

# HOW TO USE YOUR INTELE-MODEM

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 **Ultratec**


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First Edition  
October 1998

First Printing

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# INTRODUCTION

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Modems are everywhere these days, tying together millions of computers via the telephone lines. A modem can also be found at the heart of each TTY (text telephone) used by people who are deaf or hard of hearing. But not all modems are alike, nor can they all talk to each other. Computer modems use ASCII code and most TTYs use Baudot code. Without the Intel-Modem, these codes are not compatible.

The Intel-Modem's specialty is allowing computers to talk to TTYs. It listens to one type of code and converts it to the other. The Intel-Modem can also send and receive in ASCII code. Your Intel-Modem can communicate with any 110- or 300-baud ASCII device, including TTYs which use ASCII code. (The baud rate is how fast a code travels over the phone line.) In Baudot, the Intel-Modem can use either the American standard of 45 baud or 50 baud.

The Intel-Modem is Hayes-compatible. This means you can use Hayes commands (also called AT commands) to control your modem. The Intel-Menu command set makes it easy to dial numbers, answer incoming calls, set up Auto-Answer, or change any of the Intel-Modem's settings.

The Intel-Modem also features automatic detection of both Baudot and ASCII calls. It works with commercially available communications and bulletin board software. Front panel lights indicate the current operating mode and line status. Screen messages signal call progress by telling you if there's a dial tone, and if the other phone is busy or if it's ringing.

In many situations, your communication software will take care of making your calls. You won't need to send commands directly to your modem. However, when you do need to control the modem, you have your choice: Ultratec's Intel-Menu commands or standard Hayes commands.

# QUICK GUIDE

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<b>How to make a call</b>	<b>Where to find more information</b>
<ol style="list-style-type: none"><li>1. Set up your Intelé-Modem and computer and turn them on.</li><li>2. Load your communications software.</li><li>3. Press the Escape Key and the Spacebar.</li><li>4. Type ? to list the menu of commands on your screen.</li><li>5. Type D and the number you're calling.</li><li>6. When you connect, begin your conversation.</li><li>7. Press the Escape Key and type H to hang up.</li></ol>	<p>How to Set Up Your Intelé-Modem, page 3.</p> <p>Calling with Intelé-Menu Commands, page 5.</p>
<b>How to answer a call</b>	
<ol style="list-style-type: none"><li>1. Set up your Intelé-Modem and computer and turn them on.</li><li>2. Load your communications software.</li><li>3. Press the Escape Key and the Spacebar.</li><li>4. Type ? to list the menu of commands on your screen.</li><li>5. Type A while the phone is ringing.</li><li>6. When you connect, begin your conversation.</li><li>7. Press the Escape Key and type H to hang up.</li></ol>	<p>How to Set Up Your Intelé-Modem, page 3.</p> <p>Answering with Intelé-Menu Commands, page 7.</p>

# HOW TO SET UP YOUR INTELE-MODEM

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## Equipment you need

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The place where you set up your computer and modem should have several electrical outlets and a telephone wall jack within five or six feet.

**CAUTION:** The Intele-Modem is designed for standard telephone lines, and it will not work with a computerized telephone system such as a PBX.

Connecting the modem to a non-standard phone line may damage your telephone system or Intele-Modem, and will void the warranty. If you have questions, contact your phone system installer.

### The Intele-Modem.

The Intele-Modem comes with AC power and telephone cords.

### A personal computer or a computer terminal or workstation.

You can use an IBM or IBM-compatible, Macintosh or other brand of computer. You can also use a terminal designed for connection to a mainframe or network, as long as you have the right software. The serial com port setting must be: 300 BAUD, 8N1, No Flow Control (No Software Flow Control).

### A telephone line.

Don't use a party line or a line that's part of a multiple-phone system, such as a PBX. Use a standard, analog telephone line. A telephone is optional.

### A communications software program.

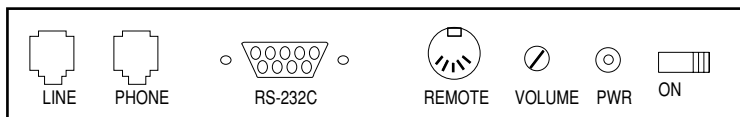
There are many different programs that will work. Any program that provides for "terminal emulation" will do. If in doubt, ask your computer store or microcomputer user group for the software that works best with your computer.

### A cable to connect your Intele-Modem to your computer.

You need a cable with a connector for the modem on one end and the right connector for your computer on the other. Computers have many different kinds of connectors. Standard cables for IBM-compatible and Macintosh computers are available from Ultratec.

## Setting up

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**Intele-Modem  
back panel**

1. Be sure the Intele-Modem "ON" switch is pushed to the right (the off position). The switch is on the back panel. Plug the AC power cord into the PWR (power) jack. Plug the other end into an electrical outlet.
2. Plug one end of the Intele-Modem computer cable into the RS-232C port on the back of your Intele-Modem. Plug the other end into the serial port of your computer (sometimes called the RS-232C port).
3. Telephone hook-up. Plug the telephone cord into either one of the telephone jacks on the back of the Intele-Modem. Plug the other end of the cord into a telephone wall jack. To connect a phone to the same line, plug the telephone cord into the second jack on the Intele-Modem's back panel.

# HOW TO USE YOUR INTELE-MODEM

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1. Connect all the hardware.
2. Turn on your computer and load your communications software. If you need more information on these first two steps, see page 3.
3. Turn on your Intele-Modem.
4. Use your software to dial or answer a call. Your software will also allow you to change settings that determine how the modem operates. See your communications software instructions for more information.

The rest of the information in this guide is for those who need to directly control their modem. To do so, follow the above steps to enter terminal mode. Then, choose the Intele-Menu command set or the Hayes command set. You must use one command set or the other—you can't intermix the two.

## Intele-Menu command set

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This is a special set of commands created by Ultratec to simplify controlling your Intele-Modem. When you type your computer's Escape Key followed by the Spacebar after turning on the modem, the modem will display this line on your computer monitor:

**Command (Press ? for help):**

All commands are issued from this Command Line (see page 5).

## Hayes command set

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These are standard commands used by most computer modems. Ultratec has added several special commands for use with Baudot code (see page 14).

## Talking to the modem vs. another computer or TTY

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No matter which command set you use, your Intele-Modem operates in two modes. Issuing commands is done in command mode, whereas the actual communication with another person takes place in on-line mode.

## Command mode

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In command mode your modem receives instructions from you via the computer keyboard. Sometimes command mode is referred to as "local" or "off-line" mode because you are talking to the modem itself, rather than to another computer or TTY.

## On-line mode

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In on-line mode, your modem serves as a bridge between your computer and another computer or TTY, transmitting the messages that you and the other person type back and forth.

## How to switch between modes

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How you switch modes depends on which command set you're using. If you're using Intele-Menu commands, use the Escape Key to enter command mode. After you've typed the command you want, use the Enter Key to return to on-line mode.

If you're using the Hayes Command Set, use the "escape sequence" to enter command mode. This is the escape sequence: wait until no characters have been typed for at least one second, type the + Key three times in a row (like this: +++), and then wait another second. When you're in command mode, switch back to on-line mode by issuing an ATO command.



# CALLING WITH INTELE-MENU COMMANDS

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## General procedure

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Set up your hardware, turn on the computer and modem, and load your communications software. Enter terminal mode. The communications program instructions will show you how to get into terminal mode (sometimes called “talk” or “on-line” mode).

1. Press the Escape Key and then the Spacebar to enter command mode. The Intelé-Modem will display the following prompt on your computer screen:

**Command (Press ? for help):**

2. Type the letter or number for the command you want (or type ? to see the Help Menu). Commands are described starting on page 9.
3. Press the Enter Key to return to on-line mode and carry on your conversation.

If you don't see the Command Line when you press the Escape Key and the Spacebar, try typing ATZ first. See the Problems and Solutions section on page 21 for more information.

## Step-by-step instructions

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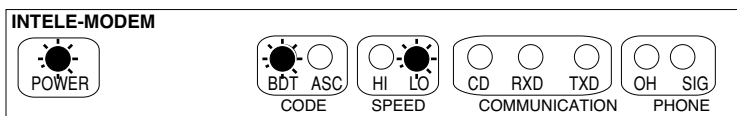
### Modem settings

When you follow these instructions, you will be using the following modem settings:

- Automatic communication mode. The modem will use either ASCII or Baudot code, depending on what it receives from the other computer or TTY.
- Half-duplex
- Pulse dialing

### Instructions

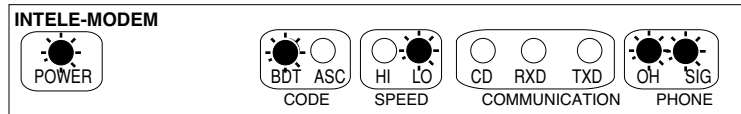
1. Turn on your computer.
2. Start up your communications software.
3. Turn your Intelé-Modem on. The POWER, BDT, and LO lights on the front panel of your modem will go on.



**Turning on the Intelé-Modem lights the Power, Baudot and Low Speed indicators.**

4. Follow your software instructions to get into terminal mode.
5. Press the Escape Key and the Spacebar.
6. Type D and the telephone number you want to dial. If you make a mistake, use the Backspace Key to make corrections.

7. Press the Enter Key. The modem will dial the number. The OH (Off-hook) and SIG (Signal) lights will go on.



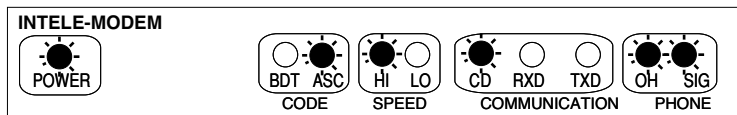
**Dialing a number lights the Off-Hook and Signal indicators.**

If the modem can't dial the number, you'll see NO DIAL TONE on your screen. The modem will hang up and the Command Line will reappear on the screen.

If the line is busy, the modem will hang up and display BUSY on the screen.

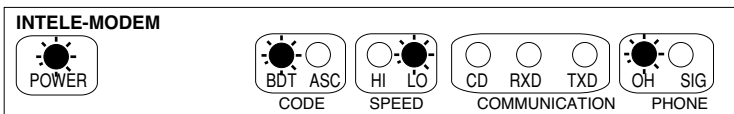
If dialing succeeds, you'll see RINGING on the screen. When the number answers, you'll see one of two responses on your screen:

CONNECT - the modem has connected to another computer or TTY and is using ASCII code. The CD (carrier detect), ASC (ASCII code), and either the HI or LO lights will all come on.



**A computer or ASCII TTY connection. HI lights when it's 300 baud.**

CONNECT TTY - the modem has connected to a TTY and the TTY has sent a message in Baudot code. The BDT, OH, and LO or HI lights will stay on. The SIG light will go on when either you or the caller type.



**A TTY connection at 45 baud lights the Baudot and Low Speed indicators.**

If the only response you see is RINGING, no one is answering. Hang up by pressing the Escape Key followed by the H Command. Return to on-line mode by pressing the Enter Key.

8. When you see one of the connect messages, go ahead and start your conversation. You'll see the RXD (Receive Data) and TXD (Transmit Data) lights flashing as you send and receive messages in ASCII code. If you're using Baudot code, the SIG (Signal) light will also flash.

If you don't see what you're typing on the computer monitor, change your duplex setting to half-duplex. Type the Escape Key, then the F Command and the Enter Key.

9. To hang up when you're done, press the Escape Key and H. You can also hang up by turning off your Intele-Modem.

## Special situations

The above description assumes that your modem is in automatic mode (set with the 1 Command). If the modem is set to ASCII, and no carrier signal is detected after 30 seconds, you will read NO CARRIER and your modem will hang up.

The description also assumes that your modem is set to half duplex. If you see double characters on the screen when you type (lIiikkee tthhiiss), change to full duplex.

## Answering with Intelé–Menu commands

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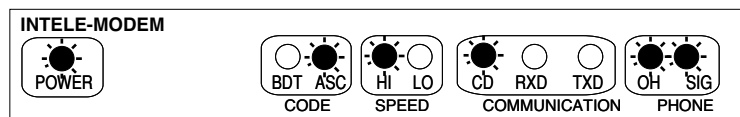
You may answer both computer and TTY calls the same way. The Intelé–Modem searches incoming signals and switches to either 300-baud ASCII code or 45-baud Baudot code, whichever is correct. If the caller uses ASCII code, the Intelé–Modem will be in answer mode at half-duplex.

1. Turn your computer on.
2. Start up your communications software.
3. Turn your Intelé–Modem on. The POWER, BDT, and LO lights on the front panel of your Intelé–Modem will go on.
4. Follow your software instructions to get into terminal mode.
5. Press the Escape Key and the Spacebar. The Intelé–Modem responds with the Command Line:

**Command (Press ? for help):**

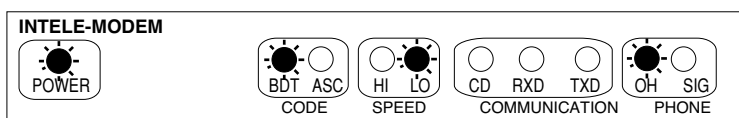
If the phone is ringing, the SIG light will go on with each ring. The modem will also display the response RING on the monitor. Type A (the answer command). Your Intelé–Modem will pick up the phone and send an ASCII answer tone for a few seconds. You'll see the OH, ASC, and HI lights all come on. If it doesn't connect with another ASCII computer or TTY, it will wait to receive a Baudot code. The ASC and HI lights will go out and the BDT and LO lights will come on.

6. If the CD (carrier detect) light goes on and you read CONNECT on your monitor, your Intelé–Modem has connected with a computer, and is communicating in ASCII code.



**A computer or ASCII TTY connection. HI lights when it's 300 baud.**

You won't know for sure if you've connected in Baudot code until the other person types a message to you. When he or she starts typing, the SIGNAL light will go on. You'll read CONNECT TTY on your monitor, which means your Intelé–Modem has connected with a TTY, and is communicating in Baudot code.



**A Baudot call is indicated by the BDT light. If the call is at 45 baud, the LO indicator also lights.**

7. Continue your conversation.
8. To hang up, type the Escape Key then the H Command.

## Changing communication settings

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To change communication settings during a call, such as changing from half-duplex to full-duplex, use the Escape Key to enter command mode. When you see the Command Line, type the letter of the setting you want to change. If you don't know which command to use, type ? to use the menu. After you change the setting, use the Enter Key to return to on-line mode.

# SETTING UP AUTO-ANSWER

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When you're away, your Intelé-Modem can automatically answer your TTY or computer calls for you. Use Intelé-Menu commands to set-up Auto-Answer.

1. Turn your computer on, and load your communications software. Follow your software instructions to get into terminal mode.
2. Turn on your Intelé-Modem.
3. Press the Escape Key and the Spacebar.
4. When you see the Command Line, type the R Command. You'll see the following prompt:

**Enter # of rings (0-255):**

Type a number greater than 0 and press the Enter Key.

5. If you want to enter an Auto-Answer message, do it by typing the M Command. You'll see the following prompt:

**Enter new AA message? (Y/N)**

Type Y for Yes. The modem responds with:

**Enter new answer message ... Press ESC to end message**

Type your message. Press the Escape Key when you're finished. You will return to the Command Line.

6. Type the Z Command. You'll see the message:

**Auto-Answer on ... Press any key to abort**

When it answers the phone, the Intelé-Modem will respond in 300-baud ASCII code or 45-baud Baudot code, whichever matches the signals received from the incoming call. If you have saved an Auto-Answer message, it will send the message automatically after it answers the phone. After sending the message, it will wait for someone to start typing. When you or the caller hang up, the Intelé-Modem will hang up and return to waiting for another call. (Note that if you want to save incoming messages, you must do so with your communications software. The Intelé-Modem doesn't do this.)

There is one difference between an ASCII and a Baudot connection in Auto-Answer mode. In ASCII, as soon as the modem loses the ASCII carrier tone, it will hang up. In Baudot, it will wait 30 seconds after it has heard the last Baudot character and then hang up.

# THE INTELE-MENU COMMAND SET

This section contains a complete description of each of the Intele-Menu commands. See page 5 for step-by-step instructions for how to make a phone call.

## How to use the commands

All commands are entered at the Command Line. When you turn on the Intele-Modem and press the computer's Escape Key, you'll see this message on your computer screen:

**Press the SPACE bar to use Intele-Menu command set**

Pressing the Spacebar tells the modem you want to use Intele-Menu commands. The modem responds by displaying the Command Line on the screen. It looks like this:

**Command (Press ? for help):**

The modem is waiting for a command from you. It's also telling you that if you type ? you'll see the help menu. The help menu is shown below.

```
===== TELEPHONE FUNCTIONS ===== COMMUNICATION SETTINGS =====
D-Dial telephone                               || 1-Communication code (AUTOMATIC)
A-Answer telephone                             || 2-BAUDOT speed (45)
H-Hang-up telephone                            || 3-ASCII speed (300)
T-Tone/Pulse dialing (PULSE)                   || O-Originate/Answer (ANSWER)
                                                || F-Full/Half Duplex (HALF)
===== MESSAGE FUNCTIONS =====             || E-Echo ON/OFF (ON)
                                                || I-Hi sensitivity (OFF)
N-Enter new message                            ||
L-List message ( 0 chars)                       ||
S-Send message                                  ||
                                                || C-Current communication settings
                                                || Q-Quit to 'AT' command mode
===== AUTO-ANSWER FUNCTIONS =====         ||
                                                ||
Z-Turn Auto-Answer on                          ||
V-View AA message ( 0 chars)                   || © Copyright ULTRATEC Inc. 1989
M-Enter new AA message                         ||
R-Set # of rings ( 0 rings)                   || Version ITM061694
                                                ||
=====
Press ENTER to go ONLINE
Command (Press ? for help):
```

Each letter or number listed on the help menu is a command which will change how the modem operates. Don't worry, you won't have to use all the commands every time you make a phone call! After things are set up, most calls won't need any changes.

## What each command does

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Many of the commands have several settings. For example the Communication Code has three possibilities. It can be set to Automatic code detect, Baudot code, or ASCII code. When you turn the modem on, the Communication Code is set to Automatic code detect. Each time you type the command, it changes to the next setting. It will change to Baudot code the first time. The next time to ASCII code. The next time after that it will change back to Automatic code detect, and so on.

If the command has a default setting, it's shown in parentheses after the name of the command. Commands are listed below in the order they appear on the Intele–Menu help menu.

## Telephone Functions

---

### D–Dial telephone

Use this command to place a call. When you enter D at the command prompt, you'll see the following prompt:

**Enter # to dial:**

Type in the number, followed by the Enter Key. Include the area code if needed. The Intele–Modem will dial using either tone or pulse dialing, depending on how the T command is set. You can include parentheses and a dash in the number, although they're not necessary. Type a comma within the phone number to get a two-second pause in dialing. Use as many commas as you need—each one equals two seconds. Examples of correct entries are:

```
1 (608) 255-1212
1-608-255-1212
16082551212
9,16082551212
9,,16082551212
```

### A–Answer telephone

Use this command to answer a call. When you type A at the Command Line, the modem answers the phone and waits. You'll see the following message:

**Answering...**

If the caller is using ASCII, you'll see the response CONNECT. If the caller is using Baudot, you won't see any response until you begin your conversation. Then you'll see CONNECT TTY.

### H–Hang-up telephone

Typing H at the Command Line will hang up the phone. The modem will respond with Hanging up phone line and the Command Line will return.

### T–Tone or pulse dialing (The default is Pulse)

Typing T changes the way the modem dials a number. The default setting is pulse dialing. Typing T at the Command Line changes the setting to tone dialing. Each time you use the command, it switches back and forth between pulse and tone dialing.

## Communication Settings

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### **1–Communication code (The default is Automatic code detect)**

This command has three possible settings: Automatic code detect, Baudot code, and ASCII code.

Automatic code detect–The modem automatically matches the caller’s code. If he or she is using ASCII, the Intel–Modem uses ASCII. If the call is in Baudot code, the modem uses Baudot.

Note that while Automatic code detect can switch codes automatically, it cannot switch speeds. If you get a call in ASCII code at 110 baud, press the Escape Key to enter command mode, type 3 to switch to 110 baud, and press Enter to return to on-line mode. Similarly, if you get a call in Baudot code at 50 baud, use the 2 Command to switch speeds.

Baudot code–The modem uses Baudot code only. The 2 Command determines whether it uses 45 baud or 50 baud.

ASCII code–The modem uses ASCII code only. The 3 Command determines whether it uses 110 baud or 300 baud.

### **2–Baudot speed (The default is 45 baud)**

This command has two settings: 45 baud and 50 baud.

45 baud–When the modem is using Baudot code, it sends and receives at the rate of 45 baud.

50 baud–When the modem is using Baudot code, it sends and receives at the rate of 50 baud.

### **3–ASCII speed (The default is 300 baud)**

This command has two settings: 110 baud and 300 baud.

110 baud–When the modem is using ASCII code, it sends and receives at the rate of 110 baud.

300 baud–When the modem is using ASCII code, it sends and receives at the rate of 300 baud.

### **O–Originate/Answer (The default is Answer mode)**

This command has two settings: Originate and Answer. It applies only to ASCII code communication. It has no effect when using Baudot code.

Originate–When the modem is using ASCII code, it sends out an ASCII originate tone.

Answer–When the modem is using ASCII code, it sends out an ASCII answer tone.

### **F–Half- or Full-duplex (The default is Half-duplex)**

This command has two settings: Half-duplex and Full-duplex. When you type a letter or number on your computer, this command determines how that character is displayed on the screen.

Half duplex–When the code for a typed character is sent to the modem, the modem sends it to the other computer or TTY and also sends it back to your computer for display on the screen.

Full duplex–The Intel–Modem sends the character code to the other computer or TTY only. It’s the responsibility of the other computer to send the code back for display on your screen.

This command is useful if you get double characters on your screen. You can set the F Command to full- or half-duplex in both ASCII and Baudot codes. For more information, see the Problems and Solutions section on page 21.

### **E–Echo on/off (The default is Echo On)**

This command has two settings: Character Echo On and Character Echo Off. It determines whether the letters you type to issue commands to the modem appear on the screen or not. It has no effect in on-line mode.

Character Echo On–When you type a command, it is displayed on the screen.

Character Echo Off–When you type a command, it is not displayed on the screen.

## I—Hi sensitivity (The default is Hi Sensitivity Off)

This command controls the Intel—Modem’s E.A.R.S. (Enhanced Acoustic Reception System™) feature. It has two settings: Hi Sensitivity On and Hi Sensitivity Off. It only applies to Baudot communication. It has no effect in ASCII mode.

Hi Sensitivity Off—This is the normal setting for TTY conversations.

Hi Sensitivity On—This setting turns on Hi Sensitivity, which improves TTY conversations when you have a weak telephone connection or other TTY that is out of tune.

## C—Current communication settings

This command displays the Communication Settings section of the help menu. When you type C Command, you’ll see the listing shown below. The current settings are in parentheses.

## Q—Quit to ‘AT’ command mode

This command quits the Intel—Menu command set. You can re-enter by pressing the Escape Key.

---

### === COMMUNICATION SETTINGS ===

1—Communication code (AUTOMATIC)  
2—BAUDOT speed (45)  
3—ASCII speed (300)  
O—Originate/Answer (ANSWER)  
F—Full/Half Duplex (HALF)  
E—Echo ON/OFF (ON)  
I—Hi sensitivity (OFF)

Typing C at the Command Line displays all of the communication settings.

---

## Message Functions

Message Functions allow you to type and store a message and send it later. Note that there are two separate message areas. The Message Functions area is for a message you want to save and send later. The Auto-Answer message area contains a completely different message. Any message you save in either area is kept as long as the modem is on. When you turn off the power, messages are erased.

### N—Enter new message

When you type N at the Command Prompt you’ll see:

**Enter new message (Y/N)**

Typing Y for Yes allows you to enter a new message. Typing N for No returns you to the Command Line and preserves any message you’ve already saved. You’ll see the following prompt when you answer yes:

**Enter new text message ... Press ESC to end message**

Your message can be up to 240 characters long. Press the Escape Key when you’re finished. You’ll see the

following prompt:

----- (# chars) -----

(# chars) is the number of characters in your message.

### L—List message (0 chars)

This displays the message on the screen. When you save a message, (0 chars) will change to the number of characters in the message.

### S—Send message

Send your message at any time during a conversation by pressing the Escape Key (to enter command mode) and then typing the S Key. It doesn’t matter whether you’re using Baudot or ASCII code.



## Auto-Answer Functions

---

Auto-Answer functions allow you to type and save a message which will be sent automatically when your Intel-Modem is set to Auto-Answer. The message is kept as long as the modem is on. Turning it off erases any messages.

### Z-Turn Auto-Answer on

When you type this command, you'll see the following message:

**Auto-Answer on ... Press any key to abort**

The modem is now waiting for a call. When someone calls, the modem will answer and send any Auto-Answer message you have saved. Note that the number of rings must be greater than 0 for auto answer to work. If you type Z and the number of rings is set to 0, you'll see the following message:

**Rings must be greater than 0 to enter Auto-Answer!**

Type R and set the number of rings to a number greater than 0, then enter the Z Command again.

### V-View AA message (0 chars)

Use this command to display any message you have saved in the Auto-Answer buffer. When you have a message saved, (0 chars) will change to show the number of characters in your message.

### M-Enter new AA message

When you type M at the Command Prompt you'll see this message:

**Enter new AA message? (Y/N)**

Typing Y for Yes allows you to enter a new Auto-Answer message. Typing N for No returns you to the Command Line and preserves the old message. You'll see the following prompt when you answer yes:

**Enter new answer message ...  
Press ESC to end message**

Your message can be up to 240 characters long. Press the Escape Key to return to the Command Line. You'll see the following prompt:

----- (# chars) -----

(# chars) tells you the number of characters you've saved.

### R-Set # of rings (The default is 0 rings)

This command sets the number of times the telephone will ring before it's answered when you're in Auto-Answer. When you type R, you'll see this message:

**Enter # of rings (0-255):**

Enter any number from 0 to 255. Remember that Auto-Answer will not work if you set 0 rings.

### ?-Help

Type the ? Key any time you want to see the help menu.

# CALLING WITH HAYES® COMMANDS

---

Use the Hayes command set with your personal computer and communications software. If you are using a terminal or workstation type of computer, you should use the Intelé–Menu command set described on pages 5-13. When you follow these instructions, you will be using the following modem settings:

- Automatic communication mode, which means the modem will automatically use either 300-baud ASCII or 45-baud Baudot code, depending upon which code it receives from the other computer or TTY.
- Full-duplex
- Pulse dialing

Each command in this section is fully described on pages 16-20.

## How to call another computer or a TTY

---

1. Turn your computer on.
2. Load your communications software.
3. Turn your Intelé–Modem on. The POWER, BDT, and LO lights on the front panel of your modem will go on.
4. Follow your software instructions to get into terminal mode. Type AT and press the Enter Key. If everything is working right, you'll read "OK" on your monitor.
5. Type ATD, followed by the telephone number you want to dial. If you make a mistake, use the Backspace Key to make corrections. Press the Enter Key. The number will be dialed. Your dialing command will look something like this:

**ATD 5551212 [Enter]**

You'll see the SIG light flash on and off when the modem dials. If the phone rings, you'll see the message RINGING on your screen. If the phone is busy, you'll see the message "BUSY" on the screen.

6. When someone answers, your Intelé–Modem will listen for an ASCII carrier tone from the other computer. If it hears the tone, you'll read CONNECT on your screen. The CD and SIG lights on the Intelé–Modem's front panel will go on.

If the person you're calling answers with a Baudot TTY, you won't see anything on the screen until the other person begins to type. Then you'll see the message CONNECT TTY on your screen. The SIG light will flash.

If your modem is in automatic mode (ATB Command set to 0), which is the default mode, it will listen indefinitely for an ASCII carrier signal or a Baudot code. Type the Escape Key to hang up.

If the modem is set to ASCII 300 mode (ATB3) or ASCII 110 mode (ATB4), and no carrier signal is detected after 30 seconds, you will read NO CARRIER and your modem will hang up.

7. After you establish a connection, you can type messages back and forth, send or receive files, or perform any other operations detailed in your communications software instructions. You'll see the RXD (Receive Data) and TXD (Transmit Data) lights flashing as your modem sends and receives messages. If you're using Baudot code, the SIG light will also flash; in ASCII mode the SIG light stays on continuously.

If you do not see the words you type on the computer monitor, change your duplex setting to half-duplex.

8. To hang up, use the escape sequence (a one-second pause, +++, and another one-second pause) to return to command mode. Then type the ATH Command. Or you can turn off your Intele-Modem.

## **How to answer a call from a computer or TTY** \_\_\_\_\_

Follow the same procedure to answer both computer and TTY calls. Your Intele-Modem will switch to either 300-baud ASCII code or 45-baud Baudot code, whichever is correct.

1. Turn your computer on.
2. Load your communications software. Follow your software instructions to get into terminal mode.
3. Turn your Intele-Modem on. The ON, BDT, and LO lights on the front panel will come on.
4. While the phone is ringing, type the ATA Command. Watch for the CD (carrier detect) light to go on. If it goes on and you read CONNECT on your monitor, your Intele-Modem is communicating in ASCII code.  
If you read CONNECT TTY on your monitor when the SIGNAL light goes on, your Intele-Modem has connected with a TTY, and is communicating in Baudot code.
5. Once you establish a connection, you can go ahead with your conversation.
6. Hang up by typing the escape sequence (a one-second pause, +++, and another one-second pause) to return to command mode and then use the ATH Command to hang up. Or turn off your Intele-Modem.

## **How to change communication settings** \_\_\_\_\_

To change communication settings during a call, such as changing from full-duplex to half-duplex, type the escape sequence (one-second pause, +++, and another one-second pause) to enter command mode and then type the commands you want to change. Use the ATO Command to go back on-line.

## **Setting up Auto-Answer** \_\_\_\_\_

Setting the S0 register to anything greater than 0 puts the modem into Auto-Answer mode. However, in most situations you'll be better off using the Intele-Menu command set for Auto-Answer. See page 8 for details.

# COMPLETE HAYES COMMANDS

---

The Intel-Modem uses the complete industry-standard Hayes command set, except that there are no self-test commands. Additional commands have been added for the Baudot code settings. If the command has a default, it's listed after the name of the command.

Hayes commands are also known as AT commands because each command must be preceded by the letters AT. Both letters must be entered in upper or lower case (at or AT). The modem will not recognize an upper case A and a lower case t (At) or the reverse (aT). AT is also a command by itself which is used to switch from on-line to command mode.

## How to type commands

---

You must use your communications software to get into terminal (or talk) mode. Each command has three parts—the AT prefix, the command itself, and the Enter Key. You can enter each command separately after its own AT prefix:

```
ATB1 [Enter]
```

```
ATF0 [Enter]
```

```
ATD5551212 [Enter]
```

or string them together after a single AT:

```
ATB1F0D5551212 [Enter]
```

You can type commands in a solid string of characters, as shown above, or you can put spaces between command characters to make them easier to read.

```
AT B1 D 555 1212 [Enter]
```

If you make a mistake, use the Backspace Key to make corrections before you press the Enter Key.

Press the Enter Key when you have typed all the command characters you want to use. When you press the Enter Key, the Intel-Modem carries out your commands.

## Default settings

---

When you turn your Intel-Modem on, it's automatically set to communicate in a specific way, called its default settings. If a command has a default setting, it's shown in parentheses after the name of the command.

## Primary Commands

---

These are the most important commands. For complete descriptions, see the listing below.

AT	Attention
D	Dial a number
Bn	Set ASCII or Baudot code and baud rate
F	Full- or half-duplex mode
A	Set answer or originate mode
S0=n	Answer the phone after n number of rings
H	Hang up the phone

## What each command means and how to use it \_\_\_\_\_

Commands are listed in alphabetical order.

### **A—Answer a call**

Use the answer command to answer a call.

### **AT—Attention**

The AT command issued by itself is used to enter command mode. AT is also the prefix for all of the other commands. For example, issue the dial command by typing ATD.

### **B—Use a specific code and speed (The default is ATB0)**

The B command controls the code and baud rate your Intel-Modem uses to communicate. If you want to specify ASCII or Baudot code and the baud rate, type ATB and a number from 0 to 4. What each number means is listed below:

**ATB0—Auto search.** When your Intel-Modem answers a call, it automatically searches the incoming signals to determine what code to use. If it hears an ASCII signal, it stays in ASCII code at 300 baud. If it doesn't hear an ASCII signal, the modem switches automatically to Baudot code at 45 baud.

Note that while Auto search can switch codes automatically, it cannot switch speeds. If a caller uses 110-baud ASCII code, use the ATB4 command to switch your modem to 110 baud. Similarly, if you get a call in Baudot code at 50 baud, use the ATB2 command to match speeds.

**B1—Baudot code, 45 baud.** Use this setting for making calls to TTYs in the United States and other countries which use 45-baud Baudot code.

**B2—Baudot code, 50 baud.** Use this setting for making calls to TTYs in countries that use 50-baud Baudot code.

**B3—ASCII code, 300 baud.** Use this setting to make calls to computers and 300-baud ASCII TTYs.

**B4—ASCII code, 110 baud.** Use this setting for making calls to 110-baud ASCII TTYs.

### **D—Dial telephone**

Type AT followed by D to dial a phone number from your computer keyboard. Press the Enter Key to dial. For example:

```
ATD 5551212 [Enter]
```

You can specify tone or pulse dialing by adding T or P to the command. For example, to tone dial, use:

```
ATDT 5551212 [Enter]
```

Type P after ATD to tell your Intel-Modem to pulse dial. For example,

```
ATDP 5551212 [Enter]
```

Typing a comma within the phone number causes a two-second pause in dialing. If you're using your Intel-Modem in an office setting where you need to dial 9 to get an outside line, a pause may be needed to allow time to get a dial tone. Here's an example:

```
ATD 9,5551212 [Enter]
```

You can use as many commas as you need. Each one equals two seconds.

### **E—Echo (The default is E1)**

Echo controls how the commands you type to your modem are displayed on your computer monitor.

**E0—Echo off.** When you type a Command, it will not be displayed on the computer monitor.

**E1—Echo on.** Commands are displayed as you type them.

### **F—Full- or half-duplex (The default is full-duplex)**

Full-and half-duplex are two ways that the modem displays what you type on your computer screen.

**ATF0—Half-duplex.** In half-duplex, your modem sends characters you type to the other computer or TTY and also to your computer screen. If each character you type appears twice on your monitor (HHII TTHHEERREE), change to full-duplex. TTYs that use Baudot code always use half-duplex. See the Problem and Solutions section

on page 21 for more information.

**F1—Full-duplex.** In full-duplex, your modem sends the characters you type only to the other computer or TTY. You read the characters on your screen when the other computer or TTY sends them back. If typed characters do not appear on your monitor, change your setting to half-duplex.

### **H—Hang up**

If you want to hang up at any time during or after a call, use the ATH Command.

### **I—Product code**

The ATI Command displays a software revision code.

### **M—Speaker on/off (The default is M1)**

M0—The speaker is always off.

M1—The speaker is on until an ASCII carrier or a Baudot character is detected.

M2—The speaker is always on.

### **N—Sensitivity (The default is N1)**

Sensitivity controls how the Intelé-Modem listens to sounds on the telephone line. If your modem is having trouble receiving data correctly, set it to high sensitivity. This is an Ultratec addition to the standard command set.

N0—High sensitivity

N1—Normal sensitivity

### **O—Online**

Use this command to return to on-line mode when you're in command mode.

### **Q—Quiet (The default is Q0)**

The Quiet command determines whether or not the modem sends its response messages to the computer monitor.

Q0—The modem sends response messages to your computer monitor.

Q1—Response messages are not sent to your computer monitor.

### **Sn?—Value of any S register**

Use this command to find out the value of any of the S registers. For example, the command `ATS1?` asks the modem for the number of times the phone has rung.

### **S0—number of rings (The default is S0=0)**

When the modem is in answer mode, the S0 register tells it how many rings to listen for before automatically answering the phone. You can set it for any number from 0 to 255.

S0=0 is the manual answer mode (default setting). Your Intelé-Modem will not automatically answer the telephone when S0 is set to 0. If your modem is turned on and a call comes in, it will send the response RING to your computer monitor. You must use the command ATA to answer the call. After you answer, you will read CONNECT or CONNECT TTY when communication is established. If your modem does not establish a connection, press Escape to hang up and return to command mode.

S0=1 tells the modem to Auto-Answer after one (1) ring.

S0=n means Auto-Answer after n rings.

Setting S0 to any number greater than 0 has the effect of putting it into Auto-Answer mode. To take the modem out of Auto-Answer mode, set S0 back to 0.

### **S1—Ring count**

This register is increased each time the phone rings.

### **S2—Set escape character (The default is S2=43, the ASCII number for the + character)**

The escape character is part of the escape sequence, which puts the modem in command mode. This is the escape sequence: Wait until data transmission has stopped for at least one second, type the escape character three times, then wait another second. Your Intelé-Modem will respond with OK, and you can enter a command. Use the ATO Command to go back on-line.

S2=43—Escape character set to +.

S2=n—Escape character set to ASCII character number n. Refer to the table of ASCII character numbers on page 26. You can set n to any number from 0 to 127.

### **S3—Define carriage return character (The default is S3=13)**

Sets the ASCII value of the carriage return character. You can set it to any value from 0–127.

### **S4—Define line feed character (The default is S4=10)**

Sets the ASCII value of the line feed character. You can set it for any value from 0–127.

### **S5—Define backspace character (The default is S5=8)**

You can use any value from 0–32 or 127.

### **S6—Set wait time before dialing (The default is S6=2)**

The time in seconds that the modem waits after picking up the phone before it dials. The value can be 2–255 seconds.

### **S7—Set carrier detect time limit register (The default is S7=30)**

When you make a telephone connection, your modem listens for a carrier signal from the other computer or TTY. S7 allows you to set the length of time you want your modem to wait for the signal before it automatically hangs up the phone. You can set it to any number from 0 to 55.

### **S8—change length of time of comma (The default is S8=2)**

The default time is 2 seconds. You can change it to any time from 0 to 255 seconds.

### **S9—Carrier detect response time (The default is S9=6)**

This register sets the amount of time the modem must hear an ASCII carrier signal before it signals CONNECT. The value is measured in tenths of a second. The range is 1 (1/10th second) to 255 (25.5 seconds).

### **S10—Time between carrier loss and hang-up (The default is S10=14)**

In ASCII mode, the modem automatically hangs up when it loses the carrier tone. This register allows the carrier to disappear for a short period of time (perhaps due to a bad connection), without causing the modem to hang up. The value is measured in tenths of a second. You can set it for any number from 1 (1/10th second) to 255 (25.5 seconds).

The value for register S10 should not be set lower than the value for S9. If it is, even a momentary loss of carrier will cause the modem to disconnect.

### **S11—Tone dialing timing (The default is S11=100)**

This register determines the duration and spacing of tones in milliseconds when tone dialing. The range is 50–255 milliseconds. This has no effect on the speed of pulse dialing, which is fixed at 10 pulses per second.

### **S12—Escape sequence guard time (The default is S12=50)**

This value is how long of a delay is required before and after an escape sequence (normally +++). The time between characters in the sequence must be shorter than this value. The default is 50 1/50th of a second (1 second). The range is 20 (20/50th of a second) to 255 (25.5 seconds).

### **S13—Baudot timeout (The default is 30)**

When your Intel-Modem is in Auto-Answer mode and detects a Baudot call, this register is the amount of time in seconds the modem will wait without detecting any code before it hangs up. The range is 0–255 seconds. This is an Ultratec extension to the standard command set.

### **S14—ASCII seek time (The default is 3)**

This register is the amount of time in seconds the modem puts out an answer tone after it answers the phone. The range is 0–255 seconds. This is an Ultratec extension to the standard command set.

### **S15—Auto-answer abort enable (The default is 1)**

You can set the Intel-Modem to abort Auto-Answer when you press any key on your computer keyboard, or to remain in auto answer.

S15=1 tells the modem to abort auto answer if a key is pressed.

S15=0 tells the modem not to abort auto answer when a key is pressed.

This is an Ultratec extension to the standard command set.

### **V—Verbose or terse modem response messages (The default is V1)**

Your Intel-Modem can respond to modem commands with numbers or with words. The response numbers (terse responses) are listed below along with the associated word messages (verbose responses).

V0—Your modem responds with numbers. For example, instead of reading OK you'll read 0.

V1—Your modem uses word responses such as OK.

### **X—Response message list (The default is X1)**

You can select the number of response messages listed above that you want your Intel-Modem to display.

X0—Displays only response messages 0 through 4. If you are communicating in ASCII only, you may choose this.

X1—Displays all nine response messages (default setting). Your Intel-Modem will tell you when you are connected in Baudot code by the response message CONNECT TTY.

### **Z—The command to reset your Intel-Modem**

Typing ATZ [Enter] will reset your Intel-Modem to the default settings and return to command mode. Your modem will respond with OK. If you are on-line, ATZ will also hang up the phone.

---

#### **Terse vs. verbose responses.**

<b>Number</b>	<b>Message</b>
0	OK
1	CONNECT
2	RING
3	NO CARRIER
4	ERROR
5	CONNECT TTY
6	NO DIAL TONE
7	BUSY
8	RINGING
9	TTY TIMEOUT

---



# PROBLEMS AND SOLUTIONS

---

**I get double characters on my screen when I'm typing to the other computer or TTY.**

Solution: The Duplex setting controls the way characters are displayed on your computer screen. There are only two possible settings, Full-duplex and Half-duplex. Here's how to change from one to the other:

Intele-Menu commands: Press the Escape Key to enter Command Mode, type F to change from Half-duplex to Full-duplex or Full- to Half-duplex, and press the Return Key to go back on-line.

Hayes commands: Use the escape sequence to enter command mode, type ATF0 to change to Half-duplex, and ATO to return to on-line mode. If you're already in Half-duplex, type ATF1 to change to Full-duplex.

**When I'm typing to another computer or TTY, I don't see anything on my screen.**

Solution: This problem is also corrected by changing the Duplex setting. Follow the same steps as in Problem 1.

**Sometimes when I answer an ASCII call, the characters that come from the caller don't make sense.**

Solution: If you answer a call in ASCII and you see "garbage" characters on the screen, you and the caller are probably at different baud rates. Try changing the speed.

Intele-Menu commands: The 3 Command controls the ASCII speed setting. There are only two speeds: 110-baud and 300-baud. Each time you type the command it switches from one to the other. Press the Escape Key and at the Command Line, type 3. Press

the Return Key to go back on-line. You can see what the speed is by watching the front panel lights. In ASCII code, the HI light means 300 baud and LO means 110 baud.

Hayes commands: The B Command controls the modem's speed. Use the escape sequence to enter command mode, type ATB3 to change to 300 baud or ATB4 to set 110 baud. Type ATO to go back on-line.

**When I press the Escape Key to use the Intele-Menu command set, the response message from the modem doesn't make any sense.**

Solution: The modem is prompting you to press the Spacebar. Even though the message doesn't make sense, pressing the Spacebar should solve the problem.

**When I press the Escape Key to use the Intele-Menu command set, nothing happens.**

Solution: This may mean that your software has already issued Hayes commands to the modem in order to enter terminal mode. The Escape Key must be the first key you type after you turn the modem on. Try typing ATZ to reset the modem. If the modem responds with OK, press the Escape Key.

**How do I download a file?**

Solution: Neither the Intele-Menu nor the Hayes command set can upload or download files. You have to use your communications software program to do that.

**My computer doesn't have an Escape Key.**

Solution: Holding down the Control Key and typing [ (open square bracket) is the same as escape.

# APPENDIX A: SPECIFICATIONS AND SERVICE

The Intel-Modem is a converting modem which works in both Baudot and ASCII codes. It uses either the industry-standard Hayes or AT command set with extensions to support TTYs or Intel-Menu commands, an alternate menu-driven command set which can be used with dumb terminals. The modem features automatic detection of both Baudot and ASCII calls. It works with commercially available communications and bulletin board software. Front panel lights indicate current operating mode and line status. Screen messages signal call progress (dial tone, busy, ringing).

## AT commands supported

A, D, E, F, H, I, M, O, Q, V, X, Z

S registers: 0-15

## Additional commands to support

### TTY modes

B0 Automatic ASCII/Baudot detection (default)

B1 Baudot 45.5 baud

B2 Baudot 50 baud

B3 ASCII 300 baud

B4 ASCII 110

N0 High sensitivity in Baudot

N1 Normal sensitivity in Baudot (default)

S13 Auto-Answer time-out in Baudot

### Result Codes

Numeric	Verbal
0	OK
1	Connect
2	Ring
3	No Carrier
4	Error
5	Connect TTY
6	No dial tone
7	Busy
8	Ringing
9	TTY time-out

### Front panel lights

Power	Power on
BDT	Baudot code
ASC	ASCII
HI	300 baud for ASCII; 50 baud for Baudot
LO	110 baud for ASCII; 45 baud for Baudot
CD	Carrier detect in ASCII
RXD	Receive data
TXD	Transmit data

OH Off-hook

SIG Telephone line signal

### Back panel connections

RJ11 Telephone line

RJ11 Telephone

DB9S RS232C

DIN 5 Accessory

Speaker volume

Power jack

On/Off switch

### RS232C connection: DB9S

Pin	Signal
2	TXD
3	RXD
4	DTR
5	GND
8	CTS

Audio Monitor: Internal speaker with volume control

Compatibility: ASCII Bell 103 110/300 bps asynchronous; TTY Baudot 45.5 or 50 baud; 1400/1800 Hz.

Dialing: Tone or pulse

Answer: Automatic or manual telephone answering

Call progress: Dial tone, busy, ringing

Receiver sensitivity: Better than -45dBm

Transmit level: -10dBm

Power: 10VAC 15VA UL-approved. 115VAC adapter included.

Size: 6.3 in. (16.2 cm) wide; 1.5 in. (3.7 cm) high; 9.5 in. (24.1 cm) deep

Weight: 24 oz (0.68 kg)

### **Service information**

If your modem should need repair or warranty service, send it to:

**National Service Center  
Ultratec, Inc.  
5901 Research Park Blvd.  
Madison, WI 53719**

Telephone: **608 238-5400 (V/TTY)**

Email: **service@ultratec.com**

Since Ultratec cannot be responsible for any damage to your unit during shipping, please insure it before you send it.

# APPENDIX B: MODEM TERMINOLOGY

---

## **ASCII code**

ASCII stands for American Standard Code for Information Interchange. ASCII is the standard communication code used by computers and ASCII TTYs in the United States and Canada. When modems use ASCII code to communicate, they use a carrier signal. After dialing a number, the calling modem listens for an answer tone. When it hears one, it puts out an originating tone. This tone is maintained throughout the conversation. If at any time the carrier tone is dropped, the modem hangs up.

## **Baud rate**

The speed a code travels from one place to another in bits per second (bps). The baud rate for Baudot code is either 45 or 50 bps. The baud rate for ASCII code depends on the modem, and can be 110, 300, 1200, 2400, or higher.

## **Baudot code**

Baudot code is the code used by most TTYs to communicate. Originally, Baudot code was used by Teletype machines in the United States to send telegrams. Baudot communication does not use a carrier tone. Tones are only sent when actual communication takes place. At other times, the line is silent.

## **Bit**

The smallest piece of a communication code. An electronic signal that TTYs and computers can send and receive.

## **Code**

A way to organize bits into meaningful information. ASCII and Baudot codes organize bits differently. Each letter, number, or symbol in ASCII code is described by 7 bits of information. In Baudot code, each character is described by 5 bits.

## **Duplex, full- or half-**

Communication settings that determine how your computer displays the characters that are sent and received. Full duplex means that what you type is sent to the other computer or TTY and then sent back to be displayed on your computer monitor. Half duplex means that what you type is simultaneously sent to the other computer and to your computer monitor. See the Problems and Solutions section on page 21 for what to do if you have double characters or no characters at all on your screen.

## **Modem**

Modems allow computers and TTYs to communicate by telephone. A modem translates the electronic signals of ASCII or Baudot code into sounds, and then sends the sounds over the telephone line. The modem for a computer or TTY determines what codes can be communicated (ASCII or Baudot), and how fast the codes can be sent and received (baud rate). TTYs have built-in modems.

## **Originate and answer**

Originate and answer are ASCII code communication settings that determine how your TTY or computer sends and receives signals. When computers and TTYs talk to each other, one must be set to originate and the other to answer. When placing a call, a modem automatically uses originate mode. When answering a call, it uses answer mode.

# APPENDIX C: INTELE-MENU HELP MENU

---

```
===== TELEPHONE FUNCTIONS ===== COMMUNICATION SETTINGS =====
D-Dial telephone                               || 1-Communication code (AUTOMATIC)
A-Answer telephone                             || 2-BAUDOT speed (45)
H-Hang-up telephone                           || 3-ASCII speed (300)
T-Tone/Pulse dialing (PULSE)                  || O-Originate/Answer (ANSWER)
                                               || F-Full/Half Duplex (HALF)
===== MESSAGE FUNCTIONS =====           || E-Echo ON/OFF (ON)
                                               || I-Hi sensitivity (OFF)
N-Enter new message                           ||
L-List message ( 0 chars)                     ||
S-Send message                                ||
                                               || C-Current communication settings
                                               || Q-Quit to 'AT' command mode
===== AUTO-ANSWER FUNCTIONS =====       ||
                                               ||
Z-Turn Auto-Answer on                         ||
V-View AA message ( 0 chars)                  ||
M-Enter new AA message                        ||
R-Set # of rings ( 0 rings)                   ||
                                               ||
=====                                     ||
Press ENTER to go ONLINE                       ||
Command (Press ? for help):                    ||
                                               ||
=====                                     ||
```

# APPENDIX D: ASCII CHARACTER TABLE

Dec. No.	Hex No.	Character	Keybd. Char	Dec. No.	Hex No.	Character	Keybd. Char	Dec. No.	Hex No.	Character	Keybd. Char
0	00	NULL	Ctrl-@	43	2B	+	+	86	56	V	V
1	01	SOH	Ctrl-A	44	2C	,	,	87	57	W	W
2	02	STX	Ctrl-B	45	2D	-	-	88	58	X	X
3	03	ETX	Ctrl-C	46	2E	.	.	89	59	Y	Y
4	04	ET	Ctrl-D	47	2F	/	/	90	5A	Z	Z
5	05	ENQ	Ctrl-E	48	30	0	0	91	5B	[	[
6	06	ACK	Ctrl-F	49	31	1	1	92	5C	±	±
7	07	BEL	Ctrl-G	50	32	2	2	93	5D	]	]
8	08	BS	Ctrl-H	51	33	3	3	94	5E		
9	09	HT	Ctrl-I	52	34	4	4	95	5F		
10	0A	LF	Ctrl-J	53	35	5	5	96	60		
11	0B	VT	Ctrl-K	54	36	6	6	97	61	a	a
12	0C	FF	Ctrl-L	55	37	7	7	98	62	b	b
13	0D	CR	RETURN	56	38	8	8	99	63	c	c
14	0E	SO	Ctrl-N	57	39	9	9	100	64	d	d
15	0F	SI	Ctrl-O	58	3A	:	:	101	65	e	e
16	10	DLE	Ctrl-P	59	3B	;	;	102	66	f	f
17	11	DC1	Ctrl-Q	60	3C	<	<	103	67	g	g
18	12	DC2	Ctrl-R	61	3D	=	=	104	68	h	h
19	13	DC3	Ctrl-S	62	3E	>	>	105	69	i	i
20	14	DC4	Ctrl-T	63	3F	?	?	106	6A	j	j
21	15	NAK	Ctrl-U	64	40	@	@	107	6B	k	k
22	16	SYN	Ctrl-V	65	41	A	A	108	6C	l	l
23	17	ETB	Ctrl-W	66	42	B	B	109	6D	m	m
24	18	CAN	Ctrl-X	67	43	C	C	110	6E	n	n
25	19	EM	Ctrl-Y	68	44	D	D	111	6F	o	o
26	1A	SUB	Ctrl-Z	69	45	E	E	112	70	p	p
27	1B	ESC	ESCAPE	70	46	F	F	113	71	q	q
28	1C	FS		71	47	G	G	114	72	r	r
29	1D	GS	Ctrl-]	72	48	H	H	115	73	s	s
30	1E	RS	c	73	49	I	I	116	74	t	t
31	1F	US	n	74	4A	J	J	117	75	u	u
32	20	SPC	S	75	4B	K	K	118	76	v	v
33	21	!	!	76	4C	L	L	119	77	w	w
34	22	"	"	77	4D	M	M	120	78	x	x
35	23	#	#	78	4E	N	N	121	79	y	y
36	24	\$	\$	79	4F	O	O	122	7A	z	z
37	25	%	%	80	50	P	P	123	7B		
38	26	&	&	81	51	Q	Q	124	7C		
39	27	'	'	82	52	R	R	125	7D	¶	¶
40	28	(	(	83	53	S	S	126	7E	§	§
41	29	)	)	84	54	T	T	127	7F	DEL	DELETE
42	2A	*	*	85	55	U	U				

# FCC INFORMATION

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Your Intelé-Modem complies with Part 68 of the Federal Communications Commission (FCC) Rules. The label on the bottom of your Intelé-Modem presents the following required information. If the telephone company requests this information, you must provide it.

FCC Registration Number:  
D8K7IB-10458-MD-E

Ringer Equivalence Number (REN):  
0.4B

Jack: USOC RJ11W

Use a telephone company registered jack to connect your Intelé-Modem to the telephone lines. Use registered jack type USOC RJ11C. This jack is a modular outlet that you can order from your local telephone company or telephone supply store.

FCC rules do not permit you to connect your Intelé-Modem to a pay telephone. Connection to party lines is subject to state regulations.

Use the Ringer Equivalence Number (REN) listed above to determine how many direct connect devices you can connect to your telephone line. When you add up the REN numbers of all the devices plugged into your phone line, including telephones, modems, and direct connect TTYs, the sum of the RENs should not be more than five. (This is for most areas of the country—contact your local telephone company to determine the exact maximum REN for your local area.) If you plug too many devices into your phone line, some of them may fail to ring when someone calls you.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper functioning of your Intelé-Modem. If this happens, they

will notify you in advance to give you the opportunity to maintain uninterrupted service. If your Intelé-Modem causes harm to the telephone network, your telephone company has the right to discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice is not practical, they will notify you as soon as possible. You will have the opportunity to correct the situation, and you will be informed of your right to file a complaint with the FCC.

Your Intelé-Modem generates and uses radio frequency energy, and may cause radio or television interference. Your Intelé-Modem complies with the regulations for a Class B computing device as specified in Subpart J of Part 15 of the FCC Rules. These rules are designed to minimize radio frequency interference in residential installations.

Use your Intelé-Modem in strict adherence with these instructions.

There is no guarantee that radio frequency interference will not occur during use. You can determine if your Intelé-Modem causes interference to radio or television reception by disconnecting and reconnecting it while your radio or television is on.

If radio frequency interference occurs, try to correct it by:

- re-orienting the radio or television receiving antenna;
- moving your Intelé-Modem away from the receiving antenna; or
- moving your Intelé-Modem away from the radio or television.

If necessary, consult an experienced radio/television technician for additional suggestions.

