

RightFAX 6.0 Fax Board Guide

Information in this document is subject to change without notice. Companies, names, and data used in examples herein are fictitious unless otherwise noted.

COPYRIGHT

©1990-1998 RightFAX, Inc., a subsidiary of AVT, Inc. All rights reserved. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form by any means without the written permission of RightFAX, Inc.

TRADEMARKS

The RightFAX logo design and RightFAX are registered trademarks of RightFAX, Inc. Other brand names, company names, and product names are trademarks or registered trademarks of their respective companies.



Document No. 005-00088-02
Revision No. 1, 11/98

Printed in the United States of America.

Contents

Introduction:	5
Using this Guide and Other Learning Tools	6
Technical Support	7
Chapter 1: Brooktrout Boards	9
Fax Board Installation	10
TR112 Fax Boards	10
TR114 Fax Boards	13
TruFax Fax Boards	17
Testing Brooktrout Loop-Start Boards	19
Testing Brooktrout DID Lines	20
Chapter 2: Brooktrout Digital Phone Line Interfacing	23
Digital Fax and Network Interface Boards	24
Installing the Fax and Network Interface Boards	25
Configuring RightFAX to Recognize Your Network Interface Boards	26
Chapter 3: GammaLink Boards	33
GammaLink Fax Board Installation	34
CPI/100 Fax Boards	34
CPD Fax Boards	36
CPI/200 Fax Boards	38
CPD/220 Fax Boards	40
CP4/LSI Fax Boards	42
CPI/400 PCI Analog Fax Boards	44
GammaLink Digital Phone Line Interfacing	45
Testing GammaLink Boards	46
Appendix A: DID Telephone Service	47



Introduction

In this chapter:

- Using this Guide and Other Learning Tools
- Technical Support

Using this Guide and Other Learning Tools

The [RightFAX Fax Board Guide](#) is designed for use by administrators who will be installing and configuring RightFAX compatible fax boards.

This guide assumes that you have a basic working knowledge of your organization's network, as well as your RightFAX server's hardware configuration.

In addition to this [RightFAX Fax Board Guide](#), RightFAX provides several additional sources for information on getting the most out of your RightFAX software.

RightFAX User's Guide

The [RightFAX User's Guide](#) is a reference for RightFAX users at every level of expertise. It is a comprehensive guide to all the features and functions of FaxUtil, RightFAX's client interface.

RightFAX Administrator's Guide

The [RightFAX Administrator's Guide](#) contains detailed instructions on installing and configuring RightFAX for both the server and the client workstations. This guide is specifically designed for RightFAX administrators and includes the technical information necessary to manage the RightFAX fax server.

RightFAX Optional Modules Guide

The [RightFAX Optional Modules Guide](#) is included when you purchase RightFAX Enterprise Suite or any one or more of the optional RightFAX modules (which can be purchased separately). This guide provides information on installing, using, managing, and integrating the following utilities with your RightFAX software:

- RightFAX E-mail Gateway
- RightFAX Web Client
- RightFAX Docs on Demand
- RightFAX Teleconnect
- RightFAX Optical Character Recognition (OCR)
- RightFAX PScript/PDF Conversion

Please contact RightFAX at (520) 320-7000 for more information on using or purchasing these or any of RightFAX's powerful, fully integrated utilities.

Quick Reference Card

Keep this card close to your computer for quick and easy access to all the most common FaxUtil functions and features.

Online Help

RightFAX's Online Help is a convenient and easy-to-use source of assistance. You can access the Online Help by selecting the Help menu in any FaxUtil or FaxAdmin window. Online help lets you scan for help by topic, or search for key words and terms.

RightFAX Training

Count on RightFAX's classroom training to enhance your RightFAX product knowledge. Technical, administrative, and user training programs provide you with the tools to optimize your RightFAX solution, and provide you with the knowledge to fully utilize RightFAX in your environment. Customized training is also available to meet your organization's specific needs. Classes are held throughout the year at the RightFAX corporate office in Tucson, Arizona. You may also choose the convenience of RightFAX training at your own location. For more information on RightFAX training classes and schedules, please visit our website at www.rightfax.com.

Technical Support

Your Customer Support Guide (enclosed in the product box) includes detailed information about the support options available to RightFAX customers. Please fill out the *RightFAX Software Warranty & Registration Card* and return it immediately. If you have questions of a technical nature, please contact your organization's RightFAX administrator or network administrator before calling our technical support department.

RightFAX Technical Support

6303 E. Tanque Verde
Suite 200
Tucson, AZ 85715 USA

Voice: (520) 320-7070
Fax (520) 321-7461
Web: www.rightfax.com
E-mail: tech@rightfax.com

5:00 a.m. to 6:00 p.m. MST, Monday through Friday

6:00 a.m. to 6:00 p.m. MST, Saturday



Brooktrout Boards

In this chapter:

- Fax Board Installation
- TR112 Fax Boards
- TR114 Fax Boards
- TruFax Fax Boards
- Testing Brooktrout Loop-Start Boards
- Testing Brooktrout DID Lines

Fax Board Installation

Before installing the fax board into the machine, you must configure it. Follow the instructions specific to your board type (TR112, TR114, or TruFax). If you are installing multiple boards of the same or different types, you should watch for special notes specific to such instances. Be sure to record the I/O addresses, DMA channel, and interrupts selected for each board for future reference.

TR112 Fax Boards

Warning! Static discharge can severely damage your fax board! Exposing your fax board to static electricity will void all warranties on the board! Always use caution when handling fax boards.

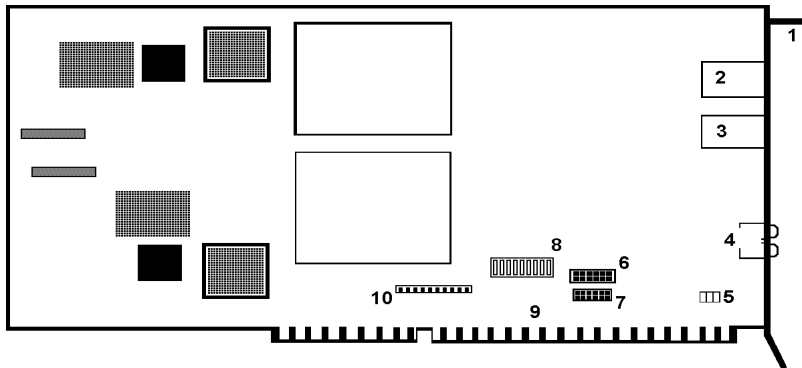
The TR112 is a two-channel fax board. There are loop-start only, DID only, and loop-start/DID combination versions of the board available. Two standard phone cables with RJ-11 heads at each end are included with each board. DID lines also require an external power supply (Tellabs 8012) available separately.

Setting the I/O Address

Each TR112 occupies eight consecutive I/O locations (four per channel). You must manually set the base address of the board and the rest of the addresses are set automatically. The base I/O address is set by switches located in the section marked SW1 on the board. Switches are numbered 8 to 1 from left to right across the top of the SW1 casing. The casing is shown below as it appears when the card is held in the upright position with the component side of the card facing you and the bracket side facing to the right.

TR112 Board Layout

1. Mounting Bracket
2. Telephone Interface (Chn.1)
3. Telephone Interface (Chn.2)
6. Interrupt Select (J32)
7. DMA Select (J31)
8. Address Select (SW1)
10. Interrupt Select (J33)



Switch position 1 is not used in determining the address. It does, however, enable the pull-down resistor for DMA for your cards. You will set the DMA later in this chapter. **Switch 1 should be ON for one and only one card in your machine.** If you have both a TR112 and TR114 installed, SW1 should be ON for only one TR114 board.

Select a card address from the following list and change the dip switches to reflect the new address. The recommended setting for your first board is 250 (hex). **Do not use a pencil to move the switches; graphite is a conductor and may damage the board!**

Address (hex)	8	7	6	5	4	3	2	1
220	OFF	ON	ON	ON	OFF	ON	ON	*
228	OFF	ON	ON	ON	OFF	ON	OFF	*
230	OFF	ON	ON	ON	OFF	OFF	ON	*
238	OFF	ON	ON	ON	OFF	OFF	OFF	*
240	OFF	ON	ON	OFF	ON	ON	ON	*
248	OFF	ON	ON	OFF	ON	ON	OFF	*
250	OFF	ON	ON	OFF	ON	OFF	ON	*
258	OFF	ON	ON	OFF	ON	OFF	OFF	*
260	OFF	ON	ON	OFF	OFF	ON	ON	*
268	OFF	ON	ON	OFF	OFF	ON	OFF	*

If you set the base port address to 250 (hex), the first channel uses addresses 250 through 253, and the second channel uses addresses 254 through 257. If you install multiple TR112 boards, each board must have a separate base address.

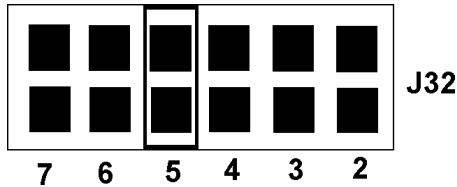
Setting the Hardware Interrupt

The TR112 generates interrupts to the computer. A jumper (which looks like a black plastic cap), placed on the pins of either J32 or J33, selects the interrupt. All TR112 and TR114 boards in your machine share the same interrupt. Therefore, if a TR112 or TR114 is already installed and operating in your system and you add other TR112 boards, set the hardware interrupt on the new boards to the same value as the original board.

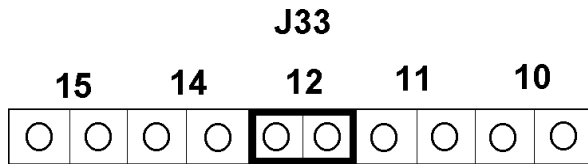
Only one jumper can be installed per board, either on J32 or J33. J32 supports interrupts 2 through 7. J33 supports interrupts 10, 11, 12, 14, and 15. Interrupt numbers 2 through 7 are labeled underneath J32, and interrupt numbers 10 through 15 are labeled above J33.

If the fax board is set to interrupt 5 (default), the I/O addresses will automatically be set during RightFAX installation.

If you install the TR112 in an 8-bit slot, you can choose any interrupt from 2 through 7. The most common choices are 3, 4, and 5. If you set the interrupt to 5, RightFAX will automatically set the I/O addresses during installation. In some systems, interrupt 3 may cause a conflict with the second serial port. If all of the TR112 and TR114 boards in your system are installed in 16-bit slots, you can use interrupts 10, 11, 12, 14, or 15 (10, 11, and 15 are good choices).



To select an interrupt from 2 through 7, place the jumper on the pair of pins above the correct interrupt number on J32.



To select an interrupt from 10 through 15, place the jumper on the pair of pins below the correct interrupt number on J33.

Setting the DMA Channel

The DMA channel settings on the fax board(s) are ignored by RightFAX.

Installing the TR112 Board

Once the TR112 board is configured for the proper base address, hardware interrupt, and DMA channel, you are ready to install it in your computer. If you are using loop-start phone lines, you may plug the standard (RJ-11) phone cables into the fax board and phone jacks. **Do not plug in the phone cables if you are using DID lines.**

TR114 Fax Boards

The TR114 family of universal port boards consists of two-, four-, and eight-channel models with some combination of loop-start and/or DID lines. Instructions in this document apply for the entire family of TR114 analog boards unless otherwise noted. If you have digital fax boards, you should refer to your board manual for installation and configuration. RightFAX currently supports the following TR114 fax boards:

- TR114-I2L,-P2L Two loop-start interfaces
- TR114-2C,-P2C One loop-start and one DID interface
- TR114-2D,-P2D Two DID interfaces
- TR114-I4L,-P4L Four loop-start interfaces
- TR114-I4C,-P4C Two loop-start and two DID interfaces
- TR114-I4D,-P4D Four DID interfaces
- TR114-I8V,-P8V Eight channels with an MVIP bus interface
- TR114-I8V+T1,-P8V+T1 Eight channels with an MVIP bus interface and an integrated T1 interface
- TR114-I12V Twelve channels with an MVIP bus interface
- TR114-I16V,-P16V Sixteen channels with an MVIP bus interface

TR114 boards that support DID interfaces require an external -48 VDC supply. Brooktrout recommends a Tellabs 8012 regulated power supply which provides 250mA of current. This is included separately with your board. Also included are phone cables. TR114-L, -C, and -D come with two Y-cables, each with one RJ-45 head and two RJ-11 heads. TR114-2L fax boards come with one Y-cable with one RJ-45 head and two RJ-11 heads. TR114-2C, and -2D come with two cables with an RJ-45 at one end and an RJ-11 at the other end.

Setting the I/O Address

You must manually set the base address of the board and the rest of the addresses are set automatically. The base I/O address is set by switches 2 through 8 located in the section marked SW1 on the board. See the figures below for the location of SW1. Switch 1 is not part of the I/O port address, but instead enables an interrupt pull-up and **should be turned ON for one and only one TR114 card**. If you have both a TR112 and TR114 installed, SW1 should be ON for only one TR114 board.

Warning! *Static discharge can severely damage your fax board! Exposing your fax board to static electricity will void all warranties on the board! Always use caution when handling fax boards.*

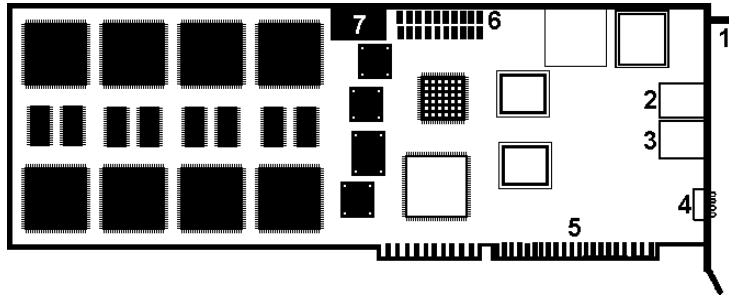
In Brooktrout's naming scheme, TR114 is the board model, I or P indicates ISA or PCI, followed by the number of channels, then a letter indicating the type of phone line interface (loop-start, DID, combination, or MVIP bus interface)

Brooktrout recently changed the layout of some TR114 fax boards. This guide assumes that you have a 900 series board and provides instructions accordingly. If you have a pre-900 series board, it may appear different; however the settings should not change. Refer to your Brooktrout Hardware Guide if you have questions

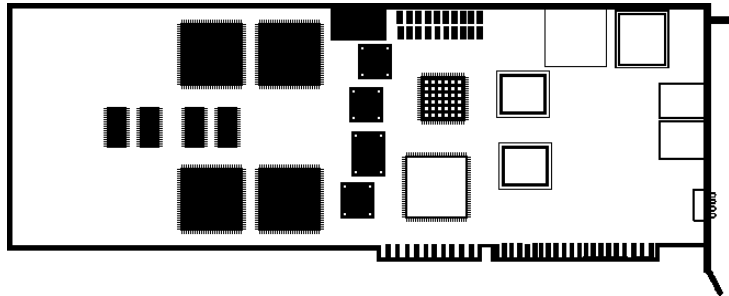
The casing is shown below as it appears when the board is held with the component side of the board facing you and the bracket side facing to the right.

TR114-L Board Layout

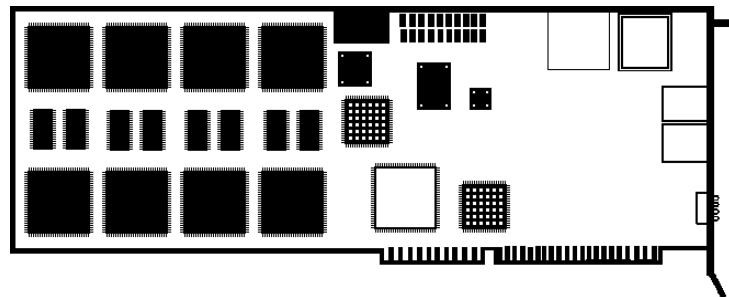
1. Mounting Bracket
2. PJ1-RJ45 telephone jack
3. PJ2-RJ45 telephone jack
4. LED's
5. ISA/EISA bus connector
6. Interrupt selector
7. I/O address selector (SW1)



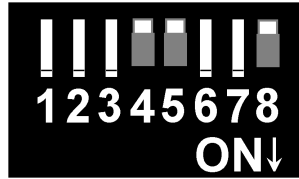
TR114-2L Board Layout with one RJ-45 telephone jack.



TR114-2C, -2D, -C, and -D Board Layout with two RJ-45 telephone jacks. (The TR114-C and TR114-D boards will have four fewer chips and processors.)



The recommended (factory set) base address for your first board is 260 (hex). **Do not use a pencil to move the switches; graphite is a conductor and may damage the board!**



SW1 - I/O address selector

The first fax channel on the board uses an address 4 greater than the base address, and each channel after that uses an address 4 greater than the previous one. For example, if the TR114 base address is set to 260 hex, the four fax channels on the board use addresses 264, 268, 26C, and 270 hex. I/O addresses from 260 through 273 are occupied in following example.

I/O ADDRESS	
260	} TR114 BASE
261	
262	
263	
264	} FAX CHANNEL ONE
265	
266	
267	
268	} FAX CHANNEL TWO
269	
26A	
26B	
26C	} FAX CHANNEL THREE
26D	
26E	
26F	
270	} FAX CHANNEL FOUR
271	
272	
273	

If you have more than one TR114 board, be careful not to assign overlapping I/O addresses. In this example, we might assign the I/O address of the next TR114 board to be 280 hex.

The following is a table of common base addresses for the TR114 and the switch settings required for SW1. Using these common addresses can make it easier to prevent overlapping of I/O port addresses.

Base I/O	Switch						
Address	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

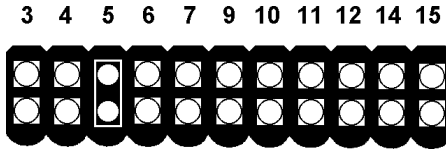
Setting the Hardware Interrupt

If you have a combination of ISA and PCI fax boards, you must set the interrupts used by your ISA card(s) as "ISA only" in your BIOS

The TR114 generates interrupts to the computer. A jumper, which looks like a small plastic cap, selects the interrupt. Refer to the figures earlier in this section for the location of the interrupt header on your TR114 board. All channels on the TR114 and all other TR114's installed in the same computer share the same interrupt. Therefore, if a TR114 is already installed and operating in your system and you add other TR114 boards, set the hardware interrupt on the new boards to the same value as the original board.

The default interrupt is 5, although other interrupt settings can be used. In some systems, interrupt 3 may cause a conflict with the second serial port and interrupt 4 may conflict with the first serial port. If all of the TR114 boards in your system are installed in 16-bit slots, you can use interrupts 10, 11, 12, 14, or 15 (10, 11 and 15 are good choices).

Only one interrupt jumper can be installed. Below is an example of an interrupt set to 5.



Installing the TR114 Board

Once the TR114 board is configured for the proper base address and hardware interrupt, you are ready to install the TR114 in your computer. Be particularly cautious of static discharge. If you are using loop-start lines, you may connect the phone cables to the fax board and phone jacks. **Do not connect the phone cables if you are using DID lines.**

TruFax Fax Boards

The TruFax is a two channel fax board supporting two loop-start telephone interfaces. TruFax is a fixed function board which cannot be mixed with TR114 or TR112 boards.

The TruFax boards may be installed into either an 8- or 16-bit slot in an ISA or EISA computer. If a 16-bit slot is used, additional interrupts (10 through 15) are available. Two standard phone cables with RJ-11 heads at each end are supplied with the board.

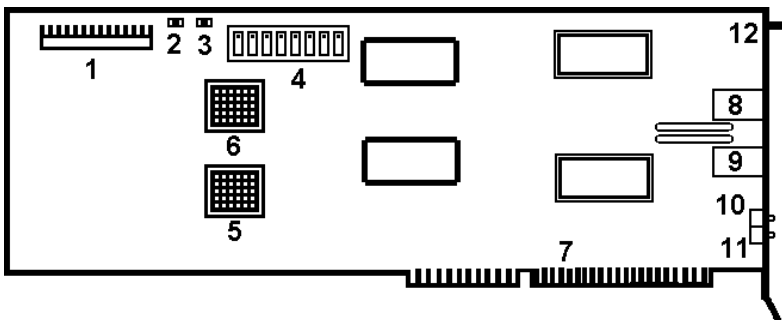
Setting the I/O Address

Each TruFax occupies eight consecutive I/O locations. The base I/O address is set by switches 4 through 7 of the address selector dip switch (see below). The default setting for the port address is 140 (hex). Switches 1, 3, and 8 should always be OFF and switch 2 should always be ON.

ISA TR114 boards may be installed into either an 8- or 16-bit slot in an ISA or EISA computer. If a 16-bit slot is used, additional interrupts are available. PCI boards must be installed in a PCI bus master slot

Warning! *Static discharge can severely damage your fax board! Exposing your fax board to static electricity will void all warranties on the board! Always use caution when handling fax boards.*

Make a note of the I/O port addresses used by each fax channel on each of your TruFax boards - you will need this information once the board is installed.



TruFax Board Layout

1. Interrupt Header
4. Address Selector
8. RJ-11 Phone Jack (Chn.1)
9. RJ-11 Phone Jack (Chn.2)
12. Mounting Bracket

Each fax channel on the TruFax uses four addresses. The address specified using the address selector switch defines the base I/O address for the first channel. The second fax channel on the board uses an address four greater than the first channel. For example, if the TruFax base address is set to 140 hex, the two fax channels on the board use addresses 140 and 144 hex. If you have more than one TruFax board, be careful not to assign overlapping I/O addresses.

The following is a table of common base addresses for the TruFax and the switch settings required for the Address Selector. Using these common addresses can make it easier to prevent overlapping of I/O port addresses. This table can also be found on the back of the TruFax board itself. Note that setting a switch to OFF is logical 1 and ON is logical 0.

Base I/O	Switch						
Address	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

Setting the Hardware Interrupt

The TruFax generates interrupts to the computer. A jumper, placed on J401, selects the interrupt. All channels on all TruFax boards installed in the same computer share the same interrupt. Therefore, if a TruFax is already installed and operating in your system and you add other TruFax boards, you must set the hardware interrupt on the new boards to the same value as the original board.

The most common interrupt choices are 3, 4, and 5. In some systems, interrupt 3 may cause a conflict with the second serial port and interrupt 4 may conflict with the first serial port. If all of the TruFax boards in your system are installed in 16-bit slots, you can use interrupts 10, 11, 12, 14, or 15 (10, 11 and 15 are good choices). Refer to the TruFax layout figure earlier in this section for the location of the address selector on the TruFax board.

Installing the TruFax Board

Once the TruFax board is configured for the proper base address and hardware interrupt, you are ready to install it in your computer. Connect the phone cables to the fax board and phone jack, being particularly cautious of static discharge.

TruFax boards may be installed into either an 8- or 16-bit slot in an ISA or EISA computer. If a 16-bit slot is used, additional interrupts are available

Testing Brooktrout Loop-Start Boards

You can test the performance of each of your fax boards using the FAX.EXE program shipped with RightFAX in the \RFBOARD directory. FAX.EXE is a command line utility that can be used to send or receive faxes to test functionality of Brooktrout fax boards and the phone lines connected to them.

If the RightFAX BoardServer Module is running, you will need to stop it before performing these tests. To stop the BoardServer Module, go to any command prompt and type:

```
net stop rfboard [Enter]
```

The FAXINIT Command

The FAXINIT command lets you check to confirm that your Brooktrout fax board I/O settings are correct. This command looks in a file called FAXINIT.CFG for a list of I/O addresses and then scans those addresses for Brooktrout fax channels.

Create a new ASCII text file called FAXINIT.CFG on your RightFAX server in the \RFBOARD directory. List the I/O addresses of your Brooktrout fax channels in the format "addr", a space, the base I/O plus 4, another space, then the number of channels. For example, the entry:

```
addr 264 4
```

is used for a four channel board with a base I/O of 260. When you have entered your fax channel I/O addresses, save and exit the file.

Once you have created a FAXINIT.CFG file in the \RFBOARD directory on your RightFAX server, make sure you are at a \RFBOARD command prompt and type:

```
faxinit faxinit.cfg [Enter]
```

The FAXINIT command will attempt to confirm that the addresses you entered in FAXINIT.CFG correspond to Brooktrout fax channels.

It is important that all letters typed in the test command lines be in lower case.

If FAXINIT cannot find the fax channels, you may have an address conflict. Check the I/O addresses of each board.

The FAX Command

Once RightFAX finds your fax channels, you can attempt to send a test fax. Connect a regular phone line to the loop start jack on the board before beginning the next test. If you are testing a DID channel, see the section below for a different test you should perform.

Run the FAX command from your \RFBOARD directory:

```
[C:\RFBOARD] fax -u # -s ,,## test1.ipk
```

Replace the first # with the channel number of the line you are testing (i.e. -u 0 for the first channel, -u 1 for the second, etc.), and the ## with the number of the fax machine where you can receive this test fax. The ‘.,’ before the phone number tells the fax board to wait for 2 seconds before dialing to acquire a dial tone. Include any numbers or pauses you need to get an outside line or for any accounting codes. For example:

```
[C:\RFBOARD] fax -u 0 -s ,,9,5559938 test1.ipk
```

If the test succeeds, you will see the following:

```
Remote ID: \
Total pages: 1
Page: 1 bad lines 0 total lines 1058
Done
```

The total lines displayed here may be different depending on your fax resolution

If you get the above response, go to your fax machine and verify that the fax was received.

If a problem occurs, one possible cause is an interrupt conflict. Verify that no other cards in your machine are using the same interrupt channel and try the test again.

Testing Brooktrout DID Lines

If you have a board with loop-start and DID lines, you can perform a loopback test to verify the operation of both channels at the same time. You will be sending a fax from the loop-start channel to the DID channel. You can test only two channels at a time. Before you begin, connect your DID power supply to the DC input jack and the fax board.

If you have a TR112 fax board, begin the loopback test by connecting a standard RJ-11 phone cord between the top and bottom phone jacks on the board. If you have a TR114 fax board, you must connect the RJ-45 ends to the boards and connect the RJ-11 ends to each other (you will have two RJ-11 ends if you have a two channel and four ends if you have a four channel board).

Use a female-to-female connector to connect cable A to cable A and cable B to cable B. Do not connect the fax board to the wall jack. Set up the DID channel to receive a fax using the FAX.EXE program. At a prompt in the \RFBOARD directory, type:

```
[C:\RFBOARD] fax -u 2 -r test2.ipk
```

where -u # denotes the fax channel, -r denotes receiving, and test2.ipk is the name of the file that is written as the fax is received.

Start a second DOS window. Again from the \RFBOARD directory, run the send command:

```
[C:\RFBOARD] fax -u 0 -s ,,1234 test1.ipk
```

where -u # denotes the fax channel, -s denotes sending, ,, denotes two 1-second pauses, 1234 can be any four-digit number (the board will answer any number called), and test1.ipk is the file to be sent by fax.

Watch both windows. You will see the fax being sent and received by the board.

If the above test does not work, you may have a problem with your fax board or the configuration. Contact RightFAX Technical Support for help. Do not call your local phone company.

Phone Test

If you only wish to test the DID functionality of the fax board, you should perform this phone test.

First, put the channel you wish to test into Receive mode. At a prompt in the \RFBOARD directory, type:

```
[C:\RFBOARD] fax -u 2 -r test2.ipk
```

where -u # denotes the fax channel, -r denotes receiving, and test2.ipk is the name of the file that is written as the fax is received.

Now connect a standard analog (not PBX) phone to the DID cable coming from the board that corresponds to the channel number you specified in the above command line.

Now pick up the phone's handset, dial four (4) digits and listen for fax tone. If you hear fax tone, but are still having problems receiving faxes on this channel, then the problem most likely lies with the phone company's configuration of your DID circuit.

If you do not hear the digits as you dial them, then check that the DID power supply is properly connected to the board and plugged into a powered outlet.

If you do hear the digits as you dial them, but do not hear fax tone, confirm that you have plugged into the phone the cable that corresponds to the channel number entered in the command line.



Brooktrout Digital Phone Line Interfacing

In this chapter:

- Digital Fax and Network Interface Cards
- Installing the Fax and Network Cards
- Configuring RightFAX to Recognize Your Fax and Network Interface Cards

Digital Fax and Network Interface Cards

RightFAX supports these digital Brooktrout fax boards for your PRI-T1, T1, PRI-E1, E1, or BRI telephone line interface.

- TR114+I2V
- TR114+I2P
- TR114+I4V
- TR114+P4V
- TR114+I4P
- TR114+I8V
- TR114+P8V
- TR114+I8P
- TR114+I12V
- TR114+I16V
- TR114+P16V

PEB bus fax boards are only supported for T1 interfacing in conjunction with the Brooktrout TRNIC-I24T and Dianatel EA24 network interface cards

Each of these digital fax boards must be connected to a separate "network interface card" which provides the digital interface appropriate to your phone line type.

The network interface card is physically connected to one or more of your digital fax boards via a Multi-Vendor Integration Protocol (MVIP) data bus.

For information on configuring the base I/O address, interrupt header, and MVIP settings of your digital fax board and network interface card, please refer to each board's hardware guide.

PRI-T1 Interface Cards

RightFAX supports these network interface cards for PRI-T1 lines:

- Netaccess ISALC-1T
- Netaccess ISALC-1T-csu
- Netaccess ISALC-2T
- Netaccess ISALC-2T-csu
- Netaccess PCI-24V
- Netaccess PCI-24V-csu
- Netaccess PCI-48V
- Netaccess PCI-48V-csu

T1 Interface Cards

RightFAX supports these network interface cards for T1 lines:

- Netaccess ISALC-1T
- Netaccess ISALC-1T-csu
- Netaccess ISALC-2T
- Netaccess ISALC-2T-csu
- Netaccess PCI-24V

- Netaccess PCI-24V-csu
- Netaccess PCI-48V
- Netaccess PCI-48V-csu
- Dianatel EA24
- Brooktrout TRNIC P24T
- Brooktrout TRNIC I24T
- Brooktrout TR114+I8V-T1
(Fax and network interface combined on one board)
- Brooktrout TR114+P8V-T1
(Fax and network interface combined on one board)

PRI-E1 Interface Cards

RightFAX supports these network interface cards for PRI-E1 lines:

- Netaccess ISALC-1E
- Netaccess ISALC-2E
- Netaccess PCI-32V
- Netaccess PCI-64V

E1 Interface Cards

RightFAX supports these network interface cards for E1 lines:

- Netaccess ISALC-1E
- Netaccess ISALC-2E
- Netaccess PCI-32V
- Netaccess PCI-64V

BRI Interface Cards

RightFAX supports these network interface cards for BRI lines:

- Netaccess BRI-ISA8

Additionally, RightFAX supports these Brooktrout fax boards which include built-in BRI interface (currently supported in Europe only):

- TR114+P2BRI
- TR114+P4BRI
- TR114+I2BRI
- TR114+I4BRI

Installing the Fax and Network Cards

If you are combining digital fax boards with network interface boards, the boards should all be installed to your RightFAX server in a layout that allows easy connection of the MVIP ribbon cable between the boards.

You can attach your network interface card to as many fax boards as it has channels available. For example, a network interface card with 24 channels can be connected via MVIP ribbon cable to three separate fax boards with eight channels each. In addition, you can install and configure two separate network interface cards per RightFAX server. The network interface card and fax board(s) do not need to be connected in any particular sequence on the MVIP cable.

Configuring RightFAX to Recognize Your Fax and Network Interface Cards

Once you have installed and connected the network interface card(s) and digital fax board(s), run the RightFAX BoardServer applet from the Control Panel. Using the **Add Brooktrout Board** button, add each of your installed digital fax boards to the list under **Global Board Settings**. Highlight each installed board in the list and complete its configuration information. For more information on configuring fax boards in the BoardServer applet, see the [RightFAX Administrator's Guide, Chapter 6, Configuring the BoardServer](#).

After you have set up your fax board(s) in the BoardServer applet, you must configure RightFAX to recognize your network interface card(s). From the **Start** menu, select **Programs, RightFAX**, then **Digital Configuration Wizard**. This runs RightFAX's Digital Card Configuration Wizard.

Complete each of the fields on each dialog according to your network interface card type(s). After completing all the information on a dialog, click the **Next** button to continue to the next screen. If you make a mistake, click the **Back** button to return to the previous dialog. Options that appear grayed-out either do not apply to the board type or settings you have selected, or the settings are not optional.

The order and type of dialogs that appear in the Configuration Wizard depends on the type of network interface board you select in this opening dialog. If the Configuration Wizard does not display dialogs in the order presented here, skip ahead until you find the dialog that is displayed

Board Type

Board type

The network interface card will be the ISA or PCI card installed in the machine which will communicate with the telephone network.

Network interface card type:

Telephone service:

Fax card bus data types:

< Back Next > Cancel

Network Interface Card Type

This is the card type or manufacturer of your network interface card(s).

Telephone Service

This is the type of digital telephone service that you will be accessing through your network interface card(s).

Fax Card Bus Data Types

Select the bus data type of your digital fax board(s). This is the data bus type that your network interface card(s) will use to communicate to your fax board(s)

Network Interface Board

Network Interface Card

This is the specific model of network interface card you have installed.

Termination

This is the type of connection between the phone line and your network interface card. Select RJ-45 or BNC. RJ-45 connectors look like oversized phone jack plugs. BNC connectors are larger than RJ-45 connectors and may have an RJ-45 connection on one end.

I/O Address

This is the unique I/O address assigned to the selected network interface card.

The I/O address and Interrupt settings are both configured by dip switches on your network interface card. Please refer to your network interface card's documentation for information on configuring these settings

Interrupt

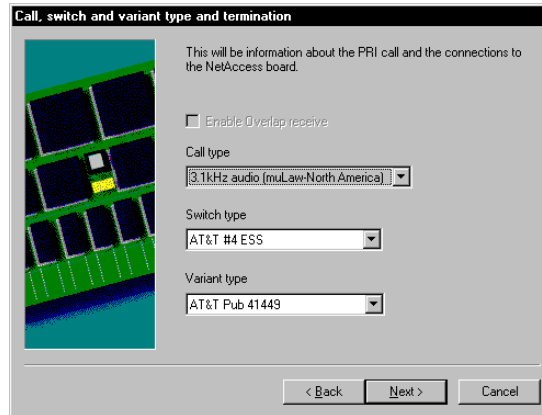
This is the network interface card's interrupt setting.

Second Network Interface Card

Check this option if you have two network interface cards installed in your RightFAX server. If this option is checked, you must also specify the interface card model, and its termination, I/O, and interrupt values.

Call, Switch, and Variant Type and Termination

All of the settings on this dialog relate to the switch between the phone lines and your organization's telephone system. If you are not sure what settings to enter for this dialog, please consult your organization's telephony specialist or telephone service provider



Enable Overlap Receive

Under certain circumstances it is possible for calls to arrive before the call originator has completed dialing the destination number, resulting in partial (or absent) called party number information. When this option is checked, the additional dialed digits are sent afterwards and the two packets are rejoined. This option is only available for E1 telephone service.

Call Type

Select the call type configured on your telephone switch.

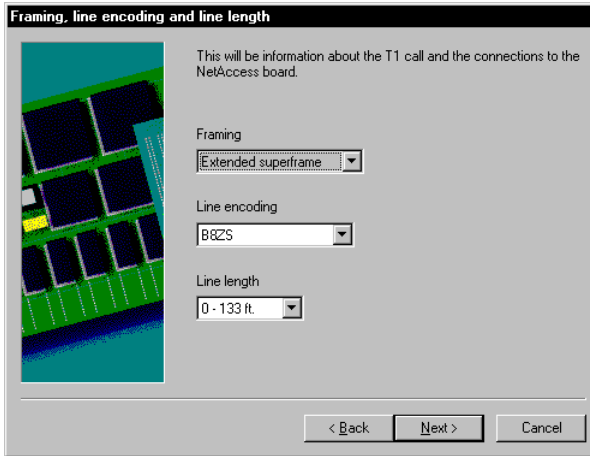
Switch Type

Select the type of telephone switch you are using. If your exact switch type is not listed, select the type that your switch emulates.

Variant Type

This is your switch type's variant. Each type of switch can be configured as any of the listed variants.

Framing, Line Encoding, and Line Length



Framing, line encoding and line length

This will be information about the T1 call and the connections to the NetAccess board.

Framing
Extended superframe

Line encoding
B8ZS

Line length
0 - 133 ft.

< Back Next > Cancel

For domestic PRI service, Brooktrout recommends your line type be configured for National ISDN 2 (NI2), extended superframe, with B8ZS line encoding

Framing

Framing is a transmission structure that divides data into distinct groups of bits called "frames". Framing is configured on your network interface card by a dip switch setting. Set this field to the framing configuration on your board.

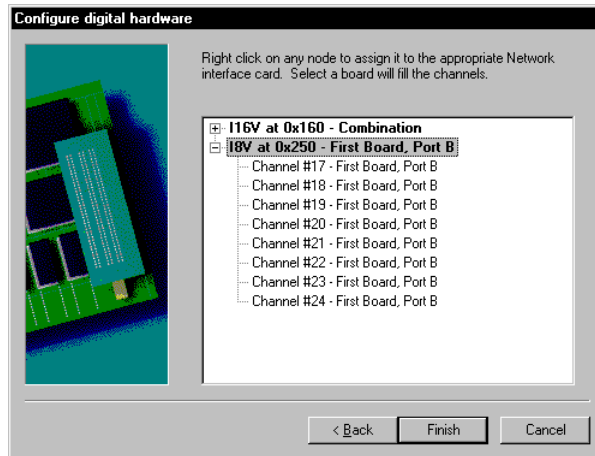
Line Encoding

This is the data format on the phone line, determined by your switch or the phone company.

Line Length

Select the distance between the two phone line termination points. This is the length of cable between your network interface card and either your switch or the phone company's direct line.

Configure Digital Hardware



Assigning Channels

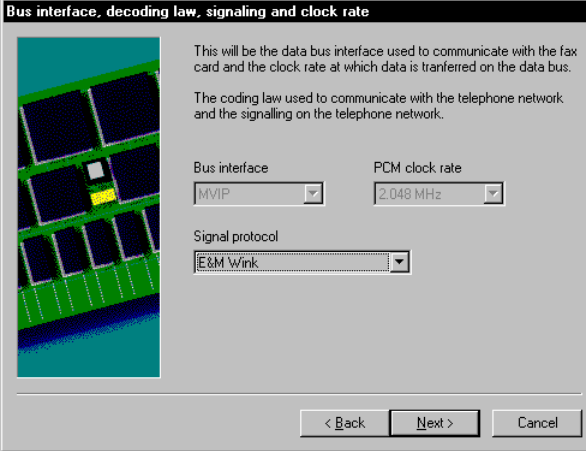
In order to send and receive faxes, each of the channels on your digital fax board(s) must be assigned to a network interface card and a port on that board. You can have one or two network interface cards installed in a single RightFAX server, and each board can have one or two ports (for connecting separate phone lines).

This dialog lists each of your digital fax boards and their channels. You can assign a network interface card and port to each channel individually, or to all channels at once.

To assign all channels on a fax board to the same network interface card and port, right-click on the board name. This opens a pop-up menu of available settings. You can add channels to either port A or port B on your first or second installed network interface card. If you have installed only one network interface card, you will only have the option of assigning channels to the first board. If your network interface card has only one phone line port, you will only have the option of assigning channels to port B (the name of the first port).

To assign fax channels individually, double-click on the board name to open a listing of all channels on that board. Right-click on a channel to open a pop-up menu of available settings. You can add the channel to either port A or port B on your first or second installed network interface cards. If you have installed only one network interface card, you will only have the option of assigning channels to the first board. If your network interface card has only one phone line port, you will only have the option of assigning channels to port B (the name of the first port).

Bus Interface, Decoding Law, Signalling, and Clock Rate



Bus interface, decoding law, signaling and clock rate

This will be the data bus interface used to communicate with the fax card and the clock rate at which data is transferred on the data bus.

The coding law used to communicate with the telephone network and the signalling on the telephone network.

Bus interface: MVIP

PCM clock rate: 2.048 MHz

Signal protocol: E&M Wink

< Back Next > Cancel

Bus Interface

This is the bus interface used to connect the network interface card with each digital fax board.

PCM Clock Rate

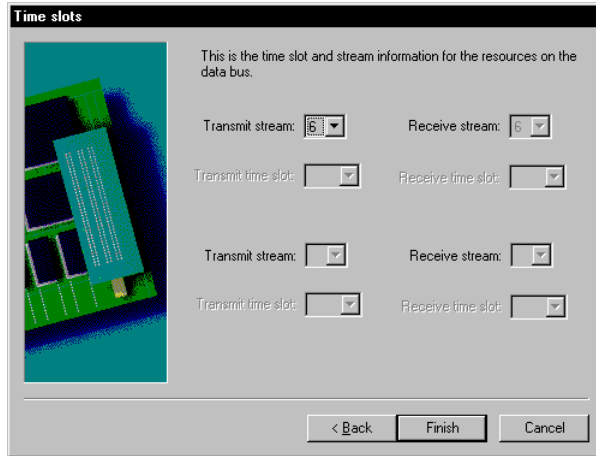
This is the clock setting of your MVIP data bus (the sampling rate).

Signal Protocol

This is the phone line signalling protocol assigned by your phone company.

For Bus Interface, select PEB only if you have installed the Brooktrout TRNIC-I24 or Dianatel E24 and PEB compatible fax board(s)

Time Slots



Transmit Stream

This is the MVIP stream data is transferred on. This setting is determined by dip switch settings on your network interface card.

Receive Stream

For MVIP, this setting must be the same as the Transmit Stream setting.



GammaLink Boards

In this chapter:

- GammaLink Fax Board Installation
- CPi/100 Fax Boards
- CPD Fax Boards
- CPi/200 Fax Boards
- CPD/220 Fax Boards
- CP4/LSI Fax Boards
- CPi/400 PCI Analog Fax Boards
- GammaLink Digital Phone Line Interfacing
- Testing GammaLink Boards

GammaLink Fax Board Installation

Warning! *Static discharge can severely damage your fax board! Exposing your fax board to static electricity will void all warranties on the board! Always use caution when handling fax boards.*

Before installing a GammaFax fax board, you must configure it. Follow the instructions specific to your CP series board type. If you are installing multiple boards of the same or different types, you should watch for special notes specific to such instances. Be sure to record the I/O addresses selected for each board for future reference. If you have any questions unanswered by this document, please refer to the GammaFax documentation included with your fax board.

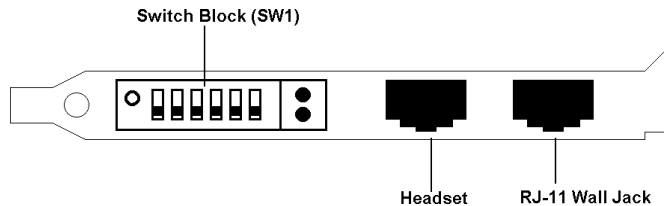
CPI/100 Fax Boards

The CPI/100 is a half-sized, single-channel loop start fax board. Up to 24 CPI/100 boards can be installed in a single PC chassis. A standard phone cable with RJ-11 connectors at each end is included with each board.

Setting the I/O Address

All GammaFax boards are shipped from GammaLink with a default I/O address of 350 hex. This allows the CPI/100 board to communicate trouble-free in almost every case. However, if more than one fax board is installed in the same machine, you may have an I/O address conflict. You must set the I/O address for each board to a unique address. The diagram below shows the location of the switch block on the mounting bracket.

Do not load any GammaFax-provided software included with the fax board. RightFAX software includes the necessary drivers and programs for the CPI/100 board.



The I/O address is set with six DIP switches, located on the mounting bracket of the fax board. DIP switch 6 is not used and should always remain in the OFF position. The following table contains possible I/O addresses and switch settings. **Do not use a pencil to move the switches; graphite is a conductor and may damage the board!**

Installing the CPI/100 Board

All changes to I/O addresses must be made before the fax board is installed.

Once the I/O address has been configured, you are ready to install the board in your computer. While the machine is **powered off**, insert the board into any 8- or 16-bit slot. Plug the standard (RJ-11) phone cable into the fax board and the phone jack. Be particularly cautious of static discharge.

DIP Switches						Physical Channels	I/O Address (hex)
1	2	3	4	5	6		
OFF	OFF	OFF	OFF	OFF	OFF	0 (default)	350-353
ON	OFF	OFF	OFF	OFF	OFF	1	360-363
OFF	ON	OFF	OFF	OFF	OFF	2	370-373
ON	ON	OFF	OFF	OFF	OFF	3	250-253
OFF	OFF	ON	OFF	OFF	OFF	4	260-263
ON	OFF	ON	OFF	OFF	OFF	5	270-273
OFF	ON	ON	OFF	OFF	OFF	6	150-153
ON	ON	ON	OFF	OFF	OFF	7	160-163
OFF	OFF	OFF	ON	OFF	OFF	8	100-103
ON	OFF	OFF	ON	OFF	OFF	9	104-107
OFF	ON	OFF	ON	OFF	OFF	10	108-10b
ON	ON	OFF	ON	OFF	OFF	11	10c-10f
OFF	OFF	ON	ON	OFF	OFF	12	110-113
ON	OFF	ON	ON	OFF	OFF	13	114-117
OFF	ON	ON	ON	OFF	OFF	14	118-11b
ON	ON	ON	ON	OFF	OFF	15	11c-11f
OFF	OFF	OFF	OFF	ON	OFF	16	280-283
ON	OFF	OFF	OFF	ON	OFF	17	284-287
OFF	ON	OFF	OFF	ON	OFF	18	288-28b
ON	ON	OFF	OFF	ON	OFF	19	28c-28f
OFF	OFF	ON	OFF	ON	OFF	20	290-293
ON	OFF	ON	OFF	ON	OFF	21	294-297
OFF	ON	ON	OFF	ON	OFF	22	298-29b
ON	ON	ON	OFF	ON	OFF	23	29c-29f
OFF	OFF	OFF	ON	ON	OFF	24	120-123
ON	OFF	OFF	ON	ON	OFF	25	124-127
OFF	ON	OFF	ON	ON	OFF	26	128-12b
ON	ON	OFF	ON	ON	OFF	27	12c-12f
OFF	OFF	ON	ON	ON	OFF	28	130-133
ON	OFF	ON	ON	ON	OFF	29	134-137
OFF	ON	ON	ON	ON	OFF	30	138-13b
ON	ON	ON	ON	ON	OFF	31	13c-13f

CPD Fax Boards

Warning! *Static discharge can severely damage your fax board! Exposing your fax board to static electricity will void all warranties on the board! Always use caution when handling fax boards.*

The CPD is a single-channel DID fax board that requires an external -48 VDC power supply. GammaLink recommends a Tellabs 8012 regulated power supply which provides 250mA of current. This is included separately with your board. Also included is a standard phone cable with RJ-11 connectors at each end.

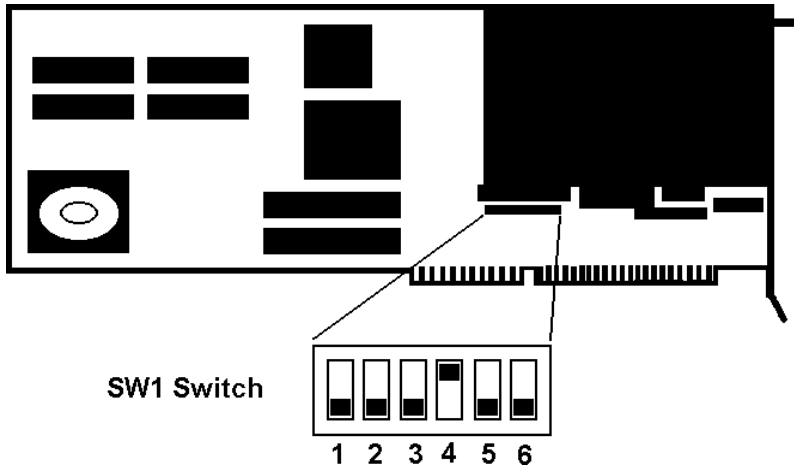
Setting the I/O Address

All GammaFax boards are shipped from GammaLink with a default I/O address of 350 hex. This allows the CPD board to communicate trouble-free in almost every case. However, if more than one fax board is installed in the same machine, you may have an I/O address conflict. You must set the I/O address for each board to a unique address.

The casing is shown below as it appears when the board is held in the upright position with the component side of the board facing you and bracket side facing to the right.

All changes to I/O addresses must be made before the fax board is installed or while the computer is turned off

Do not load any GammaLink-provided software included with the fax board. RightFAX software includes the necessary drivers and programs for the CPD board.



The I/O addresses are set with three DIP switches, located on the SW1 switch block of the fax board. The DIP switches determine both I/O addresses and physical channel numbers on the board in groups of two. The following table contains possible I/O addresses and switch settings. **Do not use a pencil to move the switches; graphite is a conductor and may damage the board!**

SW1-1	SW1-2	SW1-3	SW1-6	I/O Addresses (hexadecimal)	Physical Channel
OFF	OFF	OFF	OFF	350-353 (default)	0
ON	OFF	OFF	OFF	360-363	1
OFF	ON	OFF	OFF	370-373	2
ON	ON	OFF	OFF	250-253	3
OFF	OFF	ON	OFF	260-263	4
ON	OFF	ON	OFF	270-273	5
OFF	ON	ON	OFF	150-153	6
ON	ON	ON	OFF	160-163	7
OFF	OFF	OFF	ON	100-103	8
ON	OFF	OFF	ON	104-107	9
OFF	ON	OFF	ON	108-10b	10
ON	ON	OFF	ON	10c-10f	11
OFF	OFF	ON	ON	110-113	12
ON	OFF	ON	ON	114-117	13
OFF	ON	ON	ON	118-11b	14
ON	ON	ON	ON	11c-11f	15

Installing the CPD Board

Once the I/O address has been configured, you are ready to install the board in your computer. While the machine is **powered off**, insert the board into any 8- or 16-bit slot. **Do not connect the phone cable.**

Warning! Static discharge can severely damage your fax board! Exposing your fax board to static electricity will void all warranties on the board! Always use caution when handling fax boards.

All changes to I/O addresses must be made before the fax board is installed.

Do not load any GammaLink-provided software included with the fax board. RightFAX software includes the necessary drivers and programs for the CPi/200 board.

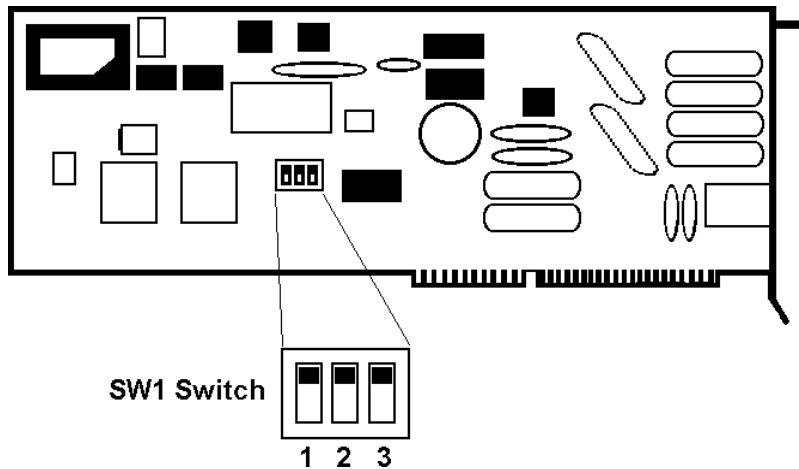
CPi/200 Fax Boards

The CPi/200 is a two-channel loop start fax board. A dual-connector Y cable (1 RJ-14 and 2 RJ-11 connectors) is included with each board.

Setting the I/O Address

All GammaFax boards are shipped from GammaLink with a default I/O address of 350 hex. This allows the CPi/200 board to communicate trouble-free in almost every case. However, if more than one fax board is installed in the same machine, you may have an I/O address conflict. You must set the I/O address for each board to a unique address.

The lower half of the casing is shown below as it appears when the board is held in the upright position with the component side of the board facing you and the bracket side facing to the right.

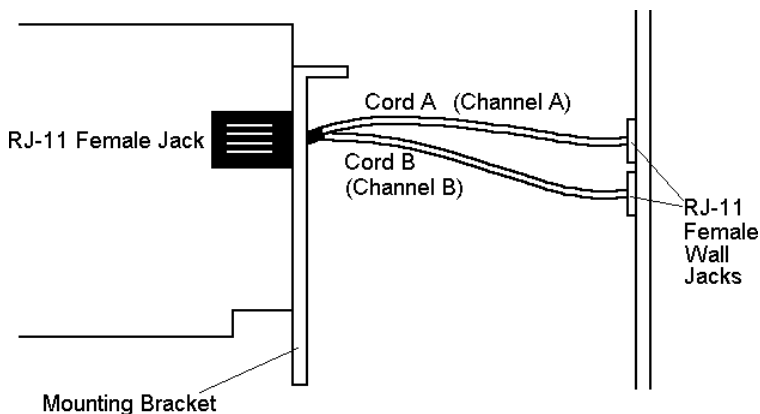


The I/O addresses are set with three DIP switches, located on the SW1 switch block of the fax board. The DIP switches determine both I/O addresses and physical channel numbers on the board in groups of two. The following table contains possible I/O addresses and switch settings. **Do not use a pencil to move the switches; graphite is a conductor and may damage the board!**

SW1-1	SW1-2	SW1-3	I/O Addresses (Physical Channels) Channel A	I/O Addresses (Physical Channels) Channel B
OFF (default)	OFF (default)	OFF (default)	350-353 (0)	360-363 (1)
ON	OFF	OFF	260-263 (4)	270-273 (5)
OFF	ON	OFF	100-103 (8)	104-107 (9)
ON	ON	OFF	110-113 (12)	114-117 (13)
OFF	OFF	ON	280-283 (16)	284-287 (17)
ON	OFF	ON	290-293 (20)	294-297 (21)
OFF	ON	ON	120-123 (24)	124-127 (25)
ON	ON	ON	130-133 (28)	134-137 (29)

Installing the CPi/200 Board

Once the I/O addresses have been configured, you are ready to install the board in your computer. While the machine is **powered off**, insert the board into any 16-bit slot. Plug the phone cables into the fax board and the phone jack as diagrammed below. Be particularly cautious of static discharge.



Warning! *Static discharge can severely damage your fax board! Exposing your fax board to static electricity will void all warranties on the board! Always use caution when handling fax boards.*

The voltage level supplied by the fax board is considered dangerous. Do not operate the system when the chassis cover has been removed

All changes to I/O addresses must be made before the fax board is installed.

Do not load any GammaLink-provided software included with the fax board. RightFAX software includes the necessary drivers and programs for the CPD/220 board.

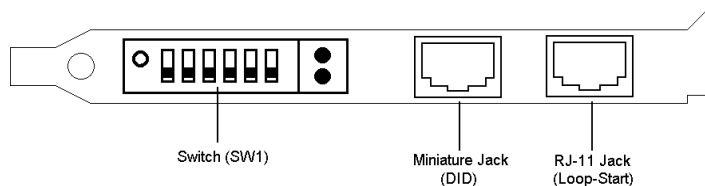
CPD/220 Fax Boards

The CPD/220 is a four-channel fax board with two loop start and two DID lines. The -48 volts of power required for the DID lines is provided through the CPD/220 board, so there is no need for an external power supply. However, you must be careful not to overload your PC power supply. In general, if your PC has a 220 watt power supply, you can have a maximum of two CPD/220 boards in the same machine. If your PC has a 300 watt power supply, you can have a maximum of three CPD/220 boards in the same machine.

Two dual connector Y-cables are also included with each board. One cable is labeled and configured for DID lines (miniature connector), the other for loop start lines (RJ-11 connector). The cables are not interchangeable.

Setting the I/O Address

All GammaFax boards are shipped from GammaLink with a default I/O address of 350 hex. This allows the CPD/220 board to communicate trouble-free in almost every case. However, if more than one fax board is installed in the same machine, you may have an I/O address conflict. You must set the I/O address for each board to a unique address. The diagram below shows the location of the switch block on the mounting bracket.



The I/O addresses are set with six SW1 DIP switches on the board. Each physical channel number represents a group of four I/O addresses. Use switches SW-1, -2, and -3 to set a new I/O address. Switches SW1-4, -5, and -6 should always be set to OFF. The following table contains possible I/O addresses and switch settings.

Do not use a pencil to move the switches; graphite is a conductor and may damage the board!

SW1-			I/O Address (Physical Channels)			
1	2	3	Channel A	Channel B	Channel C	Channel D
OFF	OFF	OFF	350-353 (0)	360-363 (1)	370-373 (2)	250-253 (3)
ON	OFF	OFF	260-263 (4)	270-273 (5)	150-153 (6)	160-163 (7)
OFF	ON	OFF	100-103 (8)	104-107 (9)	108-10b (10)	10c-10f (11)
ON	ON	OFF	110-113 (12)	114-117 (13)	118-11b (14)	11c-11f (15)
OFF	OFF	ON	280-283 (16)	284-287 (17)	288-28b (18)	28c-28f (19)
ON	OFF	ON	290-293 (20)	294-297 (21)	298-29b (22)	29c-29f (23)
OFF	ON	ON	120-123 (24)	124-127 (25)	128-12b (26)	12c-12f (27)
ON	ON	ON	130-133 (28)	134-137 (29)	138-13b (30)	13c-13f (31)

Installing the CPD/220 Board

Once the I/O addresses have been configured, you are ready to install the board in your computer. While the machine is **powered off**, insert the board into any 16-bit slot.

To ensure that your system chassis is properly grounded, you must secure the CPD/220 board using the expansion slot mounting screw

Connecting the DID and Loop Start Lines

The CPD/220 is shipped with two Y-cables. Insert the loop start line's RJ-11 connector into the port labeled "L" on the mounting bracket. Insert the DID line's connector into the port labeled "D" on the mounting bracket. To begin loop start service, plug the loop start A and B cables into the loop start phone jacks. When you are ready to begin continuous DID service, plug the DID A and B cables into the DID phone jacks.

WARNING! You should never insert a loop-start line into a DID fax port.

Doing so will damage the fax board and void all warranties. If you have any doubts, make sure to test the phone line with a volt meter prior to connecting it to a DID fax port to ensure that no current exists on the line.

The DID line must be maintained at $-48V \pm 5$, or the phone company's CO may busy out the line. This means that the computer must stay powered on. If you take the system off-line, you must notify the CO to re-engage the line.

Warning! Static discharge can severely damage your fax board! Exposing your fax board to static electricity will void all warranties on the board! Always use caution when handling fax boards.

All changes to I/O addresses must be made before the fax board is installed.

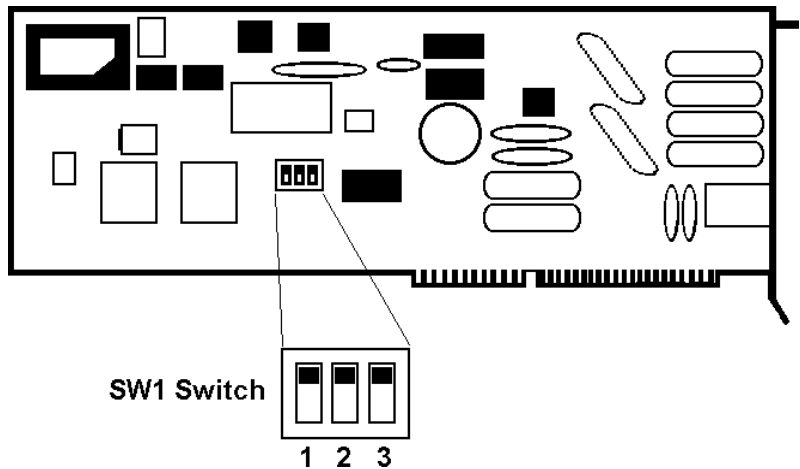
CP4/LSI Fax Boards

The CP4/LSI is a four-channel loop start fax board. Two dual-connector Y cables (1 RJ-14 and 2 RJ-11 connectors) are included with each board.

Setting the I/O Address

All GammaFax boards are shipped from GammaLink with a default I/O address of 350 hex. This allows the CP4/LSI board to communicate trouble-free in almost every case. However, if more than one fax board is installed in the same machine, you may have an I/O address conflict. You must set the I/O address for each board to a unique address.

The lower half of the casing is shown below as it appears when the board is held in the upright position with the component side of the board facing you and the bracket to the right.

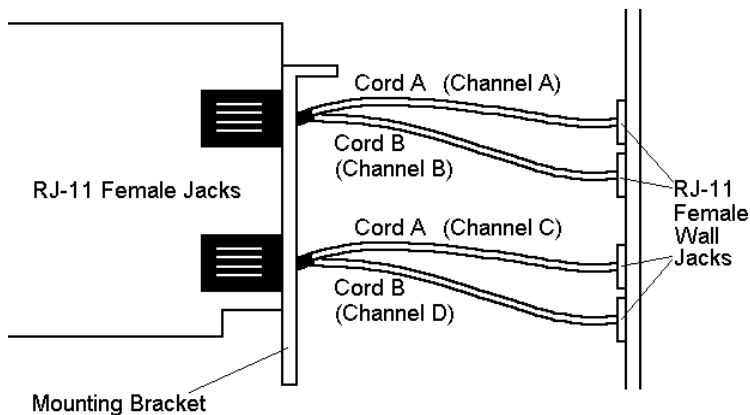


The I/O addresses are set with three SW1 DIP switches on the board. The DIP switches determine all four I/O addressees and physical channel numbers on the board in groups of four. The following table contains possible I/O addresses and switch settings. **Do not use a pencil to move the switches; graphite is a conductor and may damage the board!**

SW1-			I/O Addresses (Physical Channels)			
1	2	3	Channel A	Channel B	Channel C	Channel D
OFF	OFF	OFF	350-353 (0)	360-363 (1)	370-373 (2)	250-253 (3)
ON	OFF	OFF	260-263 (4)	270-273 (5)	150-153 (6)	160-163 (7)
OFF	ON	OFF	100-103 (8)	104-107 (9)	108-10b (10)	10c-10f (11)
ON	ON	OFF	110-113 (12)	114-117 (13)	118-11b (14)	11c-11f (15)
OFF	OFF	ON	280-283 (16)	284-287 (17)	288-28b (18)	28c-28f (19)
ON	OFF	ON	290-293 (20)	294-297 (21)	298-29b (22)	29c-29f (23)
OFF	ON	ON	120-123 (24)	124-127 (25)	128-12b (26)	12c-12f (27)
ON	ON	ON	130-133 (28)	134-137 (29)	138-13b (30)	13c-13f (31)

Installing the CP4/LSI Board

Once the I/O addresses have been configured, you are ready to install the board in your computer. While the machine is **powered off**, insert the board into any 16-bit slot. Plug the phone cables into the fax board and the phone jack as diagrammed below. Be particularly cautious of static discharge.



Warning! *Static discharge can severely damage your fax board! Exposing your fax board to static electricity will void all warranties on the board! Always use caution when handling fax boards.*

Do not load any GammaLink-provided software included with the fax board. RightFAX software includes the necessary drivers and programs for the CP4/LSI board.

CPi/400 PCI Analog Fax Boards

PCI (Peripheral Component Interconnect) is an advanced computing bus standard that allows PC component manufacturers to transport data at faster rates than existing ISA or EISA implementations.

GammaLink's CPi/400 PCI board contains four channels of loop-start telephony interfaces. With four ports of fax on a single card, the CPi/400 is designed to optimize network-based fax servers and customized applications. The CPi/400 PCI is compatible with all PCI-based chassis and RightFAX servers.

Installing the CPi/400 Fax Board

Installing your CPi/400 PCI board consists of three steps:

1. Setting the rotary switch
2. Installing the board
3. Connecting the telephone cords

Step 1: Setting the Rotary Switch

The CPi/400 PCI can support up to 16 identical boards in one chassis. RightFAX will support up to a maximum of 24 ports. If you have more than one board in your system, you need to assign each board with a unique board identifier, so the software can match the telephone number to the channels that reside on each board.

You specify a unique board identifier by setting the rotary switch on the CPi/400 PCI board. You can change the rotary switch setting before the board is installed in your system. If you need to change the setting once the board is installed, **be sure to reboot your system after changing the rotary switch setting.**

There are 16 available switch settings (from 0-F) on the rotary switch. The arrow in the center of the switch points to the current switch setting.

To set the rotary switch:

1. Locate the switch on the top right side of the board.
2. Insert a small, flat-bladed screwdriver in the arrow slot in the center of the rotary switch.
3. Turn the switch to the desired setting.

Step 2: Installing the CPi/400 PCI Board

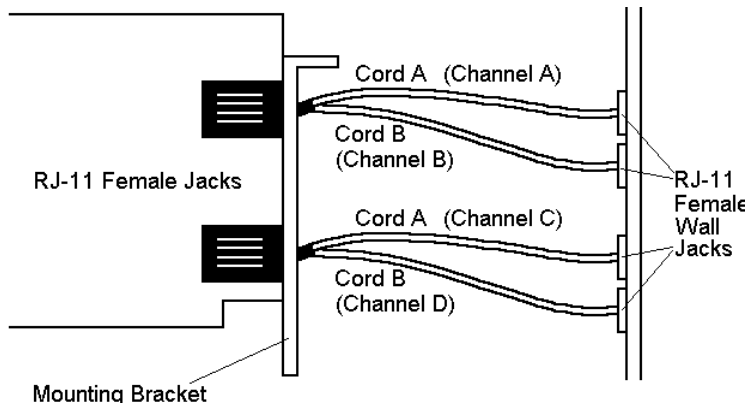
Once you have set the rotary switch, you are ready to install the board into your computer:

1. Turn off the power to the host computer and remove the cover.

2. Insert the CPi/400 PCI board into any slot for add-in boards.
3. Apply gentle pressure to firmly seat the board in the slot.
4. Replace and tighten the mounting-bracket screw to secure the board.
5. Check that the modular jacks on the mounting bracket are clear.
6. Insert the telephone cords and replace the cover.

Step 3: Connecting the Telephone Cords

Two identical telephone cords are shipped with the CPi/400 PCI board. Each cord carries two telephone lines and is configured to form a Y.



To connect the telephone cords to the board:

1. Connect the RJ-11 male connectors on the A and B arms of the Y-shaped telephone cords into modular jacks.
2. Insert the RJ-14 male connector on the remaining ends of the Y's into the modular jacks on the mounting bracket of the CPi/400 PCI board.

GammaLink Digital Phone Line Interfacing

The GammaLink CP12SC, CP6SC, and CP4SC fax boards may all be used in conjunction with digital network interface cards to support faxing via T1 telephone service. In all cases, the GammaLink board(s) connect to the network interface card via SCbus (SCSA).

No special configuration is required in RightFAX for digital phone line interfacing with GammaLink fax boards. Please refer to your GammaLink or network interface card provider's hardware configuration documentation for information on connecting and configuring the boards.

Testing GammaLink Boards

The following test will work for both analog and digital lines. It requires that the fax board(s) has been installed in the system and has been detected and configured as detailed in the *RightFAX Administrator's Guide*.

This test will confirm that the board is installed and working properly and connected to a working phone line.

1. Make sure the RightFAX BoardServer Module Service has been stopped in Control Panel/Services.
2. Open a command prompt window and change to the \RFBOARD directory.
3. Confirm that the GammaLink service is started by typing the following:

```
net start gammafax [Enter]
```

4. Type the following to send a test fax:

```
send_fax ,,<#> c:\rfboard\test001.tif <channel#>
```

Replace <#> with the number of a working fax machine that you can use to confirm the transmission of the fax. The number should be preceded by 2 commas, as shown above, as well as any prefixes necessary to dial out on your phone system. Channel number should be replaced by a channel number for example to send a fax using the first channel in your system replace <channel#> with 1.

Checking Channel Status

NTSPY is a very useful tool to determine that the GammaLink drivers are running and communicating with all of the channels configured in the system. To run NTSPY simply run the NTSPY.EXE program found in the \RFBOARD directory by going to Start\Run and typing:

```
c:\rfboard\NTSPY
```

(replacing 'c:' with the drive letter of your installation.)

While running, NTSPY displays the real-time status of all of the configured channels. This can be useful in determining that all of the channels are working properly and can help to locate channel problems.



Appendix A: DID Telephone Service

DID Telephone Service

DID (direct inward dialing) lines support inbound phone service only. Loop-start lines must be used for outbound service. A DID interface assigns more than one telephone number to a pair of wires (a telephone trunk). This enables RightFAX to provide automatic routing of faxes to the proper destination in a multi-user system.

For example, Company ABC is assigned one DID trunk and 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 trunk is available, the telephone company connects to the trunk and transmits the last few digits (usually three or four) of the dialed number to the board. By detecting these digits, the fax boards can tell which one of the one hundred numbers was actually dialed by the caller.

If the one hundred telephone numbers correspond to one hundred different users on a RightFAX system, each user could have a private fax telephone number - with only one telephone trunk and one fax channel required.

Of course, if the trunk is busy receiving a fax for one of the users, callers to any of the other ninety-nine numbers encounter a busy signal. Because of this situation, you may require more than one DID trunk to which the range of DID telephone numbers is assigned. The number of trunks required depends on the traffic demands on the system.

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

DID telephone service options are listed below, along with the recommended configuration:

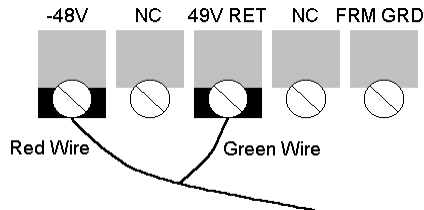
Trunk Type:	Loop Start
Service Type:	Wink Start
Signalling:	DTMF (Touch-Tone)
Digit Length:	Four

The DID fax cards must supply the DID trunk with continuous -48 VDC power. Since no source of -48 VDC exists in the computer, this power must be supplied from an outside source. A Tellabs 8012 (or equivalent) regulated power pack supplies the necessary -48VDC power.

Connecting a Tellabs 8012 power supply to a TR114, TR112, or CPD fax board

1. Turn off the PC.
2. Find the contact block on the back of the Tellabs power supply, opposite the plug end.
3. Loosen the contact labelled 48V RET.

4. Locate the supplied power cord, consisting of two wires (one green and one red) with a plastic jack at one end and two metal prongs on the other end.
5. Connect the metal prong on the end of the GREEN wire to the 48V RET contact and tighten the contact screw.
6. Loosen the contact labelled -48V.
7. Connect the metal prong on the end of the RED wire to the -48V contact and tighten the contact screw.
8. Plug the plastic plug on the other end of the power cable into the DC input jack in the fax board's mounting bracket.
9. Turn on the PC.
10. Plug the Tellabs 8012 power supply into the wall socket.



Connecting a DID phone line to a fax board

Since the DID port on the fax board is attempting to supply power to the DID phone line, care must be taken that no phone line is ever connected to a DID fax port when the said line is also attempting to supply power.

WARNING! NEVER insert a loop-start line into a DID fax port. Doing so will damage the fax board and void all warranties. If you have any doubts, make sure to test the phone line with a volt meter prior to connecting it to a DID fax port to ensure that no current exists on the line.

