THE MASTER RAM BOARD

The MASTER RAM BOARD is the first unit to offer Shadow RAM for the Electron. The screen display of the Electron may use as many as 20000 bytes of memory which is a significant amount considering that the computer offers only 32000 bytes as standard. The MASTER RAM BOARD effectively pushes the screen to one side allowing its entire 32K of fast RAM to be accessed thus allowing HIMEM to reside at 8000 in ANY mode and the speed of the Electron to be comparable to the BBC.

The Master RAM Board is a small unit which fits inside the Electron. This ensures no interference from the numerous add-ons which attach to the rear of the Electron.

It is common knowledge that games will not run with either Shadow RAM or Second Processors, for this reason, a Turbo mode has been designed into the Master RAM Board. The unit is switchable in three modes therefore allowing switching between Shadow, Normal and Turbo. This feature is explained in more depth later on.

Software which is correctly written will now automatically take advantage of the extra shadow memory without any modifications. For example, BASIC programs may be as large as 29184 bytes whilst users of Starword, the Word Processor, will now have 28,956 bytes free in both 40 and 80 column modes.

As well as the extra 20K free for Word Processing, Machine Code and Basic programming, another 12K is free so now making the Electron a 64K machine. The replacement MOS, (as supplied on the Master RAM Board), is structured so that the user may access this extra 12K. For example, the user may wish to use this extra RAM as a 12,000 byte print buffer. See the section on Technical Information for further details.

This section is intended to provide guidance on how best to use your upgraded 64K Electron.

The MASTER RAM BOARD has been programmed with a new MOS which is held in a 16K ROM fitted to the board. This ROM automatically switches out the old Acorn MOS. Three modes of operation are made available viz Normal, TURBO and 64K using the switch located towards the rear of the left hand side of the Electron. Note that when changing from one mode to another it is not necessary to switch off the computer but it is essential to perform a CTRL-BREAK after switching to the new mode. The act of changing modes will cause the computer to crash and the CTRL-BREAK is used to restore the system.

```
Acorn Electron 64K
BASIC
>
```

This indicates that "Shadow Mode" is selected and that programs and text files can now be up to 28K in length. However, programs which write directly to the screen such as the majority of games cannot be run. The operating speed of the Electron is now on a par to that of the BBC.

```
Acorn Electron TURBO
BASIC
>
```

This indicates that the Electron is operating with the normal 32K of memory but now at a speed comparable to that of the BBC. This mode also allows some non mode 7 BBC games to run at a speed whereby the game is as enjoyable as on the BBC. Two good examples are Acornsoft's Aviator and the Mirrorsoft game Strike Force Harrier. You may find that some Electron games also become far faster, for example Hopper and Snapper by Acornsoft and the Martial Arts games are now given a new lease of life. Graphics programs best demonstrate this mode, Slogger's STARGRAPH can now run at up to 300% of its original speed!
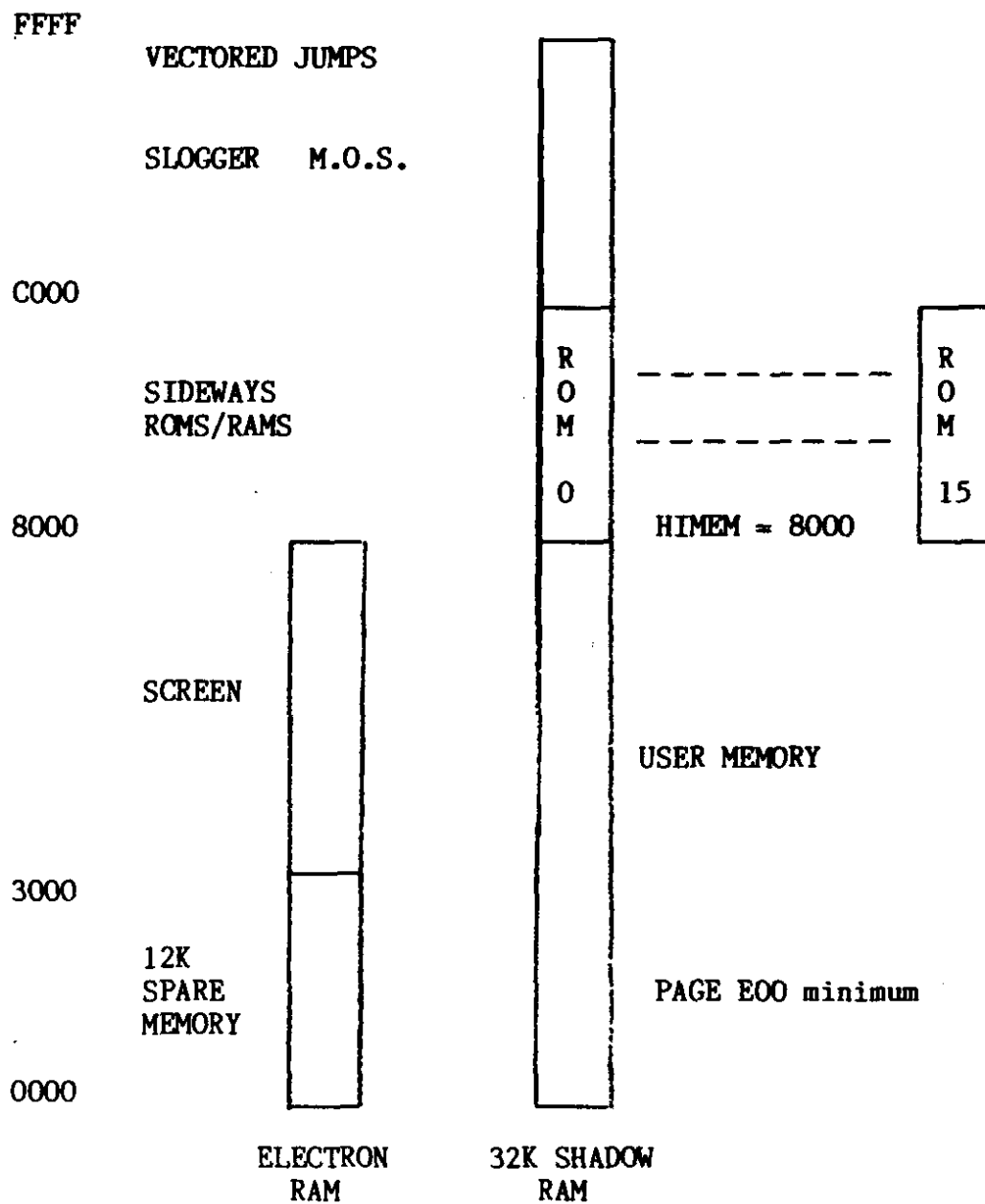
```
Acorn Electron $
BASIC
>
```

This sign-on indicates that the Electron is operating exactly as before the upgrade was performed. This mode is for users who consider games in TURBO mode to be too much of a challenge!

IMPORTANT NOTE

Note that on changing mode programs can not be restored using the
BASIC OLD command.

64k MEMORY MAP

```
FFFF
            VECTORED JUMPS

            SLOGGER   M.O.S.                 R
                                             O
                                             M
C000
                                             0         R
            SIDEWAYS              -------              O
            ROMS/RAMS                                  M
                                             0         15
8000                                      HIMEM = 8000

            SCREEN
                                          USER MEMORY

3000

            12K                           PAGE E00 minimum
            SPARE
            MEMORY

0000

          ELECTRON        32K SHADOW
          RAM             RAM
```

With the Electron running in Shadow mode the Electron RAM,
including screen, is pushed to one side and is totally replaced
by the fast 32K RAM. All programs, either BASIC, machine code
or any other language may use memory through to 8000 with no
interference from the screen.

NEW OPERATING SYSTEM CALL &FBFD

12K of memory or more, depending on screen mode, is free for use
by the user. This memory can only be accessed via a JUMP address
at location FBFD in the new MOS.

Entry Parameters

X,Y contain 16 bit address, X=low byte, Y=high byte
A - Byte to write to memory or byte read from memory
Overflow flag...   Clear = Read
              Set = Write

On exit X and Y registers are preserved, A is preserved on write

Example to read Electron RAM location
                LDX address LS
                LDY address MS
                CLV   , Clear 'overflow' flag for read
                JSR &FBFD

NOTE that locations D6,D7 and D8 in Electron memory zero page are
reserved by the Slogger Machine Operating System and should not
be corrupted.

MASTER RAM BOARD mode can be read using OSBYTE &EF or may be read
directly from location &27F as follows :

00 = Normal
01 = TURBO
80 = 64K

NOTE that with the Acorn MOS this location is always 00