Standalone RS232 Multi-Standard Modem.
Auto Dial, Auto Answer, Auto Disconnect.

*Apple II and Macintosh Systems.*
Intelligent Auto
Dial, Answer & Disconnect
RS232 Direct Connect Modem

for Apple II, /// and
Macintosh™ families

Issue 1, January 1988.
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## Contents

**Introduction**

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>READ THIS FIRST</td>
<td>1</td>
</tr>
<tr>
<td>What You Need to Know to Use This Manual</td>
<td>i</td>
</tr>
<tr>
<td>What This Manual Tells You</td>
<td>i</td>
</tr>
<tr>
<td>What's in the Package</td>
<td>ii</td>
</tr>
<tr>
<td>What The Symbols Mean</td>
<td>iii</td>
</tr>
<tr>
<td>Comments and Suggestions</td>
<td>iii</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>iv</td>
</tr>
</tbody>
</table>

**Chapter 1**

**DATA COMMUNICATIONS FOR BEGINNERS**

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition of Data Communications</td>
<td>1</td>
</tr>
<tr>
<td>Connecting Computers</td>
<td>2</td>
</tr>
<tr>
<td>What Does a Modem Do?</td>
<td>3</td>
</tr>
<tr>
<td>Data Formats, Protocols and Standards</td>
<td>3</td>
</tr>
<tr>
<td>Data Format</td>
<td>3</td>
</tr>
<tr>
<td>Protocols</td>
<td>4</td>
</tr>
<tr>
<td>Modem Standards</td>
<td>4</td>
</tr>
<tr>
<td>Summary</td>
<td>5</td>
</tr>
<tr>
<td>Speed</td>
<td>5</td>
</tr>
<tr>
<td>Originate and Answer Modes</td>
<td>5</td>
</tr>
<tr>
<td>Important Telecom Information</td>
<td>6</td>
</tr>
</tbody>
</table>
Chapter 2  INTRODUCING THE APPLE PERSONAL MODEM PLUS  1

What The Apple Personal Modem Plus Does  1
Modem and Telephone  1
Software and Your Apple Personal Modem Plus  2
Features  3
Intelligence  3
'AT' Commands  3
Asynchronous  4
Connection Information  4
Auto Dial, Auto Answer  5
Speed Rate Converter  5
Saveable Options  6
Local Error Testing  6
Telecom Approved  6

Chapter 3  INSTALLING AND TESTING
THE APPLE PERSONAL MODEM PLUS  1

The Front Panel  1
The Rear Panel  2
The Dip Switches  3
The Volume Control, Turning Up The Sound  4
Installing The Modem  5
Computer Connections  6
Macintosh 128K, 512K, 512K Enhanced  6
Macintosh Plus, SE and Macintosh II  7
Macintosh XL/Lisa  7
Apple IIe, II Plus, II and IIC Installation  7
Apple IIGS Installation  8
Apple III and III Plus Installation  8
Other Computers  8
Power Connection  9
Testing Your Installation  9
If It Doesn't Work  10
Chapter 4  USING THE APPLE PERSONAL MODEM PLUS

Getting On Line And Staying There 1
Software Versus Direct Commands 1
Getting On Line - An Example 2
What You can do with Your Modem 3
Services 3
Information 5
Research 5
Professional Data 6
Leisure 6
Finding and Selecting an Information Service 7
Linking up to the Network 8
Getting More From Your Apple Personal Modem Plus 8
Design Concepts 9
Command Control 9
Modem Commands 12
Command Prefix 12
Typing Modem Commands 13
Modem Commands at a Glance 15

Appendix A  APPLE PERSONAL MODEM PLUS

COMMAND REFERENCE 1

General Commands 1
Escape Sequence ‘+++’ 1
On line Command ‘O’ 2
Hang Up Command ‘H’ 2
Identification Command ‘I’ 3
Monitor Echo Command ‘E’ 3
Transmission Mode Command ‘B’ 3
Monitor Speaker Command ‘M’ 4
Response Code Command ‘V’ 5
Quiet Command ‘Q’ 5
Self-Test Command ‘&T’ 5
Extended Response Code Command 'X' 6
Carrier Detect Command '&C' 6
Data Terminal Ready Command '&D' 6
Read Factory Default Parameters Command '&F' 7
Reset Command 'Z' 7
Write Current Parameters to NVM Command '&W' 7
Dialling Commands 8
Dial a Number 'Dnnn' 9
Pause ',' 9
Tone and Pulse Dialling 'T' or 'P' 9
Originating a Call in Answer Mode 'R' 10
Repeat 'A/' 10
Return to Command State '; 10
Command Format 11
Setting The S Registers 12
Answering Commands 12
Controlling Auto Answer 13
Auto Answer Process 13
The Answer Command 'A' 14
Answering Range 14
Register Settings 16
Write to S Registers 'S=' 16
Read S Registers 'S?' 16
Response Codes 17
Available Special Registers 18
Sample Commands 19
Default Settings 20

Appendix B  TROUBLESHOOTING, TEST AND DIAGNOSTIC GUIDE  1

Troubleshooting 1
The Quick Fix List 3
Detailed Check List 4
Telecommunications Line Checklist 4
Hardware Checklist 5
Communications Package 6
Problems on the screen 6
Other problems 6
Phone Line Quality Checklist 7

Appendix C USING PABXS, SWITCHBOARDS AND COMMANDERS 1
PABXs and Switchboards 1
Commander Systems 2

Appendix D APPLE II SSC INTERFACE 1
Using an Existing Card 1
Adjusting and Installing a New Card 1

Appendix E GLOSSARY 1

Appendix F CABLE DIAGRAMS WITH REGISTER
& COMMAND SUMMARY 1
Cable diagrams 1
Modem Mini Din-8 socket 1
Macintosh 128K, 512, 512E 1
Macintosh Plus, SE, Macintosh II 2
Macintosh XL/LISA 2
Apple II, II Plus, Ile 3
Apple IIC 3
Apple IIGS 4
Apple III/III Plus 4
Available Special Registers 5
'AT' Commands 6
Response Codes 7
Introduction

Read this First
Introduction

READ THIS FIRST

Congratulations on your purchase of an Apple Personal Modem Plus. You will find this modem opens the door to a whole new world of communications for you.

The Apple Personal Modem Plus is designed for use with the Apple II, III and Macintosh families of computers.

In this manual you will learn how to install and use your Apple Personal Modem Plus. Together with a communications software package, such as The NetComm Program, the Apple Personal Modem Plus lets you communicate with many other micro, mini and mainframe computers.

What You Need to Know to Use This Manual

To use this manual, you should know how to use the keyboard and screen of the computer or terminal to which you will connect your Apple Personal Modem Plus. If you do not know how to use your computer or terminal please read the appropriate user manual first.

You will also need to know how to use your communications program.

What This Manual Tells You

This manual is a complete guide to the Apple Personal Modem Plus. It is organised into two parts. The first part (Chapters 1 to 4) is a basic guide to using the modem for non-technical users. The second part (the Appendices) is a complete description of the modem for users who require more detailed information.
The manual contains all the information you'll need to start using your modem. Let's have a quick look at what each chapter covers.

- Chapter 1, 'Data Communications for Beginners', introduces you to the basic ideas and terms you will need to know to understand data communications.

- Chapter 2, 'Introducing the Apple Personal Modem Plus', describes the main features of your modem.


- Chapter 4, 'Using the Apple Personal Modem Plus', describes how to use the Apple Personal Modem Plus, and the ideas and concepts behind the design of the Apple Personal Modem Plus.

The Appendices provide further information and include technical specifications and hints on resolving communications problems.

---

**What's in the Package**

In your Apple Personal Modem Plus package you should receive the items pictured in Figure I-1.
These are:

- An Apple Personal Modem Plus and its associated Plug Pack power supply.
- A telephone cable to connect your Apple Personal Modem Plus to a standard Telecom wall socket.
- This User and Reference Guide.
- Telecom Forms TS72 and TS86
- A Warranty Card

Contact your dealer if any items are missing.

Apple supplies the NetComm Program along with the cable in the appropriate Accessory Kit for your particular Apple II, Apple III or Macintosh model.

---

**What The Symbols Mean**

Helpful hints and interesting sidelights appear in boxes, like this:

```
NOTE: You may want to read this note, but then again you may not.
```

Warnings about potential problems and advice about how to avoid them appear in boxes like this:

```
WARNING: Pay attention to what's in these boxes -- or else!
```

Please also note that zeros are shown as 'Ø' in this manual. The capital of the letter 'o' is shown as 'O'.

---

**Comments and Suggestions**
If you have any suggestions for changes or improvements in the current product or this manual, or suggestions for a new product, please contact us - your comments are always welcome.

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Chapter 1

Data Communications For Beginners
Chapter 1

DATA COMMUNICATIONS FOR BEGINNERS

In this chapter, a brief introduction is given to some data communications concepts you will need to understand to use your modem and get the most from this manual. You don't need to understand what these concepts mean in great detail, but you should be able to recognise them and be able to compare the capabilities of your Apple Personal Modem Plus with those of a remote computer, thus ensuring you can successfully communicate with it.

Definition of Data Communications

Data Communications is the exchange of information between two or more computers, or between a host computer and terminals attached to that computer. In either case, the computers involved may be micros, minis or mainframes. The word 'terminal' applies to both intelligent terminals - those containing a microprocessor and thus capable of doing some processing themselves, and to non-intelligent terminals - containing no microprocessor and functioning merely as keyboards and screens.
**Connecting Computers**

There are two ways to connect computers for communication:

1. 'Hard Wire' (sometimes called Direct Connect) - where the computer and the terminal are in relatively close proximity (within 15 metres). With a hard wire connection, the computers are connected by a cable.

2. 'Remote' - where the computers are connected via a telephone line. Modems are needed for this type of connection so that the digital data can be transmitted over the telephone lines.

---

*Fig. 1.1. Connection to a Host.*

---

2 Chapter 1: Data Communications For Beginners
What Does a Modem Do?

A modem, like your Apple Personal Modem Plus, allows your computer to send and receive data over the telephone lines. The term modem stands for 'modulator/de-modulator', which is an exact description of what the modem does. Computers work with data in the form of binary pulses, but telephones were designed to transmit voices in the form of analog sound waveforms. The modem modulates (converts) binary computer data into the analog form that phone lines can carry. When you're receiving signals, the modem de-modulates the analog signals coming through the phone lines, converting them back into the binary form which the computer understands. In effect, computers and telephones speak two different languages and the modem acts as a translator.

Data Formats, Protocols and Standards

To enable computers to communicate with each other, we need to have sets of rules defining how information will be sent across the phone lines. There are a number of different sets of these rules covering different ways of communicating. As long as the computers and/or terminals linked together use the same set of rules, they will be able to exchange information.

Data Format

Modems need to use the same communications standard on both ends of a telephone line. You also need to make sure the computers at both ends use the same data format. The data format defines how the data will be 'packaged' when it is sent, so the receiving computer can identify where each piece of information begins and ends and can verify that it has received the information correctly.
A data format is often expressed in terms like '8 data bits, 1 stop bit, no parity' or '7 data bits, 1 stop bit, even parity'. For example, if you're using your modem to connect to a public bulletin board, you'll find most Australian bulletin boards use the same data format - 8 data bits, 1 stop bit and no parity.

Protocols

There are several sets of rules for communicating between computers. Each set of rules is called a protocol. The protocol determines how data is sent across the communications line between two locations.

Your Apple Personal Modem Plus supports asynchronous protocols. Asynchronous protocols generally transmit data as it is entered from the keyboard. 'Bits' are placed at the beginning and end of each character transmitted to tell the receiving modem when to prepare for the character to come and when to stop and wait for the next to be sent.

Some protocols communicate interactively. That is, each character is transmitted as you type it or when you press <RETURN>.

Other protocols transfer information in files. When you use file transfer protocols from a terminal to a host computer, you must prepare the data in advance and save it in files on disk, then transmit the files in a group (called a 'batch file transfer').

You can also use file transfer protocols to send one or a series of files from one personal computer to another. The data in each file must be prepared in advance by your word processor, spreadsheet or database program.

Modem Standards

There are two sets of standards used throughout the world governing modem communications. In the USA, the Bell standards are used to define the exchange of data. In many other countries, the standards are set by the CCITT (Consultative Committee for International Telegraphy and Telephony).
Your Apple Personal Modem Plus supports different standards, both Bell and CCITT, and so is able to communicate with other modems that also adopt one or more of those standards. The standards which your Apple Personal Modem Plus supports are:

- CCITT V21 the Australian standard for 300 bps modems
- CCITT V23 the Australian standard for 1200/75 bps modems
- CCITT V22 the Australian standard for 1200 bps modems
- Bell 103 the US standard for 300 bps modems
- Bell 212A the US standard for 1200 bps modems

Summary

Speed

The rate at which a modem can transfer information over the telephone system is called the 'modem speed'. The speed of a modem is usually expressed in 'bits per second' or 'bps'. This is also sometimes referred to as the 'baud rate' of the modem. While not strictly accurate from a technical point of view, many people use the terms 'bps' and 'baud' to mean the same thing. Baud specifically means the number of shortest pulses that can be used to create a data character that can be transmitted in a second.

Your Apple Personal Modem Plus can communicate at 300 bps, 1200/75 bps (that is, 1200 bps outbound, from the host to you, and 75 bps inbound, from you to the host) and 1200 bps.

Originate and Answer Modes

For modems of the same data communications standard to be able to communicate with each other, one modem must be in 'originate' mode while the other must be in 'answer' mode. When you dial into a remote computer system you will almost always have your Apple Personal Modem Plus in 'originate' mode. If you are using your Apple Personal Modem Plus to automatically answer the phone for other modems it will be in 'answer' mode.
Important Telecom Information

Apart from all the rules which make data communications possible, there are some requirements issued by Telecom governing the use of modems. Telecom Australia requires you to be aware of the following:

Telecom Advice Regarding Location and Connection of Modems In Dangerous Situations:
The apparatus described in this Authorisation can only be located and connected to Telecom plant in normal commercial and domestic situations. Where location and connection is required in a dangerous situation (e.g., High voltage power station) and the electrical safety protection limits of line isolation may be exceeded, separate approval must be sought from Telecom in each instance.

Telecom Compliance Regarding Repetitive Calling Facilities:
Telecom requires customers who have equipment which has repertory dialling facilities to be aware of their requirements when using this equipment. The following section is a reprint from Telecom Specification 1056, Issue 3.

Definition
Repertory Dialler - A storage device which allows a telephone customer to store one or more telephone addresses (telephone numbers), and at any subsequent time to manually select a stored address (or addresses) which will then be automatically transmitted to the exchange line to originate calls on the Switched Telephone Network.

Repetitive calling facilities shall comply with the following:

(i) The facilities shall be manually initiated, and provision shall be made for the facility, once actuated, to be cancelled before the sequence of calls has been completed.

(ii) The maximum number of calls in any automatic re-dialling sequence or sequential calling sequence where no manual action is required between calls shall be as follows.
(a) Repertory diallers which do not incorporate service tone detectors - Three calls (the original plus two automatically initiated retries).
(b) Repertory diallers which incorporate service tone detectors which will ensure that the line will be released after the receipt or otherwise of a service tone indicating the call will not be successful - Five calls (the original plus four automatically initiated retries).
(iii) At the end of any unsuccessful call, there shall be an 'Off Line' period of 60 + 10 seconds before the line is automatically looped to initiate another call to the same number.

(iv) There shall be an 'Off Line' period of at least 2 seconds between two calls addressed to different numbers.

(v) An automatic re-dialling sequence in progress shall be automatically cancelled by:
(a) A successful call (indicated by an answer from a called party) made from a repertory dialler which incorporates service tone detectors, or
(b) Any manual action of the caller which could cause a sequence in progress to be interrupted, e.g. using the associated telephone for normal caller to take control of a call established from the repertory dialler.

(vi) It shall be possible for the caller to use the repertory dialler to make single calls to any number stored in it without automatically actuating any repetitive calling facilities with which the number called is associated.
Chapter 2

Introducing and Testing the Apple Personal Modem Plus
Chapter 2
INTRODUCING THE APPLE PERSONAL MODEM PLUS

In this chapter you will learn what you can do with your Apple Personal Modem Plus and the special features of your modem.

What The Apple Personal Modem Plus Does

Your Apple Personal Modem Plus lets you communicate with other personal computers, with host computers, and with a variety of on line database, electronic mail and bulletin board services.

This means you get the use of several computers for the price of one.

Modem and Telephone

Your Apple Personal Modem Plus is the link between your computer and other remote computers via the telephone socket. You can still have a telephone, of course, by using a suitable double adaptor plug in the Telecom wall socket.
Software and Your Apple Personal Modem Plus

Most modern communications software, like The NetComm Program, is capable of controlling the modem for you, so you will normally not need to know a great deal about the detail of how the modem operates. If you are interested in the technical details of the modem, or you wish to use a communications program which is not capable of sophisticated control of the modem, you may want to read Appendix A which describes the operation of the modem in quite some detail.

Most communications software will allow you to control your communications by dialogs, menu selections or multiple choice lists. Once you have selected what you want, the software will then control your Apple Personal Modem Plus for you.