CPC Universal 512K Ram Expansion RC-3-Camel Release Notes

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Summary

This is a universal 512K RAM expansion card for all Amstrad CPC models.

The board has an 'M4' connector so requires a suitable motherboard or adapter to mount on the CPC.

On the 6128 and later computers the board provides a full 512K RAM expansion following the DK'Tronics/Amstrad specification.

On 464 and 664 computers the board will provide either

- a full 512K RAM expansion with the same limitations on mode C3 which the DK'Tronics and other available '464 RAM cards have (e.g. X-MEM, Zaxon), or
- a slightly smaller 448K expansion with full CPC6128 compatibility in mode C3, where one 64K banks is given up and used to shadow internal RAM.

Release Notes

RC-3-Bulldog is the third release candidate for alpha testing.

This is a very minor change which changes adds a resynchronizer for the reset signal, changes FF resets from asynchronous to synchronous, reverts to prioritizing area over speed for synthesis, and fixes a number of outdated comments in the verilog code.

The DIP Switches work identically to the settings in RC-2-Bulldog

DIP	Function
1	ON selects 464 mode which overdrives RD_B and ADR15 as required, OFF selects 6128/Plus mode
2	turns on shadow memory

3	selects partial shadow memory for mode3 only (OFF), or full shadow memory (ON) using SRAM instead of CPC base RAM for all addresses.
4	selects shadow memory bank as low bank 3 (OFF) or high bank 7 (ON).

When setting DIP4 be careful because the DK'Tronics Silicon Disk software does not do a good check of the memory available. SDISC will declare banks 4-7 available for the disk even if DIP4 is set ON which effectively means that bank7 is not available.

NB - for DIP switches 3 and 4 to take effect you need to power cycle the CPC. These switches are read and latched only on startup.

Recommended DIP settings in this release candidate are

Config.	**DIP1**	**DIP2**	**DIP3**	**DIP4**	**Application**	**Comment**
1	OFF	OFF	OFF	OFF	6128 or Plus computers	Disable overdrive and shadow memory and provide a full 512K expansion
2	ON	ON	OFF	OFF	464 or 664 computer using DK'Tronics silicon disk	Provides a 448KB extension which can be used as a 256K silicon disk + a 192K RAM expansion
3	ON	ON	OFF	ON	464 or 664 computer not using DK'T silicon disk	Provides a 448KB extension
4	ON	ON	ON	OFF	464 or 664 computer using DK'Tronics silicon disk	Provides a 448KB extension which can be used as a 256K silicon disk + a 192K RAM expansion using full shadow memory so that all memory reads always come from the SRAM
5	ON	ON	ON	ON	464 or 664	Provides a 448KB

5	ON	ON	ON	ON	464 or 664 computer not using DK'T silicon disk	Provides a 448KB extension, using full shadow memory so that all memory reads always come from the SRAM
6	ON	OFF	OFF	OFF	464 or 664 computers	This is the true DK'Tronics mode which does not fully support mode C3 in the same way as on the 6128, but does provide a full 512K expansion and for most purposes is sufficient - see the results table below.

Other configurations are possible, but not currently tested or recommended.

Note when running a 464 in configurations 4 or 5 (full shadow memory) the base RAM of the CPC is only ever used for video data. Thus this card can potentially revive dead CPCs which have faulty base RAM with the only proviso that any faults in video RAM will result in visible pixel corruption on screen. Full shadow mode has been tested with Gerald's RamTest ROM - see below.

Testing Results

Several cards have been tested now using 3 different CPCs: 1x CPC464 and 2xCPC6128s

Full tests have been run at 4.5V, but some additional tests have been run in the voltage range 4.25V through 5.5V.

Full Test results are visible on Google Sheets here (see the RC-3-Camel Tab)

https://docs.google.com/spreadsheets/d/11wxhIDWy2wNmKSXZwBqjqQjMN2nNZDtILEvy6_GrM8I/edit?usp=sharing

Power Consumption

See RC-2-Bulldog release notes for last power measurements