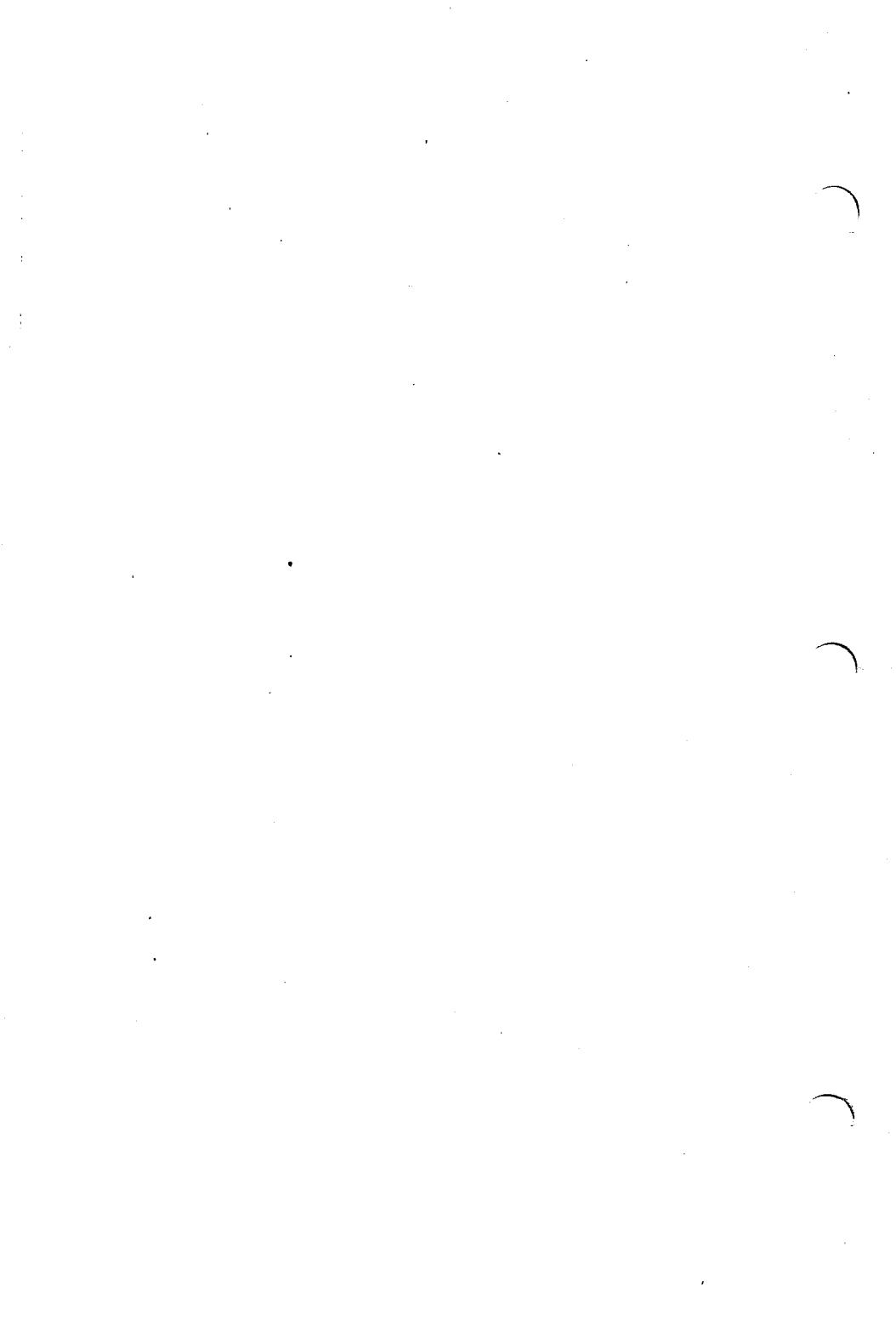


AVL GENESIS
DESK TOP COMPUTER
INSTALLATION GUIDE

Audio Visual Laboratories, Inc.



CONTENTS

CHAPTER 1:	INTRODUCTION	1-1
1.1	General Information . .	1-1
1.2	General Index.	1-2
CHAPTER 2:	SYSTEM DESCRIPTION . . .	2-1
2.1	General.	2-1
2.2	Central Processing Unit (CPU)	2-1
2.2.1	Disk Drives.	2-1
2.2.2	Rear Panel	2-3
2.2.3	Access Area.	2-6
2.3	Keyboard	2-7
2.3.1	Main Keyboard.	2-7
2.3.2	Keypad	2-8
2.3.3	Function Keys.	2-8
2.4	Video Display Monitor.	2-10
2.5	Keyboard Overlay . . .	2-11
CHAPTER 3:	INSTALLATION	3-1
3.1	General.	3-1
3.2	Site Requirements. . .	3-2
3.3	Electrical Requirements	3-2
3.4	Initial Unpacking and Inspection . . .	3-3
3.5	Installation and Set-Up Procedure . .	3-5

CHAPTER 4:	USING YOUR GENESIS
	COMPUTER 4-1
4.1	General. 4-1
4.2	Floppy Disks 4-1
4.2.1	Disk Care. 4-2
4.2.2	Handling Precautions . 4-4
4.2.3	Formatting A Disk. . . 4-5
4.2.4	Labeling Disks 4-7
4.2.5	Storing Disks. 4-7
4.2.6	Inserting and Removing Disks 4-9
4.3	Operating Systems. 4-10
4.4	System Start-Up. 4-12
4.4.1	Boot-Up From Power Off 4-13
4.4.2	Rebooting The System . 4-14
4.5	Using The Keyboard . . 4-16
4.5.1	Function Keys 4-16
4.5.2	Alphanumeric Keys. 4-17
4.5.3	Utility Keys 4-17
4.5.4	The Keypad And Num Lock 4-22
4.5.5	Other Special Keys . . 4-23
4.6	Turning Off Your System 4-25
4.7	Preventive Maintenance 4-26

CHAPTER 5	MS-DOS 2.0 UTILITIES . 5-1
5.1	General. 5-1
5.2	Disk Drive Designators 5-2
5.3	DISKUTIL 5-3
5.3.1	Formatting With DISKUTIL 5-3

5.3.2	Diskutil Copy Funtions	5-6
5.3.2.1	Perform Read Only Test On Drive A (Left) . .	5-6
5.3.2.2	Perform Read Only Test On Drive B (Right) .	5-7
5.3.2.3	Format A Disk In Drive A (Left) . . .	5-8
5.3.2.4	Format A Disk In Drive B (Right) . . .	5-9
5.3.2.5	Copy Drive A (Left) To Drive B (Right) .	5-9
5.3.2.6	Copy Drive A (Left) To Drive B (Right) With Formatting. . .	5-10
5.3.2.7	Change Disk Format . .	5-10
5.4	Formatting A Disk. . .	5-11
5.4.1	Format Procedure . . .	5-11
5.4.2	Format Program Options.	5-12
5.4.3	FORMAT And COPY . . .	5-13
5.4.4	FORMAT And DISKCOPY. .	5-15
5.5	Setting Up Communications . . .	5-16
5.6	Serial Printer Setup Procedure.	5-16
5.7	MS-DOS 2.0 Hierarchal Directory Structure.	5-19
5.7.1	Pathnames.	5-21
5.7.2	Directory Commands . .	5-22
5.8	Purchased Basic Programs	5-24

CHAPTER 6	PRINTERS	6-1
6.1	Introduction	6-1
6.2	Dot Matrix Printers. .	6-1
6.3	Daisywheel Printers. .	6-2
6.4	Printer Selection. . .	6-3
6.5	Printer Installation .	6-8
CHAPTER 7	TROUBLE-SHOOTING GUIDE	7-1
7.1	General.	7-1
7.2	Review Check List. . .	7-1
7.3	External Device Problems	7-3
7.4	Video Problems	7-6
7.5	System Problems-System Will Not Boot. . . .	7-6
7.6	Keyboard Problems . . .	7-7
7.7	Floppy Disk Problems .	7-9
7.8	EPROM T-Test	7-10
APPENDIX A:	AVL GENESIS TECHNICAL SPECIFICATIONS . . .	A-1
A.1	General.	A-1
A.2	Dimensions	A-1
A.3	Hardware	A-1
A.4	Software	A-2
A.5	Environmental Requirements	A-3
A.6	Serial Port Pin Specifications . . .	A-4
A.7	Parallel Port Pin Specifications . . .	A-6

CHAPTER 1

INTRODUCTION

1.1 GENERAL INFORMATION

The AVL Genesis is a business and personal computer for the serious user who wants to run application programs quickly and efficiently.

Packed into a compact design, the AVL Genesis is a business computer system that combines the performance of a personal computer with an array of features and software which include professional audio visual capabilities.

To meet the future computing needs of today's business, AVL provides a family of computer systems. This family approach ensures compatibility, expandability, and the capability to solve business problems. The inherent economics in this approach yields profitability through increased efficiency. Your AVL Genesis desktop will fit right in.

1.2 GENERAL INDEX

This manual is divided into the following chapters:

- CHAPTER 1: INTRODUCTION** - describes the contents of the AVL Genesis Installation Manual.
- CHAPTER 2: SYSTEM DESCRIPTION** - describes each piece of hardware that goes in to making up the system.
- CHAPTER 3: INSTALLATION** - outlines unpacking and inspection guidelines and describes the system installation and setup procedures.
- APPENDIX A: AVL GENESIS TECHNICAL SPECIFICATIONS**

CHAPTER 2

SYSTEM DESCRIPTION

2.1 GENERAL

This chapter introduces you to the basic components of the AVL Genesis Computer.

NOTE: If you are unfamiliar with a term or abbreviation used in this manual refer to the Glossary.

The remainder of this chapter describes each piece of hardware that makes up AVL Genesis.

2.2 CENTRAL PROCESSING UNIT (CPU)

The main unit of the computer, referred to as the CPU, contains the main power ON/OFF control and disk drives. Inside the main unit is the Intel 8088 micro-processor, 256K bytes (expandable to 640K bytes) of RAM, and the circuits to control interfacing of all devices.

2.2.1 DISK DRIVES

The computer RAM or internal memory is a temporary storage area for creating,

correcting, and viewing data. When the computer is turned off, any information in that temporary memory is lost. A disk drive provides you with a permanent recording of data on a floppy disk.

Your AVL Genesis has two floppy disk drives (see Figure 2-1). The floppy disk drives use 5-1/4 inch, 48 TPI (tracks per inch) disks. Either single sided or double sided formatted disks can be used. Purchased software application program disks must conform to these specifications to be read by your Genesis. The disk drive lever locks the disk into place after insertion. If a disk is not loaded properly or the lever is not closed, your system will not be able to access the disk, resulting in a disk read error message on your screen.

The A Drive is used to boot operating systems from system disks and store (save) program and data files onto floppy disks.

The B Drive is principally used to load files to temporary storage and save or copy data files onto disks.

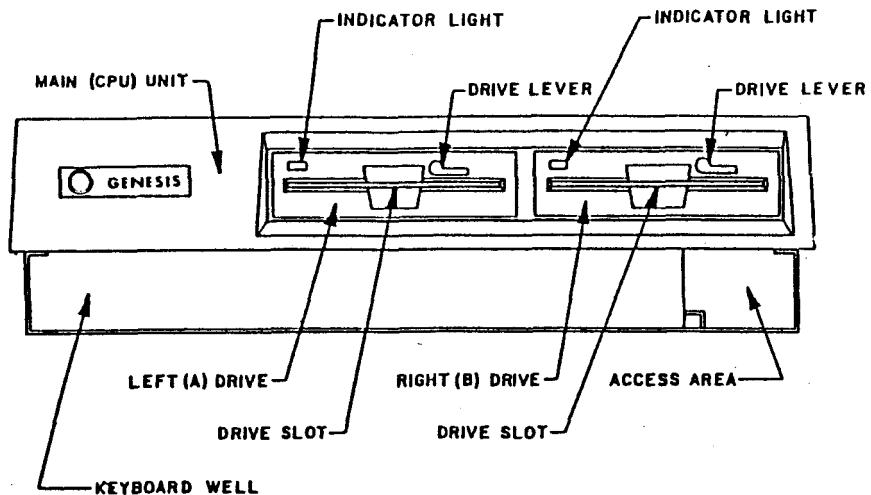


FIGURE 2-1 GENESIS FRONT PANEL

2.2.2 REAR PANEL

The rear panel (see Figure 2-2) has two male 25-pin RS-232 serial communication ports (COM1) and (COM2) and one 25-pin female parallel port (LPT1). The serial

port allows you to interface with a variety of serial devices like serial printers or modems. The parallel port is the communications connection for parallel printers. Refer to Chapter 6: Printers, for information about serial and parallel printers.

The panel also contains the multi-image input and output jacks. The Kodak type Remote Cue jack is used to advance or reverse AVL Genesis from a remote location. The XLR type Out1 and Out2 jacks are for sending program data to dissolve units. The XLR type Play In jack is used for loading all incoming data: load programming information stored on magnetic tape; verify saved tapes; play data through Genesis without entering it into memory, in the MT (magnetic Tape) BYPASS MODE; and input sync and timing pulses.

The main unit rear panel also contains the ON/OFF switch, the power outlet for the user supplied video monitor, and the main unit power cord connection. The ON/OFF switch supplies power to the system. When the red circle is showing, the power is off.

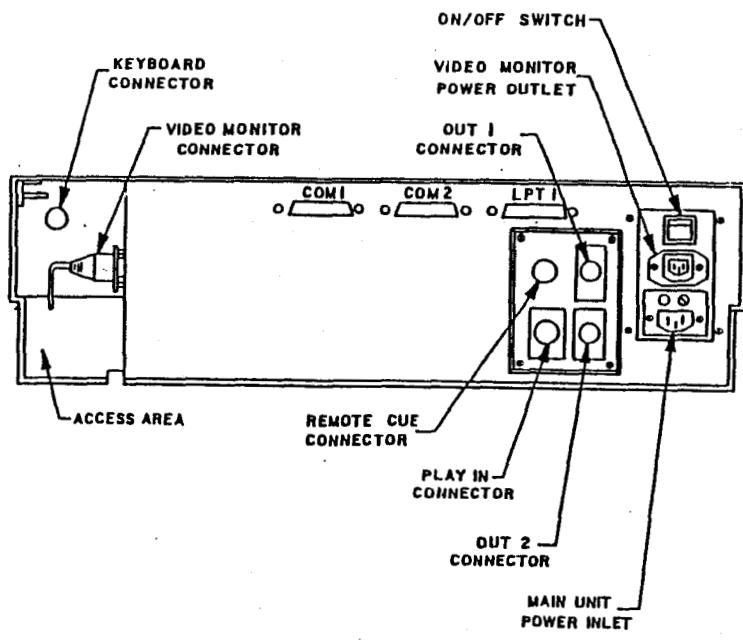


FIGURE 2-2 GENESIS REAR PANEL

2.2.3 ACCESS AREA

The Access Area (see Figure 2-3) has a side panel door with a magnetic catch. The door can be opened by inserting your fingers into the access area through the rear opening and pushing the door open.

The side panel provides access to the connectors for the keyboard and video display monitor. The Access Area also has three input/output RCA type jacks. The middle RCA jack (Out1) and the top RCA jack (Out2) are used to send programming data to the dissolve units or other interfacing equipments. The bottom RCA jack (Play In) is used to input all incoming data and sync pulses.

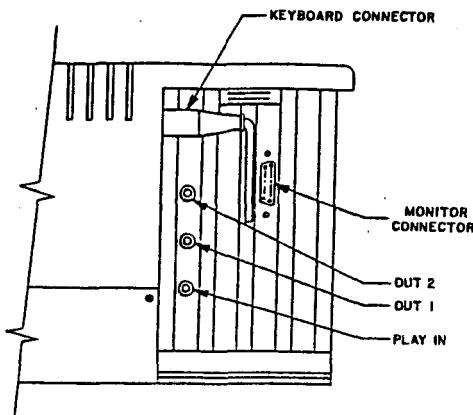


FIGURE 2-3 GENESIS ACCESS AREA

2.3 KEYBOARD

The keyboard (see Figure 2-4) is a separate unit attached to the main module by a lengthy cord to allow for individual placement. The keyboard contains 84 keys, including 10 function keys and a complete numeric keypad. Refer to the following pages for a brief description of the keyboard components. Refer to Using the Keyboard in Section 3 for more information on all the functions of the keys.

When closing up the system, slide the keyboard underneath the main unit.

2.3.1 MAIN KEYBOARD

The main section of the keyboard on the Genesis is similar to a standard typewriter. (Refer to Figure 2-1). You will find three shift keys, two are identical and act exactly as found on a standard typewriter. The third shift key, Caps Lock, shifts only the letters into uppercase. A convenient LED display on the Key will indicate whether or not the Caps Lock function is in use.

2.3.2 KEYPAD

The calculator keypad, like the keypad on an adding machine or calculator, is used for entering numbers and mathematical expressions. The keypad consists of 14 keys: numbers 0-9, decimal point (.), plus (+), minus (-), and asterisk (*) keys.

The keypad keys will also control cursor movement when used with certain software packages. In those instances, the [NUM LOCK] key is pressed (LED light on), the keypad keys are used as numeric keys.

2.3.3 FUNCTION KEYS

The gray keys to the left of the main keyboard, labeled F1-F10, are called FUNCTION KEYS. They perform special functions which will differ depending upon the software program used.

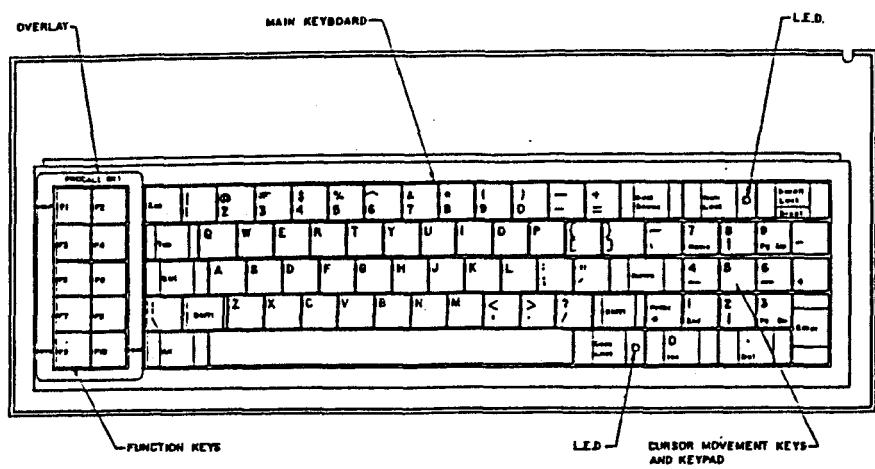


FIGURE 2-4 GENESIS KEYBOARD

2.4 VIDEO DISPLAY MONITOR

The video display monitor is a high resolution (720 x 350 pixels) CRT with a green nonglare screen.

The monitor can be conveniently placed on top of the main system enclosure for best visibility.

Refer to Figure 2-5 for an illustration of the monitor.

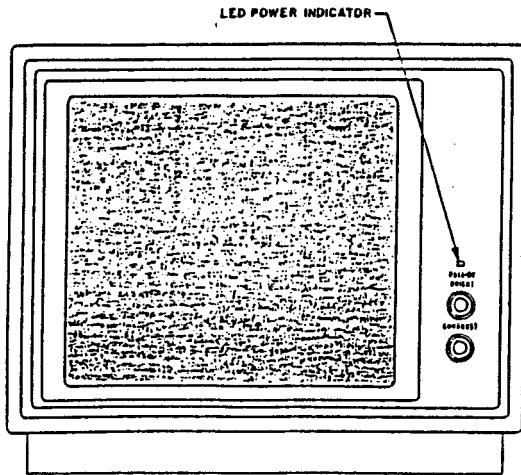


FIGURE 2-5: GENESIS DISPLAY MONITOR

2.5 KEYBOARD OVERLAY

The keyboard overlay fits over the function keys as shown in Figure 2-4. It names key F1 HELP, F9 REV Q, And F10 CUE. HELP, REV Q, and CUE are used when programming in PROCALL-X and PROCALL-5. Refer to Figure 2-6 for an illustration of the overlay.

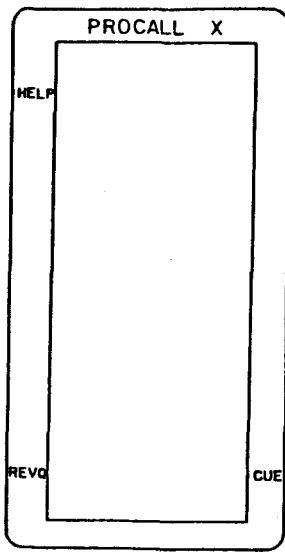


FIGURE 2-6 GENESIS KEYBOARD OVERLAY

NOTES:

CHAPTER 3

INSTALLATION

3.1 GENERAL

The AVL Genesis Computer is a well designed system which can be easily unpacked and installed for immediate use.

The following topics are covered in this chapter:

- * Site Requirements
- * Electrical Requirements
- * Initial Unpacking and Inspection
- * Installation and Set-up Procedure
- * System Description
- * Transporting Your System

Before removing the computer from its shipping box, save yourself some time and trouble by taking a few moments to read about site requirements and the unpacking precautions.

3.2 SITE REQUIREMENTS

The compact, portable design of your computer allows you considerable flexibility in choosing a suitable location. Most office and residential environments are fine; however, extremes of temperature and humidity should be avoided (Refer to Appendix A).

3.3 ELECTRICAL REQUIREMENTS

Before plugging in the computer's power cord, make certain the following listed requirements are met.

- a. A properly Grounded 3-hole outlet.
- b. Correct AC line voltage: 110 VAC, 60 Hz, or 220 VAC, 60 Hz.
- c. Motor driven appliances such as refrigerators, copiers, etc., should be plugged into a separate circuit.

WARNING: The Genesis operates on either of the above voltages, but not both because of differences in fuses and power supplies. Use the correct voltage for your machine.

3.4 INITIAL UNPACKING AND INSPECTION

Keep the shipping container in an upright position until the unit is unpacked.

Save the shipping container and packing material. Should you need to repack the computer for moving, the original container provides the best protection for the system.

If the system is returned for repair, the computer must be in the original shipping container; otherwise AVL will not accept it for servicing.

When unpacking the system, inspect it for any evidence of shipping damage. If you find any evidence of damage, stop unpacking, replace the system in the container, and notify your dealer immediately.

STEP 1 Place the shipping container upright on a flat work surface. Clear another large flat work surface for the computer system once it is removed from the shipping container.

STEP 2 Cut the strapping and open the top of the container.

- STEP 3** Place a hand under each side of the system and carefully lift it out. Place it on the cleared work surface.
- STEP 4** Remove the foam shipping blocks, packing material, and manuals.
- STEP 5** Check to see that the items listed below have been shipped with your Genesis:
- a. Computer with keyboard
 - b. AVL Genesis Operator's Manual
 - c. MS-DOS Operating System Manual
 - d. PROCALL-X User's Guide
 - e. PROCALL-5 User's Guide
- STEP 6** If the system is found to be damaged, or if one of the items listed is missing, contact your dealer.

3.5 INSTALLATION AND SET-UP PROCEDURE

- STEP 1** Place the video monitor next to or on top of the main unit.
- STEP 2** Connect the video monitor power cord into the power socket on the main unit rear panel. Refer to Figure 3-1..
- STEP 3** Connect the video monitor interface cable to the 9-pin video monitor connector in the side panel access area. Refer to Figure 3-1.
- STEP 4** Remove the cardboard insert from each floppy disk drive. Save this insert. You will need to reinsert it in the drive to protect the drives when you transport your system.

WARNING: Be sure to remove the cardboard inserts before turning on the power. If left in place, the insert could damage a floppy disk drive motor.

- STEP 5** Make sure the power ON/OFF switch, located on the rear panel of the main unit, is in

the OFF position. (The red circle on the switch should be showing). See Figure 3-1.

STEP 6 Check that the power voltage listed on the product label on the system's rear panel matches the voltage of your power outlet. (Refer to ELECTRICAL REQUIREMENTS earlier in this section).

STEP 7 Plug the power cord into a grounded, 3-hole AC outlet.

You are now ready to use your computer.

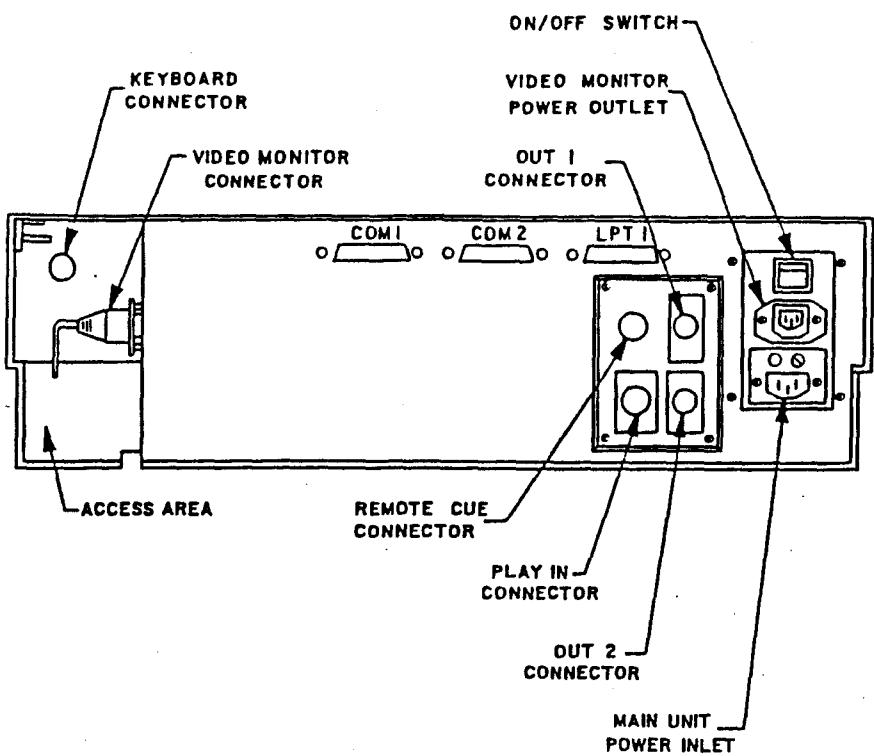


FIGURE 3-1 REAR PANEL CONNECTORS

NOTES:

CHAPTER 4

USING YOUR GENESIS COMPUTER

4.1 GENERAL

Once you have unpacked and set up your computer, you are ready to begin operation. At this point, the exact procedures you perform will depend upon what system and software you have. The basics of running your system will be presented in this section.

Information regarding floppy disks is presented first in this section. Following that will be a discussion of operating systems and instructions for booting up (loading system software) from a floppy disk. A description on using the keyboard is presented, followed by a discussion of the proper way to turn off your system, and general preventive maintenance.

4.2 FLOPPY DISKS

When using your software for the first time, you should backup your initial master set of application software onto floppy disks. The master set should then be stored away, to restore your copies if problems occur. When you

purchase additional application software, you should also make duplicate copies before use.

NOTE: When purchasing disks for your system, be sure to ask for 5-1/4 inch, double-sided, double density, soft sectored disks.

4.2.1 DISK CARE

A floppy disk is a circular piece of mylar plastic coated on one or both sides with a magnetic material. The disk is enclosed in a plastic or paper jacket to protect it from fingerprints, dust, and other contaminants. Refer to Figure 4-1 on the next page.

The oblong cut out in the protective jacket permits the read/write disk drive head to contact the exposed magnetic portion of the disk surface to record your information. Never touch this portion of the disk; oils from your fingers can contaminate the disk surface.

The square write-protect notch on the edge of the disk prevents unwanted or accidental erasure of information. When the notch is covered with a small adhesive tab accompanying the disks, the

disk can be read, but no information can be written onto or erased from the disk. You may write information on the disk only when the notch is left uncovered.

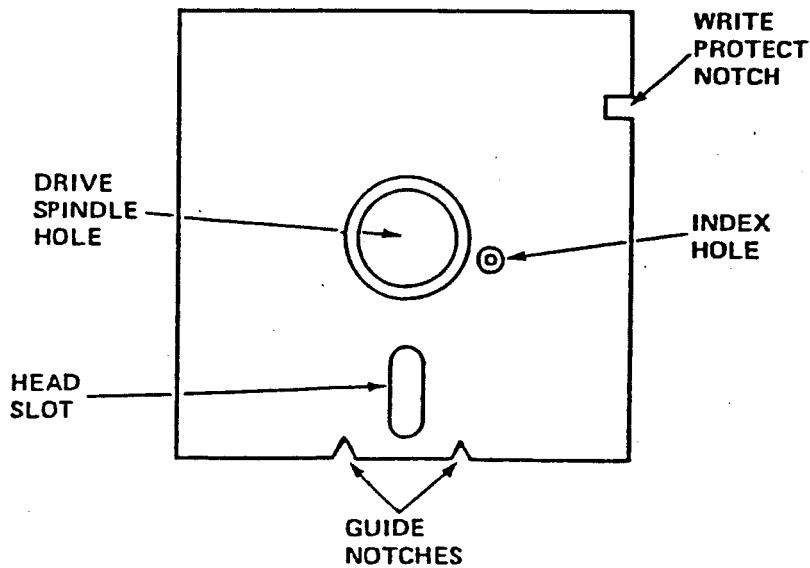


FIGURE 4-1 FLOPPY DISK

4.2.2 HANDLING PRECAUTIONS

Floppy disks are fragile and can be easily damaged if improperly handled. Your disks will soon be storing the results of hundreds of hours of valuable time and should be treated carefully. Heed the simple precautions outlined below to insure the continued good health of all your disks.

- * Do not bend or fold the disk. The magnetic coating will crack and you will lose your stored information.
- * Do not insert or remove a disk when the disk drive indicator light is on. Pulling the disk out with the indicator light on can damage the disk's stored information.
- * Do not use paper clips, rubber bands, or tape on the disk.
- * Do not touch or attempt to clean the exposed surfaces of the disk. Any scratches or oil deposits can cause loss of stored data.
- * Keep the disk away from magnetic fields, which can destroy a disk's data. Many common devices such as

telephones and paper holder stands use magnets.

- * Do not eat, drink, or smoke when handling disks.
- * Replace the disk if it becomes physically damaged, or if the recording surface becomes contaminated. Discard damaged disks.
- * Make duplicate copies of your disks on a regular basis.

4.2.3 FORMATTING A DISK

Before a new disk can store your programs and files, it has to be formatted. Formatting magnetically divides the disk into tracks and sectors (See Figure 4-2) which the AVL Genesis computer uses as reference points when storing and reading your files. For instructions on formatting disks, please refer to MS-DOS 2.0 Utility Procedures.

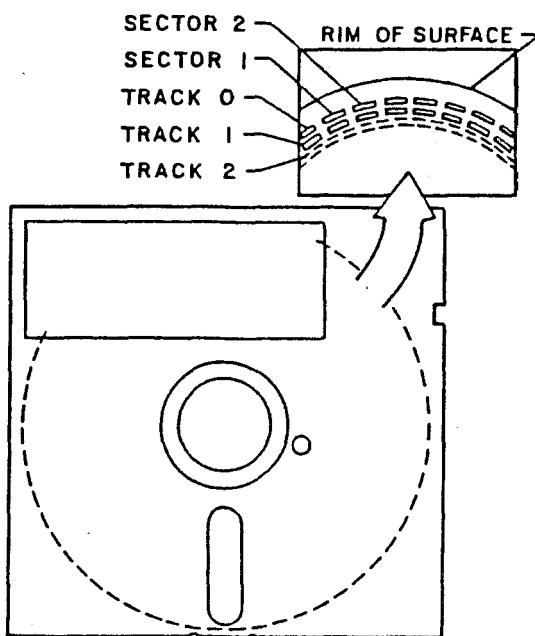


FIGURE 4-2 DISK SKELETON VIEW

4.2.4 LABELING DISKS

It is important to label your disks carefully. The label should state what is stored on the disk and whether it is a master, working, or backup disk. Other notations, such as which operating system is required, can also be valuable label information.

To label your disk, fill out one of the adhesive labels that accompany the disk package BEFORE you attach it to the disk.

CAUTION: Writing on a label attached to a disk with a ball-point pen or pencil can gouge the recording surface, resulting in the loss of stored information. If you must write on a label which is already attached to a disk, then use a felt-tipped pen and press lightly.

4.2.5 STORING DISKS

Always replace the disk in its protective envelope after you remove it from the disk drive, even if you plan to reinsert it in a short time.

There are many ways to store your disks. We recommend that you store them upright in a hard plastic container (Refer to Figure 4-3 Disk Storage Case) or in plastic disk pockets like the one included with this manual. Label your containers or disk pockets for easy reference. Both storage items can be purchased from your local authorized AVL computer dealer.

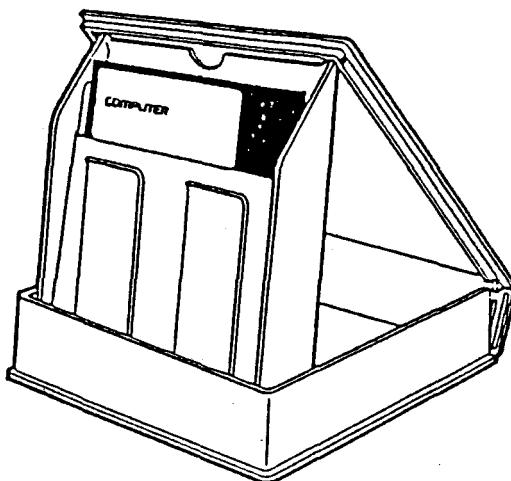


FIGURE 4-3 DISK STORAGE CASE

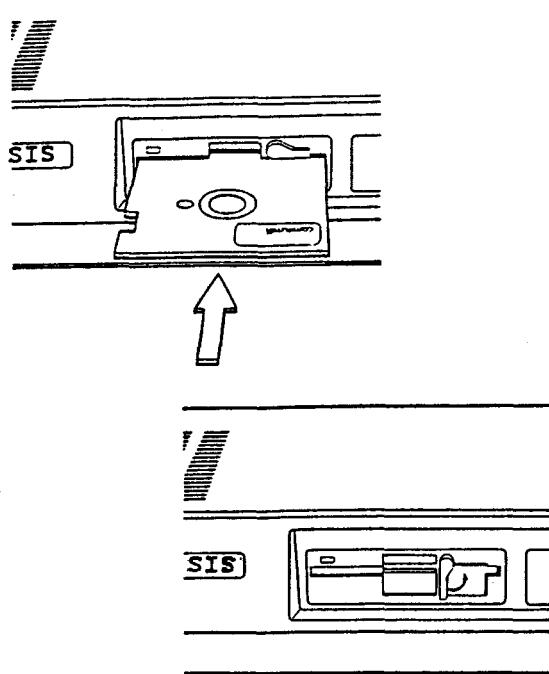


FIGURE 4-4 INSERTING A DISK

4.2.6 INSERTING AND REMOVING DISKS

Refer to Figure 4-4 when inserting or removing a disk from a disk drive.

STEP 1 Turn the floppy disk drive lever to the horizontal position.

STEP 2 With the disk label facing up and the notch on the left, slide the disk into the disk drive slot. If it does not

slide in easily, stop! Do not force it. Remove it and try again.

- STEP 3 Once the disk is fully inserted in the disk drive, turn the lever down to the vertical position.
- STEP 4 To remove the disk, turn the lever to the horizontal position and remove the disk from the drive.

4.3 OPERATING SYSTEMS

An operating system directs data traffic to the proper destinations: it runs the computer. It interacts intimately with the physical hardware which makes up the computer. Many of its operations are invisible to the user and are quite complex.

Usually an operating system has certain standard routines which the user can use to manually transfer files, direct communications, and access the disk drives. Often the user can configure parameters in the operating system, so that later internal operations of the operating system (perhaps used by applications programs) will automatically perform correctly.

Every time a computer system is successfully turned on and booted up (started), some kind of operating system has been used. Sometimes the operating system is a familiar one like MS-DOS but often games or other popular software use a special operating system which fulfills the minimum requirements for their application, but which can not be copied (it is hoped) using the usual operating system routines.

Your Genesis computer is shipped with an MS-DOS 2.0 operating system. MS-DOS 2.0 can read and manipulate MS-DOS 1.25 files.

CAUTION: An MS-DOS 2.0 9-sectored disk if used by an MS-DOS operating system earlier than 2.0, cannot be read and, if written to, will be ruined.

4.4 SYSTEM START-UP

To start up the system for operation, the computer must be plugged in and the power switch turned on. When these two things are performed, the EPROM (resident memory in the computer) routines cause the computer to read the operating system).

The system retrieves the operating system from a floppy disk properly inserted in the left floppy drive.

When the operating system has been successfully loaded into the computer, various things may occur. For MS-DOS operating systems, if there is a batch file named AUTOEXEC.BAT on the disk drive from which the operating system was obtained, then the computer will perform those batch assignments before restoring control to the user. If there is no such batch file, then MS-DOS will request the correct date and time.

If you use the PROCALL-X system disk to boot up the system, it will ask you what your name is.

NOTE: If your system fails to power up or boot from the floppy disk, please refer to: Troubleshooting Guide.

4.4.1 BOOT-UP FROM POWER OFF

Below is a summary of how to boot from each of the disk drives from a power-off condition (known as a cold boot) assuming no initial programs are run upon booting (for example, where no AUTOEXEC.BAT file is present).

- STEP 1** Insert a floppy systems disk into the left disk drive. A systems disk is one that has some type of operating system installed on it along with the program or data. You can not boot from a disk that just contains data files.
- STEP 2** Close the lever over the disk and turn on the power. The power switch is located on the rear panel.
- STEP 3** If booting is successful, the date and time screen message will appear. Enter the date and time and press the Return key to accept the defaults. The A> system prompt will appear on the screen. A> indicates that the default drive you are using is the

left floppy disk drive.

If you started the system using a system disk other than MS-DOS, a prompt asking a question or giving specific directions should come on the screen.

NOTE: Return is a quick way to answer date and time requests if they are not important. Otherwise, the date and time is stored with the disk file information so that later, you can determine which file is the most current.

4.4.2 REBOOTING THE SYSTEM

After you have been using the system for a while, you may want to boot off another floppy disk to run a specific program or game. Or you may want to clear the buffer memory and restart the system. You can do both of these tasks by rebooting the system, which reloads the operating system into the system memory.

If you have trouble rebooting, consult the Trouble-Shooting Guide.

CAUTION: Unsaved work will be lost when rebooting is performed.

- STEP 1** Put the appropriate floppy systems disk into the drive slot. Close the lever over the disk.
- STEP 2** The floppy disk LED indicator should light, and the disk drive should engage.
- STEP 3** If booting is successful, the date and time screen message will appear. Enter the date and time or press the Return key to accept the defaults. The A> system prompt will appear on the screen. A> indicates that the default drive you are using is the left floppy disk drive.

NOTE: Remember that only a systems disk containing an operating system can be booted from because the instructions for the computer reside in the operating system.

4.5 USING THE KEYBOARD:

The next several pages describe the functions of most of the keys on the 84-key keyboard. Refer to Figure 4-5 for the location of the keys.

4.5.1 FUNCTION KEYS

There are ten function keys labeled F1 through F10 on the left side of the keyboard. These keys have special uses depending on how software supports them. The ten function keys on the keyboard access up to forty different functions keys. F11-F20 are obtained by using the Shift key with keys F1-F10. F21-F30 are obtained by using the Ctrl key with F1-F10. And F31-F40 are obtained by using the Alt key with F1-F10. In other words Shift adds ten to any function key, Ctrl adds twenty, and Alt adds thirty. The MS-DOS Operating System uses F1-F5 for certain editing features.

See your MS-DOS OPERATING SYSTEM MANUAL for details regarding the editing uses of function keys F1-F5.

4.5.2 ALPHANUMERIC KEYS

The main section of the keyboard is arranged in the standard format of most typewriters. Both upper and lower case key symbols are accessible using utility keys like Shift. A full set of punctuation symbols are also provided.

4.5.3 UTILITY KEYS

The main section of the keyboard has several keys not always found on typewriters for modifying the function of other keys or providing special input to the computer. A list of these keys (beginning at the top left of the keyboard and moving across the top row) and their use follows:

Esc	Also known as Escape. Software will use the ESCAPE character to signal the user's intent to stop or abort a program. It is also used sometimes as a prefix to codes which determine selection of print styles.
------------	--

Back Space	This key moves the cursor to the left one position. Usually, software will delete the letter which is Back Spaced over. This key, therefore, is used to correct minor entry errors.
Num Lock	The Num Lock key is used to change the definition of the keypad keys. When the computer is first booted up (or rebooted), the keypad., +, -, and * keys are interpreted as special function keys. Some applications software will then use these special functions to control cursor movement.
Scroll Lock	This key is supported only with certain software programs. The Break function is used with the Ctrl key. See below.
Tab	This key is used to advance the cursor to tab positions. The default tab is every seven spaces. Applications

software may define a different tab field, and may support a backwards tab (through, perhaps, Shift + Tab).

Ctrl	Also known as Control. This key modifies the function of other keys. Control characters (the characters resulting from Ctrl + C), are displayed on the screen, as for example, C.
Retrn	Also known as Return. This key is used to enter commands or data into the computer. As an example, all operating system commands (like DIR) are typed in the followed by pressing the Return key.
Shift	These two keys, one on each side of the bottom row of letters can be used interchangeable. The main function of the shift keys is to obtain the uppercase symbols for the keys in the main section of the keyboard

Shift	When Caps Lock is depressed, the Shift key with the N key untoggles (inactivates) the Caps Lock function, so that the lower case character is obtained.
	A Shift Key will also toggle the state of the Num Lock key if the keypad keys are struck when Shift is depressed.
PrtSc*	Shift + PrtSc* will print out whatever is displayed on the screen on the LPT1 (parallel printer device).
Alt	Also known as Alternate. This key modifies the function of other keys, as Shift and Ctrl do. When Alt is used to modify a key, the result usually has no printed symbol.
Caps Lock	This key changes the alphabetical characters (A-Z) to uppercase. Numbers and punctuation symbols are not affected. When the Lock function

is being used, the LED indicator glows.

Ins Allows the insertion of text in the middle of existing text, when supported by software.

Del Removes the character underneath cursor and shifts remaining text to the left, when supported by software.

Numeric data input can be speeded up by using the keypad as a 10-key entry pad. In order for those keys to be interpreted as digits and not as special function keys used by software, press the Num Lock key. The LED indicator will glow, indicating that the function has been toggled on (activated).

NOTE: Some software programs do not take Num Lock into consideration if the keypad digits are used only for directional purposes (games, for instance). However, applications software like word processors and spread sheets will usually make the distinction between true "Num Locked" digits and special directional functions.

The Shift key in combination with one of the keypad digits will temporarily reverse the state of Num Lock. Num Lock's LED indicator does not reflect this temporary change.

4.5.4 THE KEYPAD AND NUM LOCK

The comments below which refer to numbers concern only the numerals within the keypad, not the numerals on the main keyboard.

The keypad is located at the right side of the keyboard. The keypad includes the digits 0-9; the decimal point (.); and the arithmetic keys, minus (-), plus (+), and asterisk (*).

The Num Lock key is used to change the definition of the keypad keys. When the computer is first booted up (or rebooted), the keypad numerals, ., -, +, and * keys are interpreted as special function keys. Some applications software will then define these special functions to control cursor movement.

NOTE: In applications software which support these cursor movement functions, do not use the space bar to move the cursor to the right.

Using the space bar in this manner will insert spaces along the entire path of the cursor. Instead, use the right-direction cursor movement key (appropriately toggled to the un-Num Lock state).

Enter Functionally the same as Return. Can be used anytime Return is used.

4.5.5 OTHER SPECIAL KEYS

Ctrl + PrtSc* This combination will cause whatever is subsequently displayed on the screen to be echoed to the LPT1 device, until Ctrl + PrtSc* is struck again.

Ctrl - Break Cancels a current operation, only if the Break Off command is not set in the operating system.

Ctrl + NumLock Suspends system operation. To resume operation, strike this combination again.

Ctrl + S Suspends display

scrolling until Ctrl + S
is struck again.

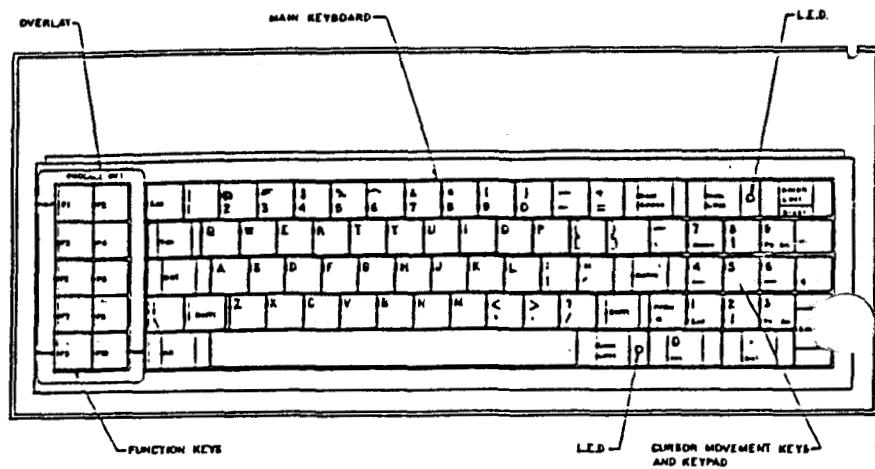


FIGURE 4.5 AVL GENESIS KEYBOARD

4.6 TURNING OFF YOUR SYSTEM

To turn off the system, follow the procedure outlined below.

- STEP 1** Exit from the software program after saving your work, and return to the operating system prompt C>.
- STEP 2** Remove disk from floppy drive.
- STEP 3** Turn the power switch to the OFF position.

4.7 PREVENTIVE MAINTENANCE

Genesis has been designed to provide years of trouble-free service. If the following preventive maintenance guidelines are followed, your system should be as good looking and reliable as the day it was purchased.

- | | |
|---------------------|---|
| VIDEO SCREEN | Do not allow direct sunlight to strike the display screen for extended amounts of time. Sunlight can damage the phosphor screen. |
| | Clean the surface of the video display with a B22 window cleaner and a soft cloth or paper towel. |
| KEYBOARD | Clean the keyboard keys or enclosure with a damp (not wet) cloth. |
| MAIN UNIT | Keep the ventilation slots at the right rear of the main unit clear and clean. Do not block any ventilation vents.

Do not place drinks, food, cigarettes, or small objects (like paper clips) on top of the main |

unit. Foreign material which enters the interior of the computer can damage the electronics.

FLOPPY

Every six months the floppy disk drive heads DISK DRIVE should be cleaned with a head cleaning kit recommended by your AVL dealer.

DISK

Please refer to Disk Care in Paragraph 4.2.1

NOTES :

CHAPTER 5

MS-DOS 2.0 UTILITIES

5.1 GENERAL

The information in this section concerns only the MS-DOS 2.0 Operating System. This material is presented so that you can perform certain fundamental operations without resorting to other manuals. Several of these operations must be performed upon initial start up of the system, other operations are presented as useful reference.

Creating copies of your data and program disks on a regular basis is extremely important. By doing so, you protect yourself against the loss of valuable files should one of your disks become worn or damaged.

When you purchase software it is also good practice to make a duplicate copy immediately for safekeeping. There are three valid ways to copy the contents of a disk:

- * Use DISKUTIL
- * Use FORMAT and COPY
- * Use FORMAT and DISKCOPY

A description of how to use these

commands is found in the following pages. Details of these commands can be found in the MS-DOS 2.0 ADDENDUM of your MS-DOS OPERATING SYSTEM MANUAL.

5.2 DISK DRIVE DESIGNATORS

AVL Genesis can read and store data files from either the hard disk or from floppy disks. For convenience, the disk drives are given abbreviated reference symbols so that you can easily specify which drive you wish to use.

Under the MS-DOS 2.0 Operating system the left floppy drive is A, and the right floppy drive is B.

When using the MS-DOS Operating System, the standard prompt is X>, where "X" indicates the current default disk drive. Default means that the operating system looks on the drive in current use for programs and files, unless another drive is specifically requested.

For example, A>DIR will provide a directory of drive A. Note that "A" is printed by operating system on the screen. You type "DIR" and press RETURN. This holds true for the following examples as well. B>DIR A: will provide a directory of the floppy disk in the drive A.

5.3 DISKUTIL

The DISKUTIL program also formats disks. Options include single or double sided formatting, and eight or nine sectors per track. DISKUTIL will not install an operating system on a freshly formatted disk except for certain DISKUTIL copy options. And, a volume label cannot be given to a disk when formatting with DISKUTIL except when you copy a disk which already has a volume label.

However, DISKUTIL is the easiest utility program to use. It is a menu-driven program that allows you to choose from five different options: Perform a read-only test on a floppy disk, format a disk, copy a disk, copy a disk with formatting, and change disk format.

The following procedure explains how to use the program.

5.3.1 FORMATTING WITH DISKUTIL

STEP 1 Turn on the system and enter the MS-DOS operating system.

STEP 2 At the operating system prompt, type DISKUTIL and

press RETURN. The following message appears on the screen:

Enter the number of Disk Drives Available (1 or 2)

- STEP 3 Type "2" and press RETURN.
- STEP 4 The next screen that appears concerns the format of your disks. The format of the disk in the default Drive A is displayed at the top of the screen. You may choose to change the format. If the current setting matches the format of the disks you intend to copy or format, type N press RETURN, and skip to STEP 7. You can alter the format selection by typing Y and pressing RETURN.
- STEP 5 If you typed Y to the last prompt, the following menu appears. The selections in this menu allow you to test, format, and copy your disks. The options are explained later.

**F1 = AVL 48 TPI Single Sided
160K (8 Sectors)**
**F2 = AVL 48 TPI Double Sided
320K (8 Sectors)**
**F3 = AVL 48 TPI Single Sided
180K (9 Sectors)**
**F4 = AVL 48 TPI Double Sided
360K (9 Sectors)**

STEP 6 Select the format by pressing the corresponding function key. Selection F4 is normally appropriate for Genesis. F1 and F3 are for IBM program disks. F2 for disks created under versions of MS-DOS earlier than 2.0.

STEP 7 Once a format selection is made, the next menu appears. The selections in this menu will allow you to test, format, and copy your disks. The options are explained in Paragraph 5.3.2 below.

**F1 = Perform read only test on
drive A (left)**
**F2 = Perform read only test on
drive B (right)**
**F3 = Format a disk in drive A
(left)**
**F4 = Format a disk in drive B
(right)**

**F5 = Copy from drive A (left)
to drive B (right)**
**F6 = Copy from drive A (left)
to drive B (right)
with formatting**
F7 = Change disk format

**STEP 8 When you have finished with
the program and wish to return
to the operating system, press
ESC.**

5.3.2 DISKUTIL COPY FUNCTIONS

**The following subparagraphs detail the
COPY funtions of DISKUTIL.**

5.3.2.1 PERFORM READ ONLY TEST ON DRIVE A (LEFT)

This option tests your disks for the integrity of data. Use this option if you experience difficulty in reading or saving a file, or operating a program from disk. Insert the disk you wish to test into the floppy drive before you select the option. Once selected, the option will immediately go into its test mode with this message:

Read Only test in progress

If the test is successful, the previous

menu will reappear. If it fails, the screen will display the type of error and this message:

Your options are -

- 1) retry the operation
- 2) return to the menu

If the message appears, retry the operation. If the same message appears, return to the menu, and try the same test on several other disks of known reliability. If every disk fails, either you selected the wrong disk format in STEP 5, or the floppy disk drive has a problem, in which case you will need to contact your AVL Customer Services for assistance. To recover the files from a failed disk, format a blank disk and transfer the files with the MS-DOS internal COPY command.

5.3.2.2 PERFORM READ ONLY TEST ON DRIVE B (RIGHT)

This option tests your disks for the integrity of data. Use this option if you experience difficulty in reading or saving a file, or operating a program from disk. Insert the disk you wish to test into the floppy drive before you select the option. Once selected, the option will immediately go into its test

mode with this message:

Read Only test in progress

If the test is successful, the previous menu will reappear. If it fails, the screen will display the type of error and this message:

Your options are -

- 1) retry the operation
- 2) return to the menu

If the message appears, retry the operation. If the same message appears, return to the menu, and try the same test on several other disks of known reliability. If every disk fails, either you selected the wrong disk format in STEP 5, or the floppy disk drive has a problem, in which case you will need to contact your AVL Customer Services for assistance. To recover the files from a failed disk, format a blank disk and transfer the files with the MS-DOS internal COPY command.

5.3.2.3 FORMAT A DISK IN DRIVE A (LEFT)

To use the option, insert the floppy disk to be formatted into drive A (left), then select the option. A

5.4 FORMATTING A DISK

All disks which your computer will use must be formatted in one way or another. Formatting a disk allocates the space on the disk so that the areas have recognizable locations (such as Sector 7, Track 3) for retrieval of stored data.

The blank disks which you purchase to store programs or make backups must be formatted using your computer system. The program disks you purchase which have software on them have already been formatted. Formatting a disk erases the contents, so be careful not to format disks which have information already on them.

To format a disk, you may either use the FORMAT or DISKUTIL programs. These programs reside in the Root directory of the MS-DOS Operating System.

5.4.1 FORMAT PROCEDURE

For this example procedure, assume that the default drive is "A" and the current directory is the A disk root directory.

STEP 1 Turn on the computer and enter the MS-DOS 2.0 Operating System.

STEP 2 Type "FORMAT B:" at the operating system A> prompt. You must specify the drive the disk will be in.

A>FORMAT B:

STEP 3 The screen displays the name and version number of the FORMAT program, the format of the disk, and instructs you to insert a new disk into the drive you specified and strike any key when ready.

NOTE: Striking CNTRL + C at this point will cancel the formatting operation before it begins.

STEP 4 When the disk is formatted, the screen displays the total disk space and amount of storage available on the disk.

5.4.2 FORMAT PROGRAM OPTIONS

The MS-DOS 2.0 Operating System supports five FORMAT options: d:, /S, /V, /1, and /8. Some of these options are described below; however, all of these options are explained in the MS-DOS 2.0

warning message will appear. Type Y and press Return to continue. When the operation is complete, the main menu will reappear.

5.3.2.4 FORMAT A DISK IN DRIVE B (RIGHT)

To use the option, insert the floppy disk to be formatted into drive B (right), then select the option. A warning message will appear. Type Y and press Return to continue. When the operation is complete, the main menu will reappear.

5.3.2.5 COPY FROM DRIVE A (LEFT) TO DRIVE B (RIGHT)

This option creates a duplicate copy of a disk. The disk which is to be the new copy must already be formatted or contain files of no consequence, since any existing files will be destroyed by this routine. If the disk to be the new copy has never been used or has not been formatted, DO NOT use this option. Use an option which both formats and copies.

To use the option, insert into the drive the disk which is to be the New copy,

and NOT the original.. Type "Y", and press RETURN. The disk will now be formatted. Wait for the prompt instructing you to insert the source (original) disk, and do so. Then, following the screen messages, switch the disks until all of the files have been compiled onto the new disk.

To create a copy, select the option. A warning message and instructions will appear on the screen. Insert the disk to be copied into drive A (left) and the disk to be the new copy into drive B (right). Type "Y" and press RETURN. Once the copy routine is complete, the main menu will reappear.

5.3.2.6 COPY FROM DRIVE A (LEFT) TO DRIVE B (RIGHT) WITH FORMATTING

This option formats and creates a duplicate copy of a disk. You would use this option whenever the new copy disk has not been formatted.

5.3.2.7 CHANGE DISK FORMAT

This option is not available at this time.

ADDENDUM in your MS-DOS OPERATING SYSTEM MANUAL.

The FORMAT program used with no options produces a disk which has nine (9) sectors (the standard for MS-DOS 2.0). Because earlier versions of MS-DOS used disks with eight sectors, the FORMAT program allows you to create 8 sectored disks with the "/8" option. MS-DOS 2.0 can operate with disks having either eight or nine sectors. A disk with nine sectors has a greater storage capacity than a disk with eight, (360 Kbytes vs. 320 Kbytes).

The "/S" option installs an operating system onto the disk after it has been formatted. This results in a disk from which the system can be booted (a system disk).

CAUTION: An MS-DOS 2.0 9-sectored disk if used by an MS-DOS operating system earlier than 2.0, cannot be read and, if written to, will be ruined.

5.4.3 FORMAT AND COPY

COPY copies one or more files from one disk to another formatted disk, and gives the copy a different name if you

specify it in the command. You must specify the source drive (the drive you are copying from) and the target drive (the drive you are copying to).

To copy a disk which has no subdirectories, for example, you can format a blank disk and then type, COPY A:.*.*B:. This command will copy all files from the disk in default drive A to the disk in drive B. If the source (original) disk has subdirectories, do not use COPY; use the DISKCOPY or DISKUTIL programs.

COPY does not copy over an operating system, so if the disk being copied is bootable - has an operating system on it - then after or during formatting, you will have to install the operating system. We recommend, for simplicity, that you use DISKCOPY to copy disks which boot. For more information, refer to your MS-DOS 2.0 OPERATING SYSTEM MANUAL.

NOTE: Certain files which make up the operating system are known as "hidden files" and cannot be accessed by name with the COPY command. DISKCOPY can perform the desired copying.

5.4.4 FORMAT AND DISKCOPY

DISKCOPY produces an exact tract-for-tract copy of the one disk onto another. When using DISKCOPY, the computer will perform a single-floppy copy and prompt you when to switch the original and target disks out of the single drive. The target disk has to be formatted prior to using DISKCOPY. Refer to Paragraph 5.4 above.

The AVL Genesis system, which has two floppy disk drives, can use both drives to produce copies of your disks. When you use the FORMAT command, type "FORMAT B:" to format a disk in the right drive when your system drive is in the left drive. When you use DISKCOPY to copy your disk, type "DISKCOPY A:B" to copy the contents of the disk in drive A onto the formatted disk in drive B.

CAUTION: Be sure that the formats of the two disks are the same. An MS-DOS 2.0 9-sectored disk, if used by an MS-DOS operating system earlier than 2.0, cannot be read and, if written to, will be ruined.

5.5 SETTING UP COMMUNICATIONS

The communications ports COM1, COM2, and LPT 1 on the Genesis' main unit rear panel are used to interface printers, modems, or other devices. These ports can be configured so that the computer will properly communicate with these devices. The two serial ports are known as COM 1 and COM 2. The parallel port is known as LPT1. SETUP is a menu-driven program that allows you to select the communications format between your computer and your printer, modem, or other communications device. Different brands of printers and modems have different characteristics (baud rate, control characters, etc.). This program adjusts the port parameters to meet your device's specifications.

SETUP initially assigns print output to the LPT1 (parallel) port. If you have a parallel printer, you should review the non-printer options (cursor type, etc.) make necessary selections, and then save the SETUP assignments. If you have a serial printer, refer to the procedure outlined in paragraph 5.6.

5.6 SERIAL PRINTER SETUP PROCEDURE

STEP 1 Turn on the computer and enter the operating system.

STEP 2 At the operating system prompt, type "SETUP" and press RETURN. A menu similar to the one below will appear.

CURRENT ASSIGNMENTS (Release 1.2)

A PRINTER: LPT1 (PARALLEL PORT)
B SELECT PARAMETERS FOR COM1:
C SELECT PARAMETERS FOR COM2:
D CURSOR: BLOCK
E SCROLL RATE: FAST
F SAVE SETUP.
G FILTER LINE FEEDS: NO
H GENERATE FORM FEED: NO
I SPECIAL CHARACTERS.
J TEST PRINTER

ESCAPE QUIT.

SELECT A FUNCTION

STEP 3 Type the letter (B or C) which corresponds to the serial port to which your printer is connected.

STEP 4 The default settings for that port will then appear on the

screen. Change the settings as needed to configure the port for your printer. An option is changed by typing its corresponding letter and selecting the proper setting from the choices displayed.

STEP 5 After you have selected the assignments, select TEST PRINTER.

NOTE: If the printer test fails, reset the assignments. If the printer fails again, check that your printer is working properly by having it perform a self test (refer to the printer manual). If you need further assistance, contact AVL Customer Service.

STEP 6 Review the non-printer options (cursor type, scroll rate, etc.) and make any changes.

STEP 7 Store the settings on disk with SAVE SETUP. Press ESC to exit SETUP and return to the system prompt.

STEP 8 Type "MODE", and press Return to direct the printer output to the chosen serial port.

Only one serial port can be assigned with this program at one time.

NOTE: Whenever you turn on or reboot AVL your Genesis, and intend to use the serial printer, you must enter MS-DOS 2.0 and type MODE.

5.7 MS-DOS 2.0 HIERARCHAL DIRECTORY STRUCTURE

This subsection discusses advanced programming information on the MS-DOS 2.0 Operating System. MS-DOS 2.0 provides you with the capability to create multiple levels of directories. With previous versions of MS-DOS, a single directory structure was used for managing files on disks. Each disk or hard disk contained a single directory listing all the files, which could be very cumbersome to use.

With MS-DOS 2.0, you can create new files, and group these files into different directories. These directories are smaller, more specific, and much easier to manipulate. Any one directory can contain a number of files, and it can also contain other directories (or subdirectories). This method of file organization using

multiple directories is known as a hierachial directory structure, or a "tree" structure.

This tree structure is actually upside down. The root directory is at the top, and is the first level of the directory structure. The subdirectories are branches of the tree, and the files are leaves.

If you do not use subdirectories, then your directory structure is essentially a tree with no branches. You have one directory area to the root directory, where all files are maintained. Most instructions in this guide, so far, have assumed that subdirectories are not involved.

All system files are in the root directory. When the computer is first stated up (assuming there is no AUTOEXEC.BAT file to change directories), you come up in the root directory. If you create subdirectories, we recommend that you keep system files in the root directory. Other programs and data files can usually be placed anywhere appropriate in the directory hierarchy.

The TREE program displays all of the subdirectories and their location in the hierarchy. For more information, see

your MS-DOS OPERATING SYSTEM MANUAL.

5.7.1 PATHNAMES

The root directory is always denoted as /. The directory named REPORTS, can be accessed by the pathname REPORTS. A pathname is a sequence of directory names, followed by a simple filename, separated by slashes (/). All files in the directory REPORTS directory can be addressed from any other directory as /REPORTS/AUGUST.ALW.

To reference other directories in the tree structure, there are several valid pathnames to allow you to travel from the one you are in to the one you want to access.

Any time a pathname is used, and the first directory named in the path is not /, the root directory, the operating system will work from the current directory's path starting from the root directory.

The .. directory is an abbreviation for the current directory's parent (next highest directory). It can be a convenient way to move to nearby subdirectories. It is also possible to use the operating system commands DIR, COPY, BACKUP, RESTORE, etc. in one

directory to handle any other directory.

Refer to the MS-DOS 2.0 OPERATING SYSTEM MANUAL for more information.

5.7.2 DIRECTORY COMMANDS

SUBDIRECTORIES are created in the operating system. you do not have to be in the root directory to manipulate them. The following commands are used to create, delete, locate and search for directories within a tree heirarchy structure.

MD [[d:]path] This command (Make Directory) creates a new directory within the structure. The directory can be specified for any appropriate disk drive [d:]. Path indicates where in the hierarchy the new directory is to be located.

RD [[d:]path] This command (Remove Directory) deletes a directory. All files must be deleted before a directory can be removed from the hierarchy.

CD [[d:]path] This command (Change Directory) informs the operating system which directory the user wants. CD/ will change the current directory back to the root, while CD will reveal what the current directory is. (Also revealed through DIR or DIR/w.)

PATH

[[d:]path]; With this command you can specify a string of directories (a search path) for the operating system, if it cannot find a program or file in the current directory.

PATH \ will allow you to access root directory application programs from any subdirectory.

PATH command, used alone, reveals the currently defined search path.

PATH; destroys the existing search path, keeping any searches within only the current directory.

For more information refer to the MS-DOS
2.0 OPERATING SYSTEM MANUAL.

5.8 PURCHASED BASIC PROGRAMS

The IBM PC's Basic language is BASICA. If you purchase Basic programs designed for the IBM Personal Computer, and the disk has an AUTOEXEC.BAT file then some editing of the batch file is necessary. Use any word processor or editing program and change all references from BASICA to GWBASIC, the name of AVL Genesis' Basic Language.

All references to BASICA must be changed to GWBASIC, no matter whether the programs have been transferred to a hard disk or continue to be used from a floppy disk.

CHAPTER 6

PRINTERS

6.1 INTRODUCTION

The AVL GENESIS computer can operate the two basic types of printers through the user-programmable communication ports on the rear panel of the computer's main unit. The two types of computer-associated printers, daisy wheel and dot matrix, differ in the quality of the printed characters, speed, and cost.

This section briefly describes the types of printers you can buy for particular business applications, and details steps you should take before you actually purchase a printer. These guidelines will save you time and frustration later. A general printer installation and setup procedure is included at the end of this chapter.

Refer to PROCALL-X and PROCALL-5 for a description of printing commands.

6.2 DOT MATRIX PRINTERS

Dot matrix printers are high speed printers which form letters by a pattern of dots produced when steel pins strike

a ribbon against paper. The quality of the printed character is not as good as that produced by daisywheel printers. However, the print speed is much faster.

Some of the newer high-quality printers have better quality print, the ability to change fonts, and sheet feeders that handle ordinary typing paper with the same conveniences you get with fanfold forms.

Dot matrix printers are commonly used for documentation, programming, and business work.

6.3 DAISYWHEEL PRINTERS

Daisywheel or thimble printers use disks or wheels with the typeface engraved on the spokes of the wheel. As the wheel rotates at high speeds, a hammer presses the wheel spoke and ribbon against the paper, creating the character image.

Daisywheel printers are further divided into precision and nonprecision printers. Precision printers can produce book-quality print (proportional spacing). Nonprecision printers produce typewriter-like (fixed pitch) print.

NOTE: Contact your dealer if you do not know whether you have a precision or nonprecision printer.

A wide range of letter quality printers are available, with print speeds ranging up to 45 characters per second.

6.4 PRINTER SELECTION

Listed on the following pages are some general guidelines that should be considered before you purchase your printer. We highly recommend that you work closely with the dealer from whom the system was purchased to ensure that the printer that is purchased will meet your needs. A hands-on demonstration with your particular software and hardware configuration is an absolute must.

1. Determine the initial software that will be used with the GENESIS system particularly word processing, spread sheet, and similar applications software. Check the software manuals for restrictions (if any) on the types and makes of printers that can be used. Some applications software do not support every kind of

printer. If necessary, the publisher of the program(s) should be contacted directly to find out if there are restrictions on printers or if special instructions must be used for specific brands of printers.

2. Make certain that the printer chosen is equal to the tasks it will perform. The printer must be intended for use with a computer. If heavy use is to be made of the printer, for example, stretches of an hour or more of continuous printing, consider using a heavy-duty business computer printer.
3. Do not use converted electric typewriters (either with manual or electronic key control devices) or teletype machines; the GENESIS will not support them.
4. Check the normal printing speed. A speed of 45 characters per second (cps) or less is characteristic of higher-priced daisywheel printers which yield letter quality output. A speed of 80 cps or more is characteristic of dot-matrix printers, some of which can yield a quality approaching that of daisywheel printers. Consider the difference in price versus needs

for quality and quick output for each type of printer.

5. Check whether the printer has a buffer or spooler feature. Some printers include a buffer which accepts and stores the data to be printed at a very high rate, so that the computer can be set for other nonprinting duties. This feature greatly increases the potential use of the computer. The capacity of the buffer should be judged by a typical document size.
6. Check that the printer offers all of the printing enhancements you require. Determine your need for full underlining (not character-by-character), boldfacing, shadow printing, superscripts, subscripts, proportional spacing (PS), bi-directional printing, etc. Such enhancements should be tested with the applications program(s) and the AVL GENESIS computer before the printer is purchased.
7. Check that all necessary printer interface cabling is supplied. Some of the serial or parallel printers can be connected to your computer with so-called "standard" RS-232 or IBM PC parallel cables, but not all. The manual for the

printer should be reviewed for cable pinouts and compared to the GENESIS. The dealer should be able to supply a cable, either from stock or custom made. The connectors at each end of the cable should be marked GENESIS and PRINTER to avoid incorrect cabling.

8. Determine all of the correct switch settings for the printer. Most printers have switches which can be set to match the printer to the needs of the computer or applications software. These settings should be supplied by the dealer or by the printer manufacturer. Once the switch settings are known and proven in use, they should be recorded in the printer manual.
9. Check the availability of ribbons, printwheels, accessories, etc. for your printer. Make certain that there is a reliable local source for all needed supplies. The dealer should be able to obtain accessories.
10. Insist on a live demonstration with the printer connected to your GENESIS computer; use the desired applications software which will output to the printer. A word-

processing program is best because it places the most demands on a printer for text purposes. Be sure to run a graphics program if that is your need.

11. Other questions to consider:

- a. Do all the special enhancements work?
- b. Does the printer produce margins and indents correctly?
- c. Can the printer subscript and superscript?
- d. Does the buffer feature (if present) work as advertised?
- e. Is the printer quality satisfactory?
- f. Can print sizes be changed?
- g. Do all of the above work in the PS (Proportional Spacing) and non-PS modes?
- h. Can ribbons and printwheels be purchased conveniently?
- i. Is it easy to install and interface to the GENESIS computer (are there compli-

cated routines to install it?)

- j. Is the printer easy to operate?
- k. Is the documentation that accompanies the printer complete and easy to understand?
- l. Is servicing available for your printer nationwide, and in your own town?

6.5 PRINTER INSTALLATION

- STEP 1** Place the printer near the GENESIS computer on a separate, supported work surface to prevent the vibrations from the printer from jarring the computer video screen.
- STEP 2** Follow the unpacking instructions in your printer's user's manual; comply with the recommended electrical requirements.
- STEP 3** Determine whether your printer is serial or parallel by referring to the printer's user's manual, or by asking

your AVL Dealer.

- STEP 4** If you have a serial printer, connect one end of the printer cable, supplied by your dealer, to COM1 or COM2 found on the main unit rear panel. If it is a parallel printer, connect the cable to LPT1.
- STEP 5** Connect the other end of the cable to the interface port on the back of your printer. Refer to your printer manual for the location of the interface port.
- STEP 6** If you purchased an automatic paper feeder for your system, install it on the printer following the directions that accompanied the feeder.
- STEP 7** Turn on the printer.
- STEP 8** Set the parameters on the computer output ports to match the printer and perform a print test. Using SETUP.
- STEP 9** Check to see that the sheet feeder (if present) is also powered up. Check that the top-of-form is set correctly.

NOTES:

CHAPTER 7

TROUBLE-SHOOTING GUIDE

7.1 GENERAL

This chapter first outlines general guidelines to follow when you have problems with your AVL GENESIS system. Once these steps have been performed, additional information is provided for further trouble-shooting in the following order: External Disk Problems, System Boot Problems, Video Problems, Keyboard Problems, Floppy Disk Problems, and EPROM T-Test.

7.2 REVIEW CHECK LIST

When your computer system fails to perform a specific instruction or else fails in a larger mechanical sense, it is important that you review the steps you performed before the failure.

1. Check to see that you have entered all data and commands using the correct spelling and syntax.
2. Check that all necessary instructions have been performed correctly and in the

proper order.

3. If the system displayed an error message, be sure to look up the meaning in the appropriate reference manual.
4. If it is possible to repeat the steps which took you to the failure point (without losing your work or having to laboriously re-enter everything), then do so. If there is the danger of losing your work when repeating certain steps, try to save your work with a filename not currently being used.
5. The best way to check your steps performed up to the failure point is to reboot and try again. (It may be necessary to boot up from the power-off condition.) Heed the above warnings about losing your work and use unique filenames during the retry.
6. Check that the floppy disk is properly inserted and the drive lever is closed.
7. Check whether peripheral

equipment (printer, modem, etc.) is indicating an error condition. The device may need to be reset, or turned on or off. Check that the device is set up and cabled correctly, and all switches and controls on the equipment are correctly set.

If the problem has not been located after checking the above list, use the following paragraphs to find the problem area.

7.3 EXTERNAL DEVICE PROBLEMS

1. Check the commands which you have entered to the external device. The device name (eg., LPT1) must be used correctly, and the device may need initialization by your system prior to use.
2. Check the external device for error conditions. For instance on printers, check whether the paper has run out, whether the ribbon has run out, or whether there has been a data error. Also check whether the printer is switched to local use. If

it seems in good shape, perform a self-test to determine that it indeed works. For a modem, a self-test is usually all that one can do.

3. If the device does not respond at all, check that it is plugged into an AC source (if necessary), that it is switched on, and the device's fuse is intact.

WARNING: Before inspecting fuses, all power must be turned off and the device disconnected from the AC source. Check your device's user's guide for further instructions.

4. Check that cables between your computer and the device, and between other devices (such as phone lines), is connected properly at both ends. The connectors should be tightly mated. Check for bent or pushed-in pins. If there are screws or hold-down clips to ensure that the cables stay attached to the machines, then be sure to use them. Check that a cable has not been

severely creased or severed. Replace a suspect cable with a good one.

5. When connecting a cable between your GENESIS computer and a serial device for the first time, be sure to compare the pinouts of GENESIS's serial ports to that of your device's. The RS-232 interface requires specific signals, so be sure to obtain qualified help if you are unable to devise a satisfactory cable yourself.
6. External devices usually require that the computer and the device communicate with a certain common protocol. For a serial device, check that each machine is set for the same transfer speed (baud rate), and that an appropriate number of start and stop bits are used.
7. Your computer is provided with two serial ports. Try connecting your serial device to the other port; keep in mind that the new port must be set up properly (baud rates, etc.).

7.4 VIDEO PROBLEMS

If no video is displayed on the screen of the control monitor, proceed as follows.

1. Make certain the monitor is connected to an AC power source and is turned on.
2. Try adjusting the brightness and contrast controls.
3. Check to see if the monitor is connected to the plug located inside the Access Panel located on the right-hand side of the CPU.
4. Turn the computer off and then on again. Be aware that the display takes several seconds to warm up.

7.5 SYSTEM PROBLEMS - SYSTEM WILL NOT BOOT

If your system does not respond in any way after switching the power on, check the following items:

1. Check that the AC power cord

is plugged into an AC source.

2. Check that the fuse is intact.

NOTE: The fuse is located directly above the AC outlet. Use only a 120 Volt, 2 Ampere fuse for replacement, or 220 Volt, 1 Ampere as indicated by the product label on the unit's rear panel.

If the system responds to the AC power, but does not boot, check the following items:

1. If you are using a floppy disk, check whether it has or needs an operating system.
2. Check the video controls.
3. If the system was running but can not be rebooted off the floppy disk drive, reboot from power off.

7.6 KEYBOARD PROBLEMS

After certain combinations of keyboard activity during disk drive accessing, the keyboard may become locked up, unable to respond. Generally, this

problem occurs when the system has become hung, and the system requires rebooting.

Sometimes the keyboard will act as if the system is hung when a simpler situation exists. Holding down a key will cause that particular character to be repeatedly inputted. At a certain point, the computer's keyboard buffer fills up and it will reject any subsequent input from the keyboard. The computer signals, each rejection with a "beep". If this situation develops, wait a few seconds for the computer to digest the characters in its buffer.

If the computer expects this input to be commands, it may take time for the sequence of "bad commands" to process. Using CTRL + BREAK may interrupt such processing. However, if the keyboard does not respond, reboot the system. Remove all disks, turn off the power, and boot from power-off.

WARNING: Never disconnect or reconnect a keyboard while a computer is running. The keyboard electronics are very charge sensitive and can be damaged simply by being unplugged with the computer on. Only connect or disconnect a keyboard

when the computer is turned off.

7.7 FLOPPY DISK PROBLEMS

Various problems can occur with floppy disks and floppy drives. When a disk begins to have read problems, it is time to receive information from it (by DISKCOPY, DISKUTIL, or COPY), or else to clean the floppy drive heads.

Check for these other circumstances:

1. Disk will not boot. Check to see if an operating system is on it (must have the file COMMAND.COM for MS-DOS).
2. "Disk error reading drive X". This usually indicates that the drive lever is not closed, or that a floppy disk is not inserted.
3. Misallocated sectors cause loss of information for at least one file. Recover as many files as possible by COPYing to another diskette.
4. If you cannot write on a disk, check whether the write-protect tab is in place.

7.8 EPROM T-TEST

Whenever the system has failed, the "T-Test" should be performed to determine if there is a major hardware failure. The T-Test routines are stored in the EPROMs.

The EPROMs on your computer's mainboard contain the firmware which commands the system to boot an operating system and other information off of a disk drive. The T-Test will display the EPROM version number for your AVL GENESIS system. Another responsibility of the EPROM is to initialize the registers on all the programmable chips within the computer.

Therefore, as a variant of the initialization procedures, AVL has included routines in the EPROM which will test all the programmable chips and all the memory addresses. These tests consist of writing to all the registers and addresses and reading back the information.

To perform the T-Test routines, simply hold down the T key while booting or rebooting. No disk drive activity will occur. If a mainboard hardware problem is at fault, then the T-Test routines will produce error messages concerning

the 8253 Timer/Counter, the 8237 DMA Controller, the serial port system, or a message about errors found with the RAM chips. Failure of certain chips can prevent the T-Test from being performed.

NOTE: The message "No RS-232 Loop Back Detected." indicates that the system will not test the serial ports. This is the normal situation, unless you have special cables for such testing.

After the tests begin cycling through the Memory Tests (RAM tests), the T-Test can be halted by turning off the system. The T-Test can be halted at any point in this way.

If an error is noted by the T-Test, repeat the T-Test (by turning the power switch off and on and holding down T to verify the problem. If the error persists, contact AVL Customer Services.

NOTES:

APPENDIX A

AVL GENESIS DESKTOP TECHNICAL SPECIFICATIONS

A.1 GENERAL

The paragraphs that follow outline the technical specifications that apply to the AVL Genesis Computer.

A.2 DIMENSIONS

	W x H x D (inches)	Weight (lbs)
Processor	20.5 X 5.75 X 13	19.5
Keyboard	18 X 1.5 X 7.4	5
Monitor	12.6 X 11.6 X 13.6	18

A.3 HARDWARE

Microprocessor - Intel 8088 @ 4.77 MHz

**RAM - 256K bytes on main board standard.
Supports up to 640 Kb.**

Disk - Dual 5-1/4", 48-tpi, double-sided, double-density, floppy disks, (360/320Kb formatted storage).

Interface - 2 RS-232 serial ports.
1 parallel port (25-pin).

3 RCA jacks: Out1, Out2,
and Play In

3 XLR jacks: Out1, Out2,
and Play In

Remote Cue Jack

Keyboard - 84 key including 10 Function
keys, numeric keypad and
cursor controls.

Video Monitor - 12", P3 green phosphor, High
Resolution Non-glare.
Display: 80 characters wide
and 25 lines long, 720 x 350
pixels.

A.4 SOFTWARE

Operating Systems - PROCALL-X and
PROCALL-5
MS-DOS 2.1

A.5 ENVIRONMENTAL REQUIREMENTS

Temperature:

System OFF	50-110 F
System ON	60-95 F

Humidity:

System OFF	20-80%
System ON	8-80%

Maximum Altitude:

System OFF	12,000 ft.
System ON	8,000 ft.

Voltage Required:

Nominal	120 Volts/60 Hz
	220 Volts/50 Hz

Minimum	90 Volts/60 Hz
	180 Volts/50 Hz

Maximum	135 Volts/60 Hz
	260 Volts/50 Hz

A.6 SERIAL PORT PIN SPECIFICATIONS

The two serial ports, COM1 and COM2, on the rear panel of the main unit, use the EIA RS-232 interface standard. Female connectors are necessary to mate with the serial ports.

The following table indicates the signal names used for each pin by your Genesis, as set up at the factory.

PIN	SIGNAL NAME
2	Transmitted Data
3	Received Data
4	Request to Send
5	Clear to Send
6	Data Set Ready
7	Signal Ground
8	Carrier Detect
20	Data Terminal Ready
22	Ring Indicator

The following is a cable wiring diagram for use with a Serial printer.

SYSTEM END

PRINTER END

Ground Pin 7 ----- Pin 7 Ground

Data Out Pin 2 ----- Pin 3 Data In

Data In Pin 3 ----- Pin 2 Data Out

Data Terminal

Ready Pin 20 ----- Pin 5 Clear to
: Send
--- Pin 6 Data Set
Ready

* Pin 5 ----- Pin 11 Printer
Busy

* Pin 6 ----- Pin 20 Data
Terminal Ready

Pin 4 ----- Pin 8

Pin 8 ----- Pin 4

- * These connections are shown for printers that have a printer busy (low) signal. For printers without the printer busy feature, omit the 5 to 11 cable connection and jumper 5 to 6 at the system end of the cable.

A.7 PARALLEL PORT PIN SPECIFICATIONS

The parallel port, LPT1, on the rear panel of the main unit, uses a 25-pin connector. A male cable connector must be used to mate with the port.

The following table indicates the signal names associated with the pins.

PIN	SIGNAL NAME
1	Strobe (-)
2	Data Bit 0 (+)
3	Data Bit 1 (+)
4	Data Bit 2 (+)
5	Data Bit 3 (+)
6	Data Bit 4 (+)
7	Data Bit 5 (+)
8	Data Bit 6 (+)
9	Data Bit 7 (+)
10	Acknowledge (-)
11	Busy (+)
12	Paper End (+)
13	Select (+)
14	Auto Feed (-)
15	Error (-)
16	Init Printer (-)
17	Select Printer (-)
18-25	Ground