

Apple-Cat II™

Communications System

Novation

PART NUMBER 490402

INSTALLATION AND OPERATION MANUAL



Apple-Cat IITM

Communications System

This manual provides installation and operation instructions for the Novation **Apple-Cat II** communications system. The APPLE-CAT II is designed exclusively for use on the Apple II[®] and Apple II Plus[®] computers to provide data communications over standard telephone lines.

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GENERAL DESCRIPTION

The APPLE-CAT II is a Large Scale Integrated (LSI) modem on a single printed circuit board that is installed in one of the peripheral slots inside the Apple computer. (FIGURE 1.) A small optional interface expansion module is positioned on the computer's rear panel to enclose phone line and accessory connections.

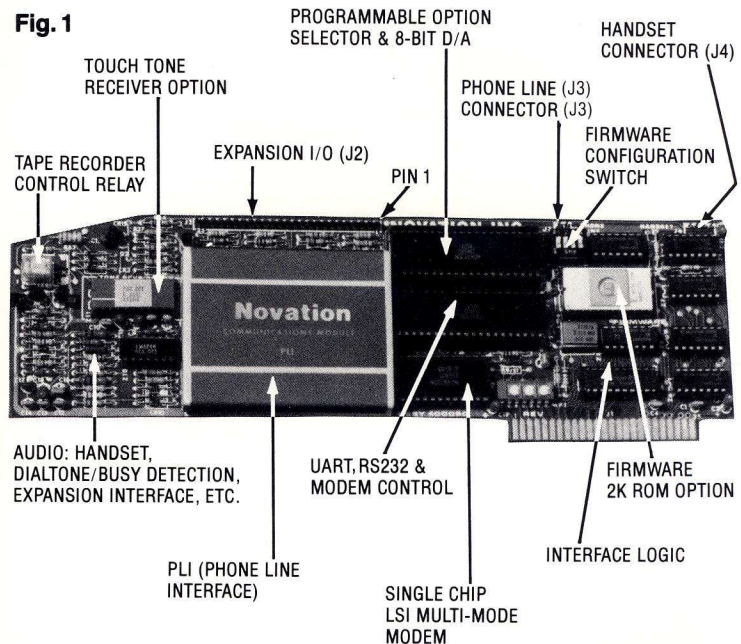
The APPLE-CAT II is a multi-function, low speed modem that is compatible with Bell 100 series (0 to 300 baud) and Bell 202 series (0 to 1200 baud) standards. It can operate at these user selectable rates:

- 50 Or 75 baud for very low speed communication.
- 110 Or 150 baud which is normally used for TWX[®] or TELEX transmissions.
- 300, 600 And 1200 baud, for use on standard dial-up telephone lines.
- A special option offers 45.5 baud, along with a Baudot coded Weitbrecht modem for the deaf TDD and TTY communications.

The APPLE-CAT II also provides operational software (COM-WARE II) on a floppy diskette that programs the computer for full data communications capability.

The system provides a selectable menu of 19 functions that are displayed on the screen. Each function is activated by pressing a single key on the keyboard. There is no programming required and all operations are identified on the screen.

Some of these features include auto tone and pulse dial, auto answer and auto re-dial modes. In addition, the system offers both on and off-line character storage in memory. The APPLE-CAT II can also transfer text and binary files over dial-up phone lines.



The APPLE-CAT II also converts the computer into a fully operational telephone, complete with an optional handset. Simple keyboard commands control dialing and answer functions.

A special TouchTone® receiver option allows decoding of standard tones for remote control of the Apple II computer.

The interface expansion module provides the following connections: direct connect to the phone line using the RJ11C compatible modular jack; handset modular jack; separate EIA RS-232-C serial port; AC Line modulator jack for BSR® remote controller; Microphone and Remote Jacks for connecting a standard cassette tape recorder; and a LED that indicates when the APPLE-CAT II is "off-hook."

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MINIMUM HARDWARE REQUIREMENT

The APPLE-CAT II requires a 48K Apple II or Apple II Plus with a single Apple II disk drive and 3.2, 3.2.1 or 3.3 Apple Disk Operating System (DOS). The optional auto-start ROM (Read Only Memory) should be installed for optimum operation.

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COM-WARE II PROGRAM

The APPLE-CAT II system includes a single 5¼" floppy disk formatted in DOS 3.2.1. The operating system can be converted to DOS 3.3 using Apple's MUFFIN program. The supplied diskette contains copyrighted programs.

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KEY OPERATIONAL FEATURES

The APPLE-CAT II provides these important operational features:

- **MENU BASED OPERATION.** All functions are displayed on the screen in a selectable list. Users choose each operation by pressing a single key on the keyboard. The program also prompts the user through various options and step by step instructions, that are displayed on the screen.
- **OPERATION SAFEGUARDS.** Software controls assure that data are accurately stored in memory. Each character is tracked using memory counters. A checksum test can also be performed on memory contents.
- **GENERATES TEXT OR BINARY FILES.** Data can be sent or received in binary or text formats for use with word processing programs.
- **OFF LINE PRINTING.** Data stored in memory can be sent directly to a serial printer, through the built-in RS-232-C port or to a parallel printer through an external parallel interface card.
- **MULTI-STATUS DISPLAY.** The lower portion of the screen continuously displays operational status of the system by monitoring 11 separate functions, both on and off-line.

• **BI-DIRECTIONAL SERIAL PORT.** A separate full duplex serial RS-232-C port is provided with handshaking capability for use with any compatible peripheral device.

• **HIGH CAPACITY MESSAGE STORAGE.** Users can create and store in memory a maximum of 27,000 characters.

• **SEPARATE TERMINAL/PRINTER FORMATS.** Users can configure the computer to operate as a communicating terminal and to print data (either in serial or parallel modes) by selecting various options from separate menus displayed on the screen.

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INSTALLATION

COMPONENTS

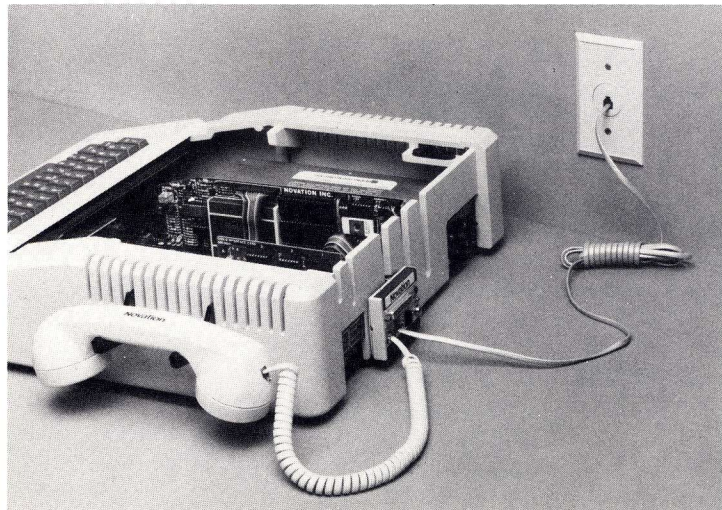
- The following components are packed with each APPLE-CAT II.
- 1/ APPLE-CAT II printed circuit board.
 - 2/ COM-WARE II program diskette, inside a protective envelope.
 - 3/ 7' Modular telephone cable.
 - 4/ Line modular jack assembly.
 - 5/ Handset modular jack assembly.
 - 6/ Installation and Operation Manual.

ACCESSORIES

The following accessories are offered for the APPLE-CAT II as optional equipment:

PART NO.	DESCRIPTION
490403	Interface expansion module.
490404	Telephone handset with cord and holder.
490405	BSR AC line modulator.
490406	Cassette recorder interface cable.
490407	TouchTone® LSI receiver.

Continued on page 6



- 490408 Program firmware. ROM containing system operating modes compatible with Basic, Pascal, Z-80 SoftCard.
- 490409 Deaf firmware.
- 490410 Duplicate COM-WARE II program diskettes.
- 490411 EIA-RS232-C printer interface cable kit.

NOTE: TouchTone® is a trademark of AT&T; BSR is a trademark of BSR Ltd; Z-80 SoftCard is a trademark of Microsoft Consumer Products.

INSTALLING THE APPLE-CAT II

CAUTION: BE SURE THE COMPUTER IS TURNED OFF.

WARNING: TO AVOID POSSIBLE STATIC DISCHARGE DAMAGE TO APPLE-CAT II OR COMPUTER, TOUCH METAL FRAME OF THE COMPUTER BEFORE HANDLING MODEM CARD OR CABLES.

Remove the computer cover and note the location of the eight printed circuit connector slots, numbered from 0 to 7. The APPLE-CAT II will operate from any of these slots, except slot 0.

Insert the end of the circuit board directly into the selected slot. Move the board back and forth slightly while applying downward pressure. This helps to firmly seat the connector into the socket.

Now examine the connections on the top of the APPLE-CAT II board. The largest is the 25 pin interface connector, identified as J2; next is the 2 pin PHONE LINE connector, identified as J3 and the 4 pin HANDSET connection, J4. The basic APPLE-CAT II has both a line and handset jack assemblies. Plug the 2 pin connector into J3 and the 4 pin connector into J4. Connect phone and handset cable to appropriate jacks. Position connectors in rear panel vents.

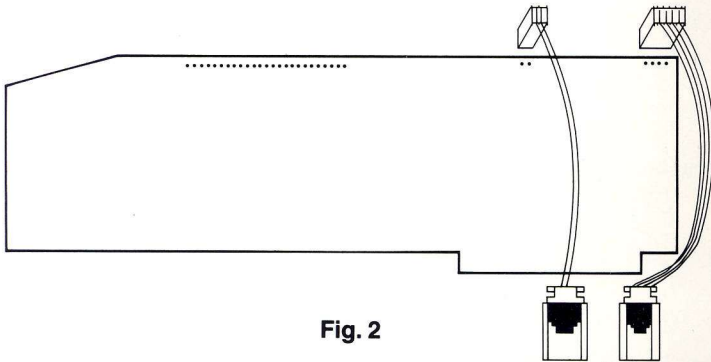


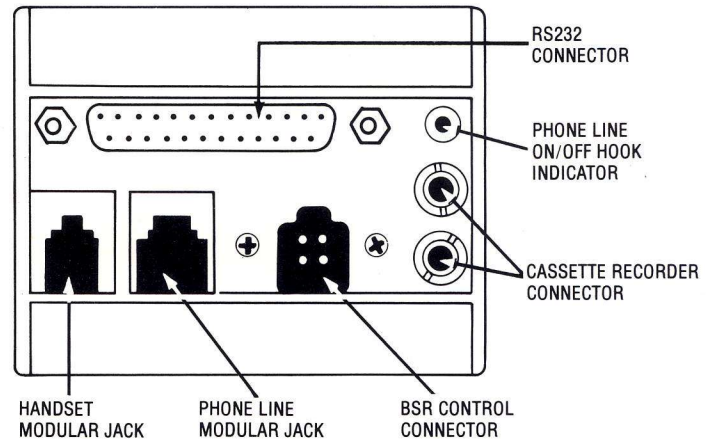
Fig. 2

The optional interface expansion module contains all hardware for both phone line and handset connections. (FIGURE 3)

Install the module on rear panel closest to the video output jack. Make sure surface is clean. Using the adhesive backing on the module, gently press the unit against the surface. The 14 wire flat cable is plugged onto the first 14 pins on the 25 pin connector (labeled J2); the 4 wire cable is plugged into the HANDSET connector labeled J4; and the 2 wire cable is plugged into the PHONE LINE connector labeled J3. Plug in optional handset. Slide two piece handset holder into side panel openings.

Directly below J3 is a four position DIP switch. This switch will be used only when operating the Firmware accessory. Instructions will be provided with the ROM.

Fig. 3



PUSH CABLES DOWNWARD TOWARD PC BOARD

NOTE: If handset is not provided by Novation, check for possible reverse handset wiring. If no sound is heard over the handset, once it is installed and in operation, reverse the handset connector and re-insert in the J4 connection. (FIGURE 4)

CAUTION: THE HANDSETS FROM TRIMLINE, TRENDLINE, PRINCESS OR SIMILAR PHONE INSTRUMENTS THAT HAVE THE DIAL OR PUSH BUTTON MECHANISMS IN THE HANDSET ITSELF, WILL NOT OPERATE IN THE APPLE-CAT II HANDSET CONNECTION.

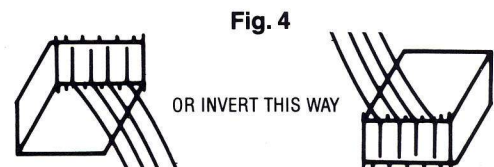


Fig. 4

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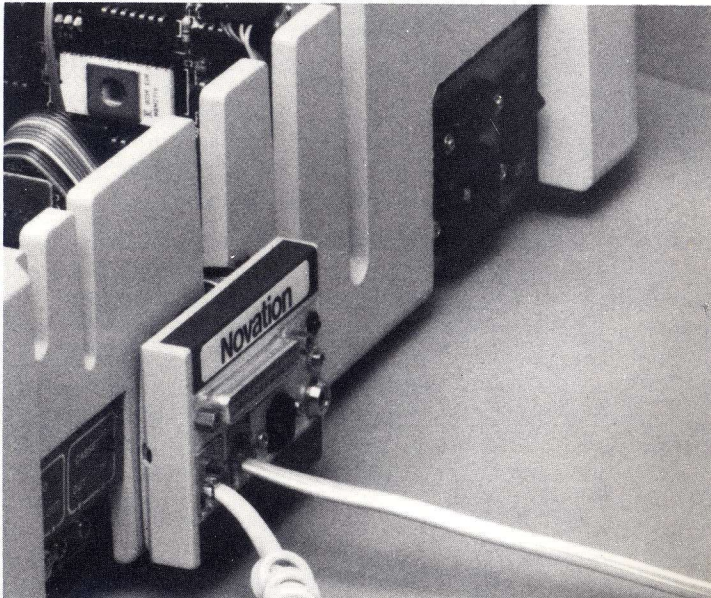
CONNECTING TO THE TELEPHONE NETWORK

The APPLE-CAT II is connected directly to the national telephone network and comes under the control and regulations of Part 68 of the Federal Communications Commission (FCC).

- 1) The APPLE-CAT II cannot be connected to party lines or to coin operated telephones.
- 2) In case of any malfunction of the APPLE-CAT II or telephone line, disconnect the unit from the phone line. If the APPLE-CAT II is found to be inoperable, return it to Novation, Inc for repair. Do not attempt field repairs or modifications as this violates FCC regulations and will void the warranty. Refer to warranty information in this manual.
- 3) Before connecting the phone line, call local telephone company. State the following FCC required information:
FCC Registration Number: AU492X-69442-DP-E
Ringer Equivalence: 0.8B
Novation Phone Line Interface Part Number 490278
- 4) Affix FCC information label provided to the rear or bottom of the Apple case.

Connect one end of the modular cable to the phone line connector box, usually located on the wall. Attach the other end of the modular cable to either the interface module or jack assembly. The APPLE-CAT II requires a USOC-RJ11W or USOC-RJ11C modular jack. (FIGURE 5)

Fig. 5



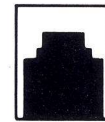
Connect telephone handset to appropriate modular jack connector.

NOTE: Two similar looking modular jacks are in the interface expansion module. One is the PHONE LINE connection; the other for the HANDSET. The PHONE LINE jack is larger than the HANDSET jack and the modular plugs are not interchangeable and should not be switched. (FIGURE 6)

Fig. 6



HANDSET



PHONE LINE

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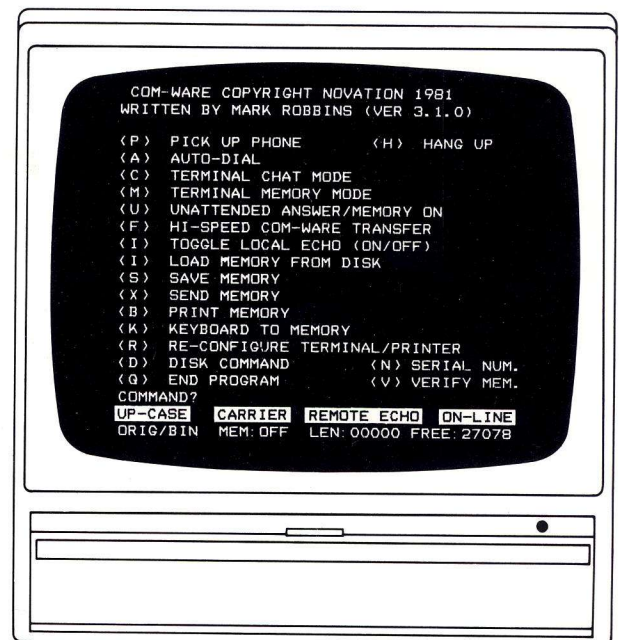
COM-WARE II TERMINAL PROGRAM

The APPLE/CAT II provides a program on a disk, called COM-WARE II, that changes the computer into a fully operational communicating terminal. The program takes full control of both the computer and the APPLE-CAT II system. It also allows complete access to conventional DOS commands.

The COM-WARE II program controls the computer through a menu of multiple functions that can be individually selected by a single key stroke.

OPERATION OF COM-WARE II SOFTWARE

The first step is to insert the COM-WARE II disk, label side up into the disk drive and power up the computer. The disk will whirl for a few seconds while the program is "booting up" and the screen will display this menu:



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STATUS DISPLAY BAR

The COM-WARE II program also creates a status display bar across the lower portion of the computer's screen. This feature monitors the APPLE-CAT II during all operational modes. It displays that the terminal is in upper or lower case; remote or local echo; on or off line; answer or originate; text or binary mode; carrier detect; memory on or off; and the counters display (LEN) filed characters, and (FREE) available characters. It also indicates when the modem is set for a test procedure.

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OPERATING COM-WARE II PROGRAM

All commands are enabled by typing the single letter enclosed in brackets by each menu item. Therefore a single keystroke initiates any of the functions. Pressing **RETURN** key is only required when a flashing cursor is displayed on the screen.

The first step in operating the program is to configure the computer to the requirements of computer communication. Press the **R** key on the keyboard. The following message will appear:

```
RE-CONFIGURE
(T) TERMINAL CHARACTERISTICS
(P) PRINTER CHARACTERISTICS
(ESC) ABORT RE-CONFIGURE
CHOICE?
```

TERMINAL CONFIGURATION

The next step is to configure the computer to operate as a terminal. Press the **T** key. The following message will be displayed.

NOTE: The most frequently used selections are stated.

MENU SELECTIONS EXPLANATION

RE-CONFIGURE TERMINAL

```
SLOT (1-7): 2
```

```
0) TEXT RECEIVE MODE
   STRIPS NULL & DLE CHARACTERS
   STRIPS (LF) AFTER (CR)
1) BINARY RECEIVE MODE:
   ALL 8 BIT DATA ACCEPTED
MODE (0-1): 1
```

Key in the slot number containing the APPLE-CAT II. The **0** selection sets the computer into the text receive mode.

Some computers send a LINE FEED after a RETURN in order to move the cursor to the next line. Many computers also send null or rub-out characters to cause a delay after RETURN to allow the head of a printer to return to position 1 on the next line. These characters are redundant in text transmission and take up unnecessary space in memory. When the APPLE-CAT II operates in the text mode, the following character formats are not stored in memory.

- 1) ANY (LF) PRECEDED BY A (RETURN)
- 2) NULLS (HEX \$00)
- 3) RUB-OUT (HEX \$FF)

The **1** sets the modem to receive all 8 data bits. All characters sent to the computer are received and stored exactly as they are transmitted. This is a useful mode when transferring a program from one computer to another.

NOTE: If the file being received is larger than the memory's capacity the following message is displayed:

```
MEMORY FULL! -->
```

The memory function is turned OFF and the computer returns to the menu.

```
0) TOUCH TONE DIALING
1) PULSE DIALING
CHOICE (0-1): 0
```

Select the type of phone system connected to the APPLE-CAT II. TouchTone is a push button phone; Pulse is a rotary dial phone.

```
0) TONE RECEIVE OPTION INSTALLED
1) TONE RECEIVE OPTION NOT INSTALLED
CHOICE (0-1): 1
```

If the optional TouchTone Receiver chip is installed on the APPLE-CAT II key in **0** if not, key in **1**

```
0) INPUT AND OUTPUT TO
   INTERNAL MODEM
1) INPUT AND OUTPUT TO
   EXTERNAL PORT
DEVICE (0-1): 0
```

If the APPLE-CAT II is being used for phone line communications, select **0**. If data is to be sent to an external EIA RS-232 C device, key in **1**

```
0) ORIGINATE
1) ANSWER
2) AUTO SEARCH
3) ANS TEST
4) ORIG TEST
```


5) HI SPEED TEST
MODE (0-5): 2

When operating at rates from 50 to 300 baud, select **0** when initiating a call, and **1** when answering a call from a remote computer or terminal.

Select **2** and the system will automatically search out the correct mode and set it. Select **3** to test the answer mode. Select **4** to test the originate mode and **5** to test the high speed transmission. Refer to MODEM SELF TEST PROCEDURE.

0) 1200 4) 110
1) 600 5) 75
2) 300 6) 50
3) 150
SPEED (0-6): 2

These are the selectable baud rates. The most frequently used speeds are **0** 1200 baud and **2** 300 baud. The 600 baud can only be used in Input or Output to external port. The maximum rate for answer and originate modes is 300 baud.

0) 8 BITS 2) 6 BITS
1) 7 BITS 3) 5 BITS
FORMAT (0-3): 0

This is set according to the requirements of the remote computer or terminal. The most frequently used selection is **0** 8 bits.

NOTE: 8 bits must be selected when transmitting or receiving binary files.

0) 1 STOP BIT
1) 1.5 STOP BITS
2) 2 STOP BITS
CHOICE (0-2): 0

Set this to requirements of remote computer. Most often the selection is **0**

PARITY ENABLED (0=NO OR
1=YES): 0

Parity is most often not enabled—set to **0**

0) ODD PARITY 2) MARK
PARITY
1) EVEN PARITY 3) SPACE
PARITY
PARITY (0-3): 3

Item **3** is most frequently used. Check requirements of remote computer or terminal. This selection ignored if no parity is used.

LOW CASE DISPLAY (1=ON/
0=OFF): 0

If computer has a separate lower case adapter installed select **1** ON.

KEY (1=RUBOUT /
0=BACKSPACE): 0

Set to requirements of remote terminal or computer.

SAVE CHANGES TO DISK (YES /
RETURN): Y

If you wish to save this information to disk, press **Y** (Yes), if not press **RETURN**.

Type in the desired value for each item. The cursor automatically moves to the proper space. To exit from this mode, at any time, press the **ESC** key. Once selections are made and saved to disk, they will be displayed in inverse figures when the menu is recalled from memory. If the current selection is correct, press the **RETURN** key. To change a value, type in a new one.

If the menu selections are saved to disk by keying in **Y** for YES, the disk will whirl and all the parameters will be stored in a special file labeled I/O COMMAND FILE. This file will be stored on the same disk that is in the disk drive when the **Y** key is pressed.

If by error, the I/O COMMAND FILE is not on the same disk as the COM-WARE II program, during boot-up, the following message will be displayed,

I/O COMMAND FILE

NOT PRESENT ON DISC

INSERT MASTER COM-WARE II

DISK AND HIT (RETURN)

If this occurs, insert the COM-WARE II disk or any disk that contains the I/O COMMAND FILE and press **RETURN**.

NOVATION SERIAL PRINTER PORT CONFIGURATION

Return to menu (use **ESC** key if necessary) and press the **R** key and then press the **P** key for PRINTER. Follow the same procedure to complete this menu as for the terminal configuration. The following message will appear:

RE-CONFIGURE PRINTER PORT

0) NOVATION PRINTER PORT

Select **0**

**1) PRINTER IN OTHER
INTERFACE SLOT
CHOICE (0-7)?**

Select **1** only if you wish to output to an external serial or parallel card installed in a different slot. Refer to other slot printer configuration, page 15.

**(0) INSERT LINE FEED
(1) NO LINE FEED
CHOICE?**

Selection is based on printer requirements. If **0** is selected, a line feed will be inserted after each **RETURN**. If **1** is selected, no line feed characters will be inserted.

RETURN DELAY (0-9): 0

Set to printer requirements. The **0** selection will provide no delay after each **RETURN**. The 1-9 delays are based on 100 milliseconds each before sending the next line.

**0) NO HANDSHAKE USED
1) NEGATIVE BUSY HANDSHAKE
2) POSITIVE BUSY HANDSHAKE
3) X-ON/X-OFF HANDSHAKE
CHOICE (0)**

Make this selection according to printer requirements. Refer to manufacturer's manual. See Glossary of Terms for more detailed explanation of handshaking.

**0) 1200 4) 110
1) 600 5) 75
2) 300 6) 50
3) 150
SPEED (0-6): 0**

Select desired baud rate for speed of printing. 1200 baud approximates 120 characters per second.

**0) 8 BITS 2) 6 BITS
1) 7 BITS 3) 5 BITS
FORMAT (0-3): 1**

Set to printer specifications.

**0) 1 STOP BIT
1) 1.5 STOP BITS
2) 2 STOP BITS
CHOICE (0-2): 0**

Set to printer specifications.

**PARITY ENABLED
(0=NO / 1=YES): 0**

Set to printer specifications.

**0) ODD PARITY
1) EVEN PARITY
2) MARK PARITY
3) SPACE PARITY
PARITY (0-3): 3**

Set to printer specifications.

**SAVE CHANGES TO DISK
(YES / (RETURN))?: Y**

OTHER SLOT PRINTER CONFIGURATION

Return to menu (press the **ESC** key, if necessary). Press the **R** key, then press the **P** key and the **1** selection.

**0) INSERT LINE FEED
1) NO LINE FEED
CHOICE (0-1): 0**

Set to printer specifications.

RETURN DELAY (0-9): 0

Set to printer specifications.

PRINTER SLOT (0-7): 1

If **0** is selected, the contents of memory will be sent to the screen in normal and inverse flashing characters. All ASCII control characters will be displayed as solid inverse characters. This is a useful technique for examining the contents of files or any data captured in memory. Select slots 1-7 to match installation of serial or parallel printer interface card. Data will be sent to the slot that is designated. If no printer interface card is installed, the system will stop or "hang" when the print command is keyed. Press **RESET** to continue.

**SET UP PRINTER
COMMAND BUFFER? (Y/N)**

If **Y** (YES) is selected, this messages appears, ENTER PRINTER SET-UP COMMAND. You may enter up to a 42 character command sequence consisting of any characters except **CTRL Z CTRL M** (which is **RETURN** **ESC** or BACK SPACE. Press **RETURN** when finished. This sequence will be sent to the printer whenever the **B** command key is pressed. Many printers or interface cards recognize certain command sequences to set page print width, select

character fonts and other format requirements. For example, the Apple parallel interface card must be sent a **CTRLI 96N** command to print 96 characters across a page. When the enter command request is displayed, key in **CTRLI 96N** and **RETURN**. The Apple parallel card is now set to print 96 columns.

SAVE CHANGES TO DISK (Y/N)

If you wish to save this configuration on a disk, press the **Y** key, if not press **RETURN** or **N** key.

Both the terminal and printer configurations are now set and the selections have been saved to memory for later recall. The COM-WARE II program is now ready to operate the APPLE computer.

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MODEM SELF TEST PROCEDURE

Test modes 4 through 6: set the APPLE-CAT II off line and configure the receive frequencies to match the transmitter. The result is that any characters sent from keyboard or memory are displayed on the screen. Remote Echo will be automatically selected when in any of the test modes.

- 1/ Load **L** Binary **B** file QBF.
- 2/ Reconfigure terminal **R**.
- 3/ Select **0** INPUT AND OUTPUT TO INTERNAL MODEM.
- 4/ Select **3** ANS TEST.
- 5/ Select **2** 300 BAUD.
- 6/ Type **ESC** to return to command mode.
- 7/ Select **X** for transmit mode.
- 8/ Enter **0** for return delay.
- 9/ Press **RETURN**.

The screen will clear and the top line will display,

APPLE-CAT II TEST FILE

THE QUICK BROWN FOX JUMPS OVER ...

The QBF message will be repeated for a number of lines. After one half page of messages, press **ESC** to exit transmit mode. If the QBF message contains no errors repeat steps 2 through 9. Then select ORIG TEST. If no errors, repeat steps 2 through 9, selecting HI SPEED TEST for 1200 baud.

If any self test mode fails, the modem is probably not operating correctly. Refer to warranty information.

If all test modes function properly, return to RECONFIGURE TERMINAL MODE and select ORIGINATE 300 BAUD.

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DESCRIPTION OF COM-WARE II COMMANDS

The following are descriptions of the various COM-WARE II commands that control the communication features of APPLE-CAT II.

(P) PICK UP PHONE

Allows you to use optional handset for operating computer as a conventional telephone. To receive a phone call, pick up handset and press **P** key. Use the **ESC** key to return to menu. If the TouchTone option is installed, all TouchTones received are decoded and displayed on the screen. The 0-9 keys are active at all times and can be used to manually dial a number if desired.

(H) HANG UP

Pressing this key terminates phone call.

(A) AUTO-DIAL

If this key is pressed, the following message will be displayed:

(D) DIAL A NUMBER

(R) RE-DIAL LAST NUMBER

(ESC) ABORT DIALING

Type **D** to set dialing function and then type the phone number. The system recognizes only the first 56 digits. As you type, the numbers will appear on the screen. Use the backspace to correct errors. When phone number is correct, press the **RETURN** key. After a 3 second delay, the status bar will display ON-LINE and the number dialed will be on the screen. Type **R** to re-dial the last number. The system repeats the same procedures used in the initial dialing, except the phone number does not need to be re-typed. The last phone number dialed remains in memory for as long as the COM-WARE program is in operation or until another number is dialed using the **D** dial command. Key in **+** if you wish to wait for additional dialtone, and **@** for a 2 second delay, if desired.

NOTE: The APPLE-CAT II automatically detects dialtone before dialing. If no dialtone is present it will wait indefinitely. If that occurs, check phone line connection. Press **ESC** to abort dialing at any time.

(C) TERMINAL CHAT MODE

If the **C** key is pressed, the memory is turned off but not cleared. You are able to communicate or 'chat' back and forth with the remote computer. The characters typed on the keyboard are displayed on the screen, but are not stored in memory. Turn ON local echo option (see menu) when communicating with any computer or

terminal which does not echo characters. Local echo should also be ON if you wish to monitor data being sent to the printer or to any other peripheral device.

(M) TERMINAL MEMORY MODE

This sets the computer to operate as a terminal with the memory ON. The **M** key sets the computer into the mode that was selected during re-configuration of the program. The following message is displayed when the **M** key is pressed,

TERMINAL MODE

NOTE: Key **I** to toggle **LOCAL ECHO** when communicating with a computer that does not echo back characters.

(U) UNATTENDED ANSWER/MEMORY ON

This mode sets the computer to automatically answer a phone call with complete unattended operation. Press the **U** key and this message appears on the screen,

(ESC) EXITS UNATTENDED ANSWER MODE

KEYBOARD IS ACTIVE

The status bar indicates that memory is ON and cleared to receive data. The computer is set to automatically answer an incoming call. When the call is detected, an audible pulsing tone is heard (the ring indication). This message appears on the screen,

CALL COMING IN

At the end of the first ring, the call is answered and this message appears,

WAITING FOR CARRIER

If there is no carrier within 18 seconds, this message appears,

NO CARRIER : CONNECTION TERMINATED

If the carrier signal is detected, the following welcome message is transmitted and seen on the screen,

HI, THIS IS AN APPLE II COMPUTER.
PLEASE LEAVE YOUR NAME AND MESSAGE
AND THEN HANG UP.

The caller can then send a message. The information is stored in memory and the character count is registered on the status bar display.

(F) HI-SPEED COM-WARE TRANSFER

When the **F** key is pressed, the following message is displayed,

HI-SPEED COM-WARE TRANSFER MODE

T) TRANSMIT MEMORY TO PORT

R) RECEIVE DATA TO MEMORY

(ESC) ABORT

This mode uses a protocol unique to Novation COM-WARE II programs. It allows the transmission of memory between two APPLE-CAT II equipped computers. During transfer, data is automatically sent at 1200 baud with 8 data bits, 1 stop bit and no parity.

TRANSMIT MEMORY

Press **T** and the screen will display,

WAITING FOR 2 STAGE HANDSHAKE

When the receiving APPLE-CAT II is ready the screen will display,

STAGE 1 COMPLETE

STAGE 2 COMPLETE

TRANSMITTING

If STAGE 2 COMPLETE message is not displayed within 2 seconds of the STAGE 1 COMPLETE message, use the **ESC** key to abort. The checksum will be displayed and you will be returned to terminal chat mode,

If handshake is successful, data transfer will begin and mode status will read XMIT/BIN on the screen. The entire contents of memory will be sent even if connection is lost.

At end of transmission the screen will display,

TRANSMISSION COMPLETE

NOTE: The carrier indicator may flash during transmission but should be ignored.

Once transmission is over, a beep will be heard. The checksum will be displayed followed by a return to chat mode. At this time you should compare checksum with the receiving computer.

RECEIVE MEMORY

Press **ESC** and the screen will display,

WAITING FOR 3 STAGE HANDSHAKE

When the APPLE-CAT II is ready the screen will display,

STAGE 1 COMPLETE

STAGE 2 COMPLETE

STAGE 3 COMPLETE

TRANSFER IN PROGRESS

If STAGE 3 COMPLETE message is not displayed within 4 seconds of the STAGE 1 message, use **ESC** key to abort operation. A checksum of 0000 will be displayed and the terminal will be returned to the chat mode.

If handshake is successful, data transfer will begin and the memory counter will run continuously until complete. During transfer the carrier indicator will be ON. If any abnormal condition occurs during transfer, the following message will be displayed,

PREMATURE LOSS OF DATA/CARRIER

A checksum will be displayed and you will be returned to the chat mode. Otherwise this message will appear,

COM-WARE TRANSFER ABORTED NORMALLY

Also, the checksum will appear and the terminal will be returned to the chat mode. At this time you should compare checksum with the transmitting computer.

NOTE: The checksum is computed with an industry recognized CRC-16 standard. If the receive checksum matches the transmit checksum, the probability of error is less than 1×10^{-12}

(I) TOGGLE LOCAL ECHO (ON/OFF)

When local echo is OFF, the characters typed on the keyboard are not displayed on the screen. Use **REMOTE ECHO** when you wish to communicate with a computer that echos back characters. Turn local echo ON: 1) when communicating with any other computer or 2) when monitoring data going to the printer or 3) when monitoring any peripheral communications device through the RS-232-C port.

(L) LOAD MEMORY FROM DISK

This function, when selected, displays the following message:

LOAD TO MEMORY

B) BINARY FILE

T) TEXT FILE

(ESC) ABORT LOAD

To use this command, load either a text or a binary file into memory. The contents of memory are cleared. If the binary file is larger than the available memory, there will be no warning and the Apple DOS will be written over and the previous stored data will be lost.

BE CAREFUL. IF A TEXT FILE IS LARGER THAN THE MEMORY CAPACITY, THE FOLLOWING MESSAGE WILL BE DISPLAYED:

BUFFER FULL - - - DATA LOST

If you wish to transfer a text file that is larger than memory, use a word processing program to separate large files into smaller files. Once this is accomplished, the data can be transmitted to other computers.

NOTE: When acquiring a word processing program, be sure to select one that operates with normal ASCII text. Some programs manipulate characters in unconventional ways to save memory space. This may cause problems when the COM-WARE II program tries to read the data.

(S) SAVE MEMORY

Pressing this key, the following message is displayed:

SAVE MEMORY TO FILE

(T) TEXT FILE

(B) BINARY FILE

(ESC) ABORT SAVE

This command allows the data in memory to be saved to a text or binary file. Any DOS errors that occur, such as 'DISK FULL' will be displayed. There will be other opportunities to save the data without losing characters.

(X) SEND MEMORY

This command sends contents of memory to another computer. Typically you would load a text or binary file into memory and send it to another computer. When you type **X** the following message is displayed:

(CR) DELAY (0-9)?

If you are sending data to computers such as THE SOURCE or MICRONET, they may need a delay after each **RETURN**. If you are sending data to printing terminals, they may also need a delay to allow the print head to reposition. You will need to experiment with this selection to determine how much delay is needed.

The next message that is displayed is:

PRESS (RETURN) TO SEND MEMORY

When transmission starts, the screen will display:

TRANSMITTING

The status display bar will indicate XMIT mode. If you wish to monitor data being sent, select LOCAL ECHO. When transmission is complete or if the ESC key is pressed to abort, the screen will immediately display:

TRANSMISSION COMPLETE

(B) PRINT MEMORY

This command causes the contents of memory to be sent to the printer. The transmission will follow the parameters set when the printer was re-configured. Pressing this key will cause the screen to display:

PRINTING

When printing is complete the screen will display:

PRINTING COMPLETE

IF ESC key is pressed during transmission, the screen will display:

PRINTING ABORTED

NOTE: CTRL S will stop and CTRL Q will start printing. With handshaking the printer will stop when the buffer is full and will continue printing as buffer space becomes available.

(K) KEYBOARD TO MEMORY

This command causes the memory to be cleared and then allows the operator to type characters directly into memory. You may type in one line at a time, if you wish. When the RETURN key is pressed, the previous line cannot be accessed. The back arrow key may be used to erase the previous character and adjust the character count only if the cursor is not on position 1 of the current line.

The K command is used to create simple files which can be sent at a later time. This command often saves long distance telephone and/or computer connect charges.

(R) RE-CONFIGURE TERMINAL/PRINTER

This operation has been described earlier in this manual. For a more detailed description of some of the terms used, refer to the GLOSSARY OF TERMS.

(D) DISK COMMAND

When the D key is pressed, the screen will display:

D. O. S. COMMAND:

The main use is to catalog any of your disk drives. For example, if you type CATALOG, S5,D2, then the disk in slot 5, drive 2 becomes the default drive for any save, load or catalog function.

(N) SERIAL NUM

This is a program test routine that performs a self test on the COM-WARE II software. It calculates a CRC-16 checksum on the program. Press the N key and this message will appear,

```
COM-WARE SERIAL NUMBER -----> XXXX
```

The X equals any number or letter. This shows that the program is intact. However, if an error is detected, the following message appears,

```
COM-WARE SERIAL NUMBER -----> XXXX
```

```
THIS SOFTWARE HAS A FATAL ERROR
```

```
REFER TO MANUAL FOR INSTRUCTIONS
```

```
HIT ANY KEY TO CONTINUE
```

If this occurs, the problem could be a defective diskette, or the program was written over by another program.

If the problem continues after re-running the program, return the diskette to the dealer for a replacement.

(V) VERIFY MEM

This command calculates a CRC-16 checksum on the contents of memory at any time.

NOTE: The memory checksum is automatically displayed after a high speed COM-WARE II transfer.

(Q) END PROGRAM

This command ends the COM-WARE II program and sets the computer into Basic.

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SOME UNLABELED COMMANDS IN TERMINAL MODE

The following are three commands that are available to users in the terminal mode:

CTRL	SHIFT	N:	Transmits 250 millisecond break.
CTRL	SHIFT	M:	Transmits (ESC)
CTRL	SHIFT	P:	Toggles Low/Upper case transmit.

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TELEPHONE HANDSET OPERATION

The telephone handset of your APPLE-CAT II is intended as a convenience feature for voice use during periods when data is not being transmitted. It is not designed as an unattended telephone since voice calls can only be made or received when the computer is ON and the COM-WARE II program is operating. In this mode, the computer can receive incoming calls. There is an audible tone, generated by the computer, that announces an incoming call.

If both the APPLE-CAT II and a separate telephone are to operate from a single wall modular jack connection, a T-adaptor is required. Connect end of modular cable from the APPLE-CAT II to the T-adaptor. Connect telephone modular cable to T-adaptor and then plug T-adaptor into wall modular plug.

NOTE: Do not lift handset on the telephone connected at the T-adaptor while computer is engaged in data transmission. Noise picked up by the handset microphone will disrupt data flow. This does not apply to the computer handset as it is not connected during data transmission.

TO ORIGINATE A VOICE CALL

To place a voice call on the computer, be sure the COM-WARE II program is in operation. Press the **A** key and then press the **D** key to dial a number. Key in the desired number of digits. (Limit is 56). As you do, the numbers will be displayed on the screen. Press **RETURN** and pick up the handset. Listen for the dial tone, and then the sound as the numbers are being dialed. Talk as you would normally and when finished press the **H** key to hang-up the phone.

TO ANSWER A VOICE CALL

The computer must be ON and the COM-WARE II program in operation. When a phone ring is heard, pick up computer handset and press the **P** key. This engages the phone line and you can converse in a normal way. Press the **H** key to hang-up the phone. To set computer to auto dial or unattended operation, key in the menu selections **A** or **U**.

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CASSETTE RECORDER OPERATION

An optional cable is offered to connect a cassette tape recorder to the APPLE-CAT II expansion module. When activated, the tape unit will record voice calls over the phone line. When a call is received, the recorder will automatically record an incoming voice message before or after data transmission. Additional information will be supplied upon request.

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BSR® REMOTE CONTROL

The capability to operate BSR power modules is an optional feature of the APPLE-CAT II and will be provided, at extra cost. Information on this system and how it operates will be supplied upon request.

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PROGRAMING INFORMATION

Information is provided on how to program the APPLE-CAT II. A description of this material is available upon request.

18

TOUCHTONE RECEIVE OPTION

This is a single chip LSI that will control operations of the APPLE-CAT II using any TouchTone telephone. Information on this option is available upon request.

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COM-WARE II UTILITY PROGRAMS

Run a catalog of the COM-WARE II diskette. The contents are as follows:

A 002 HELLO

I 002 APPLESOFT

B 043 COM-WARE II

A 002 A-CONVERT

I 002 I-CONVERT

B 008 CONVERT.BIN

B 002 I/O COMMAND FILE

B 017 QBF

THE HELLO PROGRAM

The HELLO program is run automatically whenever the COM-WARE II disk is "booted up." If the computer uses integer basic, the Apple DOS will recognize that an Applesoft program is being run. When this is detected, DOS internally issues the command RUN APPLESOFT.

The HELLO and the Applesoft programs perform the same function.

```
10 HOME: VTAB 12: HTAB 10: PRINT  
"RUNNING COM-WARE II"
```

```
20 PRINT CHR$(4) "BRUN COM-WARE II,  
A$803"
```

```
30 END
```

The COM-WARE II program will "boot up" on either an Apple II or an Apple II Plus.

The extension (A\$803) was added to allow software updates to be sent over the phone lines. The line 20 A\$803 insures that the binary file, COM-WARE II will always be loaded and run at HEX location \$803 (decimal location 2051).

To restart COM-WARE II, key in **CALL 2051** from basic or **BO3G** from the Apple monitor. The program will always re-start as if it was re-booted.

QBF (QUICK BROWN FOX TEXT)

This file can be used in all modem self test procedures and to test printer operations using the **B** command.

I-CONVERT AND A-CONVERT PROGRAMS

The purpose of the I-CONVERT and the A-CONVERT programs is to allow the user to perform the following routines:

1. Convert Applesoft or Integer Basic programs into a binary file on one communicating Apple computer, designated Apple #1.
2. Transmit the binary file from Apple #1 to Apple #2 using the COM-WARE II program.
3. Convert the binary file back into an Applesoft or integer basic program on Apple #2.

The I-CONVERT program will only run on an Apple II with integer basic.

The A-CONVERT program will only run on an Apple II with Applesoft basic.

Many Apple II users have firmware cards which make both languages available. Consult Apple literature for details.

I-CONVERT

Key in **"RUN I-CONVERT"** The menu will display,

CONVERT-A-FILE UTILITY

COPYRIGHT NOVATION INC 1981

BY MARK ROBBINS (VERSION 2.0)

(1) INT BASIC TO BINARY FILE

(2) BINARY FILE TO INT BASIC

(3) QUIT

YOUR CHOICE PLEASE

If you press **1** a catalog of the disk will appear.

The following will appear on the screen,

INTEGER PROGRAM TO CONVERT

Type in the name of the integer program you wish converted. If you typed a valid integer program name the screen will go blank and the following message will appear,

FILE CONVERTED

HIT ANY KEY TO CONTINUE

The converted file is now on the disk as a binary file with an ".I" added to the name in the catalog to indicate that it was an integer basic program. The original program remains intact.

If you press **2** a catalog will be run with this message appearing on the screen,

BINARY FILE TO CONVERT TO INTEGER:

Key in the name of the binary file to be converted.

NOTE: The binary file must have been generated by the I-CONVERT program option **1**

If a valid file name was typed, the screen will go blank and this message will appear:

PLEASE TYPE NAME TO SAVE UNDER:

Type any name for the integer program. The screen will go blank and this message appears:

FILE CONVERTED

HIT ANY KEY TO CONTINUE

The converted file will now be on the disk as an integer basic program with the name designated. The original binary file is intact.

A-CONVERT

Type **A-CONVERT** and this menu is displayed:

CONVERT-A-FILE UTILITY

COPYRIGHT NOVATION INC 1981

BY MARK ROBBINS (VERSION 2.0)

(1) FP BASIC TO BINARY FILE

(2) BINARY FILE TO FP BASIC

(3) QUIT

YOUR CHOICE PLEASE

(1) FP (FLOATING POINT) BASIC TO BINARY FILE Select **1** and the disk will run a catalog. The screen displays,

APPLESOFT PROGRAM TO CONVERT:

Key in the name of the Applesoft program to be converted. If a valid program is keyed in, the screen will go blank and this message will be displayed:

TYPE CALL 1016 (RETURN) TO CONTINUE

Proceed as directed and key in **CALL 1016**, then **RETURN**

The screen will go blank and return with

FILE CONVERTED

HIT ANY KEY TO CONTINUE

The converted file is now on the disk as a binary file with an ".A" added to the name to indicate that it was an Applesoft basic program is intact.

(2) BINARY FILE TO APPLESOFT BASIC

Press **2** and a catalog will be run followed by this message on the screen,

BINARY FILE TO CONVERT TO INTEGER:

Type in the name of the binary file to be converted.

NOTE: The binary file must have been generated by the A-CONVERT program, option **1**

If a valid binary file name has been typed, the screen will go blank and this message appears:

PLEASE TYPE NAME TO SAVE UNDER:

Type any name to identify the Applesoft program. The screen will go blank and this message appears:

FILE CONVERTED

HIT ANY KEY TO CONTINUE

The converted file will be on the disk as a Applesoft basic program with the designated name. The original binary file remains intact.

A-CONVERT AND I-CONVERT ERROR MESSAGES

Any Apple DOS error message such as FILE MISMATCH, DISK FULL, FILE NOT FOUND, LANGUAGE NOT AVAILABLE or SYNTAX ERROR will be displayed followed by an audible beep for any errors.

The following messages appear:

TYPE RETURN TO TRY AGAIN

TYPE CONTROL C TO RETURN TO MENU

If you wish to retry last command, press **RETURN**

If you wish to return to the menu then hold down the **CTRL** key and press **C**

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GLOSSARY OF TERMS

The following are brief descriptions of the most often used terms in this manual:

MEMORY—This is a storage “tank” with a limited number of character file space. When all the space is filled, the characters must be saved to a larger capacity storage device, such as the disk.

ON-LINE—This term means that the APPLE-CAT II is connected to the phone line and a call is in progress.

HANDSHAKING—This refers to how the printer (or other peripheral device) and the COM-WARE II program communicate with each other. Some printers send out a signal to the computer when the buffer is full. When this happens, the program instructs the computer to stop sending data until the printer has time to print out the buffer's contents on paper. The COM-WARE II program supports three types of “buffer full” signals.

NEGATIVE BUSY:

The printer busy line goes low when the buffer is full.

POSITIVE BUSY:

The printer busy line goes high when buffer is full.

X-ON or X-OFF: The printer sends the character X-OFF (CONTROL S) when buffer is full and then sends the character X-ON (CONTROL Q) when the buffer is ready to accept more data.

◆ **KEY (BACK ARROW)** Various computers recognize different characters to delete when backspacing. The COM-WARE II program allows the user to select from two different back-space options.

CONTROL H: Used by the Apple Computer and others for back spacing.

RUB OUT: Used by Digital Equipment computers and others for back spacing.

REMOTE ECHO/LOCAL ECHO—These terms are confusingly called full or half duplex. Local echo means that the characters typed on the keyboard are also printed on the screen. Remote echo means that the remote computer receives the same characters your computer is sending by transmitting them back. This provides verification that the remote computer is receiving accurate data.

FULL DUPLEX or HALF DUPLEX—Half duplex means that the APPLE-CAT II can send or receive data but not at the same time. Full duplex means that data can be sent or received simultaneously. This is best explained in terms of CB (Citizen Band) radio. If two people are using their radios only one person can talk at a time. The other person must listen. This is equivalent to half duplex. But, if both individuals each had two radios, one could talk on one radio and listen on the other. Since both are able to talk and listen at the same time, the functions are similar to full duplex operation.

The APPLE CAT II's 0 to 300 baud, answer and originate modes are full duplex. It has separate transmit and receive channels. The high speed COM-WARE II transfer mode (previously described) is half duplex. It can only send or receive in one direction at a time, but at the 1200 baud rate. That is four times faster than 300 baud.

LOWER CASE DISPLAY—This mode allows the screen to display lower case letters if the computer has a lower case adapter installed.

DATA FORMAT—This term is used to identify such items as parity, number of data bits, and the number of stop bits that the computer, terminal or printer requires. The selected format is most often dependent on the computer system that is being called.

The following items are a few guidelines to assist in deciding which parameters are best suited to a specific computer communication.

For time sharing computers, such as THE SOURCE, MICRONET, ETC.,

- For 110 baud: use 1 start + 8 data + 2 stop bits, no parity.
- For 300 baud up to 1200 baud: 1 start + 8 data + 1 stop bits, no parity.
- For Baudot or deaf network communications: 1 start + 5 data + 1.5 stop bits, no parity.
- For APPLE-CAT II binary transmissions: Use 1 start and 8 data bits, 1 stop bit, no parity for full information transfer.

MODEM—This is a contraction of MODulator/DEModulator. Modulating a signal is the process of making audible tones out of computer digital signals. De-modulating is converting audible tones back into digital signals. Computers can only understand binary (digital) 1's and 0's. The computer sends one modem a digital "1" which changes it into a tone. The receiving modem changes that tone back into a digital "1." The same process happens when a "0" signal is transmitted, but the modem sends out a different tone.

ANSWER or ORIGINATE MODE—This refers to the frequency bands which the modem uses to send and receive data. The 300 baud originate mode uses a low frequency band to send data and a higher frequency band to receive data. The answer mode is exactly the opposite. It uses a high frequency signal to transmit and a lower frequency to receive data. A modem set to originate can communicate with any model set to answer, or vice versa.

NOTE: An originate modem cannot communicate with another originate modem; and an answer modem cannot communicate with another answer modem. One modem must always be set to the originate mode and the other modem must be set to answer mode.

BAUD RATE—This is a term that describes the rate (or speed) at which a modem processes data. A 300 baud modem transmits and receives 30 characters per second; a 1200 baud modem transmits and receives 120 characters per second. The terms BPS and Baud are interchangeable up to speeds of 1200.

EIA RS-232-C PORT—The APPLE-CAT II has an auxiliary port which allows a serial device, such as a printer, to be connected to the computer. This port meets Electronic Industries Association (EIA) standards for a serial interface. The COM-WARE II program, as described in the data format portion of this manual, is used to control the operation of this port. The format may be selected for a printer (or other device) independently of the terminal.

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BAUDOT MODE FOR USE ON DEAF NETWORK

Novation supplies, as a firmware option, a 45.5 baud rate Baudot coded modem for TDD's (Telecommunication Devices for the Deaf). This feature will enable APPLE-CAT II users to communicate with any deaf person using any type BAUDOT or ASCII terminal. It also allows any deaf or hearing impaired person, with an Apple Computer, to communicate in the widest range of transmission modes.

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SPECIFICATIONS

SIZE: Printed Circuit Board is 9.65" x 2.75"

WEIGHT: 10 ounces

TEMPERATURE:

Operating environment: 32° to 122°F
0° to 50°C

Storage environment: -40° to 140°F
-40° to 60°C

HUMIDITY:

Operating environment: 10% to 90% relative
humidity (no condensation)

Storage environment: 5% to 95%
(no condensation)

POWER: +5V/120MA, +12V/90 MA, -12V/2MA, -5V/3MA.

TRANSMIT FREQUENCIES:

300 Baud			
Originate	Mark	1270	Hz ± .2%
Originate	Space	1070	Hz ± .2%
Answer	Mark	2225	Hz ± .2%
Answer	Space	2025	Hz ± .2%
1200 Baud			
	Mark	1300	Hz ± .2%
	Space	2100	Hz ± .2%

TOUCHTONE: The following are the transmit/receive frequency pairs: Tolerance is ± .2%

0 = 941 Hz + 1336 Hz	5 = 770 Hz + 1336 Hz
1 = 697 Hz + 1209 Hz	6 = 770 Hz + 1477 Hz
2 = 697 Hz + 1336 Hz	7 = 853 Hz + 1209 Hz
3 = 697 Hz + 1477 Hz	8 = 853 Hz + 1336 Hz
4 = 770 Hz + 1209 Hz	9 = 853 Hz + 1477 Hz
# = 941 Hz + 1477 Hz	* = 941 Hz + 1209 Hz

EXPANSION I/O PORT (J2)

PIN #	SIGNAL NAME	DESCRIPTION	
1	PRT-TXD	Output-Transmit data	} EIA-RS232-C PRINTER
2	PRT-RVD	Input-Receive data	
3	PRT-CTS	Input. Clear to send signal (busy)	
4	GND	Signal ground	} BSR REMOTE CONTROL
5	60Hz	Input. AC line reference	
6	GND	Signal ground	
7	+12V	Output. +12V DC	
9	BSR-SIG	Output. 120 KHz control signal	

CONTINUED ON PAGE 34



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