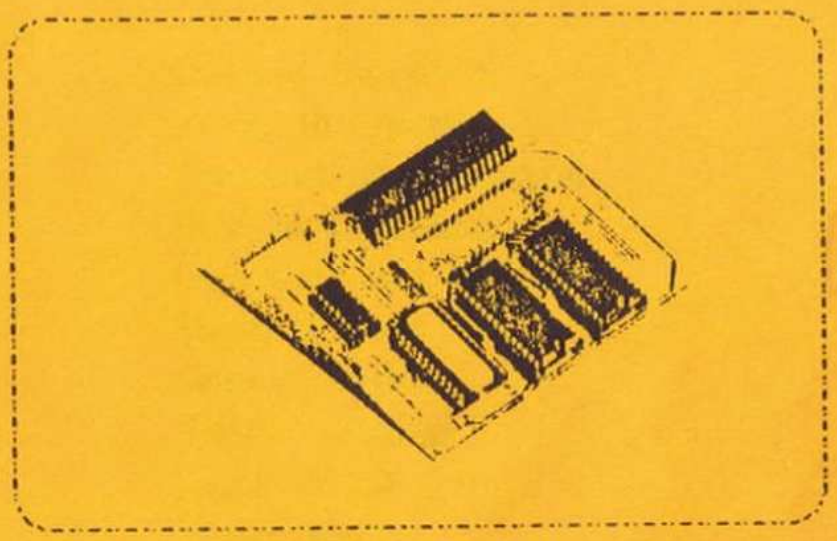
I.S 1050 PLATE ENHANCEMENT



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IS

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Read the instruction manual completely before using the drive Enhancement.



Contents Table:

Chapter 1	Introduction	1
	Purpose of the Plate	1
	User's rights	1
	Warranty Cover	1
Chapter 2	Booting the menu	2
	Using the menu	2
	Function of the menu	2
	Built in functions	3
	Functions not built in	3
	Menu options	3
	Special options	4
	Skew enable	4
	Auto 1050	4
	Fast write	4
	Format verify	5
	Slow down mode	5
	Write protect locking	5
	Alter drive number	5
	I.S.P Copier	6
	Show Tracer data	6
	Which disc's to trace	7
	Emulator's, what are they	7
	Emualtor's section	7
	A.S/D.S Doubler	8
	Standard 1050	8
	810 Archiver	8
	Happy/Lazer/Warp drive	8
Chapter 3	I.S.P Backup program, the Gremlin Grabber	9
	Notice	9
	Purpose of the Grabber	9
	Loading the Grabber	9
	Selecting the Source and Destination drive	9
	Special features	10
	Skew aligned copying	10
	Other features of the Grabber	11

Chapter 4	The DIAGNOSTIC tester	12
	Purpose	12
	Aim	12
	Using the Diagnostic program	12
	Adjusting your drive speed	14
Chapter 5	Dos extra's on your Lightspeed Menu	15
Chapter 6	The Lighter Menu	16
	Function of the Lighter Menu	16
	Booting the menu	16
	Using the menu	17
	Creating an I.S.M disc	17
	Erasing a file from the Directory	18
	Transfering files between menu's	18
	Creating bootable discs from the menu	19
	Extra details regarding the I.S.M	19
	Details regarding the organisation of menu	20
Chapter 7	Function	21
	All about disc's	21
	What are BAD sectors?	21
	Status available from drive	22
	Using the Customizer program	23
	Conclusions about the Customizer	24
Chapter 8	Taking to your I.S.P drive	25
	About the Plate	25
	Down loading data to the I.S.P	25
	The Run command	26
	Other information regarding the SIO	26
Appendix A	Glossary	27
Notice	Warranty and Disclaimers	28
	Fitting instructions	29

CHAPTER ONE
Introduction

Congratulations, you are now the proud owner of the ISP Plate™ and its dedicated programs: ISP stands for Innovated Software's PLATE.

The 1050 ISP Disk Drive modification will greatly improve the performance of your 1050. A large number of NEW special commands will get you a lot of information from your drive which was not possible before. As well as creating your own custom formats, the ISP accompanying programs allow easy access to the PLATE.

The ISP PLATE is a permanant replacement of your existing chips. The installation is straight forward and not difficult to do, just plugging in an external board. If you have problems then see your dealer about fitting.

Purpose of the ISP:

It is not our intention to promote piracy with this board as this is *Strictly against copyright laws !!*

The reason for the sale of the PLATE is to allow system development to the user. That is, to supply the user with a tool so that he/she can develop their own system. For this reason, the ISP emulator has been designed.

User's rights:

The copying and distribution of the 1050 ISP program or the PLATE is forbidden by copyright laws. But, we do advise you to make a BACKUP of your system disk.

Warranty cover:

All the 1050 ISP PLATES are subject to tests before sold. If any problems arise, then consult notice at the back of this manual.

CHAPTER TWO
Booting the LIGHTSPEED Menu

Remember , Never BOOT-UP the Disk Drive with a Disk in the Drive and the lever down. This is because large magnetic fields generated on power-up can seriously damage the magnetic medium.

Using the menu:

This menu and its accompanying programs on the disk, all require a minium of 48k in which to run.

With the LIGHTSPEED SOFTWARE menu installed, you will see a notice regarding the computer system that you are using. This will inform you that you either have a 48k system or an 130XE. This is important as the extra RAM availble in the 130 is particularly useful for the ISP COPIER program and the Gremlin Grabber™.

The menu displays the drive numbers of all ENHANCED disk drives that are on-line at the time of power-up. Any drive in SLOW mode or unenhanced drives will not appear to the system as an ISP. If you switch an enhanced drive OFF or ON, re-enable the FAST mode on a previosly "SLOWED DOWN" drive, or hook up another drive to the system, then press reset so the menu program will report the new ISP drive numbers.

Most of the programs contained on the Driver menu will only work with ISP disk drives that are recognised by the menu. Always press reset after changing the drive configuration after power-up. Doing this will allow the menu to operate properly.

Function of the menu:

The menu is a self booting portion of the LIGHTSPEED SOFTWARE disk. When first booted, the driver will enable the Tracer mode and collect old Tracer data.

Built in functions:

Once the program has booted, and the menu has been displayed, access is immediately provided for those functions which are built into the LIGHTPSEED menu without having to reaccess the disk. These are:

0) SPECIAL DOS CALLS *(MESSAGE DISPLAYED ONLY).*
1) SPECIAL OPTIONS
2) ALTER DRIVE
4) DISPLAY TRACER DATA

Functions not built into the menu:

Other functions available through the LIGHTSPEED menu require accessing the disk drive and loading the program into memory. The choosen program will boot and run. It is not possible to return back to the main menu once the program has been installed other than by pressing reset. These extra functions that require access to the Driver menu are:

3) SECTOR COPIER
5) ISP EMULATORS
6) ISP BACKUP PROGRAM
7) DIAGNOSTICS

Menu options:

Options available to the user control various parameters within the Plate which govern its mode of operation, i.e Fast write enable/disable, Fast formatting enable/disable etc. Also, with these special options come the utilites such as the ISP COPIER and the DIAGNOSTIC tester. All the programs available on the LIGHTSPEED SOFTWARE menu all use the system to the fullest, i.e if a 130XE is being used, then the COPIER and the GRABBER will use the extra RAM available.

SPECIAL OPTIONS : A list of functions found in menu option 0.

These are special commands available to the user which will permanantly change the way the Drive operates (until turned off). To initialise these functions, simply hit the key that denotes the function.

Skew enable/disable: This option is only available on OLDER Plates.

This is done automatically in the Happy Enhancement, but one way around its checking is to make Track zero one sort of sector positioning and then to sector skew the rest of the disk differently. This means that the booting software will load incredibly slowly. Hence, with the ISP you the user, can either leave AUTO 1050 mode on or force these modes on disks with different sector alignments that interfer with the operation of AUTO 1050 mode

Auto 1050 enable/disable: This allows you to toggle AUTO 1050 mode either ON/OFF. If this mode is enabled, then the drive will recognise the disk format from TRK 0 . It will then read the rest of the disk the same way. But, some disks may confuse the AUTO mode, i.e insert BAD sectors or miss sectors out (See CUSTOMIZER section for more details). Hence, for these ones you can disable AUTO mode and force it to read the disk as standard 1050 format.

Fast write enable/disable: This will toggle (enable and reset) the Drive at LSP: will write fast, without verify, on any write command. If a disk write error does occur, then the Drive's busy light will flash once every second. You simply remove the disk from the Drive and resave your file on another disk.

This option has to be enabled by you so that you can get use to the way that FAST WRITE works. You must remember, at all times, NEVER remove the disk from the Drive until the BUSY light goes out. This is because, especially during WRITE, Bad sectors can be created on your disk. This is because the way FAST WRITE works is that it will BUFFER the data you send to the drive, and then 'write' to the disk at a convient point.

Format verify enable/disable This will toggle the Drive's format command to format with verify, format without verify: handy for those disks which will not format because of one or two BAD sectors. Doing this will also increase or decrease the time it takes for the drive to format a disk.

Slow down mode: All purchased software should be write protected before running on this Drive. This is because some copyguarded disks may not work in LSP MODE. In fact, some disks may boot wrong and then attempt to erase your disk. Before trying to boot purchased software on the ISP, be sure to write protect them. If the software does not boot on the Drive, then use this option SLOW DOWN.

Another way of putting the Drive into SLOW MODE, is to BOOT the Drive with a disk covering the WRITE PROTECT sensor. This sensor is situated close to the front of the Drive towards the left, i.e hang a disk half way in the drive slot and then power-up the disk drive, switch it on.

Please note that SLOW mode is compatible with SINGLE and MEDIUM densitys.

No claims will be made for erased masters.

Write protect locking: This option will allow the user to WRITE LOCK his/her Drive. This function will toggle if used again. This allows the user to LOCK out the commands which would wipe out the disk. This can be very useful for those people who have younger people using their disks.

Alter drive number: This can be done via option 2 on the main menu.

This command allows the user to alter the number of his/her Drive without having to mess around at the back of the Drive. When you choose this option from the main menu, you will get a prompt to

enter a new drive number. Simply hit a number from 1 to 8 which denotes the new drive number.

ISP Copier: This program can be booted by choosing option 3.

This is a general purpose disk copying utility, it will not copy protected disks. It is very simple to use and most instructions for its use appear on the screen.

When the program has booted, the status of the system is shown on screen. If a 130XE is present, then this will be highlighted in the RAM DISK section. To toggle the other functions within the copier, you simply hit the desired keys.

The DENSITY option allows you to force what type of disk you wish to copy: Single, Medium, or Double density disks. You must note that this option is only available on the Enhanced drive, so on ordinary 1050's just leave this option alone.

Show tracer data: Found from option 4.

Please note that this will only show the Traced data from drive one only. If the ISP drive is any number other than drive one, then this function can not be used.

The Tracer mode within the ISP drive is perminently enabled. By loading in the Driver menu, it will reset the Tracer buffer and store the data found in the Tracer buffer for the SHOW TRACER DATA function. Hence, if you re-boot the Driver menu the TRACER DATA will only show that track zero has been used: the trace obtained from booting in the Driver menu disk.

The TRACER enables the Enhanced drive to monitor and record the loading process of a self booting disk while the disk is loading. The tracer does not examine the program, but sees and remembers each read/write operation that occurs whilst the program is loading. This

process will be carried out in both Fast and SLOW down modes. If this is to be used in slow down mode and the traced data needs to be accessed, then the RESETER has to be fitted to the drive. This will allow you to re-enable Fast mode without destroying the Tracer data.

Which disks to Trace:

The loading of any self booting disk may be traced. Disks which are not a good idea to trace are those which make repeated disk accesses even after the program is running, i.e graphic adventures, which reaccess the disk for each new screen to be displayed; or level games which load the next game from disk.

Emulator's, what are they ?

An Emulator is a piece of software which will change the mode of operation of an operating system, it is in itself a 'new' operating system to replace the old one, i.e a translator like for the XL/XE.

Emulator's section:

A list of emulators can be found by pressing option 5.

Once you have choosen this option from the main menu, a list of possible emulators on the driver disk will be displayed. You can either go back to the main menu (By pressing 0) or install one of three EMULATORS:

1) U.S/I.S DOUBLER
2) STANDARD 1050 EMULATOR
3) 1050 TO 810 ARCHIVER
4) HAPPY/LAZER/WARP DRIVE EMULATOR

The U.S/I.S DOUBLER emulator will make your ISP drive into a DOUBLER chip enhancement. This is an upgrade which gives you ULTRA SKEW option on formatting. Using this 'Translator' program may be of use to you if you wish to produce ULTRA SKEWED disks.

The STANDARD 1050 option in the menu will change your drive back into its unenhanced state. This can be useful for those who wish to use various programs which will only operate on a standard 1050 drive.

The 810 ARCHIVER program will change your drive into an old 810 drive with Archiver enhancement. Some people who still own 810 drives and may have this enhancement can now get their 1050 drives to emulate their other drives. This can be useful to those who wish to access the power of the Archiver without having to have an 810 disk drive.

The HAPPY/LAZER/WARP DRIVE emulator will make your drive emulate one of these enhancements. As the program is only a 'TRANSLATOR' type of operating system, any software for that drive which accesses a specific loaction within its ROM will not work. Hence, modified versions are available from either your dealer or direct from us.

CHAPTER THREE
ISP Backup program, the Gremlin Grabber

Notice:

It is against copyright laws to use this program to make unauthorised copies. Rememeber, before you violate other people's copyright, the amount of work which they put into the programs for small rewards.

Purpose of the Grabber:

The ISP GREMLIN GRABBER™ is intended for making duplicate copies of Atari discs. This program has now been made part of the LIGHTSPEED SOFTWARE™ program for ease of use.

Loading the Grabber:

When the LIGHTSPEED SOFTWARE disc has loaded, press option 6. The menu will not allow this program to operate if there are no Plate drives present.

Selecting the Source and Destination drives:

The menu program will automatically select the source and destination drives for the Grabber, the user can not select these, but may place the ISP drive in any of the EIGHT positions. The first encountered ISP drive will be the source drive. If there is only one ISP drive, then this will also be the destination drive otherwise the next ISP drive found will be the destination one.

The menu program reports the source drive number and if it is not drive 1, the user will be instructed to place the LIGHTSPEED SOFTWARE disc into the source drive and press return. Make sure that you have placed the disc in the source drive before pressing return. This procedure will not be necessary when drive 1 is an ISP drive.

Special features:

If you press RESET on the computer at any time all current operations are terminated immediately - prior to completion. Then, the ISP drives will deactivate. Pressing return will then allow the user to return to the main menu. Do not press RESET again until the drive is deactivated otherwise the computer may lock-up.

Whilst Backing up some discs, a noticeable delay maybe apparent. In this case the GREMLIN GRABBER is doing its best to recover the data from the disc. It is not possible to distinguish between 'weak' sectors and deliberate BAD sectors, so the software will retry for some period of time. As the drive just seems to sit their doing nothing, rest assured that the drive is trying its best to recover the data.

All track numbers etc reported by the program are now all in decimal. This is a change from previous Grabber's where all data was displayed in HEX.

SKEW Aligned copying:

Skew alignment is a special mode of copying where sectors positions on the disc relative to those on other tracks have an important relationship. By selecting this type of copying allows you to Backup those SKEW aligned discs. If you select this option, then the copying time will be greatly increased due to the way in which the process is carried out.

It is not necessary to copy using the SKEW option, but some dics you Backup normally may not work. In this case try this option as they may have SKEW alignment protection.

Other features of the Grabber:

The program will always tell the user what it is doing and what the user should do next. When completed the program will reply with the message DONE. If other messages appear like the insertion of source and destination discs, then read the mesaages properly and put the right disc in a the right time.

As the software reads the source disc, the actual track being read will be reported. Completely unreadable tracks will be reported and skipped over. Normal discs will show the number of sectors being 10. These sectors may or may not contain protected data so the program will not analyse the disc for you. If during the reading process an error occurs, i.e timeout or a BAD read, then this will be reported: ERROR IN READING RETRY (Y/N) . Just hit Y or N depending on what you want to do.

The destination disc does not need to be formatted. Any track written to the disc is firstly erased and then overwritten with the format required from the source disc. If an error occurs, i.e BAD disc or write protected, then this will be reported: ERROR IN WRITING RETRY (Y/N). Again, press Y ro N depending on the situation.

CHAPTER FOUR
The Diagnostic tester

Purpose:

The DIAGNOSTIC program on the LIGHTSPEED SOFTWARE menu checks the 1050 ENHANCEMENT hardware, in addition to some of the standard hardware of your drive. It does not test all the functions and elements of your 1050, this can only be done by qualified service technicians. If you do send your drive off to be serviced, then instruct them to use *Slow down mode*. The diagnostic program on this disk in intended to check the parts of your drive which are critical to the proper working of your ENHANCED drive.

Aim:

The DIAGNOSTIC programs your drive to perform certain tasks and reports to the user any failures. This program can only be used with the ISP Enhancement.

Using the Diagnostic program:

Boot in the ISP LIGHTSPEED menu as described in the instructions. When the disk has booted and the menu is displayed, then choose option 7. Once the program has loaded and been installed, you cannot return back to the main menu.

When the DIAGNOSTIC program is installed, it will ask you to enter the drive number of the ISP drive. Simply enter the number of the drive, a number from 1 to 8. The program will then check to make sure that the number you entered is an ISP enahncement and will report accordingly.

When the menu section of the Tester has been displayed, you can pick one of four different tests, i.e

I) PLATE ENHANCEMENT TEST
X) I/O TRANSFER TEST
R) R.P.M TEST
H) HEAD POSITIONING

Option I tests various chips within the drive that control the way in which the Enhancement functions: the CPU on the Plate, its RAM, the RIOT chip, and the FDC chip.

The I/O Transfer test will check that your link to your computer from the disk drive is functioning properly. This test transfers/receives a large amount of data from your drive at HI-SPEED. The computer and the disk drive will analyse the data and report any errors found. If an error is detected, it does not mean that your ENHANCEMENT is defective, but that the I/O cable connecting the machines is at fault. This may be because the ENHANCED drive is far away from your computer, in a daisy chain network, and another peripheral is interfering with the data. Or, that there is a strong EM interference near by which is interfering with the I/O cable its self. If this is the case then try moving your system away from the TV set or bring the drive closer to your computer.

The RPM test will calculate the speed in which your drive is running at. Most RPM testers require that you run your drive in *Slow down mode*, this does not. This test will also operate correctly on *PAL* and *NTSC* systems regardless of the supply frequency, 50 or 60Hz. This test will give you an accurate read out in milli seconds. To get this into RPM, simply take the *reciprocal* of the time and multiply it by 60sec, this will give you a result of around 288 RPM.

The Head positioning program is not a test. This just moves the head up and down the carrarige to allow you to clean/align the head.

Once the program is running, then your can move the head up and down the disc by hitting *Option* or *Select*. You can stop the test at any time by hitting the *Start* key.

Adjusting your Drive speed:

Firstly, remove the top cover from your disk drive as in options 1-3 in the fitting instructions. Now locate the potentiometer marked VR2 , this can be found at the back of the drive near were you push in the power cable for the drive. Once found, you will have to remove the sealing wax, just pinch this with some "Nose faced" pliers. Now reconnect the power to your drive and boot up the Driver disk. When installed, select the DIAGNOSTIC option.

CHAPTER FIVE
DOS Extra's on your LIGHTSPEED Menu

Other functions available on your LIGHTSPEED menu can be accessed through Atari Dos 2.0 or equivalent Dos. These allow you to use some of the SPECIAL OPTIONS on the Driver menu from Dos. These include:

FAST WRITE ENABLE/DISABLE	Type 1
FAST FORMATTING ENABLE/DISABLE	Type 1
SKEW ENABLE/DISABLE	Type 1
CHANGE DRIVE NUMBER	Type 3
ENABLE SLOW MODE	Type 2
CHECK I.S.P	Type 2

How does one use these commands ?

These programs are very easy to use and can be used in BATCH files if required. Here is the syntax of the programs:

Command , [Dn:] ON/OFF : For type 1 commands!
Command , [Dn:] ON : For type 2 commands!
Command , [Dn:] [Dx:] : For type 3 commands!

Where n denotes the drive number for the change to take place on, x is the new drive number.

Note : You must also type in the ':' to use these commands as the programs use this to check the syntax of the command. It is also a good idea for you to transfer these programs to a Dos from the Driver menu disk.

CHAPTER SIX
The Lighter Menu

This chapter will discribe how to use the Lighter menu and the special ultilities that can be found on it.

Please note: This is a special disk operating system, Dos, and is not compatable with all other disk menu systems. It is, however, compatable with 'Multi-boot', 'Alpha load', and 'Rob C', and many other similar menus.

Function of the Lighter Menu:

The Lighter menu is a form of Dos but allows the user to store his/her programs in a compact format. All commands to the Dos are external: creating the menu, transferring files etc. It also allows the user to store a great deal of files in this way, up to TWENTY files on one menu.

Booting the menu:

This menu requires a minimum of 48k to operate. This means that you should remove all cartridges on power-up. If you have an XL or an XE, you can disable the Basic cartridge by holding down the OPTION key on power- up.

Switch on the disk drive and wait for the busy light to distinguish. Then insert side B of your master disk and pull the lever down and switch on the computer. The screen will blank for a few seconds whilst the loader checks the drive and installs the rest of the program. If the drive is an UNENHANCED one, then you will have to wait a bit longer for the menu to boot in. When it has booted, a Dos window will then appear. In the window will be the available programs on the disk.

Using the menu:

When the menu has booted, a window will appear along with the directory of the disk. This will show you the available programs on the disk. Some ISM menus may have ten or more more programs on it, in this case you can look at the other directory by using the arrow keys on the keyboard, i.e The left arrow will display the first directory, or ten programs The right arrow will display the second directory, other ten programs.

The *Console* keys will allow you to move the program pointer up and down the directory. The flashing program is the one to be loaded and executed. By hitting *Start* or the *Fire Button*, the program will be loaded into memory and then ran. As well as using the keyboard, one can also use JOYSTICK 0 to do the same things (All the ultility programs on the disk operate in the same way).

Other features on the menu allow the user to change the source drive, or the one to read the directory off. You can select the drive number to look at by pressing D . This will step through the drive numbers from 1 to 8. You can also ENABLE/DISABLE Fast write from the main menu by hitting the W key or ENABLE/DISABLE sector skew by hitting S . The sector skew toggled is DOUBLER skew alignment as this seems to be the most popular (*Note:* The option for Skew is for older plates only).

Creating an I.S.M disc:

Creating the ISM Dos menu is very simple. This is achieved by loading the *I.S.M Create* file. Once loaded, the program will ask you to place the menu disk in the drive. Just leave your MASTER disk in the drive and hit <RETURN>. Then the program will read the Dos from the disk. When done, control is then given back to the user. Now you just simply follow the prompts.

You can rename the disk title that will be written onto the disk or create a BLANK formatted disk by disabling the WRITE MENU option. There are also many other options you can select that control the operation of the formator. When you wish to create a menu of a particular density, then just highlight the density of your choice and hit START. Then enter the destination disk and hit either (Y)es or (N)o to continue the format procedure.

Erasing a file from the Directory:

This can be done by loading the D.S.M Eraser program. The instructions for using this program are on screen.

To RENAME a program, you simply Highlight the program using the console keys or the joystick (as in the main menu), and hit START or the FIRE button. Then you type in your new name and when done hit RETURN.

To ERASE a program, simply hit the letter 'A' and the last program on the directory of the disk will be erased. To unerase the program just hit 'B' . If you wish to examine another disk directory, then swap the disks over and use the arrow keys to examine he directories as you would with the main menu.

Transfering files between menu's:

This is done by loading the D.S.M Copier . With this program you can transfer files between any menu (including Multi-boot, Alpha load, and Rob C menus). Transfer can take place on either a single drive or a multi drive system. To change the source drive number, then simply hit D (as before) and the drive number will be incremented by one. Keep hitting D until the number of the source drive appears on the screen.

Please note that the destination drive number is always drive one. To examine the directory of this drive or any other, then use the arrow keys and the directory of that disk will be displayed on the screen along with the disk space remaining (this will only be displayed on ISM disks). To transfer a program from the directory is very straight forward. Just highlight the program to transfer (as you would in the main menu) and hit START . The program chosen will then be read into the computers memory. When the whole of the program has been installed, the menu will then ask you to insert you MENU disk, i.e this is your destination ISM disk. Hit START when you want to write the program to your disk.

Creating Bootable discs from the menu:

These can be produced from files on the ISM by using the *D.S.M Booter* program. This is very easy to use. This program is used in the same manner as the one above. But, remember that certain size files are not portable to BOOTABLE DISK FORMAT . The files that are not are:-

SINGLE, DUAL : No files bigger than $FF sectors in length
DOUBLE : No files bigger than $80 sectors in length.

This information regarding file size is shown on the screen in the left- hand corner.

Extra details regarding the D.S.M:

Other things about the menu are:-

On all the external ultilities for the menu, you can esape back to the main menu by hitting the ESC key (*Except* for the *D.S.M Copier*).
By holding down the M key on power up, you can DISABLE the music.
OR:
By holding down the LOGO key (inverse video key) on power up, you can enable the ATARI character set on game play.

Some important things for programmers:-

Access the HD-SPEED Sie - JMP ($0002)
Safe loading area - $400, $B400
Character set is located at $B000

Deatails regarding the organisation of the menu:

The position of the directory of the menu changes with density. As there are two directorys on the disc (each having TEN programs in them), their positions relative to density are:

DENSITY	DIRECTORY1 (MAIN) SECTOR	DIRECTORY2 SECTOR	LENGTH IN SECTORS
SINGLE	33	31	2
MEDIUM	33	31	2
DOUBLE	17	16	1

The structure of these directorys are the same and are shown below:

Byte description:

0000 - List of TEN LOW byte sector positions giving starting sector of program.
000C - List of TEN HIGH bytes of the sectors
0018 - A byte indicating that its an ISM disk
0019 - Byte giving the number of programs in the directory.
001A - Byte indicating number of deleted programs from the directory.

Then follows all the names of the programs on the menu.

CHAPTER SEVEN
The Customizer program

Funtion:

This is a really useful ultility which can be found on the Lighter ISM. This program can be used to create your own custom formats so as to enable you to PROTECT your software.

All about disc's:

With this ultility, you can format the disk to how you want it to be: you can mix the densities and also add BAD sectors to the disk. Hence, you can protect your software against copying.

For best results, we advise you to use previously UNFORMATTED disks, Virgin ones!

What are BAD sectors ?

The ability to create BAD sectors has been around for some time now. It was the first REAL disk protection, but is now becoming less important. It is possible to create two types of BAD sectors: a missing sector or a CRC error. The missing sector can be created very easily, just do not format that sector. Then, when you try and read the disk, that sector can not be found and so the Drive returns a BAD sector status. A CRC error is one in which the data written onto the disk is wrong. That is, during writing to the disk a checksum is calculated from the data being written (a CRC). This checksum value is then written to the disk so that during reading, the data read can be compared with the checksum to show if an error in the data had occured. This, basically, is what a CRC error is.

Status obtainable from the drive

There is a STATUS byte returned by SIO on any read/write command issued. The meaning of this Status is as follows:-

$90 : A BAD sector of any sort was encountered during the read.
$8A : Timeout, the sector was missing and the Drive did not respond quick enough.
$8B : Device NAK. If the Drive did not respond, SIO will try again.
$8C : Serial bus error.
$01 : A good read/write.

The $90 is returned on BAD sectors, but the timeout value of the Drive is critical and can cause errors $8A-$8C. A $90 can be insured by increasing the timeout value.

These errors can be very useful for those who wish to know the types of Drive error that are returned by SIO. It is also possible to find the FDC status bits by executing the SIO $53 command. This will return four bytes to the user of which two are really useful and the second is described here.

Bit	Meaning
S7 NOT READY	This should always be zero, i.e. device is ready.
S6 WRITE PROTECT	When this is set, it indicates that the disc is protected.
S5 RECORD TYPE	Zero on write indicates 'Data mark' on read.
S4 RECORD NOT FOUND	When set, indicates sector was not found.
S3 CRC ERROR	When set, indicates a 'CRC' error in data field.
S2 LOST DATA	Should not occur, means that drive did not respond.
S1 DATA REQUEST	Should always be zero.
S0 BUSY	When set, indicates that the drive is busy.

Table 1.0 Hardware Status

All these bits are returned in LOW-TRUE form, ie. good sector is $FF.

Using the Customizer program:

The program is fairly complicated to use, but once you have used it a few times it should be easy.

When you have booted the program, the cursor appears on a scale representing the Tracks on the disk (note that all the data displayed is in HEX). This cursor can be moved along this scale. By pressing START at any instant on this scale, you will format the disk. The disk will be formatted from that track to the end of the disk with the density of that track: if the pointer is on TRK 04 and the track is DUAL density, then the disk will be formatted in dual density from TRK 04 .

To alter the density of the track, simply hit one of the following keys:-

A : Medium density format
S : Single density format
D : Double density format

You will also notice that there is a sector position table also displayed on the screen. By using the cursor keys, you can move the pointer down to this table. By entering any HEX number, you can enter your own sectors on the disk: a BAD sector is a sector whose number is not valid or is a missing sector ie. sector E8 , or no sector 12 .

Please note. By entering a ZERO sector, you have entered a NULL marker into the table and this is equivalent to ending the sector data:- Consider the following data

```
00000000000E0000011111E1
123456789ABCDE0F012345
          x    n    x
```

Where, n-is the NULL pointer; x-is a BAD sector number.

The null sector pointer indicates to the formatter to only format the sectors to the LEFT of it: the above data will format the track with the following sectors:-

```
0000000000E000
123456789ABCDE
      x
```

The next information displayed on the screen is the gap data. This is the data which separates the sectors from each other. By shortening these gaps, other BAD sectors can be created as well as CRC errors. This is because the sector identification information at the begining of one sector could be over-written by the end of the previous sector. By adding extra sectors to various tracks, then you may find you will have to modify these gaps.

Conclusions about the Customizer:

With all this knowledge, you can now create your own custom formats to your software. This will give you a unique format which, if done right, will never be copied even by the best copiers available; Altough no software can be fully protected against EXPERT programmers or 'Hackers'.

Notice: Although your PROTECTION maybe CRACKED , this may take so long that you have already managed to sell enough programs to get your money back. Alot of different protection schemes are employed today. The best ones are by far the simplest to achieve. The use of this CUSTOMIZER is just to add BAD sectors etc. But, at some later stage, there will be available a much better one which will allow the user complete control over the FDC formatting techniques and give the user some very powerfull editing facilities.

CHAPTER EIGHT
Taking to your D.S.P drive

Any programmer who wishes to access the PLATES capabilities will be glad of this article.

About the Plate:

The area of RAM available to the user is situated at $C000-$DFFF. This is the only space which is available to the programmer: there is very little PAGE ZERO memory free.

The disk drive command table is positioned at $8300. This table contains all the commands available from SIO. Please note, any additions made to the table, you must terminate with 00. The vectors for these commands are located at $8326: you have room for 38 drive commands.

Your own commands can be inserted or you can simply re-vector the commands already available. This can be useful for monitioring purposes etc.

Down loading data to the D.S.P:

This is very straight forward. Communication to the drive is achieved via SIO: JSR $E459. The command which will transmitt data to the drive is in the form:-

$302:	A0	DOWNLOAD COMMAND
$303:	80	TX NUMBER
$304,$305		ADDRESS OF BUFFER
$308,$309:	0001	TX $100 BYTES
$30A,$30B		DESTINATION MEMORY LOCATION IN DRIVE

The RUN command:

This will give control to the program which was sent to the drive. This command is also run via SIO and is of the form:-

$302:	A1	RUN CMND
$303:	00	
$30A,$30B		ADDRESS OF PROGRAM TO RUN

Other information regarding the 500:

When reading or writing to the disc, the SIO control block locations $30A and $30B usually contain the low and high byte values for the sector to be read off the disc. Now, you can also issue a TRACK and TRACK relative sector position to the drive, i.e

Read TRK: 20 and sector 2 from that track.

This would have meant setting the SIO as:

The old method:		The new one:	
$30A	7C	$30A	02
$30B	01	$30B	94

Using the extra facility on the Plate is quite easy. Just place the sector number of the track to read in $30A and the track to read (Or'ed with $80) in $30B. Hence, you can read much faster from the disc and also access specfic points and not have to mess around finding the relative positions on the disc.

APPENDIX A
Glossary

Bad: A missing sector or 'BAD' sector identifier.

Bit: Smallest unit of the computer memory. Eight of these bits is equal to one byte of memory.

Byte: The memory is arranged into units called bytes. These bytes form the computer's main memory cells.

Crc: Cyclic Redundancy Check. This is calculated by the drive and written to the disk during the WRITE cycle.

Cursor: A marker which appears on the screen to indicate the position of the next typed character.

Density: This is the name given to the data storage technique used. There are three types employed by the ISP which are SINGLE, MENDIUM, and DOUBLE densitys. These data storages of 90k, 130k, 180k respectivly.

Disc: A 'Disc' of magnetic media used to store information on. DRIVE An external peripheral used to store information.

Emulator: Term for an external operating system used to 'mimic' another system.

Fdc: This is a Floppy Disk Drive controller. The one inside the 1050 is either a 2797 or a 2793. This is the device which is used to PUT/GET data from the disk.

Gremlin Grabber: The name for Innovated's Gremlin Grabber™, a special purpose disk ulitility.

Hex: An Hexadecimal number: a decimal number to the base of sixteen.

I/O: Means Input/Output. I/O is used to describe any communication to or from the computer.

I.S.M: The IS menu.

PCB: Means 'Printed Circuit Board'.

Riot: A 'Ram Input/Output Timer'. This device is used to control various parts of the drive.

Skew: This is a special term used in formatting techniques. Skew just implies that the SECTOR positions have been organised in a different pattern on the disk.

Warranties and disclaimers:

Neither the Hardware or accompanying software and documentation may be copied in any form. Any person or persons found to have copied/reproduced in any form the Plate or any other data concerned with the Plate will be liable to any charges brought against them.

Innovated Software reserves the right to make improvements in either the manual or the product at any time and without prior notice. We also makes no warranties, either expressed or implied, regarding the contents of this manual or its accompanying software, its quality, or performance. The ISP is guaranteed to be free from any defects in materials or workmanship for a period of one year from the date of purchase. During this period, we, IS, will repair defects in materials and workmanship of the ISP and provide return postage. IS will not reimburse you for the postal cost needed to send the plate, nor will IS reimburse you for the cost of removal or re-installation of the ISP into your Drive. You must have completed the return card to receive warranty repair during this warranty period, this card must be returned to us within SEVEN days of receiving your Plate otherwise warranty cover can not be given.

If we receive a plate during this period which does not have defects stated in the above, IS will charge a minimum testing, service, postage fee. This fee may be demanded before return of your plate. We therefore recommend that you contact us before returning your plate.

Conditions and exclusions:

The warranty may become null and void if any of the details below are true:

If you have not completed the enclosed card and RETURNED it to us within SEVEN days,
OR, if the IS Plate/Software is tampered with,
OR, if the drive/Plate is subject to abuse beyond normal wear,
OR, if any circuits within the drive becomes faulty and destroys the plate,
OR, if any noticeable negligence of the fitting or removal of the Plate by persons known or unknown with regard to instructions provided

1050 Plate installation guide:

If you have problems then send your drive to Innovated Software and the board will be installed and FULLY tested for an extra cost: providing the drive has been reassmebled (and working) with the original 1050 chips.

All you need to fit the PLATE is a pair of small nose pliers and a Philips screw-driver . Now, simply follow these points:-

1) Firstly you must turn off your drive and disconnect the power supply.

2) Turn the drive over and remove the SIX securing screws. Then turn the drive over again and remove the lid (See Figure 1).

3) Now, the next thing to do is to remove the board and the drive unit. The board is held in by some little plastic lugs, simply bend these outwards and lift the board clear of the case (As is in figure 2).

4) Once you have the board free turn it over so you can see the underside of the printed circuit board.

5) The next thing to do is to remove the metal r.f shield. Just simply twist the securing tabs so as to be able to pull the bottom cover off Turn the drive over again and remove the top metal can (See figure 3). You may have to disconnect the jumper cable J6 from the pcb. If you do, then note its position relative to the jumper plug.

6) Now you have nearly completed the fitting. Next, remove the ROM and the CPU chips, carefully levering the chips from their sockets with a small screw driver - these are shown in figure 4 (circuit board reference numbers U9, U10). * See notes.

7) The next thing to do is to get the 1050 ISP PLATE. Remove this from the box *(Please observe static procedures)*. Now put the board into the socket from which the CPU chip was removed from (Socket U9): see figure 4. Press the board firmly into the socket making sure that all the board connector pins are located correctly in the socket. It may be necessary to bend the crystal (Y1) slightly to locate in the boards slot (See figure 5). * See notes.

8) Now put your drive back together. This is just the reverse process of the above.

9) Once you have replaced the drive unit into the bottom housing, connect the power supply to the drive and switch it on. If the drive does not spin or the BUSY light does not extinguish, then you are in TROUBLE. Turn the drive off quickly and check that the board is inplace or if any pins have been bent. If the drive still does not work then call your dealer for help. Otherwise, disconnect the supply and put the rest of the drive back together.

10) Now connect the drive to the computer and install your ISP system disk. Boot the computer. Choose option SEVEN of the menu: DIAGNOSTIC TEST. Run through all these tests to test the board. Any problems then consult your manual.

Now you are running the 1050 IS PLATE and have access to all its powerfull ultilities.

IMPORTANT Notes:

* Static electricity builds up within your body. This is caused by either atmospheric conditions or by wearing certain Nylon TYPE material/clothing etc. To rid of static charges, then work within distance of cold water pipe or tap (These are earthed and make ideal static dischargers). Ocassionally touch pipe/tap before removing chips and also removing and insering the IS PLATE into the drive.

FIG. 1: Unscrewing securing screws

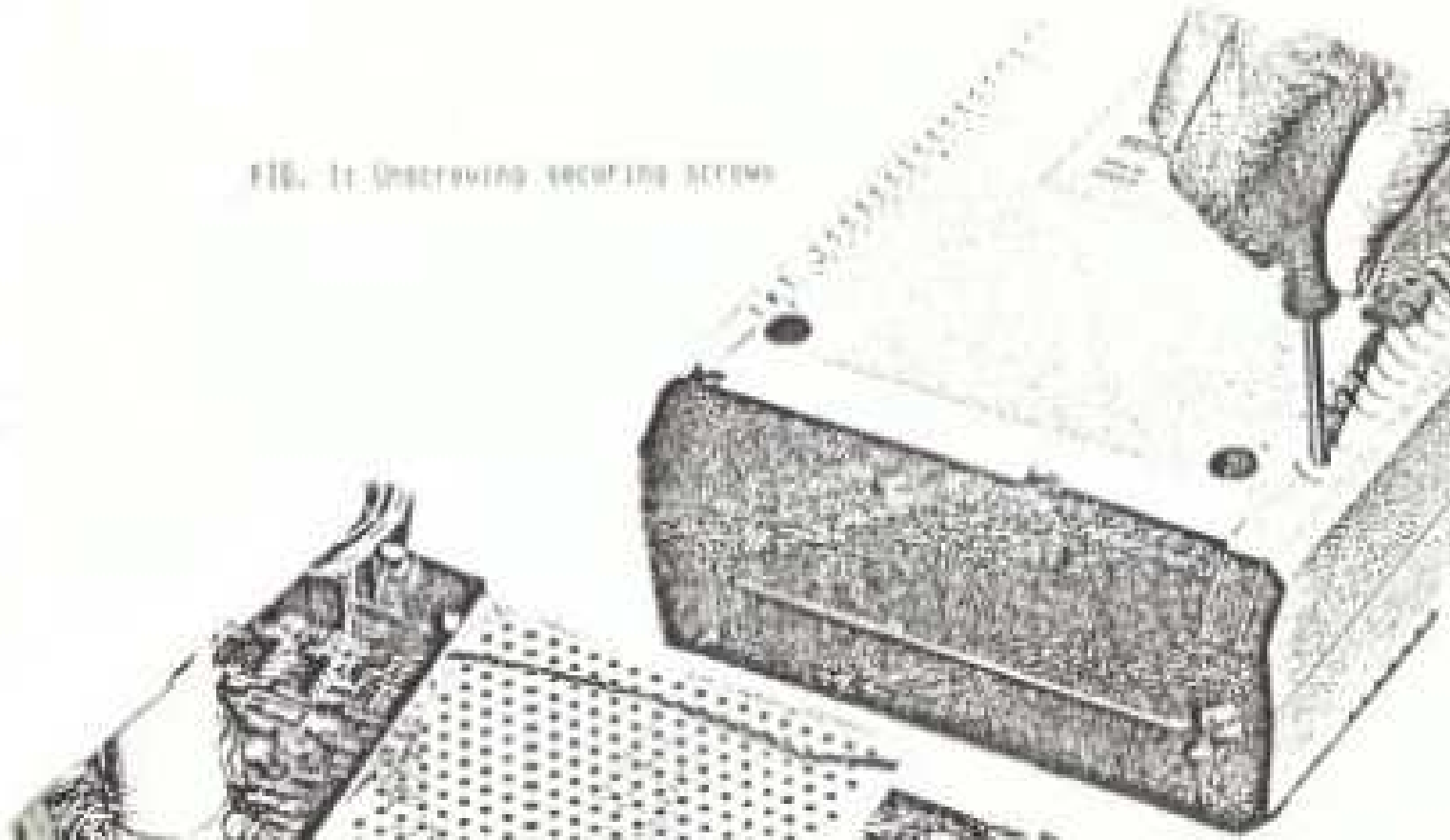

FIG. 2: Removing Drive assembly and P.C.B

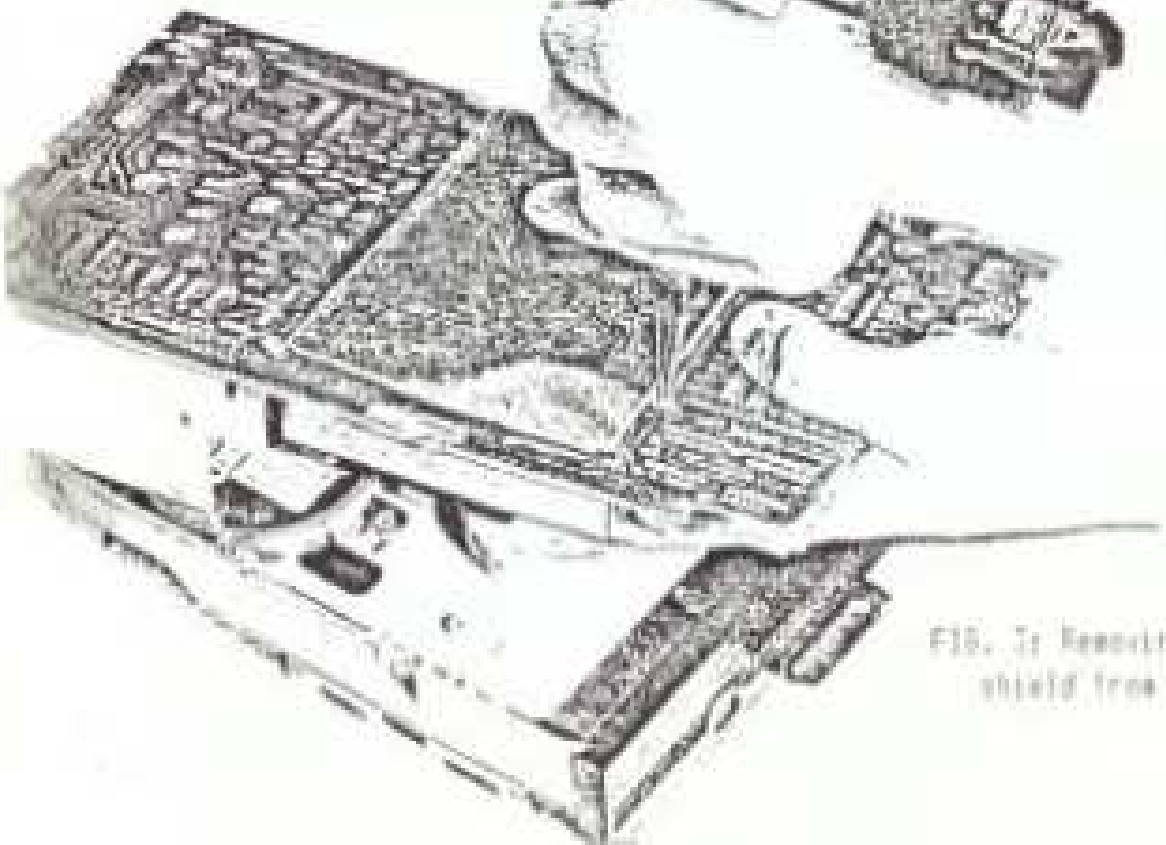

FIG. 3: Removing RADIATION shield from Drive P.C.B

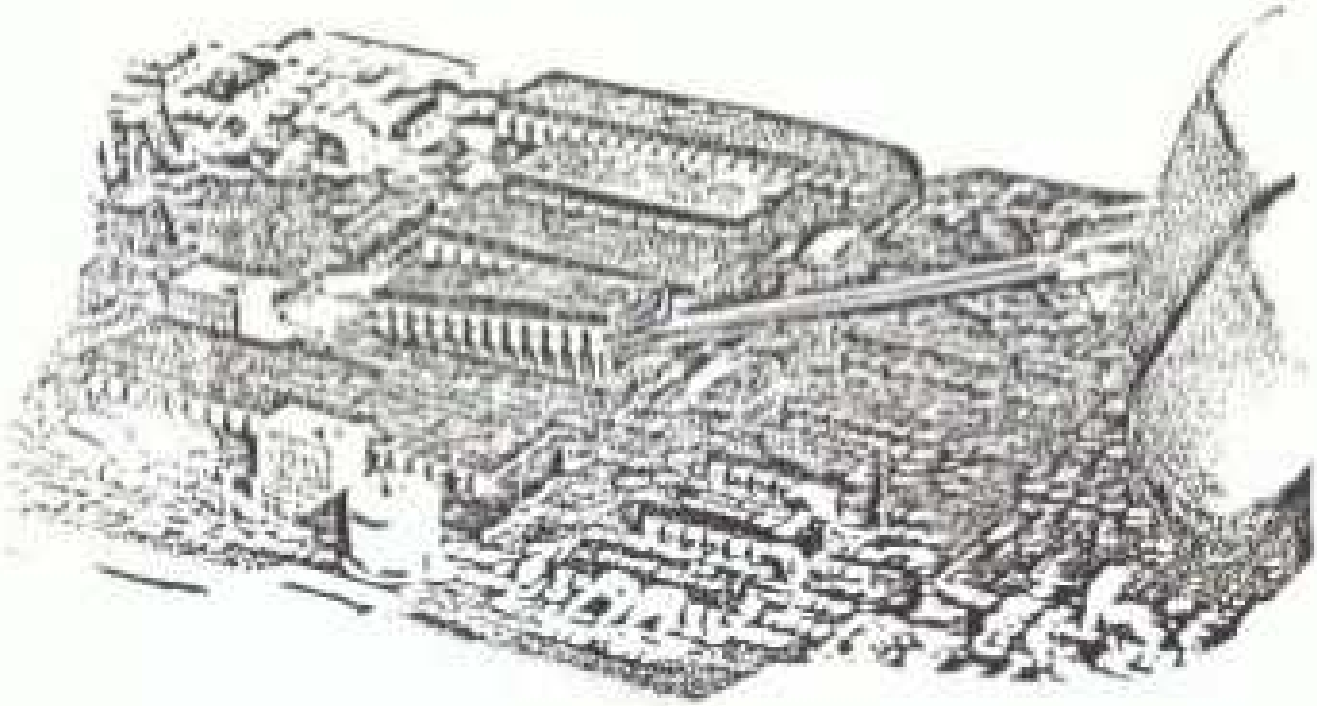

FIG. 4: Lifting out ROM and CPU chips from the drive

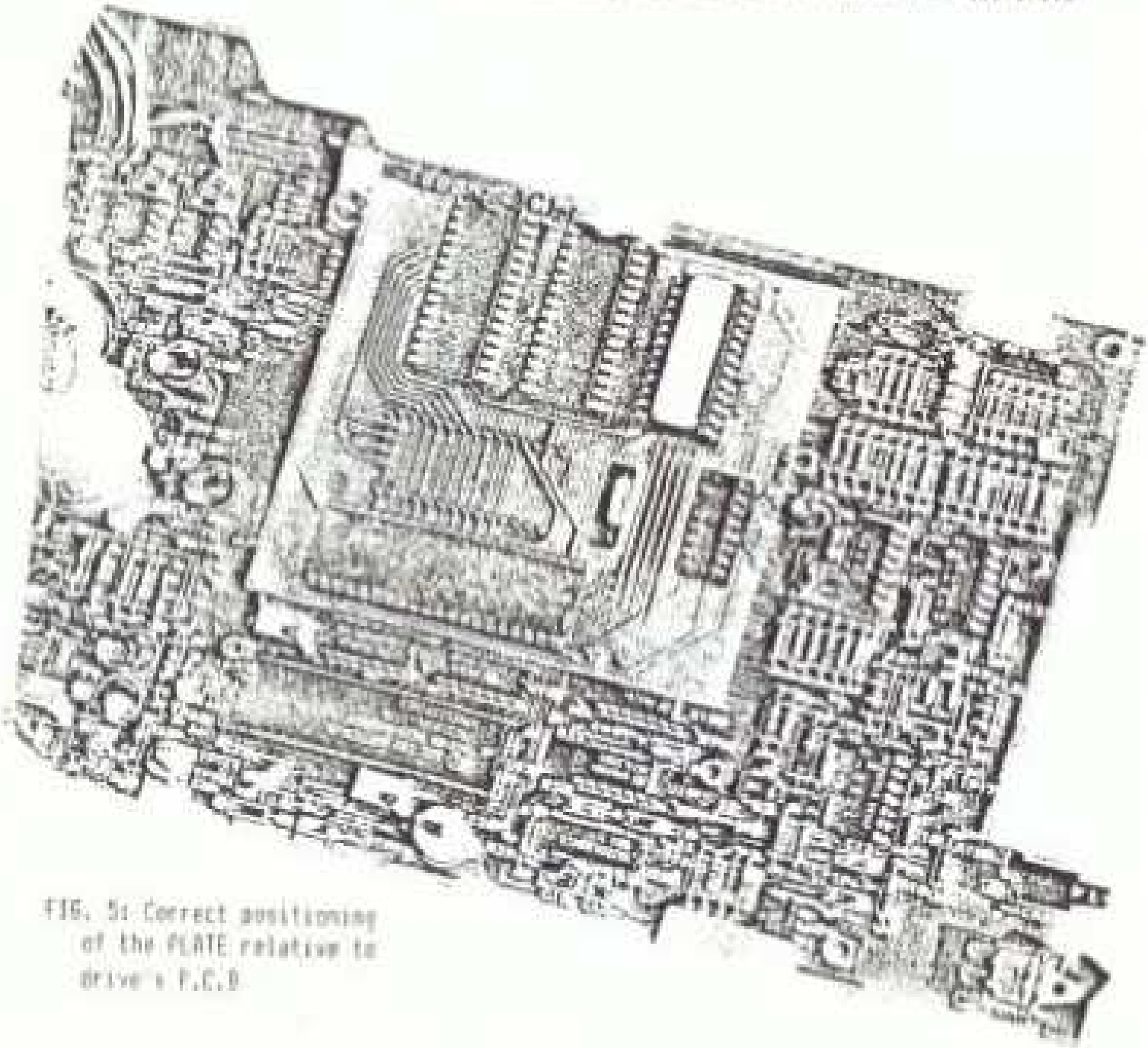

FIG. 5: Correct positioning of the PLATE relative to drive's P.C.B

Other extra's produced by us at Innovated Software:

- The *D.S Sound Sampler*
- and the *D.S Midi package.*

These two great innovations for the ST range allow the user to use **Digital sound** on the ST in many different ways.

The I.S Sound sampling package available for *£99-95* has the following features:

HARDWARE

Simple plug in cartridge
Powered by the computer
4-25KHZ sample resolution
4 or 8 bit sample resolution
Input and output sockets, *Phono*

SOFTWARE

Supports *Colour* or *Monochrome* monitors
Built in *Echo* and *Reverb* effects
Oscilloscope display level meter
Monitor sound on input, output, and sampling
Edit samples with *mouse* or *keyboard*
Ability to Digitally *mix* samples
Sample magnification up to 610 bytes
Wordprocessor type editing of waveform

LANGUAGE SUPPORT

Basic
Assembler
C

The Midi software for use with the above costs £19-95. This has the following features.

FEATURES

Assign one sample per key for as many keys as the keyboard

Plays samples through the Atari monitor or to an amp. via the DAC on the Digitiser

Multiple keyboard splits allowing as an examples: 5 Octaves all starting with Middle 'C' and each with a different sample.

Fade in and Fade out of samples

Loop point settings for each key

Ability to save a complete keyboard *arrangement* to disc, including all keyboard splits and samples assigned to them

Selectable *Midi* channels including *Omni ON/OFF*.

These products, for all the ST range, are available direct and also from other retailers in the U.K.

☎ *0903 782695* for more details regarding the above products!!!



The D.S.P Enhancement Manual.....

This new fantastic piece of hardware and software is available from Innovated Software. This increases your drive speed and offers many other options such as:

- Increased drive speed by a factor of SIX using the HI-SPEED SIO
- HI-SPEED reading and writing
- Special Lightspeed menu and a DOS system provided
- and the ability to emulate any other drive system
- Also included is the Gremlin Grabber. The best Backup tool on the market

These and many other new innovations are available only using the Plate Enhancement from Innovated Software.

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