Instructions

Tektronix

TDSXF05
TDS Series Digitizing Oscilloscopes
Video Trigger Upgrade Kit (Option 05)

070-9636-02

Warning
The servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries prior to performing service.

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Tektronix, Inc., P.O. Box 1000, Wilsonville, OR 97070–1000

Kit Description

This kit includes parts and instructions to upgrade a standard TDS Series instrument with Option 05, Video Trigger.

The TDSXF05 Video Trigger kit gives you a variety of tools for investigating events that occur when a video signal generates a horizontal or vertical sync pulse. The tools allow you to investigate a range of NTSC, PAL, SECAM and high definition TV signals. To make one of these kits work, you must have the Video Trigger hardware (provided in the kit) installed in a TDS Series oscilloscope.

Instruments

TDS500A and later, all serial numbers
TDS600A and later, all serial numbers
TDS700A and later, all serial numbers

Minimum Tools and Equipment List

Tool	Part number
Torxdriv driver & T-15, T-20 tip	n/a
Torque driver	n/a
3/16 inch nut driver	n/a

Kit Parts List

Compt no.	Quantity	Part number	Description
	1 ea	011-0055-01	Term, coaxial:75 Ω,1 W, bnc (Video trigger accessory)
	1 ea	013-0278-00 070-8762-xx	Video clamp: Display, back porch clamp (Video trigger accessory) Manual tech: User,Video Clamp
	1 ea	070-8748-xx	Manual tech: Instruction, TDS Option 05
	1 ea	070-9636-xx	Manual Tech: Instructions, TDSXF05, field kit
	1 ea	174-0655-00	Cable assy, rf: Video trigger, 50 Ω, coax, sma to petola, 22.4 length. 9-2
	2 ea	174-2574-00	Ca assy, sp: Ribbon, 28 awg, 4.875 inches length (Cable for TDS 500A and TDS 600A series except the TDS 684A)
	1 ea	174-3728-00	Ca assy, sp: Ribbon, 40-pin, 28 awg, 5.15 inches length (Cable for the TDS 500B, TDS 600B, TDS 700A and later series and TDS 684A)
	1 ea	174-3729-00	Ca assy, sp: Ribbon, 50-pin, 28 awg, 6.0 inches length (Cable for the TDS 500B, TDS 600B, TDS 700A and later series and TDS 684A)
	1 ea	174-3340-00	Ca assy, sp: Ribbon, 40-pin, 28 awg, 6.4 inches length (Cable for the TDS 500A and TDS 600A series except the TDS 684A)
	2 ea	214-2270-00	Contact, elec: Clip, attenuators to cabinet
	2 ea	210-0409-00	Nut, plain, hex: 8-32 x 0.312 brass, cd plate
	2 ea	211-0720-00	Screw, assembly, washer: 6-32 x 0.500, pnh, T-15
A27	1 ea	671-4095-00	Circuit board assy: Option connector
A29	1 ea	671-2476-04	Circuit board assy: TV trigger
A14	1 ea	671-2770-00	Circuit board assy: D1-BUS (For TDS 500A and TDS 600A except TDS 684A)
A14	1 ea	671-2848-00	Circuit board assy: D1-BUS (For TDS 500B, TDS 600B, TDS 700 and later series and the TDS 684A)

Service Safety Summary

WARNING. *The servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to the* General Safety Summary *in the appropriate TDS Series service manual before performing any service.*

Do Not Service Alone

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

Avoid Exposed Circuitry

To avoid injury, remove jewelry such as rings, watches, and other metallic objects. Do not touch exposed connections and components when power is present.

Use Care When Servicing With Power On

Dangerous voltages or currents may exist in this product. Disconnect the power, remove the battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

Installation Instructions

These instructions assume a certain familiarity with the instrument. If further details are required for disassembly or assembly, refer to the appropriate TDS Series service manual. For assistance to install this kit, please call your nearest Tektronix, Inc., Service Center or Tektronix Inc., Factory Service.

CAUTION. *To prevent static discharge damage, service the instrument only in a static-free environment. Observe standard handling precautions for static-sensitive devices while installing this kit. Always wear a grounded wrist and foot strap while installing this kit.*

Rear Cover and Cabinet Removal

Equipment required	One screwdriver with a size T-20 Torx tip.

1. Install the front cover. Set the oscilloscope face down with the front cover on the work surface and the bottom facing up (see Figure 1).
2. Unplug the power cord from its receptacle at the rear panel.
3. Using the screwdriver with size T-20 Torx tip, remove the four screws securing the rear cover to the oscilloscope. Lift off the rear cover.
4. Grasp the left and right edges of the cabinet at the rear. Pull upward to slide the cabinet off the oscilloscope. Do not bind or snag the cabinet on the oscilloscope internal cabling of the oscilloscope as you remove it.

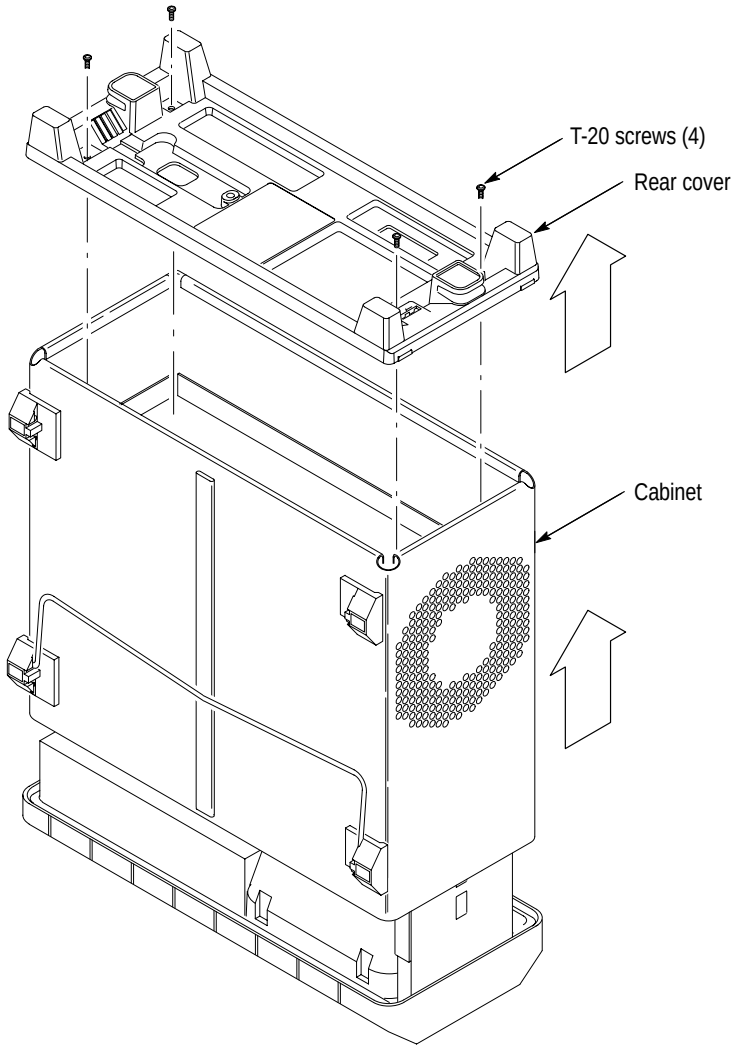

Figure 1: Rear cover and cabinet removal

TV Trigger Circuit Board Addition

Equipment required	One screwdriver with a size T-15 Torx tip.

1. The A23 SerPar circuit board (RS-232 Centronics) assembly must be removed to allow the TV Trigger circuit board to be installed onto the mounting posts, then locked in place by the rear SerPar circuit board brackets. See Figures 2 and 6.

a. Using a screwdriver with size T-15 Torx tip, remove the two screws securing the rear plate of the A23 SerPar circuit board assembly.

b. Disconnect P37, the SerPar 26 pin ribbon cable connector, from J37 on the Processor circuit board A11. Pull the cable and SerPar circuit board assembly out of the instrument.

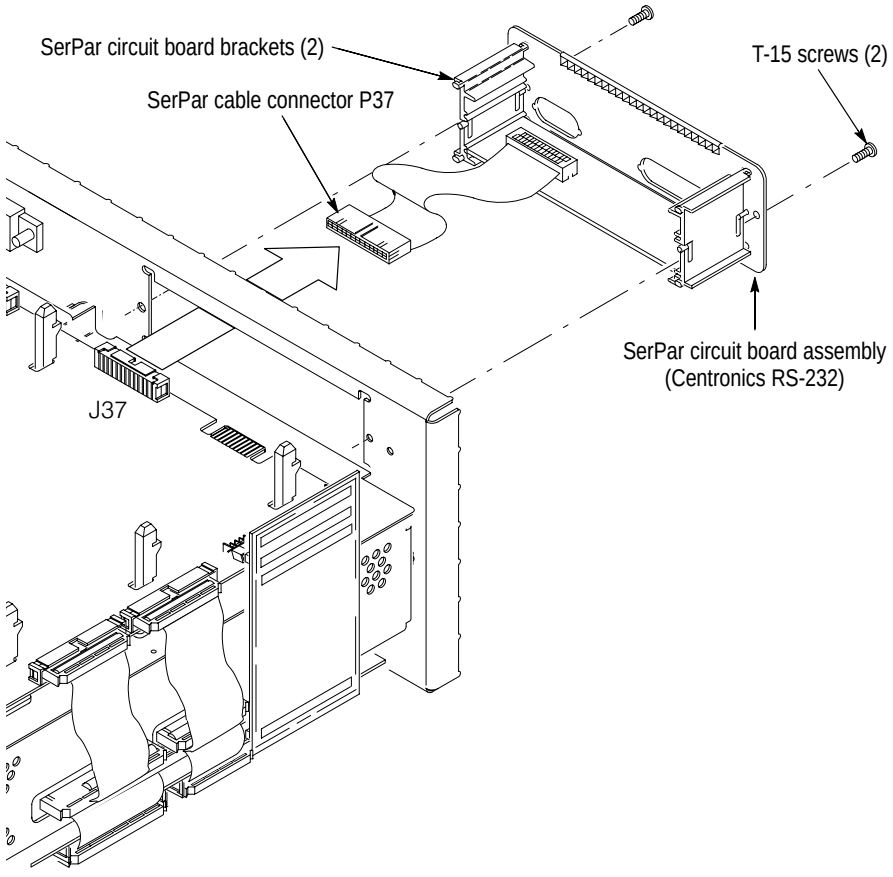

Figure 2: Pull out A23 SerPar circuit board assembly

2. Install the TV Trigger circuit board A29 (provided in this kit) into the instrument. Push down and slide the TV Trigger circuit board onto the board mounts (see Figure 3). Refer to the *Removal and Installation Procedures* in the TDS Series service manual for more detailed installation procedures.

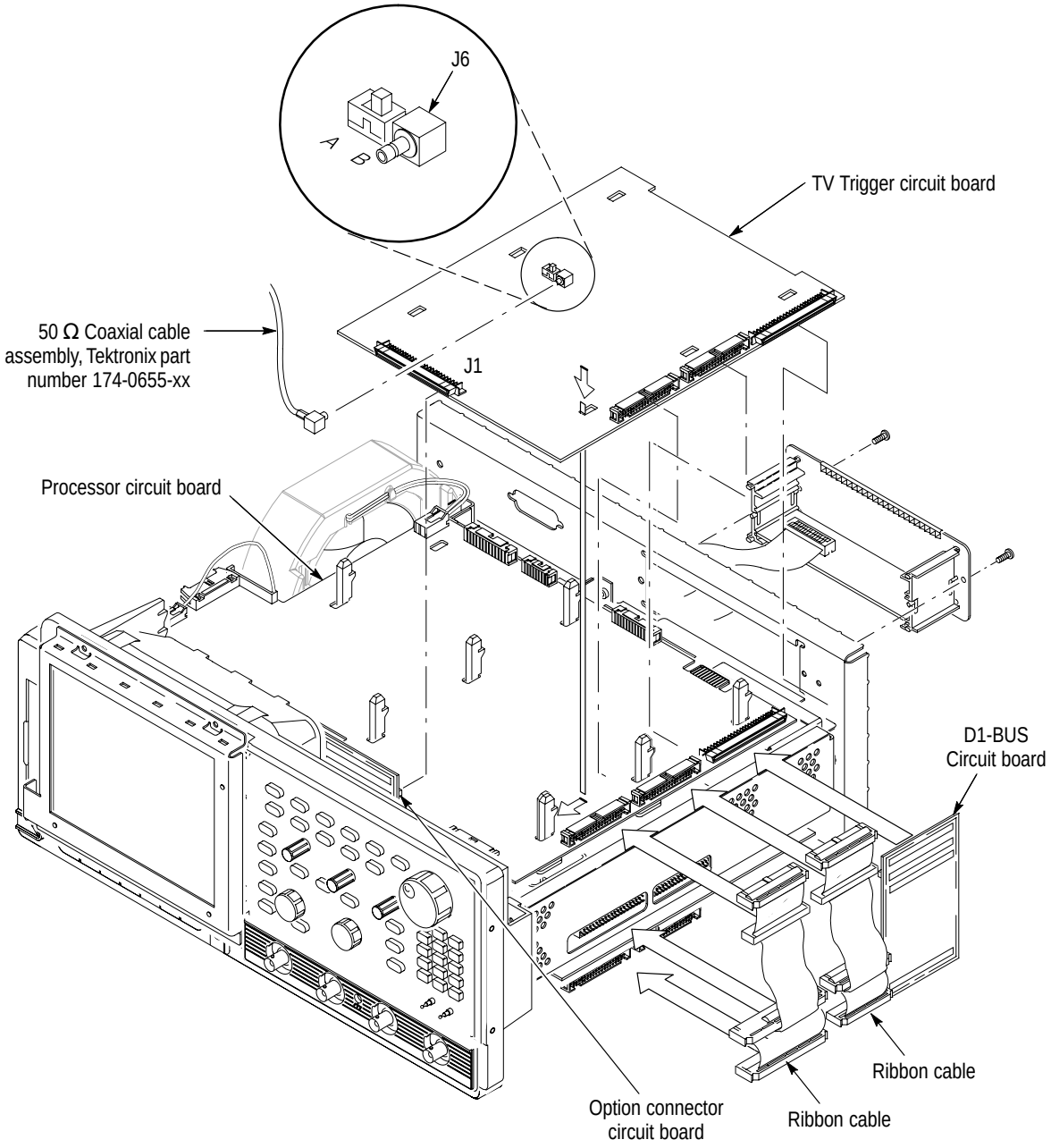

Figure 3: Circuit board insertion

3. Connect the appropriate power ribbon cables (provided in this kit). The two (2) ribbon cables interconnect to the analog power and digital power to the Acquisition circuit board, Processor circuit board, and TV Trigger circuit board.

4. Install the appropriate A14 D1-BUS board (provided in this kit).

***NOTE**. When plugging in the* D1-BUS *boards (see figure 3) make sure that they remain plugged in on both ends after the kit is installed.*

5. Install the Option Connector circuit board A27 (provided in this kit). Carefully connect the bottom of the Option Connector circuit board to J39 on the Processor circuit board. Then connect the top of the Option Connector to J1 on the TV Trigger circuit board.

6. Plug the sma connector of the 50 Ω coaxial video cable (provided in this kit) to J6 on the TV Trigger circuit board A29. Connect the petola end of the cable to J1500 on the Acquisition circuit board. See Figure 4 for the appropriate video cable routing.

7. Set the slide switch located on the TV Trigger circuit board to the following position (see Figure 3):

   a. Position A (BTL trigger IC) TDS 500B, TDS 684A, TDS 600B, and TDS 700A and later instruments.

   b. Position B (CTL trigger IC) TDS 500A and TDS 600A, except the TDS 684A.

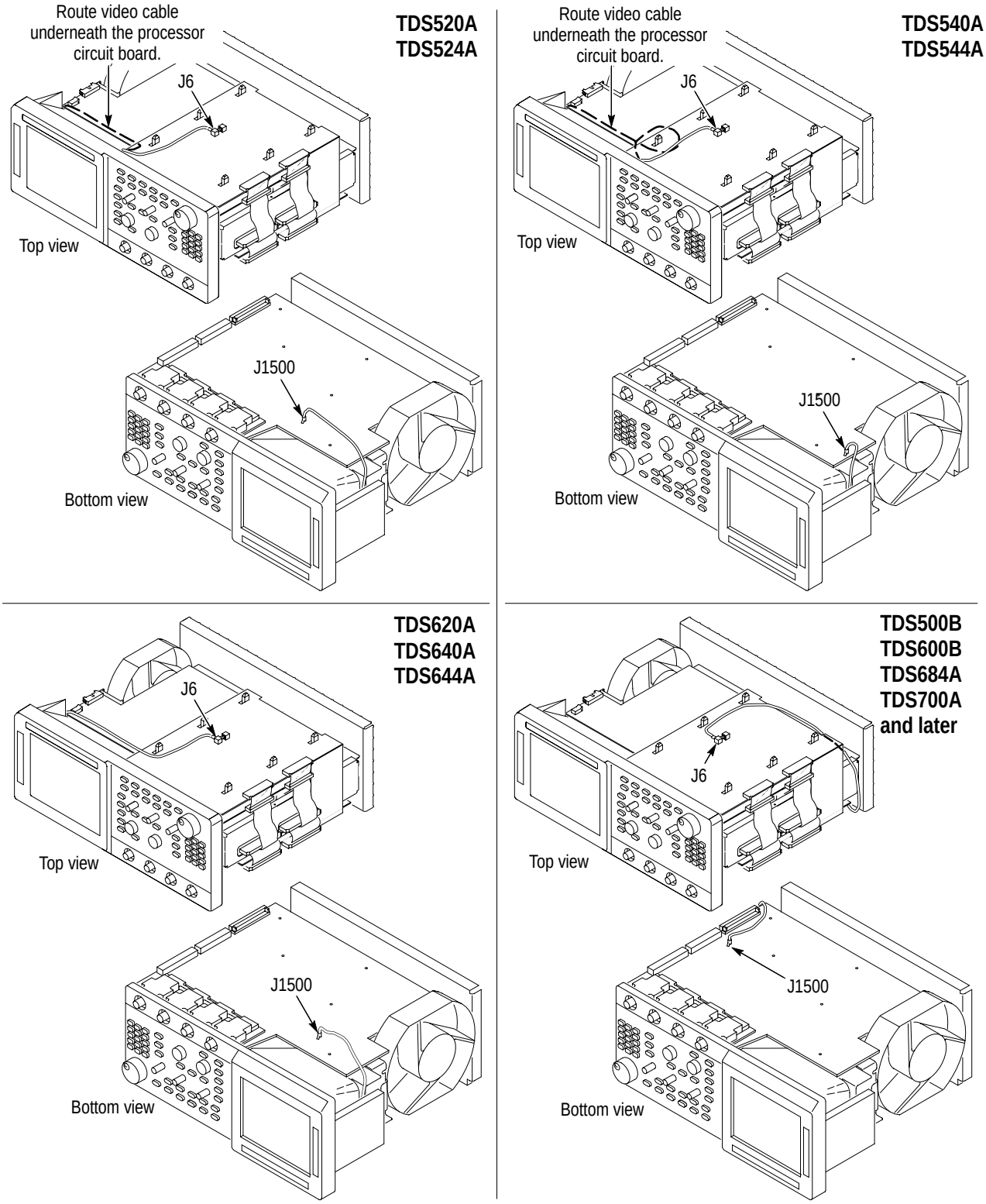

Figure 4: Video cable routing (Acquisition to Processor)

Attenuator Electrical Contacts Installation

Equipment required	One screwdriver with a size T-15 Torx tip.

TDS 500A and TDS 600A instruments (except TDS 684A) require electrical contacts to be installed on the Attenuator circuit board.

NOTE. *Examine the attenuator section located towards the front panel on the bottom side of the oscilloscope. If the attenuators are located on a separate circuit board assembly, perform the following procedure (see Figure 5).*

1. Remove and discard the second and fourth screw and washer assemblies from the Attenuator Circuit board using a T-15 Torxdriver. The screws and washer assemblies are located nearest to the Acquisition circuit board.
2. Using the 8-32 nuts (provided in this kit) as spacers, place the nuts on mounting holes just vacated by the T-15 screws just removed. The 8-32 nuts are used as spacers.

CAUTION. *To ensure proper operation of the new video trigger upgrade the electrical contact clip must be in contact with the the cabinet when reassembled. Make sure the electrical contact clip is position correctly. The small tab near the mounting clip hole should be facing up and towards the Acquisition circuit board.*

3. Place the electrical contacts, clips (provided in this kit) on top of the nuts. Secure the clips to the Attenuator circuit board by using the 6-32 x 0.500 inch panhead T-15 screws (provided in this kit).

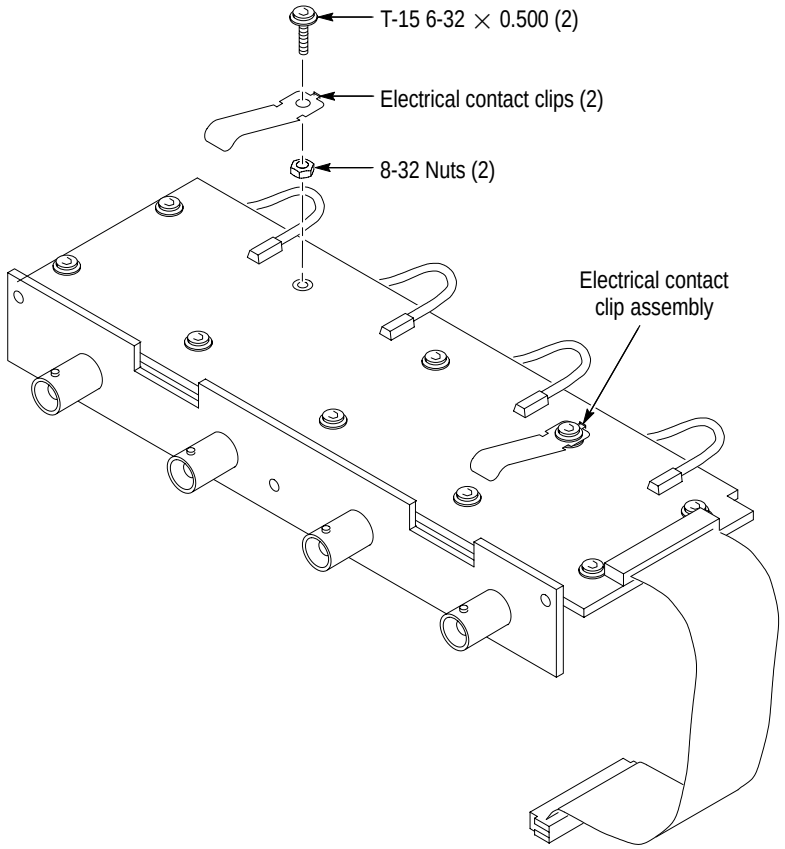

Figure 5: Partial view, attenuator electrical contacts installation

Replace A23 Circuit Board

Equipment required	One torque driver

***NOTE**. When reinstalling the four screws at the rear panel, use the torque driver to tighten the screws to 8 inch-lbs torque.*

1. Do in reverse order, steps a to b of the *TV Trigger Circuit board Addition* procedure starting on page 6.
2. Make sure the A23 SerPar circuit board brackets slide over the TV Trigger circuit board. This will lock the TV Trigger circuit board A29 into place. See Figure 6.

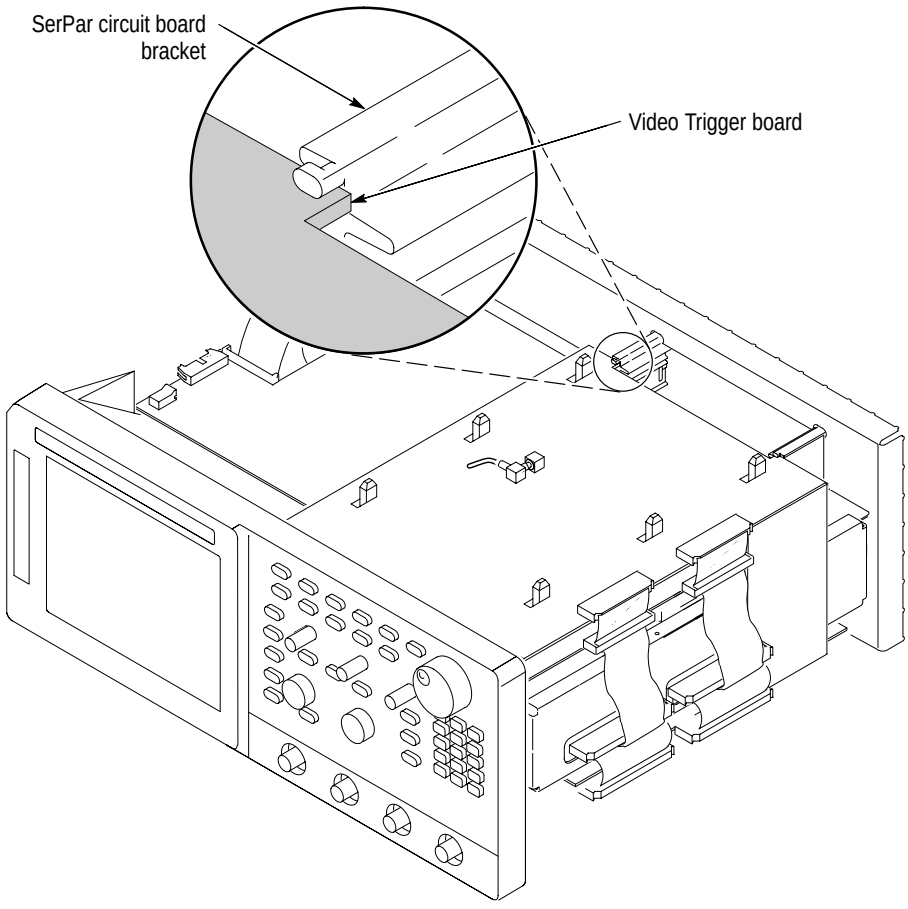

Figure 6: TV Trigger and SerPar circuit board detail

Replace Cabinet and Rear Cover

Equipment required	One screwdriver with a size T-20 Torx tip. One torque driver.

1. Do step 1 of the *Rear Cover and Cabinet Removal* procedure on page 4.
2. Do in reverse order steps 2 through 4 of the *Rear Cover and Cabinet Removal* procedure starting on page 4.

NOTE. *When reinstalling the four screws at the rear panel, use the torque driver to tighten the screws to 16 inch-lbs torque.*

Execute Diagnostics

To ensure the Video Trigger is working correctly, perform the *Diagnostics* procedure.

Prerequisites: Power on the oscilloscope and allow a 20 minute warm-up before doing this procedure.

Executing Extended Diagnostics Routine

1. Press **SHIFT UTILITY** → **System** (main) → **Diag/Err** (pop-up) → **Execute** (main) → **OK Confirm Run Test** (side).
2. The internal diagnostics routine checks oscilloscope functions. When finished, the oscilloscope displays an on-screen report of any failed modules, features, or interfaces.
3. If the video trigger feature fails diagnostics, verify that all cables are securely seated and are not damaged.
4. If the video trigger feature continues to fail diagnostics, call the nearest Tektronix, Inc., field office for assistance.

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