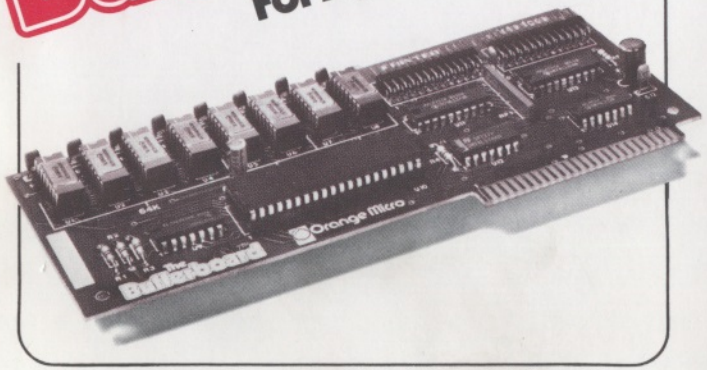
Scanned by cvxmelody

Orange Micro inc.
1400 North Lakeview, Anaheim, CA 92807
© ORANGE MICRO, INC., 1982

The Bufferboard™

For Apples and Printers



WARNING

Orange Micro reserves all rights in the software incorporated in the PROM or EPROM in the BUFFERBOARD and in the Operator's Manual. Any infringement of those copyrights will be prosecuted to the fullest extent allowed by the law.

(German) **HINWEIS**

Orange Micro reserviert alle Rechte hinsichtlich in der PROM oder EPROM in der BUFFERBOARD und der Gebrauchtsanweisung erwaehnten Software. Verstoesse gegen die copyrights jeglicher Art Werden Gerichtlich verfolgt unter vollster Ausschoepfung des anwendbaren Gesetzes.

(French) **AVIS**

Orange Micro se reserve tous droits du programme controlant les differentes operations du PROM ou EPROM du BUFFERBOARD ainsi que celles decrites dans le Manuel d'utilisation du systeme. Tout violateur de ces copyrights sera poursuivi dans toute la mesure fixee par la loi.

(Spanish) **ADVERTENCIA**

Orange Micro se reserva todos los derechos de programacion incorporada en el PROM o EPROM en el BUFFERBOARD y en el Manual de la Operadora. La violacion de estos derechos de copia ocasionara la mayor prosecucion permitida por la ley.

INTRODUCTION

The BUFFERBOARD™ is a Centronics compatible parallel buffer for the Apple® II/II+ or III computer. This unique BUFFERBOARD is used in conjunction with a parallel printer interface board. There are three different types of BUFFERBOARDS available depending on which parallel printer interface board is being used. There are versions available for Grappler*/Grappler+®, Epson® APL interface board and the Apple Centronics-type parallel interface board. The difference between the three versions of the BUFFERBOARD are the pin assignments and connectors used on each of the above interface boards.

Other parallel interface boards may be used with the BUFFERBOARD, however the user must specially configure his own cables. This should only be done by someone experienced in electronic or computer peripheral interfacing.

*NOTE: Due to the unique non-standard interface configuration of the IDS Paper Tiger, Prism, and Microprism printers, BUFFERBOARD users must configure their own cables to operate the BUFFERBOARD with these printers.

THEORY OF OPERATION

Without the BUFFERBOARD, the Apple Computer can only output data as fast as your printer can print. Most printers operate at only 80-100 characters per second. The Apple is capable of outputting up to 1000 characters per second, but is limited to 1/10 of its output rate due to the printer's slower speed. This ties up the entire system while the Apple waits for the printer to finish its job.

With the BUFFERBOARD acting as a storage tank between the Apple and the printer, the Apple is free to output data at maximum speed without waiting for the printer to catch up. Therefore, while the printer is printing, the Apple can be busily searching disks, computing data, or allowing you to input more data. This allows your system to operate at its maximum speed and efficiency.

INSTALLATION PROCEDURE

To install the BUFFERBOARD, simply plug it into any slot inside the Apple (except 0) as follows:

1. **Turn off the power to the Apple.** This is important to prevent damage to the computer and the BUFFERBOARD.

2. Remove the cover from the Apple. This is done by pulling up on the cover at the rear edge (the edge farthest from the keyboard) until the two corner fasteners pop apart. Don't lift any further; instead slide the cover backward until it comes free.

3. Connect the BUFFERBOARD 6 inch DOCKING CABLE to the connector labeled "INTERFACE" on the BUFFERBOARD. Make certain that all the pins on the card go into the cable's corresponding holes and that the cable is pointing away from the BUFFERBOARD.

4. Now disconnect your printer interface cable from your existing interface board. Place this cable on the connector of the BUFFERBOARD labeled "PRINTER." This cable will also come away from the BUFFERBOARD as did the DOCKING CABLE. (See Figure 1-1)

5. Inside the Apple, along the rear edge of the circuit board, is a series of eight long, narrow sockets called "slots." The leftmost slot (looking at the computer from the keyboard end) is slot #0. The adjacent slot is slot #1 and this is where most Apple programs expect your printer interface board to be located.

6. **Be sure the power is off,** then insert the BUFFERBOARD card into any empty slot (except #0) with a gentle rocking motion until fully seated.

7. Pass the printer cable through one of the vertical openings in the back of the Apple case.

8. Take the other end of the BUFFERBOARD DOCKING CABLE and attach it to your printer interface board. The cable will point away from the interface board. (See Figure 1-1)

9. Replace the Apple's cover. Slide the front edge of the cover into place and press down on the rear corners until they pop into place.

10. Connect the BUFFERBOARD Printer cable to your printer.

11. Now turn both your Apple and printer on. Type PR#n where n = printer interface slot number and hit RETURN 5 or 6 times. Your printer should print the prompt character each time you hit the RETURN key. If not, double-check each step of the installation procedure above.

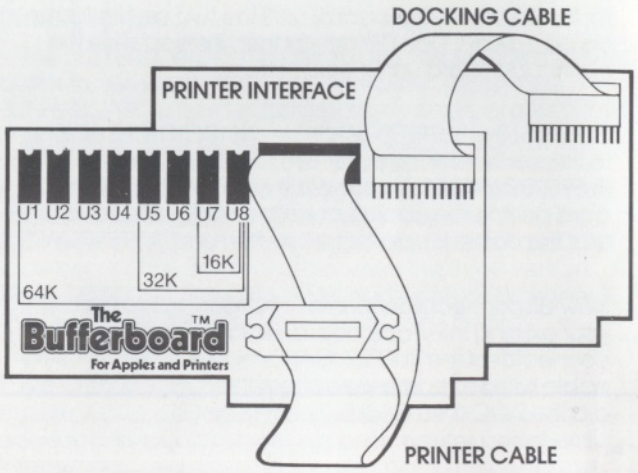


FIGURE 1-1

RAM DIAGNOSTIC SELF TEST

The BUFFERBOARD is equipped with its own built-in RAM Diagnostic Self Test. This unique feature informs the user of any abnormal condition related to the RAM memory chips. To perform the Self Test, follow these procedures:

1. Perform installation steps 1 through 10 (refer to Installation Procedure).
2. Turn your printer on with paper installed and place it on line.
3. With Apple power off, hold the RESET key down.
4. While holding the RESET key down, turn on your Apple.
5. Keep the RESET key depressed for two to three seconds, then release the RESET key. (NOTE: If keyboard encoder board switch S1 is set for CTRL-RESET, you will find this function a bit more difficult to execute with just two hands.)

Your printer will then print "RAM TEST IN PROGRESS:" to indicate that the diagnostic check is being performed, and your disk drive will "boot" if connected. After approximately 45 seconds, the test results will be printed on the printer.

The output on the printer will indicate the condition of each RAM chip as in the following example:

```
RAM STATUS-CHIP#  8 7 6 5 4 3 2 1
                  X X X X 1 1 1 1
```


A "1" below the chip number indicates that a RAM chip is installed and is in good condition. An "X" below the chip number indicates the absence of a RAM chip or improper condition of the corresponding chip. In the example above chips 1–4 are in good condition and chip sockets 5–8 are empty. This would be the configuration for a 32K RAM buffer. A Self Test on a BUFFERBOARD configured for 16K RAM would be printed out as follows:

```
RAM TEST IN PROGRESS:
RAM STATUS-CHIP#  8 7 6 5 4 3 2 1
                  X X X X X X 1 1
```

The above printout indicated that chips 1 and 2 are installed and in good condition, and chips 3 through 8 are absent.

The RAM Diagnostic Self Test will also be automatically performed if an abnormal condition occurs during power up. The test will repeat itself until the malfunction has been corrected by the user.

RESETTING THE BUFFER

Resetting the BUFFERBOARD RAM buffer is accomplished by depressing the RESET key for two seconds. This clears all data from the buffer RAM. If the printer does not have an internal buffer, printing will stop as soon as the BUFFERBOARD is reset. If the printer does have an internal buffer, printing will continue until the printer's internal buffer is emptied.

Depressing the RESET key for less than two seconds will simply RESET the Apple. Printing will continue until the BUFFERBOARD and printer buffers have been emptied.

INSTALLATION OF RAM EXPANSION CHIPS

The BUFFERBOARD includes a standard 16K RAM buffer. Additional BUFFERBOARD RAM Expansion Packages may be purchased from your local BUFFERBOARD dealer. Each RAM Expansion Package contains two Dynamic RAM chips.

To expand your BUFFERBOARD to 32K, one RAM Expansion Package must be added to sockets U5 and U6 (see Figure 1-1). To expand to 64K all sockets must contain RAM expansion chips. Note that four chips are necessary to expand from 32K to 64K; therefore, two RAM Expansion Packages must be added. Three RAM Expansion Packages would be needed to convert from 16K to 64K. There is no provision on the BUFFERBOARD for 48K.

When installing RAM chips, it is necessary to align pin 1 on the chip with pin 1 on the BUFFERBOARD socket. Each socket has pin 1 labeled "1" on the BUFFERBOARD to identify the proper orientation of the chip.

Each RAM chip has a notch at one end of the chip case. This notch identifies the end of the chip containing pin 1. The chip must be placed in the socket so that the notch is adjacent to pin 1 of the BUFFERBOARD socket. Usually, the chip socket will also have a notch near pin 1 to help you locate pin 1.

To install a RAM chip, position the chip pins into their corresponding socket holes and gently plug the chip into the socket. Look at all the pins to verify proper seating of the chip and that no pins have been bent or broken during installation.

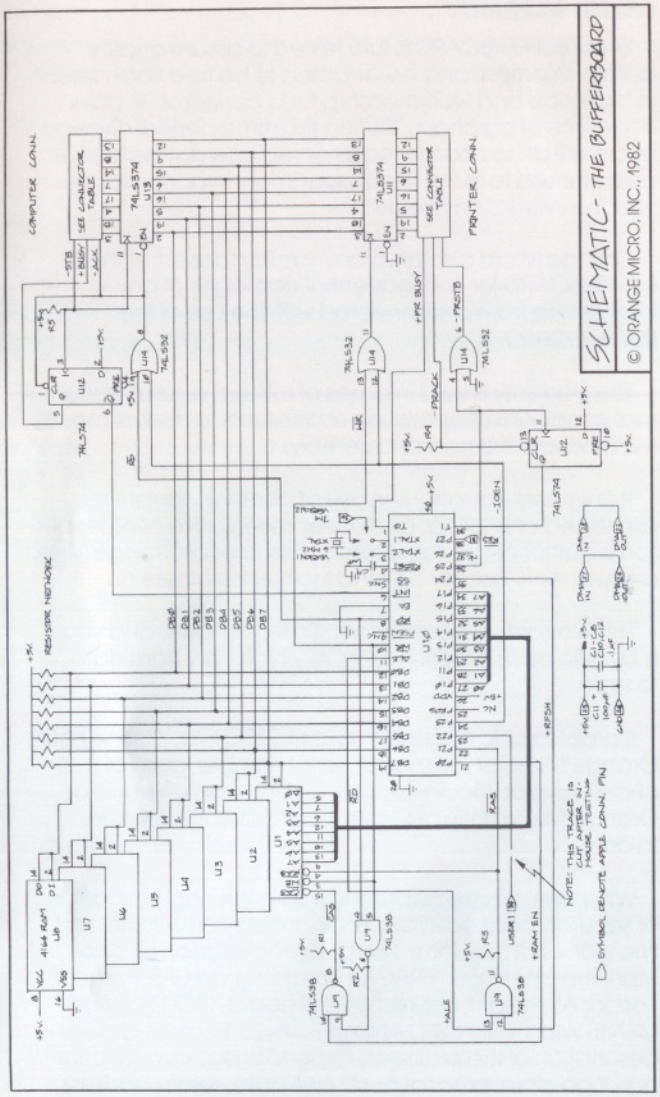
BUFFERBOARD PIN ASSIGNMENTS

Grappler/Grappler+ Interface		Epson APL Interface	
1	STB	1–3	GND
3	DØ	4	STB
5	D1	5	NC
7	D2	6	D1
9	D3	7	D2
11	D4	8	D3
13	D5	9	D4
15	D6	10	D5
17	D7	11	D6
19	ACK	12	D7
21	BUSY	13	D8
23	PE	14	ACK
25	SEL	15	GND
Others	GND	16	SEL IN

BUFFERBOARD PIN ASSIGNMENTS CONT.

Apple Centronics Interface

1	GND
2	ACK
3–7	NC
8	STB
9	NC
10	DØ
11	D1
12	D2
13	D3
14	D4
15	D5
16	D6
17	D7
18–19	NC
20	GND



LIMITED WARRANTY

Every BUFFERBOARD is fully tested to assure quality before shipment and is warranted to be free from defects in materials and workmanship for a period of 90 days from date of purchase. During that time period, Orange Micro will at no charge repair or replace any defective unit returned to its Service Department in accordance with the instructions below.

Orange Micro disclaims any liability to users of the BUFFERBOARD for consequential damages of any kind arising from or connected with the use of the BUFFERBOARD.

This warranty is void in cases of misuse, abuse, abnormal conditions of operation or attempts to alter or modify the function of a part or assembly.

This limited warranty is in lieu of all other warranties expressed or implied, and no representative or other person is authorized to represent or assume for Orange Micro any warranty liability beyond that set forth herein.

This warranty gives you specific legal rights, and you may also have additional rights which vary from state to state.

If problems do occur with a BUFFERBOARD, please notify Orange Micro of the model, serial number, date of purchase, and particular details. Do not return the unit to Orange Micro until you have received authorization to do so.

When returning equipment, ship in the original carton or securely packed in a cardboard carton with at least two inches of cushioned packing material on all sides. Mark the package "FRAGILE" and ship via UPS, Parcel Post, or Air Freight, insured and prepaid. COLLECT SHIPMENTS WILL BE REFUSED AND RETURNED. Enclose a clear description of the problems experienced, sample printouts if possible, proof of purchase date, return address, and preferred shipping method.

The Warranty expressed above applies only to the BUFFERBOARD sold and used in the United States of America.