EXHIBIT C

User Manual

RCV56HCF/SP PCI Reference Design
User's Guide
(Preliminary)

NOTICE

Table of Contents

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.INTRODUCTION

\.OVERVIEW

he Rockwell RCV56HCF/SP PCI Reference Design is provided as a product evaluation unit for customers. Detailed design information
uch as Orcad and Gerber files are provided as reference tools. The current design has not yet been determined to be production worthy
,s FCC part 15 and part 68 testing has not been completed.

\.KIT CONTENTS

Quantity	Description
1	User's Guide (This document; Order No. 1149)
1	RCV56HCF/SP PCI Target Board (RD00-D100-011) populated with the 11229 Basic Interface device and R6776-3x Modem Data Pump
1	RCV56HCF PCI/CardBus Modem Designer's Guide Rev. 1 (Order No. 1129)
1	RCV56HCF Host-Controlled K56flex Data/Fax Modem Device Family for PCI Bus Applications Data Sheet Rev. 1 (Order No. MD189)

1	Commands for RCV56HCF/SP Modems Reference Manual (Order No. 1118)
1	Fabrication Drawing (RD00-D105)
1	PCB Assembly Drawing (RD00-D100)
1	Schematic Drawing (RD00-X100)
1	Bill of Materials (Vendors Parts Listing RD00-D100)
1	Floppy Disk for IBM PC: Contains the 32-bit DOS OrCAD files
1	Floppy Disk for IBM PC: Contains the modem driver files
2	Floppy Disks containing SONIC voice application installation files
1	Driver Notes: Document containing information specific to the modem drivers included with the kit.

\.TARGET BOARD FEATURES

Data modes supporting K56flex, 33.6kbps, 31.2kbps, V.34, V.32bis, V.32, V.22bis, V.22A/B, V.23, and V.21; Bell 212A and Bell 103.
V.42bis, V.42, and MNP2-5 protocols for data compression and error correction supported by provided host drivers.
Group 3 fax modes supporting V.17 14400/12000/9600/7200 bps, V.29 9600/7200 bps, and V.27 ter 4800/2400 bps transmit/receive,
V.21 Channel 2 300 bps transmit and receive, EIA-578 Service Class 1.0 commands.
Voice and speakerphone
PCI 2.1 interface
DTE speeds up to 115.2 kbps.
V.25ter, V.25ter Annex A, and EIA 602 command set.
Designed for Windows 95 environment using TAPI compliant applications; will work with Windows 3.x applications that support
RCV56HCF/SP commands.
4-layer design.
Low power CMOS.
Minimal parts count.
On-board sounducer.

.APPLICABLE DOCUMENTS

RCV56HCF Host-Controlled K56flex Data/Fax Modem Device Family for PCI Bus Applications" Data Sheet (Order No. MD189)
RCV56HCF PCI/CardBus Modem" Designer's Guide Rev. 1 (Order No. 1129)
Commands for RCV56HCF Modems Reference Manual" (Order No. 1118)

.ABOUT THE KIT

\.RCV56HCF/SP TARGET BOARD

The RCV56HCF/SP Target Board is a PCI expansion board which plugs into a PC's PCI slot . The target board, which uses the Rockwell
R1229 and R6776 devices, is a four-layer PC board. Power for the board is supplied from the PCI bus. Jacks function are indicated in the
diagram below.
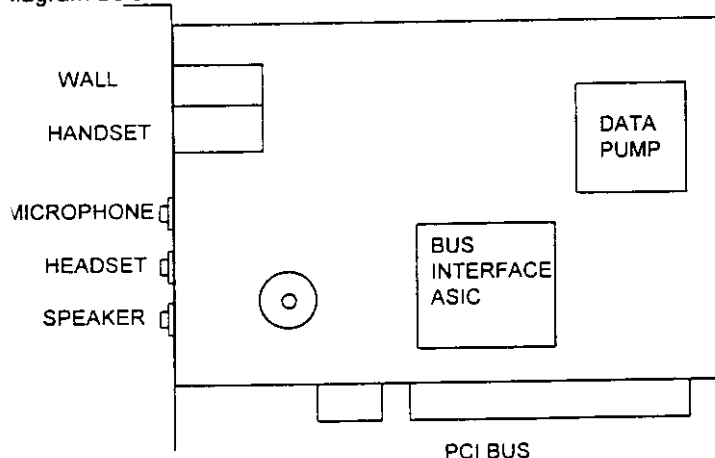
\.DESIGNER'S GUIDE (MANUAL)

The RCV56HCF/SP Modem Designer's Guide provides detailed technical and user information about the RCV56HCF/SP modem device.

\.COMMAND REFERENCE MANUAL

The Command Set Reference Manual provides detailed technical and user information about the AT commands used in Rockwell's
RCV56HCF/SP modem product.

\.FLOPPY DISK

\ diskette is supplied which contains the OrCAD files for the Target Board. Read the "READ.ME" ASCII file for instructions to access
these files. A second diskette contains the RCV56HCF/SP drivers (.INF, .VXD, and .RAM files). A third and fourth diskette contain the
SONIC application for evaluating voice mode.

I.OrCAD Files

The OrCAD files contain the bill of materials and schematics of the Target Board. The bill of materials specifies all the parts that are
required to produce the Target Board, including vendor names and part numbers. OrCAD schematic capture software is required to use
the files.

I.Driver Files

The .INF, .VXD, and .RAM files in the modem install disk is used by Windows 95 when the modem is first installed. The .INF file supplies
modem information (AT commands and features supported, names of files to copy from floppy to hard disk) to the Windows 95 operating

stem, and the .vxd and .ram files, which are copied to the windows system directory during installation, contain the modem code (which
I be executed in the PC).

Gerber Files
e Gerber directory contains the Gerber files, Aperture List, Drill Tool Table, and Drill coordinate file for the Target Board. All artwork and
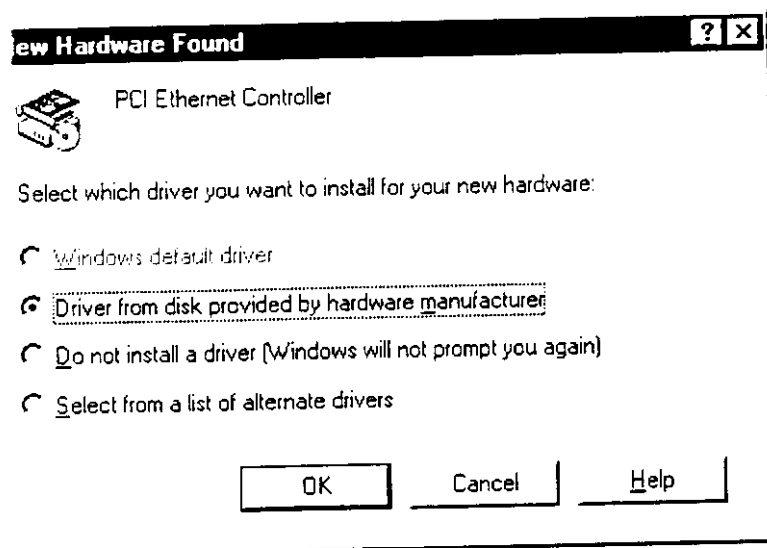II files used by board manufacturers to produce printed circuit boards are included on the floppy disk.

SAFETY
e NFPA 70, National Electrical Code (NEC), paragraph 800-51(i), requires equipment that is intended to be electrically connected to a
acommunications network to be "listed for the purpose". This listing requirement became effective for such equipment July 1, 1991. A
tionally recognized testing laboratory (NRTL) can assist in testing and selecting the appropriate listing category and safety standard for
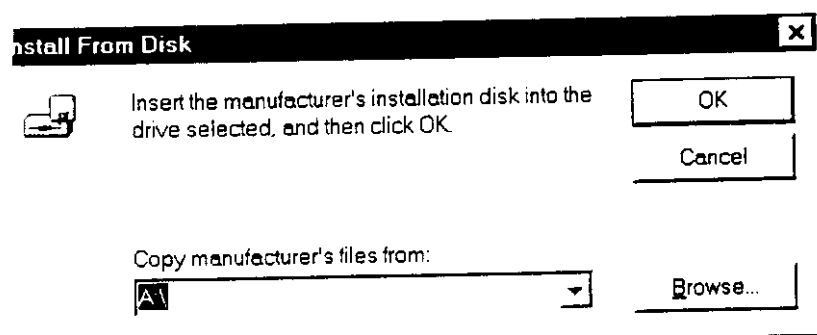s equipment depending on marketing requirements for the product.

INSTALLATION
INSTALLING THE RCV56HCF/SP TARGET BOARD
:rform the following to install your Target Board to your IBM PC or compatible computer.
Turn off power to Windows 95 PC, remove PC cover, insert the card to an available ISA slot, close PC cover, turn on power.
When Windows 95 loads, it will detect the new hardware and ask for drivers. The following window should appear:

```
ew Hardware Found                                    [?] [X]

    [icon]     PCI Ethernet Controller


  Select which driver you want to install for your new hardware:

  C   Windows default driver

  (•) Driver from disk provided by hardware manufacturer

  C   Do not install a driver (Windows will not prompt you again)

  C   Select from a list of alternate drivers


            [   OK   ]    Cancel  |    Help
```

Click OK and you should see:

```
nstall From Disk                                     [X]

   [icon]   Insert the manufacturer's installation disk into the     [   OK   ]
            drive selected, and then click OK.
                                                                      [ Cancel ]



            Copy manufacturer's files from:
            [A:\                              ▼]       [ Browse... ]
```

Insert the floppy diskette that contain the RCV56HCF/SP driver into A: and click "OK". After the floppy is accessed, you should see:

New Hardware Found [?][X]

Rockwell PCI Basic2 Modem

Select which driver you want to install for your new hardware:

○ Windows default driver

● Driver from disk provided by hardware manufacturer
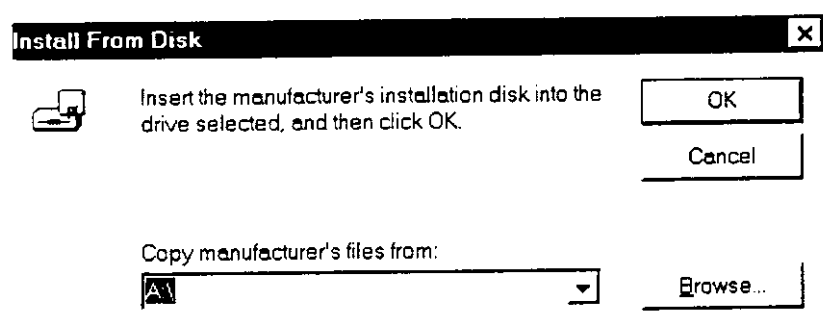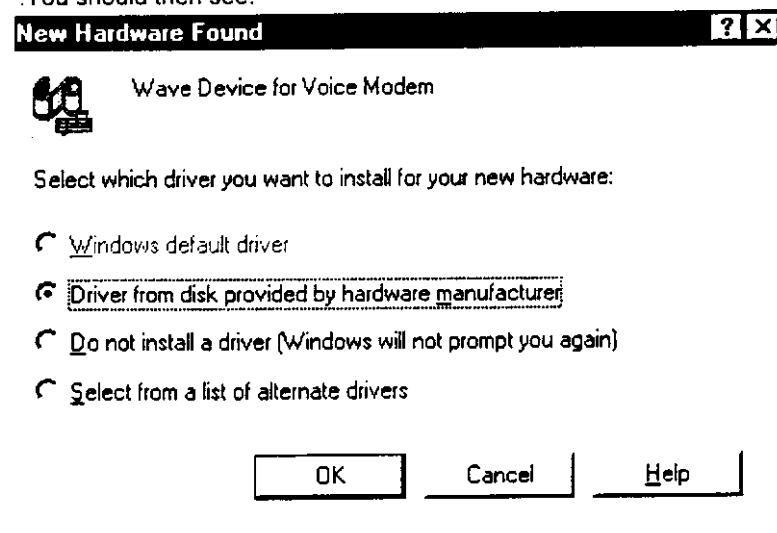
○ Do not install a driver (Windows will not prompt you again)

○ Select from a list of alternate drivers

[OK]   [Cancel]   [Help]

5.Click OK and you should see:

Install From Disk [X]

Insert the manufacturer's installation disk into the drive selected, and then click OK.

[OK]

[Cancel]

Copy manufacturer's files from:

[A:\] ▼   [Browse...]

6.Click "OK"; the modem drivers will be installed.
7.You should then see:

New Hardware Found [?][X]

Wave Device for Voice Modem

Select which driver you want to install for your new hardware:

○ Windows default driver

● Driver from disk provided by hardware manufacturer

○ Do not install a driver (Windows will not prompt you again)

○ Select from a list of alternate drivers

[OK]   [Cancel]   [Help]

8.Click "OK" and you should see:

Install From Disk   [×]

> Insert the manufacturer's installation disk into the drive selected, and then click OK.

    [OK]

    [Cancel]

Copy manufacturer's files from:
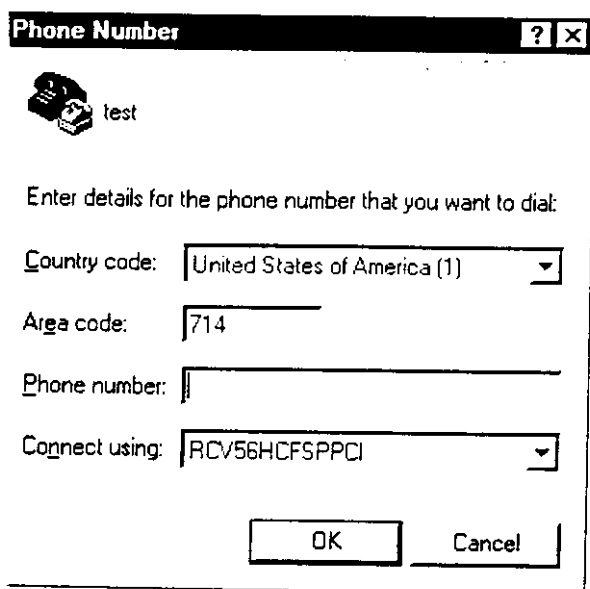
[A:\ ▼]   [Browse...]

9. Click "OK"; the modem wave driver will be installed, to complete the installation.
10. Connect the modem to the Telco using a standard RJ11 type telephone cord. You may also want to connect a handset, a microphone, and/or a speaker to the modem.

I.OPERATION IN DATA MODE

After installing the modem, you are now ready to make a connection to another modem.
1. Execute the Windows 95 Hyperterminal application into your PC. This is under START>ACCESSORIES>HYPERTERMINAL. After you enter a name for your connection, you should be prompted with:

Phone Number   [?][×]

test

Enter details for the phone number that you want to dial:

Country code: [United States of America (1) ▼]

Area code: [714]

Phone number: [ ]

Connect using: [RCV56HCFSPPCI ▼]

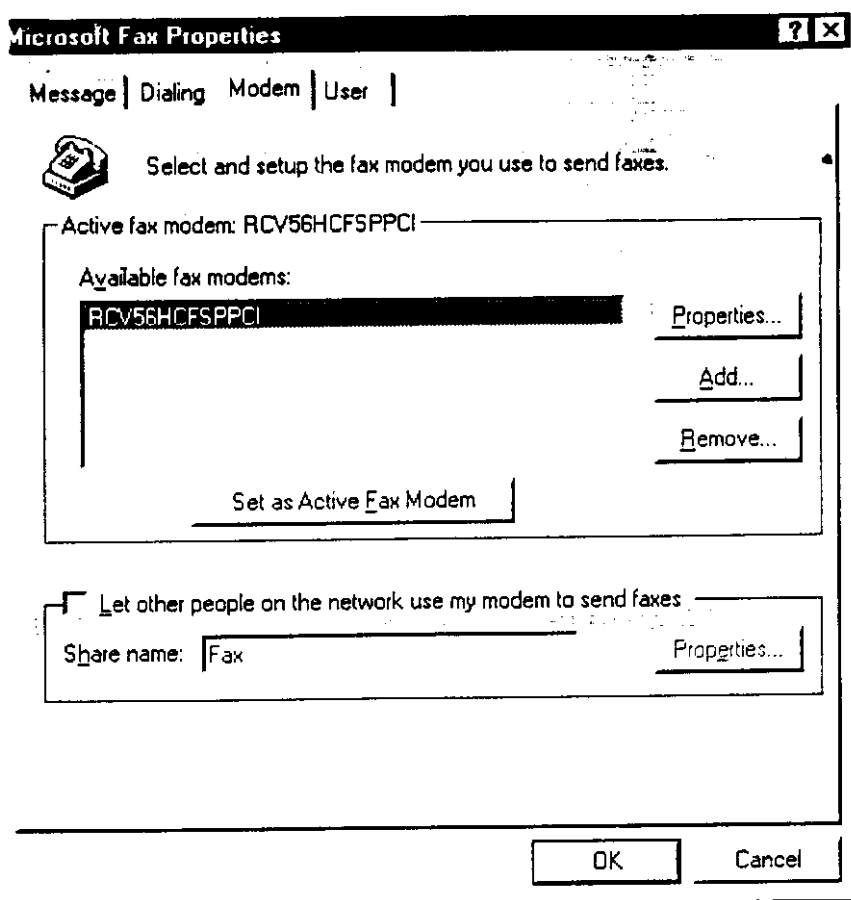   [OK]   [Cancel]

. Select "RCV56HCFSPPCI" under "Connect using:", and fill in the other parameters and click OK.
At this point, Hyperterminal is configured to use the RCV56HCF/SP and will dial the number you entered. Refer to Hyperterminal's On-line Help feature for more information on using Hyperterminal with the modem.
When using other TAPI applications, make sure that "RCV56HCF/SP" is the selected modem before attempting connections.

OPERATION IN FAX MODE

Execute the Windows 95 Microsoft Exchange application. This is under START>PROGRAMS>MICROSOFT EXCHANGE. Then under pull down menus, select TOOLS>SERVICES>PROPERTIES of Microsoft Fax>MODEM. You should see:

Message | Dialing   Modem | User |

Select and setup the fax modem you use to send faxes.

Active fax modem: RCV56HCFSPPCI

Available fax modems:

RCV56HCFSPPCI   Properties...

Add...

Remove...

Set as Active Fax Modem

Let other people on the network use my modem to send faxes

Share name: Fax   Properties...

OK   Cancel

.Select "RCV56HCFSPPCI" under "Available Fax modems", click "Set as Active Fax Modem", and then OK. At this point, Microsoft Exchange is configured to use the RCV56HCF/SP. Refer to Microsoft Exchange's on-line help feature to send and receive faxes.
.When using other TAPI applications, make sure that "RCV56HCF/SP" is the selected modem before attempting connections.

I.OPERATION IN SPEAKERPHONE MODE

.Connect speakers and microphone to the modem.
.Using Hyperterminal or an communications application, issue:

\T&F+FCLASS=8;+VSP=1;+VRA=0<CR>.
.Issue ATDT and the number you want to call; the modem will be in speakerphone mode when the modem responds "OK" after dialing.
.Issue ATH<cr> to disconnect the speakerphone connection.

.OPERATION IN VOICE MODE

. To evaluate voice mode, install the SONIC voice application that comes with the kit. The installation files take up 2 diskettes.

OTE: SONIC is a Rockwell voice evaluation application being distributed solely to allow the evaluation of the voice features of the HCF modem. This software is being distributed in an "AS IS" condition.
. Run the SONIC application. You should see the SONIC application:

Sonic101 Version 4.09 / DVTShare Ver 4.02

File   Window

Voice/Audio | Options | Speakerphone

Configuration

Sampling Rate
8000

Time Mark Period
0

Bits Per Sample
8 A-Law

Silence Detection
Off

DTE Speed
115200

Tone Timer
2

Silence Period
20

Ring Go Away
50

Ring Never Came
100

Modes
Data
Fax
Voice
Hang Up

Play Loop
1

☐ Hang up after Rec/Play

Play Through
Handset   Init

Record From
Phone Line

Idle

ᵣ If instead, you see an egg timer on the screen for more than 10 seconds, then SONIC is trying to find the modem at a default COM port and cannot find it. When the egg timer times out (less than a minute), the following should be displayed:

Initialization

❌ Can't find modem!
Please check modem and COMPort then click Init button.

OK

Click OK.
. After step 2 or 3 above, click the OPTIONS tab on SONIC. You should see:

```
┌─────────────────────────────────────────────────────┬───┐
│ Sonic101 Version 4.09 / DVTShare Ver 4.02            │ X │
├─────────────────────────────────────────────────────┴───┤
│  File   Window                                            │
```

Voice/Audio | **Options** | Speakerphone

Comm Port
Comm 3 ▲▼

Phone Number
4946

Phone Line Mode
○ Answer ⦿ Originate

Others
FF/REW Skip (s) 3
Volume Control Steps 1
Maximum Time to Wait for Answer (s) 60
Record Prompt Tone ⦿ DTMF ○ Single Tone #

Modem Commands
Before Config

After Config (before VCON)

After VCON

Play Through
Handset ▼   Init   Record From   Handset ▼

Idle

- Correct the Comm Port setting if it is incorrect, and enter the remote handset phone number that you would like to use in your voice testing.
- Click the Voice/Audio tab.
- Select the desired **Configuration, Play Through,** and **Record From** settings.
- Click the **Init** button
- Use the RW/FF/PLAY/PAUSE/STOP/RECORD buttons to test voice functionality. Voice samples can be saved in the hard disk and played back.

.ote: Sound files must be played back at the configuration that they were recorded at, otherwise the sound will be distorted.

.QUESTIONS

or questions regarding "AT" commands and operation of the RCV56HCF/SP modem, refer to the Modem Designer's Guide. For
uestions or comments regarding the RCV56HCF/SP, please contact a Rockwell Field Applications Engineer at the local Rockwell sales
fice near you.

INSIDE BACK COVER NOTES

1. INTRODUCTION

1.1 SUMMARY

The Rockwell RCV56HCF Host-Controlled Modem Device Family supports high speed analog data, high speed fax, ISDN, DSVD, AudioSpan, speakerphone, audio/voice, and VoiceView operation. It operates with PSTN or ISDN telephone lines in the U.S. and world-wide and is offered in eight device models (see Table 1-1).

The modem device set consists of PC ISA bus interface (BIF) and modem data pump (MDP) hardware available in two thin quad flat packs (TQFPs). Host-controlled modem software is also provided. Figure 1-1 illustrates the general structure of the RCV56HCF software and the interface to the RCV56HCF hardware. Figure 1-2 illustrates the major hardware interfaces supported by each model.

The RCV56HCF employs a downloadable architecture so that the user can upgrade MDP executable code.

Using K56flex™ technology, the RCV56HCF can receive data at speeds up to 56 kbps from a digitally connected central site modem, also K56flex enabled, e.g., with a Rockwell RC56CSM modem. This modem takes advantage of the PSTN which is primarily digital except for the client modem to central office local loop and is ideal for applications such as remote access to an Internet service provider (ISP), on-line service, or corporate site. The RCV56HCF can send data at speeds up to V.34 rates.

In V.34 data mode, the modem operates at line speeds up to 33600 bps. Error correction (V.42/MNP 2-4) and data compression (V.42 bis/MNP 5) maximize data transfer integrity and boost average data throughput. Non-error-correcting mode is also supported.

AudioSpan (analog simultaneous audio/voice and data) operation supports a data rate with audio of 4.8 kbps.

SP models support position independent, full-duplex speakerphone (FDSP), as well as digital simultaneous voice and data (DSVD) with speech coding per ITU-T G.729 Annex A with interoperable G.729 Annex B, and SIG DigiTalk™ DSVD.

The modem supports fax Group 3 send and receive rates up to 28800 bps and T.30 protocol.

V.80 and Rockwell Video Ready compatible synchronous access modes support host-controlled communication protocols, e.g., H.324 video conferencing.

In voice/audio mode, enhanced 8-bit linear and 8-bit μ-Law coding at 8000 Hz sample rate allows efficient digital storage of voice/audio. This mode supports digital telephone answering machine, voice annotation, and audio recording/playback applications.

AccelerATor kits and reference designs are available to minimize application design time and costs.

This designer's guide describes the modem hardware capabilities and identifies the supporting commands. Commands and parameters are defined in the RCVHCF Command Reference Manual (Order No. 1118).

1.2 FEATURES

- Data modem
  - K56flex, 33.6 kbps, 31.2 kbps, V.34, V.32 bis, V.32, V.22 bis, V.22A/B, V.23, and V.21; Bell 212A and 103 , V.90
  - V.42 LAPM and MNP 2-4 error correction
  - V.42 bis and MNP 5 data compression
  - V.25 ter, V.25 ter Annex A, and EIA 602 command sets
- Fax modem send and receive rates up to 28800 bps
  - ITU-T V.34 fax*, V.17, V.29, V.27 ter, and V.21 ch 2
  - EIA/TIA 578 Class 1, Class 1.0 (T.31) fax
- ISDN BRI support (option)*
  - PC Bus support 2B+D channels
  - IOM-2 interface to external U or S/T transceiver
  - Simultaneous transfer of B1, B2, D channels (144 kbps; 64 kbps x 2, 16 kbps)
  - V.34, DSVD, FDSP, audio functions over B channel
- AudioSpan (simultaneous audio/voice and data)*
  - ITU-T V.61 modulation (4.8 kbps data plus audio)
  - Handset, headset, or half-duplex speakerphone

* See Note 6 in Table 1-1.

- ITU-T V.70 DSVD (option)
  - ITU-T G.729 Annex A with interoperable G.729 Annex B
  - SIG (special interest group) DigiTalk DSVD
  - Voice/silence detection and handset echo cancellation
  - Handset, headset, or half-duplex speakerphone
- Full-duplex speakerphone (FDSP) mode
  - Over PSTN or ISDN B channel (option)
  - Switching to/from data, fax, DSVD and VoiceView
  - Microphone gain and muting
  - Speaker volume control and muting
  - Adaptive line and acoustic echo cancellation
  - Loop gain control, transmit and receive path AGC
  - Acoustic echo cancellation concurrent with DSVD
  - Noise suppression
  - Room monitor
- V.80 and Rockwell Video Ready synchronous access modes support host-controlled communication protocols
  - H.324 interface support
- V.8/V.8bis and supporting commands (V.25 ter Annex A)
- Data/Fax/VoiceView/Voice call discrimination
- Voice, telephony, audio, VoiceView
  - TIA-695 command set
  - VoiceView alternating voice and data (option)
  - 8-bit linear and 8-bit μ-Law coding/decoding for record/playback
  - 8.0 kHz, 11.025 kHz, 22.050 kHz and 44.1 kHz (down sampled to 11.025 kHz)
  - Handset, acoustic, line echo cancellation
  - Music on hold from host or analog hardware input
  - TAM support with concurrent DTMF detect, ring detect and caller ID
- World-class operation (option)
  - Call progress, blacklisting, multiple country support
- Integrated internal hybrid
- Caller ID and distinctive ring detect
- Modem and audio paths concurrent across PC bus
- Single profile stored in host
- Plug and Play compliant
- ISA Bus Interface
  - Only one IRQ required (IRQ3-5, 7, 9-12, or 15)
  - No DMA required
  - Independently mapped I/O blocks
- System compatibilities
  - Windows 95 and Windows NT operating systems
  - Microsoft's PC 97 Design Initiative compliant
- Device packages:
  - Bus Interface: 144-pin TQFP
  - Modem Data Pump: 144-pin TQFP

+5V operation

INFORMATION TO THE USER
****

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, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device. Pursant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, 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 booklet is available from the US government Printing Office *washington, DC 20402, Stock NO. 004-000-00345-4.

CAUTION: Any changes of modifications not expressly approved by the grantee of this device could void the users authority to operate the equipment.