

56K HSP Modem

FCC ID : NBUF560CP-001

User's Manual



Federal Communications Commission (FCC) Statement

This equipment has been tested and found to 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 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.

Warning: A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.

Use only shielded cables to connect I/O devices to this equipment.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

For equipment FCC ID: NBUF560CP-001

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.

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UPDATES

Updates to the products and the manual are obtainable at participating local dealers and distributors, or directly from local outlet.

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1. Introduction

1.1 General Description

This document provides reference information for the installation of an internal 56K HSP modem based on the *Host Signal Processing Data/Fax/Voice Modem Chip*. This 56K modem eliminates the redundant hardware parts found in most today's modems. These include the data pump, a controller, an additional UART and external memory as required in a conventional approach. In addition, the complete HSP solution allows an internal modem to be upgraded with enhancements and features through software upgrades rather than a chip change or board swap.

This information covers the system requirements, features, installation and setup and AT command sets.

1.2 Accessory Kit

The 56K HSP Modem kit includes:

1. 56K HSP Modem, PCI-bus
2. Windows 95/98 and Windows NT 4.0 Drivers
3. Communication software
4. User's manual
5. RJ-11

1. 3 System Requirements

1. Pentium 166MHz + (200MHz MMX Pentium required for V.80/Videophone)
2. AMD K6 200MHz
3. Cyrix 6*86MX PR200
4. 16MB RAM.
5. Windows 95 (Includes OSR1/OSR2), NT4.0

1. 4 Features

④ DATA

Supported Speeds

56000, 54000, 52000, 50000, 48000, 46000, 44000,
42000, 40000, 38000, 36000, 34000, 33600, 28800,
26400, 24000, 21600, 19200, 16800, 14400, 12000,
9600, 7200, 4800, 2400, 1200, 300

Supported Protocols

V.90, K56Flex, V.34, V.32bis, V.32, V.22bis, V.22, V.21,
V.23, Bell212A, Bell 103

Data Compression

V.42bis, MNP 5

Error Correction

V.42 LAPM, MNP 2,3,4

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④ **FAX**

Supported Speeds

14400, 12000, 9600, 7200, 4800, 2400, 300

Supported Protocols

V.8bis, V.80, V.17, V.29, V.27ter, V.21 Channel 2

EIA Class 1

④ **General Features**

Auto Fallback

AT Commands

Auto Selection of COM Port and IRQ settings

Automatic Answering

Signal Quality Monitoring and Auto Retrain

Single Crystal Design

Data/Fax/Voice/Speakerphone(requires full duplex sound card)

Automode

High throughput Virtual UART, DTE rate up to 115,200

PCI Bus interface

Low power consumption

Caller ID

④ **Operating System Compatibility**

Windows 95 OSR1/OSR2, Windows 98, Windows NT

4.0

2. Installation

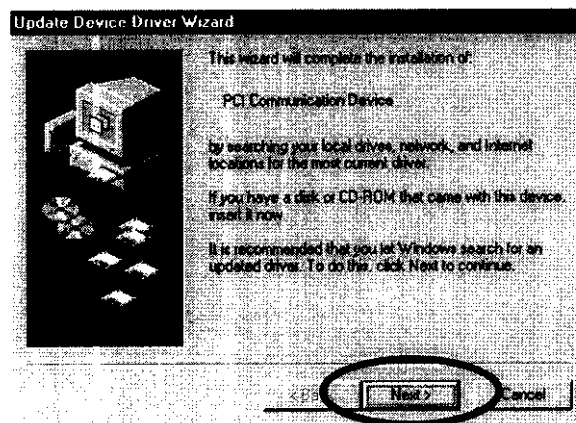
2. 1 Windows 95 Software Setup

To set up the 56K HSP Modem in Windows 95, the following installation procedures must be completed.

Caution ! Do not run the Add New Hardware Wizard.

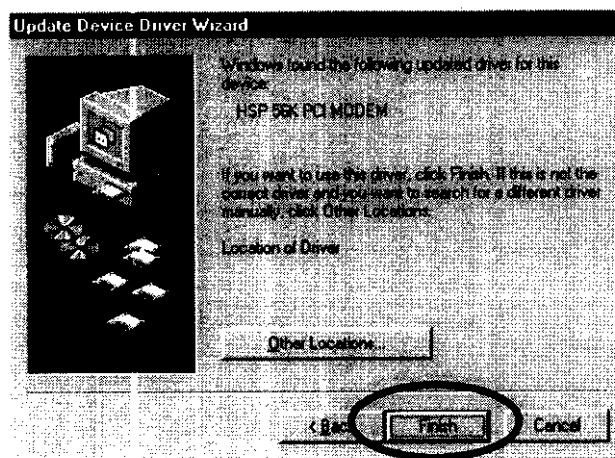
This will lead non-function to the modem.

1. Insert the modem into the slot of your mother's board and turn on your computer, then entering Windows 95, the system will detect its automatically. When displays this picture, please put CD-ROM labeled "**Modem Installation Drivers**" in your CD-ROM device, and then click "**Next**".

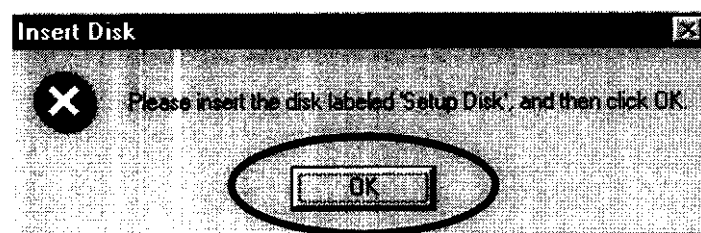


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2. Select **“Finish”** to continue next step.

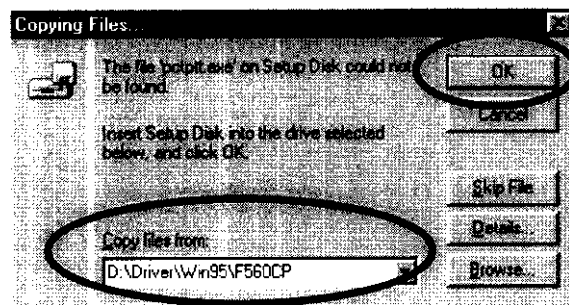


3. Then click **“OK”**.



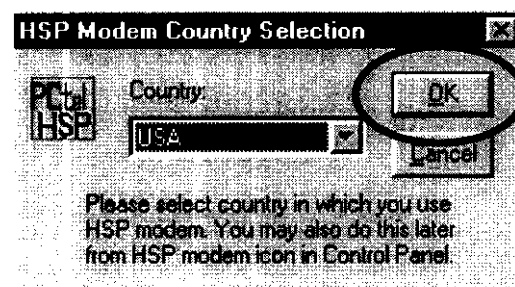
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4. When you go to this picture, please follow below path “D:\Driver\Win95\F560CP ” and select “OK”.



Please wait for a second, because Windows is installing the software for your new hardware.

5. Finally select country in which you use this modem and press “OK”.



You are now ready to explore the Internet through your modem in a speed of 56000 bps.

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Note: If your system already has the 56K HSP modem and you are upgrading your current operating system to Windows 95, then the Windows will not ask you the above. The installation procedure will be as follows instead;

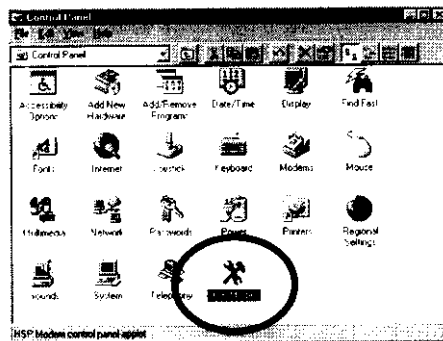
- A. Click **“Start”, “Setting” and “Control Panel”**.
- B. **Double** click the **“System”** icon.
- C. Click **“Device Manager”**.
- D. Remove all the devices under **“Other Devices”** branch
- E. Click **“Refresh”**.
- F. Then turn off the computer and turn it on.
- G. Start Windows 95
- H. When displays the picture of step1, please repeat this step as described above

Note: After you restart Windows, use the modem manager in the Windows 95 control panel to verify whether the HSP Modem is working in **“Analysis”** and run **“More Info”** to see if the HSP modem is responding.

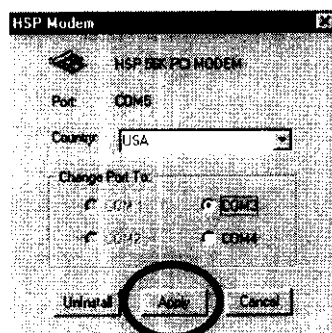
2. 2 Communications Port Change

The installation program will automatically attach the HSP Modem to Com Port 5 or higher. Since certain applications require Com Port 1-4, the Com Port can be changed by following the procedure outlined below.

1. Click “HSP Modem” under “Control Panel”.



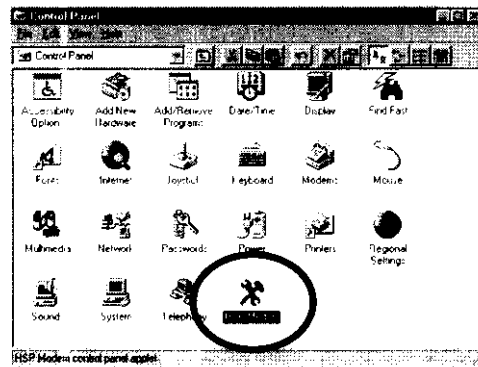
2. Choose the appropriate Com Port and click “Apply”. This will complete the Com Port change.



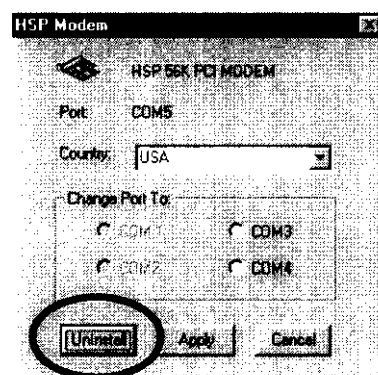
2.3 Un-installation

The HSP Modem can be un-installed by using the following procedure.

- 1 Click “HSP Modem” under “Control Panel”.



- 2 Click “Uninstall”. The un-installation program will automatically remove the HSP Modem™ from the system.



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- (3) Test the analog loopback function by typing `AT&T1<enter>`. You should see the 'CONNECT 115200/CARRIER 42000' result code. After the CONNECT message, the modem is in the data mode and ready to transfer a text file. You can either use the TRANSFER function in the terminal program to do a file transfer or by simply typing any characters from the terminal. If errors occur during the file transfer or an 'ERROR' code appeared instead of CONNECT message, it indicates that the signal quality of the modem card is degraded. Use the modem escape sequence (`+++ AT<enter>`) to return the modem to the command mode. Type `AT&V3<enter>` to get some debug information. You can type this command several times, but look carefully at the result code (especially in the OVR and UND fields.) If the number keeps increasing, the modem is having a conflict with another device. If the number remains the same, we may have a hardware problem in the CODEC or hybrid section.

If your modem passed all the above test, the next thing to check is the DAA section of the board.

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- (4) Connect your modem card to a PBX line or direct phone line. Use ATDT command to dial a number with a phone set connected. If the remote phone ring, the DAA circuit is functioning normally. Typical problem in this section will cause 'NO DIALTONE' result code.
- (5) Use a phone set to dial the modem card. You should see a 'RING' response code appear on the terminal. If you do not get that response, the ring detection circuit is not functioning.

Appendix A: AT Command

Table 1. AT Command Set

Command	Function
AT	Attention - this precedes all commands except A/
A/	Execute previous command - does not require a <CR> *
A	Causes the modem to go off hook. If a call is coming in, the modem will try to answer it. The procedure for answering a call is a short silence and then an answer tone. Sending a character to the modem during this procedure will abort the answer procedure. The amount of time the modem will wait for a carrier is programmable by modifying the S7 register.
B0 B1 B2	Select CCITT V.22 (1200 bps) Select Bell 212A (1200 bps) Select CCITT V23 Originate mode will transmit data at 75 bps and receive data at 1200 bps. Answer mode will transmit data at 1200bps and receive data at 75bps. The command N0 (Disable auto mode) must be selected.
D	D alone will take the modem off-hook and wait for a dial tone. (See X command for exceptions) The length of time to wait for a dial tone before dialing is programmable in register S6.

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Dmn	ATDmn will dial a phone number where m is a modifier: L, W, ,, ;, @, !, or S. It will dial the telephone number n.
L	Dial last number
W	Wait for dial tone. If you have selected X0 or X1 (disable dial tone detection), then you can use this modifier to override that setting.
,	Pause during dial. The amount of time to pause is determined in register S8.
;	Return to command mode after dialing. It does not for carrier or hang up.
@	Wait for 5 seconds of silence. This is used to access systems that do not provide a dial tone.
!	Hook flash. Causes the modem to go on-hook for 0.5 seconds. This is used in PBX systems and for voice features like call waiting.
S=(0-9)	Dials a stored number. Up to ten numbers can be stored, and the addresses are from 0 to 9. To store a number into one of these addresses, use the &Z command.
E0	Commands issued to the modem are not echoed to the local terminal. This only matters in the command mode. It does not affect the modem ability to send response codes.
E1	Commands are echoed to the local terminal.
H0	Force modem on-hook (hang-up).
H1	Force modem off-hook (to answer or dial).
I0	Return numeric product code
I1	Return hardware variation code
I2	Report internal code
I3	Report software revision number
I4	Report product feature listing

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L0	Speaker volume zero
L1	Speaker volume low
L2	Speaker volume low
L3	Speaker volume low (Hardware currently limits volume adjustment to on/off)
M0	Speaker always off
M1	Speaker on until carrier detected
M2	Speaker always on
M3	Speaker on during answering only
N0	Disable auto-mode. This forces the modem to connect at the speed specified in register S37.
N1	Enable auto-mode. The modem will answer at the highest available line speed and ignore any ATBn command.
O0	Return to data mode. If you have entered the command mode using the time independent escape sequence, this will put you back in data mode without going on-hook.
O1	Retrain the modem. If the line condition has changed since the original connection, retraining the modem will cause it to reconnect at the most efficient speed for the current line condition.
P	Pulse dialing allows the modem to work on telephone networks where tone is not supported. Pulse and Tone dialing can not be mixed on the same command line.
Q0	Enable response to DTE.
Q1	Disable response to DTE. The modem does not respond to the terminal. Issuing a command will not produce a response (unless the command is something like ATZ, which will restore this setting to

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	default.)
Sn	Set default S-register. Any subsequent = or ? commands will modify the default S register.
Sn=m	Set register n to value m
Sn?	Return the value of register n
T	Tone dialing Pulse and Tone dialing can not be mixed on the same command line.
V0	Result codes will be sent in numeric form. (See the result code table)
V1	Result codes will be sent in word form. (See the result code table.
W0	Report DTE speed only. After connection, there will be no message about what Error Correction or Data Compression protocol is in use.
W1	Report DCE speed, Error Correction/Data Compression protocol, and DTE speed.
W2	Report DCE speed only
X0	Send OK, CONNECT, RING, NO CARRIER, ERROR and NO ANSWER. Busy and Dial Tone Detection are disabled.
X1	Send X0 messages and CONNECT speed
X2	Send X1 message and NO DIALTONE
X3	Send X2 messages and BUSY and RING BACK. Dial Tone Detection is disabled.
X4	Send all responses
Y0	Disable long space disconnect
Y1	Enable long space disconnect; with error correction, hang up after sending 1.6 second long space; without error correction, hang up after 4 second long space.

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Z0	Reset modem to profile 0
Z1	Reset modem to profile 1
=n	Sets the value of the default S register
?	Reports the value stored in the default S register.

&	Ampersand Commands
&C0	Force DCD on
&C1	DCD follows remote carrier
&D0	DTR is assumed on
&D1	DTR drop causes modem back to command mode without disconnecting
&D2	DTR drop causes modem to hang up
&D3	DTR drop causes modem to be initialized; &Y determines which profile is loaded.
&F	Load factory profile
&G0	Disable guard tone
&G1	Enable 550Hz guard tone
&G2	Enable 1800Hz guard tone on answering modem
&K0	Disable flow control
&K3	Enable RTS/CTS flow control
&K4	Enable XON/XOFF flow control
&K5	Enable transparent software flow control
&K6	Enable both RTS/CTS and XON/XOFF flow control
&P0	Selects 33%-67% make/break ratio at 10 pulses per second
&P1	Selects 33%-67% make/break ratio at 20 pulses per second
&P2	Selects 39%-61% make/break ratio at 10 pulses per second
&P3	Selects 39%-61% make/break ratio at 20 pulses per second
&S0	Force DSR on
&S1	DSR on at the start of handshaking and off after carrier loss

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&T0	Terminate test
&T1	Start ALB test
&U0	Enable trellis coding
&U1	Disable trellis coding
&V0	Display active profile
&V1	Display stored profiles
&V2	Display stored telephone numbers
&W0	Save active profile to profile 0
&W1	Save active profile to profile 1
&Y0	Use profile 0 on power up
&Y1	Use profile 1 on power up
&Zn= m	Save telephone number (up to 36 digits) into memory location n (0-9)
%	Percent Commands
%A	Default is set to each country encoding law. For example, for USA %A is 0, for Germany %A is 1.
%A0	Mu law encoding
%A1	A law encoding
%C0	Disable data compression
%C1	Enable MNP5 compression
%C2	Enable V.42bis compression
%C3	Enable both V.42bis and MNP5
%E0	Disable auto-retrain
%E1	Enable auto-retrain
%E2	Enable auto-retrain and fallback
%E3	Enable auto-retrain and fast hang up
%L	Report received signal level in -dBm
%N0	Dynamic CPU loading disabled
%N1	Dynamic CPU loading not to exceed 10%
%N2	Dynamic CPU loading not to exceed 20%
%N3	Dynamic CPU loading not to exceed 30%

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%N4	Dynamic CPU loading not to exceed 40%
%N5	Dynamic CPU loading not to exceed 50%
%N6	Dynamic CPU loading not to exceed 60%
%N7	Dynamic CPU loading not to exceed 70%
%N8	Dynamic CPU loading not to exceed 80%
%N9	Dynamic CPU loading not to exceed 90%
%Q	Report line signal quality
\	Backslash Commands
\A0	64-character max. MNP block size
\A1	128-character max. MNP block size
\A2	192-character max. MNP block size
\A3	256-character max. MNP block size
\Bn	In non-error correction mode, transmit break in 100 ms units (1-9 with default 3)
\G0	Disable XON/XOFF flow control (modem to modem)
\G1	Enable XON/XOFF flow control (modem to modem)
\Kn	Define break type (refer to table 2)
\L0	Use stream mode for MNP
\L1	Use interactive block mode for MNP
\N0	Normal mode: speed control without error correction
\N1	Plain mode: no speed control and no error correction
\N2	Reliable mode
\N3	Auto-reliable mode
\N4	LAPM error correction only
\N5	MNP error correction only
*	Asterisk commands
*Q0	Send the "CONNECT xxxx" result codes to the DTE when an invalid TIES escape sequence is detected after the "OK" response has already been sent
*Q1	Does NOT send the "CONNECT xxxx" result codes to the DTE when an invalid TIES escape sequence is detected

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	after the "OK" response has already been sent
--	---

Table 2. AT\Kn Command

\Kn	Local DTE sends break during normal or reliable mode	Local modem sends break during plain mode	Remote modem sends break during normal mode
\K0	Enter command state; no break to remote	Break to remote; and enter command state	Empty data buffers; and send break to DTE
\K1	Empty data buffers; break to remote	Same as \K0	Same as \K0
\K2	Same as \K0	Send break to remote	Immediately send break to DTE
\K3	Immediately send break to remote	Same as \K0	Same as \K2
\K4	Same as \K0	Same as \K2	Send break to DTE with buffered RXD data
\K5	Send break to remote with TXD data	Same as \K2	Same as \K4

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Table 3. FAX Class 1 Command Set

Command	Function
+FCLASS=0	Select data mode
+FCLASS=1	Select facsimile Class 1 mode
+FAE?	Report active adaptive answer setting: 0 for disabled, 1 for enabled
+FAE=?	Report adaptive answer capability
+FAE=0	Disable adaptive answer
+FAE=1	Enable adaptive answer
+FCLASS=?	Report service classes supported
+FTS=n	Stop transmission and pause, 0-255 in 10 ms
+FRS=n	Wait for silence, 0-255 in 10 ms
+FTM=?	Report Class 1 transmit capabilities
+FRM=?	Report Class 1 receive capabilities
+FTH=n	Transmit data with carrier n, n = 3, 24, 48, 72, 73, 74, 96, 97, 98, 121, 122, 145, 146
+FRH=n	Receive data with carrier n, n = 3, 24, 48, 72, 73, 74, 96, 97, 98, 121, 122, 145, 146

Table 4. (Voice Mode) AT Command Summary

<i>Command</i>	<i>Function</i>
ATA	Answering in Voice Mode
ATD	Dial command in Voice Mode
ATH	Hang up in Voice Mode
ATZ	Reset from Voice Mode
AT#BDR	Select baud rate (turn off autobaud)
AT#CID	Enable Caller ID detection and select reporting format
AT#CLS	Select data, fax, or voice
AT#MDL?	Identify model
AT#MFR?	Identify manufacturer
AT#TL	Transmit level control
AT#REV?	Identify revision level
AT#RG	Record gain control
AT#SPK	Change the setting of Speakerphone
AT#VBS	Bits per sample (ADPCM)
AT#VBT	Beep tone timer
AT#VLS	Voice line select (ADPCM)
AT#VRA	Ring back goes away timer (originate)
AT#VRX	Voice Receive Mode (ADPCM)
AT#VSD	Silence deletion tuner (voice receive, ADPCM)
AT#VSP	Silence detection period (voice receive, ADPCM)
AT#VSS	Silence sensitivity tuner (voice receive)
AT#VTX	Voice Transmit Mode (ADPCM)
AT#VBQ?	Query buffer size
AT#VCI?	Identify compression method (ADPCM)
AT#VRN	Ring back never came timer (originate)
AT#VSR	Sampling rate selection (ADPCM)
AT#VTD	DTMF/tone reporting capability