

Tektronix®

**DC 508A
1.3 GHz COUNTER**

INSTRUCTION MANUAL

Tektronix[®]
COMMITTED TO EXCELLENCE

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

**DC 508A
1.3 GHz COUNTER**

INSTRUCTION MANUAL

Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97077
070-3638-00
Product Group 75

Serial Number _____

First Printing AUG 1980
Revised JUL 1982

Copyright © 1979, 1980 Tektronix, Inc. All rights reserved. Contents of this publication may not be reproduced in any form without the written permission of Tektronix, Inc.

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

TEKTRONIX, TEK, SCOPE-MOBILE, and  are registered trademarks of Tektronix, Inc.

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


Copyright © 1979, 1980 durch Tektronix, Inc. Alle Rechte vorbehalten. Der Inhalt dieser Publikation darf ohne Genehmigung von Tektronix, Inc. nicht weitergegeben werden.

Produkte von Tektronix, Inc. und seinen Tochtergesellschaften sind durch US- und Auslandspatente und/oder schwebende Patente abgedeckt.

TEKTRONIX, TEK, SCOPE-MOBILE und  sind geschützte Warenzeichen von Tektronix, Inc.


Gedruckt in U.S.A. Spezifikations- und Preisänderungen bleiben vorbehalten.

Copyright © 1979, 1980 TEKTRONIX INC. Tous droits réservés. Le contenu de ce manuel ne peut être reproduit sous quelque forme que ce soit sans l'accord de Tektronix Inc.

Tous les produits TEKTRONIX sont brevetés US et Etranger et les logotypes TEKTRONIX, TEK SCOPE MOBILE,  sont déposés.

Imprimé aux USA. TEKTRONIX se réserve le droit de modifier : caractéristiques et prix dans le cadre de développements technologiques.

© 1979, 1980 年版權所有テクトロニクス社。不許複製。

TEKTRONIX、TEK、SCOPE-MOBILE、 はテクトロニクス社の登録商標です。

米国にて印刷。仕様及び価格は予告なく変更する場合があります。

INSTRUMENT SERIAL NUMBERS

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

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

TABLE OF CONTENTS

| | Page | | Page |
|---|------|--|------|
| LIST OF ILLUSTRATIONS | ii | Section 4 CALIBRATION PROCEDURE ... | 4-1 |
| SAFETY SUMMARY | iii | Performance Check | 4-1 |
| Section 1 SPECIFICATION | 1-1 | Adjustment Procedure | 4-5 |
| Section 2 OPERATING INSTRUCTIONS ... | 2-1 | Section 5 MAINTENANCE AND INTERFACING INFORMATION .. | 5-1 |
| FRENCH VERSION | | Section 6 OPTIONS | 6-1 |
| GERMAN VERSION | | Section 7 REPLACEABLE ELECTRICAL PARTS | 7-1 |
| JAPANESE VERSION | | Section 8 DIAGRAM AND CIRCUIT BOARD ILLUSTRATIONS | 8-1 |
| WARNING | | Section 9 REPLACEABLE MECHANICAL PARTS | 9-1 |
| <i>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.</i> | | CHANGE INFORMATION | |
| Section 3 CIRCUIT DESCRIPTION | 3-1 | | |

LIST OF ILLUSTRATIONS

| Fig. No. | | Page No. |
|-------------|---|-------------|
| 2-1 | Plug-in installation and removal | 2-1 |
| 2-2 | Controls and connectors | 2-3 |
| 2-3 | Illustration of maximum voltage allowed to input connectors | 2-4 |
| 2-4 | Illustration comparing attenuation-to- triggering advantages | 2-4 |
| 3-1 | Gate generator pulse relationships | 3-4 |
| 3-2 | Measurement cycle timing pulse relationship | 3-4 |
| 4-1 | Location of test points and adjustments on Main circuit board | 4-6 |
| 4-2 | Location of Threshold adjustment on Prescaler circuit board | 4-7 |
| 5-1 | Front panel fuse assembly | 5-1 |
| 5-2 | Input/output assignments for plug-in rear interface connector contacts | 5-2 |

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 Handbuchs.

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 Schutzerder innerhalb des Netzanschlußkabels ist mit Gerätemasse verbunden und dient der sicheren Arbeitsweise.

ご使用の前に

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。

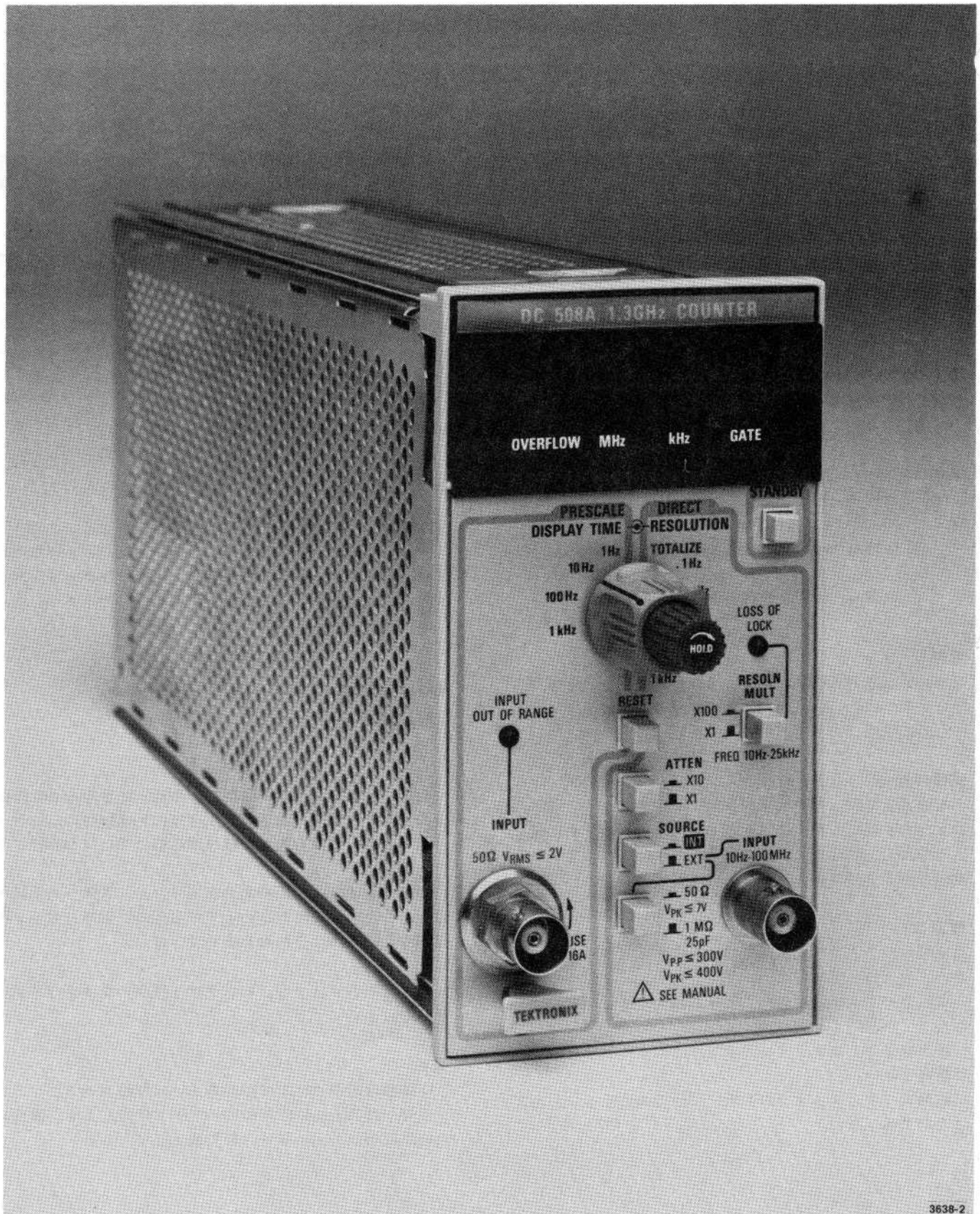
機器の内部調整または修理は、事故が起きた場合に応急手当、および処理のできる人がそばにいない時には行わないで下さい。電源を入れて修理する際は特に気をつけて下さい。

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, 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 Ω ±10%. |
| 1 MΩ | | Approximately 1 MΩ in parallel with approximately 25 pF. |
| External Maximum Input Voltage | | |
| 50 Ω | | $V_{pk} \leq 7 \text{ V}$. |
| 1 MΩ, 1X Attenuation | | $V_{pk} \leq 400 \text{ V}$, $V_{p-p} \leq 300 \text{ V}$ from dc to 0.75 MHz. $V_{p-p} \leq 400 \text{ V}$, $V_{p-p} \leq 225 \div f_{\text{MHz}}$ from 0.75 MHz to 22 MHz. $V_p \leq 400 \text{ V}$, $V_{p-p} \leq 10 \text{ V}$ above 22 MHz. Pulse: $V_{p-p} \leq 400 \text{ V}$, $\frac{dV}{dt} \leq 5 \text{ V/ns}$. |
| 1 MΩ, 10X Attenuation | | $V_{pk} \leq 400 \text{ V}$, $V_{p-p} \geq 300 \text{ V}$ from dc to 1 MHz. $V_{p-p} \leq 400 \text{ V}$, $V_{p-p} \leq 300 \div f_{\text{MHz}}$ from 1 MHz to 6 MHz. $V_{p-p} \leq 400 \text{ V}$, $V_{p-p} \leq 100 \text{ V}$ above 6 MHz. |
| Rear Interface Internal Input | | |
| Sensitivity | | ≤125 mV rms from ≤10 Hz to ≥50 MHz. |
| Impedance | | 50 Ω ±10%, dc coupled termination. |
| Maximum Input Voltage | | $V_{p-p} \leq 4 \text{ V}$. |

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 $\pm 1 \times 10^{-7}$. | Adjust to $\leq 0.1 \times 10^{-7}$ |
| Temperature Stability (0°C to +50°C) | ± 5 ppm. | |
| 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 | | ≤ 1 ppm/year. |
| Adjustment Resolution | $\pm 1 \times 10^{-7}$ or better. | |



Digitally signed by
<http://www.aa4df.com>

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. |

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 \approx 2 lbs. 2 oz. (0.964 kg). Instrument with Options 1 and 7 \approx 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.

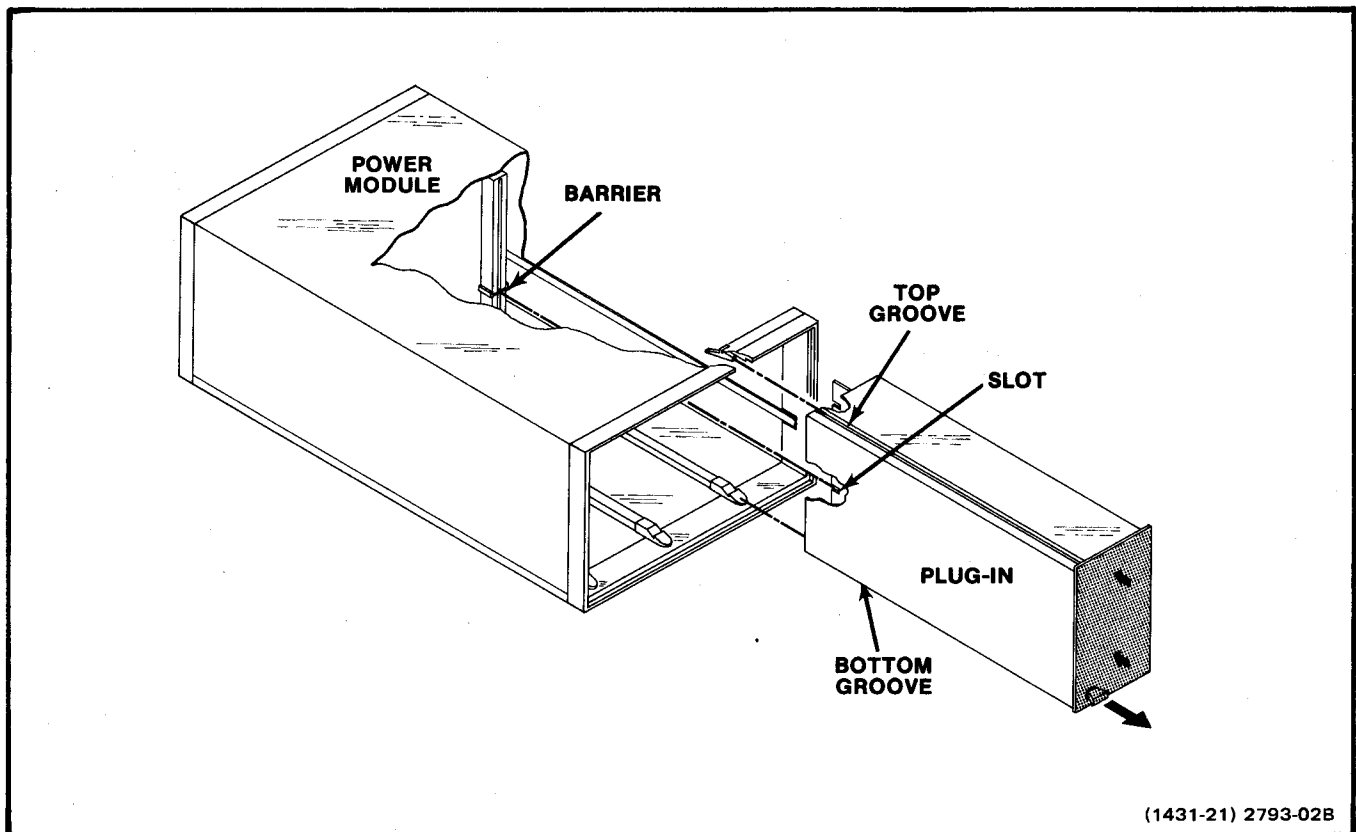


Fig. 2-1. Plug-in installation and removal.

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.

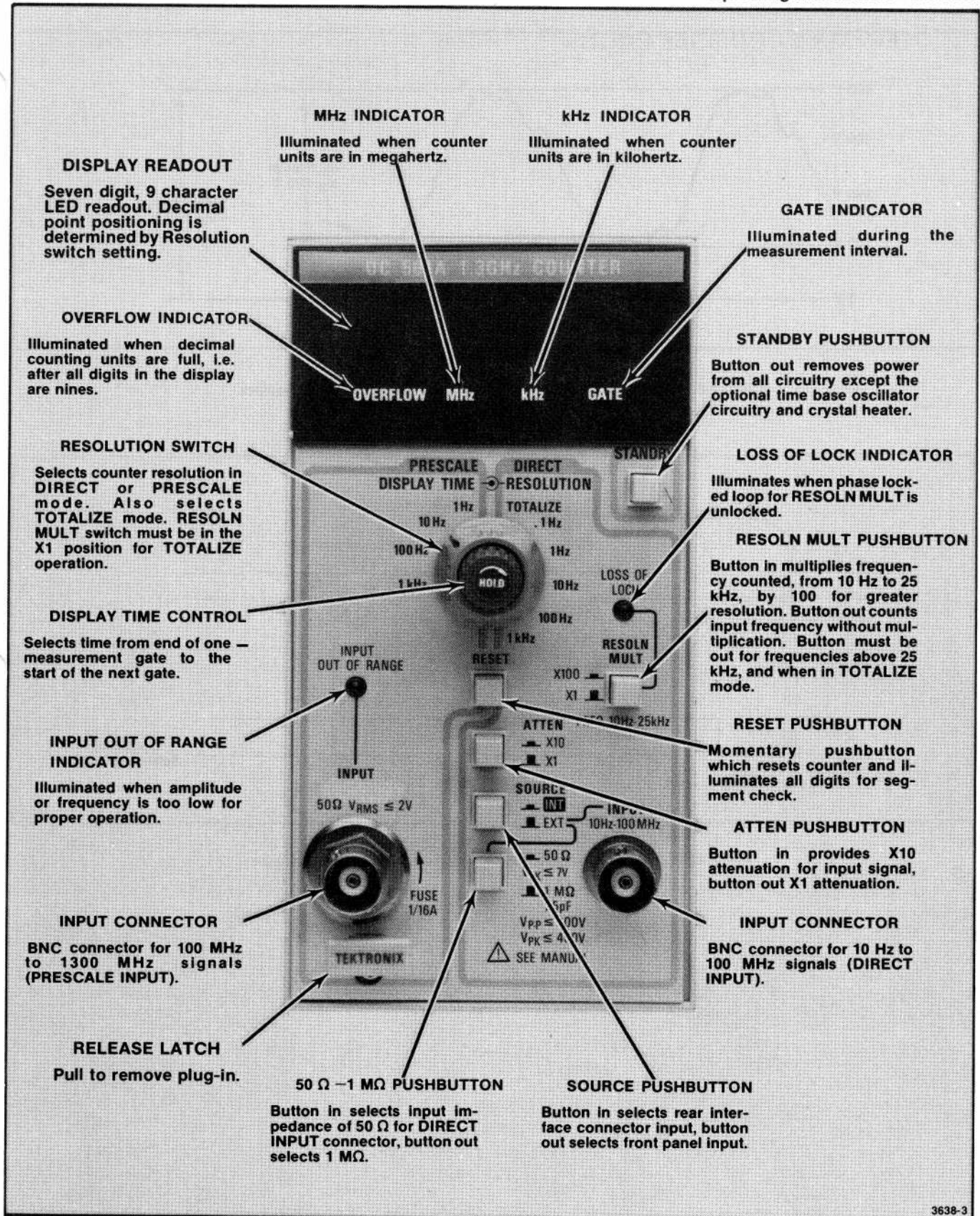
Totalize Mode

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.



3638-3

Fig. 2-2. Controls and connectors.

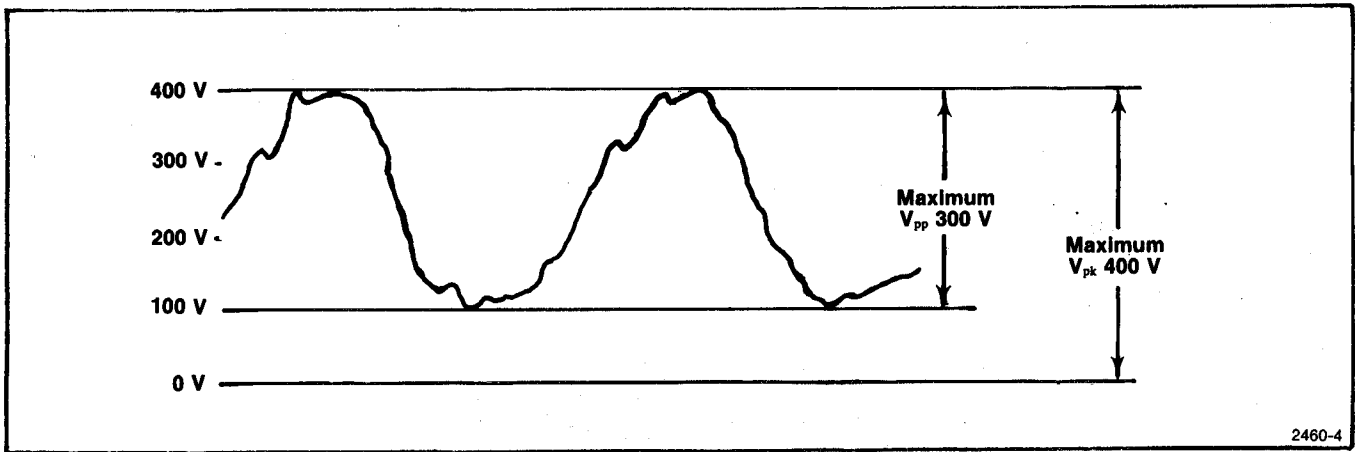


Fig. 2-3. Illustration of maximum voltage allowed to input connectors.

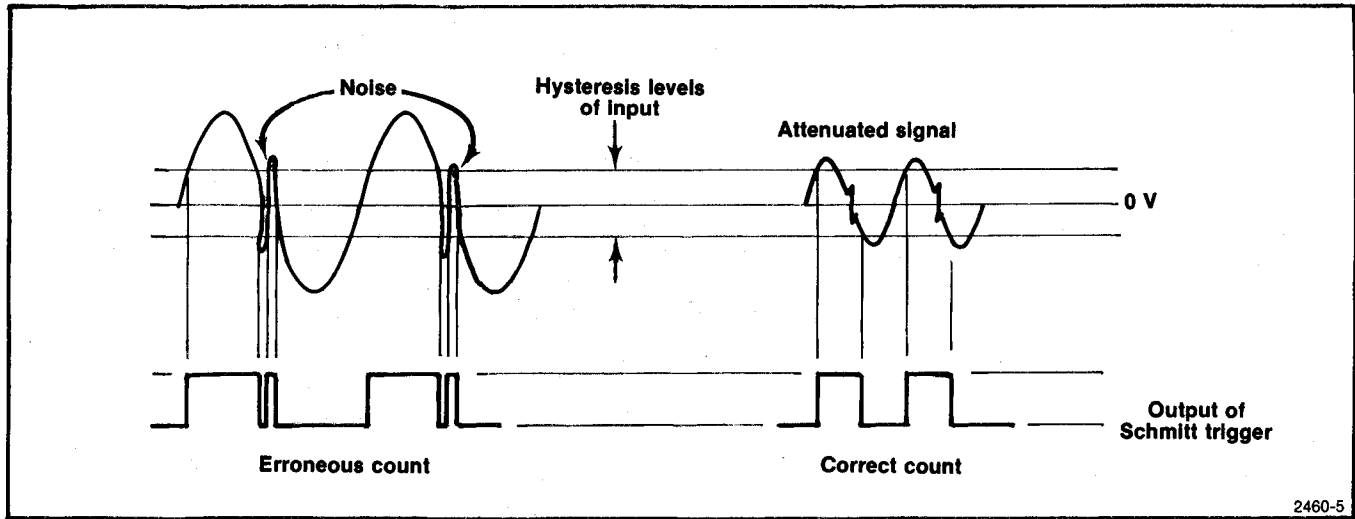


Fig. 2-4. Illustration comparing attenuation-to-triggering advantages.

INSTRUCTIONS D'UTILISATION

Description de l'appareil

Le competeur 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 competeur peut également totaliser des évènements 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.

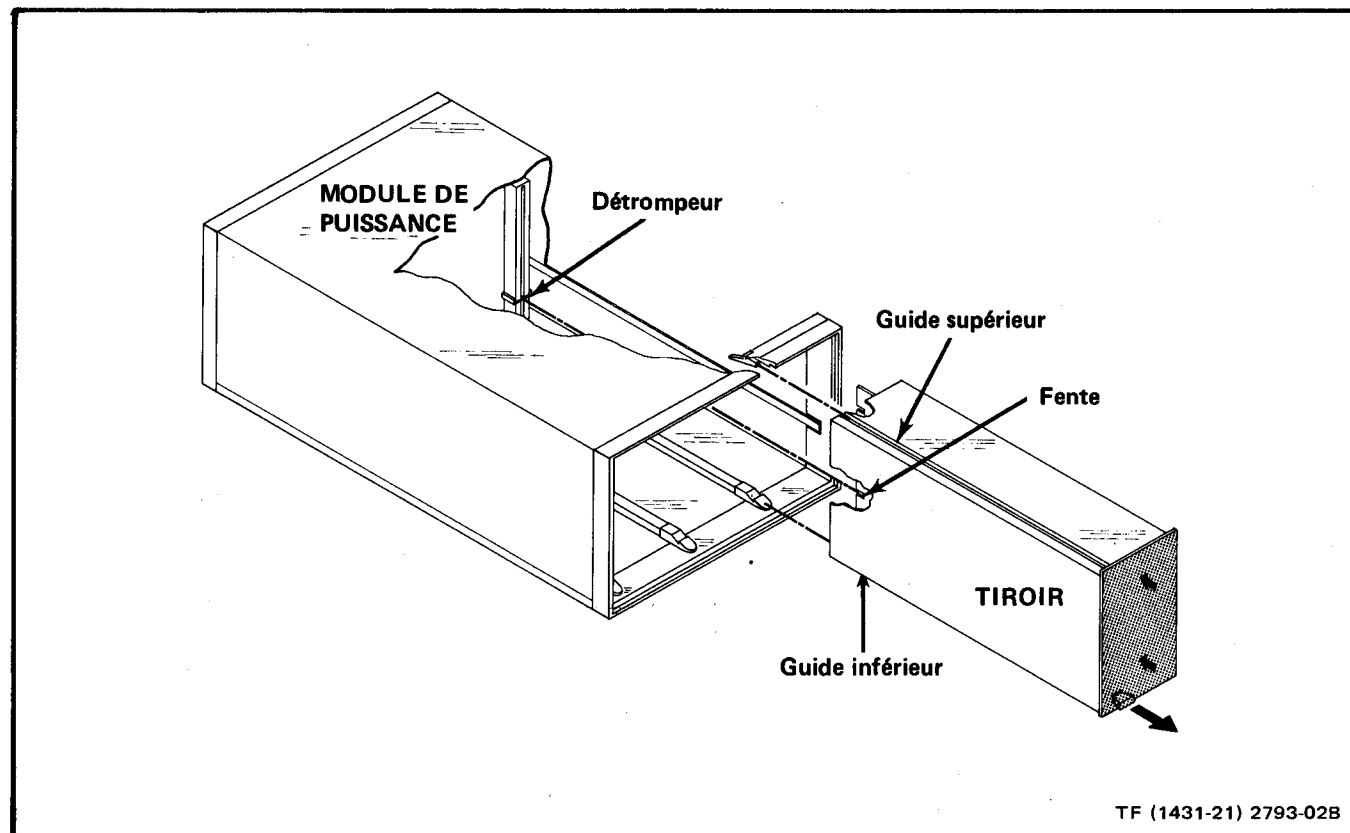


Fig. 2-1. Installation et extraction du tiroir.

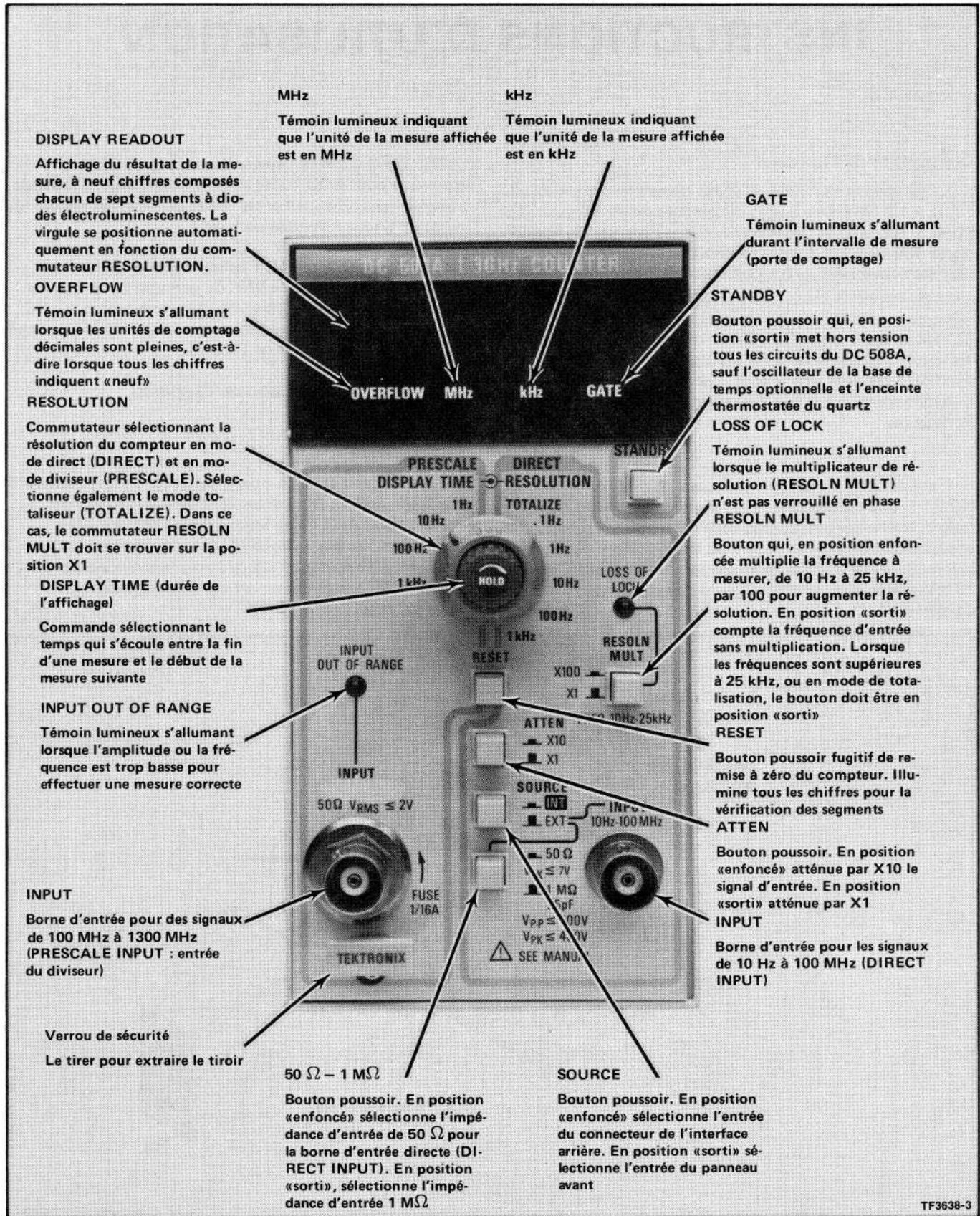


Fig. 2-2. Commandes et prises du DC 508A.

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.

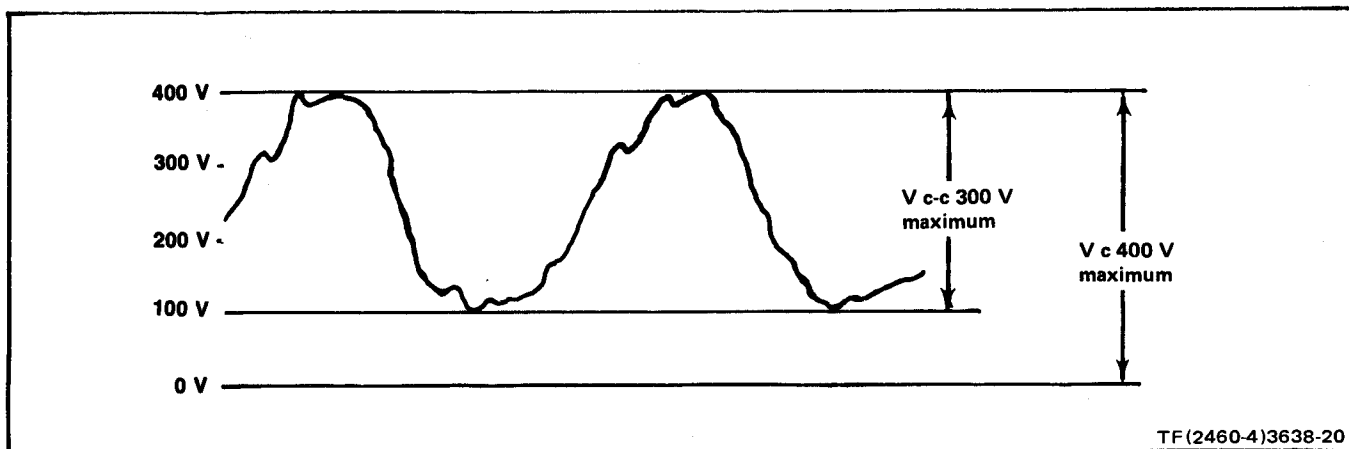


Fig. 2-3. Illustrations des limites des tensions maximales admissibles à l'entrée.

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-

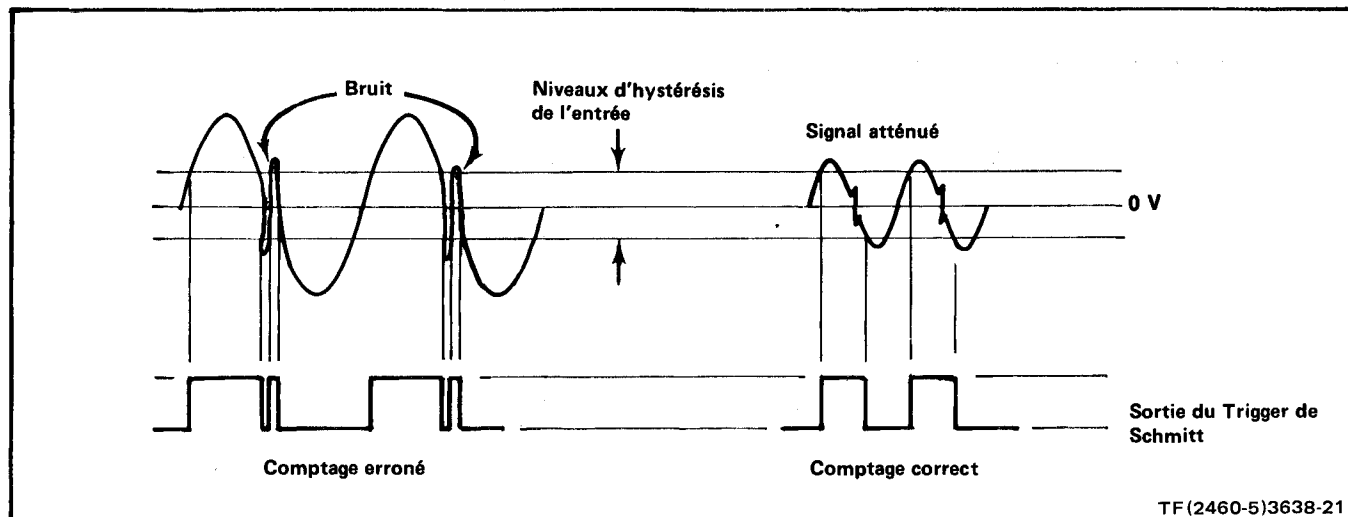


Fig. 2-4. Avantage produit par l'atténuation du signal d'entrée.

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.

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 $20 mV_{\text{eff}}$ erreicht. Liegt das Eingangssignal unterhalb des Pegels bei dem fehlerfrei gemessen wird, wird die Ziffern-Anzeige dunkel gehalten, wobei eine Lampe den Eingangsfehler signalisiert.

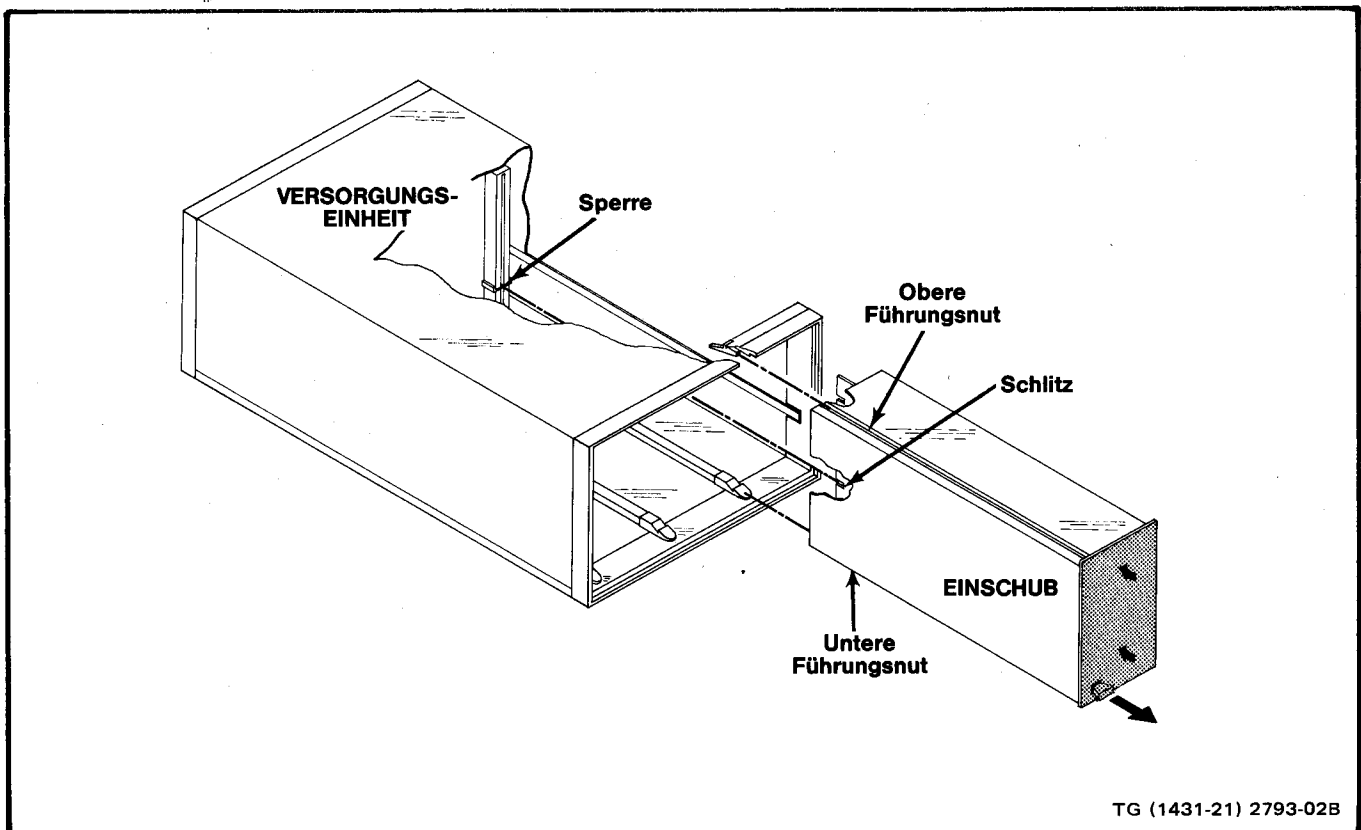
Zu messende Frequenzen können bei direktem Eingang sowohl in den Fronteingang als auch in den rückseitigen Interfaceeingang eingespeist werden.

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.



TG (1431-21) 2793-02B

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

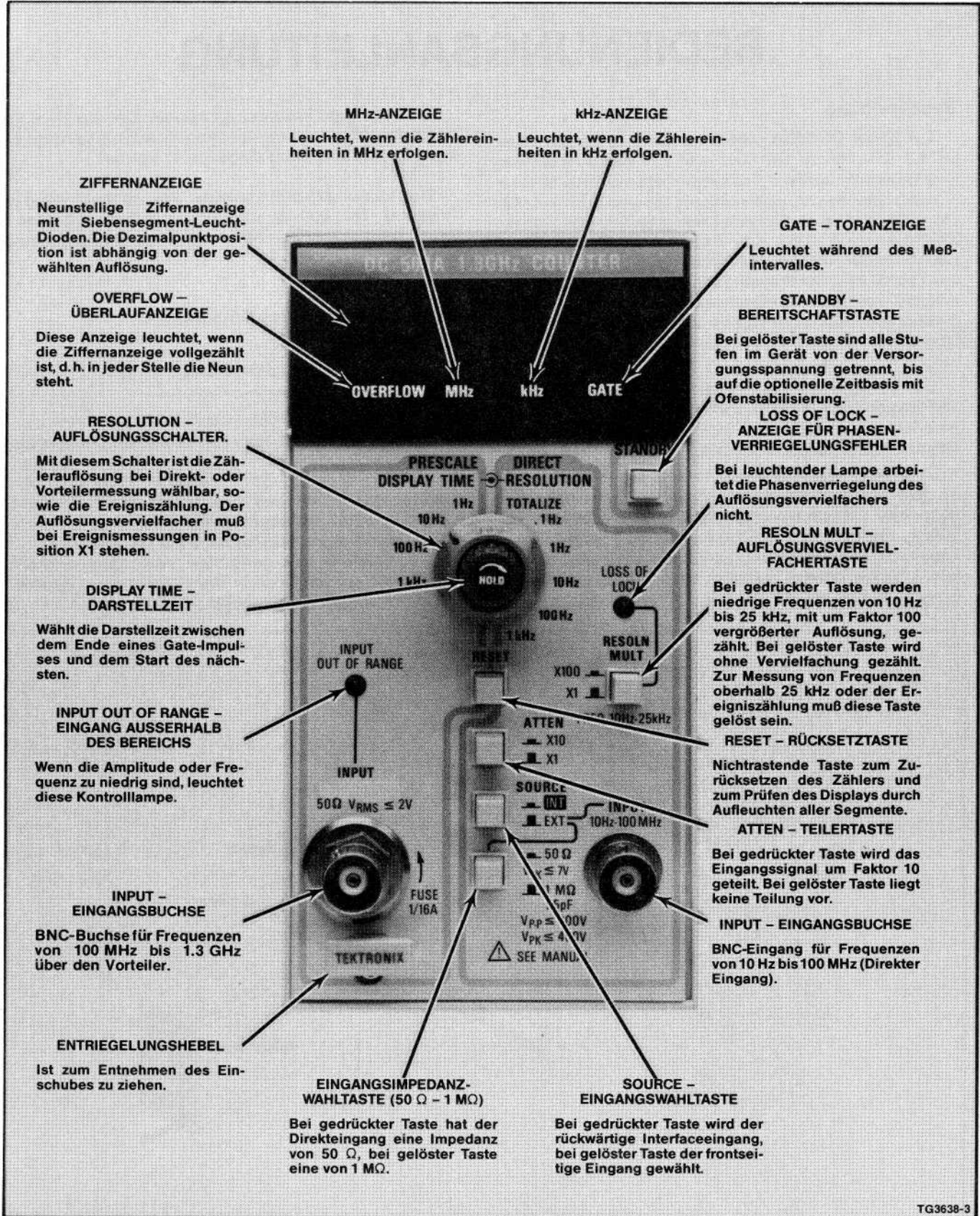


Abb 2-2. Bedienungselemente und Verbindungsbuchsen am DC 508A.

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 Bedienungselementen und Verbindungsbuchsen und eine allgemeine Beschreibung der Arbeitsweise des Gerätes, sowie die Durchführung von Grundmessungen.

Bedienungselemente und Verbindungsbuchsen

Die Hauptbedienungselemente 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.

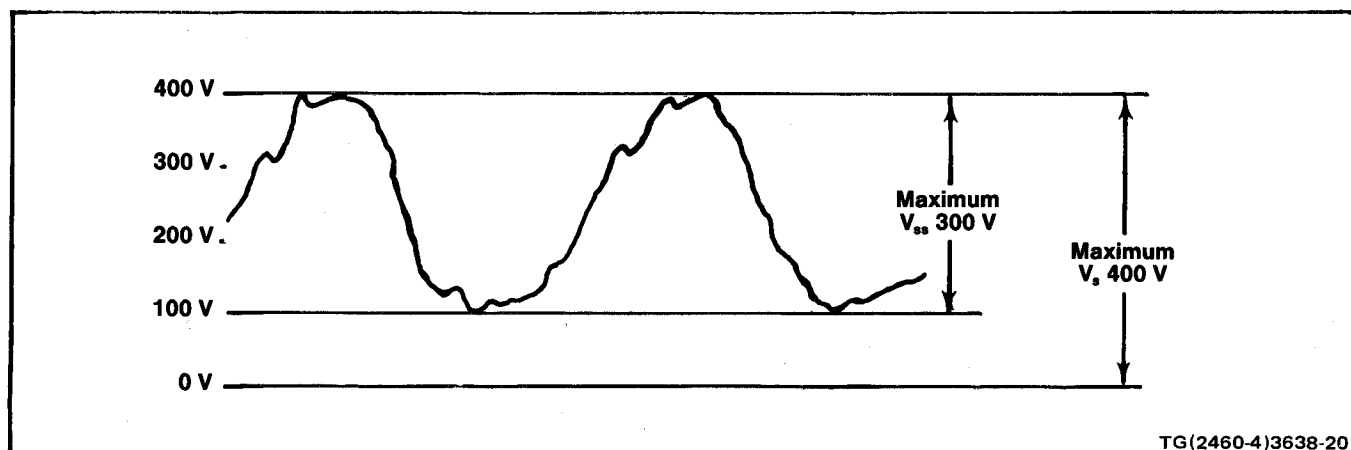


Abb 2-3. Darstellung der Spannungsgrenzen an den Eingangsbuchsen.

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 Interfaceeingang 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 Auflösungswahlnopf (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 Auflösungswahlschalter (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.

BEACHTEN

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.

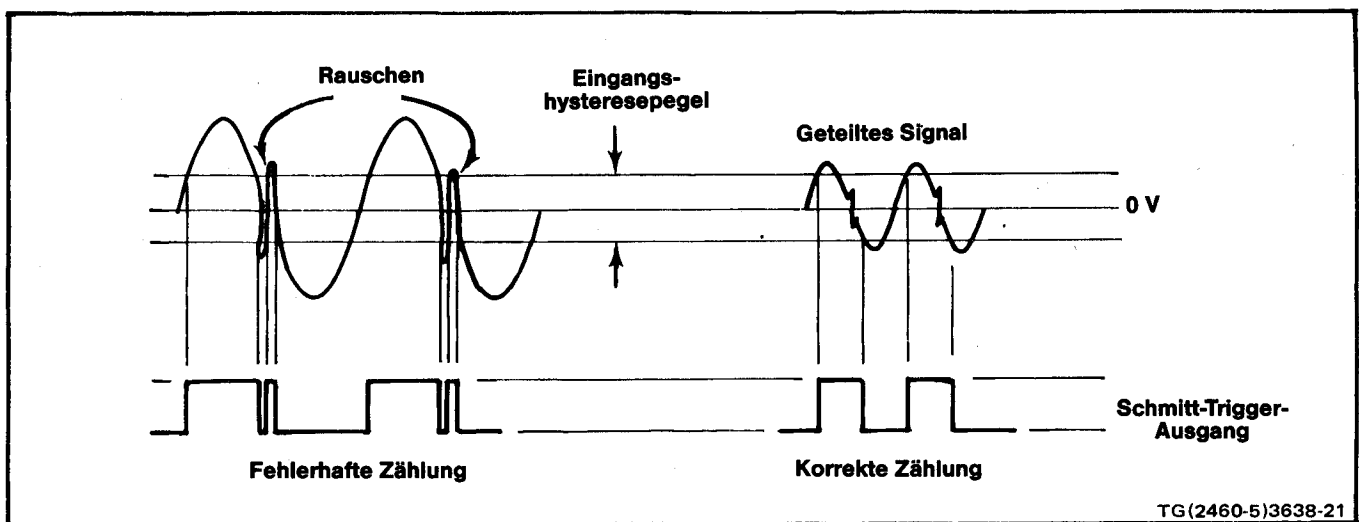


Abb. 2-4. Vergleich von Triggervorteilen bei geteiltem und nichtgeteiltem Eingangssignal.

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。

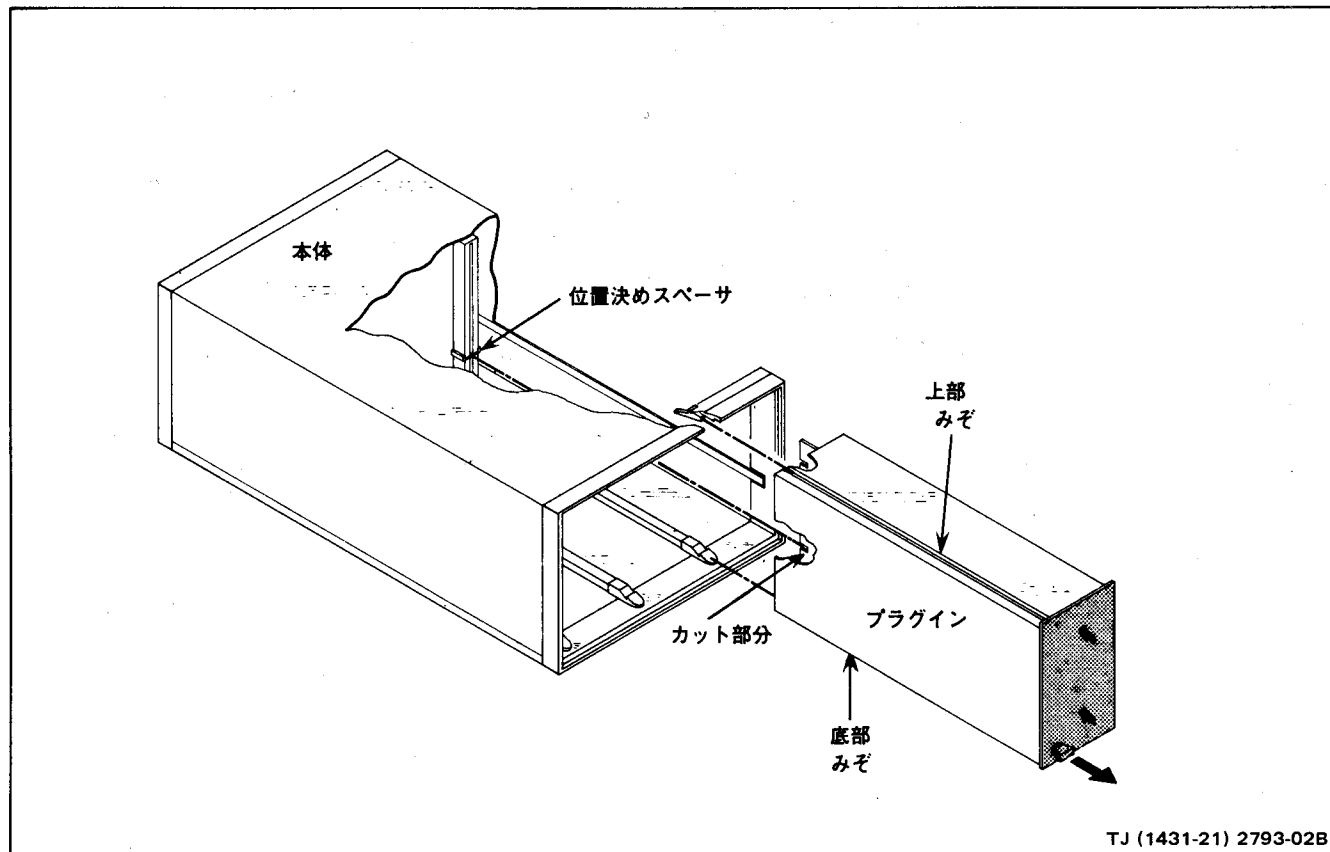
直接入力信号は前面パネルのBNCコネクタか後部インターフェイスのコネクタで接続します。

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。



TJ (1431-21) 2793-02B

2-1 図 取付および取はずし方法

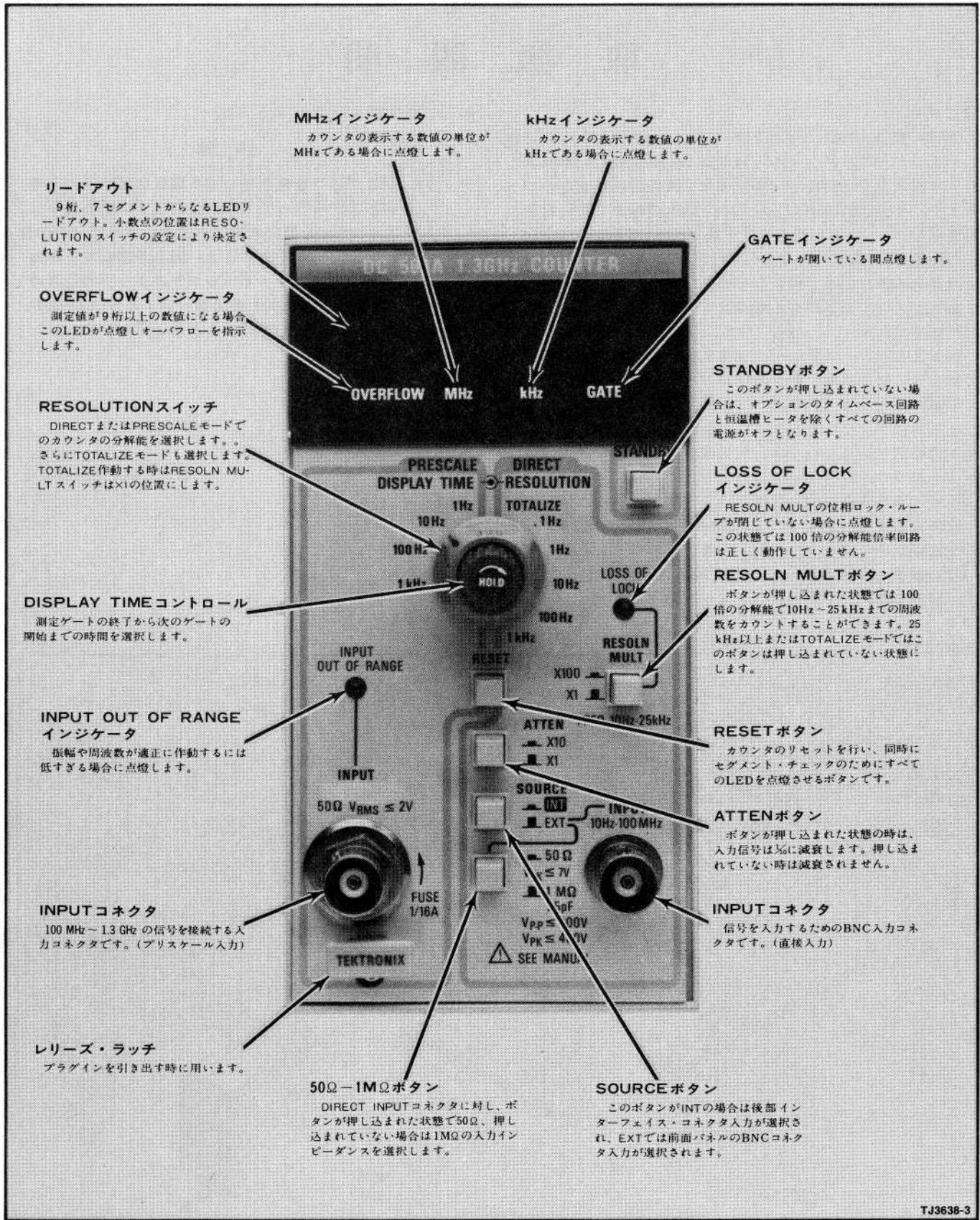


Fig. 2-2. DC 508A コントロールとコネクタ

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と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ぱ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。

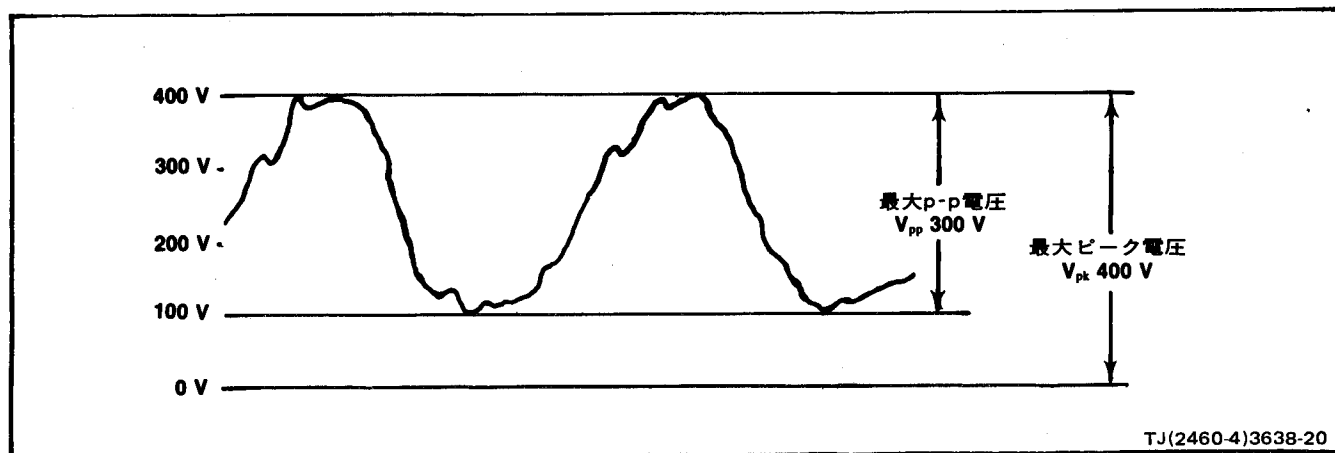
コントロールとコネクタ

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 図をご覧下さい。

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

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のランプが点燈します。

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の部分が点燈します。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インジケータが点燈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ランプが点燈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ランプが点燈します。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

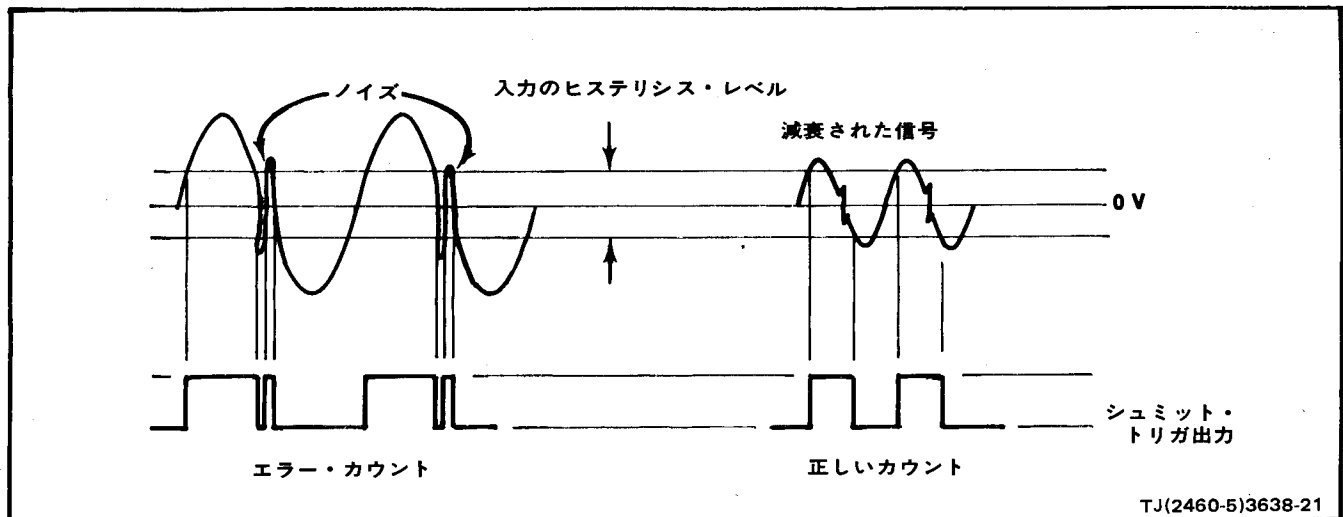
RESOLUTIONスイッチをTOTALIZEの位置に設定します。

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燈します。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



WARNING

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

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 S1590C 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 S1590B 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 S1590A. Diodes CR1690 and CR1790 provide overvoltage 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 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

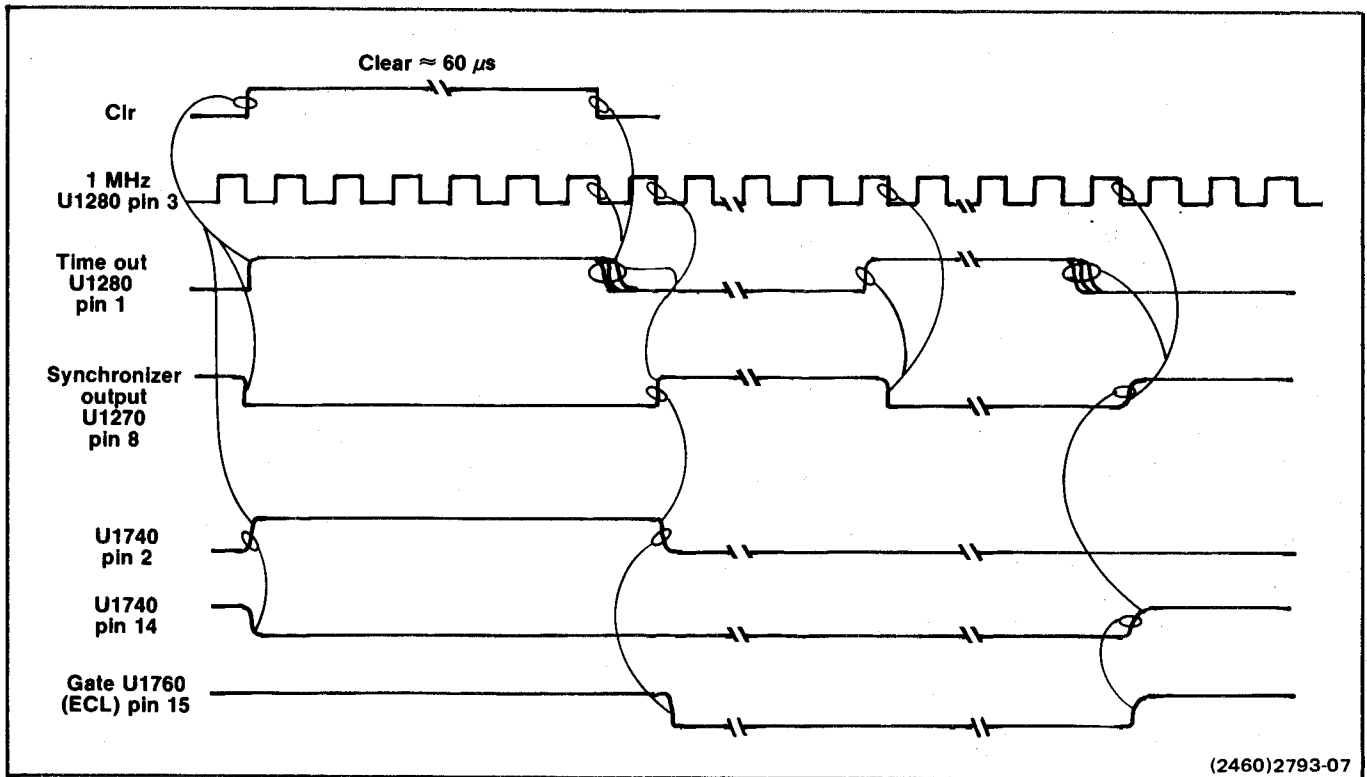


Fig. 3-1. Gate generator pulse relationships.

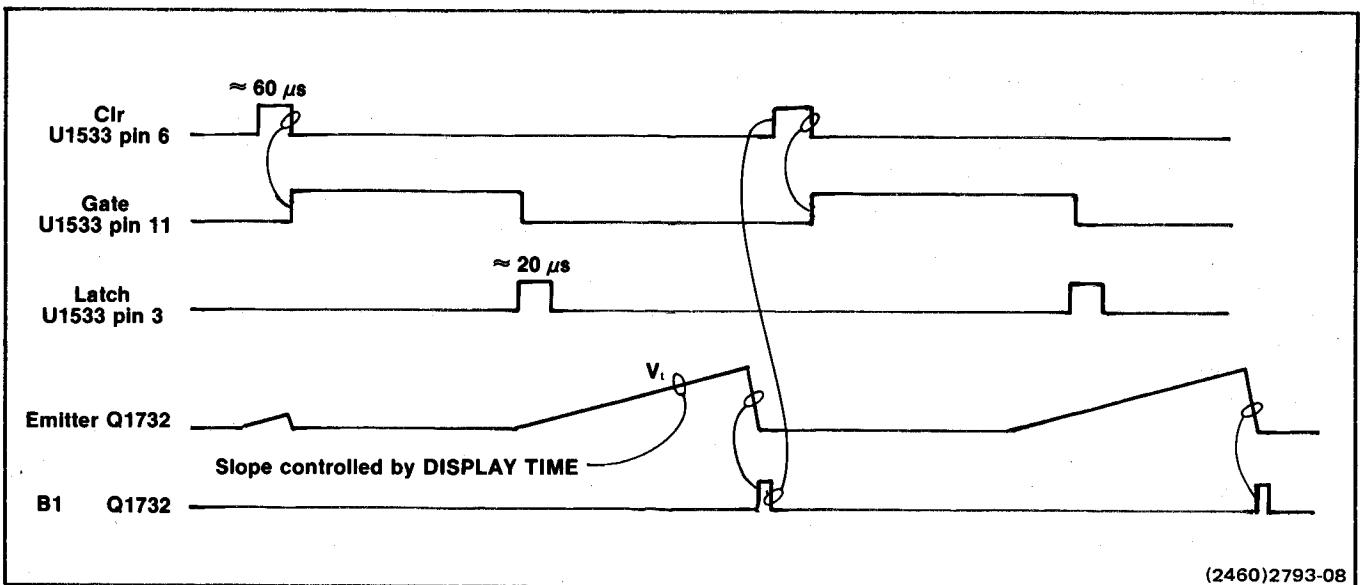


Fig. 3-2. Measurement cycle timing pulse relationship.

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 4

The 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 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, $\overline{D1}$ through $\overline{D9}$, 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 5

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{DT} . 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 4

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 6

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 \geq 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. ^a |

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. 013-0085-01. |
| 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**

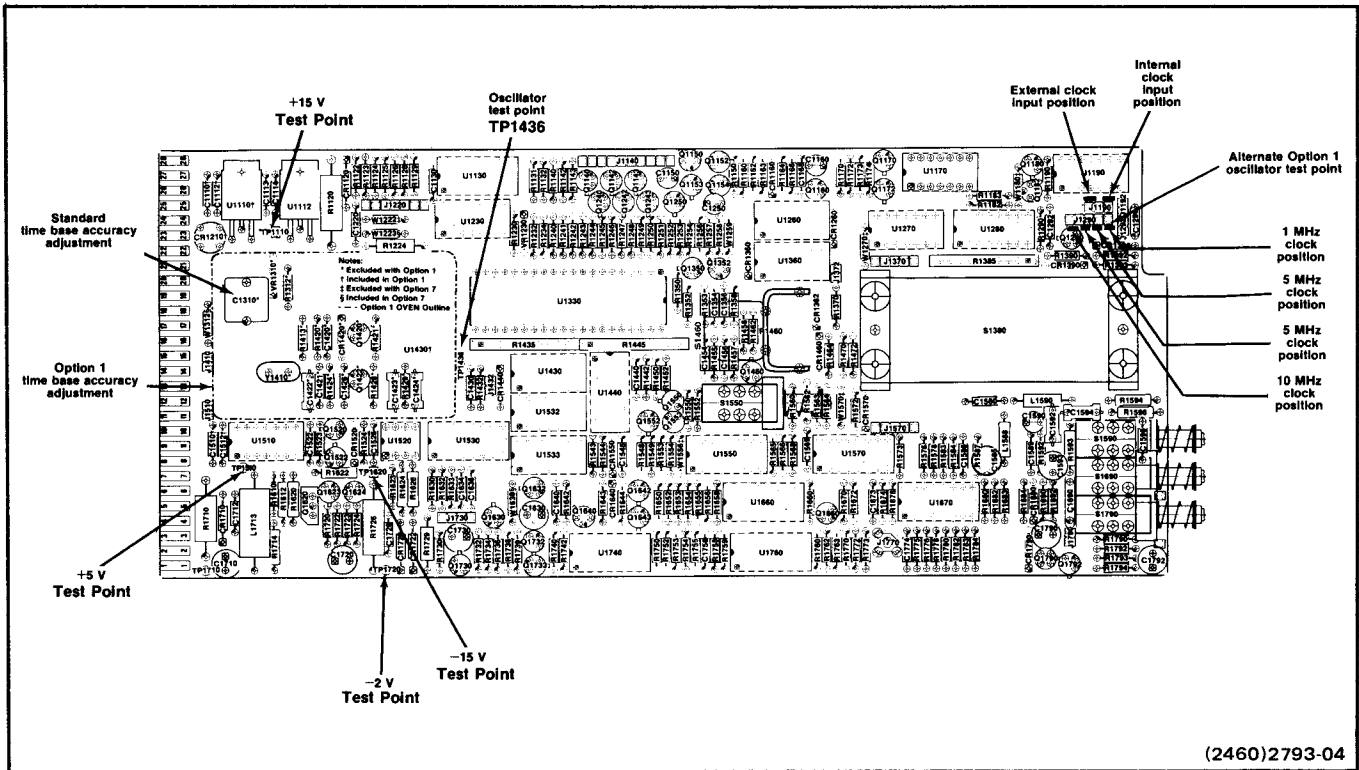


Fig. 4-1. Location of test points and adjustments on Main circuit board.

**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 probe tip 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.

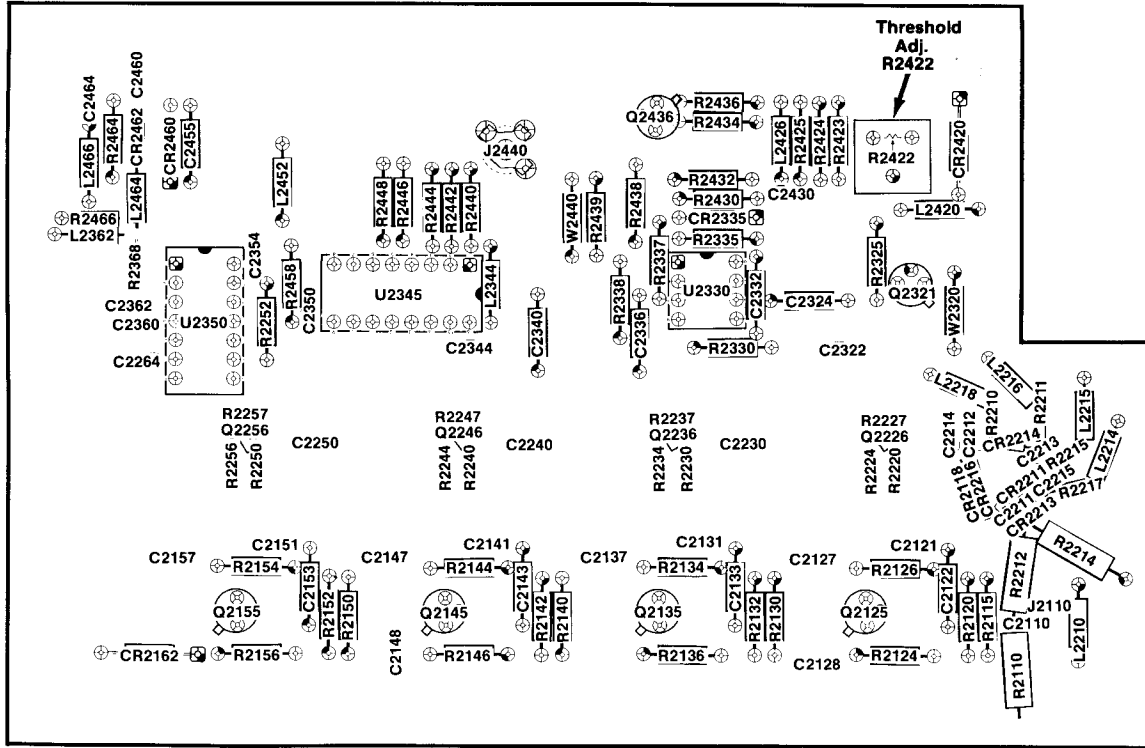
n. Set the generator output level for approximately 2 V.

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.

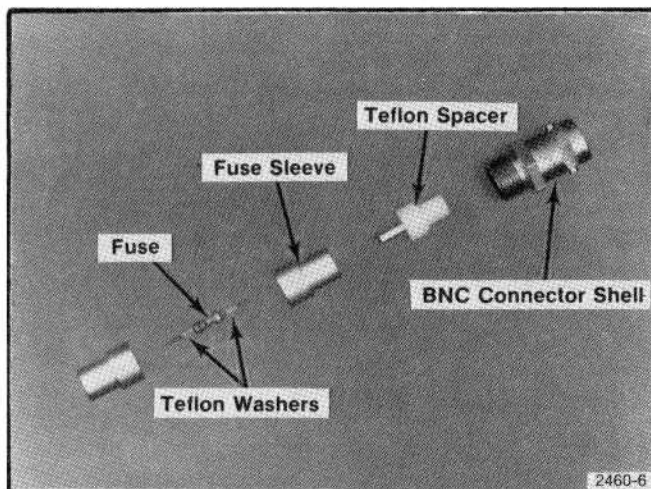


Fig. 5-1. Front panel fuse assembly.

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 | 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).

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

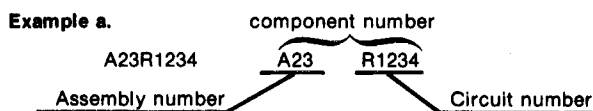
The Mfr. Code Number to Manufacturer index for the Electrical Parts List is located immediately after this page. The Cross Index provides codes, names and addresses of manufacturers of components listed in the Electrical Parts List.

ABBREVIATIONS

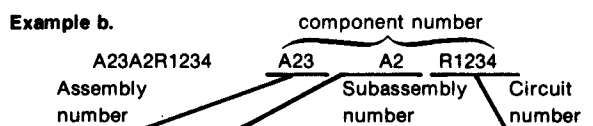
Abbreviations conform to American National Standard Y1.1.

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. | | LOS GATOS, CA 95030 |
| 14433 | ITT SEMICONDUCTORS | 3301 ELECTRONICS WAY 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 |
| 51642 | CENTRE ENGINEERING INC. | 2820 E COLLEGE AVENUE | STATE COLLEGE, PA 16801 |
| 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 |
| 59660 | TUSONIX INC. | 2155 N FORBES BLVD | TUCSON, AZ 85705 |
| 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 (STANDARD ONLY) | 80009 | 670-5102-01 |
| A1 | 670-5345-01 | | CKT BOARD ASSY:MAIN (OPTION 01 ONLY) | 80009 | 670-5345-01 |
| A1 | 670-5427-01 | | CKT BOARD ASSY:MAIN (OPTION 07 ONLY) | 80009 | 670-5427-01 |
| A2 | 670-5103-00 | | CKT BOARD ASSY:RESOLUTION MULTIPLIER (STANDARD ONLY) | 80009 | 670-5103-00 |
| A2 | 670-5352-00 | | CKT BOARD ASSY:RESOLUTION MULTIPLIER (OPTION 07 ONLY) | 80009 | 670-5352-00 |
| 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 | 670-5102-01 | | CKT BOARD ASSY:MAIN (STANDARD ONLY) | 80009 | 670-5102-01 |
| A1 | 670-5345-01 | | CKT BOARD ASSY:MAIN (OPTION 01 ONLY) | 80009 | 670-5345-01 |
| A1 | 670-5427-01 | | CKT BOARD ASSY:MAIN (OPTION 07 ONLY) | 80009 | 670-5427-01 |
| A1C1110 | 281-0775-00 | | CAP., FXD, CER DI:0.1UF, 20%, 50V (OPTION 01 AND OPTION 07 ONLY) | 04222 | SA205E104MAA |
| A1C1112 | 281-0775-00 | | CAP., FXD, CER DI:0.1UF, 20%, 50V (OPTION 01 AND OPTION 07 ONLY) | 04222 | SA205E104MAA |
| A1C1113 | 281-0775-00 | | CAP., FXD, CER DI:0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| A1C1114 | 281-0775-00 | | CAP., FXD, CER DI:0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| A1C1130 | 281-0775-00 | | CAP., FXD, CER DI:0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| A1C1132 | 290-0667-00 | | CAP., FXD, ELCTLT:330UF, +75-10%, 50V (OPTION 01 AND OPTION 07 ONLY) | 56289 | 500D158 |
| 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 | 04222 | SA205E104MAA |
| A1C1220 | 281-0775-00 | | CAP., FXD, CER DI:0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| A1C1230 | 290-0667-00 | | CAP., FXD, ELCTLT:330UF, +75-10%, 50V (OPTION 01 AND OPTION 07 ONLY) | 56289 | 500D158 |
| 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 | 59660 | 831-519-Z5U-102P |
| A1C1292 | 281-0775-00 | | CAP., FXD, CER DI:0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| A1C1310 | 281-0081-00 | | CAP., VAR, AIR DI:1.8-13PF, 375VDC | 74970 | 189-0506-075 |
| 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 | 04222 | SA205E104MAA |
| A1C1422 | 281-0564-00 | | CAP., FXD, CER DI:24PF, 5%, 500V | 59660 | 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 | 04222 | SA205E104MAA |
| A1C1454 | 281-0775-00 | | CAP., FXD, CER DI:0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| A1C1456 | 281-0775-00 | | CAP., FXD, CER DI:0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| 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 | 04222 | SA205E104MAA |
| A1C1546 | 281-0775-00 | | CAP., FXD, CER DI:0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| A1C1558 | 281-0775-00 | | CAP., FXD, CER DI:0.1UF, 20%, 50V | 04222 | SA205E104MAA |

Replaceable Electrical Parts—DC 508A

| Component No. | Tektronix Part No. | Serial/Model No. Eff Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------------|--------------------|-----------------------------|---|----------|------------------|
| A1C1569 | 281-0775-00 | | CAP., FXD, CER DI: 0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| A1C1580 | 281-0775-00 | | CAP., FXD, CER DI: 0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| 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 | 8035D2AADCOG680K |
| 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 | 59660 | 301-000H3M0100D |
| A1C1593 | 290-0720-00 | | CAP., FXD, ELCTLT: 68UF, 20%, 15V | 56289 | 196D686X0015PE3 |
| A1C1594 | 281-0574-00 | | CAP., FXD, CER DI: 0.1UF, 20%, 500V | 72982 | 3008-000S2H820K |
| A1C1596 | 281-0775-00 | | CAP., FXD, CER DI: 0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| 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 | 04222 | SA205E104MAA |
| 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 | 04222 | SA205E104MAA |
| 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 | 04222 | SA205E104MAA |
| 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 | 04222 | SA205E104MAA |
| A1C1774 | 281-0775-00 | | CAP., FXD, CER DI: 0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| 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 |
| A1CRI120 | 152-0066-00 | | SEMICONV DEVICE: SILICON, 400V, 750MA | 14433 | LG4016 |
| A1CRI160 | 152-0141-02 | | SEMICONV DEVICE: SILICON, 30V, 150MA | 01295 | 1N4152R |
| A1CRI210 | 152-0585-00 | | SEMICONV DEVICE: SILICON, BRIDGE, 200V, 1A (OPTION 01 AND OPTION 07 ONLY) | 80009 | 152-0585-00 |
| A1CRI260 | 152-0008-00 | | SEMICONV DEVICE: GERMANIUM, 75V, 60MA | 14433 | G1409 |
| A1CRI290 | 152-0141-02 | | SEMICONV DEVICE: SILICON, 30V, 150MA | 01295 | 1N4152R |
| A1CRI360 | 152-0008-00 | | SEMICONV DEVICE: GERMANIUM, 75V, 60MA | 14433 | G1409 |
| A1CRI362 | 152-0141-02 | | SEMICONV DEVICE: SILICON, 30V, 150MA | 01295 | 1N4152R |
| A1CRI390 | 152-0141-02 | | SEMICONV DEVICE: SILICON, 30V, 150MA | 01295 | 1N4152R |
| A1CRI420 | 152-0141-02 | | SEMICONV DEVICE: SILICON, 30V, 150MA | 01295 | 1N4152R |
| A1CRI440 | 152-0008-00 | | SEMICONV DEVICE: GERMANIUM, 75V, 60MA | 14433 | G1409 |
| A1CRI460 | 152-0008-00 | | SEMICONV DEVICE: GERMANIUM, 75V, 60MA | 14433 | G1409 |
| A1CRI520 | 152-0141-02 | | SEMICONV DEVICE: SILICON, 30V, 150MA | 01295 | 1N4152R |
| A1CRI550 | 152-0333-00 | | SEMICONV DEVICE: SILICON, 55V, 200MA | 07263 | FDH-6012 |
| A1CRI570 | 152-0141-02 | | SEMICONV DEVICE: SILICON, 30V, 150MA | 01295 | 1N4152R |
| A1CRI640 | 152-0141-02 | | SEMICONV DEVICE: SILICON, 30V, 150MA | 01295 | 1N4152R |
| A1CRI680 | 152-0141-02 | | SEMICONV DEVICE: SILICON, 30V, 150MA | 01295 | 1N4152R |
| A1CRI710 | 152-0066-00 | | SEMICONV DEVICE: SILICON, 400V, 750MA | 14433 | LG4016 |
| A1CRI720 | 152-0066-00 | | SEMICONV DEVICE: SILICON, 400V, 750MA | 14433 | LG4016 |
| A1CRI722 | 152-0066-00 | | SEMICONV DEVICE: SILICON, 400V, 750MA | 14433 | LG4016 |
| A1CRI790 | 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 |

| Component No. | Tektronix Part No. | Serial/Model No. Eff Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------------|--------------------|-----------------------------|--|----------|-----------------|
| 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 |
| 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 |

Replaceable Electrical Parts—DC 508A

| Component No. | Tektronix Part No. | Serial/Model No. Eff Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------------|--------------------|-----------------------------|---|----------|-----------------|
| 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 |
| 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 |

Replaceable Electrical Parts—DC 508A

| Component No. | Tektronix Part No. | Serial/Model No. Eff Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------------|--------------------|-----------------------------|--|----------|-----------------|
| 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 |
| 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 |

Replaceable Electrical Parts—DC 508A

| Component No. | Tektronix Part No. | Serial/Model No. Eff Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------------|--------------------|-----------------------------|---|----------|-----------------|
| 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 |
| A1R1726 | 308-0441-00 | | RES., FXD, WW: 3 OHM, 5%, 3W | 91637 | CW2B-3R00J |
| A1R1729 | 307-0023-00 | | RES., FXD, CMPSN: 4.7 OHM, 10%, 0.50W | 01121 | EB47G1 |
| A1R1730 | 315-0102-00 | | RES., FXD, CMPSN: 1K OHM, 5%, 0.25W | 01121 | CB1025 |
| A1R1732 | 315-0102-00 | | RES., FXD, CMPSN: 1K OHM, 5%, 0.25W | 01121 | CB1025 |
| A1R1734 | 315-0102-00 | | RES., FXD, CMPSN: 1K OHM, 5%, 0.25W | 01121 | CB1025 |
| A1R1736 | 315-0102-00 | | RES., FXD, CMPSN: 1K OHM, 5%, 0.25W | 01121 | CB1025 |
| A1R1738 | 315-0512-00 | | RES., FXD, CMPSN: 5.1K OHM, 5%, 0.25W | 01121 | CB5125 |
| A1R1739 | 315-0200-00 | | RES., FXD, CMPSN: 20 OHM, 5%, 0.25W | 01121 | CB2005 |
| A1R1740 | 315-0153-00 | | RES., FXD, CMPSN: 15K OHM, 5%, 0.25W | 01121 | CB1535 |
| A1R1742 | 315-0300-00 | | RES., FXD, CMPSN: 30 OHM, 5%, 0.25W | 01121 | CB3005 |
| A1R1750 | 315-0561-00 | | RES., FXD, CMPSN: 560 OHM, 5%, 0.25W | 01121 | CB5615 |
| A1R1752 | 315-0561-00 | | RES., FXD, CMPSN: 560 OHM, 5%, 0.25W | 01121 | CB5615 |
| A1R1753 | 315-0302-00 | | RES., FXD, CMPSN: 3K OHM, 5%, 0.25W | 01121 | CB3025 |
| A1R1754 | 315-0681-00 | | RES., FXD, CMPSN: 680 OHM, 5%, 0.25W | 01121 | CB6815 |
| A1R1755 | 315-0391-00 | | RES., FXD, CMPSN: 390 OHM, 5%, 0.25W | 01121 | CB3915 |
| A1R1758 | 315-0391-00 | | RES., FXD, CMPSN: 390 OHM, 5%, 0.25W | 01121 | CB3915 |
| A1R1759 | 315-0681-00 | | RES., FXD, CMPSN: 680 OHM, 5%, 0.25W | 01121 | CB6815 |
| A1R1760 | 315-0561-00 | | RES., FXD, CMPSN: 560 OHM, 5%, 0.25W | 01121 | CB5615 |
| A1R1762 | 315-0561-00 | | RES., FXD, CMPSN: 560 OHM, 5%, 0.25W | 01121 | CB5615 |
| A1R1763 | 315-0561-00 | | RES., FXD, CMPSN: 560 OHM, 5%, 0.25W | 01121 | CB5615 |
| A1R1770 | 315-0561-00 | | RES., FXD, CMPSN: 560 OHM, 5%, 0.25W | 01121 | CB5615 |
| A1R1772 | 315-0302-00 | | RES., FXD, CMPSN: 3K OHM, 5%, 0.25W | 01121 | CB3025 |
| A1R1773 | 315-0561-00 | | RES., FXD, CMPSN: 560 OHM, 5%, 0.25W | 01121 | CB5615 |
| A1R1775 | 315-0271-00 | | RES., FXD, CMPSN: 270 OHM, 5%, 0.25W | 01121 | CB2715 |
| A1R1776 | 315-0162-00 | | RES., FXD, CMPSN: 1.6K OHM, 5%, 0.25W | 01121 | CB1625 |
| A1R1778 | 315-0162-00 | | RES., FXD, CMPSN: 1.6K OHM, 5%, 0.25W | 01121 | CB1625 |
| A1R1780 | 315-0221-00 | | RES., FXD, CMPSN: 220 OHM, 5%, 0.25W | 01121 | CB2215 |
| A1R1782 | 315-0221-00 | | RES., FXD, CMPSN: 220 OHM, 5%, 0.25W | 01121 | CB2215 |
| A1R1783 | 315-0561-00 | | RES., FXD, CMPSN: 560 OHM, 5%, 0.25W | 01121 | CB5615 |
| A1R1784 | 315-0391-00 | | RES., FXD, CMPSN: 390 OHM, 5%, 0.25W | 01121 | CB3915 |
| A1R1790 | 315-0510-00 | | RES., FXD, CMPSN: 51 OHM, 5%, 0.25W | 01121 | CB5105 |
| A1R1792 | 315-0182-00 | | RES., FXD, CMPSN: 1.8K OHM, 5%, 0.25W | 01121 | CB1825 |
| A1R1793 | 315-0681-00 | | RES., FXD, CMPSN: 680 OHM, 5%, 0.25W | 01121 | CB6815 |
| A1R1794 | 315-0272-00 | | RES., FXD, CMPSN: 2.7K OHM, 5%, 0.25W | 01121 | CB2725 |
| A1R1796 | 305-0470-00 | | RES., FXD, CMPSN: 47 OHM, 5%, 2W | 01121 | HB4705 |
| A1S1320 | 260-1849-01 | | SWITCH, PUSH: DPDT, 4A, 250VAC | 31918 | 0BD |
| A1S1550 | 260-1421-00 | | SWITCH, PUSH: 1 STA, MOMENTARY, NON-SHORT | 80009 | 260-1421-00 |
| A1S1570 | 260-1208-00 | | SWITCH, PUSH: DPDT, 28VDC, PUSH-PUSH | 80009 | 260-1208-00 |
| A1S1590A-C | 260-1448-00 | | SWITCH, PUSH: 3 STA, NON-SHORT | 80009 | 260-1448-00 |
| A1U1110 | 156-0926-00 | | MICROCIRCUIT, LI: VOLTAGE REGULATOR (OPTION 01 ONLY) | 07263 | MICROA7824UC |
| A1U1112 | 156-0988-00 | | MICROCIRCUIT, LI: REGULATOR | 27014 | LM340T-15 |
| A1U1130 | 156-0128-00 | | MICROCIRCUIT, DI: SGL BCD TO 7-SEG DCDR/DRVR | 80009 | 156-0128-00 |
| A1U1170 | 156-0032-00 | | MICROCIRCUIT, DI: 4-BIT BINARY COUNTER | 80009 | 156-0032-00 |
| A1U1190 | 156-0079-00 | | MICROCIRCUIT, DI: DECADE COUNTER, TTL | 80009 | 156-0079-00 |
| A1U1230A-D | 156-0140-00 | | MICROCIRCUIT, DI: HEX BFR, 15V, TTL | 80009 | 156-0140-00 |
| A1U1260A-C | 156-0178-00 | | MICROCIRCUIT, DI: TRIPLE 3-INPUT NOR GATE | 01295 | SN7427N |
| A1U1270A, B | 156-0041-00 | | MICROCIRCUIT, DI: DUAL D-TYPE FLIP-FLOP | 27014 | DM7474N |
| A1U1280 | 156-0410-00 | | MICROCIRCUIT, DI: COUNTER TIME BASE | 50088 | MK5009P |
| A1U1330 | 155-0119-00 | | MICROCIRCUIT, DI: BCD COUNTER | 80009 | 155-0119-00 |

Replaceable Electrical Parts—DC 508A

| Component No. | Tektronix Part No. | Serial/Model No. Eff Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------------|--------------------|-----------------------------|---|----------|------------------|
| 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 |
| AIU1533A-D | 156-0150-00 | | MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR | 01295 | SN7437N |
| AIU1550 | 156-0642-00 | | MICROCIRCUIT,DI:BI-QUINARY CNTR | 04713 | MC10138L |
| AIU1570A-D | 156-0205-00 | | MICROCIRCUIT,DI:QUAD 2-INPUT NOR GATE | 04713 | MC10102 (P OR L) |
| AIU1660A,B | 156-0880-00 | | MICROCIRCUIT,DI:DUAL D MASTER SLAVE FF | 80009 | 156-0880-00 |
| AIU1670A-C | 156-0369-00 | | MICROCIRCUIT,DI:TRIPLE LINE RECEIVER | 80009 | 156-0369-00 |
| AIU1740A,B | 156-0230-00 | | MICROCIRCUIT,DI:DUAL D MA-SLAVE FLIP-FLOP | 04713 | MC10131 (L OR P) |
| AIU1760A-D | 156-0205-00 | | MICROCIRCUIT,DI:QUAD 2-INPUT NOR GATE | 04713 | MC10102 (P OR L) |
| AIVR1230 | 152-0279-00 | | SEMICONV DEVICE:ZENER,0.4W,5.1V,5% | 04713 | SZG35010RL |
| AIVR1310 | 152-0168-00 | | SEMICONV DEVICE:ZENER,0.4W,12V,5% | 04713 | SZG35009K4 |
| AIW1180 | 131-0566-00 | | BUS CONDUCTOR:DUMMY RES,2.375,22 AWG | 55210 | L-2007-1 |
| AIW1222 | 131-0566-00 | | BUS CONDUCTOR:DUMMY RES,2.375,22 AWG | 55210 | L-2007-1 |
| AIW1223 | 131-0566-00 | | BUS CONDUCTOR:DUMMY RES,2.375,22 AWG | 55210 | L-2007-1 |
| AIW1259 | 131-0566-00 | | BUS CONDUCTOR:DUMMY RES,2.375,22 AWG | 55210 | L-2007-1 |
| AIW1312 | 131-0566-00 | | BUS CONDUCTOR:DUMMY RES,2.375,22 AWG | 55210 | L-2007-1 |
| AIW1566 | 131-0566-00 | | BUS CONDUCTOR:DUMMY RES,2.375,22 AWG | 55210 | L-2007-1 |
| AIW1638 | 131-0566-00 | | BUS CONDUCTOR:DUMMY RES,2.375,22 AWG | 55210 | L-2007-1 |
| AIY1410 | 158-0129-00 | | XTAL UNIT,QTZ:10MHZ,0.001%,PARALLEL | 33096 | PB1109 |
| AIY1430 | 119-0894-00 | | OSCILLATOR,RF:10MHZ,24VDC (OPTION 01 AND OPTION 07 ONLY) | 75378 | 970-1937-0 |

Replaceable Electrical Parts—DC 508A

| Component No. | Tektronix Part No. | Serial/Model No. Eff Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------------|--------------------|-----------------------------|--|----------|-----------------|
| A2 | 670-5103-00 | | CKT BOARD ASSY:RESOLUTION MULTIPLIER (STANDARD ONLY) | 80009 | 670-5103-00 |
| A2 | 670-5352-00 | | CKT BOARD ASSY:RESOLUTION MULTIPLIER (OPTION 07 ONLY) | 80009 | 670-5352-00 |
| A2C4120 | 283-0194-00 | | CAP., FXD, CER DI:4.7UF, 20%, 50V | 56289 | 275C4 |
| A2C4122 | 281-0775-00 | | CAP., FXD, CER DI:0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| 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 | 04222 | SA205E104MAA |
| A2C4322 | 281-0775-00 | | CAP., FXD, CER DI:0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| A2C4330 | 281-0775-00 | | CAP., FXD, CER DI:0.1UF, 20%, 50V (OPTION 07 ONLY) | 04222 | SA205E104MAA |
| A2C4340 | 281-0775-00 | | CAP., FXD, CER DI:0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| A2CR4210 | 152-0333-00 | | SEMICONV DEVICE:SILICON, 55V, 200MA | 07263 | FDH-6012 |
| A2CR4330 | 152-0333-00 | | SEMICONV DEVICE:SILICON, 55V, 200MA | 07263 | FDH-6012 |
| 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 (OPTION 07 ONLY) | 01121 | CB1025 |
| A2R4150 | 315-0512-00 | | RES., FXD, CMPSN:5.1K OHM, 5%, 0.25W (OPTION 07 ONLY) | 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 (OPTION 07 ONLY) | 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 (OPTION 07 ONLY) | 01121 | CB1025 |
| A2R4344 | 315-0102-00 | | RES., FXD, CMPSN:1K OHM, 5%, 0.25W (OPTION 07 ONLY) | 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 (OPTION 07 ONLY) | 01295 | SN7401N OR J |
| A2U4220 | 156-0112-00 | | MICROCIRCUIT, DI:QUAD 2-INPUT POS NAND GATE | 80009 | 156-0112-00 |

Replaceable Electrical Parts—DC 508A

| Component No. | Tektronix Part No. | Serial/Model No. Eff Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------------|--------------------|-----------------------------|--|----------|-----------------|
| A2U4230 | 156-0704-00 | | MICROCIRCUIT, LI: PHASE LOCK LOOP | 04713 | MC14046CP |
| A2U4240A-F | 156-0058-00 | | MICROCIRCUIT, DI: HEX. INVERTER (OPTION 07 ONLY) | 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 (OPTION 07 ONLY) | 01295 | SN74LS76A |
| A2U4330 | ----- | | | | |
| A2U4340A-D | 156-0057-00 | | MICROCIRCUIT, DI: QUAD 2-INPUT NAND GATE (OPTION 07 ONLY) | 01295 | SN7401N OR J |
| A2VR4310 | 152-0055-00 | | SEMICONV DEVICE: ZENER, 0.4W, 11V, 5% | 04713 | SZG35009K1 |

Replaceable Electrical Parts—DC 508A

| Component No. | Tektronix Part No. | Serial/Model No. Eff Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------------|--------------------|-----------------------------|--|----------|------------------|
| A3 | 670-5101-00 | | CKT BOARD ASSY:DISPLAY | 80009 | 670-5101-00 |
| 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 | 670-5104-03 | | CKT BOARD ASSY:PRESCALER | 80009 | 670-5104-03 |
| A4C2110 | 283-0324-00 | | CAP., FXD, CER DI: 0.01UF, +80-20%, 50V | 04222 | 08055A103Z |
| A4C2121 | 283-0324-00 | | CAP., FXD, CER DI: 0.01UF, +80-20%, 50V | 04222 | 08055A103Z |
| A4C2122 | 281-0812-00 | | CAP., FXD, CER DI: 1000PF, 10%, 100V | 72982 | 8035D9AADX7R102K |
| A4C2127 | 283-0252-00 | | CAP., FXD, CER DI: 1000PF, 10%, 50V | 04222 | ULA105C102K2T60 |
| 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 | 04222 | 08055A103Z |
| A4C2133 | 281-0812-00 | | CAP., FXD, CER DI: 1000PF, 10%, 100V | 72982 | 8035D9AADX7R102K |
| A4C2137 | 283-0252-00 | | CAP., FXD, CER DI: 1000PF, 10%, 50V | 04222 | ULA105C102K2T60 |
| A4C2141 | 283-0324-00 | | CAP., FXD, CER DI: 0.01UF, +80-20%, 50V | 04222 | 08055A103Z |
| A4C2143 | 281-0812-00 | | CAP., FXD, CER DI: 1000PF, 10%, 100V | 72982 | 8035D9AADX7R102K |
| A4C2147 | 283-0252-00 | | CAP., FXD, CER DI: 1000PF, 10%, 50V | 04222 | ULA105C102K2T60 |
| 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 | 04222 | 08055A103Z |
| A4C2153 | 281-0812-00 | | CAP., FXD, CER DI: 1000PF, 10%, 100V | 72982 | 8035D9AADX7R102K |
| A4C2157 | 283-0252-00 | | CAP., FXD, CER DI: 1000PF, 10%, 50V | 04222 | ULA105C102K2T60 |
| A4C2211 | 283-0252-00 | | CAP., FXD, CER DI: 1000PF, 10%, 50V | 04222 | ULA105C102K2T60 |
| A4C2212 | 283-0252-00 | | CAP., FXD, CER DI: 1000PF, 10%, 50V | 04222 | ULA105C102K2T60 |
| A4C2213 | 283-0252-00 | | CAP., FXD, CER DI: 1000PF, 10%, 50V | 04222 | ULA105C102K2T60 |
| A4C2214 | 283-0252-00 | | CAP., FXD, CER DI: 1000PF, 10%, 50V | 04222 | ULA105C102K2T60 |
| A4C2215 | 283-0252-00 | | CAP., FXD, CER DI: 1000PF, 10%, 50V | 04222 | ULA105C102K2T60 |
| A4C2230 | 283-0252-00 | | CAP., FXD, CER DI: 1000PF, 10%, 50V | 04222 | ULA105C102K2T60 |
| A4C2240 | 283-0252-00 | | CAP., FXD, CER DI: 1000PF, 10%, 50V | 04222 | ULA105C102K2T60 |
| A4C2250 | 283-0252-00 | | CAP., FXD, CER DI: 1000PF, 10%, 50V | 04222 | ULA105C102K2T60 |
| A4C2264 | 283-0324-00 | | CAP., FXD, CER DI: 0.01UF, +80-20%, 50V | 04222 | 08055A103Z |
| A4C2322 | 283-0324-00 | | CAP., FXD, CER DI: 0.01UF, +80-20%, 50V | 04222 | 08055A103Z |
| 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 | 04222 | SA205E104MAA |
| A4C2336 | 281-0775-00 | | CAP., FXD, CER DI: 0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| A4C2340 | 281-0775-00 | | CAP., FXD, CER DI: 0.1UF, 20%, 50V | 04222 | SA205E104MAA |
| 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 | 04222 | 08055A103Z |
| A4C2354 | 283-0324-00 | | CAP., FXD, CER DI: 0.01UF, +80-20%, 50V | 04222 | 08055A103Z |
| A4C2360 | 283-0324-00 | | CAP., FXD, CER DI: 0.01UF, +80-20%, 50V | 04222 | 08055A103Z |
| A4C2362 | 283-0265-00 | | CAP., FXD, CER DI: 3.35PF, +/-1.5PF | 51642 | UC02100NP0339BPS |
| A4C2430 | 283-0324-00 | | CAP., FXD, CER DI: 0.01UF, +80-20%, 50V | 04222 | 08055A103Z |
| 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 | 04222 | 08055A103Z |
| A4C2464 | 283-0324-00 | | CAP., FXD, CER DI: 0.01UF, +80-20%, 50V | 04222 | 08055A103Z |
| 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 |
| A4CR2213 | 152-0524-00 | | SEMICONV DEVICE: SILICON, 100V, 100MA | 80009 | 152-0524-00 |

| Component No. | Tektronix Part No. | Serial/Model No. Eff Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------------|--------------------|-----------------------------|--|----------|-----------------|
| A4CR2214 | 152-0524-00 | | SEMICONV DEVICE: SILICON, 100V, 100MA | 80009 | 152-0524-00 |
| A4CR2216 | 152-0322-00 | | SEMICONV DEVICE: SILICON, 15V, HOT CARRIER | 50434 | 5082-2672 |
| A4CR2218 | 152-0322-00 | | SEMICONV DEVICE: SILICON, 15V, HOT CARRIER | 50434 | 5082-2672 |
| A4CR2335 | 152-0141-02 | | SEMICONV DEVICE: SILICON, 30V, 150MA | 01295 | 1N4152R |
| A4CR2420 | 152-0066-00 | | SEMICONV DEVICE: SILICON, 400V, 750MA | 14433 | LG4016 |
| A4CR2460 | 152-0322-00 | | SEMICONV DEVICE: SILICON, 15V, HOT CARRIER | 50434 | 5082-2672 |
| A4CR2462 | 152-0322-00 | | SEMICONV DEVICE: SILICON, 15V, HOT CARRIER | 50434 | 5082-2672 |
| 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, 360NH | 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 | 151-0188-00 | | TRANSISTOR: SILICON, PNP | 04713 | SPS6868K |
| 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 |
| 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 |

Replaceable Electrical Parts—DC 508A

| Component No. | Tektronix Part No. | Serial/Model No. Eff Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------------|--------------------|-----------------------------|---|----------|-----------------|
| 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 | 04713 | SC22967L |
| A4U2350 | 156-1302-01 | | MICROCIRCUIT, DI: DC TO 1.5GHZ DIV BY 4 PRES | 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 | 255.062 |
| 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:

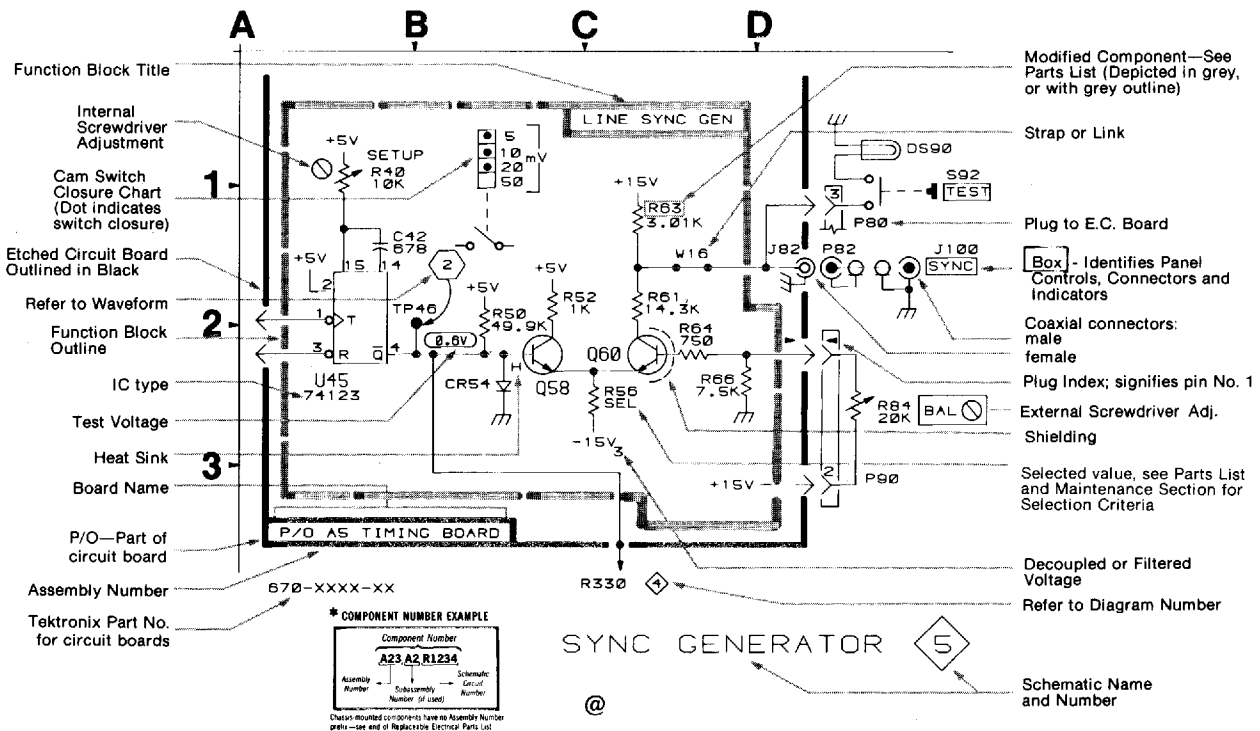
- Capacitors = Values one or greater are in picofarads (pF).
Values less than one are in microfarads (μ F).
- Resistors = Ohms (Ω).

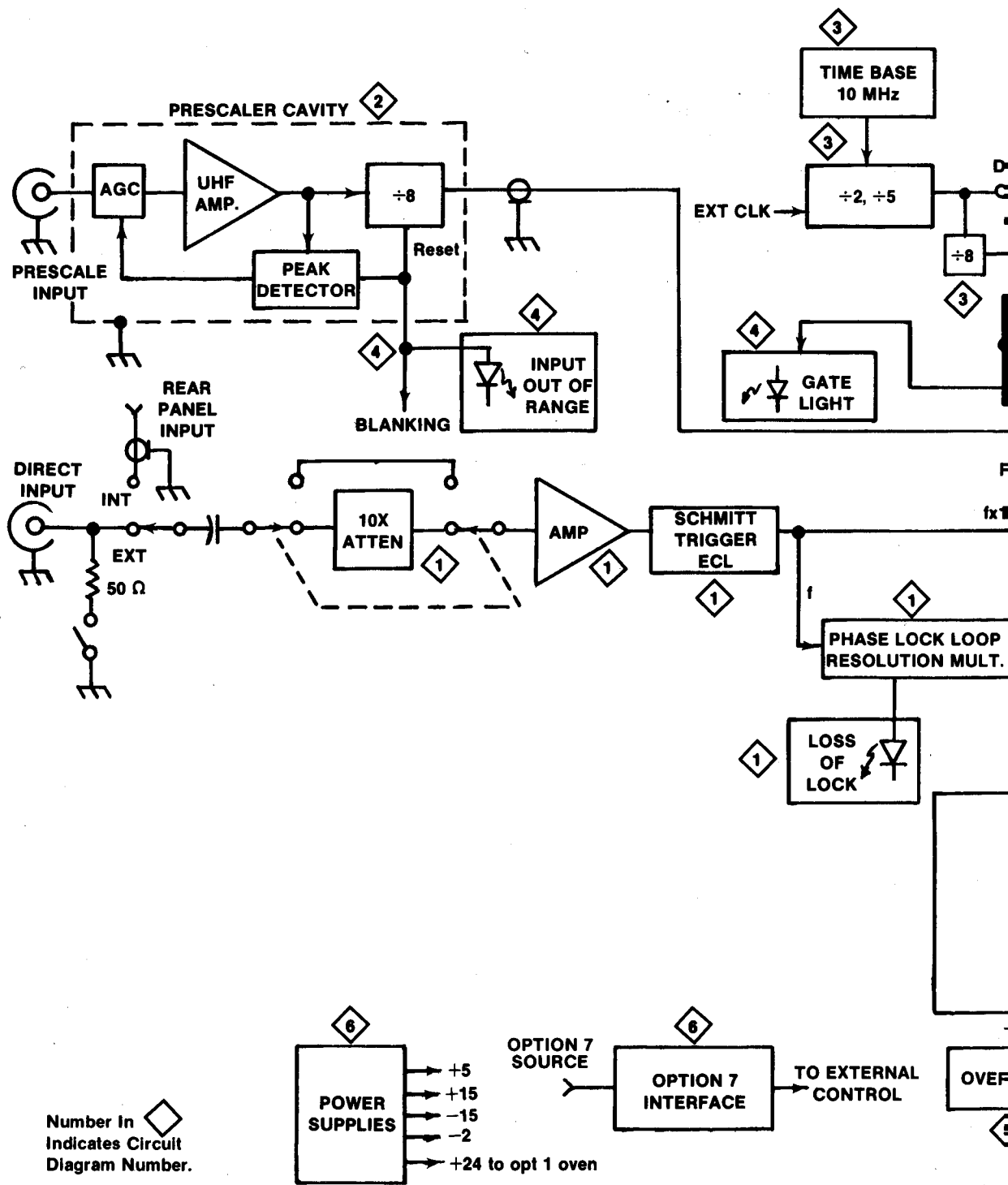
———— The information and special symbols below may appear in this manual. ————


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).

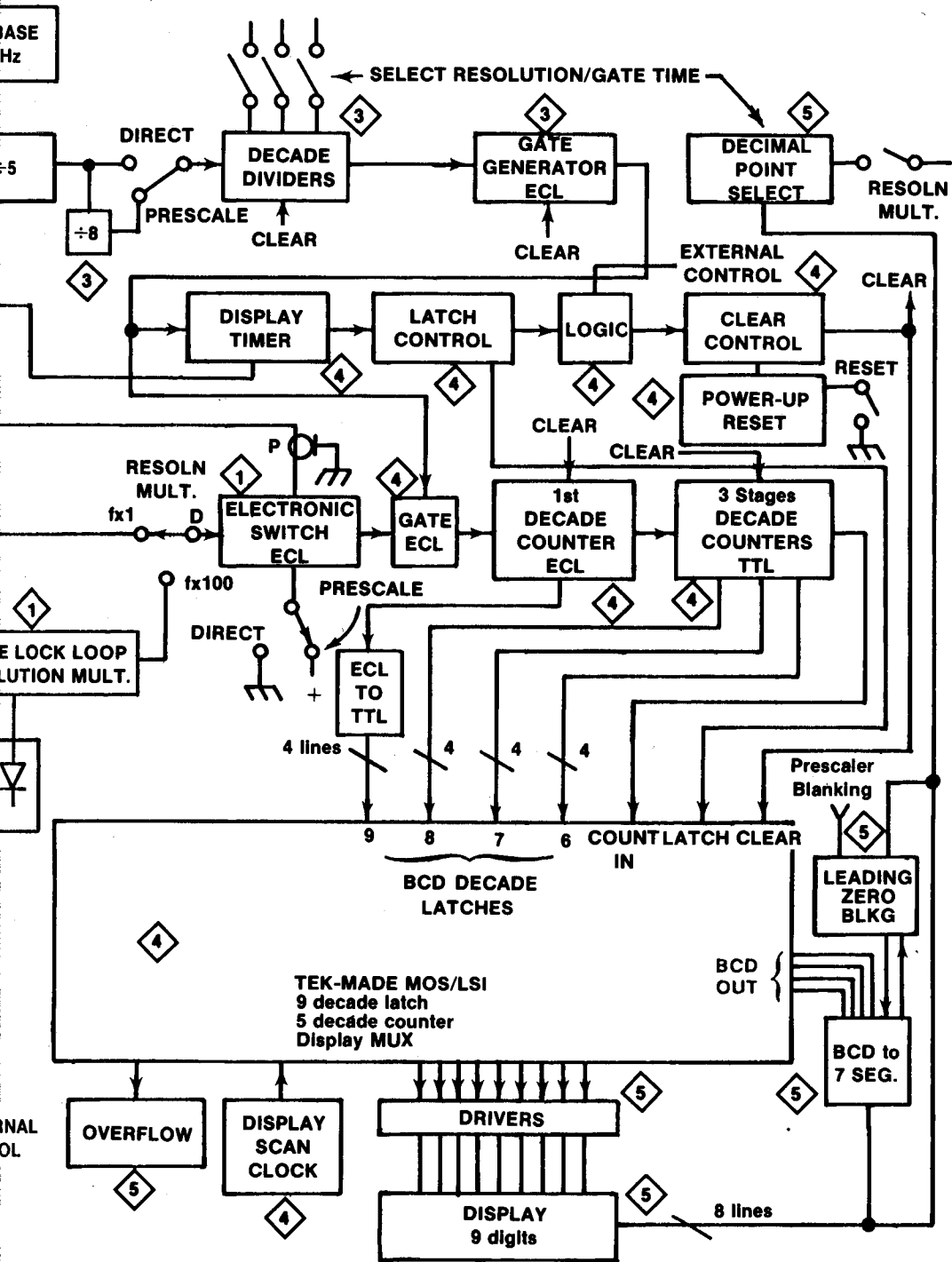
The schematic diagram and circuit board component location illustration have grids. A lookup table with the grid coordinates is provided for ease of locating the component. Only the components illustrated on the facing diagram are listed in the lookup table. When more than one schematic diagram is used 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.





Number in  Indicates Circuit Diagram Number.

DC 508A



BLOCK DIAGRAM

BLOCK DIAGRAM

(2793-9)3638-9

VOLTAGE CONDITIONS

WARNING

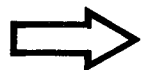
Dangerous potentials exist at several points throughout this instrument. When the instrument is operated with the covers removed, do not touch exposed connections or components. Some transistors have voltages present on their cases. Disconnect the power source before replacing parts.

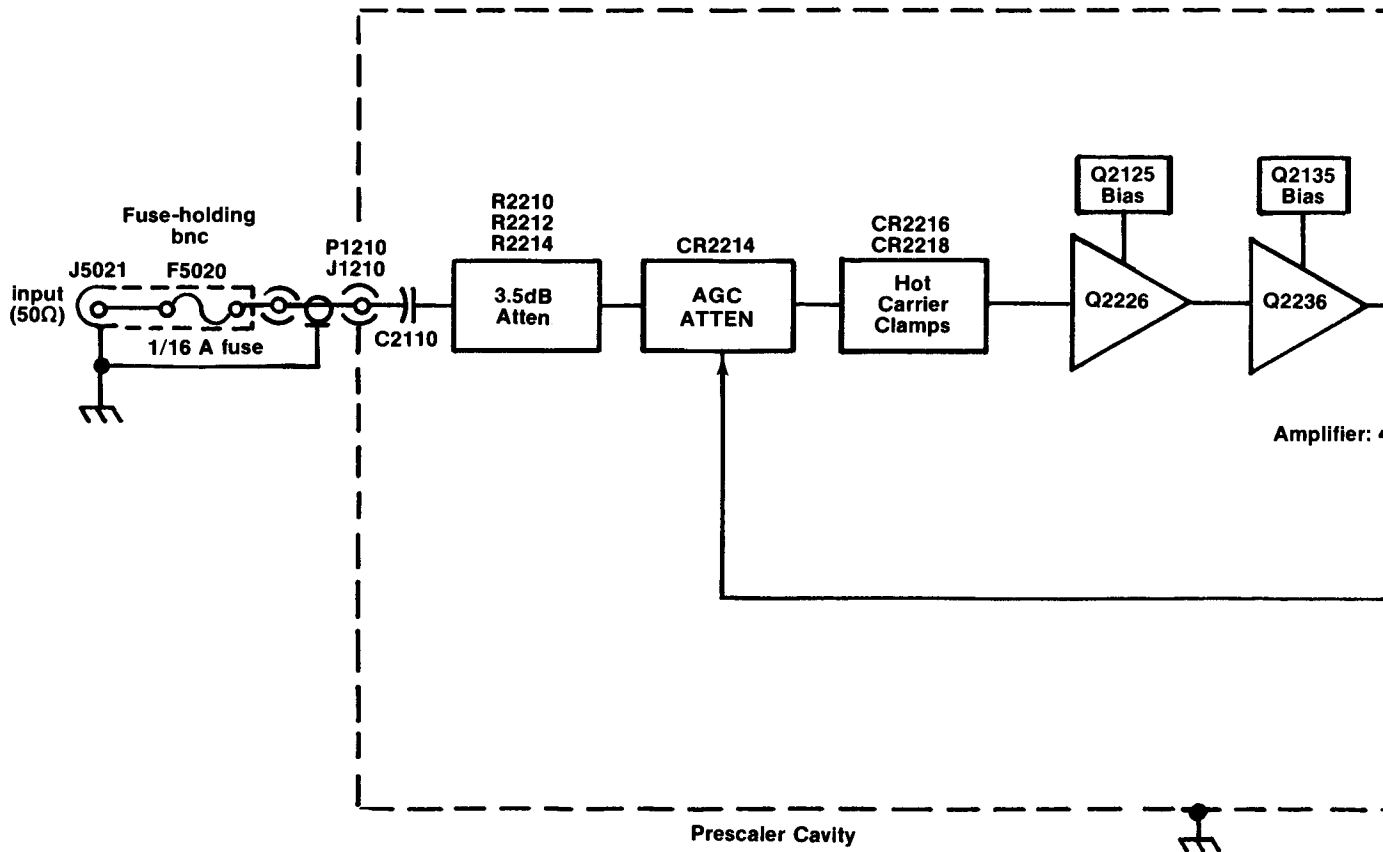
The voltages shown on diagrams 1 through 6 were taken with the DC 508A front-panel controls set as follows:

| | |
|---------------------------|------------------------|
| 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 |

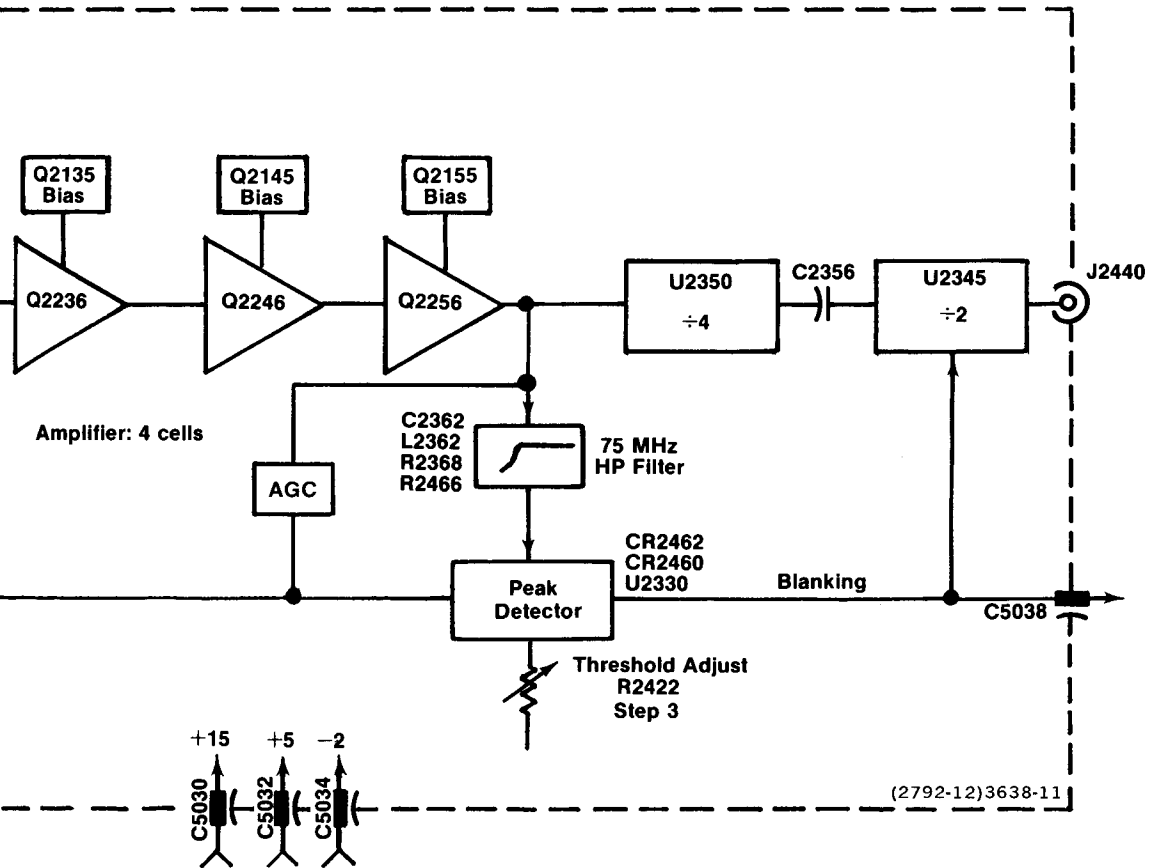
The voltages shown were taken with no input signal applied to the input connectors. The prescale assembly was removed from the main interface board location, and moved aside to gain access to the component side of the circuit board; all connections to the prescale board remain intact.

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).





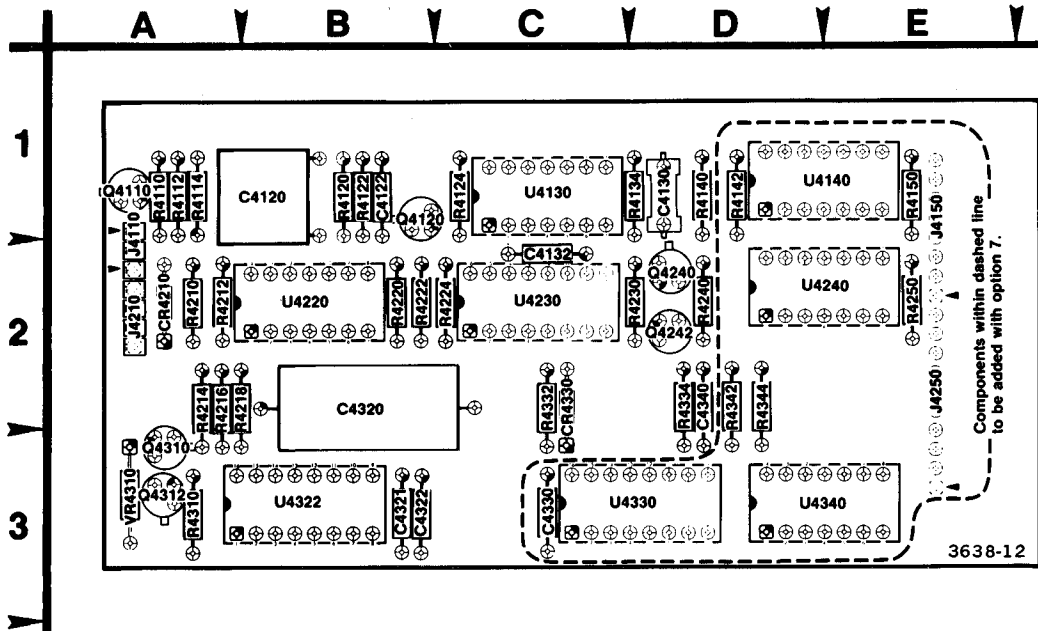
DC 508A



PRESCALE BLOCK DIAGRAM

PRESCALE BLOCK DIAGRAM

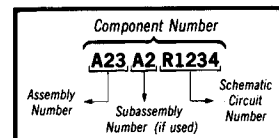
PARTS LOCATION GRID
RESOLUTION MULTIPLIER BOARD



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 | | | | | |
|----------------|--------------------|----------------|--|--------------------|----------------|----------------|--------------------|----------------|
| Circuit Number | Schematic Location | Board Location | Circuit Number | Schematic Location | Board Location | Circuit Number | Schematic Location | Board Location |
| 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

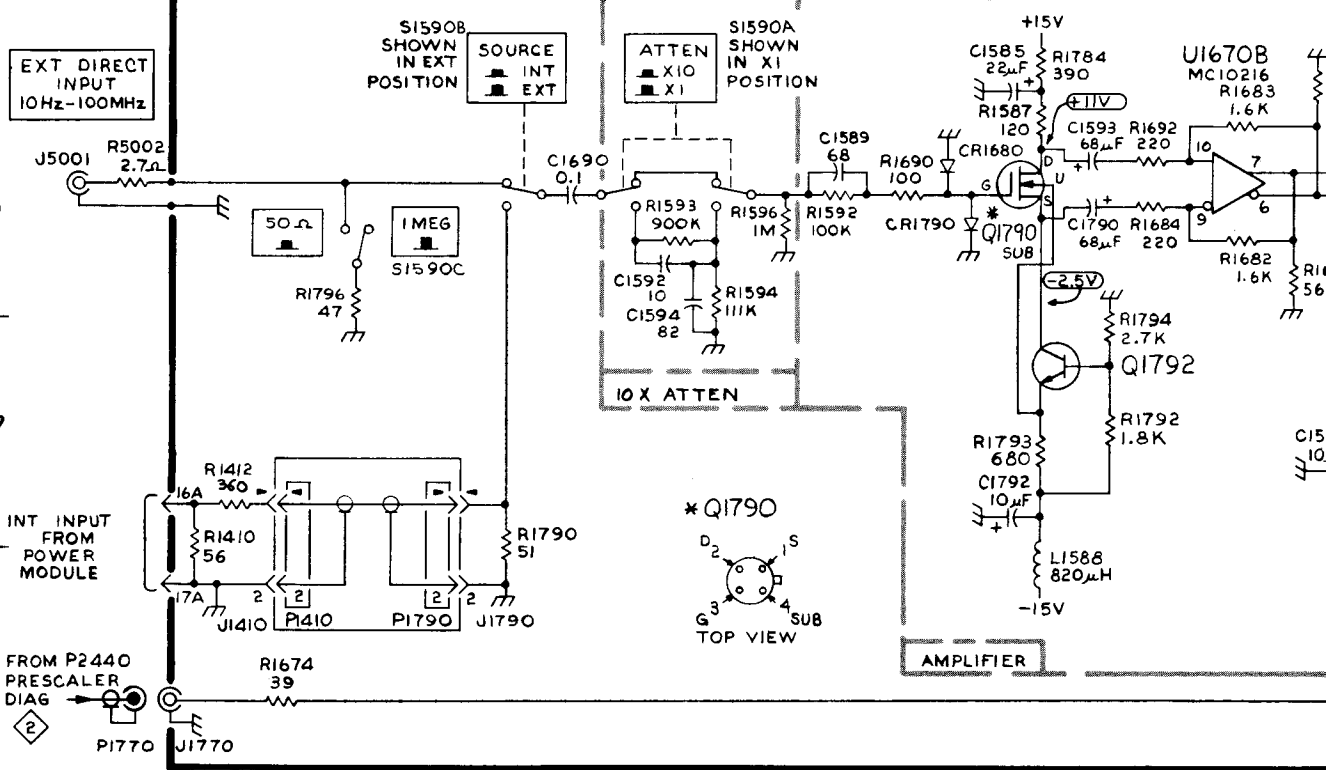
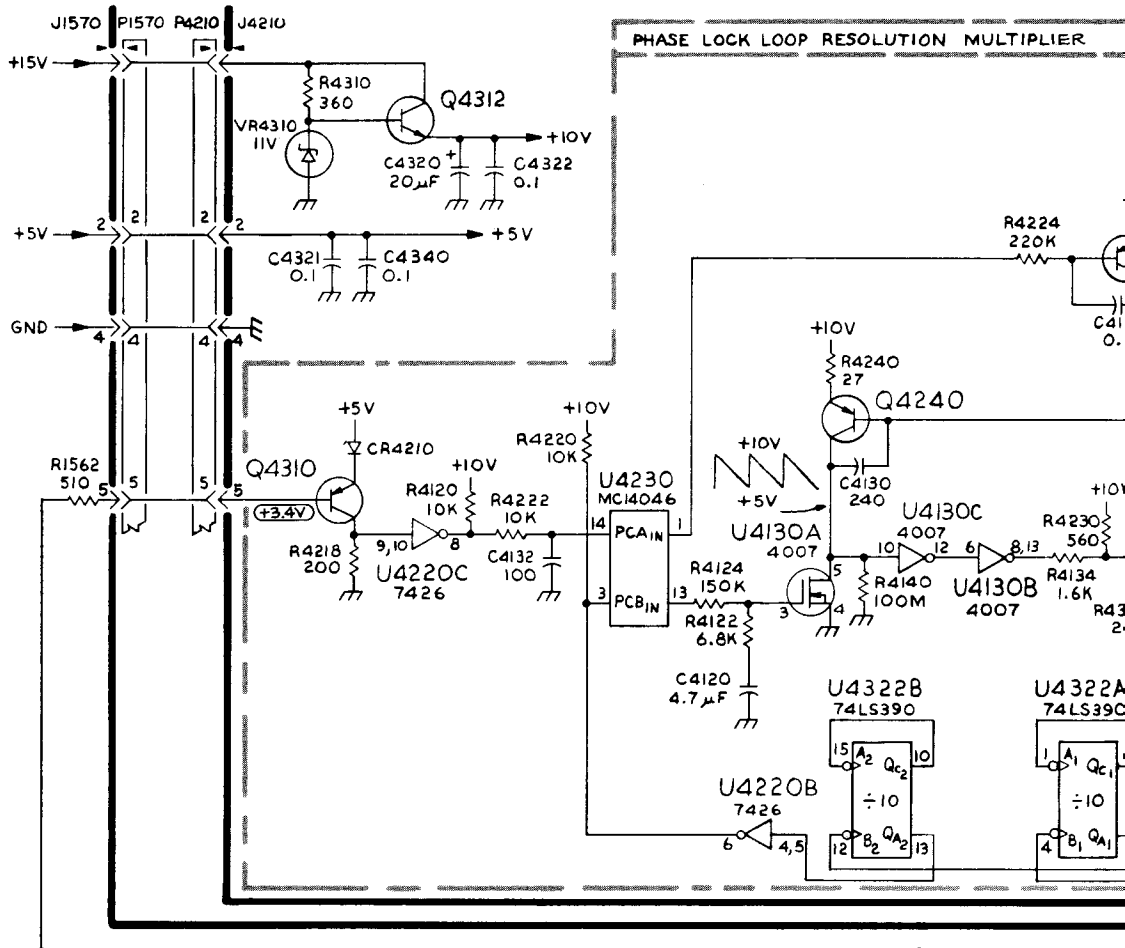
| CHASSIS | | | DIRECT INPUT & RESOLUTION MULTIPLIER 1 | | | | | |
|----------------|--------------------|----------------|--|--------------------|----------------|----------------|--------------------|----------------|
| Circuit Number | Schematic Location | Board Location | Circuit Number | Schematic Location | Board Location | Circuit Number | Schematic Location | Board Location |
| DS5023 | K1 | CHASSIS | | | | | | |
| R5002 | A6 | CHASSIS | | | | | | |

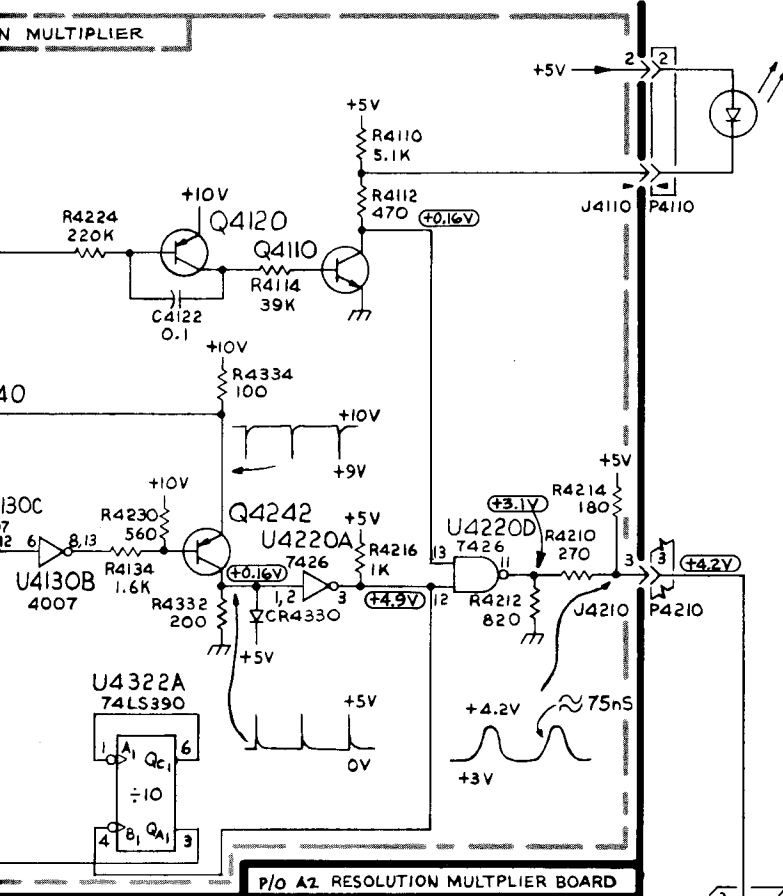
**Located on back of board.

DIRECT INPUT & RESOLUTION MULTIPLIER

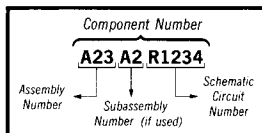
1

1
2
3
4
5
6
7
8



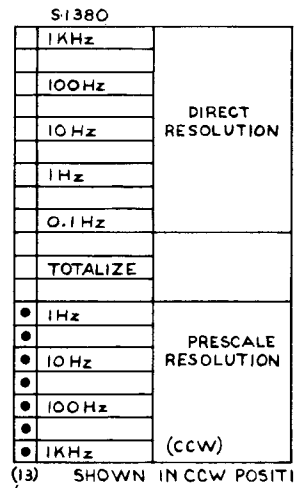


COMPONENT NUMBER EXAMPLE

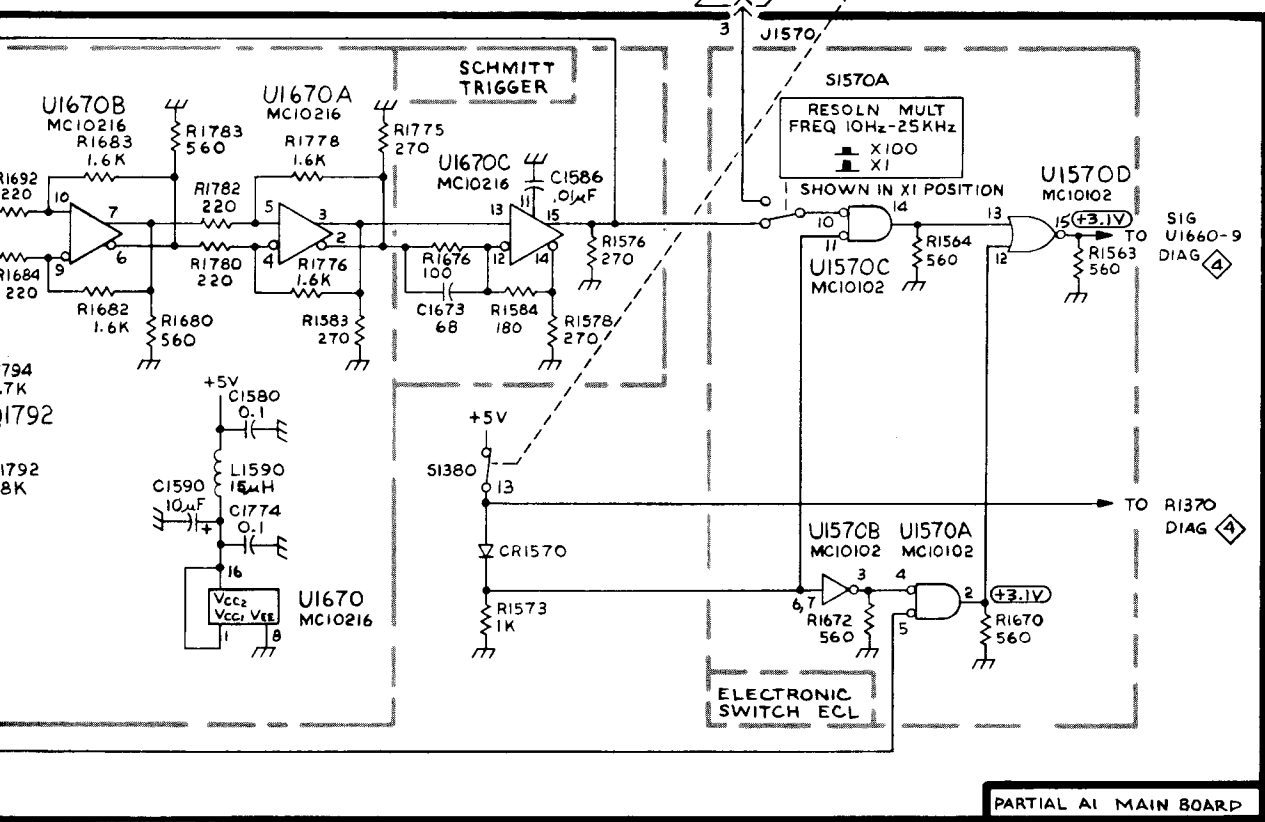


Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List

| TYPE | +10V | +5V | GND |
|---------|--------|-------|----------|
| MC10102 | | 1, 16 | 8 |
| MC14046 | 5, 16 | | 8, 9 |
| 7426 | | 14 | 7 |
| 74LS390 | | 16 | 2, 8, 14 |
| 4007 | 11, 14 | | 4, 7, 9 |



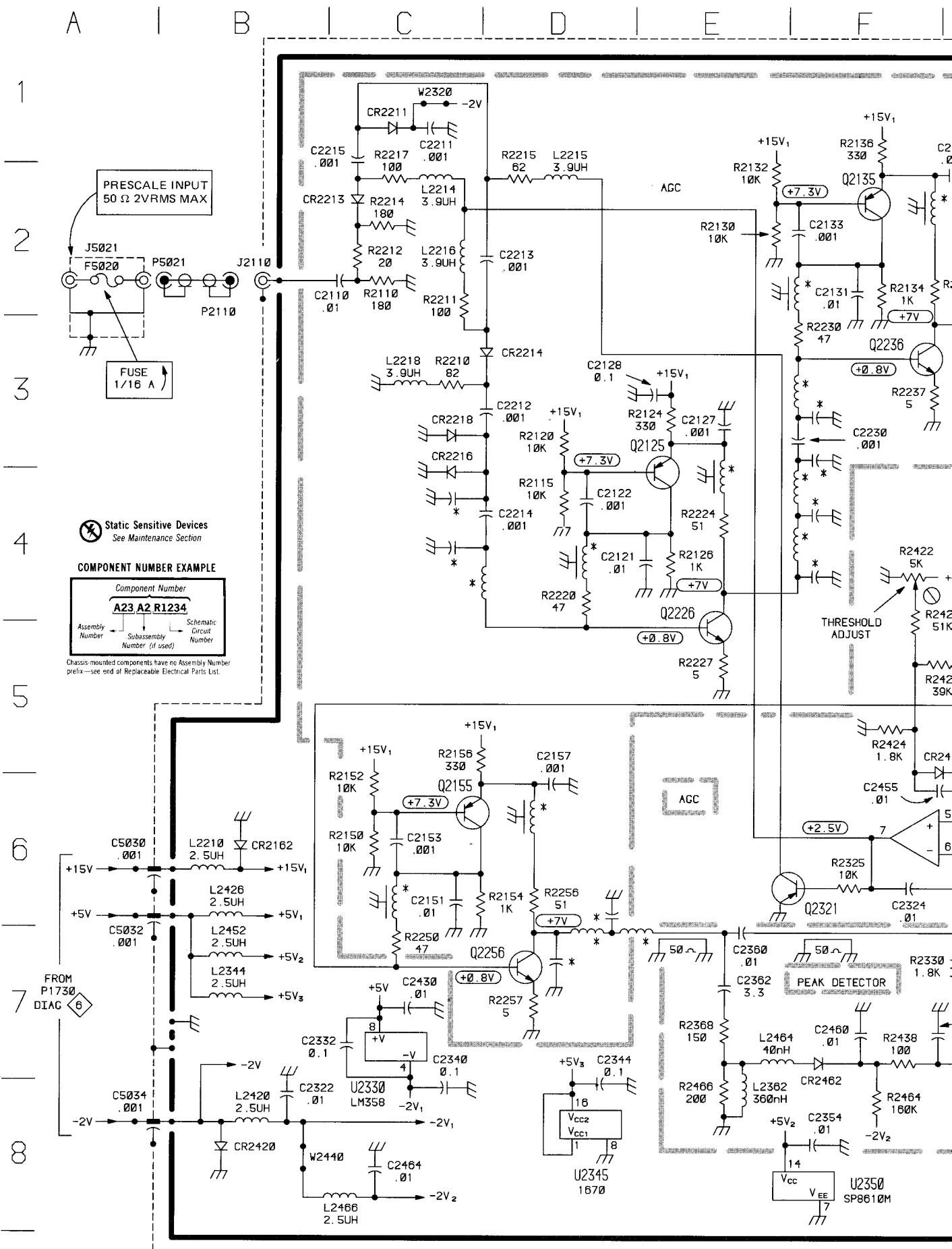
Static Sensitive Devices
See Maintenance Section



DIRECT INPUT & RESOLUTION MULTIPLIER

DIRECT INPUT & RESOLUTION MULTIPLIER

| A4 ASSY | | | PRESCALE BOARD 2 | | |
|----------------|--------------------|----------------|---|--------------------|----------------|
| 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 2 | | |
| C5030 | A6 | CHASSIS | C5038 | M8 | CHASSIS |
| C5032 | A6 | CHASSIS | | | |
| C5034 | A8 | CHASSIS | F5020 | A2 | CHASSIS |

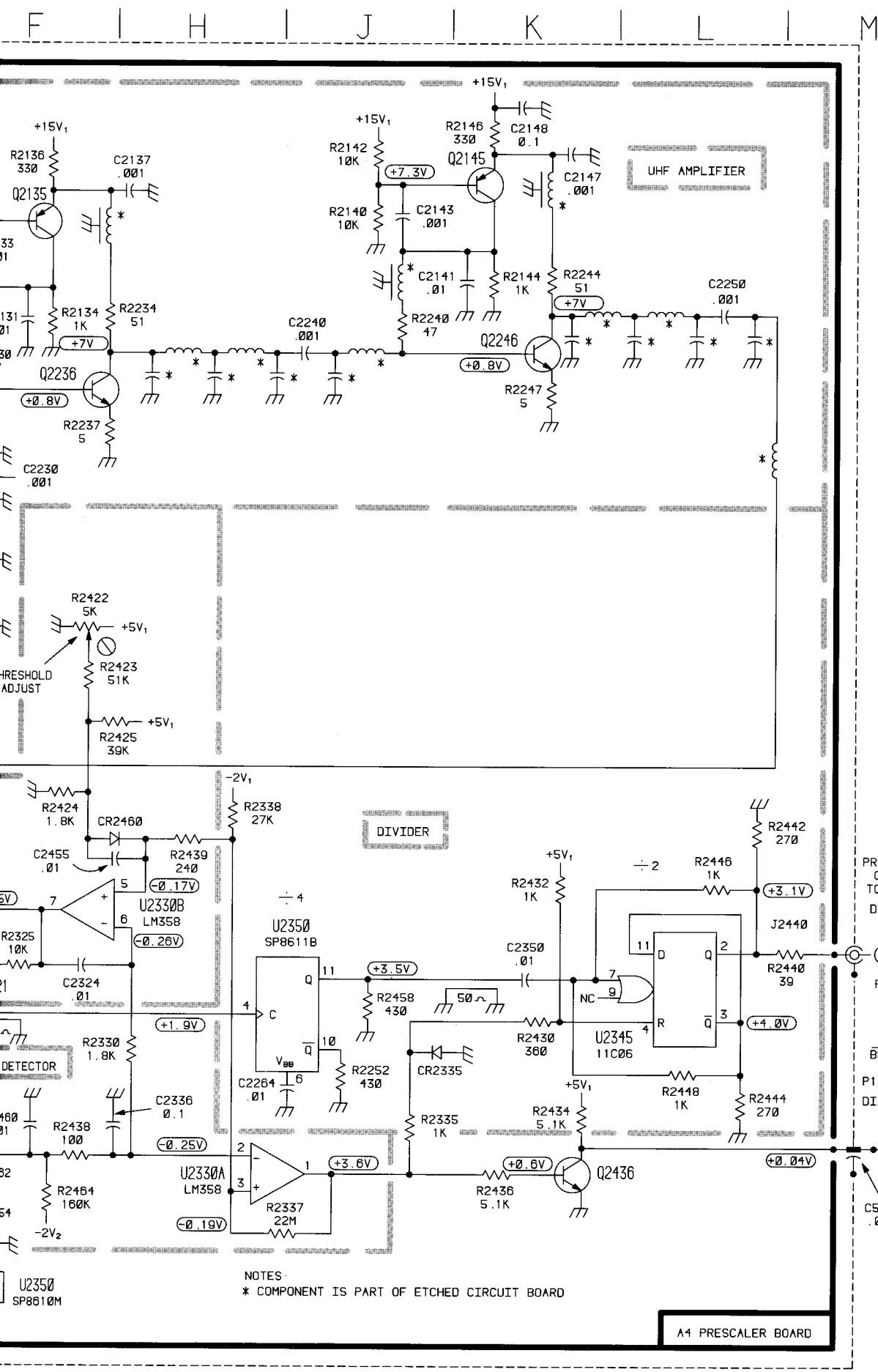


Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE

| | | |
|------------------|------------------------------|--------------------------|
| Component Number | | |
| A23 A2 R1234 | | |
| Assembly Number | Subassembly Number (if used) | Schematic Circuit Number |

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



NOTES
 * COMPONENT IS PART OF ETCHED CIRCUIT BOARD

A4 PRESCALER BOARD

| 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.

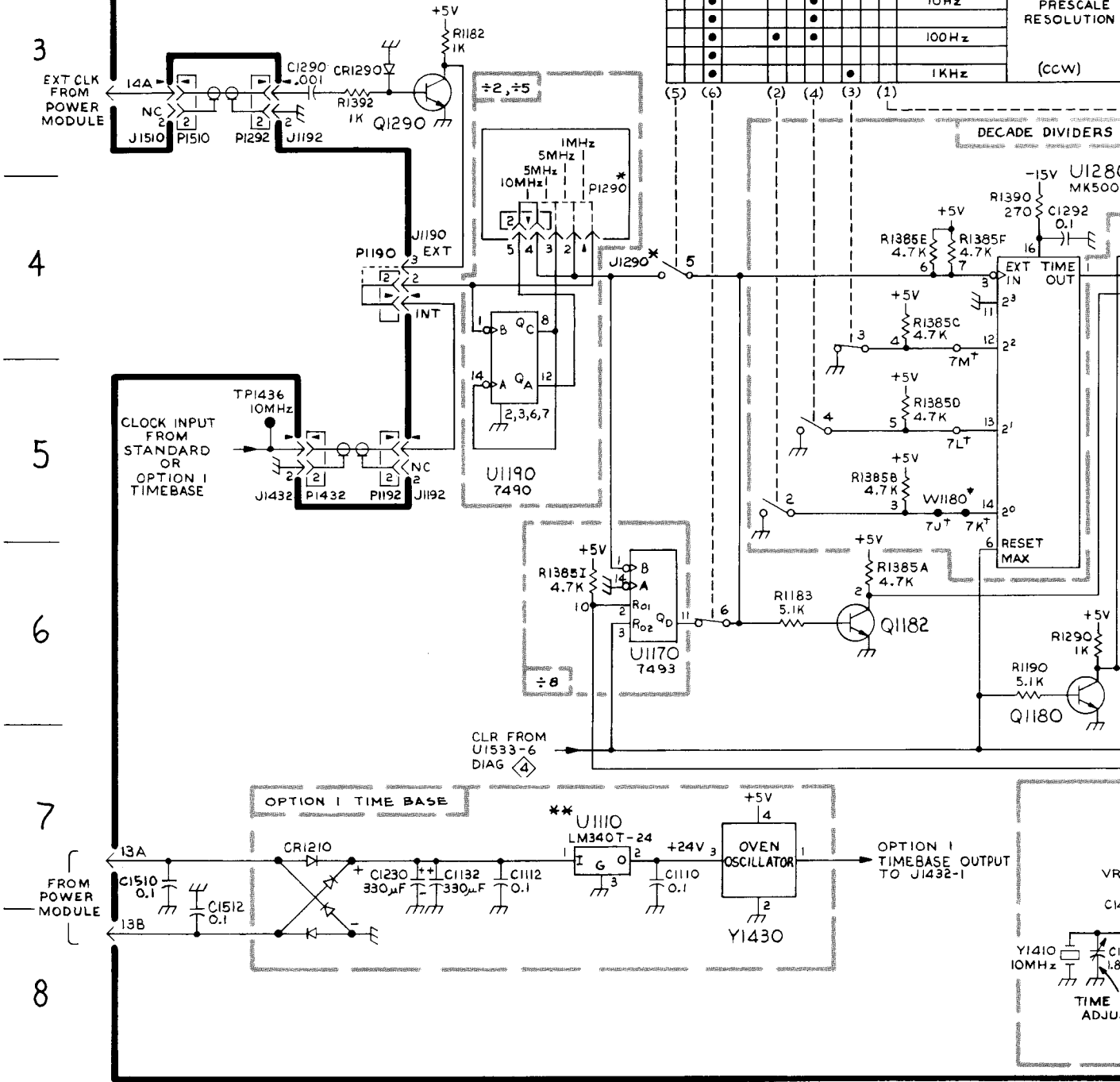
GATE GENERATOR & TIME BASES 3

A | B | C | D | E | F

1
2
3
4
5
6
7
8

51380 SHOWN IN CCW POSITION

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|----------|---------------------------------|
| | | | | | | | | | | 1KHz | DIRECT RESOLUTION |
| | | | | | | | | | | 100Hz | |
| | | | | | | | | | | 10Hz | |
| | | | | | | | | | | 1Hz | |
| | | | | | | | | | | 0.1Hz | |
| | | | | | | | | | | TOTALIZE | PRESCALE RESOLUTION (CCW) |
| | | | | | | | | | | 1Hz | |
| | | | | | | | | | | 10Hz | |
| | | | | | | | | | | 100Hz | |
| | | | | | | | | | | 1KHz | |



| |
|---------------------|
| DIRECT RESOLUTION |
| PRESCALE RESOLUTION |
| (CCW) |

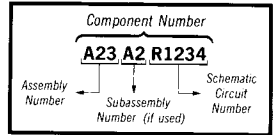
Static Sensitive Devices
See Maintenance Section

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

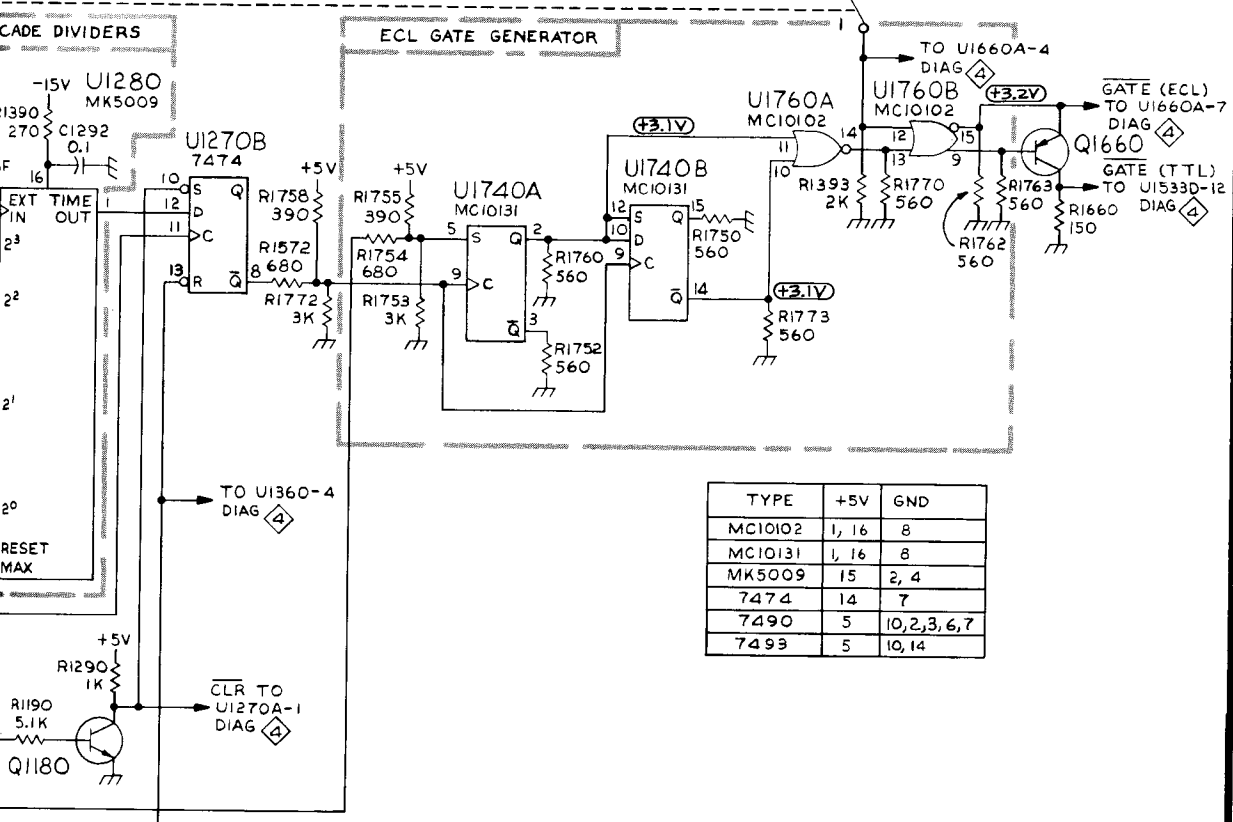


| FREQ | PINS |
|-------|------|
| 1MHz | 1E,2 |
| 5MHz | 2E,3 |
| 5MHz | 3E,4 |
| 10MHz | 4E,5 |

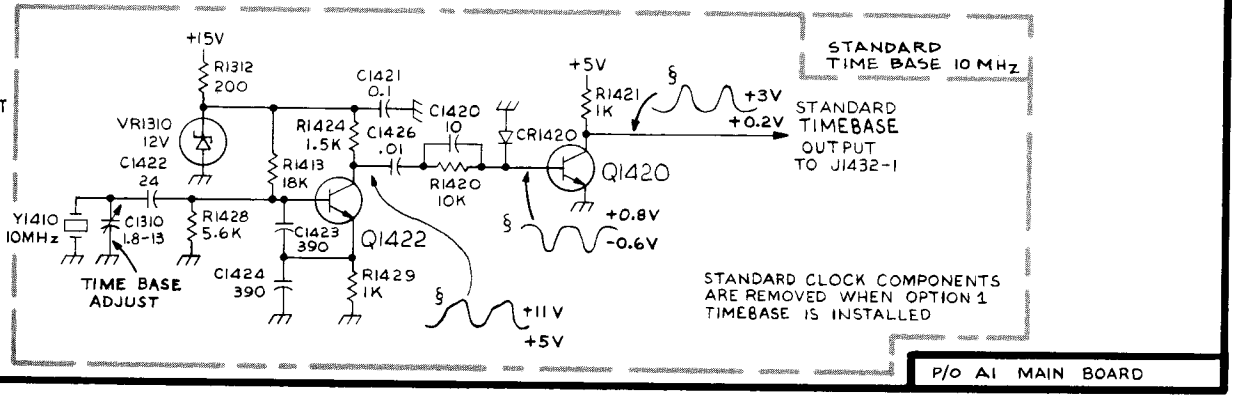
COMPONENT NUMBER EXAMPLE



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



| 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

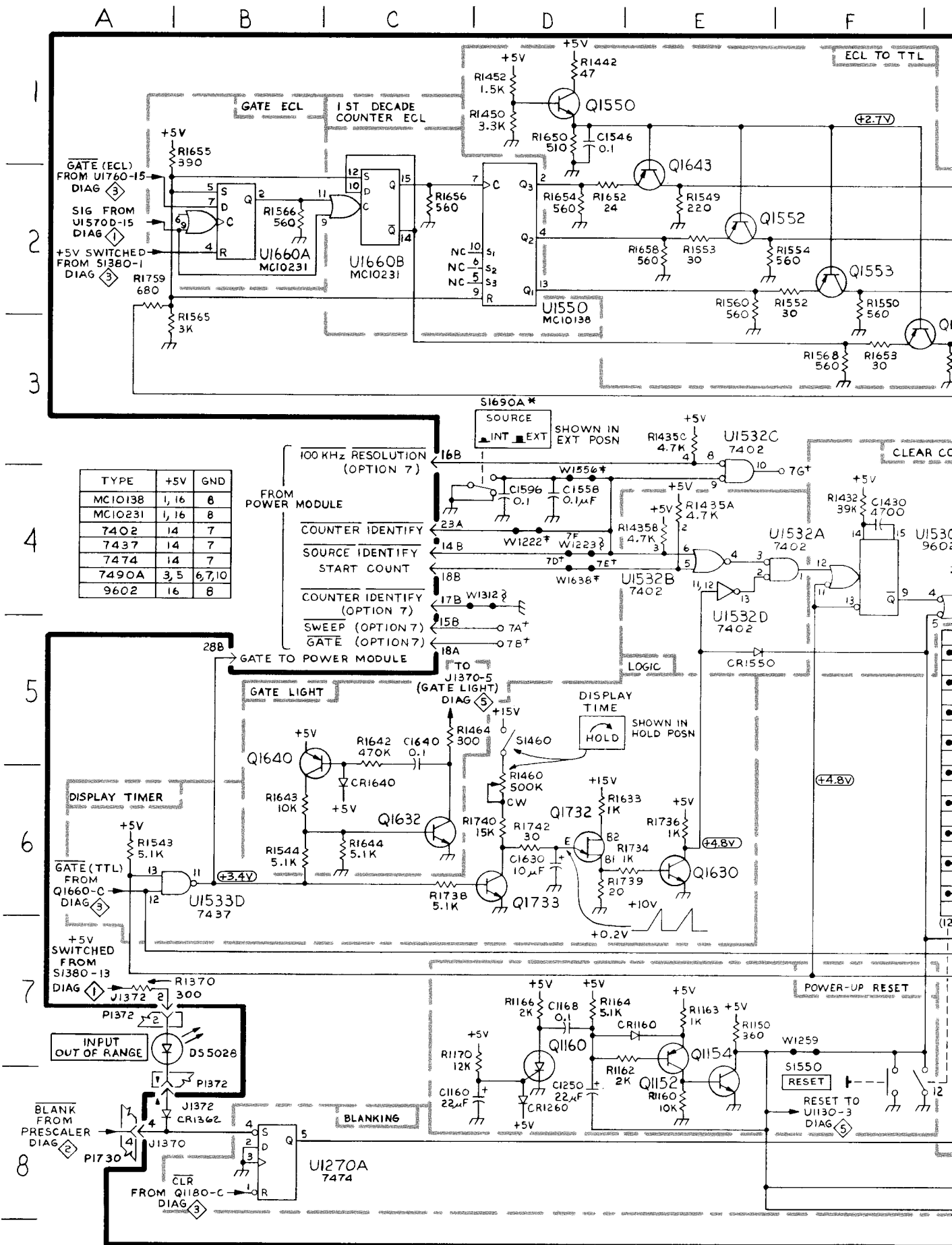
P/O AI MAIN BOARD

GATE GENERATOR & TIME BASES 3

| P/O A1 ASSY | | 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 | | | |

COUNTER PROCESSING &
DECADE COUNTERS

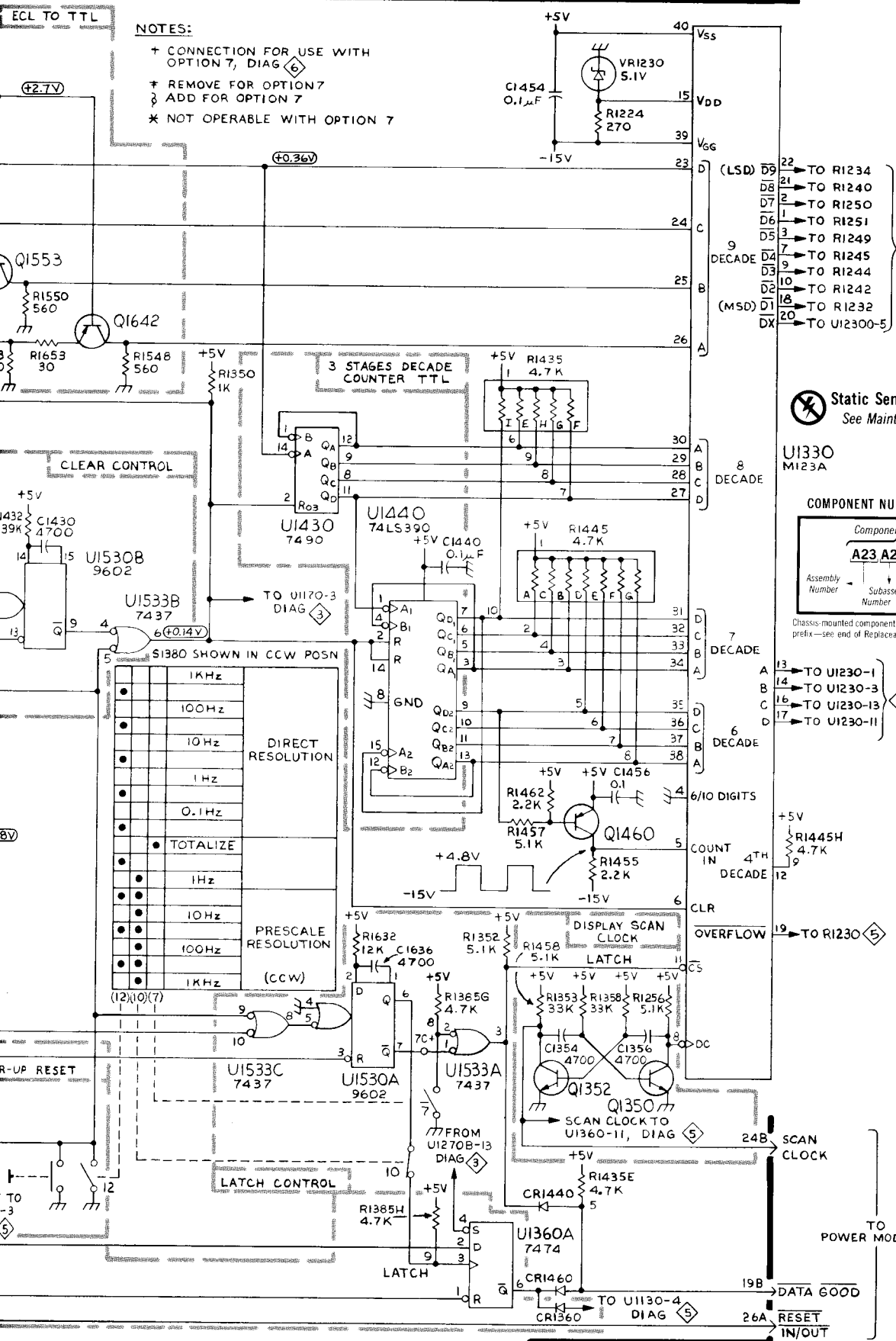




ECL TO TTL

NOTES:

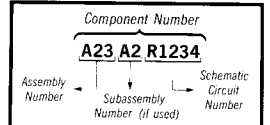
- + CONNECTION FOR USE WITH OPTION 7, DIAG 6
- + REMOVE FOR OPTION 7
- + ADD FOR OPTION 7
- * NOT OPERABLE WITH OPTION 7



Static Sensitive Devices
See Maintenance Section

U1330
M123A

COMPONENT NUMBER EXAMPLE



- 13 TO U1230-1
- 14 TO U1230-3
- 16 TO U1230-13
- 17 TO U1230-11

- 19 TO R1230

COUNTER PROCESSING & DECADE COUNTERS

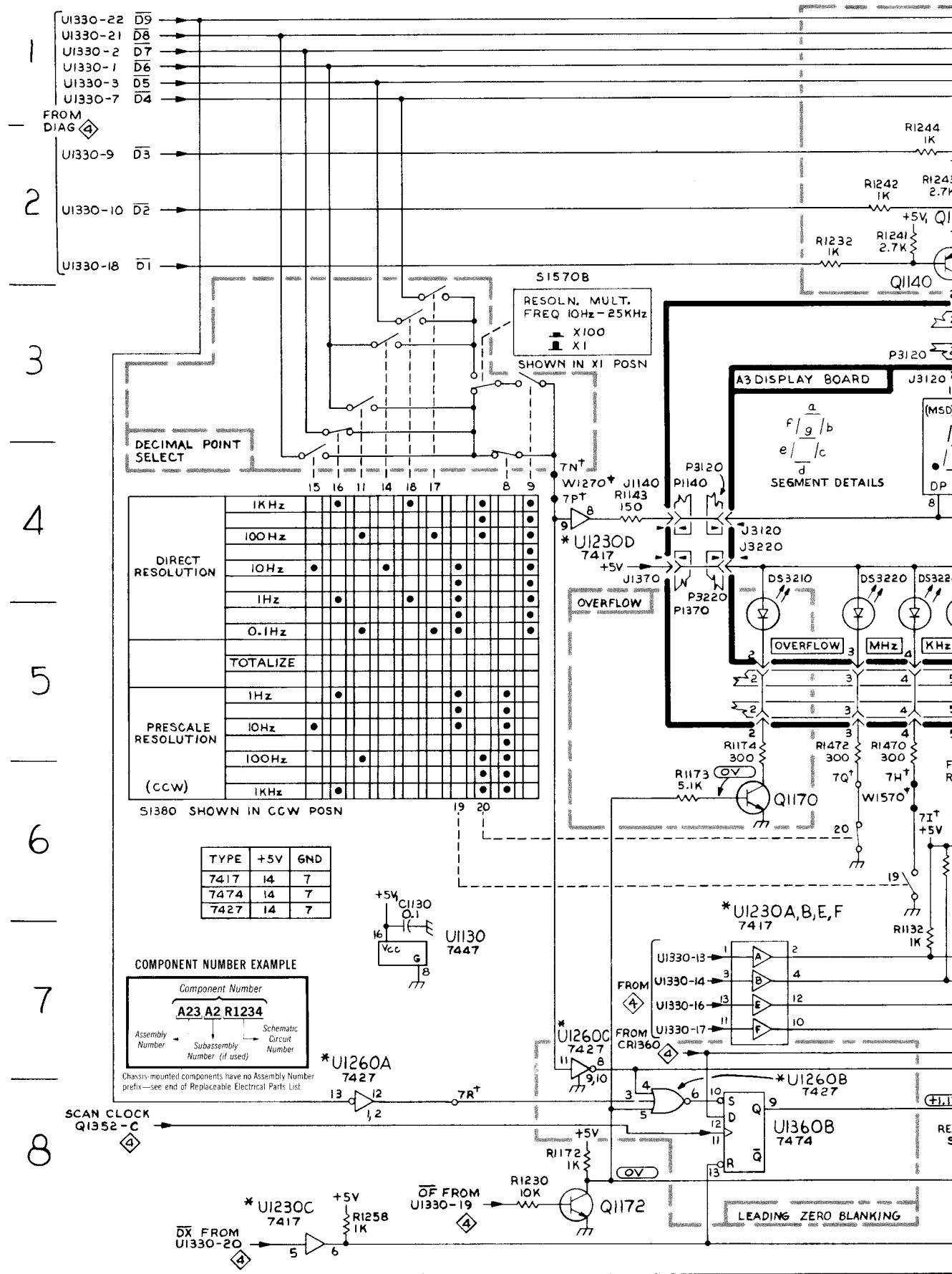
4

P/O A1 MAIN BOARD

COUNT PROCESSING & DECADE COUNTERS

4

| 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 |



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

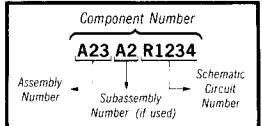
DECIMAL POINT SELECT

| | | | | | | | | | |
|---------------------|----------|---|---|---|---|---|---|---|---|
| DIRECT RESOLUTION | 1KHz | • | • | • | • | • | • | • | • |
| | 100Hz | | • | • | • | • | • | • | • |
| | 10Hz | • | | • | • | • | • | • | • |
| | 1Hz | • | • | • | • | • | • | • | • |
| | 0.1Hz | • | • | • | • | • | • | • | • |
| PRESCALE RESOLUTION | TOTALIZE | | | | | | | | |
| | 1Hz | • | • | • | • | • | • | • | • |
| | 10Hz | • | | • | • | • | • | • | • |
| | 100Hz | | • | • | • | • | • | • | • |
| (CCW) | 1KHz | • | • | • | • | • | • | • | |

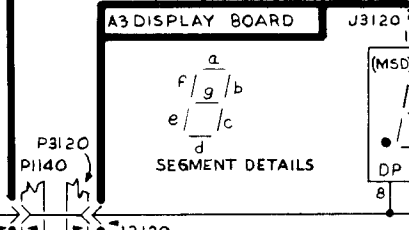
S1380 SHOWN IN CGW POSN

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

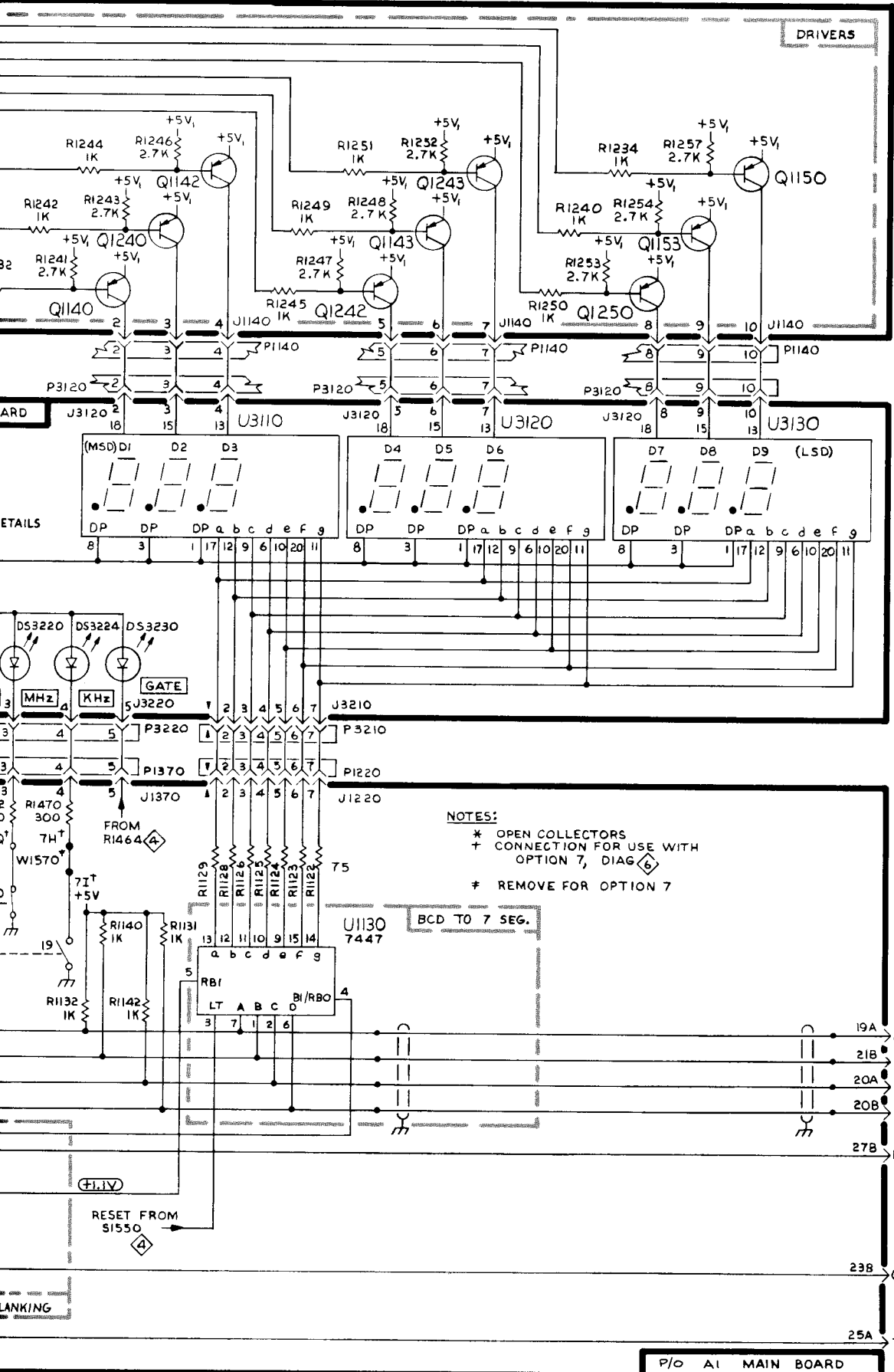
COMPONENT NUMBER EXAMPLE



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

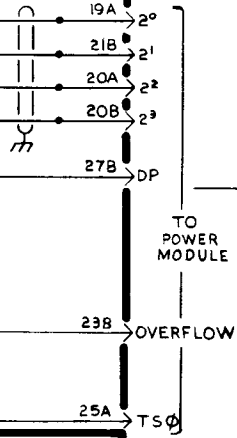


F | H | J | K | L | M



NOTES:
 * OPEN COLLECTORS
 † CONNECTION FOR USE WITH OPTION 7, DIAG 6
 ‡ REMOVE FOR OPTION 7

BCD TO 7 SEG.
 U1130 7447



DISPLAY DRIVERS & DISPLAYS

DISPLAY DRIVERS & DISPLAYS

| 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 |
| CR1120 | H2 | C1 | R1723 | H7 | C5 |
| CR1520 | F6 | C4 | R1724 | H6 | C5 |
| CR1710 | K3 | A5 | R1726 | H7 | C5 |
| CR1720 | J8 | C5 | R1729 | K6 | D5 |
| CR1722 | L6 | C5 | R1730 | K6 | D5 |
| | | | R1732 | J6 | D5 |
| J1730 | L3 | D5 | | | |
| J1730 | L6 | D5 | S1320** | E2 | B2 |
| 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.

1

2

3

4

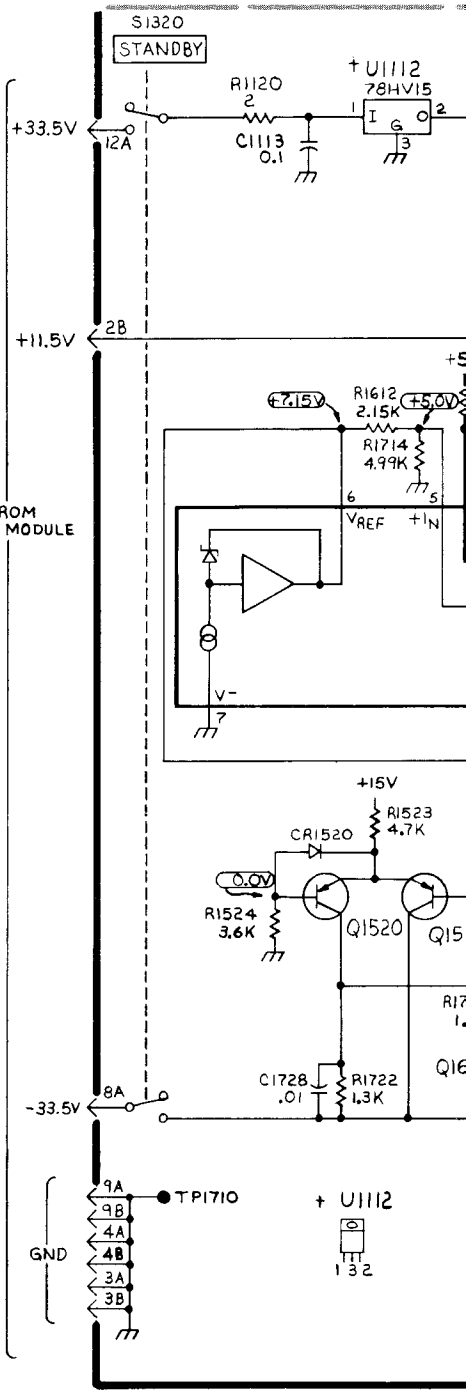
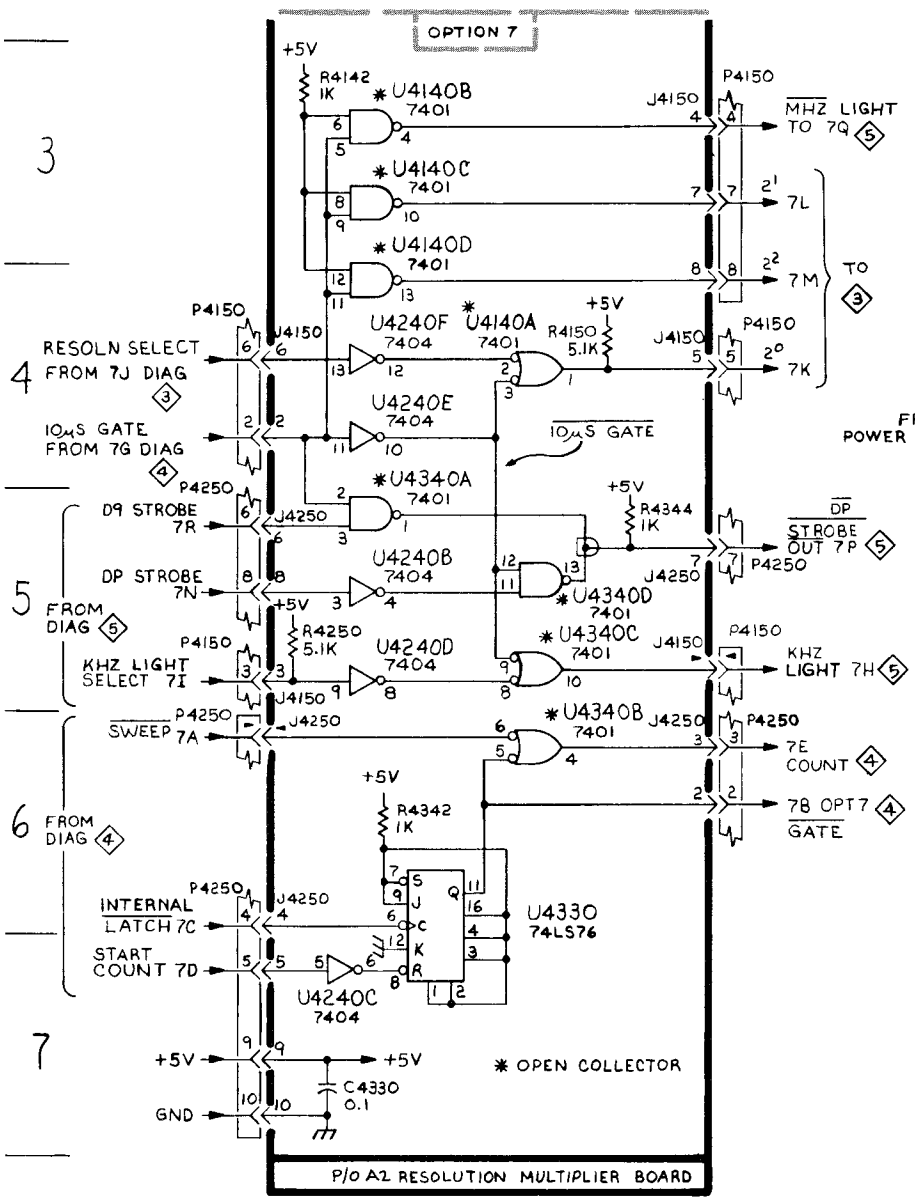
5

6

7

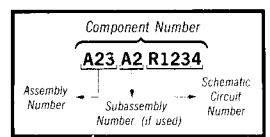
8

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



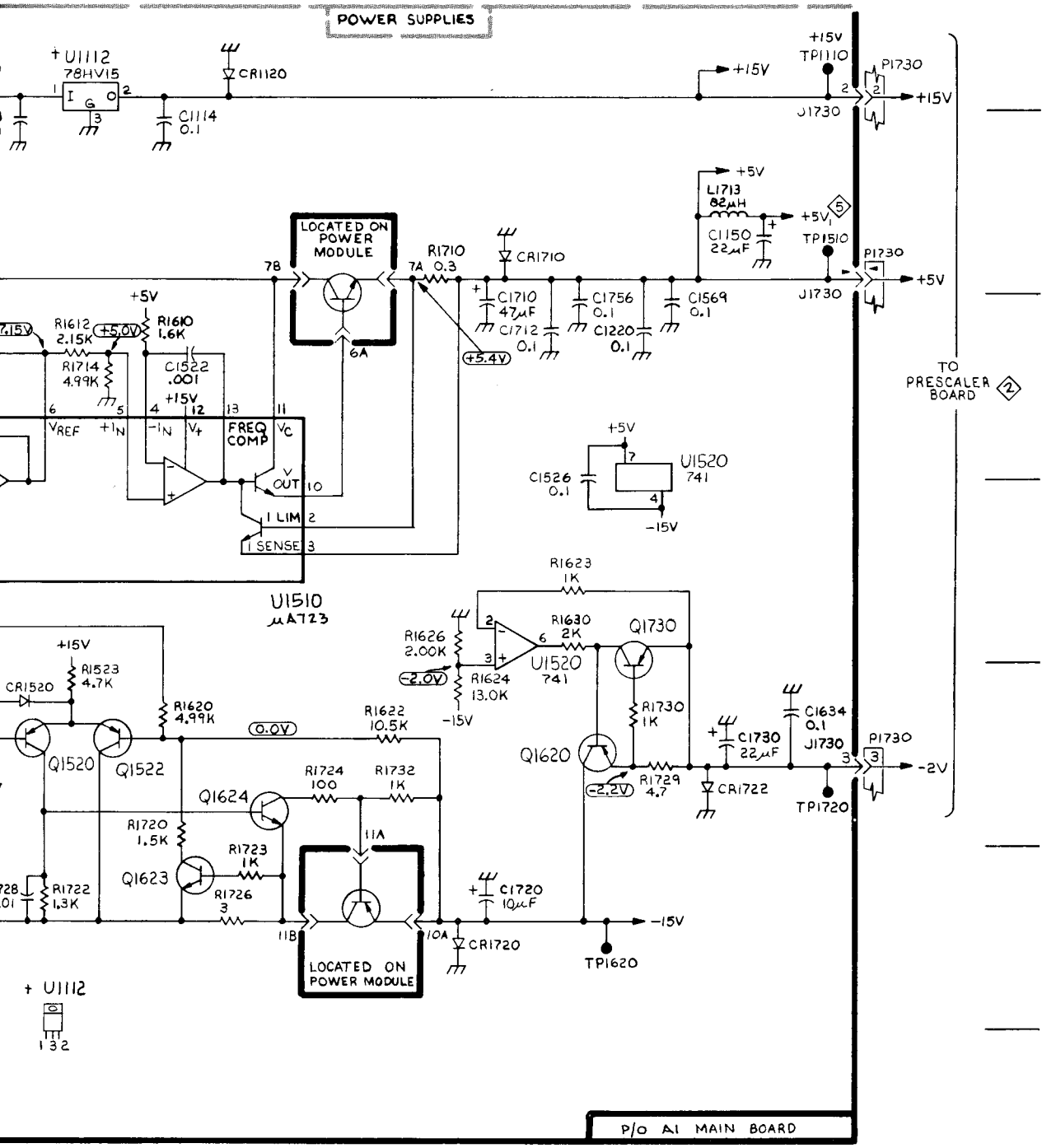
Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



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

3638-8
@



TO PRESCALER BOARD

P/O AI MAIN BOARD

OPTION 7 AND POWER SUPPLIES 6

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

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

| Mfr. Code | Manufacturer | Address | City, State, Zip |
|-----------|---|------------------------------|-----------------------------|
| 000BK | STAUFFER SUPPLY | 105 SE TAYLOR | PORTLAND, OR 97214 |
| 000CY | NORTHWEST FASTENER SALES, INC. | 7923 SW CIRRUS DRIVE | BEAVERTON, OR 97005 |
| 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,LOCKING,BRS CD PL | 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 | | 15 | | CKT BOARD ASSY INCLUDES: . TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD | 22526 | 47357 |
| -23 | 136-0252-07 | | 8 | | . SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| -24 | 131-1425-00 | | 1 | | . CONTACT SET,ELE:R ANGLE,0.150" L,STR OF 36 | 22526 | 65521-136 |
| -25 | 333-2365-02 | | 1 | | PANEL,FRONT: | 80009 | 333-2365-00 |
| -26 | 200-0935-00 | | 2 | | BASE,LAMPHOLDER:0.29 OD X 0.19 CASE | 80009 | 200-0935-00 |
| -27 | 352-0157-00 | | 2 | | LAMPHOLDER:WHITE PLASTIC | 80009 | 352-0157-00 |
| -28 | 386-3825-00 | | 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 | | 1 | | CKT BOARD ASSY INCLUDES: . CONTACT SET,ELE:R ANGLE,0.250L,STRIP OF 36 | 22526 | 65524-136 |
| -38 | 136-0269-02 | | 2 | | . SKT,PL-IN ELEK:MICROCIRCUIT,14 DIP,LOW CLE | 73803 | CS9002-14 |
| | 136-0269-02 | | 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 0.250, PNH, STL, CD PL | 83385 | OBD |
| -48 | 210-1178-00 | | 1 | . | WASHER, SHLDR: U/W TO-220 TRANSISTOR | 49671 | DF137A |
| -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 0.250, PNH, STL, CD PL | 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, STL CD PL | 83385 | OBD |
| | ----- | | - | . | * - - - * | | |
| -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 BOARD, 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 | 136-0252-07 | | 23 | . | SOCKET, PIN CONN: W/O DIMPLE | 22526 | 75060-012 |
| -66 | 131-0938-00 | | 2 | . | CONNECTOR, RCPT: 50 OHM MALE SNAP-ON | 98291 | 051-043-0349 |
| -67 | 337-2482-00 | | 1 | . | SHIELD, ELEC: CIRCUIT BOARD, 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 BOARD, 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 BOARD, 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 |
|------------------|--------------------|-----------------------------|-----|-----------|--|----------|------------------|
| 1- | 672-0661-00 | | 1 | | CKT BOARD ASSY:DISPLAY (STANDARD ONLY) | 80009 | 672-0661-00 |
| | 672-0698-00 | | 1 | | CKT BOARD ASSY:MAIN (OPTION 07 ONLY) | 80009 | 672-0698-00 |
| | | | | | (ATTACHING PARTS) | | |
| -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 0.250,PNH,STL,CD PL | 83385 | OBD |
| -94 | 210-0004-00 | | 4 | | . . WASHER,LOCK:#4 INTL,0.015 THK,STL CD PL | 000BK | OBD |
| | | | | | -----* | | |
| -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 | 12161-50 |
| -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 | 12161-50 |
| -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 | 136-0252-07 | | 5 | | . . SOCKET,PIN CONN:W/O DIMPLE | 22526 | 75060-012 |
| -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 ONLY) | | |
| | | | | | (ATTACHING PARTS) | | |
| -126 | 211-0097-00 | | 1 | | . . SCREW,MACHINE:4-40 X 0.312 INCH,PNH STL | 83385 | OBD |
| | | | | | (OPTIONS 01 AND 07 ONLY) | | |
| -127 | 210-1127-00 | | 1 | | . . WASHER,FLAT:0.203 ID X 0.048 THK,STL CD | 80009 | 210-1127-00 |
| | | | | | (OPTIONS 01 AND 07 ONLY) | | |
| | | | | | -----* | | |

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- | 136-0388-00 | | 1 | . | SOCKET, PIN TERM:U/W 0.04 DIA PIN | 71279 | 450-3704-01-0300 |
| | ----- | | - | . | (OPTIONS 01 AND 07 ONLY) | | |
| -128 | ----- | | 1 | . | MICROCIRCUIT, LI:(SEE U1110 REPL) | | |
| | ----- | | - | . | (OPTIONS 01 AND 07 ONLY) | | |
| | | | | | (ATTACHING PARTS) | | |
| -129 | 211-0507-00 | | 1 | . | SCREW, MACHINE:6-32 X 0.312 INCH, PNH STL | 83385 | OBD |
| | ----- | | - | . | (OPTIONS 01 AND 07 ONLY) | | |
| -130 | 210-0407-00 | | 1 | . | NUT, PLAIN, HEX.:6-32 X 0.25 INCH, BRS | 73743 | 3038-0228-402 |
| | ----- | | - | . | (OPTIONS 01 AND 07 ONLY) | | |
| | | | | | - - - - * | | |
| | 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 | OBD |
| -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 |

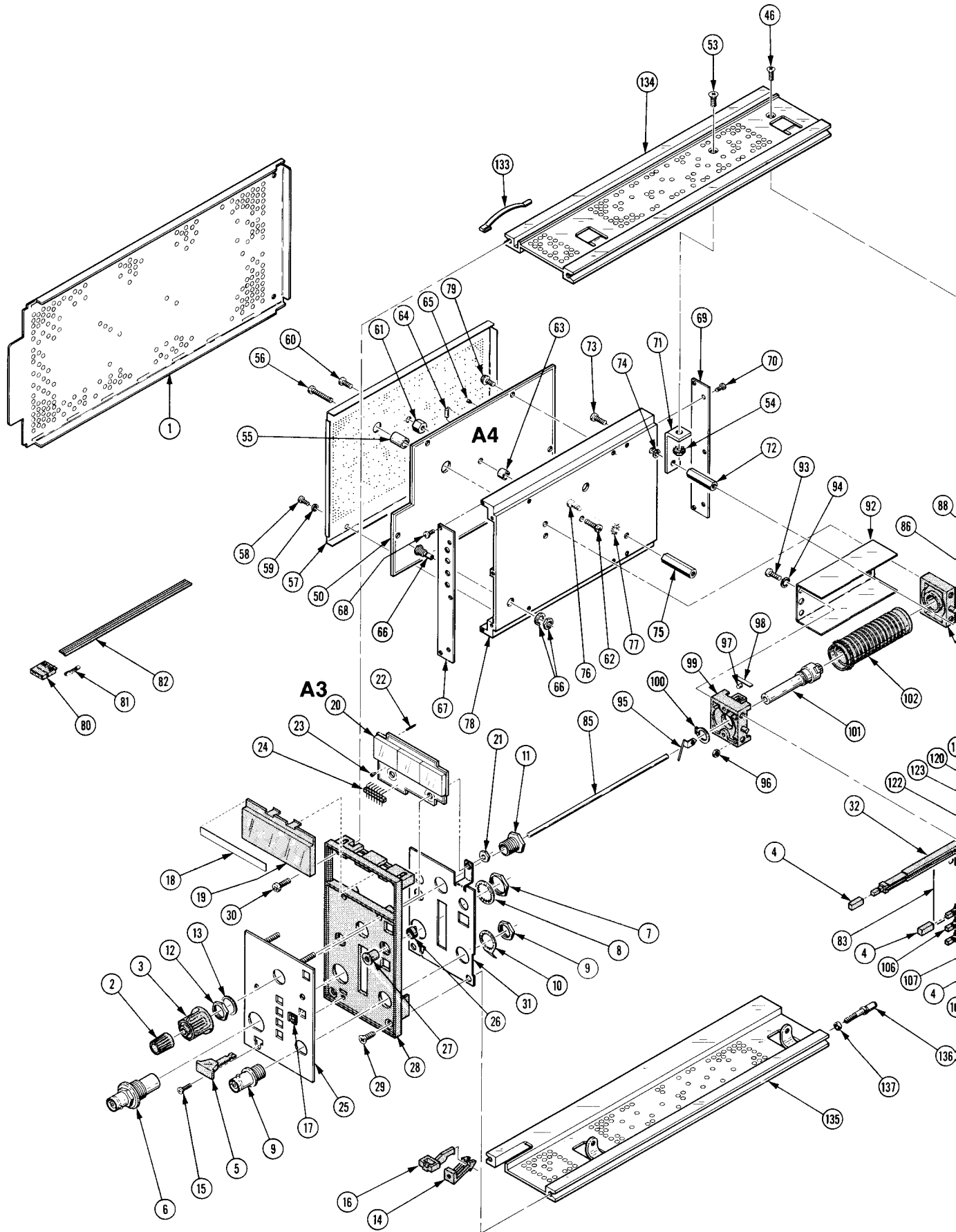
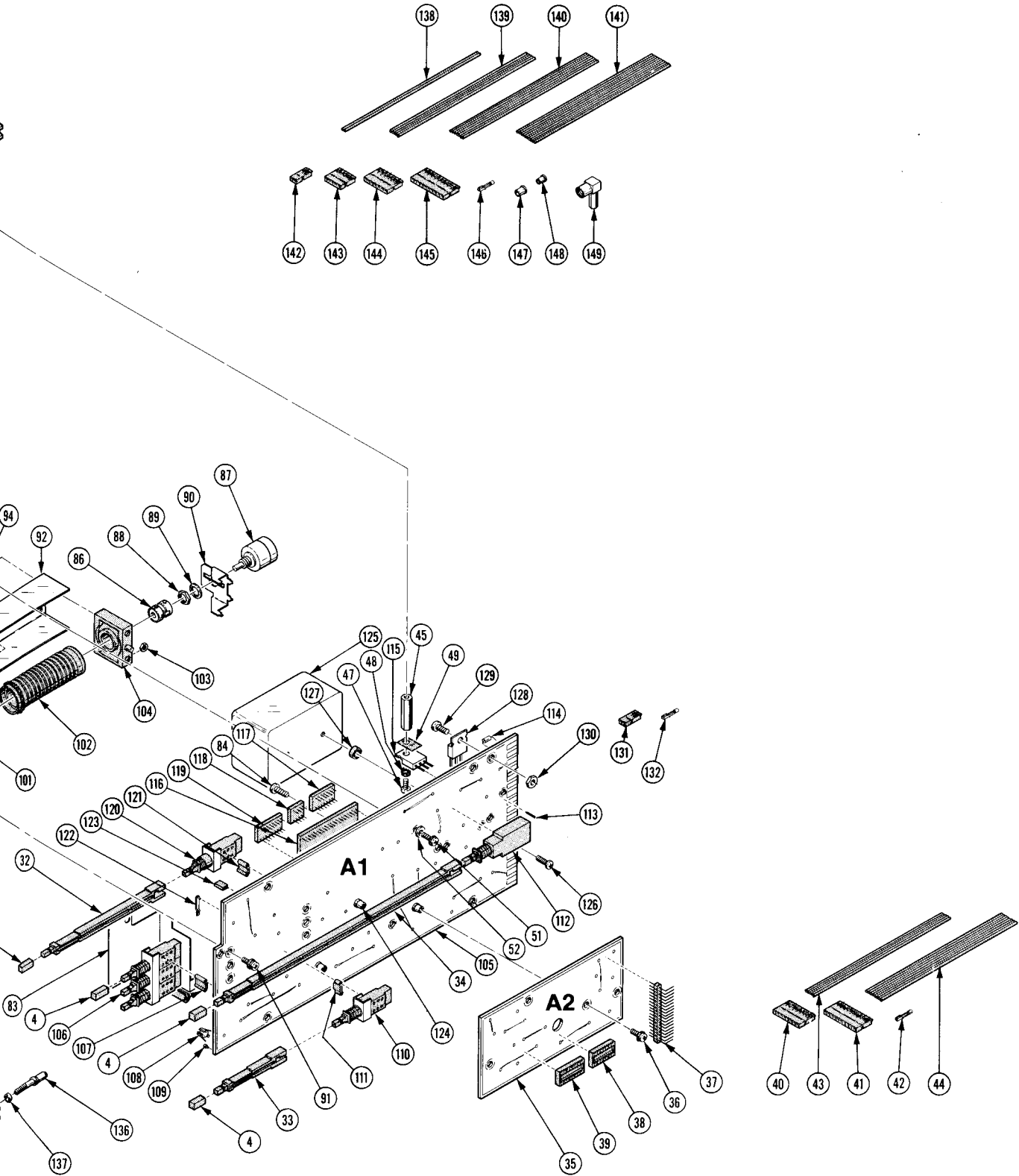


FIG. 1 EXPLODED



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

ACCESSORIES

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

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.

