

Instructions



AWG710 option02(Extended BandWidth Output) Upgrade Kit (040-A052-00)

075-A020-50

This document applies to user program version
3.0 and above.

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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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.

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.

The common terminal is at ground potential. Do not connect the common terminal to elevated voltages.

Do not apply a potential to any terminal, including the common terminal, that exceeds the maximum rating of that terminal.

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

Use Proper Fuse. Use only the fuse type and rating specified for this product.

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

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

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.

Symbols and Terms

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.*

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.

Symbols on the Product. The following symbols may appear on the product:



WARNING
High Voltage



Protective Ground
(Earth) Terminal



CAUTION
Refer to Manual



Double
Insulated

Service Safety Summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* 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 mains power by means of the power cord or, if provided, the power switch.

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.

Memory Backup Battery. This product contains a Lithium:poly-carbon monofluoride battery for memory backup purposes. This battery is not user replaceable.

040-A052-00, AWG710 option02 Upgrade Procedures

Introduction

This is the instructions sheet of the AWG710 option02 Extended BandWidth Output upgrade kit. There are Removal Procedures and Installation Procedures.

The Extended BandWidth Output function is available on the user program version 3.0 and above.

The Extended BandWidth Output upgrade kit (040-A052-00) contains a panel assembly (614-A027-00) and module kit (650-A910-00) and user program Version 3.0 CD(062-A305-50).

This instruction explains the upgrade procedures for exchange the panel assembly and module.

NOTE. *If AWG710 is not user program version 3.0 and above, you must upgrade the user program version of AWG710. Do the user program upgrade procedures, refer to the readme file in CD packed together with this Upgrade Kit.*

Instruments AWG710

Kit Parts List The upgrade kit contains:

040-A052-00, AWG710 option02 (Extended BandWidth Output) Upgrade Kit includes 614-A027-00, 650-A910-00 and 062-A305-50.

Table 1-1 shows all parts in this Kit.

Table 1-1: Parts List

Tektronix Part Number	Description	Qty
614-A027-00	PANEL ASSY KIT	1
174-B934-00	W5510, 45CM L, MKD 1, SMA-PELTRA	1
174-B935-00	W5511, 45CM L.,MKD 2, SMA-PELTRA	1
174-B936-00	W5610, 45CM L.,MKD 3, SMA-PELTRA	1
174-B937-00	W5611, 45CM L.,MKD 4, SMA-PELTRA	1
174-C046-00	W701, 15CM L.,MKD 1, SMA-SMA, (CH1-K100)	1
174-C047-00	W702, 15CM L.,MKD 2, SMA-SMA, (CH2-K200)	1
671-B152-00	A22, KEY ON/OFF	1

Table 1-1: Parts List (Cont.)

Tektronix Part Number	Description	Qty
211-0871-00	SCREW, MACHINE: M3X8MM L	3
366-0753-00	PUSH BUTTON: TEE TAN, ABS	2
343-0549-00	STRAP, TIEDOWN	2
211-0751-00	SCREW, MACHINE: M3X8MM L	5
333-A463-00	PANEL, FRONT: SMA, AWG710op02, POLYCARBONATE	1
407-A655-00	BRACKET, ASSY: OUTPUT CONNECTOR	1
650-A910-00	MODULE KIT	1
671-B271-50	A72: OUTPUT	1
148-A079-00	RELAY (K100, K200)	2
211-A240-00	SCREW MACHINE: M3X20MM	4
220-A184-00	NUT, PLAT: AL	2
174-C048-00	W5400, 25CM L MKD 1, SMA-PELTRA (K100 - A50:J5400)	1
174-C049-00	W5401, 25CM L MKD 2, SMA-PELTRA (K200 - A50:J5401)	1
174-C050-00	W510, 10CM L, MKD 1, SMA-PELTRA (K100 - A72:J510)	1
174-C051-00	W520, 10CM L, MKD 2, SMA-PELTRA (K200 - A72:J520)	1
174-C052-00	W710, W720, 10CM 4CON, RIBON	2
075-A020-50	INSTRUCTION MANUAL	1
334-A623-50	IDENTIFICATION LABEL FOR REAR	1
129-A061-00	SPACER PLAIN: #3,6MM OD	6
211-0751-00	SCREW, MACHINE: M3X8MM L	6
062-A305-50	SOFTWARE, AWG710op02, USER PROGRAM, Ver3.0	1

Preparation



WARNING. Before doing this procedure in this manual, read the Safety Summary found at the beginning of the AWG710 Service manual(070–A830–50). Also, to prevent possible injury to service personnel or damage to this generator’s components, read Preventing ESD below.



WARNING. Before doing any procedure in this subsection, disconnect the power cord from the line voltage source. Failure to do so could cause serious injury or death.



CAUTION. Static discharge can damage any semiconductor component in this generator.

Preventing ESD

When performing any service which requires internal access to the waveform generator, adhere to the following precautions to avoid damaging internal modules and their components due to electrostatic discharge (ESD).

1. Minimize handling of static-sensitive modules.
2. Transport and store static-sensitive modules in their static protected containers or on a metal rail. Label any package that contains static-sensitive modules.
3. Discharge the static voltage from your body by wearing a grounded antistatic wrist strap while handling these modules. Do service of static-sensitive modules only at a static-free work station.
4. Nothing capable of generating or holding a static charge should be allowed on the work station surface.
5. Handle circuit boards by the edges when possible.
6. Do not slide the modules over any surface.
7. Avoid handling modules in areas that have a floor or work-surface covering capable of generating a static charge.

Equipment Required

Most modules in this generator can be removed with a screwdriver with a size #2, Phillips tip. Use this tool whenever a procedure step instructs you to remove or install a screw unless a different size screwdriver is specified in that step.

Table 1-2: Tools required for module removal

Item No.	Name	Description
1	Screwdriver handle	Accepts Phillips–driver bits
2	#2 Phillips tip	Phillips–driver bit for #2 screw size
3	Wrench, 5/16 inch	Standard tool, Wrench, 5/16 inch
4	Nutdriver, 5.5mm (7/32 inch)	Standard tool, Nutdriver, 5.5mm (7/32 inch)

AWG710 Orientation

In this manual, procedures refer to “front,” “right,” “top,” etc. of the waveform generator. Figure 1–1 shows how the sides are referenced.

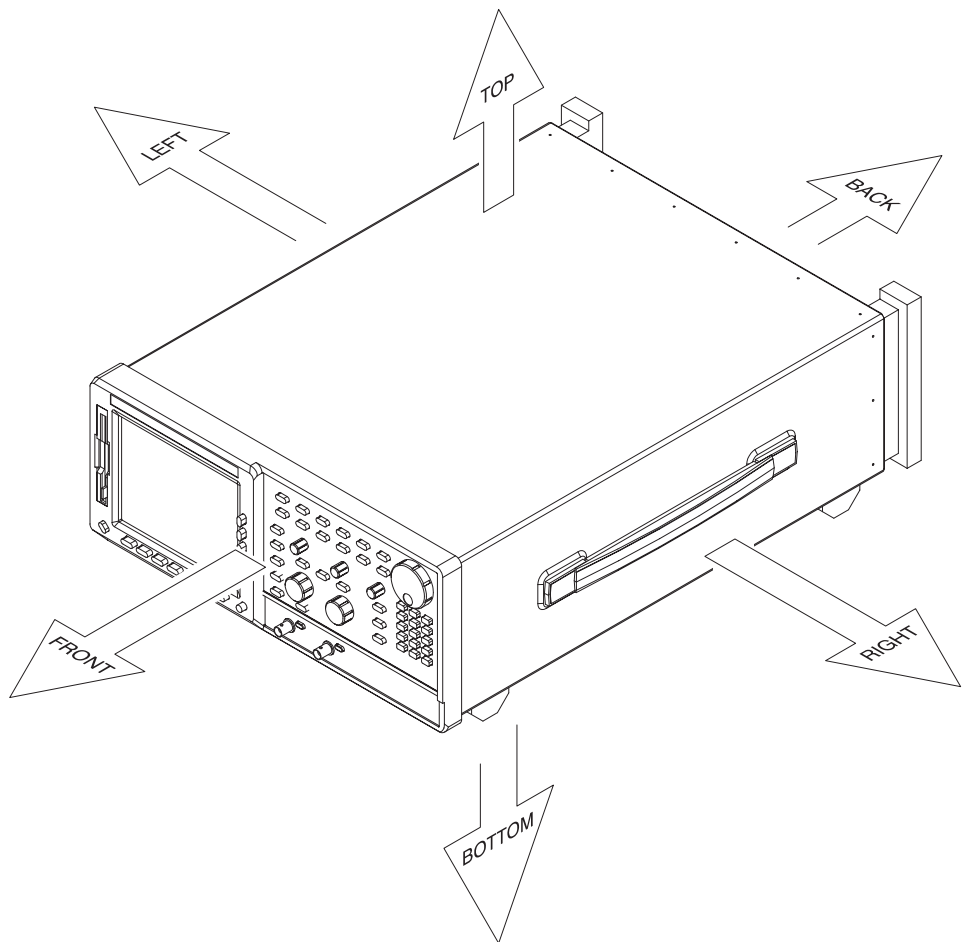


Figure 1-1: AWG710 Orientation

Upgrade the user program

To enable the extended bandwidth output function, you also need to upgrade the user program to version 3.0.

Do the system software upgrade procedures, refer to readme file in CD packed together with this Upgrade Kit.

Displaying the instrument software version

Do the following steps to display the instrument software version.

1. Push **UTILITY** (front-panel)→**Status** (bottom)→**System** (side) to display the instrument software version.

Removal Procedures

This subsection contains removal procedures for the upgrade kit.



WARNING. Before doing any procedure in this subsection, disconnect the power cord from the line voltage source. Failure to do so could cause serious injury or death.

Removal of the cabinet

Do the following procedures to remove the cabinet.

1. *Assemble equipment and locate modules to be removed:*
 - a. Have handy a screwdriver with a size Phillips #2 tip (Items 1 and 2).
 - b. Make sure the generator's front cover (optional accessory) is installed; if it's not, install it by snapping its edges over the trim ring.
2. *Disconnect the line cord:* Unplug the line cord from its receptacle at the rear cover.
3. *Orient the generator:* Set the generator so its face is down with its front cover on the work surface and its bottom facing you.
4. *Remove the cabinet:*
 - a. At the rear of the cabinet, remove the six screws securing the two feet.
 - b. At the center of the rear, remove the two screws.
 - c. At the rear of the cabinet, grasp its left and right edges.
 - d. Pull upward to slide the cabinet off the generator. Take care not to bind or snag the cabinet on the generator's internal cabling as you remove it.

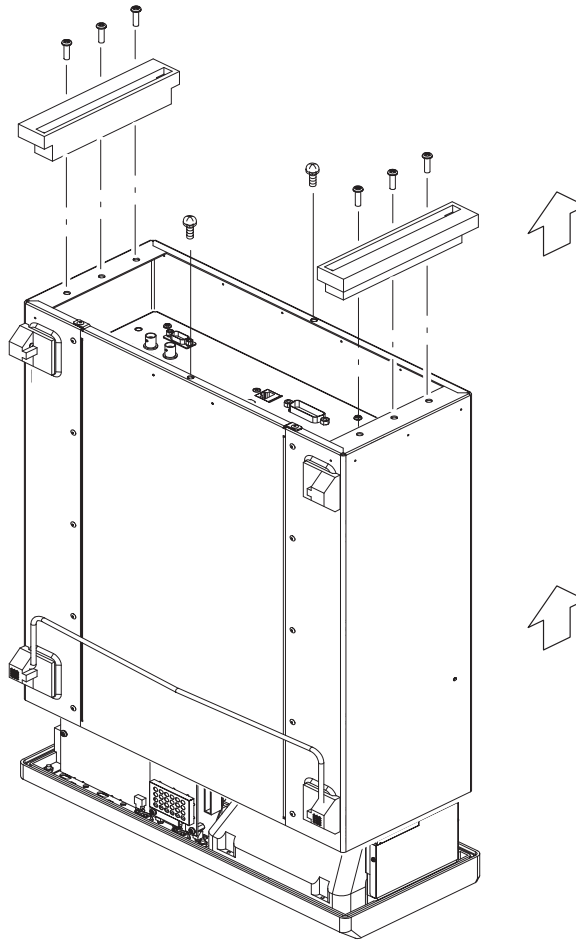


Figure 1-2: Cabinet removal

Remove Output Assembly

Remove Trim Ring

No tools are needed for this procedure.

1. Locate the modules to be removed in Figure 1-3.
2. Orient the generator so the rear is on the work surface and the bottom is facing you.
3. Remove the front cover by grasping it by the left and right edges and snap it off of the front subpanel. When installing, align and snap back on. See Figure 1-3.

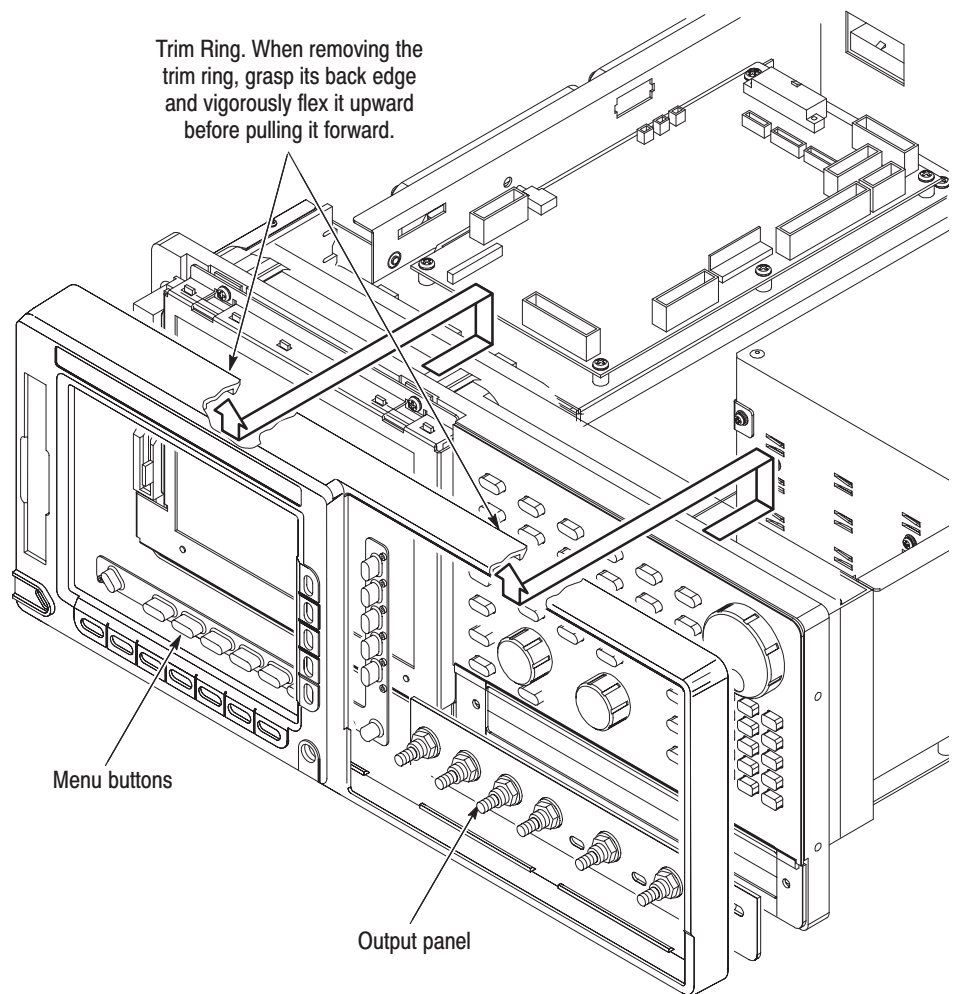


Figure 1-3: Trim ring and menu buttons removal



CAUTION. *To prevent damage to the contacts, do not touch the carbon contact points on the menu buttons installed in the trim ring. Also, do not touch the contacts on the flex circuit exposed when you remove the trim ring.*

4. Remove the trim ring by grasping the top edge and prying it up and lifting it forward to snap it off the front subpanel. If servicing the menu buttons, lift them out of the trim ring. When installing, insert the menu buttons, align the trim ring to the front subpanel and press it back on.

A20 Front Panel Assembly

This procedure includes removal and installation instructions for the front panel. Unless either of those modules are being serviced, do not do step 4.

You will need a screwdriver with a size #2 Phillips tip (Table 1–2, Items 1 and 2, Page 1–4).

1. Locate the modules to be removed in Figure 1–4, page1–9.
2. Orient the waveform generator so the bottom is on the work surface and the front is facing you.
3. Remove the front panel assembly from the front subpanel by lifting the assembly until you can reach the interconnect cable connecting to the Connector board.
4. Disconnect the cable at J154 of the Connector board. Disconnect the flex-board connector at P3 of the front panel assembly. (The flex board is part of the display-frame assembly.) See Figure 1–4, page1–9.
5. Lift the front panel assembly out of the front subpanel to complete the assembly.

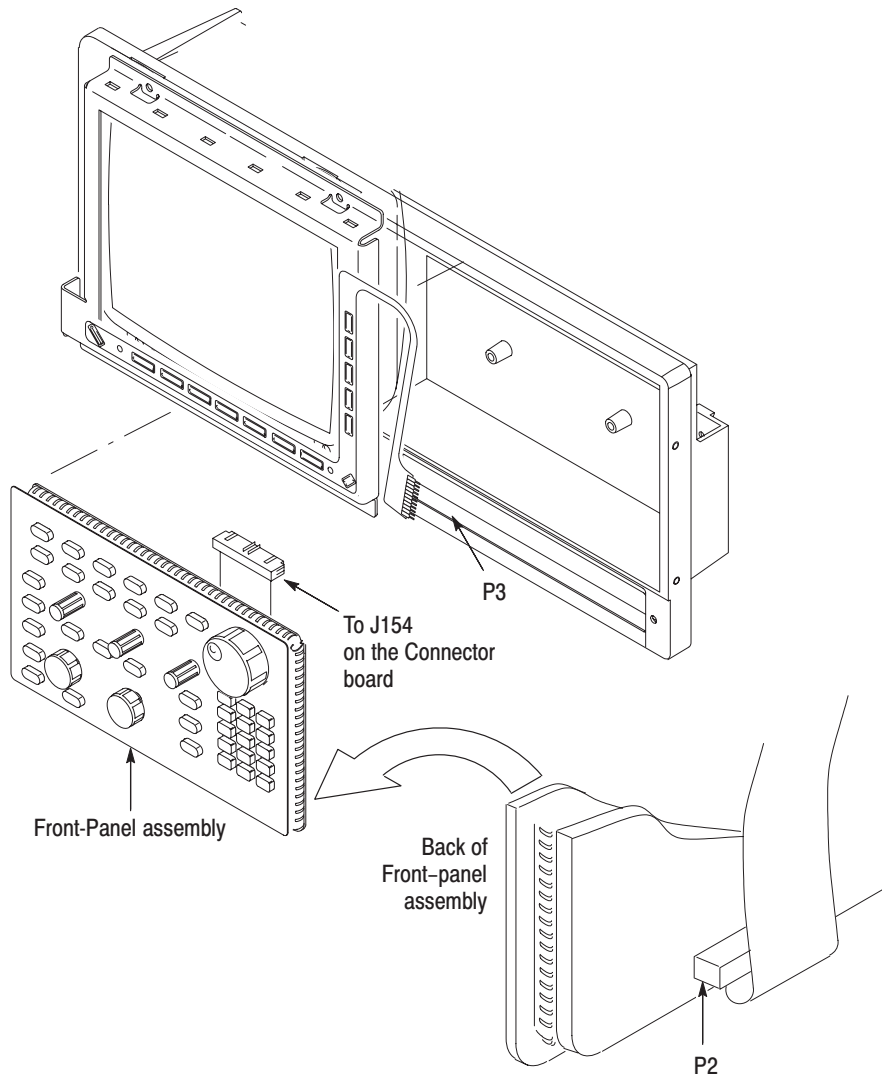


Figure 1-4: A20 Front Panel assembly removal

Remove A77 Attenuator module

This procedure describes how to remove both A77 Attenuator Module and A71 Output board.

Remove the module which A77 is within.

You will need a screwdriver with a size #2 Phillips tip (Table 1–2, Items 1 and 2, Page 1–4).

1. Locate the modules to be removed in Figure 1–5.
Figure 1–5 shows the condition that a cover has already been removed from A77 Attenuator Module.
2. Orient the waveform generator so its top is down on the work surface and its front is facing you.

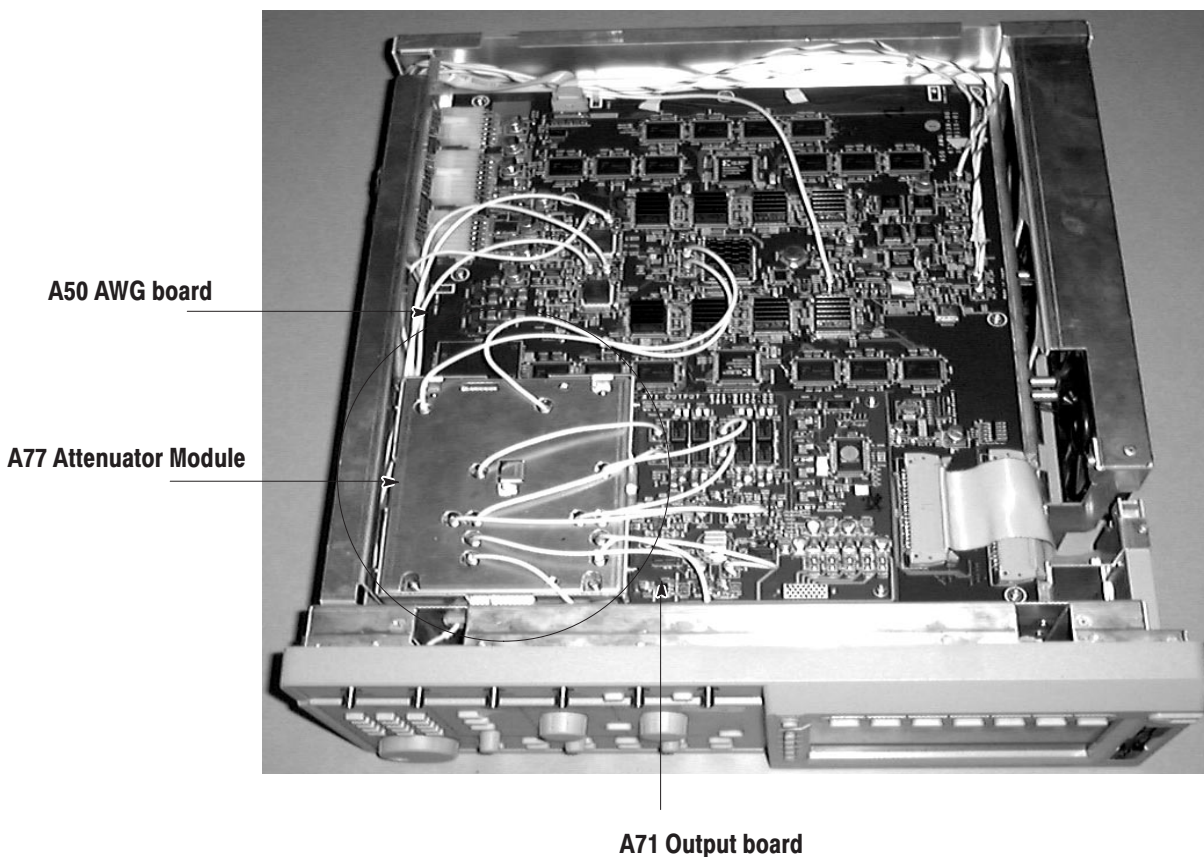


Figure 1-5: A77 Attenuator module location

3. Remove the *A77 Attenuator Module* with the shield case using Figure 1–5 on page 1–10 and Figure 1–6 on page 1–12 as a guide.

4. Remove two screws to remove a cover of A77 Attenuator module.
5. Unplug these cables:
 - Output cables to CH1 and $\overline{\text{CH1}}$ Output connector
 - Two cables from the A50 AWG board, (J5400 and J5401)
 - Eight cables from the A71 Output board
6. Remove the five screws on the upper surface attaching the shield case to the *A71 Output Board*.
7. Lift the shield case including the *A77 Attenuator Module* up perpendicularly from the *A71 Output Board* to complete the removal.

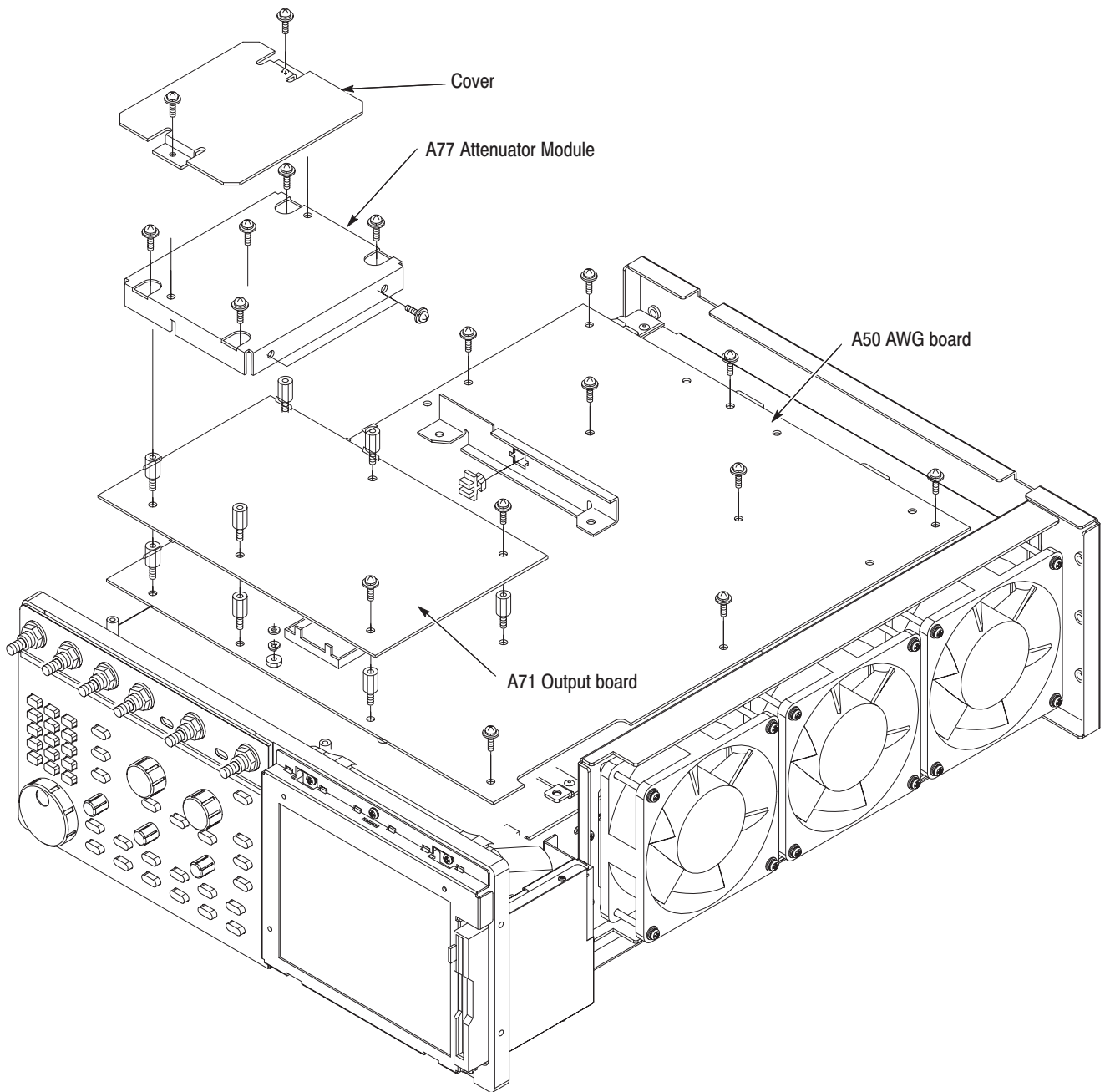


Figure 1-6: Removal of the A77 and A71 boards

Remove A71 Output Board

You will need a screwdriver with a size #2 Phillips tip (Table 1–2, Item 1 and 2, and Item 3, Page 1–4).

1. Locate the modules to be removed in Figure 1–6, page 1–12.
2. Orient the waveform generator so its top is down on the work surface and its rear is facing you.
3. Perform the *A77 Attenuator Module* procedure that precedes this procedure to remove the interconnect cables.
4. Remove the *A71 Output Board* using Figure 1–5 on page 1–10 and Figure 1–6 on page 1–12 as a guide.
5. Remove the six screws on the front panel and rear panel sides that attach the *A71 Output Board* to the A50 AWG board.
6. Lift the Output board up perpendicularly from the A50 AWG board to complete the removal.

Remove Output Assembly

You will need a screwdriver with a size Phillips #2 tip (Table 1–2, Items 1 and 2, Page 1–4).

1. Locate the modules to be removed in Figure 1–7, page 1–14.
2. Orient the waveform generator so the bottom is on the work surface and the front is facing you.
3. To remove the output panel, disconnect the on/off cable at J600 and four peltora cables(J5510, J5511, J5610 and J5611)of the A50 AWG board.
4. Remove the three screws at the front side of the chassis, the two screws on the bottom of the chassis and the two screws at the right side of the chassis attaching the Output assembly to the main chassis.
5. Pull out the Output assembly from the main chassis.

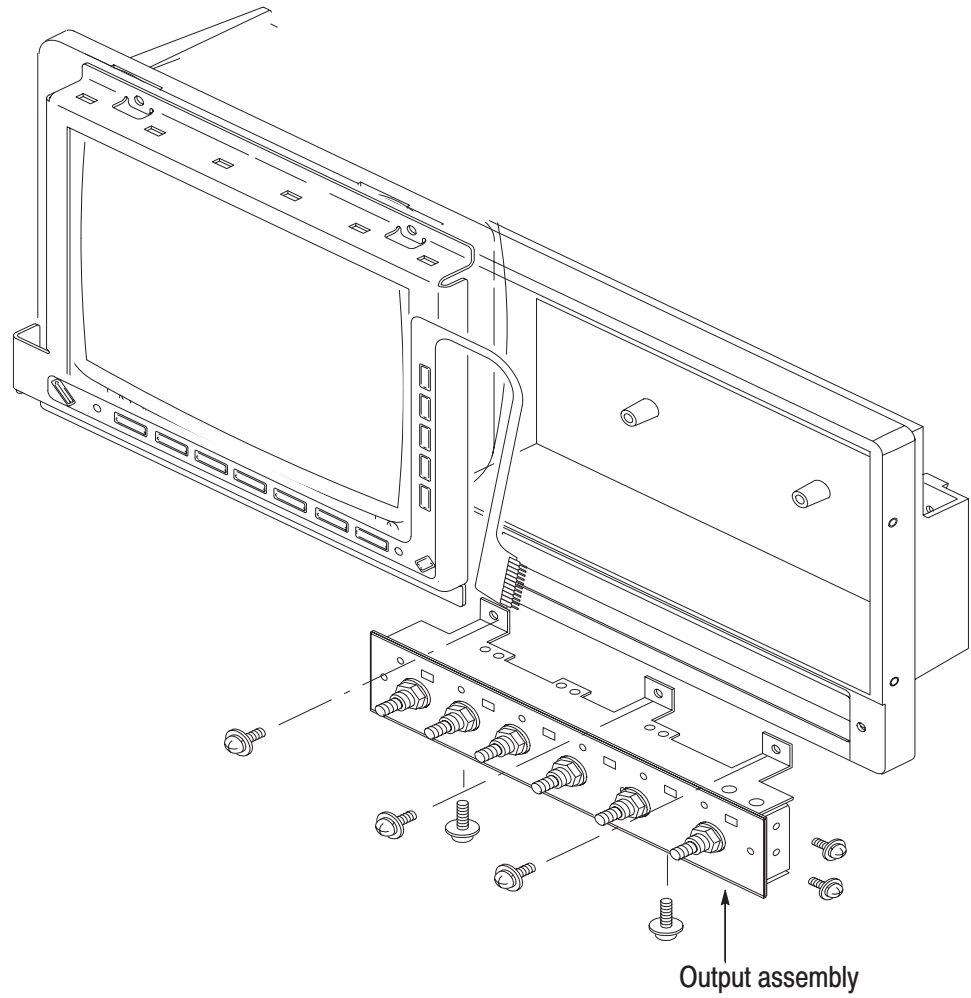


Figure 1-7: Output assembly removal

Installation Procedures

This subsection contains installation procedures for the upgrade kit. You will need a screwdriver with a size Phillips #2 tip (Table 1–2, Items 1 2, and 3, Page 1–4).

Install Output Assembly

Attach the new Output Assembly(614–A027–00)

1. Connect the on/off cable from A22 with J600 of the A50 AWG board.
2. Connect the MKD1 cable with J5510 of the A50 AWG board, the MKD2 cable with J5511, MKD3 cable with J5610, MKD4 with J5611. The MKDx is mentioned in the tip of each cable.
3. Tighten the three screws at the front side of the chassis, the two screws on the bottom of the chassis and the two screws at the right side of the chassis attaching the Output assembly to the main chassis.

Install A72 Output board

1. Exchange six post spacers on the A50 AWG board for New post spacers (129–A061–00).
2. Install the A72 Output board on the post spacer with six screws.(211–0751–00)
3. Connect the MKD1 cable with J5400 of the A50 AWG board, the MKD2 cable with J5401. The MKDx is mentioned in the tip of each cable.
4. Connect the analog output cables with SMA connectors of K100 and K200 by using the Wrench (Table 1–2).

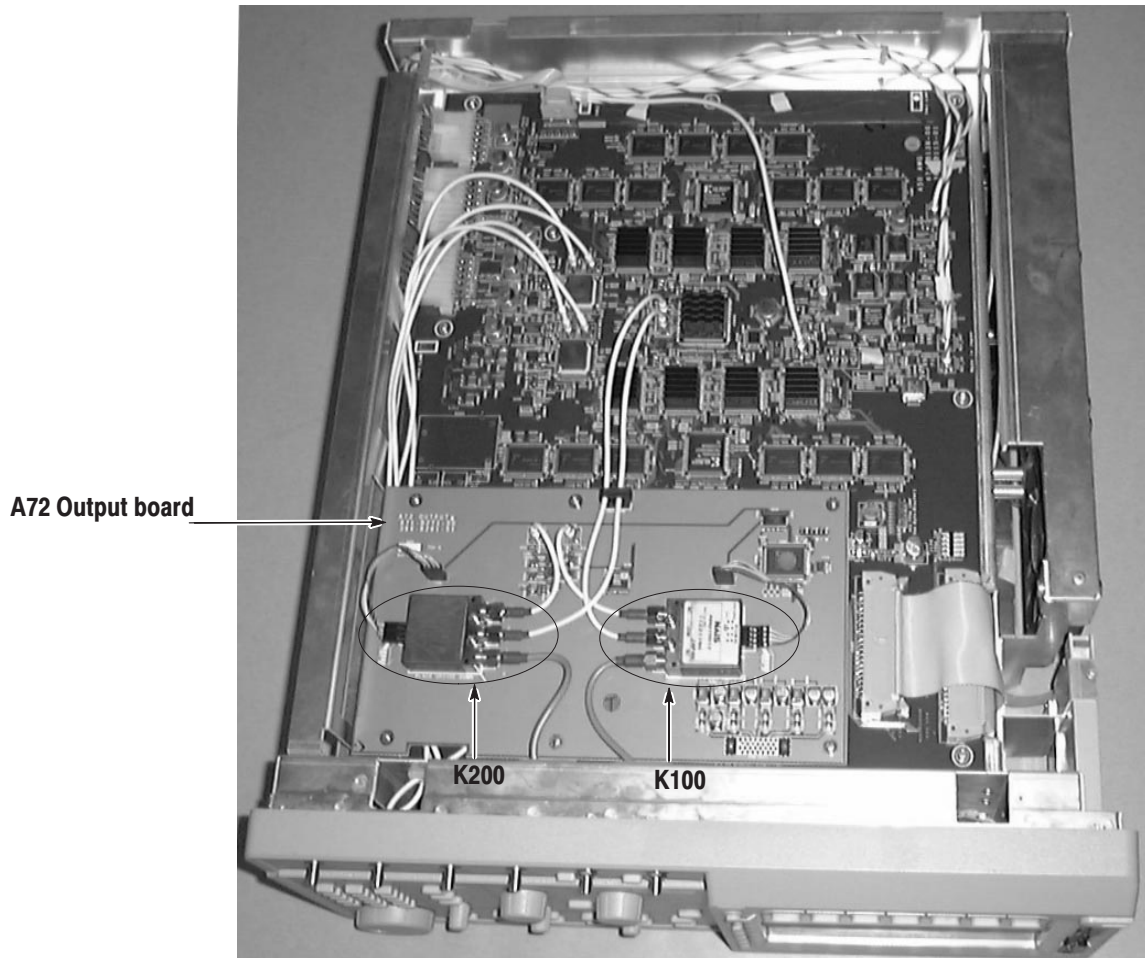


Figure 1-8: A72 Output board installation

Reinstallation of the cabinet

1. *Reinstallation of cabinet and rear cover:*
 - a. Do in reverse order steps 3 and 4 on page 1–5 to reinstall the cabinet.
 - b. Take care not to bind or snag the cabinet on internal cabling; redress cables as necessary.
 - c. When sliding the cabinet, be sure that the front edge of the cabinet aligns with the groove containing the EMI shield on the front casting.
 - d. Be sure that the ridge around the rear chassis slides into the groove containing a second EMI cable on the rear of the cabinet.
 - e. When reinstalling the eight screws at the rear panel, tighten them to 2N · m torque.

Identification label Pasting

1. Paste the identification label over the old identification label on the rear panel after completing cabinet installation.

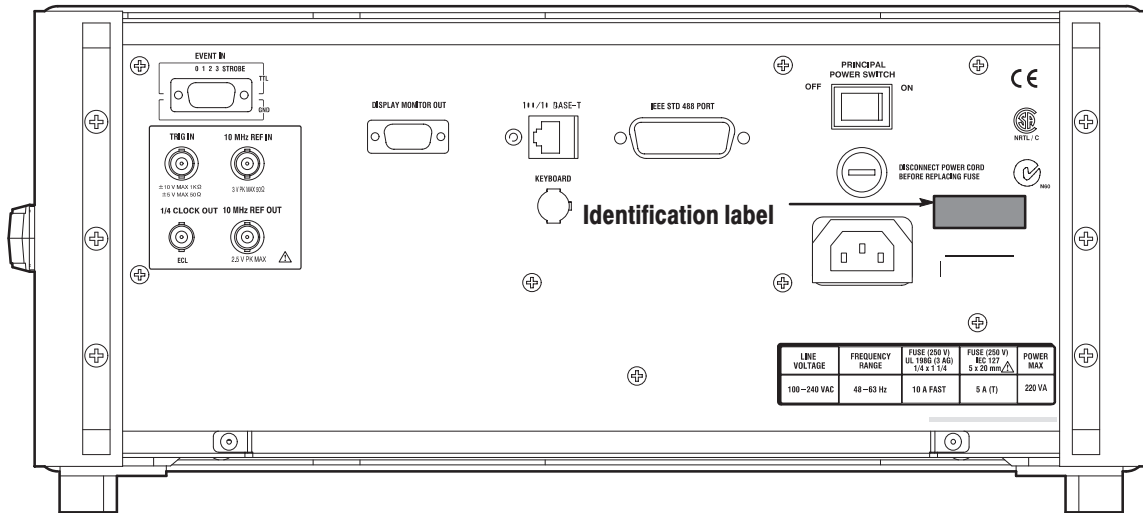


Figure 1–9: Pasting the Identification label label

Execute calibration

After 20 minutes warm up, you have to execute calibration.

Prerequisites	Power on the instrument and allow a 20 minute warm-up period at an ambient temperature between +20° C and +30° C before doing this procedure.
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Confirm that there is no output being performed by verifying that the RUN LED is not on. If the LED is on, push the **RUN** button to turn it off.

NOTE. Some calibration items may fail if you start calibration while output is being performed.

Do the following steps to verify that the internal adjustments have passed:

1. Push **UTILITY** (front-panel)→**Diag** (bottom)→ **Execute Calibration** (side).

This executes the AWG710 Waveform Generator calibration routines automatically.

The internal calibration does an extensive verification of proper the AWG710 Waveform Generator functions. While this verification progresses, the message box displaying *Executing Calibration* appears on the screen. When finished, the resulting status will appear in the message box as shown in Figure 1–10.

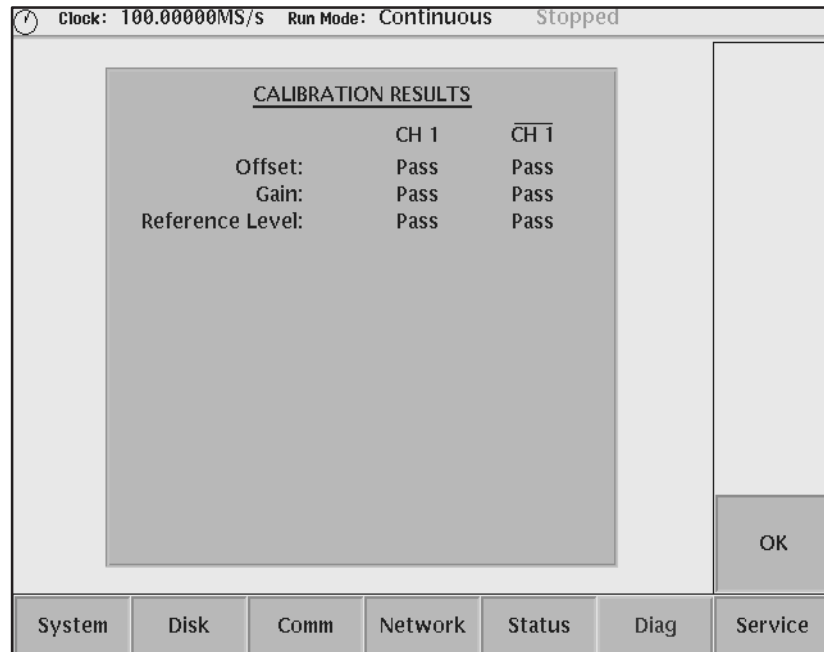


Figure 1–10: Calibration result message box

Verify that no failures are found and reported in the message box. If the calibration displays Fail as the result, consult a qualified service technician for further assistance.

2. Push the **OK** side button and then any bottom or menu button (other than the **UTILITY**) to exit the dialog screen.

NOTE. *The calibration data in the memory may be lost if the instrument is powered off while the calibration is executing.*

Check Instrument Status

Check the Instrument option.

Push **UTILITY** (front-panel)→**Status** (bottom)→**System** (side) to display the instrument option.

Check instrument option is option 02.