TR114™ ISA Analog
International
Hardware Guide

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Brooktrout Technical Support

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Chapter 4 Testing and Troubleshooting

Preface

About This Manual

This hardware guide describes how to install the TR114 ISA analog board, connect the board to the telephone service, and test your installation.

Audience

The guide is written for those who install and configure telephony boards.

The information in this guide is intended for users in countries outside of North America. *Chapter 3, Country Codes, Redialing Restrictions and Cable Descriptions* provides specific information for the countries covered by this manual.

Related Documents

TR114 Firmware Installation and Release Notes

The following documents are available for developers:

Fax, Voice, and Data API V4.0, Volume 1, User's Guide

Fax, Voice, and Data API V4.0, Volume 2, Programmer's Reference

Manual Conventions

This manual uses the following conventions of notation:

- *Italics* denote file names, directory names and program names, for example, “the *btcall.cfg* file”.
- The **`Courier`** font in **bold** indicates a command sequence entered by the user at the system prompt, for example:

  `cd /usr/sys/bfax/app.src`

- The `Courier` font not bolded indicates system output, for example:

  ```
  c:>Files installed.
  ```

- The icon below indicates a **Caution** note, meaning that the software or hardware may be damaged if the precautions described in the note are not observed.

Chapter 1
Introduction

The TR114 family of analog fax boards consists of one-channel, two-channel and four-channel models for use in computers with ISA/EISA buses. The TR114 can be used for many applications, including fax broadcast, fax-on-demand, fax store and forward, LAN fax servers, e-mail to fax services, and combined voice and fax applications.

TR114 Models

Brooktrout offers the following TR114 ISA analog boards for loop-start telephone service:

TR114+I1L - One loop-start channel
(Not available in all countries)

TR114+I2L - Two loop-start channels

TR114+I4L - Four loop-start channels

The cables and connectors that Brooktrout supplies for these boards conform to the specific needs of the country in which they are used. *Chapter 3, Country Codes, Redialing Restrictions, Compliance, and Cable Descriptions* describes the cables and connectors in detail by country.

Brooktrout also supplies TR114 ISA analog boards for use with Direct Inward Dial (DID) service in Japan and Hong Kong. See the Japanese and Hong Kong descriptions in *Chapter 3*.

Features

The TR114 boards provide high-performance fax and voice systems:

- One, two, or four independent fax and/or voice channels in one 16-bit ISA or EISA bus slot.
- Full Group 3 fax send-and-receive functionality on each channel, with advanced features, such as Error Correction Mode, Binary File Transfer, and MH, MR, or MMR compression.
- Speech record and playback.

  Each channel can record and play back ADPCM and PCM, permitting you to build a variety of fax and voice systems using a single TR114, such as voice prompted fax retrieval systems, fax mail systems with voice annotation capability, and integrated voice/fax mail systems.
- DTMF (Touch Tone), SIT, CNG, and CED detection capability.
- Auto conversion of ASCII, MH, MR, MMR, TIFF, and PCX/DCX files.
- Onboard forms overlay capability. Increases efficiency and throughput of high-volume forms-based fax applications.
- Automatic reduction or expansion of the page width on transmission.
- Adaptive in-band call progress detection capability that works world-wide.
- Downloadable firmware.

  You can easily install updates from a floppy diskette or from the Brooktrout web site to add new system functionality.
- LED status indicators.
- Direct Memory Access (DMA) and Programmed I/O (PIO) data transfer capability for efficient, multichannel support.
- Support for 11 hardware interrupts.
- Application Programmer's Interface tools and software drivers that work with the following operating systems:

AT&T UNIX System V, release 3.2, 4.0
IBM AIX for PowerPC V4.1
MS-DOS release 3.0 and higher
OS/2 release 2.0 and higher
QNX release 2/3, 4.2x
SCO UNIX System V, release 3.2
SCO Xenix/386 System V
Sunsoft Solaris V2.4 and higher
UnixWare System V, release 4.2 V1.1, V2.0
Windows NT, version 3.1 and higher
Windows 95

System Requirements

- One 16-bit slot in any computer with an ISA or EISA expansion bus.

  If you use an EISA slot, you may need to create an EISA configuration file for the board as explained on page 2-8.

- One hardware interrupt.

  All TR114 ISA boards in the system must share the same interrupt.

- One DMA channel selected through software (optional).
- A block of consecutive I/O addresses:
  - 8 addresses to support the TR114+I1L
  - 12 addresses to support the TR114+I2L
  - 20 addresses to support the TR114+I4L
- Telephone service: loop-start (analog, single-line extensions for PBX or Key telephone systems) or DID (for Japan and Hong Kong only).

Operating Requirements

- Temperature: 0° - 50° C
- Humidity: 10% - 95% (noncondensing)
- Power requirements (±5%):

Type	+5VDC	+12VDC	-12VDC	Total Power
1-channel	1 A	5 mA	10 mA	5.2 W
2-channel	1.5 A	5 mA	20 mA	7.8 W
4-channel	2.5 A	5 mA	35 mA	12.98 W

Required Cables

Brooktrout supplies the cables and connectors required for each country with the TR114 board shipped to that country. If you wish to make cables for your TR114, see *Chapter 3, Country Codes, Redialing Restrictions, Compliance, and Cable Descriptions* for the cabling information for your country.

Ordering Loop-Start Telephone Service

For loop-start telephone service, you must order the following from the telephone company:

- A loop-start telephone line for each TR114 channel; one loop-start line for a TR114+I1L, two for a TR114+I2L, and four for a TR114+I4L.
- One analog jack for each telephone line.

  Make sure the telephone number or extension number is clearly marked on the cover of each jack.

For PBX or Key systems, you must obtain the following from your PBX administrator:

- An analog single-line extension for each loop-start interface.
- A telephone system feature, such as DIL (Direct Inward Line termination), to provide outside callers direct access to the TR114 extension.
- One analog jack for each telephone line.

Chapter 2
Configuring and Installing the TR114

This chapter explains how to configure and install a TR114 ISA analog board. Instructions are also provided for connecting to loop-start telephone service. For connecting to Japanese DID service, refer to the Japanese information in Chapter 3. For connecting to Hong Kong DID service, refer to *Appendix A, Installing and Testing Hong Kong DID Service*.

The following tasks are required to set up and install a TR114 board:

- Configure the hardware
- Install the TR114 board in the computer
- Connect the cables
- Install the software
- Configure the software
  - DMA channel
  - Country code

Hardware Description

Figure 2-1 shows the layout of a TR114+I4L (daughter boards are not shown).

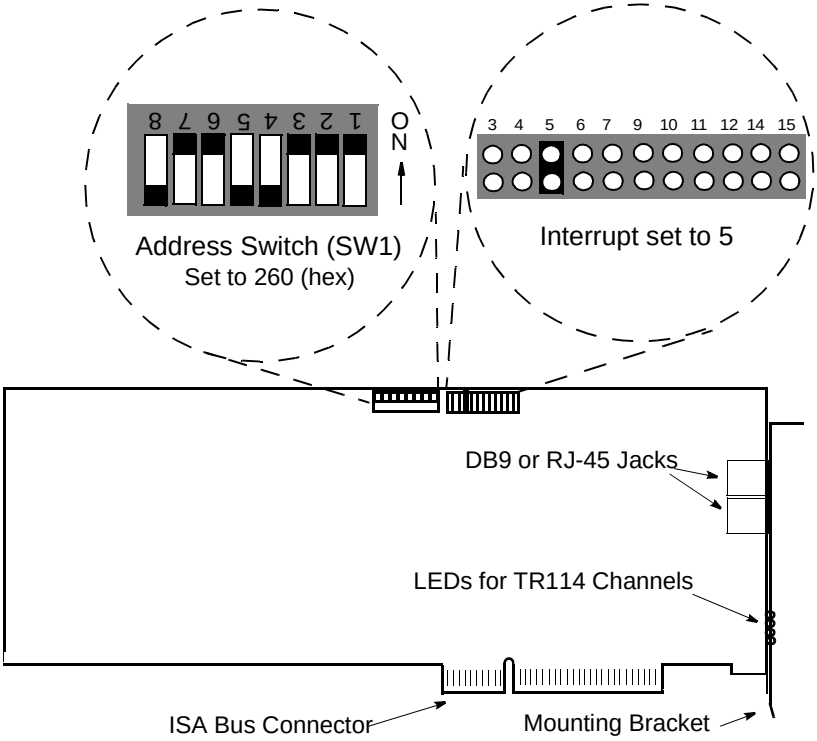


Figure 2-1. TR114+I4L ISA Analog Board

Note: The address switches are shown as they appear when you hold the TR114 board upright, with the front of the board facing you and the mounting bracket to the right.

Figure 2-2 shows the mounting brackets for the TR114 ISA analog boards. The TR114 board for your country may have a DB9 jack or RJ-45 jacks on the mounting bracket. DID versions of the board also have a power supply plug below the telephone jacks.

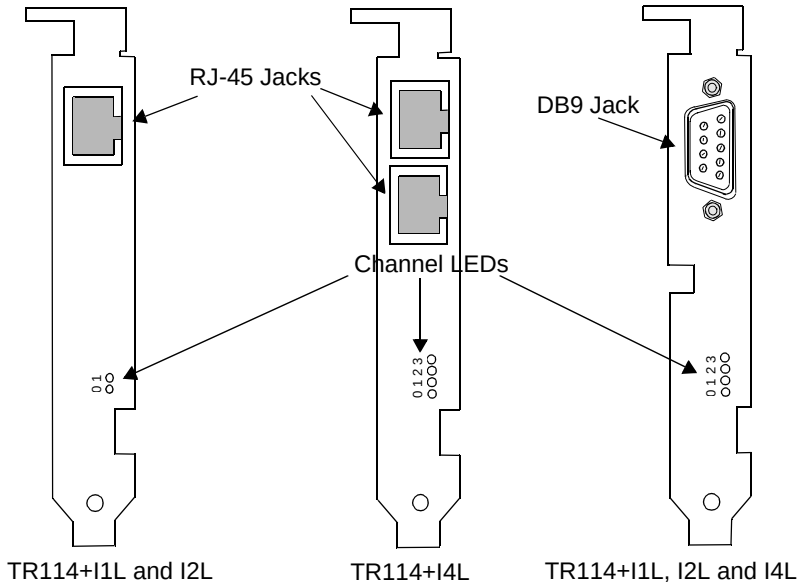


Figure 2-2. TR114 Mounting Brackets: RJ-45 and DB9 Connectors

LED Activity

The LEDs indicate the activity of their associated TR114 channels:

- Flash when the computer is powered up.
- Flash periodically when firmware is downloaded to the board.
- Flash more rapidly when the channel goes off hook.
- Flash when the channel os receiving data from the host.

The LEDs can be useful for troubleshooting problems.

Configuring the Board

To configure the TR114 board for operation in any system, you must:

- Set a unique base address.
- Set the hardware interrupt.
- Select the DMA or PIO channel via software.

Default Configuration Settings

You can quickly set up and install the TR114 board by accepting the following factory-assigned settings:

- Base I/O address = **260 hex**
- Hardware interrupt = **5**
- Data transfer mode = **DMA channel 1** (software selectable)

Changing the Default Settings

In some cases, you will not be able to use all the factory-assigned settings and will have to change one or more configuration options. The following sections describe how to change the settings.

Setting the Base Address

Each TR114 board requires assignment of a unique block of addresses to enable communication between the TR114 board and the host. This address block is subdivided into smaller blocks, each consisting of four addresses. Each channel on a TR114 board uses a 4-address block, and the TR114 board uses one for communication with the host. The number of consecutive I/O addresses required by a TR114 ISA board depends on the number of channels on the board as shown in Table 2-1.

Table 2-1. I/O Addresses Required

Board	Consecutive I/O Addresses
1-channel	8 (8 hex)
2-channel	12 (C hex)
4-channel	20 (14 hex)

These I/O addresses must not overlap with those of any other TR114 board or other devices installed in the system.

The base address, a three-digit hex number, is the first address in the assigned block. Set the base address of the TR114 board using the base address switches shown in Figure 2-1. The base address is set to 260 (hex) in the figure.

If you need to set the base address to another address, we recommend using one of the following addresses: 100, 140, 180, 200, 220, 240, 260, 280, 2A0, and 2C0. To set the base I/O address to one of those recommended, set switches 2 through 8 of the base address switches ON (toward the board) or OFF (away from the board) as shown in Table 2-2.

Table 2-2. Switch Settings for Recommended Base I/O Addresses

Base I/O Address	Switch						
	8	7	6	5	4	3	2
100	ON	OFF	ON	ON	ON	ON	ON
140	ON	OFF	ON	OFF	ON	ON	ON
180	ON	OFF	OFF	ON	ON	ON	ON
200	OFF	ON	ON	ON	ON	ON	ON
220	OFF	ON	ON	ON	OFF	ON	ON
240	OFF	ON	ON	OFF	ON	ON	ON
260	OFF	ON	ON	OFF	OFF	ON	ON
280	OFF	ON	OFF	ON	ON	ON	ON
2A0	OFF	ON	OFF	ON	OFF	ON	ON
2C0	OFF	ON	OFF	OFF	ON	ON	ON

You can select a valid base address from the range of hex numbers between 100 and 3F8 that end in 0 or 8.

Note: Switch 1 does not affect the base address; it enables an interrupt pull-up and must be ON on only *one* TR114 board in a system.

Switches 2 through 8 set the individual digits in the TR114 board's base address. Switches 8 and 7 set the first digit of the base address, switches 6 through 3 set the middle digit of the base address, and switch 2 sets the third digit as shown in Table 2-3.

Table 2-3. Switch Settings for the Base Address

Hex Value	Switches						
	8	7	6	5	4	3	2
1xx	ON	OFF					
2xx	OFF	ON					
3xx	OFF	OFF					
x**0**x			ON	ON	ON	ON	
x**1**x			ON	ON	ON	OFF	
x**2**x			ON	ON	OFF	ON	
x**3**x			ON	ON	OFF	OFF	
x**4**x			ON	OFF	ON	ON	
x**5**x			ON	OFF	ON	OFF	
x**6**x			ON	OFF	OFF	ON	
x**7**x			ON	OFF	OFF	OFF	
x**8**x			OFF	ON	ON	ON	
x**9**x			OFF	ON	ON	OFF	
x**A**x			OFF	ON	OFF	ON	
x**B**x			OFF	ON	OFF	OFF	
x**C**x			OFF	OFF	ON	ON	
x**D**x			OFF	OFF	ON	ON	
x**E**x			OFF	OFF	OFF	ON	
x**F**x			OFF	OFF	OFF	OFF	
xx**0**							ON
xx**8**							OFF

To ensure a unique base address for each TR114 ISA board when you install multiple TR114 ISA boards in a system, add or subtract from the base address of the other TR114 boards:

- 6 (hex) for 1-channel boards.
- 10 (hex) for 2-channel boards.
- 18 (hex) for 4-channel boards.

For example, if you have three TR114 ISA boards in your system, you can select:

	Board 1 Base Address	Board 2 Base Address	Board 3 Base Address
Example 1:	228	240	258
Example 2:	250	268	280
Example 3:	260	278	290

Setting the Hardware Interrupt

The TR114 board generates interrupts to the host computer. These interrupts are handled by the TR114 device driver.

See Figures Figure 2-1 for the interrupt header, which is shown set to interrupt 5.

Note: All TR114 ISA boards (and all other TR series ISA boards) installed in the same system must be set to share the same hardware interrupt.

The TR114 board can use interrupts 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, or 15.

In order of preference, we recommend using interrupt 5, 10, 12, or 15.

To set the hardware interrupt, move the jumper to the pair of pins of the interrupt header that corresponds to the hardware interrupt you want to use. The pins are numbered left to right as shown in Figure 2-1.

Using ISA Boards with Plug and Play Boards

The computer BIOS automatically configures the addresses and hardware interrupts (IRQs) for PCI and plug and play boards, which may change when the system is rebooted, especially if devices are added or moved. The BIOS does not recognize the ISA boards in your system when configuring the PCI and plug and play boards. Interrupts can be shared among PCI boards, but not between PCI boards and ISA boards.

The action you take to resolve conflicts among the various boards depends on your brand of computer. Check the manufacturer's instructions for techniques for avoiding conflicts. See *Appendix B, Common System Resource Assignments* for more information.

Generally, you can avoid conflicts among ISA, PCI, and plug and play boards by doing the following:

- Let the computer BIOS configure all the PCI and plug and play boards.
- Use the tools supplied with the computer to determine the interrupts used or reserved by other devices in your computer. For example, Dell computers have an ISA Configuration Utility to track and reserve the installed ISA boards and the resources they use.
- Choose an unused interrupt and address for the TR114 ISA boards. All TR114 ISA boards share an IRQ, but TR114 ISA and PCI boards in the same system use different IRQs.

Using ISA Boards in EISA Slots

If you install ISA boards in EISA slots, use an EISA configuration utility to create an EISA configuration file to reserve the interrupt, I/O addresses, and DMA (if used) for the TR114 board. The computer BIOS will not use the reserved interrupt, addresses, and DMA for other devices in your computer. Brooktrout does *not* supply EISA configuration files for the TR114 ISA board. Check the computer manufacturer's documentation for instructions on creating an EISA configuration file.

If you are installing multiple TR114 ISA boards in EISA slots, create an EISA configuration file for each slot and specify the unique base I/O address of each board in its respective slot. However, you must enter the interrupt for only one of the TR114 slot configurations even though multiple TR114 ISA boards share the same interrupt. This is because EISA configuration utilities do not allow an interrupt to be entered more than once.

If you cannot find a free interrupt, you may be able to disable an LPT port or a COM port that is not being used. These ports can be disabled in the BIOS on some computers. On older computers, it may require a change to a jumper setting on the motherboard. Once the port is disabled, its associated interrupt becomes available.

Installing the TR114 ISA Board in the Computer

After configuring the board, you are ready to install the TR114 board in your computer. We recommend you keep a record of the addresses and interrupt setting used in the configuration. You will need these values later when you configure your software. To install the board:

The TR114 is an electrostatic-sensitive device. Follow proper ESD procedures when handling the board.

1. Power off the computer.
2. Remove the computer's cover. If the system has a board hold-down bar, remove it as well.
3. Locate an unused expansion slot and remove the bracket for it.
4. Holding the TR114 at each top corner, insert the board firmly into the ISA or EISA slot.
5. Screw the TR114's mounting bracket securely to the computer's frame.
6. Connect the telephone cable (see *Connecting to the Telephone Service*).
7. Turn on the computer.

Once you have installed the board, you can test the board by running the *faxtest* program (see *Chapter 4, Testing and Troubleshooting*) and then install the software. Or you can install the software immediately.

Connecting to the Telephone Service

Connect the TR114 to loop-start telephone service using the following procedures.

1. Locate the cable(s) supplied with your TR114 board. Refer to *Chapter 3, Country Codes, Redialing Restrictions, Compliance, and Cable Descriptions* for the number and type of cables you should have, and whether you require adapters.
2. Plug the end with a DB9 or RJ-45 connector into the jack on the TR114 board (see Figure 2-3).

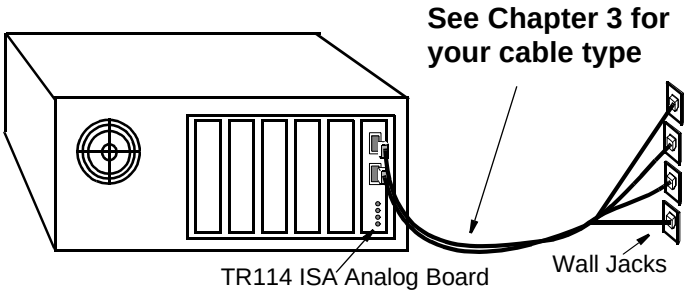


Figure 2-3. Connecting TR114 Cables to Telephone Service

3. If your cable requires adapters, attach each adapter to an RJ-11 plug (see Figure 2-4). If your cable does not require adapters, go to step 4.

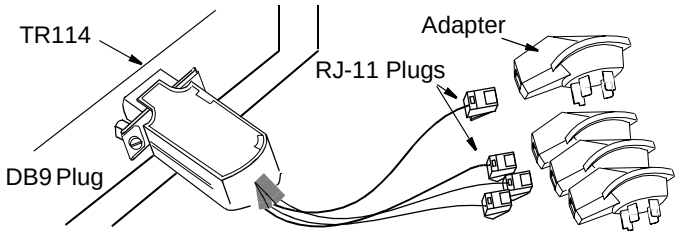


Figure 2-4. Attaching an Adapter to Your Cable

4. Plug the other end of the cable into a loop-start wall-mounted telephone jack, as shown in Figure 2-3.

   The TR114 is now connected to the telephone service.

See Appendix A for isntructions on connecting to DID service.

Installing the Software

You need to install the software to run the boards. If you are an application developer, install the Brooktrout-supplied driver, API, and firmware. If you use software from another vendor, see that vendor's manual for instructions on installing software.

Installing the Brooktrout Software

The Brooktrout API and driver are available for a variety of operating systems. See the *Brooktrout Fax, Voice, and Data API User's Guide* for information on installing the API and driver for a specific operating system.

The TR114 firmware is included on a single DOS-formatted diskette. Before running any applications that use the TR114 board, consult the *TR114 Firmware Installation and Release Notes* for detailed instructions on how to copy the contents of this diskette onto your hard disk. The Brooktrout API/driver downloads the firmware for you.

Installing LAN Fax Software

If you use software from another vendor, the firmware is, in most cases, already be included with the software, which automatically downloads the firmware to the board.

See your LAN fax application's user manual for instructions on installing your LAN fax software. After you have set up your LAN fax software to support the TR114 board, you can begin sending and receiving faxes.

Configuring the Software

After your board and software are installed, you may need to make changes to the software configuration. If you changed the base I/O address or the interrupt on the board, you can set the new values when you install the driver and initialize the board.

You can set the data transfer method when installing the driver or in the user-defined configuration file (default name, *btcall.cfg*).

You also set the country code for your board in the user-defined configuration file.

Selecting the Data Transfer Method

The TR114 ISA board can transfer data to and from the host computer in Programmed I/O (PIO) mode or in Direct Memory Access (DMA) mode.

The Brooktrout driver and API software selects DMA channel 1 for data transfers by default. However, you can select another DMA channel when you install the driver. For detailed instructions on installing the driver for your operating system, see the *Brooktrout Fax, Voice, and Data Application Programming Interface User's Guide*.

With Brooktrout software, you can also set the data transfer method using the `dma` keyword in the user-defined configuration file, *btcall.cfg*. see Appendix C in the *Brooktrout Fax, Voice, and Data Application Programming Interface Programmer's Reference Manual*.

If you use a driver from another vendor, see that vendor's manual for instructions on installing the driver and selecting PIO or a DMA channel.

Using DMA Transfer Mode

Under DMA, the DMA driver controls data transfers between memory and the TR114 channels. Although using DMA may take a little longer than PIO, using DMA may increase system performance because the host computer can process other jobs during the transfer.

All TR114 ISA boards (and all TR series ISA boards) Iinstalled in the same system must share the same DMA channel.

You can use DMA channels 0 through 3 and 5 through 7 (channels 0–3 use only 8 bits while channels 5–7 use 16 bits). The system reserves DMA channel 4 for its own use. In order of preference, we recommend using DMA channel 7 or 1.

In addition to the TR114, other boards, devices, and software use particular DMA channels. To avoid conflicts, select an unused DMA channel or disable or move any device that competes for the DMA channel you select. *Appendix B, Common System Resource Assignments*, lists some of the functions that systems may assign to particular DMA channels.

Using PIO Data Transfer Mode

Under PIO, the host CPU controls data transfers between memory and the TR114 channels. Although transfer time is faster, the host computer cannot process other jobs during the transfer.

To use Programmed I/O, change the `dma` keyword to `0` in the user-defined configuration file, *btcall.cfg* (see Appendix C of the Brooktrout *Fax, Voice, and Data API Programmer's Reference Manual*). You can also select -1 for the DMA option during Brooktrout driver installation.

Setting the Country Code

Many applications set the country code for you. If you were prompted for a country when you installed the software, the code was probably set correctly. You can check the `country_code` keyword in the user-defined configuration file, *btcall.cfg*, to verify it.

A sticker on the back of the board indicates the country in which the board is approved for use; for example, a board marked "TR114 UK" is approved for use in the United Kingdom. The county code parameter in your software *must* match the country indicated on the board.

If a board has a sticker marked EC CTR21, that board has been approved for the European community and can be used in any of the following contries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Norway, Portugal, Spain, Sweden, Switzerland, Netherlands, and UK.

Table 2-4 shows the country codes as they should be entered in the user-defined configuration file, *btcall.cfg*.

Table 2-4. Brooktrout Country Codes

Country	Country Code	Country	Country Code
Australia	610	Netherlands	310
Denmark	450	New Zealand	640
EC CTR 21	190	Norway	470
France	330	Singapore	650

Table 2-4. Brooktrout Country Codes (Continued)

Country	Country Code	Country	Country Code
Germany	490	Spain	340
Ireland	3530	Sweden	460
Italy	390	Switzerland	410
Hong Kong	8520	United Kingdom	440
Japan	See page 3-18	United States	10
Malaysia	600		

Checking the Bt_cparm.cfg File

Country codes are maintained in the country-specific configuration file, *bt_cparm.cfg* (a read-only file); the *btcall.cfg* file uses the country code parameters from this file. If the appropriate parameter for your country is not in the *bt_cparm.cfg* file, the US default value (10) is used. You can check for your country code in the *country.h* file that comes with *bt_cparm.cfg*.

If the code for your country is not in the *bt_cparm.cfg* file, you need to download the latest version of the file from the Brooktrout ftp site, as follows:

```
ftp.brooktrout.com/support/country/cparm.exe
```

This downloads a program that contains various versions of the *bt_cparm.cfg* file. You can expand the program using

```
cparm -d.
```

You must use the *bt_cparm.cfg* file for the version of the Brooktrout API that you used to develop your application; for example, if you used API V3.7 to develop your application, you must use the subdirectory, *3.7*.

Chapter 3
Country Codes, Redialing Restrictions, Compliance, and Cable Descriptions

This chapter lists the country code and describes the cabling information for your country, including the pinouts in case you wish to build your own cable. Dialing restrictions and compliance regulations are also included for those countries where applicable.

Country Code:

The country code for your country is shown as it should be entered in the user-defined configuration file (*BTCALL.CFG* is the default filename).

Redialing Restrictions and Compliance Regulations:

If your country has restrictions for redialing or regulations concerning compliance, they are described in these sections.

Cable Information:

The details for the cables that are shipped with your TR114 ISA analog boards are described in this section. The following information is included:

Column Heading	Description
TR114 Model	The name of the TR114 as you ordered it from Brooktrout, e.g., TR114+I4L
Cable Part Number and Quantity Required	The Brooktrout part number for the cable and the number of cables shipped with the TR114 model.
Connectors: Board → Wall	Specifies the connectors that connect the cable to the TR114 (board end) and to the telephone service (wall end), e.g., "DB9 → RJ-11" specifies a DB9 connector to the TR114 and an RJ-11 to the telephone service.

Pinout Abbreviations:

NC = Pin is loaded but not connected NL = Pin is not loaded

Australia

Country Code

610

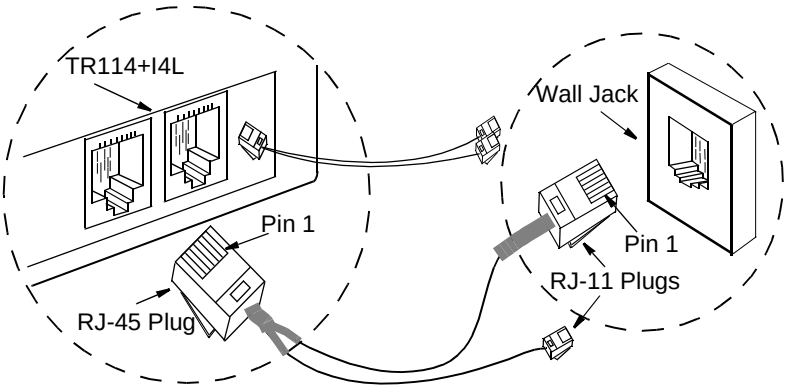
Compliance Regulations

You should include `missing_wait 40` in the *BT_CALL.CFG* file.

Australian regulatory authorities recommend that the application delay two seconds before answering an incoming call.

Cable Information

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I1L	340-033-06	1	RJ-45 → RJ-11
TR114+I2L	340-033-06	2	RJ-45 → RJ-11
TR114+I4L	340-033-05	2	RJ-45 → RJ-11



Connector Pinouts:

340-033-05: For TR114+I4L			340-033-06: For TR114+I1L and I2L	
RJ-45	**RJ-11: Channel A**	**RJ-11: Channel B**	**RJ-45**	**RJ-11: Channel A**
1 - NC	1 - NL	1 - NL	1 - NC	1 - NL
2 - NC	2 - NC	2 - NC	2 - NC	2 - NC
3 - Yellow	3 - Red	3 - Yellow	3 - NC	3 - Red
4 - Red	4 - Green	4 - Black	4 - Red	4 - Green
5 - Green	5 - NC	5 - NC	5 - Green	5 - NC
6 - Black	6 - NL	6 - NL	6 - NC	6 - NL
7 - NC			7 - NC	
8 - NC			8 - NC	

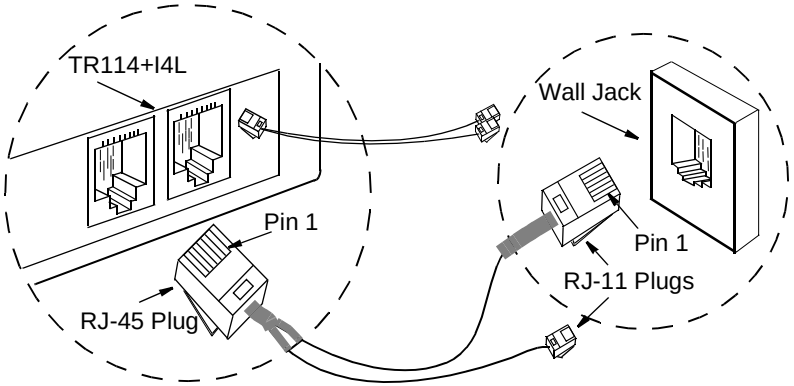
Denmark

Country Code

450

Cable Information:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I2L	340-036-02	1	RJ-45 → RJ-11
TR114+I4L	340-036-02	2	RJ-45 → RJ-11



Connector Pinouts:

340-036-02: For TR114+I2L and TR114+I4L		
RJ-45	**RJ-11: Channel A**	**RJ-11: Channel B**
1 - NC	1 - NL	1 - NL
2 - NC	2 - NC	2 - NC
3 - Yellow	3 - Green	3 - Black
4 - Green	4 - Red	4 - Yellow
5 - Red	5 - NC	5 - NC
6 - Black	6 - NL	6 - NL
7 - NC		
8 - NC		

European Community-CTR21

Country Code

190

Compliance Regulations

With respect to 98/482/EC, Annex II

This equipment has been approved in accordance with Council Decision 98/482/EC for pan-European single terminal connection to the Public Switched Telephone Network (PSTN). However, due to differences between the individual PSTNs provided in different countries, the approval does not, of itself, give an unconditional assurance of successful operation on every PSTN network termination point.

In the event of problems, you should contact your equipment supplier in the first instance.

With respect to 98/482/EC, Annex III

This equipment is designed to operate correctly on the networks of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Norway, Portugal, Spain, Sweden, Switzerland, Netherlands, and UK.

Operational problems may occur in Spain when this equipment is installed at a great distance from the central exchange.

This equipment is not designed to be installed in series with any other telecommunications equipment. Installation of this equipment in parallel with other telecommunications equipment may result in malfunction.

There are no adjustments required to use this equipment on the above listed networks.

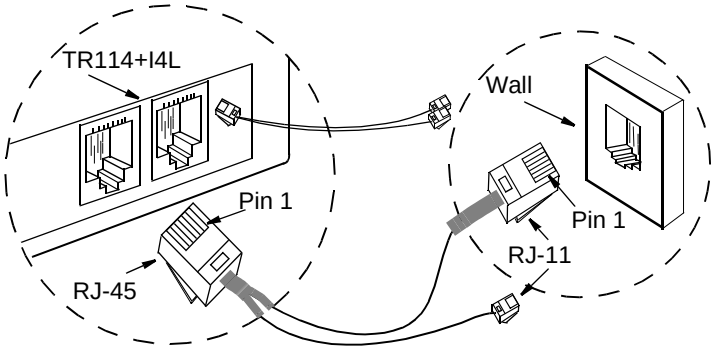
Redialing Restrictions

For transmission of any one document to any one telephone number, the application must:

- Make no more than fifteen call attempts
- Delay five seconds between successive call attempts to the same number.

Cable Information:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I2L	340-036-02	1	RJ-45 → RJ-11
TR114+I4L	340-036-02	2	RJ-45 → RJ-11



Connector Pinouts:

340-036-02: For TR114+I2L and TR114+I4L		
RJ-45	**RJ-11: Channel A**	**RJ-11: Channel B**
1 - NC	1 - NL	1 - NL
2 - NC	2 - NC	2 - NC
3 - Yellow	3 - Green	3 - Black
4 - Green	4 - Red	4 - Yellow
5 - Red	5 - NC	5 - NC
6 - Black	6 - NL	6 - NL
7 - NC		
8 - NC		

France

Country Code

330

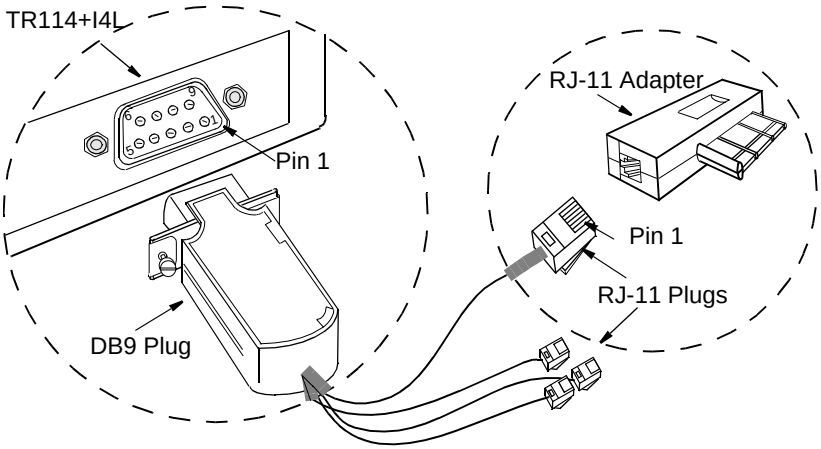
Redialing Restrictions

Unsuccessful calls can be inefficient calls or wrong calls. Inefficient calls occur when the called number fails to answer. In this case, the API reports BUSY1, BUSY2, ROBUSY, RECALL, DIALTON, SIT_, or RNGNOANS. Wrong calls occur when the called number answers but fails to send fax CED tone or V.21 signal to indicate a fax machine. In this case the API reports HUMAN, QUIET, SILENCE, or ANSWER.

- For applications that differentiate between inefficient calls and wrong calls, the application must:
  - Make no more than six call attempts per hour.
  - Delay from one to twelve minutes between each call attempt.
  - When it detects a wrong call twice during the hour, add the telephone number to the blacklist and make no more attempts to send any document to that telephone number.
- For applications that do not differentiate between inefficient calls and wrong calls, the application must:
  - Make no more than six call attempts per hour.
  - Delay from one to twelve minutes between each call attempt.
  - After six failed attempts to detect an answering fax machine, add the telephone number to the blacklist and make no more attempts to send any document to that telephone number.
- Only an operator issuing the command manually can remove a telephone number from the blacklist.

Cable Information:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Adapter
TR114+I1L	340-062-01	1	DB9 → RJ-11-to-France
TR114+I2L	340-050-02	1	DB9 → RJ-11-to-France
TR114+I4L	340-050-01	1	DB9 → RJ-11-to-France



Connector Pinouts:

340-050-01: For TR114+I4L		340-050-02: For TR114+I2L		340-062-01: For TR114+I1L (Ch. 0)	
DB9	**RJ-11**	**DB9**	**RJ-11**	**DB9**	**RJ-11**
1 - Red	1 - NL	1 - Red	1 - NL	1 - NC	1 - NL
2 - Red	2 - NL	2 - Red	2 - NL	2 - Red	2 - NL
3 - NC	3 - Red	3 - NC	3 - Red	3 - NC	3 - Red
4 - Red	4 - Green	4 - NC	4 - Green	4 - NC	4 - Green
5 - Red	5 - NL	5 - NC	5 - NL	5 - NC	5 - NL
6 - Green	6 - NL	6 - Green	6 - NL	6 - Green	6 - NL
7 - Green		7 - Green		7 - NC	
8 - Green		8 - NC		8 - NC	
9 - Green		9 - NC		9 - NC	

Germany

Country Code

490

Redialing Restrictions

For calls to the same or different telephone numbers over the same trunk, the application must:

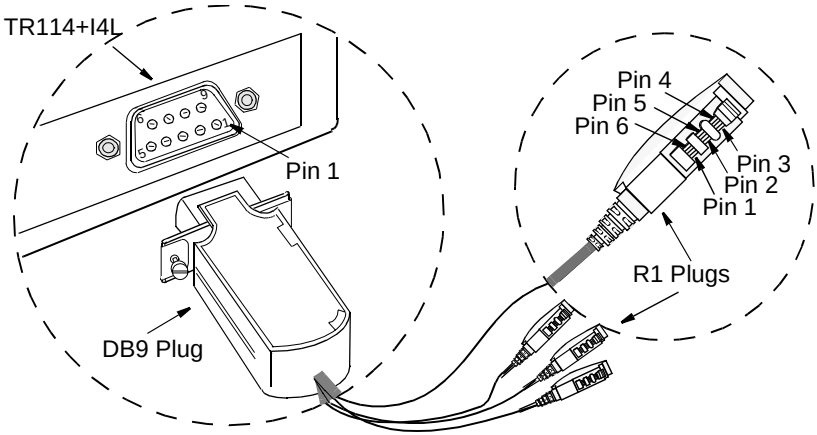
- Delay thirty seconds between releasing the line after an unsuccessful call attempt and seizing it for the next call attempt,

  or

- Delay five seconds between each call attempt and two hours after twelve successive unsuccessful call attempts.

Cable Information:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I2L	340-050-04	1	DB9 → R1 (TAES 6N)
TR114+I4L	340-050-03	1	DB9 → R1 (TAES 6N)



Connector Pinouts:

340-050-03: For TR114+I4L		340-050-04: For TR114+I2L	
DB9	**R1**	**DB9**	**R1**
1 - Red	1 - Red	1 - Red	1 - Red
2 - Red	2 - Green	2 - Red	2 - Green
3 - NC	3 - NL	3 - NC	3 - NL
4 - Red	4 - NL	4 - NC	4 - NL
5 - Red	5 - NL	5 - NC	5 - NL
6 - Green	6 - NL	6 - Green	6 - NL
7 - Green		7 - Green	
8 - Green		8 - NC	
9 - Green		9 - NC	

Hong Kong

Note: Both loop-start and DID boards are available for Hong Kong. Connecting to loop-start service is described in *Chapter 2, Configuring and Installing the TR114*. Connecting to DID service is described in *Appendix A, Installing and Testing Hong Kong DID Service*.

Country Code

8520

Compliance Regulations

The TR114 uses a standard 2-wire connection to the modular socket and therefore may be incompatible with CPEs that utilize 3-wire connections. (A CPE is any telephone product that is approved for connection to the phone network.)

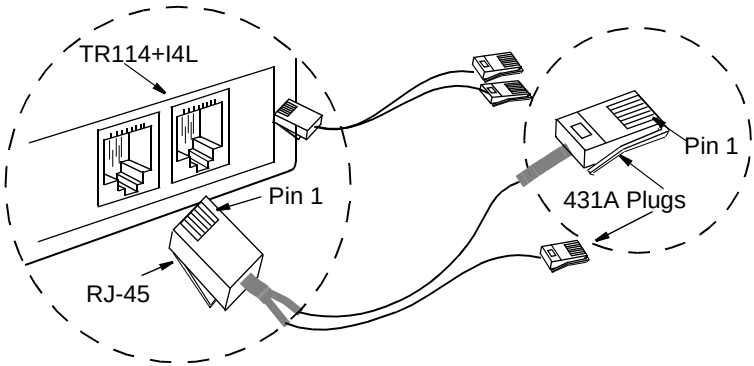
To ensure proper operation, no more than four (4) CPEs should be installed on one exchange line.

Redialing Restrictions

For transmissions of any one document to any one telephone number, over the same trunk, the application must make no more than eleven (11) call attempts. There are no restrictions on the interval between each call attempt.

The application must not attempt to transmit documents to 999 numbers.

Cabling Information



Cables for Loop-start Service:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I2L	340-038-02	2	RJ-45 → 431A UK
TR114+I4L	340-038-00	2	RJ-45 → 431A UK

Connector Pinouts for Loop-start Cables:

340-038-02: For TR114+I2L		340-038-00: For TR114+I4L		
RJ-45	**431A UK**	**RJ-45**	**431A UK Channel A**	**431A UK Channel B**
1 - NC	1 - NC	1 - NC	1 - NL	1 - NL
2 - NC	2 - Green	2 - NC	2 - Green	2 - Green
3 - NC	3 - NC	3 - Green	3 - NC	3 - NC
4 - Green	4 - NC	4 - Green	4 - NC	4 - NC
5 - Red	5 - Red	5 - Red	5 - Red	5 - Red
6 - NC	6 - NC	6 - Red	6 - NL	6 - NL
7 - NC		7 - NC		
8 - NC		8 - NC		

Cables for DID Service:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I2C & I2D	340-148-40	2	RJ-45 → RJ-11
TR114+I4C & I4D	340-148-30	2	RJ-45 → RJ-11

Connector Pinouts for DID Cables:

340-148-40: For TR114+I2C & D		340-148-30: For TR114+I4C & D		
RJ-45	**431A UK**	**RJ-45**	**431A UK Channel A**	**431A UK Channel B**
1 - NC	1 - NC	1 - NC	1 - NL	1 - NL
2 - NC	2 - Green	2 - NC	2 - Green	2 - Green
3 - NC	3 - NC	3 - Red	3 - NC	3 - NC
4 - Green	4 - NC	4 - Green	4 - NC	4 - NC
5 - Red	5 - Red	5 - Red	5 - Red	5 - Red
6 - NC	6 - NC	6 - Green	6 - NL	6 - NL
7 - NC		7 - NC		
8 - NC		8 - NC		

Ireland

Country Code

3530

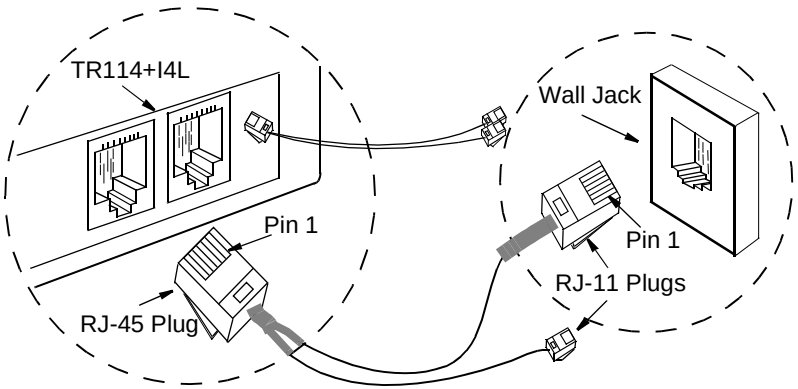
Redialing Restrictions

For calls to the same telephone number over the same trunk, the application must:

- Delay five seconds between the first and second call attempt.
- Delay sixty seconds between each subsequent call attempt.
- Make no more than four call attempts in one hour.

Cable Information:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I2L	340-036-02	1	RJ-45 → RJ-11
TR114+I4L	340-036-02	2	RJ-45 → RJ-11



Connector Pinouts:

340-036-02: For TR114+I2L and I4L		
RJ-45	**RJ-11: Channel A**	**RJ-11: Channel B**
1 - NC	1 - NL	1 - NL
2 - NC	2 - NC	2 - NC
3 - Yellow	3 - Green	3 - Black
4 - Green	4 - Red	4 - Yellow
5 - Red	5 - NC	5 - NC
6 - Black	6 - NL	6 - NL
7 - NC		
8 - NC		

Italy

Country Code

390

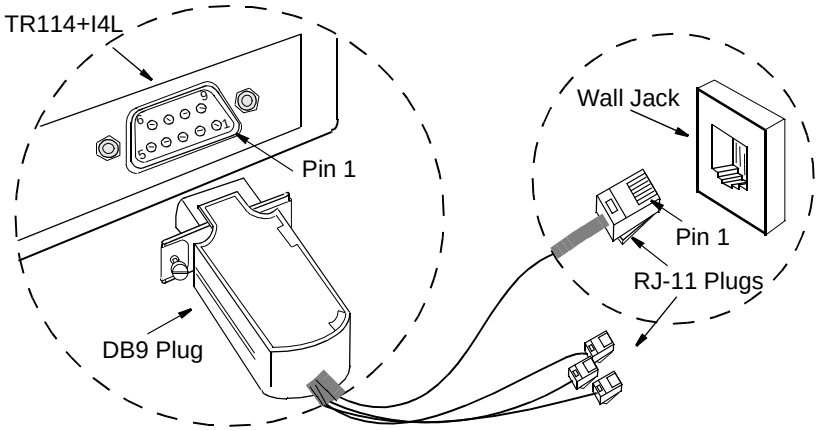
Redialing Restrictions

For calls to the same telephone number over the same trunk, the application must:

- Delay five seconds between the first and second call attempt.
- Delay sixty seconds between each subsequent call attempt.
- Make no more than four call attempts in one hour.

Cable Information:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I2L	340-050-02	1	DB9 → RJ-11
TR114+I4L	340-050-01	1	DB9 → RJ-11



Connector Pinouts:

340-050-01: For TR114+I4L		340-050-02: For TR114+I2L	
DB9	**RJ-11**	**DB9**	**RJ-11**
1 - Red	1 - NL	1 - Red	1 - NL
2 - Red	2 - NL	2 - Red	2 - NL
3 - NC	3 - Red	3 - NC	3 - Red
4 - Red	4 - Green	4 - NC	4 - Green
5 - Red	5 - NL	5 - NC	5 - NL
6 - Green	6 - NL	6 - Green	6 - NL
7 - Green		7 - Green	
8 - Green		8 - NC	
9 - Green		9 - NC	

Japan

Country Codes

Set the country code for the type of service you have.

810 - 10 pps
812 - 10 pps, DID
814 - 10 pps, DID, Auto answer

Compliance Regulations

JATE has approved the TR114+I4L to run in the following computers:

ACER 1100SX	FUJITSU FMV
ACER 1100X	GATEWAY 2000 P5
ACER Power M	IBM PC/XT/AT
COMPAQ Deskpro	IBM PS/V
COMPAQ Proliant	SONY QL-70
COMPAQ ProLinea	Wang 200 Series
COMPAQ ProSignia	Wang 300 Series

Applications must use Brooktrout Technology's Application Programming Interface (API) as library software.

You should include `missing_wait 60` in *BT_CALL.CFG*.

Redialing Restrictions

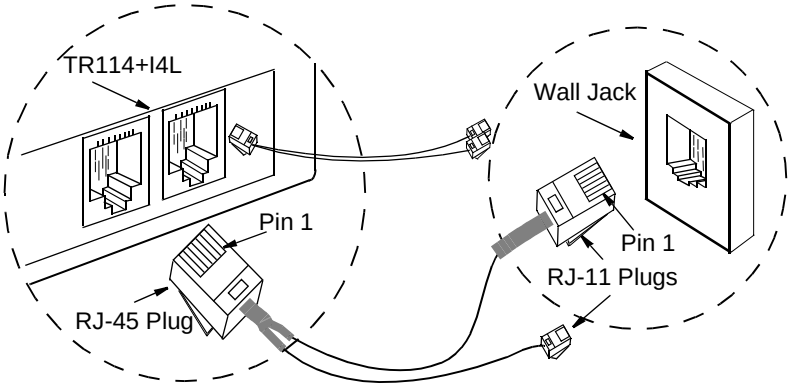
- For transmissions of any one document to any one telephone number, the application must:
  - Make no more than three call attempts in a three-minute period (new three-minute periods begin three minutes after the beginning of the first attempt of the previous period),

    or

  - Delay one minute between each call attempt, with no other restrictions.
- The application must not attempt to transmit documents to 119 or 110 numbers.

Cable Information:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I2L	340-036-02	1	RJ-45 → RJ-11
TR114+I4L	340-036-02	2	RJ-45 → RJ-11



Connector Pinouts:

340-036-02: For TR114+I2L and TR114+I4L		
RJ-45	**RJ-11: Channel A**	**RJ-11: Channel B**
1 - NC	1 - NL	1 - NL
2 - NC	2 - NC	2 - NC
3 - Yellow	3 - Green	3 - Black
4 - Green	4 - Red	4 - Yellow
5 - Red	5 - NC	5 - NC
6 - Black	6 - NL	6 - NL
7 - NC		
8 - NC		

Malaysia

Country Code

600

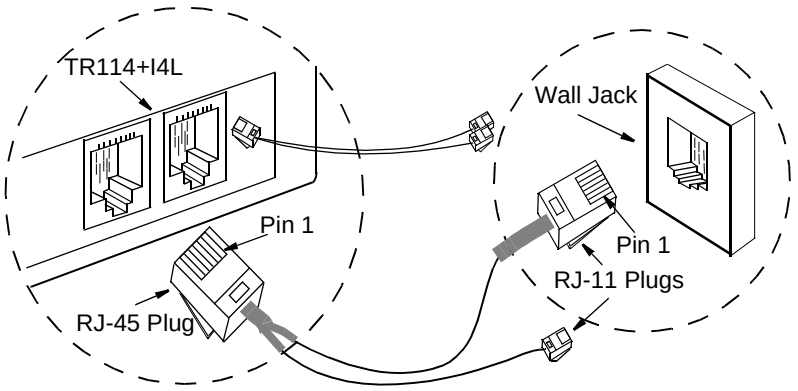
Redialing Restrictions

For an unsuccessful attempt to dial any telephone number, the application must:

- Make no more than two additional call attempts.
- Delay a minimum of two minutes between each call attempt.

Cable Information:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I4L	340-036-02	2	RJ-45 → RJ-11



Connector Pinouts:

340-036-02: For TR114+I4L		
RJ-45	**RJ-11: Channel A**	**RJ-11: Channel B**
1 - NC	1 - NL	1 - NL
2 - NC	2 - NC	2 - NC
3 - Yellow	3 - Green	3 -Black
4 - Green	4 - Red	4 - Yellow
5 - Red	5 - NC	5 - NC
6 - Black	6 - NL	6 - NL
7 - NC		
8 - NC		

Netherlands

Country Code

310

Note: If the country code in *btcall.cfg* does not match the country on the label on the back of the board, calls can neither be sent or received.

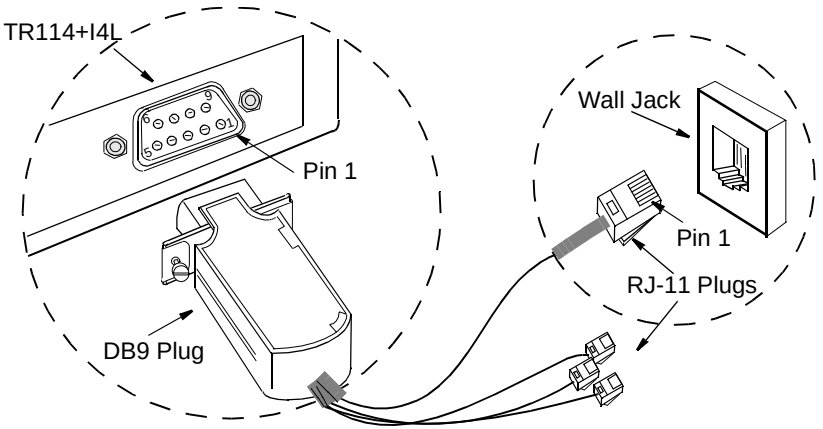
Redialing Restrictions

For transmissions of any one document to any one telephone number, the application must:

- Make no more than fifteen call attempts in one hour.
- Delay five seconds between the first and second call attempts.
- Delay one minute between each subsequent call attempt.

Cable Information:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I1L	340-062-01	1	DB9 → RJ-11
TR114+I2L	340-050-07	1	DB9 → RJ-11
TR114+I4L	340-050-01	1	DB9 → RJ-11



Connector Pinouts:

340-050-01: For TR114+I4L		340-050-07: For TR114+I2L		340-062-01: For TR114+I1L (Ch. 0)	
DB9	**RJ-11**	**DB9**	**RJ-11**	**DB9**	**RJ-11**
1 - Red	1 - NL	1 - NC	1 - NL	1 - NC	1 - NL
2 - Red	2 - NL	2 - Red	2 - NL	2 - Red	2 - NL
3 - NC	3 - Red	3 - NC	3 - Red	3 - NC	3 - Red
4 - Red	4 - Green	4 - Red	4 - Green	4 - NC	4 - Green
5 - Red	5 - NL	5 - NC	5 - NL	5 - NC	5 - NL
6 - Green	6 - NL	6 - Green	6 - NL	6 - Green	6 - NL
7 - Green		7 - NC		7 - NC	
8 - Green		8 - NC		8 - NC	
9 - Green		9 - Green		9 - NC	

New Zealand

Country Code

640

Compliance Regulations

The computer that houses the TR114 board is classified as a communications terminal. As with all mains powered electrical equipment, there is a legal requirement for it to meet the requirements of the New Zealand wiring regulations. It is the responsibility of the computer supplier rather than the Telepermit System to ensure that these requirements are met.

CAUTION

Immediately disconnect the equipment if it becomes physically damaged, and arrange for its disposal or repair.

The TR114 is not designed for installation in parallel with any other piece of telecommunications equipment. It may not provide for the effective hand-over of a call to or from a telephone connected to the same line. The operation of this equipment on the same line as telephones or other equipment with audible warning devices or automatic ring detectors will give rise to bell tinkle or noise and may cause false tripping of the ring detector. Should such problems occur, the user is not to contact Telecom Faults Service.

This equipment must not be operated in such a manner as to cause a nuisance to other customers.

Redialing Restrictions

- For all outgoing calls, the application must:
  - Go on-hook for a minimum of five seconds between the end of one call and the beginning of the next call.
  - Clearly associate preprogrammed numbers with the names of the called parties and enable operators to easily modify the numbers.
- For transmissions of any one document to any one telephone number, the application must:

- Make no more than five call attempts in one hour.
- Make no more than a total of ten call attempts.
- Delay sixty seconds between each call attempt.

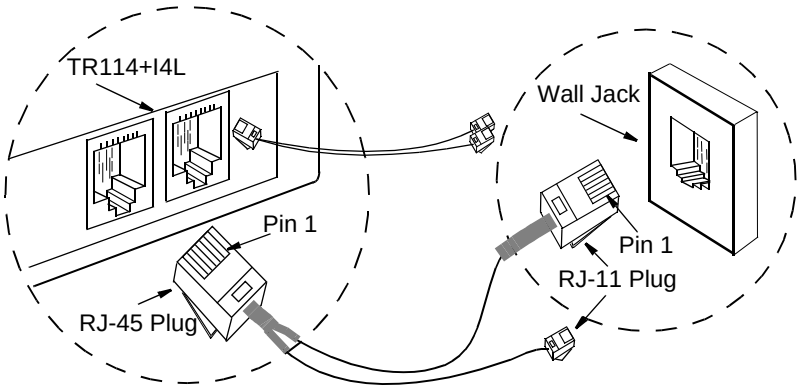
- For calls to different telephone numbers over the same trunk, the application must:
  - Delay sixty seconds between starting each call attempt.

  or

  - Delay thirty seconds between each call attempt if it delays the next attempt three minutes after detecting the congestion tone (ROBUSY).
- For all incoming calls, the application must:
  - Delay from three to fifteen seconds from the detection of ringing before automatically answering a call.
  - Remain on-hook if the system has insufficient memory or disk space to perform its functions.

Cable Information:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I2L	340-033-06	2	RJ-45 → RJ-11
TR114+I4L	340-033-05	2	RJ-45 → RJ-11



Connector Pinouts:

340-033-05: For TR114+I4L			340-033-06: For TR114+I2L	
RJ-45	**RJ-11: Channel A**	**RJ-11: Channel B**	**RJ-45**	**RJ-11: Channel A**
1 - NC	1 - NL	1 - NL	1 - NC	1 - NL
2 - NC	2 - NC	2 - NC	2 - NC	2 - NC
3 - Yellow	3 - Red	3 -Yellow	3 - NC	3 - Red
4 - Red	4 - Green	4 - Black	4 -Red	4 - Green
5 - Green	5 - NC	5 - NC	5 - Green	5 - NC
6 - Black	6 - NL	6 - NL	6 - NC	6 - NL
7 - NC			7 - NC	
8 - NC			8 - NC	

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Norway

Country Code

470

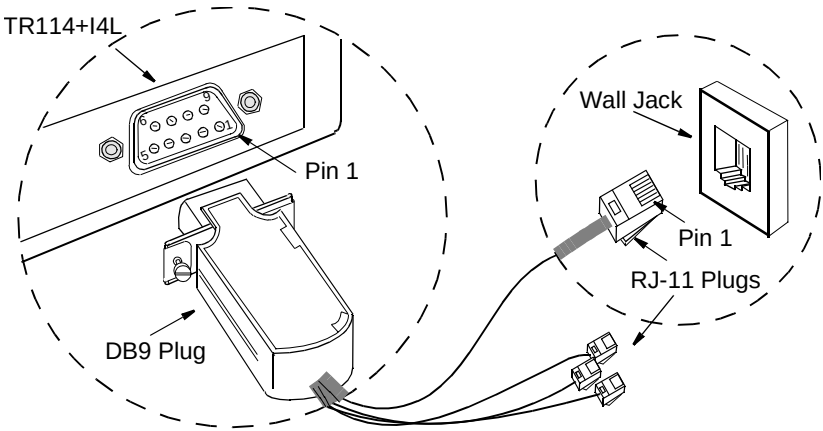
Redialing Restrictions

For calls to the same telephone number over the same trunk, the application must:

- Delay five seconds between the first and second call attempt.
- Delay sixty seconds between each subsequent call attempt.

Cable Information:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I2L	340-050-02	1	DB9 → RJ-11
TR114+I4L	340-050-01	1	DB9 → RJ-11



Connector Pinouts:

340-050-01: For TR114+I4L		340-050-02: For TR114+I2L	
DB9	**RJ-11**	**DB9**	**RJ-11**
1 - Red	1 - NL	1 - Red	1 - NL
2 - Red	2 - NL	2 - Red	2 - NL
3 - NC	3 - Red	3 - NC	3 - Red
4 - Red	4 - Green	4 - NC	4 - Green
5 - Red	5 - NL	5 - NC	5 - NL
6 - Green	6 - NL	6 - Green	6 - NL
7 - Green		7 - Green	
8 - Green		8 - NC	
9 - Green		9 - NC	

Singapore

Country Code

650

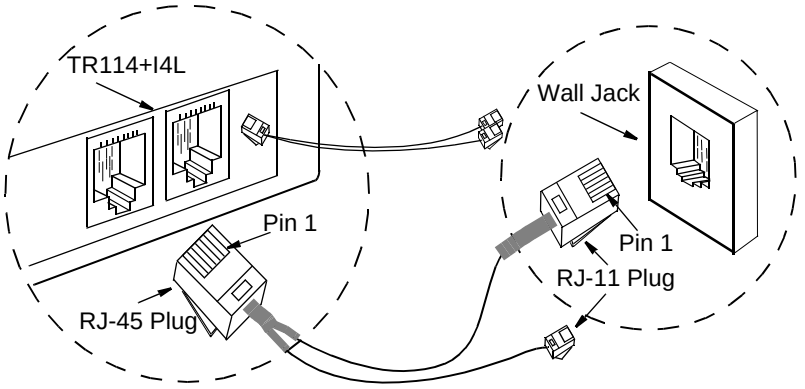
Redialing Restrictions

For an unsuccessful attempt to dial any telephone number, the application must:

- Make no more than ten additional call attempts.
- Delay a minimum of sixty seconds between each call attempt.

Cable Information:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I4L	340-036-02	2	RJ-45 → RJ-11



Connector Pinouts:

340-036-02: For TR114+I4L		
RJ-45	**RJ-11: Channel A**	**RJ-11: Channel B**
1 - NC	1 - NL	1 - NL
2 - NC	2 - NC	2 - NC
3 - Yellow	3 - Green	3 - Black
4 - Green	4 - Red	4 - Yellow
5 - Red	5 - NC	5 - NC
6 - Black	6 - NL	6 - NL
7 - NC		
8 - NC		

Spain

Country Code

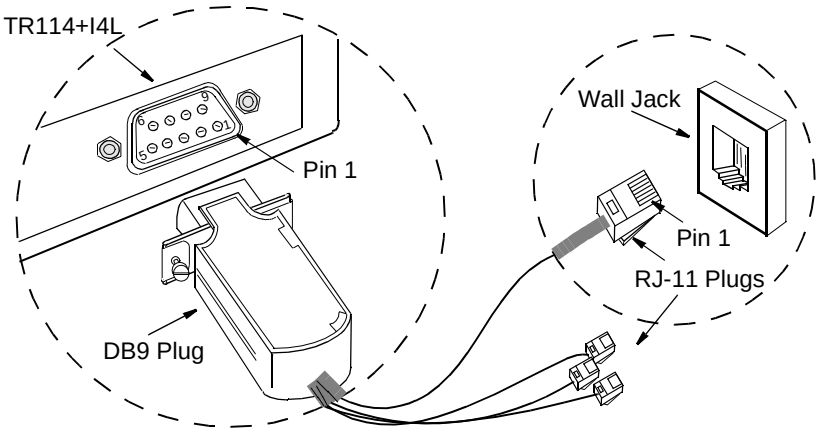
340

Redialing Restrictions

- For transmissions of any one document to any one telephone number, the application must:
  - Make no more than five call attempts in one hour.
  - Delay five seconds between the first and second call attempts.
  - Delay one minute between each subsequent call attempt.
- For calls to different telephone numbers over the same trunk, the application must delay two seconds between releasing the line after an unsuccessful call attempt and seizing it for the next call attempt.

Cable Information:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I2L	340-050-02	1	DB9 → RJ-11
TR114+I4L	340-050-01	1	DB9 → RJ-11



Connector Pinouts:

340-050-01: For TR114+I4L		340-050-02: For TR114+I2L	
DB9	**RJ-11**	**DB9**	**RJ-11**
1 - Red	1 - NL	1 - Red	1 - NL
2 - Red	2 - NL	2 - Red	2 - NL
3 - NC	3 - Red	3 - NC	3 - Red
4 - Red	4 - Green	4 - NC	4 - Green
5 - Red	5 - NL	5 - NC	5 - NL
6 - Green	6 - NL	6 - Green	6 - NL
7 - Green		7 - Green	
8 - Green		8 - NC	
9 - Green		9 - NC	

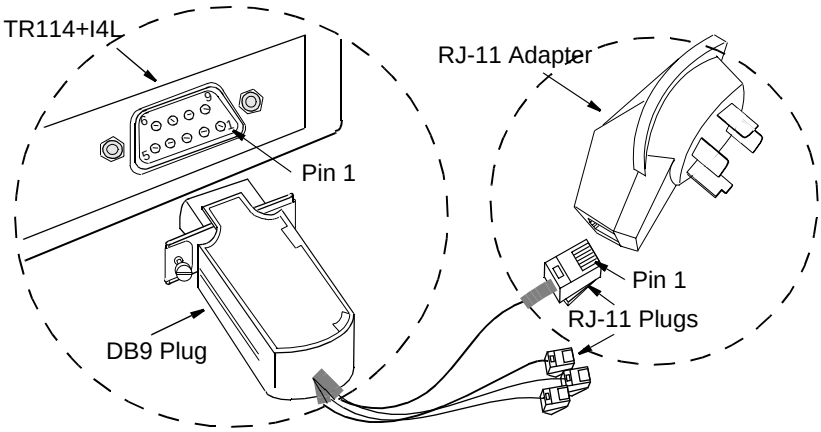
Sweden

Country Code

460

Cable Information:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Adapter
TR114+I2L	340-050-02	1	DB9 → RJ-11 to 4
TR114+I4L	340-050-01	1	DB9 → RJ-11 to 4



Connector Pinouts:

340-050-01: For TR114+I4L		340-050-02: For TR114+I2L	
DB9	**RJ-11**	**DB9**	**RJ-11**
1 - Red	1 - NL	1 - Red	1 - NL
2 - Red	2 - NL	2 - Red	2 - NL
3 - NC	3 - Red	3 - NC	3 - Red
4 - Red	4 - Green	4 - NC	4 - Green
5 - Red	5 - NL	5 - NC	5 - NL
6 - Green	6 - NL	6 - Green	6 - NL
7 - Green		7 - Green	
8 - Green		8 - NC	
9 - Green		9 - NC	

Switzerland

Country Code

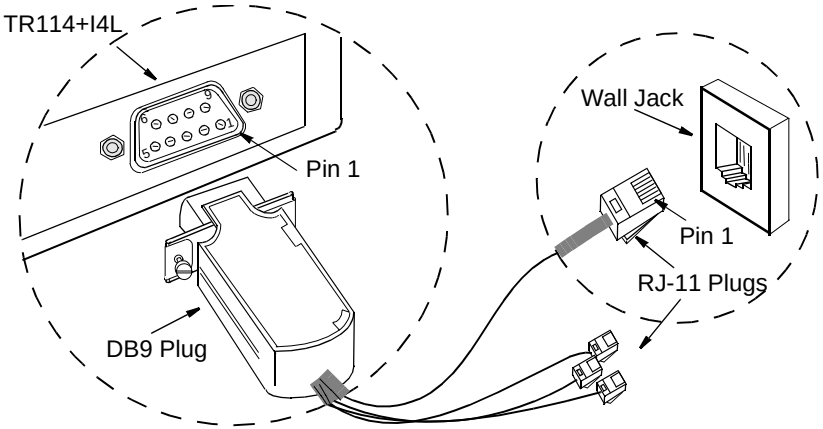
410

Redialing Restrictions

- For an unsuccessful attempt to dial any telephone number, the application must:
  - Make no more than four call attempts. Each transmission of dialing information counts as one dial attempt.
  - Delay a minimum of thirty seconds between each call attempt.
  - Release the line for a minimum of five seconds before dialing a different telephone number.
- For a successful dialing to any telephone number, the application must:
  - Prevent automatic dial attempts to the same telephone number.
  - Release the line for a minimum of five seconds before dialing a different telephone number.

Cable Information:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I2L	340-050-02	1	DB9 → RJ-11
TR114+I4L	340-050-01	1	DB9 → RJ-11



Connector Pinouts:

340-050-01: For TR114+I4L		340-050-02: For TR114+I2L	
DB9	**RJ-11**	**DB9**	**RJ-11**
1 - Red	1 - NL	1 - Red	1 - NL
2 - Red	2 - NL	2 - Red	2 - NL
3 - NC	3 - Red	3 - NC	3 - Red
4 - Red	4 - Green	4 - NC	4 - Green
5 - Red	5 - NL	5 - NC	5 - NL
6 - Green	6 - NL	6 - Green	6 - NL
7 - Green		7 - Green	
8 - Green		8 - NC	
9 - Green		9 - NC	

United Kingdom

Country Code

440

Note: If the country code in *btcall.cfg* does not match the country on the label on the back of the board, calls can neither be sent or received.

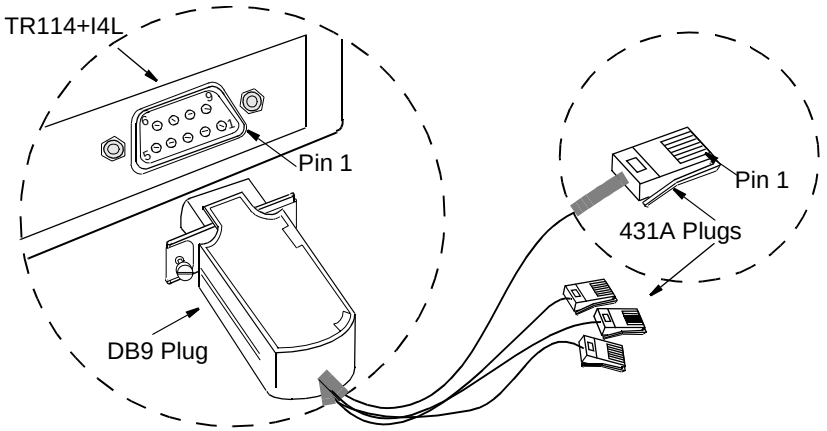
Redialing Restrictions

For transmission of any one document to any one telephone number, the application must:

- Make no more than sixteen call attempts.
- Delay five seconds between each call attempt.

Cable Information:

TR114 Model	Cable Part Number	Quantity Required	Connectors: Board → Wall
TR114+I1L	340-064-01	1	DB9 → 431A UK
TR114+I2L	340-050-08	1	DB9 → 431A UK
TR114+I4L	340-050-05	1	DB9 → 431A UK



Connector Pinouts:

340-050-05: For TR114+I4L		340-050-08: For TR114+I2L		340-064-01: For TR114+I1L (Ch. 0)	
DB9	**431 A**	**DB9**	**431 A**	**DB9**	**431 A**
1 - Red	1 - NL	1 - Red	1 - NL	1 - NC	1 - NL
2 - Red	2 - Green	2 - Red	2 - Green	2 - Red	2 - Green
3 - NC	3 - NC	3 - NC	3 - NC	3 - NC	3 - NC
4 - Red	4 - NC	4 - NC	4 - NC	4 - NC	4 - NC
5 - Red	5 - Red	5 - NC	5 - Red	5 - NC	5 - Red
6 - Green	6 - NL	6 - Green	6 - NL	6 - Green	6 - NL
7 - Green		7 - Green		7 - NC	
8 - Green		8 - NC		8 - NC	
9 - Green		9 - NC		9 - NC	

Chapter 4
Testing and Troubleshooting

This chapter explains how to test a TR114 installation using Brooktrout's configuration and test software. The test software is included on diskette with the board; the diskette is labelled "TR Series Hardware Test". You can also download a copy from the Brooktrout web site; see *Chapter 5, Contacting Technical Support* for the procedures.

Using the Test Software

In order to test the TR114, the board must be installed in the computer and connected to active loop-start telephone service. The following tasks are required to install and use the test software:

- Load the test software
- Change the TR114 configuration, if necessary.

  If you installed more than one TR114 or TR series boards, you must change the configuration file (*btdriver.cnf*) before you run the tests.
- Set the country code in the *user.cfg* file
- Boot the system under DOS
- Test the configuration
- Test each loop-start channel by sending and receiving a fax

TR114 Test Files

Table 4-1 describes the files included in the test software. The test files must remain together; do not store them in separate directories.

Table 4-1. TR114 Test Files

File Name	Description
btdriver.bat, btk1.exe, btk2.exe	A batch file and DOS TSR that must be installed in order to run the *faxtest* program.
btdriver.cnf	The configuration file that contains the interrupt, the DMA channel, and the I/O addresses of the TR114 channels in the system. Used by the *btdriver.bat* file.
country.cfg	Read-only configuration file with country-specific information.
faxtest.exe	A test program to send and receive facsimiles.
send.fil	A single page Group 3 fax test file; sent by default.
test-164.pex	Test firmware automatically downloaded by the *faxtest* program to the TR114.
user.cfg	A user-modifiable configuration file that contains a number of run-time configuration parameters.

Installing the Test Software

This section explains how to install the TR114 test software. You can copy the contents of the diskette to the hard drive or run the program from the diskette.

Note: If you are using OS/2 or Windows NT (with the NTFS file system), do not use the test program from a DOS window. Boot from a DOS diskette (not supplied by Brooktrout) and run the test software from the diskette drive.

1. Make the directory in which to store the test software (for example, *bfax\faxtest)* by typing:

   ```
   mkdir \bfax\faxtest
   ```

2. Make the new directory the current directory:

   ```
   cd \bfax\faxtest
   ```

3. Copy the files from the diskette to the current directory:

   ```
   copy A:*.*
   ```

4. If there are other software applications or TSRs for Brooktrout boards running on the system, create a temporary *autoexec.bat* file that does not contain the lines that run such software.

5. Reboot the system under DOS using the modified *autoexec.bat* file.

   Remember to restore the original *autoexec.bat* file when you finish testing.

Changing the TR114 Configuration

Depending on the number and models of TR114 boards installed and whether their installation caused any conflicts with other hardware or software in the system, you may need to edit the *btdriver.cnf* configuration file distributed with the test software. You can use any text editor to change the parameters in this file.

The *btdriver.cnf* configuration file contains the following configuration parameter values:

```
intnum 5
dmachan 1
addrs 264 4
```

This file is for a single, four-channel TR114 ISA board with the default configuration. The configuration parameters shown above indicate that a four-channel TR114 is installed at base address 260 and is using interrupt 5 and DMA channel 1.

For each additional TR114, add another `addrs` line in the configuration file. For example, if you installed two TR114 four-channel boards in the system (one at address 260 and the other at address 280), change the contents of the *btdriver.cnf* configuration file as follows:

```
intnum 5
dmachan 1
addrs 264 4
addrs 284 4
```

If you installed one TR114 two-channel board in the system (at address 260), change the contents of the configuration file as follows:

```
intnum 5
dmachan 1
addrs 264 2
```

Setting the Country Code

If you need to change the country code in your application software, you will also need to change it in the *user.cfg* file in order to run the test program. Note that if you are testing the board using the software from the Brooktrout-supplied diskette, the test file, *user.cfg* is the same file as *btcall.cfg* and will require the same parameter settings that you make in *btcall.cfg*.

Testing the Configuration

Test the TR114 configuration using the following procedure.

1. Boot the system to run under DOS.
2. Change to the directory in which you copied the test software.
3. Execute the *btdriver* batch file:

   `btdriver btdriver.cnf`
4. Verify that the program displays the same number of channels you installed and specified in the *btdriver.cnf* file.

   For example, if you have one TR114 four-channel board installed, you should see the following output:

   ```
   Total Channels: 4 TR114; 0 Trufax;
   0 TR112/TR111MC; 0 TR200
   No BRI TR114s found
   ```

   If you have two TR114 four-channel boards installed in your system, you should see the following output:

   ```
   Total Channels: 8 TR114; 0 Trufax;
   0 TR112/TR111MC; 0 TR200
   No BRI TR114s found
   ```
5. If the number of channels is correct, the system initialized successfully. If it is not correct, refer to the following checklist for possible solutions.

a. Make sure the switches on the address switch (SW1) and the interrupt jumper are set correctly on the board, and that they match the parameters in the *btdriver.cnf* configuration file.

b. Make sure the I/O address settings do not conflict with another device in your system. Refer to *Appendix B, Common System Resource Assignments* for more information.

c. If you are installing multiple TR114s, make sure that each board had a unique base I/O address and that it is entered in the *btdriver.cnf* configuration file.

d. Make sure the LEDs (on the TR114 mounting bracket) flash once when you power up the system. If they fail to flash, or if they remain on, there may be a problem with the TR114 or with the computer. To determine where the problem lies, see the section, *Troubleshooting* on page 4-7 for help.

Testing the Loop-Start Channels

This section explains how to send and receive faxes with the *faxtest* program in order to test the TR114 loop-start channels. In order to run these tests, the *btdriver* program must have run successfully and the TR114 must be connected to the telephone service.

Press `Q` at any time to quit *faxtest*.

Faxtest Command Line Options

The following command line options allow you to specify additional information when sending or receiving a fax when you are running the *faxtest* program.

`-r`	Places the channel in receive mode.
`-s <phonenum>`	Places the channel in send mode and sends the phone number in `<phonenum>`.

`-u #`	The unit parameter followed by the number of the channel that you want to test, e.g, **`-u 0`** specifies channel 0.
`-v`	Turns on verbose output, to capture the trace data.
`-w`	Forces the TR114 to wait for a dial tone.

Displaying Command Line Options

You can display the list of command line options by typing:

```
faxtest
```

Sending a Test Fax

To test sending a fax, test all TR114 loop-start channels.

To send a fax from any TR114 loop-start channel, follow these steps, pressing Enter after each entry:

1. Change to the directory where you copied the test software.
2. Execute the *faxtest* program, where # is the number of the channel and **`phonenum`** is the phone number of the receiving fax machine:

   ```
   faxtest -u # -s phonenum
   ```

   Note: If you install the TR114 on a PBX extension, you may have to insert a prefix (e.g., `9`) in front of the fax machine's phone number, for example,

   ```
   faxtest -u # -s 95551212
   ```

3. If the fax transmission is successful, the *faxtest* program displays the following message at the end of transmission:

   ```
   Fax Sent Successfully - Test Completed.
   ```

   Otherwise, an error message is displayed. Refer to the section, *Troubleshooting* on page 4-7 to determine the cause of the problem.

Receiving a Test Fax

For receiving faxes, you only need to run the *faxtest* program on even-numbered channels (including channel 0).

To receive a fax, follow these steps, pressing the Enter key after each entry:

1. Change to the directory where you copied the test software.
2. Execute the *faxtest* program, where # is the number of the channel:

   ```
   faxtest -u # -r
   ```

3. From a fax machine, dial the telephone number connected to the channel you are testing to send it a test fax.

   If the fax is received successfully, the *faxtest* program displays the following message at the end of reception:

   ```
   Fax Received Successfully - Test Completed.
   ```

   Otherwise, an error message is displayed. Refer to the next section, *Troubleshooting*, to determine the cause of the problem.

Troubleshooting

This section describes some errors you may encounter when you run the test program. Some solutions are also provided for resolving the problem.

Some Typical Errors

SYMPTOM(S): LEDs do not flash on power up.

Probable Cause: There was a self-test failure at power on. The power supply requirements may be unsuitable.

Solution: Try installing the board in a different system.

SYMPTOM(S): Cannot consistently originate and/or answer calls

Probable Cause: Country code mismatch

Solution: Ensure that the country code in the *user.cfg* file matches the country specific variant on the back of the board.

SYMPTOM(S): *btdriver* does not detect all the channels in the system.

Two channels should be detected for each two-channel board and four channels for each four-channel board.

Probable Cause: I/O address conflict with other devices in the system, possibly other Brooktrout boards.

Solution: Ensure the `addrs` entries in the *btdriver* configuration files are 4 hex more than the switch settings of the hardware.

Use operating system tools (such as NTdiagnostics), system documentation, or BIOS configuration, to check for device conflicts and available I/O addresses.

Remove all Brooktrout boards from the system, then re-install and test them one at a time.

Remove other boards, such as network adapters, to check for conflicts.

SYMPTOM(S): *btdriver* loads successfully but the *faxtest* program does not display output after attempting to reset the channel.

Probable Cause: Interrupt conflicting with another device, interrupt jumper wire installed on wrong number, not set snugly on the pins, or not set correctly in the *btdriver.cnf* file.

Solution: Make sure the interrupt jumper wire is on the correct pins.

Check that the interrupt pull-up switch (switch 1 on SW1) is set to ON, on only one board in the system.

Ensure that the `intnum` parameter in the *btdriver.cnf* file matches that of the board.

Use operating system tools (such as NTdiagnostics), system documentation, or BIOS configuration, to check for device conflicts and available interrupts.

Try other jumper settings, even if the interrupt chosen is expected to be free.

Check the BIOS configuration if one is available for your system. Many EISA systems will not allow the interrupt to be used unless it is configured in the BIOS.

Remove other boards, such as network adapters, to check for conflicts.

SYMPTOM(S): Cannot send and/or receive faxes properly; Fax can be received but is unrecognizable.

Probable Cause: DMA conflict or mismatch, or a DMA incompatibility exists with the computer's motherboard.

Solution: To identify if it is a DMA or interrupt issue, disable DMA by changing the `dma` parameter from `dma 512` to `dma 0` in the *user.cfg* file.

If it is an interrupt issue, try one of the following:

- Try other jumper settings, even if the interrupt chosen is expected to be free.
- Use operating system tools (such as NTdiagnostics), system documentation, or BIOS configuration, to check for device conflicts and available interrupts.
- Check the BIOS configuration if one is available for your system. Many EISA systems will not allow the interrupt to be used unless it is configured in the BIOS.
- Make sure that the interrupt jumper wire is on the correct pins.
- Check that the interrput pull-up switch (switch 1 on SW1) is set to ON on only one board in the system.
- Ensure that the `intnum` parameter in the *btdriver.cnf* file matches that of the board.
- Remove other boards, such as network adapters, to check for conflicts.

Sending the Test Results to a File

You can redirect the output from your fax test to a file. If you need to contact Brooktrout Technical Support or your reseller to resolve problems you cannot correct, they will want to examine the test results to determine the cause of the malfunction.

In the following steps, **#** is the number of the channel you are testing, `log.txt` is the name of the output file, and **-v** sets verbose mode to capture the data.

1. On sending a fax, redirect the output from the test program to a file by typing:

   ```
   faxtest -u # -v -s phonenum >log.txt
   ```

2. On receiving a fax, redirect the output from the test program to a file by typing:

   ```
   faxtest -u # -v -r >log.txt
   ```

We recommend that you fax or e-mail the test results to Brooktrout Technical Support or to the reseller from whom you purchased your TR114 board. For instructions on how to contact or send test results to Brooktrout Technical Support, see *Chapter 5, Contacting Technical Support*.

Rebooting the Operating System

Reboot your system to run under the operating system you normally use. If your system normally runs under DOS, and you booted your system with a special *autoexec.bat* file to run the test software, reboot your system now using the original *autoexec.bat* file that contains the lines that run your fax application software.

You can now configure your fax software and start sending and receiving faxes with your TR114 ISA board.

Chapter 5
Contacting Technical Support

Brooktrout provides technical support for customers who have purchased their TR114 board directly from Brooktrout Technology, Inc. If you purchased your TR114 board from a reseller, contact that reseller for technical support.

In the event of equipment malfunction, Brooktrout Technology, Inc. or an authorized agent should perform all repairs. The user is responsible for reporting the need for service to Brooktrout or to one of its authorized agents.

Getting Technical Support

If you call Brooktrout Technical Support, please be prepared to work with the support personnel. You may be asked to do several things, such as taking down your server.

Please have the following information ready:

- The part number (PN) of the TR114 board in question.

  Part numbers begin with the digits 802 or 812. The part number is on the back, or solder-side, of the base board.

- Test results obtained from running the diagnostic software (refer to the section, *Sending the Test Results to a File* on page 4-11 for instructions for creating a file).

Contact the Brooktrout office nearest to you. The numbers are shown in the following pages.

Contacting Belgium

- Telephone: +32 2 658 0170
- e-mail: eurosupport@brooktrout.com
- Fax: +32 2 658 0180
- FTP Site: ftp.brooktrout.com
- Web Site: http://www.brooktrout.com

Contacting Japan

- Telephone: +81 3 5800 9183
- e-mail: inu@dns1.infocom.co.jp
- Fax: +81 2 658 0180
- FTP Site: ftp.brooktrout.com
- Web Site: http://www.brooktrout.com

Contacting Singapore

- Telephone: +65 224 4485
- e-mail: singsupport@brooktrout.com
- Fax: +65 224 0337
- FTP Site: ftp.brooktrout.com
- Web Site: http://www.brooktrout.com

Contacting USA

- Telephone: +1 781-433-9600
- e-mail: techsupport@brooktrout.com
- Fax: +1 781-449-9009
- FTP Site: ftp.brooktrout.com
- Web Site: http://www.brooktrout.com

Downloading Software from the FTP Site

You can download copies of the latest TR114 firmware and the diagnostic software from the Brooktrout FTP site. Use the following procedures.

TR114 Firmware

1. Connect to the Brooktrout FTP site by typing the following:

   ```
   ftp.brooktrout.com
   ```

2. Log in as **anonymous**. Enter your e-mail address as your password when required.

3. Change to the *firmware* directory:

   ```
   cd support/firmware/v18x
   ```

   where **x** is the latest revision of the software.

4. In binary mode, transfer the files, *v18x.pex*, *v18x-2m.pex*, and the contents of the *csum* folder.

Diagnostic Software

1. Connect to the Brooktrout FTP site by typing the following:

   ```
   ftp.brooktrout.com
   ```

2. Select the *support* directory.

3. Select *diag.zip*.

Click the appropriate file from the list that is displayed; the software downloads automatically.

Returning a Defective TR114 Board

If you suspect that your TR114 board is malfunctioning, contact Brooktrout Technology Europe Ltd. or the reseller from whom you purchased it.

Typically, Brooktrout Technical Support or your reseller will request that you run diagnostics on the TR114 board to determine whether it has a hardware defect. (See page 4-11 for running diagnostics and creating a file from your test output.) If the board has a hardware defect, you will need to return it for repair to Brooktrout Technology, Inc. or to the reseller from whom you purchased it.

If you purchased the TR114 board directly from Brooktrout Technology, Brooktrout Technology Europe Ltd. will issue a Return Material Authorization (RMA) number for it. If your TR114 board is no longer under warranty, you must get a Purchase Order Number before Brooktrout Technology Europe Ltd. will issue you an RMA number.

When returning a product on RMA to Brooktrout Technology, Inc., write the RMA number clearly on the shipping container and send the container to the following address:

Brooktrout Technology, Inc.
152 Second Avenue
Needham, MA 02494-2722
USA

Appendix A
Installing and Testing Hong Kong DID Service

This appendix explains how to connect and test a TR114 ISA analog DID board for Hong Kong.

The TR114 ISA analog board is offered in the following configurations for use for DID telephone service:

TR114+I2C - One loop-start and one DID interface
TR114+I4C - Two loop-start and two DID interfaces
TR114+I2D - Two DID interfaces
TR114+I4D - Four DID interfaces

Requirements for DID

To run a Brooktrout TR114 ISA analog board with DID, your system requires the following:

- DID telephone service
- External -48V$_{DC}$ power supply

  You need to purchase a power supply separately from the TR114. Brooktrout offers a power supply from Computer Products that is approved for use with the TR114.

DID Telephone Service

DID (Direct Inward Dialing) lines support incoming calls only. More than one telephone number is assigned to a DID line. DID service can provide automatic routing of facsimiles to the proper destination within a multiuser fax system.

For example, Company ABC is assigned one DID trunk that is composed of one hundred telephone numbers ranging from 239-9400 to 239-9499. When any one of the numbers in this range is dialed and the DID line is available, the telephone company transmits the last few digits (usually 3 or 4) of the dialed number to the TR114. By detecting these digits, the TR114 can tell which of the hundred numbers was actually dialed.

If the line is busy, callers to any of the other numbers encounter a busy signal. Because of this situation, many fax messaging systems require more than one DID line to which the range of DID telephone numbers is assigned. The number of lines required depends on the traffic demands on the system.

Since DID lines are one-way (inward), a two-way fax messaging system using DID requires one or more loop-start telephone lines for sending facsimiles.

The TR114+I2C, which contains one loop-start and one DID interface, or the TR114+I4C, which contains two loop-start and two DID interfaces, are options for smaller systems that need only one or two inbound lines and one or two outbound lines.

The TR114+I2D, which contains two DID interfaces, and the TR114+I4D, which contains four DID interfaces, are intended for larger systems that employ two or more DID lines and service a large volume of calls.

DID Operation

When a person or a fax machine dials a number connected to a TR114 DID channel, the board recognizes it as an incoming call. The next step depends on how the DID line has been configured – with wink-start (the most common configuration) service, or with immediate-start service.

On a line configured for *wink-start* service, the board performs a "wink" after it recognizes the call; that is, it signals the telco that it is ready to receive the last few digits of the dialed number. The telco transmits these digits to the board with DTMF signals (or in some cases with pulse signals). You must inform the telco of the number of DID digits you want the them to transmit.

When the TR114 board has detected all of the DID digits, it signals the telco that it has accepted the call. If the board does not detect the correct number of DID digits, it plays a fast busy signal.

On a line configured for *immediate-start* service, the board does not perform a wink. Instead, the telco waits a fixed amount of time before it sends the DID digits to the board. Then, when it detects or fails to detect the correct number of DID digits, the board responds the same as it does when configured for wink-start service.

Installing the TR114 DID Board

To install and connect a TR114 ISA analog DID board, you will need to perform the following tasks:

- Configure and install the board using the procedures in *Chapter 2, Configuring and Installing the TR114*.
- Install a power supply using the procedures in *Installing a Power Supply for DID Service* below.
- Connect the cables using the procedures in the section, *Connecting to DID Service* on page A-5.
- Ensure that the board is working using the procedures in the section, *Testing the DID Channels* on page A-7.

Installing a Power Supply for DID Service

The TR114 must supply the DID line with continuous -48V$_{DC}$ power; service can be lost if the telephone company does not detect -48V$_{DC}$ power on the line. After you install the TR114 board in the computer and before you connect the telephone lines for DID service, connect a power supply to the TR114.

You can connect multiple TR114 boards to a single power supply. However, Brooktrout recommends that each board have its own power supply so that power is not lost for multiple boards if a single power supply fails.

Once the DID power supply is installed, leave it on to ensure continued DID service. You can turn off the computer without turning off the DID power supply.

Connecting a Computer Products Universal Power Supply

The Computer Products universal power supply is shown in Figure A-1.

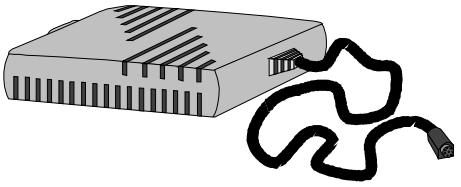


Figure A-1. Computer Products Universal Power Supply

Note: The DID power cord supplied with the board will not be needed when using the power supply; it can be retained or discarded.

Attach the power supply using the following procedure.

1. Power off the computer.
2. Locate the power supply, the mains cord set, and the DID adapter cable shown in Figure A-2.

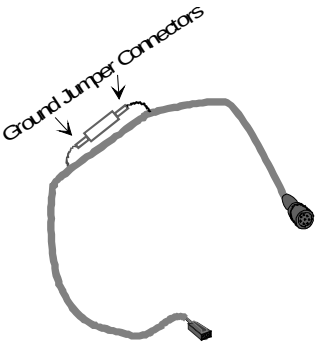


Figure A-2. DID Adapter Cable

3. Verify that the mains cord set is compatible with the mains power socket that will be used with the power supply. If it is not, contact Brooktrout Technology for the appropriate cable.

4. Ensure that the ground jumper connectors (shown in Figure A-2) on the DID adapter cable are mated. This connects the positive side of the DID power supply output to earth as required by most telecom authorities. If the mains supply used does not provide a path to earth, a separate ground will need to be provided to the black lead in the ground jumper connector.
5. Plug the DID adapter cable into the end of the DC output cable from the power supply, and plug the mains cord set into the AC input socket on the power supply.
6. Plug the jack on the other end of the DID power cable into the DID power connector on the TR114 mounting bracket.

   The jack is keyed to ensure proper insertion.
7. Power up the computer.
8. Plug the mains cord set into a grounded wall socket.

   If the wall socket is not grounded, use an adapter to ground the power supply. Be sure to follow the instructions supplied with the adapter to connect to ground. Alternatively, plug a separate earth ground into the female side of the ground jumper connector (attached to the black wire) on the DID adapter cable (see Figure A-2).

Connecting to DID Service

After you have installed the TR114 in the computer and connected a DID power supply to the TR114, you can connect the TR114 to DID telephone service. Table A-1 shows how the TR114 channels connect to DID telephone service.

Table A-1. Channel Identification

TR114 Model	Split Cable Label	Channel	Service Type
I2D	N/A	0	DID
		1	DID
I4D	A	0	DID
		1	DID
	B	2	DID
		3	DID
I2C	N/A	0	Loop-start
		1	DID
I4C	A	0	Loop-start
		1	Loop-start
	B	2	DID
		3	DID

Connect the TR114 telephone cables using the following procedure:

1. Locate the cables supplied with your TR114 (the wires on the split cables for the I4C and I4D are labeled A and B).
2. Plug the end with a single RJ-45 plug into the RJ-45 jack on the TR114 mounting bracket; plug the RJ-11 plugs at the other end into wall-mounted DID phone jacks.

CAUTION

Do not plug a DID cable into a loop-start line – this can cause serious damage to the TR114.

The TR114 DID channels are now connected to the DID lines.

Testing the DID Channels

The test software contains DOS programs and files you can use to ensure that your TR114 is installed correctly and to run diagnostics if you have a problem. One of these programs, *faxtest*, is used to send and receive faxes and verify DID operation. The *btdriver* program can be used to identify the boards and channels.

This section explains how to test DID channels with and without active DID service:

- Testing *without* active DID service (with a telephone connected directly to the DID channel) ensures that the hardware and power supply are functioning properly.
- Testing *with* DID service ensures that the TR114 DID parameters are configured correctly in the *btdriver.cfg* file and that the TR114 is providing the proper voltage to the telco and generating the wink signal.

If you need another copy of the test program (*diag.exe*), see *Chapter 5, Contacting Technical Support* for downloading files from Brooktrout's FTP site.

To perform the tests, you need access to a fax machine with a telephone or a standard analog telephone.

Before you run either test, the *btdriver* program must be successfully run, and a -48 VDC power source must be connected to the board. Before you can run the test with active DID service, you must also activate the DID line, connect the DID channels on the TR114 to the telephone lines, and make sure the DID-related parameters in the *user.cfg* file match the DID service options.

Changing the DID Configuration

You may have to change the DID configuration; this is done in the *user.cfg* test configuration file using any text editor. The *user.cfg* file is a text file that contains two DID-related parameters, service type and DID digits. The default value for service type is `wink`; the default value for DID digits is `4`.

If your DID service is set up for immediate-start operation, change `wink` to `immediate`. Depending on your DID service, you may also need to change the number of DID digits.

If you change the *user.cfg* file so that the tests are performed correctly, you should make the same changes in the *BTCALL.CFG* file, which is the default user-defined configuration file. *User.cfg* is a copy of *BTCALL.CFG*.

Testing DID Channels without Active Service

To test reception on a DID channel without active service, use a standard analog telephone or a fax machine with a built-in telephone to run this test for each DID channel.

1. Connect a fax machine with telephone directly to a DID channel. Use an RJ-11 cable or the split cable supplied with the TR114 (see Table A-1 for identifying TR114 DID channels).
2. Change to the directory in which you copied the test software (in this example, *\bfax\faxtest*) by typing:

   ```
   cd \bfax\faxtest
   ```

3. Execute the *faxtest* program by typing:

   ```
   faxtest -u # -r
   ```

   where:

   `-u #` Specifies the number of the channel to test, for example, **`-u 0`** specifies channel 0.

   `-r` Places the channel in receive mode.

   The program displays the following message:

   ```
   waiting for a call
   ```

   If this message does not display, refer to the section, *Troubleshooting Your DID Installation* on page A-10, for information on solving problems.

4. Pick up the handset and dial the appropriate number of DID digits from the fax machine/telephone connected to the DID channel you are testing.

   If the DID digits are detected successfully, the digits are displayed on the screen, and the TR114 generates a fax answer tone.

If the DID digits do not display or if there is no fax answer tone, run the *faxtest* program again and see if you can hear the DID digits in the telephone receiver as you enter them.

a. If you can hear the digits, check the setup of the *user.cfg* configuration file:

- If the DID parameter values are incorrect, change them.
- If the DID parameter values are correct, run the *faxtest* program again, and make sure it's really waiting for a call.

b. If you cannot hear the digits, the line is not receiving voltage.

Check the power supply, the power connection, and the cable to the TR114.

Testing DID Channels with Active Service

To test call reception on any DID channel with active DID service:

1. Connect the DID channel to the DID telephone line. Use an RJ-11 cable or the split cable supplied with the TR114.
2. Change to the directory in which you copied the test software (in this example, *\bfax\faxtest*) by typing:

   ```
   cd \bfax\faxtest
   ```

3. Execute the *faxtest* program by typing:

   ```
   faxtest -u # -r
   ```

   where:

   `-u #` Specifies the number of the channel to test, for example, **`-u 0`** specifies channel 0.

   `-r` Places the channel in receive mode.

   The program displays the following message:

   ```
   waiting for a call
   ```

   If this message fails to display, refer to the *Troubleshooting Your DID Installation*, for information on solving problems.

4. Make a call to your DID channel and check to see if you hear fax tones. If so, the line is working correctly.

If instead, you hear a fast busy signal, the telephone company may not have yet activated the line. Check with the telephone company; if they tell you that the line is activated, see the next section for more information.

Troubleshooting Your DID Installation

You may encounter errors when you run the *faxtest* program when you are connected to DID service. Some possible errors are explained below, along with some solutions for resolving the problem. Also see the section on troubleshooting on page 4-7 for more help.

SYMPTOM(S): DID line does not work, or there is a fast-busy signal.

Probable Causes: DID service may not be activated, or;

The number of DID digits may not be set correctly in the *user.cfg* file, or;

There is a polarity problem; the telephone wiring may be reversed. That is, although the output of the TR114 has the correct polarity across the telephone line's two wires, a wiring reversal could exist elsewhere in the building.

Solution: Verify that the number of DID digits is set correctly in the *user.cfg* file.

Make sure that DID service is active by testing the line using the procedures in the section, *Testing DID Channels without Active Service* on page A-8.

If the telephone test works, but you still have problems with your DID line, make sure the telephone wiring is not reversed.

SYMPTOM(S): Noise on a DID trunk when you make a call to it.

Probable Cause: Grounding problem.

Solution: OPen the ground jumper on the DID adapter cable (see Figure A-2).

Contact Brooktrout Technical Support. See *Chapter 5, Contacting Technical Support*.

SYMPTOM(S): DID line was working but now it stops working.

Probable Cause: Power from the DID power supply has been interrupted, or;

Service may have been discontinued by the telco.

Solution: Make sure the DID line is connected to the TR114 and that the board is receiving -48VDC power from the DID power supply.

Call one of the telephone numbers in your block of DID numbers. If a busy signal sounds immediately, the service has probably been disconnected by the telco.

Appendix B
Common System Resource Assignments

Addresses Used by Other Devices

In addition to the TR114, other boards, hardware devices, and software commonly use particular addresses. Table B-1 lists some of the functions that systems may assign to particular addresses.

Table B-1. System Address Assignments

Address	Function
000-01F	DMA controller 1
020-03F	Interrupt controller 1
040-05F	Timer
060-06F	Keyboard controller
070-07F	Real time clock
080-09F	DMA page memory
0A0-0BF	Interrupt controller 2
0C0-0DF	DMA controller 2
0E8	Shadow RAM and cache control bit
0F0-0F1	Numeric processor extension
0F8-0FF	Numeric processor extension
1F0-1F8	Fixed disk
200-207	Game I/O
278-27F	Parallel printer port 2
2F8-2FF	Serial port 2

Table B-1. System Address Assignments (Continued)

Address	Function
300-31F	Prototype board
360-36F	Reserved
378-37F	Parallel printer port 1
380-38F	SDLC, bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome display and printer adapter
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1

Hardware Interrupts Used by Other Functions

Table B-2 lists some of the functions that computers sometimes assign to particular interrupts.

Table B-2. Hardware Interrupt Assignments

Interrupt	Function
3	Serial port 2
4	Serial port 1
5	Sound card, parallel port 2
6	Diskette controller
7	Parallel port 1
9	Software redirect to interrupt 2

Table B-2. Hardware Interrupt Assignments (Continued)

Interrupt	Function
10	Unassigned
11	Unassigned
12	Unassigned
14	Fixed disk controller
15	Unassigned

DMA Channels Used by Other Functions

Table B-3 lists some of the functions that systems commonly assign to DMA channels.

Table B-3. System DMA Channel Assignments

DMA Channel	Function
0	Unassigned
1	SDLC
2	Diskette (IBM PC)
3	Unassigned
4	Cascade for CTRL 1
5	Unassigned
6	Unassigned
7	Unassigned

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