BARR/CHANNEL
Offload

Solutions for Connecting Your Windows-Based
Computer to Your Mainframe Channel

BARR®

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November 5, 2007

Preface

BARR/CHANNEL Offload comes with both a printed manual with getting started information and extensive online documentation.

This manual

Follow the instructions in this manual to install the BARR/CHANNEL Offload hardware and software. The manual provides basic information to help get you started. Refer to the Help for detailed instructions on configuring and operating BARR/CHANNEL Offload. Chapter 7 explains how to start and use the Help.

HTML Help

The Help gives you comprehensive step-by-step configuration and operation instructions for BARR/CHANNEL Offload. You can view up-to-date Help files for the current software release by visiting the support page of the Barr Systems Web site (www.barrcentral.com).

Barr Technical Support

You can contact Barr Systems by e-mail, fax, or phone to work directly with a Support Analyst. Our Frontline and Research support is available five days a week, Monday – Friday. Refer to the Technical Support Web site (www.barrcentral.com) for specific information regarding the hours of operation.

Other methods of technical support include on-site visits, remote control service, and FTP server access. You have two easy-to-use support options available 24 hours a day, 7 days a week using the Internet.

- **Knowledgebase** – The knowledgebase system (www.barrcentral.com/support/kb) offers a complete database of solutions to known problems. Our knowledgebase is designed to locate solutions based on the symptoms you are experiencing. We search the same knowledge when you call or e-mail us! When we solve your problem, we add it to our knowledgebase.
- **Case Manager** – If you've looked in our latest Help and knowledgebase and you still didn't find your answer, you probably need our Technical Support. We've opened our case tracking system up to you on Barr Central through Case Manager (www.barrcentral.com/support/cases). With Case Manager you can create a new case, add notes to the case, check its status, and attach diagnostics. Barr Systems is notified of these events so our Support team knows what you need, and we keep in contact with you while the issue is being worked on.

When you contact Technical Support, please include the hardware serial number and software version number in your correspondence.

Barr Messages

Barr Systems provides messages that help to resolve problems concerning the installation, configuration, tuning, testing, and operation of our products. Message boxes display when the system needs to notify you about a particular situation or condition. See the *Interpreting Barr Messages* Help topic to learn more about the Barr messages.

The following buttons provide more detailed information about the message. They link directly to the Help or Knowledgebase system.

Button	Explanation
	Provides a link to the Help where additional information can be found. This will open an associated Help topic or the *Getting help* topic where you can search for related information.
	Provides a link to Barr Central (www.barrcentral.com) where an updated message might be available. You can link from this page in Barr Central to the knowledgebase, a complete database of solutions to known problems. The knowledgebase will locate solutions based on the symptoms you are experiencing.

Software version number

Once BARR/CHANNEL Offload has been installed, from the taskbar, click Start | Programs | Barr Channel Offload | **Channel Offload**. From the BARR/CHANNEL Offload menu bar, select Help | **About BARR/CHANNEL Offload**. The software version number and the hardware key serial number display in this window.

The Barr Technical Support analyst may also request version numbers for additional program files. Use the Windows Explorer and navigate to the folder where you installed the Barr software (usually \\Program Files\Barr\Channel Offload). Right-click **TOSConsole.exe**, and then select **Properties**. Select the **Version** tab and note the **File version** number.

Hardware serial numbers

You can obtain the hardware key serial number from the blue sticker on the hardware key. Once BARR/CHANNEL Offload has been installed, click Start | Programs | Barr Channel Offload | **Channel Offload**. From the BARR/CHANNEL Offload menu bar, select Help | **About BARR/CHANNEL Offload**. The software version number and the hardware key serial number display in this window.

You can also obtain the adapter serial number from any of the following places.

- Blue sticker on the adapter edge, visible from the rear of the computer
- Back of the adapter, where it is handwritten in permanent ink
- Blue sticker on the adapter box

Notes:

Contents

Introduction

BARR/CHANNEL Offload provides high speed mainframe file transfer for companies using MVS/JES2 or VSE/POWER. It is a combination of software and hardware that allows you to physically connect your Windows-based computer to your mainframe channel using ESCON or Bus & Tag. It emulates multiple tape drives and provides a method for the mainframe spool offload facility to move SYSOUT from MVS/JES2 or VSE/POWER using TCP/IP sockets. Full headers and trailers are received to provide complete information for jobs and data sets. Offload job selection can be based on multiple job selection criteria, such as Class, Jobname, and Destination.
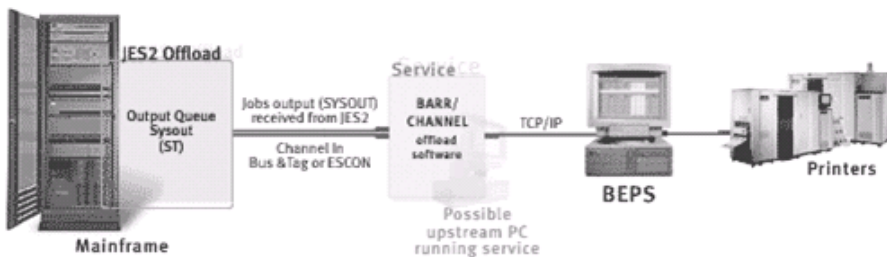
BARR/CHANNEL Offload offers two options:

ESCON Input – The computer connects to the mainframe through the Barr channel adapter. A thin, flexible, fiber-optic cable connects the adapter to the mainframe. You can also connect the cable to an ESCON director, which is connected to the mainframe. With an ESCON director, you can attach multiple adapters to the mainframe.

Bus & Tag Input – The computer connects to the mainframe through the Barr channel adapter. Bus & Tag cables connect the adapter to the mainframe and to any other downstream channel-attached devices.

1.1 Features

BARR/CHANNEL Offload includes the following features.

- Move SYSOUT data from JES2 to BEPS using the mainframe channel
- Receive full headers and trailers for jobs and data sets
- Similar to BARR/PRINT CHANNEL but without the need for banner recognition and extraction
- Higher throughput than 3211 emulation
- Easy host configuration - one command to configure the offload process, one command to configure the SYSOUT transmitter
- Up to 8 offload processes per JES2 system
- Job selection based on multiple job selection criteria, such as Class, Jobname, Destination etc.
- Offload process can be started and drained like a printer with $S and $P commands

1.2 System requirements

Install BARR/CHANNEL Offload on a computer server or workstation that meets the following requirements.

Software requirements

For BARR/CHANNEL Offload, you need the following software installed.

- Microsoft Windows XP Professional, Microsoft Windows 2000, or Microsoft Windows Server 2003
- Microsoft Internet Explorer version 5.5 or later
- When used in conjunction with Barr Enterprise Print Server, the Barr Enterprise Print Server must be version 4.1 or later

Hardware requirements

The computer where you install BARR/CHANNEL Offload must meet the minimum hardware requirements.

Minimum
- 1.0 GHz Pentium Processor
- 512 megabytes (MB) of RAM
- 30 GB Hard Drive
- CD-ROM Drive
- SVGA Display

- Parallel or USB port
- PCI slots half length and full height for Barr adapters

Recommended

- 2.8 GHz Processor with Hyper-threading
- 1 GB of RAM
- 36 GB SCSI or SATA Hard Drive
- CDRW Drive or USB Flash Drive
- Configured/Tested backup system (dependent on downtime tolerance)

These are basic recommendations. Specific requirements are dependent on the operating system, expected production volume, and other applications.

1.3 Section 508 – Software accessibility

In 1998, Congress amended the Rehabilitation Act to require Federal agencies to make their electronic and information technology accessible to people with disabilities. Inaccessible technology interferes with an individual's ability to obtain and use information quickly and easily. Section 508 was enacted to eliminate barriers in information technology, to make available new opportunities for people with disabilities, and to encourage development of technologies that will help achieve these goals. The law applies to all Federal agencies when they develop, procure, maintain, or use electronic and information technology.

Barr Systems believes that Section 508 compliance is important for industry, government, and essential for people with disabilities. We proactively design accessible products and document how our products meet the Section 508 Standards. BARR/CHANNEL Offload meets the Section 508 software accessibility standards.

1.4 Package contents

Your BARR/CHANNEL Offload package includes these items:

- CD-ROM containing the BARR/CHANNEL Offload software and HTML Help
- Hardware key used for software copy protection
- BARR/CHANNEL Offload manual (this manual)

See the corresponding hardware manual for a list of the hardware package contents for the channel hardware.

Notes:

Install the Software and Hardware
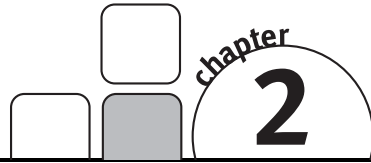
Follow the instructions in this chapter to install the BARR/CHANNEL Offload software and hardware on your computer. When you finish the installation, refer to the subsequent chapters of this manual or the Help for configuration instructions. Complete the following steps to install BARR/CHANNEL Offload.

1. Install or reinstall the software
2. Install the hardware key
3. Install the CHANNEL-IN hardware
4. Install the device driver

2.1 Install or reinstall the software

⚠ You must be a member of the local **Administrators** group on the computer where you install BARR/CHANNEL Offload.

Follow these steps to install the BARR/CHANNEL Offload software. The setup program will copy files from the BARR/CHANNEL Offload CD to your computer.

1. If you are reinstalling the software, stop all BARR/CHANNEL Offload connections, if they are not already stopped.
    a. Open BARR/CHANNEL Offload. (From the taskbar, click Start | Programs | Barr Channel Offload | **Channel Offload**.)
    b. Right-click each connection, and click **Stop**.
2. Exit all Windows programs.
3. Insert the BARR/CHANNEL Offload CD into the CD-ROM drive. The BARR/CHANNEL Offload Setup program automatically displays. If auto run is disabled on your system or if the setup program does not automatically display, right-click **Start** on the taskbar and select **Explore**. Navigate to the CD-ROM drive and double-click **Setup.exe**.
4. Read the information on the **Welcome** dialog box, and then click **Next**.
5. Review the license agreement, and then click **Yes**. (To install the software, you must accept the terms of the license agreement.)
6. On the **User Information** dialog box, enter your name and your company name, and then click **Next**. This information is required.

7. On the **Select Program Folder** dialog box, select the folder for storing BARR/CHANNEL Offload program icons, and then click **Next**. As files are installed, installation progress displays on your screen.

8. On the **Setup Complete** dialog box, choose whether or not to launch BARR/CHANNEL Offload and the online Help.

9. Click **Finish**. You may be prompted to restart your computer.

10. Open the BARR/CHANNEL Offload window to activate the software before your grace period expires (usually 30 days). You can receive your activation code by clicking **Barr Central** on the activation dialog box, visiting www.barrcentral.com/activate, or contacting Barr Systems Technical Support. Activation codes are valid only for a single version of the BARR/CHANNEL Offload software.

Remove BARR/CHANNEL Offload

Use the Windows Add or Remove Programs utility to remove BARR/CHANNEL Offload from your computer. Complete the following steps.

1. Stop all connections, if they are not already stopped.
   a. Open BARR/CHANNEL Offload.
   b. Right-click each connection, and click **Stop**.

2. Close BARR/CHANNEL Offload. (On the menu bar, select File | **Exit**.)

3. Open the Windows Add or Remove Programs utility.
   - For Windows 2000, from the taskbar, select Start | Settings | Control Panel | **Add or Remove Programs**.
   - For Windows XP or Windows Server 2003, from the taskbar, select Start | Control Panel | **Add or Remove Programs**.

4. Select **BARR/CHANNEL Offload**, and then click **Remove**.

5. A confirmation message box displays. Click **Yes** to remove the software. Click **No** to return to the Windows Add or Remove Programs utility.

6. A message box displays asking if you want to remove your configuration data. If you are permanently removing the software, click **Yes** to remove the BARR/CHANNEL Offload configuration data. If you are upgrading, click **No** to leave the configuration data.

7. When removing the software, the **Remove Shared File** dialog box may display. Select **Yes** to remove the file, or select **No** to leave the file. If you choose **Yes** and other Barr programs use the file, those programs may not function properly. Because leaving the file will not harm your system, we recommend choosing **No**.

8. A message will display once the software is removed. Click **OK**.

9. To reinstall the software, follow the steps in the preceding section. If you are permanently removing the software, remove the hardware key from the parallel or USB port.

2.2 Install the hardware key

After you install the Barr software, you must install the hardware key on a parallel port (LPT1, LPT2, or LPT3) or a USB port on your computer. Hardware keys that attach to parallel ports act as a pass-through to the printer or other peripherals so it does not prevent the port from being used for other purposes. If more than one device requires a parallel port, daisy chain the hardware keys together from the same port. For example, plug the hardware key into the parallel port, and then plug the printer into the hardware key. Hardware keys that attach to the USB port can be attached to a hub to allow other connections to the USB port. You may be required to restart your computer before the BARR/CHANNEL Offload software can be used.

After you install the Barr software and the hardware key, you can display the hardware key serial number by selecting Help | **About BARR/CHANNEL Offload** on the BARR/CHANNEL Offload menu bar.

2.3 Install the CHANNEL-IN hardware

Your BARR/CHANNEL Offload package comes with a separate manual for your CHANNEL-IN hardware. Follow the instructions in the CHANNEL-IN manual to install the hardware.

For ESCON connections, install the CHANNEL-IN (ES) adapter, ESCON coupler (if needed), and fiber-optic cable. For Bus & Tag connections, install the CHANNEL INTELLIGENCE or CHANNEL-IN (BT) adapter. With the CHANNEL INTELLIGENCE adapter, you will install the CHANNEL INTELLIGENCE cable. With the CHANNEL-IN (BT) adapter, you will install a Bus & Tag cable and CAB.

2.4 Install the device driver

The BARR/CHANNEL Offload setup program installs the BARR/CHANNEL Offload software files. To complete installation, use the Device Manager in Windows 2000, Windows XP, or Windows Server 2003 to install and configure the device driver. Depending on your operating system, complete one of the following methods.

Windows 2000
Complete the following steps if you are using Windows 2000.

1. After you've installed the CHANNEL-IN hardware, turn on your computer.
2. Once Windows successfully locates and begins installing the appropriate device driver, the **Found New Hardware** dialog box displays. When this dialog closes, the hardware installation is complete.

3. If you are installing a CHANNEL INTELLIGENCE or CHANNEL-IN (BT) adapter, complete the following steps to set the channel transfer mode.

   a. Open Device Manager. (From the taskbar, click Start | Control Panel | **System**. The **System Properties** dialog box displays. On the **Hardware** tab click **Device Manager**.)

   b. Under **Barr adapters**, right-click the appropriate adapter and select **Properties**.

   c. On the **Properties** tab, select the **Channel transfer mode** and click **OK**. Consult your mainframe systems programmer to determine which protocol to use. The transfer mode must match the host definition's **CNTLUNIT** statement. You can configure up to four adapters.

Windows XP or Windows Server 2003

Complete the following steps if you are using Windows XP or Windows Server 2003.

1. After you've installed the CHANNEL-IN hardware, turn on your computer.

2. Windows displays a message that the Device Manager is scanning for Plug and Play compliant hardware, then the Found New Hardware Wizard opens.


3. Select **Install the software automatically** and click **Next**. Windows will search for the software and then install the appropriate device driver.

4. Once Windows has successfully located and installed the appropriate device driver, a dialog box will confirm that the Found New Hardware Wizard has finished installing the software.

5. Click **Finish** to close the wizard.

6. If you are installing a CHANNEL INTELLIGENCE or CHANNEL-IN (BT) adapter, complete the following steps to set the channel transfer mode.

   a. Open Device Manager. (From the taskbar, click Start | Control Panel | **System**. The **System Properties** dialog box displays. On the **Hardware** tab click **Device Manager**.)

   b. Under **Barr adapters**, right-click the appropriate adapter and select **Properties**.

   c. On the **Properties** tab, select the **Channel transfer mode** and click **OK**. Consult your mainframe systems programmer to determine which protocol to use. The transfer mode must match the host definition's **CNTLUNIT** statement. You can configure up to four adapters.

Notes:

Run Hardware Diagnostics
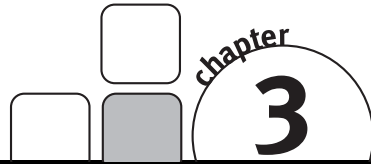
Run hardware diagnostics immediately after you install the hardware. Use the BARR/CHANNEL-IN utility to run hardware diagnostics to verify that you have installed the channel adapter and hardware correctly and that they function properly. The steps for running hardware diagnostics vary depending on the type of hardware you are using. Complete the following steps, depending on your CHANNEL-IN hardware type.

⚠ You can only perform diagnostics on an adapter when no other program is using the adapter.

- CHANNEL-IN (ES)
- CHANNEL INTELLIGENCE
- CHANNEL-IN (BT)

💡 Windows 2000, Windows XP, and Windows Server 2003 users can also use Windows Device Manager to run hardware diagnostics.

3.1 CHANNEL-IN (ES) diagnostics

Use the BARR/CHANNEL-IN utility to run hardware diagnostics to verify that you have installed the CHANNEL-IN (ES) adapter and fiber-optic cable correctly and that they function properly. To perform the self-test, you need the ESCON fiber-optic cable, ESCON coupler, and the ESCON loop plug.

Adapter diagnostics consist of a single self-test. Usually, you test the adapter and cable together. If the combined test fails, you can test the adapter separately by running the self-test again with the loop plug installed on the adapter, so you can isolate any errors.

If the self-test detects an error, it immediately stops and posts an error message. Correct the error, and then repeat the test to confirm that there are no additional errors.

⚠ If the CHANNEL-IN (ES) adapter is already connected to your mainframe or an ESCON director, follow your mainframe procedures for disconnecting ESCON devices before you attempt this test.
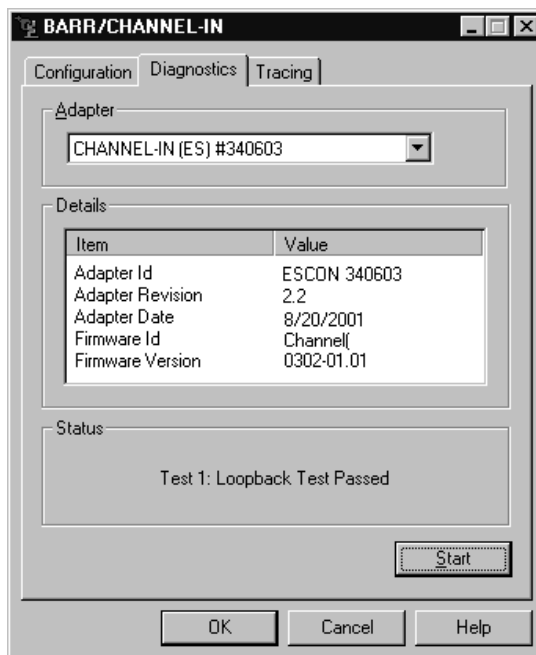
Phase 1: Adapter and cable test

Phase 1 confirms all connections are valid, the adapter drivers are valid, the adapter and its components are working, and the cable is working. Phase 1 proceeds as follows.

- The software locates the adapter and performs an internal adapter test. The test verifies correct operation of IRQ and bus-master logic.
- The software verifies correct functioning of the cable by sending a data string through the adapter in a rotating pattern. The adapter test plug returns the data through the receive-side of the adapter. The test verifies that the returned data matches the sent data.
- The software tests the mainframe fiber-optic cable, if the mainframe cable is included in the loop.

Complete the following steps to test the adapter and cable.

1. Stop all connections, programs, or services using the CHANNEL-IN device driver.
2. Connect the CHANNEL-IN (ES) fiber-optic cable to the adapter, attach the coupler to the cable, and then attach the loop plug to the coupler.
3. Open the BARR/CHANNEL-IN utility. (From the taskbar, click Start | Programs | Barr Hardware | **Channel In**.)
4. From the **Diagnostics** tab, select the adapter to test, and then click **Start**. As the self-test runs, diagnostic status messages display. Refer to the table at the end of this section for a description of the status messages. If Phase 1 reports an error, see the *Adapter installation and settings errors* Help topic for possible resolutions.

Phase 2: Isolated adapter test

If Phase 1 (adapter and cable test) fails, run Phase 2 to isolate the error. Phase 2 tests only the adapter. If Phase 2 fails, the adapter is faulty. If Phase 2 passes after Phase 1 fails, the cable is faulty.

Complete the following steps to test the adapter.

1. Disconnect the ESCON fiber-optic cable from the adapter.
2. Attach the ESCON loop plug to the adapter.
3. Open the BARR/CHANNEL-IN utility.
4. From the **Diagnostics** tab, click **Start** to begin the test. As the self-test runs, diagnostic status messages display. Refer to the table at the end of this section for a description of the status messages.

ESCON status messages

When you run the self-test, one or more of the following messages display in the **Status** box on the **Diagnostics** tab of the BARR/CHANNEL-IN utility.

Message	Description
Loopback Test Passed	The adapter passed all diagnostics, including the loopback tests.
Internal Loopback Error	An internal adapter error was detected. Verify that the adapter is correctly installed in the computer.
External Loopback Error	An external adapter error was detected. Verify that the cable and test plugs are installed correctly.
Loopback Failed: Oscillator Error (0x100)	An oscillator on the adapter is not working properly. The adapter must be replaced.

3.2 CHANNEL INTELLIGENCE diagnostics

Use BARR/CHANNEL-IN to run hardware diagnostics to verify that you have installed the CHANNEL INTELLIGENCE adapter and cable correctly and that they function properly. To perform the self-test, you need the test plugs, terminator plugs, and the CHANNEL INTELLIGENCE cable.

Running diagnostics will check the connections from the adapter to the CHANNEL INTELLIGENCE cable through the Bus & Tag lines. The CHANNEL INTELLIGENCE diagnostic testing confirms that all connections are valid, the adapter drivers are valid, the adapter and its components are working, and the cable is working. You can also test the mainframe channel cable, if the mainframe cable is included in the loop and no other channel devices are attached.

Phase 1: Adapter test

In Phase 1, the software locates the adapter and performs an internal adapter test. The test verifies correct operation of IRQ and bus-master logic.

Complete the following steps to test the adapter.

1. Stop all connections, programs, or services using the CHANNEL-IN device driver.
2. Connect the adapter test plug to the adapter.
3. Open the BARR/CHANNEL-IN utility. (From the taskbar, click Start | Programs | Barr Hardware | **Channel In**.)
4. From the **Diagnostics** tab, select the adapter to test, and then click **Start** to begin the test. As the self-test runs, diagnostic status messages display. Refer to the table at the end of this section for a description of the status messages. If Phase 1 reports an error, see the *Adapter installation and settings errors* Help topic for possible resolutions.

Phase 2: Cable test

In Phase 2, the software tests the CHANNEL INTELLIGENCE cable and the Bus & Tag lines. Data received through Bus In is routed back through Bus Out by the bus test plug, and data received through Tag In is routed back through Tag Out by the tag test plug. The test verifies that the returned data matches the sent data.

Complete the following steps to test the cable.

1. Stop all connections, programs, or services using the CHANNEL-IN device driver.
2. If the CHANNEL INTELLIGENCE adapter is online with the mainframe, remove it from service. The channel must be isolated from the mainframe in accordance with the host's requirements. Typically this is performed by turning off a channel switch or varying offline each channel device. These procedures vary from data center to data center. Follow the procedures required by the data center where the mainframe resides.
3. If necessary, disconnect the Bus & Tag cables from the CHANNEL INTELLIGENCE cable.
4. Attach the Bus terminator and Tag terminator plugs to the white or gray BUS OUT and TAG OUT cable plugs. Attach the Bus & Tag test plugs to the black BUS IN and TAG IN cable plugs.

⚠ The test will fail if you install the test plugs incorrectly.

CHANNEL INTELLIGENCE cable with the terminator and test plugs installed correctly.

5. Verify that the CHANNEL INTELLIGENCE cable is securely fastened to the adapter.
6. Open the BARR/CHANNEL-IN utility.
7. From the **Diagnostics** tab, select the adapter to test, and then click **Start** to begin the test. As the self-test runs, diagnostic status messages display. Refer to the table at the end of this section for a description of the status messages.

CHANNEL INTELLIGENCE status messages

When you run the self-test, one or more of the following messages display in the **Status** box on the **Diagnostics** tab of the BARR/CHANNEL-IN utility.

Message	Description
Loopback Test Passed	The adapter passed all diagnostics, including the loopback tests.
Loopback Failed: Possible Host Attachment	The Channel Intelligence cable is still connected to the mainframe channel and the channel is active. Verify that the mainframe channel has been removed from service.
Loopback Failed: DMA	The bus master DMA logic is not working properly or there is a DMA conflict with some other hardware device.
Loopback Failed: IRQ	The interrupt logic on the adapter is not working properly or there is an IRQ conflict with some other hardware device.
Loopback Failed: Loopback Plug Missing	The test plugs were not detected because they are not installed or they are installed incorrectly.
Loopback Failed: BUS	The test plugs were detected, but a problem exists with one or more of the bus lines.
Loopback Failed: TAG	The test plugs were detected, but a problem exists with one or more of the tag lines.
20 MHz Oscillator Error (0x31)	An oscillator on the adapter is not working properly. The adapter must be replaced.
30 MHz Oscillator Error (0x32)	An oscillator on the adapter is not working properly. The adapter must be replaced.

3.3 CHANNEL-IN (BT) diagnostics

Use BARR/CHANNEL-IN to run hardware diagnostics to verify that you have installed the CHANNEL-IN (BT) adapter and CAB correctly and that they function properly. To perform the self-test, you need the adapter test plug and the CAB terminator and test plugs.

Adapter and CAB diagnostics consist of a single self-test. To test both pieces of hardware, you must run the self-test twice – each time with test plugs installed at a different location – so you can isolate any errors.

⚠️ Always perform Phase 1 before you attempt Phase 2 or 3. If the problem is with the adapter, you can avoid running Phase 3, which requires you to disconnect the CAB from the mainframe channel.

If the self-test detects an error, the test immediately stops and posts an error message. Correct the error, and then repeat the test to confirm that there are no additional errors.
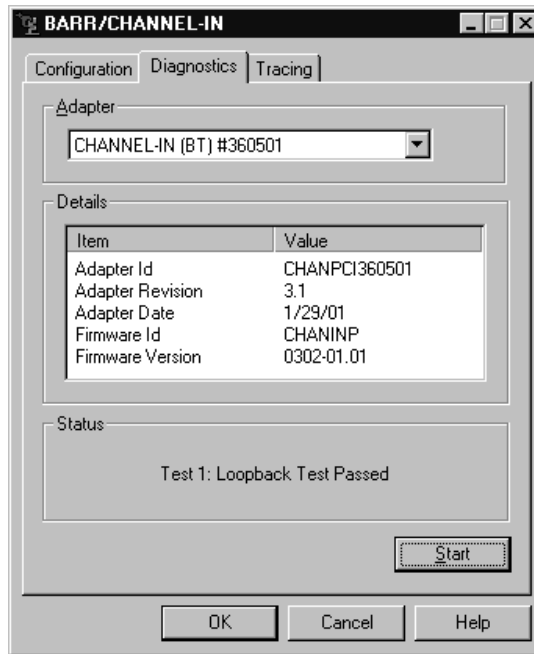
Phase 1: Adapter test

Phase 1 confirms that all connections are valid, the adapter drivers are valid, and the adapter and its components are working. The software locates the adapter and performs an internal adapter test. The test verifies correct operation of DMA, IRQ, and bus-master logic.

Complete the following steps to test the adapter.

1. Stop all connections, programs, or services that are using the CHANNEL-IN device driver.
2. Connect the adapter test plug to the adapter.
3. Open the BARR/CHANNEL-IN utility. (From the taskbar, click Start | Programs | Barr Hardware | **Channel In**.)

4. From the **Diagnostics** tab, select the adapter to test, and then click **Start** to begin the test. As the self-test runs, diagnostic status messages display. Refer to the table at the end of this section for a description of the status messages. If Phase 1 reports an error, see the *Adapter installation and settings errors* Help topic for possible resolutions.

Phase 2: Cable test

Phase 2 confirms that the cable is working. The software verifies correct functioning of the cable by sending a data string through the adapter in a rotating pattern. The adapter test plug returns the data through the receive-side of the adapter. The test verifies that the returned data matches the sent data.

Complete the following steps to test the cable.

1. If you have not already done so, stop all connections, programs, or services using the CHANNEL-IN device driver.
2. Connect the CHANNEL-IN (BT) cable to the adapter and attach the test plug to the other end of the cable.
3. Open the BARR/CHANNEL-IN utility.
4. From the **Diagnostics** tab, select the adapter to test, and then click **Start** to begin the test. As the self-test runs, diagnostic status messages display. Refer to the table at the end of this section for a description of the status messages.

Phase 3: CAB installation and connections

Phase 3 verifies the connections from the adapter to the CAB through the Bus & Tag lines. Phase 3 confirms that all connections are valid, the adapter drivers are valid, the adapter and its components are working, the cable is working, and the CAB is working. This phase also can be used to test the mainframe channel cable if the mainframe cable is included in the loop and no other channel devices are attached. Phase 3 proceeds as follows.

- The software performs the internal adapter test as described in Phase 1.
- The software tests the cable and CAB. Because the adapter test plug is not installed, the sent data also travels through the Bus & Tag lines. Data received through Bus In is routed back through Bus Out by the bus test plug, and data received through Tag In is routed back through Tag Out by the tag test plug. The test verifies that the returned data matches the sent data.

Complete the following steps to test the CAB installation and connections.

⚠ Always perform Phase 1 and 2 before you attempt Phase 3. If the problem is with the adapter, you can avoid running Phase 3, which requires you to disconnect the CAB from the mainframe channel.

1. If the CAB is online with the mainframe, remove it from service. Typically, you need to isolate the mainframe by turning off a channel switch or varying offline each channel device. These procedures vary from data center to data center. Follow the procedures required by the data center where the mainframe resides. Phase 3 proceeds only if the self-test determines that the CAB is isolated from the channel.

2. Verify that the CAB power supply is connected to an electrical outlet and that the ENABLE/DISABLE switch is set to **ENABLE**. The test will not pass unless the CAB has power and is enabled.

3. Disconnect the Bus & Tag cables from the CAB. Then attach the terminator plugs and test plugs. The test will fail if you install the test plugs incorrectly.

4. Verify that the adapter is connected to the CAB. In Phase 2, you connected the test plug to the cable. For Phase 3, you need to remove the test plug and reattach the CHANNEL-IN (BT) cable to the CAB.

5. Open the BARR/CHANNEL-IN utility.

6. From the **Diagnostics** tab, click **Start** to begin the test. As the self-test runs, diagnostic status messages display. Refer to the table at the end of this section for a description of the status messages. If Phase 3 reports an error, contact Barr Systems Technical Support.

Bus & Tag status messages

When you run the self-test, one or more of the following messages display in the **Status** box on the **Diagnostics** tab of the BARR/CHANNEL-IN utility.

Message	Description
Loopback Test Passed	The adapter passed all diagnostics, including the loopback tests.
Loopback Failed: Possible Host Attachment	The test can run only if the CAB is isolated from the mainframe channel. Verify that the mainframe has been removed from service.
Loopback Failed: DMA	The bus master DMA logic is not working properly or there is a DMA conflict with some other hardware device.
Loopback Failed: IRQ	The interrupt logic on the adapter is not working properly or there is an IRQ conflict with some other hardware device.
Loopback Failed: Loopback Plug Missing	The test plugs were not detected because they are not installed or they are installed incorrectly.
Loopback Failed: BUS	The test plugs were detected, but a problem exists with one or more of the bus lines.
Loopback Failed: TAG	The test plugs were detected, but a problem exists with one or more of the tag lines.
20 MHz Oscillator Error (0x31)	An oscillator on the adapter is not working properly. The adapter must be replaced.
30 MHz Oscillator Error (0x32)	An oscillator on the adapter is not working properly. The adapter must be replaced.

Configure the Host
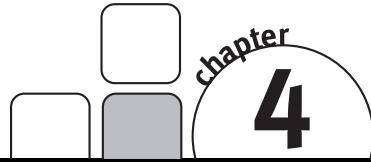
To configure BARR/CHANNEL Offload, you must configure the host for your device. The **CHPID** and **CNTLUNIT** parameters on the host definition vary depending if you are using an ESCON or Bus & Tag connection.

4.1 ESCON configuration

Use the following host definitions for BARR/CHANNEL Offload using an ESCON device.

```
CHPID        PATH=((00)),TYPE=CNC
CNTLUNIT     CUNUMBR=0090,PATH=(00),UNITADD=((90,001)),  *
             SHARED=N,UNIT=3490,CUADD=0
IODEVICE     ADDRESS=(090,001),CUNUMBR=(0090),TIMEOUT=Y, *
             STADET=N,UNIT=3490
```
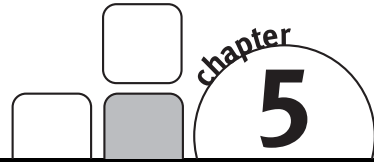
4.2 Bus & Tag configuration

Use the following host definitions for BARR/CHANNEL Offload using a Bus & Tag device.

```
CHPID        PATH=((00)),TYPE=BL
CNTLUNIT     CUNUMBR=0090,PATH=(00),UNITADD=((90,001)),  *
             SHARED=N,PROTOCL=D,UNIT=3490
IODEVICE     ADDRESS=(090,001),CUNUMBR=(0090),TIMEOUT=Y, *
             STADET=N,UNIT=3490
```

Notes:

Configure and Use the Software

⚠ You must be a member of the local **Administrators** group to configure and start connections.

Once you have completed the steps in the preceding chapters, you are ready to set up and manage your connections. BARR/CHANNEL Offload allows you to physically connect your Windows-based computer to your mainframe channel. It emulates multiple mainframe-attached tape devices and allows you to print from the mainframe to your local network printers. Complete the following steps to configure and use the software.

⚠ If you are adding a new device definition to the mainframe, you must configure the host before you use BARR/CHANNEL Offload. Follow the steps in Chapter 4 to configure the host. If you are replacing an existing channel-attached tape device, you do not need to configure the host.

1. Add connections
2. Start and stop connections
3. Interpret connection status

5.1 Add connections

When adding a BARR/CHANNEL Offload connection, you must configure the communication properties. Complete the following steps to add a connection.

⚠ You must be a member of the local **Administrators** group to add, modify, and remove connections.

1. Open BARR/CHANNEL Offload. (From the taskbar, click Start | Programs | Barr Channel Offload | **Channel Offload**.)
2. On the menu bar, select Connection | **Add**. The **Connection Properties** tab pages display.

3. Select the **Communications** tab.

4. In the **Name** box, type the name you want to display in the BARR/CHANNEL Offload window.

5. Next to **Startup**, select how you want to start the connection. You can either start the connection manually from the window or configure the connection to start automatically with Windows startup.

> ⚠ You must be a member of the local **Administrators** group to start connections. If the operator is not a member of the local **Administrators** group, select **Automatic** so the connection will start automatically with Windows startup.

6. From the **Adapter** drop-down list, select the adapter to use for this device.

7. If you are using an ESCON connection, type a hexadecimal value (0-F) in the **Image number** box. You must select an adapter before you can specify the image number. If you are using a CHANNEL INTELLIGENCE or CHANNEL-IN (BT) adapter, this option will not be available.

8. In the **Channel address** box, type the channel address of the device you are adding. Each device must have a unique address, which must match the subchannel address at the host. You can get this hexadecimal number from your host systems programmer. You can enter an address in the range from 00 to FF. The default address is 90.

9. In the **IP address** box, type the unique IP address of the Barr Enterprise Print Server computer. This can also be a string that a DNS server can resolve into an IP address.

10. In the **IP port number** box, type the IP port number of the Barr Enterprise Print Server computer. The default value is 2277.

11. If you want to set advanced properties, select the **Advanced** tab. See the *Advanced tab* help topic for a description of each option.

12. Click **OK** several times to return to the BARR/CHANNEL Offload window. The connection you added displays in the window and will remain disconnected until you start it. Before a connection can be used, you must initiate offload on the host. See the *Operator commands* help topic for examples.
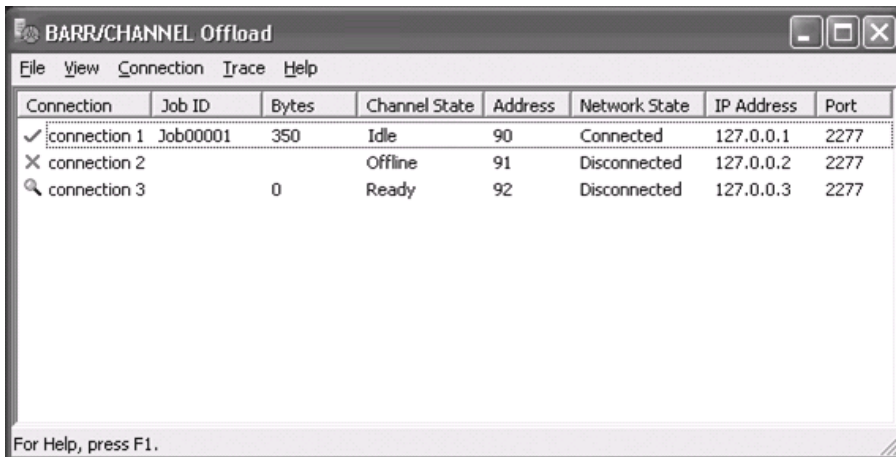
5.2 Start and stop connections

The connection you created must be started in order to use BARR/CHANNEL Offload. Refer to the following sections for information on starting and stopping connections.

⚠️ You must be a member of the local **Administrators** group to start and stop connections.

To start connections

Complete the following steps to start the connection.

1. Open BARR/CHANNEL Offload.
2. Use one of the following methods to start the connection. Once the connection is started, BARR/CHANNEL Offload is ready to receive jobs from the host.
   - Select the connection, and then on the menu bar, select Connection | **Start**.
   - Right-click the connection and select **Start**.

To stop connections

Connections must be stopped before you can remove a connection. Complete the following steps to stop the connection.

⚠️ If connections are stopped when data is being received from the host, the data stream will stop and an error will occur at the host.

1. Open BARR/CHANNEL Offload.
2. Use one of the following methods to stop the connection.
   - Select the connection, and then on the menu bar, select Connection | **Stop**.
   - Right-click the connection and select **Stop**.

To restart connections

If you are experiencing problems with a connection, your first step in troubleshooting should be to restart the connection. Complete the following steps to restart the connection.

1. Open BARR/CHANNEL Offload.
2. Use one of the following methods to restart the connection.
   - Select the connection, and then on the menu bar, select Connection | **Restart**.
   - Right-click the connection and select **Restart**.

5.3 Interpret connection status

Use the following table to review common connection states. The table corresponds directly to the status columns in the BARR/CHANNEL Offload window. If you are having a problem with a connection, review the *Troubleshooting* Help topic for possible resolutions.

Connection	Job Name	Bytes	Channel State	Address	Network State	IP Address	Port

Connection	Channel State	Network State	Description
✖	Offline	Disconnected	The connection is not started.
✔	Online	Disconnected	The connection has been started. This is a temporary state before the Channel state changes to Ready.
✔	Ready	Disconnected	The connection is ready and waiting for data from the host.
✔	Receiving	Connected	Data is being received from the host.
✔	Ready	Connected	The device has received the data from the host but is waiting to detect the end of the job.
✔	Ready	Pending	There is a problem with the network. For example, an incorrect IP address or port number may have been specified. Verify that the values are correct on the **Communications** tab.

✖ Stopped

✔ Started

Notes:

Capture a Trace
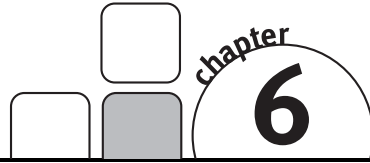
With BARR/CHANNEL Offload, you can capture several types of traces. You can capture a trace of the IP network, channel adapter, or perform internal tracing of the service. Depending on the type of trace you need to do, complete the steps in the following sections.

1. Trace the problem
   - Network or channel
   - Internal
2. Gather and send diagnostics

You can also use the Operator Console to capture a trace. See the *Using the Operator Console* Help topic for more information.

6.1 Trace the problem

BARR/CHANNEL Offload provides the ability to capture traces of the IP network and channel adapter, as well as perform internal tracing of the service. Network and channel tracing can also be configured to occur automatically when the connection is started.

You must be a member of the local **Administrators** group to conduct a trace.

Tracing may cause performance degradation and should only be used for troubleshooting purposes.

To capture a network or channel trace

If you have communication problems, you can capture a trace of the IP network or channel adapter from the BARR/CHANNEL Offload window. When capturing a channel adapter trace, all connections using the selected adapter will be traced.

Complete the following steps to capture a trace.

1. Open BARR/CHANNEL Offload. (From the taskbar, click Start | Programs | Barr Channel Offload | **Channel Offload**.)
2. Select the connection you want to trace.

3. Use one of the following methods to start the selected connection.
   - On the menu bar, select Connection | **Start**.
   - Right-click the connection and select **Start**.
4. Use one of the following methods to start the trace.
   - For a network trace, on the menu bar, select Trace | Network | **Long Format** or **Short Format**, depending on how detailed you want the trace to be. You can also right-click the connection and select Network Trace | **Long Format** or **Short Format**.
   - For a channel adapter trace, on the menu bar, select Trace | Channel | **Long Format** or **Short Format**, depending on how detailed you want the trace to be. You can also right-click the connection and select Channel Trace | **Long Format** or **Short Format**.
5. Recreate the problem. The trace file is saved in the \\Program Files\Common Files\Barr\Trace folder. The trace file name will be the name of the service, with an .ipt extension for network traces and a .chi extension for channel traces. Each connection is saved as a Windows service. Services are named as follows, BarrTOS*AdapterNumber_ImageNumberChannelAddress* (for example, BarrTOS0_090). If you are using a Bus & Tag adapter, the image number will not appear.
6. Use one of the following methods to stop the trace.
   - For a network trace, on the menu bar, select Trace | Network | **Off**. You can also right-click the connection and select Network Trace | **Off**.
   - For a channel adapter trace, on the menu bar, select Trace | Channel | **Off**. You can also right-click the connection and select Channel Trace | **Off**.
7. Follow the steps in Section 6.2 to gather and send the diagnostics file to Barr Systems Technical Support. The trace file will be included as part of the diagnostic file.

You can also configure tracing to occur at startup on the **Advanced** tab.

Channel traces can also be captured from the BARR/CHANNEL-IN utility. See the *Capturing a channel trace* Help topic for more information.
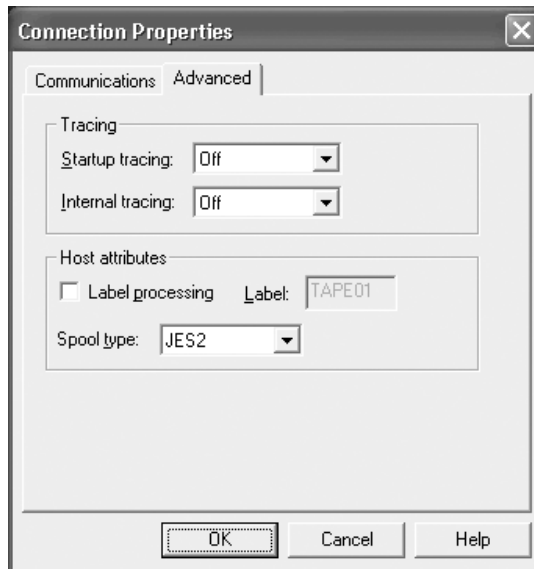

To capture an internal trace

Internal tracing should only be performed if a Barr Systems support analyst advises you to do so. Complete the following steps to capture an internal trace of the service.

1. Open BARR/CHANNEL Offload.
2. Select the connection you want to trace.
3. Use one of the following methods to start the connection.
   - On the menu bar, select Connection | **Start**.
   - Right-click the connection and select **Start**.
4. Select the connection and click Connection | **Modify** on the menu bar, or right-click the connection and select **Modify**.

5. Select the **Advanced** tab.

6. Set the **Internal tracing** drop-down list to **On**. This will capture a trace of the internal state of the system.

7. Recreate the problem. The trace file is saved in the \\Program Files\Common Files\Barr\Trace folder. The trace file name will be the name of the service, with an .int extension. Each connection is saved as a Windows service. Services are named as follows, BarrTOS*AdapterNumber_ImageNumberChannelAddress* (for example, BarrTOS0_090). If you are using a Bus & Tag adapter, the image number will not appear.

8. To stop the trace, from the **Advanced** tab set the **Internal tracing** option to **Off**.

9. Follow the steps in Section 6.2 to gather and send the diagnostics file to Barr Systems Technical Support. The trace file will be included as part of the diagnostic file.

6.2 Gather and send diagnostics

If you have trouble operating BARR/CHANNEL Offload and contact Barr Systems Technical Support, a support analyst may request that you capture a trace and use the Diagnostics Utility to send the resulting diagnostic file.

The Diagnostics Utility automatically gathers diagnostics information into a single compressed file that you can e-mail or mail to Barr Systems Technical Support. This file includes such information as version, registry, general computer information, hardware serial numbers for adapters and the hardware key, message and error logs, and user comments.

Complete the following steps to gather and send the diagnostic files to Barr Systems Technical Support.

1. Open the Diagnostics Utility. (From the BARR/CHANNEL Offload menu bar, select Trace | **Send**.)
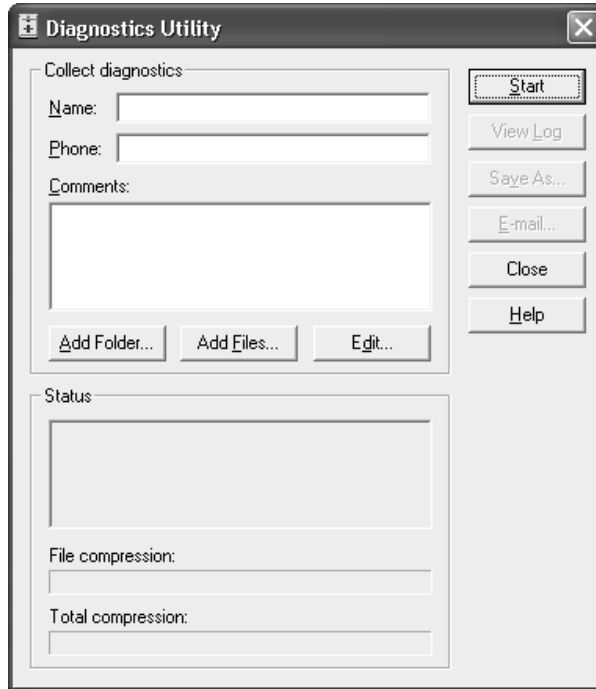
2. In the **Name** box, type the name of the contact person. This is a required field.
3. In the **Phone** box, type the phone number of the contact person. This is a required field.
4. In the **Comments** box, type your assigned problem tracking number and a brief description of the problem.
5. Click **Add Folder** to select a folder (and all of its subfolders and files) to be included with the diagnostics.
6. Click **Add Files** to select individual files to be included with the diagnostics.

   Barr software configuration files and all trace files located in the \\Program Files\Common Files\Barr\Trace folder will be automatically included in the diagnostics. Once the files in the trace folder are included in the trace, they will be moved to the \\Program Files\Common Files\Barr\Old Trace folder. If a file with the same name exists in the Old Trace folder, the existing file is replaced with the new file.

7. Click **Start**. The status of the progress of the diagnostics being gathered will be indicated in the **Status** box. The name and location of the compressed .bct file will display, indicating that all diagnostics have been collected.

8. To view the details of the diagnostics, click **View Log.**

9. To save the BarrDiag.bct file to an alternate location, click **Save As**. This is useful because the BarrDiag.bct file is saved to a hidden folder by default.

10. Use one of the following methods to send the diagnostics file.

   ▪ If you have Internet e-mail access, click **E-mail** to send files to Barr Systems Technical Support. The e-mail will be sent to support@barrsystems.com.

   ▪ Use the FTP server at ftp.barrsystems.com. Contact Barr Systems Technical Support for more information.

   ▪ Use a software disk. Send your disk to:

   ATTN: Technical Support – BARR/CHANNEL Offload

   Barr Systems, LLC
   4500 NW 27 Avenue
   Gainesville, FL 32606-7031

Notes:

Use HTML Help
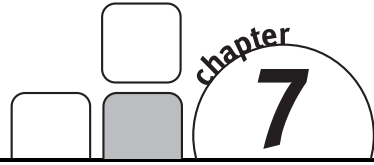
HTML Help provides information on installing, configuring, and operating the BARR/CHANNEL Offload software. In HTML Help, the familiar WinHelp window has been refashioned into an HTML Help viewer – a combination of the standard Help window with the added functionality of an Internet browser. HTML Help incorporates an easy-to-use table of contents, a comprehensive index and glossary, and a full text search with advanced search capabilities. HTML Help can be accessed at any time by pressing F1, clicking a **Help** button, or by selecting Help | **Contents and Index** on the menu bar. You can also access new Help topics by visiting our Web site at www.barrsystems.com.

7.1 Launch the Help

Use any of these methods to open the BARR/CHANNEL Offload Help.

From the window

You can launch the HTML Help by selecting Help | **Contents and Index** on the menu bar. Alternatively, press F1 to launch HTML Help and display information about the software window.

From dialog boxes

From any BARR/CHANNEL Offload dialog box, click **Help** to launch HTML Help and open the topic relating to the dialog box. Alternatively, press F1.

From the taskbar

After you install the software, you can launch HTML Help from the program menu, even when the software is not running. From the taskbar, click Start | Programs | Barr Channel Offload | **Help**.

7.2 Navigate within the Help

You can browse through Help topics or use the **Contents**, **Index**, **Search**, or **Favorites** tabs to locate the topic of your choice.

Browse through Help topics

It is often helpful to browse through Help topics when looking for information.

Use the **Back** button to move backward in the sequence of topics you have viewed. Use the **Forward** button to move forward in the sequence of topics you have viewed.

Use the Contents tab

The table of contents in an HTML Help system is a tree outline that displays topics in an expandable/collapsible hierarchy.

Follow these steps to find a topic in the table of contents.

1. Select the **Contents** tab.
2. Open or close books by clicking them. A closed book has a plus sign (+) next to it, and an open book has a minus sign (-).
3. Click the topic you want to view.

Use the Index tab

The index provides a multilevel list of keywords that are found in the Help. The index is hierarchical – like the kind you find at the back of a book – and can include multiple levels.

Complete the following steps to find a topic using the index.

1. Select the **Index** tab.
2. Type a word or scroll through the list of index entries.
3. To see any topics associated with a keyword, double-click it or select it from the list and click **Display**.
4. If there is more than one topic associated with a keyword, select a topic from the **Topics Found** dialog box.

Topics are often indexed under more than one entry.

Use the Search tab

With the **Search** tab you can perform a full-text search. With full-text searching, you can search through every word in the Help system. A basic search consists of the word or phrase you want to find. Advanced searches can incorporate Boolean operators, wildcard expressions, nested expressions, similar word matches, a previous results list, or topic titles to further define a search.

The basic rules for formulating search queries are as follows.

- Searches are not case-sensitive, so you can type your search in uppercase or lowercase characters.
- You can search for any combination of letters (a-z) and numbers (0-9).
- Punctuation marks such as the period, colon, semicolon, comma, and hyphen are ignored during a search.
- Group the elements of your search using double quotes or parentheses to set apart each element. You cannot search for quotation marks.

> When searching for words in Help topics, you can have each occurrence of the word or phrase highlighted in the topics that are found. To highlight all instances of a search word or phrase, on the Help toolbar, select Options | **Search Highlight On**.

To run a simple search

Follow these steps to run a simple search.

1. Select the **Search** tab.
2. Type the word or phrase you want to find.
3. Press ENTER or click **List topics**.
4. To view a found topic, double-click it or select the topic and click **Display**.

Advanced search features

The following are the available advanced search features.

- **Boolean operators** – You can include Boolean operators in your search. To insert a Boolean operator in your search, click the arrow next to the search text box and select **AND**, **OR**, **NOT**, or **NEAR**.
- **Advanced search options** – Use the check boxes at the bottom of the **Search** tab to select advanced search options **Search previous results**, **Match similar words**, and **Search titles only**.

> For more information on advanced search features, refer to the *Searching the Help* Help topic.

Use the Favorites tab

It might be helpful to maintain a list of favorite Help topics that you reference frequently. Complete the following steps to add topics to a list, return to a favorite topic, rename a topic, or remove a topic.

Add a topic

Follow these steps to add a topic to your list of favorites.

1. Locate the Help topic you want to make a favorite topic.
2. Select the **Favorites** tab and click **Add**.

Return to a favorite topic

Follow these steps to open a topic in your list of favorites.

1. Select the **Favorites** tab and find the topic in your list.
2. Double-click the topic or click **Display**.

Rename a topic

Follow these steps to rename a topic in your list of favorites.

1. Select the **Favorites** tab.
2. Right-click the topic and select **Rename**.
3. Type a new name and press ENTER.

Remove a favorite topic

Follow these steps to remove a topic from your list of favorites.

1. Select the **Favorites** tab.
2. Select the topic and click **Remove**.

Use the Glossary tab

The glossary provides an alphabetized list of terms and definitions related to BARR/CHANNEL Offload. Complete the following steps to use the glossary.

1. Select the **Glossary** tab.
2. Scroll through the list of glossary entries.
3. Select a term from the list and view the definition in the lower portion of the **Glossary** tab.

You can also search for a glossary term by typing the first letter of the word you are looking for. The **Term** window will focus on words beginning with that letter.

7.3 Get more out of HTML Help

Here are some tips on how to find more information when using HTML Help.

- To link to another topic, a Web page, a list of other topics, or a program, click the colored, underlined words.
- To view topics that contain related information, use the "See also:" and "What do you want to do?" topic links.
- To see if a word or phrase contained in a topic is in the index, select the word, and then press F1.
- If you use a particular Help topic often, you can add it to your favorites list.
- Right-click in the **Contents** tab or **Topic** pane for shortcut menu commands.

7.4 Copy or print a Help topic

When HTML Help is displayed, you can copy or print Help topics.

Copy a Help topic

You can copy Help topics to the Clipboard with one of these methods. You can paste the topic text into a text editor, such as Microsoft Word, or into an e-mail message.

1. In the topic pane, right-click anywhere in the topic you want to copy and select **Select All**.
2. Right-click again, and then select **Copy**. This copies the topic to the Clipboard.

> If you want to copy only part of a topic, select the text you want to copy, right-click, and then select **Copy**.

3. Open the document you want to copy the topic to.
4. Place the pointer where you want the information to appear.
5. On the menu bar, select Edit | **Paste**.

Print a Help topic

You can print a Help topic with one of these methods.

- To print the currently displayed topic, click **Print** on the Help toolbar.
- In the topic pane, right-click anywhere in the topic and select **Print**.
- From the **Contents** tab, right-click a topic, and then select **Print**. You will be given the option of printing only the current topic, or the current heading and all subtopics.

When printing an HTML Help topic, you can control the margins and headers and footers. On the Microsoft Internet Explorer's menu bar, select File | **Page Setup** to access these features. Changes made in Internet Explorer affect printing from the Help view. Use the **?** on the **Page Setup** dialog box to learn more about the features.

7.5 Customize your Help

As with any window, you can easily change the size and location of the Help viewer. In addition, you can resize the navigation and topic panes and set color, font, and accessibility options.

Show or hide the navigation pane

- Click **Hide** to close the navigation pane from view.
- Click **Show** to display the navigation pane.

Resize the navigation or topic pane

Follow these steps to change the size of the navigation pane or the topic pane.

1. Point to the divider between the two panes.
2. When the pointer changes to a double-headed arrow, drag the divider right or left.

Resize the Help viewer

Follow these steps to change the size of the Help viewer.

1. Point to any corner of the Help viewer so the pointer changes to a double-headed arrow.
2. Press the left mouse button and drag up, down, left, or right. The viewer is resized after you release the mouse button.

Change colors, fonts, and accessibility options

Follow these steps to change the colors, fonts, or accessibility options of your viewer.

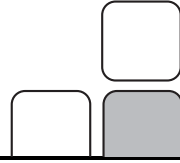⚠️ Changing these settings will also change your settings for Internet Explorer.

1. On the Help toolbar, select Options | **Internet Options**.
2. On the **General** tab, click **Colors**, **Fonts**, or **Accessibility**.
3. Select the options you want, and then click **OK**.
4. To apply the new settings, in the **Internet Options** dialog box, click **OK**.

Notes:

Glossary

adapter
Add-on equipment you can plug into a computer to allow the computer to connect to another device.

bus
A set of hardware lines (conductors) used for data transfer among the components of a computer system. A bus is essentially a shared highway that connects different parts of the system -- including the processor, disk-drive controller, memory, and input/output ports -- and enables them to transfer information. Most computers contain one or more expansion slots into which additional boards can be plugged to connect them to the bus.

Bus & Tag cables
Cables used to connect devices to mainframe channels. The bus cable transmits data and the tag cable controls information on the bus.

channel
(1) A path along which signals can be sent. (2) A functional unit that directs the flow of information between control units and main storage.

channel-attached
Direct method of attaching printers to S/390 mainframes.

compressed
Reduced the amount of space or bandwidth needed to store or transmit a block of data. Data compression is also called data compaction.

configuration
A specific combination of hardware that forms a system. When referring to IBM computers, the term configuration describes characteristics such as the type of video adapter, the number and description of printers, the amount of memory, and description of serial ports.

daisy chain
(1) A set of devices (such as printers) connected in series. In order to eliminate conflicting requests to use the channel (bus) to which all the devices are connected, each device is given a different priority. SCSI (Small Computer System Interface) and the newer USB (Universal Serial Bus) both support daisy-chained devices. (2) To connect a series of devices, one to another, like daisies in a chain of flowers.

device
An input and output unit connected to the computer such as a printer, plotter, or monitor.

---

diagnostics
A program to detect and isolate errors in programs and faults in equipment.

disconnect
To break a communications link.

DMA
Acronym for Direct Memory Access. A technique for moving data directly between main storage and peripheral equipment without requiring the processing unit to process the data.

DNS server
Short for Domain Name System server, a computer that can answer Domain Name System (DNS) queries. The DNS server keeps a database of host computers and their corresponding IP addresses.

driver
A program that controls a device, such as a printer, disk drive, or keyboard. Every device has a driver program; many come with the operating system.

ESCON director
Provides a switched point-to-point fiber-optic configuration, so that failed components can be replaced, and controllers and channels relocated without disrupting operation.

extension
In a file name, one to three characters that follow the period. Example: STUDY5.JOB.

fiber-optic cable
A form of cable used in networks that transmits signals optically, rather than electrically as do coaxial and twisted-pair cable. The light-conducting heart of a fiber-optic cable is a fine glass or plastic fiber called the core. Fiber-optic cable can transmit clean signals at speeds as high as 2 Gbps. Because it transmits light, not electricity, it is also immune to eavesdropping.

FTP
Acronym for File Transfer Protocol. In TCP/IP, an application protocol used to transfer files to and from host computers. FTP requires a user ID and perhaps a password to allow access to files on a remote host system. FTP assumes that TCP is the underlying protocol.

GB
Abbreviation for gigabyte. One billion (technically 1,073,741,824) bytes.

hardware key
A small device used for software protection that plugs into the computer's input/output port. The software will not work correctly unless the hardware key is installed.

hexadecimal
Uses the digits 0 through 9 and the letters A through F (uppercase or lowercase) to represent the decimal numbers 0 through 15. One hexadecimal digit is equivalent to 4 bits, and 1 byte can be expressed by two hexadecimal digits. Also called hex.

host programmer
  The person who installs and maintains host computer software.

IP address
  Short for Internet Protocol address. A 32-bit (4-byte) binary number that uniquely identifies a host (computer) connected to the Internet to other Internet hosts, for the purposes of communication through the transfer of packets. An IP address is expressed in "dotted quad" format, consisting of the decimal values of its 4 bytes, separated with periods; for example, 127.0.0.1.

IRQ
  Acronym for interrupt request. The hardware line over which the processor and adapter communicate. The IRQ carries signals to get the processor's attention when the adapter is ready to receive or send information.

job
  A specified amount of processing performed as a unit by a computer.

LPT1, LPT2, LPT3
  Computer parallel printer ports 1, 2, and 3.

mainframe
  Term used for a large central computer that offers a full set of computing services. The term originated in the days when the central processor, memory, and input/output channels were located in one central housing called the mainframe. Synonymous with Host Computer.

MB
  Abbreviation for megabyte. Usually 1,048,576 bytes; sometimes interpreted as 1 million bytes.

network
  A group of computers and associated devices that are connected by communications facilities. A network can involve permanent connections, such as cables, or temporary connections made through telephone or other communication links. A network can be as small as a LAN (local area network) consisting of a few computers, printers, and other devices, or it can consist of many small and large computers distributed over a vast geographic area (WAN or wide area network).

offline
  Logically (or physically) disconnected and unable to communicate with the host computer.

online
  Activated and ready for operation; capable of communicating with or being controlled by a computer.

operating system
  Software that controls the execution of computer programs and that might provide services such as resource allocation, scheduling, input/output control, and data management.

parameter
  A value given to a variable, either at the beginning of an operation or before an expression is evaluated by a program.

port

An access point for data entry or exit. Also, a connector on a device to which cables for other devices, such as printers, are attached.

port number

A number that enables IP packets to be sent to a particular process on a computer connected to the Internet. Some port numbers, called "well-known" port numbers, are permanently assigned; for example, e-mail data under SMTP goes to port number 25. A process such as a telnet session receives an "ephemeral" port number when it starts; data for that session goes to that port number, and the port number goes out of use when the session ends.

program

Program that operates in tandem with a program window. When you start the program window, the program starts. When you exit the program window, the program stops. Contrasts with service.

remote

A computer or other device located in another place (room, building, or city), but accessible through a cable or communications link.

service

Program that operates independently of a program window. You can start the program without opening the program window. You can exit the window without affecting program operation. Contrasts with application program.

terminator plug

A part that ends the cable path on a computer system. The terminator plug is attached to the last device in a series.

timeouts

Events that indicate that a predetermined amount of time has elapsed without some other expected event taking place. The timeout event is used to interrupt the process that had been waiting for the other expected event.

trace

A recording of the frames sent and received on a communication line useful for diagnosing communications problems.

workstation

(1) A combination of input, output, and computing hardware that can be used for work by an individual. (2) A powerful stand-alone computer of the sort used in computer-aided design and other applications requiring a high-end, usually expensive, machine with considerable calculating or graphics capability. (3) A microcomputer or terminal connected to a network.

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