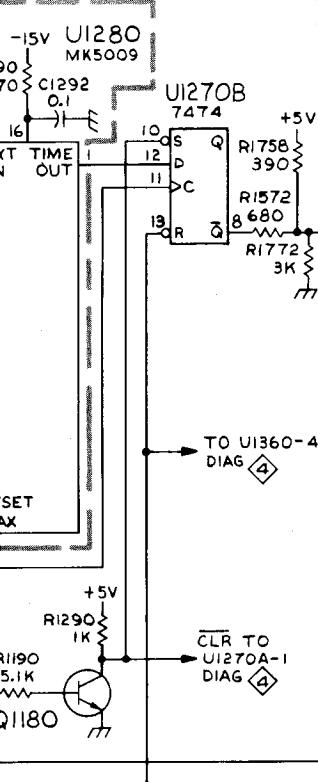
COMPONENT NUMBER EXAMPLE



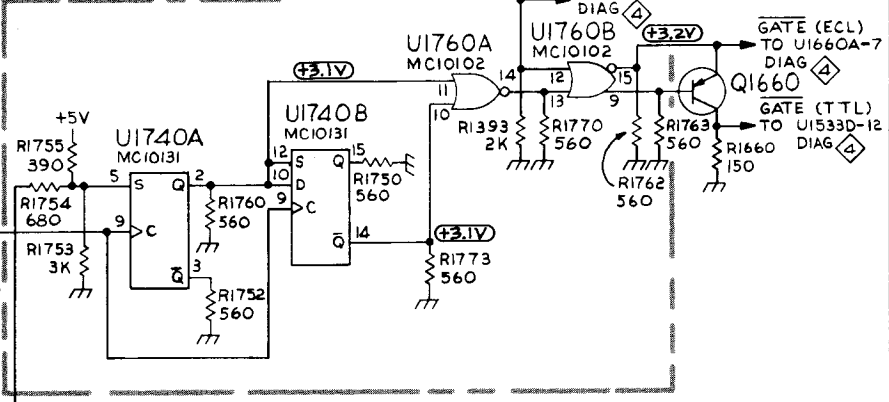
Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

DIRECT RESOLUTION
PRESCALE RESOLUTION
(CCW)

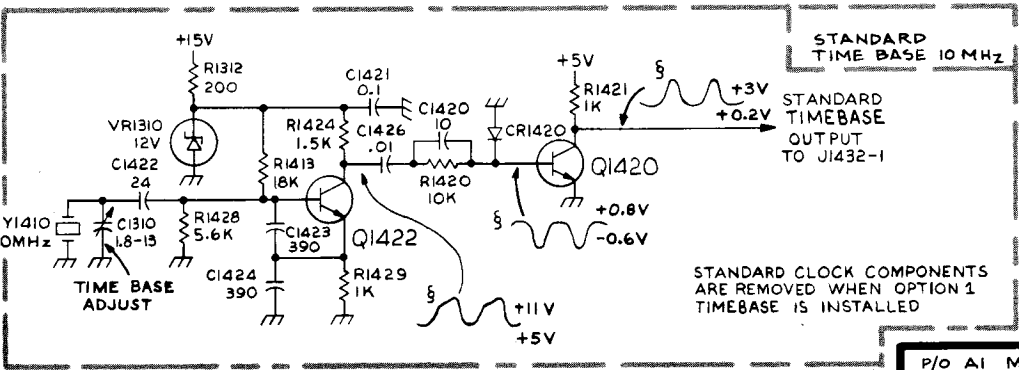
DE DIVIDERS



ECL GATE GENERATOR



TYPE	+5V	GND
MC10102	1, 16	8
MC10131	1, 16	8
MK5009	15	2, 4
7474	14	7
7490	5	10, 2, 3, 6, 7
7493	5	10, 14



STANDARD CLOCK COMPONENTS ARE REMOVED WHEN OPTION 1 TIMEBASE IS INSTALLED

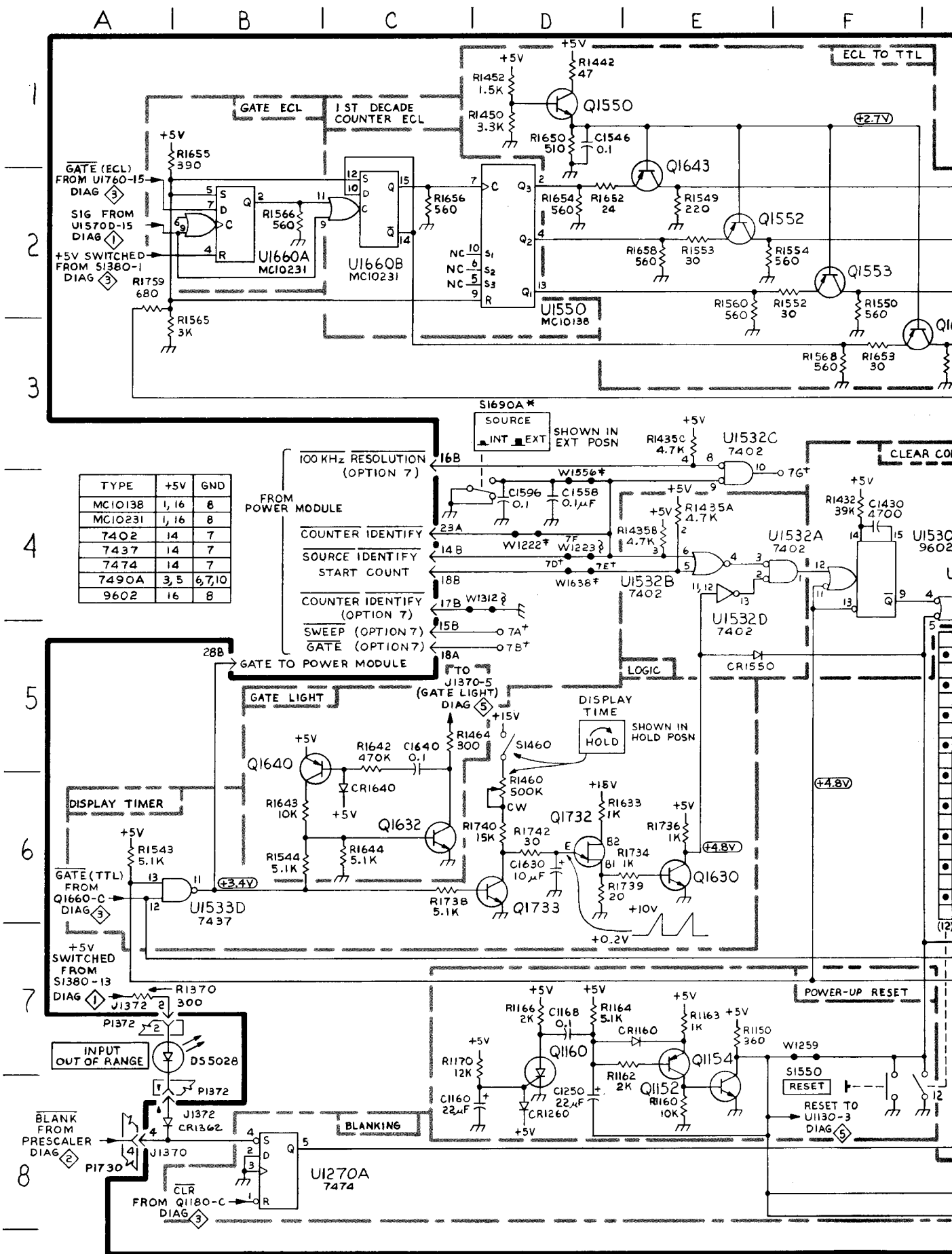
P/O AI MAIN BOARD

GATE GENERATOR & TIME BASES 3

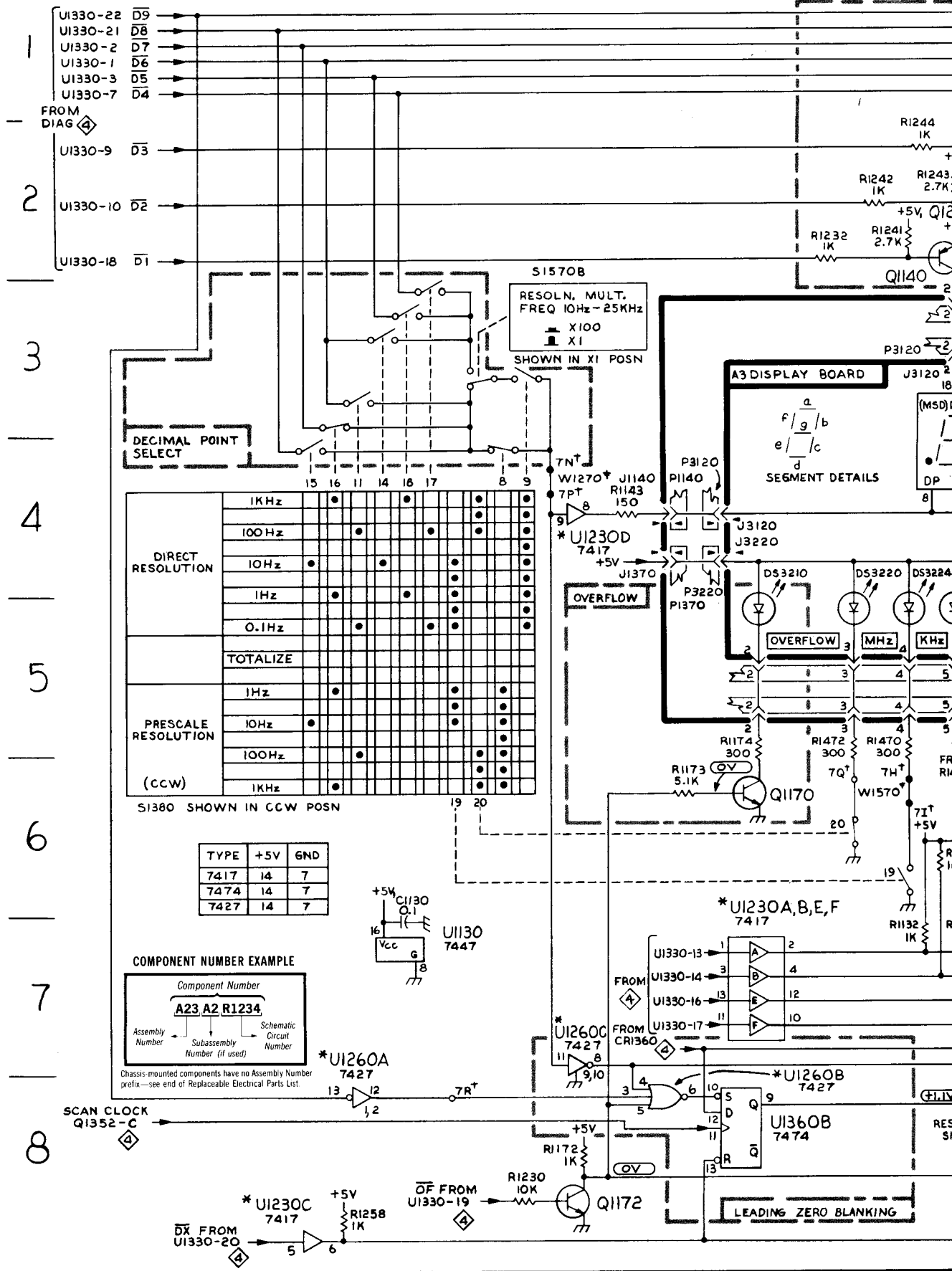
P/O A1 ASSY			GATE GENERATOR & TIME BASES 3		
Circuit Number	Schematic Location	Board Location	Circuit Number	Schematic Location	Board Location
C1110	D7	A1	R1312	H7	B2
C1112	C7	A1	R1385	E5	J2
C1132**	C7	E1	R1385A	E6	J2
C1230**	C7	E2	R1385B	E5	J2
C1290	B3	L2	R1385C	E4	J2
C1292	F4	K2	R1385E	E4	J2
C1310	H8	B2	R1385F	F4	J2
C1420	J7	C3	R1385J	D6	J2
C1421	J7	B3	R1390	F4	K2
C1422	H8	B3	R1392	B3	L2
C1423	H8	C3	R1393	L4	L2
C1424	H8	C3	R1413	H8	B3
C1426	J7	C3	R1420	J7	B2
C1510	B7	A4	R1421	J8	C3
C1512	B7	A4	R1424	H7	C3
			R1428	H8	C3
CR1210	B7	A2	R1429	H8	C3
CR1290	B3	L2	R1572	H4	H4
CR1390	L3	K2	R1660	M4	G5
CR1420	J7	C3	R1750	K4	F5
			R1752	J5	F5
J1190	C4	K1	R1753	J4	F5
J1192	B3	L1	R1754	J4	F5
J1432	B5	D3	R1755	J4	F5
J1510	A3	A4	R1758	H4	F5
			R1760	J4	H5
Q1180	F6	K1	R1762	L4	H5
Q1182	E6	K1	R1763	L4	H5
Q1290	C3	K2	R1770	L4	H5
Q1420	J8	C3	R1772	H4	H5
Q1422	H8	C3	R1773	K5	H5
Q1660	L4	H5			
			TP1436	B5	D3
R1182	C3	J1			
R1183	E6	J1	U1110	D7	B1
R1190	F6	K1	U1170	D6	J1
R1290	F6	K2			

P/O A1 ASSY also shown on 1 4 5 & 6

**Located on back of board.



P/O A1 ASSY			COUNTER PROCESSING & DECADE COUNTERS 4		
Circuit Number	Schematic Location	Board Location	Circuit Number	Schematic Location	Board Location
C1160	D8	H1	R1350	H3	F2
C1168	D7	G1	R1352	K6	F2
C1250	D8	F1	R1353	K7	F2
C1354	K7	F2	R1358	L7	G2
C1356	L7	G2	R1370	A7	H2
C1430	F4	D3	R1385H	K7	J2
C1440	K4	F3	R1385I	K8	J2
C1454	K1	F3	R1432	F4	D3
C1456	L5	G3	R1435	K3	D3
C1546	D1	F4	R1435A	E4	D3
C1558	D4	G4	R1435B	E4	D3
C1596	D3	G4	R1435C	E3	D3
C1630	D6	E5	R1435E	K8	D3
C1636	J6	D4	R1442	D1	F3
C1640	C5	E4	R1445	K4	F3
			R1445H	M6	F3
CR1160	E7	G1	R1450	D1	F3
CR1260	D8	H2	R1452	D1	F3
CR1360	K8	G2	R1455	K6	G3
CR1362	B8	H3	R1457	K5	G3
CR1440	K8	D3	R1458	K7	G3
CR1460	K8	H3	R1460	D6	G3
CR1550	E5	E4	R1462	K5	G3
CR1640	C6	E4	R1464	C5	H3
			R1543	A6	E4
J1370	B8	H2	R1544	B6	E4
J1372	A7	H2	R1548	H3	F4
J1372	B8	H2	R1549	E2	F4
			R1550	F2	F4
Q1152	E7	G1	R1552	F2	F4
Q1154	E8	G1	R1553	E2	F4
Q1160	D7	H1	R1554	F2	F4
Q1350	L7	F2	R1560	E2	G3
Q1352	K7	G2	R1565	B2	G4
Q1460	K5	G3	R1566	B2	G4
Q1550	D1	F3	R1568	F3	G4
Q1552	E2	F4	R1632	J6	D4
Q1553	F2	F4	R1633	D6	D4
Q1630	E6	D5	R1642	C5	E4
Q1632	C6	E4	R1643	B6	E4
Q1640	B5	E5	R1644	C6	F4
Q1642	H3	F4	R1650	D1	F5
Q1643	E1	F5	R1652	D2	F5
Q1732	D6	E5	R1653	F3	F5
Q1733	D6	E5	R1654	D2	F5
			R1655	B1	F5
R1150	E7	G1	R1656	C2	F5
R1160	E8	G1	R1658	E2	G5
R1162	E7	G1	R1734	E6	D5
R1163	E7	G1	R1736	E6	D5
R1164	D7	G1	R1738	C6	D5
R1166	D7	G1	R1739	D6	D5
R1170	D7	H1	R1740	D6	E5
R1224	L1	C2	R1742	D6	E5
R1256	L7	F2	R1759	A2	G5
P/O A1 ASSY also shown on 1 3 5 & 6					
CHASSIS			COUNTER PROCESSING & DECADE COUNTERS 4		
DS5028	B7	CHASSIS			



DECIMAL POINT SELECT

S1570B
RESOLN. MULT. FREQ 10Hz-25KHz
X100
X1
SHOWN IN X1 POSN

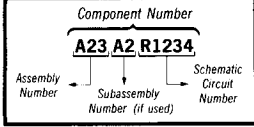
DIRECT RESOLUTION

PRESCALE RESOLUTION (CCW)

S1380 SHOWN IN CCW POSN

TYPE	+5V	GND
7417	14	7
7474	14	7
7427	14	7

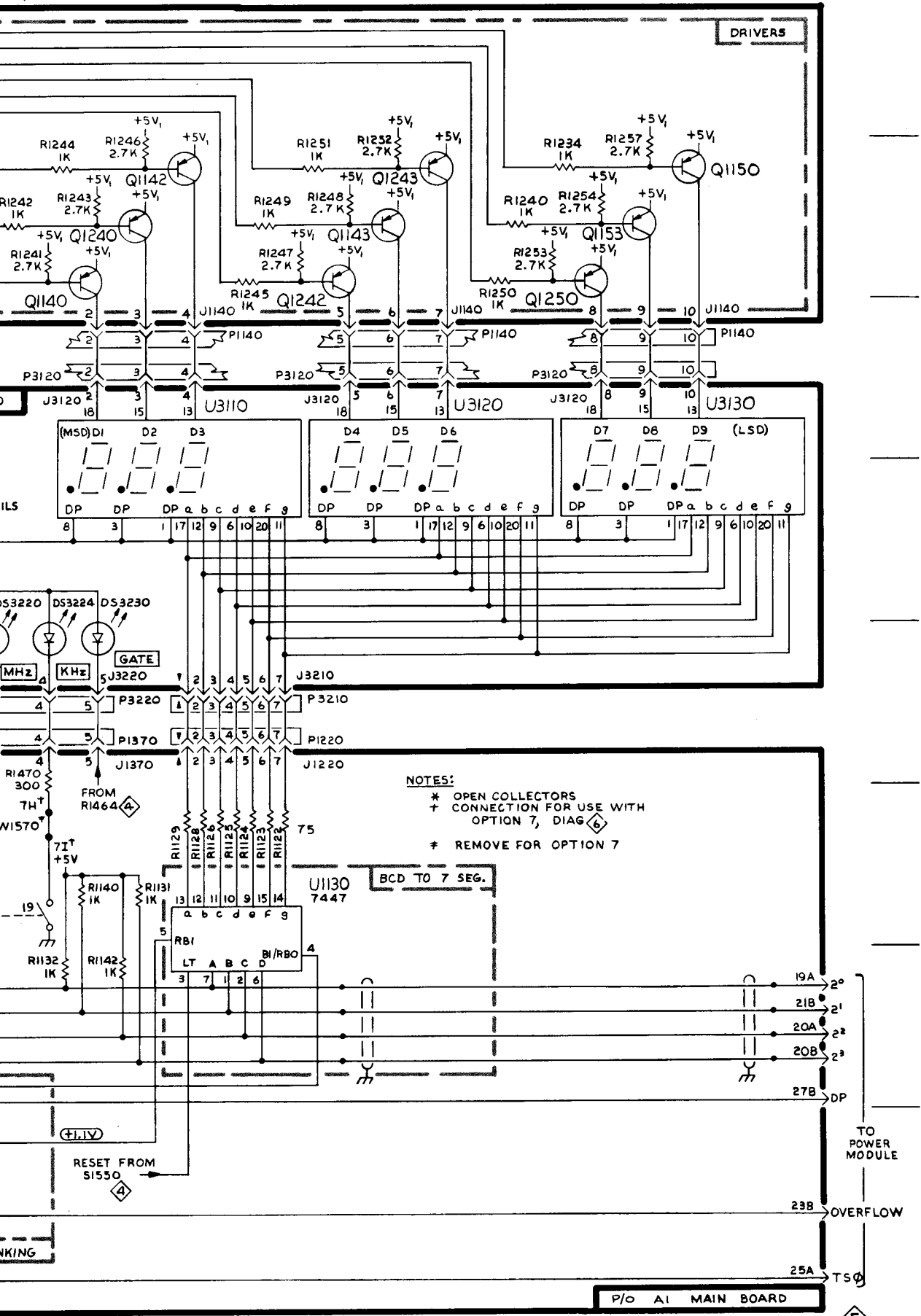
COMPONENT NUMBER EXAMPLE



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

SCAN CLOCK Q1352-C

LEADING ZERO BLANKING



DISPLAY DRIVERS & DISPLAYS

P/O A1 ASSY			DISPLAY DRIVERS & DISPLAYS 5		
Circuit Number	Schematic Location	Board Location	Circuit Number	Schematic Location	Board Location
C1130	C7	D1	R1240	K2	E2
J1140	H3	F1	R1241	F2	E2
J1140	K3	F1	R1242	F2	E2
J1140	L3	F1	R1243	F2	E2
J1140	D4	F1	R1244	F2	E2
J1220	J5	C1	R1245	H2	E2
J1370	D4	H2	R1246	H2	E2
J1370	H5	H2	R1247	J2	F2
Q1140	F2	E1	R1248	J2	F2
Q1142	H2	E1	R1249	H2	F2
Q1143	J2	F1	R1250	K2	F2
Q1150	L2	F1	R1251	J2	F2
Q1153	L2	F1	R1252	J2	F2
Q1170	E6	H1	R1253	K2	F2
Q1172	D8	H1	R1254	K2	F2
Q1240	H2	E1	R1257	L2	F2
Q1242	J2	F1	R1258	B8	G2
Q1243	J2	F1	R1470	F5	H3
Q1250	K2	F1	R1472	F5	H3
R1122	H6	C1	S1380	A6	J3
R1123	H6	C1	S1570B	D2	J3
R1124	H6	C1	U1130	H6	D1
R1125	H6	C1	U1230A	E7	D2
R1126	H6	C1	U1230B	E7	D2
R1128	H6	C1	U1230C	B8	D2
R1129	H6	C1	U1230D	D4	D2
R1131	H6	E1	U1230E	E7	D2
R1132	F7	E1	U1230E	E7	D2
R1140	F6	E1	U1260A	B8	G2
R1142	F7	E1	U1260B	D8	G2
R1143	D4	E1	U1260C	D7	G2
R1172	D8	H1	U1360B	E8	G2
R1173	E6	H1	W1270	D4	H2
R1174	E5	H1	W1570	F6	H3
R1230	D8	D2			
R1232	F2	E2			
R1234	K2	E2			
P/O A1 ASSY also shown on 1 3 4 & 6					
A3 ASSY			DISPLAY DRIVERS & DISPLAYS 5		
DS3210	E5	A2	J3120	E4	B1
DS3220	F5	B2	J3210	J5	A2
DS3224	F5	B2	J3220	E4	B2
DS3230	F5	C2	J3220	H5	B2
J3120	F3	B1	U3110	H3	A1
J3120	J3	B1	U3120	K3	B1
J3120	K3	B1	U3130	L3	C1

1

2

3

4

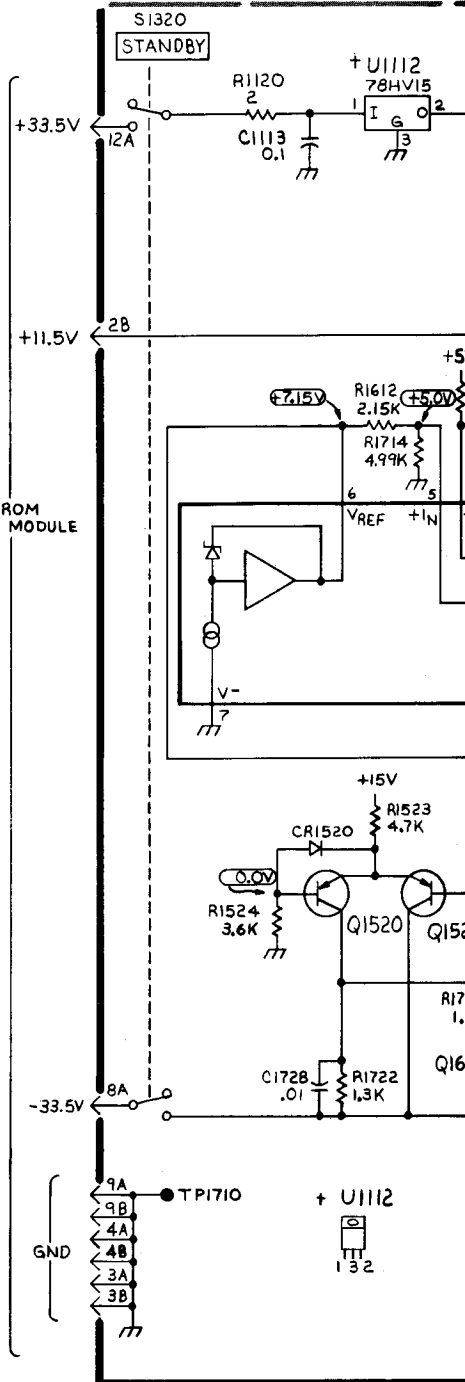
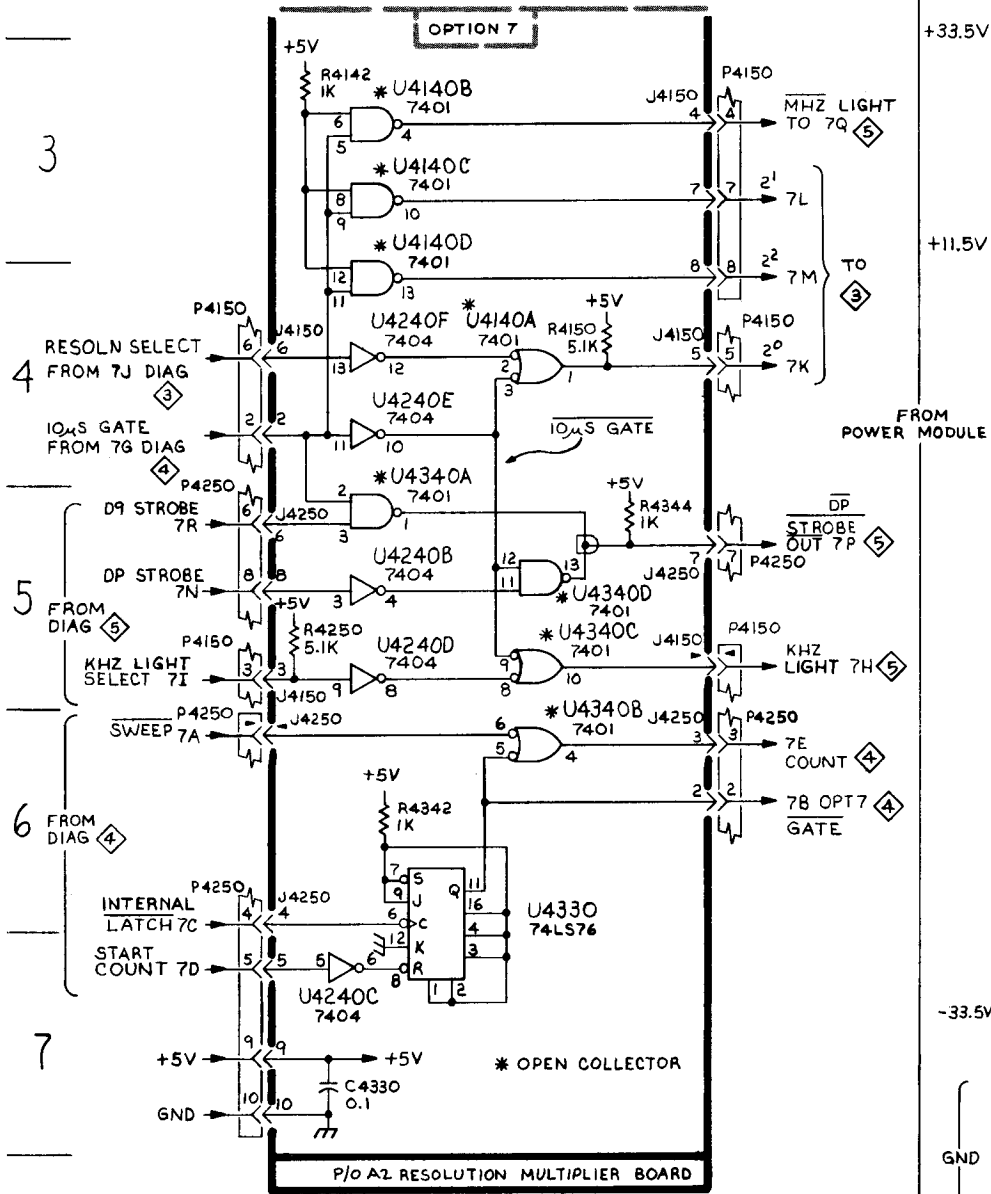
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6

7

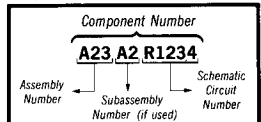
8

TYPE	+5V	GND
7401	14	7
7404	14	7
74LS76	5	13



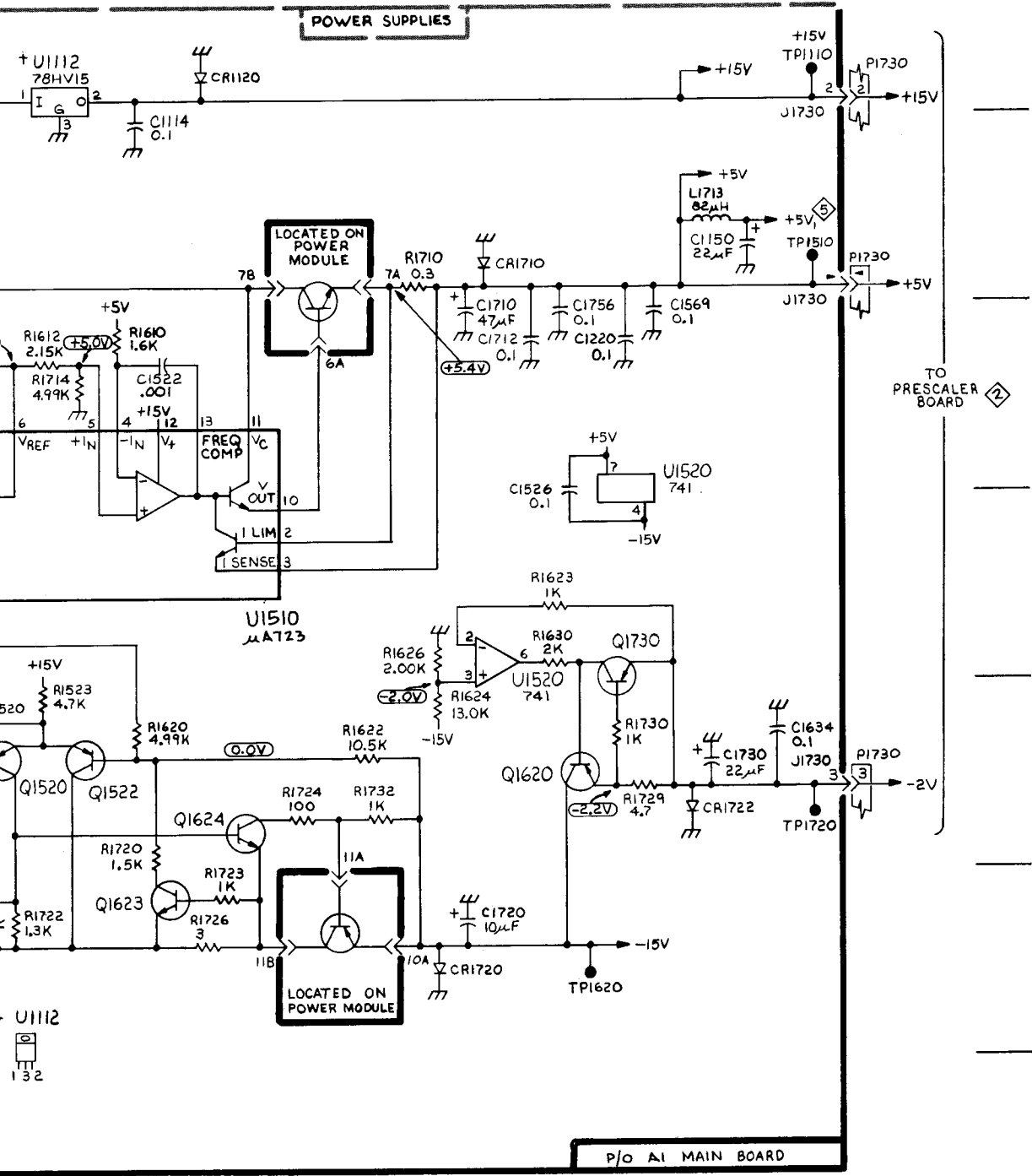
Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



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

3638-8
@



OPTION 7 AND POWER SUPPLIES 6

P/O A1 ASSY			OPTION 7 & POWER SUPPLY 6		
Circuit Number	Schematic Location	Board Location	Circuit Number	Schematic Location	Board Location
C1113	F2	B1	R1120	F2	C1
C1114	H2	B1	R1523	F6	B4
C1150	L3	F1	R1524	F6	C4
C1220	K4	C2	R1610	H4	B4
C1522	H4	B4	R1612	F4	B4
C1526	K4	C4	R1620	H6	B4
C1596	K4	L4	R1622	J6	C4
C1634	L6	D4	R1623	K5	C4
C1710	J4	A5	R1624	J6	C4
C1712	K4	B5	R1626	J5	C4
C1720	J7	C5	R1630	K5	D4
C1728	F7	C5	R1710	J3	A5
C1730	L6	D5	R1714	F4	B5
C1756	K4	F5	R1720	H6	C5
			R1722	F7	C5
			R1723	H7	C5
CR1120	H2	C1	R1724	H6	C5
CR1520	F6	C4	R1726	H7	C5
CR1710	K3	A5	R1729	K6	D5
CR1720	J8	C5	R1730	K6	D5
CR1722	L6	C5	R1732	J6	D5
J1730	L3	D5	S1320**	E2	B2
J1730	L6	D5			
L1713	C3	B5	TP1110	L2	B2
			TP1510	L3	B4
Q1520	F6	C4	TP1620	K7	C4
Q1522	F6	C4	TP1710	F7	A5
Q1620	K6	B4	TP1720	L6	C5
Q1623	H7	C4			
Q1624	H6	C4	U1112	F2	B1
Q1730	K5	D5	U1510	H5	B4
			U1520	K5	C4
P/O A1 ASSY also shown on 1 3 4 & 5					
P/O A2 ASSY			OPTION 7 & POWER SUPPLY 6		
C4330	B7	C3	U4140A	C4	D1
J4150	B5	E1	U4140B	B3	D1
J4150	C3	E1	U4140C	B3	D1
J4150	C4	E1	U4140D	B4	D1
J4150	C5	E1	U4240B	B5	D1
J4250	C5	E2	U4240C	B7	D1
J4250	C6	E2	U4240D	B5	D1
J4250	B6	E2	U4240E	B4	D1
J4250	B5	E2	U4240F	B4	D1
			U4250	B5	
R4142	B3	D1	U4330	B6	C3
R4150	C4	E1	U4340A	B4	D3
R4250	B5	E2	U4340B	C5	D3
R4342	B6	D2	U4340C	C5	D3
R4344	C5	D2	U4340D	C5	D3
			U4342	B6	
P/O A2 ASSY also shown on 1					

**Located on back of board.

REPLACEABLE MECHANICAL PARTS

PARTS ORDERING INFORMATION

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

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

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

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

SPECIAL NOTES AND SYMBOLS

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

FIGURE AND INDEX NUMBERS

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

INDENTATION SYSTEM

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

```

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

```

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

Attaching parts must be purchased separately, unless otherwise specified.

ITEM NAME

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

ABBREVIATIONS

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

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
000CY	NORTHWEST FASTENER SALES, INC.	7923 SW CIRBUS DRIVE	BEAVERTON, OR 97005
000EX	O'HARA METAL PRODUCT COMPANY	542 BRANNAN STREET	SAN FRANCISCO, CA 94107
00779	AMP, INC.	P O BOX 3608	HARRISBURG, PA 17105
08261	SPECTRA-STRIP CORP.	7100 LAMPSON AVE.	GARDEN GROVE, CA 92642
22526	BERG ELECTRONICS, INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
24931	SPECIALITY CONNECTOR CO., INC.	2620 ENDRESS PLACE	GREENWOOD, IN 46142
49671	RCA CORPORATION	30 ROCKEFELLER PLAZA	NEW YORK, NY 10020
71159	BRISTOL SOCKET SCREW, DIV. OF AMERICAN CHAIN AND CABLE CO., INC.	P O BOX 2244, 40 BRISTOL ST.	WATERBURY, CT 06720
71279	CAMBRIDGE THERMIONIC CORP.	445 CONCORD AVE.	CAMBRIDGE, MA 02138
71785	TRW, CINCH CONNECTORS	1501 MORSE AVENUE	ELK GROVE VILLAGE, IL 60007
73743	FISCHER SPECIAL MFG. CO.	446 MORGAN ST.	CINCINNATI, OH 45206
73803	TEXAS INSTRUMENTS, INC., METALLURGICAL MATERIALS DIV.	34 FOREST STREET	ATTLEBORO, MA 02703
74445	HOLO-KROME CO.	31 BROOK ST. WEST	HARTFORD, CT 06110
78189	ILLINOIS TOOL WORKS, INC. SHAKEPROOF DIVISION	ST. CHARLES ROAD	ELGIN, IL 60120
78471	TILLEY MFG. CO.	900 INDUSTRIAL RD.	SAN CARLOS, CA 94070
79136	WALDES, KOHINOOR, INC.	47-16 AUSTEL PLACE	LONG ISLAND CITY, NY 11101
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
98291	SEAELECTRO CORP.	225 HOYT	MAMARONECK, NY 10544

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	337-1399-05		2						SHIELD,ELEC:SIDE	80009	337-1399-05
-2	366-1031-09		1						KNOB:GY,HOLD,0.127ID,0.392 OD,0.466 H	80009	366-1031-09
	213-0246-00		1						. SETSCREW:5-40 X 0.093 ITL BK OXD,HEX SKT	71159	OBD
-3	366-1170-03		1						KNOB:GRAY,0.25 ID X 0.706 OD,0.6H	80009	366-1170-03
	213-0153-00		2						. SETSCREW:5-40 X 0.125,STL BK OXD,HEX SKT	000CY	OBD
-4	366-1559-00		6						PUSH BUTTON:SIL GY,0.18 SQ X 0.43	80009	366-1559-00
-5	366-1690-00		1						KNOB:SIL GY,0.53 X0.23 X 1.059	80009	366-1690-00
-6	-----		1						ADAPTER,CONN:(SEE J5021 REPL) (ATTACHING PARTS)		
-7	220-0497-00		1						NUT,PLAIN,HEX.:0.5-28 X 0.562 INCH HEX,BRS	73743	OBD
-8	210-1039-00		1						WASHER,LOCK:INT,0.521 ID X 0.625 INCH OD -----*-----	24931	OBD
-9	-----		1						CONNECTOR,RCPT,:(SEE J5001 REPL)		
-10	210-0255-00		1						TERMINAL,LUG:0.391" ID INT TOOTH	80009	210-0255-00
-11	358-0029-00		1						BSHG,MACH.THD:HEX,0.375-32 X 0.438"LONG (ATTACHING PARTS)	80009	358-0029-00
-12	210-0590-00		1						NUT,PLAIN,HEX.:0.375 X 0.438 INCH,STL	73743	2X28269-402
-13	210-0978-00		1						WASHER,FLAT:0.375 ID X 0.50 INCH OD,STL -----*-----	78471	OBD
-14	105-0719-00		1						LATCH,RETAINING:PLUG-IN (ATTACHING PARTS)	80009	105-0719-00
-15	213-0113-00		1						SCR,TPG,THD FOR:2-32 X 0.312 INCH,PNH STL -----*-----	93907	OBD
-16	105-0718-01		1						BAR,LATCH RLSE:	80009	105-0718-01
-17	426-1072-00		6						FRAME,PUSH BTN:PLASTIC	80009	426-1072-00
-18	334-3144-01		1						MARKER,IDENT:	80009	334-3144-01
-19	378-2030-01		1						LENS,LED DSPL:RED,W/MARKINGS	80009	378-2030-01
-20	-----		1						CKT BOARD ASSY:DISPLAY(SEE A3 REPL) (ATTACHING PARTS)		
-21	210-0407-00		2						NUT,PLAIN,HEX.:6-32 X 0.25 INCH,BRS -----*-----	73743	3038-0228-402
-22	131-0608-00		-						. CKT BOARD ASSY INCLUDES:		
-23	136-0252-04		15						. TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
-24	131-1425-00		8						. SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS	22526	75060-007
-25	333-2365-02		1						. CONTACT SET,ELE:R ANGLE,0.150" L,STR OF 36	22526	65521-136
-26	200-0935-00		1						PANEL,FRONT:	80009	333-2365-02
-27	352-0157-00		2						BASE,LAMPHOLDER:0.29 OD X 0.19 CASE	80009	200-0935-00
-28	386-3825-00		2						LAMPHOLDER:WHITE PLASTIC	80009	352-0157-00
			1						SUBPANEL,FRONT: (ATTACHING PARTS)	80009	386-3825-00
-29	213-0123-00		2						SCREW,TPG,TF:6-32 X 0.375,SPCL TYPE,FLH	93907	OBD
-30	211-0531-00		2						SCREW,MACHINE:6-32 X 0.375,FIL,STL -----*-----	83385	OBD
-31	337-2478-00		1						SHIELD,ELEC:REAR,SUBPANEL	80009	337-2478-00
-32	384-1101-00		1						EXTENSION SHAFT:4.14 INCH LONG	80009	384-1101-00
-33	384-1341-00		1						EXTENSION SHAFT:2.183 INCH LONG,OFFSET	80009	384-1341-00
-34	384-1058-00		1						EXTENSION SHAFT:8.157 INCH LONG	80009	384-1058-00
-35	-----		1						CKT BOARD ASSY:RESOLN MULTR(SEE A2 REPL) (ATTACHING PARTS)		
-36	211-0244-00		3						SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH STL -----*-----	78189	OBD
-37	131-1426-00		-						. CKT BOARD ASSY INCLUDES:		
-38	136-0269-02		1						. CONTACT SET,ELE:R ANGLE,0.250L,STRIP OF 36	22526	65524-136
	136-0269-02		2						. SKT,PL-IN ELEK:MICROCIRCUIT,14 DIP,LOW CLE	73803	CS9002-14
	-----		7						. SKT,PL-IN ELEK:MICROCIRCUIT,14 DIP,LOW CLE (OPTION 07 ONLY)	73803	CS9002-14
-39	136-0260-02		2						. SKT,PL-IN ELEK:MICROCIRCUIT,16 DIP,LOW CLE	71785	133-51-92-008
	198-3795-00		1						. WIRE SET,ELEC: (OPTION 07 ONLY)	80009	198-3795-00
-40	352-0166-07		1						. . CONN BODY,PL,EL:8 WIRE VIOLET (OPTION 07 ONLY)	80009	352-0166-07
-41	352-0168-00		1						. . CONN BODY,PL,EL:10 WIRE BLACK (OPTION 07 ONLY)	80009	352-0168-00

Replaceable Mechanical Parts—DC 508A

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-42	131-0707-00		18	.	CONNECTOR, TERM.: 22-26 AWG, BRS& CU BE GOLD	22526	47439
	-----		-	.	(OPTION 07 ONLY)		
-43	175-0828-00		FT	.	WIRE, ELECTRICAL: 5 WIRE RIBBON	08261	SS-0526-710610C
	-----		-	.	(OPTION 07 ONLY)		
-44	175-0831-00		FT	.	WIRE, ELECTRICAL: 8 WIRE RIBBON	08261	SS-0826-710610C
	-----		-	.	(OPTION 07 ONLY)		
-45	129-0425-00		1	.	SPACER, POST: 0.90 L X 0.25 HEX (ATTACHING PARTS)	80009	129-0425-00
-46	211-0101-00		1	.	SCREW, MACHINE: 4-40 X 0.25, 100 DEG, FLH STL	83385	OBD
-47	211-0008-00		1	.	SCREW, MACHINE: 4-40 X 0.25 INCH, PNH STL	83385	OBD
-48	210-1178-00		1	.	WSHR, SHOULDERED: FOR MTG TO-220 TRANSISTOR	49671	DF 137A
-49	342-0224-00		1	.	INSULATOR, PLATE: TRANSISTOR	80009	342-0224-00
					- - - * - - -		
-50	-----		1	.	CKT BOARD ASSY: PRESCALER (SEE A4 REPL) (ATTACHING PARTS)		
-51	211-0008-00		2	.	SCREW, MACHINE: 4-40 X 0.25 INCH, PNH STL	83385	OBD
-52	210-0054-00		2	.	WASHER, LOCK: SPLIT, 0.118 ID X 0.212"OD STL	83385	OBD
-53	211-0538-00		1	.	SCREW, MACHINE: 6-32 X 0.312"100 DEG, FLH STL	83385	OBD
-54	210-0457-00		1	.	NUT, PL, ASSEM WA: 6-32 X 0.312 INCH, STL	83385	OBD
					- - - * - - -		
				.	CKT BOARD ASSY INCLUDES:		
-55	166-0032-00		1	.	SPACER, SLEEVE: 0.18 ID X 0.313 INCH LONG (ATTACHING PARTS)	80009	166-0032-00
-56	211-0016-00		1	.	SCREW, MACHINE: 4-40 X 0.625 INCH, PNH STL	83385	OBD
					- - - * - - -		
-57	337-2479-00		1	.	SHIELD, ELEC: CIRCUIT CARD, TOP (ATTACHING PARTS)	80009	337-2479-00
-58	211-0022-00		6	.	SCREW, MACHINE: 2-56 X 0.188 INCH, PNH STL	83385	OBD
-59	210-0053-00		6	.	WASHER, LOCK: INTL, 0.092 ID X 0.175"OD, STL	83385	OBD
					- - - * - - -		
-60	211-0012-00		1	.	SCREW, MACHINE: 4-40 X 0.375, PNH STL CD PL	83385	OBD
-61	361-0225-00		1	.	SPACER, SLEEVE:	80009	361-0225-00
-62	211-0097-00		1	.	SCREW, MACHINE: 4-40 X 0.312 INCH, PNH STL	83385	OBD
-63	129-0517-00		1	.	POST, ELEC-MECH: 0.25 L X 0.25 HEX, AL	80009	129-0517-00
-64	-----		4	.	LINK, TERM. CONNE: (SEE A4W2320, W2440 REPL)		
-65	136-0252-04		23	.	SOCKET, PIN TERM: U/W 0.016-0.018 DIA PINS	22526	75060-007
-66	131-0938-00		2	.	CONNECTOR, RCPT, : 50 OHM MALE SNAP-ON	98291	051-043-0349
-67	337-2482-00		1	.	SHIELD, ELEC: CIRCUIT CARD, FRONT (ATTACHING PARTS)	80009	337-2482-00
-68	211-0022-00		5	.	SCREW, MACHINE: 2-56 X 0.188 INCH, PNH STL	83385	OBD
-69	337-2481-00		1	.	SHIELD, ELEC: CIRCUIT CARD, REAR (ATTACHING PARTS)	80009	337-2481-00
-70	211-0022-00		5	.	SCREW, MACHINE: 2-56 X 0.188 INCH, PNH STL	83385	OBD
					- - - * - - -		
-71	407-2064-00		1	.	BRACKET, ANGLE: ELECTRICAL SHIELD, ALUMINUM	80009	407-2064-00
-72	129-0463-00		1	.	SPACER, POST: 0.188 HEX X 0.937"L, W/4-40 THD	80009	129-0463-00
-73	211-0116-00		1	.	SCR, ASSEM WSHR: 4-40 X 0.312 INCH, PNH BRS	83385	OBD
-74	210-0054-00		1	.	WASHER, LOCK: SPLIT, 0.118 ID X 0.212"OD STL	83385	OBD
					- - - * - - -		
-75	129-0692-00		1	.	SPACER, POST: 1.016 L, W/4-40 THRU THD, AL (ATTACHING PARTS)	80009	129-0692-00
-76	211-0007-00		1	.	SCREW, MACHINE: 4-40 X 0.188 INCH, PNH STL	83385	OBD
					- - - * - - -		
-77	210-0054-00		1	.	WASHER, LOCK: SPLIT, 0.118 ID X 0.212"OD STL	83385	OBD
					- - - * - - -		
-78	337-2480-00		1	.	SHIELD, ELEC: CIRCUIT CARD, BOTTOM (ATTACHING PARTS)	80009	337-2480-00
-79	211-0116-00		1	.	SCR, ASSEM WSHR: 4-40 X 0.312 INCH, PNH BRS	83385	OBD
					- - - * - - -		
	198-3875-00		1	.	WIRE SET, ELEC:	80009	198-3875-00
-80	352-0162-04		1	.	CONN BODY, PL, EL: 4 WIRE YELLOW	80009	352-0162-04
-81	131-0707-00		4	.	CONNECTOR, TERM.: 22-26 AWG, BRS& CU BE GOLD	22526	47439
-82	175-0827-00		FT	.	CABLE, SP, ELEC: 4, 26 AWG, STRD, PVC JKT, RBN	08261	SS04267(1061)0C
-83	337-2504-00		1	.	SHIELD, ELEC: INPUT	80009	337-2504-00

Replaceable Mechanical Parts—DC 508A

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
	672-0698-00		1	CKT BOARD ASSY:MAIN					(ATTACHING PARTS)	80009	672-0698-00
1-84	213-0146-00		4	SCR,TPG,THD FOR:6-20 X 0.313 INCH,PNH STL					-----*	83385	OBD
	-----		-	CKT BOARD ASSY INCLUDES:							
-85	384-0923-00		1	EXTENSION SHAFT:5.06 INCH LONG						80009	384-0923-00
-86	376-0051-00		1	CPLG,SHAFT,FLEX:0.127 ID X 0.375 ID DELRIN						80009	376-0051-00
	213-0022-00		4	SETSCREW:4-40 X 0.188 INCH,HEX SOC STL						74445	OBD
-87	-----		1	RES NONWIR:(SEE R1460 REPL)					(ATTACHING PARTS)		
-88	210-0583-00		1	NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS						73743	2X20317-402
-89	210-0046-00		1	WASHER,LOCK:0.261 ID,INTL,0.018 THK,BRS					-----*	78189	1214-05-00-0541C
-90	407-0803-00		1	BRACKET,ELEC SW:BRASS						80009	407-0803-00
	-----		-	SW CAM ACTR AS:DISPLAY(SEE S1380 REPL)					(ATTACHING PARTS)		
-91	211-0244-00		4	SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH STL					-----*	78189	OBD
	-----		-	SW CAM ACTR ASSY INCLUDES:							
-92	200-2123-00		1	COWER,CAM SW:ALUMINUM					(ATTACHING PARTS)	80009	200-2123-00
-93	211-0008-00		4	SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL						83385	OBD
-94	210-0004-00		4	WASHER,LOCK:#4 INTL,0.015THK,STL CD PL					-----*	78189	1204-00-00-0541C
-95	131-0963-00		1	CONTACT,ELEC:GROUNDING						000EX	OBD
-96	210-0406-00		4	NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS						73743	2X12161-402
-97	214-1752-00		2	ROLLER,DETENT:						80009	214-1752-00
-98	214-1139-02		1	SPRING,FLAT:GREEN COLORED						80009	214-1139-02
	214-1139-03		1	SPRING,FLAT:RED COLORED						80009	214-1139-03
-99	401-0180-00		1	BEARING,CAM SW:FRONT & REAR					(ATTACHING PARTS)	80009	401-0180-00
-100	354-0390-00		1	RING,RETAINING:0.338 ID X 0.025" THK,STL					-----*	79136	5100-37MD
-101	384-0878-18		1	SHAFT CAM SW:OUTER CNCTRC,W/DRVR,TIME/CM						80009	384-0878-18
-102	105-0762-00		1	ACTUATOR,CAM SW:DISPLAY						80009	105-0762-00
-103	210-0406-00		2	NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS						73743	2X12161-402
-104	401-0178-01		1	BEARING,CAM SW:CENTER/REAR						80009	401-0178-01
-105	-----		-	CKT BOARD ASSY:MAIN(SEE A1 REPL)							
-106	-----		1	SWITCH,PUSH:(SEE A1S1590A-C REPL)							
-107	361-0383-00		4	SPACER,PB SW:CHARCOAL,0.33 INCH LONG						80009	361-0383-00
-108	131-1003-00		1	CONN,RCPT,ELEC:CKT BD MT,3 PRONG						80009	131-1003-00
-109	136-0252-04		5	SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS						22526	75060-007
-110	-----		1	SWITCH,PUSH:(SEE A1S1570 REPL)							
-111	361-0384-00		2	SPACER,PB SW:0.133 INCH LONG						80009	361-0384-00
-112	-----		1	SWITCH,PUSH:(SEE A1S1320 REPL)							
-113	131-0608-00		53	TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD						22526	47357
-114	-----		7	LINK,TERM.CONNE:(SEE A1W1180,W1222,W1223, W1259,W1312,W1566,W1638 REPL)							
-115	-----		1	TRANSISTOR:(SEE A1U1112 REPL)							
-116	136-0623-00		1	SOCKET,PLUG-IN:40 DIP,LOW PROFILE						73803	CS9002-40
-117	136-0269-02		10	SKT,PL-IN ELEK:MICROCIRCUIT,14 DIP,LOW CLE						73803	CS9002-14
-118	136-0514-00		1	SKT,PL-IN ELEK:MICROCIRCUIT,8 DIP						73803	CS9002-8
-119	136-0260-02		10	SKT,PL-IN ELEK:MICROCIRCUIT,16 DIP,LOW CLE						71785	133-51-92-008
-120	-----		1	SWITCH,PUSH:(SEE A1S1550 REPL)							
-121	361-0383-00		2	SPACER,PB SW:CHARCOAL,0.33 INCH LONG						80009	361-0383-00
	131-1426-00		1	CONTACT SET,ELE:R ANGLE,0.250L,STRIP OF 36						22526	65524-136
-122	131-0604-00		20	CONTACT,ELEC:CKT BD SW,SPR,CU BE						80009	131-0604-00
-123	131-0993-00		2	BUS,CONDUCTOR:2 WIRE BLACK						00779	530153-2
-124	129-0277-00		2	SPACER,POST:0.18 L,W/4-40THD THRU,BRASS						80009	129-0277-00
-125	-----		1	OSCILLATOR,RF:(SEE A1Y1430 REPL)							
	-----		-	(OPTIONS 01 AND 07)					(ATTACHING PARTS)		
-126	211-0097-00		1	SCREW,MACHINE:4-40 X 0.312 INCH,PNH STL						83385	OBD
	-----		-	(OPTIONS 01 AND 07)							
-127	210-1127-00		1	WASHER,FLAT:0.203 ID X 0.048 THK,STL CD						80009	210-1127-00
	-----		-	(OPTIONS 01 AND 07)					-----*		

Replaceable Mechanical Parts—DC 508A

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
	136-0388-00		1	.	.	.	.	.	SOCKET,PIN TERM:U/W 0.04 DIA PIN	71279	450-3704-01-0300
	-----		-	.	.	.	.	.	(OPTIONS 01 AND 07)		
1-128	-----		1	.	.	.	.	.	MICROCIRCUIT,LI:(SEE U1110 REPL)		
	-----		-	.	.	.	.	.	(OPTIONS 01 AND 07)		
									(ATTACHING PARTS)		
-129	211-0507-00		1	.	.	.	.	.	SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	0BD
	-----		-	.	.	.	.	.	(OPTIONS 01 AND 07)		
-130	210-0407-00		1	.	.	.	.	.	NUT,PLAIN,HEX.:6-32 X 0.25 INCH,BRS	73743	3038-0228-402
	-----		-	.	.	.	.	.	(OPTIONS 01 AND 07)		
									- - - * - - -		
	198-3794-00		1	.	.	.	.	.	WIRE SET,ELEC:	80009	198-3794-00
-131	352-0169-01		2	.	.	.	.	.	HLDR TERM CONN:2 WIRE,BROWN	80009	352-0169-01
	352-0169-02		2	.	.	.	.	.	CONN BODY,PL,EL:2 WIRE RED	80009	352-0169-00
	352-0169-03		2	.	.	.	.	.	CONN BODY,PL,EL:2 WIRE ORANGE	80009	352-0169-03
-132	131-0707-00		12	.	.	.	.	.	CONNECTOR,TERM.:22-26 AWG,BRS& CU BE GOLD	22526	47439
	198-3795-00		1	.	.	.	.	.	WIRE SET,ELEC:	80009	198-3795-00
	352-0166-07		1	.	.	.	.	.	CONN BODY,PL,EL:8 WIRE VIOLET	80009	352-0166-07
	352-0168-00		1	.	.	.	.	.	CONN BODY,PL,EL:10 WIRE BLACK	80009	352-0168-00
	131-0707-00		18	.	.	.	.	.	CONNECTOR,TERM.:22-26 AWG,BRS& CU BE GOLD	22526	47439
	175-0828-00		FT	.	.	.	.	.	WIRE,ELECTRICAL:5 WIRE RIBBON	08261	SS-0526-710610C
	175-0831-00		FT	.	.	.	.	.	WIRE,ELECTRICAL:8 WIRE RIBBON	08261	SS-0826-710610C
-133	214-1061-00		1	.	.	.	.	.	SPRING,GROUND:FLAT	80009	214-1061-00
-134	426-0725-19		1	.	.	.	.	.	FR SECT,PLUG-IN:TOP	80009	426-0725-19
-135	426-0724-04		1	.	.	.	.	.	FR SECT,PLUG-IN:BOTTOM	80009	426-0724-04
-136	386-3657-01		2	.	.	.	.	.	SUPPORT,PLUG IN:	93907	0BD
-137	210-1270-00		2	.	.	.	.	.	WASHER,FLAT:0.141 ID X 0.04 THK,AL	80009	210-1270-00
	198-3793-00		1	.	.	.	.	.	WIRE SET,ELEC:	80009	198-3793-00
-138	175-0825-00		FT	.	.	.	.	.	WIRE,ELECTRICAL:2 WIRE RIBBON	80009	175-0825-00
-139	175-0828-00		FT	.	.	.	.	.	WIRE,ELECTRICAL:5 WIRE RIBBON	08261	SS-0526-710610C
-140	175-0830-00		FT	.	.	.	.	.	WIRE,ELECTRICAL:7 WIRE RIBBON	08261	SS-0726-710610C
-141	175-0833-00		FT	.	.	.	.	.	WIRE,ELECTRICAL:10 WIRE RIBBON	08261	SS-1026-7
-142	352-0169-02		1	.	.	.	.	.	CONN BODY,PL,EL:2 WIRE RED	80009	352-0169-00
	352-0169-03		1	.	.	.	.	.	CONN BODY,PL,EL:2 WIRE ORANGE	80009	352-0169-03
-143	352-0163-05		4	.	.	.	.	.	CONN BODY,PL,EL:5 WIRE GREEN	80009	352-0163-05
-144	352-0165-07		2	.	.	.	.	.	CONN BODY,PL,EL:7 WIRE VIOLET	80009	352-0165-07
-145	352-0168-00		2	.	.	.	.	.	CONN BODY,PL,EL:10 WIRE BLACK	80009	352-0168-00
-146	131-0707-00		62	.	.	.	.	.	CONNECTOR,TERM.:22-26 AWG,BRS& CU BE GOLD	22526	47439
-147	210-0774-00		1	.	.	.	.	.	EYELET,METALLIC:0.152 OD X 0.245 INCH L,BRS	80009	210-0774-00
-148	210-0775-00		1	.	.	.	.	.	EYELET,METALLIC:0.126 OD X 0.23 INCH L,BRS	80009	210-0775-00
-149	131-0375-00		3	.	.	.	.	.	CONNECTOR,PLUG,:RIGHT ANGLE	98291	051-328-3188-220

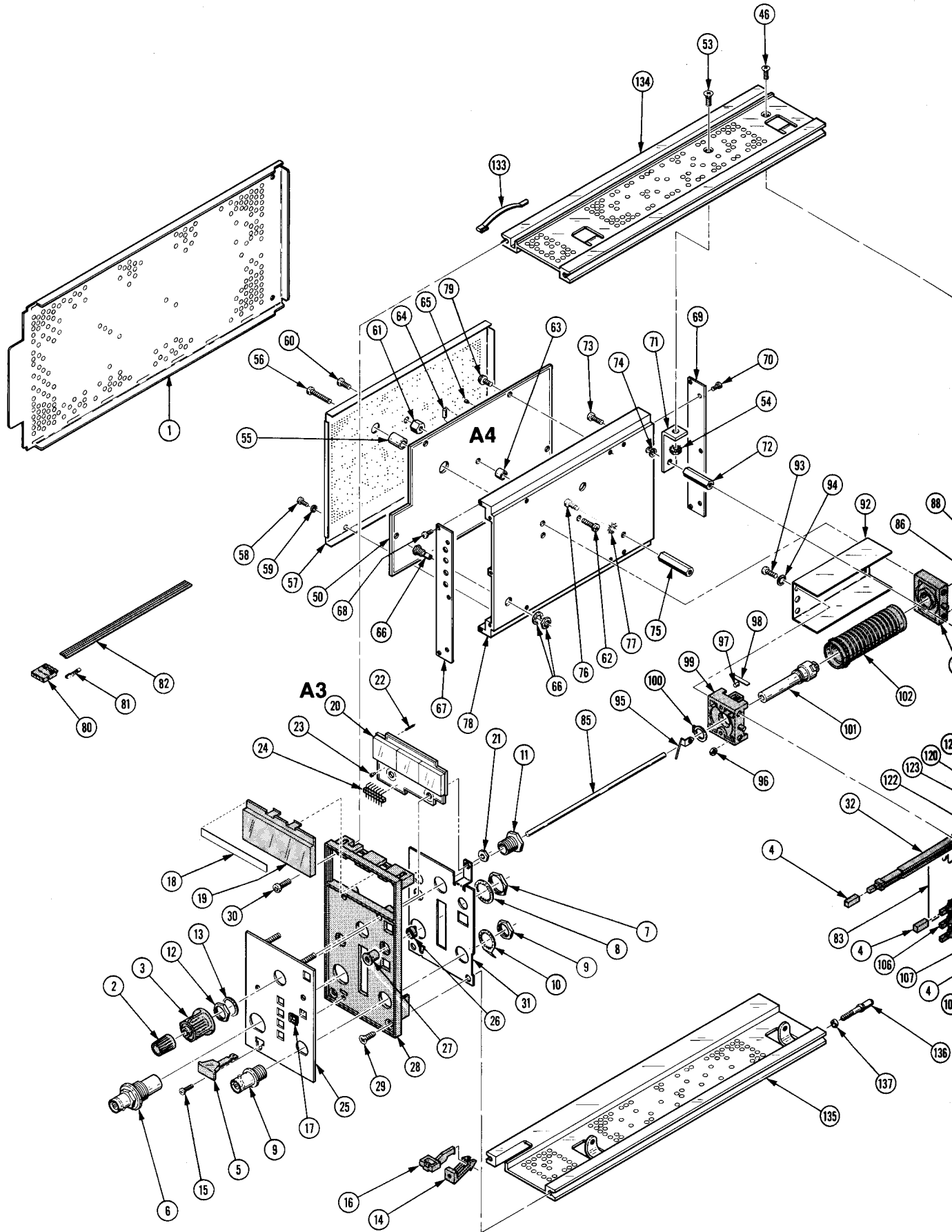
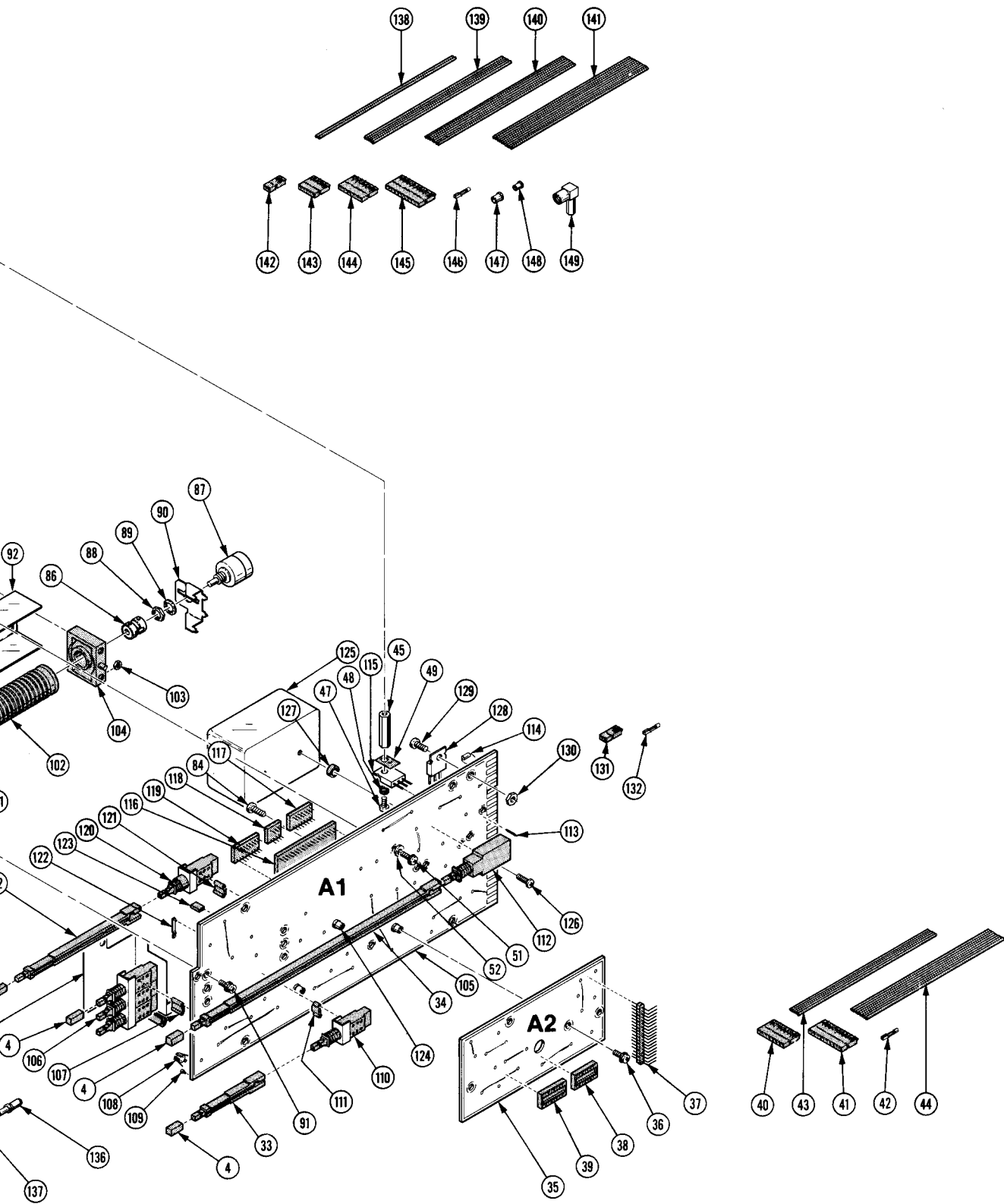


FIG. 1 EXPLODED



DC 508A

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
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ACCESSORIES

070-3638-00			1						MANUAL, TECH:	80009	070-3638-00
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ACCESSORIES

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.

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

Date: 10-1-80

Change Reference: C1/1080

Product: DC 508A 1.3 GHz COUNTER

Manual Part No.: 070-3638-00

DESCRIPTION

SCHEMATIC CORRECTION

Diagram 2 coordinate A2

CHANGE TO:

PRESALE INPUT

100 - 1300MHz

50Ω 2VRMS MAX

Date: 6-10-81 Change Reference: C2/681

Product: DC 508A 1.3 GHz COUNTER Manual Part No.: 070-3638-00

DESCRIPTION

REPLACEABLE ELECTRICAL PARTS CHANGES

CHANGE TO:

A4U2345 156-0377-00 MICROCIRCUIT,DI:TYPE D FLIP-FLOP,MC1690L,ECL