MultiMobile ZLX



MT128ZLX-ST/NT ISDN PC-Card Modem User Guide



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MultiMobile MT128ZLX PC Card Modem User Guide

P/N S0000154, Revision A

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 Revision
 Date
 Description

 A
 2/24/01
 Supersedes Owner's Manual P/N 82068901

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1 Introduction

Product Description

The MT128ZLX-ST/NT is a credit-card-size ISDN terminal adapter. It is plug-and-play compatible. The MT128ZLX-ST/NT is a Type II PCMCIA (PC-card) device with a thickness of 5 mm. It complies with the PCMCIA Standard Release 2.1 and JEIDA 4.2. The MT128ZLX-ST works with the "S/T" ISDN interface. The MT128ZLX-NT works with the "U" ISDN interface. Otherwise the MT128ZLX-ST and the MT128ZLX-NT are functionally equivalent.

The MT128ZLX is compatible with common ISDN telephony switch types, including NI-1, AT&T 5-ESS, Nortel DMS-100, ETSI, and Japan INS-64. It uses Basic-Rate-Interface (ISDN-BRI) service and operates at data speeds up to 128Kbps.

The MT128ZLX supports most common communications protocols (including V.110, V.120, PPP, MLP, MLP+BOD, and HDLC Transparent).

The MT128ZLX supports common Application Program Interfaces like NDIS, CAPI 2.0, and VCOMM (for Windows 95/98/2000/ME but not for Windows NT).

About This Manual

This User Guide explains how to install, configure, and operate your MT128ZLX-ST or MT128ZLX-NT terminal adapter in each of five operating systems.

MT128ZLX-ST/NT & Computer Operating Systems

Procedures for installing, verifying, configuring, and un-installing the MT128ZLX are quite different for each operating system. The use of Application Program Interfaces also differs significantly from one operating system to another. For this reason, this manual contains a separate chapter for each operating system. The operating systems are:

Windows 95	Windows 2000
Windows 98	Windows ME (Millenium Edition)
Windows NT	

Before you can install the MT128ZLX in your computer under any operating system, you will need to obtain information from your telephone company about your ISDN service. The information needed is that which is specific to the way ISDN is implemented with the specific telephony equipment that your telephone company uses in addition to specific information about your own individual ISDN account. You will need:

SPIDs (North America only) Switch Type Voice Encoding scheme Telephone Number(s)

MT128ZLX-ST/NT & Application Program Interfaces

The MT128ZLX-ST/NT operates in conjunction with three Application Program Interface software packages: NDIS, VCOMM, or CAPI. The full names of these programs are as follows:

NDIS (Network Driver Interface Specification):

VCOMM (Virtual Communications Driver):

CAPI (Common ISDN Application Program Interface):

Each API contains software components that interact with the operating system (OS) of the computer in which the MT128ZLX is installed. The "API Usage" section of each OS-specific chapter will present examples of how the MT128ZLX can be used with these APIs in that particular OS. (The CAPI-compliant program used in these examples is RVS-COM Lite.)

Each API adds communications functionality to the system. Each of the three APIs adds a different set of features to the system, although the APIs have substantial functionality in common with each other.

Safety Warnings

Never install telephone wiring during a lightning storm.

Never install telephone jacks in wet locations unless the jacks are specifically designed for wet locations.

Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.

Use caution when installing or modifying telephone lines.

Avoid using a telephone (other than cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.

Do not use the telephone to report a gas leak in the vicinity of that leak.

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Features

- Compatible with most laptop computers
- Compatible with Card and Socket Services
- Easy to install and use
- Card is hot swappable
- Supports popular OSs (e.g., Windows 95/98/NT/2000/ME)
- Windows-based configuration utility included
- Microsoft Plug and Play (PnP) Compatible
- Multiple signaling protocol compatibility with the following ISDN protocols and switches: NI-1, ETSI, AT&T 5ESS and Nortel DMS-100
- B-Channel speed support: 56Kbps and 64Kbps
- B-Channel Protocol: V.120, X.75, Async-to-Sync PPP Conversion, Multi-Link PPP (RFC1317), and HDLC raw data, V.110
- Three Application Program Interfaces (APIs) are supported: NDIS, CAPI, and VCOMM (VCOMM not supported for WinNT)
- AT command set compatible
- Windows-based configuration utility included.

2 Installation & Use in Windows 95

MT128ZLX-ST/NT: Windows 95 Driver Procedures

Windows 95 Installation

- NOTE: Before beginning the installation, you must obtain the following technical information from your telephone company:
 - SPIDs (North America only) Switch Type Voice Encoding scheme Telephone Number(s)
- NOTE: As you begin this procedure, the MT128ZLX card should not be installed in the computer's PCMCIA slot. The setup.exe file must be run before the card is installed. Otherwise problems will arise as Windows 95 detects the device.
- 1. For now, leave the MT128ZLX card out of the computer's PCMCIA slot.
- 2. Insert the MT128ZLX Installation CD into the computer's CD-ROM drive.
- 3. Using Windows Explorer, browse to the win9x directory on the MT128ZLX Installation CD.
- 4. Double-click on the Setup.exe file to launch the Configuration Utility Setup program.



At the Welcome screen, click Next>.

5. At the **Choose Destination Location** screen, you can accept the default path or enter a different path at which to install the **Configuration Utility** files.

Choose Destination Loc	ation	×
	Setup will install Configuration Utility in the following folder. To install to this folder, click Next. To install to a different folder, click Browse and select another folder. You can choose not to install Configuration Utility by clicking Cancel to exit Setup.	
	Destination Folder C:\\Configuration Utility Bjowse < <u>B</u> ack <u>Next></u> Cancel	

Click Next>.

6. At the **Select Program Folder** screen, you can accept the default folder or select another folder into which the program icons will be added.

Select Program Folder		×
	Setup will add program icons to the Program Folder listed below. You may type a new folder name, or select one from the existing Folders list. Click Next to continue. Program Folders: Configuration Utility Existing Folders: Accessories Online Services StartUp	
	< <u>B</u> ack <u>N</u> ext > Cancel	

Then click **Next**>.

7. The **Start Copying Files** screen allows you one last chance to go back and change information that you have provided in previous steps.

Start Copying Files	×
	Setup has enough information to start copying the program files. If you want to review or change any settings, click Back. If you are satisfied with the settings, click Next to begin copying files.
	< <u>B</u> ack <u>Next></u> Cancel

When satisfied with your settings, click Next> to begin copying files.

8. Progress screens will appear while files are being copied to your hard disk.

9. When prompted to install the Accelerator Pack, click Yes.



The Accelerator Pack updates the Dial-Up Networking software components to include ISDN functionality.

10. Click **Yes** to accept the license agreement.

Microsoft ISDN Accelerator Pack 1.1	х
Please read the following license agreement. Press the PAGE DOWN key to see the rest of the agreement.	y
The ISDN Accelerator Pack software which you have downloaded for use only with Microsoft Windows 95 operating system software is considered part of such Microsoft Windows 95 operating system software. Therefore, its use is subject to the same terms and conditions governing use of Microsoft Windows 95 operating system. A copy of such terms and conditions is reprinted below for your convenience.	
Microsoft Windows 95 Licenses: 1	
END-USER LICENSE AGREEMENT FOR MICROSOFT SOFTWARE	·
Do you accept all of the terms of the preceding License Agreement? If yo choose No, Install will close. To install you must accept this agreement.	u
Yes <u>N</u> o	

11. You will be prompted to read the manufacturer's documentation.



Click OK.

12. At the Setup Complete screen, select Yes, I want to restart my computer now.



Click Finish.

13. When the restart process is complete, a message will appear indicating that "ISDN PC Card does not exist," meaning that the card is not in the computer's PCMCIA slot. This is normal. After the drivers are installed, this message will appear upon restart anytime the MT128ZLX card is not installed in its slot.

STATUS	×
⚠	The ISDN PC Card does not exist
	OK]

Click OK.

14. Insert the MT128ZLX into the computer's PCMCIA slot.



15. Windows 95 will detect the MT128ZLX card. The **New Hardware Found** wizard will display a series of screens indicating that is has found new hardware and that it is installing the corresponding software.

16. Go to **Start | Settings | Control Panel**. Select the **Network** icon. Select the **Configuration** tab.

Network 🔋 🗙
Configuration Identification Access Control
The following <u>n</u> etwork components are installed:
Client for Microsoft Networks
File and printer sharing for Microsoft Networks
Add Remove Properties
Direct Natural Learn
Client for Microsoft Networks
<u>F</u> ile and Print Sharing
Description
OK Cancel

Click Add.

17. At the Select Network Component Type screen, highlight Adapter and click Add.



18. At the **Select Network Adapters** screen, highlight "MultiTech" in the **Manufacturers** pane. In the right pane (the **Network Adapters** pane), the MT128ZLX ISDN Adapter appears in the list.

Select Network adapters	×
Click the Network ad- you have an installation	apter that matches your hardware, and then click OK. If on disk for this device, click Have Disk.
Mpufacturers:	Network Adapters:
Madge	MultiMobile MT128ZLX-ST ISDN TA (Net)
Microdyne	
Mitron	
🔢 MultiTech 🔽	
	<u>H</u> ave Disk

Click **OK**. This installs the NDIS Application Program Interface and adds **ISDN-LINE0** and **ISDN-LINE1** to the list of devices in **Dial-Up Networking**.

At the Network screen (under the Configuration tab), click OK.

19. The ISDN Configuration wizard begins.

ISDN Configuration	
	Now that you have installed a new ISDN adapter, you need to give Windows some information about your ISDN service. When you ordered your ISDN line from the telephone company, you should have received the following information from them. • the switch protocol that the telephone company uses • one or more telephone numbers Depending on the switch protocol, you may have received additional information. In this wizard, you will be asked to enter the information described above. If you did not receive this information you should contact the telephone company.
	< Back Next > Cancel

NOTE: The information entered in the Microsoft ISDN Configuration wizard does not affect the operation of the MT128ZLX. However, completing this wizard is necessary to update certain dial-up networking software components to add ISDN functionality to Windows 95. The MT128ZLX is configured for use with the Configuration Utility that was installed during driver installation. In the section "Configuring the MT128ZLX" (presented later in this chapter), you will supply setup information for using the Configuration Utility program with your particular computer.

Click Next>.

20. Accept the default value for the "Switch Protocol." Click Next>.

ISDN Configuration	
	Select the switch protocol that your telephone company uses from the list below. Switch protocol:
	C Back Netto Cancel

21. The next wizard screen requests **Phone Number** and **SPID** information. It is not necessary to enter this information here. You will be asked to supply this information later (in the **Configuration Utility** program).

ISDN Configuration	
	Enter the telephone numbers and the corresponding SPIDs (Service Profile ID). If you have only one telephone number you may leave the second phone number blank. If your telephone company does not require a SPID, leave the SPID fields blank.
	SPID:
*	
	Phone number:
Ĵ	SPID:
	< <u>B</u> ack <u>N</u> €,≹> Cancel

Leave the fields of this dialog box blank. Click Next>.

22. At the 'completion' screen, click **Finish**.

ISDN Configuration	
	The ISDN configuration is complete. To use ISDN, create a new connection using Dial-Up Networking, and select your ISDN adapter as the device to use for the connection. To modify the settings you have just entered, go to the ISDN Tools program group under Accessories on the Start Menu and click on ISDN Configuration Wizard.
	< <u>B</u> ack Filsh Cancel

23. When prompted to restart your computer, click Yes.

24. Driver installation is now complete. However, before you can use your MT128ZLX in Windows 95, it must be configured with SPIDs (in the U.S. and Canada), telephone numbers, voice-encoding information, and switch-type information. (See the procedure "Configuring the MT128ZLX In Windows 95" below.)

Verifying the Windows 95 Installation

1. Go to **Start | Settings | Control Panel**. Click on the **System** icon. When the **System Properties** screen appears, select the **Device Manager** tab.

System Properties	? ×
General Device Manager Hardware Profiles Performance	
• View devices by type • • • • • • • • • • • • • • • • • • •	
Hard disk controllers Hard disk controllers Image Infrared IspNAdapter	
MultiMobile MT128ZLX-ST (ISDN)	1
⊡	
Mouse Multi-function adapters	
MultiMobile MT128ZLX-ST Multi-Function Card	
MultiMobile MT128ZLX-ST ISDN TA (Net)	
Properties Herresh Remove Print	
OK Cance	1

2. After a successful driver installation, the Device Manager will contain the following entries:

MultiMobile MT128ZLX-ST (ISDN)

MultiMobile MT128ZLX-ST (modem)

MultiMobile MT128ZLX-ST Multi-Function Card

MultiMobile MT128ZLX-ST ISDN TA (Net)

3. If these entries do not appear, re-do the driver installation procedure. If the installation fails repeatedly, call MultiTech Tech Support (800-972-2439).

Configuring the MT128ZLX in Windows 95

NOTE: In this procedure, you will be asked to enter detailed configuration information that relates to the ISDN equipment being used by your telephone company. Specifically, your telephone company must provide the following information:

SPIDs, Phone Numbers, Switch Type, and Voice Encoding type.

This information is supplied by your telephone company and you must have it available when doing this procedure.

1. Go to **Start | Programs | Configuration Utility | Config.** The **Configuration Utility** dialog box will appear.

2. Enter the information needed in each field of the dialog box.

S-Configuration Utility	×
Switch Type General COM Port Setting Tools	
Select the switch type that your ISDN service provider is using.	
Switch Type : AT&T SESS Detail	
Phone Number	
Enter the ISDN phone numbers and the Service Profile Identifier number (SPID) from your ISDN service provider.	
B1 Number : B1 SPID :	
B2 Number : B2 SPID :	
B Channel Speed Voice Encoding	
C 56K. C A-law for European countries	
C 64K C MuHaw for North American countries	
Set Default	
OK Cancel ép	ply

Switch Type: See listed options.

Phone Numbers:	B1 number and B2 number.
SPID	Needed only in the U.S. and Canada.
B-Channel Speed	56 kbps or 64 kbps
Voice Encoding:	for Net3 or ETSI, use A-law voice encoding
	for other switches, use Mu-law voice encoding

Click OK.

Uninstalling MT128ZLX-ST/NT Drivers in Windows 95

1. Close the **Status** program. After the **Configuration Utility** has been installed, the Status program's icon normally appears at the lower right corner of your screen. Click on this icon and close the Status program.

2. Go to **Start | Settings | Control Panel**. Click on the **Add/Remove Programs** icon. The **Add/Remove Programs Properties** dialog box will appear. At the **Install/Uninstall** tab, highlight **Configuration Utility**. Click on the **Add/Remove** button.

Add/Remo	we Programs Properties	×
Install/Un	install Windows Setup Startup Disk	
2	To install a new program from a floppy disk or CD-RDM drive, click Install.	
	jnstall	
3	The following software can be automatically removed by Windows. To remove a program or to modify its installed components, select it from the list and click. Add/Remove.	
ATI Dis	play Driver	
Configu	Support for Mindows 95 Version 2.0	
in the states		
1		
	444179-11-11	
	Add/Hemove	
	or I could be	۲
	UK Cancel Apply	

3. At the Confirm File Deletion screen, click Yes.



4. The **Uninstall Shield** program will appear. At the **Remove Programs From Your Computer** screen, click **OK**.



Click on **Details** to see files that must be manually deleted later. Record file names as needed.



Click **OK** at both of these screens to proceed.

5. A message screen appears recommending that you restart your computer.



Click **OK**. Then restart your computer.

MT128ZLX: Using APIs in Windows 95

About APIs

The MT128ZLX-ST/NT operates in conjunction with three Application Program Interface software packages: NDIS, VCOMM, or CAPI. This chapter presents examples of how the MT128ZLX can be used with these APIs. The CAPI-compliant program used in these examples is RVS-COM Lite.

Each API contains software components that interact with the operating system of the computer in which the MT128ZLX is installed. Each API adds communications functionality to the system. Each of the three APIs adds a somewhat different set of features to the system, as summarized in the table below and described more fully in subsequent sections.

API	Full Name	Functionality
NDIS	Network Driver Interface Specification	dial-up networking (DUN)connection, network interface card (NIC) emulation
VCOMM	Virtual Communications Driver	dial-up networking (DUN)connection, modem emulation
CAPI	Common ISDN Application Program Interface	dial-up networking (DUN)connection, modem emulation, G3 and G4 FAX, V.110, V.120, X.75, HDLC, interface to ISDN features and services

The NDIS API

NDIS allows Network Interface Cards (NICs) to work with each other, with the operating system, and with higher order protocol drivers. NDIS is an interface that facilitates development of NIC drivers. NDIS program routines can implement the functions that NIC drivers must perform. These include interaction with protocol drivers, the handling of hardware interrupts, and interface with underlying NICs by dealing with registers, port I/O, and other functionality. NDIS allows drivers to be developed in high-level programming languages, such that their creation and implementation are platform-independent.

The VCOMM API

The communications device driver known as "VCOMM" provides protected-mode services. It allows makes ports and modems available to Windows-based software application programs. VCOMM also uses plug-and-play functionality to simplify the installation and configuration of communications devices.

The CAPI API

Being a common interface, the ISDN CAPI (Common Application Program Interface), allows software programs to use all ISDN services. Computer programs have access to most services and features of ISDN when used with CAPI. This access is hardware-independent. CAPI makes call numbers available, as well as several kinds of service information: caller number, called number, call charges, ISDN service ID. CAPI also facilitates transmission of data, FAX, or voice, and multiple B-channels can also be used simultaneously on a single call.

It is the capabilities of the ISDN adapter and the type of ISDN connection that determine which services and features are actually available. CAPI merely serves as a common interface. ISDN CAPI is a platform-independent standard which can be used in non-Windows operating systems like OS/2 and UNIX, as well as in Microsoft operating systems.

CAPI 2.0 is the current form of CAPI. ISDN adapters with CAPI 2.0 can be used anywhere in Europe with the DSS1 Euro-ISDN connection.

Intro to API Single-Channel and MultiLink Examples

In the following procedures, you will use Application Program Interfaces (APIs) to set up and use dial-up networking with the MT128ZLX in conjunction with the particular operating system your computer is using. The APIs are installed as part of the MT128ZLX driver installation, which must be complete before these procedures can be done. Note that the procedures presented here are examples only. Your use of APIs will depend on the needs and limitations of your operating environment.

Windows 95 NDIS : Single Channel Access Example

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.
1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.
2. If you are connecting to a non-Windows server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.
3. If applicable, you will need to know the domain name of the network to which you will be connected.
4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

1. Go to **Start | Programs | Accessories | Dial-Up Networking**. At the **Dial-Up Networking** folder, select **Make New Connection**.

🔯 Dia	l-Up	Netw	orking	- 🗆 ×
<u>F</u> ile <u>E</u>	dit	⊻iew	<u>C</u> onnecti	ons
<u>H</u> elp				
Make	Nev ectio	n	6	
1 objec	t(s) s	elected		11.

2. The **Make New Connection** screen appears. Enter a descriptive name for the connection. In the "Select a Modem" drop-down box, highlight **ISDN-Line0**.

Make New Connection	
	Lype a name for the computer you are dialing: My Connection Select a modern: MultiMobile MT1282LX-ST (modern) ISDN-Line0 ISDN-Line1 MultiMobile MT1282LX-ST (modern)
	Cancel

Click Next>.

3. At the next screen, enter the area code and phone number of your ISP or the remote device you will be calling using this connection. Select the appropriate Country Code and click **Next**> to complete the setup.

Make New Connection	
	Type the phone number for the computer you want to calt Agea code: <u>Lelephone number</u> 763 • 5552000 Cognity code: United States of America (1)
	< Back Newt> Cancel

4. At the completion screen, click **Finish**.

R	You have successfully created a new Dial-Up Networking connection called My Connection Click Einish to save it is use a Dial-Up Networking folder.
	Double-click it to connect. To edit this connection later, click it, click the File menu and then click Properties.
Ť	< Back Finish Cancel

The new dialup connection is ready to configure.

5. From the Dial-Up Networking folder, right-click on your new connection icon. Choose Properties.

📴 Dial-Up Network	ing 💶 🗵
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>C</u> o	nnections
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Connection	Create <u>S</u> hortcut
	<u>D</u> elete
	Rena <u>m</u> e
Opens the property sh	P <u>r</u> operties

6. On the **General** tab, type in the phone number for the adapter port. You may change the connection options by clicking **Configure**.

My Connection 20	×
General Server Types Scripting	
My Connection	l
✓ Use country code and area code (for all devices)	L
Cognitry code: Area code:	L
United States of America (1) 💌 763 💌	l
Primary Device:	l
Phone number: 5552000	l
Using: ISDN-Line0	l
🤝 Configure	l
Set additional devices:	l
Number of additional devices available: 4	L
Sgittings S	
OK Cancel	

7. Click on the **Server Types** tab to configure logon options, encryption, log file information and network protocol options, including TCP/IP Settings for your remote server and DNS connections. If necessary, contact your ISP or network administrator to obtain the correct TCP/IP addressing information.

8. Use the **Scripting** tab to define scripts that will run when this connection is made. Click **OK** to complete the configuration.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

Windows 95 NDIS: Dual Channel Access Example (MultiLink)

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

If you would like to use multi-linking with your NDIS connection, first be sure that your ISDN provider supports a 128kbps MLP option.

1. To begin, you will need to create a new dial-up connection as described above ("Windows 95 NDIS : Single Channel Access Example") or modify an existing connection. Right-click on the **Dial-Up Connection** icon and select **Properties**.

My Connection	? ×
General Server Types Scripting	
Add Sectors	
I Use country code and area code (for all devices)	1
Cognitry code: Agea code:	
United States of America (1) 💌 763 💌	
Primary Device: Phone number: 5552000	1
User ISDN-Line0	
📀 Qonfigure	
Set additional devices:	1
Number of additional devices available: 4	
Settings 😽	
OK Cance	1

Click on Settings.
2. The Set Additional Devices screen appears.

Set Additional Devi	ces		Ŷ×
Do not use addi	tional devices		
Cultural Constant	inclusion of the second		
S Use additional d	levices		
Selected device:			
644	Remove	5.0	-1
P(<u>4</u> A	Tremove	Editor	
		-	
	OK.	Cance	el 🛛

3. Select Use Additional Devices. Click Add.

At the **Edit Extra Device** screen, in the **Device Name** drop-down box, select **ISDN-Line1**. Enter the **Phone Number** of your ISP or the remote device that you will be calling with this connection.

Edit Extra Device	? ×
Device name:	<u>0</u> K
Phone number: 5552000	Cancel

When complete, continue to click **OK** to leave the **Set Additional Devices** configuration screens.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

Windows 95 Vcomm: Single Channel Access Example

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

1. Go to **Start | Programs | Accessories | Dial-Up Networking**. At the **Dial-Up Networking** folder, select **Make New Connection**.

😰 Dial-Up Networking 📃 🔳 🛛		
<u>E</u> ile <u>E</u> dit ⊻i	ew <u>C</u> onnect	tions
<u>H</u> elp		
Make New Connection	A	
1 object(s) sele	cted	- 11.

2. The **Make New Connection** screen appears. Enter a descriptive name for the connection. In the "Select a Modem" drop-down box, highlight **MultiMobile MT128ZLX-ST (modem)**.

Make New Connection	
	Type a name for the computer you are dialing My Connection Select a modern: MultiMobile MT1282LX-ST (modern) ISDN-Line0 ISDN-Line1 MultiMobile MT1282LX-ST (modern)
	K∄esk Newt> Cancel

3. At the next screen, enter the area code and phone number of your ISP or of the remote device you will be calling using this connection. Select the appropriate Country Code and click **Next**> to complete the setup.

Make New Connection	
	Type the phone number for the computer you want to call Agea code: Ielephone number: 763 Cognity code: United States of America (1)
	< Back Next> Cancel

4. At the completion screen, click **Finish**.



The new dialup connection is ready to configure.

5. From the Dial-Up Networking folder, right-click on your new connection icon. Choose Properties.

📴 Dial-Up Network	king 💶 🗵
<u>File E</u> dit <u>V</u> iew <u>C</u> o	onnections
<u>H</u> elp	
Make New My Co	7 C <u>o</u> nnect
Connection	Create <u>S</u> hortcut
	<u>D</u> elete
	Rena <u>m</u> e
Opens the property sh	Properties

6. On the **General** tab, type in the phone number for the adapter port. You may change the connection options by clicking **Configure**.

Ny Connection ? 🗙
General Server Types Scripting
My Connection
✓ Uge country code and area code (for all devices)
Country code: Agea code: United States of America (1) 763
Primary Device:
Usigg: MultiMobile MT128ZLX-ST (modem)
Configure
- Set additional devices:
Number of additional devices available: 4
Sgillings
OK Cancel

7. Click on the **Server Types** tab to configure logon options, encryption, log file information and network protocol options, including TCP/IP Settings for your remote server and DNS connections. If necessary, contact your ISP or network administrator to obtain the correct TCP/IP addressing information.

8. Use the **Scripting** tab to define scripts that will run when this connection is made. Click **OK** to complete the configuration.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

Windows 95 Vcomm: Dual Channel Access Example (MultiLink)

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

If you would like to use multi-linking with your VCOMM connection, first be sure that your ISDN provider supports a 128kbps MLP option.

In order to use VCOMM multi-linking, you must install a second ISDN device in the **Modems** applet in the **Control Panel**. The first ISDN device was installed automatically during the initial driver installation.

1. Install the virtual modem for your MT128ZLX in Windows 95 by selecting **Start | Settings | Control Panel | Modems | Add**. The **Install New Modems** screen will appear.



Select "Other" and click Next>.

2. At the next screen, Windows 95 will prepare to detect your modem. Click on "Do not detect my modem; I will select it from a list."

Windows will now try to detect your modem. Before continuing, you should: 1. If the modem is attached to your computer, make sure it is turned on. 2. Quit any programs that may be using the modem
Click Next when you are ready to continue.
< <u>B</u> ack Next> Cancel

Click Next>.

3. The next screen displays a list of modem manufacturers and modem models. In the **Manufacturers** pane, highlight "MultiTech." In the **Models** pane, highlight "MultiMobile MT128ZLX-ST (modem)."

Install New Modem
Click the manufacturer and model of your modem. If your modem is not listed, or if you have an installation disk, click Have Disk.
Manufacturers: Models Motorola (Ger) Motorola - International MTD Systems MultiMobile MT128ZLX-ST (modem) MultiMobile MT128ZLX-ST (modem)
<u>H</u> ave Disk
< <u>B</u> ack Mext> Cancel

Click Next>.

 Install New Modem

 You have selected the following modem:

 MultiMobile MT128ZLX-ST (modem)

 Select the port to use with this modem:

 Communications Port (COM1)

 ECP Printer Port [LPT1)

 ISDN 2nd COM

 MultiMobile N_1128ZLX-ST (COM port) (COM7)

 Witten Infrared COM port

 Virtual Infrared COM port

4. The next screens allows you to select which COM port to use with the MT128ZLX.

Select "ISDN 2nd COM." Click Next>.

5. At the completion screen, click **Finish**. You should now see two ISDN devices in the **Modems Properties** window.

Modems Properties ? ×
General Diagnostics
The following moderns are set up on this computer:
MultiMobile MT1282LX-ST (modern) MultiMobile MT1282LX-ST (modern) #2
Add Remove Properties
Dialing from: Default Location
Use Dialing Properties to modify how your calls are dialed.
Dialing Properties
Close Canpel

Click **Close** to exit from the **Modems Properties** window. Then close the **Control Panel** window.

6. For this example, we will use the existing connection that was created in the VCOMM single-channel procedure above ("Windows 95 Vcomm: Single Channel Access Example").

Go to **Start | Programs | Accessories | Dial-Up Networking**. This will open up the **Dial-Up Networking** folder.

From the Dial-Up Networking folder, right-click on your new connection icon. Choose Properties.

📴 Dial-Up Network	ing 🔳 🗆 🗙
<u>File E</u> dit <u>V</u> iew <u>C</u> o	nnections
<u>H</u> elp	
Make New My Co	d Lonnect
Connection	Create <u>S</u> hortcut
	<u>D</u> elete
	Rena <u>m</u> e
Opens the property sh	P <u>r</u> operties

7. The Connection menu screen appears. Click on Settings.

My Connection	? ×
General Server Types Scripting	
My Connection	
Use country code and area code (for all devices)	- 1
Cognitry code: Area code:	
United States of America (1) 💌 763 💌	
Primary Device:	
Phone number: 5552000	
Using: MultiMobile MT1282LX-ST (modern)	
Configure	
Set additional devices:	
Number of additional devices available: 5	
Settings	
OK Cane	el
	_

8. The Set Additional Devices screen appears.

Set Additional Devices		
C Use additional d	evices	
Sejected device:		
<u>Add</u>	Eemove	<u>E</u> dt
	0K.	Cancel

9. Select Use Additional Devices. Click Add.

At the **Edit Extra Device** screen, in the **Device Name** drop-down box, select **MultiMobile MT128ZLX-ST** (modem) #2. Enter the **Phone Number** of your ISP or of the remote device that you will be calling with

	Edit Extra Device	? ×
	Device name:	
	MultiMobile MT128ZLX-ST (modem)	<u>0</u> K
	Phone number: 5552000	Cancel
this connection.		

When complete, continue to click **OK** to leave the **Set Additional Devices** configuration screens.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

Windows 95 CAPI: Single Channel Access Example

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.
 If you are connecting to a non-Windows server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.
 If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

To use the Common ISDN Application Interface (CAPI), you must install a CAPI-compliant telecommunications application, such as the RVS-COM Lite program, which will be used for this example.

After installing RVS-COM Lite, several new virtual modems become available to configure. The following example uses the RVS ISDN V.120 modem. Before beginning, be sure that the RVS-COM Center is running (the icon will appear in the Windows 95 Task Bar).

1. Go to **Start | Programs | Accessories | Dial-Up Networking**. At the **Dial-Up Networking** folder, select **Make New Connection**.

😰 Dial-Up Networking 🛛 🗖 🗙		
<u>File E</u> dit <u>V</u> iev	v <u>C</u> onnections	
<u>H</u> elp		
Make New Connection	ß	
1 object(s) selected		

2. The **Make New Connection** screen appears. Enter a descriptive name for the connection. In the "Select a Modem" drop-down box, highlight **RVS ISDN V.120**.

Make New Connection	
	Type a name for the computer you are dialing: My Connection Select a modem:
	< Reck Next > Cancel

Click **Next**>.

3. At the next screen, enter the area code and phone number of your ISP or of the remote device you will be calling using this connection. Select the appropriate Country Code and click **Next**> to complete the setup.

Make New Connection	
	Type the phone number for the computer you want to calt Agea code: Lelephone number: 763 . 5552000
1	Country code: United States of America (1)
	<back next=""> Cancel</back>

4. At the completion screen, click **Finish**.

Make New Connection	
	You have successfully created a new DiaHUp Networking connection called My Connection Click Finish to save it in your DiaHUp Networking folder. Double-click it to connect. To edit this connection later, click it, click the File menu and then click Properties.
	< Back Finish Cancel

The new dialup connection is ready to configure.

5. From the **Dial-Up Networking** folder, right-click on your new connection icon. Choose **Properties**.

😥 Dial-Up Networking 🛛 🗖 🗙		
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>C</u> onnections		
<u>H</u> elp		
Make New MyCo	∂ C <u>o</u> nnect	
Connection	Create <u>S</u> hortcut	
	<u>D</u> elete	
	Rena <u>m</u> e	
Opens the property sh		

6. On the **General** tab, type in the phone number for the adapter port. You can change the connection options by clicking **Configure**.

My Connection ? 🗙
General Server Types Scripting
My Connection
✓ Use country code and area code (for all devices)
Cognitry code: Area code:
United States of America (1) 💌 763 💌
Primary Device:
Ehone number: 5552000
Using RVS ISDN V.120
Configure
Set additional devices:
Number of additional devices available: 11
Sgittings
0K Cancel

7. Click on the **Server Types** tab to configure logon options, encryption, log file information and network protocol options, including TCP/IP Settings for your remote server and DNS connections. If necessary, contact your ISP or network administrator to obtain the correct TCP/IP addressing information.

8. Use the **Scripting** tab to define scripts that will run when this connection is made. Click **OK** to complete the configuration.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

Windows 95 CAPI: Dual Channel Access Example (MultiLink)

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

 You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.
 If you are connecting to a non-Windows server, you will also need to know in advance

whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

If you would like to use multi-linking with your CAPI connection, first be sure that your ISDN provider supports a 128kbps MLP option.

The ports you link must first be enabled through RVS-Com. In this example, the RVS ISDN V.120 modems are used.

1. To enable the ports in RVS-Com, open the RVS-Com Comm Center.

2. Click the **Services** tab. In the **Virtual Com Ports** section of the window, place a check mark in front of both ports. Associate each port with a unique COM port number (the two devices must use different COM ports).

Click Apply, and then OK.

Next you will need to identify the two modems to be linked or installed.

3. In the example, if two RVS ISDN V.120 modems do not exist, you will need to create a new definition for each of them. To create a new definition, go to **Start | Settings | Control Panel | Modems | Add**. The **Install New Modems** screen will appear.





2. At the next screen, Windows 95 will prepare to detect your modem. Click on "Do not detect my modem; I will select it from a list."

Install New Modem	
	 Windows will now try to detect your modern. Before continuing, you should: 1. If the modern is attached to your computer, make sure it is turned on. 2. Quit any programs that may be using the modern. Click Next when you are ready to continue. Image: Click Next when you are ready to continue. Image: Click Next when you are ready to continue.
	< Back Next> Cancel

Click Next>.

3. The next screen displays a list of modem manufacturers and modem models. In the **Manufacturers** pane, highlight "RVS Datentechnik." In the **Models** pane, highlight "RVS ISDN V.120."

Install New Modem	
Click the manufact or if you have an in	urer and model of your modern. If your modern is not listed, stallation disk, click Have Disk.
Racal Reveal RFI Elektronik Rockwell RVS Datestechnik Sohmidt Elektronic Laborate	
	< Back Next > Cancel

Click Next>.

4. The next screens allows you to select which COM port to use with the "RVS ISDN V.120 modem."



Select "RVS Port (COM 4)." Click Next>.

5. At the completion screen, click **Finish**. You should now see two "RVS ISDN V.120" devices in the **Modems Properties** window.

Modems Properties
General Diagnostics
The following moderns are set up on this computer:
PIVS ISDN Modern analog
FIVS ISDN V.120
RVS ISDN V.120 #2
RVS ISDN X 75 transnarent
Add Remove Properties
Dialing Preferences Dialing from: Default Location Use Dialing Properties to modify how your calls are dialed
Dialing Properties
Close Ganzel

Click **Close** to exit from the **Modems Properties** window. Then close the **Control Panel** window.

6. For this example, we will use the existing connection that was created in the CAPI single-channel procedure above ("Windows 95 CAPI: Single Channel Access Example").

Go to **Start | Programs | Accessories | Dial-Up Networking**. This will open up the **Dial-Up Networking** folder.

From the Dial-Up Networking folder, right-click on your new connection icon. Choose Properties.

📴 Dial-Up Networking 🛛 🗖 🗙	
<u>File E</u> dit <u>V</u> iew <u>C</u> onnections	
<u>H</u> elp	
Make New	Connect
Connection	Create <u>S</u> hortcut <u>D</u> elete Rena <u>m</u> e
Opens the property sh	Properties

7. The Connection menu screen appears. Click on Settings.

My Connection	?	X
General Server Tupes Scripting		
N		1
My Connection		
- V Use country code and area cor	te (for all devices)	
United States of America (1)	⊻ ⁷⁶³ ⊻	
Discus Devices		
Primary Device:		
Phone number: 5552000		
Using: RVS ISDN V.120	•	
	Configure	
Set additional devices:		
Number of additional devices av	ailable: 12	
	Settings	
	<u> </u>	
	OK Cancel	

8. The Set Additional Devices screen appears.

et Additional Dev	ices	? ×
C Use additional of	devices	
Selected device:	Courses	
P <u>3</u> 1	Elemone	<u>Eq.</u>
	0K.	Cancel

9. Select Use Additional Devices. Click Add.

At the **Edit Extra Device** screen, in the **Device Name** drop-down box, select **RVS ISDN V.120 #2**. Enter the **Phone Number** of your ISP or of the remote device that you will be calling with this connection.

Edit Extra Device	? ×
Device name: RVS ISDN V.120 #2	<u></u> K
Phone number: 5552000	Cancel

When complete, continue to click **OK** to leave the **Set Additional Devices** configuration screens.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

3 Installation & Use in Windows 98

MT128ZLX-ST/NT: Windows 98 Driver Procedures

Windows 98 Installation

NOTE: Before beginning the installation, you must obtain the following technical information from your telephone company:

SPIDs (North America only)

Switch Type

Voice Encoding scheme

Telephone Number(s)

- NOTE: As you begin this procedure, the MT128ZLX card should <u>not</u> be installed in the computer's PCMCIA slot. The setup.exe file must be run before the card is installed. Otherwise problems will arise as Windows 98 detects the device.
- NOTE: During the installation, you should have your Windows 98 CD-ROM close at hand. Windows 98 may need to add or update files which must be copied from the CD.

1. For now, leave the MT128ZLX card out of the computer's PCMCIA slot.

2. Insert the MT128ZLX Installation CD into the computer's CD-ROM drive.

3. Using Windows Explorer, browse to the win9x directory on the MT128ZLX Installation CD.



4. Double-click on the Setup.exe file to launch the Configuration Utility Setup program.

At the Welcome screen, click Next.

5. At the **Choose Destination Location** screen, you can accept the default path or enter a different path at which to install the **Configuration Utility** files.



Click **Next**>.

6. At the **Select Program Folder** screen, you can accept the default folder or select another folder into which the program icons will be added.



Then click Next>.

7. The **Start Copying Files** screen allows you one last chance to go back and change information that you have provided in previous steps.

Start Copying Files		×
	Setup has enough information to start copying the program files. If you want to review or change any settings, click Back. If you are satisfied with the settings, click Next to begin copying files. Current Settings: Copy the ISDN Card Application and Driver	
	< <u>B</u> ack <u>Next></u> Cancel	

When satisfied with your settings, click Next> to begin copying files.

8. Progress screens will appear while files are being copied to your hard disk.

9. The **Configuration Utility** screen appears, displaying the various applets of the Configuration Utility program.



Close the **Configuration Utility** window.

10. At the Setup Complete, screen, select Yes, I want to restart my computer now.

Setup Complete	N
	Setup has finished copying files to your computer. Before you can use the program, you must restart Windows or your computer. Yes, I want to restart my computer now No, I will restart my computer later. Remove any disks from their drives, and then click Finish to complete setup.
	< <u>B</u> ack Finish

Click Finish.

11. When the restart process is complete, a message will appear indicating that "ISDN PC Card does not exist," meaning that the card is not in the computer's PCMCIA slot. This is normal. After the drivers are installed, this message will appear upon restart anytime the MT128ZLX card is not installed in its slot.



Click OK.

12. Insert the MT128ZLX into the computer's PCMCIA slot.



13. Windows 98 will detect the MT128ZLX card. The **New Hardware Found** wizard will display a series of screens indicating that is has found new hardware and that it is installing the corresponding software.

Network ? 🗙
Configuration Identification Access Control
The following patients components are installed
Clark in Microsoft Naturalis
DiskUp Adapter
3 NetBEUI
File and printer sharing for Microsoft Networks
Add Berrows Bogertes
Primary Network Logon:
Client for Microsoft Networks
Ele and Print Shating
Description
OK. Cancel

14. Go to **Start | Settings | Control Panel**. Select the **Network** icon. Select the **Configuration** tab.

Click Add.

15. At the **Select Network Component Type** screen, highlight **Adapter** and click **Add**.

Select Network Component Type	? ×
Click the type of network component you want to install: Client Adapter Protocol Service	Add Cancel
A network adapter is a hardware device that physically connects your computer to a network.	

16. At the **Select Network Adapters** screen, highlight "MultiTech" in the **Manufacturers** pane. In the right pane (the **Network Adapters** pane), the MT128ZLX ISDN Adapter appears in the list.

Select Network adapters	×
Click the Network you have an instal	adapter that matches your hardware, and then click DK. If llation disk for this device, click Harve Disk.
Myoufacturers: Microdyne Microzoft Microzoft Micro MultiTech	Network Adapters:
	Have Disk
	OK Cancel

Click **OK**. This installs the NDIS Application Program Interface and adds **ISDN-LINE0** and **ISDN-LINE1** to the list of devices in **Dial-Up Networking**. At the **Network** screen (under the **Configuration** tab), click **OK**.

17. The ISDN Configuration wizard begins.



NOTE: The information entered in the Microsoft ISDN Configuration wizard does not affect the operation of the MT128ZLX. However, completing this wizard is necessary to update certain dial-up networking software components to add ISDN functionality to Windows 98. The MT128ZLX is configured for use with the Configuration Utility that was installed during driver installation. In the section "Configuring the MT128ZLX" (presented later in this chapter), you will supply setup information for using the Configuration Utility program with your particular computer.

Click Next>.

18. Accept the default value for the "Switch Protocol." Click Next>.



19. The next wizard screen requests **Phone Number** and **SPID** information. It is not necessary to enter this information here. You will be asked to supply this information later (in the **Configuration Utility** program).

ISDN Configuration	
	Enter the telephone numbers and the corresponding SPIDs (Service Profile ID). If you have only one telephone number you may leave the second phone number blank. If your telephone company does not require a SPID, leave the SPID fields blank.
7	Phone number: SPID: Cancel
	SPID: Phone number: SPID: < <u>Back</u> Cancel

Leave the fields of this dialog box blank. Click Next>.

20. At the 'completion' screen, click Finish.

ISDN Configuration	
	The ISDN configuration is complete. To use ISDN, create a new connection using DiaHUp Networking, and select your ISDN adapter as the device to use for the connection. To modify the settings you have just entered, go to the ISDN Tools program group under Accessories on the Start Menu and click on ISDN Configuration Wizard.
	< Back Filligh Cancel

21. In some cases, Windows 98 may require an additional software component which can be loaded from the Windows 98 CD-ROM. If this occurs, a notification screen will appear.

Insert Dis	ek 💦 🔀
8	Please insert the disk labeled Windows 98 Second Edition CD-ROM', and then click DK.
	DK

Insert your Windows 98 CD into the CD-ROM drive and follow the Windows 98 messages to allow the required files to be copied.

22. When the ISDN Configuration wizard process is complete, you will be prompted to restart your computer.

System	Setting: Change 🛛 🕅
You must restart your computer before the new settings will take effect Do you want to restart your computer new?	
	<u>Yes</u> <u>No</u>

Click Yes.

23. Driver installation is now complete. However, before you can use your MT128ZLX in Windows 95, it must be configured with SPIDs (in the U.S. and Canada), telephone numbers, voice-encoding information, and switch-type information. (See the procedure "Configuring the MT128ZLX in Windows 98" below.)

Verifying the Windows 98 Installation

1. Go to **Start | Settings | Control Panel**. Click on the **System** icon. When the **System Properties** screen appears, select the **Device Manager** tab.



2. After a successful driver installation, the **Device Manager** will contain the following entries:

MultiMobile MT128ZLX-ST (ISDN)

MultiMobile MT128ZLX-ST (modem)

MultiMobile MT128ZLX-ST Multi-Function Card

MultiMobile MT128ZLX-ST ISDN TA (Net)

3. If these entries do not appear, re-do the driver installation procedure. If the installation fails repeatedly, call MultiTech Tech Support (800-972-2439).

Configuring the MT128ZLX-ST/NT in Windows 98

NOTE: In this procedure, you will be asked to enter detailed configuration information that relates to the ISDN equipment being used by your telephone company. Specifically, your telephone company must provide the following information:

SPIDs, Phone Numbers, Switch Type, and Voice Encoding type.

This information is supplied by your telephone company and you must have it available when doing this procedure.

1. Go to **Start | Programs | Configuration Utility | Config.** The **Configuration Utility** dialog box will appear.

🚖 Configuration Utility	×			
Switch Type General COM Port Setting Tools				
Select the switch type that your ISDN service provider is using.				
Switch Type :	T SESS			
Phone Number	Phone Number			
Enter the ISDN phone numbers and the Service Profile Identifier number (SPID) from your ISDN service provider.				
B1 Number :	B1 SPID :			
B2 Number :	B2 SPID :			
B Channel Speed	Voice Encoding			
C 56K	C A-law for European countries			
€ 64K.	Mulaw for North American countries			
	Set Default			
	OK Cancel Apply			

2. Enter the information needed in each field of the dialog box.

Configuration Utility			
Switch Type General COM	Port Setting Tools		
Select the switch type that your ISDN service provider is using.			
Switch Type : 🕅	T 5E55 Detail		
Phone Number			
Enter the ISDN phon	e numbers and the Service Profile		
Identitier number (SP	D) non your ISDN service provider.		
B1 Number :	B1 SPID :		
B2 Number :	B2 SPID :		
B Channel Speed	Voice Encoding		
C 56K	C A-law for European countries		
€ 64K.	Mu-law for North American countries		
	Set Default		
		_	
	OK Cancel Apply		

Switch Type:	See listed options.
Phone Numbers:	B1 number and B2 number.
SPID	Needed only in the U.S. and Canada.
B-Channel Speed	56 kbps or 64 kbps
Voice Encoding:	for Net3 or ETSI, use A-law voice encoding
	for other switches, use Mu-law voice encoding

NOTE: It is essential for the proper operation of your device that this information is entered correctly. Please take a moment to verify that the information entered is correct.

Click OK.

Uninstalling MT128ZLX-ST/NT Drivers in Windows 98

1. Close the **Status** program. After the **Configuration Utility** has been installed, the Status program's icon normally appears at the lower right corner of your screen. Click on this icon and close the Status program.

NOTE: Failure to close the **Status** program at this point will result in an incomplete uninstallation process.

2. Go to **Start | Settings | Control Panel**. Click on the **Add/Remove Programs** icon. The **Add/Remove Programs Properties** dialog box will appear. At the **Install/Uninstall** tab, highlight **Configuration Utility**. Click on the **Add/Remove** button.

Add/Remo	Add/Remove Programs Properties 🔹 😰 🗷		
Install/Uninstall Windows Setup Startup Disk			
2	To install a new program from a floppy disk or CD-ROM drive, click Install.		
	Instal		
7	The following software can be automatically remo Windows. To remove a program or to modify its in components, select it from the list and click. Add/Remove.	ived by istalled	
ATIDis	play Driver		
		- 11	
		- 11	
		- 11	
Add/Bemove			
	OK Cancel	Apply	

3. At the **Confirm File Deletion** screen, click **Yes**.



4. The **Uninstall Shield** program will appear. At the **Remove Programs From Your Computer** screen, click **OK**.



If, for any reason, the **Status** screen was not closed earlier (step 1), the uninstall procedure will be incomplete and some program files will remain on the computer. If this happens, the **Remove Programs From Your Computer** screen will point out that files need to be removed manually. To identify the files that must be manually deleted later, click on the **Details** button. Record file names as needed.

Details	
File in use "C-VProgram Files/configuration Utility/Configuration Utility/Status.exe/ File in use "C-VProgram Files/configuration Utility/Configuration Utility/Status.dl". Unable to delete folder "C-VProgram Files/configuration Utility/Configuration Utility/ Unable to delete folder "C-VProgram Files/configuration Utility/.	2
<u>*</u>	۲ ۲
	OK

Click **OK** to proceed.

5. A message screen appears recommending that you restart your computer.

'Configuration Utility' has been removed from your system. It is recommended that you restart your machine to remove files that were in use during uninstall.	

Click **OK**. Then restart your computer.

MT128ZLX: Using APIs in Windows 98

About APIs

The MT128ZLX-ST/NT operates in conjunction with three Application Program Interface software packages: NDIS, VCOMM, or CAPI. This chapter presents examples of how the MT128ZLX can be used with these APIs. The CAPI-compliant program used in these examples is RVS-COM Lite.

Each API contains software components that interact with the operating system of the computer in which the MT128ZLX is installed. Each API adds communications functionality to the system. Each of the three APIs adds a somewhat different set of features to the system, as summarized in the table below and described more fully in subsequent sections.

API	Full Name	Functionality
NDIS	Network Driver Interface Specification	dial-up networking (DUN)connection, network interface card (NIC) emulation
VCOMM	Virtual Communications Driver	dial-up networking (DUN)connection, modem emulation
CAPI	Common ISDN Application Program Interface	dial-up networking (DUN)connection, modem emulation, G3 and G4 FAX, V.110, V.120, X.75, HDLC, interface to ISDN features and services

The NDIS API

NDIS allows Network Interface Cards (NICs) to work with each other, with the operating system, and with higher order protocol drivers. NDIS is an interface that facilitates development of NIC drivers. NDIS program routines can implement the functions that NIC drivers must perform. These include interaction with protocol drivers, the handling of hardware interrupts, and interface with underlying NICs by dealing with registers, port I/O, and other functionality. NDIS allows drivers to be developed in high-level programming languages, such that their creation and implementation are platform-independent.

The VCOMM API

The communications device driver known as "VCOMM" provides protected-mode services. It allows makes ports and modems available to Windows-based software application programs. VCOMM also uses plug-and-play functionality to simplify the installation and configuration of communications devices.

The CAPI API

Being a common interface, the ISDN CAPI (Common Application Program Interface), allows software programs to use all ISDN services. Computer programs have access to most services and features of ISDN when used with CAPI. This access is hardware-independent. CAPI makes call numbers available, as well as several kinds of service information: caller number, called number, call charges, ISDN service ID. CAPI also facilitates transmission of data, FAX, or voice, and multiple B-channels can also be used simultaneously on a single call.

It is the capabilities of the ISDN adapter and the type of ISDN connection that determine which services and features are actually available. CAPI merely serves as a common interface. ISDN CAPI is a platform-independent standard which can be used in non-Windows operating systems like OS/2 and UNIX, as well as in Microsoft operating systems.

CAPI 2.0 is the current form of CAPI. ISDN adapters with CAPI 2.0 can be used anywhere in Europe with the DSS1 Euro-ISDN connection.

Intro to API Single-Channel and MultiLink Examples

In the following procedures, you will use Application Program Interfaces (APIs) to set up and use dial-up networking with the MT128ZLX in conjunction with the particular operating system your computer is using. The APIs are installed as part of the MT128ZLX driver installation, which must be complete before these procedures can be done. Note that the procedures presented here are examples only. Your use of APIs will depend on the needs and limitations of your operating environment.
Windows 98 NDIS : Single Channel Access Example

- NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.
 - 1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.
 - 2. If you are connecting to a non-Windows NT server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.
 - 3. If applicable, you will need to know the domain name of the network to which you will be connected.
 - 4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

1. Go to **Start | Programs | Accessories | Communications | Dial-Up Networking**. If this is your first communications connection, the **Welcome to Dial-Up Networking** screen will appear. Otherwise, click on the **Make New Connection** icon.



Click Next>.

The **Make New Connection** screen appears. Enter a descriptive name for the connection. In the "Select a device" drop-down box, highlight **ISDN-Line0**.

Make New Connection		×
	Lype a name for the computer you are dialing: My Connection Select a device: MultiMobile MT1282LX-ST (modem) ISDN-Line0 ISDN-Line1 MultiMobile MT1282LX-ST (modem)	
	KRack Next> Cancel	

Click **Next**>.

3. At the next screen, enter the area code and phone number of your ISP or the remote device you will be calling using this connection. Select the appropriate Country or Region Code and click **Next**> to complete the setup.



4. At the completion screen, click **Finish**.



The new dialup connection is ready to configure.

5. From the Dial-Up Networking folder, right-click on your new connection icon. Choose Properties.



6. On the **General** tab, type in the phone number for the adapter port. You may change the connection options by clicking **Configure**.

My Connection	? ×
General Server Types Scripting Multilink	
My Connection	
Phone number:	- 1
Area code: Telephone number:	
763 💌 - 5552000	
Country code:	
United States of America (1)	
Uge area code and Dialing Properties	
Cognect using:	- L
ISDN-Line0	
Configure	
OK Car	cel

7. Click on the **Server Types** tab to configure logon options, encryption, log file information and network protocol options, including TCP/IP Settings for your remote server and DNS connections. If necessary, contact your ISP or network administrator to obtain the correct TCP/IP addressing information.

8. Use the **Scripting** tab to define scripts that will run when this connection is made. Click **OK** to complete the configuration.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

Windows 98 NDIS: Dual Channel Access Example (MultiLink)

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

If you would like to use multi-linking with your NDIS connection, first be sure that your ISDN provider supports a 128kbps MLP option.

1. To begin, you will need to create a new dial-up connection as described above ("Windows 98 NDIS : Single Channel Access Example") or modify an existing connection. Right-click on the **Dial-Up Connection** icon and select **Properties**.

My Connection	? ×
General Server Types Scripting Multilink	
My Connection	
Phone number:	- 1
Arcs cost: Telephone number: 763 5552000	
Country code:	
United States of America (1)	
Lyuze area code and Dialing Properties	
Cognect using:	
ISDN-Line0	
Configure	
OK Car	icel

Click on the **MultiLink** tab.

My Connection	<u> ? ×</u>
General Server Types Scripting Multilin	k
C. Do not use additional devices	
Device name	Phone #
ISDN-Line1	5552000
Sejected device: ISDN-Line1	
A <u>d</u> d <u>R</u> emove	<u>E</u> dit
0	Cancer

2. Select Use Additional Devices. Click Add.

At the **Edit Extra Device** screen, in the **Device Name** drop-down box, select **ISDN-Line1**. Enter the **Phone Number** of your ISP or of the remote device that you will be calling with this connection.

Edit Extra Device	? ×
Device name:	<u></u> K
Phone number: 5552000	Cancel

When complete, continue to click **OK** to leave the **Set Additional Devices** configuration screens.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

Windows 98 VCOMM: Single Channel Access Example

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

1. Go to **Start | Programs | Accessories | Communications | Dial-Up Networking**. If this is your first communications connection, the **Welcome to Dial-Up Networking** screen will appear. Otherwise, click on the **Make New Connection** icon.



Click Next>.

2. The **Make New Connection** screen appears. Enter a descriptive name for the connection. In the "Select a device" drop-down box, highlight **MultiMobile MT128ZLX-ST (modem)**.



Click Next>.

3. At the next screen, enter the area code and phone number of your ISP or of the remote device you will be calling using this connection. Select the appropriate Country Code and click **Next**> to complete the setup.



Click Next>.

4. At the completion screen, click **Finish**.



The new dialup connection is ready to configure.

5. From the Dial-Up Networking folder, right-click on your new connection icon. Choose Properties.



6. On the **General** tab, type in the phone number for the adapter port. You may change the connection options by clicking **Configure**.

My Connection	?×
General Server Types Scripting Multilink	
My Connection	
Phone number	- 1
Ajea code: Telephone number:	
Country code:	
United States of America (1)	
IV U₂e area code and Dialing Properties	
Cognect using:	
MultiMobile MT128ZLX-ST (modern)	
Configure	
OK Can	cel

7. Click on the **Server Types** tab to configure logon options, encryption, log file information and network protocol options, including TCP/IP Settings for your remote server and DNS connections. If necessary, contact your ISP or network administrator to obtain the correct TCP/IP addressing information.

8. Use the **Scripting** tab to define scripts that will run when this connection is made. Click **OK** to complete the configuration.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

Windows 98 Vcomm: Dual Channel Access Example (MultiLink)

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

If you are connecting to a non-Windows server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

If you would like to use multi-linking with your VCOMM connection, first be sure that your ISDN provider supports a 128kbps MLP option.

In order to use VCOMM multi-linking, you must install a second ISDN device in the **Modems** applet in the **Control Panel**. The first ISDN device was installed automatically during the initial driver installation.

1. Install the virtual modem for your MT128ZLX in Windows 98 by selecting **Start | Settings | Control Panel | Add**. The **Install New Modems** screen will appear.



Select "Other" and click Next>.

2. At the next screen, Windows 98 will prepare to detect your modem. Click on "Do not detect my modem; I will select it from a list."

Install New Modem	
	 Windows will now try to detect your modern. Before continuing, you should: 1. If the modern is attached to your computer, make sure it is turned on. 2. Quit any programs that may be using the modern. Click Next when you are ready to continue. Image: Click Next when you are ready to continue. Image: Click Next when you are ready to continue.
	<back next=""> Cancel</back>

Click Next>.

3. The next screen displays a list of modem manufacturers and modem models. In the **Manufacturers** pane, highlight "MultiTech." In the **Models** pane, highlight "MultiMobile MT128ZLX-ST (modem)."

Install New Modem
Click the manufacturer and model of your modem. If your modem is not listed, or if you have an installation disk, click Have Disk.
Manufacturers: Models
Motorola (Ger) Motorola - International MTD Systems Mulogic MultiTech MultiTech (Ger)
<u>H</u> ave Disk
< <u>B</u> ack Mext> Cancel

Click Next>.

4. The next screens allows you to select which COM port to use with the MT128ZLX.



Select "ISDN 2nd COM." Click Next>.

5. At the completion screen, click **Finish**. You should now see two ISDN devices in the **Modems Properties** window.

Modem: Propertie:
General Diagnostics
The following moderns are set up on this computer.
MultMobile MT1262LX-ST (modern) MultMobile MT1262LX-ST (modern) #2
Add Rgmove Pjoperties
Dialing Preferences
Dialing from: Default Location
Use Dialing Properties to modify how your calls are dialed.
Dialing Properties
Close Control

Click **Close** to exit from the **Modems Properties** window. Then close the **Control Panel** window.

6. For this example, we will use the existing connection that was created in the VCOMM single-channel procedure above ("Windows 98 Vcomm: Single Channel Access Example").

Go to **Start | Programs | Accessories | Communications | Dial-Up Networking**. This will open up the **Dial-Up Networking** folder.

From the **Dial-Up Networking** folder, right-click on your new connection icon. Choose **Properties**.

😢 Dial-Up Networking 📃 💷 🗙				
Eile Edit	⊻іем	<u>G</u> o	Favorites	>>
÷.	. ⇒		Ē.	33
Bask.	Forwa	rd	Up	
Address 😰	DiaHUpl	Netwo	king	
Connection Create Shortcut				
	Rename			
		Pj	operties	
Opens the property sheet of selected items. //				

7. The Connection menu screen appears. Click on the **MultiLink** tab.

My Connection	? ×			
General Server Types Scripting Multilink				
C. Do not use additional devices				
Use additional devices				
Device name Phone #				
MultiMobile MT128ZLX-ST (modem) 5552000				
Sejected device: MultiMobile MT128ZLX/ST (modem)				
Add Bemove Edt				
0K Cano	e			

Select Use Additional Devices. Click Add.

with this

8. At the **Edit Extra Device** screen, in the **Device Name** drop-down box, select **MultiMobile MT128ZLX-ST (modem) #2**. Enter the **Phone Number** of your ISP or of the remote device that you will be calling

	Edit Extra Device	? ×
	Device name:	
	MultiMobile M1128/2LX-51 [modem]	
	Phone number: 5552000	Cancel
nection.		

When complete, continue to click **OK** to leave the **Set Additional Devices** configuration screens.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

Windows 98 CAPI: Single Channel Access Example

NOTE: To c	complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.
	1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.
	2. If you are connecting to a non-Windows server, you will also need to know in advance
	whether or not the server requires you to type in login information or to know TCP/IP
	addresses before dialing.
	3. If applicable, you will need to know the domain name of the network to which you will be
	connected.
	4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

To use the Common ISDN Application Interface (CAPI), you must install a CAPI-compliant telecommunications application, such as the RVS-COM Lite program, which will be used for this example.

After installing RVS-COM Lite, several new virtual modems become available to configure. The following example uses the RVS ISDN V.120 modem. Before beginning, be sure that the RVS-COM Center is running (the icon will appear in the Windows 98 Task Bar).

1. Go to **Start | Programs | Accessories | Communications | Dial-Up Networking**. If this is your first communications connection, the **Welcome to Dial-Up Networking** screen will appear. Otherwise, click on the **Make New Connection** icon.



Click **Next**>.

2. The **Make New Connection** screen appears. Enter a descriptive name for the connection. In the "Select a device" drop-down box, highlight **RVS ISDN V.120**.

Make New Connection		×
	Type a name for the computer you are dialing: My Connection Select a gevice:	× 1 ×
	< Beck Next> Car	cel

Click Next>.

3. At the next screen, enter the area code and phone number of your ISP or of the remote device you will be calling using this connection. Select the appropriate Country Code and click **Next**> to complete the setup.

Make New Connection	×
	Type the phone number for the computer you want to call: Agea code:elephone number: 763 • 5552000 Cognity or region code: United States of America (1) •
	< Back Next Cancel

4. At the completion screen, click **Finish**.



The new dialup connection is ready to configure.

5. From the Dial-Up Networking folder, right-click on your new connection icon. Choose Properties.



6. On the **General** tab, type in the phone number for the adapter port. You may change the connection options by clicking **Configure**.

My Connection	ŶΧ
General Server Types Scripting Multilink	
Bee My Connection	
Phone number:	- 1
Agea code: Telephone number:	8
763 . 5552000	Ť.
Country code:	
United States of America (1)	
Uge area code and Dialing Properties	
Cognect using	
RVS ISDN V. 120	
Configure	
UN Can	

7. Click on the **Server Types** tab to configure logon options, encryption, log file information and network protocol options, including TCP/IP Settings for your remote server and DNS connections. If necessary, contact your ISP or network administrator to obtain the correct TCP/IP addressing information.

8. Use the **Scripting** tab to define scripts that will run when this connection is made. Click **OK** to complete the configuration.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

Windows 98 CAPI: Dual Channel Access Example (MultiLink)

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.
 If you are connecting to a non-Windows server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.
 If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

If you would like to use multi-linking with your CAPI connection, first be sure that your ISDN provider supports a 128kbps MLP option.

The ports you link must first be enabled through RVS-Com. In this example, the RVS ISDN V.120 modems are used.

1. To enable the ports in RVS-Com, open the RVS-Com Comm Center.

2. Click the **Services** tab. In the **Virtual Com Ports** section of the window, place a check mark in front of both ports. Associate each port with a unique COM port number (the two devices must use different COM ports).

Click Apply, and then OK.

Next you will need to identify the two modems to be linked or installed.

3. In the example, if two RVS ISDN V.120 modems do not exist, you will need to create a new definition for each of them. To create a new definition, go to **Start | Settings | Control Panel | Modems | Add**. The **Install New Modems** screen will appear.





4. At the next screen, Windows 98 will prepare to detect your modem. Click on "Do not detect my modem; I will select it from a list."

Install New Modem	
	 Windows will now try to detect your modern. Before continuing, you should: 1. If the modern is attached to your computer, make sure it is turned on. 2. Quit any programs that may be using the modern. Click Next when you are ready to continue. ✓ Don't detect my modern; I will select it from a list.

Click Next>.

5. The next screen displays a list of modem manufacturers and modem models. In the **Manufacturers** pane, highlight "RVS Datentechnik." In the **Models** pane, highlight "RVS ISDN V.120."

Install New Modem	
Click the manufacturer or if you have an instal	and model of your modern. If your modern is not listed, lation disk, click Have Disk.
Manufacturers:	Models
Reveal RFI Elektronik Rockwell RS Components RVS Datentechnik Sinhmidt Flantmore Laborat	RVS ISDN HDLC transparent RVS ISDN Internet PPP RVS ISDN Minitel RVS ISDN Modem analog RVS ISDN V.110 RVS ISDN V.120 RVS ISDN V.25 T 20NI
	Have Disk
	<back next=""> Cancel</back>

Click Next>.

 Install New Modem

 Image: State of the point of the point

Select "RVS Port (COM 5)." Click Next>.

7. At the completion screen, click **Finish**. You should now see two "RVS ISDN V.120" devices in the **Modems Properties** window.

Modem: Propertie:
General Diagnostics
The following modems are set up on this computer:
🗢 RVS ISDN Modem analog 🛛 🔒 🔺
FIVS ISDN V.120
RVS ISDN V.120 #2
RVS ISDN X 75 transnarent
Add Remove Properties
Dialing Preferences Dialing from: Default Location
Use Dialing Properties to modify how your calls are dialed.
Dialing Properties
Close Genod

Click Close to exit from the Modems Properties window. Then close the Control Panel window.

6. The next screens allows you to select which COM port to use with the "RVS ISDN V.120 modem."

8. For this example, we will use the existing connection that was created in the CAPI single-channel procedure above ("Windows 98 CAPI: Single Channel Access Example").

Go to **Start | Programs | Accessories | Communications | Dial-Up Networking**. This will open up the **Dial-Up Networking** folder.

From the Dial-Up Networking folder, right-click on your new connection icon. Choose Properties.



9. The Connection menu screen appears. Click on the MultiLink tab.

My Connection	? ×
General Server Types Scripting Multilink	
C Do not use additional devices	
C Use additional devices	-1
Device name Phone # RVS ISDN V.120 #2 5552000	
1	
Sejected device: RVS ISDN V.120 #2	
AddBemove Edt	
OK Car	ncel

Select Use Additional Devices. Click Add.

10. At the **Edit Extra Device** screen, in the **Device Name** drop-down box, select **MultiMobile MT128ZLX-ST (modem) #2**. Enter the **Phone Number** of your ISP or of the remote device that you will be calling with this connection.

Edit Extra Device	? ×
~	
Device name:	
RVS ISDN V.120 #2	<u>0</u> K
Phone number: EEE2000	Cancel
Enone number: [3332000	

When complete, continue to click **OK** to leave the **Set Additional Devices** configuration screens.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

4 Installation & Use in Windows NT

MT128ZLX-ST/NT: Windows NT4 Driver Procedures

Windows NT4 Installation

Note: To install, configure, and remove devices in Windows NT, your logon permissions must include the ability to load and remove device drivers.



1. Insert the MT128ZLX card into the laptop PC.

2. Insert the MT128ZLX Installation CD into the computer's CD-ROM drive.

3. In Windows Explorer, browse to the NT40 directory on the MT128ZLX Installation CD.

Welcome		×
	Welcome to the Configuration Utility Setup program. This program will install Configuration Utility on your computer.	
	It is strongly recommended that you exit all Windows programs before running this Setup program.	
	Click Cancel to quit Setup and then close any programs you have running. Click Next to continue with the Setup program.	
	WARNING: This program is protected by copyright law and international treaties.	
e y	Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum exten possible under law.	
		_
	<u>N</u> ext > Cancel	

4. Double-click on the Setup.exe file to launch the Configuration Utility Setup program.

At the Welcome screen, click Next>.

5. At the **Choose Destination Location** screen, you can accept the default path or enter a different path at which to install the Configuration Utility files.

Choose Destination Loc	ation	×
	Setup will install Configuration Utility in the following folder.	
	To install to this folder, click Next.	
	To install to a different folder, click Browse and select another folder.	
	You can choose not to install Configuration Utility by clicking Cancel to exit Setup.	
es (1)	Destination Folder	1
	C:\\Configuration Utility Browse	
	< <u>B</u> ack <u>Next></u> Cancel	

Click Next>.

6. At the **Select Program Folder** screen, you can accept the default folder or select another folder into which the program icons will be added.

Setup will add program icons to the Prog You may type a new folder name, or sele Folders list. Click Next to continue.	am Folder listed below. ct one from the existing
Program Folders: Configuration Utility Existing Folders: Administrative Tools (Common) Startup	
< <u>B</u> ack <u>N</u> ex	> Cancel

Then click Next>.

7. The **Start Copying Files** screen allows you one last chance to go back and change the information that you have provided in previous steps.

When satisfied with your settings, click Next> to begin copying files.

8. Progress screens will appear while files are being copied to your hard disk. When file copying is complete, a **Configuration Utility** window will also appear, displaying the three applets of the Configuration Utility program (HW Detect, Protocol Analyzer, and Status monitor).



Close the **Configuration Utility** window.

9. At the Setup Complete, screen, select Yes, I want to restart my computer now.



Click Finish.

### detect			×
		Address	
🔀 Interrupt 1	-	110	<u> </u>
Interrupt 2		120	
Interrupt 3		130	
🔀 Interrupt 4		300	
Interrupt 5	•	320	•
			Correct
	L	<u> </u>	

10. When the restart process is complete, the **HW Detect** window will appear.

This screen presents the IRQ values and base-I/O addresses that are available in the computer. Available resources are marked with a green check. Resources already in use are marked with a red "X."

This is an informational screen only.

Click OK.

NOTE: The resource information presented on the **HW Detect** screen is also available at **Start | Programs | Administrative Tools | Windows NT Diagnostics**. Then select the **Resources** tab. Click on the **IRQ** button to see the IRQ resources already in use. Click on **I/O Port** to see the base-I/O addresses already in use. 11. Go to Start | Settings | Control Panel | Network.. Select the Adapters tab.

Network			? ×
Identification Se	vices Protocols s:	Adapters Bind	dings
Ⅲ <u>₽[1] MS Loop</u>	back Adapter		
Add	<u>R</u> emove	<u>P</u> roperties	Update
MS Loopback A	dapter		
		OK	Cancel

Click Add.

12. The Select Network Adapter screen appears.

Select Ne	etwork Adapter 🔋 🗙	
	Click the Network Adapter that matches your hardware, and then click OK. If you have an installation disk for this component, click Have Disk.	
<u>N</u> etwork	Adapter:	
Com 3C508 ISA 16-bit Ethernet Adapter SCom Etherlink II Adapter (also II/16 and II/16 TP) SCom Etherlink III ISA/PCMCIA Adapter SCom EtherLink III PCI Bus-Master Adapter (3C590) SCom Etherlink16/EtherLink16 TP Adapter SCom Etherlink16/EtherLink16 TP Adapter		
	<u>H</u> ave Disk	
	OK Cancel	

Click Have Disk.

13. At the Insert Disk screen, enter D:\nt40, where "D" is the CD-ROM drive letter.

Insert Disk 🛛 🕅						
F	Insert disk with software provided by the software or hardware manufacturer. If the files can be found at a different location, for example on another drive type a new path to the files below.	OK Cancel				
	D:\nt40					

Click OK.

14. The Select OEM Option screen appears.

Select OEM Option 🛛 🛛				
Choose a software supported by this hardware manufacturer's disk.				
k				
MT128ZLX ST ISDN Adapter for CAPI and NDIS				
OK Cancel <u>H</u> elp				

Click OK.

15. A progress screen will appear while files are being copied.

MultiMobile MT128STZLX Setup			X
Adapter Setting I/O Base: 0x300 • Interrupt: 11 • Mem: 0xD0000 • Pemcia: 365 COMP •	Line Setting Switch Type: PHONE 0: PHONE 1: SPID 0: SPID 1: Analog encoder:	US NI-1	
OK Cancel			

16. The MultiMobile MT128ZLX Setup screen will appear.

Enter the "Adapter Settings" (these are computer resource settings) and the "Line Settings" (these are ISDN settings) that are requested on the screen.

Click OK.

17. A progress screen appears briefly. Then a **Setup Message** screen appears indicating that RAS must be configured.



Click OK.

 Network
 ? X

 Identification
 Services

 Computer Browser
 NetBIOS Interface

 Remote Access Service
 RPC Configuration

 Server
 Workstation

 Add...
 Bemove

 Properties...
 Update

 Description:
 Enables users to work offsite as though connected directly to a network.

 Close
 Cancel

18. At the Network screen, click on the Services tab. Highlight Remote Access Service.

Click on **Properties**.

19. At the Remote Access Setup screen, select Add.

Remote Access	Setup		×
<u>P</u> ort	Device	Туре	
COM1	Standard 28800 bps Modem	Modem (unimodem)	Continue
			Cancel
		\mathbb{R}	<u>N</u> etwork
		Ů	<u>H</u> elp
, <u>A</u> dd	<u>R</u> emove <u>C</u> onfigure	Cļone	

20. The Add RAS Device screen appears.

Add RAS Device		X
RAS Capable <u>D</u> evices:		OK
ISDN1 - MT128STZLX	•	Cancel
		<u>H</u> elp
		Install <u>M</u> odem
		Install X25 <u>P</u> ad

Highlight "ISDN1 – MT128STZLX" and click OK.

Remote Acce	ss Setup		×
<u>P</u> ort	Device	Туре	
COM1	Standard 28800 bps Modem	Modem (unimgdem)	Continue
ISDN1	MT128STZLX	ISDN 🔨	
			Lancei
			<u>N</u> etwork
			<u>H</u> elp
, <u>A</u> dd	<u>R</u> emove <u>C</u> onfigure	Clone	

21. At the **Remote Access Setup** screen, select **Add** again.

22. The Add RAS Device screen appears again.

Add RAS Device	×
RAS Capable <u>D</u> evices:	ОК
ISDN2 - MT128STZLX	Cancel
N	<u>H</u> elp
h	Install <u>M</u> odem
	Install X25 <u>P</u> ad

Highlight "ISDN2 – MT128STZLX" and click **OK**.

23. At the **Remote Access Setup** screen, click **Continue**.

R	emote Access 9	Setup		×
	<u>P</u> ort	Device	Туре	
	COM1	Standard 28800 bps Modem	Modem (unimodem)	Continue
	ISDN1	MT128STZLX	ISDN	Cancel
				<u>N</u> etwork
				<u>H</u> elp
		<u>R</u> emove <u>C</u> onfigure	Clone	

24. At the Network screen, click Close.

Network	? ×
Identification Services Protocols Adapters Bindings	
Network Services:	
Add <u>Remove</u> <u>Properties</u> Update Description: Distributed protocol required for running the Computer Brow- service.	ser
Close	Cancel
25. Progress screens appear while bindings are being stored. You will then be prompted to reboot your computer.





26. Installation is complete.

Verifying the Windows NT4 Installation

1. When the restart process is complete, go to **Start | Settings | Control Panel**. Click on the **PC Card** applet.



The MultiMobile MT128ZLX is listed with a question-mark icon. This is normal. Click OK.

2. Go to **Start | Programs | Administrative Tools | Windows NT Diagnostics**. Select the **Resources** tab and the **IRQ** button.

🛃 Windo	ows NT Di	agnostics - \\(COMPAQNT	4	_ 🗆
<u>F</u> ile <u>H</u> elp	D				
Ver Se	rsion ervices	System Resources	Display Env	Drives ironment	Memory Network
				Include <u>H</u> AL	. resources 🗖
IRC 01 04 06 12 12 14	Q Devic i8042; Serial Floppy Isdnī i8042; atapi	e		Bus 0 0 0 0 0	Type Isa Isa Isa Isa Isa
	IRQ	1/0 Port	<u>D</u> MA	<u>M</u> emory	De <u>v</u> ices
	Ē		<u>R</u> efresh	Pri <u>n</u> t	ОК

Verify that the ISDN-TA device is assigned to the IRQ that you selected earlier.

3. Under the **Resources** tab, click the **I/O Port** button.

😹 Windows NT Di	agnostics - W	COMPAQNT	4	
<u>F</u> ile <u>H</u> elp				
Version Services	System Resources	Display Env	Drives	Memory Network
			Include <u>H</u> Al	resources 🗖
Address	Device		Bus	Туре
0060 - 0060 0064 - 0064 01CE - 01CF 0370 - 030F 0378 - 039F 0370 - 039F 0360 - 038B 03C0 - 039F 03F0 - 03F5 03F6 - 03F6 03F7 - 03F7 03F8 - 03FE	i8042prt i8042prt VgaSave atapi IsdnTa Parport VgaSave VgaSave VgaSave Floppy atapi Floppy Serial		0 0 0 0 0 0 0 0 0 0 0	Isa Isa Isa Isa Isa Pci Pci Isa Isa Isa
IRQ	1/0 Port	<u>D</u> MA	<u>M</u> emory	De <u>v</u> ices
<u>.</u>	Properties	<u>R</u> efresh	Pri <u>n</u> t	ОК •

Verify that the ISDN-TA device is using the I/O address that you selected earlier.

4. If for any reason the IRQ or I/O Port are not the same as the ones you specified earlier, go back and repeat the Windows NT procedure at step 11 and then re-check that the correct IRQ and I/O Port values have been assigned. If you still have problems with this, call MultiTech's Tech Support group at 1-800-972-2439.

Configuring the MT128ZLX in Windows NT4

NOTE: In this procedure, you will be asked to enter detailed configuration information that relates to the ISDN equipment being used by your telephone company. Specifically, your telephone company must provide the following information:

SPIDs, Phone Numbers, Switch Type, and

Voice Encoding type (or "Analog Encoder").

This information is supplied by your telephone company and you must have it available when doing this procedure.

1. Go to **Start | Settings | Control Panel | Network**. At the Network screen, click on the **Adapters** tab. Highlight "MultiMobile MT128STZLX Adapter." Click on **Properties**.

MultiMobile MT128STZLX Setup		×
Adapter Setting I/O Base: 0x300 Interrupt: 10 Mem: 0xD0000 Pcmcia: 365 COMP	Line Setting Switch Type: US NI-1 PHONE 0: PHONE 1: SPID 0: 0555100001 SPID 1: 0555300001	
OK Cancel	Analog encoder: MU_LAW	

2. The MultiMobile MT128STZLX Setup screen will appear.

3. Enter the information needed in each field of the **Line Setting** pane.

Switch Type:	See listed options.
Phone Numbers:	B1 number and B2 number
SPID:	Needed only in the U.S. and Canada.
B-Channel Speed:	56kbps or 64 kbps
Analog Encoder:	For Net3 or ETSI, use A-law voice encoding.
	For other switches, use Mu-law voice encoding.

Click OK.

At the Network screen, click Close.

When prompted to reboot, click **Yes**.

Uninstalling the MT128ZLX-ST/NT Drivers in Windows NT4

1. Go to **Start | Settings | Control Panel**. Click on the **Network** icon. At the **Network** dialog box, click on the **Services** tab. Highlight **Remote Access Service**.

Click Properties.

2. The Remote Access Setup dialog box appears.

F	emote Access 9	Setup		×
	<u>P</u> ort	Device	Туре	
	COM1	Standard 28800 bps Modem	Modem (unimodem)	Continue
	ISDN1	MT128STZLX	ISDN	
	ISDN2	MT128512LX	ISDN	Cancel
				<u>N</u> etwork
				<u>H</u> elp
	<u>A</u> dd	<u>R</u> emove <u>C</u> onfigure	Clone	

Highlight "ISDN1" and click **Remove**.

	Remote Access Setup		\times
	?	Remove Port ISDN1?	
At the confirmation screen, click Yes .		Yes No	

3. At the Remote Access Setup dialog box, highlight "ISDN2" and click Remove.

F	lemote Access	Setup		×
	<u>P</u> ort	Device	Туре	
	COM1	Standard 28800 bps Modem	Modem (unimodem)	Continue
	ISDN2	MT128STZLX	ISDN	
				Cancel
				Network
		Ν		<u>H</u> elp
	I	43		
	<u>A</u> dd	<u>R</u> emove <u>C</u> onfigure	Cjone	

At the confirmation screen, click **Yes**.

4. Click **Continue** at the **Remote Access Setup** screen. When the **Network** dialog box appears again, click on the **Adapters** tab. Highlight the entry "MultiMobile MT128STZLX Adapter."

Network	? ×
Identification Services Protocols Adapters Bindings	1
Network Adapters:	
[1] MS Loopback Adapter	
Add Remove Properties U	odate
Item Notes:	· · ·
MultiMobile MT128STZLX	
Close	Cancel

Click Remove.

5. When the confirmation screen appears, click Yes.



6. When the **Network** dialog box appears again, click **Close**. Transient progress screens will appear while bindings are being stored.

7. When prompted to restart your computer, click Yes.

8. When the restart process is complete, go to **Start | Settings | Control Panel**. Click on the **Add/Remove Programs** icon. Highlight **Configuration Utility**.

Add/Remo	ve Programs Properties	?	×
Install/Uni	install Windows NT Setup		
₽	To install a new program from a floppy disk or CD-F drive, click Install.	ROM	
	Install		
3	The following software can be automatically remov Windows. To remove a program to modify its ins components, select it from the list and click Add/Remove.	ed by talled	
Configu	ration Utility		
	Add/ <u>R</u> emov	′e	
	OK Cancel	<u>A</u> pply	

Click on Add/Remove.

10. At the Confirm File Deletion screen, click Yes.



11. The **Uninstall Shield** program will appear. At the **Remove Programs From Your Computer** screen, click **OK**.



12. When the Add/Remove Programs Properties screen appears, click OK.

13. The uninstall procedure is complete.

MT128ZLX: Using APIs in Windows NT

About APIs

The MT128ZLX-ST/NT operates in conjunction with three Application Program Interface software packages: NDIS, VCOMM, or CAPI. However, VCOMM is not supported in Windows NT. This chapter presents examples of how the MT128ZLX can be used with NDIS and CAPI. The CAPI-compliant program used in these examples is RVS-COM Lite.

Each API contains software components that interact with the operating system of the computer in which the MT128ZLX is installed. Each API adds communications functionality to the system. Each of API adds a somewhat different set of features to the system, as summarized in the table below and described more fully in subsequent sections.

API	Full Name	Functionality
NDIS	Network Driver Interface Specification	dial-up networking (DUN)connection, network interface card (NIC) emulation
VCOMM	Virtual Communications Driver	not supported in Windows NT
CAPI	Common ISDN Application Program Interface	dial-up networking (DUN)connection, modem emulation, G3 and G4 FAX, V.110, V.120, X.75, HDLC, interface to ISDN features and services

The NDIS API

NDIS allows Network Interface Cards (NICs) to work with each other, with the operating system, and with higher order protocol drivers. NDIS is an interface that facilitates development of NIC drivers. NDIS program routines can implement the functions that NIC drivers must perform. These include interaction with protocol drivers, the handling of hardware interrupts, and interface with underlying NICs by dealing with registers, port I/O, and other functionality. NDIS allows drivers to be developed in high-level programming languages, such that their creation and implementation are platform-independent.

The CAPI API

Being a common interface, the ISDN CAPI (Common Application Program Interface), allows software programs to use all ISDN services. Computer programs have access to most services and features of ISDN when used with CAPI. This access is hardware-independent. CAPI makes call numbers available, as well as several kinds of service information: caller number, called number, call charges, ISDN service ID. CAPI also facilitates transmission of data, FAX, or voice, and multiple B-channels can also be used simultaneously on a single call.

It is the capabilities of the ISDN adapter and the type of ISDN connection that determine which services and features are actually available. CAPI merely serves as a common interface. ISDN CAPI is a platform-independent standard which can be used in non-Windows operating systems like OS/2 and UNIX, as well as in Microsoft operating systems.

CAPI 2.0 is the current form of CAPI. ISDN adapters with CAPI 2.0 can be used anywhere in Europe with the DSS1 Euro-ISDN connection.

Intro to API Single-Channel and MultiLink Examples

In the following procedures, you will use Application Program Interfaces (APIs) to set up and use dial-up networking with the MT128ZLX in conjunction with the particular operating system your computer is using. The APIs are installed as part of the MT128ZLX driver installation, which must be complete before these procedures can be done. Note that the procedures presented here are examples only. Your use of APIs will depend on the needs and limitations of your operating environment.

Windows NT4 NDIS: Single Channel Access Example

- NOTE: To install, configure, and remove devices in Windows NT, your logon permissions must include the ability to load and remove device drivers.
- NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows NT server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

5. You will need to know how to configure your port usage (dial-out calls only, receive calls only, dial-out and receive calls).

1. Go to **Start | Programs | Accessories | Dial-Up Networking**. If this is your first communications connection, the **Dial-Up Networking** screen will appear.

Dial-Up Networking 🛛 🗙		
•	The phonebook is empty.	
N.	Press OK to add an entry.	
	OK	

2. The **Dial-Up Networking Wizard** will be launched.

🥾 Dial-Up Networking	? ×
	Phonebook entry to dial: MyDialUpServer New Phone number preview: Dialing from: New Location Location
	<u>D</u> ial <u>C</u> lose

Click New.

3. The New Phonebook Entry Wizard screen appears.

New Phonebook Entry Wizard		
	Dial-Up Networking connects you to remote networks using your modem, ISDN, or other WAN adapter. This wizard helps you create a phonebook entry that stores the settings needed to connect to a particular remote network.	
Ť	Name the new phonebook <u>e</u> ntry: <mark>MyDialUpServer</mark>	
	I know all about phonebook entries and would rather edit the properties directly	
	< <u>B</u> ack <u>N</u> ext > Cancel	

Type in a descriptive name for the phonebook entry. Click Next>.

4. The Server screen appears. Click the check-boxes that apply.

Server	
	Check all that apply:
	 Send my plain text password if that's the only way to connect. The non-Windows NT server I am calling expects me to type login information after connecting, or to know TCP/IP addresses before dialing.
	< <u>B</u> ack <u>N</u> ¶ <u>4</u> ≻ Cancel

Click Next>.

Modem or Adapter	
	Select the modem or adapter this entry will use. All available ISDN lines multi-linked MT128STZLX (ISDN1) MT128STZLX (ISDN2) Standard 28800 bps Modem (COM1) The list shows devices set up to dial out. If a device is missing, you will need to add it with the Control Panel by starting Network and selecting Remote Access Service.
	< <u>B</u> ack <u>N</u> { <u>xt</u> > Cancel

5. The Modem or Adapter screen appears. For this example, select "MT128STZLX (ISDN1)."

Click Next>.

6. The **Phone Number** screen appears. Enter the phone number of the dial-up server you are calling.

Phone Number		
	Enter the phone number of the dial-up server you are calling. Alternate phone numbers, if any, are dialed automatically if the primary phone number cannot be reached. They may also be used to set different numbers on individual multi-linked ISDN lines.	
	Phone number: 5552000	
	<u>A</u> lternates	
	Use Telephony dialing properties	
	< <u>B</u> ack <u>N</u> { <u>At</u> } Cancel	

Click Next>.

7. At the completion screen, click **Finish**.

New Phonebook Entry Wizard			
	That's it. Press Finish to save 'MyDialUpServer'.		
	< <u>B</u> ack Freish Cancel		

8. The **Dial-Up Networking** screen re-appears.

🥵 Dial-Up Networking	? ×
TOUR OP THE WORKING	Phonebook entry to dial: MyDialUpServer New More ▼ Phone number preview: 5552000 Dialing from: New Location

Solution State Contemporation			? ×
	Phonebook entry to dial: MyDialUpServer		
	_	<u>N</u> ew	More A
	Phone number pre <u>v</u> iew: 5552000		<u>E</u> dit entry and modem properties Clone entry <u>and modem properties</u> Delete entry Create <u>shortcut to entry</u>
	Dialing from:		Monjtor status
	New Location		Operator assisted or manual dialing User preferences Logon preferences
			Help
		<u>D</u> ial	

9. Click More. Highlight and click on Edit Entry and Modem Properties.

10. The Edit Phonebook Entry screen appears.

Edit Phoneboo	k Entry		? ×
Basic	Server Script	Security	X.25
Entry name:	MyDialUpServer		
Co <u>m</u> ment:			
Phone <u>n</u> umber	r: 5552000	g properties	<u>A</u> lternates
<u>D</u> ial using:	MT128STZLX (ISDN1)	▼	<u>C</u> onfigure
		ОК	Cancel

11. Click on the **Server** tab to configure logon options, encryption, log file information and network protocol options, including TCP/IP Settings, for your remote server and DNS connections. If necessary, contact your ISP or network administrator to obtain the correct TCP/IP addressing information.

12. Use the **Script** tab to define scripts that will run when this connection is made. Click **OK** to complete the configuration.

To use the new connection, click on the **Dial** button. Type in the user name and password for your remote account. If you are joining a domain, you must also specify the domain name.

Windows NT4 NDIS: Dual Channel Access Example (MultiLink)

NOTE: To install, configure, and remove devices in Windows NT, your logon permissions must include the ability to load and remove device drivers.

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows NT server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

5. You will need to know how to configure your port usage (dial-out calls only, receive calls only, dial-out and receive calls).

If you would like to use multi-linking with your NDIS connection, first be sure that your ISDN provider supports a 128kbps MLP option.

1. To begin, you will need to create a new dial-up connection as described above ("Windows NT NDIS : Single Channel Access Example") or modify an existing connection. Go to **Start | Programs | Accessories** | **Dial-Up Networking**.



🥵 Dial-Up Networking			? ×
	Phonebook entry to dial: MyDialUpServer		
		<u>N</u> ew	More A
T T	Phone number pre⊻iew: 5552000 Dialing fr <u>o</u> m:		Edit entry and modem properties Clone entry and modem properties Delete entry Create shortcut to entry Monjtor status
			Operator assisted or manual dialing User preferences Logon preferences <u>H</u> elp
		<u>D</u> ial	

2. Click More. Highlight and click on Edit Entry and Modem Properties.

3. The Edit Phonebook Entry screen appears.

Edit Phonebook	Entry	? ×
Basic	Server Script Security	X.25
<u>E</u> ntry name: Co <u>m</u> ment:	MyDialUpServer	
Phone <u>n</u> umber:	5552000	<u>A</u> lternates
<u>D</u> ial using:	MT128STZLX (ISDN1)	<u>C</u> onfigure
	ОК	Cancel

In the **Dial using** drop-down box, select "Multiple Lines."

4. Click on the **Configure** button. The **Multiple Line Configuration** screen appears. For this example, highlight **MT128STZLX (ISDN2)** and click the check box.

Multiple Line Configuration ? 🗙		
Multiple lines simultaneously connecte single faster connection. Check the m connection:	d to a PPP multi-link server behave like a nodems and adapters to use for this	
Modem or device	Phone numbers	
MT128STZLX (ISDN1)	5552000	
🗌 🗆 🥮 Standard 28800 bps Modem (I	COM1)	
MT128STZLX (ISDN2)	5552000	
4		
	Phone <u>n</u> umbers <u>C</u> onfigure	
	OK Cancel	

Click on the **Phone Numbers** button.

	Phone Numbers
	New phone number:
	5552000
	<u>A</u> dd <u>R</u> eplace
	Phone numbers:
	5552000
	Lp † Down J Delete
	Move successful number to the topof the list on connection
appear	OK Cancel

5. The **Phone Numbers** screen will appear.

In the **New phone number** field, type in the phone number. (In this example, both ISDN lines use the same phone number. In some cases, a separate phone number is used for each ISDN connection.) Click **Add**. The new phone number will appear in the **Phone numbers** field. Click **OK**.

At the Multiple Line Configuration screen, click OK.

At the Edit Phonebook Entry screen, click OK.

To use the new multi-link connection, click on the **Dial** button. Type in the user name and password for your remote account. If you are joining a domain, you must also specify the domain name.

Windows NT4 VCOMM: Single Channel Access

Not supported.

Windows NT4 VCOMM: Dual Channel Access

Not supported.

Windows NT4 CAPI: Single Channel Access Example

- NOTE: To install, configure, and remove devices in Windows NT, your logon permissions must include the ability to load and remove device drivers.
- NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator:

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows NT server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

5. You will need to know how to configure your port usage (dial-out calls only, receive calls only, dial-out and receive calls).

To use the Common ISDN Application Interface (CAPI), you must install a CAPI-compliant telecommunications application, such as the RVS-COM Lite program, which will be used for this example.

After installing RVS-COM Lite, several new virtual modems become available to configure. The following example uses the RVS ISDN V.120 modem. Before beginning, be sure that the RVS-COM Center is running (the icon will appear in the Windows NT Task Bar).

1. Go to Start | Settings | Control Panel | Network. Select the Services tab. Highlight Remote Access

Network			N		?)
Identification	Services	Protocols	s Adapters	Binding	s
<u>N</u> etwork Se	rvices:				
Compu NetBIC Renot Server Vorkst	ter Browser IS Interface Access Se onfiguration ation	ervice			
 Descriptio Enables u network.	n: isers to work	emove < offsite as	Properties.		Update ectly to a
			01		Cancel

2. Select Properties.

The Remote Access Setup screen appears. Click Add.

R	emote Access S	Setup		×
	<u>P</u> ort	Device	Туре	\searrow
	COM1 ISDN1 ISDN2	Standard 28800 bps Modem MT128STZLX MT128STZLX	Modem (unimodem) ISDN ISDN	Continue Cancel <u>N</u> etwork <u>H</u> elp
	<u>Add</u>	<u>R</u> emove <u>C</u> onfigure	Clone	

3. The Add RAS Device screen appears. In the RAS-capable devices drop-down box, select "COM3-RVS

	Add RAS Device	×
	RAS Capable <u>D</u> evices:	ОК
		Lancel
		Help
		Install <u>M</u> odem
		Install X25 <u>P</u> ad
ISDN V.120."		

Click OK.

4. The Remote Access Setup screen re-appears. Click on the Configure button. The Configure Port

	Configure Port Usage	×
	Port: COM3 Device: RVS ISDN V.120	Cancel
	Port Usage Dial <u>o</u> ut only <u>Receive calls only</u> <u>Dial out and Receive calls</u>	<u>H</u> elp
Usage screen appears.		

Select the appropriate port usage. Click **OK**.

5. At the **Remote Access Setup** screen, click on the **Network...** button.

Network Configuration	×
Dial out Protocols: □ <u>NetBEUI</u> ☑ <u>I</u> CP/IP □ IPX	OK Cancel <u>H</u> elp

Select the appropriate network protocol to be used. Click **OK**.

6. At the **Remote Access Setup** screen, click the **Continue** button.

7. At the **Network** screen, click **Close**. Transient screens will appear while bindings are being stored. You will be prompted to restart your computer. Click **Yes**.

8. Go to **Start | Programs | Accessories | Dial-Up Networking**. If this is your first communications connection, the **Dial-Up Networking** screen will appear.

Dial-Up I	Networking 🛛 🗙
٩	The phonebook is empty. Press OK to add an entry.
(OK)	

9. The Dial-Up Networking Wizard will be launched.

🥾 Dial-Up Networking	? 🗙
	Phonebook entry to dial: MyDialUpServer
	<u>D</u> ial <u>C</u> lose

Click New.

10. The New Phonebook Entry Wizard screen appears.

New Phonebook Entry Wizard		
	Dial-Up Networking connects you to remote networks using your modem, ISDN, or other WAN adapter. This wizard helps you create a phonebook entry that stores the settings needed to connect to a particular remote network.	
Ť	Name the new phonebook <u>e</u> ntry: <mark>MyDialUpServer</mark>	
	I know all about phonebook entries and would rather edit the properties directly	
	< <u>B</u> ack <u>N</u> ext > Cancel	

Type in a descriptive name for the phonebook entry. Click Next>.

11. The Server screen appears. Click the check-boxes that apply.



Click Next>.

Select the modem or adapter this entry will use. All available ISDN lines multi-linked MT128STZLX (ISDN1) MT128STZLX (ISDN2) REF MT128STZLX (ISDN2)
Standard 28800 bps Modern (COM1) The list shows devices set up to dial out. If a device is missing, you will need to add it with the Control Panel by starting Network and selecting Remote Access Service.
 < Back Nevt Cancel

12. The **Modem or Adapter** screen appears. For this example, select "RVS ISDN V.120 (COM3)."

Click Next>.

13. The **Phone Number** screen appears. Enter the phone number of the dial-up server you are calling.

Phone Number			
	Enter the phone number of the dial-up server you are calling. Alternate phone numbers, if any, are dialed automatically if the primary phone number cannot be reached. They may also be used to set different numbers on individual multi-linked ISDN lines.		
Ť	Phone number: 5552000 		
	Use Telephony dialing properties		
	< <u>B</u> ack <u>N(v</u> t)> Cancel		

Click Next>.

14. At the completion screen, click **Finish**.

New Phonebook Entry W	/izard
	That's it. Press Finish to save 'MyDialUpServer'.
	< Back Fruish Cancel

15. The **Dial-Up Networking** screen re-appears.

🥵 Dial-Up Networking	? ×
	Phonebook entry to dial: MyDialUpServer
	Phone number pre <u>v</u> iew: 5552000 Dialing from: New Location
	Dial Close

🥾 Dial-Up Networking			? ×
	Phonebook entry to dial: MyDialUpServer	<u>N</u> ew	
Ť	Phone number pre <u>v</u> iew: 5552000		<u>E</u> dit entry and modem properties Clone entry <u>a</u> nd modem properties Delete entry Create <u>s</u> hortcut to entry
	Dialing from:		Monitor status
			Operator assisted or manual dialing User preferences Logon preferences
			<u>H</u> elp
		<u>D</u> ial	

16. Click More. Highlight and click on Edit Entry and Modem Properties.

17. The Edit Phonebook Entry screen appears.

Edit Phoneboo	k Entry	? ×
Basic	Server Script Security	X.25
<u>E</u> ntry name: Co <u>m</u> ment:	MyDialUpServer	R
Phone <u>n</u> umbe	r: 5552000	Alternates
<u>D</u> ial using:	RVS ISDN V.120 (COM3) ▼	<u>C</u> onfigure
	OK	Cancel

18. Click on the **Server** tab to configure logon options, encryption, log file information and network protocol options, including TCP/IP Settings, for your remote server and DNS connections. If necessary, contact your ISP or network administrator to obtain the correct TCP/IP addressing information.

19. Use the **Script** tab to define scripts that will run when this connection is made. Click **OK** to complete the configuration.

To use the new connection, click on the **Dial** button. Type in the user name and password for your remote account. If you are joining a domain, you must also specify the domain name.

Windows NT4 CAPI: Dual Channel Access Example (MultiLink)

- NOTE: To install, configure, and remove devices in Windows NT, your logon permissions must include the ability to load and remove device drivers.
- NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows NT server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

5. You will need to know how to configure your port usage (dial-out calls only, receive calls only, dial-out and receive calls).

To use the Common ISDN Application Interface (CAPI), you must install a CAPI-compliant telecommunications application, such as the RVS-COM Lite program, which will be used for this example.

After installing RVS-COM Lite, several new virtual modems become available to configure. The following example uses the RVS ISDN V.120 modem. Before beginning, be sure that the RVS-COM Center is running (the icon will appear in the Windows NT Task Bar).

If you would like to use multi-linking with your CAPI connection, first be sure that your ISDN provider supports a 128kbps MLP option.

The ports you link must first be enabled through RVS-Com. In this example, the RVS ISDN V.120 modems are used.

1. To enable the ports in RVS-Com, open the RVS-Com Comm Center.

2. Click the **Services** tab. In the **Virtual Com Ports** section of the window, place a check mark in front of both ports. Associate each port with a unique COM port number (the two devices must use different COM ports).

Click **Apply**, and then **OK**.

Modems Properties	? ×			
General				
The following modems	are set up on this computer:			
Modem	Attached To 🔄			
🗇 RVS ISDN Fax	сомз 🧏			
ISDN Internet PPP	СОМЗ			
ISDN Modem analog	СОМЗ —			
🗢 RVS ISDN V.120	СОМЗ			
RVS ISDN X 75 transparent	сомз 🔟 📗			
Add <u>B</u> emove <u>P</u> roperties				
Dialing Preferences Dialing from: New Location				
Use Dialing Properties to modify how your calls are dialed.				
	Close Cancel			

3. Go to Start | Settings | Control Panel | Modems. Click Add.

4. The Install New Modems screen appears. Select "Don't detect my modem; I will select it from a list."

	nstall New Modem	
		 Windows NT will now try to detect your modem. Before continuing, you should: 1. If the modem is attached to your computer, make sure it is turned on. 2. Quit any programs that may be using the modem. Click Next when you are ready to continue. Image: Don't detect my modem; I will select it from a list.
Click Next>.		< <u>B</u> ack. <u>N</u> ext > Cancel

5. The next screen displays a list of modem manufacturers and modem models. In the **Manufacturers** pane, highlight "RVS Datentechnik." In the **Models** pane, highlight "RVS ISDN V.120."

Cick the manufacturer or if you have an instal	and model of your modern. If your modern is not listed, lation disk, click Have Disk.
Manufacturers: Reveal RFI Elektronik Rockwel RS Components RVS Datentechnik Schwidt Flactword Laboration	Models PIVS ISON HDLC transparent PVS ISON Internet PPP RVS ISON Modem analog PVS ISON V.110 PVS ISON V.110 RVS ISON V.120 RVS ISON X.75 T.20NI Have Disk
	Cancel

Click Next>.

6. The next screens allows you to select which COM port to use with the "RVS ISDN V.120 modem."

Install New Modem	
	You have selected the following modem: RVS ISDN V.120 On which ports do you want to install it? All ports Selected ports COM1 COM3 COM4 COM5 COM6 COM7 COM8 COM8 COM8
	< <u>Back N</u> ext > Cancel

7. At the completion screen, click **Finish**. The **Modems Properties** screen appears.

Modems Properties	? ×		
General			
The following modems	are set up on this computer:		
Modem	Attached To		
ISDN Internet PPP	СОМЗ		
ISDN Modem analog	СОМЗ		
RVS ISDN V.120	сомз —		
RVS ISDN V.120 #2	COM4		
RVS ISDN X 75 transparent	сомз		
(<u>A</u> dd <u>R</u> emov	ve <u>P</u> roperties		
Dialing Preferences Dialing from: New Location Use Dialing Properties to modify how your calls are dialed. Dialing Properties			
	Close Cancel		

Click Close. You will be prompted to configure your dial-up networking because the list of modems has



Click Yes.

8. The Remote Access Setup screen appears. Click Add.

5. The Aud RAS Device	the screen appears. From the RAS-Capable Devices drop-down box, select		
	Add RAS Device	×	
	RAS Capable <u>D</u> evices:	ОК	
	COM4 - RVS ISDN V.120 #2	Cancel	
		<u>H</u> elp	
		Install <u>M</u> odem	
		Install X25 <u>P</u> ad	
– RVS ISDN V.120 #2."			

9. The Add RAS Device screen appears. From the RAS-Capable Devices drop-down box, select "COM4

Click OK.

10. The **Remote Access Setup** screen re-appears. Click on the **Configure** button. The **Configure Port**

	Configure Port Usage	×
Usage coreen appears	Port: COM3 Device: RVS ISDN V.120 Port Usage © Dial <u>o</u> ut only © <u>B</u> eceive calls only © <u>D</u> ial out and Receive calls	OK Cancel <u>H</u> elp
Usage screen appears.	N	

Select the appropriate port usage. Click **OK**.

11. At the **Remote Access Setup** screen, click on the **Network...** button.

Network Configuration	×
Dial out Protocols: ☐ <u>NetBEUI</u> ☑ ICP/IP ☐ IPX	OK Cancel <u>H</u> elp

Select the appropriate network protocol to be used. Click OK.

12. At the **Remote Access Setup** screen, click the **Continue** button.

Remote Acc	ess Setup		X
<u>P</u> ort	Device	Туре	
COM1 COM3	Standard 28800 bps Modem RVS ISDN V.120	Modem (unimodem) Modem (unimodem)	Continue
COM4	RVS ISDN V.120 #2	Modem (unimodem)	Cancel
ISDN1 ISDN2	MT128STZLX MT128STZLX	ISDN 🔓 ISDN	<u>N</u> etwork
<u></u> dd	<u>R</u> emove <u>C</u> onfigure	Clone	<u>H</u> elp

13. Transient screens will appear while bindings are being stored. You will be prompted to restart your computer. Click **Yes**.

14. You will need to create a new dial-up connection as described above ("Windows NT CAPI : Single Channel Access Example") or modify an existing connection. Go to **Start | Programs | Accessories | Dial-Up Networking**.

🥾 Dial-Up Networking	? ×
	Phonebook entry to dial: MyDialUpServer ▼ <u>N</u> ew <u>M</u> ore ▼
	Phone number preview: 5552000 Dialing from: New Location

Solution Networking			? ×
	Phonebook entry to dial: MyDialUpServer	<u>N</u> ew	▼ More ▲
	Phone number pre <u>v</u> iew: 5552000 Dialing fr <u>o</u> m: New Location		Edit entry and modem properties Clone entry <u>a</u> nd modem properties Dele <u>t</u> e entry Create <u>s</u> hortcut to entry
			Monitor status Operator assisted or manual dialing User preferences Logon preferences
	[<u>D</u> ial	Help

15. Click More. Highlight and click on Edit Entry and Modem Properties.

16. The Edit Phonebook Entry screen appears.

Edit Phonebook	CEntry	? ×
Basic	Server Script Security	X.25
<u>E</u> ntry name: Co <u>m</u> ment:	MyDialUpServer	
Phone <u>n</u> umber	E 5552000 ☐ Use Telephony dialing properties	<u>Alternates</u>
<u>D</u> ial using:	MT128STZLX (ISDN1) MT128STZLX (ISDN1) MT128STZLX (ISDN2) Standard 28800 bps Modem (COM1) Multiple Lines	2onfigure
	OK	Cancel

In the **Dial using** drop-down box, select "Multiple Lines."

17. Click on the **Configure** button. The **Multiple Line Configuration** screen appears. For this example, highlight **RVS ISDN V.120#2 (COM4)** and click the check box.

Multiple Line Configuration 🛛 📪 🗙					
Multiple lines simultaneously connected to a PPP multi-link server behave like a single faster connection. Check the modems and adapters to use for this connection:					
Modem or device	Phone numbers				
🛛 🥮 RVS ISDN V.120 (COM3)	5552000				
Standard 28800 bps Modem (COM1)					
RVS ISDN V.120 #2 (COM4)	5552000				
MT128STZLX (ISDN1)					
TIME MT128STZLX (ISDN2)					
Phone numbers					
	OK Cancel				

Click on the **Phone Numbers** button.

	Phone Numbers
	<u>N</u> ew phone number: 5552000 <u>A</u> dd <u>R</u> eplace
	Phone numbers:
	5552000
	<u>∐</u> p † <u>D</u> own ↓ Delete
	Move successful number to the top of the list on connection
	OK Cancel
18. The Phone Numbers screen will appear.	

In the **New phone number** field, type in the phone number. (In this example, both ISDN lines use the same phone number. In some cases, a separate phone number is used for each ISDN connection.) Click **Add**. The new phone number will appear in the **Phone numbers** field. Click **OK**.

At the Multiple Line Configuration screen, click OK.

At the Edit Phonebook Entry screen, click OK.

To use the new multi-link connection, click on the **Dial** button. Type in the user name and password for your remote account. If you are joining a domain, you must also specify the domain name.

5 Installation & Use in Windows 2000
MT128ZLX-ST/NT: Windows 2000 Driver Procedures

Windows 2000 Installation

NOTE: Before beginning the installation, you must obtain the following technical information from your telephone company:

SPIDs (North America only)

Switch Type

Voice Encoding scheme

Telephone Number(s)

- NOTE: To install, configure, and remove devices in Windows 2000, your logon permissions must include the ability to load and remove device drivers.
- NOTE: As you begin this procedure, the MT128ZLX card should not be installed in the computer's PCMCIA slot. The setup.exe file must be run before the card is installed. Otherwise problems will arise as Windows 2000 detects the device.
- 1. For now, leave the MT128ZLX card out of the computer's PCMCIA slot.
- 2. Insert the MT128ZLX Installation CD into the computer's CD-ROM drive.
- 3. Using Windows Explorer, browse to the win2000 directory on the MT128ZLX Installation CD.

4. Double-click on the Setup.exe file to launch the Configuration Utility Setup program.



At the Welcome screen, click Next>.

5. At the **Choose Destination Location** screen, you can accept the default path or enter a different path at which to install the **Configuration Utility** files.

	Setup will install Configuration Utility for win2000 in the following folder. To install to this folder, click Next. To install to a different folder, click Browse and select another folder. You can choose not to install Configuration Utility for win2000 by clicking Cancel to exit Setup.
29	Destination Folder C:\\Configuration Utility for win2000 Browse < Back Next > Cancel

Click Next>.

6. At the **Select Program Folder** screen, you can accept the default folder or select another folder into which the program icons will be added.



Then click **Next**>.

7. The **Start Copying Files** screen allows you one last chance to go back and change information that you have provided in previous steps.

Start Copying Files		×
	Setup has enough information to start copying the program files. If you want to review or change any settings, click Back. If you are satisfied with the settings, click Next to begin copying files. Current Settings: Copy the ISDN Card Application and Driver	
	<back cancel<="" td=""><td></td></back>	

When satisfied with your settings, click **Next**> to begin copying files.

8. Progress screens will appear while files are being copied to your hard disk. When file copying is complete, a **Configuration Utility** window will also appear, displaying the various applets of the Configuration Utility program (HW Detect, Protocol Analyzer, and Status monitor, etc.).



Close the **Configuration Utility** window.



9. At the Setup Complete, screen, select Yes, I want to restart my computer now.

Click **Finish**.

10. When the restart process is complete, the **Line Status** window will appear briefly. Now, insert the MT128ZLX card into the laptop PC.



11. Windows 2000 detects the MT128ZLX card and the Found New Hardware screen appears.

12. The Digital Signature Not Found screen will appear.

Digital Signature Not Fou	nd X
	The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested. The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows. MultiMobile MT128ZLX-ST (modem) If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available. Do you want to continue the installation?
	Yes No More Info

Click Yes.

13. The **Found New Hardware** screen appears again, followed by another **Digital Signature Not Found** screen.



ISDN Se Your equip	etch Type or D-channel ISDN adapter must be config ment.	Protocol gured to match your phon	e company/sISDN	E.
Selec	t the ISDN switch type or D-	channel protocol that you	r phone company us	81.
ISDN New	switch type or D-channel pr real ISON 1 (NI-1)	focot		
	R			
		(Back	Nets	Cancel

14. The ISDN Configuration wizard screen sequence (labeled ISDN - Intelligent PCMCIA ISDN TA (Net))

NOTE: The information entered in the Microsoft ISDN Configuration wizard does not affect the operation of the MT128ZLX. However, completing this wizard is necessary to update certain dial-up networking software components to add ISDN functionality to Windows 2000. The MT128ZLX is configured for use with the Configuration Utility that was installed during driver installation. In the section "Configuring the MT128ZLX" (presented later in this chapter), you will supply setup information for using the Configuration Utility program with your particular computer.

The info entered in this screen sequence will be superseded.

Click Next>.

15. The next screen requests Phone Number and SPID information. Again, this info will be superseded.

Select a line on your ISDN adapter. Then, relet reach shared, and type is provided by your phone company. Repeat for each line on your ISDN adapter. If you phone company provided only one phone number and SPID for each ISDN line, select channel. To that line, and type the phone number and SPID. ISDN line: Dannet: Dannet: SPID (service postie ID):	DN Phone Nu Phone susber into service.	niber and SPID I s and SPIDs are re-	Information guied to bring your ISDN line(s) and channel(s)
H your phane company provided only one phone number and SPID for each ISDN line, select channel 1 for that line, and type the phone number and SPID. ISDN line: Dannel: Channel information Phone number: SPID (service prolie ID)	Select a line or number and SF ISDN adapter.	your ISDIN adapte 1D, as provided by	. Then, select each channel, and type its phone your phone company. Repeat for each line on your
ISDN line: Drannel: Channel information Phone number: 2 SPID (service profile ID)	If your phone a select channel	ompany provided o 1 for that line, and	ity are phone number and SPID for each ISDN line, type the phone number and SPID.
Phose number: Phose number: SPID (service profile ID):	ISDN line:	Channel	Charvel information
SPID (service prolite ID):	1	2	Phone number:
			SPID (service profile ID)
			SPID (service profile ID)

Leave the fields on this screen blank. Click Next>.

16. A completion screen appears.

Found New Hardware Wizard	
~ 20	Completing the Found New Hardware Wizard
	Intelligent POMCIA ISON TA (Net)
	Windows has finished installing the software for this device.
	The hardware you installed will not work until you restart your computer.
	To close this wizard, click Finish.
	< Back Reide Cancel

Click Finish.

17. You will be prompted to restart your computer. Click **Yes**. The driver installation procedure is now complete. However, before you can use your MT128ZLX in Windows 2000, it must be configured with SPIDs (in the U.S. and Canada), telephone numbers, voice-encoding information, and switch-type information. (See the procedure "Configuring the MT128ZLX In Windows 2000" below.)

Verifying the Windows 2000 Installation

1. Go to **Start | Settings | Control Panel**. Click on the **System** icon. Click on the **Hardware** tab. Click on the **Device Manager** button.



2. After a successful driver installation, the **Device Manager** will contain the following entries: Intelligent PCMCIA ISDN TA (ISDN) \ MultiMobile MT128ZLX-ST (ISDN) Modems \ MultiMobile MT128ZLX-ST (Modem)

Multifunction Adapters \ MultiMobile MT128ZLX-ST (Multi-Function Card)

Network Adapters \ Intelligent PCMCIA ISDN TA (Net)

3. If these entries do not appear, re-do the driver installation procedure. If the installation fails repeatedly, call MultiTech Tech Support (800-972-2439).

Configuring the MT128ZLX-ST/NT in Windows 2000

NOTE: In this procedure, you will be asked to enter detailed configuration information that relates to the ISDN equipment being used by your telephone company. Specifically, your telephone company must provide the following information:

SPIDs, Phone Numbers, Switch Type, and Voice Encoding type.

This information is supplied by your telephone company and you must have it available when doing this procedure.

1. Go to Start | Programs | Configuration Utility for Win2000 | Config.

😤 Configuration Utility		Þ	×
Switch Type General CON	Port Setting Tools	~o	
Select the switch type	that your ISDN service pro	rvider is using.	
Switch Type :	NI-1 💌	Detail	
- Phone Number			_
Enter the ISDN phon Identifier number (SP	e numbers and the Servic 1D) from your ISDN service	e Profile e provider.	
B1 Number :	B1 SPID :		1
B2 Nunber :	82 SPID :		
B Channel Speed	Voice Encoding		
C 56K	A law for Europe	een conulties	
€ 64K	C Mulaer for North	h American countri	ie:
	Se	et Derfault	
	OK.	Cancel	Apply

2. Enter the information needed in each field of the dialog box.

Sconfiguration Utility	×
Switch Type General CDM P	ort Setting Tools
Select the switch type the	et your ISDN service provider is using.
Switch Type : AT&T	SESS Detail
Phone Number	
Enter the ISDN phone Identifier number (SPID	numbers and the Service Profile ()from your ISDN service provider.
B1 Number :	B1 SPID :
B2 Nunber :	82 SPID :
-B Channel Speed	Voice Encoding
C 56K	C A-law for European countries
€ 64K	Mu-law for North American countries
	Set Default
	OK Cancel èpply

Switch Type:	See listed options.
Phone Numbers:	B1 number and B2 number.
SPID	Needed only in the U.S. and Canada.
B-Channel Speed	56 kbps or 64 kbps
Voice Encoding:	for Net3 or ETSI, use A-law voice encoding
	for other switches, use Mu-law voice encoding

Click OK.

Uninstalling the MT128ZLX-ST/NT Drivers in Windows 2000

1. Go to **Start | Settings | Control Panel**. Click on the **Add/Remove Programs** icon. At the **Add/Remove Programs** dialog box, highlight **Change or Remove Programs**.



Click Change/Remove.

2. At the confirmation screen, click Yes.



3. The Uninstall Shield program will appear. At the Remove Programs From Your Computer screen, Remove Programs From Your Computer



Click on **Details** to see files that must be manually deleted later. Record file names as needed.

Details		
Unable to delete folder 'C:	Program Files/Configuration Utility/	*
		-1
×		Ľ
		OK.

4. Click **Continue** at the **Remote Access Setup** screen. When the **Network** dialog box appears again, click on the **Adapters** tab. Highlight the entry "MultiMobile MT128STZLX Adapter."

Vetwork				?)
Identification Services Pr	otocols	Adapters Bir	ndings	
Network Adapters:				
I] MS Loopback Adap (5) MultiMobile MT128	ter TZLX A	dapter		
Add Remov	/e	<u>P</u> roperties	<u>U</u> pdate	
MultiMobile MT128STZLX				
		Close	Cano	sel

Click Remove.

5. When the confirmation screen appears, click Yes.



6. When the **Network** dialog box appears again, click **Close**. Transient progress screens will appear while bindings are being stored.

7. When prompted to restart your computer, click Yes.

8. When the restart process is complete, go to **Start | Settings | Control Panel**. Click on the **Add/Remove Programs** icon. Highlight **Configuration Utility**.

Add/Remo	ove Programs Properties	? ×
Install/Uni	install Windows NT Setup	
₽	To install a new program from a floppy disk or CD-RO drive, click Install.	м
	install]
3	The following software can be automatically removed Windows. To remove a program to modify its install components, select it from the list and click Add/Remove.	by ed
Configu	iration Utility	
	Add/ <u>R</u> emove.	
	OK Cancel Ap	yly

Click on Add/Remove.

10. At the Confirm File Deletion screen, click Yes.



11. The **Uninstall Shield** program will appear. At the **Remove Programs From Your Computer** screen, click **OK**.

Remove Programs From Yo	Remove Programs From Your Computer		
	unInstallShield will remove the software 'Configuration Utility' from your computer. Please wait while each of the following components is removed ✓ Shared program files ✓ Standard program files ✓ Folder items ✓ Program folders ✓ Program directories ✓ Program registry entries		
	Uninstall successfully completed.		
	Cok		

- 12. When the Add/Remove Programs Properties screen appears, click OK.
- 13. The uninstall procedure is complete.

MT128ZLX: Using APIs in Windows 2000

About APIs

The MT128ZLX-ST/NT operates in conjunction with three Application Program Interface software packages: NDIS, VCOMM, or CAPI. This chapter presents examples of how the MT128ZLX can be used with these APIs. The CAPI-compliant program used in these examples is RVS-COM Lite.

Each API contains software components that interact with the operating system of the computer in which the MT128ZLX is installed. Each API adds communications functionality to the system. Each of the three APIs adds a somewhat different set of features to the system, as summarized in the table below and described more fully in subsequent sections.

API	Full Name	Functionality
NDIS	Network Driver Interface Specification	dial-up networking (DUN)connection, network interface card (NIC) emulation
VCOMM	Virtual Communications Driver	dial-up networking (DUN)connection, modem emulation
CAPI	Common ISDN Application Program Interface	dial-up networking (DUN)connection, modem emulation, G3 and G4 FAX, V.110, V.120, X.75, HDLC, interface to ISDN features and services

The NDIS API

NDIS allows Network Interface Cards (NICs) to work with each other, with the operating system, and with higher order protocol drivers. NDIS is an interface that facilitates development of NIC drivers. NDIS program routines can implement the functions that NIC drivers must perform. These include interaction with protocol drivers, the handling of hardware interrupts, and interface with underlying NICs by dealing with registers, port I/O, and other functionality. NDIS allows drivers to be developed in high-level programming languages, such that their creation and implementation are platform-independent.

The VCOMM API

The communications device driver known as "VCOMM" provides protected-mode services. It allows makes ports and modems available to Windows-based software application programs. VCOMM also uses plug-and-play functionality to simplify the installation and configuration of communications devices.

The CAPI API

Being a common interface, the ISDN CAPI (Common Application Program Interface), allows software programs to use all ISDN services. Computer programs have access to most services and features of ISDN when used with CAPI. This access is hardware-independent. CAPI makes call numbers available, as well as several kinds of service information: caller number, called number, call charges, ISDN service ID. CAPI also facilitates transmission of data, FAX, or voice, and multiple B-channels can also be used simultaneously on a single call.

It is the capabilities of the ISDN adapter and the type of ISDN connection that determine which services and features are actually available. CAPI merely serves as a common interface. ISDN CAPI is a platform-independent standard which can be used in non-Windows operating systems like OS/2 and UNIX, as well as in Microsoft operating systems.

CAPI 2.0 is the current form of CAPI. ISDN adapters with CAPI 2.0 can be used anywhere in Europe with the DSS1 Euro-ISDN connection.

Intro to API Single-Channel and MultiLink Examples

In the following procedures, you will use Application Program Interfaces (APIs) to set up and use dial-up networking with the MT128ZLX in conjunction with the particular operating system your computer is using. The APIs are installed as part of the MT128ZLX driver installation, which must be complete before these procedures can be done. Note that the procedures presented here are examples only. Your use of APIs will depend on the needs and limitations of your operating environment.

Windows 2000 NDIS: Single Channel Access Example

NOTE: To install, configure, and remove devices in Windows 2000, your logon permissions must include the ability to load and remove device drivers.

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows 2000 server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

1. Go to **Start | Programs | Accessories | Communications | Network and Dial-Up Connections**. The **Network Connection Wizard** screen will appear. At this 'welcome' screen, click **Next**>.

Network Connection Wizard	
	Welcome to the Network Connection Wizard Using this wizard you can create a connection to other computers and networks, enabling applications such as e-mail, Web browsing, file sharing, and printing. To continue, click Next.
	< Back Next > Cancel

2. At the **Network Connection Type** screen, choose the type of network connection you want to create, based on your network configuration and your networking needs. For this example, we will select "Dial-up to private network."

Network Connection Wizard
Network Connection Type You can choose the type of network connection you want to create, based on your network configuration and your networking needs.
Connect using my phone line (modern or ISDN).
 Dial-up to the Internet Connect to the Internet using my phone line (modem or ISDN).
 Connect to a private network through the Internet Create a Virtual Private Network (VPN) connection or 'turnel' through the Internet.
 Accept incoming connections Let other computers connect to mine by phone line, the Internet, or direct cable.
 Connect directly to another computer Connect using my serial, parallel, or initiared port.
< Back Next > Cancel

Click Next>.

3. The **Select a Device** screen appears. At this screen, you specify the device to be used for this connection. In this example, we have chosen the "ISDN Channel-Intelligent PCMCIA ISDN TA (Net)."

Network Connection Wizard
Select a Device This is the device that will be used to make the connection.
You have more than one dial-up device on your computer.
Select the devices to use in this connection:
🗆 📭 All available ISDN line: multi-linked
Infrared Modern Port (SERIAL1-0)
🖾 🧶 ISDN: channel - Intelligent PCMCIA ISDN TA (Net)
ISDN channel - Intelligent PCMCIA ISDN TA (Net)
🗆 🎒 Modem - Compaq 56K. (V. 90) PCI Modem (COM3)
Modem - MultiMobile MT128ZLX-ST (modem) #2 (COM5)
< Back Next > Cancel

Click Next>.

4. The **Phone Number to Dial** screen appears. At this screen, you will type the phone number of the computer or network to which you are connecting.

Network Connection Wizard		
Phone Number to Dial You must specify the phone number of the computer or network you want to connect to.		
Type the phone number of the computer or network you are connecting to. If you want your computer to determine automatically how to dial from different locations, check Use dialing rules.		
Area code: Phone number: 5552000		
Country/region code:		
Use dialing rules		
A Back Next > Cancel		

Click Next>.

5. The **Connection Availability** screen appears. At this screen, you can choose to make this connection available only to yourself or, alternatively, to all users.

Network Connection Wizard
Connection Availability You may make the new connection available to all users, or just yourself.
You may make this connection available to all users, or keep it only for your own use. A connection stored in your profile will not be available unless you are logged on.
Create this connection:
(* For all users
C Only for myself
< Back Next > Cancel

Click Next>.

6. The **Completing the Network Connection Wizard** screen appears. At this screen, you should type in a descriptive name for this connection.



Click Finish.

Connect Dial-u		× P
User name: Password:	Administrator	_
	Save password	
Dial:	5552000	•
Dial	Cancel Properties	Help

7. The **Connect Dial-Up Connection** screen appears.

To configure this connection, click the **Properties** button.

Vial-up Connection	<u>? ×</u>
General Options Security Networking	
Connect using:	
SDN: channel - Intelligent PCMCIA ISDN Modem - Compaq 56K (V.90) PCI Modem (Modem - MultiMobile MT1282LX-ST (mode	TA(Na ♪ COM3) m)#2 ↓ \$
All devices call the same numbers	ntigure
Phone number Area code: Phone number: 5552000	Alternates
County/region code:	
	Ψ
Use dialing rules	Rules
Show icon in taskbar when connected	
OK.	Cancel

From the **Dial-Up Connection** screen, do one or more of the following:

- to configure dialing services, phone numbers, host address, country/region codes, or dialing rules, click the **General** tab;
- to configure dialing and re-dialing options, multi-link configuration, domain name, or X.25 parameters, click the **Options** tab;
- to configure identity, authentication, data encryption, or terminal window and scripting options, click the **Security** tab;
- to configure the remote access server and protocols used for this connection, click the **Networking** tab.

When configuration is complete, click **OK** to return to the **Connect Dial-Up Connection** screen.

Connect Dial-u	p Connection	<u>?</u> ×
		2
User name:	Administrator	
Password:	******	
	Save password	
Dial:	5552000	•
Dial	Cancel Properties	Help

To use the new connection, click on the **Dial** button. Type in the user name and password for your remote account. If you are joining a domain, you must also specify the domain name.

Windows 2000 NDIS: Dual Channel Access Example (MultiLink)

If you would like to use multi-linking with your NDIS connection, first be sure that your ISDN provider supports a 128kbps MLP option.

- NOTE: To install, configure, and remove devices in Windows 2000, your logon permissions must include the ability to load and remove device drivers.
- NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows 2000 server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

1. To begin, you will need to create a new dial-up connection as described above ("Windows 2000 NDIS : Single Channel Access Example") or modify an existing connection. Go to **Start | Programs | Accessories** | **Communications | Network and Dial-Up Connections**.



Connect Dial-u	p Connection	? ×
	10	P
User name:	Administrator	
Password		
	Save password	
Diat	9952000	•
Dial	Cancel Properties	telp

2. Double-click on the icon of the connection you want to configure. At the Connect Dial-Up Connection

screen, click **Properties**.

3. The **Dial-Up Connection** screen appears. Select the **General** tab. Select the check-box for the additional "ISDN Channel-Intelligent PCMCIA ISDN TA (Net)" listed in the **Connect Using** field. Since the multi-link connection you are making requires two of these devices, be sure that both "ISDN Channel-Intelligent PCMCIA ISDN TA (Net)" entries are selected.

Dial-up Connection Properties	? ×
General Options Security Networking	
Connect using:	
Sister Charter Intelligent PORCIA ISON TAL IN-	2
Modem - Compad Sor (V. Su) PCI Modem (CUMS)	⇒
All devices call the same numbers Configure	
Phone number	
Area code: Phone number: Image: State of the st	J
Country/region code:	
United States of America (1)	
Vise dialing rules Rules	1
Show icon in taskbar when connected	
OK Can	cel

Click OK.

The Connect Dial-Up Connection screen appears.

Connect Dial-u	p Connection
User name:	Administrator
Password:	******
Dial:	5552000
Dial	Cancel Properties Help

Type in the user name and password for your remote account. If you are joining a domain, you must also specify the domain name.

To use the new multi-link connection, click on the **Dial** button.

Windows 2000 Vcomm: Single Channel Access Example

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows NT server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

1. Go to **Start | Programs | Accessories | Communications | Network and Dial-Up Connections**. The **Network Connection Wizard** screen will appear. At this 'welcome' screen, click **Next**>.

Network Connection Wizard	
	Welcome to the Network Connection Wizard Using this wizard you can create a connection to other computers and networks, enabling applications such as e-mail, Web browsing, file sharing, and printing. To continue, click Next.
	< Back Next > Cancel

2. At the **Network Connection Type** screen, choose the type of network connection you want to create, based on your network configuration and your networking needs. For this example, we will select "Dial-up to private network."

Network Connection Wizard
Network Connection Type You can choose the type of network connection you want to create, based on your network configuration and your networking needs.
Dial-up to private network. Connect using my phone line (modem or ISDN).
 Dial-up to the Internet Connect to the Internet using my phone line (modem or ISDN).
 Connect to a private network through the Internet Create a Virtual Private Network (VPN) connection or 'tunnel' through the Internet.
 Accept incoming connections Let ofher computers connect to mine by phone line, the Internet, or direct cable.
 Connect directly to another computer Connect using my serial, parallel, or infrared port.
< Back Next> Cancel

Click Next>.

3. The **Select a Device** screen appears. At this screen, you specify the device to be used for this connection. In this example, we have chosen the "ISDN Channel-Intelligent PCMCIA ISDN TA (Net)."

twork Connection Wizard	
Select a Device This is the device that will be used to make	e the connection.
You have more than one dial-up device or	your computer.
Select the devices to use in this connectio	π
All available ISDN lines multi-linked All available ISDN lines multi-linked Sinfrared Modern Port (SERIAL1-0) SiSDN channel - Intelligent PCMCI SiSDN channel - Int	d A ISDN TA (Net) A ISDN TA (Net) Modem (COM3) T (modem) #2 (COM5)
La	
	< Back Next > Cancel

Click Next>.

4. The **Phone Number to Dial** screen appears. At this screen, you will type the phone number of the computer or network to which you are connecting.

Network Connection Wizard
Phone Number to Dial You must specify the phone number of the computer or network you want to connect to.
Type the phone number of the computer or network you are connecting to. If you want your computer to determine automatically how to dial from different locations, check Use dialing rules.
Area code: Phone number:
Country/region code:
Use dialing rules
< Back Next > Cancel

Click Next>.

5. The **Connection Availability** screen appears. At this screen, you can choose to make this connection available only to yourself or, alternatively, to all users.

etwork Connection Wizard	
Connection Availability You may make the new connection avail	lable to all users, or just yourself.
You may make this connection available connection stored in your profile will not b	to all users, or keep it only for your own use. A se available unless you are logged on.
Create this connection:	
For all users	
C Dnly for myself	
	<back next=""> Cancel</back>

Click Next>.

6. The **Completing the Network Connection Wizard** screen appears. At this screen, you should type in a descriptive name for this connection.



Click Finish.

7. The Connect Dial-Up Connection screen appears.

Connect Dial-u	up Connection	? ×
		27
User name:	Administrator	
Password:	******	
	Save password	
Dial:	5552000	•
Dial	Cancel Properties	Help

To configure this connection, click the **Properties** button.

Dial-up Connection
General Options Security Networking
Connect using:
✓ Modem - MultiMobile MT128ZLX-ST (modem) #2
All devices call the same numbers Configure
Phone number
Area code: Phone number: S552000 Alternates
Country/region code:
Use dialing rules Rules
Show icon in taskbar when connected
OK Cancel

8. From the **Dial-Up Connection** screen, do one or more of the following:

- to configure dialing services, phone numbers, host address, country/region codes, or dialing rules, click the **General** tab;
- to configure dialing and re-dialing options, multi-link configuration, domain name, or X.25 parameters, click the **Options** tab;
- to configure identity, authentication, data encryption, or terminal window and scripting options, click the **Security** tab;
- to configure the remote access server and protocols used for this connection, click the **Networking** tab.

Connect Dial-u	p Connection	r× S
User name:	Administrator	
Dial:	Save password	-
Dial	Cancel Properties Help	

When configuration is complete, click **OK** to return to the **Connect Dial-Up Connection** screen.

To use the new connection, click on the **Dial** button. Type in the user name and password for your remote account. If you are joining a domain, you must also specify the domain name.

Windows 2000 Vcomm: Dual Channel Access Example (MultiLink)

NOT SUPPORTED.

Windows 2000 CAPI: Single Channel Access Example

- NOTE: To install, configure, and remove devices in Windows 2000, your logon permissions must include the ability to load and remove device drivers.
- NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows 2000 server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

To use the Common ISDN Application Interface (CAPI), you must install a CAPI-compliant telecommunications application, such as the RVS-COM Lite program, which will be used for this example.

To use the Common ISDN Application Interface (CAPI), you must install a CAPI-compliant telecommunications application, such as the RVS-COM Lite program, which will be used for this example.

After installing RVS-COM Lite, one modem, "RVS ISDN," is installed automatically during the RVS-COM installation. We will use this single modem for this example. Additional modems of various types can be installed as needed. Before beginning, be sure that the RVS-COM Center is running (the icon will appear in the Windows 2000 Task Bar).

1. Go to **Start | Programs | Accessories | Communications | Network and Dial-Up Connections**. The **Network Connection Wizard** screen will appear. At this 'welcome' screen, click **Next**>.



2. At the **Network Connection Type** screen, choose the type of network connection you want to create, based on your network configuration and your networking needs. For this example, we will select "Dial-up to private network."

Network Connection Wizard
Network Connection Type You can choose the type of network connection you want to create, based on your network configuration and your networking needs.
Connect using my phone line (modern or ISDN).
 Dial-up to the Internet Connect to the Internet using my phone line (modern or ISDN).
Connect to a private network through the Internet Create a Virtual Private Network (VPN) connection or "tunne" through the Internet.
Accept incoming connections Let other computers connect to mine by phone line, the Internet, or direct cable.
Connect directly to another computer Connect using my serial, parallel, or infrared port.
< Back Next > Cancel

Click Next>.

5. The **Select a Device** screen appears. At this screen, you specify the device to be used for this connection. In this example, we have chosen the "Modem-RVS ISDN (COM4)."

Network Connection Wizard
Select a Device This is the device that will be used to make the connection.
You have more than one dial-up device on your computer.
Select the devices to use in this connection:
SIDN channel - Intelligent POMDA ISDN TA (Net)
Modem - Compag 56K (V. 90) PCI Modem (COM3) Modem - MultiMobile MT1282LX/ST (modem) #2 (COM5)
🖬 🧶 Modem - RVS ISDN (DDM4)
K
54
< Back Next > Cancel

Click Next>.

6. The **Phone Number to Dial** screen appears. At this screen, you will type the phone number of the computer or network to which you are connecting.

Network Connection Wizard
Phone Number to Dial You must specify the phone number of the computer or network you went to connect to.
Type the phone number of the computer or network you are connecting to. If you want your computer to determine automatically how to dial from different locations, check Use dialing rules.
Area code: Phone number:
Country/region code:
Use dialing rules
< Back Next> Cancel

Click Next>.

7. The **Connection Availability** screen appears. At this screen, you can choose to make this connection available only to yourself or, alternatively, to all users.

Network Connection Wizard				
Connection Availability You may make the new connection available to all users, or just yoursell.				
You may make this connection available to all users, or keep it only for your own use. A connection stored in your profile will not be available unless you are logged on.				
Create this connection:				
(* For all upers				
C Dnly for myself				
< Back. Next > Cancel				

Click Next>.

8. The **Completing the Network Connection Wizard** screen appears. At this screen, you should type in a descriptive name for this connection.



Click Finish.

Connect Dial-up Connection

? ×

Image: Connect Dial-up Connection

Value

User name: Administrator

Password:

Image: Save password

Dial: 5552000

Dial

Cancel

9. The Connect Dial-Up Connection screen appears.

To configure this connection, click the **Properties** button.

Dial-up Connection			
General Options Security Networking			
Connect using:			
Modem - RVS ISDN (COM4) Modem - Compaq 56K (V.90) PCI Modem (COM3) Modem - MultiMobile MT128ZLX-ST (modem) #2			
All devices call the same numbers Configure			
Phone number			
Area code: Phone number: Image: S552000 Alternates			
Country/region code:			
 ✓ Use dialing rules ✓ Rules ✓ Show icon in taskbar when connected 			
OK Cancel			

10. From the **Dial-Up Connection** screen, do one or more of the following:

- to configure dialing services, phone numbers, host address, country/region codes, or dialing rules, click the **General** tab;
- to configure dialing and re-dialing options, multi-link configuration, domain name, or X.25 parameters, click the **Options** tab;
- to configure identity, authentication, data encryption, or terminal window and scripting options, click the **Security** tab;
- to configure the remote access server and protocols used for this connection, click the **Networking** tab.

Connect Dial-u	p Connection	× P
User name:	Administrator	
Password:	******	
	Save password	
Dial:	5552000	•
Dial	Cancel Properties H	elp

When configuration is complete, click **OK** to return to the **Connect Dial-Up Connection** screen.

To use the new connection, click on the **Dial** button. Type in the user name and password for your remote account. If you are joining a domain, you must also specify the domain name.
Windows 2000 CAPI: Dual Channel Access Example (MultiLink)

NOTE: To install, configure, and remove devices in Windows 2000, your logon permissions must include the ability to load and remove device drivers.
 NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator. 1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected. 2. If you are connecting to a non-Windows 2000 server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing. 3. If applicable, you will need to know the domain name of the network to which you will be connected. 4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

To use the Common ISDN Application Interface (CAPI), you must install a CAPI-compliant telecommunications application, such as the RVS-COM Lite program, which will be used for this example.

After installing RVS-COM Lite, one modem, "RVS ISDN," is installed automatically during the RVS-COM installation. We will use this single modem for this example. Additional modems of various types can be installed as needed. Before beginning, be sure that the RVS-COM Center is running (the icon will appear in the Windows 2000 Task Bar).

If you would like to use multi-linking with your CAPI connection, first be sure that your ISDN provider supports a 128kbps MLP option.

The ports you link must first be enabled through RVS-Com Lite.

1. To enable the ports in RVS-Com, open the RVS-Com Comm Center.

2. Click the **Services** tab. In the **Virtual Com Ports** section of the window, place a check mark in front of both ports. Associate each port with a unique COM port number (the two devices must use different COM ports).

Click **Apply**, and then **OK**.

Phone And Modern Options	? ×
Dialing Rules Modems Advanced	
The following moderns are installed:	
Modem Attached To	
Compag 56K (V.90) PCI Modem COM3	
MultiMobile MT128ZLX-ST (modern) #2 COM5	
RVS ISDN COM4	
Add Remove	Properties
OK Caused	heeku.

3. Go to **Start | Settings | Control Panel | Modems**. The Phone and Modem Options screen appears.

Select the **Modems** tab.

Click on the Add button.

4. The **Add/Remove Hardware Wizard** screen appears. Select "Don't detect my modem; I will select it from a list."



Click Next>.

5. The next screen displays a list of modem manufacturers and modem models. In the **Manufacturers** pane, highlight "RVS Datentechnik." In the **Models** pane, highlight "RVS ISDN."

Add/Remove Hardware Wizard	
Install New Modem	
Select the manufacturer an have an installation disk, cli	d model of your modern. If your modern is not listed, or if you ck Have Disk.
Manufacturers: Scom 3Com 3X Aceex Aceer 4 4	Models: Communications cable between two computers Standard 300 bps Modem Standard 1200 bps Modem Standard 9600 bps Modem Standard 14400 bps Modem Standard 14400 bps Modem Standard 19200 box Modem Standard 19200 box Modem Have Disk
	< Back Next > Cancel

Click Next>.

6. The next screens allows you to select which COM port to use with the "RVS ISDN modem."

Add/Remove Hardware Wi	izard			
Install New Modem Select the port(s) you a	want to install the m	odem on.		
	You have select RVS ISDN On which ports of All parts COM1 COM1 COM4 COM7 COM8 COM9 COM10	ed the following mo to you want to insta ts	den:	×
		< Back	Next>	Cancel

Select "COM 6." Click Next>.

7. The Digital Signature Not Found screen appears.



Click **Yes** to continue the installation.

8. At the completion screen, click **Finish**. You should now see two "RVS ISDN" devices in the **Phone and Modem Properties Options** window.

Add/Remove Hardware Wizard		
Install New Modem Modem installation is fin	ished 🚱	
	Your modem has been set up successfully. If you want to change these settings, double-click the Phone and Modem Options icon in Control Panel, click the Modems tab, select this modem, and then click Properties.	
	K Back Finish Cancel	

Click **OK** to exit from the **Phone and Modem Properties Options** window. Then close the **Control Panel** window.

Phone And Modern Options		<u> ?</u> ×
Dialing Rules Modems Advanced		
The following modems are installed	đ	
Modem	Attached To	
Compaq 56K (V.90) PCI Modem	COM3	
MultiMobile MT128ZLX-ST (modern) #2	COM5	
RVS ISDN	COM4	
RVS ISDN #2	COM6	
Add	Bemove Proper	ties
DK	Cancel	aply -

9. For this example, we will use the existing connection that was created in the CAPI single-channel procedure above ("Windows 2000 CAPI: Single Channel Access Example").

10. Go to **Start | Programs | Accessories | Communications | Network and Dial-Up Connections**. This will open up the **Network and Dial-Up Connections** folder. At the **Network and Dial-Up Connections** folder, right-click on your new connection icon. Choose **Properties**.



11. The **Dial-Up Connections Properties** window appears.

12. The **Dial-Up Connection** screen appears. Select the **General** tab. Select the check-box for the additional "Modem-RVS ISDN #2 (COM6)" listed in the **Connect Using** field. Since the multi-link connection you are making requires two of these devices, be sure that both "Modem-RVS ISDN" entries

	Sal-up Connection
	General Options Security Networking
	Connect using:
	Modem - RVS ISDN (CDM4) Modem - RVS ISDN (%)(CDM5)
	Modem - Compag 56K (V. 90) PCI Modem (CDM3)
	M All devices call the same numbers Configure
	Phone number
	Assa cods: Phone number:
	Country/region code:
	×
	Use dialing rules Boles
	Show icon in taskbar when connected
	OK Canad
are selected.	

Click OK. The Connect Dial-Up Connection screen appears.

Connect Dial-u	ap Connection	१×
	10	Ŷ
User name:	Administrator	
Password	EPAGAARA	
	Save password	
Diat	5552000	*
Dial	Cancel Properties	Help

Type in the user name and password for your remote account. If you are joining a domain, you must also specify the domain name.

To use the new multi-link connection, click on the **Dial** button.

6 Installation & Use in Windows ME

MT128ZLX-ST/NT: Windows ME Driver Procedures

Windows ME Installation

NOTE: Before beginning the installation, you must obtain the following technical information from your telephone company:

SPIDs (North America only)

Switch Type

Voice Encoding scheme

Telephone Number(s)

- NOTE: As you begin this procedure, the MT128ZLX card should not be installed in the computer's PCMCIA slot. The setup exe file must be run before the card is installed. Otherwise problems will arise as Windows ME detects the device.
- NOTE: During the installation, you should have your Windows ME CD-ROM close at hand. Windows ME may need to add or update files which must be copied from the CD.

1. For now, leave the MT128ZLX card out of the computer's PCMCIA slot.

2. Insert the MT128ZLX Installation CD into the computer's CD-ROM drive.

3. Using Windows Explorer, browse to the win9x directory on the MT128ZLX Installation CD.



4. Double-click on the Setup.exe file to launch the Configuration Utility Setup program.

At the Welcome screen, click Next.

5. At the **Choose Destination Location** screen, you can accept the default path or enter a different path at which to install the **Configuration Utility** files.



Click Next>.

6. At the **Select Program Folder** screen, you can accept the default folder or select another folder into which the program icons will be added.



Then click Next>.

7. The **Start Copying Files** screen allows you one last chance to go back and change information that you have provided in previous steps.



When satisfied with your settings, click Next> to begin copying files.

8. Progress screens will appear while files are being copied to your hard disk.

9. The **Configuration Utility** screen appears, displaying the various applets of the Configuration Utility program.

😋 Configuration Utility		_ D ×
Ele Edit View Favorites Icolo Help		
] ← Beck + → + 🔂 (@Search CarFolders @History	昭昭×8 国・	
Address 🛅 Configuration Utility		• @Go
Configuration Utility	Protocol Status Analyzer	Terrinal
	l≩	
5 object(s)	2.87 KB	🧮 My Computer 🥢

Close the Configuration Utility windows.

10. At the Setup Complete, screen, select Yes, I want to restart my computer now.



Click Finish.

11. When the restart process is complete, a message will appear indicating that "ISDN PC Card does not exist," meaning that the card is not in the computer's PCMCIA slot. This is normal. After the drivers are installed, this message will appear upon restart anytime the MT128ZLX card is not installed in its slot.



Click OK.

12. Insert the MT128ZLX into the computer's PCMCIA slot.



13. Windows ME will detect the MT128ZLX card. The **New Hardware Found** wizard will display a series of screens indicating that is has found new hardware and that it is installing the corresponding software.

14. Go to Start | Settings | Control Panel. Double-click the Add New Hardware icon.



The Add New Hardware Wizard begins with a warning to close all open applications. Click Next>.

A plug-and-play screen appears.

Add New Hardware Wize	ard Windows will now search for any new Plug and Play devices on your system. Your screen may go blank during this process. This is normal. To continue, click Next.
	< <u>B</u> ack [<u>Next></u>] Cancel

Click Next>.

15. When prompted about the device list, select "No, the device isn't in the list."

Add New Hardware Wize	and Is the device that you want to instal listed below? No, the device isn't in the list. Yes, the device is in the list. Select the device that you want to install, and then clock Next. Devices:
	<back next=""> Cancel</back>

Click Next>.

16. When prompted about the hardware list, select "No, I want to select the hardware from a list."

Add New Hardware Wiza	rd
	Windows can now search for hardware that is not Plug and Play compatible, or you can select your hardware from a list. When Windows detects new hardware, it automatically determines the current settings for the device and installs the correct driver. For this reason it is strongly recommended that you have Windows search for your new hardware. Do you want Windows to search for your new hardware? Yes (Recommended) No. I want to select the hardware from a list.
	<back next=""> Cancel</back>

Click Next>.

17. In the "Hardware Types" list, select Network Adapters.

Select the type of hardware you want to insta Hardware types:	L
Infrared devices ISDNAdapter Keyboard Memory Technology Drivers (MTDs) Modem Monitors Mouse Multi-function adapters Ketwork sclepters Conter devices	•
< Back Next>	Cancel

Click Next>.

18. At the **Select Device** screen, highlight "MultiTech" in the Manufacturers pane; highlight "MultiMobile MT128ZLX-ST ISDN TA (Net)" in the Models pane.

Select Device	K
Click the Network adapters that matches your hardware, and then click OK. If you don't know which model you have, click OK. If you have an installation disk for this device, click Have Disk.	
Manufacturers: Mogels:	
Microsense MultiMobile MT1282LX-ST ISDN TA (Net)	
Microsoft	
Mitron	
MultiTech	
Natilinal Datacomm 🔹	
∐ave Disk	
OK. Cancel	

Click OK.

19. At the completion screen, click Finish.

Add New Hardware Wizard		
~	Windows can continue installing your hardware now. To continue installing the software needed by your hardware, click Finish.	
	< Back Finish Cancel	

Progress screens appear while files are being copied.

20. The ISDN Configuration wizard is launched.



At the first screen, click Next>.

NOTE: The information entered in the Microsoft ISDN Configuration Wizard is overridden by the information entered in the MT128ZLX configuration utility, which was installed during the driver installation. However, completing this wizard is necessary to update certain dial-up networking software components to add ISDN functionality to Windows ME. The MT128ZLX is configured for use with the Configuration Utility that was installed during driver installation. In the section "Configuring the MT128ZLX" (presented later in this chapter), you will supply setup information for using the Configuration Utility program with your particular computer.

21. Accept the default value for the "Switch Protocol." Click Next>.

ISDN Configuration	×
	Select the switch protocol that your telephone company uses from the list below. Switch protocol ATT: AT&T ESS 5
	<back next=""> Cancel</back>

22. The next wizard screen requests **Phone Number** and **SPID** information. It is not necessary to enter this information here. You will be asked to supply this information later (in the **Configuration Utility** program).

Leave the fields of this dialog box blank.

ISDN Configuration		X
	Enter the telephone numbers and the corresponding SPIDs (Service Profile ID). If you have only one telephone number you may leave the second phone number blank. If your telephone company does not require a SPID, leave the SPID fields blank.	
	Phone number: SPID:	
	Phone number: SPID:	
	<back next=""> Cancel</back>	

Click Next>.

21. In some cases, Windows ME may require an additional software component which can be loaded from the Windows ME CD-ROM.

If this occurs, insert your Windows ME CD into the CD-ROM drive and follow the Windows ME messages to allow the required files to be copied.

23. At the completion screen, click **Finish**.

ISDN Configuration	×
	The ISDN configuration is complete. To use ISDN, create a new connection using Dial-Up Networking, and select your ISDN adapter as the device to use for the connection. To modify the settings you have just entered, go to the ISDN Tools program group under Accessories on the Start Menu and click on ISDN Configuration Wizard.
	<back cancel<="" finish="" td=""></back>

24. When prompted to restart your computer, click Yes.

25. Driver installation is now complete. However, before you can use your MT128ZLX in Windows ME, it must be configured with these parameters:

- SPIDs (in the U.S. and Canada),
- telephone numbers,
- voice-encoding information, and
- switch-type information.

(See the procedure "Configuring the MT128ZLX In Windows ME" below.)

Verifying the Windows ME Installation

1. Go to **Start | Settings | Control Panel**. Double-click the **System** icon. At the **System Properties** screen, select the **Device Manager** tab.

System Properties	? ×
General Device Manager Hardware Profiles Performance	
ISDNAdapter MultMoble M1-282LX-ST [ISDN] E-02 Keyboard	-
Modem Compag Global Mini PCI 56K (V.90) Modem MultMobie MT1282LX-ST (modem) MultModem MT563421X-E	
Monitors Mouse Multifunction adapters	
MultiTech MT5634ZLX-E [Ethemet+Modern] Card MultiMobile MT128ZLX-ST MultiFunction Card Network adapters	
Dial-Up Adapter Multi-Tech MT56342LX-E [Ethernet] Card Multi-Tech MT1282LX-ST ISDN TA [Net] MultiMobile MT1282LX-ST ISDN TA [Net]	-
Properties Refresh Remove Prigt	
OK C	ancel

2. After a successful driver installation, the **Device Manager** will contain the following entries:

ISDN Adapter \ MultiMobile MT128ZLX-ST (ISDN)

Modem \ MultiMobile MT128ZLX-ST (modem)

Multifunction Adapters \ MultiMobile MT128ZLX-ST Multi-Function Card

Network Adapters \ MultiMobile MT128ZLX-ST ISDN TA (Net)

3. If these entries do not appear, un-install the Configuration Utility (see the un-install section in this chapter). Then run the **Setup.exe** file again. If the installation fails repeatedly, call MultiTech Tech Support (800-972-2439).

Configuring the MT128ZLX-ST/NT in Windows ME

NOTE: In this procedure, you will be asked to enter detailed configuration information that relates to the ISDN equipment being used by your telephone company. Specifically, your telephone company must provide the following information:

SPIDs, Phone Numbers, Switch Type, and Voice Encoding type.

This information is supplied by your telephone company and you must have it available when doing this procedure.

1. Go to **Start | Programs | Configuration Utility | Config.** The **Configuration Utility** dialog box will appear.

2. Enter the information needed in each field of the dialog box.

😤 Configuration Utility	×
Switch Type General COM Po	ort Setting Tools
Select the switch type that	t your ISDN service provider is using.
Switch Type :	ESS Detail
Phone Number	
Enter the ISDN phone n Identitier number (SPID)	unibers and the Service Profile from your ISDN service provider.
B1 Number :	B1 SPID :
B2 Number :	82 SPID :
B Channel Speed	/aice Encoding
C 56K	C A-law for European countries
(€ 64K.	G Murlaw for North American countries
	Set Default
	0K Cancel Apply

Switch Type:	See listed options.
Phone Numbers:	B1 number and B2 number.
SPID	Needed only in the U.S. and Canada.
B-Channel Speed	56 kbps or 64 kbps
Voice Encoding:	for Net3 or ETSI, use A-law voice encoding
	for other switches, use Mu-law voice encoding

Click OK.

Uninstalling the MT128ZLX-ST/NT Drivers in Windows ME

1. Close the **Status** program. After the **Configuration Utility** has been installed, the Status program's icon normally appears at the lower right corner of your screen. Click on this icon and close the Status program.

2. Go to **Start | Settings | Control Panel**. Click on the **Add/Remove Programs** icon. The **Add/Remove Programs Properties** dialog box will appear. At the **Install/Uninstall** tab, highlight **Configuration Utility**. Click on the **Add/Remove** button.

Add/Remo	ve Programs Properties 🛛 😰 🗷
Instal/Un	instal Windows Setup Startup Disk
影	To install a new program from a floppy disk or CD-ROM drive, click Install.
	Instal
1	The following toftware can be automatically removed by Windows. To remove a program or to modify its installed components, select it from the list and click. Add/Remove.
ATLDis	play Driver ration Utility
	Add/Hemove
	OK Cancel 2000

3. At the **Confirm File Deletion** screen, click **Yes**.



4. The **Uninstall Shield** program will appear. At the **Remove Programs From Your Computer** screen, click **OK**.



Click on **Details** to see files that must be manually deleted later. Record file names as needed.



Click **OK** at both of these screens to proceed.

5. A message screen appears recommending that you restart your computer.



Click **OK**. Then restart your computer.

MT128ZLX: Using APIs in Windows ME

About APIs

The MT128ZLX-ST/NT operates in conjunction with three Application Program Interface software packages: NDIS, VCOMM, or CAPI. This chapter presents examples of how the MT128ZLX can be used with these APIs. The CAPI-compliant program used in these examples is RVS-COM Lite.

Each API contains software components that interact with the operating system of the computer in which the MT128ZLX is installed. Each API adds communications functionality to the system. Each of the three APIs adds a somewhat different set of features to the system, as summarized in the table below and described more fully in subsequent sections.

API	Full Name	Functionality
NDIS	Network Driver Interface Specification	dial-up networking (DUN)connection, network interface card (NIC) emulation
VCOMM	Virtual Communications Driver	dial-up networking (DUN)connection, modem emulation
CAPI	Common ISDN Application Program Interface	dial-up networking (DUN)connection, modem emulation, G3 and G4 FAX, V.110, V.120, X.75, HDLC, interface to ISDN features and services

The NDIS API

NDIS allows Network Interface Cards (NICs) to work with each other, with the operating system, and with higher order protocol drivers. NDIS is an interface that facilitates development of NIC drivers. NDIS program routines can implement the functions that NIC drivers must perform. These include interaction with protocol drivers, the handling of hardware interrupts, and interface with underlying NICs by dealing with registers, port I/O, and other functionality. NDIS allows drivers to be developed in high-level programming languages, such that their creation and implementation are platform-independent.

The VCOMM API

The communications device driver known as "VCOMM" provides protected-mode services. It allows makes ports and modems available to Windows-based software application programs. VCOMM also uses plug-and-play functionality to simplify the installation and configuration of communications devices.

The CAPI API

Being a common interface, the ISDN CAPI (Common Application Program Interface), allows software programs to use all ISDN services. Computer programs have access to most services and features of ISDN when used with CAPI. This access is hardware-independent. CAPI makes call numbers available, as well as several kinds of service information: caller number, called number, call charges, ISDN service ID. CAPI also facilitates transmission of data, FAX, or voice, and multiple B-channels can also be used simultaneously on a single call.

It is the capabilities of the ISDN adapter and the type of ISDN connection that determine which services and features are actually available. CAPI merely serves as a common interface. ISDN CAPI is a platform-independent standard which can be used in non-Windows operating systems like OS/2 and UNIX, as well as in Microsoft operating systems.

CAPI 2.0 is the current form of CAPI. ISDN adapters with CAPI 2.0 can be used anywhere in Europe with the DSS1 Euro-ISDN connection.

Intro to API Single-Channel and MultiLink Examples

In the following procedures, you will use Application Program Interfaces (APIs) to set up and use dial-up networking with the MT128ZLX in conjunction with the particular operating system your computer is using. The APIs are installed as part of the MT128ZLX driver installation, which must be complete before these procedures can be done. Note that the procedures presented here are examples only. Your use of APIs will depend on the needs and limitations of your operating environment.

Windows ME NDIS: Single Channel Access Example

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

1. Go to **Start | Programs | Accessories | Communications | Dial-Up Networking**. If this is your first communications connection, the **Welcome to Dial-Up Networking** screen will appear. Otherwise, click on the **Make New Connection** icon.



Click **Next**>.

The **Make New Connection** screen appears. Enter a descriptive name for the connection. In the "Select a device" drop-down box, highlight **ISDN-Line0**.

Make New Connection		<
	Lype a name for the computer you are dialing: My Connection Select a device: MultiMobile MT128ZLX-ST (modem) ISDN-Line1 MultiMobile MT128ZLX-ST (modem)	
	KBack Next > Cancel	

Click **Next**>.

3. At the next screen, enter the area code and phone number of your ISP or the remote device you will be calling using this connection. Select the appropriate Country or Region Code and click **Next**> to complete the setup.



4. At the completion screen, click **Finish**.



The new dialup connection is ready to configure.

5. From the **Dial-Up Networking** folder, right-click on your new connection icon. Choose **Properties**.



6. On the **General** tab, type in the phone number for the adapter port. You may change the connection options by clicking **Configure**.

My Connection ? 🔀
General Networking Security Scripting Multilink Dialing
Los My Connection
Area code: Telephone number:
Country code: United States of America (1)
✓ Use area code and Dialing Properties
Connect using:
OK Cancel

7. Click on the **Networking** tab to configure logon options, encryption, log file information and network protocol options, including TCP/IP Settings for your remote server and DNS connections. If necessary, contact your ISP or network administrator to obtain the correct TCP/IP addressing information.

8. Use the **Scripting** tab to define scripts that will run when this connection is made. Click **OK** to complete the configuration.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

Windows ME NDIS: Dual Channel Access Example (MultiLink)

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

If you would like to use multi-linking with your NDIS connection, first be sure that your ISDN provider supports a 128kbps MLP option.

1. To begin, you will need to create a new dial-up connection as described above ("Windows ME NDIS: Single Channel Access Example") or modify an existing connection. Right-click on the **Dial-Up Connection** icon and select **Properties**.

My Connection ? ×
General Networking Security Scripting Multilink Dialing
Los My Connection
Phone number: Area code: Telephone number:
Country code:
United States of America (1)
✓ Use area code and Dialing Properties
Connect using:
ISDN-Line0
<u>C</u> onfigure
OK Cancel

Click on the **MultiLink** tab.

My Connection	<u>? ×</u>
General Networking Security Scriptin	g Multilink Dialing
O Do not use additional devices	
Device name	Phone #
ISDN-Line1	5552000
Selected device: ISDN-Line1	
Add <u>R</u> emove	<u></u> dit
0	K Cancel

2. Select Use Additional Devices. Click Add.

At the **Edit Extra Device** screen, in the **Device Name** drop-down box, select **ISDN-Line1**. Enter the **Phone Number** of your ISP or of the remote device that you will be calling with this connection.

Edit Extra Device	? ×
Device name:	<u>0</u> K
	Cancel

When complete, continue to click **OK** to leave the **Set Additional Devices** configuration screens.

To use this new connection, double-click on the new Dial-Up Networking Connection icon. Type in the user name and password for your remote account and click **Connect**.

Windows ME Vcomm: Single Channel Access Example

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

1. Go to **Start | Programs | Accessories | Communications | Dial-Up Networking**. If this is your first communications connection, the **Welcome to Dial-Up Networking** screen will appear. Otherwise, click on the **Make New Connection** icon.



Click Next>.

2. The **Make New Connection** screen appears. Enter a descriptive name for the connection. In the "Select a device" drop-down box, highlight **MultiMobile MT128ZLX-ST (modem)**. Click **Next**>.



3. At the next screen, enter the area code and phone number of your ISP or of the remote device you will be calling using this connection. Select the appropriate Country or Region Code and click **Next**> to complete the setup.

Make New Connection	×
	Type the phone number for the computer you want to call: Area code:elephone number: 763 • 5552000 Cognity or region code: United States of America (1) •
	< Back Next

Click Next>.

4. At the completion screen, click **Finish**.



The new dialup connection is ready to configure.

5. From the Dial-Up Networking folder, right-click on your new connection icon. Choose Properties.



6. On the **General** tab, type in the phone number for the adapter port. You may change the connection options by clicking **Configure**.

My Connection ? X
General Networking Security Scripting Multilink Dialing
My Connection
Phone number:
Area code: Telephone number:
763 · 5552000
Country code:
United States of America (1)
Use area code and Dialing Properties
Cognect using
MultiMobile MT1282LX-ST (modern)
Configure
OK Cancel

7. Click on the **Networking** tab to configure logon options, encryption, log file information and network protocol options, including TCP/IP Settings for your remote server and DNS connections. If necessary, contact your ISP or network administrator to obtain the correct TCP/IP addressing information.

8. Use the **Scripting** tab to define scripts that will run when this connection is made. Click **OK** to complete the configuration.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

Windows ME Vcomm: Dual Channel Access Example (MultiLink)

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

If you would like to use multi-linking with your VCOMM connection, first be sure that your ISDN provider supports a 128kbps MLP option.

In order to use VCOMM multi-linking, you must install a second ISDN device in the **Modems** applet in the **Control Panel**. The first ISDN device was installed automatically during the initial driver installation.

1. Install the virtual modem for your MT128ZLX in Windows ME by selecting **Start | Settings | Control Panel | Add**. Windows ME will prepare to detect your modem. The **Install New Modems** screen will appear.

Click on "Do not detect my modem; I will select it from a list."



Click Next>.

3. The next screen displays a list of modem manufacturers and modem models. In the **Manufacturers** pane, highlight "MultiTech." In the **Models** pane, highlight "MultiMobile MT128ZLX-ST (modem)."
| stall New Modem |
|--|
| Click the manufacturer and model of your modern. If your modern is not listed,
or if you have an installation disk, click Have Disk. |
| Manufacturers: Models
Motorola (Ger)
Motorola - International
MTD Systems
Multimeth
Multimeth
Multimeth (Ger)
Multimeth (Ger)
Multimet |
| < <u>Back</u> Megt> Cancel |

Click Next>.

4. The next screens allows you to select which COM port to use with the MT128ZLX.



Select "ISDN 2nd COM." Click Next>.

5. At the completion screen, click **Finish**. You should now see two ISDN devices in the **Modems Properties** window.

Modem: Propertie:
General Diagnostics
The following moderns are set up on this computer.
MultiMobile MT1282LX-ST (moden) MultiMobile MT1282LX-ST (moden) #2
Add Rgmove Properties
- Dialing Preferences
Dialing from: Default Location
Use Dialing Properties to modify how your calls are dialed.
Dialing Properties
Close

Click Close to exit from the Modems Properties window. Then close the Control Panel window.

6. For this example, we will use the existing connection that was created in the VCOMM single-channel procedure above ("Windows ME Vcomm: Single Channel Access Example").

Go to **Start | Programs | Accessories | Communications | Dial-Up Networking**. This will open up the **Dial-Up Networking** folder.

From the Dial-Up Networking folder, right-click on your new connection icon. Choose Properties.

Dial-Up Networking	
<u>F</u> ile <u>E</u> dit ⊻iew	F <u>a</u> vorites »
$] \leftarrow Back \rightarrow \rightarrow ($	🔄 🔍 Search 🏻 🎽
🛛 Address 📴 Dial-Up Networkin 💌 🔗 Go	
💾 T.	C <u>o</u> nnect
Make New My Con Connection	Set as De <u>f</u> ault
	Create <u>S</u> hortcut
	<u>D</u> elete
	Rena <u>m</u> e
	P <u>r</u> operties
🤤 Opens the property sheet of selected iten 🎢	

7. The Connection menu screen appears. Click on the MultiLink tab.

My Connection ? ×
General Networking Security Scripting Multilink Dialing
Do not use additional devices Use additional devices Device name Phone # MultiMobile MT128ZLX-ST (modem) 5552000
Selected device: MultiMobile MT128ZLX-ST (modem)
OK Cancel

Select Use Additional Devices. Click Add.

8. At the **Edit Extra Device** screen, in the **Device Name** drop-down box, select **MultiMobile MT128ZLX-ST (modem) #2**. Enter the **Phone Number** of your ISP or of the remote device that you will be calling with this connection.

Edit Extra Device	? ×
Device name: MultiMobile MT128ZLX-ST (modem) ▼	<u></u> K
Phone number: 5552000	Cancel

When complete, continue to click **OK** to leave the **Set Additional Devices** configuration screens.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

Windows ME CAPI: Single Channel Access Example

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

1. You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.

2. If you are connecting to a non-Windows server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.

3. If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

To use the Common ISDN Application Interface (CAPI), you must install a CAPI-compliant telecommunications application, such as the RVS-COM Lite program, which will be used for this example.

After installing RVS-COM Lite, several new virtual modems become available to configure. The following example uses the RVS ISDN V.120 modem. Before beginning, be sure that the RVS-COM Center is running (the icon will appear in the Windows ME Task Bar).

1. Go to **Start | Programs | Accessories | Communications | Dial-Up Networking**. If this is your first communications connection, the **Welcome to Dial-Up Networking** screen will appear. Otherwise, click on the **Make New Connection** icon.



Click Next>.

2. The **Make New Connection** screen appears. Enter a descriptive name for the connection. In the "Select a device" drop-down box, highlight **RVS ISDN V.120**.

Make New Connection		×
	Lype a name for the computer you are dialing: My Connection Select a glevice:	-
	CEeck Next> Car	cel

Click Next>.

3. At the next screen, enter the area code and phone number of your ISP or of the remote device you will be calling using this connection. Select the appropriate Country Code and click **Next**> to complete the setup.

Make New Connection	×
	Type the phone number for the computer you want to call: Agea code:elephone number: 763 • 5552000 Cognity or region code: United States of America (1) •
	< Back Next Cancel

4. At the completion screen, click **Finish**.



The new dialup connection is ready to configure.

5. From the Dial-Up Networking folder, right-click on your new connection icon. Choose Properties.



6. On the **General** tab, type in the phone number for the adapter port. You may change the connection options by clicking **Configure**.

My Connection ?>
General Networking Security Scripting Multilink Dialing
L S My Connection
Phone number: - Area code: Telephone number: 763 - 5552000
Country code: United States of America (1)
✓ Use area code and Dialing Properties
Connect using:
RVS ISDN V.120
<u>C</u> onfigure
OK Cancel

7. Click on the **Networking** tab to configure logon options, encryption, log file information and network protocol options, including TCP/IP Settings for your remote server and DNS connections. If necessary, contact your ISP or network administrator to obtain the correct TCP/IP addressing information.

8. Use the **Scripting** tab to define scripts that will run when this connection is made. Click **OK** to complete the configuration.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

Windows ME CAPI: Dual Channel Access Example (MultiLink)

NOTE: To complete this procedure, you will need to know several technical details that can be provided by your ISP or by your network administrator.

You will need to know whether or not an encrypted password is needed to access the network to which you will be connected.
 If you are connecting to a non-Windows server, you will also need to know in advance whether or not the server requires you to type in login information or to know TCP/IP addresses before dialing.
 If applicable, you will need to know the domain name of the network to which you will be connected.

4. You will need to know the dial-out network protocol to be used (NetBEUI, TCP/IP, or IPX).

If you would like to use multi-linking with your CAPI connection, first be sure that your ISDN provider supports a 128kbps MLP option.

The ports you link must first be enabled through RVS-Com. In this example, the RVS ISDN V.120 modems are used.

1. To enable the ports in RVS-Com, open the RVS-Com Comm Center.

2. Click the **Services** tab. In the **Virtual Com Ports** section of the window, place a check mark in front of both ports. Associate each port with a unique COM port number (the two devices must use different COM ports).

Click Apply, and then OK.

Next you will need to identify the two modems to be linked or installed.

3. Install the virtual modem for your MT128ZLX in Windows ME by selecting **Start | Settings | Control Panel | Add**. Windows ME will prepare to detect your modem. The **Install New Modems** screen will appear.

Click on "Do not detect my modem; I will select it from a list."



Click Next>.

5. The next screen displays a list of modem manufacturers and modem models. In the **Manufacturers** pane, highlight "RVS Datentechnik." In the **Models** pane, highlight "RVS ISDN V.120."

Install New Modem	
Click the manufacturer of or if you have an instalk	and model of your modern. If your modern is not listed, ation disk, click Have Disk.
Manufacturers: Reveal RFI Elektronik. Rockwell RS Components RVS Datentechnik. Solumith Flantmore Laborat	Models RVS ISDN HDLC transparenk RVS ISDN Internet PPP RVS ISDN Minkel RVS ISDN Modem analog RVS ISDN V.110 RVS ISDN V.120 RVS ISDN X.75 T.20NI Have Disk
	< Back Vent> Cancel

Click Next>.

6. The next screens allows you to select which COM port to use with the "RVS ISDN V.120 modem."

Install New Modem	
	You have selected the following modem: RVS ISDN V.120 Select the port to use with this modem: ECP Printer Port (LPT1) ISDN_2nd_COM MultiMobile MT1282LX-ST (CDM port) (COM7) RVS Port (COM3) RVS Port (COM4)
	<back next=""></back>

Select "RVS Port (COM 4)." Click Next>.

7. At the completion screen, click **Finish**. You should now see two "RVS ISDN V.120" devices in the **Modems Properties** window.

Modems Properties	? ×
General Diagnostics	_
The following moderns are set up on this computer	
🗢 RVS ISDN Modem analog 🛛 🗟 🛓	
FVS ISDN V.120	
FVS ISDN V.120 #2	41
RVS ISDN X 75 transnarent	9
Add Remove Pjoperties	
Dialing Preferences	
Dialing from: Default Location	
Use Dialing Properties to modify how your calls are dialed.	
Dialing Properties	
	-
Close Canas	4

Click Close to exit from the Modems Properties window. Then close the Control Panel window.

8. For this example, we will use the existing connection that was created in the CAPI single-channel procedure above ("Windows ME CAPI: Single Channel Access Example").

Go to **Start | Programs | Accessories | Communications | Dial-Up Networking**. This will open up the **Dial-Up Networking** folder.

From the Dial-Up Networking folder, right-click on your new connection icon. Choose Properties.

😫 Dial-Up Networking	
<u>File E</u> dit <u>V</u> iew F ₂	evonites 🍀 🏢
$] \neq Back + \Rightarrow - \blacksquare$	Q Search *
Address 🙆 Dial-Up Net	workin 💌 🄗 Go
- E T.	Connect
Make New My Con Connection	Set as Dejault
	Create Shortout
	Delete
	Rena <u>m</u> e
	Properties
2 Opens the property sheet of selected iten //	

9. The Connection menu screen appears. Click on the MultiLink tab.

My Connection	? ×
General Networking Security Scripting Mutilink Dialir	ן פי
C Do <u>n</u> ot use additional devices	
✓ Use additional devices	
Device name Phone # RVS ISDN V.120 #2 5552000	
Selected device: RVS ISDN V.120 #2	
A <u>d</u> d <u>R</u> emove <u>E</u> dit	1
OK Cance	el

Select Use Additional Devices. Click Add.

10. At the **Edit Extra Device** screen, in the **Device Name** drop-down box, select **MultiMobile MT128ZLX-ST (modem) #2**. Enter the **Phone Number** of your ISP or of the remote device that you will be calling with this connection.

Edit Extra Device	? ×
N	
Device name:	
RVS ISDN V.120 #2	<u>0</u> K
Phone number: 5552000	Cancel

When complete, continue to click **OK** to leave the **Set Additional Devices** configuration screens.

To use this new connection, double-click on the **New Dial-Up Networking Connection** icon. Type in the user name and password for your remote account and click **Connect**.

7 Warranty, Service, & Tech Support

Limited Warranty

Multi-Tech Systems, Inc. (MTS) warrants that its products will be free from defects in material or workmanship for a period of two years from the date of purchase, or if proof of purchase is not provided, two years from date of shipment. MTS MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. This warranty does not apply to any products which have been damaged by lightning storms, water, or power surges or which have been neglected, altered, abused, used for a purpose other than the one for which they were manufactured, repaired by the customer or any party without MTS's written authorization, or used in any manner inconsistent with MTS's instructions.

MTS's entire obligation under this warranty shall be limited (at MTS's option) to repair or replacement of any products which prove to be defective within the warranty period, or, at MTS's option, issuance of a refund of the purchase price. Defective products must be returned by Customer to MTS's factory transportation prepaid.

MTS WILL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES AND UNDER NO CIRCUMSTANCES WILL ITS LIABILITY EXCEED THE PURCHASE PRICE FOR DEFECTIVE PRODUCTS.

Upgrades and Tech Support

You can access updated versions of firmware, drivers, and other software-related support for MultiMobile MT128ZLX products via the MultiTech web site and/or the MultiTech FTP site.

www.multitech.com. Go to **Support** page and select the **MultiMobile** product family. Drivers, software, and firmware are available here. Follow links for manuals, replacements, our warranty, and access to our FTP site.

ftp://ftp.multitech.com. Resources for MultiMobile products are grouped with ISDN devices.

Service

Multi-Tech has an excellent technical support staff available to help you get the most out of your Multi-Tech product. If you have any questions about the operation of this product, call Technical Support at (800) 972-2439. Before calling Technical Support, note the status of your equipment, including screen messages, diagnostic test results, problems with a specific application, etc.

Appendix A

Regulatory Agency Information

FCC Regulatory Statements

Consumer Instructions

1. This equipment complies with part 68 of the Federal Communications Commission Rules. On the outside surface of this equipment is a label that contains, among other information, the FCC registration number and ringer equivalence number (REN). If requested, this information must be provided to the telephone company.

2. As indicated below, the suitable jack (Universal Service Order Code connecting arrangement) for this equipment is shown. If applicable, the facility interface codes (FIC) and service order codes (SOC) are shown.

3. An FCC-compliant telephone and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant. See installation instructions for details.

4. The ringer equivalence number (REN) is used to determine the quantity of devices not ringing in response to an incoming call. In most, but not all areas, the sum of the REN's should not exceed five (5.0). To be certain of the number of devices tat may be connected to the line, as determined by the total REN's, contact the telephone company to determine the maximum REN for the calling area.

5. If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

6. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications in order to maintain uninterrupted service.

7. If trouble is experienced with this equipment (the model of which is indicated below) please contact Multi-Tech Systems, Inc. at the address shown below for details of how to have repairs made. If the equipment is causing harm to the network, the telephone company may request you to remove the equipment from the network until the problem is resolved.

8. No repairs are to be made by you. Repairs are to be made only by Multi-Tech Systems or its licensees. Unauthorized repairs void registration and warranty.

9. This equipment cannot be used on public coin service provided by the telephone company. Connection to Party Line Service is subject to state tariffs. (Contact the state public utility commission, public service commission or corporation commission for information.)

10. If so required, this equipment is hearing-aid compatible.

11. The telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device, including fax machines, to send any message unless such message clearly contains in a margin at the top or bottom of each page or on the first page of the transmission, the date and time is sent and an identification of the business or other entity, or individual sending the message and the telephone number of the sending machine or such business, other entity, or individual. In order to program this information into your fax machine please refer to the installation instructions.

Product/Manufacturer Description

Multi-Tech Systems, Inc.
MultiMobile
MT128NTZLX
N/A
RJ45
Multi-Tech Systems, Inc.
2205 Woodale Drive
Mounds View, MN 55112
Phone: (763) 785-3500
Fax: (763) 785-987

FCC Part 15 Statement

NOTE: This equipment has been tested and found to be comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC rules.

Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference that may cause undesired operation.
- **Warning**: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Canadian Limitations Notice

Notice: The ringer equivalence number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination of a interface may consist of any combination of devices subject only to the requirement that the sum of the ringer equivalence numbers of all the devices does not exceed 5.

Notice: The Industry Canada label identifies certificated equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Industry Canada does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

EMC, Safety, and Terminal Directive Compliance

The CE mark is affixed to this Multi-Tech product to confirm compliance with the following European Community Directives:

Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility;

and

Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits;

and

Council Directive 91/263/EEC of 29 April 1991 on the approximation of the laws of the Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity.

each amended by

Council Directive 93/68/EEC of 22 July 1993 on the harmonization of CE marking requirements.

Appendix B

Technical Specifications

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Technical Specifications

<u>Tradename :</u>	*MultiMobile TM
Model Numbers:	*MT128NTZLX for U-interface,
	*MT128STZLX for S/T-interface
ISDN Interface & Standard:	* 2B+D Basic Rate Access
	* U-interface: 2B1Q, complies with ANSI T1.601
	* S/T-interface: complies with ITU-T I.430
ISDN Line Rate:	* 64 Kbps on 1 B-Channel
	* 128 Kbps aggregate on 2 B-Channels
	* 16 K bps on D-Channel for signalling
<u>DTE Data Rate:</u>	* Asynchronous, up to 460.8 Kbps
ISDN Ducto colo	
<u>ISDN Froiocol:</u>	* 110-1 Q.921/Q.931 and E151 NE15
ISDN Notwork & Switch	
<u>Compatibility:</u>	* National ISDN-1 (NI1)
	* AT&T 5ESS Custom
	* Northern Telecom DMS-100 Custom
	* DSS1 (Euro-ISDN)
	* INS-Net (Japan)
B-Channel Protocol:	* V.120
	* X.75
	* Async-to-Sync PPP Conversion
	* Multi-Link PPP (RFC1317), and HDLC raw data
<u>Application Interface:</u>	* ISDN AT Command Set
	* WINISDN
	* NDIS

Operating System Support:	* Windows 95
	* Windows 98
	* Windows NT
	* Windows 2000
	* Windows ME
<u>General Features:</u>	* Menu-Driven Configuration Utility
	* Microsoft (<i>PnP</i>) Plug and Play
	* Hot-Swap and Insertion * RJ-45 Line Interface
Dimensiona	* 54mm (W) v 85 6mm (I) v 5mm (II)
<u>Dimensions:</u>	PCMCIA Type II
Wannastu	*5 Voor
wanani.	· J 10als

Appendix C Troubleshooting

Troubleshooting

Problem/Cause/Solution Dialogue

This chapter provides general and specific problem solving steps. Below is a number of examples of

Problems (**P**:), Causes (**C**:), & Solutions (**S**:).

If your MultiMobile is not working properly, look up the problem and solution here; if unsuccessful, call Tech Support (see Chapter 7). At the end of this chapter we present some specific steps for resolving IRQ and COM port conflicts.

P: When running Applications Programs (APs), system reports "Open port fail".

- **S:** Windows 95 suddenly shows "Open port fail" because the MultiMobile is in use by other APs. Terminate the other APs and try again.
- **S:** Enter the Run! ISDN configuration utility, check the currently active API shown at the bottom of the Utility Manager's main screen, and make sure the AP uses the consistent API with the current active mode. If not, select the appropriate API for the AP.
- **S:** If VCOMM API is used, check if the AP's COM port setting is consistent with the COM port setting in Windows 95's **System** properties.
- **S:** If none of the above solutions resolve the prob-lem, uninstall the MultiMobile and install it once again.

P: No Response to AT Commands

- C: The COMx port for which the TA is set may be conflicting with another card.
- S: Change the COMx port of MultiMobile to a different unused port. It might be best to set it to COM3 or COM4. Even if you are not using a serial port which is set to the same COMx port as the MultiMobile, it can still interfere. Be sure to update your software COMx port setting as well.
- C: The Interrupt that the MultiMobile is using may be the same Interrupt another card is using.
- S: Change the IRQ settings to a different, unused, IRQ. Even if you are not using a serial port which is set to the same IRQ as the MultiMobile, it can still interfere with the TA.
- S: Type AT&F and press <Enter>, then type AT again, the MultiMobile should respond with an OK message. Otherwise, uninstall the MultiMobile, and reinstall it.

P: The TA Does Not Execute the Command Line

C: Make sure you type 'AT' at the beginning of command line (and press Enter at the end).

- C: Make sure the TA is not in Data Mode. Type +++ if necessary.
- C: Make sure your software is set to the same COMx port as your MultiMobile.

P: The TA Does Not Give a Response After an Executed AT Command

- C: The echo and/or responses may be turned off by the *ATE0Q1* commands. Enable the *AT&V1* to check Result Codes.
- **S**: Use *ATE1Q0*<cr> to change them back.
- C: Make sure the MultiMobile is in Command Mode and not Data Mode when you type the AT command.

P: The Software Does Not Control the TA Properly or Cannot Detect the TA

- S: Make sure the software properly configured. Check the initialization string and dial string.
- C: Some TSRs (programs that stay in memory after they are loaded) may conflict with the communications software.
- S: Try starting your computer without loading any TSRs.

P: The Characters on the Screen Are Doubled

- $C: \ Both the TA and the software have the echo feature turned on.$
- S: Since only one needs an echo, turn the software echo feature off.
- C: The remote TA is echoing your typed characters.
- S: Type *ATE1*<cr>>. Then turn off the software echo feature.

P: No Text Appears on the Screen When in Command Mode

S: If you can't see the characters you are typing, then type ATE1 then press Enter.

P: Communications Software Dials, but Fails

- C: Make sure the software dialing prefix is *ATDT*.
- C: Make sure the software and TA are set to the same COMx port.
- C: The TA may not have hung up the phone line since the last call.
- S: Change to Command mode and type *ATH* then press Enter.

P: In NDIS mode (Microsoft ISDN Accelerator Pack has been installed already), when your laptop is powered on, Microsoft ISDN Accelerator Pack reports "Network adapter fail".

S: If all VCOMM, WinISDN, and NDIS are installed at the very beginning, only oneAPI is activated when the laptop is power on. And the other two APIs are disabled. If NDIS is not set as power up active API, Microsoft ISDN Accelerator will report "Network adapter fail".

Enter Run! ISDN configuration utility, check the current active API shown at the bottom of the Utility Manager's main screen, and make sure the NDIS is set as the currently active mode. If not, change the currently active API to NDIS mode, then reboot the laptop.

P: How can one know if the ISDN phone line is attached properly to the ISDN network connection cable so that you can originate/answer ISDN calls?

S: When the U-interface network connection cable is used, the LED indicator on the connection cable has following meanings:
 LED always OFF: ISDN phone line is not attached, check the ISDN phone line connection between MultiMobile and ISDN switch.

LED flashes very quickly: U-interface is in connection mode.

LED flashes once per second: U-interface connection successful, S/T-interface is in connection mode.

LED always ON: ISDN link established, you can make/answer ISDN calls now.

In VCOMM mode, you can use the **ATH5** command to check if the ISDN link between MultiMobile and ISDN switch is ready to make/answer calls. The following responses report the MultiMobile's status:

Line Lost: ISDN phone line is not connected (check the connection between MultiMobile and ISDN network connection cable, check the connection between ISDN network connection cable and ISDN switch, check the ISDN switch type setting).

SPID Fail: Both SPID numbers are not correctly configured.

1 SPID Ready: One of the SPID numbers is incorrect.

2 SPID Ready: The MultiMobile is ready to operate.

P: It seems that the throughput of the MultiMobile is not as fast as expected.

S: Sometimes the resident anti-virus program and the laptop's BIOS settings, like "Auto-detect PNP Function", affects the MultiMobile's I/O operation, and might lower the ISDN TA's file transfer throughput. Disable them (keep the system as simple as possible) and try again.

P: I can run Application Program (API) successfully, and the MultiMobile responds OK when entering AT, but I cannot Originate/Answer ISDN calls. Why?

- **S**: (1) Check if ISDN phone line is connected properly.
 - (2) Check if the ISDN switch type is selected correctly.
 - (3) Check if the SPID numbers are correct.
 - (4) Issue the ATH5 command (in VCOMM mode) to check the MultiMobile function.

P: How can one make sure the MultiMobile's hardware functions properly?

- S: Use AT&K command (in VCOMM mode) to verify the MultiMobile hardware function. The response to the AT&K command is "ISDN Hardware is OK" or "ISDN Hardware is 'BAD'."
- S: Connect the ISDN phone line between ISDN switch and MultiMobile, and use the ATH5 command (in VCOMM mode) to verify the ISDN PC Card function. All the following messages show the MultiMobile hardware is without problems:
 SPID Fail
 1 SPID Ready

2 SPID Ready

P: When plugging-in the MultiMobile, the PCMCIA alert message is not heard.

S: Enter Control Panel >> System >> Device Manager in Windows 95 to check whether the MultiMobile and the drivers are installed prop erly. If not, uninstall the MultiMobile, and reinstall it.

With **VCOMM, NDIS and WinISDN** APIs installed, the correct settings should be:Intelligent TA IM128 (ISDN)

COM Port and IRQ Conflicts - General

If you have isolated the problem with IRQs or COM ports, refer to the following sections for resolving IRQ and COM port conflicts in Windows 95.

When installing a card in an IBM PC compatible computer, it is important to choose settings for the PC Card which does not conflict with any other cards in the computer.

Choose an Interrupt (IRQ) and a COMx: port for your terminal adapter card, that does not interfere with any other devices in your computer. Select the Port and Interrupt you want to use, and remember to update your communications software to the same settings.

The following is a list of some settings other cards in your computer may already be using.

COM Port and IRQ Conflicts - Windows 95

In Windows 95, right-click on *My Computer*, select *Properties* from the menu, click on the *Device Manager* tab, double-click on *Parts*, then double-click on the *Communications Part* your TA is connected to. In the port's *Properties* sheet, click on the *Resources* tab to see the port's Input/Output range and Interrupt Request. If another device is using the same address range or IRQ, it will appear in the Conflicting Device List. Uncheck "Use Automatic Settings" to change the port's settings so they do not conflict with the other device, or select the port the conflicting device is on and change it instead. If you need to open your computer to change switches or jumpers on the conflicting device, refer to the device's documentation.

Appendix D Using AT Commands

AT Command Summary

Usually, your data comm software controls the MultiMobile for you. However, you may also want to use the AT commands. These commands give you complete control over your MultiMobile. You need to be careful when using these commands, because they can cause your software to loose its ability to control the MultiMobile. If you do find that an AT command has caused a problem, turn the computer off, and then back on. That will reset AT commands to the factory default settings. You can also type *AT&F* to go back to the factory default setting.

To use an AT command, you must first:

- 1. Run your communication software.
- 2. Configure the software for the appropriate COM port and IRQ settings, if necessary.
- 3. Enter Terminal mode (aka "Command mode", "Local mode", or "Direct mode"). This is the mode in which most data comm software packages start up. You can then type the desired AT command, and press the **Enter** key.

For example, type:

ATHO<Enter> to hang up the MultiMobile connection, or AT&V<Enter> Display current configuration

Most of the AT commands can be entered in "strings" (i.e., on the same command line) without spaces between the individual commands. For example:

AT&VHO<Enter>

As shown above, it is not necessary to put spaces between the commands. So, there are no spaces between *AT*, *&V*, and *H0*.

The MultiMobile usually returns a response (or "Result Code") at the next line if it understands the command. The response is usually *OK* or *ERROR* unless the AT command provides other (extended) messages.

Command	Options	Function & Description
ATA		Go off-hook (answer the incoming call immediately)
ATD	<number></number>	Dial out the ISDN phone number
ATDT	<number></number>	Dial out the ISDN phone number
ATDSn		Dial out the pre-stored phone number (n=0, 1, 2,). See AT&Zn= <isdn_phone_number> command for phone number storage.</isdn_phone_number>
ATDL		Re-dial the last ISDN phone number
ATEn	n=0	Echo in command mode is disabled n=1 Echo in command mode is enabled
ATH		Hang up the ISDN link
ATH4		Restart ISDN layer 2 link. Issue this command when SPID numbers are changed.
ATH5		 View ISDN TA status Responses: Line Lost: ISDN phone line is not properly attached. SPID Fail: Both SPID numbers are incorrect 1 SPID Ready: One of the SPIDs incorrect 2 SPID Ready: ISDN TA OK
ATO		Return to connection (on-line) mode.
Command AT!C0=n	Options n=00 n=01 n=02 n=05	Function & Description ISDN D-channel protocol and switches selection AT&T 5ESS Custom Northern Telecom DMS-100 Custom ETSI Europe ISDN U.S. National ISDN-1 (NI-1), factory default
Command AT!C0=n AT!C6=n	Options n=00 n=01 n=02 n=05 Example:	Function & DescriptionISDN D-channel protocol and switches selectionAT&T 5ESS CustomNorthern Telecom DMS-100 CustomETSI Europe ISDNU.S. National ISDN-1 (NI-1), factory defaultSet Service Profile ID 0 (SPID 0), where " n" is the SPID number up to 20 characters.ISDN phone number: 5551000SPID 0: 0555100001
Command AT!C0=n AT!C6=n AT!C2=n	Options n=00 n=01 n=02 n=05 Example:	Function & DescriptionISDN D-channel protocol and switches selectionAT&T 5ESS CustomNorthern Telecom DMS-100 CustomETSI Europe ISDNU.S. National ISDN-1 (NI-1), factory defaultSet Service Profile ID 0 (SPID 0), where " n" is the SPID number up to 20 characters.ISDN phone number: 5551000SPID 0: 0555100001Set Service Profile ID 1 (SPID 1), where " n" is the SPID number up to 20 characters.
Command AT!C0=n AT!C6=n AT!C2=n	Options n=00 n=01 n=02 n=05 Example:	Function & DescriptionISDN D-channel protocol and switches selectionAT&T 5ESS CustomNorthern Telecom DMS-100 CustomETSI Europe ISDNU.S. National ISDN-1 (NI-1), factory defaultSet Service Profile ID 0 (SPID 0), where " n" is the SPID number up to 20 characters.ISDN phone number: 5551000SPID 0: 0555100001Set Service Profile ID 1 (SPID 1), where " n" is the SPID number up to 20 characters.ISDN phone number: 5553000SPID 1: 0555300001
Command AT!C0=n AT!C6=n AT!C2=n AT!N0=n	Options n=00 n=01 n=02 n=05 Example:	Function & DescriptionISDN D-channel protocol and switches selectionAT&T 5ESS CustomNorthern Telecom DMS-100 CustomETSI Europe ISDNU.S. National ISDN-1 (NI-1), factory defaultSet Service Profile ID 0 (SPID 0), where " n" is the SPID number up to 20 characters.ISDN phone number: 5551000SPID 0: 0555100001Set Service Profile ID 1 (SPID 1), where " n" is the SPID number up to 20 characters.ISDN phone number: 5553000SPID 1: 055300001Set ISDN Directory Number 0 (DN 0), where "n" is the ISDN phone number.
Command AT!C0=n AT!C6=n AT!C2=n AT!N0=n	Options n=00 n=01 n=02 n=05 Example: Example:	Function & DescriptionISDN D-channel protocol and switches selectionAT&T 5ESS CustomNorthern Telecom DMS-100 CustomETSI Europe ISDNU.S. National ISDN-1 (NI-1), factory defaultSet Service Profile ID 0 (SPID 0), where " n" is the SPID number up to 20 characters.ISDN phone number: 5551000SPID 0: 0555100001Set Service Profile ID 1 (SPID 1), where " n" is the SPID number up to 20 characters.ISDN phone number: 5553000 SPID 1: 0555300001Set ISDN Directory Number 0 (DN 0), where "n" is the ISDN phone number.DN 0: 5551000 => n=5551000
Command AT!C0=n AT!C6=n AT!C2=n AT!N0=n AT!N0=n	Options n=00 n=01 n=02 n=05 Example: Example:	Function & DescriptionISDN D-channel protocol and switches selectionAT&T 5ESS CustomNorthern Telecom DMS-100 CustomETSI Europe ISDNU.S. National ISDN-1 (NI-1), factory defaultSet Service Profile ID 0 (SPID 0), where " n" is the SPID number up to 20 characters.ISDN phone number: 5551000SPID 0: 0555100001Set Service Profile ID 1 (SPID 1), where " n" is the SPID number up to 20 characters.ISDN phone number: 5553000 SPID 1: 0555300001Set ISDN Directory Number 0 (DN 0), where "n" is the ISDN phone number.DN 0: 5551000 => n=5551000Set ISDN Directory Number 1 (DN 1), where "n" is the ISDN phone number.

Command	Options	Function & Description
AT!Q=n	n=0	Set B-channel speed to 64 K
	n=4	Set B-channel speed to 56 K
AT!Z=n		B-channel protocol selection
	n=05	V.120
	n=09	Async to Sync PPP conversion
AT&F		Load factory default profile to active RAM.
AT&J0		Use two different ISDN phone numbers for making multi-link PPP calls.
AT&J1		Use single ISDN phone number for Multi-Link PPP connections.
AT&K		Verifies TA hardware function; entering AT&K invokes hardware is "OK" or "BAD".

The "!" command modifier is used to change certain fundamental configuration parameters which are infrequently changed – typically, only once at installation. Using these "!" commands during normal operation with the telephone line connected to the Terminal Adapter (TA), can cause unpredictable results. It is best to issue the "!" command when the TA is not connected to the ISDN network to avoid confusion between the TA and ISDN network. The recommended procedure for using the "!" commands is as follows:

- (1) Disconnect the ISDN phone line from the TA.
- (2) Issue the "!" commands to set the correct value for the "!" command related parameters.
- (3) Issue the AT&Wn command to store the parameters changed during step (2) in the user
 - profile.
- (4) Reconnect the ISDN phone line.
- (5) Reset or reboot the ISDN sub-system with the updated configuration parameters.

<u>Command</u>	<u>Options</u>	Function & Description
AT&L0		Load user profile 0 to active RAM.
AT&L1		Load user profile 1 to active RAM.
AT&L2		Load user profile 2 to active RAM.
AT&L3		Load user profile 3 to active RAM.
AT&L4		Load user profile 4 to active RAM.
AT&L5		Load user profile 5 to active RAM.
AT&L6		Load user profile 6 to active RAM.
AT&L7		Load user profile 7 to active RAM.
AT&L8		Load user profile 8 to active RAM.
AT&L9		Load user profile 9 to active RAM.
AT&N0=0	Set Sing	gle-Link mode for Async to Sync PPP Conversion.
AT&N0=1	Set Mul	ti-Link mode for Async to Sync PPP Conversion.
AT&P0	Copy us	ser profile 0 to profile E, and set it as power-up profile.
AT&P1	Copy us	ser profile 1 to profile E, and set it as power-up profile.
AT&P2	Copy us	ser profile 2 to profile E, and set it as power-up profile.
Commond	Ontions	Eurotion 8 Description
Command	options	Function & Description
AT&P3	Options	Copy user profile 3 to profile E, and set it as power-up profile.
AT&P3 AT&P4	options	Copy user profile 3 to profile E, and set it as power-up profile. Copy user profile 4 to profile E, and set it as power-up profile.
AT&P3 AT&P4 AT&P5		Copy user profile 3 to profile E, and set it as power-up profile. Copy user profile 4 to profile E, and set it as power-up profile. Copy user profile 5 to profile E, and set it as power-up profile.
AT&P3 AT&P4 AT&P5 AT&P6		Copy user profile 3 to profile E, and set it as power-up profile. Copy user profile 4 to profile E, and set it as power-up profile. Copy user profile 5 to profile E, and set it as power-up profile. Copy user profile 6 to profile E, and set it as power-up profile.
AT&P3 AT&P4 AT&P5 AT&P6 AT&P7		Copy user profile 3 to profile E, and set it as power-up profile. Copy user profile 4 to profile E, and set it as power-up profile. Copy user profile 5 to profile E, and set it as power-up profile. Copy user profile 6 to profile E, and set it as power-up profile. Copy user profile 7 to profile E, and set it as power-up profile.
AT&P3 AT&P4 AT&P4 AT&P5 AT&P6 AT&P7 AT&P8		Copy user profile 3 to profile E, and set it as power-up profile. Copy user profile 4 to profile E, and set it as power-up profile. Copy user profile 5 to profile E, and set it as power-up profile. Copy user profile 6 to profile E, and set it as power-up profile. Copy user profile 7 to profile E, and set it as power-up profile. Copy user profile 7 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set as it power-up profile.
Command AT&P3 AT&P4 AT&P5 AT&P6 AT&P7 AT&P8 AT&W0		Copy user profile 3 to profile E, and set it as power-up profile. Copy user profile 4 to profile E, and set it as power-up profile. Copy user profile 5 to profile E, and set it as power-up profile. Copy user profile 6 to profile E, and set it as power-up profile. Copy user profile 7 to profile E, and set it as power-up profile. Copy user profile 7 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set as it power-up profile. Save current active settings in RAM to user profile 0.
Command AT&P3 AT&P4 AT&P5 AT&P6 AT&P7 AT&P8 AT&W0 AT&W1		Copy user profile 3 to profile E, and set it as power-up profile. Copy user profile 4 to profile E, and set it as power-up profile. Copy user profile 5 to profile E, and set it as power-up profile. Copy user profile 6 to profile E, and set it as power-up profile. Copy user profile 7 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set it as power-up profile. Save current active settings in RAM to user profile 0. Save current active settings in RAM to user profile 1.
Command AT&P3 AT&P4 AT&P5 AT&P6 AT&P7 AT&P8 AT&W0 AT&W1 AT&W2		Copy user profile 3 to profile E, and set it as power-up profile. Copy user profile 4 to profile E, and set it as power-up profile. Copy user profile 5 to profile E, and set it as power-up profile. Copy user profile 6 to profile E, and set it as power-up profile. Copy user profile 7 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set as it power-up profile. Save current active settings in RAM to user profile 0. Save current active settings in RAM to user profile 1. Save current active settings in RAM to user profile 2.
Command AT&P3 AT&P4 AT&P5 AT&P6 AT&P7 AT&P8 AT&W0 AT&W1 AT&W2 AT&W3		Copy user profile 3 to profile E, and set it as power-up profile. Copy user profile 4 to profile E, and set it as power-up profile. Copy user profile 5 to profile E, and set it as power-up profile. Copy user profile 6 to profile E, and set it as power-up profile. Copy user profile 7 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set as it power-up profile. Save current active settings in RAM to user profile 1. Save current active settings in RAM to user profile 2. Save current active settings in RAM to user profile 3.
Command AT&P3 AT&P4 AT&P5 AT&P6 AT&P7 AT&W0 AT&W1 AT&W2 AT&W3 AT&W4		Copy user profile 3 to profile E, and set it as power-up profile. Copy user profile 4 to profile E, and set it as power-up profile. Copy user profile 5 to profile E, and set it as power-up profile. Copy user profile 6 to profile E, and set it as power-up profile. Copy user profile 7 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set as it power-up profile. Copy user profile 8 to profile E, and set as it power-up profile. Save current active settings in RAM to user profile 1. Save current active settings in RAM to user profile 2. Save current active settings in RAM to user profile 3. Save current active settings in RAM to user profile 3. Save current active settings in RAM to user profile 4.
Command AT&P3 AT&P4 AT&P5 AT&P6 AT&P7 AT&W0 AT&W1 AT&W2 AT&W3 AT&W4		Copy user profile 3 to profile E, and set it as power-up profile. Copy user profile 4 to profile E, and set it as power-up profile. Copy user profile 5 to profile E, and set it as power-up profile. Copy user profile 6 to profile E, and set it as power-up profile. Copy user profile 7 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set as it power-up profile. Save current active settings in RAM to user profile 0. Save current active settings in RAM to user profile 1. Save current active settings in RAM to user profile 2. Save current active settings in RAM to user profile 3. Save current active settings in RAM to user profile 4. Save current active settings in RAM to user profile 5.
AT&P3 AT&P4 AT&P5 AT&P6 AT&P7 AT&W0 AT&W1 AT&W2 AT&W3 AT&W4 AT&W5		Copy user profile 3 to profile E, and set it as power-up profile. Copy user profile 4 to profile E, and set it as power-up profile. Copy user profile 5 to profile E, and set it as power-up profile. Copy user profile 6 to profile E, and set it as power-up profile. Copy user profile 7 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set as it power-up profile. Save current active settings in RAM to user profile 0. Save current active settings in RAM to user profile 1. Save current active settings in RAM to user profile 2. Save current active settings in RAM to user profile 3. Save current active settings in RAM to user profile 4. Save current active settings in RAM to user profile 5. Save current active settings in RAM to user profile 5. Save current active settings in RAM to user profile 6.
Command AT&P3 AT&P4 AT&P5 AT&P6 AT&P7 AT&W0 AT&W1 AT&W2 AT&W3 AT&W4 AT&W5 AT&W6 AT&W7		Copy user profile 3 to profile E, and set it as power-up profile. Copy user profile 4 to profile E, and set it as power-up profile. Copy user profile 5 to profile E, and set it as power-up profile. Copy user profile 6 to profile E, and set it as power-up profile. Copy user profile 7 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set as it power-up profile. Save current active settings in RAM to user profile 0. Save current active settings in RAM to user profile 1. Save current active settings in RAM to user profile 2. Save current active settings in RAM to user profile 3. Save current active settings in RAM to user profile 4. Save current active settings in RAM to user profile 5. Save current active settings in RAM to user profile 5. Save current active settings in RAM to user profile 6. Save current active settings in RAM to user profile 7.
Command AT&P3 AT&P4 AT&P5 AT&P6 AT&P7 AT&W0 AT&W1 AT&W2 AT&W3 AT&W4 AT&W5 AT&W6 AT&W7 AT&W8		Copy user profile 3 to profile E, and set it as power-up profile. Copy user profile 4 to profile E, and set it as power-up profile. Copy user profile 5 to profile E, and set it as power-up profile. Copy user profile 6 to profile E, and set it as power-up profile. Copy user profile 7 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set it as power-up profile. Save current active settings in RAM to user profile 0. Save current active settings in RAM to user profile 1. Save current active settings in RAM to user profile 2. Save current active settings in RAM to user profile 3. Save current active settings in RAM to user profile 4. Save current active settings in RAM to user profile 5. Save current active settings in RAM to user profile 6. Save current active settings in RAM to user profile 6. Save current active settings in RAM to user profile 7. Save current active settings in RAM to user profile 8.
AT&P3 AT&P4 AT&P5 AT&P6 AT&P7 AT&P8 AT&W0 AT&W1 AT&W2 AT&W3 AT&W5 AT&W6 AT&W7 AT&W8 AT&W9		Copy user profile 3 to profile E, and set it as power-up profile. Copy user profile 4 to profile E, and set it as power-up profile. Copy user profile 5 to profile E, and set it as power-up profile. Copy user profile 6 to profile E, and set it as power-up profile. Copy user profile 7 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set it as power-up profile. Copy user profile 8 to profile E, and set as it power-up profile. Save current active settings in RAM to user profile 0. Save current active settings in RAM to user profile 1. Save current active settings in RAM to user profile 3. Save current active settings in RAM to user profile 4. Save current active settings in RAM to user profile 5. Save current active settings in RAM to user profile 6. Save current active settings in RAM to user profile 7. Save current active settings in RAM to user profile 8. Save current active settings in RAM to user profile 8. Save current active settings in RAM to user profile 8. Save current active settings in RAM to user profile 8.

Command	Options	Function & Description
AT&Z0		Set the Secondary Dial Number for Async to Sync Multi-link PPP Mode.
AT&V		Display current configuration
AT&Zn=x		Store phone number n as x
	n	index number 0, 1, 2
	X	saved phone number

Appendix E: ISDN Primer

Introduction to ISDN

Integrated Services Digital Network (ISDN) is a digital telephony service that offers high-speed data communications over the existing twisted-pair copper telephone wiring commonly found in residential and commercial phone service. Two distinct types of ISDN service are available around the world: : Basic Rate Interface (BRI) and Primary Rate Interface (PRI). In ISDN, the signalling bitstream is time-division-multiplexed, which means that multiple data "channels" are interspersed with each other in the same physical signalling stream. This allows multiple data connections to occur simultaneously on the same conductor.

BRI ISDN

BRI consists of two bearer channels (B-channels) plus one administrative data channel (D-channel). In BRI, the telephone signalling path is divided into three digital channels: two B-channels, used for data transmission at 56 kbps or 64 kbps (depending on telco services), and one D-channel, used to carry control signals and customer call data, at 16 kbps. With a total of 144 kbps of data bandwidth, BRI is well suited to individual users. (Note that the "k" used in data transmission speeds means literally 1000, not 1024, as in computer memory descriptions. That is, 1 kbps equals 1000 bits per second, not 1024.)

Note that every B-channel is capable of carrying its own data telephone call. The B-channels are typically used for sending voice or circuit switched data or packet switched data and can function independently of each other or bonded together to achieve 128 kilobits-per-second of bandwidth. With ISDN you can mix connections. You can have a voice call on B-channel while receiving packet or switched data packets on the second B-channel.

The administrative telephony tasks of D-channels include the setting up and tearing down of calls, as well as monitoring. D-channels also contain ANI information(Automatic Number Identification), which is the number of the phone that is making an incoming call.

PRI ISDN

PRI has two subtypes, US orNorth American PRI and Euro PRI. US PRI consists of 23 B-channels (64 kbps each) plus one D-channel (also 16 kbps). Euro PRI has 30 or 31 B-channels (64 kbps each) plus one D-channel (also 64 kbps). Again, B-channels carry message data and D-channels carry control signals and customer call data (sometimes called "administrative" data). With a total of 1544 kbps of data bandwidth, US PRI service is carried on a T1 line and is well suited for subscribers who require greater data transmission capacity. US PRI ISDN is described as 23B + D.

The US ISDN-PRI (23B+D) is comprised of the following components: twenty three 64 kilobits-per-second B-channels and 1 16 kilobit-per-second D-channel over a T-1 line for a total bandwidth of 1.544 megabits-per-second (Mbps)

European ISDN-PRI Service (described as 30B+D), with its 30 or 31 B-channels and one D-channel, can be carried on either a T1 or E1 line and, again, is suited to customer with high data throughput requirements. In Euro ISDN, D-channels as well as B-channels are 64 kbps and one D-channel can be used to control one or more E1 or T1 lines.

(The remainder of this discussion will focus on BRI ISDN.)

Digital End-to-End

Telephony signals within central offices, between central offices, and on long-distance lines are all digital. The link from the central office to the subscriber (the subscriber drop) is really the only non-digital part of the telephony signal stream. ISDN digitizes subscriber drops, making the signal digital end-to-end.

The availability of ISDN varies greatly from country to country and region to region. It became available on the East and West Coasts of the United States earlier than in the Midwest. It is widely available in Europe. To offer ISDN, the telco must have special equipment in its central office switching systems. Also, the distance of ISDN transmissions is limited. To access BRI service, it is necessary to subscribe to an ISDN phone line. Generally, the subscriber must be 18000 feet (about 3.4 miles or 5.5 km) or less from the telco central office to qualify for BRI service. (ISDN signal extension devices are available but expensive.)

ISDN Configuration

ISDN service must be configured at both the telco end and at the subscriber end. There are many features and options of ISDN service that the telco must set up in keeping with its particular implementation of ISDN. This configuration process at the telco's central office is called "provisioning."

Configuration at the subscriber end involves four pieces of information:

- Switch type
- Telephone numbers (or "directory numbers")
- Service Profile Identifiers (SPIDs)
- Voice Encoding Type (A-law or Mu-law)

Switch Type. Only a comparatively small number of telephony switching systems are available in the world. "Switch type" refers to the brand and model of switch in use by the telco. Outside of the U.S., there is generally only one switch type in most nations. Unfortunately, different phone switch manufacturers have implemented ISDN somewhat differently, thus requiring ISDN subscriber devices to have software components compatible with all of these various switch-specific ISDN implementations.

Telephone Numbers. During ISDN configuration, the subscriber must know the phone numbers (or "directory numbers") that the service will use. It can work one of two ways. There can be one phone number for both B-channels, or there can be a separate phone number for each B-channel. This is dependent on your telco's implementation of ISDN. Having two phone numbers adds the convenience of being able to make voice phone calls while maintaining your computer ISDN connection.

SPIDs. Service Profile Ids (SPIDs) are used only in the U.S. and Canada. The SPID consists of the ten-digit phone number of the ISDN line, plus a prefix and a suffix, which can identify features on the line. The information in the SPID is used before call setup. If SPIDs are supplied incorrectly, the ISDN line will not be able to complete incoming or outgoing calls.

Voice Encoding Type. A-law and Mu-law are separate standards for PCM (Pulse Code Modulation) encoding and companding (the sampling scheme applied to digitize analog voice signals). The Mu-law scheme is used in the U. S., Canada, Japan, and other locations influenced by U.S. telephony standards. The A-law scheme is used in Europe and in most of the rest of the world. This setting is vital. If set wrong, the ISDN service will not work at all.

ISDN Terminal Adapters – Internal or External.

Although ISDN terminal adapters are sometimes called "ISDN modems," this term is a misnomer. In fact, with ISDN, the signal stream is always digital, no modulation or demodulation are required (as implied by the term "modem"). Both internal and external ISDN terminal adapters are available. Internal adapters are inserted into an ISA or PCI slot in the computer's motherboard. External adapters are connected through a port connector on the computer. External adapters can be attached or removed without opening the computer.

When ISDN terminal adapters are connected through a port, a data bottleneck may be introduced to the system. This is because the ISDN connection has a data speed of 128 kbps, whereas the serial ports on most computers are limited to 115 kbps (although 230 kbps is now available on some models). The external terminal adapter can also slow down computer performance because it uses significant CPU resources when connected. External ISDN terminal adapters are best used on computers with a Pentium processor, or better, and a CPU processing speed of at least 200 MHz.

Some important functionality resides in ISDN terminal adapters themselves, for example, Point-to-Point protocol, multi-linking (where two B-channels are "bonded" or used together to double data throughput speed). It is up to the subscriber to be sure that correct and up-to-date drivers are used to implement these ISDN features. Drivers generally evolve over time. Bugs appear and are remedied, and new features are introduced.

Interfaces for ISDN Devices: "U" or "S/T"

The "U" interface uses a single-pair of telephone wires, whereas the "S/T" interface uses two pairs. In the U.S., telcos provide customers with the U interface. It carries data over the single-pair wiring in fullduplex mode, but is limited in its connections: the U interface accommodates only one ISDN device, namely a "Network Termination 1" device, or NT-1. In practice, many ISDN devices (including terminal adapters, ISDN-ready phones, and ISDN fax machines), have NT-1 devices built into them. If the NT-1 device is a separate unit, it generally must be powered from a wall outlet (instead of drawing power from the telephony system). The purpose of the NT-1 is really to convert the single-pair signal into a dual-pair signal, which is the S/T interface. The U interface is generally easy to install.

The S/T interface is commonly available in Europe and elsewhere in the world. The S/T interface is a bus arrangement to which as many as seven ISDN devices can be connected. The dual-pair wiring of the S/T interface allows for separate physical paths for "transmit" data and "receive" data.

The Telco/Subscriber Responsibility Boundary

The "demarc", or demarcation point between equipment for which the telco is responsible versus equipment for which the ISDN subscriber is responsible lies at the wall of the subscriber's building. The subscriber is responsible for everything from the wall jack inward, whereas the telco is responsible for everything outside the wall jack. This means subscribers must pay for maintenance of equipment inside the demarc. In most cases, the telco will install and maintain equipment within the demarc for a specified fee. The wall jack from which the subscriber accesses the ISDN service must be connected directly to the ISDN service as it exists on the telco side of the demarc. This is called the subscriber drop or "home run."

ISDN Wiring: Standards & Pitfalls

The ISDN service on the telco side of the demarc must be conveyed to the wall jack from which the subscriber will be accessing the ISDN service. However, some telephone wiring in both residential and commercial buildings are unsuited to ISDN use. For example, some surplus wires may already be use for analog lines, to power the lights on phones with illuminated dialing buttons. Telephone wires in a "daisy-chain" configuration are also inappropriate for ISDN use.

For these reasons, the subscriber should check with the telco to be sure the wiring proposed for ISDN use will actually work properly.

There are two types of connector jacks that are commonly used for ISDN physical connections:

- RJ11 This is the standard four-wire analog phone jack. ISDN wiring from the subscriber's wall box to the NT-1 device is generally done with RJ11 jacks.
- RJ45 This is an eight-wire jack that is somewhat wider than the RJ11. The physical connection between the NT-1 device and the ISDN adapter typically is outfitted with RJ45 jacks.

ISDN Lines and Multitple Devices

A single ISDN line can have up to eight devices connected to it. The list of devices that you may attach to an ISDN line include bridges, routers, Group 4 ISDN fax machines, ISDN telephones and analog telephone devices. Because ISDN is capable of routing incoming calls between the two B-channels, up to two devices may be used simultaneously.

By using a network bridge or router, a single ISDN line can be shared on a LAN in order that all computers on the LAN can make use of it.

As previously mentioned, multiple ISDN devices can be connected to a single ISDN line. For example you could have an internal ISDN TA installed in your computer and Group 4 fax machine both connected to the same ISDN line. This would allow you to surf the internet and accept incoming voice calls and faxes at the same time. For this configuration to work, an NT-1 that supports multiple S/T interface connections would be required and each device would have to be connected to the NT-1. Each device would also be required to have it's own SPID in order that the calls could be routed to the correct device.

Also, some NT-1s or ISDN devices are capable of converting between an analog signal and ISDN and can support the use of traditional analog devices such as telephones, modems, Group 3 fax machines, and answering machines.

ISDN Connections

As with most digital services, ISDN is sensitive to outside interference and has certain restrictions. For instance, such factors as the distance from the telephone company's central office and the grade of cable used can affect the signal quality. For ISDN lines, the maximum distance from the central office is 18,000 feet and normally uses twisted pair cabling for its transmission media.

For small sites, ISDN-Basic Rate Interface (ISDN-BRI) would be most appropriate while for medium to large sites ISDN-Primary Rate makes more sense.

Appendix F: Glossary of ISDN-Related Terms
ISDN Glossary

2B+D

a Basic Rate Interface ISDN line consisting of two B channels and one D channel

A-Law

Voice encoding scheme used in Europe and widely throughout the world outside of Japan and North America.

AT@T® "5ESS"

Central office telephone switching system equipment manufactured by AT&T

B-Channel

One 64 kilobit-per-second digital data channel of an ISDN line

Bandwidth Allocation Control Protocol

A set of rules that govern bandwidth over PPP dynamic multilink connections

Basic Rate Interface (BRI)

An ISDN service that provides for 3 digital channels: 2 B-channels and 1 D-channel

Bridge

A device used to connect and forward information betweenn two or more network segments. Also known as a data link relay or a level 2 relay. A bridge is simpler and less expensive than a router, but the information that it can carry is limited.

Central Office (CO)

The local telephone facility that provides telephone service in your area

CENTREX

A virtual PBX for a set of extensions provided by the central office.

Customer Access line charge (CALC)

Also known as End User Common Line Charge (EUCL) or Subscriber Line Charge (SLC). This is a federal tariff charged for installing your ISDN line. The amount Of this tariff will vary from state to state or province to province.

Demarc

Or "Demarcation point" is the point where the telephone companies wiring stops and your wiring begins. In other words the telephone company is responsible for wiring before the Demarc and your responsibility is anything after that point.

D-channel

One of the three channels that make up a BRI line. The D-channel is rated for 16 kilobits-per-second and is used to carry signaling information and low speed packet data.

DMS

Another ISDN switch type, this switch type is manufactured by Northern Telcom (now Nortel).

EWSD

Another ISDN switch type, this switch type is manufactured by Siemens Stromberg-Carlson

Exchange

The local telephone facility that provides telephone service in your area.

Inside Wiring

Wiring work that would be needed on your side of the Demarc for your ISDN line and which would thus be the responsibility of the ISDN subscriber. The telephone company will typically do this work for you for an additional charge.

ISDN

Integrated Services Digital Network: A digital telephone network used to carry voice, data, images, and video at high speeds. Can use existing copper phone line.

ISDN Ordering Code

The telephone company uses this predefined number to determine how to provision your ISDN line based on your ISDN hardware requirements.

Line Extension

A method used to provide ISDN service beyond the normal distance limit between the central office and your site.

Line or Loop Qualification

A test the phone company runs to measure the line quality and distance to your location from the central office to determine if your line meets the requirements for ISDN service.

Mu-Law

Voice encoding scheme used in Canada, the U.S., Japan, and in other locations influenced by North American telephony standards.

Multi-Link PPP

Allows you to "bond" or combine two or more B channels to form a single, faster PPP connection. This configuration will allow you to realize the full 128 kilobit/second bandtwidth available from your ISDN service.

NI-1 (National ISDN-1)

The "Standard" ISDN phone line specification. Intended to be used as a standard to which manufacturers must conform.

NT-1 (Network Terminiation-1)

A device that connects your ISDN hardware to an ISDN U-interface and an ISDN S/T-interface.

PBX

Private Branch Exchange. A PBX is a telephone switch that provides switching for an office or campus.

Point-to-Point Protocol (PPP)

A transport protocol that allows a computer to use TCP/IP to connect to other computers over a standard telephone line.

POTS

Plain Old Telephone Service. An analog telephone line.

Primary Rate Interface

An ISDN service that offers 23 B channels at 64 kbps and one D channel at 64 kbps (23B+D). In Europe PRI consists of 30 B channels at 64 kbps and two D channels (30B+D)

Provisioning

A telephone company term for configuring your ISDN line with various features, such as caller ID, call bumping, call waiting, etc...

Router

A device used to connect and forward information between two or more network segments. A router is like a bridge except with more capabilities. A router will determine the best route for a packet to take to get from point to point.

RJ-11

A common telephone jack. It is a six conductor modular jack that is wired with 4 wires.

RJ-45

An 8-pin modular jack that is a little larger than an RJ-11 jack and is used in networks and ISDN connections.

Service Profile Indentifier (SPID)

A set of numbers assigned to your ISDN line. They are provided to the ISDN subscriber by the phone company. SPIDS are a unique identifier for each ISDN line.

S/T-interface

The part of the ISDN line that connects to the phone or computer

Switch Type

The brand or manufacturer of the equipment/software that the telephone company uses to provide ISDN service to you. There are just a few switch types in existence and generally only one switch type is used per country except in the United States.

Twisted Pair

A telephone company term for telephone wiring. The name comes from the fact that each pair of wires in the cable are twisted to reduce attenuation (or crosstalk) in the wiring.

Voice Encoding

The method of transforming the analog voice signal picked up by a telephone handset into a digital signal in Pulse Code Modulation form based on sampling. A-Law and Mu-Law are the two types of voice encoding used for ISDN.

U-Interface

A 2-wire ISDN circuit that connects the ISDN line to the central office. The U-type interface is more common than the S/T interface.

Appendix G

Phone Jack Pin Assignments

RJ45 pin-outs of U-Interface

Pin 1	Not Connected
Pin 2	Not Connected
Pin 3	Not Connected
Pin 4	Signal
Pin 5	Signal
Pin 6	Not Connected
Pin 7	Not Connected
Pin 8	Not Connected

RJ45 Pinouts of S/T Interface

Pin 1	Not Connected
Pin 2	Not Connected
Pin 3	Transmit Signal (T1)
Pin 4	Receive Signal (R1)
Pin 5	Receive Signal (R2)
Pin 6	Transmit Signal (T2)
Pin 7	Not Connected
Pin 8	Not Connected

The Intelligent ISDN TA PC Card comes with either a U-interface or S/T-interface network connection cable. The U-interface connection cable is for direct ISDN line connection, which does not need any extra ISDN NT1 device.

The S/T-interface connection cable is for connecting to NT1. Both U- and S/T-interface use RJ45 phone jacks, but with different pin assignments. The bundled RJ45 phone cord can be used for both U- or S/T-interface connections.

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