DEC ISDN Router 100 Installation Guide

Order Number EK-DISDN-IN.001

digital equipment france, annecy

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WARNING

The following installation instructions provide specific directions for the safe installation of the ISDN ROUTER kit. For your protection from possible shock or energy hazards, do not attempt to access or disassemble parts of the equipment other than those specified. Refer other servicing to qualified personnel.

ATTENTION

Suivre les instructions pour installer l'option ISDN Router en toute sécurité. Afin d'éviter tout risque d'électrocution, ne manipuler que les pièces indiquées. Pour toute autre opération, faire appel à du personnel qualifié.

VORSICHT

Um das "ISDN ROUTER kit" richtig und gefahrlos zu installieren, gehen Sie unbedingt nach den folgenden Anweisungen vor: Hantieren Sie auf keinen Fall an anderen als den angegebenen Teilen, oder versuchen Sie nicht, diese zu entfernen. Es könnte sonst Berührungsspannung auftreten. Wartungsarbeiten dürfen ausschließlich von geschultem Fachpersonal ausgeführt werden.

PRECAUCIÓN

Las siguientes instrucciones de instalación ofrecen directrices específicas para una segura instalación del juego de "ISDN ROUTER kit". Para evitar posibles descargas eléctricas o cualquier tipo de riesgo, no intente acceder o desarmar ninguna parte del equipo que no sean las especificadas. En caso de cualquier duda, consulte a personal cualificado.

WAARSCHUWING

Volg onderstaande instructies voor het veilig installeren van de "ISDN ROUTER kit". Om risico's of elektrische schokken te voorkomen, alleen werkzaamheden verrichten aan de gespecificeerde onderdelen. Laat onderhouds- en reparatiewerkzaamheden over aan gekwalificeerd personeel.

ATTENZIONE

Le seguenti istruzioni per l'installazione forniscono informazioni per una corretta installazione del "ISDN ROUTER kit". Onde evitare possibili pericoli di scariche di corrente, non tentare di accedere o smontare parti diverse da quelle indicate. Consultare, per qualsiasi ulteriore necessità, personale qualificato.

ADVARSEL

Følgende installasjonsveiledning viser nøyaktig fremgangsmåte for en korrekt og trygg installasjon av "ISDN ROUTER kit". For å unngå elektrisk støt eller andre personskader, er det viktig at man ikke berører eller prøver å ta fra hverandre deler av utstyret. Utfør bare det som er anvist i håndboken. Overlat all annen reparasjon og service til kvalifisert fagfolk.

VARNING

Följande installationsanvisning innehåller exakt vägledning för en säker installation av "ISDN ROUTER kit". För att undvika elektriska stötar eller annan fara, bör man inte försöka komma åt eller montera isär andra delar av utrustningen, än de angivna. För övrig service, kontakta en fackman.

VAROITUS

Seuraavat asennusohjeet varmistavat "ISDN ROUTER kit" turvallisen asennuksen. Jotta vaaratilanteilta vältytään, ei pidä koskea muihin laitteiston osiin kuin ohjeissa on mainittu eikä pyrkiä purkamaan niitä. Muut ylläpitotoimet on jätettävä koulutetun ylläpitohenkilöstön huoleksi.

ADVARSEL

Følgende installationsprocedure giver vejledning i sikker installation af "ISDN ROUTER kit". Forsøg ikke at berøre eller adskille andre dele af udstyret, da der kan være risiko for højspænding. Yderligere service bør udføres af autoriseret personale.

AVISO

As instruções que se seguem explicam a forma de proceder, com segurança, à instalação de um "kit" de "ISDN ROUTER". Não tente, de forma alguma, aceder ou abrir as partes do equipamento que não se refiram aqui, para que não corra o risco de choques eléctricos. Qualquer outro tipo de serviços que necessite, exija a presença de pessoal qualificado.

注意：
モジュール・キットを安全にインストールするために，必ず本書の指示に従ってください。ここで示されている箇所以外の部分に手を触れたり，部品等を取り外したりするとたいへん危険です。電圧等によるショックやけがのもととなりますから絶対におやめください。他の部分についての修理，変更は，当社技術部にご相談ください。

אזהרה

הוראות ההתקנה המובאות להלן נועדו
להבי'א להתקנה בטוחה.

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Preface

Scope

This guide describes the installation and maintenance of the packaged DEC ISDN Router 100, also known as *DISDN*. It also provides information on running the verification procedure to verify the DEC ISDN Router 100 functionality over the ISDN network.

Intended Audience

This guide is for:

- Customer Services Engineers who install, maintain, and support this product.
- Customer Engineers who may perform the first level service on this product.

Conventions

`text like this`	represents output from the computer
`boldface text like this`	represents user's input to the computer
SMALL CAPITALS LIKE THIS	represents a file specification

Related Publications

Table 1: DIV32 Manuals

Title	Order Number
DIV32 Hardware Installation Guide	EK-DIV32-IN
DIV32 Device Driver Manual	AA-PA9CA-TE
VAX ISDN Software Installation Guide	AA-NS17A-TE
VAX ISDN Software Management Guide	AA-NS18A-TE

Table 2: VAXserver 3300 Manuals

Title	Order Number
MicroVAX 3300 VAXserver 3300 Installation	EK-O17AA-IN
VAXserver 3300 Operation Manual	EK-O18AA-OM
VAXserver 3300 Technical Information Manual	EK-O20AA-IS
MDM User's Guide	AA-FM7AB-DN
MicroVAX Site Preparation Guide	EK-239AC-SP

Chapter 1
Introduction

1.1 Scope

This chapter provides an overview of the DEC ISDN Router 100 hardware and summarises its technical details.

1.2 Overview

The ISDN Router is a package consisting of a VAXserver 3300 (without tape drive) to facilitate the connection of DIGITAL Systems to ISDN Networks. The package includes one or more DEC ISDN Controller 100 devices (otherwise known as DIV32 boards) bundled with licences for VMS, DECnet and VAX ISDN software.

Six varieties of the DEC ISDN Router 100 package exist, giving single or multiple ISDN basic rate access(es) (S0). These are:

- **DISDN-A2**, with one DIV32, for 120V operation
- **DISDN-A3**, with one DIV32, for 240V operation
- **DISDN-B2**, with two DIV32's, for 120V operation
- **DISDN-B3**, with two DIV32's, for 240V operation
- **DISDN-C2**, with three DIV32's, for 120V operation
- **DISDN-C3**, with three DIV32's, for 240V operation.

1.2.1 Configuration

The DEC ISDN Router 100 configuration consists of:

- One VAXserver 3300 base system (for 120V or 240V power supplies)
- One to three (maximum) DIV32 boards (M7531-PA) installed in the VAXserver 3300
- DIV32 loopback plugs (H3072)
- The Vax ISDN Software licence (note that VMS comes already installed, so a separate licence for this is not required)

- One console used for maintenance and troubleshooting purposes.

1.2.2 Physical Description

The ISDN Router system components are housed in a BA215 pedestal system enclosure with the following dimensions:

- Height: 67.5 cm (27.0 in)
- Width: 34.0 cm (13.6 in)
- Depth: 44.5 cm (17.8 in)

1.2.3 Operating Conditions and Electrical Requirements

The DEC ISDN Router 100 must comply with the VAXserver 3300 environmental and electrical requirements. Refer to the *MicroVAX Site Preparation Guide* for details.

Note

The *MicroVAX Site Preparation Guide* describes the physical, environmental, and electrical requirements for operating the system. It is assumed that the user's site meets all the described installation requirements.

1.3 Hardware Modules

The VAXserver 3300 houses the following boards in a BA215 pedestal enclosure:

- Central Processing Unit (KA640) module, which includes an on-board Ethernet controller, disk drive adaptor, and 4 Mb of main memory
- One, two or three DIV32 modules (M7531-PA).

Figure 1–1 shows the position of the modules in the cabinet; the illustration is of the DISDN-C2 or DISDN-C3 model, the others look the same except that they have fewer DIV32 boards. The DISDN-A2 and DISDN-A3 models have board 1 only; models DISDN-B2 and DISDN-B3 have boards 1 and 2 only.

1.4 Interfaces

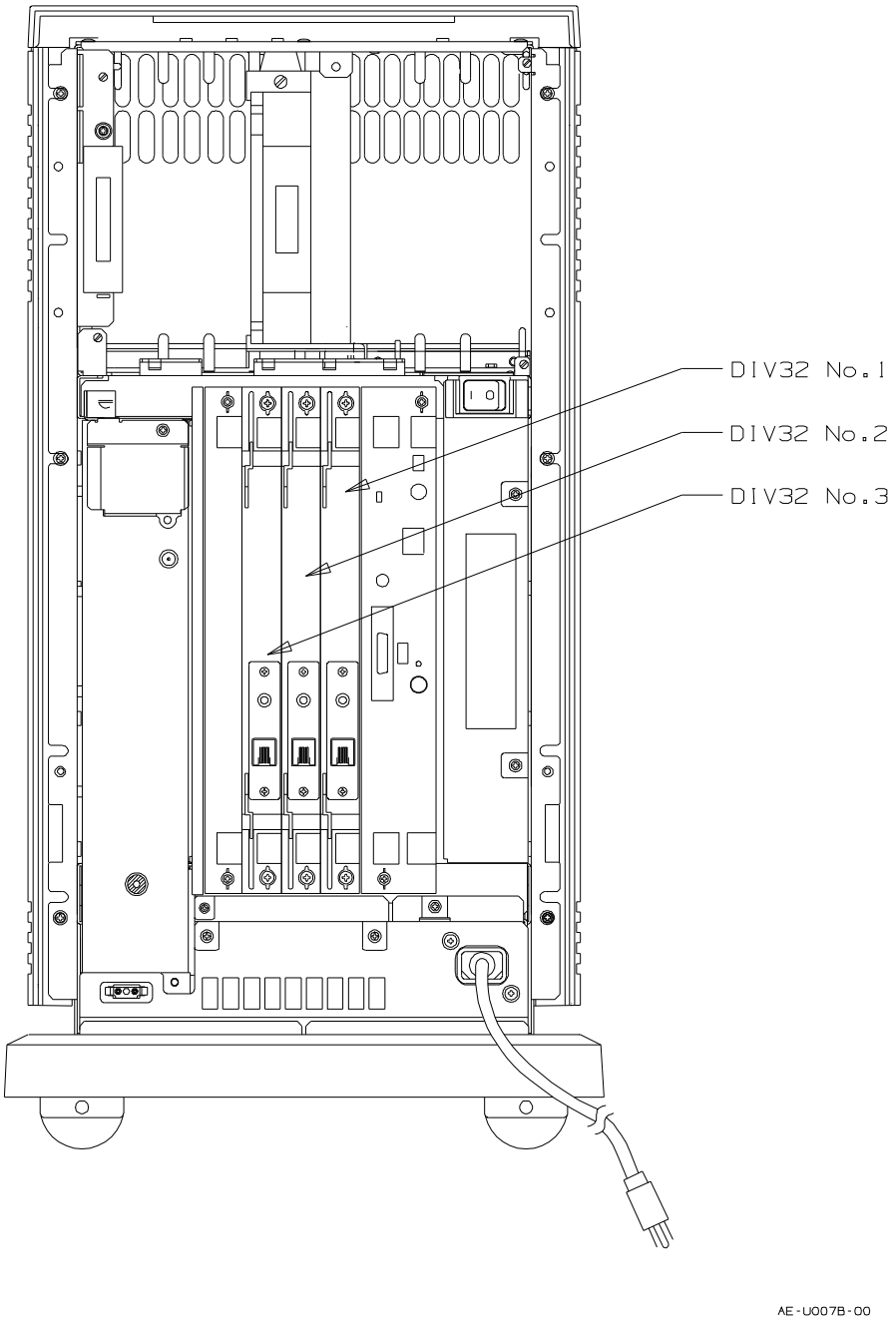
1.4.1 Ethernet Interface

The ISDN Router communicates over an Ethernet channel using DECnet with services on a host computer. The Router is connected to the Ethernet coaxial cable by a standard connection.

The length of the connecting cable must not exceed the length specified for standard connection to Ethernet.

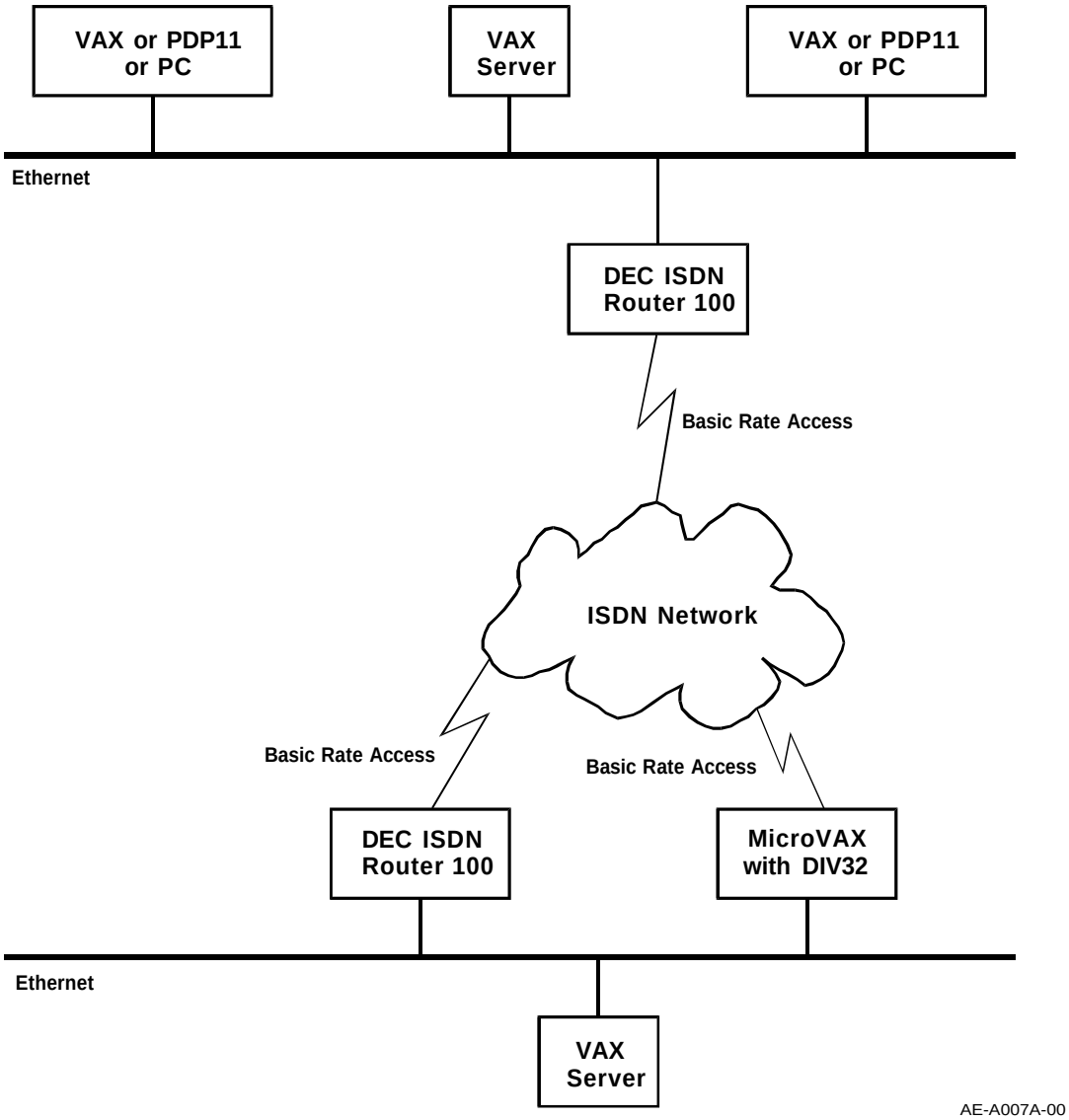
Figure 1–2 shows a typical ISDN Router configuration.

Figure 1–1: VAXserver 3300 Module Layout



1.4.2 ISDN Interface

Figure 1–2: Typical DEC ISDN Router 100 Configuration



The Router communicates with the ISDN Network over one or more Basic Rate Accesses using DECnet. Each such access comprises two "B" channels to carry the user's information and one "D" channel dedicated to signalling (call set-up and dialling). The two "B" channels are independent—for example, one could run DECnet on one, and DECnet with VAXPSI on the other, simultaneously. The "D" channel protocol is handled by the VAX ISDN Software.

The Router is connected to the ISDN wall socket by an ISDN cable which is delivered separately.

Chapter 2
Installation

2.1 Scope

This chapter describes how to install the ISDN Router hardware and how to connect it to Ethernet and the ISDN wall socket.

Note

Refer to *MicroVAX 3300 VAXserver 3300 Installation* and *DIV32 Hardware Installation Guide* for additional information concerning the installation of these products.

2.2 Summary of Installation Tasks

The ISDN Router installation includes the following steps:

1. Site preparation
2. Checking the shipment
3. Siting the Router
4. Installing the console terminal
5. Selecting switch settings on the system
6. Connecting the Ethernet cable
7. Connecting the power cable
8. Turning on the system
9. Downline loading of the diagnostics and software
10. Installing the ISDN cable
11. Attaching the Front Panel to the system.

2.2.1 Site Preparation

Before you begin the installation, make sure that the site has been prepared correctly. Refer to the *MicroVAX Site Preparation Guide* for details of this.

The following additional items should be verified:

- The main power source or outlet must be located within 2.5 metres (8 ft. 2½ ins.) of the ISDN Router enclosure. The power cord is 2.5 metres long.
- There must be another MicroVAX or VAX running (Micro)VMS connected to the same Ethernet and equipped with a disk and tape (TK Reader), in order to perform the initial Software installation (downloading).
- There must be an Ethernet transceiver cable (standard or thin Wire).
- There must be an ISDN Wall Socket where you install the Router. The ISDN cable (TE) is available in two lengths: 10 feet (3.05 metres) and 25 feet (7.62 metres)

Note

The line cord (TE cable) is not delivered in the ISDN Router package and must be ordered separately.

2.2.2 Checking the Shipment

Unpack all cartons and check the contents against the shipping list delivered with the system. If any item is missing or damaged, contact your delivery agent or Digital Sales Representative.

2.2.3 Siting the Router

Position the ISDN Router where it will be used. You must consider the following points:

- Allow space around the enclosure for air circulation and servicing.
- Place the system away from heaters and direct sunlight.
- Minimise static electricity by placing the system away from areas in constant use.
- Keep the area free from dust and abrasive materials.

2.2.4 Installating the Console Terminal

Refer to the section entitled “Install the Console Terminal” in *MicroVAX 3300 VAXserver 3300 Installation*, for your terminal installation and set-up procedures.

Note

The terminal acts as a system console. It allows the customer to monitor network activity and provide some fault information to Customer Services in the event of failure.

2.2.5 Switch Setting

Refer to the section entitled “Set Controls on your System” in *MicroVAX 3300 VAXserver 3300 Installation*, for the installation procedures.

2.2.6 Connecting the Ethernet Cable

Refer to the section entitled “Connect to an Ethernet Network” in *MicroVAX 3300 VAXserver 3300 Installation*.

2.2.7 Connecting the Power Cable

WARNING

Do not proceed unless you have verified that your power source matches the power requirements of your system. The correct voltage for the system is listed on the serial number label next to the left-hand power supply (when viewed from the front).

Connect the power cable to the system as follows:

1. Make sure that the system ON/OFF switch is set to OFF.
2. Check that the plug on the end of the cable matches the wall power socket. *Do not connect the cable into the power socket yet.*
3. Feed the cable under the system and connect the other end to the system.
4. Connect the plug into the wall power socket.

2.2.8 Turning on the System and Selecting a Language

Refer to the section entitled “Turn on the System and Select a Language” in *MicroVAX 3300 VAXserver 3300 Installation*.

2.2.9 Downloading of the Diagnostics

The ISDN Router does not contain a tape drive, and so the MDM software files required to test the Router need to be downline loaded on to the Router’s system disk from another host system.

Refer to the section entitled “Maintenance” in *MicroVAX 3300 VAXserver 3300 Installation*, for details.

2.2.10 Attaching the Front Panel to the System

Refer to the section entitled “Attach the Front Panel to the System” in *MicroVAX 3300 VAXserver 3300 Installation*, for futher guidance.

2.2.11 VAX ISDN Software Installation Procedure

The ISDN Router software must be downloaded from a host system equipped with a TK reader, connected to the same Ethernet as the Router. Proceed as follows:

❶ Log in as System on the machine which has the TK tape drive. For the purpose of the examples given here, suppose the node name to be REMOTE, and System’s password to be METSYS.

❷ Insert the first tape containing the delivered software into the drive.

❸ Create a suitable directory on the hard disk of node REMOTE, for example:

```
$ CREATE/DIRECTORY DUA0:[TEMP]
```

❹ Issue the following command on node REMOTE:

```
$ MOUNT MUA0: ISDN
```

❺ Issue the following command on node REMOTE:

```
$ COPY/LOG MUA0:*.* DUA0:[TEMP]
```

This will copy the software savesets from tape to disk within the REMOTE machine.

❻ Issue the following command on node REMOTE:

```
$ DISMOUNT MUA0:
```

and remove the tape.

❼ Log in as System on the Router console. For the purpose of the examples given here, suppose the node name to be ROUTER.

❽ Create a suitable directory on the hard disk of the Router, for example:

```
$ CREATE/DIRECTORY DUA0:[TEMP]
```

❾ Issue the following command on node ROUTER:

```
$ COPY/LOG REMOTE"SYSTEM METSYS"::DUA0:[TEMP]*.* DUA0:[TEMP]
```

This will copy the software savesets across to the Router via Ethernet.

❿ Install the downloaded software on the VAXserver 3300 as described in *VAX ISDN Software Installation Guide*. When the installation asks you:

```
* Where will the distribution volumes be mounted:
```

you should reply:

```
* Where will the distribution volumes be mounted: DUA0:[TEMP]
```

⓫ After the installation, you can remove the files you copied earlier from the tape:

```
$ DELETE DUA0:[TEMP]*.*;*
```

⓬ Finally delete the directory itself:

```
$ SET PROTECT=W:D DUA0:[0,0]TEMP.DIR
$ DELETE DUA0:[0,0]TEMP.DIR;*
```

⓭ Log out from node ROUTER.

⓮ Delete the files and directory at the console for node REMOTE:

```
$ DELETE DUA0:[TEMP]*.*;*
$ SET PROTECT=W:D DUA0:[0,0]TEMP.DIR
$ DELETE DUA0:[0,0]TEMP.DIR;*
```

⓯ Log out from node REMOTE.

Chapter 3
Maintenance

3.1 Scope

This chapter describes the ISDN Router maintenance strategy and shows how to downline load the MDM fles from a host computer.

3.2 Maintenance Strategy

3.2.1 Preventive Maintenance

The ISDN Router does not require any preventive maintenance. However, when you are servicing the Router, you should check for loose connectors and damaged cables.

3.2.2 Corrective Maintenance

The corrective maintenance is based on finding and replacing defective FRUs. There are several diagnostic tests to help you. Observe the following sequence:

1. Run the System Power On self-tests. If the self-tests do not detect any hardware errors, then:
2. Run the Microvax Diagnostic Monitor (MDM) tests. Load the MDM software into the ISDN Router from a host computer (See Section 3.5.1).

   Details of the MDM tests for the ISDN Router modules are given in the chapter entitled “Running Diagnostics and Hardware Troubleshooting” in the *DIV32 Hardware Installation Guide*.

3.3 Troubleshooting

Refer to the chapter entitled “Running Diagnostics and Hardware Troubleshooting” in the *DIV32 Hardware Installation Guide* for the troubleshooting procedures.

3.4 Self-Test

There are two sets of Self-tests which run simultaneously at Power On. They are:

- VAXserver 3300 module Self-test
- DIV32 (M7531) module Self-test
- Self-Call test.

3.4.1 VAXserver Self-test

This Self-test starts when you switch the ISDN Router On. Refer to the section entitled "Autobooting the System" in *VAXserver 3300 Operation Manual* for details.

3.4.2 DIV32 (M7531) Module Self-test

The ISDN module Self-test starts automatically when you switch the ISDN Router On. This Self-test lasts 15 seconds. At the end of the test, the green LED located at the front of the module must remain On. This indicates that the Self-test was successful. Refer to the chapter entitled "Running Diagnostics and Hardware Troubleshooting" in the *DIV32 Hardware Installation Guide* for details.

3.4.3 Self-Call Test

The VAX ISDN Software provides a self-call function. The following sequence of commands will carry it out:

```
$ run sys$system:isdn$ncp
ISDN$NCP>set line isdn_0 controller div-0
ISDN$NCP>clear line isdn_0 unit 0 incoming subaddress
ISDN$NCP>clear line isdn_0 unit 1 incoming subaddress
ISDN$NCP>clear line isdn_0 unit 0 incoming setup information
ISDN$NCP>clear line isdn_0 unit 1 incoming setup information
ISDN$NCP>set line isdn_0 state off
ISDN$NCP>set line isdn_0 local address 99824220
ISDN$NCP>set line isdn_0 mode simple state on
ISDN$NCP>set line isdn_0 unit 0 call setup self
```

At this point, if an error occurs, a message will be displayed. If no message is displayed, then the self-call must have been set up successfully; in other words, correct signalling on the D-Channel will have occurred between the Router and the ISDN. Continue as follows:

```
ISDN$NCP>exit
$ run sys$system:ncp
NCP>set line DIV-0-0 state on
NCP>set circuit DIV-0-0 state on
NCP>set line DIV-0-1 state on
NCP>set circuit DIV-0-1 state on
NCP>loop circuit DIV-0-0
```

At this point, the Router will attempt to send data over the ISDN to itself (via the B-Channels). If an error occurs, an error message will be displayed. If successful, information concerning the transfer of the data will be displayed.

This test will continue indefinitely. Stop it by pressing Ctrl-C, then terminate the Self-Call like this:

```
Ctrl-C
NCP>exit
$ run sys$system:isdn$ncp
ISDN$NCP>set line isdn_0 unit 0 call clear
ISDN$NCP>exit
$
```

Note that the number 99824220 in the sequence above is an example only; in other words, you must substitute your own ISDN local address when issuing the command.

For further details, see *VAX ISDN Software Management Guide* (refer to "call self" in the index).

3.5 MicroVAX Diagnostic Monitor (MDM) Tests

Refer to the chapter entitled "Running Diagnostics and Hardware Troubleshooting" in the *DIV32 Hardware Installation Guide* for details.

3.5.1 Running the MDM Diagnostics

The ISDN Router has no Tape Loader. You must use Ethernet to download the MDM software from a host computer.

3.5.1.1 Setting up the Host DECnet Database

Before you can download the MDM software, you need information about the network environment. Table 3–1 is a template for recording this information.

Table 3–1: Pre-Installation Worksheet

Item:	Example:	Fill in:
Host Node Name	John	
Host Node Location	Computer Center	
ISDN Router Node Name	Fred	
ISDN Router Node Location		
Host Account Name	JOHNSON	
Host Circuit Number	5.172	
ISDN Server circuit Number	5.524	
Host's Service circuit	UNA-0 or BNA-0 or QNA-0	
ISDN Service circuit name	QNA-0	
ISDN Router Hardware Addr	AA-00-03-01-3C-79	
Diagnostic boot file name	NA06AO.SYS or MDM$MAINT:NA06AO.SYS	

After you have completed the pre-installation worksheet, set up the DECnet database on the host system by performing the following steps:

❶ Log in to an account which has the following privileges: OPER, TMPMBX, NETMBX, and SYSPRV.

❷ Run NCP by entering:

```
$ RUN SYS$SYSTEM:NCP
```

❸ Check that the service circuit is enabled for downline loading of software from the host to the ISDN Router. Take the service circuit value from the worksheet and enter the following command:

```
NCP>SHOW CIRCUIT Host's service circuit CHARACTERISTICS
```

If the service circuit displays "Disabled" you must enter the following commands to enable the service circuit:

```
NCP>SET CIRCUIT Host's service circuit STATE OFF
NCP>SET CIRCUIT Host's service circuit SERVICE ENABLED
NCP>SET CIRCUIT Host's service circuit STATE ON
```

Note

When you set the service circuit to STATE OFF, DECnet mail and file transfers cannot occur. When you set the service circuit to STATE ON, DECnet resumes normal operation.

❹ Store the ISDN Router node service circuit, the Ethernet hardware address and the diagnostic boot file name in the Host node database by entering the following commands:

```
NCP>SET NODE isdn router node name ADD isdn service circuit number
NCP>SET NODE isdn router node name SERVICE CIRCUIT isdn service circuit name
NCP>SET NODE isdn router node name HARDWARE ADDRESS isdn router hardware addr
NCP>SET NODE isdn router node name LOAD FILE diagnostic bootfile name
```

Storing the ISDN Router SERVICE CIRCUIT and HARDWARE ADDRESS in the Host Ethernet node database enables the ISDN Router to boot on the specified file, and the file to be automatically downloaded.

❺ Check that the commands were entered correctly by entering:

```
NCP>SHOW NODE isdn router node name CHARACTERISTICS
```

The following information should be displayed. Other items may also appear, depending on the network set-up of the particular site.

```
Node Volatile Characteristics as of 10-APR-1990 13:31:26

Remote node = 5.524 FRED

Service circuit = QNA-0
Hardware address - AA-00-03-01-3C-79
Load file = MDM$MAINT:NA06AO.SYS
```

The setting up of the host DECnet database is now complete.

To DIGITAL Field Service Engineers

If the customer has not purchased the necessary product licence, remove all the MDM files using the host console terminal when you have finished troubleshooting the ISDN Router.

3.5.1.2 Checking that MDM is Present on the Host

Prior to downloading MDM to the ISDN Router from the host, you should check that MDM is indeed present on the host. To do this, enter the following command on the host console:

```
$ DIRECTORY MDM$MAINT:NA06AO.SYS
```

If this boot file is present, make sure that it is the correct version of MDM, namely 129 or higher, by looking in the release notes MDM$MAINT:MDM_RELEASE.NOTE.

If the boot file is not there (or the MDM$MAINT directory does not exist), then copy the file from the TK50 tape like this (after inserting the tape containing MDM into drive 0):

```
$ MOUNT MUA0: MDM
$ CREATE/DIRECTORY SYS$SYSDEVICE:[MDMMAINT]
$ ASSIGN/SYSTEM SYS$SYSDEVICE:[MDMMAINT] MDM$MAINT
$ COPY/LOG MUA0:NA06AO.SYS MDM$MAINT
$ DISMOUNT MUA0:
```

3.5.2 Downloading Sequence

Once the DECnet database has been set up, you must download the MDM software into the ISDN Router. You do this by re-booting the ISDN Router.

Once re-booted, the ISDN Router sends a request to the host to download the software into its memory. The download operation then takes place automatically.

The following display, indicating the progress of the download sequence, should appear on the console terminal:

```
Loading system software.
2..1..0..
```

Note

The system software may take a few minutes to load.

The "2" in the output display indicates that the ISDN Router is sending a boot request to the host system. The "1" indicates that the MDM load file has been downloaded into the ISDN Router memory and the "0" indicates that the ISDN Router has booted without error.

The load time will vary, depending on the Ethernet circuit load, but should not be more than five minutes.

When the download operation has completed, you should see the initial display of the MDM Maintenance System on the console.

Refer to the chapter entitled “Running Diagnostics and Hardware Troubleshooting” in the *DIV32 Hardware Installation Guide* if there are any problems.

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