CPC Universal 512K Ram Expansion RC-4-Dolphin 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 bank is given up and used to shadow internal RAM.

DIP switches can be used to configure the device so that the new RAM is mapped either to IO port &7Fxx or &7Exx. Thus two cards can be used together to create a 1MB expansion, or the card can be used either with an X-MEM or Y-MEM to achieve the same 1MB expansion together with 512KB of Flash ROM from the X/Y-MEM card.

Release Notes

RC-4-Dolphin is the first release candidate for beta testing.

The main change in this release candidate is the additional decoding to allow the 512K RAM to appear either at IO Address 7Fxx or 7Exx. This allows two RAM cards to work together to provide a 1MB expansion. It also make the card compatible with the existing X-MEM and Y-MEM cards from ToTO. Selection of IO Port address is controlled by the DIP switches and this has necessitated recoding all the combinations.

- **DIP Switch settings are totally different in this build compared with previous releases.**
- **DIP switches 3 and 4 to take effect you need to power cycle the CPC. These switches are read and latched only on startup.**

The new DIP settings and effects are listed below

Config	DIP 1234	464/Z80 overdrive	Port	Shadow/ Bank	Compatibility X-MEM	Y-MEM	RAM	C3 Mode
0	0000	OFF	7Fxx	None/x	No	Yes	512KB	AMS
1	0001	OFF	7Fxx	None/x	No	Yes	512KB	AMS
2	0010	OFF	7Exx	None/x	Yes	No	512KB	AMS
3	0011	OFF	7Exx	None/x	Yes	No	512KB	AMS
4	0100	ON	7Fxx	None/x	No	Yes	512KB	DK'T
5	0101	ON	7Fxx	None/x	No	Yes	512KB	DK'T
6	0110	ON	7Exx	None/x	Yes	No	512KB	DK'T
7	0111	ON	7Exx	None/x	Yes	No	512KB	DK'T
8	1000	ON	7Fxx	Partial/lo	No	No	448KB	AMS
9	1001	ON	7Fxx	Partial/hi	No	No	448KB	AMS
10	1010	ON	7Exx	Partial/lo	Yes	No	448KB	AMS
11	1011	ON	7Exx	Partial/hi	Yes	No	448KB	AMS
12	1100	ON	7Fxx	Full/lo	No	No	448KB	AMS
13	1101	ON	7Fxx	Full/hi	No	No	448KB	MAS
14	1110	ON	7Exx	Full/lo	No	No	448KB	AMS
15	1111	ON	7Exx	Full/hi	No	No	448KB	AMS

In the table above, the compatibility columns show the settings which can be used with an X-MEM or Y-MEM to get a total of 1MB RAM expansion.

Recommended (and tested) configurations for the RAM card on its own are

- 0 for CPC6128 providing standard 512KB expansion
- 4 for CPC464 providing standard 512KB expansion with DK'Tronics C3 mode
- 8 for CPC464 providing standard 448KB expansion with Amstrad C3 mode

Using the RAM card in pairs or with X-MEM/Y-MEM

To use two RAM card in pairs to get a 1MB expansion, one card must be set up to map memory to IO Port &FFxx and the other to IO Port &FE00. Further, both cards should be set up with the same shadow RAM arrangement: ie both using no shadow RAM, both using partial shadow RAM or both using full shadow RAM.

Similarly, when using a RAM card with X-MEM or Y-MEM the RAM card needs to have DIP switches set so that the memory IO port don't clash.

- X-MEM maps memory to IO port &FFxx so set the RAM card DIP to select &FExx
- Y-MEM maps memory to IO port &Fexx so set the RAM card DIP to select &FFxx

Note when running a CPC464 in configurations 12-15 (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 on both CPC464s and CPC6128s

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-4-Dolphin Tab)

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