

THE DOUBLE DENSITY UPGRADE
for the Osborne One Computer

INSTALLATION & OPERATING INSTRUCTIONS



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A NOTE OF CAUTION!

THE INTEGRATED CIRCUITS USED IN COMPUTERS SUCH AS THE OSBORNE ONE ARE EXTREMELY SENSITIVE TO STATIC ELECTRICITY. THEY CAN BE DAMAGED OR DESTROYED VERY EASILY IF PROPER PRECAUTIONS ARE NOT TAKEN TO ELIMINATE THE GENERATION OF STATIC CHARGES. NYLON OR POLYESTER CLOTHING AND FLOOR CARPETING ARE SOME OF THE PRIME CULPRITS IN THE GENERATION OF STATIC ELECTRICITY. IF AT ALL POSSIBLE, WORK IN AN UNCARPETED ROOM AND WEAR CLOTHING MADE OF NATURAL FIBER, PREFERABLY COTTON, WHILE INSTALLING THE 80 COLUMN UPGRADE TO MINIMIZE THE CHANCE OF DAMAGING YOUR COMPUTER FROM STATIC ELECTRICITY. WHEN THE COMPUTER IS OPENED UP, DO NOT WALK UP TO IT FROM A CARPETED AREA AND TOUCH ANY PART OF THE CIRCUIT BOARD OR OTHER SUB-ASSEMBLIES WITHIN THE CASE WITHOUT ALLOWING TIME FOR STATIC CHARGES TO DISSIPATE.

INTRODUCTION

The Double Density Upgrade by Nuevo Electronics was designed to convert single density Osborne One computers to double density. The result is a computer that is functionally identical to the factory-version double density O-1. The minimum file size for the Double Density Upgrade is 1K, as is the factory version.

In addition, the Double Density Upgrade is capable of utilizing standard (non-Osborne) disk drives by simply using the alternate "Standard Drives" connector on the Upgrade board along with a separate disk drive power cable.

The Double Density Upgrade is itself upgradeable to double-sided double density, offering a storage capacity of 380K per disk drive.

BEFORE INSTALLING THE DOUBLE DENSITY UPGRADE...

Attention should be given to the current condition of your disk drives. If the drive speed or alignment is off a bit you may have little or no problems with single density operation. Double density operation is not always so forgiving. If you have good reason to suspect that drive speeds or alignment are not in correct adjustment then have your computer serviced before installation of the Double Density Upgrade. Symptoms of possible alignment or speed problems include the following:

- 1) BDOS errors that occur more often than "rarely".
- 2) Disks that work well in one drive but not the other.
- 3) Disks that work well with your computer but don't work well in a different computer, or vice versa.
- 4) Original disks, or for that matter any "older" disks, that once worked in your computer but now seem less willing.

Included on the disk that is supplied with the Double Density Upgrade is a program called DISK. This is a menu-driven diagnostic program that will give you a numerical value for your current drive speeds.

Make a copy of the Nuevo-supplied disk and set the original aside.

Now put into Drive A one of your system disks that has the arrow keys configured for CP/M, not WordStar. Put the copy of the Nuevo disk in Drive B. Boot on Drive A. When you have the CP/M prompt enter

```
B:DISK <RETURN>
```

and simply follow the instructions to check the drive speeds for both drives. The "correct" answer is 200msec. If your actual drive speed is between 198msec and 202msec then you're in good shape. However, if the speeds are less than 196msec or higher than 204msec then you must have your drives adjusted. Take your computer to a qualified technician for speed adjustment and an alignment check. (Although most users are probably capable of making the speed adjustments themselves, a problem on drive speeds could well indicate a problem with alignment, too. Most users are not capable of performing a proper disk alignment procedure.)

If you're OK to this point there's just one final thing to do before getting to the actual installation...

The BIOS on your disks' system tracks is for single density only. We must now install a BIOS that will handle both single and double density.

NOTE: IF YOU HAVE ALREADY INSTALLED NUEVO'S 80 COLUMN UPGRADE, OR THE OCC SCREEN-PAC, IT IS NOT NECESSARY TO CONDUCT THIS PROCEDURE. YOU ALREADY HAVE A DOUBLE DENSITY BIOS! IF YOU ARE INSTALLING BOTH THE 80 COLUMN UPGRADE AND THE DOUBLE DENSITY UPGRADE AT THE SAME TIME THEN FOLLOW THE BIOS INSTALLATION INSTRUCTIONS FOR THE 80 COLUMN UPGRADE ONLY. DISREGARD THE BIOS INSTALLATION FOR THE DOUBLE DENSITY UPGRADE.

Double density BIOS installation is accomplished as follows:
Place in Drive A one of your system disks that contains the following programs:

SYSGEN.COM
MOVCPM.COM
DDT.COM
SUBMIT.COM
XSUB.COM

Place in Drive B a copy (not write-protected) of the Nuevo-supplied disk.

Boot the computer on Drive A and when you have the CP/M prompt enter
SYSGEN
and press <RETURN>.

✓ When asked for the "Source" drive enter
A
and press <RETURN>.

✓ When asked for the "Destination" drive enter
B
and press <RETURN>.

✓ Press <RETURN> again to exit the SYSGEN program.

Now swap disks, placing the disk from Drive A into Drive B and the disk from Drive B into Drive A.

✓ Enter
^C

From the CP/M prompt enter
B:SUBMIT SYS-DDEN
and press <RETURN>.

Automatic processing will now occur. When the disk drives stop and the CP/M prompt reappears enter
B:SYSGEN
and press <RETURN>.

When the program asks for a "Source" drive
DO NOT ENTER ANY LETTER
Enter only a <RETURN>.

When asked for a "Destination" drive enter
A
and press <RETURN>.

The program will again ask for a "Destination" drive or for a <RETURN> to exit. At this time you should press the RESET button and stop. Label the disk in Drive A "Install DD BIOS". Do not attempt any operation whatsoever with it at this time. Wait until the Double Density Upgrade has been installed.

Now it's time for the good part, the actual installation of your Double Density Upgrade board.

INSTALLATION

STEP 1

The first thing that you need to do is provide yourself with a clean, uncluttered workspace of sufficient size to accommodate your Osborne One in unassembled form. As a general rule, you should allow yourself twice as much space as you think you will need!

Unplug the computer from the wall outlet and, for blue case models, remove the power cord. Disconnect the keyboard by pushing aside the retaining latches and pulling out on the connector. Also disconnect any accessories that may be plugged into the front panel. Remove these from the immediate work area. Note: If a Comm-Pac modem is installed it is only necessary to unplug the bottom (MODEM) connection. Leave the Comm-Pac installed in the disk storage slot.

Remove the knobs on the "BRT" and "CONTR" controls. If your computer has a brown case it will be necessary to loosen (not remove) the set screws first with a .050 hex wrench. For blue case computers simply pull the knobs off. They will likely be snug. Now put these knobs in a secure place, a jar or some other container, so that they'll be around when it's time to put things back together.

Now refer to Figure 1 if you have a blue case O-1 or to Figure 1A if you have a brown case model.

For Blue Case Models: There are six Phillips head screws securing the front panel to the computer. Loosen all six screws and carefully slide the front panel off.

For Brown Case Models: There are seven Phillips head screws securing the front panel to the computer. Loosen all seven screws and carefully slide the front panel off.

Again, put the screws in a secure location for later retrieval. Remove the computer's front panel from the immediate work area. You won't be needing it for a while.

REMOVE SCREWS INDICATED BY ARROWS

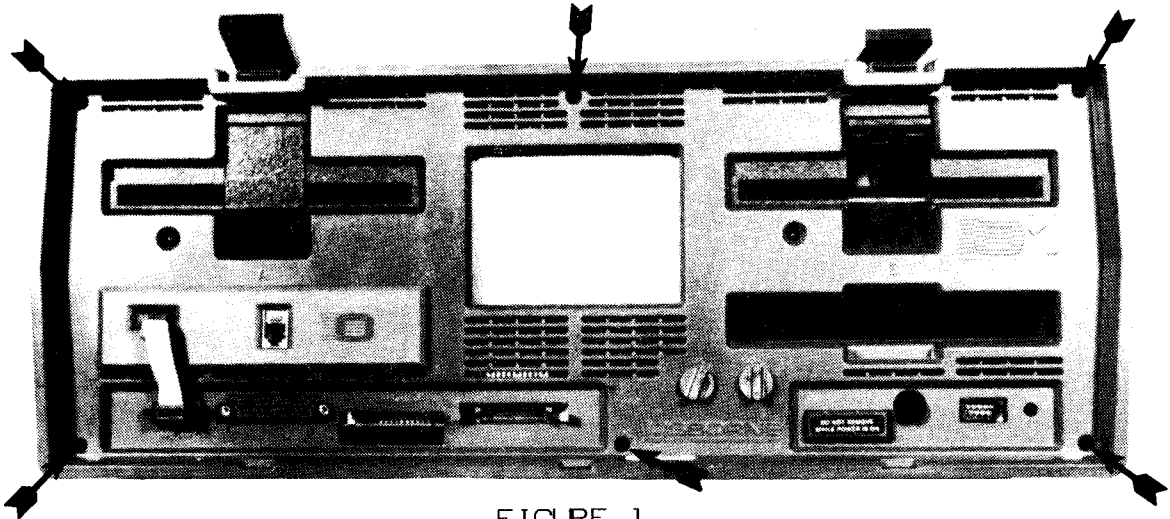


FIGURE 1
(Blue Case Only)

REMOVE SCREWS INDICATED BY ARROWS

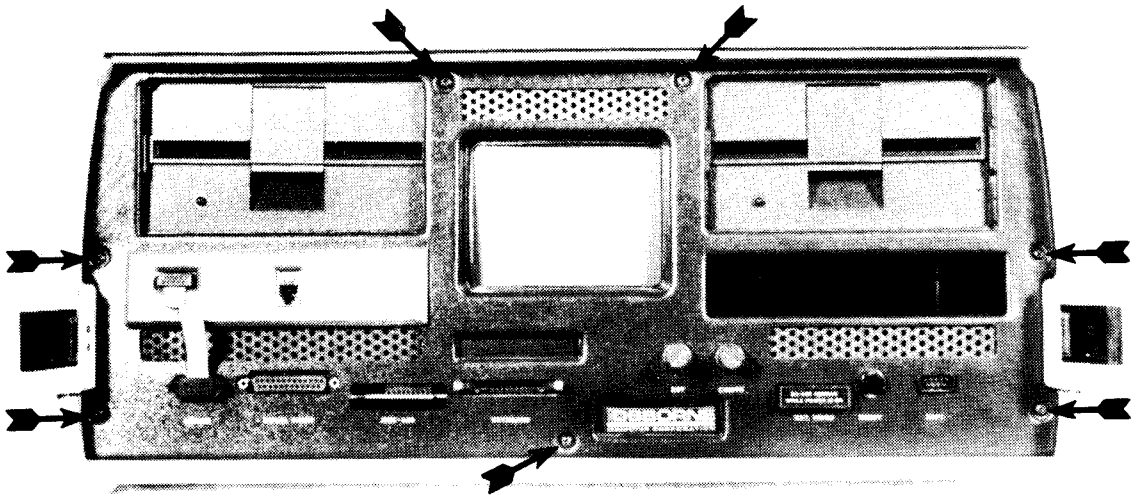


FIGURE 1A
(Brown Case Only)

STEP 2

For Blue Case Models: Carefully turn the computer upside down, keeping the front of the machine facing you. Loosen but do not remove the five Phillips screws securing the case bottom. Lift the case bottom away from the computer. Don't tip it or the screws will fall out! Set it aside, leaving the screws inside the recesses.

For Brown Case Models: On the back of the instrument there are two screws located on either side of the carrying handle. Remove these screws and tape them together so that they aren't later confused with the similar but shorter front panel screws. At the front of the unit there are four more screws that secure the chassis to the instrument case. Two are midway up the case, one is on the left side and another is on the right. Two more are at the bottom, again one on the left and another on the right. Refer to Figure 2. Remove these last four screws and carefully slide the chassis out of the case. If the chassis resists removal, the wires from the power panel at the back of the case are likely the cause. In some cases it will be necessary to remove the screws securing the power panel to allow enough slack for removal of the chassis. When the chassis is removed, turn it over to an upside down position. Keep the front of the chassis facing you.

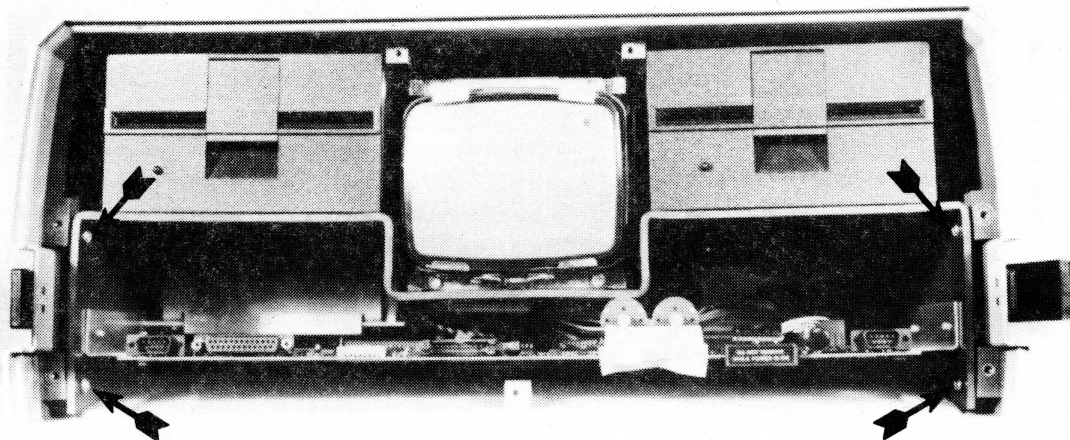


FIGURE 2
(Brown Case Only)

Before going any further take the packaging material that came with the Upgrade board and lay it on your work surface near the computer. This is an anti-static material that will reduce the chance of static damage to your computer board.

The printed circuit board is secured to "H" shaped mounting brackets at either end of the board. These mounting brackets are in turn secured to posts on the main internal frame. Remove the board with its brackets by taking out the four Phillips screws at the posts. There should be a ring terminal ground wire between the screw and the bracket on the left rear post and possibly another ground wire to the immediate right held by a screw that secures the main board to the bracket. See Figure 3. If this second ground wire connection exists remove it, too, at this time. (With some computers there will be no ground wires at all. Don't worry about it.)

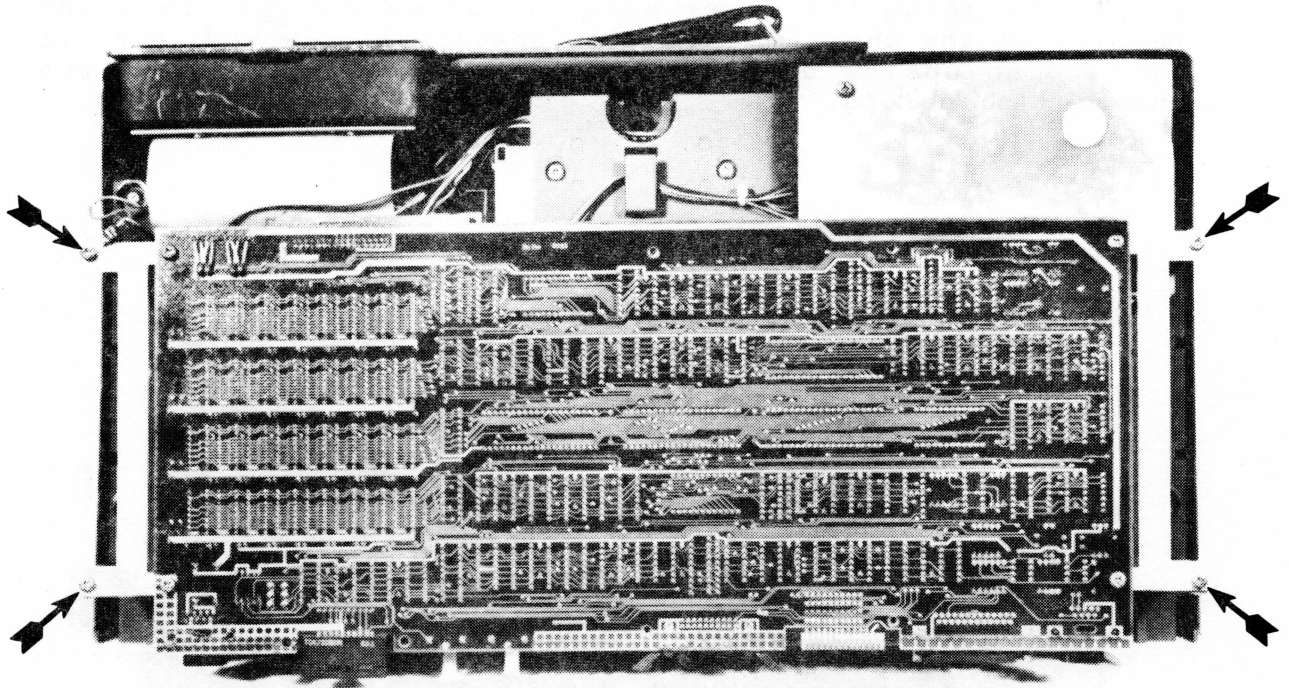


FIGURE 3

Now fold back the board as per Figure 4. Disconnect the power supply cable, the CRT monitor cable and the disk drive cable.

The main board should now be totally disconnected. Carefully place it on the packing material, component side up.

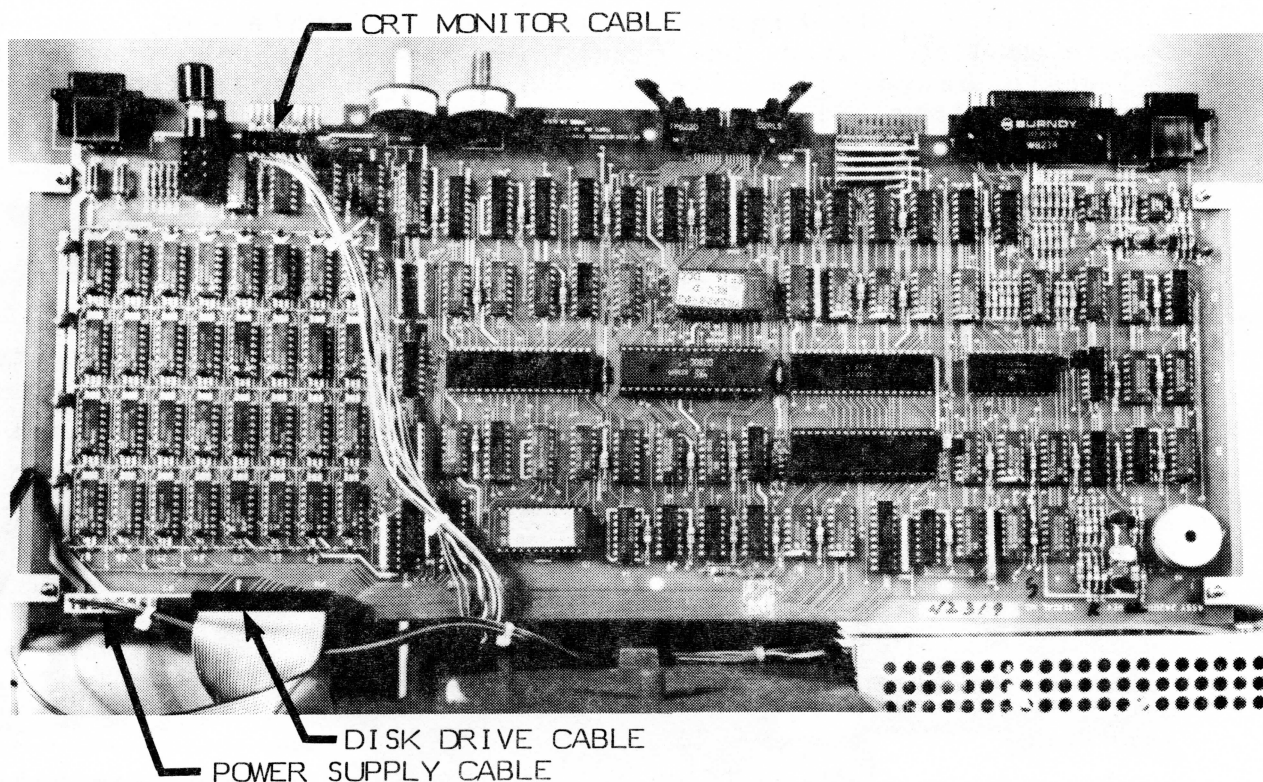


FIGURE 4

STEP 3

Go back and read again the caution regarding integrated circuit handling printed at the front of this manual.

NOTE: THE NEXT TWO PARAGRAPHS SHOULD BE OMITTED IF YOU HAVE ALREADY INSTALLED NUEVO'S 80 COLUMN UPGRADE OR THE OCC SCREEN-PAC!

Locate the Monitor PROM on the main board at grid position D-12. Refer to Diagram 1 on P. 18. With a small slotted screwdriver gently pry one end of the PROM up from its socket about 1/8 inch or so. (Be certain that you place the screwdriver between the PROM and its socket. DO NOT attempt to pry the socket from the printed circuit board!) Try to avoid touching the IC pins to the extent possible. Now pry up the other end slightly higher than the first. Continue working at alternate ends A LITTLE AT A TIME until the PROM is free of its socket. Hopefully you will manage to extract the IC without bending any of the pins. However, if pins are bent lay the PROM, pins down, on aluminum foil before attempting to straighten them. Wrap this PROM in aluminum foil and save it.

Replace it with the PROM supplied by Nuevo. The IC should be oriented such that the notch at one end is aligned with the notch in the socket. Be certain that ALL pins of the PROM are correctly aligned within the socket before applying insertion pressure. It's a good idea to just barely insert the IC and then sight between the IC and its socket to verify that all pins are in place. If the pins are bent it's very easy for one or more of them to "curl under" when you apply insertion pressure. If this happens it's difficult to detect after the IC is in place. Once you're satisfied with the pin alignment, insert the IC into the socket by applying equal pressure with your thumbs at both ends of the PROM.

*U2 ROM
INSTALLED*

Referring to Figure 5 for proper orientation, plug the Double Density Upgrade board into the disk drive connector on the O-1 main board. Confirm proper seating by looking at the connection from all angles.

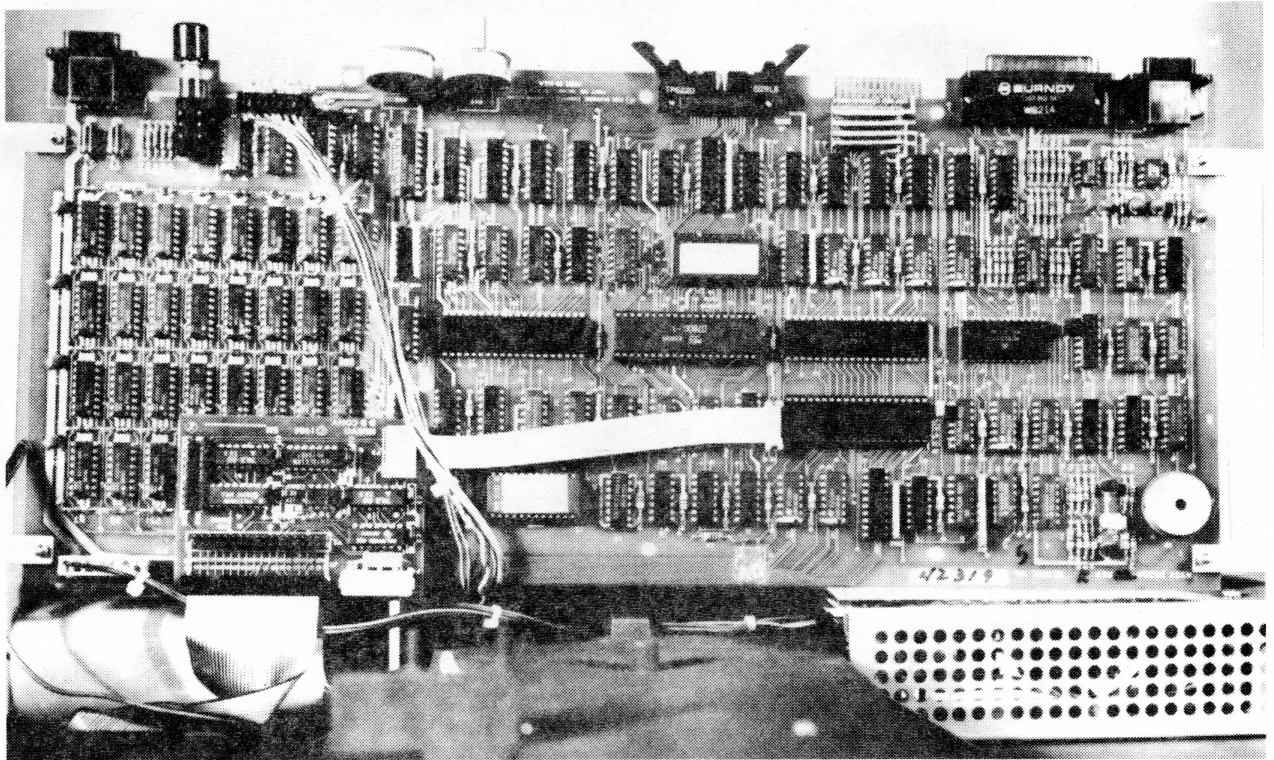


FIGURE 5

Now locate the two jumpers (small plastic caps) installed at "J4" and "J5" on the main board at grid position B-10,11. Remove these two jumpers. Refer to Diagram 1 on P. 18 if necessary.

The ribbon cable from the Double Density Upgrade should now be plugged into the exposed pins at these jumper locations. Note that the ribbon cable connector is keyed to prevent an improper installation.

The last step is simple but VERY important. A jumper must be installed across the two pins at position "J3", grid location B-6,7. Refer again to Diagram 1. If the jumper here is absent, install one of the jumpers that you removed from "J4" and "J5".

Installation is now complete!

REASSEMBLY

Now refer to Figure 5 again. To reinstall the main printed circuit board, stand it on end at the back of the computer as was done during disassembly. Reconnect the power supply and CRT cables as they were originally. Now plug the disk drive cable into the Double Density Upgrade connector labeled "Osborne Drive".

Now position the board over the mounting posts and reinstall the four mounting screws, being sure to replace the ring-terminal ground wire(s), if any, that you disconnected. Do not tighten down on the screws until all four have been installed.

For Blue Case Models: With the O-1 still in an inverted position, carefully put the bottom cover back in place, taking care to insure that the handle assembly and power cord/door assembly are in their proper slots. MAKE CERTAIN THAT THESE THREE COMPONENTS ARE PROPERLY POSITIONED AND SEATED BEFORE ATTEMPTING TO REINSTALL THE FIVE BOTTOM SCREWS. Once this stage of reassembly is complete, turn the O-1 over to its upright position.

For Brown Case Models: Turn the chassis over to its upright position. Carefully slide the chassis back into the case. Reinstall the four screws at the front of the unit. When these are secure reinstall the two screws that go on either side of the carrying handle. Resecure the power panel if it was removed.

Make sure that the two latches for the keyboard connector are in the closed position and then carefully slide the front panel into position. Once you're satisfied with the fit, install the screws that secure the front panel to the computer. Again, do not tighten until all the screws have been installed.

AFTER THE DOUBLE DENSITY UPGRADE IS INSTALLED...

Reconnect the keyboard and the power cable and then turn on your Osborne One. (NOTE: When you first turn power on you should hear that familiar short "beep" that indicates "all's well". If the beep is continuous turn the computer off immediately and recheck your installation procedure. You probably installed the new PROM incorrectly!)

With the hardware installation completed, it's time to address the software installation.

The software part of the Double Density Upgrade installation consists of transferring the double density BIOS (from the "Install DD BIOS" disk, via SYSGEN) to your system disks and then updating three utility programs (COPY, SETUP & SYSGEN).

NOTE: IF YOU'VE PREVIOUSLY INSTALLED NUEVO'S 80 COLUMN UPGRADE THIS PROCEDURE IS NOT NECESSARY. YOU'VE ALREADY PERFORMED IT! THE SAME APPLIES IF YOU HAVE THE OCC SCREEN-PAC. IF EITHER OF THESE 80 COLUMN BOARDS IS INSTALLED SKIP TO THE BEGINNING OF THE NEXT SECTION.

Let's take the SYSGENING and utility file replacements separately.

First, the SYSGENING....

Experience has shown that a good bit of confusion and misunderstanding exists about what SYSGEN.COM is and how it works. A little explanation now may save a lot of confusion later.

Comparing SYSGEN.COM and COPY.COM is often helpful. Both are copy programs. COPY.COM produces exact copies of the entire Source disk. SYSGEN.COM produces exact copies of the system tracks of the Source disk.

By running SYSGEN.COM, any and all information contained on the system tracks of the Source disk is copied to the Destination disk. If system track data already resides on the Destination disk it will be completely overwritten by the system track data from the Source disk.

The information that you install using SETUP.COM is stored on the system tracks. (So is ZCPR, if you're using this replacement for the CCP.) THIS INFORMATION WILL BE OVERWRITTEN BY THE DATA FROM THE SOURCE DISK WHEN SYSGEN IS RUN!

So..., before actually SYSGENING your disks you should make certain that you know how SETUP is configured for your various disks. If it's different from the way it's configured on your "Install DD BIOS" disk and you're not all that versed with your computer's operation, it may prove time consuming to later get it back the way you really want it.

Chances are that SETUP is not installed the same way on all of your disks. The arrow keys are likely configured for WordStar on your WordStar disk but probably for CP/M on your other disks. Some parameters, like those for the printer, are probably the same on all of your disks. If you have any doubt, check each and every system disk in your inventory and make a record of how SETUP is configured.

If you are using ZCPR, install it at this time on the "Install DD BIOS" disk. This will save having to install it later on each disk individually after they've been SYSGENED from the "Install DD BIOS" disk. (If you don't know whether or not you're using ZCPR it's probably safe to assume that you are not. ZCPR is public domain software, written specifically for the Z-80 microprocessor, that replaces the CCP portion of CP/M.)

Also, if SETUP is configured the same on all of your disks you should run NEWSETUP on the "Install DD BIOS" disk, configure it accordingly, and, again, save yourself the effort of reinstalling it individually on your disks after they have been SYSGENED. (Refer to Appendix A, P.16, for notes on the use of NEWSETUP.COM)

With this background and explanation out of the way, let's get to SYSGENING your disks to install the new BIOS!

Insert the "Install DD BIOS" disk in Drive A, and from the CP/M prompt enter
 SYSGEN
 and press <RETURN>

Follow the instructions on the screen and put backups, or copies, of your present disks in Drive B, one at a time until all of your disks have been "SYSGENED". (Even data disks can be "SYSGENED". Since the first three tracks of a disk are reserved for the CP/M system it "costs" nothing to make all disks "system" disks.)

After SYSGENING your disks run the program NEWSETUP.COM, if necessary, to individually reinstall these disks with the parameter values the way you had them prior to SYSGENING.

Next you should replace the three utility programs COPY, SETUP and SYSGEN.

The monitor ROM that you replaced during the Double Density Upgrade installation is an enhancement of Rev. 1.44, the latest factory version. Older versions of COPY, SETUP, and SYSGEN are not compatible with the newer BIOS. The disk that came with your Upgrade contains the newer versions of these three files that are compatible.

Using PIP or some other file transfer program, replace all of your existing files named COPY, SETUP and SYSGEN with the newer versions named COPY, NEWSETUP and SYSGEN that are on the "Install DD BIOS" disk. In the case of COPY and SYSGEN it is not necessary to erase the older versions first. The newer files will simply overwrite the older files of the same name.

It will also be necessary to delete from your working disks all copies of MOVCPM.COM and replace them with MOVE-CPM.COM. The reason for this is that MOVCPM contains a record of the BIOS. The file MOVCPM.COM contains a record of your old (unmodified) BIOS. The file MOVE-CPM.COM contains a record of the newly installed BIOS. The BIOS record in the file that allows you to "move" CP/M must match the BIOS of the disk on which this file is "moving" CP/M. The reason for the file name change is only to distinguish the new from the old. (The file MOVE-CPM is not on the disk provided by Nuevo. It will appear on the "Install DD BIOS" disk AFTER performing the BIOS installation procedure.)

If you have other accessories such as the JG Communications clock, the Drive C ramdisk or the Trantor hard disk then you must reinstall that device per manufacturer's instructions after your disks have been SYSGENED per Nuevo and the file MOVCPM.COM is replaced by MOVE-CPM.COM.

NOW THAT I'VE GOT DOUBLE DENSITY, WHAT DO I DO WITH IT?

At this point you now have a full-function double density Osborne One computer. It will continue to read single density disks as before, but the important thing is that you're also set for double density. You need not try to tell the computer which type of disk you're using. It will figure that out all by itself.

You're probably wondering what you should do with your current inventory of single-density disks. Well, you don't have to do anything with them. In fact, if the disks themselves are a single-density grade, it is rather strongly recommended that you leave them "as is".

But you no doubt are quite anxious to get those other files on your favorite disks that just didn't have the room for them before. Here's how to do it...

Use the COPY program to format a new disk. The program will ask you whether you want to "copy" or "format", the same as it always did. Now, after the disk to be formatted is placed in the appropriate drive and a <cr> is entered, it will ask if you want S(ingle) or D(ouble) density formatting. Tell the program you want D(ouble). You may notice that an * replaces the former F under the track number as the disk is being formatted. Aside from this, the new COPY program works pretty much like the old one did.

Now place in Drive A one of your single density disks that you want to convert to double density. (If you've been following the steps thus far this disk will have been "sysgened" with the new system BIOS and if COPY, SETUP or SYSGEN are on the disk they will be the newer versions of these files.) The disk you just formatted in double density should be in Drive B. Using PIP or some other file transfer program, transfer all of the files to the disk in Drive B. DO NOT attempt to "copy" the Drive A disk to Drive B. To do so would just wipe out the double density formatting and give you an exact replica of the "copied" disk, single density formatting and all.

The above procedure is equally valid for converting either system disks or data disks to double density. The only difference is that "system" disks must be "SYSGENED" following the file transfer routines. File transfer programs DO NOT transfer system tracks. Only COPY and SYSGEN can accomplish this. For reasons just discussed, the COPY program is inappropriate for this procedure.

You may very well want to continue using your single density program disks as they are now but store data files on a double density disk. No problem. Simply format a disk for double density and write the files that you will create onto this disk.

IF YOU HAVE OPERATIONAL PROBLEMS...

they will most likely be due to improper drive alignment. The classic symptoms of alignment problems are read and/or write errors on the higher track numbers during COPY and FORMAT operations.

In some cases the COPY problems may persist even after the drives are realigned. If so, it will be necessary to format a disk and individually transfer the files to the newly formatted disk. This disk, then, should COPY properly.

WHAT IF I WANT TO REPLACE MY DRIVES?

If your Osborne drives have been acting up and they defy repair, you may be considering replacing them. Standard, commercially available drives are handled quite nicely by the Double Density Upgrade. If you're considering a replacement of your drives we strongly suggest you consider going with "standard" (non-factory) drives that use conventional signal and power connections. They will almost certainly be less expensive and probably easier to have serviced.

Standard full-height drives will readily fit inside the O-1 computer. You can even use the disk drive ribbon cable that's used with the Osborne drives. You will need to add a separate power cable, daisy chained with three connectors. Two of the connectors plug into each of the disk drives. The third connector plugs into the socket labeled "P4" on the Double Density Upgrade board. This power cable is available from Nuevo at nominal cost. The power cable voltages from the Double Density Upgrade are labeled on Diagram 2. The user should confirm that these voltages properly match the replacement disk drive voltages when the power cable is plugged in.

Disk drive replacement must be done in matched pairs. You cannot have one Osborne drive and one "standard" drive.

If you have any questions on drive replacements, please contact the factory.

You may have noticed a "WRITE PRE COMP" jumper on the Double Density Upgrade. Some manufacturers of standard drives may recommend using write precompensation. If so, install a jumper across these two pins. If you're using the Osborne drives that came with your computer, leave the jumper pins as they are.

APPENDIX A

NOTES ON THE FILE NEWSETUP.COM

NEWSETUP.COM was written primarily for Nuevo's 80 Column Upgrade to enable users to readily install their choice of 9 different cursor possibilities. Some features, however, are also useable on the Double Density Upgrade.

NEWSETUP allows you to enable or disable an autostart command. Most of you are familiar with the WordStar and SuperCalc disks that were configured by OCC to autostart on their respective disks. By using NEWSETUP you can now name any other COM file that you may want to autostart. File names so entered must be in caps.

If you want to retain the factory method of autostarting WordStar and SuperCalc then you should run the NEWSETUP program, enable the autostart feature, and specify AUTOST.COM as the file to be autostarted.

NEWSETUP allows you to select from 16 different baud rate values compared to the 2 values available in the older SETUP.COM. However, unless the Baud Rate Generator option of the 80 Column Upgrade is installed, any value selected besides 300 baud will in fact install 1200 baud. Selecting 300 baud always installs 300 baud.

APPENDIX B

NOTES ON THE NEW BIOS

The new BIOS (we're calling it Version 1.5) that you installed with the Double Density Upgrade is significantly different from Version 1.4, the most recent factory version. NEWSETUP.COM required significant changes to implement its capabilities. It should be stressed that Versions 1.4 and 1.5 are functionally compatible except for the programs SETUP.COM and NEWSETUP.COM. For those of you that are interested, the following are the differences between the two BIOS versions:

- 1) The "59K" portion of the sign-on message in BIOS Version 1.5 has been deleted since it can be misleading if the CCP/BDOS/BIOS system has been relocated with MOVCPM.
- 2) For BIOS Version 1.5 the disk parameter blocks for IBM, Xerox and DEC formats have been removed to provide space for code to allow auto configuration at boot time via NEWSETUP.COM. Space remains for two more DPB's to be inserted.
- 3) The autostart command space allotment in BIOS Version 1.5 permits 8 character names. Version 1.4 allowed only 7 characters.
- 4) BIOS Version 1.5 checks for the presence of the Nuevo 80 Column Upgrade. If not present, the configuration routine for the 80 Column Upgrade will be skipped. Thus, the Version 1.5 BIOS will boot and run correctly on machines that don't have the Nuevo 80 Column Upgrade.
- 5) The "Unformatted disk in Drive..." message has been deleted from Version 1.5. The message "Can't recognize disk in Drive..." is retained and is used for all 'unrecognizable disk' errors.
- 6) The jump table configuration and the jump table start address (E100h) is the same in BIOS Version 1.5 as in BIOS Version 1.4.

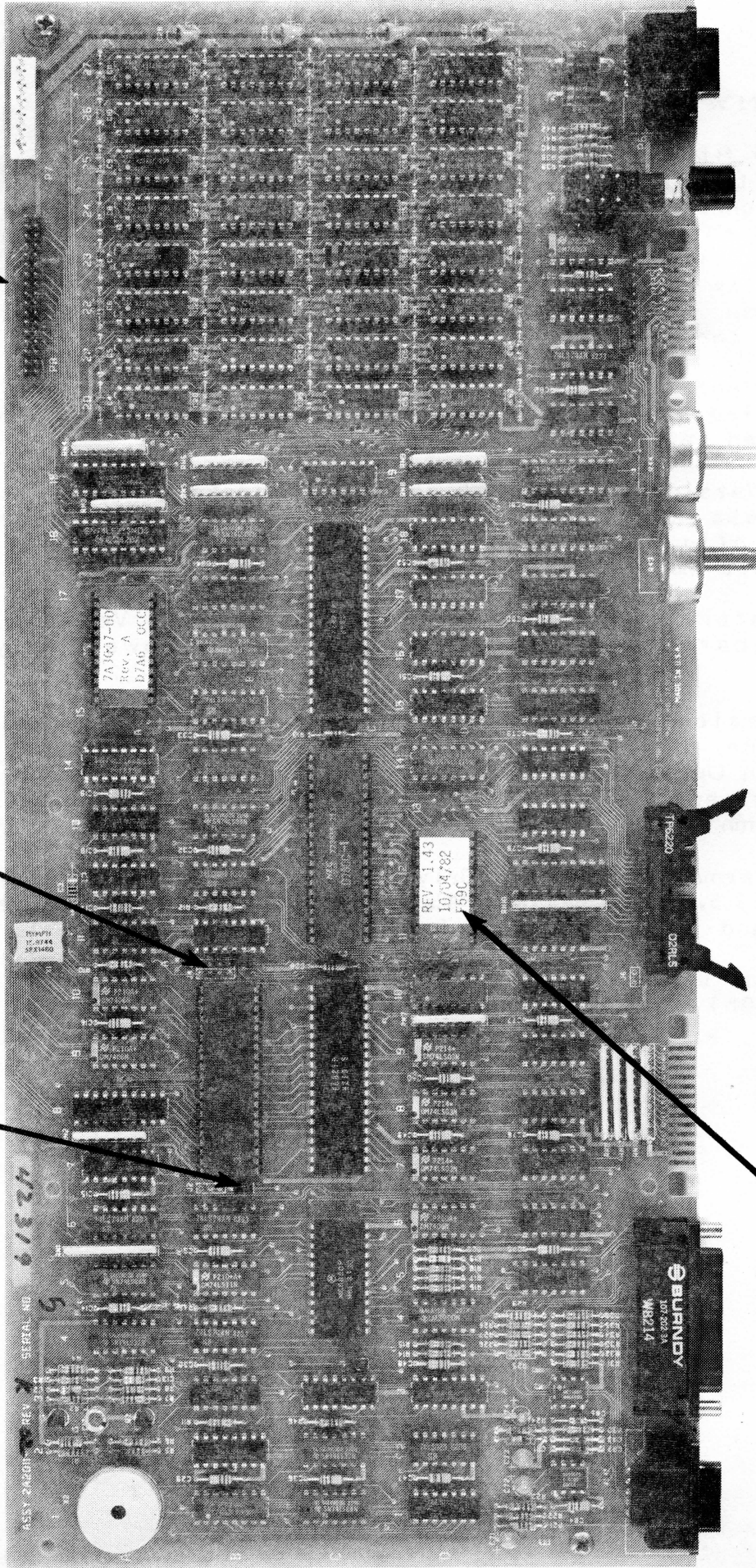
Double Density Upgrade plugs in here



Remove two jumpers here



A jumper must be in place here



Monitor PROM. Remove and replace with PROM provided



DIAGRAM I

