Qservice ----- This Document is a complete scan from the Original Tektronix Manual ----- Qservice

Part No. 070-7763-0
Product Group 47

THE 11A16

TWO-CHANNEL CURRENT AMPLIFIER

User Reference

Please check for CHANGE INFORMATION at the rear of this manual.

First Printing JAN 1991
Revised FEB 1991

Tektronix®
COMMITTED TO EXCELLENCE

Instrument Serial Numbers

Each instrument manufactured by Tektronix has a serial number on a panel insert or tag, or *stamped on the chassis. The first letter in the serial number 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:

B010000	Tektronix, Inc., Beaverton, Oregon, USA
E200000	*Tektronix United Kingdom, Ltd., London*
J300000	Sony/Tektronix, Japan
H700000	Tektronix Holland, NV, Heerenveen, The Netherlands

Instruments manufactured for Tektronix by external vendors outside the United States are assigned a two digit alpha code to identify the country of manufacture (e.g., JP for Japan, HK for Hong Kong, etc.).

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

Printed in U.S.A.

Copyright © Tektronix, Inc., 1991. All rights reserved. Tektronix products are covered by U.S. and foreign patents, issued and pending. The following are registered trademarks: TEKTRONIX, TEK, TEKPROBE, SCOPEMOBILE and

Contents

General Information

Features 1-1
Mainframe Compatibility 1-1
Mainframe Firmware 1-1
Probe Calibration and Deskew 1-2
Components of this Supplement 1-3
Safety Summary 1-4
Terms in Manuals 1-4
Terms on Equipment 1-4
Symbols in Manuals 1-4
Symbols on Equipment 1-4
Power Source 1-4
Grounding the Amplifier 1-5
Danger Arising from Loss of Ground 1-5
Do Not Operate in Explosive Atmospheres 1-5
Do Not Remove Covers or Panels 1-5
Initial Inspection 1-5
Operating Temperature 1-5
Installing and Removing the Amplifier 1-6
Instrument Accessories 1-7
Packaging for Shipment 1-8

Operation

Displaying Waveforms 2-1
Functions Controlled by the Mainframe 2-2
Sensitivity and Offset 2-2
Bandwidth Limit 2-3
Display and Trigger Polarity 2-3
Adding and Subtracting Waveforms 2-3
Effects of Input Coupling Mode on DC Circuit Loading 2-4
Probe Operation 2-5
Degaussing the Probe 2-5
Calibrating the Probe with Digitizing Mainframes 2-6
Calibrating the Probe with Analog Oscilloscopes 2-7
Probe ID 2-8
Front-Panel Error Messages 2-9
Input Overload 2-9
DAC Overflow 2-9
Probe Calibration and Deskew Errors 2-10
GPIB and RS-232-C Commands and Syntax 2-11

Specifications

Performance Conditions 3-1
System Specifications 3-6

Change Information

Illustrations

Figure 1-1	Installing and Removing the Amplifier	1-6
Figure 1-2	Voltage Adapter	1-7
Figure 1-3	Current Loop Adapter	1-7
Figure 2-1	11A16 Amplifier Front Panel	2-1
Figure 3-1	Dimensions of the 11A16 Amplifier	3-5

Tables

Table 1-1	Mainframe Firmware Compatibility	1-2
Table 2-1	CH Command Links	2-11
Table 2-2	CH Command Query-Only Links	2-11
Table 3-1	Electrical Characteristics (With Voltage Adapter)	3-1
Table 3-2	Environmental Characteristics	3-4
Table 3-3	Physical Characteristics	3-5
Table 3-4	Electrical Characteristics of the 11A16 Amplifier with Probes	3-6

Qservice ----- This Document is a complete scan from the Original Tektronix Manual ----- Qservice

General Information

This supplement to the *User Reference* manual for your mainframe describes the features and operation of the Tektronix 11A16 Two-Channel Current Amplifier. The *11A16 Service Reference* manual provides service information and test procedures for the 11A16 Amplifier.

This manual discusses the performance of 11000 and DSA Series Mainframes that are configured with the 11A16 Amplifier. Functions common to all plug-in amplifiers, such as offset, sensitivity, input impedance, and coupling, are described in the *User Reference* for each mainframe. Unique capabilities and limits of the 11A16 are discussed in this manual.

Features

- Two independent current amplifier channels
- Coarse and fine sensitivities from 1 mA to 2 A/division with the A6302 probe and 5 mA to 10 A/division with the A6303 probe
- Calibrated DC offset adjustment (0.25 divisions/increment, coarse; 0.025 divisions/increment, fine)
- DC to 50 MHz bandwidth (with the A6302 Current Probe); DC to 15 MHz bandwidth (with the A6303 Current Probe)
- Convenient probe degaussing
- Display and trigger polarity can be individually inverted
- Coupling: AC, DC, or Off
- Programmable over the mainframe GPIB and RS-232 interfaces

Mainframe Compatibility

The 11A16 amplifier is designed for use in 11300, 11400, DSA 600, and some CSA Series mainframes; it is not compatible with 11800 Series mainframes. Many performance parameters, such as vertical accuracy, and some functions, such as channel deskew, depend on the mainframe and probes used. Detailed performance specifications for different systems are included in the System Specifications section at the end of this manual.

Mainframe Firmware

The 11A16 Amplifier will work best when your mainframe has an updated firmware version. However, your mainframe will operate properly with the 11A16 when the firmware versions listed in Table1-1 are installed in your mainframe.

Table 1-1 — Mainframe Firmware Compatibility

Mainframe	Firmware Version
11301/11302	2.4 or later
11301A/11302A	1.0 or later
11401/11402	3.0 or later
11402A/11403	2.2 or later
11403A, CSA 404	3.0 or later
DSA 601/DSA 602	1.1 or later

Contact your Tektronix field office for the most recent firmware version for your mainframe.

Degauss in 11300 Series — If you change any 11A16 settings during the two second probe Degauss process, it can result in a **Plugin Communication Failure** error which is displayed. The error occurs because the 11A16 ignores mainframe requests during deskew. Commands sent to the 11A16 over the ASCII interface can also produce this error.

When degauss is complete, the 11A16 is fully operational. If an error does occur it can be easily cleared after degauss by changing any 11A16 setting.

Probe Calibration and Deskew

When you select probe calibration from the mainframe UTILITY menu, the mainframe performs vertical probe calibration and time deskew on the channel you select. Calibration adjusts sensitivity and offset parameters for greatest accuracy. Then the deskew operation attempts to match the time delay between the selected channels.

The deskew operation of most mainframes will correct for delay differences up to 15 ns between channels. This delay includes the cable propagation time and rise time of the probes and amplifiers. If the delay difference between channels is greater than 15 ns, a complete automated deskew will not be possible

You should be aware of the following limitations and interactions:

- Always deskew current probes first, then calibrate the voltage amplifier channels that you plan to use.
- Current probes with cables longer than two meters and A6303 probes in general can not be fully deskewed against voltage probes. This is due to the long propagation time through the cables and, in the case of the A6303, is due additionally to the slow rise time inherent in the 15 MHz bandwidth probe.
- Deskew values are maintained until the channel is again calibrated.
- An electrically noisy environment can cause deskew failure.

Certain mainframes have unique limitations with deskew as follows: