MASTER SMART CARTRIDGE.

INTRODUCTION

The MASTER SMART CARTRIDGE (abbreviated to MSC in this manual) was designed by MORLEY ELECTRONICS in conjunction with CARE ELECTRONICS. It is suitable for the BBC MASTER 128 computer only. The MSC simply plugs into one of the Cartridge slots in the machine, and can thus be fitted or removed in seconds.

The MSC can perform many useful functions. The ROM software contained within the MSC has a range of facilities which should appeal to most users, and the options are menu driven for ease of use. The ROM also recognises *COMMANDs, these will be explained later.

Some of the most useful features are:-
Graphics printer dump of screens (Epson compatibles only).
Screen dumps to disc/tape.
Pause facility.
Entire memory save (for subsequent re-loading).
Inbuilt or user *COMMANDs.
The above, and more, can be achieved by simply pressing a button.
Contact addresses:-

MORLEY ELECTRONICS
MORLEY HOUSE
WEST CHIRTON, NORTH SHIELDS
TYNE & WEAR
NE29 7TY
091 257 6355

CARE ELECTRONICS,
800 ST ALBANS ROAD,
GARSTON,
WATFORD,
HERTS.
WD2 6NL
Tel. (0923) 672102
WARRANTY.

The MSC is warranted free of defects in materials and workmanship for a period of one year from the date of purcahase. During this time it will be replaced or repaired free of charge.

MORLEY & CARE ELECTRONICS will not be liable for any injury, loss or damage, direct or consequential, arising out of the use of, or the inability to use, this product. Nor will the above warranty apply if the unit has been tampered with or modified in any way.

MASTER SMART CARTRIDGE.

FITTING INSTRUCTIONS.

With the computer switched off, fit the MSC into one of the two Cartridge slots, ENSURING THAT THE LABEL FACES TOWARDS THE BACK OF THE COMPUTER. Switch on and type *GGTEST (RETURN), whereupon a test will be done on the MSC ROM and RAM. If the checksum matches that shown on the label of the MSC, and the ramtest shows as passed then ignore the rest of this section.

Installation checks:-
The following checks assume that the Cartridge slots on the. computer
are in working order. If in doubt have them tested.

Is the MSC inserted correctly ?
If not switch off and insert correctly (this may prove pointless, because damage may already have been done to the MSC).

Type *ROMS (RETURN) and check the following:-

Is the MSC ROM shown as being present in ROM slot 0 or 2 ?
If not try the MSC in the other Cartridge slot, and if it still does not show up in slot 0 or 2, return the MSC for testing.

Is the ROM slot occupied by the MSC unplugged ?
If so, insert it using *INSERT (remember to press CTRL/BREAK), and repeat the *GGTEST.

Is there another ROM intercepting the *GGTEST command ? If so, prefix the command with an 'M' i.e. *MGGTEST or unplug the offending ROM using *UNPLUG (remember to press CTRL/BREAK), and repeat the *GGTEST.

If the ramtest showed as failed, repeat the test again and if it still fails return the MSC for testing.

If all of the above is in order and it is only the ROM checksum that is incorrect, then please check the version number of the ROM by typing *HELP (RETURN) and check that it is the same as the one quoted on the SMC label. In any event please phone or write quoting the checksum you obtained and we will be able to tell you if such a ROM was ever released. At the time of writing the current version of the software is 2.00

Do not tamper with the MSC, this may invalidate your warranty.

MASTER SMART CARTRIDGE.

OPERATING INSTRUCTIONS.

*COMMANDs. - (OSCLI commands) - (Operating System commands).

If you type *HELP SMART (RETURN) you will see that the MSC as well as showing the version etc. also recognises the following commands:-

GINIT
GMENU
GGDUMP
GGTEST

To help avoid ROM clashes, all of these may be prefixed with an 'M'. Also abbreviations of the above may be used, i.e. *GM. for *GMENU

*GINIT
This command initialises the MSC to its default settings. This is done automatically on power-up, and the command only needs to be issued if for instance the MSC RAM has been corrupted, or the MSC has been installed without switching the computer off.

*GMENU
This command displays a MODE7 menu screen from which the required action of the MSC can be selected. When the required option has been selected use ESCAPE to quit the menu. We will examine the various options available in the next section.

*GGDUMP
This command runs a graphics printer dump routine. It has been included so that the dump can be called from BASIC programs etc. without the need to use the *GMENU printer dump option.

*GGTEST
This command runs a self test routine, which has already been mentioned in the 'fitting instructions' section. It can be used to ascertain whether or not the MSC is operating correctly.

MASTER SMART CARTRIDGE.

OPTIONS AVAILABLE FROM THE MENU.

This section deals with the options available from the menu, this is called by typing *GMENU (RETURN). We will deal with them in turn.

A- SAVE ENTIRE MEMORY.

This saves the entire computer's memory from &0000 to 48000 plus the SHADOW RAM, and some of the MOS private workspace. A total of seven files will be saved, the currently selected filename will be suffixed with the lower case letters a to g inclusive. Files d and e hold the real and shadow screens. To re-load these files simply type *(filename)a or */(filename)a or *RUN (filename)a. As an example suppose the selected filename was GAME. To restart from where it was saved you would insert the disc/tape and type *GAMEa.

When this option is selected you are asked to INPUT a filename. Should you wish the previous setting to remain unchanged simply press RETURN. THIS APPLIES TO ALL USER INPUT, WITH THE EXCEPTION OF OPTION T.

B- SAVE SCREEN MEMORY.

This saves the currently displayed screen to disc/tape. After a screen has been saved, the lower case letter suffix will increment by one. This allows several dumps to take place without re-entering the menu. As an example if the selected filename was SDUMP, the first screen to be dumped would be given the filename SDUMPa, the second SDUMPb, etc. Should the letter try to pass lower case 'z' it will revert to 'a'. Whenever a new filename is INPUT the start letter will be set to 'a'.

C- DUMP SCREEN TO PRINTER.

This dumps the currently displayed screen to a printer (Epson).

D- PAUSE

This pauses the computer. To restart press any key.

E-, F- and G- PATCH1, 2 and 3.

These call address &A700 in the MSC RAM. The only difference is that option E enters with 1 in the A register, F enters with 2 and G enters with 3. It is intended that users' own machine code routines be used in this area. The user code can be entered into the MSC RAM by using the *SRLOAD command. The code must not be loaded below &A700, and must be no more than one page (&100) bytes in length. All registers have already been pushed, and the user code should terminate with an RTS instruction, unless of course you want to take control of the machine.

H- to S- OSCLI (*COMMANDs).

These are inbuilt commands which may prove useful, and will be executed as though they had been typed in at the keyboard. One point to note is that certain computer memory locations are re-installed once the command has been executed. This means that screen output may look a little strange after certain commands have finished. Generally, however, this will correct itself.

T- POKE.

When this option is selected you must INPUT six hexadecimal digits. This is to ensure that you are aware of the address and value being poked. Careless poking may well cause a software crash. One use for this option is to gain extra lives in games. Suppose a game keeps its number of 'lives left' in location &22DF, in a hexadecimal format, then to have say 3 lives you would enter 22DF03 for the six digits. Some useful pokes for games, adventures etc. can be found in the popular micro-computer magazines.

U- USER.

This option allows you to INPUT your own *COMMANDs. They will be executed in the same manner as previously described in options H to S.

V- RUN.

This allows a machine code program/utility to be *RUN from disc/tape. If the program doesn't take control of the computer, doesn't corrupt too much main memory, and ends with an RTS instruction, then a clean exit from the interrupt routine should take place.

W- TOGGLE OUTPUT FILING SYSTEM.

This option allows the output filing system to be selected, pressing the key cycles through the three available options. These are TAPE, DISC and ADFS. The selected filing system will be entered before options A and 8 are executed.

LEAVING THE MENU SCREEN.

Once the required option has been chosen press ESCAPE to leave the menu screen. The MSC is now set-up to perform the chosen option by simply pressing the button located on the top. The current set-up will remain intact even after CTRL/BREAK. The response time to the button being pressed will depend upon what the computer is doing at that precise moment. Generally the button should be pressed and held down for at least half a second. Should no response at all occur try pressing it at a different point in the program.

MASTER SMART CARTRIDGE.

HINTS AND TIPS.

The MSC operates via a non recognised Interrupt Request. Because the processor can be instructed to ignore such interrupts the MSC will not always perform the required task. You may find it responds at some points in a program, but not at others. Also if the MSC control ROM has been disabled, by for instance protected software, then the interrupts generated by pressing the button will generally be ignored. The reason why Non Maskable Interrupts (which cannot be ignored) were not used, is that modifications to the computer's firmware would need to be carried out by the user.

How to transfer from tape/disc to tape/disc:-

Whenever the *GMENU command is issued certain memory locations are stored on the MSC RAM. It is best therefore, that after issuing this command, no major changes to the computer have taken place. By major changes we mean *UNPLUGGING ROMs, adding extra Cartridges etc. It is best to issue the *GMENU command and set-up the required option and filename as well as the output filing system immediately prior to attempting any transfer. Suppose we want to transfer a program called GAZZA from tape to disc, we would proceed as follows:-

Type *GGMENU (RETURN)

Press the 'A' key, INPUT a filename. In this case we will use GAZ, (press RETURN to terminate the input). Next if disc is not currently selected as the output filing system press 'W' until it is, then press ESCAPE to leave the menu. Type *TAPE (RETURN) and CHAIN or *RUN the program called GAZZA from tape. After the ENTIRE program has loaded try to find some suitable point from which to save the computer's memory to disc. (Don't forget to have *a* disc ready in the drive). Such suitable points are generally menu pages, high score tables, or indeed anywhere where the display appears stable. It is best if the screen is not in the process of being scrolled. When a suitable point has been found, press the button on top of the MSC for about half a second, then release it. The disc drive should soon start up and the computers' memory will be saved. You will usually be able to carry on with what you were doing once the save has taken place. To re-run the program from say switch on, you would insert the disc and type *GAZa

It is only possible to re-run saved programs if the MSC is fitted into the computer. If anyone out there cares to modify the re-load code which is held in the first file (in the above example GAZa), then you are quite welcome to do so. Other users may be interested in such a facility. Also should you write any good patch programs we would be interested to hear from you.

Should you wish that the SIDEWAYS RAM be saved with menu option 'A', then after the memory save has taken place, BREAK out of the program and use the operating system *SRSAVE command.

Some programs use unorthodox screen modes and are thus unlikely to be transferred successfully. Also some of the registers which control the VDU display are write only, and are therefore impossible to read, for subsequent re-installment.