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CISCO SYSTEMS

Installing the G.703 Applique

Cisco Product Numbers

APP-JG71	**Applique with one connector**	**(A-type Chassis)**
APP-LG72	**Applique with two connectors**	**(A-type Chassis)**
APP-LG74	**Applique with four connectors**	**(A-type Chassis)**
APP-LG76	**Applique with six connectors**	**(A-type Chassis)**
APP-LG78	**Applique with eight connectors**	**(A-type Chassis)**
APP-IG71	**Applique with one connector**	**(M and C-type Chassis)**
APP-SG72	**Applique with two connectors**	**(M and C-typeChassis)**
APP-SG74	**Applique with four connectors**	**(M-type Chassis)**

Part Description

Cisco Systems uses the term *applique* for any hardware unit that provides the external interface connections from a router to the network. This publication contains instructions for installing the G.703 applique into a Cisco router. The G.703 applique is a single-port device designed for direct connection to G.703 Service Category type 5C operating at 2 Mbps over digital private circuits (as described in the OFTEL standard, OTR 001, "Technical Requirements for Private Branch Exchanges with Telecommunications Ports"). The G.703 applique is available as a data terminal equipment (DTE) interface only.

This publication covers the following:

- G.703 applique overview
- Site prerequisites
- Installation of the G.703 applique

Before beginning installation, read this entire publication to ensure that you have all the necessary tools and equipment, and that you have the correct modules for your system configuration.

Note: Before installing the G.703 applique, read "Safety Warnings and Requirements" for details of the safety warnings and requirements that are an integral part of the approval process for directly connected apparatus.

The G.703 network interface is the output port, consisting of two bayonet (BNC) connectors, adjacent to the approval symbol. The input port is connected by a ribbon cable to either a CSC-MCI or CSC-SCI interface card.

Clock (timing) for the G.703 applique is derived from the network input at approximately 2048 Kbps.

The G.703 applique is designed to operate under the following conditions (see Table 1).

Table 1 G.703 Applique Hardware Specifications

Specification	Description
Environment	5 to 40 degrees Celsius (41 to 104 degrees Fahrenheit)
Humidity	10–90 % (noncondensing)
Power	5V (+/- 5%), 150mA

Applique Overview

The G.703 applique can come mounted on individual, dual, or ladder connector plates, which are then installed in the rear of the Cisco chassis, component side up. Figure 1 shows the G.703 applique individual connector plate.

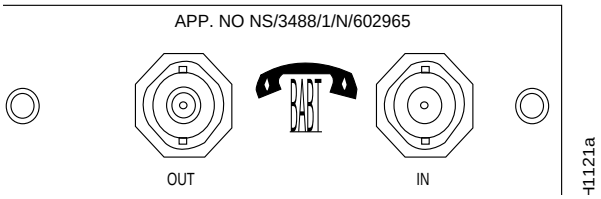

Figure 1 G.703 Applique Individual Connector Plate

Figure 2 shows the G.703 ladder plate option.

Figure 2 G.703 Ladder Plate Option

Figure 3 shows an example of an individual-size connector plate positioned as it is installed in an A chassis. You must use a BNC transition cable to provide a standard G.703 external connection.

A ribbon cable connects each port on the applique internally to a serial network interface card in the system card cage. For further information on connector plates and how they are installed in the chassis, refer to the Cisco Systems installation and maintenance publication you received with your system.

Figure 3 G.703 Applique on an Individual Connector Plate

The serial interface controller card can be a Serial-Port Communications Interface (CSC-SCI) Card that provides up to four serial ports or a Multiport Communications Interface (CSC-MCI) Card that provides up to two serial ports.

Installation Prerequisites

Before installing the applique, ensure that your system meets the following prerequisites:

- You have a BNC transition cable of the correct gender for DTE mode.
- Your system must contain an MCI or SCI card with at least one available serial port for each applique to be installed.
- The jumpers on your MCI or SCI card must be set correctly for DTE.
- Your chassis must have available space for the applique on the rear panel mounting plate area.

If your current system configuration does not meet all of the above requirements, contact your service representative for information on hardware upgrades.

List of Parts

Before beginning this procedure, ensure that you have the following parts:

- G.703 applique with attached connector plate
- DTE male BNC cable

- Ribbon cable for the internal connection between the applique and the serial interface card
- Electrostatic discharge (ESD) prevention wrist strap. A disposable wrist strap is included with the applique; use it to prevent damage to equipment from electrostatic discharge.

If any of these parts appear damaged, contact your service representative for a replacement.

Required Tools

You will need some or all of the following tools to perform the installation procedures. Before you begin, read through the procedure to determine which tools you need for your chassis and task.

- Standard Phillips screwdriver (No. 1or No. 2)
- No.1 flat-blade screwdriver for an M or C chassis
- ESD-prevention wrist- or ankle-strap. A disposable ESD-prevention wrist strap is included with the card; use it to prevent damage to equipment from electrostatic discharge.

Safety Warnings and Requirements for the U.K.

These warning notices apply to the **Input Port**, the port marked "SAFETY WARNING: see instructions for use."

Warning: The port marked "SAFETY WARNING: see instructions for use" does not provide isolation sufficient to satisfy the requirements of BS6301; apparatus connected directly to this port should either have been approved to BS6301 or have previously been evaluated against British Telecommunications PLC (Post Office) Technical Guides 2 or 26 and given permission to attach. Any other usage will invalidate the approval of the Applique.

Interconnection of the applique **Input Port** (the port marked "SAFETY WARNING: see instructions for use), directly, or by way of any other apparatus, with ports on other apparatus (marked or not so marked) may produce hazardous conditions on the network. Users should seek advice from a competent engineer before making such a connection.

The applique is approved as Independent of Host. As such, the applique is only approved for use with a host and with host attachments that are either type approved in their own right, or, if supplied after 1st March 1989, are covered by the terms of the General Approval number NS/G/1234/J/100003. A Host supplied under the terms of the General Approval number NS/G/1234/J/100003 satisfies the conditions of the paragraphs above.

The applique must not be modified in any way. Any form of modification invalidates the approval for connection, and the Cisco warranty of the unit. The applique approval label must be visible externally. The approval label must not be detached from the applique, nor attached to the host.

The terms of the approval require that there must be a minimum distance (5mm) between the applique and any other part of the host, including other Cisco appliques. This condition is met by default when the applique is installed in a Cisco enclosure in accordance with the instructions. If voltages greater than 250V are present in the host, users should refer to a competent safety engineer for advice.

It is a condition of the approval that a copy of these user instructions and safety warnings must be supplied with the host. Failure to provide the applique user instructions with the host will invalidate the applique approval.

Failure to install the applique in accordance with these instructions will invalidate the approval. If you experience difficulties, or are in any doubt, contact your Cisco representative.

Preventing Electrostatic Discharge Damage

Electrostatic Discharge (ESD) is a discharge of stored static electricity that can damage equipment and impair electrical circuitry. It occurs when electronic printed circuit cards are improperly handled and can result in complete or intermittent failures.

Whenever you install or remove an applique, follow these steps:

Step 1: Prior to opening a chassis, ensure that power to the unit is turned off and unplug the power cord from the wall receptacle.

Step 2: Slip on an ESD wrist strap, ensuring that it makes good skin contact.

Step 3: Connect the equipment end of the strap to an unpainted surface of the chassis frame or another proper grounding point or surface. Cisco Systems recommends that you attach it to the inside bottom of the chassis or to the rear panel (inside or outside) without making contact with any connectors or appliques.

Step 4: Handle the applique by its edges only. Avoid contact between the card and clothing. The wrist strap only protects the card from ESD voltages on the body; ESD voltages on clothing can still damage the card.

To properly guard against ESD damage and shock, the wrist strap and cord must operate effectively. Do not remove the wrist strap until the installation is complete.

Preparing to Connect the G.703 Network Interface

Cisco makes three modular chassis styles: A, M, and C. The applique mounting brackets vary by system type. Each applique is supplied with a single small mounting bracket. The applique can also be used with larger mounting brackets, where multiple G.703 appliques are required in a single system.

Selecting the Proper BNC Cables

External connection to the G.703 network interface must be made by using cables of the correct specification. The BNC cables required have the following characteristics.

- Two off 75 ohm coax cables, of diameter 5mm, terminated in male BNC connectors
- Maximum cable attenuation: 6 dB at 1024 kHz

Note: Attenuation characteristics should follow the “root f ” law. The outer conductor is isolated from system earth.

Installing the G.703 Applique

Following are procedures for installing the G.703 applique in your chassis. The applique is mounted on a connector plate, which you will install in the rear of the chassis. Before proceeding, ensure that your system meets the requirements listed in “Installation Prerequisites.”

If you are adding a CSC-SCI or CSC-MCI card to your system in addition to the G.703 applique, then it will be necessary to set the unit number as described in "Unit Numbering." If you are not adding an additional CSC-SCI or CSC-MCI card, then proceed to "Opening the Chassis."

Unit Numbering

The unit numbers of the CSC-SCI and CSC-MCI cards must be unique. Unit numbers are assigned by setting a dip switch (S1) which is located in the upper left corner of the CSC-SCI card, next to the bank of LEDs, as shown in Figure 4 (the switch is actually on the front edge of the card when viewed with the card installed in the card cage).

Note: Figures 6 and 7 show the factory-set jumper settings for DTE operation.

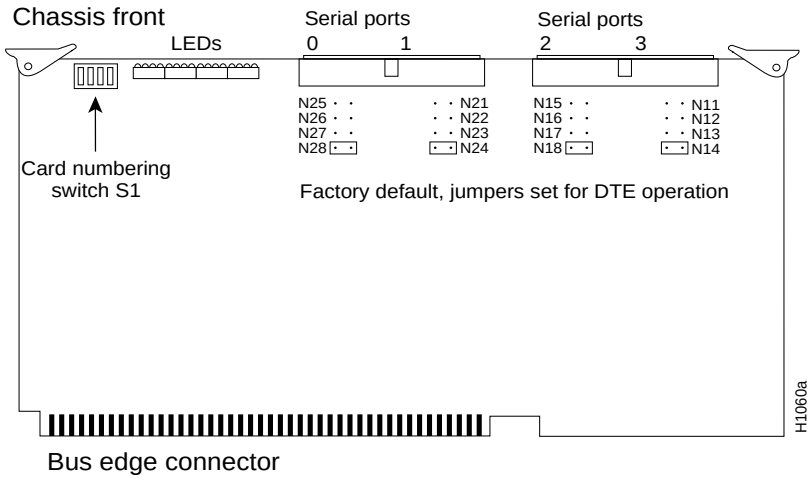

Figure 4 CSC-SCI Card and Jumpers Set for DTE Operation

Table 2 lists the CSC-SCI switch S1 settings for unit numbering.

Table 2 CSC-SCI Switch S1 Settings for Unit Numbering

Unit	S1-1	S1-2	S1-3	S1-4
0	Off	Off	Off	Off
1	Off	Off	Off	On
2	Off	Off	On	Off
3	Off	Off	On	On
4	Off	On	Off	Off
5	Off	On	Off	On
6	Off	On	On	Off
7	Off	On	On	On

Figure 5 shows the CSC-MCI card jumpered for DTE operation.

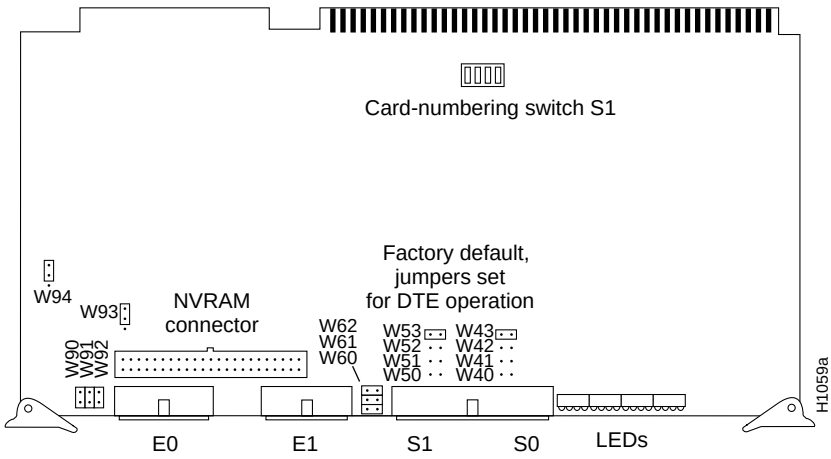

Figure 5 CSC-MCI Card and Jumpers Set For DTE Operation

Opening the Chassis

Following are the steps for opening the chassis to access the connector plates in each of the three types of Cisco modular chassis: A, M, and C. Refer to the related illustration as you perform the installation.

Opening the A Chassis

You must remove the top panel to gain access to the back panel connector plates and make internal cable connections. (Refer to Figure 6 when removing the chassis cover) To remove the chassis cover, proceed as follows:

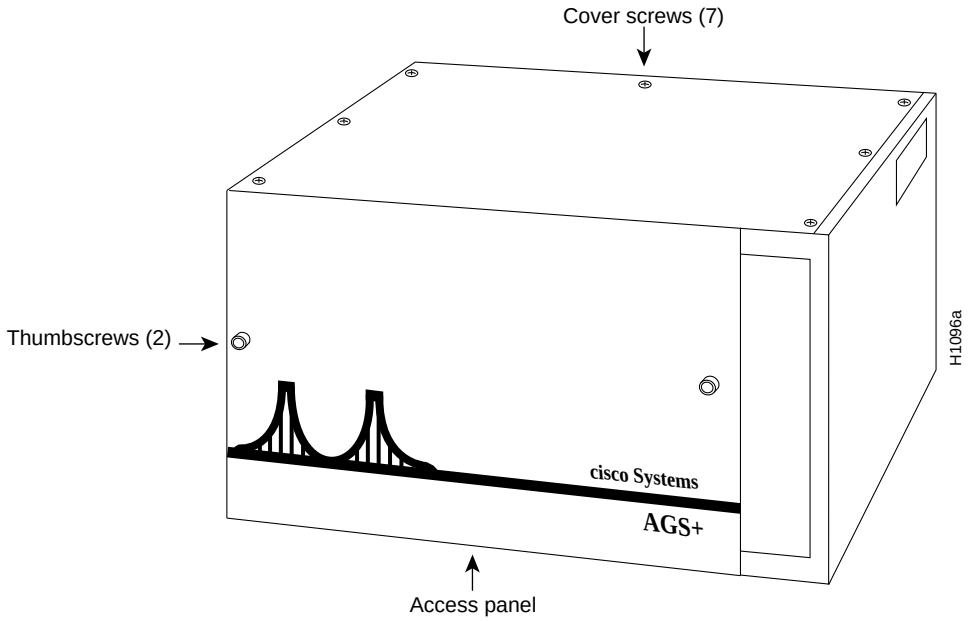

Figure 6 A Chassis Cover and Front Access Panel Fasteners

Step 1: On the front access panel, loosen (but do not attempt to remove) the two thumb fasteners and pull the panel off the chassis (see Figure 6).

Step 2: Locate and remove the seven screws securing the top panel to the chassis; three are located on each of the two sides of the cover, and one is at the back.

Step 3: Lift the top cover up and away from the chassis.

Closing the A Chassis

Step 1: To replace the cover, place the edge with the bent lip at the front of the chassis.

Step 2: Align the screw holes, then replace and tighten the screws.

M Chassis

You must remove the top panel to gain access to the back panel connector plates and make internal cable connections. Refer to Figure 7 when performing the following steps.

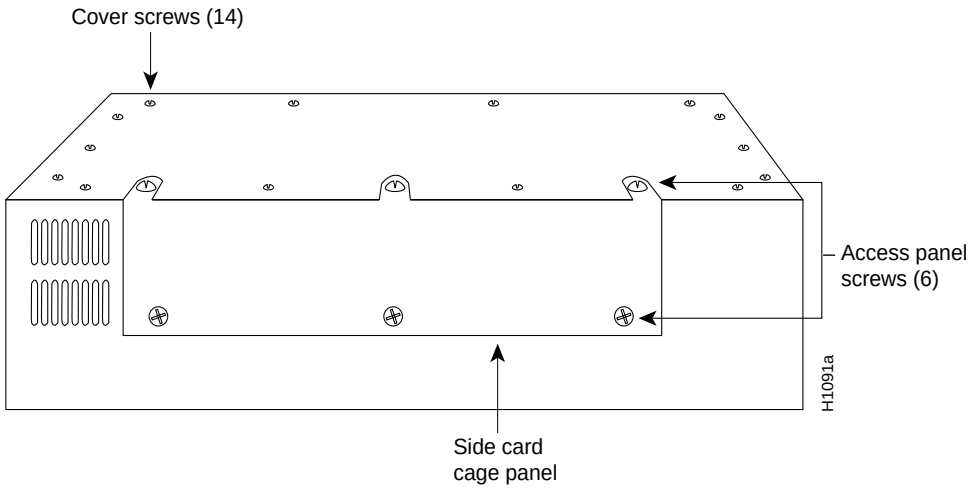

Figure 7 M Chassis Cover Fasteners

Step 1: After removing the card cage access panel on the side of the chassis, loosen the three Phillips screws at the bottom of the panel; then turn the top fasteners three-quarters of a turn counterclockwise.

Step 2: Locate and remove the 14 No. 1 Phillips screws that secure the top panel to the chassis: four are on each of the two sides of the cover, three on the back, and three on the front of the chassis.

Step 3: Lift the cover up and away from the chassis.

Closing the M Chassis

Step 1: To replace the cover, align the access panel slots with the tabs (on the right side, when viewed from the front).

Step 2: Replace the 14 screws, beginning with the back ones. When all screws are in place, tighten them.

Step 3: Replace the card cage access panel and tighten the six access panel screws to secure it (as shown in Figure 7).

C Chassis

To gain access to the system card cage, you must remove the chassis cover. The cover on a C chassis system envelopes the chassis and is secured by ten screw: six on the bottom and two on each side. Refer to Figure 8 when removing the chassis cover.

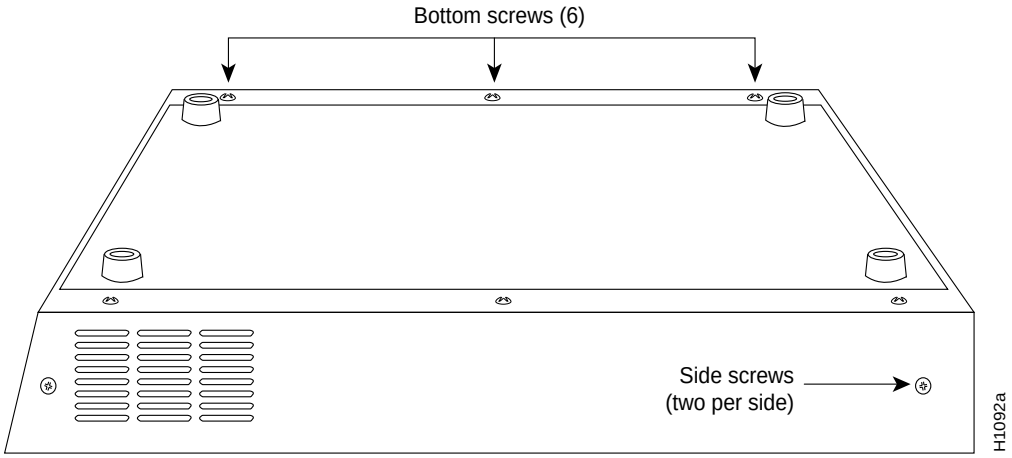

Figure 8 C Chassis Cover—Bottom View

Following is the procedure for accessing the C chassis interior:

Step 1: Disconnect all power and interface cables from the rear of the chassis.

Step 2: Remove the two screws on each side of the cover (see Figure 8)

Step 3: Turn the system upside down and remove the six screws along the edge, beginning with those nearest the back.

Step 4: Use a flatblade screwdriver to gently lift the back end of the chassis away from the cover.

Step 5: To remove the cover, pull it from the front of the chassis. The cover fits the chassis quite tightly, so expect some resistance.

Closing the C Chassis

Step 1: To replace the cover, turn the CGS system so that it is resting on its back, and the front of the chassis is pointing up.

Step 2: Position the cover so the angled end will meet the front of the frame (the squared end goes on first).

Step 3: Slip the cover over the chassis and push down firmly. You are inserting the lip at the back of the cover into a rim on the chassis. (If you find it necessary to loosen the four screws securing the fan, be sure to retighten the fan screws once the cover is replaced.)

Step 4: Make sure the screw holes are aligned properly, then replace and tighten the screws.

Installing the Applique

Follow this procedure to install the applique in the rear of the chassis and route the attached ribbon cable to an available port on the SCI or MCI card in the system card cage.

Step 1: Turn off power to the chassis and unplug the power cord.

Step 2: Ensure that the jumpers on the SCI or MCI card are set for DTE by comparing them to Figure 4 and Figure 5.

Step 3: On the rear of the chassis, remove a blank plate from the connector area (see Figure 9). Large mounting plates are secured with six screws, small plates with four screws, and individual plates with two. Set the screws aside.

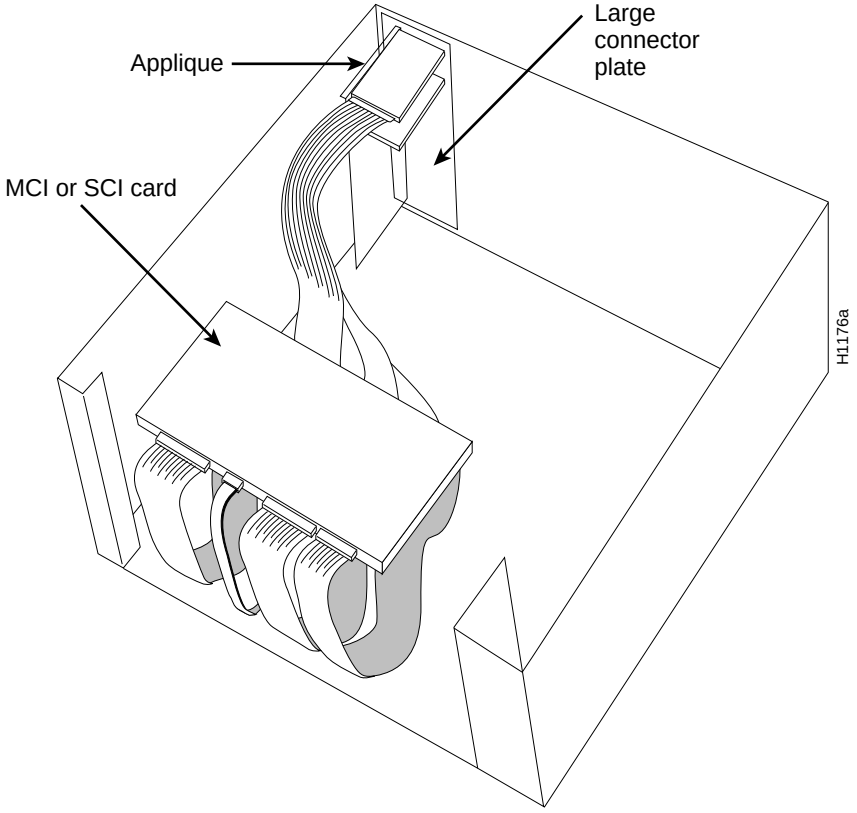

Figure 9 Typical Installation, A Chassis

Step 4: Place the new connector plate, with the attached G.703 applique, component side up, on the inside of the chassis against the opening. Secure the applique with the screws you removed from the blank connector plate.

Step 5: Connect an internal ribbon cable between the 25-pin connector J1 on the applique and an available port on the CSC-SCI or CSC-MCI card in the system card cage (see Figure 9).

Step 6: Route the cable under the system card cage and up to the card in the front of the chassis. Be careful not to tug on or kink the cable.

Step 7: Attach the end of the transition cable to the G.703 connector on the applique and the other end to your network segment.

Step 8: Turn on the power switch to check the installation. (See the section "Testing the Installation.")

Step 9: When the installation check is successful, replace and secure the chassis cover.

Step 10: Port-identifiying labels are provided for you to attach. Affix the new labels (Serial 0, Serial 1, etc.) below the BNC connectors on the rear of the chassis.

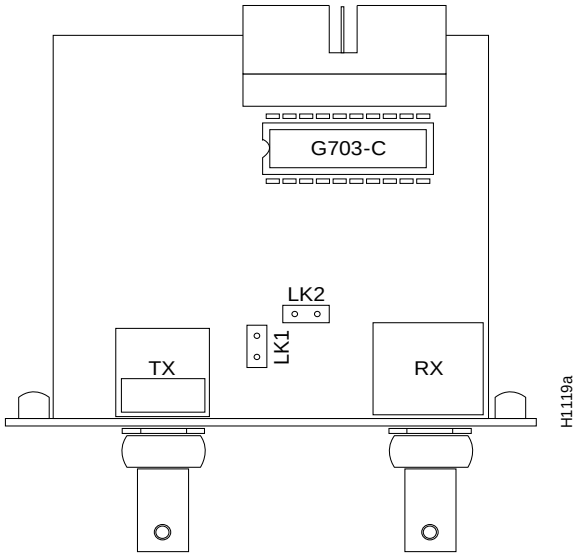

Figure 10 G.703 Applique (Component-Side View)

The connector labeled *TX* on the G.703 applique is the transmitting port (see Figure 10); the connector labelled *RX* on the card is the receiving port. Externally the BNC connectors are labelled *OUT* for transmit and *IN* for receive.

Note: The identification label, which includes the BABT symbol and the BABT Approval Number, must be visible from the outside of the system, and must be adjacent to the BNC connectors. Two labels are supplied with the G.703 applique. One is fixed to the small mounting bracket supplied with the applique. The other is contained in the package and is for use when a larger mounting bracket is used to accommodate multiple appliques. The second label must be fixed to the large panel using the small panel as the model, to ensure that the unit conforms to the labeling requirements.

Testing the Installation

The following procedure tests the G.703 applique installation:

Step 1: Connect the power cable and turn on the power to the chassis.

Step 2: After the system boots up, verify the correct mode of the newly installed interface by using the **show controller mci** and **show interface serial** *number* commands (where *number* refers to the interface number of the newly installed serial port and applique).

The following is a sample of output from the **show controller mci** command (Serial 0 and DTE mode are used in the examples):

```
Router#show controller mci
MCI 0, controller type 1.1, microcode version 1.9
  128 Kbytes of main memory, 4 Kbytes cache memory
22 system TX buffers, largest buffer size 1520
  Restarts: 0 line down, 0 hung output, 0 controller error
  Interface 0 is Serial0, electrical interface is G.703 DTE
```

In this example, the important information is contained in the last line, which indicates the type and mode of the serial interface attached.

Note: Much screen text has been eliminated from the above example for the sake of clarity.

The following is an example of the **show controller mci** command which indicates the state of the newly installed serial interface (the interface should be up if everything is connected and configured correctly).

```
Router#show controller mci
Serial 0 is up, line protocol is up
  Hardware is MCI Serial
```

Note: An error condition exists if the newly installed interface is not seen by the system or does not come up after system boot. If this happens, check that all cards and cables are firmly seated. If a second power-up attempt fails, contact your service representative.

Following are examples of possible error conditions and their symptoms:

- If a DTE applique is used, but the MCI or SCI jumpers are set for DCE, the interface will stay down.
- If the external or internal cable is not connected, the interface will be up, but line protocol will be down.

Following Successful Testing

Follow these steps after successfully testing the G.703 applique installation:

Step 1: Turn off the power and unplug the chassis.

Step 2: Replace and secure the chassis cover.

Step 3: Affix the new serial interface labels (Serial 0 and so forth) below the appropriate connector on the rear of the chassis and to the internal ribbon cables attached to each new interface, if you have not already done so.

Note: If it becomes necessary to reconfigure a single applique after it is installed, remove the chassis cover and use a 3/16" nut driver to remove the cable nuts that secure the individual applique to the mounting plate. With these nuts removed, the applique may be pulled out of the mounting plate, reconfigured, and reattached without having to remove the entire rear plate assembly or interior cables.

This completes *Installing the G.703 Interface Applique.*

The system is ready to be installed in the network.

This document is to be used in conjunction with the *AGS+ Installation and Maintena*nce, ASM Installation and Maintenance, and MGS/CGS Installation and Maintenance publications.