SmartWare

Communications

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Chapter 1: Introduction to ANGOSS Communications

Congratulations on your purchase of ANGOSS Communications. By choosing ANGOSS, you can use a single program to create documents, worksheets, and database files and then share them with others via computer communications.

This manual describes the features and capabilities of ANGOSS Communications. Topics covered include:

- transmitting and receiving data using ANGOSS Communications
- accessing bulletin board services
- emulating remote terminals
- issuing commands to remote computers

In addition, you will find sample applications in this chapter so you can see some of the ways you might use ANGOSS Communications.

What is Computer Communications?

Using a computer to communicate with other people or computer systems has great advantages. You can easily transmit and receive documents, worksheets, or other data from long distances in a matter of minutes. You can also gain access to on-line data services that allow you to research and explore various topics through abstracts, periodicals, and other reference materials.

On-line Data Services

You may have heard of computer services like Compuserve, Dow Jones, and others and wondered how to gain access to their information resources. These companies maintain large mainframe computers that are linked together (networked) through the phone system. For a fee, these on-line data services offer everything from book reviews to demographic information and stock prices. When your computer is properly equipped with a modem and ANGOSS Communications, you can call these mainframe computers and use their services.

Bulletin Boards

By using computer communications, you can also gain access to bulletin boards, which allow users to leave information or messages for other users. Often, you can find shareware programs on bulletin boards, or find out about user groups and other resources for computer users. Calling a bulletin board is a good way to practice using ANGOSS Communications because access is usually free; the only cost you incur is for the use of your phone line.

ANGOSS Communications also transmits and receives files that have been compressed using one of the compression utilities available in the public domain, such as the ARC and ZIP programs. These compression utilities allow you to archive one or more files into a single, compressed file. Each file is compressed to save storage space and transfer time. Be sure to read your compression utility documentation for more information about "arcing" and "unarcing" files before and after transmission.

Using ANGOSS Documentation

This manual explains how to use ANGOSS to transmit and receive files; issue commands to another computer; emulate different kinds of terminals; and transfer data between other ANGOSS modules. How-to instructions, and practice exercises at the end of some chapters, are provided to encourage you to try the procedures discussed. ***Chapter 7: ANGOSS Communications Command Reference,*** contains a descriptive, comprehensive listing of all of the commands available in ANGOSS Communications. Refer to ***Chapter 7*** for in-depth information about the scope and sequence of commands.

Comments, Notes, and Importants

Throughout this manual, you will encounter standard formatting conventions, such as paragraphs with boldfaced NOTE:, COMMENT: and IMPORTANT: labels. Paragraphs labeled with a boldfaced COMMENT: offer information to enhance your understanding of a topic or provide insight into the interactive capabilities of some commands. Paragraphs labeled with a boldfaced NOTE: contain information that **you should read** before proceeding. Paragraphs labeled with a boldfaced IMPORTANT: contain information that **you MUST read** before proceeding. Failure to read and follow the instructions provided in IMPORTANT paragraphs may cause unexpected results or program failure.

In addition to these formatting conventions, you will also encounter boldface type, numbered lists, and bulleted lists throughout this manual. Please refer to ***ANGOSS Software System*** for more information about these formatting conventions and how they can help you understand the related information.

Practice Sessions

At the end of some chapters in this manual you will find Practice Sessions. These sessions are designed to reinforce the information you have just read. Please take time to perform the Practice exercises before continuing to the next chapter.

Before Starting

If you have not read ***ANGOSS Software System,*** do so now before continuing. This manual contains information common to all ANGOSS modules, including detailed explanations of operating conventions and on-line help. If you have already read ***ANGOSS Software System*** but have not installed ANGOSS Communications, you should do so now before continuing to ***Chapter 2*** of this manual.

ANGOSS Communications Under Unix

ANGOSS communications is available for use as a Unix product and provides all the functionality found in ANGOSS communications for DOS. However, the Unix operating system provides its own communication tools (such as cu and uucp) that may provide more functionality than that found in ANGOSS Communications. Consult your Unix Manual for uucp for further information.

Mouse Support

A Microsoft compatible mouse can be used with ANGOSS in the Communication module. For complete details on using Mouse usage, refer to the section called “Using the Mouse” in the Software System Manual.

Chapter 2: Getting Started

This chapter explains some of the terminology and operating conventions you should be familiar with to begin using ANGOSS Communications. Topics covered include:

- how to enter and run ANGOSS Communications
- how to use ANGOSS Tutorial and Smart Help
- how to use different operating modes in ANGOSS Communications
- how to exit ANGOSS Communications

Before beginning this chapter, make certain you have ANGOSS installed.

Running ANGOSS Communications

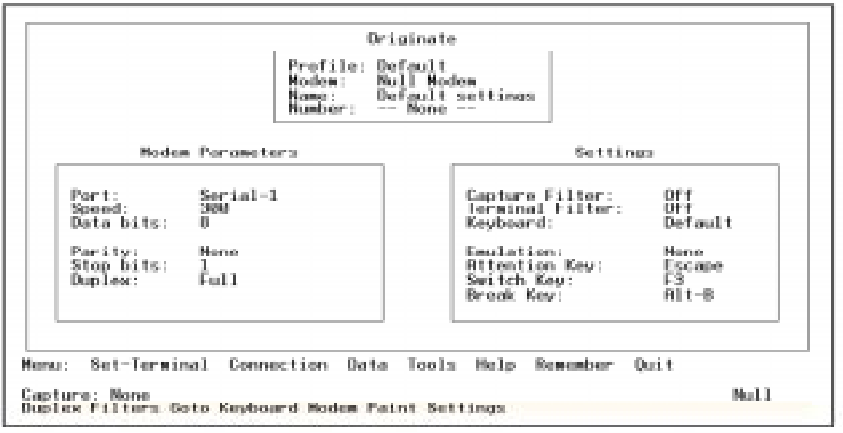
To enter ANGOSS from your operating system, type **angoss c** at the prompt. You will then see the Main Menu with a list of module keywords as well as Tools, Help, Remember, and Quit. Throughout ANGOSS, keywords are selected by positioning the illuminated, rectangular box, called the "highlighter," on top of the keyword you wish to select and pressing **Enter**. The highlighter can be moved forward through any keyword menu by pressing **Spacebar** and backward by pressing **Backspace**. Select the Communications keyword from the Main Menu.

You can also select keywords in a single keystroke by pressing the first letter of the desired keyword. Therefore, to select Communications, you can simply type **c**.

NOTE: You can enter ANGOSS Communications directly from your operating system by typing **angoss c** where "c" stands for Communications. This allows you to bypass the Main Menu.

After you select Communications, the ANGOSS Communications program is loaded, and your screen appears similar to Figure 2-1.

Figure 2-1



Using the Tutorial

If you have never used ANGOSS Communications before, you may wish to use the Communications Tutorial to familiarize yourself with the terminology and operating features of the module. The tutorial is designed to provide you with a short demonstration of some of the features of ANGOSS Communications.

If you have installed the Communications Tutorial, you can use the following procedure to gain access to it.

NOTE: The Communications Tutorial is a simulation of what happens when you use ANGOSS Communications.

1. Make certain you have entered ANGOSS Communications. A module menu beginning with the keyword Set-Terminal should appear in the Control Area of your screen.
2. Select the Help keyword.
3. Select the Tutorial keyword.

For information about using ANGOSS Tutorials on a network, contact your system administrator.

ANGOSS Communications Operating Modes

ANGOSS Communications has two operating modes, Command Mode and Terminal Mode. You can toggle between these two modes by pressing the current "Switch Key." The default Switch Keys are **F3** for the ANSI and dumb terminal emulations, and **F5** for VT100, VT102, and VT52 emulations. Command Mode is used to execute ANGOSS Communications commands. Terminal Mode is used to actually transmit and receive data through ANGOSS Communications.

Command Mode

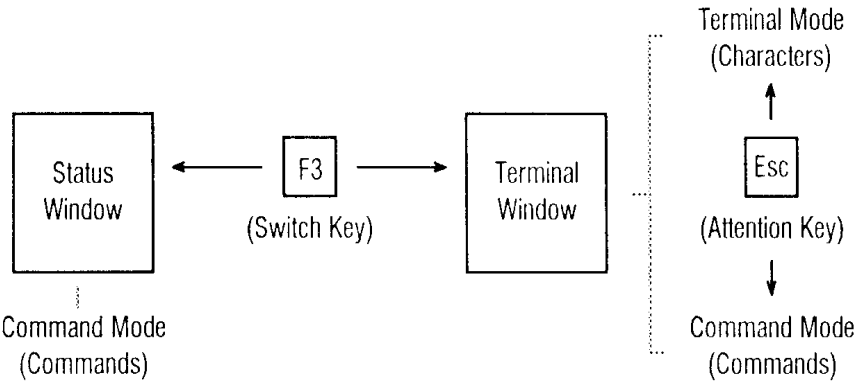
When you first enter ANGOSS Communications, the program is in Command Mode. Use Command Mode to build commands from the keywords located on the ANGOSS Communications module menu. A keyword menu appears only when the program is in Command Mode.

By selecting keywords from the module menu and answering prompts, you can build Communications commands. Your combined response to the options and prompts presented becomes a part of the complete command format. See ***ANGOSS Software System*** for more information about building commands.

Windows

There are two windows, or screens, displayed in ANGOSS Communications: the Status Window and the Terminal Window. The Status Window displays the current communications settings. The Terminal Window appears when you have begun a communications session.

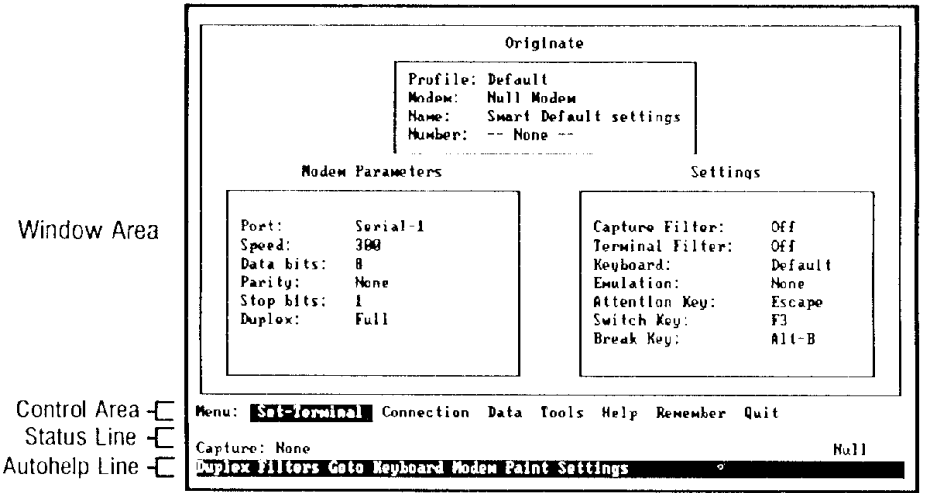
Figure 2-2



Status Window

The Status Window appears when you first enter ANGOSS and is divided into four distinct areas, as shown in Figure 2-3.

Figure 2-3. Quick Reference



The Window Area. On the Status Window, the Window Area occupies the largest portion of the screen display and is surrounded by a border. Many of the default settings you select for your communications sessions are shown in the Window Area.

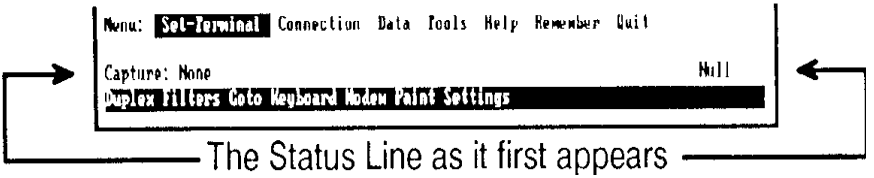
The Control Area. The Control Area is located just beneath the Window. When you enter ANGOSS Communications, the Control Area displays module menu keywords from which you can build commands. As you use ANGOSS Communications, the information displayed in the Control Area may include menus, prompts, Quick Keys, function keys, or error messages, depending on your activities.

ANGOSS Communications Quick Keys allow you to select the most frequently used commands without having to use the ANGOSS Communications module menu. A Quick Key can be a function key, or it can be some key combination involving **Alt** or **Ctrl**.

To display the Quick Key lists in the Control Area, press **F2** repeatedly until you have cycled through the entire series of lists. Regardless of the list displayed, you may use any Quick Key while viewing either the Status Window or the Terminal Window. See the ***Quick Reference Guide*** for a full discussion of ANGOSS Communications Quick Keys.

The Status Line. Directly beneath the Control Area is the Status Line, which contains information relating to the current status of ANGOSS Communications. When you enter the module, the Status Line appears as it does in Figure 2-4.

Figure 2-4



The "Capture:" designation indicates whether you are capturing to a buffer, a printer, or to a file. If you are capturing to a buffer, the amount of available buffer space is indicated. If you are capturing to a printer, the word "Print" is displayed. If you are capturing to a file, the filename appears.

The Autohelp Line. The Autohelp Line is located at the bottom of your screen and displays a single line of help information related to your current activity. (Autohelp does not display on terminals with fewer than 25 lines.) You can turn the Autohelp Line off or on using the Tools Preferences Global command. Some screen illustrations in this manual show the Autohelp Line and others do not, depending upon whether Autohelp is pertinent to the activity being discussed. Upon entering the module, the Autohelp Line displays a list of module menu keywords.

Terminal Window

Interactive communications with another system can occur only if the Terminal Window is displayed. Unlike the Status Window, the Terminal Window can be used in Command Mode or in Terminal Mode.

To switch from the Status Window to the Terminal Window, press the Switch Key (the default Switch Key is **F3**). You will see a Terminal Window that looks like the one shown in Figure 2-5.

To get to Command Mode from the Terminal Window, press the Attention Key (the default Attention Key is **Esc**). The module menu will be displayed at the bottom of the Terminal Window; you can then build commands. The keystrokes you press while in Command Mode are not sent to the remote computer. Remember that you can also use Quick Keys to execute a command from either Command Mode or Terminal Mode. Figure 2-6 shows a Terminal Window in Command Mode.

Figure 2-5

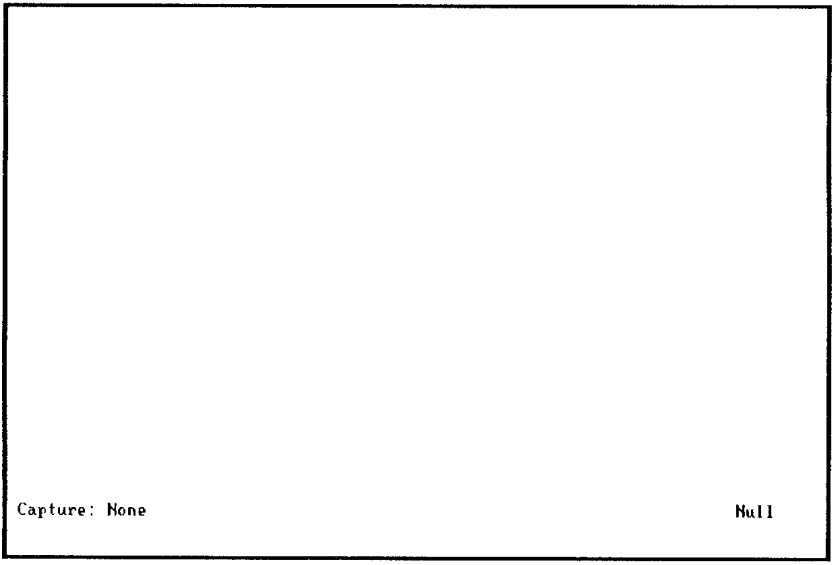
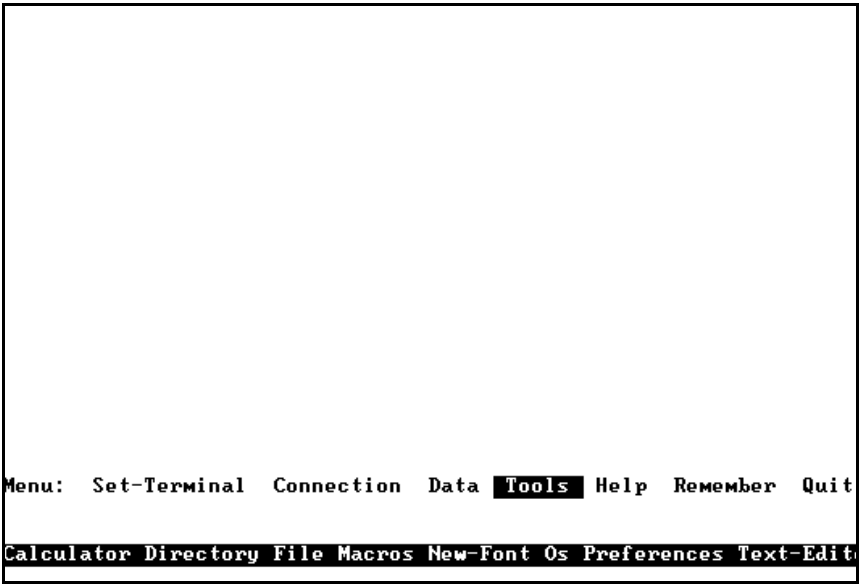


Figure 2-6



Terminal Mode

As you begin a Communications session, ANGOSS automatically enters Terminal Mode once it connects with another computer (the "remote computer"). Terminal Mode is used to communicate interactively with the remote computer, whether you've called the computer, or the remote computer operator has called you. In Terminal Mode, every character you type is sent to the other computer.

Terminal Mode Screen

The Terminal Window appears only during communications with another system. You can switch to the Status Window during communications, or you can press the Attention Key to show the module menu (Command Mode).

Keys

The Switch Key, defined as **F3**, is used to switch back and forth between the Status Window and the Terminal Window.

The Attention Key, defined as **Esc**, is used to switch back and forth between Command Mode and Terminal Mode.

The Break Key, defined as **Alt B**, is used to instruct the remote computer to interrupt any current processing or other activity.

You may redefine the Switch, Attention, and Break Keys using the Set-Terminal Keyboard Define command. The ability to redefine these keys is important because you may have to communicate with a remote computer system that uses **F3** or **Esc** for its own operations. See ***Chapter 5*** for information about redefining keys.

ANGOSS Help

One of the most useful features ANGOSS offers you is the ability to receive on-line help from anywhere within the program. Help is always available to you simply by pressing **F1**.

When you press **F1** at any keyword or option, the help screen appears over your current screen. Help includes information about the current topic as well as related topics. Use **up arrow** and **down arrow** and **PgUp** and **PgDn** to scroll up and down through the help information. Use + and - to move through the related topics list. To select a related topic, position the keyword highlighter over the desired topic and press **Enter**.

In addition, help is available from the Help keyword. A table of contents and an index to *ANGOSS Communications Command Reference* are provided to help you find the information you need. An explanation of each error message is available through the On-Error option. Information on using help is available through the About-Help option. To remove help from your screen, press **F10**. For more information about on-line help, refer to ***ANGOSS Software System***.

The Status Display

ANGOSS Communications has a Display Screen that is shown by pressing the Quick Key **Ctrl F1**. Do not confuse the Status Display with the Status Window. The Status Display relates to the computers internal status and shows the following information.

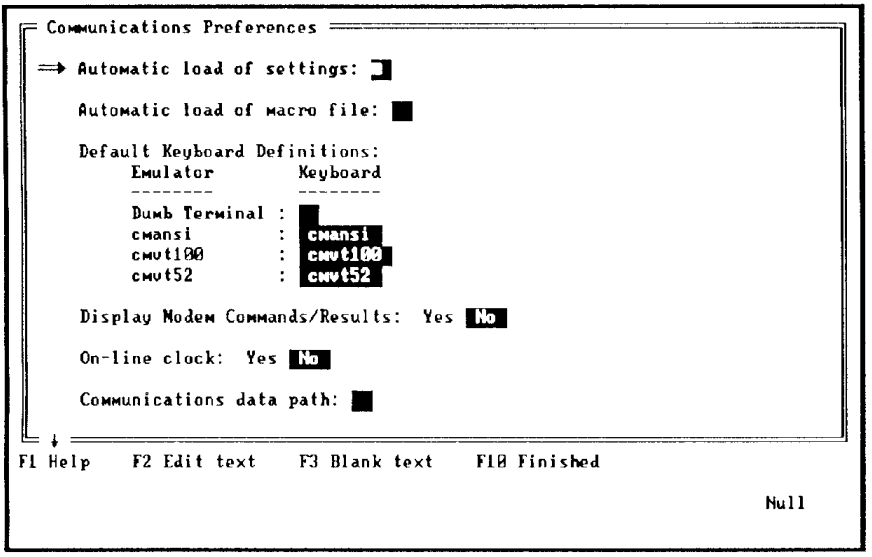
- the amount of disk space remaining
- the amount of memory remaining
- the version of your copy of ANGOSS Communications

Definition Menus

ANGOSS Communications includes several commands that invoke definition menu's, composed of a combination of prompts and option lists. Responses to these prompts and option lists are called "settings." The settings specified in definition menus control system wide and module-specific preferences for data formats, data paths, execution of project files, preference settings for communicating with other computers, and many other operating features.

When you first enter ANGOSS Communications, certain definition menu settings are already established by the system as "defaults." You can change these settings at any time by gaining access to the appropriate definition menu. Figure 2-7 shows the Communication Preferences definition menu, available through Tools Preference Communications.

Figure 2-7



Remember from *ANGOSS Software System* that you select the Tools Preferences Global and Tools Preferences Hardware commands to establish system-wide preferences and to change your computer hardware. (Modems are selected using the Set-Terminal Settings Modem.) These commands are fully discussed in ***ANGOSS Software System***, along with the cursor movement keys that are used in all ANGOSS definition menus. The Tools Preferences Communication command, covered in this manual, is used to set Communications-specific settings that include:

- automatic loading of macro files
- execution of project files
- default keyboard definitions

See the discussion of the Tools Preferences Communications command in ***Chapter 7*** for more information.

Setting Preferences

Before proceeding to Chapter 3, make certain that you have selected appropriate settings for display, output, and hardware compatibility. Refer to ANGOSS Software System for detailed information concerning global and hardware preference settings.

Terminology and Concepts

The following section describes some basic computer communications terminology and concepts. You should review this section if you are not familiar with any of these terms. This will help you when you begin defining profiles for you communications sessions.

Baud Rate

Baud rate determines how fast data is transmitted in bits per second. Each character is transmitted using ten bits (8 data bits plus the start and stop bits). The baud rate divided by ten gives the transmission speed in characters per second. For example, a 300 baud modem transmits at 30 characters per second. Baud rate is commonly abbreviated as “bps” (bits per second).

The baud rates of two systems communicating with each other must be the same, or your screen may begin filling up with “garbage “ characters (not regular letters or numbers). Normally it is best to set the baud rate at the highest speed that your modem supports. With most modems, if a faster baud rate modem begins communicating with a slower modem, the faster modem will automatically adjust its speed downward to match the slower modem’s baud rate. If not, and you begin receiving garbage, just execute a Connection Hang-up command, change the baud rate setting, and re-connect.

Bits and Bytes

In computer communications, data is represented by a series of digital signals. These signals are generally interpreted in binary code. In binary-coded data, a character or number is represented by a series of 1s and 0s, with each 1 or 0 being a “bit.” There are eight bits in a byte, and each byte represents a character.

Data Bits

Data bits refers to the number of bits used to represent each character. You determine whether 5, 6, 7, or 8 bits will be used when you define a communication profile. Use the data bit setting required by the remote computer. There is no general rule for how many data bits to use, but if you plan to use parity checking)an error checking technique), you must generally choose 7 bits or less. Talk to the other

communications operator or check the manuals for the computer system you will be communicating with for the correct setting.

The data bits settings between the local and remote computers must match.

Duplex

You can choose to run ANGOSS Communications at full duplex or half duplex. Generally, in computer communications full duplex allows both computers to transmit and receive at the same time. Half duplex permits only one computer to transmit at a time. In most communications software, including ANGOSS Communications, the duplex setting only affects the way characters are echoed on the Terminal Window.

Local, Remote

In this manual, the terms “local computer” and “remote computer” are used to distinguish the computer you are using to run ANGOSS Communications (local) from the computer that is at the other end of the communications link (remote).

Modem

The word “modem” is actually an acronym for modulate/demodulator. Your modem “modulates,” or varies, digital (binary) signals transmitted from your computer to an analog format that can be sent over the phone lines. The remote modem (on the other end) receives the analog signal and demodulates it; that is, it translates the signal back into a digital form so that the remote computer can interpret it. Refer to ***Chapter 3*** for more information about modems.

Parity

Parity is an error checking feature. You can select even or odd parity, or none. If you select even parity and the number of binary 1s transmitted in each byte is even, then there are no errors. If odd parity is selected the number of 1s in each byte must be odd. If parity is set to none, then no parity error checking is used. Parity error checking is useful primarily for text file transmission. For more information about parity, refer to the section titled ***Communication Profile Settings*** in ***Chapter 7: Command Reference***.

The parity settings between the local and remote computers must match or you might receive garbage.

Port

A port on a computer system is a signal channel that allows the computer to be connected to other types of equipment, such as modems, printers, plotters and other computers. The port is the point of entry or exit for data you are receiving or transmitting. In general, there are two different types of ports used on computers: serial and parallel ports. In ***Chapter 3*** you will learn about the kind of port you need on your system.

Protocol

Protocol is a method of data transfer that allows accurate communications regardless of the hardware or software being used. ANGOSS Communications offers two types of file transfer protocols: text file and Xmodem. You will learn more about these kinds of protocols in ***Chapter 4***.

Start and Stop Bits

Start and Stop bits signal the beginning and end of a byte being sent to the receiving computer. Since binary data consists of 1s and 0s, the start and stop bits "frame" each byte so that it can be interpreted as a particular character. ANGOSS Communications always uses one start bit; you can specify whether to use 1, 1.5, or 2 stop bits when you define your communications profile. Start and Stop bits are used for asynchronous (two-way) communications only. See the section titled ***Communication Profile Settings*** in ***Chapter 7: Command Reference*** for more information.

The stop bits settings between the local and remote computers must match or you might receive garbage,

Uploading / Downloading

"Uploading" a file is transmitting it from your local computer to a remote computer. Receiving a file from a remote computer to your local computer is called "downloading." This process is described in more detail in ***Chapter 4***.

Exiting ANGOSS Communications

Follow these instructions to exit ANGOSS Communications.

Step 1: Finish your communications session by executing the Connection Hang-up command and press **F10**.

A menu is displayed, showing the other ANGOSS modules you can go to as well as Quit.

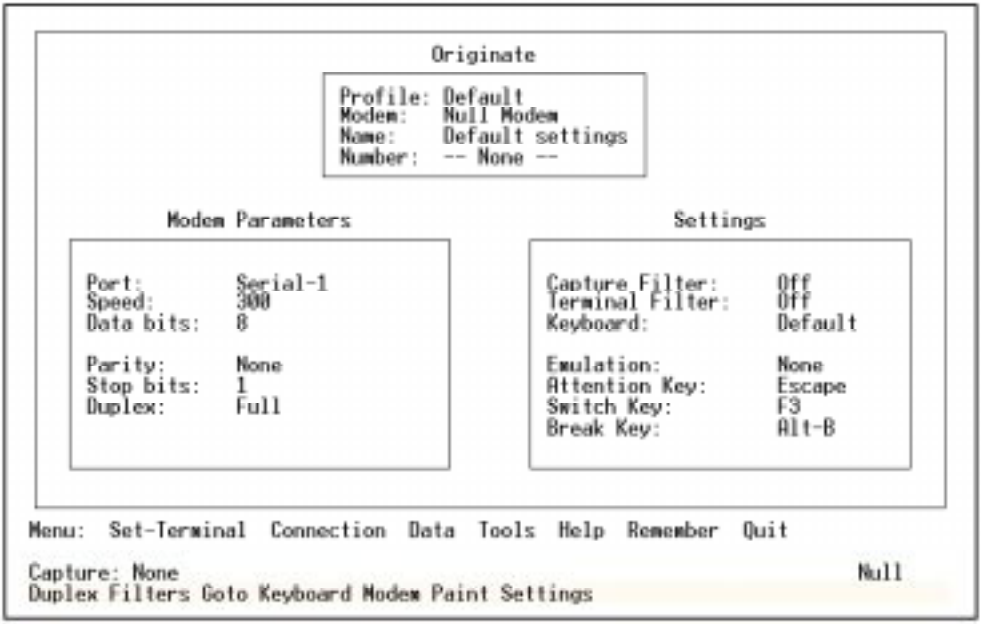
Step 2: Use the **Spacebar** or the **Backspace** key to position the highlighter over the module you want to select and press **Enter**.

Practise

In the following practise steps, you will enter the ANGOSS Communications module from your operating system, access the Quick Key list in the Control Area, toggle between Command and Terminal Modes, execute a simple command, and exit ANGOSS Communications.

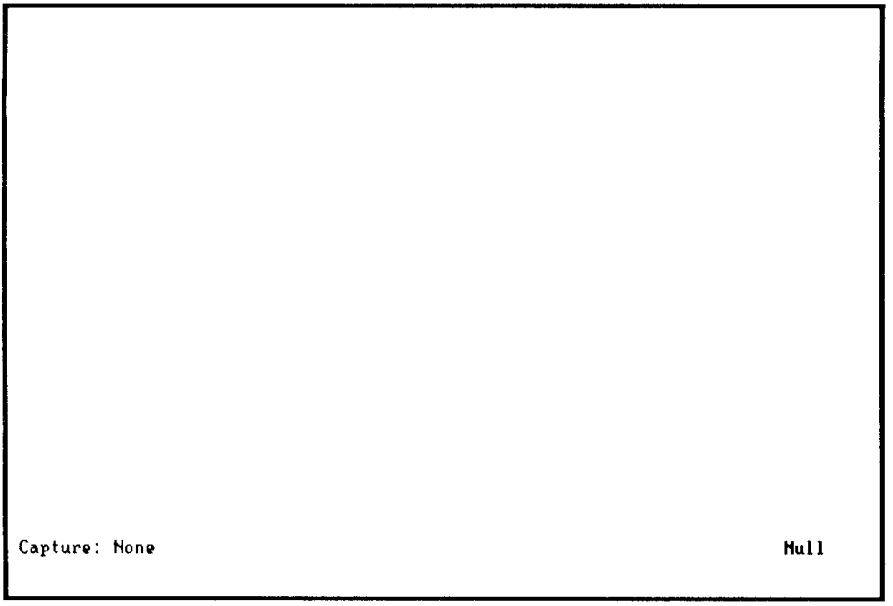
1. From the appropriate directory in your operating system, execute the Communications module. You can type either **angoss c**, or **angoss** and then select the Communications module from the Main Menu. The ANGOSS Communications Status Window will be displayed, as shown in Figure 2-8.

Figure 2-8



2. Press **F2** to see the lists of Quick Keys displayed in the Control Area of your screen. You can move through these lists by continuing to press **F2**. When you have finished, press **Esc** to display the module menu again.
3. Switch from the Status Window to the Terminal Window by pressing the Switch Key, which is usually defined as **F3** for dumb terminals. You will see a Terminal Window that looks like the one shown in Figure 2-9.

Figure 2-9



To return to Command Mode from the Terminal Window, press the Attention Key. (The default Attention Key is **Esc**.)

4. From the Communications module menu, select Help by typing **h**. Next, select the About-Help option by typing **a**.

   You can scroll through the About-Help information by using the cursor movement keys. When you are finished, you can leave About-Help by pressing **F10**.

5. Press **F10** again or select Quit from the module menu. Select the Quit option on the next menu to return to your operating system.

Chapter 3: Beginning a Communications Session

This chapter describes how to begin a communications session. If you have not used computer communications before, you should carefully read all of ***Chapter 3*** before beginning. Topics covered include:

- setting up your hardware
- creating communications profiles
- answering and dialing remote computers

A practice exercise is included at the end of this chapter. After you've finished reading ***Chapter 3***, you may wish to reinforce what you've learned by completing the exercise.

Overview

To begin a communications session with ANGOSS Communications, you must first

STEP 1: Set up the required hardware. This process is described at the beginning of this chapter.

STEP 2: Determine what computer you will be communicating with.

STEP 3: Create a communications profile containing the settings for communicating with another computer.

System Requirements

To fully utilize ANGOSS Communications you must have the following hardware:

Modem. A modem is required to dial a remote computer system. Supported modems are listed in the ***Hardware Guide***.

Cables. If you intend to connect your computer directly to another computer with a cable, you must use a null modem cable. If you are going to use an external modem, you must have an RS-232 cable to connect your computer to the modem. You do not need cables if you plan to use an internal modem.

Serial port. If you plan to use an external modem, or use a direct connection, you must have an RS-232 serial communications port on your computer. If you plan to use an internal modem, a serial port is not required.

Compatible phone line. The phone line you plan to use must be compatible with your modem. If you have problems connecting your modem to a phone line, contact your telephone service company.

Setting up Hardware

Before setting up your hardware, you should refer to the ***Hardware Guide***, which contains a list of supported modems and information about cables and settings. If your modem is not listed there, check the documentation accompanying it for a description of its features. If your modem is fully compatible with the Hayes modem codes, you can select the appropriate Hayes modem configuration when you select your communications settings.

NOTE: If you have a call waiting feature on your telephone, be sure to disconnect it before using a modem. If you receive a call while you are transmitting or receiving a file, the call waiting feature will cause the line to be disconnected.

If your modem is not supported, it may be possible to create a modem definition for it using the Set-Terminal Modem Define command. Modem definitions are discussed in ***Chapter 5***.

IMPORTANT: You must thoroughly understand the command codes that are sent to your modem during operation before defining a new modem. Check your modem documentation for information about its command set and registers.

Please read the following instructions that correspond to the type of modem you will be using.

Null Modem

A null modem is actually just a serial cable connecting two computers. This cable allows two computers to send or receive files as though they were transmitted through a phone line via modem. You can also select the Null Modem option in your Communication Profile to communicate directly with your modem. This allows you to test your modem prior to initialization.

External Modem

An external modem is a peripheral that is separate from the computer. It is connected to the computer by an RS-232 cable by way of an RS-232 serial port. The telephone line connects to the modem.

To set up your external modem, you must do the following:

STEP 1: Refer to the hardware manuals for your computer.

Does your computer already have a serial port installed? Most personal computers have at least one RS-232 port already installed. If it already has a serial port, how is it configured (i.e., does it use serial-1 or serial-2)?

STEP 2: If your computer does not have a serial port and you plan to use an external modem, you must obtain an add-on circuit board (also called a card) that has a serial port.

Once you have obtained the add-on board, you must follow the installation instructions that came with the board. When you have completed the installation, you are ready to connect the modem to the serial port. Cable is used to connect the port to the modem.

STEP 3: Once the serial port on the computer is ready, follow the installation instructions that came with the external modem.

When you have completed the modem setup, you are ready to begin using ANGOSS Communications.

Internal Modems

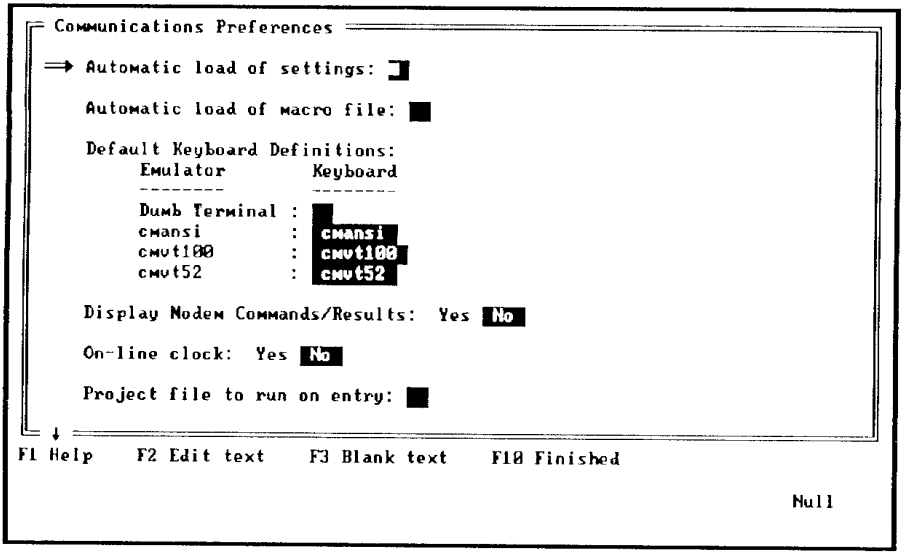
An internal modem is an add-on circuit board that is installed inside the computer. The serial connection between the internal modem and the computer is incorporated onto the internal modem card. All of the internal modems currently supported by ANGOSS Communications are designed for the IBM PC compatible bus.

The instructions that come with the internal modem should explain how to install the modem in the computer. Once you have completed installation, you are ready to begin using ANGOSS Communications.

Communications Preferences

Communications preferences are default settings that you determine for all communications sessions. These settings are defined on the Communications Preferences definition menu, which appears when you execute the Tools Preferences Communications command. Each setting is explained in detail in ***Chapter 7***. Before you actually begin a communications session, you should set all your preferences. The Communications Preferences menu is shown in Figure 3-1.

Figure 3-1



Profiles

Creating a communications profile for each computer you wish to communicate with can be a time saver. Communications profiles include settings for each computer you communicate with. By saving these settings in a profile, you can load the profile at any time without having to redefine settings for each computer you wish to call.

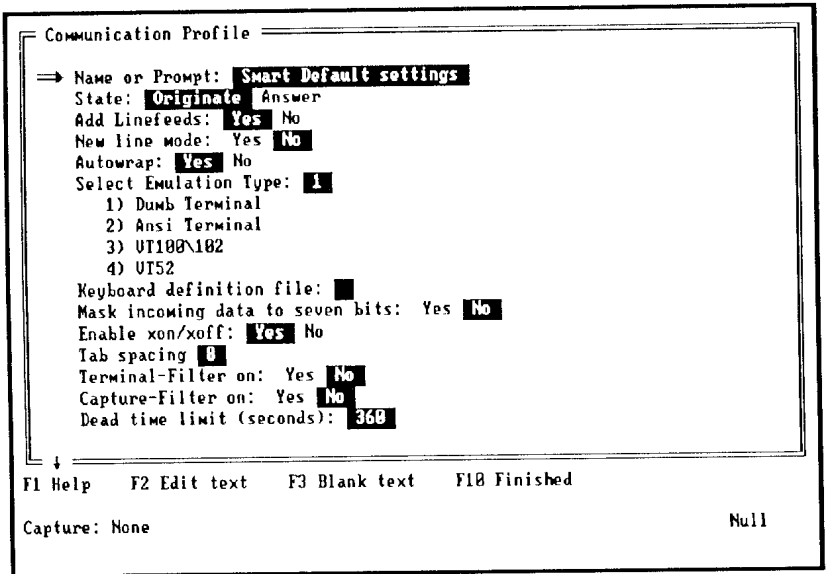
To create a communications profile, make certain ANGOSS is in Command Mode and then select Set-Terminal. Next, select Settings and then Define. You are prompted to enter a filename. If you have already created a profile, the filename appears on a prompter list.

The first page of the Communication Profile definition menu is then displayed. You can select the settings you want by moving the **Spacebar** to highlight them. Default settings are already highlighted.

The entire Communication Profile menu contains several screens (also called "pages"). As you move the pointer down, it automatically advances to the next page when you reach the bottom of the screen. You can also press **PgUp** and **PgDn** keys to move to different pages of the menu.

There are six categories of settings on the Communication Profile menu. They include General, Originate, Answer, Modem, Text File Transmission, and Advanced User. (For specific information about each setting, please refer to ***Chapter 7***.) Figure 3-2 shows the first page of communications profile settings.

Figure 3-2



Once you have named the profile, you are ready to select the appropriate settings for your communications session. There are only a few profile settings that you must know about before you can

begin a communications session. The next sections describe these important settings you must select to perform various communications activities.

Answering

To answer a call with your local computer, you must first define a communications profile, or load an existing one, that has the correct settings enabled for answering a call. Under the General settings on the Communication Profile definition menu, `State:` should be set to **Answer**. There are also settings in the Answer category of the definition menu that concern password protection. You can read more about these settings in ***Chapter 7***.

Other settings you must select include `Modem Type:`, `Modem Port:`, `Baud Rate:`, `Data Bits:`, `Parity:`, and `Stop Bits:`.

At the `Modem Type:` setting select the type of modem you are using. (The Null Modem option should be selected if your computer is directly connected to another computer by a serial cable.) Press **F6** to display a list of available modems supported by ANGOSS. Select the modem name from the list by positioning the highlighter on your selection and pressing **Enter**. This initializes your modem; the message `Initializing Modem` appears in the Control Area.

The `Modem Port:` setting defines which communication port is to be used. Choose either Serial-1, Serial-2, Serial-3 or Serial-4 whichever one your modem is connected to.

NOTE: Make certain that you are not using the port you selected for your modem for another peripheral device, too, such as a printer, plotter, or mouse. If you are using the same port for more than one device, your hardware may not function properly. For example, your modem may not be initialized or your printer may print garbage.

The `Baud Rate:` setting determines how fast the data is sent (see ***Chapter 2***). The baud rates of two systems communicating with each other must be the same. Normally, it is best to set the baud rate at the highest speed that your modem supports.

NOTE: If you try to establish a connection with a remote system and your screen fills with "garbage," or unwanted characters, you may be using the wrong baud rate. Your baud rate and that of the remote system must be the same.

The other settings are determined relative to the other computer's requirements and settings. Most of the time the defaults will be adequate, but you may need to adjust them later. Refer to ***Chapter 7*** for more information about profile settings.

To save these settings in the file you have specified, press **F10**. Then select the Connection Answer command. Your computer will then initialize the modem and wait for an incoming call. Once the call from the remote computer comes in, your local computer will answer the call and switch to Terminal Mode. You can then begin communications.

Hanging Up

To disconnect (or hang up) a call, just execute the Connection Hangup command. When you select the Quit keyword, you also automatically disconnect the call.

Dialing

To originate a call (dial a remote computer), you must define a communications profile, or load an existing one, that has the correct settings enabled for originating a call. Under the General settings on the Communication Profile definition menu, `State:` should be set to **Originate**.

At the `Number:` option under the Originate settings, you may wish to include the number of the system you are dialing. (If you do not wish to include the number in the profile, you can also enter it when you actually dial the remote computer.) You can include up to 40 characters, including numbers, commas, or dashes for readability. A comma causes the system to pause for two seconds during dialing. You might want to use commas when you must dial 9 for access to an outside line.

At the `Originate Password:` option of the Originate settings, you can enter a password for gaining access to a password protected remote computer. You can find out what the password is by calling the remote computer operator. If you do not wish to include the password in the profile, you can enter it if you are prompted for one by the remote computer.

The `Dial Prefix:` option allows you to specify a different dial prefix, which is a sequence of characters sent to the modem before the phone number is set. You may need to specify a dial prefix for a non-supported modem or indicate whether your phone system uses tone or pulse dialing. If your system uses tone dialing, leave the prefix at the default value AT DT. If your system uses pulse dialing, set the prefix to AT DP.

The remaining Originate settings, `Seconds to wait between redials:`, `Seconds to wait for carrier:`, and `Maximum number of re-dial attempts:`, all contain

default values that you do not have to change if you are originating a call for the first time. See ***Chapter 7*** for information about other profile settings.

Finally, you must select the `Modem Type:`, `Modem Port:`, `Baud Rate:`, `Data Bits:`, `Parity:`, and `Stop Bits:` settings you want, as explained in the section in this chapter titled ***Answering***. Once you have all of these profile settings specified, press **F10** to save the profile.

Next, select the Connection Dial command from the module menu. The options Carrier and Voice appear.

If you select Carrier, your computer will wait for the remote computer to answer with a modem carrier tone. Your local computer will then make the connection. If a carrier tone is not detected in the time specified in the `Seconds to wait for carrier:` setting of your profile, the modem will hang up and then wait the number of seconds you specified before attempting to re-dial.

If you select Voice, your local computer will not wait for a carrier tone. This option should be used when you wish to speak to someone at the remote computer before transmitting files. You must have a telephone connected to your modem to use this option.

Once dialing begins, if your modem is equipped with a speaker that has been enabled, you will hear the modem dial, and the line will ring. If you have selected the Carrier option and the remote computer is answering, you will hear a continuous tone (a carrier tone) and then a sound similar to static. Your computer will then switch to Terminal Mode, and you can now begin communication with the remote computer.

If you have selected the Voice option, the sequence of sounds is the same, but when the line rings, someone answers. When the ring is answered, pick up the phone that is connected to the modem. You can then discuss the settings, protocols, or any other information you must exchange with the operator of the remote computer. You can then execute the Set-Terminal Goto Carrier command.

When the connection is made the modem will become silent.

Security Features

Most computers that connect to phone lines have security features that control access to the computer. The primary security feature used by most large computer systems is sometimes called a user name/password procedure or login system. To log in you must enter a name that identifies you to the remote computer system and then enter a password.

You can specify the password that will be sent back when you originate a call to a password-protected system in the `Originate Password:` setting. In Answer state, you can control the rights of the caller by selecting the appropriate password level in the Answer settings of a profile. These settings are described in more detail in ***Chapter 7***.

Communications Checklist

Before beginning a communications session, review the information in this section. Some of these steps may prevent common communication problems.

STEP 1: Use the correct hardware.

Remember, you cannot use ANGOSS Communications unless you have a serial port or an internal modem installed.

STEP 2: Connect your modem properly.

If you receive an error message that your modem is off-line or that switches are set incorrectly, first make certain your modem is correctly connected to the computer and to the phone line. If it still doesn't work, you should select a different modem type on the Communications Profile menu.

You can test your modem to make certain it is connected to the right port and is responding correctly before initializing it. First, select the Null Modem option under the Modem Settings section of the Communication Profile menu. Next, set the duplex to half by selecting Set-Terminal Duplex Half and then display the Terminal Window by pressing **F3**.

If you have an external modem, you can verify that the serial port is set correctly by pressing keys on the keyboard and watching the transmit and receive lights blink on the modem. The lights should come on whenever a key is pressed.

If your modem is Hayes compatible, you can also test it by entering an uppercase **AT** in Terminal Mode. If you see a zero (0), OK, or an error on the screen, the serial port is set correctly. The zero means that the serial port has been initialized correctly. If you do not see the modem lights blink, or you do not see a zero or OK on your screen, you can try shutting the modem off and then turning it back on to reset it. If it still doesn't work, your modem switches may be set incorrectly.

Once you've done this test, be sure to reset your modem type to the modem you are using and save your settings again. Also, reset duplex to Full. To read more about initialization, refer to the section titled ***Modem Wakeup Sequences*** under the Set-Terminal Modem Define command in ***Chapter 7***.

STEP 3: Know whether your phone system uses tone or pulse dialing.

If you try to dial a number and nothing happens, you may need to specify a different dial prefix in your settings. If your system uses tone dialing and you are using a Hayes modem, leave the prefix at the default value AT DT. If your system uses pulse dialing and you are using a Hayes modem, set the prefix to AT DP.

STEP 4: Coordinate your settings with those of the remote computer.

The `Baud Rate:`, `Data Bits:`, `Parity:`, and `Stop Bits:` settings must all be the same for both the transmitting and receiving computers.

Practice

In the following practice steps, you will create a communications profile for answering a call from another system.

1. From the Status Window, select the Set-Terminal Settings Define command.
2. At the `Enter filename:` prompt, type **profile**.
3. For your profile settings, enter the information shown in the following sample settings. Remember to use the cursor movement keys to move the pointer to the appropriate setting or to highlight setting items. When you have entered or selected an item for a setting, press **Enter** or move the pointer to the next setting.

   Under General Settings select the following:

   `Name or Prompt:` **Practice Profile**

   `State:` **Answer**

   Under Answer Settings select the following:

   `Receive/Transmit Password:` **practice**

   `Number of rings:` **3**

   `Connection time limit (minutes):` **20**

   Under Modem Settings select the following:

   `Select Modem Type:`

   (Press **F6** for a list of modems. Use the cursor keys to point to your modem and press

Enter.)

`Modem Port:` **Serial-1**

`Baud Rate:` **1200**

`Data Bits:` **8**

`Parity:` **none**

`Stop Bits:` **1**

NOTE: The default settings shown here for *`Data Bits:`*, *`Parity:`*, and *`Stop Bits:`* are suitable for most transmissions.

`Duplex:` **Half**

4. To finish defining and saving the profile, press **F10**.

Chapter 4: Transmitting and Capturing Data

This chapter explains how to transmit files using two different protocols, or transfer conventions. In addition, capturing data to various locations is covered. Topics include:

- transmitting files using text file protocol
- transmitting files using Xmodem protocol
- capturing data to the buffer, a file, or to a printer

Protocols

There are several different methods of transferring information via modems. These methods are referred to as "communications protocols." ANGOSS Communications can use two different protocols.

The first protocol is called text file transmission. In this method, the file's data is transmitted in ASCII format, that is, letters a-z, numerals 0-9, and some symbols. This type of transmission is used for:

- documents that have been converted into ASCII text files
- databases and worksheets that have been exported as ASCII files
- files created with the ANGOSS Text-Editor

The other method of transmission is called Xmodem. This form of transmission sends any file in a series of blocks. Each block has error correction coding added to it. Use this protocol to transmit files that contain formatting information and special coding, for example, document files, data files, and worksheets.

Before beginning, you may need to know how long it will take to transmit a given file. To estimate the approximate amount of time it will take to send your file, select the Data Xfer-Time command. You will then be prompted for a filename.

Specify the name of the file you will be transmitting, including the path name, if necessary, and then press **Enter**. The transfer time for that file will then be displayed. The time for transfer is based on the baud rate setting you are currently using and assumes a text file transfer. An Xmodem transfer will take longer than a Text File transmission.

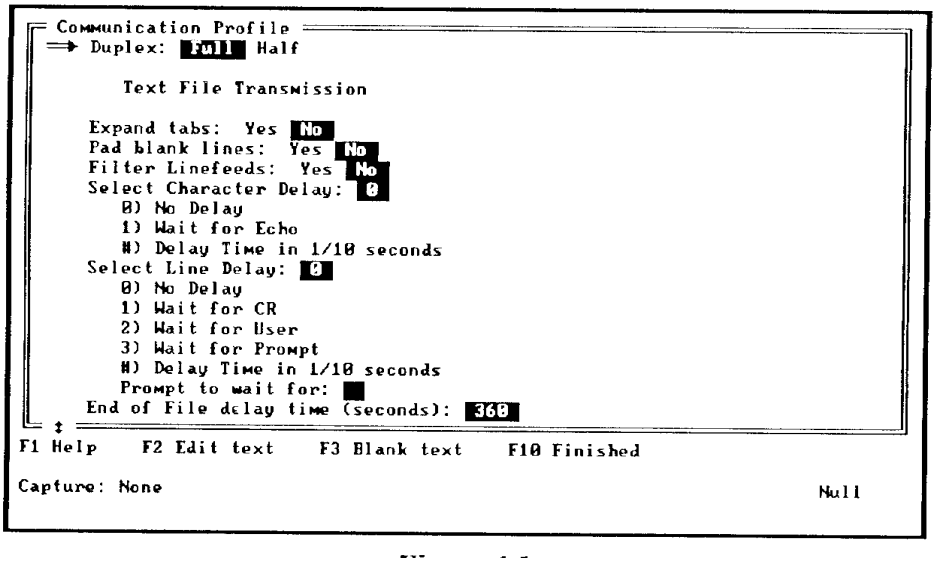
Text Files

This section explains how to specify settings for text file transmission and how to prepare and transmit text files.

Text File Settings

Remember from ***Chapter 3*** that you gain access to the Communications Profile menu by selecting the Set-Terminal Settings Define command. The Communications Profile menu contains settings for text file transmission. Figure 4-1 shows the Text File Transmission settings in a sample communications profile.

Figure 4-1



COMMENT: To change settings on the Communication Profile menu, select the Set-Terminal Settings Edit command.

The default settings for text file transmission will work in most instances. However, if the remote computer you are transmitting to is having trouble receiving your text files, consult the remote computer operator to determine whether the text file settings should be changed.

Preparing Text Files

If you are transmitting files to a remote computer, you should prepare the files before you begin transmission. If you are receiving files from a remote computer, the files should be prepared for you by the remote computer operator, or you can prepare them yourself using Remote Command Mode. See ***Chapter 5*** for information about Remote Command Mode.

When a file is transmitted as a text file, only standard printable ASCII characters can be used. This means that an ANGOSS Word Processor document cannot be transmitted as a text file because it contains formatting data. Some formatting data is not part of the printable ASCII character set. Therefore, the document would have to be changed into a text file; use the File File-Type command in ANGOSS Word Processor to do this. The file can then be transmitted as a text file. If you want to transmit an ANGOSS file as is, see the next section on Xmodem transfer.

In addition to ANGOSS document files, you can also convert ANGOSS Database files and Spreadsheet worksheets into ASCII format using the appropriate commands in each module. See ***Chapter 6: ANGOSS Integration for more details.***

NOTE: Although you can transmit and receive database files via text file transmission, you should send large databases using Xmodem protocol.

Transmitting Text Files

After the text file has been prepared for transmission, enter ANGOSS Communications and establish a connection with the remote computer. You are now ready to transmit using the text file protocol. Select the Data Transmit Text-File command.

You are then prompted to enter a filename to transmit. Type in the filename, or use the file pointer and press **Enter**. If you have just sent the file to ANGOSS Communications from another ANGOSS module, you can select the "default" option on the prompter menu and ANGOSS will transmit the last file you sent. The file will have an .IFF extension. Select the default option by pointing to it with the prompter arrow and pressing **Enter**.

Once you've selected the filename, transmission will begin immediately, and your computer will switch to Terminal Mode. The file will be displayed on your screen as it is transmitted.

Receiving Text Files

After you have entered ANGOSS Communications and established a connection, you are ready to receive a file using the text file transmission protocol. Select the Data Receive Text-File command. You will be prompted for a receiving filename.

Enter a filename for the incoming text file. The name you give the file does not have to be the same as the original filename. You can also specify a directory path, if necessary.

The prompt `Wait for expression:` appears after you enter the filename. An entry at this prompt is optional. If you enter an expression, the receiving computer transmits it to the transmitting computer. The receiving computer will not accept a transmitted text file until the expression has been echoed back to it from the transmitting computer. This allows you to know exactly when the transmitting computer begins transmitting the text file. Be sure that the expression evaluates to text.

Xmodem Protocol

This section explains how to specify settings for Xmodem transmission and how to prepare and transmit files.

Xmodem Settings

In addition to Text File Transmission settings, the Communications Profile menu also contains a setting for Xmodem transmission, which is used to transfer binary data. The Xmodem protocol transmits blocks of data that include error checking codes for each block. If a block is received at the remote computer and the error checking codes indicate that the block is not correct, the remote computer will send a retry signal to your local computer. Individual blocks are retried a maximum of nine times by default. If that limit is reached, the transfer is aborted.

The `Maximum number of Xmodem retries:` setting equals the total number of errors allowed per file during transmission. This setting is under Advanced User Settings near the end of the Communications Profile menu.

Because Xmodem is used to transfer binary data, and therefore uses all 8 bits, setting the parity bit is not useful for error checking. In addition, Xmodem protocol already provides its own error checking capability.

Preparing Files

Unlike text file protocol, Xmodem can transmit any ANGOSS file type, retaining all formatting and special coding. Xmodem transfer allows you to transmit ANGOSS files as is, including formatting information, codes, and formulas.

The Xmodem protocol also has error checking capabilities. When a file is transmitted with the Xmodem protocol, it is broken up into blocks of 128 bytes. Each block contains a piece of the file and a checksum. The checksum is calculated by adding the ASCII values of each character in the 128 byte block. The sum of these values is then divided by 255, and the remainder is retained as the checksum.

After each block of data is received, the receiving computer recalculates the checksum and compares the result to the checksum received from the transmitting computer. If the two values are not equal, the receiving computer sends the transmitter a negative acknowledgment character (NAK), which requests the retransmission of the last block. The system will retransmit the same block up to 9 times; if the block still cannot be sent without errors, transmission will be halted.

If you plan to use Xmodem transfer to transmit a group of files or to transmit ANGOSS Database files, you might want to use a compression utility such as ARC or ZIP. If you will be sending the data to an application other than ANGOSS, you should export the files to ASCII format before sending via Xmodem.

NOTE: Remember that data exported to ASCII format loses any special attributes or formatting. For example, formulas are not retained in worksheet data, formatting and fonts are not retained in documents, and database structures, such as keys, are not retained. For more information about exporting data to ASCII format, refer to the appropriate module manuals.

Xmodem Transmission

After the file has been prepared for transmission, enter ANGOSS Communications and establish a connection with the remote computer. You are now ready to transmit using Xmodem protocol. Select the Data Transmit Xmodem command.

You are then prompted for the filename of the file you wish to transmit. A prompter is displayed showing all files in the current data path. Select a filename or type in a new filename and press **Enter**. Xmodem transmission of the file will begin, and your computer will display the Status Window. The Status Window will display the status of the transfer. When the transfer is complete, the Status Window returns to normal.

Xmodem Receiving

To receive a file using Xmodem protocol, make certain you have a connection established, and then select the Data Receive Xmodem command. You will be prompted for a receiving filename.

Enter a filename for the incoming text file. A prompter is displayed showing all files in the current data path. Select a file or type in a new name. The name you give the file does not have to be the same as the original filename. You can also specify a directory path, if necessary. When you press **Enter**, the transfer will begin. The Status Window will be displayed, showing the status of the transfer. When the transfer is complete, the Status Window returns to normal.

Xmodem Transfer Status

As files are transmitted using Xmodem protocol, the receiving computer displays the current block number, error counts for each transmitted block, as well as the total number of errors. The transmitting computer displays transmit time, total blocks to send, the current block being sent, and the percentage of the transfer that is complete.

If the total number of errors during the transfer exceeds the number specified in the setting `Maximum number of Xmodem retries:`, the transfer will be canceled. The transfer will also be canceled if more than nine errors occur in a single block.

NOTE: The setting for *`Maximum number of Xmodem retries:`* is under Advanced User Settings near the end of the Communication Profile menu.

If the transfer is canceled, you may have a "noisy" (or bad) connection. Try redialing for another connection. You might also try using a lower baud rate. If the transfer is still canceled, try increasing the total number of errors allowed. Be aware that allowing more errors results in more retries, which in turn, results in a longer transmission time.

If the problem persists, ask your local telephone company to examine your phone line.

Capturing Data

ANGOSS Communications allows you to save text coming onto the Terminal Window by executing the Data Capture commands. Text can be captured to the buffer, a file, or a printer and can be captured to any or all of these locations at the same time.

Capturing to the Buffer

In ANGOSS Communications, you can choose to store incoming text in the "buffer." A buffer is simply memory that is available for storage. When activated, the buffer can hold the incoming text from the Terminal Window. The contents of the buffer can be viewed or saved to a file, or sent to one of the other ANGOSS modules.

Execute the Data Capture Buffer Begin command to start capturing to the buffer. The Quick Key **F5** can also be used to toggle capturing to the buffer on or off. When capturing to the buffer, the word "Buffer" appears after the word "Capture:" on the Status line of the Terminal Window. The amount of free memory is also displayed on the Status Line. Data Capture Buffer End stops capture to the buffer.

If the buffer becomes full, ANGOSS Communications stops and asks if you want to save the buffer contents to a file before continuing, to prevent any loss of text.

To examine the buffer contents, use the Data Capture Buffer View command. To save text to a file that has been captured to the buffer, use the Data Capture Buffer Save command. To erase contents of the buffer, select the Data Capture Buffer Clear command.

Capturing to a File

To capture incoming text to a file, select the Data Capture File Begin command. ANGOSS Communications prompts you to enter the name of the file you want to use. You may also use the Quick Key **F7** to toggle file capturing on or off. If no filename has been entered since you entered the Communications module, ANGOSS prompts you to enter one when **F7** is pressed. If a filename has been entered, **F7** toggles capturing to that file on or off. When capturing to a file, the word "File" and the filename appear after the "Capture:" designation on the Status Line of the Terminal Window. Data Capture File End stops capture to the file.

NOTE: Capturing to a file may be slower than capturing to a buffer. If you are connected to a pay service, it may be preferable to capture to the buffer and then save the buffer contents later. Capturing to the printer will be much slower than either capturing to a file or the buffer.

Capturing to a Printer

You may also capture incoming text to a printer by executing the Data Capture Printer Begin command. The Quick Key **F6** can also be used to toggle printer capturing on or off. When capturing to the printer, the word "Print" appears after the "Capture:" designation on the Status line of the Terminal Window. Data Capture Printer End stops capture to the printer.

Printer settings are determined on the Hardware Preferences menu. The paper profile settings on the Hardware Preferences screen will control the page size and paper path when you capture to a printer using Data Capture Print. See the discussion of the Tools Preferences Hardware command in ***ANGOSS Software System*** for information about printer settings and paper profiles.

Chapter 5: Special Features

This chapter details features that require special instructions for use. Subjects in this chapter include:

- terminal emulation
- keyboard definitions
- modem definitions
- Remote Command Mode

Terminal Emulation

Terminal emulation is a common application of communications software. ANGOSS Communications allows you to emulate four different terminals and define your own keyboard emulations.

When your local computer connects to a remote computer and ANGOSS goes into Terminal Mode, your local computer screen and keyboard react like a terminal of the remote computer. A terminal is simply a screen and keyboard that allow you to communicate with a computer. Some computers use specific types of terminals, such as VT100s or VT52s.

When ANGOSS is in Terminal Mode, everything you enter is sent to the remote computer. For example, if your company uses a mainframe computer that is accessed by VT100 terminals, ANGOSS Communications' terminal emulation feature allows you to perform operations on the mainframe as if your computer were a VT100 terminal.

You can emulate four types of terminals by selecting from the `Select Emulation Type:` setting on the Communication Profile menu. Select the appropriate terminal for the computer system you plan to communicate with and save the profile settings. You can then load the profile whenever you plan to communicate with a computer that uses the type of terminal you have selected.

The following list describes the terminal selections:

Dumb Terminal. This refers to a display terminal that performs no processing of received and transmitted signals.

ANSI Terminal. ANSI refers to American National Standards Institute. ANSI has defined a standard set of codes and characters for computer terminals. An ANSI terminal can display and respond to standard ANSI characters and control sequences.

VT100/102. The VT100 and VT102 belong to the same family of DEC (Digital Equipment Corporation) terminals. In ANGOSS Communications, the two terminals are combined into one emulator. The VT100 code set is a subset of the VT102 codes.

VT52. The VT52 terminal is also a DEC terminal.

IMPORTANT: VT terminal emulation will not work unless you have installed a 25-line screen driver.

If you try to establish a connection with a remote system and your screen fills with garbage, first make certain that your baud rate, parity, stop bits, and data bits match those of the other system. If they do match and you still have garbage on your screen, then you may be using the wrong terminal emulation.

Generally, it is best to use Dumb Terminal as your emulation type. However, you should talk to the remote operator to find out which emulation is being used for the remote system. If that is not possible, you may find the following guidelines helpful:

- Try using VT100 \102 emulation when you are connecting to a UNIX system.
- Try VT52 emulation when you are connecting to a mainframe system.
- Try ANSI emulation when you are connecting to a bulletin board.

NOTE: Some bulletin board systems will display color and graphic characters if you select ANSI emulation. Before dialing the BBS, you must exit ANGOSS and from DOS modify your CONFIG.SYS file to contain

DEVICE==***d:\path***\ANSI.SYS

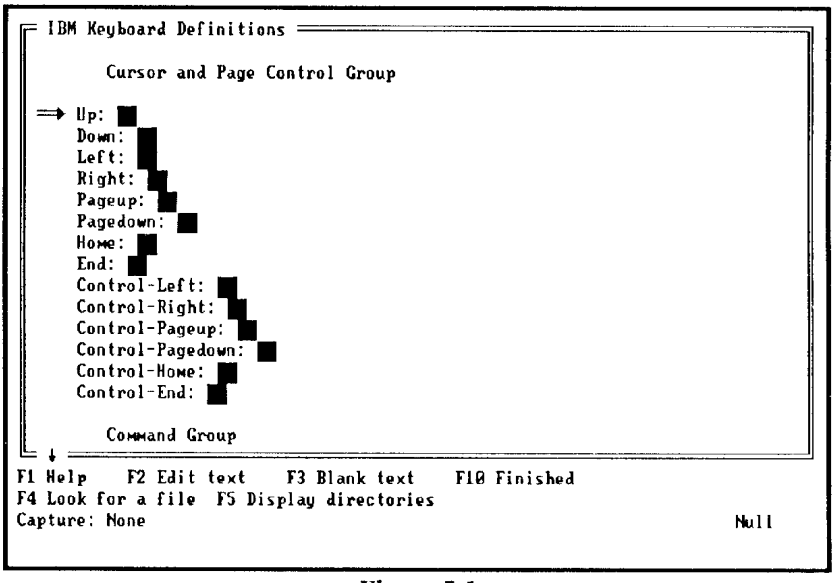
where ***d:\path*** is the drive and subdirectory specification of the DOS driver file called ANSI.SYS. Next, reboot your system so the new CONFIG.SYS settings take effect. Then, when you access ANGOSS Communications again, select ANSI Terminal as your emulation type in your settings. When you select the graphics mode option on the BBS, you will see graphics and color.

Keyboard Definitions

In addition to changing the appearance of your terminal, you can also emulate the keyboard layout of another computer system. By using the Keyboard Definition Menu, you can create and save a Keyboard Definition file for use with remote computers.

To create a Keyboard Definition, select the Set-Terminal Keyboard Define command. The Keyboard Definition Menu, as shown in Figure 5-1, is displayed.

Figure 5-1



The Keyboard Definitions are divided into the following groups:

Cursor and Page Control Group. This group of keys controls cursor and page movements. In most cases, you won't have to redefine these keys.

Command Group. This group of keys defines editing keys (e.g., Insert, Delete, Backspace) and control keys (e.g., Esc).

Alternate Numeric Group.

Alternate Function Group. Each key in these groups is actually a combination of two keys, the **Alt** key and a number, function, or letter key. These can be redefined to perform commands specific to the remote computer or to output character sequences. However, a key definition is limited to 50 characters, including quotation marks.

Control Alphabetical Group.

Control Function Group. Each key in these two groups is actually a combination of two keys, the **Ctrl** and a letter or function key. Like the Alternate Groups, these can be redefined to perform commands specific to the remote computer or to output character sequences.

Function Group. The keys in this group are the function keys. These keys can be redefined like those in the Alternate and Control Groups.

Shift Function Group. This group is a combination of the **Shift** key and a function key. These keys can be redefined like those in the Alternate and Control Groups.

To redefine one of the keys in a group listed above, simply enter what you want the key to represent on the line next to the key. There are three ways of specifying key definition codes:

Literal	To specify literal characters, enter them in quotation marks
Decimal	To represent characters decimally, enter them as numbers corresponding to the ASCII decimal code. (See ***ANGOSS Software System***.)
Hexadecimal	To represent characters hexadecimally, enter them as numbers preceded by H. The number would correspond to the ASCII hexadecimal code (e.g., H0D represents a carriage return)

Two types of character representation can be mixed in the same setting. For example, a key might be defined as "your login name" 13. This means that whenever the key is pressed, the characters of your login name and a carriage return (13 is the ASCII decimal value of a carriage return) would be entered. This can be used for quick login procedures.

The Set-Terminal Keyboard Definition command is also used to redefine the Attention, Break, and Switch keys. For a dumb terminal, these keys are defined as:

Esc	Attention

Alt B	Break
F3	Switch

These definitions are changed by placing one of the three keywords, Attention, Break, or Switch, after a key label (do not use quotes for these keywords). For example, to change the Attention key to **F8** instead of **Esc**, find the **Esc** key definition line and blank out the Attention label. You can delete a key definition by using the Quick Key **F3**. Next, find the **F8** key and enter the Attention label as follows:

F8: Attention

Once this change has been made, whenever this Keyboard Definition is loaded **F8** is the Attention Key instead of **Esc**.

To load the Keyboard Definition, create a communications profile. In the `Keyboard definition file:` setting enter the filename of the Keyboard Definition you have created; then load those settings. In the profile you must also include other connection information, such as phone number, modem type, and baud rate.

NOTE: Many of the key combinations discussed are ANGOSS Communication Quick Keys. When you redefine a key, make sure you do not need to use it as a Quick Key, if it has a Quick Key function. When you load a Keyboard Definition file along with a communications profile the key definitions take effect, and any Quick Key functions associated with the redefined keys will not be available as long as those settings are loaded and the Terminal Window is displayed.

A Keyboard Definition takes effect only when a communications profile is loaded that specifies the Keyboard Definition filename you entered in the `Keyboard definition file:` setting. If you want to change the Keyboard Definition for profiles that are already loaded, select Set-Terminal Settings Edit to specify the new Keyboard Definition filename. The changes to the profile take effect immediately.

Creating Modem Definitions

You can add support for a modem or modify the initialization codes used for a supported modem by selecting the Set-Terminal Modem Define command.

IMPORTANT: Before you use this command make certain you have a detailed manual for your modem that describes all of the modem's command code sequences. If you do not have a manual for your modem, do not use this command. You will not be able to enter accurate code sequences.

Once you've selected Set-Terminal Modem Define, the Modem Definition Menu is displayed. Enter the command code sequences specified in your modem manual into the appropriate prompts on the Modem Definition Menu. Each prompt on the Modem Definition Menu is described in detail in ***Chapter 7*** under the Set-Terminal Modem Define command.

You may also need to refer to the ***Switch Settings*** section of the ***Hardware Guide*** to see ANGOSS requirements for switch settings. If your modem is configured to these settings, you probably do not need to create a new modem definition. Refer to your modem manual to find out how your modem is configured.

Modem Display

When you are using the Set-Terminal Modem Define command you should set the Communications Preference menu prompt `Display Modem Commands/Results:` to **Yes**. This preference setting allows you to see the command code sequences that ANGOSS Communications sends to your modem. This feature was designed to be used in conjunction with the Set-Terminal Modem Define command. It helps you create a Modem Definition by letting you see how the computer and the modem are communicating and figure out how the modem is functioning in response to your Modem Definition.

COMMENT: Select Tools Preferences Communications to display the Communications Preferences menu.

When this preference is set to yes and you execute a command that sends code sequences to the modem, a box showing four lines is displayed on the screen as the modem is initialized. When the command is finished, the screen is restored to normal. The format for the four lines is:

Command Issued: <Command sequence sent to modem>

Result Expected: <Expected results>

Result Received: <Actual results>

Wait Length: <How long to Wait for response>

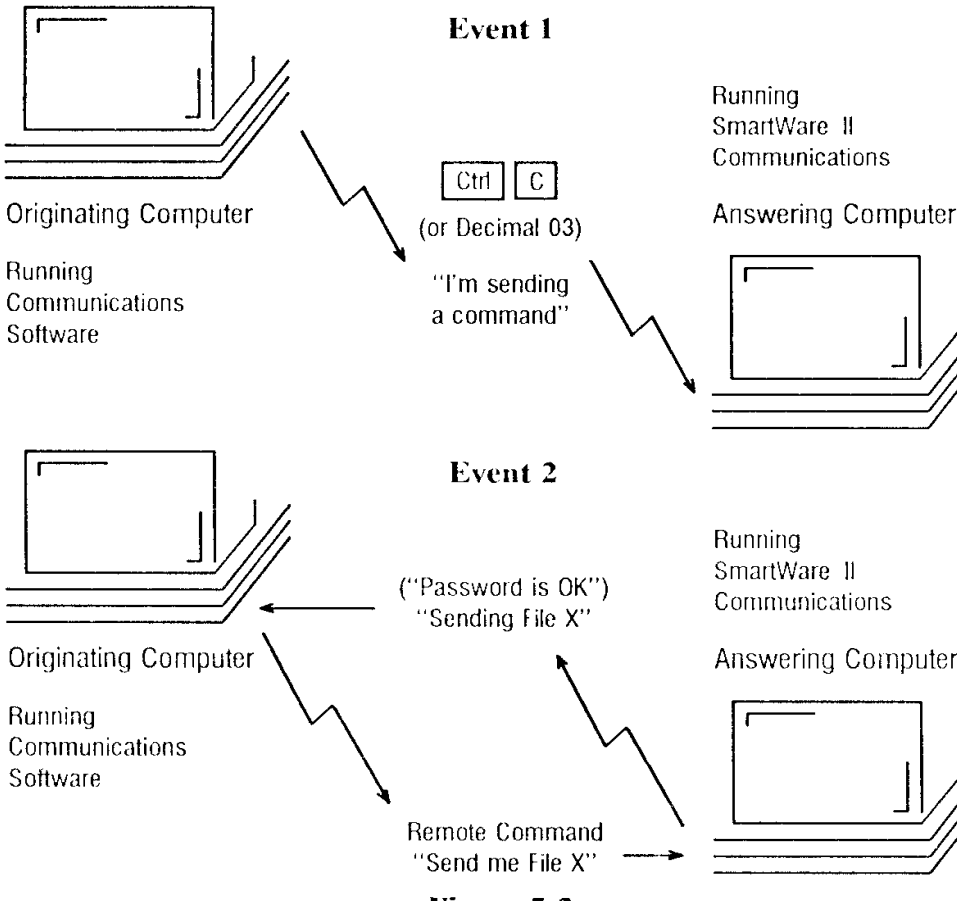
NOTE: If the command executes properly, lines 2 and 3 are the same. If the command does not execute properly, lines 2 and 3 will not be the same.

When the command code sequences are displayed on the screen, you may see graphic characters. These are usually the display characters for carriage returns or linefeeds. If you do not know the value or code a character represents, refer to your operating system documentation for an ASCII table showing characters and equivalent values.

Remote Commands

The Remote Command feature of ANGOSS Communications allows the originating computer to execute certain commands on the answering computer. Figure 5-2 shows a diagram that illustrates this concept.

Figure 5-2



Using Remote Command Mode, the originating computer can send and receive files and access directories on the answering computer. These activities can be performed without an answering computer operator, if the answering computer is running ANGOSS Communications.

IMPORTANT: If the answering computer is running software other than ANGOSS Communications, this section does not apply.

To protect the answering computer from unauthorized entry, there are four levels of access, each protected by a password, that the answering computer can establish. These access levels are established in the Answer settings in your profile.

Remote Settings

The profile settings you must select to use Remote Command Mode include those you would normally select for answering a call plus either `Receive/Transmit Password:`, `Receive Password:`, `Transmit Password:`, or `Connect-Only Password:`.

These four passwords are used to determine the caller's rights (or permissions) as follows:

- Receive/Transmit (R/T) - permits the caller to download and upload files from the answering computer.
- Receive-Only (R) - allows the caller to download files from the answering computer.
- Transmit-Only (T) - allows the caller to upload files to the answering computer.
- Connect-Only (C) - allows the caller to use the Terminal Mode of the answering computer, but the caller cannot execute any remote commands.

To get into Remote Command Mode, the originator must send a **Ctrl C** while in Terminal Mode, or send the ASCII decimal code 03. Upon receipt of this character, the answering computer checks to see if there are passwords limiting access. In the absence of a password, Receive/Transmit access is granted, and the caller has access to all available remote commands.

If there is password-protection, the answering computer grants the appropriate access level based on the password the originating computer sent when the phone was answered. Once access to the system is granted, the caller is allowed to execute a single command.

Issuing Remote Commands

There are several Remote Commands that may be executed. Table 5-1 shows each command with its shorthand format and the access level that permits it to be executed. Use the shorthand format of each command to simplify executing remote commands.

Table 5-1

Command Format	Shorthand	Access Levels
Data Transmit Text-File (filename)	TT (filename)	T, R/T
Data Transmit Xmodem (filename)	TX (filename)	T, R/T
Data Receive Text-File (filename)	RT (filename)	R, R/T
Data Receive Xmodem (filename)	RX (filename)	R, R/T
Tools Directory Display (specification)	DI (specification)	R, T, R/T
Help	?	C, R, T, R/T

The commands used to transmit and receive are the same as those used in regular Command Mode. The Tools Directory Display (DI) command displays the names of the files, the dates and times they were created, their sizes, and their transmission times. The file specification may include an optional path or wild cards.

The Help command displays a summary of the commands available in Remote Command Mode.

After the remote command has been executed, the system returns to normal Terminal Mode. Another remote command may be executed by repeating the procedure.

Practice 1

In the following practice session, you will create a new keyboard definition file.

1. Enter ANGOSS Communications and execute the Set-Terminal Keyboard Define command.
2. At the `Enter keyboard definition filename:` prompt enter the filename KEYBRD1 and press **Return**.

3. Press **down arrow** until you reach the line next to Esc in the Command Group. Delete the key word ATTENTION next to the Esc key by pressing **F3**.
4. Press **down arrow** until you reach the line next to Control-A in the Control Alphabetical Group. Enter the key word ATTENTION next to the Control-A key.
5. Now go to the line next to Control-N. On that line enter your name in quotation marks followed by the number 13, as follows, and press **Enter**:

   "Lisa Jones" 13
6. Press **F10** to complete the Keyboard Definition.

You have created a Keyboard Definition file that defines the key **Ctrl A** as the Attention Key for ANGOSS Communications, and the key **Ctrl N** to output the characters of your name and a carriage return.

To use the Keyboard Definition file, create a communications profile that specifies KEYBRD1 in the prompt line `Keyboard definition file:`.

Practice 2

The following practice steps explain how to set up an ANGOSS to ANGOSS communications session.

To set up the answering (remote) system, do the following:

1 From the Status Window, select the Set-Terminal Settings Define command. Name the file **answer**.

2. Enter the information shown in the following sample settings.

   Under General Settings select the following:

   `Name or Prompt:` **ANGOSS to ANGOSS**

   `State:` **Answer**

   Under Answer Settings select the following:

   `Receive/Transmit Password:` **practice**

   NOTE: Remember that passwords are case-sensitive.

   `Number of rings:` **3**

   `Connection time limit (minutes):` **20**

Under Modem Settings select the following:

`Select Modem Type:`

(Press **F6** for a list of modems. Use the cursor keys to point to your modem and press **Enter**.)

`Modem Port:` **Serial-1**

`Baud Rate:` **1200**

`Data Bits:` **8**

`Parity:` **none**

`Stop Bits:` **1**

NOTE: The default settings shown here for Data Bits, Parity, and Stop Bits are suitable for most transmissions.

`Duplex:` **Half**

3. To finish defining and saving the profile, press **F10**.

   To set up the originating (local) system, do the following:

4. Select Set-Terminal Settings Define again. Name the file **orig**.
5. Enter the following information.

   Under General Settings select:

   `State:` **Originate**

   Under Originate Settings select the following:

   `Number:`

   (Type the phone number of the system you are calling and press **Enter**.)

   `Originate Password:` **practice**

   `Dial Prefix:` **AT DT**

   `Dial Suffix:` **|**

   `Seconds to wait between re-dials:` **60**

   `Maximum Number of re-dial attempts:` **3**

   `Seconds to wait for carrier:` **45**

   Under Modem Settings select the following:

`Select Modem Type:`

(Press **F6** for a list of modems. Use the cursor keys to point to your modem and press **Enter**.)

`Modem Port:` **Serial-1**

`Baud Rate:` **1200**

`Data Bits:` **8**

`Parity:` **none**

`Stop Bits:` **1**

NOTE: The default settings shown here for Data Bits, Parity, and Stop Bits are suitable for most transmissions.

`Duplex:` **Full**

6. To finish defining and saving the profile, press **F10**.
7. Select the Connection Dial Carrier command.
8. Once the connection has been made, type **Ctrl C**. At the `COMMAND:` prompt, you can enter one of the following commands:

Command	Meaning	Password	Notes
DI	Directory	R/T	Wildcards can be used
TT	Transmit Textfile	R	Answering system transmits
TX	Transmit via Xmodem	R	Answering system transmits
RT	Receive Textfile	T	Answering system receives
RX	Receive via Xmodem	T	
?	Help	any password	Displays a command list

9. To receive a file, enter the TX command followed by a filename. From the module menu, select Data Receive Xmodem ***filename***.

10. Select Connection Hangup.

Chapter 6: ANGOSS Integration

One of the best reasons to use the ANGOSS Software System is its powerful integration capabilities. By using the Data Send commands, you can transfer data stored in ANGOSS Communications to any other ANGOSS module you have purchased and installed.

The Data Send commands can be used in conjunction with the Data Format command. Data Format allows you to translate data into an appropriate format for sending to another module.

Data Send

Select Data Send to send data from a file or from the capture buffer to any other ANGOSS module you have installed. Files can be created by capturing data directly to a file; capturing to the buffer and then saving the data to a file; or receiving a text file with either the Data Receive Text-File or Data Receive Xmodem commands.

When you select Data Send, you are prompted to specify the source (location) of the data you are sending, namely, either the buffer or a file. If you specify a file, you are prompted for a filename. You can include a path in the filename, if necessary.

Sending Formatted Data

When you select either Data Send Buffer or Data Send File, you are asked whether the data you are sending needs to be formatted or whether you want to send it in its present form. If you are sending data to ANGOSS Spreadsheet or ANGOSS Database, the data must be stored either in the ANGOSS Interchange Format, or it must be formatted as it is sent to the other module. The ANGOSS Interchange Format separates each piece of data (text or a number) with a space and each line with a carriage return and a line feed pair. Text is surrounded by quotation marks. Null fields must have two quotation marks to act as place holders. Numbers and values should not contain quotation marks, but should be separated by spaces. ANGOSS Spreadsheet and ANGOSS Database will properly read this format.

NOTE: Data items within a text file being sent cannot contain quotation marks because ANGOSS interprets anything surrounded with quotation marks as a separate data item.

If the data is not in ANGOSS Interchange Format, use the Data Format Define command to create a format specification table to format the data as it is sent. You can read more about formatting

data in the section titled ***Data Format*** in this chapter and the section on the Data Format Define command in ***Chapter 7***.

If you are going to format the data as it is sent and you have defined a format using the Data Format Define command, select the Formatted-By option of Data Send Buffer or Data Send File. When you select the Formatted-By option, you must enter the name of the Format Definition file that you created when you formatted your data using the Data Format Define command.

Once you execute the Data Send command, ANGOSS automatically exits ANGOSS Communications and accesses the module to which you sent the data. When you enter the destination module, the data you sent will be displayed on the screen, either in the Spreadsheet or in a standard view in the Database.

Sending Unformatted Data

If you want to send a standard text file to ANGOSS Word Processor, or if the data you want to send is already in the ANGOSS Data Interchange Format, select the Un-Formatted option of the Data Send Buffer or Data Send File command.

Once you execute the Data Send command, ANGOSS automatically exits ANGOSS Communications and accesses the module to which you sent the data. When you enter the destination module, the data you sent will be displayed on the screen in the Spreadsheet or Word Processor, or in a standard view in the Database.

For more information about Data Send, refer to ***Chapter 7***.

Data Format

Use Data Format Define to create a conversion format for text you want to send to ANGOSS Database or ANGOSS Spreadsheet. When you select Data Format Define, you are prompted for a Format Definition filename. You can either type in the filename or select from the prompter list that is displayed.

Format definitions are used to arrange data into a format you have specified as it is sent from Communications to another module. For example, you can use a format to define where a field begins and ends, or whether it is text or numeric. The format you specify does not permanently alter your stored file; the format is imposed only as the data is sent. After you have specified your Format Definition filename, the Format Definition Menu is displayed. This menu consists of 25 groups of data format specifications that arrange the data into the desired format for sending. Each group is numbered to make it easier to keep track of which format group you are formatting. You can read more about the Format Definition Menu in ***Chapter 7*** in the section on the Data Format Define command.

Chapter 7: ANGOSS Communications Command Reference

Overview

This chapter explains the purpose and format of each ANGOSS Communications command. Menu keywords are presented in this chapter in the same order in which they appear on the ANGOSS Communications keyword menu.

Four of the keywords, Tools, Help, Remember, and Quit, are applicable to all ANGOSS modules. Discussions of these keywords are general, with details being limited to Communications usage. For more information on the use of these commands, refer to ***ANGOSS Software System*** and ***Project Processing***.

If you have not used a communications package before, we suggest that you read the first six chapters of ***ANGOSS Communications*** and that you also use the Communications Tutorial.

Classifying Commands by Related Function

ANGOSS Communications' module menu contains the keywords for all command format combinations that are available in the module. When ANGOSS Communications is in Command Mode, the module menu displays the following keywords:

Set-Terminal Connection Data Tools Help Remember Quit

Commands are built from the module menu keywords in functionally logical sequences. To help you become more familiar with command groups, this section classifies commands by function.

Getting Help Information

Help About-Help	Displays information on using ANGOSS' on-line help feature
Help Contents	Displays a table of contents for the on-line help

Help On-Error	Displays help text for specified error messages
Help Index	Displays an index of help topic
Help Tutorial	Invokes the Communications Tutorial

Setting Preferences

Tools Preferences	Controls how ANGOSS Communications performs, as well as allowing you to set global and hardware preferences

File Transfer

Data Capture	Specifies whether to capture incoming data to the buffer, a file, or a printer
Data Receive	Receives data being sent to you from a remote computer system
Data Transmit	Transmits data from your system to a remote computer system
Data Send	Provides file integration with other ANGOSS modules

Using Set-Terminal to Prepare for Communications

Settings	Defines, edits, loads, saves, and undefines a communications profile containing operational settings
Keyboard	Defines or undefines a keyboard definition file for use in terminal emulation

Modem	Defines a modem not currently supported by ANGOSS Communications, or undefines an existing modem definition
Paint	Controls the colors on the Status and Terminal Windows

Beginning or Ending Communications

Connection Answer	Waits for and answers incoming call
Connection Dial	Connects with another system through a carrier signal or through voice communications
Connection Hangup	Disconnects a communications link with another system

Obtaining Information About Files

Tools Directory	Displays, creates, removes, or changes a file directory.

Set-Terminal

The Set-Terminal commands in ANGOSS Communications are used to control configurations of your local computer and modem.

Set-Terminal provides the following options:

Duplex. Changes the Duplex setting.

Filters. Filters out unwanted characters.

Goto. Switches between voice and data communications.

Keyboard. Creates and deletes keyboard definition files.

Modem. Creates and modifies modem definition files.

Paint. Modifies the color of your communications screens.

Settings. Changes the current communications profile settings.

Set-Terminal Duplex

The Set-Terminal Duplex command is used to change the Duplex setting. Generally, duplex refers to whether communication is one-way (half) or two-way (full). In ANGOSS Communications, the Duplex setting refers to whether locally typed characters are echoed to the screen during a communications session. You can select either Half or Full Duplex.

Duplex Full

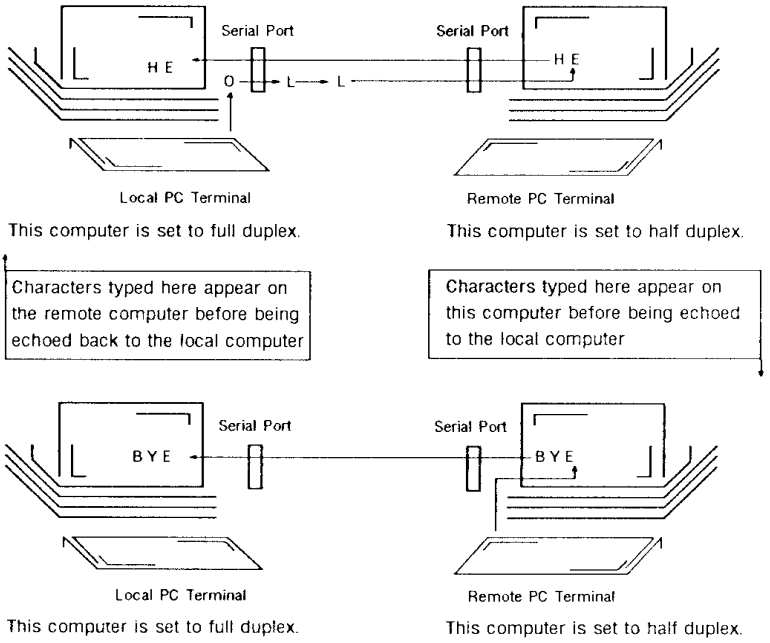
If you select Set-Terminal Duplex Full, no characters that you type will be echoed to your screen. You will be able to see characters only if the remote computer echoes them to your screen. When ANGOSS Communications is in Terminal Mode and you notice that every character you type appears on your screen twice, execute the Set-Terminal Duplex Full command. Duplex Full is generally used by the originating computer.

Duplex Half

If you select Set-Terminal Duplex Half, the characters that you type on your computer will be echoed to your terminal screen. If every character you type does not appear on your screen, but the characters the remote computer is sending do appear on your screen, execute the Set-Terminal Duplex Half command. Duplex Half is generally used by the answering system.

The Quick Key **Alt U** displays the Half/Full Duplex option on the menu.

Figure 7-1



Related Profile Settings

The `Forced local echo:` setting in the Advanced User Settings section of the Communications Profile Menu will force character echoing to the terminal screen of your computer if it is set to on. Some remote computers may not echo characters properly, so you can always use this setting in combination with Duplex commands to get the correct character echoing.

Set-Terminal Filters

Select Set-Terminal Filters to identify characters that you do not want captured or displayed. The Filter commands allow you to edit the filter tables that are used to filter incoming characters. Filter

tables stop unwanted characters from being displayed or captured. See Figure 7-2 for an example of a filter table.

NOTE: Editing the filter tables does not activate the filters. You must select the Set-Terminal Settings Edit command and enable the filter.

The tables that you edit with these commands are attached to the currently loaded settings. Once you've edited a filter table, you must use the Set-Terminal Settings Save command to save the changes you've made. The saved filter table will always be associated with the profile that was loaded at the time of the save. Whenever you load that profile, the filter table will also be loaded.

Options for Set-Terminal Filters include Capture and Terminal.

Filters Capture

Select Set-Terminal Filters Capture to edit the Capture Filter Table. This filter table is used to filter characters that are captured to the buffer, a file, or a printer. The Capture Filter Table is explained in the section titled ***Filter Tables***.

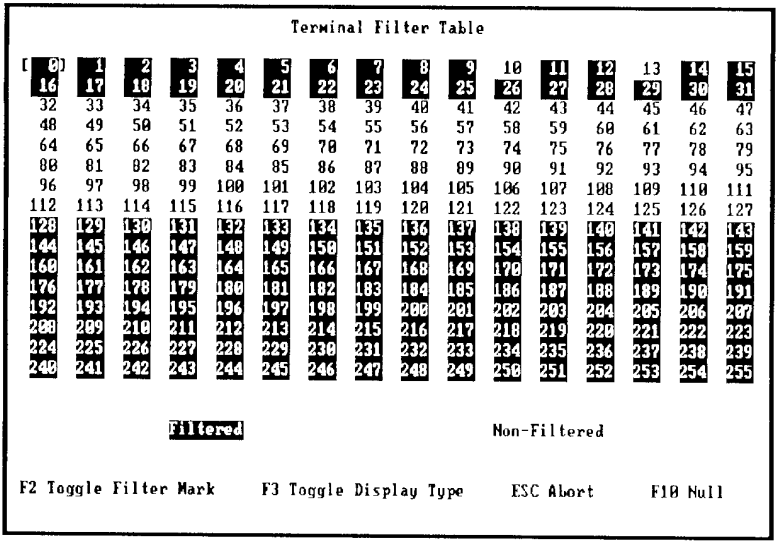
Filters Terminal

Select Set-Terminal Filters Terminal to edit the Terminal Filter Table. This filter table is used to filter characters that are sent to the terminal screen. The Terminal Filter Table is explained in the section titled ***Filter Tables***.

Filter Tables

When you select the Set-Terminal Filters Capture command, the Capture Filter Table is displayed. When you select the Set-Terminal Filters Terminal command, the Terminal Filter Table is displayed. Both tables display the characters, or their values, that your system supports. The default screen for editing the filter table lists the decimal values of the character set (0 - 255).

Figure 7-2



Two other screens display the same filter table in different formats. Press **F3** to display another format. The two other formats include a hexadecimal table of characters and the displayable characters themselves.

To select the characters you do not want captured or displayed, press the arrow keys until a desired character is enclosed by the brackets. The **F2** key acts as a toggle to turn highlighting on or off. Highlighted characters are filtered out. Characters that are not highlighted are captured or displayed.

If you wish to stop editing the filter tables without saving changes, you can press **Esc** to abort. To complete the changes you make to the filter table, press **F10** and then select the Set-Terminal Settings Save command. Remember that the filter table will not be saved to disk until the settings are saved with the Set-Terminal Settings Save command.

Set-Terminal Goto

Select Set-Terminal Goto to switch between voice and data communications. Options for Goto include Carrier and Voice.

The Quick Key **F4** allows you to start execution of the Set-Terminal Goto command.

Goto Carrier

Use Set-Terminal Goto Carrier when you wish to exchange any type of data through ANGOSS Communications. When you execute this command, ANGOSS waits for a carrier signal to respond. You and the remote computer operator should coordinate execution of this command as much as possible. When you select Set-Terminal Goto Carrier, the message `Issuing carrier, hangup phone. Escape to cancel carrier` appears.

Goto Voice

Use Set-Terminal Goto Voice when you must interrupt a communications session to talk to the remote computer operator. Once your conversation is complete, you can switch back to carrier (data) mode to resume data transmission. This command works only when both systems are running ANGOSS Communications.

If you initiate a request for voice communication, you see the message `Voice request in progress, awaiting reply. Escape to cancel.` Next, you and the respondent, in this case the remote computer operator, both see the message `Press F10 to go to voice. Escape to cancel.` Once you press **F10**, the other party has three seconds to pick up the phone before the connection is broken.

After completing the conversation, you may return to data communications by selecting Set-Terminal Goto Carrier.

NOTE: If you wish to switch the current communication link to voice communication, a telephone must be connected to the modems at both ends of the link.

Set-Terminal Keyboard

The Set-Terminal Keyboard command is used to create and erase keyboard definition files. These files have two functions. First, they allow keyboard keys to be redefined while ANGOSS Communications is in Terminal Mode. This is useful when you need to emulate other terminal keyboards. In addition, keyboard definition files allow the Attention, Break, and Switch Keys to be redefined. Keyboard definition files are used in conjunction with a communications profile.

A specific keyboard definition is used only when a profile is loaded that specifies that definition filename in the Keyboard Definition section. If you wish to define a keyboard definition for a profile that is already loaded, the profile must be edited to specify the new definition filename. The

changes take effect immediately, but you must save the profile if you wish to reload the new keyboard definition later.

The Quick Key **Alt J** begins execution of Set-Terminal Keyboard, displaying the options Define and Undefine.

Keyboard Define

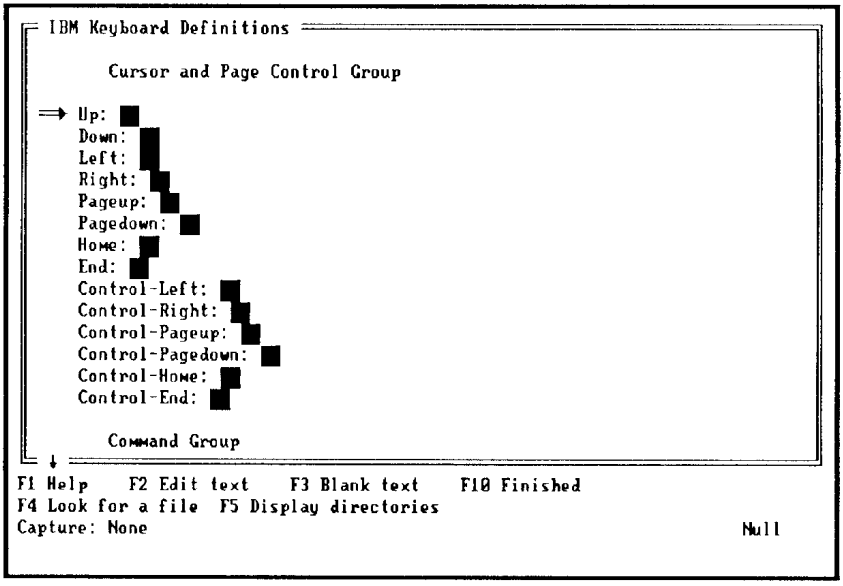
Select Set-Terminal Keyboard Define to define a keyboard for terminal emulation. When you execute this command, you are prompted to enter a key definition filename. Enter a new filename (a definition you wish to create) or an old filename (a definition you wish to edit), and press **Esc**. The Keyboard Definition menu appears. All keyboard definition files have a .key extension.

NOTE: Database key files also use a .key extension, so make certain you have created separate subdirectories for each module, as described in **ANGOSS Software System**.

Keyboard Definition Menu

After you have selected a keyboard definition file to edit, the Keyboard Definition menu, shown in Figure 7-3, is displayed.

Figure 7-3



Use the same keys to edit the Keyboard Definition menu as you would to edit any definition menu in ANGOSS. Refer to ***ANGOSS Software System*** for information about ANGOSS definition menus.

There are four ways to define a key:

Literal. To specify literal characters, type them in at the key designation, enclosing them in quotation marks. For example, at the `Down:` setting type **abcd**. Once the specified keyboard definition file is loaded, every time **down arrow** is pressed the letters abcd are transmitted while ANGOSS Communications is in Terminal Mode.

Decimal. To specify characters with decimal representation, enter them as numbers corresponding to the ASCII decimal code. For example, at the `Home:` setting, if you typed **13**, **Home** would be redefined to produce a carriage return every time it is pressed.

Hexadecimal. To specify characters with Hexadecimal representation, enter them as numbers preceded by an H. The number should correspond to the ASCII hexadecimal code. For

example, the definition `Home: H0D` (H zero D) would redefine **Home** to produce a carriage return when it is pressed.

NOTE: If you reenter the Keyboard Definition menu later, any hexadecimal characters you defined will be in decimal format.

System Key Word. To redefine the three special system keys used in ANGOSS Communications, use ATTENTION, BREAK, and SWITCH. The default keys for dumb terminals only are as follows: **Esc** equals ATTENTION; **Alt B** equals BREAK; and **F3** equals SWITCH. As an example, if you wish to redefine the Attention Key from **Esc** to **Ctrl A**, simply use **F3** to delete the word ATTENTION next to the `Escape:` designation and then type **ATTENTION** next to the `Control-A:` designation.

NOTE: Except for System Key words, you can mix two types of character representations in the same keystroke definition. For example, to redefine **Tab** to the ANSI erase screen code, at the *`Tab:`* option type **27 "[2J"**.

Keyboard Undefine

Select Set-Terminal Keyboard Undefine to erase a previously created keyboard definition. When you execute this command, you are prompted for a definition filename. Enter a filename to be erased.

Set-Terminal Edit-Modem

Select Set-Terminal Edit-Modem to create or modify modem definition files for modems not currently supported by ANGOSS. When the Modem Resources prompter is displayed, showing the list of available modem definition files, you can make a selection or enter a new name to create a modem resource. To add modem descriptors supported by ANGOSS, run the Install program to make changes. If you are editing an existing file, please note that you must give a new name for the modem, otherwise the original configuration will be written over.

IMPORTANT: Use this command only if your modem is not supported and you understand the internal operation of your modem. Do not use this command to change configurations on existing modems. Also, do not use this command unless you have a manual for your modem that lists all of the codes your modem uses.

Modem Definition Menu

When you are using the Set-Terminal Edit-Modem command you should set the Communications Preference menu prompt `Display`

`Modem Commands/Results:` to **Yes**. This preference setting allows you to see the command code sequences that ANGOSS Communications sends to your modem.

COMMENT: Select Tools Preferences Communications to display the Communications Preferences menu.

When this setting is set to yes and you execute a command that sends code sequences to the modem, a box showing four lines is displayed on the screen as the modem is initialized. When the command is finished, the screen is restored to normal. The format for the four lines is:

Command Issued:	<Command sequence sent to modem>
Result Expected:	<Expected results>
Result Received	<Actual results>
Wait Length:	<How long to Wait for response>

NOTE: If the command executes properly, lines 2 and 3 are the same. If the command does not execute properly, lines 2 and 3 will not be the same.

When the command code sequences are displayed on the screen, you may see graphic characters. These are usually the display characters for carriage returns or linefeeds. If you do not know the value or code a character represents, refer to your operating system documentation for an ASCII table showing characters and equivalent values.

Modem Definition

The first prompt on the Modem Definition menu is `Modem Name:`. This prompt allows you to define a name for the modem you want to use. The modem name can contain up to 40 characters.

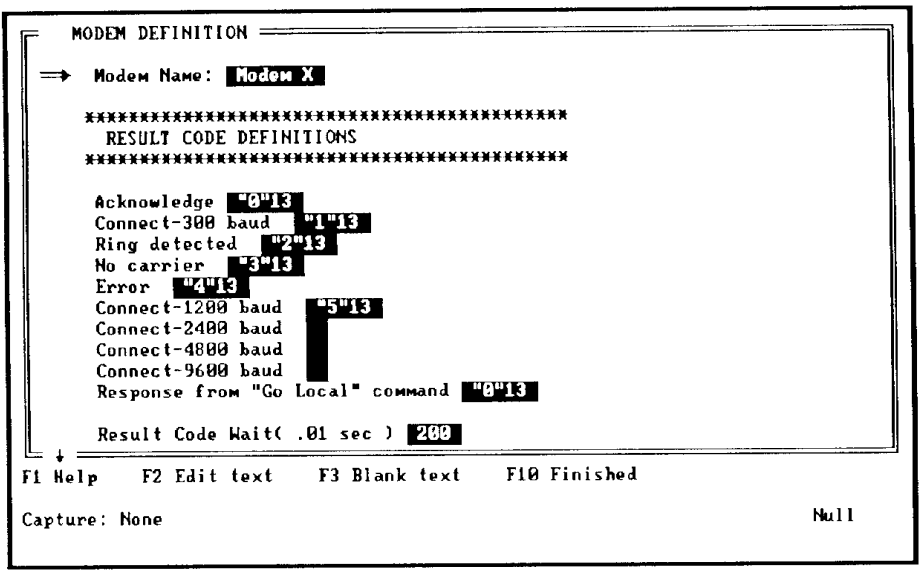
If you are editing an existing modem definition file and you want to keep the original settings, you must enter a new Modem Name. Otherwise the old file will be written over.

The remainder of the Modem Definition menu is divided into four sections: Result Code Definitions, Modem Wakeup Sequences, Modem Command Definitions, and Modem Control Parameters.

Result Code Definitions

Result code definitions are text strings sent from the modem to the computer to signal that modem commands were executed properly. Although some communication programs do not use result codes, ANGOSS requires you to at least set connect result codes to answer incoming calls. For best results in using your modem, you may also wish to specify additional result codes in your modem definition to ensure correct operation of your modem. Figure 7-4 shows the result codes on the Modem Definition menu.

Figure 7-4



COMMENT: Select Tools Preferences Communications to gain access to the Communications Preferences menu.

All result code strings that you enter on the Modem Definition menu are sent by the modem to your computer system to signal that the modem has received and executed a valid modem command. If you have set `Display Modem Commands/Results:` to **yes** on the Communications Preferences menu, a box will be displayed on the Status Window showing any discrepancies between the expected result and the actual result.

There are three ways of specifying modem definition codes:

Literal	To specify literal characters, enter the characters, enclosing them in quotation marks
Decimal	To specify characters with decimal representation, enter them as numbers corresponding to the ASCII decimal code
Hexadecimal	To specify characters with hexadecimal representation, enter them as numbers preceded by an H. The number would correspond to the ASCII hexadecimal code (e.g., H0D represents a carriage return)

NOTE: Two types of character representation can be mixed in the same setting. For example, a setting for a wakeup sequence might be "ATX1"13, which would represent the characters ATX1 and a carriage return.

Result code definitions include the following:

Acknowledge. This code signals that the modem has received and executed a valid modem command.

Connect 1200 baud. (also Connect 2400, 4800, or 9600 baud) This code signals connection with another modem at the correct baud rate. This result code and the other connect result codes are required for ANGOSS Communications to connect at these baud rates. ANGOSS Communications evaluates the codes sent by the modem to determine the baud rate at which the modem is running. If a match to one of the connect codes specified here is found, ANGOSS switches to the baud rate being used.

Ring Detected. This code is sent by the modem each time the phone line rings.

No Carrier. This code is sent by the modem when a connection is expected but does not occur.

Error. This setting contains the string that is sent by the modem when a command is expected but is not executed correctly.

Response from "Go Local" command. This code is sent by the modem when it switches from the on-line state to the local command state. (It is usually the same as the acknowledge code.)

Result Code Wait (.01 sec.) This setting is used to define, in 1/100 of a second, how long ANGOSS Communications waits before looking for a result code. For example, if you specify 200, ANGOSS waits 2 seconds after connection when you select Connection Answer before looking for the connection baud rate.

Modem Wakeup Sequences

This section contains nine settings used to specify modem commands, result codes, and wait times, which together are called the wakeup sequence. The wakeup sequences are issued by ANGOSS when the modem name, state (answer or originate), or the `Seconds to wait for carrier:` specified in the communication profile have changed.

Both a command and a result must be specified if you want ANGOSS to indicate when a command fails. If you do not specify a result code, there will be no way for ANGOSS Communications to verify that the modem command executed properly.

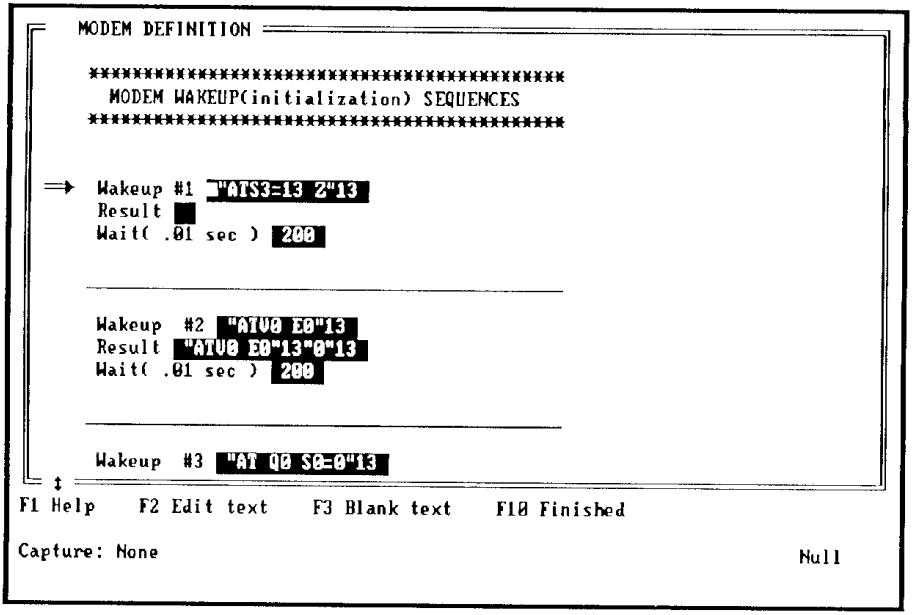
When ANGOSS Communications issues a command to the modem, it then follows these steps:

1. ANGOSS clears both the transmit and receive queues; that is, it verifies that no characters are waiting to be received from a previous command and none of the previous command is left to be transmitted.
2. ANGOSS transmits the command string to the modem.
3. ANGOSS pauses for the duration of time specified in the `Wait:` length.
4. ANGOSS checks the receive queue.
5. ANGOSS compares the characters it found in the receive queue to the result code specified in the modem definition. If the two strings match, ANGOSS Communications has verified that the command was executed correctly. If the result received and the result code specified in the modem definition do not match, ANGOSS repeats steps 1 through 5 three times. If there is still no match on the third try, ANGOSS Communications indicates that the command has failed.

NOTE: For commands that issue a guard sequence, there is an additional delay between steps 1 and 2.

Figure 7-5 shows the first wakeup sequence with a wait time specified.

Figure 7-5



The first nine commands, Wakeup 1 through Wakeup 9, are used to set initialization sequences for the modem. For best results with your modem, you should use the commands that accomplish the following:

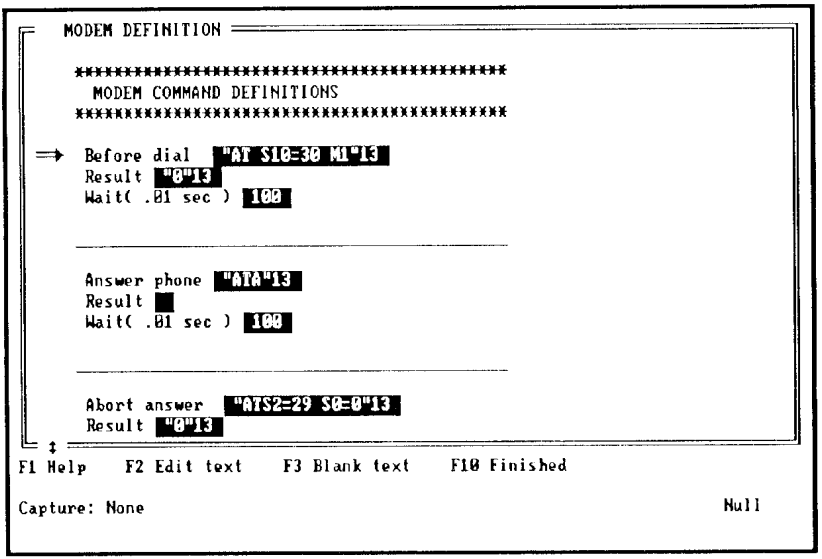
1. Clear the modem of any stored settings so that it always responds the same way during initialization. This command should be stored in the first wakeup sequence (Wakeup 1).
2. Force the result codes to match those defined in the Result Codes settings in the modem definition (i.e., words/verbose vs. numbers/terse).
3. Instruct the modem to respond to commands. (Some modems use a command that prevents them from responding.)
4. Instruct the modem to treat received characters as commands when Go Local commands are issued.

5. Instruct the modem to not automatically answer the phone if the modem switches are not already set to No Auto-Answer (unless you select the Answer Phone command on the Modem Definition menu.)

Modem Command Definitions

The second part of the modem command definitions include commands that ANGOSS Communications sends to the modem to instruct it to perform certain functions. Like wakeup sequences, these commands also include a result code and a wait time. Figure 7-6 shows part of the modem command definitions.

Figure 7-6



Before Dial. This command is issued each time you dial another system. After you select Connection Dial, but before the command is actually executed, the Before Dial command is sent to the modem. The Before Dial command should be used to turn the modem speaker on until the connection is established and to set the duration that the modem should wait before hanging up if the carrier is lost. Five to ten seconds is generally sufficient.

Answer Phone. This command instructs the modem to answer the phone to establish a connection.

NOTE: ANGOSS Communications does not generally use the "auto-answer" feature supplied by most modems because it would be incompatible with the profile setting specifying that ANGOSS answer after a certain number of rings.

Abort Answer. This command is issued if you press **Esc** to abort the Connection Answer command. It also sets the modem to no auto-answer.

Before Answer. This command is issued to the modem immediately before the Connection Answer command is issued. It is issued at the baud rate specified in your communications profile settings to allow high speed modems to transmit at the highest baud rate possible.

Goto Carrier (Originate). This command is issued after you select the Set-Terminal Goto Carrier command in Originate State. It causes the modem to switch to on-line state and to issue the proper originate frequency.

Goto Carrier (Answer). This command is issued after you select the Set-Terminal Goto Carrier command in Answer State. It causes the modem to switch to on-line state and to issue the proper answer frequency.

Goto Voice. This command prevents disconnection while you and the remote computer operator pick up the phone when going to voice communication.

Hangup (modem control method). This command is issued when you select Connection Hangup and the modem control parameters have been set to use the modem control method.

Set Wait for Carrier. This command is issued whenever the wakeup commands (1-9) are issued and sets the amount of time the modem waits for a carrier signal before disconnecting. It is related to the amount of time specified in your communication profile under the `Seconds to wait for carrier:` setting (under Originate).

Go Local from Answer State. This string is issued when you are answering a call to instruct the modem to interpret characters as commands rather than as data.

Go Local from Originate State. This string is issued when you are originating a call to instruct the modem to interpret characters as commands rather than as data.

Before Go Local from Originate State. This command is issued whenever the wakeup sequence is issued in Originate State. It's function is to set the guard sequence while originating a call. The guard sequence instructs the modem whether to process data or commands.

Before Go Local from Answer State. This command is issued whenever the wakeup sequence is issued in Answer State. It's function is to set the guard sequence while answering a call. The guard sequence instructs the modem whether to process data or commands.

Legal Dial String Characters. Setting this command is optional. It is provided so you can extend the character set allowed by ANGOSS Communications to accommodate your modem. The string you specify for this command is compared to the string you specified for the Dial Phone command.

Modem Control Parameters

The Modem Control Parameters are used to specify how and when the commands defined in the Modem Command Definitions are used.

Issue Wakeup (initialization sequence). These three parameters allow you to specify additional times when the wakeup sequence is sent to the modem. Currently, all predefined modem definitions set these parameters to no. They include `After Hangup:`, `Before Dial:`, and `Before Answer:`.

Hangup via removal of DTR (hardware method). If you specify yes for this setting, ANGOSS Communications attempts to hang up the phone by removing the DTR signal for approximately one second. Currently, the predefined modem definitions are all set to yes. If you specify no, ANGOSS issues the appropriate Go Local command followed by a Hangup command.

Sync Port to Connect Baud Rate. If this command is set to yes, after a connection is established ANGOSS looks for a connect result code and will then switch to the baud rate specified by that result code. This allows ANGOSS to more readily connect to multiple speed modems.

Initialize Modem Using Current Baud Rate. This parameter is set to no for all current predefined modem definitions. When this parameter is set to no, ANGOSS issues all modem commands sent during the initialization sequence at 300 baud, 8 data bits, no parity, and 1 stop bit. If it is set to yes, ANGOSS sends the initialization sequence at the baud rate, data bits, parity, and stop bits specified in the communication profile that is loaded. This parameter may be useful when using a high speed modem.

Allow Modem to Auto-Answer Phone. This parameter is set to no for all current predefined modem definitions. If you specify yes, ANGOSS Communications will not issue the answer commands specified in the modem definition. For example, the setting for answering

after a specified number of rings is ignored. Instead, ANGOSS will expect the modem to automatically answer.

NOTE: If you set this parameter to yes, you may have to modify the wakeup commands.

Set-Terminal Paint

If you are using a color monitor, you can select Set-Terminal Paint to modify the colors of the Status and Terminal Windows.

The colors you select with these commands are stored with a communications profile. When the profile is loaded, the colors that were saved with it become the current colors. The current colors are saved when Set-Terminal Settings Save is executed.

Paint Status-Window

Select Set-Terminal Paint Status-Window to change the colors of the border, settings, or window area of the Status Window.

The Set-Terminal Paint Status-Window Border command changes the window border and settings borders to the specified color. You are prompted for a foreground color only. This command changes the color of all boxes on the Status Window.

The Set-Terminal Paint Status-Window Settings command changes the color of values you have specified in the current profile settings. You are prompted for a foreground color only.

The Set-Terminal Paint Status-Window Window command changes the color of the window background and settings titles or labels. You are prompted for a background color to change the window and a foreground color to change the settings titles.

Paint Terminal-Window

The Set-Terminal Paint Terminal-Window allows you to change the foreground and background colors of the Terminal Window.

Set-Terminal Settings

The Set-Terminal Settings commands are used to define, edit, load save, or undefine (delete) the current communication profile. For more information about settings in the Communication Profile menu, see the section in this chapter titled ***Communication Profile Settings***.

Settings Define

The Set-Terminal Settings Define command allows you to create or edit a profile using the Communication Profile definition menu. Any changes or edits to settings are saved to a file when you exit the Communication Profile menu by pressing **F10**.

When you begin executing this command you are prompted for a profile filename. Enter a new filename at the prompt or select a profile to edit from the file prompter menu. You can identify a profile by its .ucp file extension.

Settings Edit

Set-Terminal Settings Edit allows you to change the current communication profile settings. Once you've executed this command, the Communication Profile definition menu is displayed. Use this menu to change the current profile settings.

IMPORTANT: Any settings that you change will not be saved to a file until you execute the Set-Terminal Settings Save command.

The Quick Key **Alt S** allows you to execute the Set-Terminal Settings Edit command, displaying the Communication Profile menu.

Settings Load

When you select Set-Terminal Settings Load, you are prompted for a filename for a previously defined profile. The file prompter menu is displayed if the current directory contains any previously defined profiles. Select a profile with the arrow keys, or specify a profile that is in another directory and press **Enter**.

The Quick Key **Alt L** allows you to start execution of the Set-Terminal Settings Load command.

Settings Save

The Set-Terminal Settings Save command saves the current settings into a file. When you execute this command you are prompted for a filename. Enter the filename and press **Enter**. If a profile

is currently loaded, simply press **Enter** at the prompt, and the file will be updated with the current settings and any changes that may have been made.

Settings Undefine

The Set-Terminal Settings Undefine command deletes a profile that has been created previously.

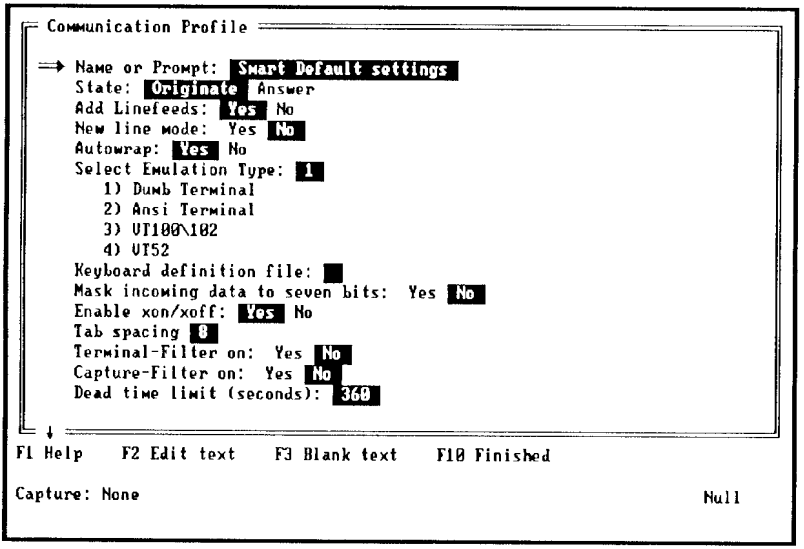
Communication Profile Settings

After you select either the Set-Terminal Settings Edit command (editing the currently loaded settings) or the Set-Terminal Settings Define command (editing stored settings), the first screen of the Communication Profile definition menu is displayed. Figure 7-7 illustrates this menu.

To move between settings, move the pointer at the left side of the screen up or down using the arrow keys. There are several pages of profile settings. As you move the pointer down to the bottom of the screen, it automatically advances to the next page. You can also press **PgUp** and **PgDn** to move to different pages of the profile settings.

Once you've moved the arrow to the setting you wish to select or edit, either type in a response, or for those settings that include options, press the **Spacebar** until the desired option is highlighted.

Figure 7-7



The six categories of settings are General, Originate, Answer, Modem, Text File Transmission, and Advanced User.

General Settings

The general settings are used in both Originate and Answer state. The items appear here as they do on the screen.

Name or Prompt. This setting has two functions, depending on which state ANGOSS Communications is in. In Originate, it serves as a short description of the settings. If the settings are to be used when calling another computer, you can leave this option blank or type a short description of the settings. In Answer, this setting is sent to the calling system as a greeting.

State. The State setting allows you to choose Originate if you are calling another computer (using the Connection Dial command) or Answer if you are receiving calls from another computer (using the Connection Answer command).

If you load settings with Originate selected, you will be unable to execute the Connection Answer command because Originate is used only with the Connection Dial command. The opposite is true of Answer. If you load settings with Answer selected, you will be unable to execute the Connection Dial command.

Add Linefeeds. This setting allows you to specify whether an automatic linefeed should be executed after every carriage return received. Select **yes** at this setting for computer systems that do not send a linefeed at the end of a line.

This setting can be changed, after you connect, with the Set-Terminal Settings Edit command. If received lines overwrite each other, set this option to **yes**. If received lines are double spaced, set this option to **no**.

New Line Mode. This is related to the `Add Linefeeds:` setting. Select **yes** to add a carriage return to incoming linefeeds.

Autowrap. Select **yes** to move the cursor to the left margin of the succeeding line when characters overflow the right margin. Select **no** if you want characters to overwrite each other when they reach column 80.

Select Emulation Type. This setting specifies which type of terminal is emulated when the Terminal Window is displayed. The choices for this setting are:

1. **Dumb Terminal.** A "generic" terminal that performs no processing of received or transmitted signals.
2. **ANSI Terminal.** The ANSI terminal option recognizes the supported ANSI control sequences that are received and performs the appropriate terminal operation. This type of terminal emulation can display some graphics characters and colors.
3. **VT100/102 and**
4. **VT52.** These are terminals that are widely used in industry for various types of multi-user (mainframe) computers.

Keyboard Definition File. This setting is used to specify a keyboard redefinition and can be used in connection with the terminal emulation option. It allows the keys on your keyboard to be more closely matched to a familiar terminal or necessary keyboard layout.

Once the Keyboard Definition filename is entered, it will be loaded whenever this group of settings is loaded. The Keyboard Definition file must be created using the Set-Terminal Keyboard Define command.

Mask incoming data to seven bits. This setting specifies whether the high bit is set to zero on incoming characters. Select **no** if you want the characters to pass through unchanged. Select **yes** if you want all characters to be masked before passing through the Terminal filter or the Capture filter. This process is also referred to as high bit masking. This setting has no effect on the Xmodem protocol.

Enable XON/XOFF. This setting specifies whether ANGOSS Communications uses XON/XOFF protocol. XON/XOFF protocol stops and starts the flow of data to prevent it from flowing faster than the receiving computer can process it. If this setting is enabled, your system watches for an XOFF character when it is sending data. If your system finds one, it stops transmitting until an XON character is received. Also, if characters are being received faster than your system can process them, ANGOSS sends an XOFF character to the other system. It then sends an XON character as soon as it catches up. If this parameter is disabled, no special processing is done during sending or receiving. Normally, you should select **yes** for this setting.

Tab Spacing. This setting determines spacing when a tab character is received. You can enter any value between 3 and 20; the default is 8.

Terminal-Filter on. This setting allows the terminal filter to be turned on or off. If the filter is on, any characters selected on the terminal filter table are not displayed on your screen. If the filter is off, all received characters are passed directly to the screen.

Capture-Filter on. This setting allows the capture filter to be turned on or off. If the filter is on, any characters selected on the capture filter table are not captured. If the filter is off, all received characters are captured.

Dead time limit (seconds). This setting specifies the maximum time that a connection will be maintained when no activity occurs. Any value between 30 and 9,999 seconds may be entered. The dead time limit is used to detect when the other computer is no longer sending data. This setting can be particularly useful during project execution; if two computers are communicating automatically (using two projects), and one stops processing but stays on-line, this parameter disconnects the phone lines after the specified dead time limit.

Originate Settings

The originate settings are used when you are placing a call to another computer system. The items appear on the screen in the order shown below.

Number. The `Number:` setting is the phone number of the computer you are going to call. The number may include up to 40 characters. Currently, the characters 0123456789TPRtp,*#()-

; can be included in this setting. This setting is not needed if your system will be answering another computer's call.

Originate Password. While originating a call, ANGOSS Communications interprets receipt of a **Ctrl E** (decimal value 5) from the answering system as a request for a password. ANGOSS then answers with the string you specify in this setting.

Dial Prefix. This setting allows you to specify a different dial prefix. A dial prefix is the sequence of characters that is sent to the modem before the phone number is sent. This setting can be used to alter the dial prefix for activities such as pulse dialing, rather than tone dialing. It can also be used to define a dial prefix for a non-supported modem. A vertical bar (|) may be used to indicate a carriage return.

Dial Suffix. The `Dial Suffix:` setting allows you to specify a different dial suffix. A dial suffix is the sequence of characters that is sent to the modem after the phone number is sent. The vertical bar (|) may be used to indicate a carriage return.

Seconds to wait between redials. This setting specifies the number of seconds ANGOSS Communications will wait before trying to dial a number again. It is used in conjunction with the `Maximum number of re-dial attempts:` setting. Any value between 0 and 9,999 may be entered.

Maximum number of re-dial attempts. This setting specifies the number of times the program will re-dial a busy number before terminating the Connection Dial command. Any value between 0 and 9,999 may be entered.

Seconds to wait for carrier. This setting specifies the number of seconds the program will wait to receive a carrier signal after a number is dialed. Any value between 1 and 255 seconds can be included.

Answer Settings

The Answer Settings are used when you are receiving a call from another computer system. The items appear on the screen in the order shown below. These settings are ignored when you originate a call to another computer.

- Receive/Transmit Password.
- Receive Password.
- Transmit Password.

Connect-Only Password. These four passwords are used to determine the originator's rights when ANGOSS is in Remote Command Mode. If a password has been specified here, when the answering computer answers the phone the caller is prompted to enter a password. The password that is entered determines what rights the caller will have. Receive-only allows the caller to download files. Transmit-only allows the caller to upload files. Transmit/Receive allows the caller to upload or download files. Connect-only allows the caller to enter the system but not to upload or download files. If the passwords are left blank, the originator is not prompted. See the section called ***Remote Command Mode*** in ***Chapter 5*** for additional information.

Number of rings. This setting is used only in Answer state. It designates how many rings are needed before ANGOSS Communications answers the phone. Any number between 0 and 10 may be entered. This setting will be ignored if you have set your modem to automatically answer in the modem definition file.

Connection time limit (minutes). This setting specifies the maximum time that the system will remain on-line after answering the phone and is used to prevent one caller from tying up the system. Any value between 1 and 9,999 minutes may be entered.

Modem Settings

The modem settings are used to specify the modem type and corresponding parameters. The items appear on the screen in the order shown below.

Select Modem Type. This setting allows you to select the type of modem you are using from a prompter when you press **F6**. Select Null Modem if your computer is directly connected to another computer by a serial cable.

Modem Port. This setting defines which communication port is to be used. Select either Serial-1 or Serial-2 depending on the port to which your cable is connected.

Baud Rate. The `Baud Rate:` setting determines how fast the data is sent. The terms "baud rate" and "bits persecond" are equivalent. Bits per second describes how many computer digits (1s and 0s) are being transferred per second. The baud rates of two systems communicating with each other must be the same, or your screen may begin filling up with "garbage" characters. Normally, it is best to set the baud rate at the highest speed that your modem supports. With most modems, if a faster baud rate modem connects to a slower modem, the faster modem will automatically adjust its speed downward to match the slower modem's baud rate. If not, and you begin receiving garbage, change the baud rate and re-connect.

Data Bits. The `Data Bits:` setting allows you to change the number of data bits sent for each character. Use the data bit setting required by the remote computer.

There is no general rule for how many data bits to use, however, if you plan to use parity checking, you must generally choose 7 data bits or less. Check with the manuals or operator of the computer system you are going to be communicating with for additional information.

Parity. Parity is a form of error checking that can be performed on each byte that is sent. Many computer systems ignore the parity bit, although some systems require it. Check with the manuals or the operator of the remote computer for the correct settings, if necessary.

Stop bits. This setting allows you to set the number of stop bits sent after each byte. Normally, you would use 1 stop bit.

Duplex. The `Duplex:` setting specifies which computer system is responsible for echoing the typed characters. The general rule is that the originating computer uses full duplex, and the answering computer uses half duplex. You can also use the Quick Key **Alt U** to change the duplex.

Text File Transmission

These options affect only the Data Transmit Text-File command. The items appear on the screen in the following order:

Expand tabs. This setting determines whether tabs within the text file are transmitted as tab characters or as spaces. If you select yes for this setting, tabs in the text file are transmitted as spaces (ASCII value 32); if you select no, tabs are transmitted as tab characters (ASCII value 9). This setting also specifies that transmitted tabs be expanded to the tab width selected in the `Tab Spacing:` option of the General Settings.

Pad blank lines. This setting specifies whether to pad blank lines with a space before transmitting them. Padding is required by some mainframe computer systems. If you select yes for this setting, any blank lines transmitted in a text file will have a space inserted before the carriage return. If you select no, blank lines are transmitted as carriage returns, with or without linefeeds, as determined by the `Filter Linefeeds:` setting.

Filter Linefeeds. In a standard text file created in ANGOSS, each line is terminated with a combination of two characters, a carriage return and a linefeed. The linefeed filter setting specifies whether linefeeds are filtered out of transmitted data. Some computers expect only a carriage return, rather than a linefeed and a carriage return, in which case linefeeds must be filtered out. If you select yes for this setting, linefeeds are not transmitted in text files. If you select no, linefeeds are transmitted.

Select Character Delay. Use this setting to specify the amount of time ANGOSS Communications waits between transmitting characters to the remote computer. Some computer systems are not able to accept characters as fast as your system can send them, so you should select a character delay. The No Delay option bypasses all character delays and is the default setting. The Wait for Echo option causes the program to wait until the previous character is echoed back before transmitting the next character. The selections for character delay are:

0 No delay between characters. Your computer will send them as fast as it can.

1 Wait for echo. Your computer will wait for the last character it sent to be echoed (sent back) by the remote computer before it sends the next character.

A delay time period that you select. If a number greater than 1 is entered, it represents the number of tenths of a second to delay after each character. For example, if 10 is entered, the program pauses one second between the transmission of each character.

Select Line Delay. The Line Delay option specifies how much time ANGOSS Communications waits after a complete line is transmitted.

0 No delay. There will be no delay between the transmission of each line. Your computer will send each line as fast as it can.

1 Wait for CR. When you select this option, your computer will wait for the remote computer to send a carriage return before sending the next line.

2 Wait for User. When you select this option, your computer stops after each line and waits for you to press a key.

3 Wait for Prompt. The Prompt option stops after each line and waits for the remote computer to send a specified prompt. If you select this option you must also specify the prompt in the `Prompt to Wait For:` setting. You can make this prompt contain non-printable characters by entering them with a preceding backslash, followed by the ASCII value (decimal) of the character.

Example:

\10	waits for a line feed character (ASCII 10)
\92\13\10	waits for backslash (ASCII 92), carriage return (ASCII 13) linefeed (ASCII 10)
\109	waits for "m" (ASCII 109)

Delay Time in 1/10 second. The Delay option allows you to enter a number representing how many tenths of a second to delay after each line is sent.

End of File delay time (seconds). Use this setting to specify how long ANGOSS Communications waits before terminating the Data Transmit Text-File command when no characters are being received.

Advanced User Settings

Debug Mode. This setting is used for debugging communications problems. When the program is in debugging mode, the Terminal Filter and the high-bit mask are disabled. Incoming data is displayed in decimal, hexadecimal, or character format.

Off is the normal setting. The remaining three options are used when debugging mode is desired. The Character option displays incoming data as characters. The Decimal option displays incoming data as decimal numbers. The Hex option displays incoming data as hexadecimal numbers.

Forced Local Echo. When set to on, this setting forces the data you are transmitting to be echoed to the screen, regardless of the duplex setting specified.

Maximum number of Xmodem retries. This setting is for Xmodem protocol only. Enter a number between 9 and 9,999 to specify the number of errors that will be tolerated during an Xmodem file transfer before transmission is canceled.

Break signal length (in hundredths of second). Use this setting to specify the length of a break signal (**Alt B** is the default Break Key). Enter the duration of the break signal in hundredths of a second; the default break signal length is one character frame. The Break Key is definable in a Keyboard Definition.

NOTE: To edit settings, use the Set-Terminal Settings Edit command. If you want to save any edited settings, use the Set-Terminal Settings Save command to store these settings in a file for later use.

Connection

The Connection commands are used to control the connection of your local computer to the remote computer.

Options for Connection include:

Answer. Answers incoming calls.

Dial. Dials a remote computer system.

Hangup. Disconnects a communication link.

Connection Answer

Select Connection Answer to answer an incoming call from a remote computer system. Before selecting this command, you must have loaded a communication profile that contains the appropriate answer settings. You can also use the Quick Key **Alt A** to immediately execute the Connection Answer command.

Once you've selected Connection Answer, your system will be ready to receive an incoming call. Press **Esc** to cancel Connection Answer.

Connection Answer automatically forces ANGOSS Communications into half duplex so the caller can see what is typed. If this is not suitable, you may select the Set-Terminal Duplex Full command after the phone has been answered to change to full duplex.

Related Profile Settings

Connection Answer must be used in conjunction with a communication profile. The General communication profile settings that affect operation of Connection Answer include `Name or Prompt:` and `State:`. The Answer settings that affect operation include the four password settings,

`Number of rings:`, and `Connection time limit:`. For specific information about these settings, see the section in this chapter on the Set-Terminal Settings commands.

Connection Dial

Use Connection Dial to originate a call to a remote computer system. Before selecting this command, you must have loaded a communication profile that contains the appropriate Originate settings, including a modem selection other than Null Modem.

Options for Connection Dial include Carrier and Voice.

Dial Carrier

Use the Connection Dial Carrier command when you expect a computer to answer with a carrier signal. When you execute this command, you are prompted for a number to dial. If you have specified a number in the communication profile, simply press **Enter** to begin the call. If there is no number specified in the profile, you will see the message `There is no number to dial in the current profile`. You must then type in a number.

The Quick Key **Alt D** allows you to execute the Connection Dial Carrier command, using the number currently contained in the settings. If no number has been specified, you must select Dial from the menu and supply a number at the prompt or edit the current profile.

Related Profile Settings

Connection Dial Carrier must be used in conjunction with a communication profile. The General communication profile setting that affects operation of Connection Answer includes `State:`. The Originate settings that affect operation include `Number:`, `Originate Password:`, `Seconds to wait between re-dials:`, `Maximum Number of re-dial attempts:`, and `Seconds to wait for carrier:`. For specific information about these settings, see the section in this chapter on the Set-Terminal Settings commands.

Dial Voice

Use the Dial Voice command when you wish to talk with the remote computer operator before making a data connection. Once you've selected Dial Voice, you are prompted for a phone number. Both you and the person you are calling must have voice phones connected to your modems.

If you have loaded a profile that initializes the modem, you can switch to data transfer after the connection is established by selecting the Set-Terminal Goto Carrier command.

Related Profile Settings

Connection Dial Voice must be used in conjunction with a communication profile. The General communication profile setting that affects operation of Connection Dial includes `State:`. The Originate settings that affect operation include `Number:`, `Seconds to wait between re-dials:`, and `Maximum Number of re-dial attempts:`. For specific information about these settings, see the section in this chapter on the Set-Terminal Settings commands.

Connection Hangup

Select the Connection Hangup command to disconnect a communication link with another system. The Quick Key **Alt H** allows you to immediately execute the Hangup command.

Data

Use the Data commands to control data that you are transmitting or receiving.

Data provides the following options:

Capture. Retrieves incoming data and sends it to the buffer, a file, or a printer.

Receive. Receives data files from another system.

Transmit. Sends data files to another system.

Get. Takes the next character or line that is received from the Terminal Window and places it into a project variable.

Match. Halts a project file until a specified sequence of characters is received.

Output. Sends a specified set of characters directly to the modem port.

Send. Sends files received with ANGOSS Communications to other ANGOSS modules.

Format. Defines or undefines a file containing a specified conversion format for text.

Xfer-Time. Estimates time to transmit a file at the current baud rate.

Data Capture

Select Data Capture to "trap" incoming text into the buffer (temporary storage), a file, or a printer.

All characters are filtered through the capture filter if it is enabled in the current settings. A capture filter is attached to each profile.

Capture Buffer

Select Data Capture Buffer to capture incoming data and store it in the buffer. The buffer is memory that is available for storing data temporarily. The Quick Key **F5** works as a toggle so you can choose to capture to the buffer or not.

The following options are available for Data Capture Buffer:

Begin. Select this option to begin capturing data to the buffer. The Status Line at the bottom of the screen indicates the buffer status and shows the amount of memory left for data storage.

If the buffer becomes full while capturing data, a message appears indicating that the buffer is full. You are asked whether to save the data in the buffer. You can then choose to clear the buffer by typing n, or you can type y to save the data to a file. You must then enter a name for a file where the data can be saved. If you name a file that already exists, you can choose to overwrite the file by typing o, or you can append the buffer data to the file by typing a. Press Esc to abort the command, if necessary.

Clear. Select Clear to erase the contents of the buffer. If there is currently data stored in the buffer, the prompt `Save buffered text? (y/n),` appears.

If you type n in response to the prompt, the data in the buffer will not be saved and the buffer will be cleared. If you type y, you are prompted to enter a filename. If you name a file that already exists, you can choose to overwrite the file by typing o, or you can append the buffer data to the file by typing a. Press **Esc** to abort the command, if necessary. In either case, after clearing the buffer, data capture is turned off. You can begin saving to the buffer again by selecting Data Capture Buffer Begin.

End. Select this option to stop saving text to the buffer. Data capture is suspended when you select this option, and no additional incoming text is added to the buffer until you execute Data Capture Buffer Begin.

Save. Select this command to store the current buffer contents into a file. When you execute this command, you are prompted to enter a filename. If you name a file that already exists, you

can choose to overwrite the file by typing o, or you can append the buffer data to the file by typing a. Press **Esc** to abort the command, if necessary.

View. Select View to display the current contents of the capture buffer on your screen. You can scroll through the contents of the buffer by pressing **PgUp**, **PgDn**, **up arrow** or **down arrow**. Press **Esc** to stop viewing the contents of the buffer. Press the Quick Key **Alt V** to immediately execute the Data Capture Buffer View command.

Capture File

Select Data Capture File to capture data to a file. The Quick Key **F7** works as a toggle so you can choose to capture to a file or not. Options for this command are Begin and End.

Begin. Select Data Capture File Begin to begin saving captured data to a file. You are prompted to enter a filename. You can choose to append new data to the last file captured by pressing **Enter** instead of entering a filename. However, if no file has been captured to since you entered ANGOSS Communications, you will see an `Invalid Filename` message. Press any key to clear the message. Select Data Capture File Begin again and enter a valid filename, including a full path name if you want to save the file somewhere other than the current directory. If you do not enter a path name, the file will be saved in the current directory.

If you name a file that already exists, you can choose to overwrite the file by typing o, or you can append the data to the file by typing a. Press **Esc** to abort the command, if necessary.

End. Select this option to stop capturing data to a file. You can continue capturing to the same file by selecting Data Capture File Begin and pressing **Enter** at the `Enter filename:` prompt. You can also continue by pressing **F7**.

Capture Printer

Select Data Capture Printer to control the capture of incoming text to a printer. The Quick Key **F6** acts as a toggle so you can choose to capture to a printer or not. Options include Begin and End to start or stop data capture.

Printer settings are determined on the Hardware Preferences menu. See the discussion of the Tools Preferences Hardware command in ***ANGOSS Software System*** for information about printer settings.

Data Receive

Use Data Receive to receive a file sent from another computer system. The Quick Key **Alt R** allows you to start execution of the Data Receive command. Options for this command include Text-File and Xmodem.

Receive Text-File

Select Data Receive Text-File to receive a file in text file format, also known as standard ASCII file format. Text files contain only printable characters. Once you've received a text file, you can convert it into an ANGOSS document, worksheet, or data-file within each ANGOSS module. Text files can be edited using ANGOSS' text-editor, found by selecting the Tools Text-Editor command.

Once you've selected the Text-File protocol, you are prompted to enter a filename for the incoming file. The filename can also include a path, if necessary. You can select a filename that is different from the name under which the file is stored at the transmitting computer. The name that you enter here does not change the file's name at the transmitting computer. If you enter a filename that already exists, you can choose to overwrite the current file with new data, or append the new data to the end of the current file. Type **o** to overwrite the file; type **a** to append data to the end of the existing file.

After you name the file and press **Enter**, you are prompted to `Wait for expression:`. Entering an expression is optional. You can enter an expression (a string of characters) that will be sent to the transmitting computer. The receiving computer will not accept a transmitted text file until the expression has been echoed back to it from the transmitting computer. This allows you to know whether the transmitting computer is ready to transmit the text file.

Expressions can contain any valid ANGOSS expression that evaluates to a text string. If you enter a string, be certain to enclose it in quotation marks. For more information about expressions, refer to ***ANGOSS Formula Reference***.

If you do not enter an expression, ANGOSS begins receiving data immediately. ANGOSS Communications saves received data under the filename you specified until an "end-of-file" marker (typically a CTRL-Z) is received from the transmitting computer.

During execution of the Data Receive Text-File command, the capture filter can be used to filter any unwanted characters. If the high-bit mask is turned on (in the current settings), any characters above ASCII decimal 127 are stripped of their highest bit. To receive files containing eight bit data, use the Data Receive Xmodem command, or make sure that the high-bit mask is disabled in the current settings.

Receive Xmodem

Select Data Receive Xmodem to receive files containing any type of data, for example, binary files, executable files, ANGOSS documents, worksheets, and text files.

Xmodem protocol checks all data being received for errors. If errors are detected, the data is transmitted again until an error-free transmission occurs. The Xmodem protocol should be used most of the time because of its error checking and correcting capabilities.

Once you've selected Data Receive Xmodem, you are prompted to enter a filename for the incoming file. The filename can also include a path, if necessary. You can select a filename that is different from the name under which the file is stored at the transmitting computer. The name that you enter here does not change the file's name at the transmitting computer. If you enter a filename that already exists, the prompt `File already exists. Overwrite it? (y/n)` appears. Type **y** to overwrite the existing file with new data. Type **n** to stop execution of the command. If you still want to receive the incoming file while retaining the old file, you must enter a different name for the incoming file.

When the file is being received, the following information appears on the status screen:

Receiving file: text.doc

Current block a

Errors

Current block b

Total c

The current block being received is indicated by "a"; "b" is the number of errors that have been detected in the current block; and "c" is the number of total errors that have been detected in the received file. If errors are detected, the block is retransmitted until an error-free block is received.

If no transmission is received within two minutes after the Data Receive Xmodem command is executed, the command is halted.

NOTE: ANGOSS Communications checks for errors using Xmodem checksum.

Data Receive Xmodem always receives with 8 data bits, no parity, and 1 stop bit. It automatically switches to those settings regardless of the number of data bits defined in the current settings. When the file is received, the original settings are returned.

IMPORTANT: Both the transmitting and receiving computers must be using the same transmission protocol.

Data Transmit

Use Data Transmit to transmit a file to another computer system. The Quick Key **Alt T** allows you to start execution of the Data Transmit command. Options for this command include Text-File and Xmodem.

Transmit Text-File

Select Data Transmit Text-File to transmit a file in text file format, also known as standard ASCII file format. Text files contain only printable characters. If you want to transmit a ANGOSS document, worksheet, or data-file, you must first convert it to a text file before transmitting it using Text-File protocol.

Once you've selected the Text-File protocol, you are prompted to enter the name of the file you want to transmit. The filename can also include a path, if necessary. Enter the filename and press **Enter** to begin transmission.

Transmit Xmodem

Select Data Transmit Xmodem to transmit files containing any type of data, for example, binary files, executable files, ANGOSS documents, worksheets, and text files. Enter the name of the file to transmit.

Xmodem protocol checks all data being transmitted for errors. If errors are detected, the data is transmitted again until an error-free transmission occurs. The Xmodem protocol should be used most of the time because of its error checking and correcting capabilities.

When a file is being transmitted with the Xmodem protocol the following information appears on the Status Window:

Sending file: text.doc

Xmit time (mins.): a

Total blocks: b

Current block: c

Complete: d

The estimated number of minutes needed to send the file is represented by "a"; "b" is the total number of blocks; "c" is the current block being sent; and "d" is the percentage of the transmission completed.

Data Transmit Xmodem always transmits with 8 data bits, no parity, and 1 stop bit. It automatically switches to those settings regardless of the number of data bits defined in the current settings. When transmission has been completed, the original settings are returned.

Related Profile Settings

The `Maximum Number of Xmodem Retries:` option under the Advanced User Settings on the Communication Profile definition menu controls the total number of times a Data Transmit Xmodem command will attempt to retransmit blocks during transmission. The number of retries can be between 9 and 9,999. If the number of retries exceeds the number that you enter here, the command will be aborted. Transmission will also halt if the number of errors for one block exceeds the maximum of 9 errors per block.

NOTE: The number of retries is the total number for all blocks allowed during a single Xmodem file transfer.

If you cannot obtain an error-free transmission of a given file after the number of re-tries specified in the current settings, there may be severe noise on the line.

IMPORTANT: Both the transmitting and receiving computers must be using Xmodem checksum.

Data Get

The Data Get commands are used primarily in Project Processing. Data Get takes the next character or line that is received from the Terminal Window and places it into a project variable.

For example, you could create a project file that calls Dow Jones and searches for a particular stock price. You could then use Data Get Line to put that stock quote into a project variable that can then be used in a project file designed to track stock trends.

IMPORTANT: If a Remote Command Mode request, **Ctrl C**, is received while your system is gathering characters or lines into a project variable, the Data Get command is suspended and all data gathered up to that point is lost. The remote command is then executed. Once the command is executed, the Data Get command begins again. You can abort operation of a Data Get command by pressing **Esc** locally.

The Quick Key **Alt G** allows you to start execution of the Data Get command. Options include Character and Line.

The syntax for the Data Get commands is as follows:

Data Get Character variable <***varname***>

Data Get Line variable <***varname***>

where <***varname***> is a project variable.

Get Character

The Data Get Character commands indicate that the next character that is received on the Terminal Window should be placed in a variable. Data Get Character stops once the next character is detected. The variables you can use are described in the section titled ***Variables***.

Get Line

The Data Get Line commands indicate that the next line that is received on the Terminal Window should be placed in a variable. Data Get Line stops after a carriage return is detected or when it receives 254 characters. The carriage return is included in the variable. The variables you can use are described in the section titled ***Variables***.

Variables

After selecting the Character or Line option, you are prompted to `Enter a variable name:`. Enter the name of a project file variable that is used in the project being constructed.

Refer to ***Project Processing*** for more information about project files and variables.

Data Match

The Data Match command is normally used in Project Processing. This command causes the project to pause until the specified sequence of characters is received. Project execution continues only when the specified characters are received.

When you select Data Match, you are prompted to `Enter a character expression to match:`. Expressions can contain any valid ANGOSS expression that evaluates to a text string. If you enter a string, be certain to enclose it in quotation marks. For more information about expressions, refer to ***ANGOSS Formula Reference***.

IMPORTANT: If a Remote Command Mode request, **Ctrl C**, is received while your system is searching for characters to place into a project variable, the Data Match command is suspended and all data gathered up to that point is lost. The remote command is then executed. Once the command is executed, the Data Match command begins again. You can abort operation of a Data Match command by pressing **Esc** locally.

Be aware that although the Data Match command has suspended command execution, capturing to the buffer, printer, or a file does continue.

The Quick Key **Alt M** allows you to start execution of the Data Match command; you are prompted for character(s) to match.

Related Profile Settings

If you have set the `Terminal-Filter:` setting to **on** in the current profile, all characters are filtered through the Terminal Filter table before being checked by the Data Match command.

NOTE: Make certain that the Data Match command is not searching for a filtered character or a character that will be changed by the high-bit mask. If either of these situations exists, the match will never occur.

Data Output

Data Output sends a specified set of characters directly to the serial port configured as your modem port. It is normally used in Project Processing to allow an unattended computer to send text (e.g., an access code or a password) to the other system. It is very useful in creating automatic login projects.

COMMENT: Data Output can be used to send special characters to the remote computer; for example, Data Output chr(27) sends **Esc**. This is useful if **Esc** or other keys are defined as command keys.

The Quick Key **Alt C** allows you to start execution of the Data Output command.

When you select Data Output, you are prompted to `Enter a character expression to output:`. Expressions can contain any valid ANGOSS expression that evaluates to a text string. If you enter a string, be certain to enclose it in quotation marks.

If you press **Enter** without entering a text expression (no characters are entered), a carriage return is sent to the serial port.

Data Send

Select Data Send to send data from ANGOSS Communications to another ANGOSS module. If you have purchased and installed all of ANGOSS, your options include Database, Spreadsheet, and Wordprocessor. Once you've selected the option for the destination module, specify whether you are sending data that is currently stored in the capture buffer or in a file.

The data may be sent unformatted (in the same format it currently exists in the file) or formatted in a standard ANGOSS format. You are then prompted to `Enter project file for next application`:. You can enter the name of a project file in the application to which you are sending. Project files can be used to automate your data handling. If you enter the name of a project created in the next application, it will be executed when the data is transferred. For more information about project files, see ***Project Processing***. If you are not using a project file, press **Enter** at the prompt.

Send *module* Buffer

Select the Data Send ***module*** Buffer commands to send data currently in the buffer to the specified module.

Formatted-By. This option allows you to specify a formatting definition to be used in translating the data as it is sent. This option can be used only with files that have a fixed format, such as a file produced by printing a report to a text file. It is most often used when sending to ANGOSS Database or ANGOSS Spreadsheet. The format file must have been previously defined using the Data Format Define command. When you select this option, you are prompted to `Enter format filename:`. You can include a path name.

Un-Formatted. Select this option to send data as it appears in the buffer. This is most often used when sending to ANGOSS Word Processor.

Send *module* File

Select Data Send ***module*** File to send data from a file to the specified module. You are prompted for a filename.

Formatted-By. This option allows you to specify a formatting definition to be used in translating the data as it is sent. This option can only be used with files that have a fixed format, such as a file produced by printing a report to a text file. It is most often used when sending to ANGOSS Database or ANGOSS Spreadsheet. The format file must have been previously defined using the Data Format Define command.

When you select Data Send ***module*** File Formatted-By, you are prompted to `Enter format filename:`. You must type the filename of a format definition or select a filename from the prompter list and press **Enter**. You can include a path name with the filename.

Un-Formatted. Select this option to send data as a standard text file. This is most often used when sending to ANGOSS Word Processor.

Data Format

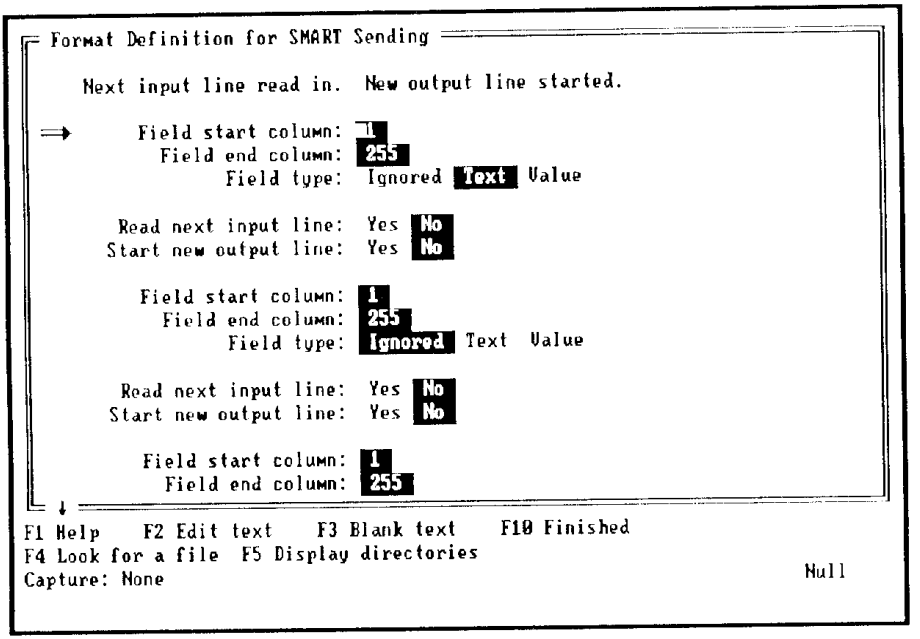
Select Data Format to define or undefine a file containing a specified conversion format for text. The conversion format translates a text file into database fields and records or worksheet rows and columns. This conversion format is used in conjunction with the Data Send command. Options for Data Format include Define and Undefine.

NOTE: Your data is formatted as it is sent, but your stored file is not permanently altered.

Format Define

When you select Data Format Define, you are prompted for a format definition filename. Enter a new filename (a format definition you wish to create) or select an existing filename (one you wish to edit) from the prompter list and press **Enter**. The Format Definition menu is then displayed, as shown in Figure 7-8.

Figure 7-8



Format Definition Menu

The Format Definition menu consists of 25 groups of data format specifications. You can think of each format specification as a rule that is applied to the text being sent. Each group consists of five specifications that you must supply for each column or field:

Field start column:

Field end column:

Field type: Ignored Text Value

Read next input line: Yes No

Start new output line: Yes No

For each group you must define the starting and ending column of each field in the text file with `Field start column:` and `Field end column:`. Each prompt can contain a number from 1 to 255.

NOTE: The values you specify at these two prompts must be between 1 and 255; if you select anything other than a number in that range, an error message will be displayed. To change a value select **F2** to edit the field.

Next, you can specify the field type to be either value or text, or you can ignore it.

The last two options, `Read next input line:` and `Start new output line:`, specify how the text file will be divided into rows or records.

Three formats can be defined, as follows:

1 Convert each line into one spreadsheet row or one database record.

For this format, always set both the `Read next input line:` and `Start new output line:` prompts to **No**.

2. Convert each line into two or more spreadsheet rows or database records.

For the second format, set the `Start new output line:` prompt to **Yes** after specifying the number of columns to convert.

For example, if you have 15 columns in a text file, and you want the file divided into three records per line, you would set the `Start new output line:` prompt to **Yes** on the fifth and tenth groups. Here is an example of the first line of the text file:

100 AAA 200 BBB 300 110 CCC 210 DDD 310 120 EEE 220 FFF 320

After this example line is converted, the format looks like this:

100 "AAA" 200 "BBB" 300

110 "CCC" 210 "DDD" 310

120 "EEE" 220 "FFF" 320

The format definition is shown here:

(1) Field start column: 1

Field end column: 4

Field type: Value

Read next input line: No

Start new output line: No

(2) Field start column: 5
Field end column: 7
Field type: Text
Read next input line: No
Start new output line: No

(3) Field start column: 8
Field end column: 12
Field type: Value
Read next input line: No
Start new output line: No

(4) Field start column: 13
Field end column: 15
Field type: Text
Read next input line: No
Start new output line: No

(5) Field start column: 16
Field end column: 20
Field type: Value
Read next input line: No
Start new output line: Yes

(6) Field start column: 21
Field end column: 24
Field type: Value
Read next input line: No
Start new output line: No

3. Convert one or more text lines into one spreadsheet row or one database record.

   For the third format set the `Read next input line:` prompt to **Yes** after each group of columns that make up a row.

For example, if your text file has five columns, and you want each row to consist of a group of three lines, you would set the `Read next input line:` prompt to **Yes** on the fifth and tenth groups. Following is an example of the first nine lines of a text file.

100 AAA 300 BBB 500

110 CCC 310 DDD 510

120 EEE 320 FFF 520

140 GGG 340 HHH 540

150 III 350 JJJ 550

160 KKK 360 LLL 560

170 MMM 370 NNN 570

180 OOO 380 PPP 580

190 QQQ 390 RRR 590

After these lines are converted, they look like this:

100 "AAA" 300 "BBB" 500 110 "CCC" 310 "DDD" 510 120 "EEE" 320 "FFF" 520

140 "GGG" 340 "HHH" 540 150 "III" 350 "JJJ" 550 160 "KKK" 360 "LLL" 560

170 "MMM" 370 "NNN" 570 180 "OOO" 380 "PPP" 580 190 "QQQ" 390 "RRR" 590

The format definition for this format follows:

(1) Field start column: 1
Field end column: 4
Field type: Value
Read next input line: No
Start new output line: No

(2) Field start column: 5
Field end column: 7
Field type: Text
Read next input line: No
Start new output line: No

(3) Field start column: 8
Field end column: 12

Field type: Value
Read next input line: No
Start new output line: No

(4) Field start column: 13
Field end column: 15
Field type: Text
Read next input line: No
Start new output line: No

(5) Field start column: 16
Field end column: 19
Field type: Value
Read next input line: Yes
Start new output line: No

(6) Field start column: 1
Field end column: 4
Field type: Value
Read next input line: No
Start new output line: No

Sending Formatted Data

When you select Data Send ***module*** Formatted-By, the data formatting specifications are used in sequential order on the text file specified.

The first line of text is read; next, all 25 data format specification groups are used to format the output line, which is written to a temporary file. The next line of text from the file is read in and the process is repeated until all 25 data format specification groups are used. This continues until all lines of the text file have been read and formatted. At that point, the ANGOSS module the file was sent to is activated.

You should remember the following information when you define a format for sending data. Each line or group of lines must have the same column spacing, and each column must contain the same data type. Columns in the line can be processed twice. `Read next input line:` is used when a group of items (a record) is contained on multiple lines and you wish to combine the items into one unit

of information (record) in the output. By default, a new line is read and a new output line is started during each cycle of the Send operation. `Start new output line:` is used when the input text has multiple units of information (e.g., multiple records) on one line.

Format Undefine

This command removes a previously created format definition. When you execute this command, you are prompted for a format definition filename. Enter a filename to be erased.

Data Xfer-Time

Select Data Xfer-Time to calculate the approximate minimum time required to transmit a file. The calculation is based on the current baud rate and the byte size of the file.

When you execute Data Xfer-Time, you are prompted for a filename. Enter a filename and path, if necessary. The approximate time required to transmit that file (in minutes) will be displayed on your screen.

The Quick Key **Alt Q** allows you to start execution of the Data Xfer-Time command.

Transfer time can be approximated with the following ANGOSS formula:

round((((<file size> * <packet>) / <baud rate>) / 60), 2)

Where:

<file size> = The size of the file in bytes.

COMMENT: If you want Xmodem times use 8 data bits, 1 stop bit, and no parity (i.e., <packet> = 10).

<packet> = (1 + data-bits + parity-bit + stop-bits). Data-bits and stop-bits correspond to the values being used in your settings. If your parity is none, parity-bit = 0. If your parity is even, odd, mark, or space, parity-bit = 1.

<baud rate> = The current baud rate setting of the currently loaded settings.

This formula calculates the transfer time at a given baud rate, assuming there are no errors or retransmissions. Be sure to use the correct baud rate for your system. The file size is multiplied by

<packet> to yield bits and divided by bits per second (baud). This gives the time for transfer in seconds. Seconds divided by 60 equals transfer time in minutes.

NOTE: The calculated times will be approximate.

Tools

The Tools commands provide various file manipulation capabilities. You can copy, erase, print, or rename files; manipulate directories; or set preferences for global, hardware, or Communications preferences. You can also use the Tools Calculator or define macros.

Only the Tools Preferences Communications commands will be discussed here. Refer to ***ANGOSS Software System*** for detailed information on using the other Tools commands.

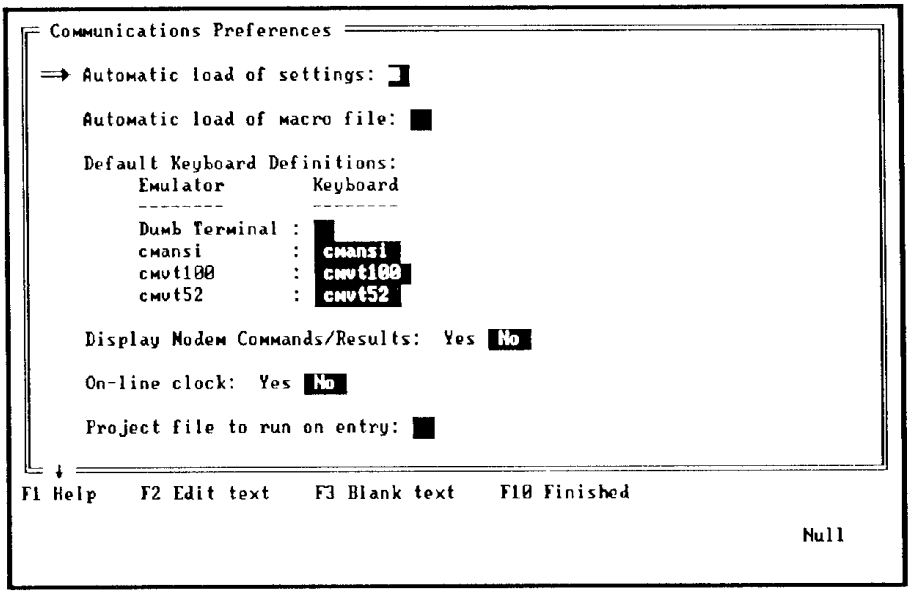
Tools Preferences

The Tools Preferences commands are used to configure default settings. When you select Tools Preferences, you must specify whether you want to set Communications, Global, or Hardware defaults. For information on the Global and Hardware options, refer to ***Chapter 9*** of ***ANGOSS Software System***.

Preferences Communications

When you select Tools Preferences Communications, ANGOSS displays the Communications Preferences definition menu, containing specification items that control how ANGOSS Communications performs whenever it is accessed. Any changes that you make to the specifications on this definition menu become the performance defaults the next time you enter ANGOSS Communications. Figure 7-9 shows the Communications Preferences menu.

Figure 7-9



Access the Communications Preferences definition menu to change the following Communications settings. Movement keys are listed in Table 7-1.

Automatic Load of Settings. Use this setting to automatically load a communications profile whenever you enter ANGOSS Communications.

Automatic Load of Macro File. A macro file contains a set of character output redefinitions for one or more keyboard keys. This menu item allows you to specify the name of a macro file to automatically load whenever ANGOSS Communications is accessed. The macro filename may be preceded by a path if the file is not located on the current path.

Default Keyboard Definitions. Select the Keyboard Definition that will be used as a default when ANGOSS Communications is using terminal emulation.

Display Modem Commands/Results. When set to yes, this setting allows you to see the command code sequences that ANGOSS Communications sends to your modem and can be

used in conjunction with the Set-Terminal Modem Define command. When you select yes for this setting, the following information is displayed on the screen as the modem is initialized:

<Command sequence sent to modem>

<Expected results>

<Actual results>

<Wait times>

When the command is finished the screen is restored to normal.

NOTE: If the command executes properly, lines 2 and 3 are the same. If the command does not execute properly, lines 2 and 3 will not be the same.

On-line Clock. This option determines if the on-line clock is displayed in the lower right corner of you terminal screen. When the clock is displayed it shows how long the current connection has existed. The clock is reset when you hang up or otherwise break the connection.

Communications Data Path. Enter the data path to be used for storing and retrieving files. The data path specified here overrides the data path specified in the Global Preferences Definition Menu. Unless another path is specified during a save or load operation, or by selecting Tools Directory New-Directory, ANGOSS always utilizes the Communications data path when storing or retrieving files.

Project File to Run on Entry. A project file contains a set of command format statements, including application commands and project commands, that perform some predetermined activity. This menu item allows you to specify the name of a project file to automatically execute whenever ANGOSS Communications is accessed. The project filename may be preceded by a path if the file is not located in the current directory.

Table 7-1 lists the keys and corresponding actions that may be used to move through the definition menu, specify options, respond to prompts, and record selected settings:

Table 7-1

Key	Action
F1	Display Help information
F2	Edit text on the prompt line. (Use arrow keys to move cursor while editing.)
F3	Delete text currently on the prompt line
F10	Exit the definition menu and store the setting
Esc	Cancel the command and restore the original settings. (ANGOSS then displays the prompt `Cancel without updating? (y/n)`. The original settings are restored only if you type y.)
down arrow	Move the cursor to the next option
up arrow	Move the cursor to the previous option
Ctrl Home	Move the cursor to the top of the definition menu
Ctrl End	Move the cursor to the bottom of the definition menu
PgUp	Move to the previous page of definition item
PgDn	Move to the next page of definition items
Home	Move to the top of the current scree
End	Move to the bottom of the current screen
Spacebar or +	Move the highlighter to the right one option
Backspace or -	Move the highlighter to the left one option

Help Commands

The Help commands invoke ANGOSS' extensive on-line help information. The following options are available:

About-Help. Displays information on how to use ANGOSS' on-line help feature.

Contents. Displays a table of contents for the on-line help.

Index. Displays an index of topics included in the on-line help information.

On-Error. Displays help text for specified error messages.

Tutorial. Invokes the tutorial for the appropriate module.

Help About-Help

Help About-Help displays the information explaining how to use ANGOSS' on-line help feature. On-line help includes context-sensitive help information as well as help for program error messages.

Help Contents

Help Contents displays a table of contents for ANGOSS' on-line help. Initially, only the first level of headings appears. Press **F4** to display the next level of headings and continue to do so until you reach the heading level you want. Select the topic for which you want help information and press **Enter**. The help information related to that topic is displayed. To return to the table of contents, press **F4**. To get to the index, press **F3**. To leave help and return to the module menu, press **F10**.

Help Index

Help Index displays an index for ANGOSS' on-line help. Initially, only the first level of the index is displayed. To reach the second level, press **F3**. To return to the first level, press **Esc**.

You may search the index for a particular word or phrase, if necessary, by pressing **F7** and entering the string you want to search for. The string cannot be longer than 40 characters. Press **F9** to repeat the search.

When you have selected a topic, the related help information appears. To return to the index, press **F3**. To leave help and return to the keyword menu, press **F10**. If you want to get to the table of contents, press **F4**.

Help On-Error

Help On-Error displays help text for specific error messages. When prompted, enter the number corresponding to your error message and press **Enter**. The appropriate help information is displayed.

For a listing of error messages and their corresponding numbers, refer to ***Project Processing***.

To leave help and return to the module menu, press **F10**.

Help Tutorial

Help Tutorial invokes the tutorial for the current module. You may use the tutorial in a step-by-step process to learn the entire module, or you may use it to learn about one particular aspect of the module.

Enter your name at the prompt `Ask for Name:`. If this is the first time you have used the tutorial, you are asked if you want a review of the keyboard. Type **y** if you want a quick lesson on keys, otherwise, type **n**.

To use the tutorial as a step-by-step process, select the first option on the tutorial's main menu. If you want to learn about something specific, select the appropriate topic.

Refer to the on-line tutorial information for additional instructions.

Remember Commands

The Remember keywords allow you to create and run Project Processing files. Project Processing is an automated method of executing a sequence of commands.

Refer to ***ANGOSS Software System*** and ***Project Processing*** for detailed information on executing the Remember commands.

Quit Commands

The Quit keywords allow you to leave ANGOSS Communications to enter another ANGOSS module or to return to the operating system. Options for Quit include the following:

Quit. Returns to the operating system.

Main-Menu. Returns to the Main Menu of ANGOSS.

Database. Leaves ANGOSS Communications and enters ANGOSS Database.

Spreadsheet. Leaves ANGOSS Communications and enters ANGOSS Spreadsheet.

Word Processor. Leaves ANGOSS Communications and enters ANGOSS Word Processor.

If you have selected the Quit keyword and decide that you do not want to leave ANGOSS Communications, press **Esc**.

Appendix A: Supported Terminal Emulations

The following sections describe the terminal code sequences that ANGOSS Communications uses. Use these sections when you need to know the exact terminal code sequences ANGOSS Communications uses.

IMPORTANT: These terminal emulations require Xon/Xoff protocol. When using The ANGOSS Communications for terminal emulation, make sure that the *Enable xon/xoff* setting in the communications settings file is set to **Yes**.

ANSI Emulations

This section discusses supported ANSI escape sequences used in standard VT100 terminal emulation mode. All sequences begin with an escape character (27 decimal). The "#" in any of the sequences represents a decimal number specified with ASCII digits.

Absolute Cursor Position. The first parameter represents the line and the second represents the column.

Cursor Position (CUP):	Esc[#;#H
Horizontal and vertical position (HVP):	Esc[#;#f

Relative Cursor Moves. The parameter specifies the number of lines or columns to move the cursor:

Cursor Up (CUU):	Esc[#A
Cursor Down (CUD):	Esc[#B

Cursor Forward (CUF):	Esc[#C
Cursor Backward (CUB):	Esc[#D

Other Cursor Moves. This moves the cursor down one line in the same column. If the cursor is at the bottom of the screen, a scroll-up occurs:

Index (IND):	Esc D

This moves the cursor up one line in the same column. If the cursor is at the top of the screen, a scroll-down occurs:

Reverse Index (RI):	Esc M

This moves the cursor to the left margin of the next line. If the cursor is at the bottom of the screen, a scroll-up occurs:

Next Line (NEL):	Esc E

Device Status Report. Upon receipt of the following sequence ANGOSS Communications outputs a cursor position report in the form shown. The parameters of the response represent the current cursor line and column location:

Device Status (DSR):	Esc[6n
Response:	Esc[#;#R

Save and Restore Cursor. The following two sequences save and restore the cursor position. The restore cursor position sequence repositions the cursor to its location before a save cursor sequence was issued:

Save cursor position (SCP):	Esc[s
Restore cursor position (RCP):	Esc[u

Changing Lines, Characters, and Pages. The following sequences will erase, delete and insert lines, pages and characters.

Erase Line (EL)

Erase from cursor to end of line:	Esc[0K
Erase from beginning of line to cursor:	Esc[1K
Erase entire line:	Esc[2K

Erase Display (ED)

Erase from cursor to end of screen:	Esc[0J
Erase from upper left to cursor:	Esc[1J
Erase all of screen:	Esc[2J

Insert/Delete Line/Character. The following sequences manipulate lines and characters. The parameters in the sequences specify the number of lines or characters.

Insert Line (IL), lines below are moved down. Lines moved off bottom of screen are lost:	Esc[#L
Delete Line (DL), Deletes lines beginning with the current line. Lines below are moved up. Blank lines are added at the bottom:	Esc[#M
Delete character (DCH), this deletes # characters starting with the character at the cursor position. All remaining characters to the right are shifted left:	Esc[#P

Changing Tabs. The following sequence sets a horizontal tab at the current cursor position:

Horizontal Tabulation Set (HTS):	EscH

The following sequence clears horizontal tab positions. If no parameter is included, or if # = 0, the tab at the current cursor position is cleared. If # = 3, all tabs are cleared.

Clear Tab (TBC):	Esc[#g

Graphics Codes. Multiple graphics codes can be sent. For example "ESC[0;37;40m" clears the previous settings and sets colors to white on black for the text that will follow.

Set Graphics Rendition (SGR):	Esc[#;…#m (# = numbers following)
Cancel all attributes set by SGR commands	0
Set bold attribute	1
Set underscore on	4
Set blink on	5
Set inverse video colors	7
Invisible (foreground set to background)	8
Black foreground	30
Red foreground	31
Green foreground	32
Yellow foreground	33
Blue foreground	34
Magenta foreground	35
Cyan foreground	36
White foreground	37
Background colors, same as 30-37	40-47

Changing Mode. When using the following sequences you can enter multiple parameters (e.g., Esc[20;4h).

Set Mode:	Esc[#;…;#h # = numbers following)
Line feed/new line (New line mode = yes)	20
Insert mode on	4
Forced local echo off	12

ReSet Mode:	Esc[#;#;…;#l (# = numbers following)
Line feed	20
Insert mode off	4
Forced local echo on	12

Printer Control.

Media Copy (MC):	Esc[#i (# = numbers below)
Print screen	0 or no number

Media Copy (MC):	Esc[#i (# = numbers below)
Print controller off. Characters are directed to the screen	4
Print controller on. Characters go directly to the printer after a carriage return	5

VT100/102 and VT 52 Emulation

Because the VT100 and VT102 belong to the same family of Digital Equipment Corporation (DEC) terminals, they have been combined into one emulation. VT100 code sequences are a subset of the VT102 codes (with the exception of 'DECREQTPARM', which is not supported).

In most cases when using the VT emulations, in the settings file Add linefeeds, Autowrap, and New line mode all should be set to NO. Note that these are not the default ANGOSS Communications settings.

Each item of incoming data is masked to seven bits regardless of the Mask incoming data to seven bits setting in the communication settings.

For more information on VT code sequences, consult the VT100, VT200 and VT 52 documentation.

Key Equivalents

Keyboard mapping for Special Keys

VT100 Key	VT100 Emulation Key Equivalent
No scroll	Scroll lock (where available)
Break	**Alt B** (may be redefined)
Shift-Break (long break)	Generally **Alt H** (hang-up) is equivalent

^Break	No standard equivalent but may be entered into Keyboard Definition if desired
Line Feed	**Alt L**
^Enter (auto print on)	No equivalent. Note that you can use the command Data Capture Printer Begin to send text to the printer
Shift Enter (print screen)	No DEC equivalent. Note that you can use the commands Data Capture to trap text in a buffer or file and print later. If you are using a PC you can use the **Prt Sc** key.
Setup	No equivalent. Edit your Settings to modify parameters as required
^Space (Null)	No standard equivalent but may be entered into Keyboard Definition if desired

Key Equivalents to Numeric Keypad

VT100	ANGOSS	VT100	ANGOSS
PF1	**F1**	PF2	**F2**
PF3	**F3**	PF4	**F4**
0...9	**Alt 0** ...**Alt 9**	-	**Alt F1**
,	**Alt F2**	.	**Alt F3**
ENTER	**Alt F4**		

Character Sets. ANGOSS supports the U.S., the U.K., and the special character and line drawing sets used by the VT100. ANGOSS does not support alternate ROM character sets nor the VT52 graphics mode. In addition, the following characters in the special character set cannot be reproduced and are replaced with spaces:

Decimal Code	Unsupported Symbol Description
98	Tab symbol
99	Form feed symbol
100	Carriage return symbol

101	Line feed symbol
104	New line symbol
105	Vertical tab symbol
111	Scan line 1
112	Scan line 3
114	Scan line 7

Code Sequences for DEC Terminals

The following lists contain the control codes used by the VT100, VT102 and VT52 terminals along with a brief description of each. For more complete descriptions refer to the appropriate DEC manual.

For control code sequences that are not supported, information appears about appropriate action or the default value that ANGOSS Communications uses. In the control code sequence, **Esc** refers to an escape character, # refers to a numeric parameter, parenthetical expressions such as (or 1) indicate alternate parameters and all other symbols are literal characters.

VT100/102 Supported Control Code Sequences

Mnemonic	Sequence	Effect
DECANM	Esc[?21]	Enter VT52 mode
DECSTBM	Esc[#;#r	Set scroll option
DECOM	Esc[?6h	Move to home position in scroll region
	Esc[?6l	Move to home position at upper left of screen
CUU	Esc[#A	Move cursor up # lines
CUD	Esc[#B	Move cursor down # lines
CUF	Esc[#C	Move cursor right # characters
CUB	Esc[#D	Move cursor left # characters
CUP	Esc[#;#H	Move cursor to line, column
HVP	Esc[#;#f	Move cursor to line, column
IND	EscD	Index: move cursor down 1 line with scroll

RI	EscM	Reverse index: move cursor up one line with scroll
NEL	EscE	New line
DECSC	Esc7	Save cursor position
DECRC	Esc8	Restore cursor position

Mnemonic	**Sequence**	**Effect**
DECAWM	Esc[?7h	Auto wrap on
	Esc[?7l	Auto wrap on
LNM	Esc[20h	Newline mode on
	Esc[20l	Newline mode off
SRM	Esc[12h	Forced local echo off
	Esc[12l	Forced local echo on
DECCKM	Esc[?1h	Cursor key application mode
	Esc[?1l	Cursor key normal mode
SCS	Esc(A	UK set is G0
	Esc(B	US set is G0
	Esc(0	Graphics set is G0
	Esc(A	UK set is G1
	Esc(B	US set is G1
	Esc(0	Graphics see is G1
SGR	Esc[m	All attributes off
	Esc[1m	Bold on
	Esc[4m	Underscore on
	Esc[5m	Blink on
	Esc[7m	Reverse video
HTS	EscH	Set tab at cursor position
TBC	Esc[g	Clear tab at cursor position

	Esc[3g	Clear all tabs
EL	Esc[K	Erase from cursor to end of line
	Esc[1K	Erase from start of line to cursor
	Esc[2K	Erase line
ED	Esc[J	Erase from cursor to end of screen
	Esc[1J	Erase start of screen to cursor
	Esc[2J	Erase entire screen
DCH	Esc[#P	Delete # characters

Mnemonic	**Sequence**	**Effect**
IL	Esc[#L	Insert # lines
DL	Esc[#M	Delete # lines
IRM	Esc[4h	Insert mode on
	Esc[4l	Insert mode off
MC	Esc[?5i	Auto print on. Prints on screen and on printer
	Esc[?4i	Auto print off. Causes a form feed
	Esc[5i	Print controller on
	Esc[4i	Print controller off
	Esc[?1i	Print line
	Esc[i	Print screen
DECPEX	Esc[?19h	Print extent is entire screen
DECPFF	Esc[?18h	Form feed mode on
DECPFF	Esc[?18l	Form feed off
DSR	Esc[5n	Terminal status request: reply Esc[On (ready)
	Esc[15n	Printer status request: reply Esc[?1On (ready)
DA	Esc[c	Terminal ID request: reply Esc[?6c (VT100)
DECID	EscZ	Identify terminal: reply Esc[?6c (VT102)
RIS	Escc	Reset to initial state

Supported VT52 Code Sequences

Sequence	Effect
Esc<	Enter VT100 mode
EscA	Move cursor up 1 line
EscB	Move cursor down 1 line
Esc C	Move cursor right 1 character
EscD	Move cursor left 1 character

Sequence	Effect
EscH	Move cursor to home position
EscY##	Move cursor to specified row and column
Escl	Reverse line feed
EscK	Erase from cursor to end of line
EscJ	Erase from cursor to end of screen
Esc^	Auto print on
Esc_	Auto print off. Causes form feed
EscW	Print controller on
EscX	Print controller off. Causes form feed
EscV	Print current line
Esc]	Print screen
EscZ	Terminal ID request: reply Esc/Z (VT52)

Supported Single Character Codes (VT100 And VT52)

Mnemonic	Sequence	Effect
NUL	0	Null: Ignored
ENQ	5	Originate password is transmitted

BEL	7	Bell tone sounds
BS	8	Backspace
HT	9	Horizontal tab
LF	10	Line feed
VT	11	Vertical tab (processed as linefeed)
FF	12	Form feed (processed as linefeed)
CR	13	Carriage return
SO	14	Select G1 as active character set
SI	15	Select G0 as active character set
DC1	17	XON if XON/XOFF enabled
DC3	19	XOFF if XON/XOFF enabled
CAN	24	Halts current escape sequence
SUB	26	Same ac CAN

Unsupported VT100/102 Code Sequences

Mnemonic	Sequence	Effect
DECSCLM	Esc[?4h (or I)	Set smooth (or jump) scroll: always jump
DECCOLM	Esc[?3h (or I)	Set 132 (or 80) column mode: always 80
DECSCNM	Esc[?5h (or I)	Set light (or dark) background: Always the same
KAM	Esc[2h (or I)	Lock (or unlock) Keyboard: Always unlocked
DECARM	Esc[?8h (or I)	Typematic keyboard on (or off): Always on
DECKPAM	Esc=	Put keypad in application mode: Always numeric, use Alternate keys (see previous section titled Key Equivalents)
DECPNM	Esc>	Put keypad in numeric mode: Ignored
SCS		Esc(1 G0 is Alternate ROM character set: Ignored
		Esc(2 G0 is Alternate ROM2 character set: Ignored
		Esc)1 G1 is Alternate ROM character set: Ignored

	Esc)2	G1 is Alternate character ROM2 character set: Ignored
SS2	EscN	Select G2 for 1 character: Ignored
SS3	EscO	Select G3 for 1 character: Ignored
DECDHL	Esc#3	
	Esc#4	Turn double width or height lines on or off: Ignored, always single width and height
DECSWL	Esc#5	Turn double width or height lines on or off: Ignored, always single width and height

Mnemonic	**Sequence**	**Effect**
DECDWL	Esc#6	
DECTST	Esc[#;#y	Start hardware tests: Ignored
DECLL	Esc[0 (or 1 - 4)	Turns LEDs off (or on): Ignored
DECREQTPARM	Esc[x	Request terminal parameters: Ignored

Unsupported VT52 Code Sequences

Sequence	**Effect**
Esc=	Put keypad in application mode: Always numeric, use Alternate keys (see a previous section titled BI‘‘Key Equivalents
Esc>	Put keypad in numeric mode: Ignored
EscF	Use VT52 graphics set: VT100 graphics set is used, (not the same as VT52).
Esc G	Exit VT52 graphics: Returns to U.S. character set.

Appendix B

Hayes Commands

Hayes command subset. ‘‘EI‘‘EIX

If you are using a Hayes or 100% Hayes-compatible modem, the following subset of Hayes modem commands may be useful if your modem does not initialize properly. For more information about commands your modem can use, refer to your modem documentation.

NOTE: All Hayes commands are preceded by **AT**. Commands should be entered in upper case. See Chapter 3 for more information about initializing your modem.

Command	Meaning
AT	Attention. This identifies a modem command, as opposed to text that is being entered. If your modem has been set up correctly, executing the AT command will cause a zero (0) or OK to be displayed on the screen
ATZ	Reset the modem. This command returns your modem to the state it was in when you turned it on. Resetting the modem will not eliminate any commands that were issued and written to non-volatile memory
ATQ1	Quiet mode off. Smart modem definitions require that quiet mode be turned off. If your modem initializes after you execute this command, you may need to write a custom modem definition
ATQ0	Quiet mode on

Command	Meaning
ATV#	Result codes. This command controls the way result codes are returned. For debugging, you may want the result codes to be returned as words, i.e., in verbose mode. For verbose mode, # =1. In this mode, an AT command returns the word OK. However, most Smart modem definitions require that modem commands be returned as numbers, i.e., in terse mode. For terse mode, # =0. When you are finished debugging, be sure to execute ATV0 to return result codes as numbers. In terse mode, an AT command returns a zero (0)
ATD	Dial. Execute ATDT for tone dialing or ATDP for pulse dialing
ATH0	Hang up
ATX#	Result code set. This command determines what “level” of Hayes result codes to use. If # =1, a non-Hayes modem will generally return result codes as if it were a Hayes modem. Using a value of 2 or more activates extended result codes that require modification of the modem driver to be properly interpreted
ATE0	Echo off. Smart requires that modem commands are not echoed back to the screen
ATE1	Echo on.

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