Installing SPEX Net Modules in ASN Platforms

Bay Networks

Bay Networks

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Electromagnetic Emissions

Meets requirements of:

FCC Part 15, Class A
EN 55 022 (CISPR 22:1985), Class A <and Class B>
VCCI Class 1 ITE

Canada Requirements Only

Canada CS-03 Rules and Regulations

Note: The Canadian Department of Communications label identifies certified equipment. The certification means that the equipment meets certain telecommunications network protective operations and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent the degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Canada CS-03 -- Règles et règlements

Note: L'étiquette du ministère des Communications du Canada indique que l'appareillage est certifié, c'est-à-dire qu'il respecte certaines exigences de sécurité et de fonctionnement visant les réseaux de télécommunications. Le ministère ne garantit pas que l'appareillage fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer l'appareillage, s'assurer qu'il peut être branché aux installations du service de télécommunications local. L'appareillage doit aussi être raccordé selon des méthodes acceptées. Dans certains cas, le câblage interne du service de télécommunications utilisé pour une ligne individuelle peut être allongé au moyen d'un connecteur certifié (prolongateur téléphonique). Le client doit toutefois prendre note qu'une telle installation n'assure pas un service parfait en tout temps.

Les réparations de l'appareillage certifié devraient être confiées à un service d'entretien canadien désigné par le fournisseur. En cas de réparation ou de modification effectuées par l'utilisateur ou de mauvais fonctionnement de l'appareillage, le service de télécommunications peut demander le débranchment de l'appareillage.

Pour leur propre sécurité, les utilisateurs devraient s'assurer que les mises à la terre des lignes de distribution d'électricité, des lignes téléphoniques et de la tuyauterie métallique interne sont raccordées ensemble. Cette mesure de sécurité est particulièrement importante en milieu rural.

Attention: Les utilisateurs ne doivent pas procéder à ces raccordements eux-mêmes mais doivent plutôt faire appel aux pouvoirs de réglementation en cause ou à un électricien, selon le cas.

Canada Requirements Only *(continued)*

D. O. C. Explanatory Notes: Equipment Attachment Limitations

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Notes explicatives du ministère des Communications: limites visant les accessoires

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Canada Requirements Only *(continued)*

Canadian Department of Communications Radio Interference Regulations

This digital apparatus (Access Feeder Node, Access Link Node, Access Node, Access Stack Node, Backbone Concentrator Node, Backbone Concentrator Node Switch, Backbone Link Node, Backbone Link Node Switch, Concentrator Node, Feeder Node, Link Node) does not exceed the Class A limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Réglement sur le brouillage radioélectrique du ministère des Communications

Cet appareil numérique (Access Feeder Node, Access Link Node, Access Node, Access Stack Node, Backbone Concentrator Node, Backbone Concentrator Node Switch, Backbone Link Node, Backbone Link Node Switch, Concentrator Node, Feeder Node, Link Node) respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Réglement sur le brouillage radioélectrique du ministère des Communications du Canada.

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Read this guide if you are responsible for installing a Stack Packet Exchange (SPEX) or Stack Packet Exchange-Hot Swap (SPEX-HS) net module in a Bay Networks™ ASN™ platform. This guide describes how to

- Install the net module (Chapter 1)

- Attach cables to the net module (Chapter 2)

- Interpret the LEDs on the net module (Chapter 3)

Conventions

italic text	Indicates variable values in command syntax descriptions, new terms, file and directory names, and book titles.
quotation marks (" ")	Indicate the title of a chapter or section within a book.

Acronyms

LED	light-emitting diode
SPEX	Stack Packet Exchange
SPEX-HS	Stack Packet Exchange Hot Swap

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Chapter 1
Installing a Net Module

To install a SPEX or SPEX-HS net module in an ASN:

1. Remove the ASN component tray.

2. Attach the antistatic wrist strap.

3. Remove the filler brackets.

4. Remove a net module (if necessary).

5. Install the new net module.

6. Replace the filler brackets.

7. Replace the component tray.

The following sections describe these steps.

➡ **Note:** Experienced network operators can safely perform the user-serviceable procedures described in this book.

Removing the Component Tray
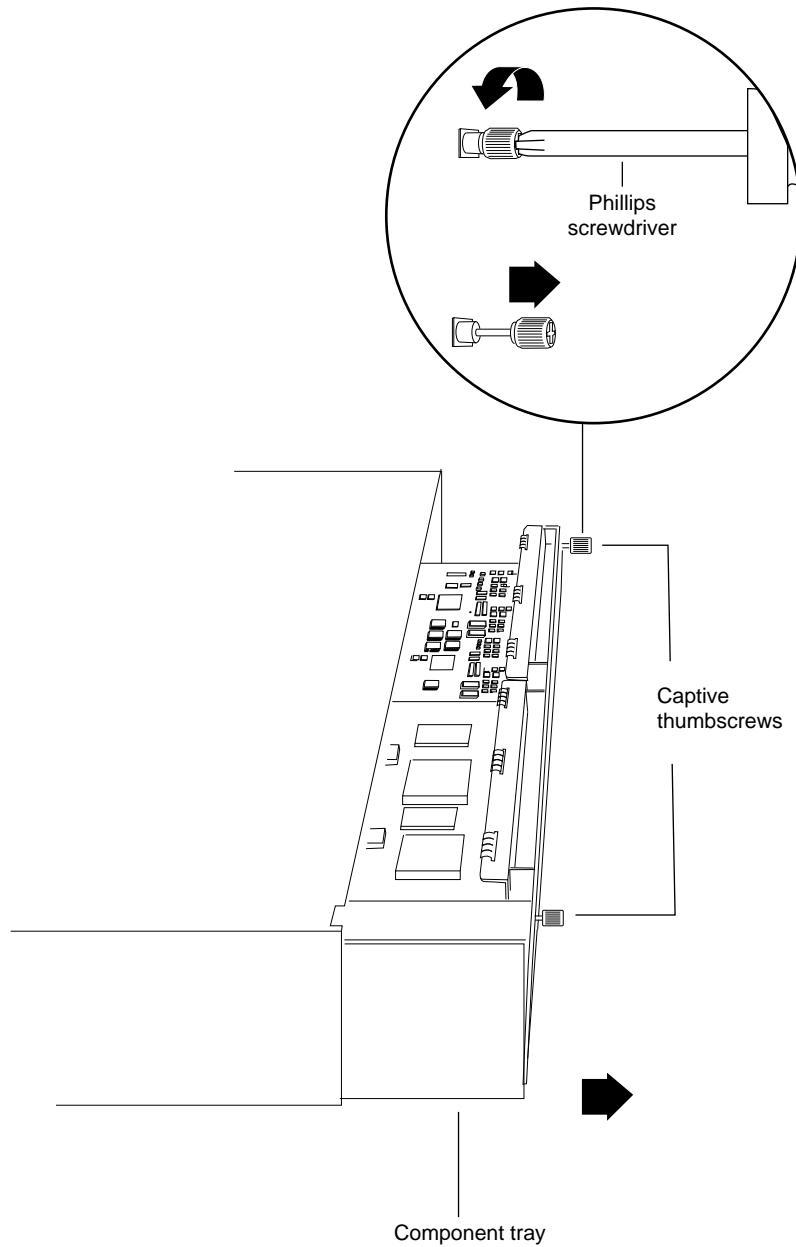
To remove the component tray:

1. **Power off the ASN.**

2. **Detach all cables from the ASN back panel.**

3. **Using a Phillips screwdriver, loosen the two captive screws that fasten the tray to the chassis (Figure 1-1).**

   a. **Pull the two captive screws and gently slide the tray out of the chassis just a few inches (Figure 1-1).**

   b. **Hold the sides and bottom of the tray to support it, and then slide the tray completely out of the chassis.**

   Try to keep the tray level as you slide it out.

4. **Place the tray on a sturdy work surface.**

Caution: Do not touch any components or boards in the ASN until you have attached an antistatic wrist strap. See the next section, "Attaching the Antistatic Wrist Strap."

Phillips
screwdriver

Captive
thumbscrews

Component tray

ASN0031A

Figure 1-1.   Removing the Component Tray

Attaching the Antistatic Wrist Strap

Your ASN comes with an antistatic wrist strap. The antistatic wrist strap directs the discharge of static electricity from your body to the chassis of the ASN, thereby avoiding discharge to sensitive electronic components. You must wear an antistatic wrist strap whenever you remove, install, or handle the net module.

Caution: Electrostatic discharge can damage hardware. Follow the procedure in this section to protect your equipment from damage.

Attach the antistatic wrist strap as follows:

1. **Remove the strap, alligator clip, and cable from their package.**

2. **Attach (snap) the snap end of the cable to the wrist strap.**

3. **Place the strap around your wrist. Adjust the strap to ensure that the metal buckle inside the strap touches your skin.**

4. **Plug the jack at the other end of the cable into the opening on the alligator clip.**

5. **Attach the alligator clip to any unpainted, metal surface on the component tray.**

Removing Filler Brackets

Filler brackets cover empty ASN net module positions and the openings above positions 1 and 3 (Figure 1-2). When you install a net module, you must remove the filler brackets not only from the position in which you want to install the net module, but also from the openings above positions 1 and 3.

➡️ **Note:** This manual refers to the end of the component tray where the net module ports are exposed as the "back end" of the tray. To perform maintenance tasks on the ASN components, you face the back end of the tray.

To remove a filler bracket, grasp its top edges. Then lift the bracket up and toward the front of the tray to release the metal tabs.
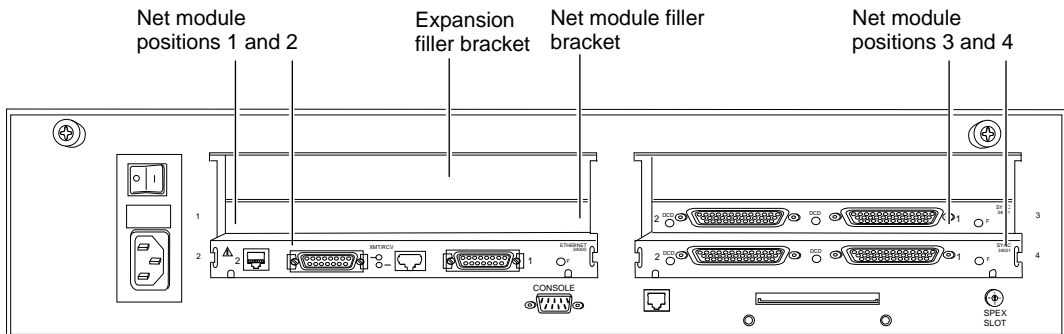

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Figure 1-2. **Locating Net Modules and Filler Brackets**

Removing a Net Module

Read this section if a net module already occupies the slot you want to use. To remove a module from position 2 or 4 (Figure 1-2), you must first remove the filler bracket and net module (if any) above it. See the previous section, "Removing Filler Brackets."

🛑 **Caution:** Do not touch any components or boards in the ASN until you have attached the antistatic wrist strap.

To remove a net module:

**1. Grasp the handle on the net module. Use your thumb to push back the white retaining tab (Figure 1-3).**
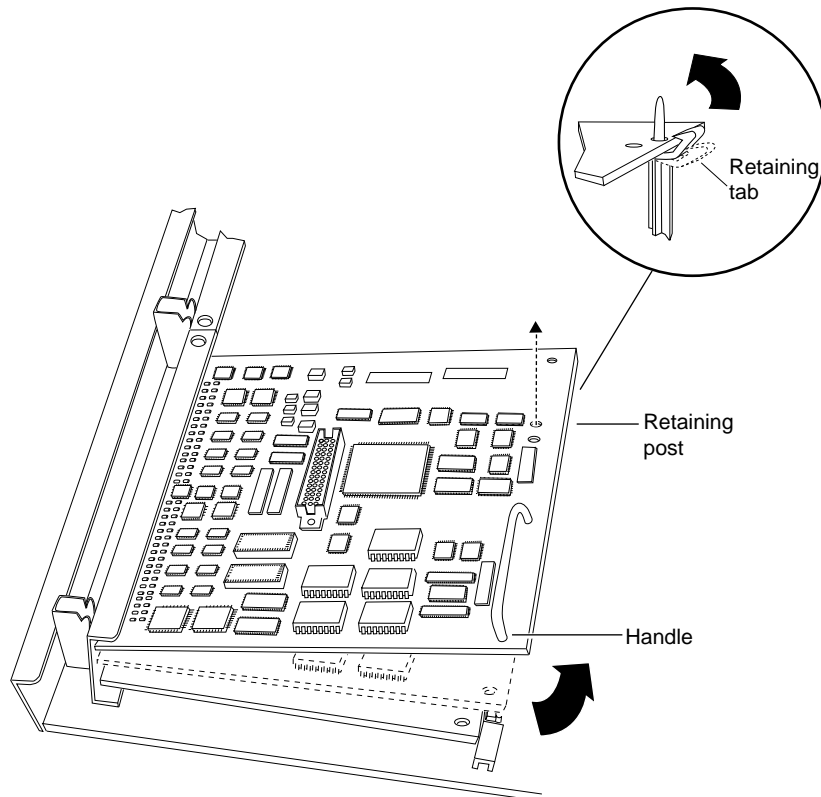
AMC0006A

Figure 1-3.   Preparing to Remove a Net Module

2. **Pull up to release the module from the connector (Figure 1-4).**

Caution: You must lift the module straight up. If you rock the module back and forth or side to side, you can bend the connector pins. Attempting to reinstall a net module with bent connector pins can damage the power supply.
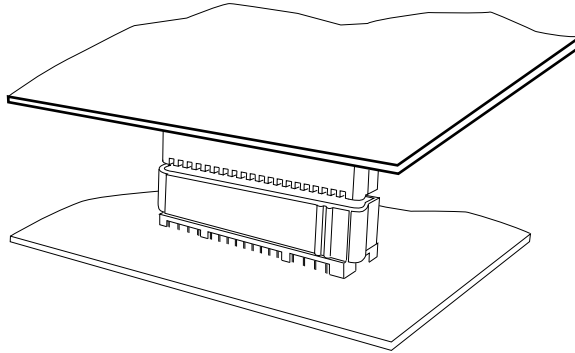
AMC0010A

Figure 1-4.   Removing a Net Module from the Connector

3. **Lift the module bracket up and toward the front of the tray to release it from the metal tabs that hold it in place (refer to Figure 1-3).**

Installing a Net Module

Before you install a SPEX or SPEX-HS net module, note the following:

- You must install the SPEX or SPEX-HS net module in position 4 only (refer to Figure 1-2).

- To install a net module in a position from which you just removed a net module of a different type, you must first delete the old net module from the router's configuration file. Then install the new module in the chassis. For information, refer to *Configuring Routers* if you use router software or *Administration Guide* if you use BayStream software.

To install a net module:

1. **Align the slots at each end of the module bracket with the metal tabs in the net module position that you want to use (Figure 1-5).**

   Do not rest the module bracket on the metal tabs; doing so makes it difficult to align the module connector with the connector on the system board.

2. **Align the module connector with the connector on the system board. Make sure that the white retaining post on the system board goes through the hole in the net module (Figure 1-5).**

> **Note:** If you accidentally turn the white retaining post on the system board, it will not go through the hole in the net module. In this case, turn the post so that its rectangular base is perpendicular to the net module connectors on the system board.

3. **Firmly press the handle on the net module so that the net module is secure in its connector on the system board. Make sure that the white retaining tab snaps into place.**

4. **Press down on the module bracket so that it rests on the metal tabs.**
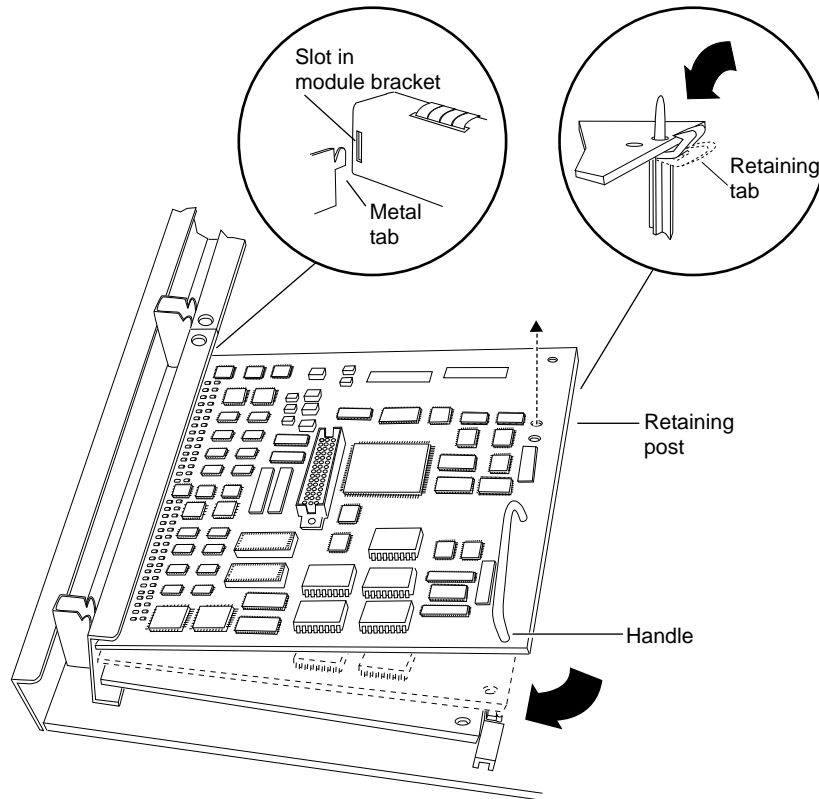
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Figure 1-5.   Aligning a Net Module

Installing a Filler Bracket

Install filler brackets in any unused net module positions. You must replace the filler brackets that fill the openings above positions 1 and 3.

→ **Note:** The filler brackets you use above positions 1 and 3 are different from the brackets that fill unused net module positions 1 through 4. To fill the openings above positions 1 and 3, make sure that you use the brackets labeled "Expansion Filler" (refer to Figure 1-2).

To install a filler bracket:

1. **Align the slots at each end of the bracket with the metal tabs of the position where you are installing the bracket (Figure 1-6).**

   Make sure that the edge of the bracket labeled "Top Surface" faces up.

2. **Position the bracket so that it rests on the metal tabs.**
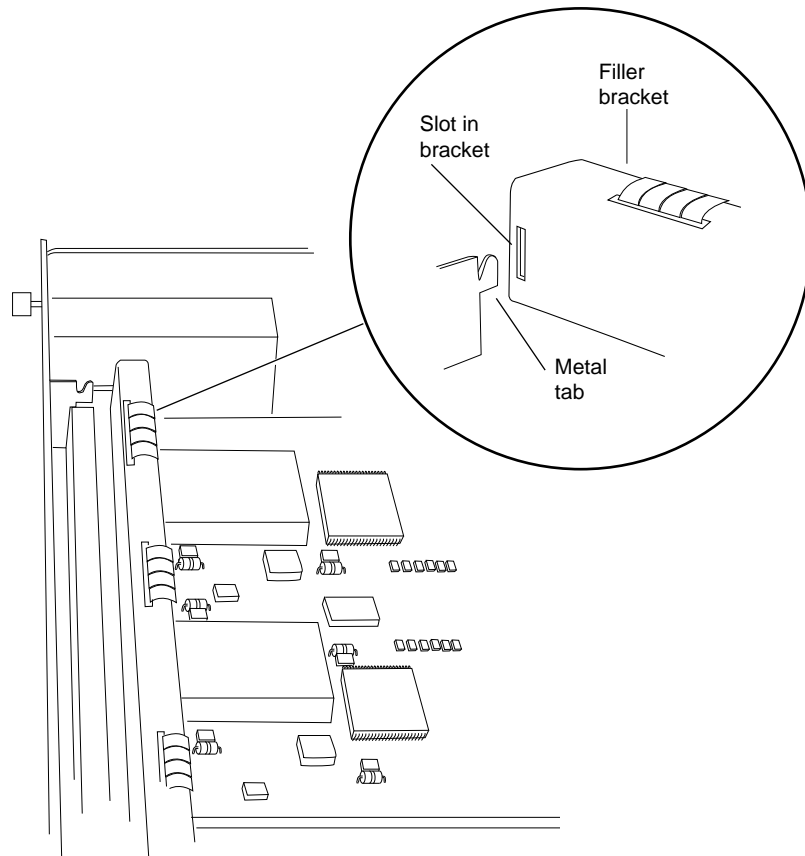
ASN0043A

Figure 1-6.   Installing a Filler Bracket

Replacing the Component Tray

Before you replace the component tray, remove the alligator clip of the antistatic strap from the chassis. Then remove the antistatic wrist strap from your wrist.

To replace the component tray:

1. **Gently slide the tray into the chassis.**

2. **Use a Phillips screwdriver to tighten the two captive screws that fasten the tray to the chassis (refer to <u>Figure 1-1</u>).**

3. **Reattach the cables to the proper connectors on the back panel.**

➡ **Note:** If you just installed a **SPEX net module**, and you are not stacking nodes, you must insert a SPEX terminator plug (Order No. 7140) in both the IN and OUT ports of the net module. Do not use the SPEX cable to connect the IN port to the OUT port. If you do not have terminator plugs, remove the SPEX net module.

If the ASN contains a **SPEX-HS net module**, and you are not stacking nodes, you must attach one of the connectors on the SPEX-HS cable (Order No. 7166) to Port A on the net module. If you do not have a SPEX-HS cable, remove the SPEX-HS net module.

Refer to Chapter 2 for more information about attaching cables to SPEX and SPEX-HS net modules. Chapter 3 describes how to interpret the LEDs on the net modules.

Chapter 2
Attaching Cables to SPEX and SPEX-HS Net Modules

You can stack as many as four ASNs and use the SPEX or SPEX-HS net modules to connect them so that they function as one logical router. Be sure to place the nodes as close together as possible to allow for SPEX or SPEX-HS cabling.

➡️ **Note:** If you just installed a **SPEX net module**, and you are not stacking nodes, you must insert a SPEX terminator plug (Order No. 7140) in both the IN and OUT ports of the net module. Do not use the SPEX cable to connect the IN port to the OUT port. If you do not have terminator plugs, remove the SPEX net module.

If the ASN contains a **SPEX-HS net module**, and you are not stacking nodes, you must attach one of the connectors on the SPEX-HS cable (Order No. 7166) to Port A on the net module. If you do not have a SPEX-HS cable, remove the SPEX-HS net module.

The steps you follow to connect stacked nodes depend on whether you are using SPEX or SPEX-HS net modules.

If the nodes in the stack contain SPEX net modules, proceed to the next section, "Connecting Nodes That Use SPEX Net Modules."

If the nodes contain SPEX-HS net modules, go to "Connecting Nodes That Use SPEX-HS Net Modules."
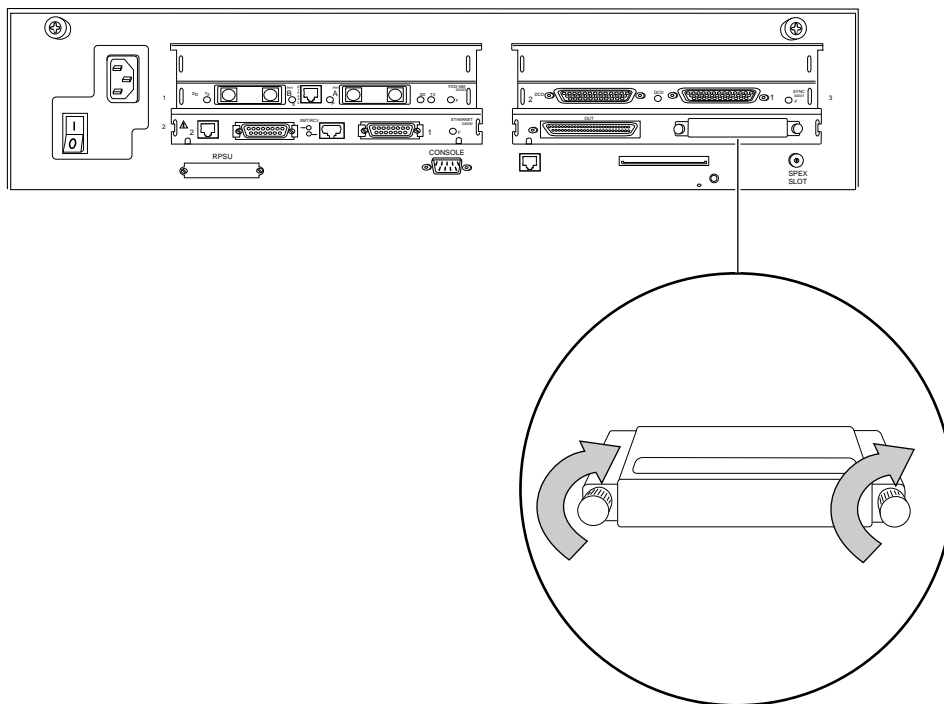
➡️ **Note:** An ASN with an SPEX net module cannot run in the same stack as an ASN with a SPEX-HS net module.

Connecting Nodes That Use SPEX Net Modules

To connect stacked nodes:

1. **On the ASN at the bottom of the stack, insert a terminator plug into the port labeled IN on the SPEX net module. Tighten the thumbscrews on the terminator plug (Figure 2-1).**

ASN0007A

Figure 2-1.   Inserting a Terminator Plug

2. **On the ASN at the top of the stack, insert a terminator plug into the SPEX port labeled OUT. Tighten the thumbscrews on the plug.**

3. **Insert one end of the SPEX cable (Order No. 7141) into the SPEX OUT port of the ASN at the bottom of the stack.**

4. **Insert the other end of the SPEX cable into the SPEX IN port on the ASN above the one you just cabled.**

5. Use separate SPEX cables to connect the SPEX OUT port of each ASN to the SPEX IN port of the ASN above it.

Figure 2-2 shows how to connect the SPEX cables in a stack of four nodes.
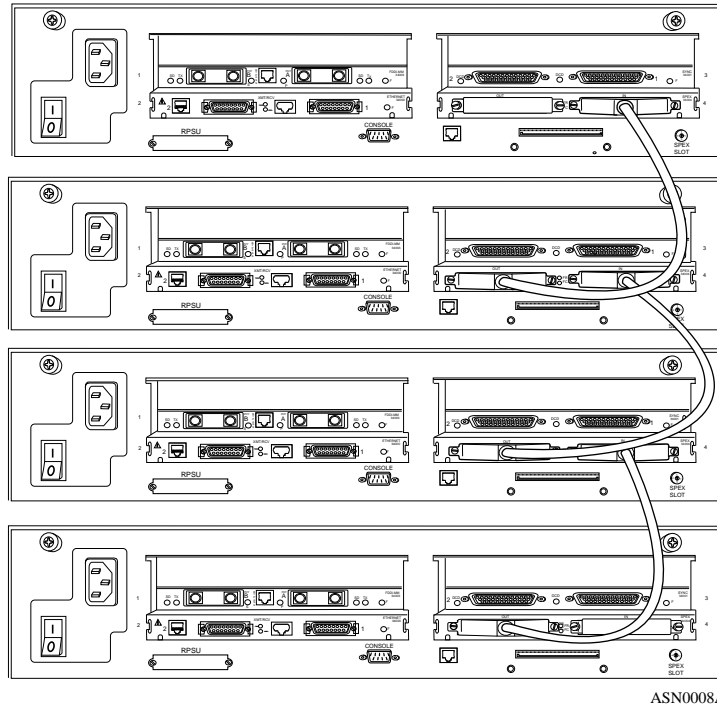

ASN0008A

Figure 2-2. Connecting Stacked Nodes Using SPEX Cables

Next, you must set the slot ID to a unique number on each ASN in the stack. For information, see *Installing and Maintaining ASN Routers and BNX Platforms*.

Connecting Nodes That Use SPEX-HS Net Modules

Caution: Before you can use an ASN with a SPEX-HS net module, your router must be running Bay Networks Router Software Version 8.10 or later (or BNX Software Version 5.00 or later), and diagnostic PROM (*asndiag.exe*) Version 2.16 or later.

If your router is not running these minimum versions, it will fail diagnostics and will not boot.

To upgrade your diagnostic PROM, use the Technician Interface **prom** command. (Refer to *Using Technician Interface Software* if you use router software or *Troubleshooting and Testing* if you use BayStream software.)

Connecting Nodes with a Single SPEX-HS Cable

To connect nodes with a single SPEX-HS cable:

1. **Insert the connector at one end of the SPEX-HS cable (Order No. 7166) into the SPEX-HS Port A on the ASN at the bottom of the stack. Tighten the thumbscrews.**

   The SPEX-HS Port C is reserved for future use.

2. **Insert the next connector on the SPEX-HS cable into the SPEX-HS Port A on the next ASN in the stack. Tighten the thumbscrews.**

3. **Repeat Step 2 for each node in the stack.**

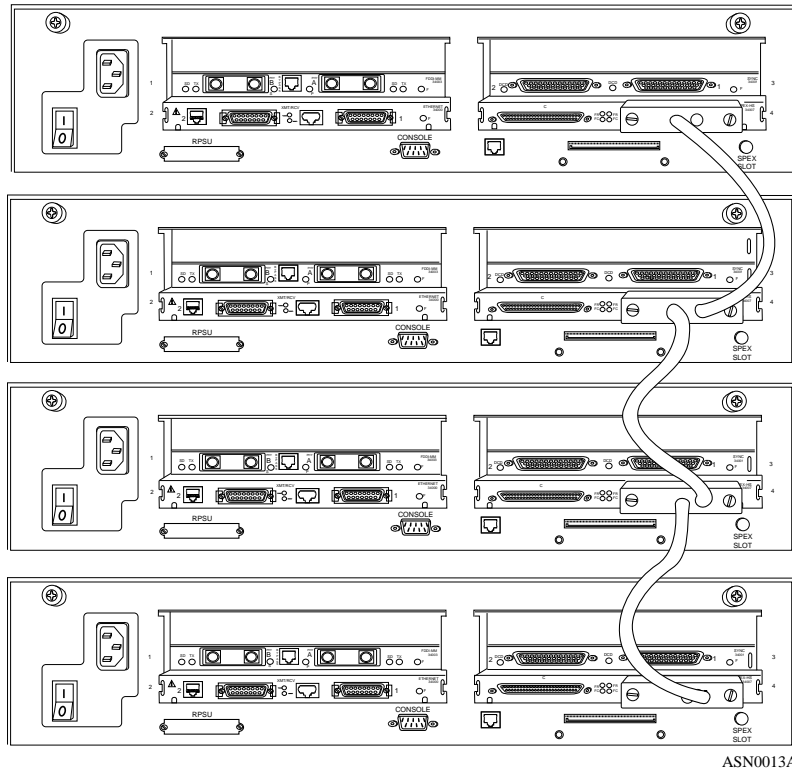Figure 2-3 shows four ASNs connected with a single SPEX-HS cable.

ASN0013A

Figure 2-3.   Connecting Stacked Nodes Using a SPEX-HS Cable

→ **Note:** The connectors on the SPEX-HS cable provide termination; therefore, do not use terminator plugs with SPEX-HS net modules.

Next, you must set the slot ID to a unique number on each ASN in the stack. For information, see *Installing and Maintaining ASN Routers and BNX Platforms*.

Connecting Nodes with Dual SPEX-HS Cables

Caution: To enable dual bus cable support for a SPEX-HS net module, your router must be running Bay Networks Router Software and Boot PROM Version 10.0 or later (or BNX Software and Boot PROM Version 6.00 or later), and diagnostic PROM (*asndiag.exe*) Version 2.16 or later.

If your router is not running these minimum versions, it will not recognize the second port.

To upgrade your diagnostic PROM, use the Technician Interface **prom** command. (Refer to *Using Technician Interface Software* if you use router software or *Troubleshooting and Testing* if you use BayStream software.)

To connect nodes with dual SPEX-HS cables, complete the steps in the previous section, and then

1. **Use a Phillips screwdriver to remove the cover labeled RESERVED FOR FUTURE on the SPEX-HS Port C of each ASN in the stack (Figure 2-4).**

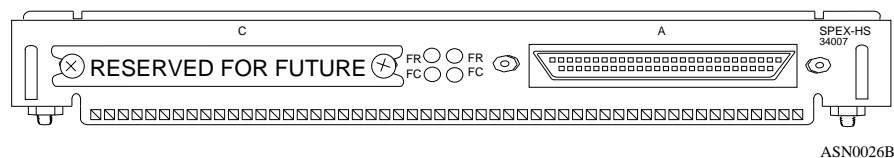ASN0026B

Figure 2-4. **Cover Labeled RESERVED FOR FUTURE**

2. **Insert the connector at one end of the second SPEX-HS cable (Order No. 7166) into the SPEX-HS Port C on the ASN at the bottom of the stack. Tighten the thumbscrews.**

3. **Insert the next connector on the second SPEX-HS cable into the SPEX-HS Port C on the next ASN in the stack. Tighten the thumbscrews.**

4. **Repeat Step 2 for the remaining nodes in the stack.**

Figure 2-5 shows four nodes connected with dual SPEX-HS cables.
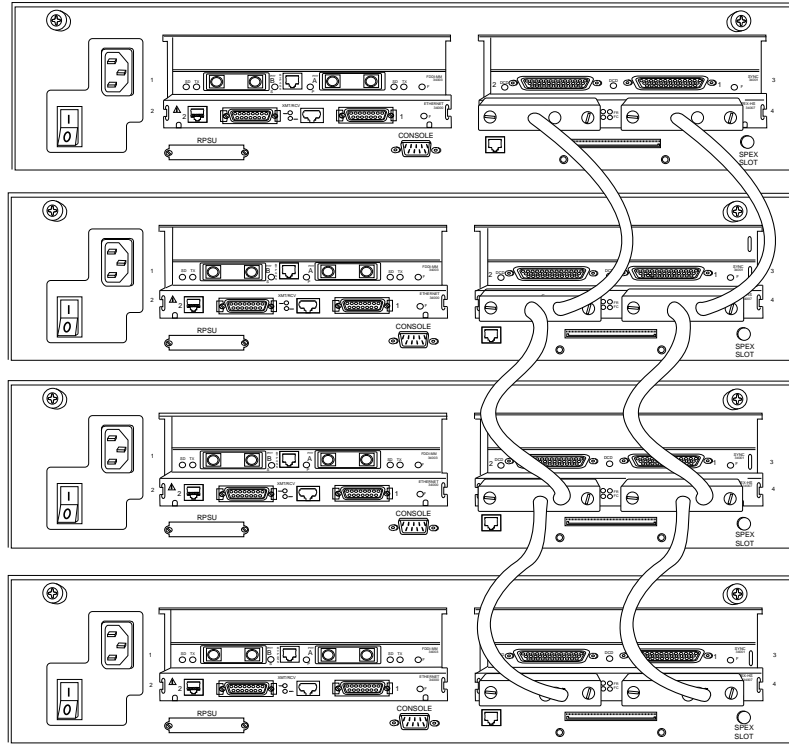
ASN0012A

Figure 2-5.   Connecting Stacked Nodes Using Dual SPEX-HS Cables

→ **Note:** The connectors on the SPEX-HS cable provide termination; therefore, do not use terminator plugs with SPEX-HS net modules.

Next, you must set the slot ID to a unique number on each ASN in the stack. For information, see *Installing and Maintaining ASN Routers and BNX Platforms*.

Chapter 3
Checking the SPEX Net Module LEDs

This chapter describes the LEDs on the SPEX and SPEX-HS net modules.

Stack Packet Exchange Net Module LEDs

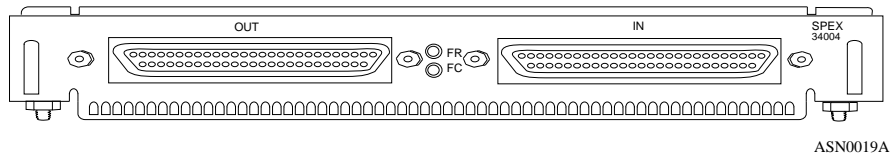Figure 3-1 shows the SPEX net module and Table 3-1 describes the function of each LED.

ASN0019A

Figure 3-1. **SPEX Net Module LEDs**

Table 3-1. **Functions of the SPEX Net Module LEDs**

LED	Function
FR	Indicates that the SPEX net module is transmitting a frame.
FC	Indicates when Flow Control is on. The SPEX net module uses Flow Control to reduce the rate of data transmission whenever there is congestion on the receiving end.

Stack Packet Exchange Hot-Swap Net Module LEDs

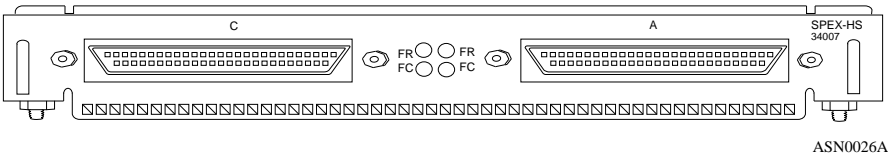Figure 3-2 shows the SPEX-HS net module.

ASN0026A

Figure 3-2.   SPEX-HS Net Module LEDs

The pairs of LEDs labeled FR and FC indicate the status of the corresponding physical connectors A and C, as Table 3-1 describes.

Table 3-2.   Functions of the SPEX-HS Net Module LEDs

LED	Function
FR	Indicates that the SPEX-HS net module is transmitting a frame.
FC	Indicates when Flow Control is on. The SPEX-HS net module uses Flow Control to reduce the rate of data transmission whenever there is congestion on the receiving end.