



# Product modification

046-0041-01

M70526, M71244

## 11802 ENHANCEMENT

For the following TEKTRONIX® instrument:

11802            B010100 to B039999

This kit contains parts and instructions that adds firmware version 9.0 to the 11802 Sampling Oscilloscope. This kit also removes and replaces the Acquisition Unit and Time Base/Controller circuit board A5.

**KIT PARTS LIST:**

<b>Ckt Number</b>	<b>Quantity</b>	<b>Part Number</b>	<b>Description</b>
	1 ea	020-1717-03	Comp, kit:EPROM's firmware, ver 9.0
	1 ea	657-0059-02	Acquisition Unit
A5	1 ea	670-9362-53	Ckt BD Assy:Time Base/Controller
	1 ea	-----	Manual, tech:11800 supplement
	1 ea	-----	Label:046-Kit

**MIINIMUM TOOL REQUIREMENTS FOR INSTALLATION:**

Screwdriver, magnetic, holder for Torx head tips	Tektronix, pn 003-0293-00
Torx head screwdriver tip, T-8	Tektronix, pn 003-0964-00
Torx head screwdriver tip, T-10	Tektronix, pn 003-0814-00
Torx head screwdriver tip, T-15	Tektronix, pn 003-0966-00
Torx head screwdriver tip, T-20	Tektronix, pn 003-0866-00

**WARNING**

*Dangerous shock hazards may be exposed when the instrument covers are removed. Before proceeding, ensure the mainframe power switch is in the off position. Then, disconnect the instrument from the power source. Disassembly should only be attempted by qualified service personnel.*

**CAUTION**

*Many components within this instrument are extremely susceptible to 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 strap.*

**CAUTION**

*To prevent problems concerning duplication of U240 and U612 circuit locations, take the following precaution. Before installing the EPROM's refer to the part numbers as well as the Uxxx numbers printed on each EPROM. This will ensure the microcircuits are installed in the correct cricuit board.*

*A17U240, pn 160-5491-XX, on the Main Processor A17.  
A29U240, pn 160-6516-XX, on the Memory Expansion circuit board A29.*

*A7U612, pn 160-5503-XX, on the Display Controller circuit board A7. A18U612, pn 160-5477-XX, on the Memory circuit board A29.*

**NOTE**

*These instructions assume a familiarity with the instrument. If additional assembly or disassembly details are required, refer to the 11802 Service Reference Manual.*

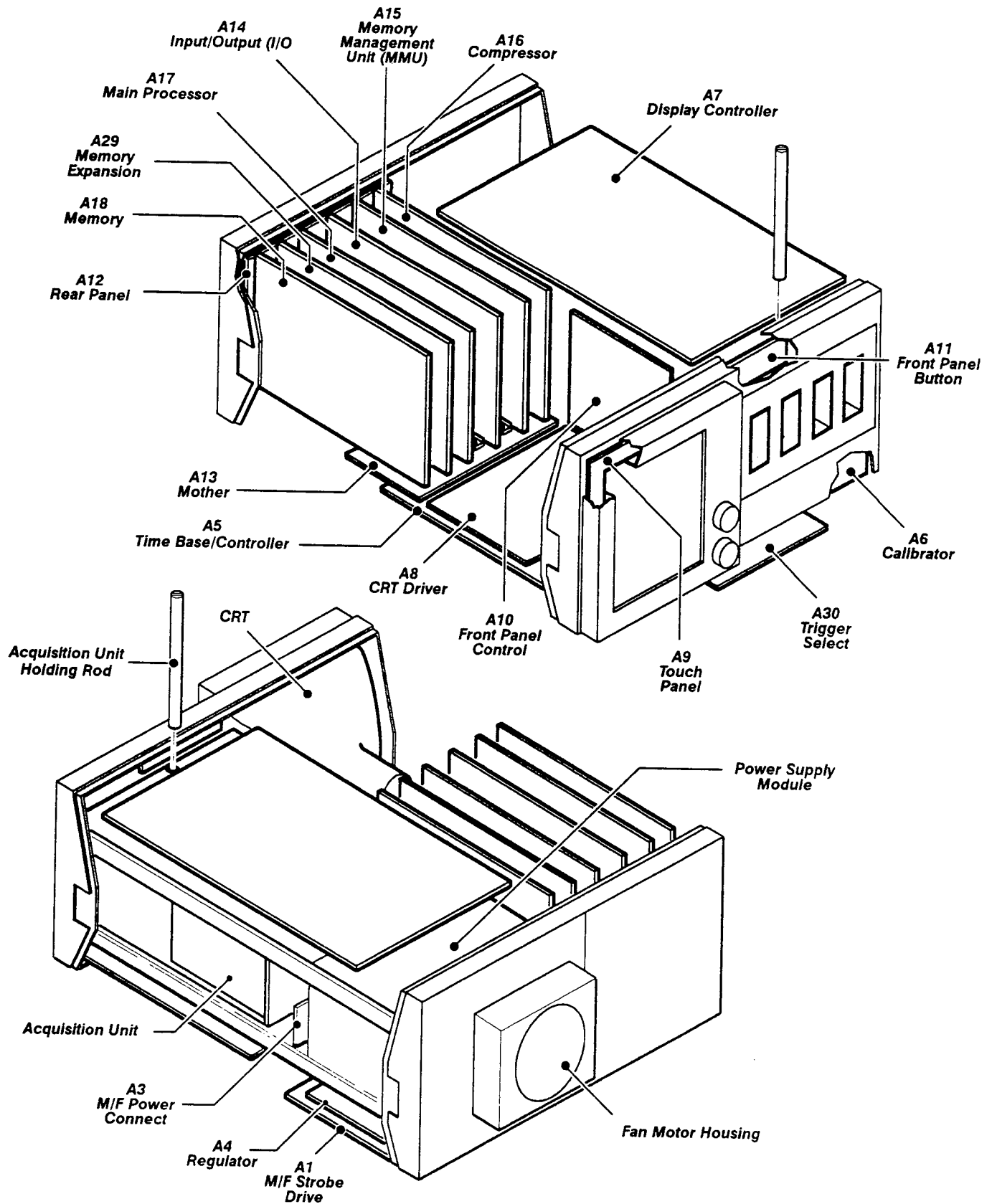


Figure 1, - Mainframe circuit board locations.

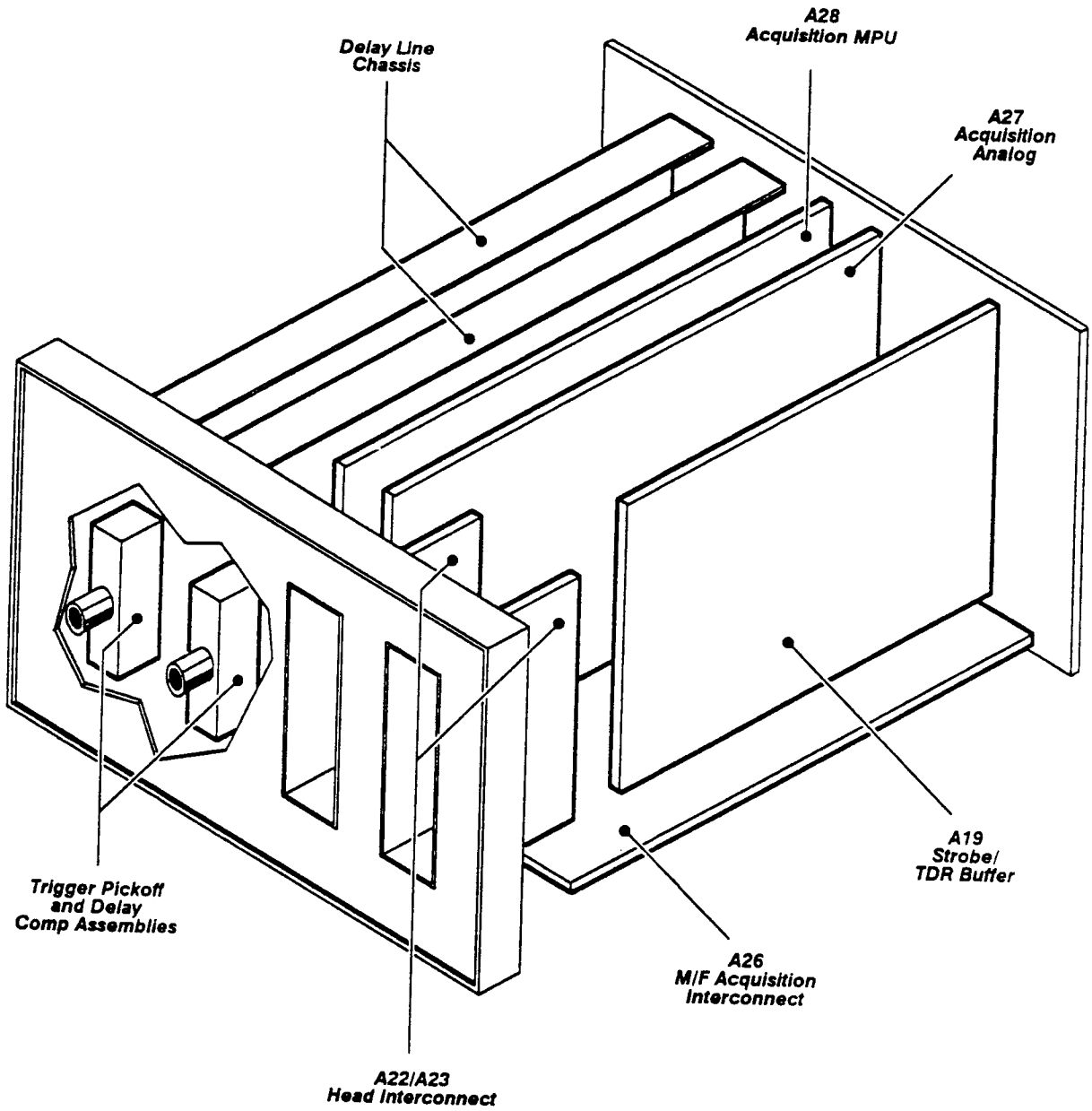


Figure 2, - Acquisition Unit circuit board locations.

## INSTRUCTIONS:

### REMOVE SAMPLING HEADS FROM ACQUISITION UNIT:

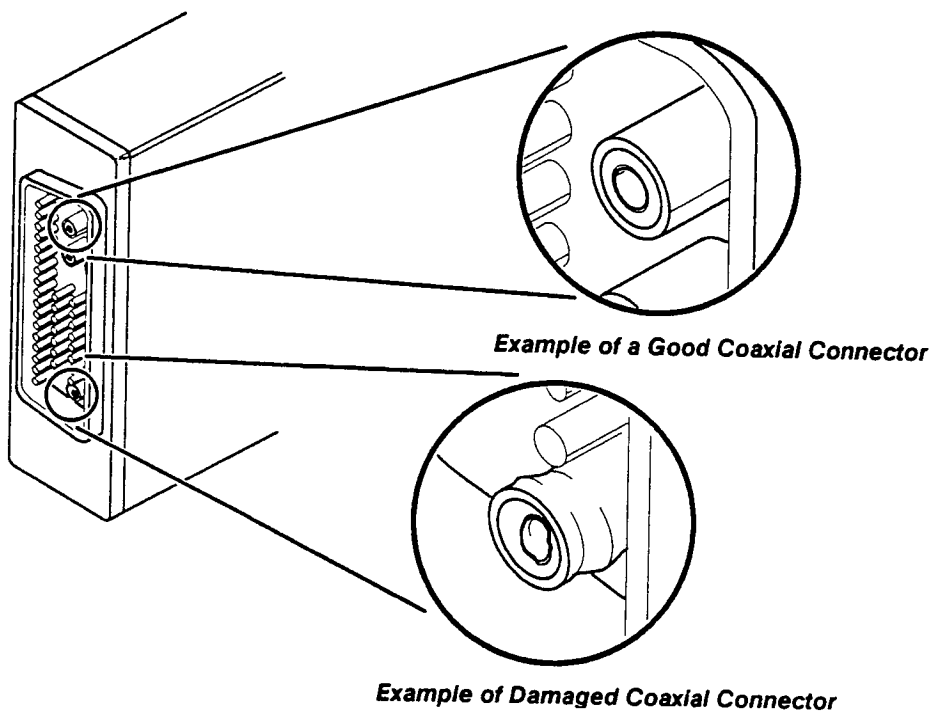
#### CAUTION

*Never install or remove a sampling head when oscilloscope power is on.*

*Whenever you remove a sampling head from the oscilloscope, install shorts on the sampling head connectors. Be sure to store the head in a static-free container, such as the shipping container. Whenever you move the sampling head from one oscilloscope to another, use a static-free container to carry the head.*

*Be sure to follow the precautions described in the manuals accompanying your oscilloscope, to guard against electro-static damage to the oscilloscope and sampling heads.*

- ❑ 1. Remove all sampling heads from the Acquisition Unit.
- ❑ 2. Examine the coaxial cable connectors located in the sampling head "D" connector (interface connector). Check the coaxial connectors shields and conductors for damage. Make sure the coaxial connectors are in the proper position, **not pushed back into the plastic housing**. Refer to Figure 3, Sampling head "D" connectors. **Send Sampling Heads with damaged interface connectors to Tektronix for factory repair.**



**Figure 3, - Sampling head "D" connectors.**

## REMOVE AND REPLACE THE ACQUISITION UNIT:

### NOTE

*Position the instrument with the top right side towards the installer (as viewed from the front of the instrument).*

- 1. Turn the slotted fasteners one quarter turn counter clockwise. Then remove the dust covers by lifting the top and bottom dust covers from the instrument.
- 2. Remove the Torx drive screws T-15 that secure the right-side trim covers (viewed from the front of the instrument). Then remove the trim covers.

### NOTE

*Do not lift the trim covers to remove them; doing so will break the trim covers. There is a clip on the inside of the trim cover which slides over the end of the side frame section. To remove the trim covers properly and prevent breakage of these covers, move each cover towards the end of the oscilloscope where it is located. (The front cover moves forward and the rear moves backward). Moving the clip about 1/8-inch will release the cover. Then, the trim cover can be removed from the oscilloscope. Refer to Figure 5 Trim and frame removal.*

- 3. Remove the Torx drive screws T-20 that secure the right-side frame section to the instrument. Then remove the frame section from the instrument.
- 4. Remove the long holding rod located on the top of the instrument in front of the Display Controller circuit board A7. The holding rod secures the Acquisition Unit into the instrument. Refer to Figure 1, for holding rod location.
- 5. Disconnect the coaxial cable connectors J29A, J30A, J32, J33A and J33B on the Strobe/TDR Buffer circuit board A19. Note cable location for later reassembly.
- 6. Disconnect the ribbon cable connector J34 from the Strobe/TDR Buffer circuit board A19. Note cable location for later reassembly.
- 7. Disconnect the ribbon cable connector J10 from the M/F Acquisition Interconnect circuit board A26. Note cable location for later reassembly.
- 8. Remove the three (3) Torx drive screws that secure the Trigger Select circuit board A32. The Trigger Select circuit board is located on the bottom of the instrument below the Acquisition Unit.
- 9. Disconnect coaxial cable connectors J86 and J89 from the Trigger Select circuit board. Note cable connector locations for later reassembly. Move the Trigger Select circuit board aside to allow J86 and J89 coaxial cables to be pulled through the grommets in the lower frame chassis. Refer to Figure 4 for J86 and J89 connector locations.

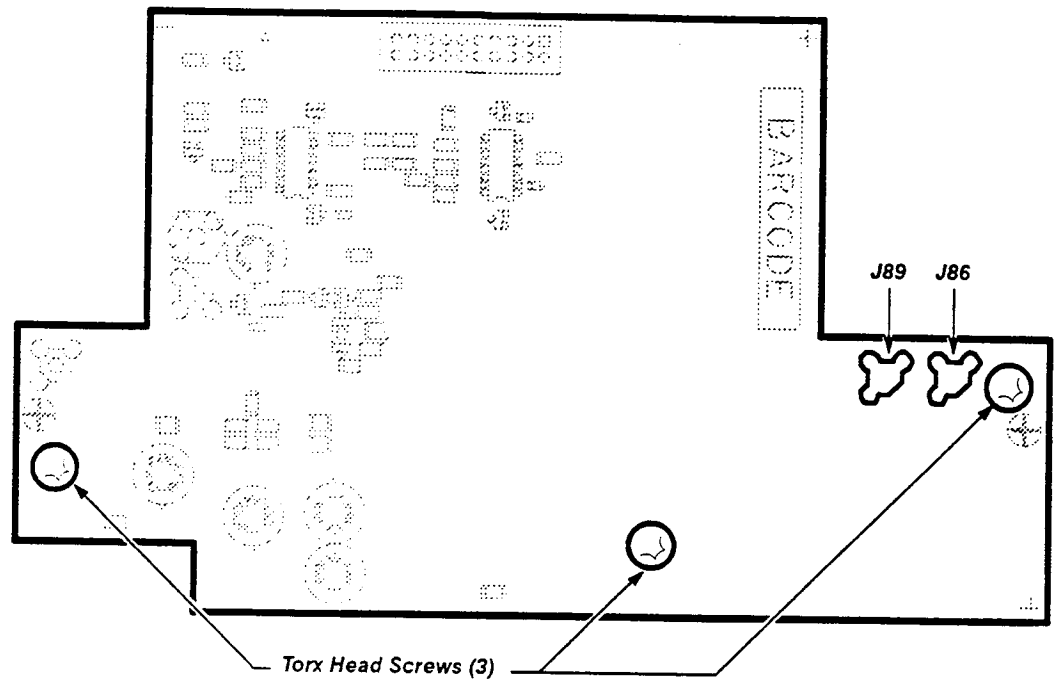


Figure 4, - Trigger Select circuit board A32.

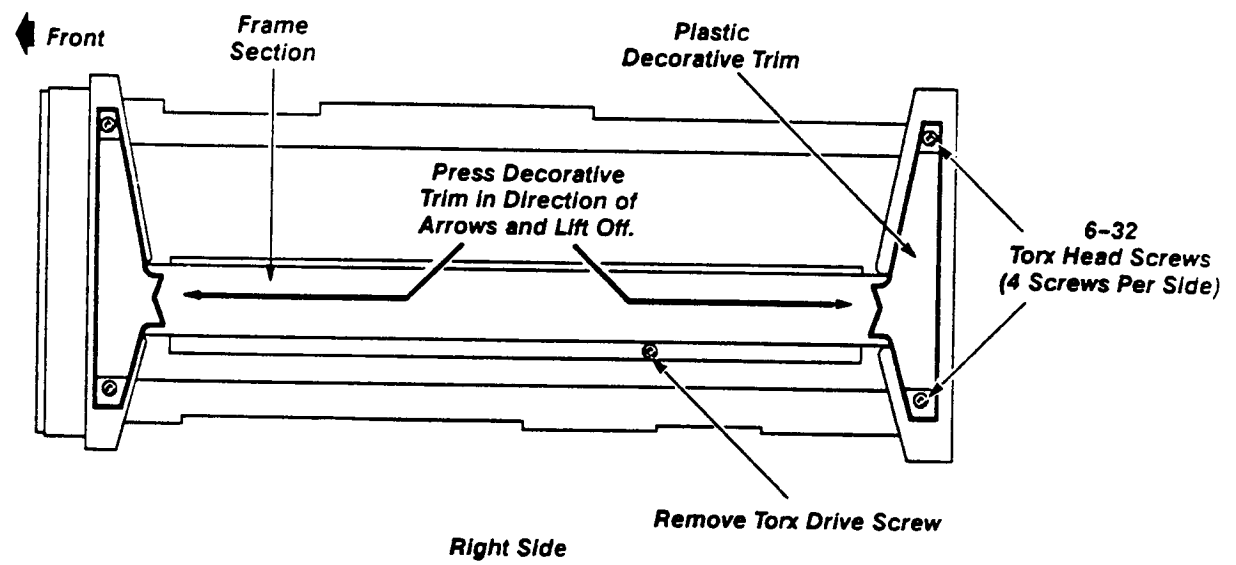


Figure 5, - Trim and frame removal.

33A 03 294 9  
 33B 3 30A 0  
 32 1

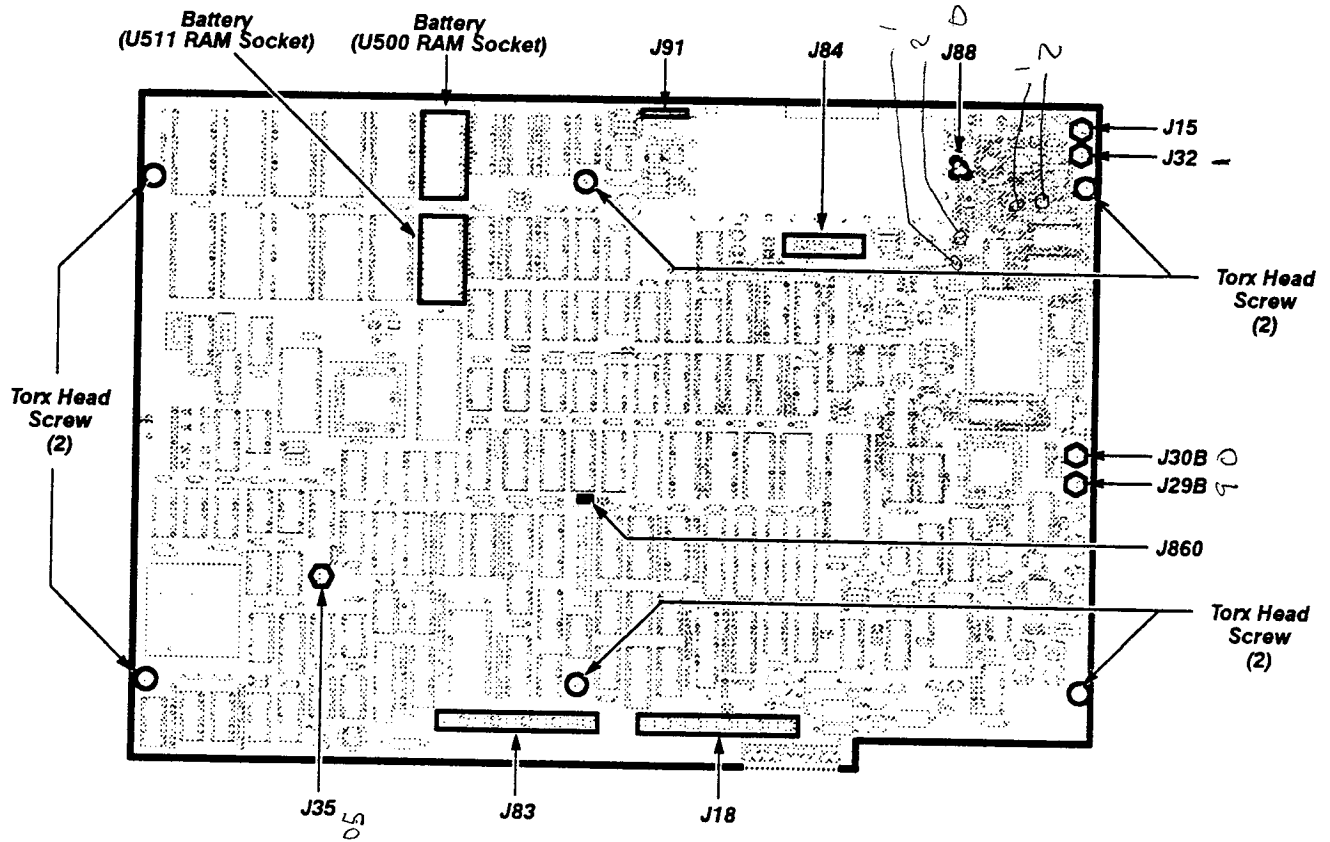


Figure 6, - Time Base/Controller ckt bd A5.



## REMOVE AND REPLACE TIME BASE/CONTROLLER CKT BOARD A5:

### NOTE

*Position the instrument with the bottom facing the installer.  
Refer to Figure 5 for hardware and connector locations.*

- 1. Disconnect the coaxial cables J15, J29B, J30B, J32, J35, and J88 located on the Time Base/Controller circuit board A5.
- 2. Disconnect the ribbon cables J18, J83, J84, and J91 located on the Time Base/Controller circuit board A5.
- 3. Disconnect the coaxial cables J16 and J87 located on the Trigger Select circuit board A24.
- 4. Remove the six (6) Torx drive screws that secure the Time Base/Controller circuit board A5. Then remove the circuit board from the instrument.

### NOTE

*The Time Base/Controller circuit board being replaced contains firmware. If this level of firmware needs to be maintained remove the firmware from the old Time Base/Controller circuit board and installed it on the new Time Base/Controller circuit board. Otherwise install the new firmware version 9.0 that is provided in this kit. If the old firmware is maintained return the new 9.0 firmware to Tektronix Inc.*

### NOTE

*When the Time Base/Controller circuit board is out of the instrument, check instrument for damaged ribbon and coaxial cables for damage. Make sure the cables and wires will not get pinched when the Time Base/Controller circuit board is reinstalled. Damage is usually from component leads on the bottom of the Time Base/Controller circuit board. Cables may be relocated and taped (black electrical) as required.*

- 5. Install U300, U310, U400 and U410 microcircuits in the Time Base/Controller circuit board A7.
- 6. Replace the Time Base/Controller circuit board A5 using the hardware removed in steps 4 in this section.
- 7. Replace the Trigger Select circuit board A32 securing it using the Torx drive screws removed in step 8, in the previous section.
- 8. Reconnect J86 and J89 coaxial cables to the Trigger Select circuit board removed in step 9. **CHECK cables to ensure connections are as follows: Delay line 1 is connected to J89, and Delay line 2 is connected to J86.**

- 9. Reconnect the coaxial cables and ribbon cables removed in steps 1 through 3. Make sure the coaxial cable J16 connecting the M/F Strobe Drive circuit board to the Trigger Select circuit board is located between the Time Base/Controller circuit board and the chassis (cable is under all ribbon cables).

FRU IC Detail

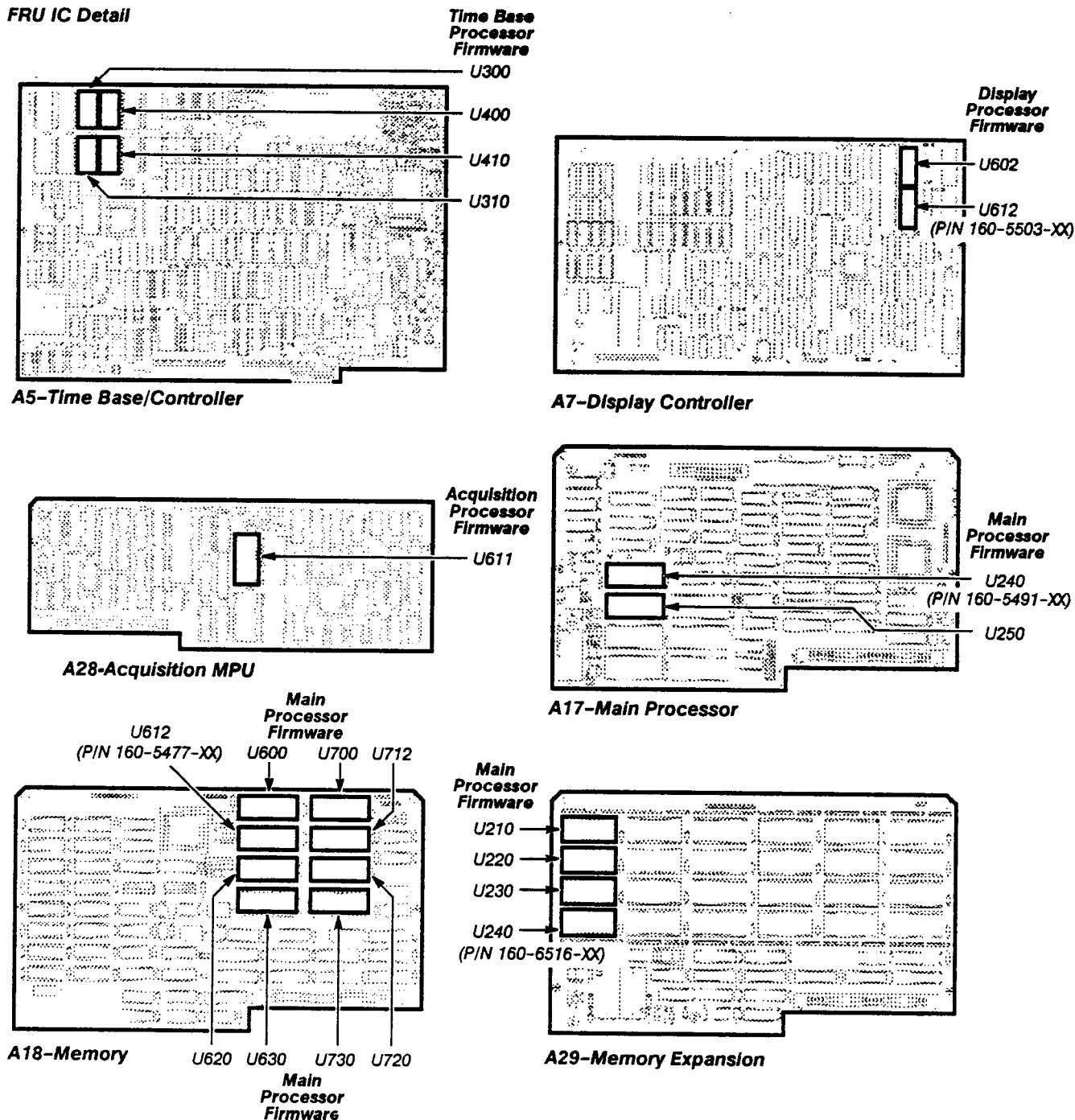


Figure 7, - EPROM locations.

## FIRMWARE REPLACEMENT:

- 1. Remove both nylon circuit board guides from the top of the card cage. The guides are retained by two (2) small catches located in the two (2) holes in the left bracket of the card cage. Both ends of the guides can be pried loose for removal.
- 2. Remove the three (3) screws that secure the card cage retainer, then remove the retainer from the instrument.

### NOTE

*When installing the new EPROM microcircuits be certain pin 1 is position correctly and all component pins are properly seated.*

*Avoid touching the IC's or its socket contacts with your fingers. Finger oils can degrade component reliability.*

*Refer to Figure 6 for component locations.*

- 3. Remove the Memory circuit board A18 from the card cage.
- 4. Replace the following microcircuits on the Memory circuit board A18 with the new microcircuits provided in this kit:

U600	160-5479-XX
U612	160-5477-XX
U620	160-5475-XX
U630	160-5473-XX
U700	160-5619-XX
U712	160-5478-XX
U720	160-5476-XX
U730	160-5474-XX

- 5. Replace the Memory circuit board A18 to its former location in the card cage.
- 6. Remove the Memory Expansion circuit board A29 from the card cage. The Memory Expansion circuit board is located next to the Memory circuit board A18.
- 7. Replace U210 and U220, microcircuits with the new microcircuits provided in this kit. Then install U230 and U240 microcircuits provided in this kit.
- 8. Replace the Memory Expansion circuit board A29 to its former location in the card cage.

- ❑ 9. Remove the Main Processor circuit board from the card cage. The Main Processor circuit board is located next the Memory Expansion circuit board A29. J77 cable connector must be removed before the Main Processor circuit board can be removed from the card cage. Note the positions of the cable connector index marks for later reassembly.
- ❑ 10. Replace U240 and U250, microcircuits with the new microcircuits with the new microcircuits provided in this kit.
- ❑ 11. Replace the Main Processor circuit board A17 former location in the card cage. Then reconnect J77 cable connector removed in step 9.
- ❑ 12. Replace the card cage retainer with the three (3) screws removed in a earlier step, then replace the two (2) nylon circuit board guides.
- ❑ 13. Replace U602 and U612, microcircuits, located on the Display Controller circuit board A7, with the new microcircuits provided in this kit.

**REASSEMBLY:**

- 1. Replace the right-side frame section using the Torx drive screws T-15 removed in a earlier step.
- 2. Replace the right-side trim covers using the Torx drive screws T-20 removed in a earlier step.
- 3. Replace the top and bottom dust covers removed in an earlier step.
- 4. Remove the protective backing from the 046-kit label and place it on the clean, dry area on the rear panel of the instrument. This label indicates that this kit has been installed.

# PRODUCT MODIFICATION KIT SUGGESTION/CORRECTION FORM

DATE \_\_\_\_\_

KIT NUMBER \_\_\_\_\_ STEP/PAGE \_\_\_\_\_

FIGURE NUMBER \_\_\_\_\_ PUBLICATION DATE \_\_\_\_\_

DISCREPANCY \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

SUGGESTED CORRECTION/COMMENTS \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

SUGGESTED BY: NAME/ORGANIZATION \_\_\_\_\_

\_\_\_\_ REPLY REQUESTED

(PLEASE TYPE OR PRINT LEGIBLY)

RETURN TO LOCAL FIELD OFFICE/SERVICE CENTER

FIELD OFFICE/SERVICE CENTER/DEL. STA. \_\_\_\_\_

SERVICE CENTER: RETURN TO FIELD MODS 39-283

## REPLY

\_\_\_\_ WILL MAKE CHANGE IMMEDIATELY

\_\_\_\_ WILL MAKE CHANGE AT NEXT PRINTING

\_\_\_\_ OTHER \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

SIGNED \_\_\_\_\_ DATE \_\_\_\_\_



# MANUAL CHANGE INFORMATION

Date: 8-SEP-89 Change Reference: M70526

Manual Part No.: 070-7047-01

Product: 11802 Service

Product Group: 47

## DESCRIPTION

These changes are effective for all serial numbers

Add this note to the Maintenance Section.

### ATTENTION

If the FRU (field replaceable unit) being replaced contains firmware, the **firmware must be removed from the old FRU and installed on the new FRU.** The replacement assemblies (FRUs) will not have any firmware installed from the factory or Module Repair station.

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**TEK**

**Firmware Update Ver 9.0**

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**Tek Firmware Update**

Incorporate the following features into the attached firmware update supplement.

Firmware Version 9.0 has all the features of 8.0 plus the features listed below.

This release of 11801 and 11802 mainframes have the following firmware version numbers.

	11801	11802
EXP:	9.01	9.02
TBC:	9.01	9.02
ACQ:	9.00	9.00
DSY:	9.00	9.00

Features Added:

1. "cal error filter." keeps normal calibration re-attempts from being reported as errors.
2. Partial waveforms are displayed for very slow triggers.
3. Automatic loopgain calibration is more stable.
4. Enveloped data format now matches manual's specification.

*NOTE: this may pose a compatibility problem for some system applications.*