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# Z88

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## *Memory Cards*

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The Z88 uses three types of plug-in memory card, RAM, EPROM and ROM. RAM cards are for expanding the amount of immediately available memory. EPROMs are for long-term recording of important data. ROM cards are used for external applications and extra help text.

# RAM

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The Z88 has 32K of built in RAM (Random Access Memory) of which about 20K is free for use. This may be increased by adding extra RAM cards in the slots along the front. There are three slots, each of which may take upto 1 Megabyte of RAM although it is advisable to use slots 1 and 2 for RAM leaving slot 3 available for EPROM. This is because slot 3 is the only one which can be used to record data onto EPROM. Also RAM cards will consume more power in this slot than in slots 1 and 2 and therefore reduce battery life.

## Inserting a RAM card

- 1) Make sure that the Z88 is switched ON and the INDEX is displayed.
- 2) Open the perspex flap at the front, the Z88 will give a short beep and the screen will go blank.
- 3) Push the RAM pack into the slot making sure that the label is facing outwards and is the correct way up. Make sure that the card is pushed in as far as it will go.
- 4) Close the flap. The Z88 will turn itself back on and re-display the INDEX. You can check that the card has been recognised by typing <>CARD.

If you remove a RAM pack from the Z88 any data held in it will be lost instantly. Do not remove a RAM card unless you must. If you do have to remove a RAM card, the Z88 will display 'FAIL' in the top right hand corner of the screen. You will have to perform a soft-reset on the Z88 and any suspended activities will be lost.

# ROM

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ROM cards are used to contain extra data or applications programs such as databases, communications program or spelling checkers.

The procedure for inserting a ROM card is very similar to that for inserting a RAM card. First turn the Z88 ON and enter the INDEX. Open the flap and push the card into a free slot. Close the flap. The Z88 will take note of the new card, check this by typing <>CARD from the INDEX.

To remove a ROM card the Z88 must once again be ON and you must be in INDEX. You must not have any suspended activities which are making use of the card. To check this look at the list of activities on the display and see if any of them have a number in the rightmost column. If they do, and this is the slot number which holds the card in question, then that activity must be killed (using <>KILL) before the ROM card is removed.

If you remove a card that is in use the Z88 will sound a warning when you close the flap and display the symbol CARD at the top right of the screen. You must then replace the card in the same slot that it came from and kill all remaining activities.

If you remove a card whilst you are not in the INDEX the Z88 will sound a warning when you close the flap and display the symbol INDEX at the top right of the screen. You must return the card to the original slot, close the flap and return to the INDEX. You will then be able to remove the card normally.

Do not remove ROM cards while the Z88 is switched OFF.

# EPROM

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EPROM cards can only be used in slot 3. They are designed to be used for long-term storage of important data or programs. Unlike RAM, EPROMs will retain information even when removed from the Z88. Thus, in addition to providing a means to make back-up copies of valuable data, EPROMs provide a convenient means for transferring data between Z88s.

One important fact to note about EPROMs is that data cannot be changed once it is recorded into them. If you record a file onto EPROM and then make some changes you will be able to record a complete new copy of the file but this will use up more space within the EPROM. The space occupied by the original version will not become available again. When an EPROM becomes completely full in this way you will only be able to re-use it by erasing ALL the data which it contains. EPROMs cannot be partially erased.

EPROMs may be inserted or removed at any time, except when they are actually being read or written to. They do not consume much power except when being written to, at which time the Z88's screen will be switched off to conserve power.

Note – It is important to remove any EPROM card from the Z88 if you have to re-power a Z88 which has been left without power. Otherwise there is a small risk that data on the card may be corrupted. If the EPROM becomes corrupted it will need to be fully erased and all the data will be lost.

# Using Extra RAM

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When you insert a RAM card the extra memory space which it provides will be instantly available to activities such as Pipedream. However, files which are saved in RAM must be specifically directed either to the original internal memory or to the extra memory provided by the card. For example, if you insert a RAM card in slot 1, in order to cause it to be used for files you will need to alter the default device setting in the Z88's Panel utility.

To do this enter the Panel utility by typing  
[J]S

Then move the cursor to the default device and change the value to  
:RAM.1

Any new activities which you start will then save their data in the new RAM card.

Existing activities will still save data files in the old RAM. To cause an existing activity to use the new RAM, go into it and then enter the filer by typing [J]F. Use the select device option to select the new RAM card and then return to the activity by pressing ESC.

If you have RAM cards in more than one slot you may wish to save files to each of them explicitly. To do this you should use the device name :RAM.1/ or :RAM.2/ when specifying the filename where the number refers to the slot in which the RAM card has been placed. The original memory of the Z88 can be referred to as :RAM.0 in all cases.

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