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CHALLENGER COMPATIBILITY LIST

VIEW  
WORDWISE  
WORDWISE +  
REPLICA  
ACORNSOFT ELITE  
MINI OFFICE  
ECONET  
MICROPOWER  
SOLIDISK SIDEWAYS RAM  
ALL SIDEWAYS ROM BOARD  
6502 2ND PROCESSOR  
Z80 2ND PROCESSOR  
ACORN DFS  
BBC +  
VINE MICROS  
AMX MOUSE  
DISC DOCTOR  
MERLIN SCRIBE  
BEEB CALC

## ADDITIONAL NOTES ON THE USE OF CHALLENGER

Challenger disc sub-system incorporates a double sided 80 track disc drive, ¼ MByte of memory upgradable to ½ MByte of memory and a double density floppy disc interface.

The Challenger unit offers the following advantages over alternative RAM disc and disc interface products.

### 1 Fitting

The Challenger unit requires no internal modifications to the BBC Micro computer. No tracks need to be cut and no soldered links need to be made.

Fitting simply comprises the installation of one eprom and the connection of a ribbon cable to the 1 MHz Bus connector and the auxiliary power socket. If Link S9 has been cut at some previous stage, it may be re-connected or alternatively the header supplied with the Challenger may be installed in location IC78.

This is a significant improvement on the fitting requirements of both double density disc interfaces which require a header board to be inserted and alternative RAM disc products which require up to a dozen leads to be soldered into position on the BBC Mother board and also eliminate the use of the User Port. There is no hardware clash with the use of ROM Boards or sideways RAM Boards which may already be installed in the computer, nor is there any clash with any boards designed to increase the memory capacity of the BBC, such as the Aries B20 and B32 boards.

The fitting has been kept simple so that Dept stores & dealers are able to stock and sell the unit knowing that there will be no inherent problems in the servicing of BBC computers with it fitted.

### 2 Disc Interface

Challenger incorporates a double density disc interface employing a Western Digital 1770 floppy disc controller chip, the same type which is used in the BBC B+ Micro computer. This floppy disc interface chip requires no calibration and is not temperature sensitive. Thus eliminating weak calibration and producing a very reliable unit. The software supplied with Challenger is an extended version of the popular Opus DDOS which provides an increasing capacity over conventional Acorn single density of 80% and allows a maximum of 248 files on each surface of a disc, whilst Access speeds are improved by approximately 80%.

DDOS provides a high degree of compatibility with Acorn DFS and features highly sophisticated emulation of the 8271 to provide compatibility with Osword 7F calls

### 3 4 MByte of RAM

The Challenger comes supplied with 256k of dynamic Random Access memory. This memory is paged into the Thread memory area on the 1 MHz bus. The two top locations of the Gem memory area on the 1 MHz bus are used as paging registers. This is the Acorn approved method for adding additional memory to the BBC Micro computer. By using this organisation there is no conflict with any sideways ROM or RAM boards, nor is any use made of the User port. The Challenger unit has been tested with the Aries B20 the ATPL Sideways board and the Solidisc Sideways RAM boards and a number of Sideways ROM and RAM boards. No conflict has been discovered.

NOTE: that because the memory is organised on the 1 MHz bus it cannot be used to store and use sideways ROM based firmware.

Opus recommend the use of the ATPL sideways ROM board or the Aries B32 board for use with Challenger.

In operation the RAM supplied with Challenger is used for two purposes. Approximately 3 KBytes of RAM is used for the RAM workspace required by the disc filing system. This means that PAGE remains unchanged, normally \$E00 if no other filing system is installed. This means that most cassette based software will run directly on Challenger and does not need to be relocated down in Memory after loading at a higher position. It further allows programmes which make the maximum use of memory to be loaded. The remaining 253K of memory is organised as a disc drive and referred to as Drive 4. All the normal filing system disc commands may be used with it including \*LOAD \*SAVE \*COMPACT and \*CAT etc. Similarly the drive is supported by the normal filing system command entry points, such as OS GB TB and Osword 7F. The RAM disc is organised to simulate a disc having 10 sectors/track of 256 bytes/sector, which is the same as a single density Acorn disc. Because the RAM disc emulates a single density Acorn disc drive the file limit is 31 files. If a further 256k of RAM is installed into the Challenger then this is treated as a 255k RAM disc and referenced as Drive 5. Some software is designed always to run from Drive 0 and either Drive 1 or Drive -2. In order to maintain compatibility with such software an additional command has been added to the operating system \*CONFIG, this allows physical drives to be referred to by a different logical number, so drive 4 and 5 may be re-configured to be referenced by drives 0 and 1 in software.

The use of RAM disc provides an increase in file access speeds of between 20 and 25 times that of a standard Acorn DFS. This permits extremely rapid development of software saving interim versions and very fast use of Databases Spelling Checker and File intensive programmes. In one application which involves sorting a database, the time to sort was reduced from 8 hours 32 mins. to less than 11 mins 15 secs. The other effect of having a RAM disc present is to emulate the presence of a dual drive system.

## 3 /cont...

For copying discs the fastest procedure is to take a copy of the disc using the very fast copying routines available under Challengers filing system onto a RAM disc. The disc may then be changed and the files copied from the RAM disc back onto the new disc. For making multiple copies this software version is approximately twice as fast as a normal copying routine.

4 The Disc Drive

Challenger comes equipped with a half height double sided 80 track disc drive of the latest technology. The software supplied with Challenger enables this disc drive to be used in both 40 and 80 track modes and may be set to automatically recognise the type of disc present.

In single density mode the format of the disc is exactly that used by the Acorn DFS providing a capacity of 200 KBytes per surface and up to 31 files per surface.

In double density mode the capacity of the disc drive is 360 KBytes per surface, 720 KBytes for the drive and up to 248 files may be stored on each surface of the disc. In double density mode the data transfer speed is approximately 80% greater than single density mode.

5 Use of the Challenger with Other Disc Filing Systems

A Challenger may be used with other disc filing systems installed, and may be selected by holding down the 'C' key, whilst typing the BREAK key, or by typing \*C DISC. All commands and utilities may be selected by preceding them with 'C'. If it is required to switch between Challenger and another disc filing system without causing a 'BREAK', then the Challenger ROM should be installed at a lower priority than the ROM for the other disc filing system. On power up the alternative filing system will be selected; when the Challenger filing system is required enter \*C DISC. All the Challenger commands may now be issued with or without preceding them with 'C', however the utility commands which are present in both filing systems, eg \*LIST, \*TYPE, \*BUILD etc, should be preceded by 'C' to force Challenger's own utility to be selected. This is to prevent memory conflicts where the alternative filing system uses memory it has not got assigned. An alternative to this approach is to disable the alternative disc filing system ROM, using one of the ROM management programs which are on the market, or by putting a 0 in the corresponding location in &DFO to &DFF.

If only occasional use is required of the alternative disc filing system, and there is no need to change filing systems under program control, or without a BREAK, then it is recommended that the alternate filing system is installed at a lower priority than the CHALLENGER ROM. The alternate filing system will be selected by holding the 'D' key down whilst striking the BREAK key. When both filing systems are installed, PAGE and OSHWM will be the same as they would be if Challenger was not installed.