WFM612UP, WFM702UP, and WFM712UP Upgrades
WFM6120, WFM7020, and WFM7120
Waveform Monitors

Instructions

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.

Tektronix

Contacting Tektronix

Tektronix, Inc.
14200 SW Karl Braun Drive
P.O. Box 500
Beaverton, OR 97077
USA

For product information, sales, service, and technical support:
- In North America, call 1-800-833-9200.
- Worldwide, visit www.tektronix.com to find contacts in your area.

Table of Contents

General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it.

To avoid potential hazards, use this product only as specified.

Only qualified personnel should perform service procedures.

While using this product, you may need to access other parts of a larger system. Read the safety sections of the other component manuals for warnings and cautions related to operating the system.

To Avoid Fire or Personal Injury

Use Proper Power Cord. Use only the power cord specified for this product and certified for the country of use.

Connect and Disconnect Properly. Do not connect or disconnect probes or test leads while they are connected to a voltage source.

Ground the Product. This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Power Disconnect. The power cord disconnects the product from the power source. Do not block the power cord; it must remain accessible to the user at all times.

Do Not Operate Without Covers. Do not operate this product with covers or panels removed.

Do Not Operate With Suspected Failures. If you suspect that there is damage to this product, have it inspected by qualified service personnel.

Avoid Exposed Circuitry. Do not touch exposed connections and components when power is present.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

Provide Proper Ventilation. Refer to the manual's installation instructions for details on installing the product so it has proper ventilation.

Terms in this Manual   These terms may appear in this manual:

⚠️ *WARNING. Warning statements identify conditions or practices that could result in injury or loss of life.*

⚠️ *CAUTION. Caution statements identify conditions or practices that could result in damage to this product or other property.*

Symbols and Terms on the Product

These terms may appear on the product:

■ DANGER indicates an injury hazard immediately accessible as you read the marking.

■ WARNING indicates an injury hazard not immediately accessible as you read the marking.

■ CAUTION indicates a hazard to property including the product.

The following symbol(s) may appear on the product:

⚠️
CAUTION
Refer to Manual

⏚
Protective Ground
(Earth) Terminal

Kit Description

This document provides instructions for installing the video and audio upgrades listed below into an existing Tektronix WFM6120, WFM7020, or WFM7120 waveform monitor.

Table 1: Supported upgrades

Video Upgrades	WFM612UP	WFM702UP	WFM712UP	Description
Option 3G		✓	✓	Adds support for 3Gbps signals for either Level A or Level B (requires option DL)
Option CPS	✓	✓	✓	Adds support for monitoring analog video in composite formats
Option HD		✓	✓	Adds support for monitoring high definition, digital video
Option DL		✓	✓	Adds support for monitoring dual link (requires option HD)
Option SIM			✓	Adds support for monitoring two simultaneous inputs

Audio Upgrades	WFM612UP	WFM702UP	WFM712UP	Description
Option AD	✓	✓	✓	Adds the capabilities of Option DS plus adds support for monitoring analog audio
Option DDE			✓	Adds the capabilities of Option DD plus adds support for monitoring and decoding Dolby E audio

Analysis Upgrades	WFM612UP	WFM702UP	WFM712UP	Description
Option JIT			✓	Adds jitter measurement and jitter waveform capabilities for 3Gbps signals (requires option 3G)
Option AVD	✓		✓	Adds support for out-of-service audio video delay measurements
Option EYE	✓		✓	Adds support for eye pattern and basic jitter measurements; includes cable length measurements
Option PHY	✓		✓	Adds the capabilities of Option EYE plus advanced physical layer measurements; includes automated eye measurements
Option DAT	✓		✓	Adds support for the data analysis, which allows for logic-level viewing of the video and audio digital data stream and ANC data extraction

Products

The following Tektronix products are supported by this kit:

WFM6120 All instruments
WFM7020 All instruments
WFM7120 All instruments

Required Tools

The following table lists the tools required to install the upgrade.

Table 2: Required tools

Name	Description
TORX screwdriver handle (Hardware options only)	Accepts TORX-driver bits
T-10 and T-15 TORX tips (Hardware options only)	TORX-driver bit for T-10 and T-15 screw heads
1/4 inch nut driver (Hardware options only)	Standard tool
9/16 inch socket (Hardware options only)	Deep socket to fit over BNC connector
Standard PC	Running Windows 98, Windows NT 4.0, Windows ME, Windows 2000, or Windows XP
Anti-static wrist strap (Hardware options only)	
WFM6120, WFM7020, and WFM7120 Specifications and Performance Verification manual and all test equipment listed within to perform the verification checks	Tektronix part number 077-0080-XX Available for download from the Tektronix Web site

Kit Parts Lists

The following tables list the parts supplied with each upgrade kit. Before you start the upgrade, verify that you received all of the parts for the upgrade kit you ordered.

WFM612UP CPS
WFM702UP CPS
 WFM712UP CPS

Table 3: Option CPS parts list

Quantity	Part number	Description
1 EA	——	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-0940-XX	INSTRUCTIONS; WFM612UP, WFM702UP, AND WFM712UP UPGRADES
1 EA	672-1788-XX	CIRCUIT BD SUBASSY; ANALOG COMPOSITE

WFM702UP HD
WFM712UP HD
WFM612UP DAT
WFM712UP DAT
WFM712UP SIM
WFM702UP DL
WFM712UP DL
WFM612UP AVD
WFM712UP AVD
WFM712UP JIT

Table 4: Option HD, DAT, SIM, DL, AVD, and JIT parts list

Quantity	Part number	Description
1 EA	——	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-0940-XX	INSTRUCTIONS; WFM612UP, WFM702UP, AND WFM712UP UPGRADES

WFM612UP EYE

Table 5: Option EYE parts list

Quantity	Part number	Description
1 EA	——	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-0940-XX	INSTRUCTIONS; WFM612UP, WFM702UP, AND WFM712UP UPGRADES
3 EA	134-0246-XX	PLUG, HOLE COVER; BUTTON PLUG, ACCOM 0.5 DIA HOLE, NYLON, BLACK
1 EA	174-5028-XX	CABLE ASSY, FLAT RIBBON; 2X20, 4.50 INCH LONG
1 EA	672-6318-XX	CIRCUIT BD SUBASSY; PHYSICAL LAYER

WFM712UP EYE

Table 6: Option EYE parts list

Quantity	Part number	Description
1 EA	——	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-0940-XX	INSTRUCTIONS; WFM612UP, WFM702UP, AND WFM712UP UPGRADES
3 EA	134-0246-XX	PLUG, HOLE COVER; BUTTON PLUG, ACCOM 0.5 DIA HOLE, NYLON, BLACK
1 EA	174-5028-XX	CABLE ASSY, FLAT RIBBON; 2X20, 4.50 INCH LONG
1 EA	672-5902-XX	CIRCUIT BD SUBASSY; PHYSICAL LAYER

WFM612UP PHY   **Table 7: Option PHY parts list**

Quantity	Part number	Description
1 EA	–––	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-0940-XX	INSTRUCTIONS; WFM612UP, WFM702UP, AND WFM712UP UPGRADES
3 EA	134-0246-XX	PLUG, HOLE COVER; BUTTON PLUG, ACCOM 0.5 DIA HOLE, NYLON, BLACK
1 EA	174-5028-XX	CABLE ASSY, FLAT RIBBON; 2X20, 4.50 INCH LONG
1 EA	672-6318-XX	CIRCUIT BD SUBASSY; PHYSICAL LAYER

WFM712UP PHY   **Table 8: Option PHY parts list**

Quantity	Part number	Description
1 EA	–––	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-0940-XX	INSTRUCTIONS; WFM612UP, WFM702UP, AND WFM712UP UPGRADES
3 EA	134-0246-XX	PLUG, HOLE COVER; BUTTON PLUG, ACCOM 0.5 DIA HOLE, NYLON, BLACK
1 EA	174-5028-XX	CABLE ASSY, FLAT RIBBON; 2X20, 4.50 INCH LONG
1 EA	672-5902-XX	CIRCUIT BD SUBASSY; PHYSICAL LAYER

WFM702UP 3G
WFM712UP 3G   **Table 9: Option 3G parts list**

Quantity	Part number	Description
1 EA	–––	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-0940-XX	INSTRUCTIONS; WFM612UP, WFM702UP, AND WFM712UP UPGRADES
3 EA	134-0246-XX	PLUG, HOLE COVER; BUTTON PLUG, ACCOM 0.5 DIA HOLE, NYLON, BLACK
1 EA	174-5028-XX	CABLE ASSY, FLAT RIBBON; 2X20, 4.50 INCH LONG
1 EA	870-0187-XX	CIRCUIT BD SUBASSY; 3GBT INTERFACE

WFM612UP AD
WFM702UP AD
WFM712UP AD

Table 10: Option AD parts list

Quantity	Part number	Description
1 EA	——	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-0940-XX	INSTRUCTIONS; WFM612UP, WFM702UP, AND WFM712UP UPGRADES
1 EA	131-7430-XX	CONN, DSUB; SLDR CUP, MALE, STR, 62 POS
1 EA	672-6307-XX	CIRCUIT BD SUBASSY; DIGITAL AND ANALOG AUDIO

WFM712UP DDE

Table 11: Option DDE parts list

Quantity	Part number	Description
1 EA	——	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-0940-XX	INSTRUCTIONS; WFM612UP, WFM702UP, AND WFM712UP UPGRADES
1 EA	119-7167-XX	CIRCUIT BD ASSY; CAT552 DOLBY E/DIGITAL DECODER MODULE; 72 PIN SIMM
1 EA	131-7430-XX	CONN, DSUB; SLDR CUP, MALE, STR, 62 POS
1 EA	672-6309-XX	CIRCUIT BD SUBASSY; DIGITAL AND ANALOG AUDIO

Upgrade Installation

This section provides instructions for the following:

- Verifying the currently installed options
- Preventing electrostatic discharge
- Installing the software upgrade
- Installing the hardware upgrade
- Installing the software option key

Verify the Currently Installed Options

The software option key supplied in this kit is based on the serial number you supplied when you ordered the upgrade for the instrument. The new software option key should enable the new option(s) you ordered, and also preserve your previously purchased options.

Before you install the upgrade, perform the following steps to verify which options are currently installed in your instrument. After you install the upgrade, you will verify that the new options are installed and that any previously installed options are still enabled.

1. Power on the instrument you are upgrading.
2. Press the **CONFIG** button on the front panel.
3. Navigate to **Utilities** > **View Instmt Options**.
4. Make a list of the installed options.

List installed options

How to Prevent Electrostatic Discharge

When you perform any service that requires internal access to the instrument, adhere to the following precautions to avoid damage due to electrostatic discharge (ESD):

1. Minimize handling of static-sensitive circuit boards and components.

2. Transport and store static-sensitive boards or modules in static protected containers.

3. Discharge the static voltage from your body by wearing a grounded antistatic wrist strap while handling these modules.

4. Service static-sensitive modules only at a static-free work station.

5. Do not allow anything capable of generating or holding a static charge on the work surface.

6. Handle circuit boards by the edges or hold onto grounded shields when possible.

7. Do not slide circuit boards over any surface.

Install the Software Upgrade

⚠️ **CAUTION.** *To prevent upgrade failure, your instrument must have the latest version of software installed before you install the hardware upgrade and before you install the software option key.*

Before You Begin   You do not need to perform the software upgrade if your instrument has the latest version of software installed. Perform the following steps to determine if the software on your instrument needs to be upgraded:

1. Power on the instrument.

2. Verify the current software version installed on the instrument:

   a. Press the **CONFIG** button on the front panel.

   b. Navigate to **Utilities** > **View Hw/Sw Version**.

   c. In the Hardware and Software Versions display window, note the software version number of the instrument.

Instrument Software version number	

3. Verify the latest version of software at the Tektronix Web site:

   a. Use the Web browser on a PC to navigate to the following Tektronix Web site:

      `http://www.tek.com/products/video_test`

   b. On the Video Test Web page, click the link **Software Downloads** under Product Resources.

   c. On the Software and Firmware Finder Web page, search by model number (i.e.: WFM7120) or use the keyword WFM to locate the software-upgrade package for the instrument.

   d. Note the latest version number of the software-upgrade package(s).

Web site Software version number	

4. If the latest software version at the Web site is newer than the version on your instrument, you need to upgrade the firmware.

To perform the upgrade, you will use a PC to transfer the new software to the instrument using your local Ethernet network or using an Ethernet cross-over cable. Read the entire procedure before starting the software upgrade. The time required to complete the upgrade is about 25 minutes.

⚠ *CAUTION. Once the instrument has started to erase internal flash, DO NOT remove power from the instrument. If you do so, the instrument flash will be corrupted. The instrument will have to be sent to a Tektronix factory service center to have the system software restored.*

NOTE. If power to the instrument is lost before it begins erasing the internal flash, you can restart the software upgrade after the instrument reboots.

PC System Requirements.. The data-transfer utility used to upgrade the instrument runs on the following PC systems: Windows 98, Windows NT 4.0, Windows ME, Windows 2000, and Windows XP. The utility also requires an Ethernet interface and 128 MB of free disk space be present on the PC system.

Upgrade the Software   After you have verified that your instrument needs to have the software upgraded, perform the following procedure to upgrade the software on your instrument:

1. If you are connecting your PC directly to the instrument, connect the Ethernet cross-over cable between the Ethernet ports on the PC and instrument, otherwise proceed to step 2.

2. Connect the instrument and PC to your local Ethernet network.

3. Power on the instrument.

4. Assign the instrument an IP address:

NOTE. The data-transfer utility requires that the instrument be assigned a valid IP address. To allow network access to the instrument, the instrument must be assigned a valid IP address for your network. Network addresses can be assigned either manually or automatically using DHCP. If your network does not use DHCP, you will have to manually enter the address for the instrument. To get a valid IP address, contact your local LAN administrator.

Alternatively, if you connect the PC directly to the instrument using an Ethernet cross-over cable, you can assign the instrument any IP address that is compatible with the IP address of the PC.

    a. Press the **CONFIG** button on the front panel.

    b. Navigate to **Network Settings** > **IP Config Mode**.

    c. Select either **Manual** or **DHCP** as directed by your LAN administrator. Select Manual if you are using an Ethernet cross-over cable to connect the PC directly to the instrument.

    d. If you selected Manual mode, enter the IP address, subnet mask, and gateway address as directed by your LAN administrator. You need to

enter only an IP address if you are using an Ethernet cross-over cable to connect the PC directly to the instrument.

NOTE. *If you selected DHCP mode, the network will automatically assign the instrument an IP address.*

---

  e. Press the **CONFIG** button on the front panel to close the menus.

5. Download the latest version of software at the Tektronix Web site:

  a. Use the Web browser on the PC to navigate to the following Tektronix Web site:

    `http://www.tek.com/products/video_test`

  b. On the Video Test Web page, click the link **Software Downloads** under Product Resources.

  c. On the Software Downloads page, search by model number (i.e.: WFM7120) or use the keyword WFM to locate the latest software-upgrade package for the instrument.

  d. Download the latest version to your PC.

  e. After the software package is downloaded, click on the self-extracting archive to extract the following files into the directory of your choice: transfer.exe and firmware.pkg. There may also be a readme.txt file.

6. Prepare the instrument for the software upgrade:

  a. Press the **CONFIG** front panel button.

  b. Navigate to **Utilities** > **System Upgrade** > **Upgrade Options** > **Network Upgrade**.

  c. Press the **SEL** front panel button. This displays the System Software Upgrade window.

  d. To continue with the upgrade, select **Continue** and press **SEL**. The monitor display goes to black and the DISPLAY SELECT keys flash in sequence.

    If the arrow keys also flash, the instrument is in DHCP mode. Wait until the arrow keys stop flashing before proceeding.

7. Perform the software upgrade:

  a. On the PC, double-click the **transfer.exe** file to launch the transfer program.

  b. Type the IP address or DNS name of the instrument you are upgrading, and then press **Enter**. This starts the software upgrade process.

⚠ **CAUTION.** *To prevent upgrade failure, do not close the transfer.exe window until the transfer utility asks for another IP address. When the software upgrade completes, the instrument may reboot.*

    c. The transfer utility displays done when the software upgrade completes. When the software upgrade completes, the instrument will reboot.

```
Please enter DNS name or address of target instrument:
128.181.221.2
Opened TCP connection to 128.181.221.2:77
Reading Firmware Data... done
Erasing Flash... done
Programming Flash... done
Verifying Flash Programming... done
done

Please enter DNS name or address of target instrument:
▄
```

Figure 1: Sample of transfer.exe window after the upgrade is complete

8. If the instrument did not reboot at the completion of the software upgrade, remove and then reapply power to the instrument to cause it to reboot.

9. Verify the software upgrade:

    a. Press the **CONFIG** button on the front panel.

    b. Navigate to **Utilities** > **View Hw/Sw Version**.

    c. Verify that the software version number matches the version of the software-upgrade package you installed.

10. Remove power from the instrument.

Install the Option Hardware

⚠ **WARNING.** *Before installing any hardware option, disconnect the power cord from the line voltage source. Failure to do so could cause serious injury or death.*

⚠ **CAUTION.** *To prevent upgrade failure, your instrument must have the latest version of software installed before you install the hardware upgrade. (See page 10, Install the Software Upgrade.)*

The procedures in this section are for upgrades that require the installation of hardware modules. For software-only upgrades, you do not need to remove the instrument cover since these upgrades are enabled by the new software key you received with this kit.

NOTE. *If you are only installing one of the software-only upgrades (Options HD, DAT, SIM, DL, AVD, or JIT), you only need to install the option software key. (See page 26, Install the Option Software Key.)*

The hardware installation procedure consists of the following steps:

- ■ Removing the instrument cover and the module guide brackets

- ■ Installing the new hardware

- ■ Reinstalling the module guide brackets and the instrument cover

Locations of the Optional Hardware Modules

The modules for the hardware options can be installed only in the specific locations. (See Figure 2.)
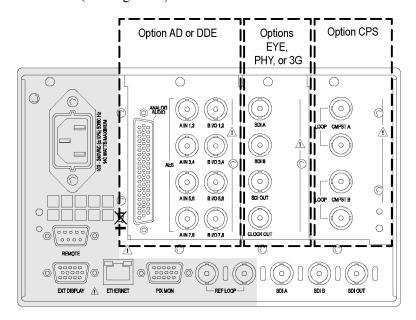

Figure 2: Rear panel showing the locations of the optional modules

Remove the Instrument Cover and Module Guide Brackets

If you are installing an upgrade option that includes hardware installation, perform the following steps to remove the instrument cover and module guide brackets.

> ⚠ **WARNING.** *Disconnect the power source from the instrument before beginning this or any procedure requiring you to remove the cover from the instrument chassis. Fan blades and other components inside the instrument could cause serious injury if power is on while the instrument chassis is open.*

1. Remove power from the instrument.

2. If necessary, remove the instrument from the portable cabinet or rack adapter sleeve.

3. Place the instrument on a static-safe work surface. Be sure to follow safe handling procedures to avoid electrostatic damage to the instrument or module. (See page 9, *How to Prevent Electrostatic Discharge.*)

4. Remove the six screws from the chassis cover. (See Figure 3.) Save the screws for reinstallation.
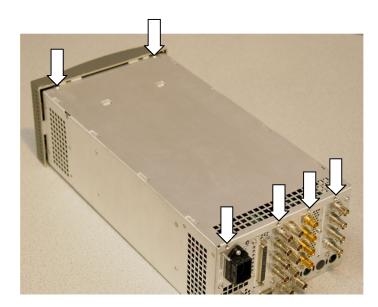
Figure 3: Removing the chassis cover

5. Slide the chassis cover toward the back of the instrument, and then lift and remove the chassis cover from the instrument.

6. Remove the four screws from the module guide brackets. (See Figure 4.) Remove the brackets and save the screws for reinstallation. Note that the brackets are keyed to the fit on the chassis in only one direction.
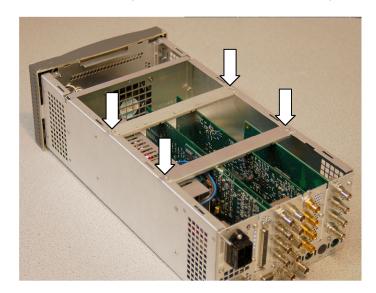

Figure 4: Removing the module guide brackets (option boards shown)

Hardware Installation
WFM612UP EYE
WFM712UP EYE
WFM612UP PHY
WFM712UP PHY
WFM702UP 3G
WFM712UP 3G

For Options EYE, PHY, and 3G upgrades, perform the following steps to install the option module into the instrument. Read the entire installation procedure before installing the module.

NOTE. Options EYE, PHY, and 3G all occupy the same compartment in the instrument. If your instrument already contains a module in the EYE, PHY, or 3G compartment, it must be removed.

If removing an option module is necessary, you can reinstall the removed option module if you require its functionality.

1. Remove the six screws from the Option EYE/PHY/3G and CPS rear panels. (See Figure 5.) Save the screws for reinstallation.

2. Remove the Option EYE/PHY/3G and CPS rear panels, or if installed, remove the Option Eye/PHY/3G and/or Option CPS module(s) from the instrument.

NOTE. If you have difficulty removing or installing a module or rear panel because of a lack of clearance with an adjacent rear panel, loosen the screws on the adjacent panel to allow more room for moving the desired module or rear panel while you are performing this procedure.
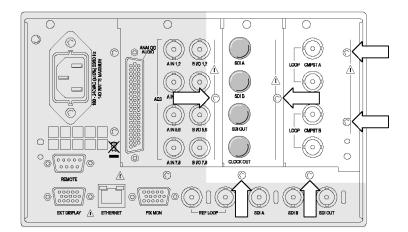

Figure 5: Removing the Option EYE/PHY/3G and CPS rear panel screws

3. If installed, perform the following steps to remove the I/O Mezzanine module:

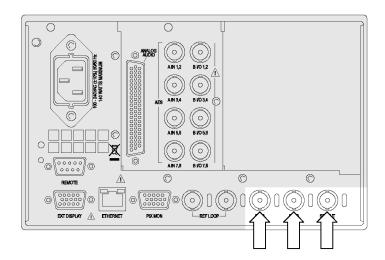   a. Remove the hex nuts and washers from the three BNC connectors on the I/O Mezzanine module. (See Figure 6.)

Figure 6: Removing the hex nuts and washers from the BNC connectors

⚠ *CAUTION. To prevent damage to the cable wires, remove the ribbon cable by grasping the connector housing. Do not pull up on the cable wires.*

    b. Remove the ribbon cable between J4 in the I/O Mezzanine module and J16 on the Main Interface board. (See Figure 7.)

    c. Remove the two screws from the I/O Mezzanine module. Save the screws for reinstallation.

    d. Lift the I/O Mezzanine module out of the instrument. Place the removed module in an anti-static bag for storage.

    e. Replace the two standoff posts on the Main Interface board (that supported the I/O Mezzanine module) with the two screws you removed in step c.

    f. Insert the plastic hole plugs supplied in this kit into the three empty BNC connector holes on the rear panel.
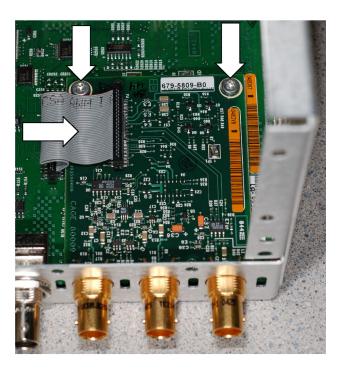
Figure 7: Removing the I/O Mezzanine module

⚠️ *CAUTION. To prevent damage to the cable wires, install the ribbon cable by grasping the connector housing. Do not press or pull on the cable wires.*

4. Install one end of the ribbon cable supplied in this kit onto J16 on the Main Interface board. The cable connector is keyed and can only be installed one way on both the Main Interface board and the option board.

   - Option EYE or PHY: Dress the cable towards the side of the instrument away from the power supply. (See Figure 8.)

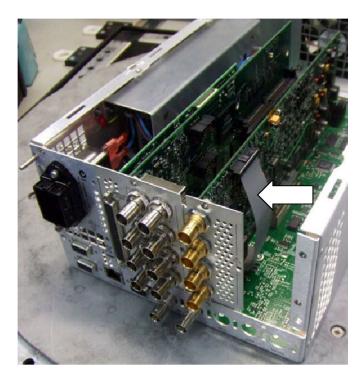   - Option 3G: Dress the cable towards the power supply. (See Figure 9.)
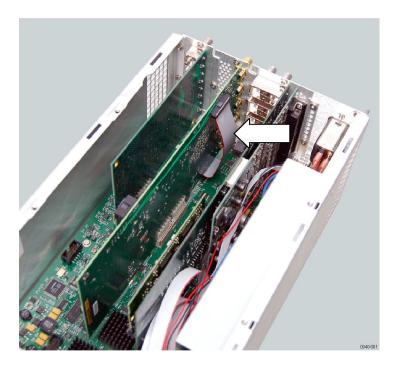
Figure 8: Installing the Option EYE or PHY cable

Figure 9: Installing the Option 3G cable

5. Install the new Option EYE, PHY, or 3G module into the instrument, fully inserting the connector on the module into J9 on the Main Interface board.

The recessed flange on the left side of the module rear panel slides behind the adjacent rear panel.

6. Install the other end of the ribbon cable onto J5 on the Option EYE, PHY or 3G module.

7. Perform the following steps if you do not have any other hardware modules to install. Otherwise, proceed to installing the next module.

   a. Reinstall the Option CPS rear panel or module. The recessed flange on the left side of the module rear panel slides behind the adjacent rear panel.

   b. Install the six screws into the Option EYE/PHY/3G and CPS rear panels. (See Figure 5.) Tighten the six screws and any adjacent rear panel screws you loosened to 8 in/lbs.

   c. Reinstall the instrument cover and module support brackets by performing the removal procedure in reverse order. (See page 15, *Remove the Instrument Cover and Module Guide Brackets*.)

   d. Install the option software key. (See page 26, *Install the Option Software Key*.)

**Hardware Installation
WFM612UP CPS
WFM702UP CPS
WFM712UP CPS**

For Option CPS upgrades , perform the following steps to install the Option CPS module into the instrument. Read the entire installation procedure before installing the module.

1. Remove the four screws from the Option CPS rear panel. (See Figure 10.) Then remove the panel. Save the screws for reinstallation.

NOTE. If you have difficulty removing or installing a module or rear panel because of a lack of clearance with an adjacent rear panel, loosen the screws on the adjacent panel to allow more room for moving the desired module or rear panel while you are performing this procedure.
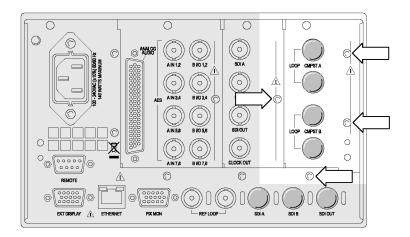

Figure 10: Removing the Option CPS rear-panel screws

2. Install the Option CPS module supplied with this kit into the instrument, fully inserting the connector on the module into J13 on the Main Interface board. The recessed flange on the left side of the module rear panel slides behind the adjacent rear panel.

3. Perform the following steps if you do not have any other hardware modules to install. Otherwise, proceed to installing the next module.

   a. Install the four screws into the Option CPS rear panel. Tighten the four screws and any adjacent rear panel screws you loosened to 8 in/lbs.

   b. Reinstall the instrument cover and module support brackets by performing the removal procedure in reverse order. (See page 15, *Remove the Instrument Cover and Module Guide Brackets*.))

   c. Install the option software key. (See page 26, *Install the Option Software Key*.)

**Hardware Installation
WFM612UP AD
WFM702UP AD
WFM712UP AD
WFM712UP DDE**

For audio upgrades only (Option AD or DDE), perform the following steps to install the audio module into the instrument. Read the entire installation procedure before installing the module.

NOTE. If only installing the hardware Option DDE (an audio board is already present), skip to step 4 to install the Option DDE hardware.

1. Remove the four screws from the audio-options rear panel. (See Figure 11.) Save the screws for reinstallation.

2. Remove the audio-options rear panel. If an audio module is already installed, remove the audio module from the instrument. Place the removed module in an anti-static bag for storage.

NOTE. If you have difficulty removing or installing a module or rear panel because of a lack of clearance with an adjacent rear panel, loosen the screws on the adjacent panel to allow more room for moving the desired module or rear panel while you are performing this procedure.
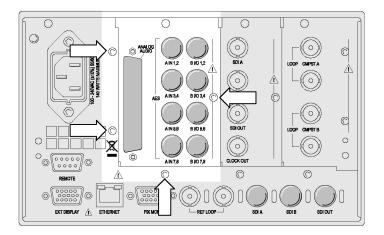

Figure 11: Removing the audio-options rear panel screws

3. On the new audio module, carefully squeeze the two circuit boards together near the inter-board connector and verify that the connector is fully seated. (See Figure 12.)

4. **Option DDE only.** Install the Dolby E module supplied in this kit into J631 of the audio module. Fully insert the connector on the Dolby E module into the socket on the audio module, and then rotate the Dolby E module in towards the audio module until the Dolby E module latches into position. (See Figure 13.)

NOTE. If installing Option DDE into an instrument with an audio module already installed, you do not need to remove the module from the instrument to install Option DDE.

---

5. Install the new audio module into the instrument, fully inserting the module connector into J8 on the Main Interface board. The recessed flange on the left side of the module rear panel slides behind the adjacent rear panel.
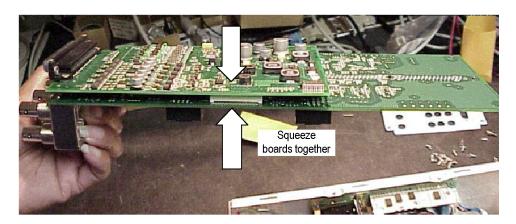

Squeeze
boards together

Figure 12: Checking the inter-board connection

Insert Dolby E module into socket,
and then rotate in towards audio
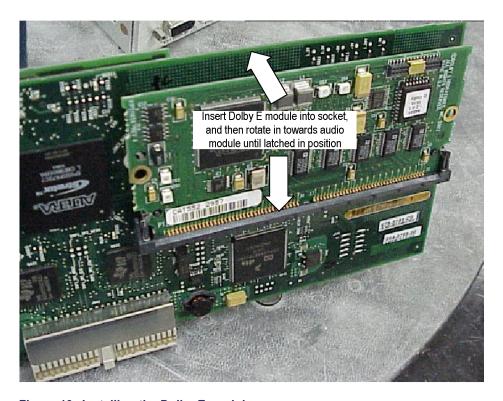module until latched in position

Figure 13: Installing the Dolby E module

NOTE. For audio options AD and DDE, use the supplied 62-pin DSUB connector to attach analog-audio signals to the instrument. Solder wires to the connector as needed to accommodate the desired audio inputs and outputs. Refer to the Quick Start User Manual for the connector pin assignments.

Audio signals can be connected as either balanced or unbalanced. Be sure to use a suitable cable when you are wiring balanced audio. An example of a suitable cable is Belden 8451, which is a shielded twisted pair cable.

Alternatively, you can purchase an audio breakout cable (Tektronix part number 012-1688-00), which provides a two meter cable with XLR connectors for all twelve inputs and eight outputs.

---

6. Perform the following steps if you do not have any other hardware modules to install. Otherwise, proceed to installing the next module.

   a. Install the four screws into the audio-options rear panel. Tighten the four screws and any adjacent rear panel screws you loosened to 8 in/lbs.

   b. Reinstall the instrument cover and module support brackets by performing the removal procedure in reverse order. (See page 15, *Remove the Instrument Cover and Module Guide Brackets*.)

   c. Install the option software key. (See page 26, *Install the Option Software Key*.)

Install the Option Software Key

Read the entire procedure before installing the software option key.

> ⚠ **CAUTION.** *To prevent upgrade failure, your instrument must have the latest version of software installed before installing the hardware upgrade and before installing the option key. (See page 10, Install the Software Upgrade.)*

1. Verify that the instrument is powered on and connected to your local network.

2. Verify the IP address of the instrument:

    a. Press the **CONFIG** button on the front panel.

    b. Navigate to **Utilities** > **Communications** > **Network Setup**.

    c. Note the IP address of the instrument.

    d. If the instrument does not have an IP address set, ask your network administrator for a valid IP address. Refer to the online help or the *Technical Reference* manual on how to set the instrument IP address.

3. Verify that you have access to a PC with a Web browser application that is connected to a network with access to the instrument.

4. Perform the following steps to enter the software option key:

    a. On the PC, open your Web browser application.

    b. In the address bar of the Web browser, enter the IP address of the instrument you are upgrading. This opens the **Tektronix WFM6120/WFM7120 Remote Interface** screen.

    c. Click the **Instrument Options** link to open the **Active WFM 6x00/7x00 Options** screen.

    d. In the **Key** field, enter the 20-character option key string (with or without dashes). The new option key is supplied in the Important Documents envelope.

    e. Click the **Submit** button to enable the software option. The instrument enables the option and adds the installed option to the list of currently installed options shown at the top of the screen.

> **NOTE.** *If you purchased multiple options, the software option key supplied with this kit activates all of the options you purchased.*

Verify the Upgrade

Quick Verification

Perform the following procedure to verify that the new option(s) have been installed and the instrument is functioning correctly:

1. Power on the instrument.

2. Verify the installed options by performing the following steps:

    a. Press the **CONFIG** button on the front panel.

    b. Navigate to **Utilities** > **View Instmt Options** to display the installed options.

    c. Verify that the options installed prior to this upgrade are still enabled, and that the new option(s) you installed are enabled.

NOTE. If the option(s) you just installed are not listed or if your previously installed options are not listed, contact Tektronix for assistance.

3. Verify that the instrument passes the advanced diagnostic tests by performing the following steps:

    a. In the Config menu, navigate to **Utilities** > **Run Advanced Diag**.

    b. Press the **SEL** button on the front and select **Continue** in the Advanced Diagnostics dialog to start the tests.

    c. Verify that for each diagnostic test the result reads **Pass**.

    d. Press the **SEL** button on the front panel to reboot the instrument.

NOTE. If a diagnostic test fails, contact Tektronix for assistance.

Detailed Verification

If you want to perform additional verification of the installed options, perform the *Incoming Inspection Tests* found in the *Specifications and Performance Verification* manual using the specified test equipment.

- End of document -