

VECTO

SYSTEM 2600

Overview Manual

VECTOR SYSTEM 2600

OVERVIEW

INSTALLATION, USE, AND MAINTENANCE MANUAL

REVISION A

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8) If your system is Mainframe based, lead the cable out the rear panel by means of the slot near the top rear of the backplane. If your system is Vector 3 based, loosen one screw on the cable clamp and completely remove the other. Thread the wide cable under the clamp, fasten the removed screw and tighten both.

9) You may now fasten the cover back on your computer.

10) Connect the printer to an appropriate wall outlet by means of the power cable shipped with the unit.

11) Find the ribbon cartridge and the NEC Spinwriter Product Description manual that was shipped with the unit. Check to make sure that the print thimble has been installed. Install the ribbon as per the instructions in the SPINWRITER Operator's Guide.

12) Conduct preliminary checkout as per Section 2.5.2 and following section in the SPINWRITER Product Description Manual.

13) Now return to your system Overview manual and go through the CONFIG procedure explained there in the printer installation section of the manual. Make sure to choose the System Printer option. Continue on in that manual from that point.

**NEC 7700 Q SYSTEM PRINTER
INSTALLATION INSTRUCTIONS**

NOTE:

THESE INSTRUCTIONS ARE TO AID THE DEALER IN INSTALLING AND TESTING A NEC 7700Q PRINTER WHICH HAS BEEN SHIPPED WITH A VECTOR GRAPHIC SYSTEM AS A SYSTEM PRINTER. THESE INSTRUCTIONS ARE NOT DESIGNED TO PROVIDE RETROFIT INFORMATION.

Please substitute these instructions for the Sprint 3 installation instructions which are an integral part of the attached Vector Graphic System Overview Manual. These instructions have been written to be included with all Vector Systems. If some material does not seem to apply to your system, skip over it to the next step. These instructions also assume that you have two NEC documents in your possession: the Spinwriter Product Description Manual and the Spinwriter Operator's Guide. They have been shipped in the box with the printer. Additional copies are available through Vector Graphic.

- 1) If you have not unpacked your Nec System Printer at this point, please do so now following the instructions which are taped to the outside of the box.
- 2) Be sure to save all cartons, packing material, fasteners, etc. in case the printer ever has to be shipped anywhere.
- 3) You will notice that there is a wide cable which exits from the rear of the printer which has been rolled up with an interface board at its center. If this cable/board assembly has been taped and/or bagged, please remove it from its packing material.
- 4) Remove the cover of the computer: if you have a Vector 3 based unit, remove the console cover by unscrewing the 4 Phillips head screws that hold it on; if you have an MZ based unit, remove the cover from the mainframe box in a likewise manner.
- 5) Locate the ZCB board. It has a single blue 34 pin connector on top. The letters ZCB are also silkscreened near the bottom of the board on the component side. It may be difficult to see this without removing the board itself.
- 6) Unroll the wide cable that is attached to the printer. You will see that there is a 34 pin connector on the bottom of the interface card. The card is the same one that was used with the Sprint 3 and should say "ZCB/Sprint 3 Interface Board" (P/N 3526-0000-01-00) on it.
- 7) Attach this interface card to the connector on the top of the ZCB board. Orient it so that it overhangs the solder side of the ZCB board, not the component side.

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FOREWORD

Audience	This manual is intended for dealers, distributors, salespersons, consultants, and service personnel.
Scope	It describes what major components the Vector System 2600 consists of, how to install, how to use and how to maintain the system.
Organization	For many dealers and users, no other hardware manuals will be necessary, though technicians will make use of the more technical publications. Users will reference specific software manuals, depending on the particular application.

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1. PERSPECTIVE

1.1 Introduction

Vector System 2600s are economy sized, general purpose, microprocessor based computers, emphasizing modularity and commonality of components. They are delivered by Vector Graphic assembled and fully tested, including both hardware and operating system software. Included with the System 2600 are two double sided, quad-density 5-1/4" floppy disk drives with a storage capacity of 630K bytes per drive.

1.2 Standard hardware and software

- 1) Video console with a keyboard featuring the feel of an excellent electronic typewriter and a 10-key number pad;
- 2) Two double sided, quad density 5-1/4 inch diskette drives (630 Kbytes storage each). The two drives of the System 2600 provide 1.2 Mbytes of on line storage.
- 3) 56K of available random-access memory;
- 4) Capability of interfacing to one printer at a time, either one of Vector's system printers, or one of the many standard printers on the market;
- 5) Communications capability (will interface to a standard asynchronous modem or acoustic coupler); standard software with the system enables 30 characters/second (i.e. 300-baud) emulation of a "dumb" serial terminal;
- 6) Industry-compatible CP/M 2.2 operating system, allows use of most CP/M compatible software on the system.
- 7) Microsoft BASIC-80, release 5, one of the fastest and most powerful general purpose languages available (used in conjunction with CP/M).
- 8) Additional powerful software development tools including SCOPE - an advanced screen-oriented program editor; RAID - a full-screen simulator-debugger for assembly language programs; the ZSM assembler using the 8080-superset mnemonics; and the Extended Systems Monitor on PROM, allowing direct manipulation of memory and input/output.

9) Computer electronics consisting of:

- a) Chassis with heavy duty power supply and 6-slot fully shielded and terminated S-100 motherboard
- b) High-speed (4 MHz) ZCB Single Board Computer
- c) 64K Dynamic RAM board
- d) Flashwriter II Video board featuring a replaceable character set
- e) Dual mode disk drive controller board

1.3 Optional hardware and software

- 1) Two additional floppy diskette drives can be added, by adding additional drives.
- 2) A 5-1/4" hard disk drive may be added via the dual mode controller board.
- 3) Vector Graphic offers the Sprint 3 letter-quality daisywheel printer as a system printer.
- 4) Memorite word processing software from Vector Graphic.
- 5) Peachtree ready-to-use general business accounting software, from Vector Graphic, including programs for Accounts Receivable, Accounts Payable, General Ledger, Payroll, and Inventory Management.
- 6) ExecuPlan video calculator.
- 7) BSTAM and RBTE communications software.
- 8) CCA Data Management System.

1.4 Hardware specifications**POWER**

For a system with 1 terminal, 2 Tandon drives, 1 Sprint 3 printer

Voltage option	115 VAC +/-10%	220 VAC +/-10%
Frequency	60 Hz +/- .5%	50 Hz +/- .5%
Current, Operating	3.5 Amps	1.5 Amps
Current, Surge	15 Amps	7.5 Amps
Power Dissipation	385 Watts	385 Watts
Heat Generation	1200 BTU's	1200 BTU's

DIMENSIONS AND WEIGHT

	Height inches/cm	Depth* inches/cm	Width inches/cm	Weight lbs/kg
Console	12.8/32.4	18/45.7	21/53.3	22/10
Ministor Module	7/17.8	12/30.5	8.3/21.1	17.5/7.9
Sprint 3 printer	7.5/18.0	18.5/47.0	23.6/60.0	28/12.7

* Dimensions do not include requirement for cabling, typically 4 in./10.2 cm.

ENVIRONMENT

	Operating	Storage
Temperature	10 to 32° C	-34 to 65° C
Humidity (non-condensing)	20-80%	20-80%

SPRINT 3

Speed	55 characters/second
Paper Width	14 inches
Print quality	Tested to manufacturer published acceptance specifications

COMMUNICATIONS

Interface RS-232C
 Asynchronous baud rates 110, 150, 300, 600, 1200, 2400, 4800, 9600

FLOPPY DISK DRIVEPerformance

Kind of diskettes used	16 sector, hard sectored, 5 1/4 inch
Capacity per drive	630K bytes, formatted
Transfer rate	250K bits/second
Average rotational latency time	100 milliseconds
Access time - track-to-track	3.0 milliseconds
Settling time	15 milliseconds
Drive motor start time	1 second
Rotational speed	300 RPM
Recording density	5450 bits per inch (BPI)
Track density	100 tracks per inch (TPI)
Surfaces used per diskette	2

Reliability

MTBF	20,000 hrs.
Soft error rate	1 in 10 EXP 9
Hard error rate	1 in 10 EXP 12
Seek error rate	1 in 10 EXP 6

VIDEO TERMINAL

Screen	12 inch, monochromatic
Characters	ASCII, 8X10 dot matrix
Contrast	Dark on light or light on dark selected by software Normally light on dark
Contrast	Operator adjustable
Display area	24 lines X 80 characters
Radiation	Complies with U.S. Federal Regulation for Radiation Control, as required by the Radiation Control for Health and Safety Act of 1968, implemented by Title 21, Subchapter J, Code of Federal Regulation

1.5 Pre-installation check-list

The Vector System 2600 can be ordered for either 110 or 220 volt power sources. Make sure that the system to be installed has the proper power supply for the power supply in your region.

It is recommended but not required that the power line to which the computer is connected be a "dedicated" power line; that is, the line comes directly from the building's power source, no other devices except another Vector System making use of it, and that it is well grounded. The intent in this recommendation is to eliminate electronic "noise" on the power line which can affect the reliability of the system, and to avoid the loss of data if a circuit breaker is tripped because another device short circuits or too many devices are connected. It is particularly critical that heavy machinery not be connected to the same power line.

Do not install more than two Vector System 2600's per 20A circuit.
Extension cords are not recommended.

Special air-conditioning and raised floors are not required for a Vector System 2600. They will function in any normal office environment.

Do not install a Vector System 2600 in an abnormally dusty or dirty environments, due to the effect on the disk drives and diskettes.

Make sure that there is adequate area for all equipment, and that there is adequate desk space next to the console. The console should be low enough for comfortable typing.

Make sure that the console is not directly opposite a bright open window, which will create glare on the surface of the screen.

If the carpet in the computer's area is a shag or thick carpet, especially if there is a lot of foot traffic near the computer or if the operator's chair has rolling casters, there may be a build up of static in the operator and passing people that can discharge into the system and cause the system to malfunction or crash. If you anticipate or experience this problem, spray the carpet in the machine's vicinity once a month, or more often as needed, with anti-static spray, available in many electronic supply and carpet distributors. If the system is still affected by static, we recommend purchase of a 3M anti-static mat to be placed on the floor in the computer's area.

II. INSTALLATION AND CHECKOUT

2.1 Installation of a Vector System 2600

1. Inspect all cartons for external signs of damage. If any damage is observed, have the delivery agent note the damage on the shipping document. Some shippers may wish to be present when the container is opened if external damage is apparent.
2. Open all cartons and then withdraw the equipment and manuals with the styrofoam packing material. Remove the styrofoam packing material from the equipment. If present, remove plastic bags from the equipment. Store the packing material in the cartons and save them in case the equipment ever has to be shipped anywhere.
3. Place the console with integrated computer chassis in a horizontal position with the separate disk drive as near as possible.
4. Remove the cover of the console by removing the four Phillips head screws, two on each side. Carry out a quick internal inspection, checking for obvious shipping damage and loose boards due to shipping vibration. Press each board in firmly, making sure it is fully inserted in its slot. If you find any obviously broken boards or parts, do not use the equipment in order to avoid further damage, or unexplained malfunction at the user's site at a later date. Report the damage to the carrier, and contact qualified service personnel, or Vector Graphic.
5. Remove the cover from the disk drive module and then remove the flat metal shipping plate that is held by four pan head phillips screws. Be careful not to drop the screws or washers into the drives. Store the plate and screws with the shipping material in case the system ever has to be shipped. Replace the cover and fasten it.
6. With the console cover off, connect the disk drives as follows. Connect the DE-9 power cable from the rear of the disk drive module to the 9-pin power connector on the rear panel of the Vector 3. Connect the 34-pin flat cable coming from the rear of the Microstor module to the connector marked "J2" on the dual mode disk controller board in the Vector 3 chassis. If you have a model which terminates in a 50 pin connector and there is a matching socket on the rear of the computer console, plug it in there. Note: the term "Vector 3" refers to the integrated computer and terminal subsystem. When making the above connections make note that the connectors are "keyed" so that pin-1 on the cable matches pin-1 on the controller board connector. You will be able to identify pin-1 by the blue stripe along the side of the cable on which pin-1 is located.
7. Using the black power cable which comes with the system, connect the console to power. Connect the female end of the cable to the special 3-prong connector at the rear of the console chassis.

WARNING!

During any operations when power is applied to the Vector 3 subsystem with the cover removed, potentially lethal voltages are present. Do not touch any parts within the computer, particularly when reaching behind for the on/off switch or the reset button.

8. Switch the on-off switch in the rear of the console to the on position. The console screen should light up showing a banner identifying the "Vector Graphic Monitor." The "Monitor", short for Extended Systems Monitor, is the firmware built into the system which waits for commands from the operator as soon as the system is turned on. If the screen does not light up, check the connection to the console. If the screen still does not light up, press the reset button in the rear of the console to the right of the on-off switch. If the "Vector Graphic Monitor" banner does not show up, and something else shows up instead, turn the system off then on. Try it several times if necessary, before contacting qualified service personnel.

9. When the Monitor banner shows up, depress N on the keyboard, following the Mon> prompt on the screen. N causes a memory test to occur. The acceptable response is "E000 FF C3", which should appear on the next line down within a few seconds. (E000 is the first memory address which is not Random Access Memory in a 56K system.) Following this, another Mon> prompt should appear on the next line.

10. Following the Mon> prompt, depress Y. This puts the system into an "echo" mode, in which each key causes its character to appear or causes the cursor to move, but has no other function. Depress every key on the keyboard except the ESC key, making sure that each one functions and that no keys stick. When you have completed this test, then depress the ESC key, which will take the system out of echo mode and put another Mon> prompt on the screen.

11. Unwrap the CP/M system disk which comes with the system and insert it in the right-hand drive (drive A in CP/M nomenclature). Insert it with the labeled side to the left and with the edge closest to the oval exposed region going in first. Push it in gently until it stops. Mount the disk by pressing the door slowly to the right, until it snaps into place. To remove the disk, pull the door out and to the left, then take out the disk.

12. With the CP/M System Disk in the rightmost drive, boot up the CP/M operating system depressing B on the keyboard, following the Mon> prompt. The red light on the rightmost floppy disk drive should light up, the phrase "BOOT FLOPPY" will appear following the Mon> prompt. Very soon a message announcing the CP/M operating system should appear on the screen.

If this does not occur within 5 seconds of pressing B, depress RESET on the back of the computer console, then dismount the disk. Remove it from the drive and make sure that (a) it is the serialized CP/M 2 disk that came with the system, (not from a different system), and (b) that it is oriented correctly as described above. Then remount it carefully. Depress the RESET button on the computer chassis and try the B command again.

If still no CP/M message appears, repeat the process of RESETTING, dismounting, checking the disk, remounting and rebooting once again. Then, if there is no CP/M message, try the same process but use a CP/M 2 disk from a different system if you have one. Note: this second CP/M diskette must be intended for a 2600 or any Vector system equipped with a Tandon double sided drive. You cannot boot up the System 2600 with a single sided CP/M diskette. If none of these double sided diskettes boot up, the chances are that there is something wrong with the disk subsystem that requires the help of service personnel.

13. When CP/M boots up, you should see an A> prompt on the screen following the sign on message. Type DIR (return) following the prompt. (return) means press the RETURN key. You do NOT have to use capital letters when typing a CP/M command. You should immediately see a directory of the files on the diskette, consisting of at least 5 lines of names. Make sure there is a file named BACKUP. This will be used next.

14. You are now going to copy the CP/M serialized diskette. This has the double function in that it tests the disk drives for compatibility and it gives you a working copy of CP/M - the copy which will become the personalized CP/M 2 System Diskette. Insert and mount a completely unused diskette (or one whose contents are not needed) in the left-hand drive (drive B in the CP/M nomenclature). Make sure it is a Dysan or Verbatim brand 16-sector double sided, double density 100/96 TPI diskette. We recommend those with reinforced centers. These are the only types of diskettes you should use with a System 2600, due to the high density of storage employed; other brands have been found unreliable in this system. Scotch single sided, single density diskettes may be used but backed up frequently.

After the diskettes have been mounted, type BACKUP (return) following the A> prompt. In response to the question "Source drive", press A. In response to the question "Destination drive", press B. In response to the command "Press RETURN to begin", press the RETURN key. The backup process will take approximately 3 minutes at this point.

15. At the end of the process, or earlier if an error occurs, you will see a message on the screen following the last line. This message tells you whether or not the copying process succeeded. Always look for it. If successful, you will see "Copy complete".

If unsuccessful, you will see either "Bad source diskette" or "Bad destination diskette". If unsuccessful, you should unload completely, and remount the diskettes, then go to step 15 and try the process again with the same diskettes. If it does not succeed a second time and you get "Bad destination diskette", try again using a different diskette as the destination diskette, because it is probably defective. If possible, try a different brand of diskette, from one of the two brands mentioned above. Each time you try it, unload and remount both diskettes.

16. In response to the statement "(R) to return to system (B) execute backup again", type an R to return to the CP/M executive (Console Command Processor), or type B if you want to repeat the backup process.

17. Once you have backed up your serialized CP/M diskette, the Vector System (without its printer) is probably functioning satisfactorily.

18. After backing up the personalized diskette for use in a 56K system, remove the serialized diskette, return it to its envelope and store it in a safe place. Unless the personalized diskette and all its copies are damaged, you should never use the serialized diskette again. Unload the personalized CP/M 2 System Diskette, and label it as such, including the release number and the serial number of the serialized diskette.

19. There is one additional factor which you have to consider. Will you be running single sided diskettes on your system? If you have programs or data stored on single sided floppy diskettes you may use them with your 2600 (though you cannot use them to boot up on). To enable the operation of single sided diskettes on your system, run the program MOVCPMH by typing MOVCPMH (return) in response to the "A>" prompt. You will see:

```
COPYRIGHT (C) DIGITAL RESEARCH, INC. 1979
PORTIONS COPYRIGHT (C) VECTOR GRAPHIC, INC. 1980
```

```
CONSTRUCTING 56K CP/M VERSION 2.21 J/L
```

```
WHICH DRIVE SHOULD BE SINGLE SIDED (B,C,D)
```

If you wish to configure drive B: to run single side diskettes, type B (return). You will see next:

```
READY FOR SYSGEN OR SAVE 45 CPM56.COM
```

followed by the A> prompt. If you wish to permanently configure your system to use single sided disks on drive B run the "SYSGEN" program. (Instructions are found in the CP/M introductory manual if you are unfamiliar with this program.) If you just want to use single sided disks temporarily, just continue on from this point with what you

want to do next. The system will stay configured this way until you either reboot from drive A: or turn the system off. If you will regularly be switching drive B: from single sided to double sided, you can sysgen the modified system onto drive B: Therefore, by warm booting from drive B:, you will be able to use single sided disks in drive B: When you want to switch back, warm boot from drive A:

20. At this time, if you are using a printer, you should connect the printer to the computer. If you are using a Sprint 3 printer from Vector Graphic, go NOW to Section 2.2 and continue there. If you are not going to use a printer with your system go to step 24 and continue there.

If it is a serial printer emulating the Diablo protocol such as Diablo 1610, 1620, or 1640, NEC Spinwriter 5515, Dataproducts serial daisywheel printer, or Qume Sprint 5, or emulating the standard serial (sometimes called Teletype) protocol (such as a Decwriter or TI 810), and it runs at 1200 baud or less, simply connect it using a 25-line flat ribbon cable to the female socket labeled "RS-232C" on the rear of the computer chassis. Some printers may require a cable with male connectors at both ends. The Nec Spinwriter 5515 and the TI 810 require CD/ to be pulled high. This can be done at the cable.

If it is one of the above kinds of printers, remove the cover of the computer and check that the baud rate setting of the serial channel of the ZCB board matches the speed of the printer. Find the serial channel switch near the upper left hand corner of the board, press the desired rocker down and away from the OPEN designation, and press all other rockers in the opposite direction. A Sprint 5 always operates at 1200 baud. The system does NOT have to be turned off during this procedure.

If it is a Sprint 3 printer from Vector Graphic, but not part of a Vector System 2600 from the factory, connect the printer as described in the instructions that come with the printer.

If you have a printer which has a Centronic's parallel interface, you must obtain Vector Graphic P/N 3594-0000-00-00 "Centronic's Interface Assembly" which consists of an adapter board which mounts on the ZCB parallel connector, a cable which connects that board to a connector at the back of the computer and a cable which connects that connector to the printer. Installation instructions are included with the assembly.

If it is a TI 810 printer and you want to operate it at 1200 baud, determine if it will be used to print word-processing text, long program listings, or any kind of output which is dumped directly and continuously from memory, with no breaks for disk access or calculation. If so, an additional hardware modification to the system is required. If not, skip this step; it is not necessary for accounting applications. Note: the following applies only to systems with a Rev. 2

or 3 ZCB board. You may order Vector P/N 3595-0001-00-00 which is an RS-232 cable specially made for this application. In lieu of this you can modify the RS-232 cable assembly that connects the printer to the computer. The change will only work on RS-232 cable assemblies which use round cable and connectors that are screwed together. You cannot use a flat cable assembly which has press fit connectors. Take apart and identify the wire which is connected to pin 4. For instance, it may be a green wire with a white stripe on it. Cut this wire about one inch from the pin. Now identify the wire which is connected to pin 11 of the connector. Cut this wire flush with the pin. Now solder the loose end of this wire to the one inch lead attached to pin 4. Now reassemble the shell. Connect the cable to the the RS-232 output at the rear of the computer. Having made this modification, you can communicate to the printer at 9600 baud, which will speed up throughput by about 25%. Set both the Serial Channel and the printer to 9600 baud.

If you are using a kind of printer not mentioned above, refer to both the printer's manual and the ZCB manual for the information you will need to connect it, but Vector Graphic does not take responsibility for supporting this interface or its consequences.

You may now return the cover of the computer. Unless you plan further hardware modifications, you may screw the cover down.

Refer to the printer's manual on how to load ribbon, paper, printwheel, how to connect it to power, and how to turn it on. (Instructions for connecting and turning on the Sprint 3 in a Vector System 2600 are found in Section 2.2 below.)

21. After connecting and turning on the printer, you have to configure the personalized CP/M 2 System Diskette to work with this system. First, mount the personalized CP/M 2 System Diskette in drive A (right-hand drive). If you just turned the system on after connecting the printer, boot up CP/M from this diskette by depressing B. If, however, the system has been on all along, then just depress control-C after the A> prompt. This is the so-called "warm boot", which tells the system a new CP/M diskette is in drive A.

Then, following the A> prompt, type CONFIG (return). Answer the first question by choosing the appropriate printer option. (IMPORTANT: If you are using the Sprint 3, select the System Printer option.) After selecting a printer option, go through the rest of the configuration procedure without selecting any of the special options (just press [RETURN]) except the I/O interface question. Choose the ZCB option. Depress Y when you are asked whether to save the configuration on disk. Note: If you wish to understand more of what can be done with CONFIG, read section 3.7 of the CP/M Introductory Manual. Two new CONFIG enhancements (CONFIG ? and CONFIG S) are explained in the Appendix of this manual.

If you get an error message regarding the disk system, remount the diskette in drive A, and while you are at it, make sure there is no write-protect tab on the diskette. (This tab is a piece of tape over the cutout on the right edge of the diskette, described in Section 2.6 of the CP/M 2 Introductory Manual.) Then try the CONFIG procedure again.

22. The best way to test the printer is to print several pages of material on it. To do this, first turn the printer on and load continuous fan-fold paper having 11-inch page length. If the printer is wide enough, use standard 14-inch wide fan-fold paper. If you are using a printer having an add-on form-feed tractor (such as the Vector Sprint 3), and if you are not familiar with it, do not try to use the form-feed tractor mechanism (which usually comes with an ordinary typewriter. Make sure that the paper is loaded so that the print-head, when at the left edge of the printer, lines up just to the right of the sprocket holes on the left edge of the paper. Make sure the ribbon and printwheel (if any) are in place, and that the cover is on. If the printer has a character spacing switch on its front, set it for 12 characters per inch. (Sprint 3 has no such switch.) Then, following the A> prompt type PIP LST:=DUMP.PRN (return). The computer will read this sample file from the diskette and then print it out.

It will use up 5 sheets of paper. Make sure that the printer spaces down to the top of each new sheet. (Note that it should do this, even though you did not specify the Automatic Paging option in the CONFIG routine. This is because the form-feed commands are within the DUMP.PRN text.) Make sure that each line is even along the left margin and that the characters in the line are level and evenly spaced. No lines should print past the right margin, even if the printer is set for 10-characters per inch. Make sure that the characters are printed completely and evenly. (If they are not, it is probably because the printwheel or the ribbon is not loaded properly).

23. If the printer came with an add-on form-feed tractor, you may put it on the printer now.

With the Sprint 3, or Qume Sprint 5 printers, you must remove the top cover of the printer and snap the tractor mechanism over the platen axle, so that its gear meshes with the platen gear. To open the metal fingers which snap over the platen axle, press on the metallic levers on each side of the form feed tractor. In order to use a form-feed tractor, the platen pressure lever on the right side of the Sprint 3 or Sprint 5 printer must be in the forward position so that the paper slides through freely.

24. Once the Vector System and its printer are tested and working, you have completed the basic installation and check out of a Vector System 2600.

After all interior modifications are complete, you may screw down the

computer cover.

2.2 Installing and using the Sprint 3 printer in a Vector System 2600

This section is only applicable if the internal interface components of the Sprint 3 Subsystem have already been installed within the computer chassis.

2.2.1 Unpacking

1. If not already done, remove the printer from its carton and any plastic bag. The following items should be found in the carton: Sprint 3 printer with attached power supply, power supply cover, four round metal plugs, a printwheel, and a ribbon.
2. Inspect the printer for scratches, dents, loose or damaged parts, or other signs of damage. Note any evidence of such damage on the invoice, and file a claim with the carrier immediately, if the condition of the units warrants.
3. Remove any paper wrapped around the platen.
4. Remove the top front cover by lifting up under the edge at the front of the printer.
5. **IMPORTANT:** Using cutting pliers, cut and remove the two plastic ties securing the paper bail during shipping.
6. **IMPORTANT:** Cut and remove the plastic tie securing the carriage assembly to the printer chassis.
7. Now, load the printwheel and then the ribbon in the printer. Instructions will be found in Chapter 3 of the Sprint 3 Maintenance/Training manual, if you are not familiar with the procedure. Make sure the printwheel is completely flat against the metal plate on the carriage. Make sure the carriage mechanism is returned to the horizontal position and the "C" button is clicked-down. Make sure the ribbon cartridge is fully clicked-in and the ribbon is threaded through both guides.
8. Manually slide the print-head carriage from the left side of the printer all the way to the right, and back again. Make sure it slides smoothly over the complete range. Make sure that there are no obstructions or foreign objects inside the printer. Slide the carriage fully to the left. Now, return the top cover of the printer. Make sure that the line down the center of the print-hammer lines up, or is further to the left of, the 0 mark on the printer cover.

2.2.2 Connecting

9. **IMPORTANT:** If the computer is on, dismount any diskettes in the

drives (you do not have to remove them from the drives), and turn the computer off.

10. Find the 50-line flat ribbon cable coming out from inside the back of the computer chassis. Plug the far end of this cable into the socket on the right side of the rear of the printer (when you are facing the rear of the printer). Make sure that the colored edge of the cable is on the left side of the cable when you are facing the rear of the printer. (Normally, this is the only way the connector will go in because of a restraining insert in the connector.) If the connector has screws for fastening to the corresponding screw holes in the printer, tighten them down snugly.

11. Now, turn the computer power on again. Turn the printer power on by depressing the red button on the side of the power supply at the rear of the printer. Note that the lights on the front panel of the printer go on. If the printer does not go on, check that the power cable is properly installed. If it does go on, but one or more of the front panel lights does not light up, refer to the troubleshooting tips below.

12. Otherwise, return to step 25 in Section 2.1, and follow the instructions there for testing the printer subsystem. If the printer does not work during testing, you may refer to the troubleshooting points below.

2.2.3 TROUBLESHOOTING

If the Sprint 3 printer does not work:

(1) Make sure that you are commanding it correctly.

(2) Check the POWER light on the printer. If it is off, make sure the power connection to the printer is intact.

(3) Check the READY light on the printer. If it is off but power is on, this means either: the cover of the printer is not on tight, there is some kind of jam in the mechanism preventing the printwheel from rotating properly, there is something preventing the carriage from moving back and forth freely, or there is something more seriously wrong with the printer. Check the first three possibilities. If after correcting the problem the printer does not start up by itself, you may have to reinitialize it by rebooting the operating system, or in the case of Memorte software, issuing an RS command. If you cannot get the READY light to go back on, then refer to the accompanying Sprint 3 Printer Maintenance/Training manual or qualified service personnel.

(4) If the other lights are on, Check the RIBBON light on the printer. If it is off, this means that the ribbon is out. Load a fresh ribbon.

(5) If the POWER, READY, and RIBBON lights are on and it still does not print, make sure the connection to the computer is complete. Refer to the Sprint 3 manual if necessary for a description of the cabling.

(6) If the above checks do not get the printer going, then refer to the accompanying Sprint 3 Printer Maintenance/Training manual or qualified service personnel.

2.2.4 MAINTENANCE OF THE SPRINT 3 PRINTER

The Sprint 3 is a highly reliable device that will work well for long periods without attention. In a normal office environment, the Sprint 3 requires periodic lubrication and simple preventive maintenance every six months for optimal performance and to prevent more serious breakdowns. In very heavy use, this period should be shortened accordingly. Full instructions for this maintenance procedure are given in the Sprint 3 Printer Maintenance/Training manual, included in the system's hardware documentation. General maintenance procedures for the Sprint 3, for use by service personnel, are found in the same manual.

III. APPENDIX

3.1 Alignment of VCO center frequency

Tools required; 35 MHz Oscilloscope or 15 MHz Frequency Counter, Vector Graphic System B, S-100 Extender card (Vector) and a small screwdriver.

PROCEDURE:

1. Place the DualMode controller board on the extender card.
2. Make sure that there are NO CABLES plugged into the connectors at the top of the board.
3. Apply power to the computer.

First the floppy VCO center frequency is adjusted:

1. Measure the frequency on U1 pin 7 with an oscilloscope or a frequency counter.
2. With the probe on U1-7 adjust the right hand potentiometer (R15) for a 500 kHz square wave (2 micro-second period). This signal should be a clean square wave with a 50% duty-cycle.

To adjust the Hard disk VCO center frequency:

1. Reset the System and enter the following machine code at 0000:

```
0000: 3E 00 D3 C0 C3 00 00
```

2. Type "ESC" and "G 0000". (Execute the program at 0000). This continually outputs to port C0H which forces the controller to attempt to access the hard disk.
3. Now measure the frequency on U1 pin 10 with the oscilloscope or frequency counter.
4. With the probe on U1-10 adjust the left hand potentiometer (R1) for a 10 MHz square wave (100 nano-second period). This signal should approximate a square wave with a 50% duty-cycle.

SIGNAL:	LOCATION:	FREQUENCY:	POTENTIOMETER:
FLOPPY VCO	U1-7	500 kHz	R15
HARD DISK VCO	U1-10	10 MHz	R1

3.2 CONFIG program enhancements

There are two new enhancements to the CONFIG program which enable the user to set a higher processor speed and to check the configuration of his system.

1. Typing CONFIG S (return) will allow the user to change certain system parameters such as write protection disable/enable and disk drive step rate.
2. Typing CONFIG ? (return) shows the user important facts about the configuration of the system such as the logical drive assignments, printer driver selection and boot options. It then leads directly into the standard CONFIG routine. See your CP/M introductory manual for further details.

3.3 MOVCPM program

There is an optional enhancement to all current versions of the MOVCPM program. If you type an "S" after the system size such as "MOVCPML 56 S", the program will ask you to set the processor speed. If you desire to change this, input the letter of the speed, not the number. The processor speed is determined by the hardware in your system, it is not software selectable. This feature will allow easy upgradability when higher speed CPU boards are available.

2600 MEMORY MAP

DRIVES: Two 5 1/2" Tandon Floppy Disks (Double Sided)

BOARDS: ZCB, 64K, Dualmode, FWII

 = ROM
  = RAM
  = Undefined

ADDRESS	TYPE	SIZE	BOARD	IMPLEMENTATION
0000	RAM	56K	64K DYNAMIC MEMORY	USER AVAILABLE MEMORY
E000	ROM			
E200	ROM	2K		MONITOR
E400	ROM			
E600	ROM		ZCB	
E800	ROM			
EA00	ROM	1K		DISK PROM
EC00	ROM			
EE00	ROM	1K		PRINTER DRIVER (Optional)
F000	RAM			
F200	RAM			
F400	RAM	2K	FLASHWRITER II	VIDEO DISPLAY
F600	RAM			
F781	USEABLE AREA			NOT SHOWN ON VIDEO
F800	Undefined	1K	Undefined	Undefined
FC00	RAM	1K	ZCB	STACK AREA
FFFF	RAM			