

Amiga™
Modem/1200 RS
User's Guide



1680



AmigaTM
MODEM/1200 RS
USER'S GUIDE

For your Amiga Personal Computer, or
any RS232 Compatible Computer

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CHAPTER ONE INTRODUCTION

The Modem/1200 RS is a compact, powerful computer device that lets you communicate instantly with other computers over ordinary telephone lines.

It gives you direct access to the wide range of information services, both national and local. You can play games against distant opponents, send and receive mail electronically, pay bills, bank, and shop from your home.

With appropriate software, you can take advantage of the modem's auto-answer feature and turn your computer system into an electronic bulletin board.

What a Modem Does

Telecommunication consists of electrical signals sent from your computer to another computer via the phone lines. Normally, the type of electrical signal your computer generates cannot be sent directly over phone lines. However, a modem translates (modulates) a computer's digital signals into the analog signals that phone lines can transmit. The incoming signals are retranslated (demodulated) into a signal your computer can use.

The word modem was created by combining the first parts of the words MODulator/DEModulator.

The Modem/1200 RS is an "intelligent" modem. This means it contains its own microprocessor to oversee the telecommunications process. It can be instructed to dial a specific phone number, detect a remote computer's signals and establish a connection to your computer with a single command, or to answer incoming calls from other computers. It can adjust the speed of incoming or outgoing transmissions (auto-baud). In addition, it uses a built-in sound system to let you listen in on an attempted connection, so you will know if you reach a busy or incorrect number.

Included with the Modem/1200 RS are two terminal software programs: AmigaTerm™, the terminal software program designed specifically for the Amiga, and CONNECT!™, which is an IBM PC®-compatible terminal

program. A terminal program enables your computer to work with your modem to communicate with other computers. Each program comes with a user's guide that explains how to use it.

Your modem is capable of communicating with a variety of other computers connected to various modems. Successful telecommunications is made possible by a process called handshaking, which is the pattern of communication between two terminals. Both computers must use the same settings for speed, unit of data, and other factors (collectively called a communications protocol) for telecommunication to work.

There are several standard handshaking protocols, and most terminal programs are capable of using one or more of these protocols, in addition to individualized settings. For more details about protocol settings, see the **Glossary** for brief definitions of baud, duplex, parity, stop bit, and word length.

What Comes With Your Modem

Carefully unpack your modem if you have not already done so. Examine the package contents. Besides your Modem/1200 RS you should find:

- locating template
- plastic hanging bracket
- modular telephone cord
- power cord
- AmigaTerm; a terminal program for the Amiga (on 3½" disk) with a manual
- CONNECT!; a terminal program for IBM PC-compatible computers (on 5¼" disk) with a manual
- warranty card
- disk replacement card

If you are missing any of these articles, contact the dealer who sold you the modem.

How to Use This Manual

If you have little or no previous experience with modems and computers, you should read this manual completely. If you have had previous experience with modems, the following chapter-by-chapter summary of the contents should allow you to locate any specific information you may need.

All users, regardless of previous experience, should read Chapters Two and Four.

Chapter Two, Installation and Care, provides step-by-step illustrated instructions for installing your modem and includes notes for proper modem care.

Chapter Three, What You Need to Know, is an introduction to the world of telecommunications. It provides information that will help you in choosing among information services.

Chapter Four, Commands, gives a detailed description of the commands used to control the Modem/1200 RS. Also included are sections covering registers and dip switches. You need to be familiar with the dialing commands described in this chapter in order to use any terminal software programs, whether they are provided with your modem or purchased separately.

Chapter Five, Troubleshooting, helps you locate and solve common telecommunications programs.

Chapter Six, Technical Specifications, provides technical information for the advanced user or programmer.

Glossary contains a list of telecommunications terminology.

Federal Communications Commission (FCC) Statement describes the regulations imposed on modem use.

CHAPTER TWO

INSTALLATION AND CARE

Before connecting your modem, be sure to read and follow the instructions carefully. It's not difficult to hook up the modem and connect the phone lines, but you can damage your computer if you do it wrong.

Press firmly, but do not force any cable into a connector further than it will go easily. If the cable doesn't connect properly, check the cable and connector to make sure they match, and review the installation instructions.

The following instructions and photos describe and illustrate how to connect the Modem/1200 RS to an Amiga. Read and become familiar with these instructions before you try to connect the modem. If you own a computer other than an Amiga, you'll follow the same instructions—except where noted.

Connecting the Modem/1200 RS

These are the items you need to connect the Modem/1200 RS to your computer. All should be included with the modem.

- locating template
- plastic hanging bracket
- modular telephone cord
- power cord

ATTACHING THE BRACKET AND MODEM

NOTE: The hanging bracket was designed specifically for the Amiga as a convenient place to put the modem. It may or may not be useful with another computer. If not, you can place the modem in any convenient location.

1. Remove the paper backing from the adhesive on the bracket. Set the bracket aside, adhesive side up.

2. Place the locating template against the side of the Amiga containing the power switch. The left and bottom edges of the template should line up with the edges of the Amiga, as shown in Figure 1.

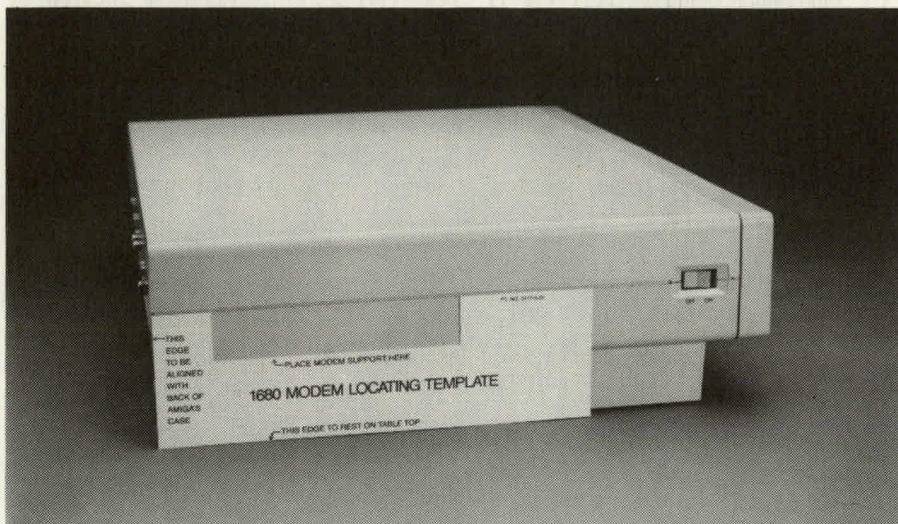


Figure 1

3. Hold the template in place with one hand. Place the bracket inside the opening in the template. Press firmly, so that the bracket adheres solidly to the side of the Amiga (see Figure 2). Remove the template.

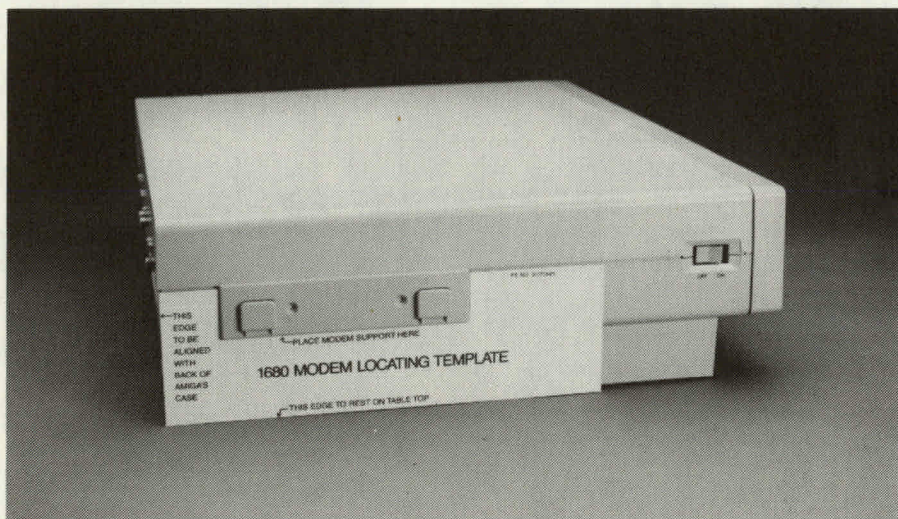


Figure 2

4. Position the modem above the slots in the hanging bracket. Slide the modem onto the bracket, making sure it sits securely (see Figure 3).



Figure 3

CONNECTING THE MODEM

5. Examine the cable coming out of the modem. It has a double-sided connector—one side (called the “male”) has pins, the other side (called the “female”) has holes. The male (see Figure 4) is used to connect the modem to the Amiga and other computers with female serial ports. The female side enables you to connect the modem to

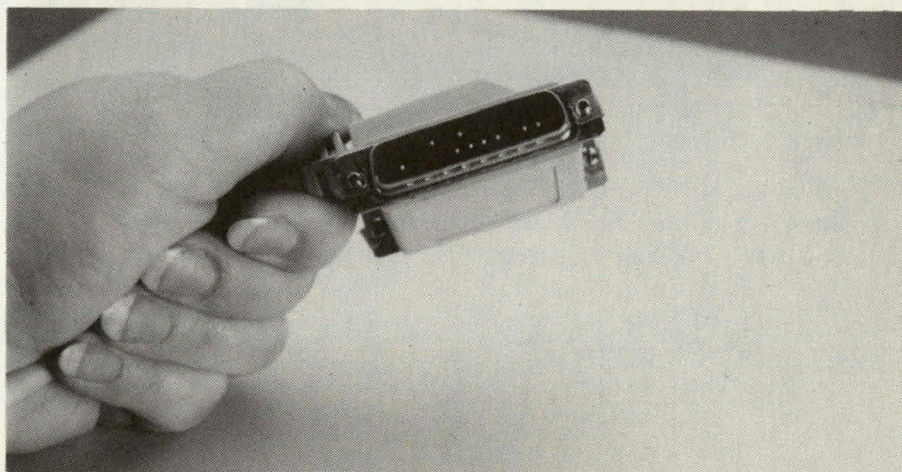


Figure 4

computers that have male ports. If you don't have an Amiga, check the serial port on your computer to determine which side of the connector you should use.

6. Insert the male connector into the serial port on the back of the Amiga. The port is clearly labeled, and has a figure of a telephone above it. When you insert the connector, make sure its shape matches the shape of the port—it won't go in upside-down. Use a small screwdriver to tighten the screws on either side of the connector. Figure 5 illustrates the proper connection.

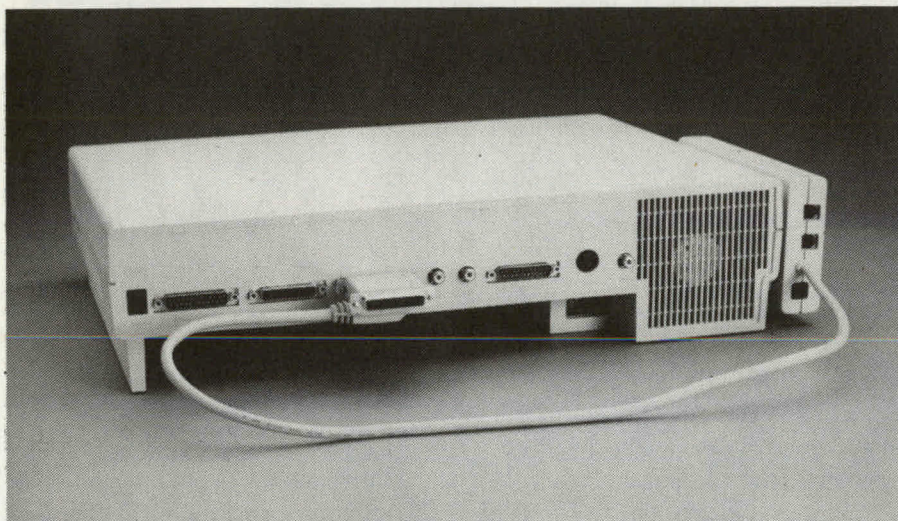


Figure 5

CONNECTING THE PHONE LINES

7. Disconnect your phone cord from the wall, leaving the other end connected to the phone. Insert the free end into the modem jack labeled PHONE (see Figure 6).

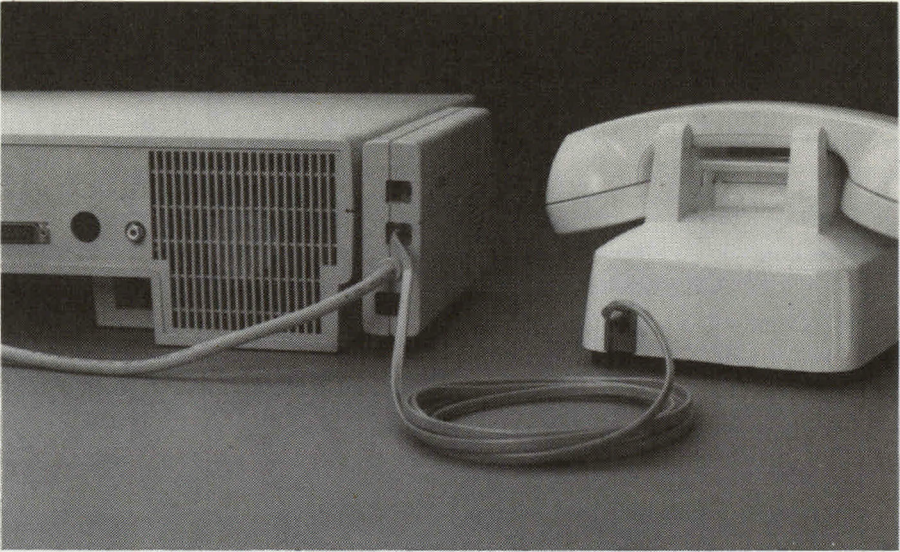


Figure 6

8. Insert one end of the phone cord supplied with the modem into the jack labeled LINE (see Figure 7). Insert the other end into the wall jack from which you disconnected your phone cord.

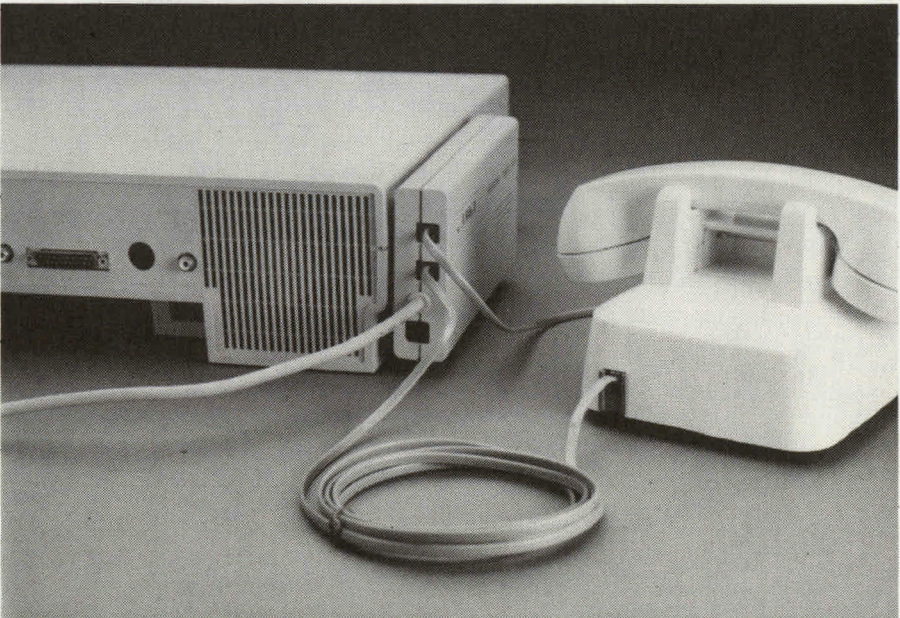


Figure 7

CONNECTING THE POWER SUPPLY

9. Insert the smaller end of the power cord into the remaining connector on the modem (see Figure 8). First, make sure the pins inside the end of the cord are lined up with the holes of the connector by looking for the small arrow near the end of the cord. As you insert the cord, the arrow should face upward and point toward the modem. Press firmly but don't force the cord into the connector because you might damage the pins if they aren't lined up correctly.

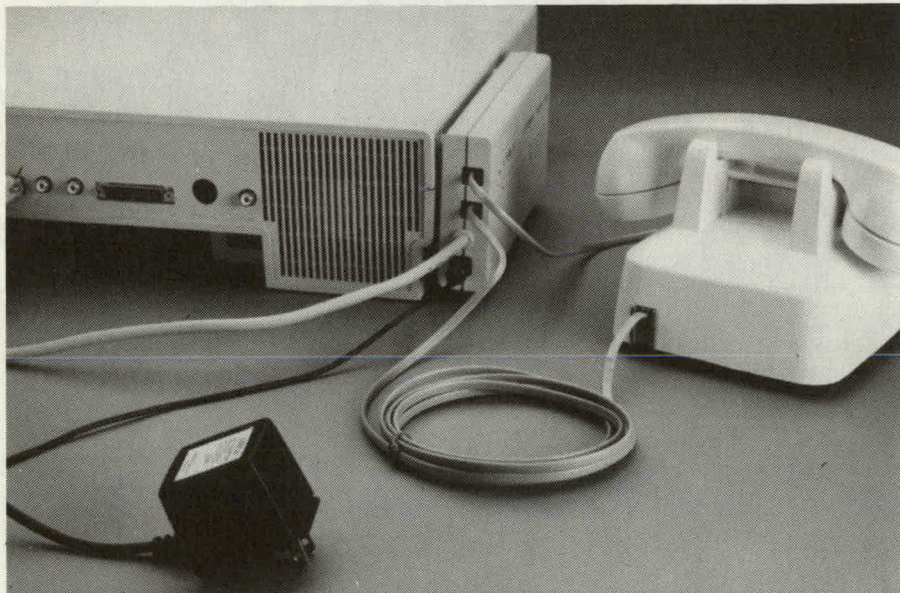


Figure 8

10. Plug the power cord into an electrical outlet. If everything is connected properly, the modem will beep to indicate it's ready to use.

Care of the Modem

Your Modem/1200 RS was designed to function properly for years with a minimum of maintenance. Taking a few precautions should keep it operating at peak efficiency. Keep the modem dry and clean. Liquids, chemical fumes, even steam, can damage it. Use only a dry cloth to wipe it.

A modem is sensitive to magnetic fields, so avoid placing it near equipment such as televisions and radios which generate magnetic energy. Your computer and peripherals are shielded to neutralize their magnetic frequencies.

CHAPTER THREE

WHAT YOU NEED TO KNOW

The Modem/1200 RS provides you with access to a large number of telecommunications services that can bring a tremendous amount of information and enjoyment into your home or office with speed and convenience.

Before you can begin, though, you'll need a basic knowledge of telecommunications services—the types of services available and what they offer. This chapter should provide enough background for you to make an informed choice of service(s).

Electronic Messages

Bulletin Boards. People often make Bulletin Board Services (commonly called BBS's) their first entry into telecommunication. Many electronic bulletin boards operate free of charge. You can read messages left by other users, and respond to questions. Some bulletin boards concentrate on very specific areas of interest, while others are more like open forums.

Electronic Mail. You can send messages to one person or to a hundred people at once with electronic mail, often called E-mail. Most information services offer an E-mail function, while others specialize in it.

File Transfer. You can send entire computer programs or large amounts of data across the phone lines.

Financial Services

Home Banking. Many banks provide on-line access to your bank account status, or even allow transferral of funds and bill-paying to be handled electronically.

Stock Quotes. Investors can view the latest stock activity, even buy and sell shares through an on-line broker.

Shopping and Sharing

Department Stores. You can compare prices, order merchandise or merely browse through electronic stores.

Swap Networks. If you have a product or service to offer, you might be able to trade it for something else you want. There are databases to match you up with a complementary offer.

Public Domain Software. Programs that are not copyrighted, and therefore obtainable free of charge, are called Public Domain programs. Many people who program as a hobby often upload their newest creations onto a BBS, so other users can download and use the programs.

Information Services

Travel. You can act as your own travel agent by making airline and hotel reservations, even view restaurant and city guides.

Research. There are on-line encyclopedias, news clippings, weather reports, and classified job listings. Professionals can obtain medical and legal data, obtain demographic statistics or chart flight plans. There are even on-line consultants who will handle more complicated research for you, for a fee.

Games. Many text-oriented games are available on national services. You can play against the computer, or against another user from across the country.

Advice, Humor and Gossip. BBS's require user names, like CB handles, that allow a person to remain anonymous. Other information services identify users only by numbers. So many users express opinions freely, and the messages range from raucous to thought-provoking. Some services provide a special meeting area function, to help users make contact with one another.

Choosing a Service

Many services charge an initial or yearly membership fee, and most charge for connect-time. Rates can vary according to the time of day, and certain sections of many services have higher per-hour rates. In most cases, transmitting at 1200 baud is more expensive than 300 baud, but so much more can be accomplished in a given period of time that connect-time charges are often lower.

Most information services have a national base, but you are rarely charged for long-distance phone usage. That's because most national networks use local access systems that can transmit digital information at lower cost than voice communication. There are also several commercial carriers, such as Uninet, that handle the local access system for certain information services. In some cases you will be charged an additional monthly fee for the carrier services, in other cases the fee is paid by the information service and included in your monthly fee.

Charges can add up quickly, so choose carefully among services. Make sure you're getting what you want. Also consider how easy the service is to use, and how helpful the operators of the service will be.

You can find help in choosing a service through the many books about telecommunication that are available. Entire books devoted to various information services help you maximize the benefits and minimize the costs of using a particular service.

Check out local user groups. They often maintain BBS's, and can provide lists and opinions of other services. Whatever you decide, be sure you take time to carefully consider your needs before writing a check for a membership fee.

CHAPTER FOUR

COMMANDS

Terminal mode is the mode of operation in which telecommunication takes place. Terminal software programs, such as AmigaTerm, perform various functions in terminal mode—such as downloading a file from an information service or controlling the memory buffer. The specific commands that execute those functions vary from program to program. For example, some programs use a system of menus, while others use predefined function keys or command codes.

Hayes® Commands

Some commands remain constant regardless of the terminal program in use. These are often called Hayes commands. Most are used in command mode (before actual communication is established with a remote computer). Those include commands that instruct the modem to dial or answer the phone. In addition, many terminal programs have built-in Hayes commands.

In general, the Hayes commands used with the Modem/1200 RS consist of a single letter, usually followed by a number (called a value). The letter represents a function, and the value represents a particular option of the function. If you don't specify a value, a pre-set (default) value is used.

All commands **must** be given in format described below:

- Type the letters **AT**.
The **AT**tention code alerts the modem that what follows is a command, not just random characters.
- Type in the command.
Commands are listed and described in Table 4-1.
- Press the RETURN key.
That signals the end of the command line.

There are two exceptions to the above procedure.

- The **A/** command requires neither the **AT** nor the carriage return (RETURN key).
- The + + + command doesn't need the **AT**.

Those exceptions are also noted in the descriptions of the commands in Table 4-1.

Table 4-1
Command Summary

NOTE: All commands are sent to the modem as ASCII characters (see Glossary). Also remember that, except where noted, all commands are preceded by an **AT** and followed by an ASCII carriage return (RETURN key).

Command	Function
AT	<i>Attention</i> ; indicates to the modem that the following characters are a command. AT must precede all commands except A/ and + + +. Up to 58 characters may be entered as a command or series of commands. Characters can be upper- or lowercase, and spaces may be inserted without affecting the command. You must use a carriage return to complete a command (except A/).
+ + +	<i>Escape</i> ; interrupts a telecommunication session by taking the modem out of terminal mode and putting it into command mode, where you can issue more commands or hang up. It does not require the AT prefix, but it must be preceded and followed by at least one second of no data transmission. The + + + can be changed to another symbol (see Register S2 in Table 4-2).
A	<i>Answer</i> ; tells the modem to answer a call without waiting for a ring, allows you to switch from voice to computer communication.
A/	<i>Again</i> ; repeats the previous command, generally used to redial after getting a busy signal. Requires neither AT before, nor carriage return after.
B	<i>Balance</i> ; adjusts the transmit level for non-Bell phone systems. B1 decreases it by 3dBm, while B0 (default) turns the feature off.

Table 4-1, con't

Command	Function
Cn	<i>Transmitter Carrier</i> ; used when more than one modem is connected to the same phone line. C1 (default) turns it ON for normal operation with one modem. CO turns it OFF for setting a RECEIVE ONLY condition of an additional device sharing the phone line.
D	<i>Dial</i> ; indicates to the modem that the following characters are part of a phone number. Spaces and hyphens can be used, without affecting the transmission. Commands commonly used with D include: P, T, R, comma (,) and semicolon (;).
P	<i>Pulse</i> ; selects pulse method for dialing phone numbers. It's the default setting for the modem.
T	<p><i>Touchtone</i>; selects touchtone method for dialing phone numbers. After you issue the AT T command, all subsequent dialing commands will be executed in touchtone.</p> <p>The modem recognizes the touchtone characters # and *.</p> <p>The touchtone dialing speed can be changed (see Register S11 in Table 4-2).</p> <p>You can use both pulse and touchtone dialing in the same phone number by combining the two commands. You can also mix the two within a dialing sequence.</p>
R	<i>Reverse</i> ; allows you to contact "originate only" modems. Placing this command at the end of a dialing sequence puts your modem in answer mode and enables you to contact those modems programmed to transmit, but not receive calls.
, (comma)	<i>Pause</i> ; creates a two second pause in transmission, most often used in dialing sequences. The length of the pause can be changed (see Register S8 in Table 4-2).

Table 4-1, con't

Command	Function
;	<i>Return to command mode</i> ; returns you to command mode after dialing. It must be the last character in the dialing sequence.
En	<i>Echo</i> ; used only in command mode. When ON (E1, the default), the characters you type appear on (echo to) the screen. When OFF (EO), characters don't appear on the screen, but commands are executed anyway.
Fn	<p><i>Duplex</i>; controls the echo in terminal mode. F1 (default) indicates full duplex communication, where the local echo is turned OFF and your characters are echoed back to you from the on-line system. Use FO to turn the local echo ON if the system does not echo back characters.</p> <p>If the local echo is ON and you are transmitting to a system that echoes back, everything you type appears twice (aass iiff yyooouu"rree sseeeeiinngg ddoouubbllee).</p>
Hn	<p><i>Hook</i>; used to hang up (put ON the hook) or pick up (take OFF the hook) the phone.</p> <p>When you terminate a call with + + +, the phone lines are still open, although the link to the host computer has been broken.</p> <p>HO, or just H, hangs up the modem's connection to the phone (puts it ON the hook). H1 takes the phone OFF the hook. There is no default setting.</p> <p>Note that you must first issue the Escape command (+ + +) before you issue the Hook command.</p>
In	<i>Inquiry</i> ; requests the product code (IO) or the ROM checksum (I1). There is no default setting.
Mn	<i>Monitor speaker</i> ; enables you to listen in on an attempted connection or a connection in progress. M1, the default, turns the speaker on during command mode and off in terminal mode. M2 turns the speaker on all the time. MO turns the speaker off completely.

Table 4-1, con't

Command	Function
O	<i>On-line</i> ; returns you to terminal mode (on-line) from command mode if you have been issuing commands in the middle of a telecommunication session. You can use the Escape code (+ + +) to get out of terminal mode without terminating the session, issue commands, then type AT O to resume telecommunicating.
S	<i>Set registers</i> ; sets the 14 registers that control various elements of telecommunication. Table 4-2 lists the registers and their functions.
Sr?	<i>Query register</i> ; Tells you the current value of register r.
Xn	<i>Result codes</i> ; status reports that are displayed on the screen in numeric or verbal (words) form (see the V command). You can prevent the codes from being displayed (see the Q command).

There are 10 codes, divided into three overlapping groups. X0 selects codes 0 through 4, X1 selects 0 through 5, and X2 selects the full set of codes. The following table lists and describes the codes.

Result Code Num/Verbal	Meaning
0/OK	Command being executed.
1/CONNECT	Going on-line.
2/RING	Incoming call (enters answer mode).
3/NO CARRIER	You're disconnected.
4/ERROR	Invalid command.
5/CONNECT 1200	On-line at 1200 baud.
6/NO DIAL TONE	Returns to command mode.
7/BUSY	The host is busy.
11/RINGING	The host is not busy.
12/VOICE	A person, not a modem, answered.

Table 4-1, con't

Command	Function
Qn	<p><i>Quiet</i>; decides whether or not result codes are displayed on the screen. Result codes (see the X command described later in this table) are status reports that are ordinarily displayed during telecommunication.</p> <p>QO, the default, displays the codes. Q1 suppresses them.</p>
Vn	<p><i>Verbal</i>; determines whether result codes are displayed as words (V1, the default) or code numbers (VO).</p>
Z	<p><i>Zap</i>; resets modem to all default settings. Has the same effect as unplugging, then plugging it in again.</p> <p>Can be used to initiate new dip switch settings.</p>

Sample Session

Since many terminal programs handle some modem commands internally, you may only have to use a handful of commands to successfully telecommunicate. Here is a sample of a telecommunications session:

Let's say you are going to the shore for the weekend, and want to get the weather report from the information service you subscribe to.

Type: **AT X1**

Turns on the result code set that allows you to see if the connection has been made at 300 or 1200 baud.

Type: **ATDT xxx-xxxx**

AT D puts the modem in Dial mode. T indicates touchtone dialing, and xxx-xxxx represents the local access number for your information service.

Place a comma in the number to transmit a 2-second pause (often necessary when dialing from a business with a PBX line).

You will hear a clicking sound. This is the monitor speaker function. Then the remote phone will ring.

If the call is successful, CONNECT 1200 appears when a connection is made at 1200 baud. NO CARRIER appears if a connection is not made.

If connection is not successful,

Type: **AT** Re-executes the previous command. It does not require the AT prefix.

Once you receive a CONNECT response, you can begin to navigate the information service. These are all different, but when you subscribe to a service you are provided with enough information to get you started.

When you are ready to complete your telecommunications session,

Type: **+++** Terminates the telecommunications session.

Type: **ATH** Hangs up the phone.

If you want to issue a command while you are still on-line,

Type: **AT ;** Returns you to command mode but does not terminate the session.

Type: **ATO** Returns to terminal mode and resumes the telecommunications session.

Setting Registers

There are 14 registers, most of which deal with timing, that alter aspects of the modem's memory to tailor the modem's performance to your needs. All the commands use the same structure:

AT **Sr = n** Where r is the number of the register and n is the new value.

Table 4-2 lists the 14 register settings and describes their functions.

Table 4-2
Register Settings

Register	Default	Function
S0	See Dip Switch 5	Sets the number of rings before automatic answering. See Dip Switch 5.
S1	0	Counts and stores the number of rings from an incoming call.
S2	43	Allows the user to redefine the ASCII character for the escape code character. Default = +.
S3	13	Allows the user to redefine the ASCII character for Carriage Return.
S4	10	Allows the user to redefine the ASCII character for Line Feed.
S5	8	Allows the user to redefine the ASCII character for Backspace.
		Note that when you use a backspace to delete a character from a command, the character remains on the screen but will not be transmitted.
S6	2	Sets the number of seconds the modem waits for a dial tone before dialing.
		2 is the lowest value possible. The modem will automatically reset S6 to 2 if a value less than 2 is input.
S7	30	Sets the number of seconds the modem waits for a carrier. May be set for much longer duration if, for example, the modem is originating an international connection.

Register	Default	Table 4-2, con't Function
S8	2	Sets the duration, in seconds, for the pause (,) option in the Dial command and the pause between command reexecutions for the Repeat command.
S9	6	The duration, in tenths of a second, of Carrier Detect time (presence of the remote modem's carrier signal) before it is recognized by the local modem. This setting cannot be changed.
S10	7	Sets the duration, in tenths of a second, that the modem waits after loss of carrier before hanging up.
S11	70	Allows user to define duration and spacing, in milliseconds, of Touch-Tones. 50 is the minimum value for this register. The modem will reset to 50 if a value lower than 50 is input.
S12	50	Allows user to define guard time, in 50ths of a second, for escape code sequence.
S16	0	Modem self-test: 0 Data mode (no testing) 1 Analog loopback

Dip Switches

The dip switches, located on the side of the device, adapt the modem to your equipment and specific requirements. Generally, the factory settings are appropriate for most use. You may need to change some dip switch settings to obtain accurate telecommunication.

Table 4-3 lists the dip switch settings, their functions, and factory settings.

Table 4-3
Dip Switch Settings

Switch	Function	Factory Setting
1	Data Terminal Ready Up DTR normal, RS-232C Pin controls modem Down DTR always ON	UP
2	Verbal/numeric result codes UP Verbal (word) messages DOWN Numeric result codes	UP
3	Result code display UP Quiet mode, no display DOWN Result codes displayed	DOWN
4	Modem echo UP Modem echoes (displays) commands you send it from the keyboard DOWN Modem does not echo	UP
5	Auto Answer UP Modem answers on first ring DOWN Auto Answer suppressed	DOWN
6	RS-232C Carrier Detect Pin UP RS-232C Pin 8 indicates modem is on-line and a carrier data signal is present DOWN Carrier Detect signal is always ON	UP
7	Single/Multiple Installation UP Single phone line connection (RJ11 jack) DOWN Multiple phone installation (RJ112 or RJ113 jack)	UP
8	"AT" Command Set Recognition UP AT command set recognition disabled DOWN Normal Operation	DOWN

NOTE: When you change a dip switch setting, the new setting is initiated when you plug in the Modem/1200 RS. If the modem is already plugged in, initiate the new setting by issuing the Zap (AT Z) command.

CHAPTER FIVE

TROUBLESHOOTING

From time to time, all modem users encounter difficulties with their telecommunications. Many common modem problems are attributable to factors you can identify and correct.

If you run into a problem, check for these obvious causes:

Is all equipment properly connected? Try unplugging then reconnecting all cables and connectors.

Did I type the command correctly? Remember that all Hayes commands except A/ and + + + require the AT prefix.

Am I calling the correct number? Check the number and redial. Often, difficulties are caused by the phone lines, and sometimes redialing can clear up a problem.

If you have eliminated the obvious possibilities, then use your modem's self-test capability to determine if the modem itself is functioning.

Type: **AT S16=1D** (in originate mode)

or

AT S16=1A (in answer mode)

This command activates the analog loopback. Everything you type should appear on the screen. This is because characters you type are being sent to the modem then "looped back" to the screen.

If your modem passes the analog loopback test, then you must evaluate the problem more closely. Table 5-1 lists some common problems, with possible causes and solutions.

Table 5-1
Common Telecommunications Problems

Problem	Possible Causes and Solutions
Garbage on screen	<p>This is a common occurrence due to interference on the phone lines. If only a few random characters interrupt your session, there is nothing to be concerned about. If your terminal program has an error-check, use it when transmitting to ensure accurate communication of important material. If the entire screen is filled with garbled messages, there are several possible causes:</p> <ul style="list-style-type: none"> ● The phone or an extension phone on the same line is off the hook. ● The baud rate is incorrect for the particular host. ● The parity setting is incorrect for the particular host. ● The duplex setting is incorrect for the particular host. <p>Each of these problems indicates a simple solution. Put the phone back on the hook, or change one of the settings.</p>
Data from host appears on screen, but what you type doesn't	Host is probably using half duplex. Turn on your on-line local echo (F0)
Data from host seems to be missing some characters	There may be an overflow. Try lowering the baud rate using Xon/Xoff protocol if your software has it.
Incoming data isn't correctly spaced	If it's double-spaced, try to cancel your software's line feed function. If incoming data keeps overwriting itself, turn on your software's line feed function.

Table 5-1, con't
Possible Causes and Solutions

Problem	
Call waiting signal interrupts your data transmission	The call waiting signal is not long enough to make you lose the carrier, but you can lose data if you are uploading or downloading a program. If you can't set up a separate phone line for your modem, consider adding Call Forwarding and direct incoming calls elsewhere while you telecommunicate. Or use your modem when you are less likely to receive phone calls.
You can't make a connection regardless of what you try, or you have a lot of interference while telecommunicating.	There could be a problem with your phone lines, which may require a visit from a telephone serviceman. If the modem is causing the problems, the phone company can tell you to disconnect the modem until it is repaired.
You've tried everything in this chapter and you still can't get the modem to work.	The Customer Support number at Commodore is (215) 436-4200.

CHAPTER SIX

TECHNICAL SPECIFICATIONS

The following information is provided for programmers and advanced users who require more specific information about the Modem/1200 RS.

Data Format:

Serial, binary, asynchronous; odd, even, no parity, mark comma or space parity.

One start bit, 7 data bits, one parity bit, one or two stop bits.

One start bit, 8 data bits, no parity bit, one stop bit.

Custom Data Formats, up to 8 bits in length.

Carrier frequencies:

Transmit/Originate Receive/Originate

Receive/Answer Transmit/Answer

212A mode:

1200 Hz $\pm .001\%$ 2400 Hz $\pm .001\%$

103 Mode:

Mark: 1270 Hz $\pm .5\%$ Mark: 2225 Hz $\pm .5\%$

Space:

1070 Hz $\pm .5\%$ Space: 2025 Hz $\pm .5\%$

Data Interface:

Serial, Binary, Asynchronous, 10 bit data

Data Rate, computer to modem:

0 to 300 and 1183 to 1230 bps

Data Rate, modem to computer:

0 to 300 and 1219 bps

Dialing:

Touch Tone (DTMF) 70 ms/70ms ON/OFF

Rotary 10pps, 60/40 Break/Make, 700 ms interdigit

Answer Tone Detector:

2125-2350 Hz

Answer Tone:

2225 Hz for 17 seconds

Failed Call Timer:

Programmable 2-255 seconds, 30 second default

Carrier Detect Threshold:

Off-to-on: -43 dBm

On-to-off: -48dBm

Billing Delay:

2.1 Seconds

Abort Time:

17 seconds after billing delay

Loss of Carrier Disconnect:

250 ms

Transmit Level:

Carrier less than -9 dBm into 600 ohms

Tone pair less than 1 dBm into 600 ohms

Power Consumption:

less than 350mA from 12.6Vac-CT

Logic Levels:

Conforming to EIA-RS232C Specification

Storage:

Ambient temperature: -20 to +65 degrees Celsius (-4 to +149 degrees Fahrenheit)

Relative humidity: 95% maximum with no condensation (description)

Electrical Specifications:

The RS232 cable has the following pinout:

DB25 pin	Signal	Source
3	Receive data	from modem
7	Signal ground	from computer
6	Data set ready	from modem
12	Speed indicate	from modem
22	Ring Indicate	from modem
8	Carrier detect	from modem
5	Clear to send	from modem
2	Transmit data	from computer
20	Data terminal ready	from computer
All other pins are not connected.		

Performance

On a 3002 line at -30 dBm with a signal to noise ration of 13 dB (max) the bit error rate does not exceed 10^{-5}

GLOSSARY

ASCII

The abbreviation for American Standard Code for Information Interchange. ASCII is the code that represents the characters on the keyboard. Standard ASCII uses 7 bits to represent a character, and Commodore ASCII uses all 8 bits (in a byte) to allow an extra 128 graphics characters. An ASCII conversion routine like AmigaTerm is necessary to communicate between a Commodore system and a standard ASCII device, such as many host computers or a non-Commodore printer.

Baud

A unit of measurement for the transmission of data. The Modem/1200 RS operates at 1200 baud, that is it transmits approximately 1200 signal elements (bits) per second.

Bit

The smallest unit of information in a computer system. A bit may be either "off", representing zero, or "on", representing one. Specific combinations of bits represent meaningful information.

Block

A unit of information sent and received between devices, usually predefined in terms of number of bytes.

Buffer

A temporary storage area, usually in a computer's memory. The data is stored in the buffer and later output to tape, disk or printer or acted upon by the computer program currently in memory. Peripheral devices such as disk drives and printer can also have their own buffers to temporarily manage and store data.

Bulletin Board	An electronic public storage medium within an information network where messages can be transmitted and received.
Byte	A unit of information consisting of combinations of bits. A byte may represent a letter, number, special symbol, or control information.
Conferencing	A method of communication where several users within a large geographic area can "meet" in a public storage location of an information network and exchange messages, conduct computer dialogues or participate in a class.
Cursor	The indicator on your screen that shows where the next character will be displayed.
Database	A large collection of related information stored on a computer medium such as disk, tape or in a computer's memory. Databases are often available to the public for a fee.
Download	The process of SAVEing information transmitted from another computer to your disk, tape, printer, or memory.
Dump	The bulk movement of information from one area (device) to another as a single activity.
Duplex	Full duplex is the simultaneous transmission of data from remote to host and host to remote; half duplex is transmission in only one direction at a time.

Escape codes	A special character used in telecommunications to indicate that the succeeding characters are different than the characters making up the actual message. The standard escape character is CHR\$(27), which usually signifies that the following characters will be control characters in an escape sequence that may include such directions as clear screen, position cursor, etc.
Files	Collections of information on disk. Files may consist of programs, or text information for use by a program.
Handshake	The defined electrical line sequences for proper communication between digital devices.
Host/Remote	In telecommunications the host is the computer that receives a call from the other computer. The host controls the processing while the computer that originated the call, the remote, acts according to the way the host dictates.
Information Service	An electronic information source, usually on a large computer, that provides information to other computers through telecommunications.
Intelligent terminal	A remote computer with the capacity to upload (transmit) and download (receive) files to and from a host computer.
Line feed	In telecommunications, indicates that a carriage return will be added whenever the data being transmitted cannot fit on one line of the screen.

Modem	A communication device that acts as an interface (connector) between a computer and a telephone. It allows electronic signals from one computer to be sent across standard telephone lines to another computer. The word stands for MOfulator/DEModulator.
On-line	The state of being connected to a host computer as a terminal.
Parity	The agreed-upon definition of valid bit combinations in a character. The parity bit is used as a checking mechanism to determine if transmission has been complete. Parity may be even, odd, mark, space, or none.
Program File	A set of computer instructions stored on disk or tape, which can be executed in a computer's memory.
Protocol	The appropriate settings for parameters required for accurate sending or receiving of information during a telecommunications dialogue. The telecommunication protocol includes parameters such as duplex, parity, word length and baud.
Sequential File	A collection of related data stored (one character after the other) as a complete unit on disk or tape.
Stop bit	A bit that signals the end of a character being transmitted.

Synchronous/Asynchronous
Communication

Synchronous computer systems transmit data according to and in unison with the internal system clock of the computer. Asynchronous systems, like the Amiga, transmit data independently of the internal system clock and use stop and start bits to regulate transmission.

Telecommunications

The sending and receiving of information between computers across standard telephone wires.

Terminal Mode

The mode of operation in which sending and receiving information takes place.

Upload

The process of transmitting the contents of your computer's memory to the memory of another computer where it can be executed or saved.

Word length

The number of data bits in a telecommunications word, or unit of data transmission. Usually 7 or 8 (plus start bit, stop bit(s), and optional parity bit.) This is determined by software; most programs default to one start bit, eight data bits, one stop bit and no parity.

Federal Communications Commission (FCC) Statement

Radio and Television Interference

This equipment generates and uses radio frequency energy and if not installed and used properly, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. The modem has been tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference in a residential installation.

However, there is no guarantee that interference will not occur in a particular installation. If this device does cause interference to radio or television reception, which you can determine by monitoring reception when the modem is on and off, try to correct the problem with one or more of the following measures.

1. Reorient the receiving antenna.
2. Relocate the computer with respect to the receiver.
3. Relocate the computer and/or the receiver so that they are on separate branch circuits.

If necessary, consult your Amiga dealer or an experienced radio/television technician for additional suggestions. You may find the following booklet, prepared by the FCC, helpful:

How to Identify and Resolve Radio-TV
Interference Problems
Stock No. 004-000-0345-4
U.S. Government Printing Office
Washington, DC 20402

Notifying the Telephone Company

Before you install your Modem/1200 RS, you should notify the telephone company that you plan to use a modem on your phone line. You will need to give the company the following information.

1. The telephone number (or numbers) to which the modem is to be connected.

2. The FCC registration number on the label on the bottom of the modem.
3. The ringer equivalence noted on the FCC label

You should also inform the telephone company if you ever permanently remove the modem from your phone line.

The FCC has established rules which govern data modem direct connection to the telephone network. A jack is provided by the telephone company for the direct connection. Jacks of the modular type required for the connection are not provided on party lines or coin lines.

If the data modem is malfunctioning, it may be affecting the telephone lines outside the permissible operation specifications of FCC 68. In this case, the modem should be disconnected until the source of the difficulty is traced.

For Canadian Modem Users

The Canadian Department of Communications (DOC) label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operative and safety requirements. The department does not guarantee the equipment will operate to a user's satisfaction.

Before installing this equipment, make sure you are permitted to connect it to the facilities of the local telecommunications company. You must also install the equipment using an acceptable method of connection. In some cases you may also extend the company's inside wiring for single-line individual service by means of a certified connector assembly (telephone extension cord). You should be aware, however, that compliance with the above conditions may not prevent degradation of service in some situations.

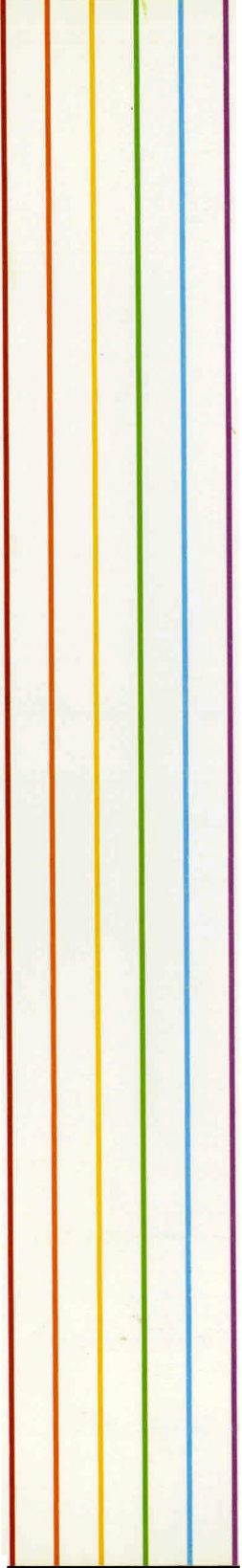
Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by a user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

For your own protection, make sure the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION: Do not attempt to make such connections yourself; contact the appropriate electric inspection authority or electrician.

Modem 1200 RS Load Number

The load number assigned to each terminal device denotes the percentage of the total load to be connected to the telephone loop used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices, subject only to the requirement that the total of load numbers of all the devices not exceed 100. An alphabetic suffix is also specified in the load number for the appropriate ringing type (A or B), if applicable. For example, LN = 5B designates a load number of 5 and a B-type ringer.



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