

# Instructions

**Tektronix**

## **1180FC & CSA8FC Conversion Upgrade Kit**

**075-0155-00**

**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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## Service Safety Summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the safety summaries in your product manual before performing any service procedures.

**Do Not Service Alone.** Do not perform internal service or adjustments of this product unless another person capable of rendering first aid and resuscitation is present.

**Disconnect Power.** To avoid electric shock, disconnect the main power by means of the power cord or, if provided, the power switch.

**Use Caution When Servicing the CRT.** To avoid electric shock or injury, use extreme caution when handling the CRT. Only qualified personnel familiar with CRT servicing procedures and precautions should remove or install the CRT.

CRTs retain hazardous voltages for long periods of time after power is turned off. Before attempting any servicing, discharge the CRT by shorting the anode to chassis ground. When discharging the CRT, connect the discharge path to ground and then the anode. Rough handling may cause the CRT to implode. Do not nick or scratch the glass or subject it to undue pressure when removing or installing it. When handling the CRT, wear safety goggles and heavy gloves for protection.

**Use Care When Servicing With Power On.** Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections.

**X-Radiation.** To avoid x-radiation exposure, do not modify or otherwise alter the high-voltage circuitry or the CRT enclosure. X-ray emissions generated within this product have been sufficiently shielded.

Service Safety Summary

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## Kit Description

This document provides instructions for the 1180FC and CSA8FC conversion upgrade kits. The instructions are similar for both kits.

The 1180FC conversion upgrade kit includes parts and instructions to upgrade an 11801B to the features of the 11801C Digital Sampling Oscilloscope. When this kit is installed in your 11801B it will be functionally identical to an 11801C Digital Sampling Oscilloscope. The front-panel nomenclature will remain the same as the current front panel.

The CSA8FC conversion upgrade kit includes parts and instructions to upgrade a CSA 803A to the features of the CSA 803C Communications Signal Analyzer. When this kit is installed in your CSA 803A it will be functionally identical to a CSA 803C Communications Signal Analyzer. The front-panel nomenclature will remain the same as the current front panel.

## Products

<b>11801B</b>	All serial numbers
<b>CSA 803A</b>	All serial numbers

## Minimum Tool and Equipment List

Required tools and equipment	Part number
Slotted Screwdriver	n/a
Torx Driver with T-10 and T-15 heads	n/a
Wrench, 1/4 inch	n/a
Torque wrench, 5/16 inch (5 in/lb)	n/a
Wrench, 3/8 inch	n/a
Antistatic wrist strap	006-3415-04

## Kit Parts List

If you are upgrading an 11801B, refer to the parts list in Table 1. If you are upgrading a CSA 803A, refer to the parts list in Table 2.

**Table 1: 1180FC parts list**

Circuit/figure number	Quantity	Part number	Description
A18U440	1 ea.	160-8193-00	IC, Digital STTL, PLD: PAL
A18U830	1 ea.	160-6979-08	Microckt, dgtl: CMOS, EPROM, ver 4.05
A18U820	1 ea.	160-6984-08	Microckt, dgtl: CMOS, EPROM, ver 4.05
A18U920	1 ea.	160-6985-08	Microckt, dgtl: CMOS, EPROM, ver 4.05
A18U930	1 ea.	160-6978-08	Microckt, dgtl: CMOS, EPROM, ver 4.05
A18U810	1 ea.	160-6986-08	Microckt, dgtl: CMOS, EPROM, ver 4.05
A18U910	1 ea.	160-6987-08	Microckt, dgtl: CMOS, EPROM, ver 4.05
A18U800	1 ea.	160-6988-08	Microckt, dgtl: CMOS, EPROM, ver 4.05
A18U900	1 ea.	160-6989-08	Microckt, dgtl: CMOS, EPROM, ver 4.05
	1 ea.	174-3076-00	Ca assy, rf: 50Ω, coaxial, peltola to smb
A5U1510	1 ea.	165-0036-01	Trigger hybrid
A5U1200	1 ea.	671-4209-00	Prescaler
	1 ea.	131-6337-00	Connector, prescaler, front panel, SMA-to-SMA
	1 ea.	174-3781-00	Ca assy, rf: 50Ω, coaxial semirigid, SMA-to-SMA
	1 ea.	070-9971-00	11801C User manual
	1 ea.	070-9972-00	11801C Service manual
	1 ea.	070-9970-00	Programmer Manual, 11801C & CSA 803C
	1 ea.	075-0155-00	Kit instructions
	1 ea.	_____	Kit label

**Table 2: CSA8FC parts list**

Circuit/figure number	Quantity	Part number	Description
A18U440	1 ea.	163-0999-00	IC, Digital STTL, PLD: PAL
A18U830	1 ea.	160-6979-08	Microckt, dgtl: CMOS, EPROM, ver 4.05
A18U820	1 ea.	160-6984-08	Microckt, dgtl: CMOS, EPROM, ver 4.05
A18U920	1 ea.	160-6985-08	Microckt, dgtl: CMOS, EPROM, ver 4.05
A18U930	1 ea.	160-6978-08	Microckt, dgtl: CMOS, EPROM, ver 4.05
A18U810	1 ea.	160-6986-08	Microckt, dgtl: CMOS, EPROM, ver 4.05
A18U910	1 ea.	160-6987-08	Microckt, dgtl: CMOS, EPROM, ver 4.05
A18U800	1 ea.	160-6988-08	Microckt, dgtl: CMOS, EPROM, ver 4.05
A18U900	1 ea.	160-6989-08	Microckt, dgtl: CMOS, EPROM, ver 4.05
	1 ea.	174-3076-00	Ca assy, rf: 50Ω, coaxial, peltola to smb <sup>1</sup>
A5U1510	1 ea.	165-0036-01	Trigger hybrid
A5U1200	1 ea.	671-4209-00	Prescaler
	1 ea.	131-6337-00	Connector, prescaler, front panel, SMA-to-SMA
	1 ea.	174-3781-00	Ca assy, rf: 50Ω, coaxial semirigid, SAM-to-SMA
	1 ea.	070-9973-00	CSA 803C User manual
	1 ea.	070-9974-00	CSA 803C Service manual
	1 ea.	070-9970-00	Programmer Manual, 11801C & CSA 803C
	1 ea.	075-0155-00	Kit instructions
	1 ea.	_____	Kit label

<sup>1</sup> Cable assembly is not needed for Option 10 instruments

Kit Description

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## Installation Instructions

These instructions are for personnel who are familiar with servicing the product. If you need further details for disassembling or reassembling the product, refer to the appropriate product manual. Contact your nearest Tektronix, Inc., Service Center or Tektronix Factory Service for installation assistance.



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**WARNING.** *Dangerous shock hazards may be exposed when you remove the instrument covers. 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.*

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

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**NOTE.** *When this kit is installed the stored settings and stored waveforms will be erased.*

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## Remove

1. Remove the top and bottom cabinet panel covers by loosening the fasteners one quarter turn counterclockwise.
2. Remove the three (3) Torx-drive screws that attach the CRT cover, and then remove the CRT cover.
3. Refer to Figure 1 and remove both of the plastic board guides from the top of the card cage. These guides are retained by two (2) small catches located in the two (2) holes in the left bracket of the card cage. The other ends of the guides contain slots which attach to the edge of a metal bracket. Both ends of the guides can be pried loose. The rear guide is also secured into place with a Torx-drive screw.
4. Disconnect connector J77 from the Executive Processor circuit board A17 (see Figure 1) Note the position of the multi-pin connector's index triangles to ensure correct reassembly.

Installation Instructions

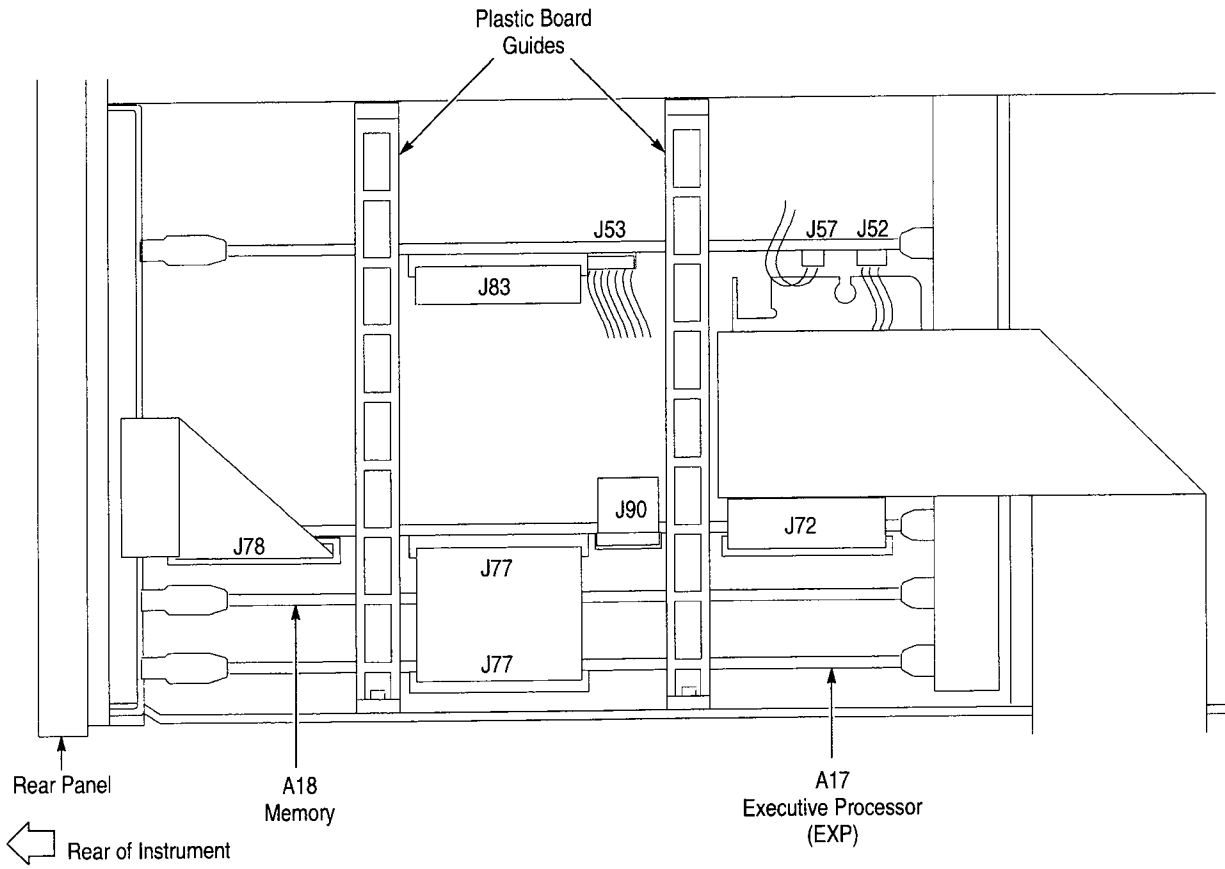
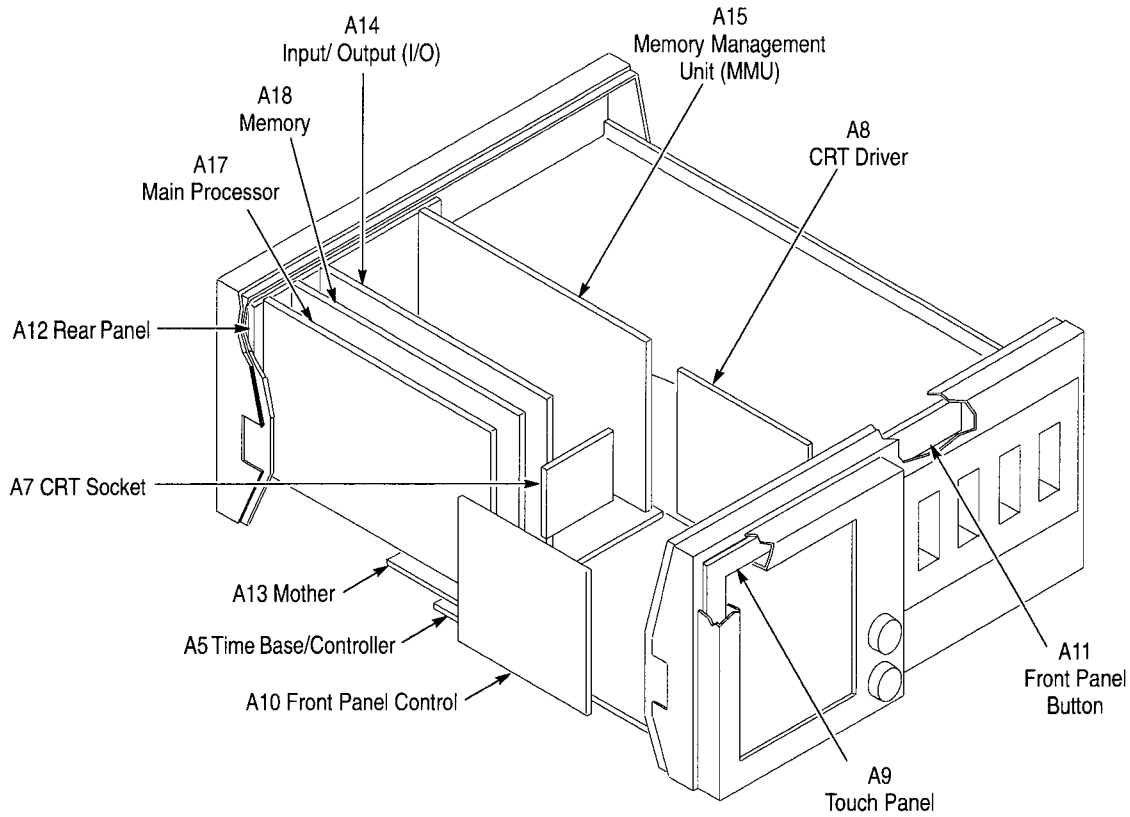


Figure 1: Top view of the card cage

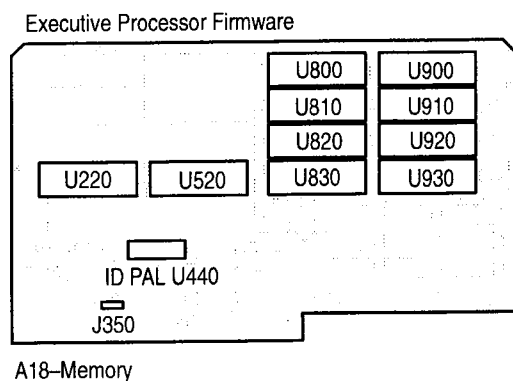


**Figure 2: Mainframe circuit board locations**

5. Lift the hinged tabs (circuit board ejectors) at the front and rear edges of the Memory circuit board A18. Pull the tabs upward until the Memory circuit board A18 separates from Mother circuit board A13. Then remove the circuit board from the instrument.

- Replace the following EPROMs on the Memory circuit board A18 with the new EPROMs provided in this kit. Refer to Figure 3 for component locations.

U800	U900
U810	U910
U820	U920
U830	U930



**Figure 3: EPROM locations**

- Replace U440 with the new PAL IC provided in this kit. Refer to Figure 3, for component locations.
- Remove the J350 jumper from the Memory circuit board for approximately 10 seconds. The J350 jumper is located near the lithium battery.
- Replace the J350 jumper to same position.

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**NOTE.** During Extended Diagnostics there may be a battery error message displayed.

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- Replace the Memory circuit board A18 to its former location in the card cage.
- Replace J77, the plastic board guides, and the CRT cover that you removed earlier.



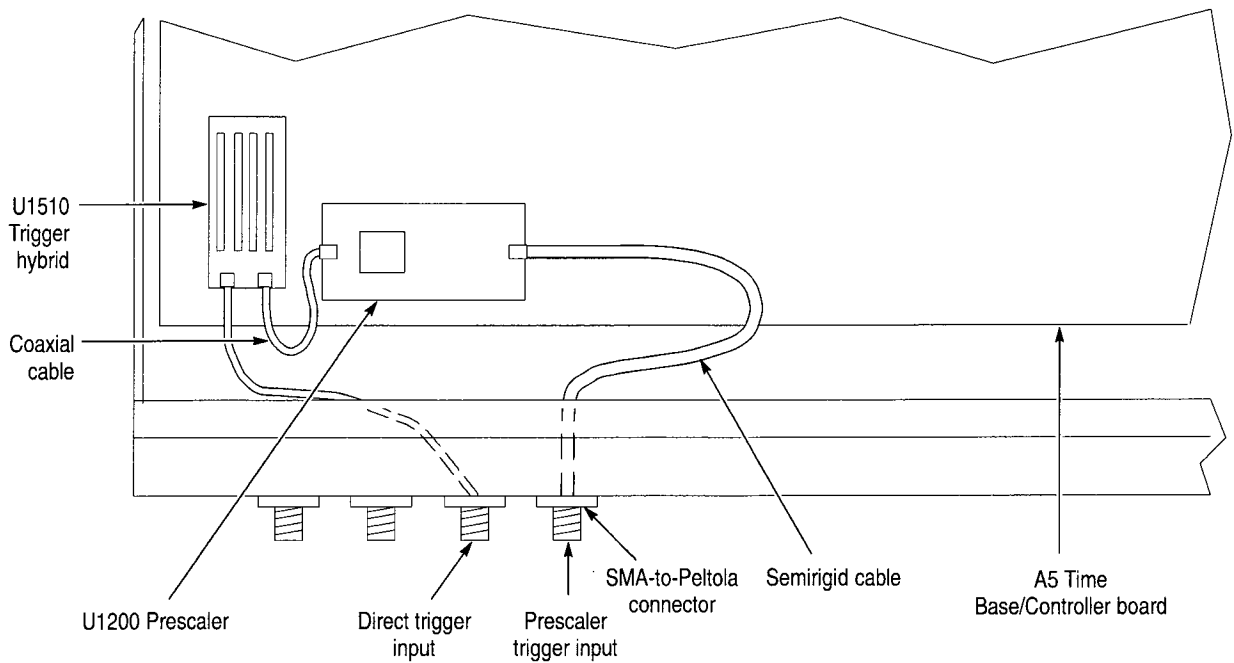

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**CAUTION.** Always wear a grounded wrist and foot strap. Observe standard handling precautions for static-sensitive devices while installing this kit.

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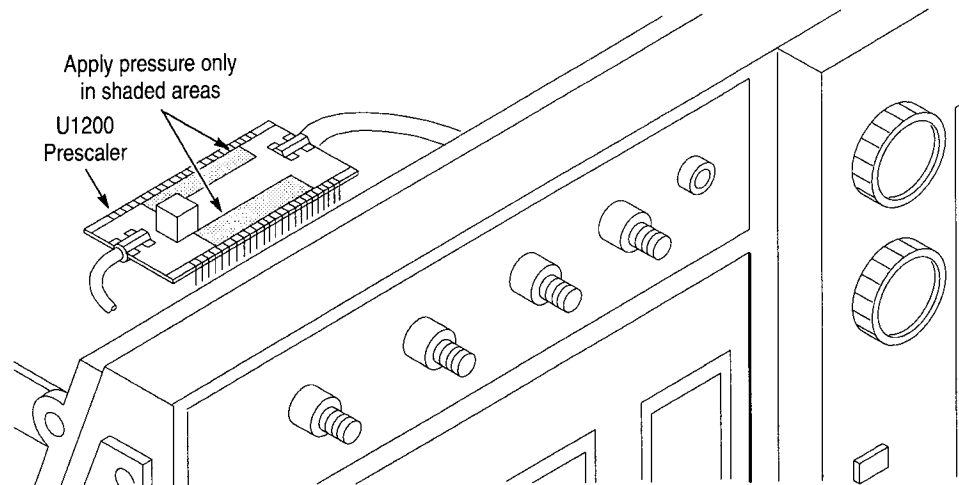
12. Remove the old U1510 trigger hybrid and U1200 prescaler from the A5 Time Base Controller board using the following procedure. Refer to Figure 4 for U1510 and U1200 locations.

**NOTE.** *CSA 803 instruments with Option 10 do not have U1200 installed.*



**Figure 4: U1200 prescaler assembly**

- a. Remove the U1510 retainer clip and remove both SMB cables from the hybrid inputs. Remove U1510 from the time base controller board.
- b. Remove the semirigid cable from the input to U1200 and from the front panel.



**Figure 5: Prescaler front panel connector assembly.**



**CAUTION.** *Be careful not to apply force to the ends of the hybrid microcircuit; the hybrid is extremely brittle and can easily be damaged.*

- c. Gently rock the prescaler out of the U1200 socket.
- d. Remove the coaxial cable from the prescaler output.
- e. Remove the SMA-to-peltola connector from the front panel prescaler input.

**NOTE.** *When installing the new Prescaler Hybrid microcircuit be certain pin 1 is positioned correctly.*

13. Install the new U1510 trigger hybrid and U1200 prescaler using the following steps:
  - a. Install the new U1510 trigger hybrid in the A5 Time Base board. Snap the retainer clips in place and connect the two SMB cables to the inputs.
  - b. Install the new U1200 prescaler in the A5 Time Base board and connect the coaxial cable from the U1510 trigger hybrid to the prescaler output.
  - c. Install the new front panel prescaler input SMA-to-SMA connector in the front panel.

- d. Connect the new SMA-to-SMA semirigid cable between the front panel and the prescaler input. Make sure that there is no stress on the prescaler input. If necessary, gently bend the semirigid cable to relieve any stress. Tighten the SMA connectors with a 5/16-inch torque wrench set to five inch pounds. DO NOT over tighten.

## Reassemble

1. Replace the top and bottom dust covers removed in step 1, Cover and Card Cage Removal section.
2. Remove the protective backing from the kit label and place it on a clean, dry area on the rear panel of the instrument (do not place the label on the power supply fan side of the rear panel). This label indicates that the upgrade kit has been installed.

## Verify Operation

After the instrument is reassembled, the nonvolatile memory must be cleared before normal operation can be resumed. The memory is cleared as follows:

1. Before pushing the ON/STANDBY switch to the ON Position, press and hold down the top two major menu buttons (WAVEFORM and TRIGGER), then push the ON/STANDBY switch to the ON position.
2. Continue pressing the WAVEFORM and TRIGGER major menu buttons until all the LEDs beside the major menu buttons are lighted (about six to seven seconds), and then release the buttons.

When the power-up self-test is complete and normal operation resumes, the following message will appear at the top of the display screen:

Teksecure Erase Memory Status: Erased; Instrument ID,  
on-time, and number of power-ups retained.

## Calibration

Perform the performance verification procedures described in the service manual to verify that the instrument operates correctly. If the performance verification procedures verify that the instrument is within the specifications, no further calibration is necessary.

If the performance verification procedures identify an out-of-tolerance condition, perform the adjustment procedures described in the service manual.

## New Hardware Upgrade Features

- New direct trigger with improved bandwidth, jitter, input sensitivity, and metastability; See Appendix B of the User manual (included in this kit).
- New prescaler with improved bandwidth and input sensitivity.

## New Features for Version 4.05

Firmware version 4.05 has the following new features:

- Four new electrical Fibre Channel masks (133 Mb/s, 266 Mb/s, 531 Mb/s, 1063 Mb/s)
  - Four new optical Fibre Channel masks (133 Mb/s, 266 Mb/s, 531 Mb/s, 1063 Mb/s)
  - Optical Gigabit Ethernet mask
  - Updates to STS1 and DS3 masks to reflect changes in industry
  - Updated printer support: existing black and white laser and color inkjet printer support enhanced in the HARDCOPY menu.
- ❑ End of document ❑