IBM INSTALLATION INSTRUCTIONS

FC 5229. Expansion Attachment Card for 3494 Tape Libraries with a High Availability Unit (Model HA1)

Document Number 05H7343   EC H28116A

SSD, Tucson

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Status:	Field Use

Note: Install this Field Feature Bill Material (FFBM) only on the 3494 Tape Library Dataserver for which it was shipped.

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Before Install (Sections 1 through 8)

1.0 Machines Affected

This FFBM affects all 3494 subsystems that require the "Expansion Attachment Card"(FC 5229), which is required to support the fifth through the eighth tape control unit and host attachments on subsystems with the High Availability model (HA1).

Note: If this feature will be installed at the same time as FC 5227 ("32 Port Attachment"), DO NOT use this installation instruction. Use installation instruction PN 19P1379 ("Install FC 5227 - 32 Port Attachment") that was furnished in FFBM 19P1082.

Note: This installation instruction applies only to a 3494 subsystem with Model HA1. If you are installing FC 5229 into a 3494 without the HA1 model, refer to installation instruction PN 05H4072.

2.0 Prerequisites / Concurrent / Companion

2.1 Prerequisites

This FFBM will be installed on a 3494 with the High Availability model (HA1). The Patch level must be LM516.xx or higher.

Checkpoint for Microcode ECs: Check the EC level of the Library Manager by using the following steps:

1. From the **Mode** pulldown menu on the Library Manager, select **Service Menu...**. If asked for, type the password **SERVICE**.

2. From the **Service** pulldown menu, select **View Code Levels...**.

3. From the **View Code Levels** window, scroll down to **LM Patch Level is...** and read the current Patch level.

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3.0 FFBMs To Be Installed

FFBM	Description
05H7344	Installation Instructions and Hardware

4.0 Preparation

Read and understand the purpose and details of this installation instruction.

Check all items listed on the bill(s) of material to determine that all parts have been received.

Note: For 3494 subsystems with Model HA1, one FC 5229 must also be ordered and installed in the HA1 right service bay Library Manager. Both FC 5229 must be installed in the 3494 at the same time, as described in this installation instruction.

5.0 Programming Updates

None.

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6.0 Purpose and Description

6.1 Purpose

This FFBM provides eight additional ports. Each port can be jumper selected to be RS-485 compatible or RS-232-A compatible. For 3494 systems with the HA1 model, these instructions install all eight ports as RS-485 control/tape unit ports "8" through "F". See the 3494 Maintenance Information Manual for information about installing host direct attachment ports to 3494 systems with the HA1 model.

Note: In the 3494, control unit interfaces are also referred to as RS-422 ports. For purposes in the 3494, RS-485 and RS-422 are identical.

6.2 Description

Provides a second ARTIC adapter, ARTIC cable, ARTIC breakout box, mounting fasteners, Expansion Attachment Feature diskette and installation instructions to allow installation of the Expansion Attachment Card for the Library Manager.

7.0 Installation Time

Machine Hours	System Hours	CE Hours
2.7	0.0	3.0

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8.0 Special Tools, Materials, and/or Procedures Required

Warning: Some parts handled during this installation are sensitive to electrostatic discharge (ESD). See "Working with ESD-Sensitive Parts" in the CARR section of the 3494 Maintenance Information Manual.

If your LM is at 525.04 or higher, you need a CD, otherwise you will require Disk 1 of the Library Manager microcode. In either case, you will need wrap plugs (P/N 6425494 for breakout box positions 0 and 1, and P/N 09F1799 for breakout box positions 2—7) that were both shipped with the 3494 for installation of this feature.

If you have a Model 7588 Industrial PC, you will require a copy of the **7588 Industrial Computer Information manual** (S20L-2782 or PN 11N9565) that was shipped with the 3494. Familiarize yourself with Chapter 3, "Installing Options", located in the **7588 Industrial Computer Information manual**.

If you have a Model 7581 Industrial PC, you will require a copy of the **IBM 7581 Library Manager Console Maintenance Information manual** (PN 18P7157) that was shipped with the 3494.

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Details of Installation (Sections 9, 10, and 11)

9.0 Safety

9.1 Safety Notice

Refer to 10.1 Subsystem Power and follow steps 10.1.1 through 10.1.13.

10.0 Details Of Installation

10.1 Vary Drives Offline

___ 1. Inform customer operations that the 3494 needs to be taken offline.

___ 2. If the Library **IS NOT** in a **Peer-to-Peer** Copy environment, request from customer operations that all drives (and logical drives if attached to a VTS) in this library need to be varied offline from the host.

___ 3. Do not proceed until operations has verified that the appropriate drives in the library have been varied offline at all attached systems.

___ 4. If the Library Manager is in a **Peer-to-Peer** environment, put the VTS in **service prep mode** by referring to the **Service Allocation** section of the **Start** chapter of the *IBM TotalStorage 3494 Peer-to-Peer Virtual Tape Server Maintenance Information* manual.

Do not proceed until the VTS is in Service Prep Mode.

Proceed to Section 10.2, "Vary Control Unit(s) Offline."

10.2 Vary Control Unit(s) Offline

___ 1. Vary Offline any B10/B16/B18/B20 via the Service pulldown.

___ a. Select **Service**.

___ b. Select **VTS Subsystem Management**.

___ c. Select **Online/Offline**.

___ d. Select **VTS1->Offline**.

___ e. If applicable select **VTS2->Offline**.

___ f. Wait for the message **VTS is now Offline** before proceeding.

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10.3 Subsystem Power

If this library configuration includes a Peer-to-Peer VTS, go to "Entry into Start" of the START chapter of the *IBM TotalStorage Maintenance Information Model B18 VTS, Model AX0/VTS, Model CX0* to prepare for service. Then, return here and continue.

__   1. Place the active library manager in **Offline** mode by selecting the **Offline** option from the **Mode** pull-down menu.

__   2. Place the active library in **Pause** by selecting the **Pause** option from the **Mode** pull-down menu.

__   3. Shut down the active library manager by selecting the **Shutdown** option from the **Mode** pull-down menu.

__   4. Open a Service Window by selecting the **Service Window** button on the **3494 Tape Library Dataserver Shutdown** panel. A Service window is opened for you. If asked for, type the password: **SERVICE**.

__   5. Insert the Library Manager microcode disk 1 or CD into the drive.

   a. If the code level is below 525.04, type **A:\RTICINST** (media - Floppy)

   b. If the code level is 525.04 through 527.01, type **H:\RTICINST** (media - CDROM)

   c. If the code level is 527.01A or higher, type **H:\52701\RTICINST** (media - CDROM)

__   6. Follow the displayed instructions, selecting the defaults by pressing the Enter key. You will be prompted to insert the Expansion Attachment Feature install diskette during this process.

__   7. Remove the Expansion Attachment Feature install diskette from the diskette drive after completion of the previous step

__   8. Type **exit** at the prompt (**C:**).

__   9. From the active library manager, select **Shutdown computer for power off** from the Shutdown panel.

__ 10. Repeat steps 4 through 9 for the other LM.

__ 11. After the Shutdown completes on **both** Library Managers, use the library **Unit Power switch** on the library operator panel to power the library down.

__ 12. Turn off **CB1** on the 3494 Control Unit power control compartment (PCC). Turn off **CB1** on the right HA1 service bay PCC also.

Proceed to Section 10.4, "Prepare the Library Manager System Unit for Service" on page 8.

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10.4 Prepare the Library Manager System Unit for Service

__ 1. If the braided strap is short, loosen the screw holding the strap to the MIC1 card or the metal stiffener around the MIC3 and LPC3/DSW2/DBF2 cards and remove the strap.

__ 2. If you are working with a 7581 proceed to step 3d. Otherwise, continue at the next step.

__ 3. Remove the cover of the Library Manager by following the instructions below.

    __ a. Loosen the six screws on the top cover of the system unit, and place the cover to the side for future reinstallation.

    __ b. Disconnect the IDE ribbon cables and the power cables from the front of each hard disk drive (HDD). Note the cable locations so that they can be correctly installed later.

    __ c. Loosen the three knurled thumbscrews that secure the HDD carrier to the sheet metal chassis, and then gently place the HDD carrier assembly to the side for future reinstallation. Proceed to Section 10.5, "Prepare the Second ARTIC Adapter for Installation."

    __ d. Remove the cover of the library manager by following the instructions below.

        1) Loosen the 8 screws on top of the cover of the system unit and place the cover to the side for future reinstallation.

        2) Remove the card hold-down bracket.

        3) Go to section 10.5, "Prepare the Second ARTIC Adapter for Installation."

10.5 Prepare the Second ARTIC Adapter for Installation

__ 1. Verify that the JP01 jumper **11** is located on the ARTIC card as shown.

__ 2. Verify that the JP02 jumper **12** is located on the ARTIC card as shown.

__ 3. Verify that the JP03 jumper **13** is located on the ARTIC card as shown.

__ 4. Verify that the JP04 jumper **10** is located on the ARTIC card as shown.

__ 5. Verify that the SW1 switch settings **9** are set as shown.

    Note: Since this is an HA1 model, all eight ports (labelled PORT0 through PORT7) must be in the RS-485 position.

__ 6. Verify that the JP05 **1** , JP06 **2** , JP07 **3** , and JP08 **4** jumpers (also labelled PORT0, PORT1, PORT2, and PORT3) are located on the ARTIC card in the RS-485 position.

__ 7. Verify that the JP09 **5** , JP10 **6** , JP11 **7** , and JP12 **8** jumpers (also labelled PORT4, PORT5, PORT6, and PORT7) are located on the ARTIC card in the RS-485 position.

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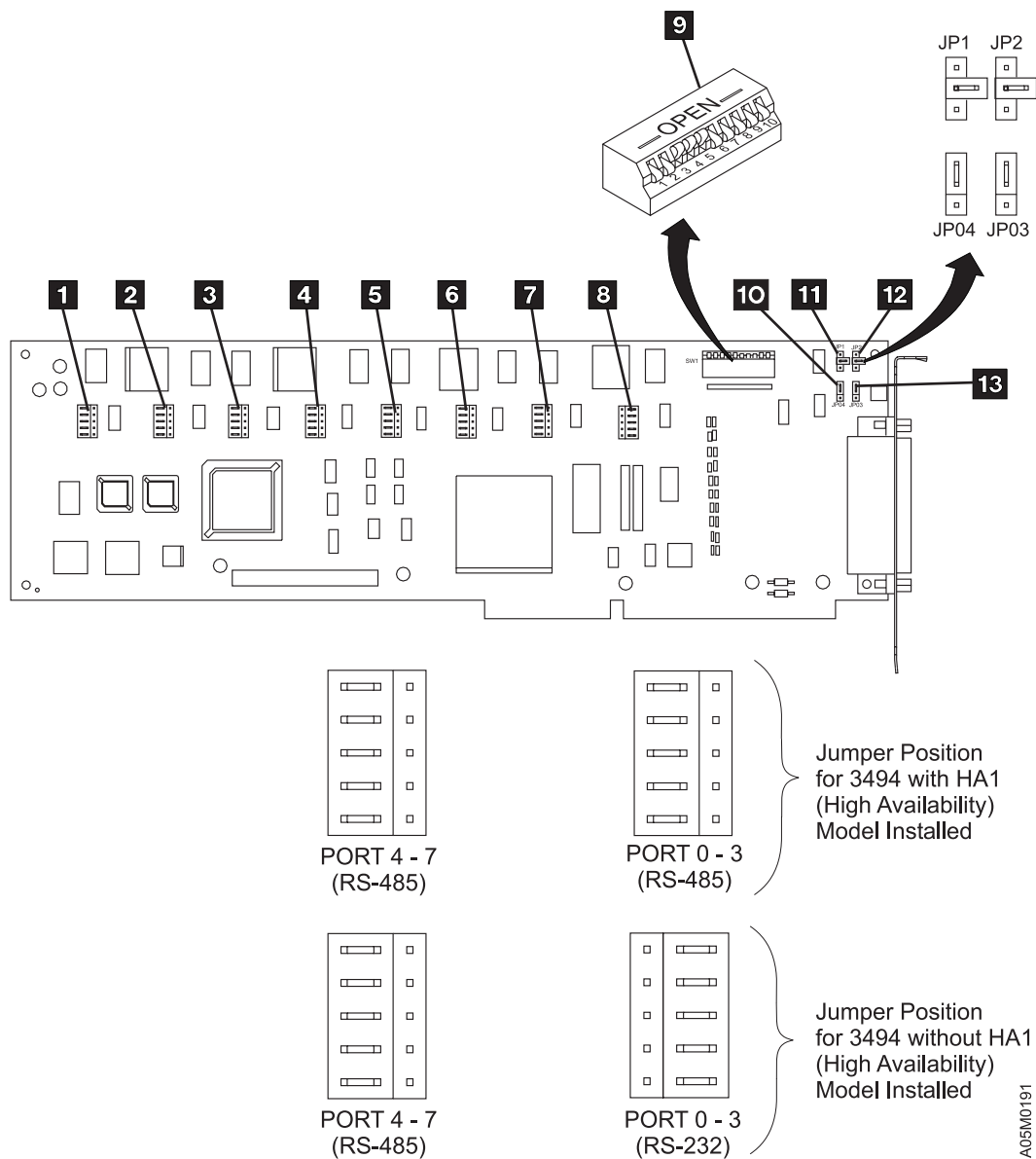
Figure 1. ARTIC186 8-Port Adapter Version 2

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10.6 Install the Second ARTIC Adapter

___ 1. If you are working with the 7581 Industrial Computer System Unit, proceed to step 5. Otherwise continue at the next step.

___ 2. Using the **Installing Adapters** instructions from the *Industrial Computer Information* manual, Chapter 3, install the second ARTIC adapter. Check if you have a hard drive mirroring card plugged into card slot 5 of the 7588. The hard drive mirroring card has two cables that connect to the two hard drives.

___ 3. If a hard drive mirroring card **is installed,** install the second ARTIC adapter card in card slot 8 (**10** in With Mirrored Hard Drive Figure 2 on page 11).

  If a hard drive mirroring card is **not installed,** install the second ARTIC adapter card in card slot 7 (**10** in Without Mirrored Hard Drive Figure 2 on page 11).

___ 4. Proceed to Section 10.7, "Reinstall the Computer Cover" on page 13.

___ 5. Disconnect the DupliDisk-2 Host IDE cable connecting to the SBC.

___ 6. Disconnect the Status LED cable at the front and move the cable out of the way.

___ 7. Using the *Installing Adapters* instructions from the **7581 Installation, Operation, Hardware Maintenance** manual, install the second ARTIC adapter into slot 7. (**7** within Figure 3 on page 12).

___ 8. Reconnect the DupliDisk-2 Host IDE cable and the Status LED cable.
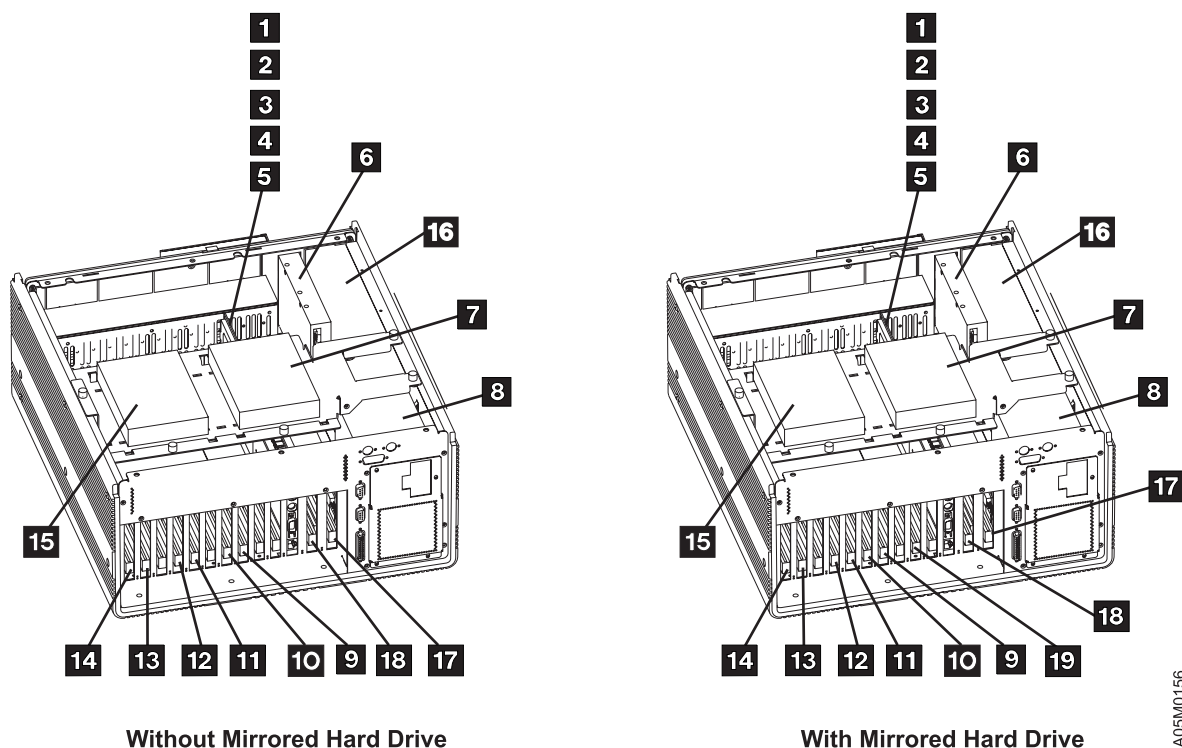
___ 9. Reinstall the card hold-down bracket.

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Without Mirrored Hard Drive   **With Mirrored Hard Drive**

Figure 2. Model 7588 Industrial Computer System Unit

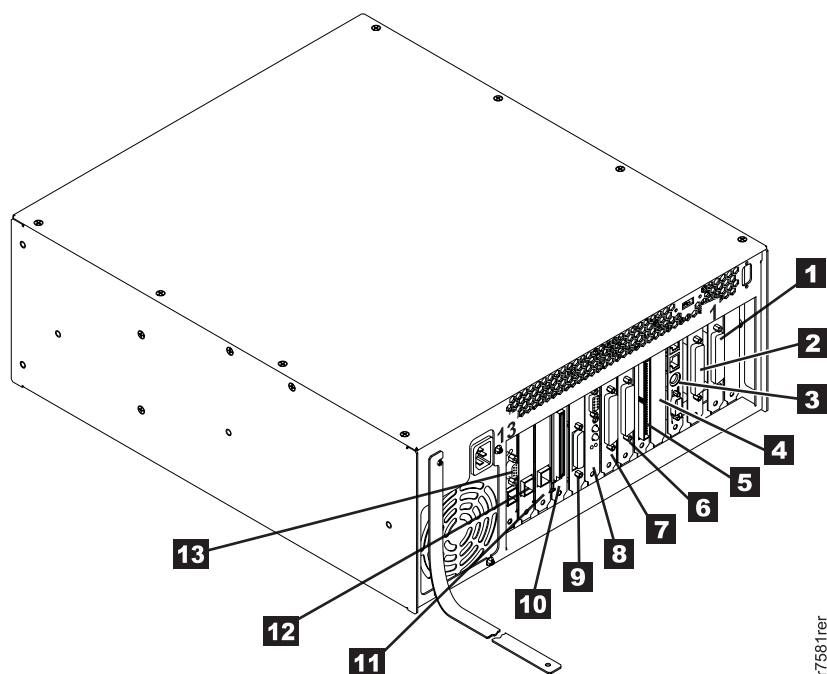| Table 1. Slot Assignments for Model 7588 LM PC		
Slot	**Assignment (Mirroring)**	**Assignment (without Mirroring)**
1	Ethernet Adapter (Alternate link)	Ethernet Adapter (Alternate link)
2	Ethernet Adapter (Primary link)	Ethernet Adapter (Primary link)
3	SBC (Microprocessor) Adapter	SBC (Microprocessor) Adapter
4	SBC needs this slot	SBC needs this slot
5	Mirrored hard drive adapter	Token Ring/Ethernet (FC 5219/5220)
6	Token Ring/Ethernet (FC 5219/5220)	ARTIC card 0 adapter
7	ARTIC card 0 adapter	ARTIC card 1 adapter (FC 5229)
8	ARTIC card 1 adapter (FC 5229)	Empty
9	Servo control adapter	Servo control adapter
10	Display adapter card	Display adapter card
11	ARTIC card 2 adapter (FC 5227)	ARTIC card 2 adapter (FC 5227)
12	ARTIC card 3 adapter (FC 5227)	ARTIC card 3 adapter (FC 5227)
13	DI/DO adapter	DI/DO adapter

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Figure 3. Model 7581 Industrial Computer System Unit

Table 2. Slot Assignments for Model 7581 LM PC		
Slot	**Type**	**Adapter**
1	PCI/ISA	ARTIC 0
2	PCI/ISA	ARTIC 2
3	Combo	SBC
4	ISA	Not Used (SBC needs this slot)
5	ISA	Servo
6	ISA	ARTIC 3
7	ISA	ARTIC 1
8	PCI/ISA	DupliDisk-2
9	PCI	Display
10	PCI	DI/DO
11	PCI	Ethernet (Alternate)
12	PCI	Ethernet (Primary)
13	PCI	Token Ring/Ethernet (FC 5219/5220)

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10.7 Reinstall the Computer Cover

___ 1. If you are working with the 7581 Industrial Computer System Unit, proceed to step 5. Otherwise continue at the next step.

___ 2. Reinstall the HDD carrier assembly by tightening the three knurled thumbscrews that secure the HDD carrier to the sheet metal chassis.

___ 3. Connect the IDE ribbon cable(s) and the power cable(s) to the front of each HDD. If a mirrored hard drive card is installed, ensure that the IDE cable labelled 'Primary' is plugged into the Primary hard drive (**7** in Figure 2 on page 11) and that the IDE cable labelled 'Mirrored' is plugged into the Mirror hard drive (**15** in Figure 2 on page 11).

___ 4. Reinstall the cover, and tighten the six screws on the top cover of the system unit.

Proceed to Section 10.8, "Install ARTIC Cable and Breakout Box" on page 14.

___ 5. (7581 Only) Reinstall the cover, and tighten the eight screws on the top cover of the system unit.

Proceed to Section 10.8, "Install ARTIC Cable and Breakout Box" on page 14.

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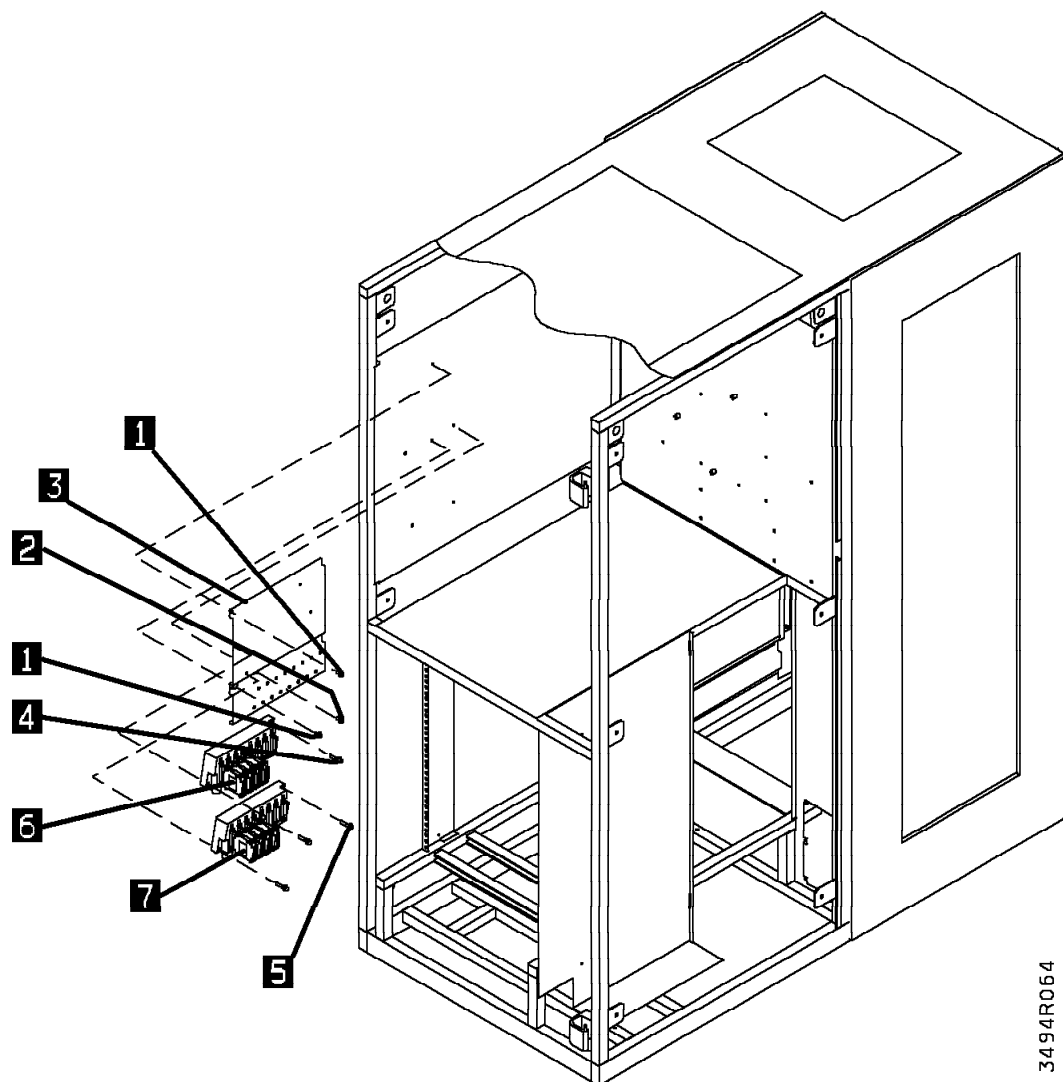## 10.8 Install ARTIC Cable and Breakout Box

Figure 4. Breakout Boxes With Tape Control Expansion

See Figure 4 when performing the following step.

Do not perform the following step if you are installing this MES within the 3494 Model HA1 right service bay.

___ 1. Using two screws **5** (P/N 1624782, provided), install the "Expansion Attachment Card" ARTIC breakout box (P/N 00F5531, provided) on the bracket directly below the basic library manager ARTIC breakout box.

See Figure 5 on page 16 when performing the following steps.

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Perform the following two steps only if you are installing this MES within a control unit frame and the 3494 subsystem **DOES CONTAIN** the 3494 Model HA1 Service Bay.

___ 2. Route the new ARTIC cable (P/N 05H8261, supplied) to the **2ND ARTIC - LIBRARY MANAGER A ARTIC CARD 1** PMX card **4** in the left service bay, and connect the other end of the cable to the second ARTIC adapter you just installed **3** .

___ 3. Route the new ARTIC breakout box cable **2** to the PMX card **6** in the left service bay and connect the cable to the **2ND ARTIC - ARTIC BREAKOUT BOX 2** position.

Perform the following three steps only if you are installing this MES within the 3494 Model HA1 right service bay:

___ 4. Route the new ARTIC cable (P/N 05H8262, supplied) through the HA1 **right** service bay frame hole **8** and connect the cable to the second ARTIC adapter you just installed **1** .

___ 5. Route the remaining ARTIC cable length through the HA1 **left** service bay frame hole **7** and connect the cable to the **2ND ARTIC - LIBRARY MANAGER B ARTIC CARD 1** position on the PMX card **5** . If required, remove one or more of the cable trough covers in the accessor aisle to provide access to the cable routing area.

___ 6. Coil and store the excess cable length in the HA1 left service bay. Reinstall any cable trough covers that were removed in the previous step.

___ 7. Remove the shrink tubing from the cable at the clamp area in both service bay frames **7** **8** and clamp the braided area of the cable using clamps provided in the service bay frames.

Proceed to Section 10.9, "Secure the Library Manager Cables" on page 17.

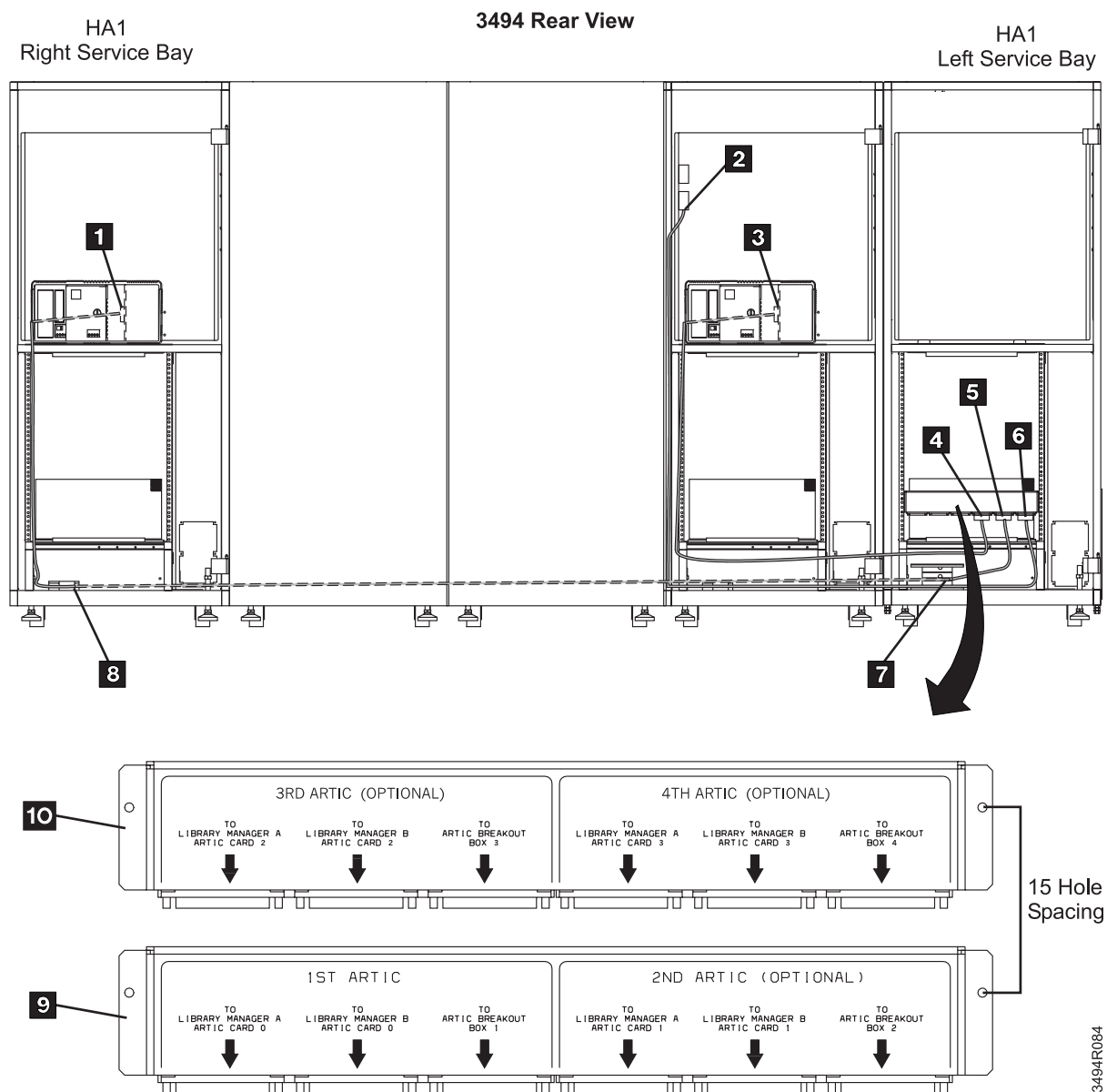| 3494	PN 05H7343	EC C70611	EC D19293	EC F23303	EC H27323A	EC H28116A
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3494 Rear View

HA1
Right Service Bay

HA1
Left Service Bay

Figure 5. Cable Routing On High Availability Model

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10.9 Secure the Library Manager Cables

Perform the following three steps only if you are installing this MES within a 3494 control unit frame (Models L10/L12/L14).

__ 1. Ensure that the front of the library manager is facing you.

__ 2. Reinstall the cables that were removed from their cable clamps, and route the breakout box cable just installed.

__ 3. Secure the cable clamps.

__ 4. If required, reinstall the ground strap that was removed from the MIC1 card, or the metal stiffener around the MIC3 and LPC3/DSW2/DBF2 cards, and tighten the ground strap mounting screw.

Proceed to Section 10.10, "3494 Power-up."

10.10 3494 Power-up

Install the second ARTIC adapter in both Library Managers before performing the following three steps.

__ 1. Turn **CB1** on in the 3494 Control Unit and the HA1 right service bay.

__ 2. Ensure the **Power-on switch** is activated on the Library Manager and all diskettes have been removed.

__ 3. Power on the 3494 using the **Library Unit power switch**.

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11.0 Test Procedure

The test procedure must be performed from each Library Manager while it is the **active Library manager**.

__ 1. After the LM finishes its initialization, select **Auto, Offline**.

__ 2. Run **Teach Current Configuration** if you have **not added** a frame to the library. If you have **added a frame**, run **Teach Additional Box**.

   Note: In the interface tests below, the ARTIC ports are numbered as follows:

   ARTIC Breakout Box 1 ports 0—7 = ARTIC ports 0—7
   ARTIC Breakout Box 2 ports 0—7 = ARTIC ports 8—F

__ 3. From the **Mode** pulldown menu on the Library Manager, select **Service**. If requested, type the password **service**.

__ 4. If new drives or control units have been installed and are ready for use, connect the RS-422 cables to the appropriate breakout box ports. Refer to the 'ARTIC Adapter Cables' section and following in the 3494 MI **Installation** chapter.

__ 5. Run the **Interface Test - Direct Attach** on any direct attach RS-232 ports that have been added.

   __ a. From the **Service** pulldown menu, select **Test interface**. Then select **Direct attach**.

   __ b. Select the first direct-attach RS-232 port to test.

   __ c. Install wrap plug PN 6425494 (which can be used on all breakout ports) onto the corresponding breakout box port.

   __ d. Select OK to initialize the direct attach interface test.

   __ e. If the message "Unable to initialize port. Do you want to run the wrap test?" appears, select **Yes**. A successful wrap test will display "Test completed with no errors".

   __ f. If the test is successful, continue testing the remaining newly added direct attach RS-232 ports.

__ 6. Run **Drive Get/Put** on each drive attached to newly added and Teach-configured ARTIC RS-422/485 ports or ARTIC ports that were changed from RS-232 to RS-422 with converters (PN 50G0947).

   __ a. From the **Service** pulldown menu, select **Exercise cartridge accessor**. The select **Drive Get/Put**.

   __ b. Select the first drive-connected control unit ARTIC port that was added and Teach-configured, or was changed from RS-232 to RS-422.

   __ c. Select **OK** to initialize the Drive Get/Put test.

   __ d. If the test is successful, continue testing the remaining added or converted drive-attached ports. If the test is not successful, isolate the problem by running the control unit interface test (see step 7 below) with the cable to drive control unit disconnected from the ARTIC breakout box.

__ 7. Run the **Interface test-Control unit** on each newly added and Teach-configured ARTIC RS-422/485 port or ARTIC port that was converted from RS-232 to RS-422 with converter (PN 50G0947) if the port does not have a drive connected to it yet.

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__ a. From the **Service** pulldown menu, select **Test interface**. Then select **Control unit**.

__ b. Select the first non-drive connected control unit ARTIC port that was added and Teach-configured or was changed from RS-232 to RS-422.

__ c. Install wrap plug PN 6425494 (which can be used on all breakout box ports) onto the RS-232 to RS-422 converter (PN 50G0947) if installed, or directly onto the breakout box port if the converter is not installed.

__ d. Select **OK** to initiate the control unit interface test.

__ e. If the message "Unable to initialize port. Do you want to run the wrap test?" appears, select **Yes**. A successful wrap test will display "Test completed with no errors".

__ f. If the test is successful, continue testing the remaining added and Teach-configured control unit ports, or converted control unit ports that do not have drives attached.

__ 8. If new RS-232 direct attach ports are being added, connect the RS-232 cables to the appropriate breakout box ports. Refer to the 'ARTIC Adapter Cables' section and following in the 3494 MI **Installation** chapter.

__ 9. Return the subsystem to the customer.

Go to Section 12.0, "Field Updating" on page 20.

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After Installation (Sections 12 through 15)

12.0 Field Updating

None

13.0 Field Support Publications

Save these instructions and the feature install diskette with the 3494 manuals and tools. If the database is lost, they may be needed to re-install this feature.

14.0 Parts Disposition

None

15.0 Machine Records

__ 1. Using existing procedures, update all field records to reflect that feature code 5229 ("Expansion Attachment Card") has been installed.

__ 2. Using existing procedures, report installation and quality.

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