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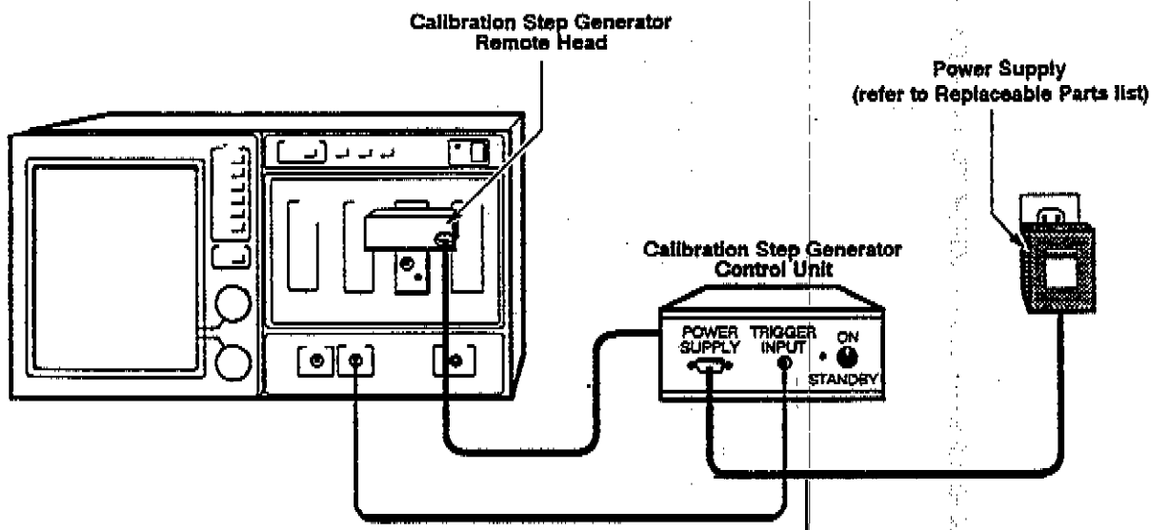
instruction sheet

LID PRODUCT DOCUMENTATION

CALIBRATION STEP GENERATOR

067-1338-00 (using Standard power)
067-1338-01 (using European power)
067-1338-02 (using United Kingdom power)
067-1338-03 (using Australian power)
067-1338-05 (using Swiss power)
067-1338-06 (using Japanese power)



PRODUCT DESCRIPTION

The 067-1338-00 Calibration Step Generator is intended to support calibration of a new series of sampling heads including the SD-24 TDR/Sampling Head, me SD-26 Sampling Head, and future Tektronix sampling heads.

The Calibration Step Generator is capable of certifying sampling head acquisition performance to a controlled internal Tektronix standard acquisition unit.

The Callbration Step Generator unit consists of a control unit end a remote head. The control unit features a power supply port for connecting a removable power supply, a TRIGGER INPUT connector for external trigger signals, and an ON/STANDBY switch: which enables me output of the Calibration Step Genera-- tor. (The remote head attaches directly to the sampling head through a male SMA connector.)

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TEK INTER-OFFICE COMMUNICATION

TO John Martin 94-540 DATE June 25, 1991

FROM Frank Gray, 50-PAT

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Francis I. Gray
Group Patent Counsel

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Contents

Safety Summary

The safety information in this 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.

Terminology

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

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

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

DANGER on equipment means a personal injury hazard immediately accessible as one reads the marking.

Symbols

Static Sensitive Devices

DANGER High Voltage

Protective ground (earth) terminal

ATTENTION Refer to manual

The Calibration Step Generator Is grounded through the control unit and power supply.

General Information

This section lists specific warnings and cautions and discusses using connectors.

WARNING

To avoid electric shock, make sure that the power supply is plugged into a properly wired receptacle where earth ground has been verified by a qualified service person. Without the protective ground, all parts of the power supply, control unit, and remote head are shock hazards. This includes the knobs and controls that may appear to be insulators.

The Calibration Step Generator provides no explosion protection from static discharges or arcing components. Do not operate the Calibration Step Generator in an atmosphere of explosive gases. Also, only operate the Calibration Step Generator in a static-controlled environment, and when you are not using the Calibration Step Generator, reattach the short circuit termination provided with and initially attached to the remote head.

CAUTION

Applying an external signal can result in damage. Static electricity is a hazardous to the Calibration Step Generator.

The input diodes used in the remote head are very susceptible to damage from DC voltages and from electrostatic discharge.

Note: *Never apply an external signal to the remote head.*

Connecting Signals

The signal connector used for the sampled output on the remote head is a precision APC 3.5 connector, mechanically compatible with the SMA standard.

CAUTION

Do not over-tighten SMA-compatible connectors.

You must attach cables to the SMA compatible connectors carefully to prevent damage to the cables or the signal connector. Do not turn the cable, only turn the nut on the cable, and use light finger pressure initially to connect the cable. Then, use a torque wrench to tighten the connection to within the 7-10 lb-in (79-112N-cms) range.

Packaging for Shipment

If the Calibration Step Generator is to be shipped long distances by commercial transportation, we recommend that it be packaged in the original manner. The carton and packaging material in which your Calibration Step Generator was shipped should be saved and used for this purpose.

Also, if the Calibration Step Generator is to be shipped to your local Tektronix Service Center for service or repair, attach a tag to the Calibration Step Generator showing the following:

- Owner of the Calibration Step Generator (with address):
- Name of person to contact at your firm;
- Complete Calibration Step Generator type and serial number;
- Describe the service required, or the symptoms that the Calibration Step Generator is exhibiting.

If the original packaging is unfit for use or not available, package the Calibration Step Generator as follows:

☐ Step 1: Obtain a corrugated cardboard shipping carton with a 375-pound test strength and having inside dimensions at least six inches greater than the Calibration Step Generator dimensions (refer to Specifications in this instruction sheet). This allows for cushioning.

☐ Step 2 Wrap the Calibration Step Generator with polyethylene sheeting or equivalent material to protect the finish.

☐ Step 3: Cushion the Calibration Step Generator on all sides by tightly packing dunnage or urethane foam between the carton and the Calibration Step Generator, allowing three inches on each side.

☐ Step 4: Seal the carton with shipping tape or with an industrial stapler.

☐ Step 5: Mark the address of the Tektronix Service Center and your return address on the carton in one or more prominent locations.

Installation

This section lists examples of the test equipment required for the Installation and Operational Checkout Procedures that follow. Also, the Installation Procedure is listed here.

Table 1 contains examples of test equipment required to perform the Installation and Operational Checkout Procedures. Procedure steps are based on the test equipment examples given, but other equipment with similar specifications may be substituted. Setup information and related adapters/connectors may need alteration for use with different equipment.

Table 1 — Equipment List

Description	Examples of Applicable Test Equipment
11800-Series Digital Sampling Oscilloscope	TEKTRONIX 11801 Digital Sampling Oscilloscope TEKTRONIX 11802 Digital Sampling Oscilloscopes
SD-Series Sampling Head (verified)	TEKTRONIX SD-24 TDR/Sampling Head TEKTRONIX SD-26 Sampling Head
Coaxial Cable 1 ns, male SMA to male SMA	Tektronix Part 015-1019-00

Installation Procedures

☐ Step 1: Connect the power supply, supplied with your Calibration Step Generator, to an appropriate power source. Connect the D connector of the power supply to the power supply port on the control unit.

☐ Step 2: Connect the SMA cable from the INTERNAL CLOCK OUTPUT on the 11801/11802 Oscilloscope to the TRIGGER INPUT on the control unit.

CAUTION

Refer to the General Information section under Connecting Signals for information about SMA compatible connectors.

The 11801/11802 Oscilloscopes have an internal clock, which is synchronized with the INTERNAL CLOCK OUTPUT on the 11801/11802 Oscilloscopes.

☐ Step 3: Connect the output of the remote head to the channel you are testing.

Note: *To assure optimum performance and accurate test results, the remote head must be connected directly to the sampling head input.*

☐ Step 4: Turn the ON/STANDBY switch on the control unit to ON. The LED indicator on the control unit should be red; indicating the presence of a signal.

Operational Checkout

This procedure explains how to use the 067-1338-00 Calibration Step Generator with a verified SD-24 TDR/Sampling Head or SD-26 Sampling Head and an 11801 or 11802 Oscilloscope. For an introduction to the SD-Series sampling heads or 11800-Series oscilloscopes, refer to the *SD-24 TDR/Sampling Head Installation/User manual* and *SD-26 Sampling Head Installation/User manual* or *Introducing the 11 801 Digital Sampling Oscilloscope manual* and *Introducing the 11802 Digital Sampling Oscilloscope manual*, respectively.

me following Operational Checkout Procedure shows how to quickly display an appropriate trace on me display, and discusses the basic oscilloscope controls.

Operational Checkout Procedure

Initialize the oscilloscope to default settings using me Initialize selector, which appears in ma UTILITY major menu.

The setup illustration for this procedure is displayed on me front cow of this instruction sheet.

☐ Step 1: Press me UTILITY button under MENUS on me oscilloscope.

This illuminates me UTILITY button LED and displays me UTILITY major menu:

☐ Step 2: Press me Channel Select button corresponding to me channel you are using.

The yellow light on me sampling, head blinks to indicate that me channel is being displayed.

Since me trace is not triggered, a trace will not be visible on me display. The trigger icon, ( ) at me left of the graticule displays ! not ! to indicate mat me trace has not been triggered. This icon will always show you me trigger status.

Use this trigger to view me trace. (To set triggering, you need to use me TRIGGER major menu.)

☐ Step 3: Press me TRIGGER button under MENUS on the oscilloscope.

☐ Step 4: Touch me Source selector in me TRIGGER major menu.

me Source selector should indicate mat me current trigger source Is me External Trigger.

☐ Step 5: Touch me Internal clock selector in me Trigger Source pop-up menu.

This selects me internal trigger source and removes me Trigger Source pop up menu. Notice that me Source selector in the TRIGGER major menu now Indicates Internal.

☐ Step 6: You now see a flat trace on ma display. However, me pad of me desired trace is not shown. To quickly show the desired data, press me AUTOSET button, located at ma top of me o scillosmpe and to ma right of me

major menu buttons. The AUTOSET button automatically sets the horizontal, vertical, and trigger parameters to display the desired position of the trace.

A display should appear as shown in Figure 1.

There are two control knobs to the right of the display and below the major menu buttons. These knobs are adjustable, and you can always look at the knob menu to determine what the knobs will adjust; this is called the current knob assignment. The knob menu appears on the display to the right of the major menu.

To control vertical size and offset of a trace, you need to reassign these knobs. To reassign these knobs, use the icons above and to the left of the graticule. These icons are always visible and selectable regardless of which major menu is displayed.

A trigger icon ( ), a vertical icon ( ), and a horizontal icon ( ) are also visible and selectable.

Touching the vertical icon ( ) changes the knob assignments, as reflected in the knob menu selectors. Turning the knob will alter the vertical characteristics of the trace.

☐ Step 7: Touch the vertical icon ( ) and turn each knob left and right. Observe the changes in the trace.

To access smoothing, use the **Sampling Head Fnc's** selector in the *WAVEFORM major menu.*

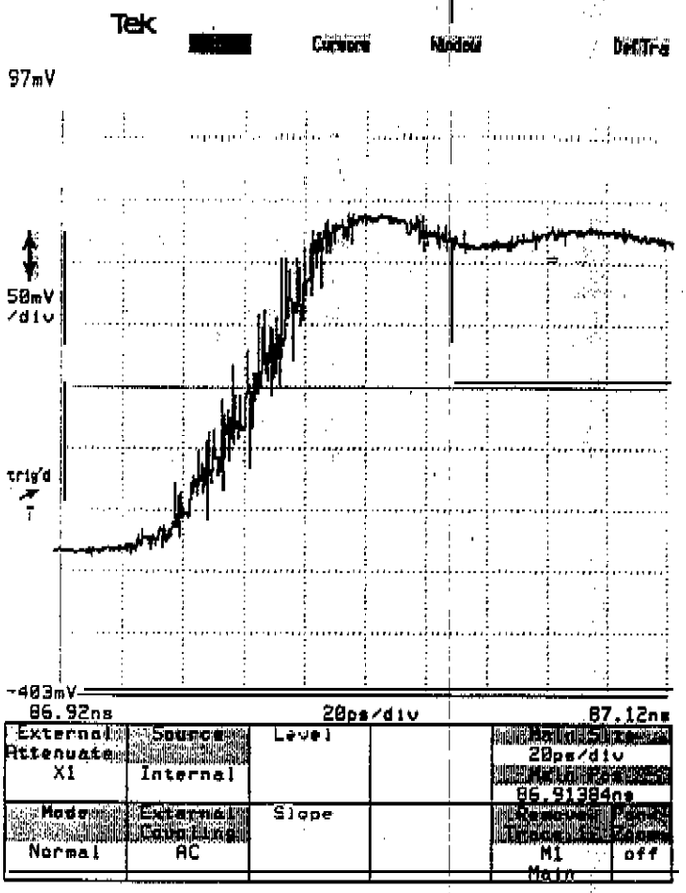

Figure 1 — The Calibration Step Generator Signal Display After Pressing Autoset

☐ **Step 8: Press the WAVEFORM button.**

☐ **Step 9: Touch Sampling 'Head Fnc's.**

❑ Step 10: **Touch 1 (or whichever channel you are using) and Smoothing** In the **Sampling** Head Functions **pop-up menu. (Observe** that **the trace** is **smoother.)**

Maintenance

This section gives information on how to exchange and service your Calibration Step Generator if it does not pass the Operational Checkout Procedure earlier in this Instruction Sheet, or does not function properly under some other circumstance.

Exchanging the Calibration Step Generator

If your Calibration Step Generator does not function properly, then you can exchange it for a new Calibration Step Generator with your local Tektronix Service Center. Refer to Packaging for Shipment, earlier in this Instruction Sheet, for packaging information.

Servicing

Your Calibration Step Generator should be calibrated or re-certified once every year. For more information on servicing, contact your local Tektronix Service Center.

Specifications

This section lists the electrical, environmental and mechanical, and Physical specifications particular to this Calibration Step Generator.

Table 2 — Electrical Specifications

Characteristic	Specification
-step Response	refer to the Test Data Sheet packaged with your Calibration Step Generator
Step Generator Repetition Rate	200 kHz maximum
Absolute Maximum Signal Voltage on Output	±3 V
Absolute Maximum Signal Trigger Input Voltage	−0.5 V to +3.0 V
Step Amplitude	+250 mV ±10 mV
Insertion Delay Stability	11 ns nominal ±1 ps/°C
Source Resistance	50 Ω nominal

table 3 — Environmental and Mechanical Specifications

Characteristic	Specification
Ambient Temperature Operating Non-operating	 15° to 35° C (59° to 95° F) −40° to 75° C (−40° to 167° F)
Altitude Operating Non-operating	 to 4.5 km (15,000 ft) to 15 km (50,000 ft)
Humidity (Nonoperating)	to 95% relative humidity at up to 50° c (122° F)
Vibration Operating and Nonoperating	 0.015 In. total displacement from 10 Hz to 55 Hz, 75 min. total

Table 3 (cont) — Environmental and Mechanical Specifications

Characteristic	Specification
Shock	
Remote Head (Nonoperating)	1000 G's, half sine, 1 ms duration, all sides, 18 shocks total
Control Unit (Nonoperating)	Mil-T-28800C, Sec 4.5.5.4.1, Type III, Class 5
Packaged Product Vibration and Shock	
Vibration and Shock	ASTM D999-75, method A, para. 3.1g. (NSTA Proj 1A-B-1)
Drop	ASTM D775-61, method 1, para. 5 (NSTA Proj 1A-B-2)
Electromagnetic Compatibility	
United States	Mil-Std-461B: RE-02 Pt 7, RS-01 Pt 4, RS-02 Pt 5, RS-03 Pt 7 (limited to 1 GHz)
Germany	Meets VDE 0871/6.78 Class B

Table 4 — Physical Specifications

Characteristic	Specification
Remote Head Dimensions	
Height	2.90 in
Width	0.95 in
Depth	3.25 in
Control Unit Dimensions	
Height	2.55 in
Width	5.65 in
Depth	5.20 in
Interconnect Cable Length	1 m
Weight	
Net	2 lbs 10 oz
Domestic Shipping	5 lbs 12 oz

Replaceable Parts

This section contains a list of the components that are replaceable for the 067-1338-00 Calibration Step Generator. As described below, use this list to identify and order replacement 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 be come available and to give you the benefit of the latest circuit improvements. Therefore, when ordering parts, it is important to include the following information in your order:

- Part Number
- Intrument Type or Model Number
- Instrument Serial Number
- Instrument Modification Number, if applicable

If a part you order has been replaced with a different or improved part, your local Tektronix Field Office or representative will contact you concerning any change in the part number.

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

Using the Replaceable Parts List

The tabular information in the Replaceable Parts List is arranged for quick retrieval. Understanding the structure and features of the list will help you find the all the information you need for ordering replacement parts.

Item Names

In the Replaceable 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, U.S. Federal Cataloging Handbook H6-1 can be used where possible.

Indentation System

This parts list is indented to show the relationship between items. The following example is 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
(END ATTACHING PARTS)

Detail Part of Assembly and/or Component
Attaching parts for Detail Part
(END ATTACHING PARTS)

Parts of Detail Part
Attaching parts for Parts of Detail Part
(END ATTACHING PARTS)

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. Attaching parts must be purchased separately, unless otherwise specified.

Abbreviations

Abbreviations conform to American National Standards Institute (ANSI) standard Y1.1

CROSS INDEX - MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip Code
26805	M/A-COM OMNI SPECTRA INC MICROWAVE CONNECTOR DIV SUB OF M/A-COM INC	140 4TH AVE	WALTHAM MA 02154-7507
55170	SUMMAGRAPHICS CORP	777 STATE ST EXT	FAIRFIELD CT 06430-5451
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97707-0001

Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Serial/Assembly No. Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
-1	119-1748-w			1	POWER SUPPLY:115V PLUG IN (067-1338-00)	80009	119-1748-00
-2	119-1748-01			1	POWER SUPPLY:220/240V W/UNIVERSAL EUROPEAN POWER CORD OPT A1 (067-1338-01)	55170	ORDER BY DESCR
-3	119-1748-m			1	POWER SUPPLY:220/240V W UNITED KINGDOM POWER CORD OPT A2 (067-1338-02)	55170	ORDER BY DESCR
-4	119-1748-a			1	POWER SUPPLY:220/240V W/AUSTRALIAN POWER CORD OPT A3 (067-1338-03)	55170	ORDER BY DESCR
-5	119-1748-E			1	POWER SUPPLY:220/240V W/SWISS POWER CORD OPT A5 (067-1338-05)	55170	ORDER BY DESCR
-6	119-1748-06			1	POWER SUPPLY:JAPANESE,100V (067-1338-06)	80009	119-1748-06
					STANDARD ACCESSORIES		
	015-1021-W			1	TERMN,COAXIAL:SHORTCIRCUIT,944	26805	2020-1314-00
	070-7056-00			1	SHEET,TECHNICAL:INSTR,067-1338-00	80009	070-7056-00