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Cornerstone Voice

Model 5 Indoor Voice Port Installation Guide

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Front cover

Cornerstone Voice

Model 5 Indoor Voice Port Installation Guide

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Contents

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About this document

This guide describes the installation and testing procedures for the Cornerstone® Model 5 Indoor Voice Port™ models:

- A2IP02WA (all European markets except Germany)
- A2IP02WG (Germany)

When installing a new Voice Port, perform the following procedures in order:

- Preparing for installation
- Installing the Voice Port
- Testing the Voice Port

If problems occur with the operation of the Voice Port, refer to the section:

- Troubleshooting

References in this document

This document references the following:

- *User Interfaces Reference Guide*, ARSVD00412
- *HDT Commissioning and Testing Guide*, ARSVD00391

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Safety requirements

Cornerstone complies with the applicable requirements for performance, construction, labeling, and information as outlined in the following documents:

- Canadian Standards Association standard CSA 22.2 No. 225, Equipment Electrically Connected to a Telecommunication Network
- Part 1910—Occupational Safety and Health Standards
- (Title 29— Labor, Chapter XVII-OSHA, Dept. of Labor)
- Department of Health, Education, and Welfare, Bureau of Radiological Health (BRH), 21 CFR 1040.10

European compliance

This product complies with the provisions of the Electromagnetic Compatibility (EMC) Directive (89/336/EEC), the Amending Directive (92/31/EEC), the Low Voltage Directive (73/23/EEC), the CE Marking Directive (93/68/EEC), and, as such, this product bears the CE marking in accordance with the applicable Directive(s). This product is intended for deployment in a domestic environment, and complies with the relevant EMC standards, EN55022 (class B) and EN50082-1, and safety standard EN60950.

In accordance with the requirements of EN60950 and EN41003, the Cornerstone Model 5 Indoor Voice Port meets the following interface safety standards:

- Subscriber Telephone Connections TNV
- Coaxial Network TNV
- Power Connection TNV

Preparing for installation

This chapter details the Model 5 Indoor Voice Port components and explains how to prepare to install the Voice Port.

About the Model 5 Indoor Voice Port

The Model 5 Indoor Voice Port is a two-line Voice Port designed for use with Cornerstone CsV08 and newer releases. This Voice Port has a built-in power supply with battery backup. The battery can supply six hours of idle time and three hours of usage time (with one line off hook) to the Voice Port when the AC power is disconnected.

Model 5 Indoor Voice Port models

Table 1-1 lists the Model 5 Indoor Voice Port models and the differences between them.

Table 1-1
Model 5 Indoor Voice Port models

Feature	A2IP02WA	A2IP02WG
Market	Europe (except Germany)	Germany
Telephony connectors	RJ-11	TAE
Ringing	25 Hz or 50 Hz	25 Hz
RF connector location	Internal	External
Installer	Craftsperson	Craftsperson or Subscriber

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Modem identification

A label on the back of the Voice Port shows the modem identification (modem ID) number. This modem ID number is also referred to as the Voice Port identification (VPID). The VPID is used by the Cornerstone HDT to identify the Voice Port and phone number(s) associated to the Voice Port. Record the VPID for provisioning and other future uses.

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Voice Port connections

The Model 5 Indoor Voice Port contains the following connections, as shown in Figure 1-1 and Figure 1-2:

- two coaxial F-connectors:
  - — the network or “drop” coaxial F-connector, where downstream CATV signal is connected to the electronics module
  - — the subscriber, or “home” coaxial F-connector, that feeds the subscriber equipment
- two subscriber telephone connections

Figure 1-1
Model 5 Indoor Voice Port connections (A2IP02WA)

CS-10504A

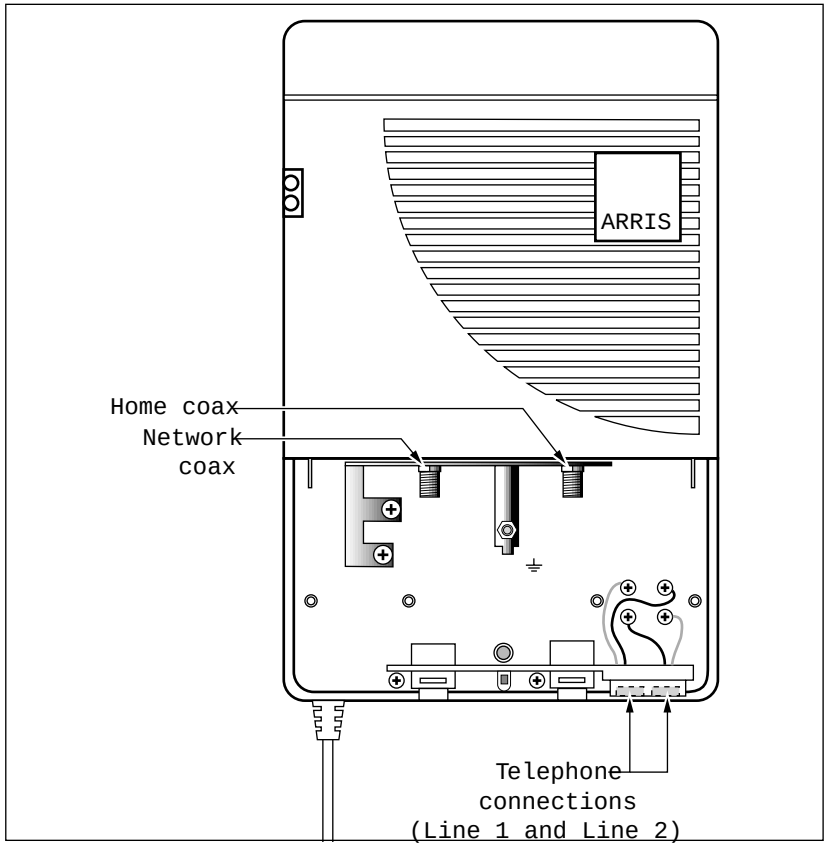

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Figure 1-2
Model 5 Indoor Voice Port connections (A2IP02WG)

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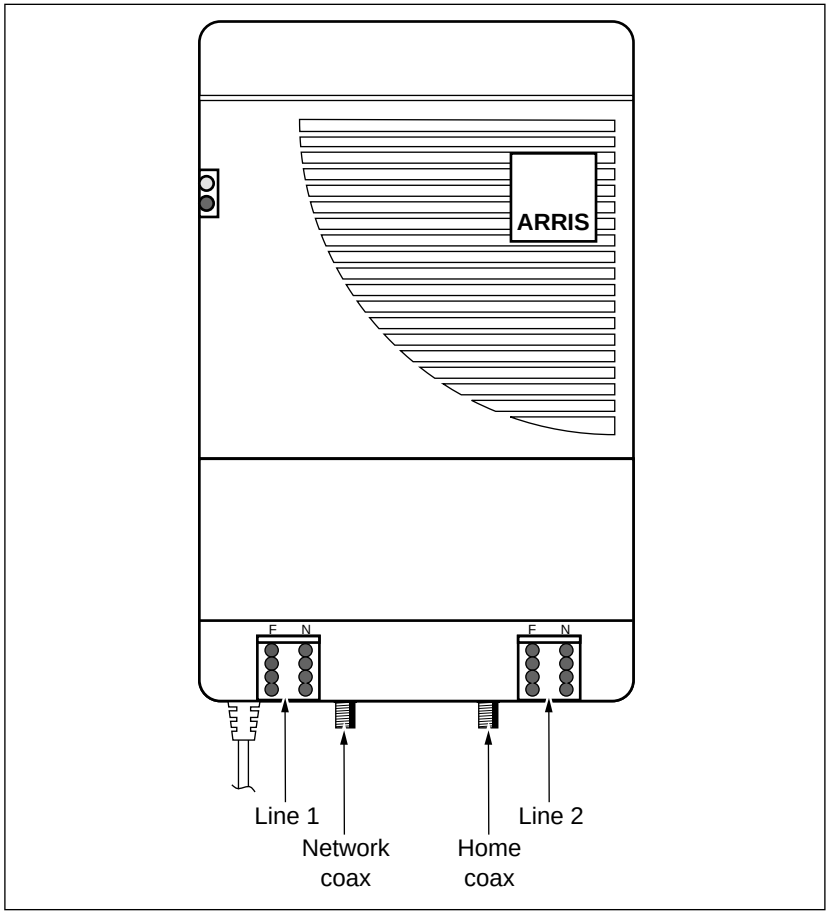

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Procedure 1-1
Preparing the Voice Port for installation

Use this procedure to prepare the Model 5 Indoor Voice Port for installation.

Requirements

To install an Model 5 Indoor Voice Port, the following parts and materials are required:

- one Model 5 Indoor Voice Port module
- tools as follows:
  - — one #2 flat-head screwdriver (for mounting the base)
  - — a #2 Phillips screwdriver (for securing the cover and cable ties)
  - — torque-limiting wrench

In addition, the following tools are optional, but recommended if available:

- CATV test set (for checking signal quality and level)
- a telephone butt-set with #6 spade lugs (for dial tone verification); an off-the-shelf telephone can be used as well

Action

1 Verify that you have all the required materials necessary for this particular installation.

2 Unpack the Voice Port.

3 If this is a pre-planned installation, verify that the customer name, address, telephone number, and VPID on the label on the back of the Voice Port match those on the work order.

4 Locate the Voice Port where both network cable and a power outlet are within convenient reach.

—continued—

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Procedure 1-1 (continued)
Preparing the Voice Port for installation

5 Remove the two screws (shown in the figure below) securing the battery cover to the Voice Port and remove the cover. If the battery is already installed, remove the battery as well.

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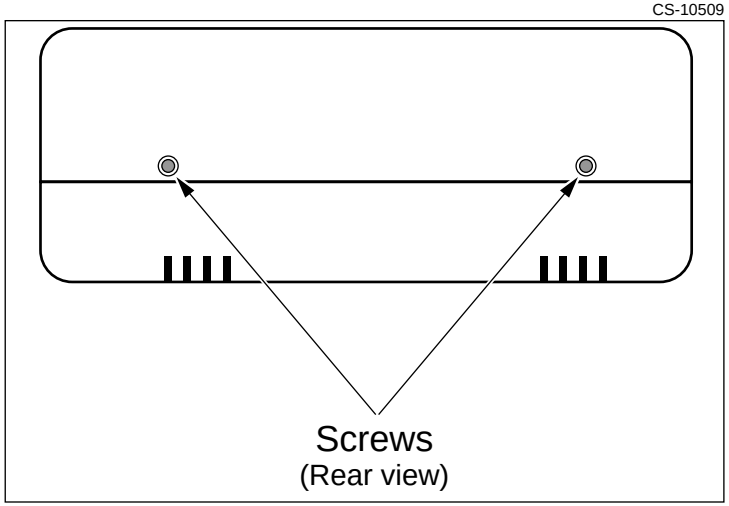

6 Check that the center pin of the drop cable connector end is not deformed or damaged.

If the coaxial cable center pin is	**Then** go to
damaged	step 7
not damaged	step 8

7 Replace connector end of the coaxial cable.

Note: The recommended connector end has its own center pin and can be directly crimped to the end of the coaxial cable. Currently, these connectors are manufactured by Augat Snap & Seal and by Gilbert TAC.

8 Remove the screw securing the front cover on the Voice Port and remove the cover.

9 Proceed to “Installing the Voice Port” on page 2-1.

—end—

Installing the Voice Port

This chapter explains how to install a new Model 5 Indoor Voice Port at a subscriber site.

Requirements

Before performing the procedures in this chapter, verify the following:

- the subscriber name, address, new telephone number, and Voice Port serial number
- the accessibility of house wiring (cable, telephone, and power)

  Note: The Voice Port provides the connection point for network coax cables up to RG11 in diameter.

- a power outlet is available near the chosen site
- the Voice Port is provisioned at the headend (if not, provision it)

  Note: Provisioning a line takes approximately two minutes.

How to use this chapter

The following table lists the procedures in this chapter. Perform them in the order shown.

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Procedure 2-1
Mounting the Voice Port

This procedure applies to Model 5 Indoor Voice Port models A2IP02WA and A2IP02WG. The Model 5 Indoor Voice Port can be wall-mounted or placed on a desktop.

Requirements

Complete the procedure “Preparing the Voice Port for installation” on page 1-5 before mounting the Voice Port.

Make sure you have the following tools before proceeding:

- one #2 flat-head screwdriver (for mounting the base)
- a #2 Phillips screwdriver (for securing the covers)
- a torque limiting wrench (for connecting the cable F-connector)

If you are wall-mounting the Voice Port, the following requirements and recommendations apply:

- For mounting to wood siding: three 31.75 mm (1.25”) 8/18 self-tapping hex slot wood screws **(included with Voice Port)**
- For mounting to drywall: three 31.75 mm (1.25”) wallboard bolts (required length may vary with thickness of drywall)

  Note: When mounting the Voice Port on drywall, try to locate the Voice Port so that the bottom screw is fastened to a stud. This may prevent future problems with the Voice Port pulling out of the wall.

- If you have already installed the battery, remove it before wall-mounting the Voice Port.

Always locate the Voice Port:

- within 1.3 m (4 feet) of an electrical outlet; the power cord must reach without stretching or by adding extension cords
- near a cable jack (to avoid long cable runs)
- near a telephone jack

—continued—

Procedure 2-1 (continued)
Mounting the Voice Port

Action

This procedure assumes that you have already completed “Preparing the Voice Port for installation” on page 1-5.

1 Proceed as follows:

If you are…	**Then** go to…
wall-mounting the Voice Port	step 2.
placing the Voice Port on a desktop	step 8.

Wall-mounting instructions

2 Position the Voice Port in the location where you intend to mount it. Drive one of the two screws (or anchor bolts) into the wall about 50 mm (2”) above the bottom center of the Voice Port. Leave a gap of about 2 mm (1/16”) between the screw head and the wall.

3 Lift the Voice Port into position. Slip the large end of the keyhole slot (in the back of the Voice Port) over the screw, then slide the case down until the narrow end of the keyhole slot contacts the screw shaft.

4 Locate the two screw slots inside the battery compartment. Use a pencil to mark the locations for the other two screws.

5 Lift the Voice Port case from the wall and set it aside. Drive the other two screws into the wall at the points marked in the previous step, then remove the screws.

6 Replace the Voice Port on the wall as described in step 3. Replace the two top screws into their holes through the battery compartment. Tighten the screws.

7 Proceed to “Connecting the Voice Port” on page 2-4.

Desktop mounting instructions

8 Make sure that sufficient room is available where you plan to place the Voice Port.

9 Orient the Voice Port so that the RF connections are facing the nearest wall. Place the Voice Port where there is no danger of it falling to the floor. The subscriber may place a phone on top of the Voice Port after you complete installation.

10 Proceed to “Connecting the Voice Port” on page 2-4.

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Procedure 2-2
Connecting the Voice Port

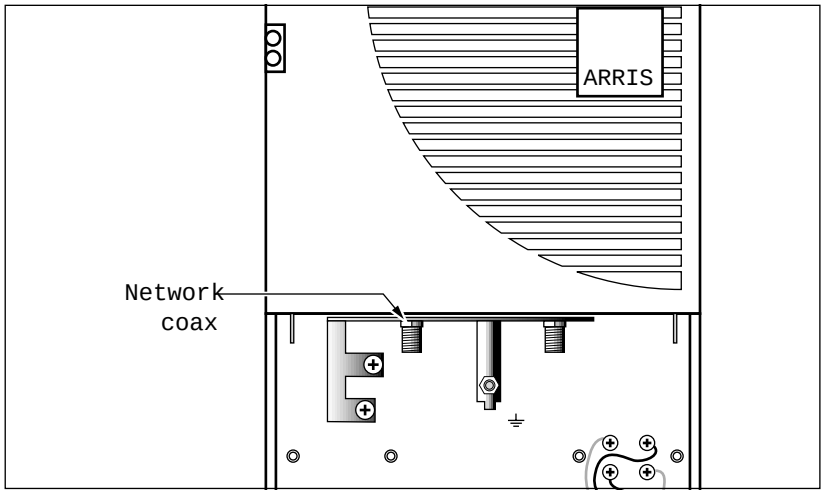
Follow these steps to make power, RF, and telephone connections to the Voice Port. Before proceeding, complete Procedure 2-1, “Mounting the Voice Port” on page 2-2.

Action

1 (Model A2IP02WA only) Remove the three screws securing the coax interface insert to the Voice Port. Set the plate and screws aside.

2 Using a torque limiting wrench, apply torque pressure of 17 to 23 Kg-cm (15 to 20 in-lb) to connect the network coax cable to the Voice Port.

CS-10505A



3 Connect a test set to the Home coax port on the Voice Port. Make sure that the quality and level of the CATV signal meets your company’s standards before proceeding. If the signal is not up to standards, refer to “Troubleshooting.”

Note: The Voice Port will pass RF signals through whether power is connected or not. Perform this step before connecting power.

—continued—

Procedure 2-2 (continued)
Connecting the Voice Port

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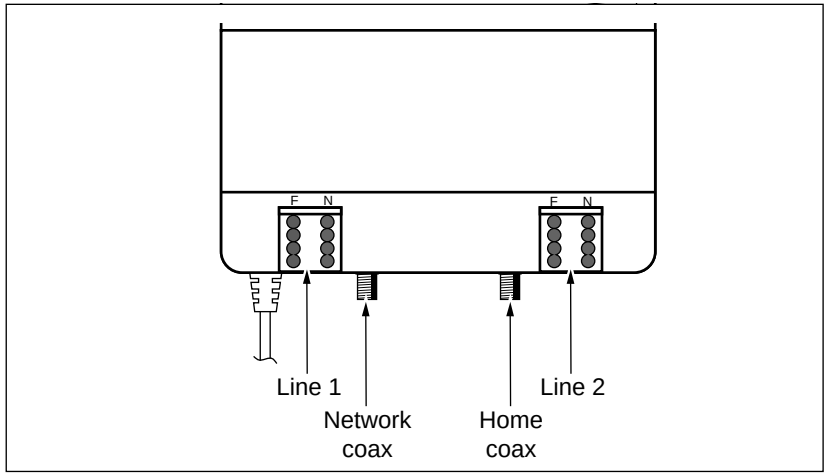
Connecting Home Coax and Phone Lines

4 Using a torque wrench, connect the house coax to the connector labelled “Home”. Apply torque pressure of 17 to 23 Kg-cm (15 to 20 in-lb).

5 (Model A2IP02WG only) Replace the coax interface insert removed in step 1, routing the network and home coax cables with TAE connectors as shown below through the slots in the insert. Secure the plate to the Voice Port using the three screws removed in step 1.

CS-10507



6 (Model A2IP02WA only) Replace the coax interface insert removed in step 1, routing the network and home coax cables through the slots in the insert. Secure the plate to the Voice Port using the three screws removed in step 1.

7 Connect a telephone cable to line 1 as follows:

- Use the connector on the left (marked **F**) for telephones.
- Use the connector on the right (marked **N**) for faxes, answering machines, and other devices.

For a second line, connect another telephone cable to line 2.

—continued—

Left even

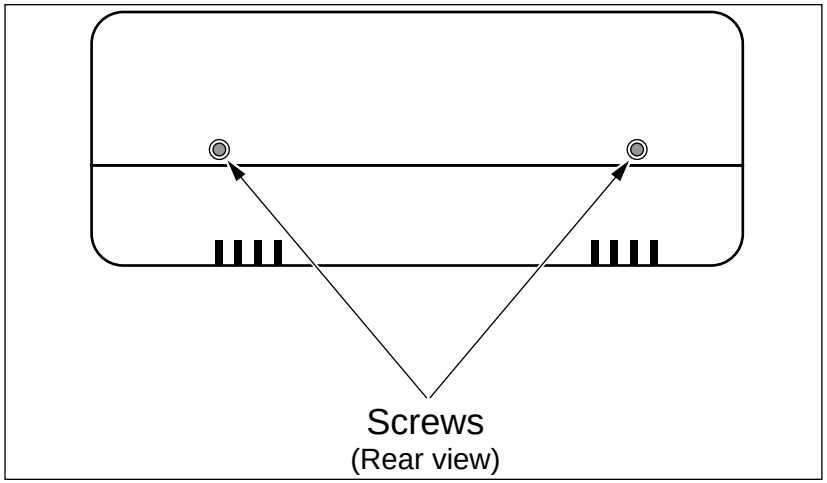
Procedure 2-2 (continued)
Connecting the Voice Port

Installing the battery

8 If you have not done this already, remove the two Phillips screws securing the battery cover, then remove the cover. See Figure 2-1 below.

Figure 2-1
Battery cover

CS-10509



9 Make sure the red and black wires run through the slots in front of the battery compartment, as shown in Figure 4-4 on page 4-13.

10 Insert the battery in the Voice Port. See the label inside the battery compartment for proper alignment.

11 Connect the battery power wires to the new battery. Connect the negative (black) wire first, then the positive (red) wire.

12 Replace the battery cover and secure with the Phillips screws removed in step 8.

Note: If the battery is inserted backwards, you will not be able to replace the cover.

—continued—

Procedure 2-2 (continued)
Connecting the Voice Port

Finishing the installation

13 Connect the power cord from the Voice Port to a convenient outlet.
The green LED on the side of the Voice Port should be on, and the red LED should be off. See “Power and status indicators” on page 4-5 for details.

14 Test the Voice Port as outlined in “Testing the Voice Port” on page 3-1.

15 Replace the front cover and secure it with the screw in the middle of the cover.

—end—

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Testing the Voice Port

This chapter explains how to test the voice lines of an Model 5 Indoor Voice Port at a subscriber site when the Voice Port is first installed.

Requirements

The following requirements must be met before performing this procedure:

- You have completed steps 2 through 13 of Procedure 2-2.
- The Voice Port and telephone line have been provisioned and correlated to the system (at the headend).
- You have a telephone butt-set with the appropriate connector.
- You have the appropriate telephone numbers for testing voice lines.

Left even

Procedure 3-1
Testing the Voice Port

Action

1 Connect the telephone butt-set to line 1. Check for dial tone.

Note: In some cases the telephone may need to go off-hook, on-hook, and off-hook to get dial tone for the first time.

2 Perform additional phone tests (as required by your company).

3 If possible, check the cable and voice lines inside the subscriber premises.

4 If a second telephone line was not requested, go to step 5. If a second line was requested, disconnect the telephone butt-set from line 1 and connect it to line 2. Repeat steps 2 and 3.

5 Replace the front cover and secure it with the screw in the middle of the cover.

—end—

Troubleshooting

This chapter identifies problems that might occur following the Model 5 Indoor Voice Port installation. These troubleshooting procedures provide the corrective actions required for the most common problem symptoms.

DANGER
Risk of injury
Coax powered networks have up to 90 volts on the center conductor. Please follow your company procedures and guidelines for handling live drop cable.

The Voice Port has a diagnostic LED indicator to aid during installation and troubleshooting. The red LED is located between the RF connectors, under a cover. The LED indicates the Voice Port operational state as shown in Table 4-1 on page 4-3.

The Model 5 Indoor Voice Port also has a pair of power indicator LEDs along the left-hand edge of the unit. These LEDs indicate the status of the Voice Port power as shown in Table 4-2 on page 4-5.

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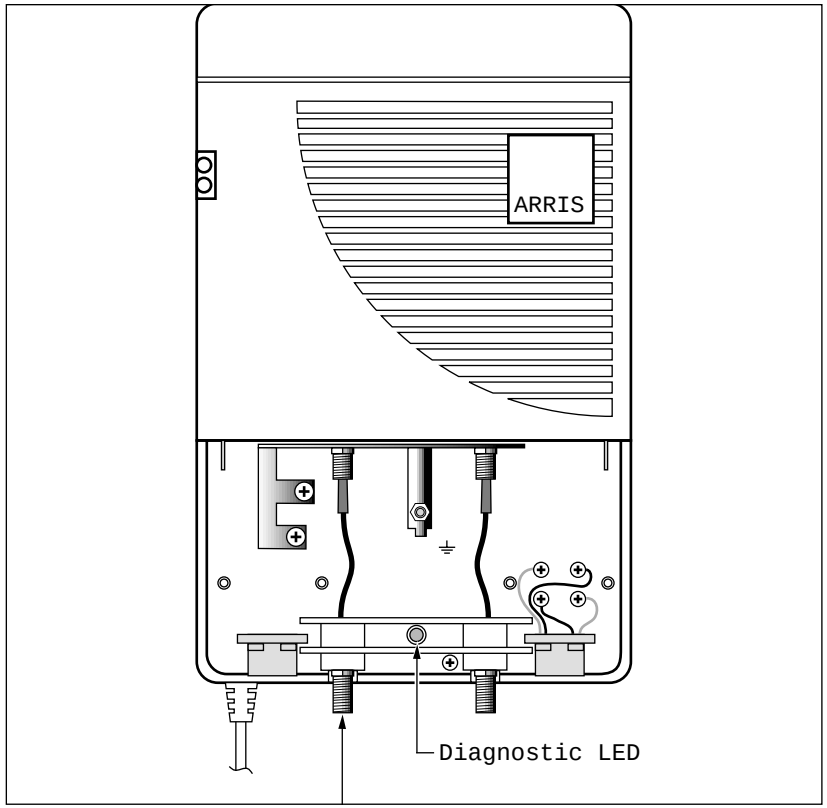
Diagnostic LED

Figure 4-1 shows the location of the diagnostic LED.

Figure 4-1
Indoor Voice Port diagnostic LED

CS-10508A



The Voice Port has a diagnostic LED indicator to aid during installation and troubleshooting. The red LED is located behind the network access door of the Voice Port.

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Table 4-1 lists the Voice Port operational states indicated by the LED and recommended actions if the indication pattern persists longer than five minutes.

Table 4-1
Voice Port LED diagnostic indications

LED state	Indication	Problem if pattern persists
Off	No power to the Voice Port	No power to the Voice Port. See Procedure 4-1, “Troubleshooting power problems” to resolve.
Constantly on	Voice Port is hunting for an RF carrier	Downstream network problem. See Procedure 4-2, “Troubleshooting downstream network problems” to resolve.
Blinking four times (CsV05 and higher)	Voice Port is marshalling to the HDT; the Voice Port is locked to a downstream carrier but the HEM has not yet acquired the Voice Port’s upstream signal	Upstream network problem. See Procedure 4-3 “Troubleshooting upstream network problems” to resolve.
Blinking three times	Marshalling in progress	Marshalling problem; see “Three-blink state” on page 4-4 or more information.
Blinking two times	Voice Port is fully marshalled, but no line has been provisioned at the head end	Provisioning problem. See Procedure 4-4, “Troubleshooting provisioning problems”
Blinking one time	Voice Port is in-service	None; no further action is required.

Blinking patterns are provided every three seconds for the first hour after the Voice Port changes state. After that, the pattern repeats only once every 15 seconds in order to save power in the steady state.

When installing a new Voice Port, the installer must note the state of the LED and perform the corrective actions described in this chapter as needed.

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Three-blink state

When the LED is blinking three times for longer than five minutes, one or more of the following conditions may apply. To resolve these issues, proceed to the appropriate procedure in this chapter.

For this item ...	**Then perform**
The Spectrum Manager may be in an LOC (loss of communications) state	Procedure 4-2, “Troubleshooting downstream network problems” and Procedure 4-4, “Troubleshooting provisioning problems” as needed
Voice Port may be locking onto the wrong downstream	Procedure 4-2, “Troubleshooting downstream network problems”
Voice Port may not be locating out-of-band marshalling (OOB) carrier path	Procedure 4-2, “Troubleshooting downstream network problems”
Voice Port may have a marginal transmit level or impeded path	Procedure 4-3 “Troubleshooting upstream network problems” and Procedure 4-4, “Troubleshooting provisioning problems” as needed
Voice Port is a new installation and cannot marshal into the HEM due to unprovisioned or misprovisioned state	Procedure 4-4, “Troubleshooting provisioning problems”

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Power and status indicators

The Integrated Indoor Voice Port has two LED indicators on the outside of the case (see Figure 4-2).

Figure 4-2
Power and status indicators

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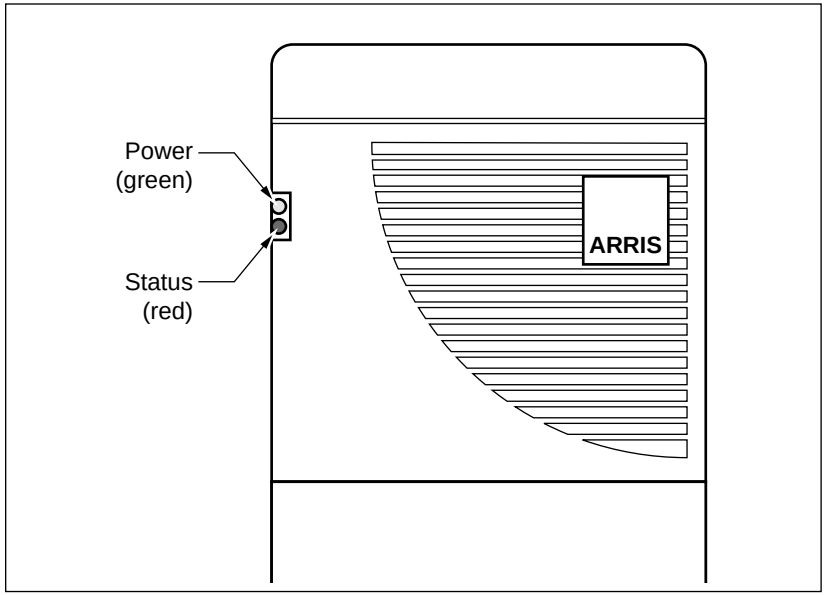

These indicators show the power and battery status of the Voice Port as shown in Table 4-2.

Table 4-2
Integrated Indoor Voice Port power LEDs

Power LED	Status LED	Power status
On	Off	AC power present
Off	On	The Voice Port is using battery power
Off	Off	No AC power, battery dead or not present (or the Voice Port has not been plugged in since the battery was installed)
On	On	Invalid power state

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Procedure 4-1
Troubleshooting power problems

Most power-related problems are caused by one of the following:

- Faulty power at the outlet (the voltage should be between 198V and 264V AC).
- The Voice Port must be plugged in before it can provide service. Once the Voice Port has AC power, it can switch to battery power if unplugged or the power fails.
- Faulty Voice Port

Action

1 If using a local power supply, check the following:

- the Voice Port is plugged in and the green (Power) LED is on
- the receptacle has the proper voltage present (avoid using switched outlets where possible)
- the fuse or circuit breaker is not blown or tripped

2 Replace the Voice Port.

Right odd

Procedure 4-2
Troubleshooting downstream network problems

A downstream network problem prevents the Voice Port from receiving signals from the headend. This means the Voice Port cannot find a downstream RF carrier.

Action

1 Using a tamper-resistant hex driver, remove the Voice Port's network front cover.

2 Check the CATV signal on the drop coax at the Voice Port and verify signal level and quality.

If CATV signal is...	**Then**
up to your company standards	go to step 3.
not up to standards	go to step 6.

—continued—

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Procedure 4-2 (continued)
Troubleshooting downstream network problems

3 Call the headend. Have an operator check the transmit levels on the Headend Modem (HEM) associated with the service area.

If the transmit levels are...	**Then**
not within range	adjust the transmit level; if the problem persists, go to step 5.
within range	go to step 5.

4 If using out-of-band marshalling (OOB), have the operator make sure the highest numbered in-service headend modem (HEM) assigned to a downstream carrier path is properly cabled for upstream and downstream communications. If the HEM is properly cabled, continue with step 7.

5 Have the operator check the Spectrum Manager communication state.

If the...	**Then**
communication state is LOC	reset the Spectrum Manager; if the problem persists, go to step 6.
communication state is IS	go to step 6.

6 Connect a signal generator at the headend, and check the CATV signal at the tap. Verify signal level and quality.

If the signal is...	**Then**
of the proper level and quality	replace the drop cable; if the problem persists, go to step 7.
not of the proper level and quality	the tap or distribution system may be at fault; call plant maintenance personnel.

7 Replace the Voice Port. If this clears the problem, the original Voice Port is faulty. Otherwise, the tap or distribution system may be at fault; call plant maintenance personnel.

—end—

Procedure 4-3
Troubleshooting upstream network problems

An upstream network problem prevents the Voice Port from sending signals to the headend. This means the Voice Port attempts to marshal, but does not receive a response.

Action

1 Call the headend. Have an operator check the receive levels on the HEM associated with the service area.

If the receive levels are...	**Then** ...
not within range	adjust the receive level; if the problem persists, go to step 2.
within range	go to step 2.

2 Have the operator check the Spectrum Manager port noise threshold levels.

If the threshold levels are...	**Then** ...
not within range	adjust the threshold level; if the problem persists, go to step 1.
within range	go to step 3.

3 (Model A2IP02WA only) Using a Phillips screwdriver, open the Voice Port front cover.

—continued—

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Procedure 4-3 (continued)
Troubleshooting upstream network problems

CAUTION
Risk of network power disruption
Coax powered networks have up to 90 volts on the center conductor. Please follow your company procedures and guidelines for handling live drop cable.

DANGER
Risk of injury
Avoid contact with center conductor of coax powered networks. The conductor has up to 90 volts.

4 Connect a signal generator to the drop cable and verify that the signal can be received at the headend.

If the signal is...	**Then** ...
of the proper level and quality	go to step 5.
not of the proper level and quality	there may be a problem with one or more amplifiers in the upstream direction; call plant maintenance personnel.

5 Replace the Voice Port.

—end—

Procedure 4-4
Troubleshooting provisioning problems

A provisioning problem indicates that the Voice Port can communicate with the headend, but has not been provisioned in Cornerstone.

Action

1 Call the headend. Have the operator provision the Voice Port as described in the *HDT Commissioning and Testing Guide*, ARSVD00391.

If the problem persists, continue with step 2.

2 Confirm the Voice Port status with the headend operator.

If Voice Port state is...	**Then**...
`IS-Trbl unequipped`	Check the setting of the minimum marshalling distance (for in-band marshalling). If the marshalling distance is correct, perform Procedure 4-3.
`IS-Trbl unassigned`	Check that the Voice Port is assigned to a modem.
`IS-Trbl CP mismatch`	Check the HDT provisioning to ensure that the Voice Port is assigned to the proper carrier path or head-end modem.
`IS (no service)`	Check that the correct service is assigned to the Voice Port line and that the CRV is in-service on the switch. Verify that the Line Card is in-service.
`IS`	Go to step 3.

3 Replace the Voice Port.

—end—

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Procedure 4-5
Replacing the battery

Use this procedure to replace the Voice Port internal battery. The battery should be replaced every two years. The battery can supply six hours of idle time and three hours of usage time (with one line off hook) to the Voice Port when the AC power is disconnected.

Note: To maintain telephone service during this procedure, leave the AC power connected while changing the battery.

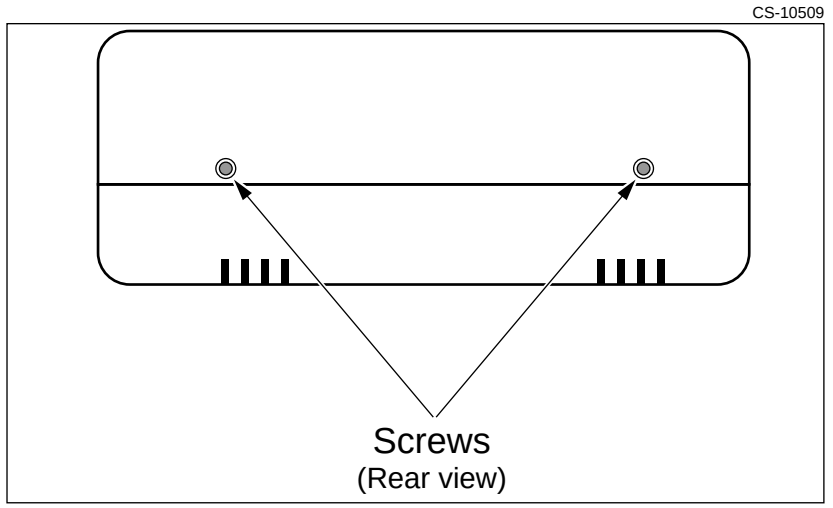
Requirements

- Battery (Yuasa NP2.3-12, or equivalent 12V 2.3 Ah battery)
- Phillips screwdriver

Action

1 Remove the two Phillips screws securing the battery cover, then remove the cover. See Figure 4-3.

Figure 4-3
Battery cover



2 Pull the connectors away from the battery terminals. Remove the positive (red) wire first, then the negative (black) wire.

3 Lift the battery straight up and pull it out of the Voice Port.

—continued—

Procedure 4-5 (continued)
Replacing the battery

4 Put the replacement battery in the Voice Port. See the label inside the battery compartment for proper alignment.

Note: Make sure the battery wires are routed through the notches as shown in Figure 4-4.

Figure 4-4
Battery alignment and wire position

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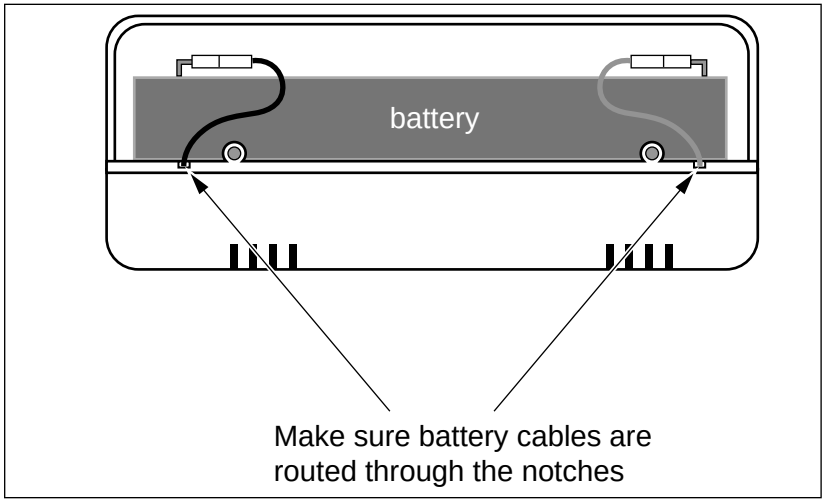

5 Connect the battery power wires to the new battery. Connect the negative (black) wire first, then the positive (red) wire.

Note: You may notice a small spark when connecting the red wire. This is normal.

—continued—

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Procedure 4-5 (continued)
Replacing the battery

6 Replace the battery cover and secure with the Phillips screws removed in step 1.

Note: If the battery is inserted backwards, you will not be able to replace the cover.

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