

R O M B O

8 SOCKET ROM BOARD

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for the

AMSTRAD CPC464. CPC664 and CPC6128

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1. INSTALLATION

NOTE: The power to the computer must always be turned off whenever **ANY** alterations are made, either to the connection of the board or for the installation or removal of Roms.

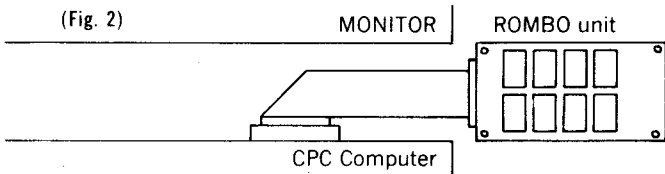
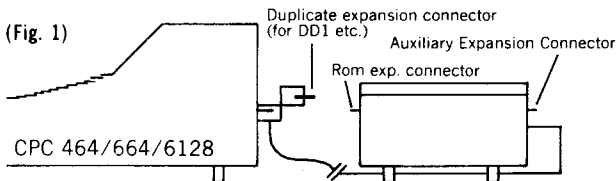
There are three separate stages to installing a ROMBO.

1. Connecting the ROMBO to the computer.
2. Fitting the Roms into the ROMBO.
3. Selecting socket numbers and Setting the DIP switches.

1. Connecting the Rombo.

The Rombo is connected to the computer by a short length of flat ribbon cable which serves the purpose of ensuring a 'wobble' free connection and convenient positioning. The board may be located either directly behind or to either side of the computer.

The cable should be connected to the expansion bus, marked 'EXPANSION', on the back of the computer in such a way that the cable exits from the bottom of the connector. The board may then be positioned so that the cable passes under it, with the Rombo end on (See fig. 1), or alternatively it may be positioned sideways by putting a 90 degree twist in the cable (See fig. 2).



A duplicate expansion connector is provided immediately above the original one on the computer and a second auxiliary one, on one end of the Rombo box. Either of these may be used for the connection of other peripherals, but CPC464 owners should note that if they use a DDI disc drive interface, this will almost certainly need to be attached to the duplicate connector as it will not work correctly if separated from the computer by lengths of cable.

2. Installation of Roms in the ROMBO.

Care should be taken in selecting the sockets to be used when installing a Rom. The section on 'Roms in general' should be studied for details of any restrictions or conditions.

Before inserting any Roms into the sockets it is important to make sure that the legs on the Rom are straight and parallel. It may be necessary to straighten them a little to ensure that they fit easily into the socket and this should be done by carefully holding the centre of the Rom without touching the legs and pressing the side of the legs against a flat surface.

The Rom should be positioned over the socket, making sure that the notch at one end of the Rom is towards the top edge of the board (The top edge is the one in line with and nearest to the DIP switches). Check carefully that all the legs of the Rom are positioned correctly and push the Rom carefully, but firmly into the socket.

3. Selecting the socket numbers and setting the DIP switches.

The ROMBO can be set either as sockets 0 to 7, or 8 to 15. There are three pins, marked LINK on the inlay diagram, which determine which range is selected. A small link is provided and should be used to connect the centre and right hand pins for sockets 0-7, or the centre and left hand pins for sockets 8-15.

There may be certain advantages for CPC664 and CPC6128 users to set the sockets up as 8-15, but if there is any doubt, the section below on 'Rom socket selection' should be read first.

After installing a Rom it is necessary to set the appropriate DIP switch to the ON position, to activate the Rom socket. The DIP switches are the row of eight small switches positioned towards the top right hand side of the board. The rule is that the DIP switch should be ON if a socket is occupied and OFF if it is empty. The diagram in the lid of the box shows the numbering of the sockets. A small screwdriver is useful for altering the switch settings.

NOTE: The switches are numbered from 1-8 by the switch manufacturer, whereas the sockets will either be configured as sockets 0-7 or 8-15, depending on which has been chosen. Therefore, if the sockets are configured as 0-7, it will be found that the first switch (numbered 1) will actually be controlling socket 0 and so on. It may be less confusing to count along the switches rather than use the numbers printed on the switches.

Removal of Roms from sockets.

The power supply to the computer should be switched off before any attempt is made to remove a Rom. Special tools are available for the removal of Roms, but they are expensive and they can be removed quite easily by carefully levering the Rom out of its socket with a small screwdriver. Care should be taken to avoid levering on the side of the box, to avoid damage to the box and the Rom should be prised up, keeping it as level as possible. When it is loose in the socket, it can be lifted out. Finally the DIP switch for that socket should be moved to the OFF position.

2. ROMS IN GENERAL

The CPC range of computers permit the use of ROM software and an increasing number of ROM based programs are becoming available.

The main advantages of ROM software are convenience (instantly available at all times) and the fact that they occupy virtually none of the memory of the computer, leaving more space available for data and other programs.

Most of the software available at the present time can be categorised as being either Utility, Applications, or Communications software. Some examples of Utility software are programs which extend the range of Basic commands, or provide disc editing facilities. Applications are programs such as Word Processors or Machine Code Assemblers, whilst Communications programs provide the facility to transfer data between computers, access Bulletin Boards and databases such as Prestel.

On occasions both the words ROM and EPROM will be seen mentioned. To the user they are effectively the same thing, the difference being that an Eprom can be erased with an ultra violet light eraser and re-programmed with a special programmer, whereas a Rom, once programmed, cannot be erased. As far as the ROMBO is concerned, there is no difference between them and either can be used.

Either 8 or 16K Roms may be used and the Amstrad specification specifies the 'fast' 200nS type. The circuitry of the ROMBO has been designed to permit the use of the more readily available 'slow' 250nS Roms as well.

Roms on the Amstrad can take one of three forms and it is important to understand the differences when deciding which sockets to use.

1. Foreground ROMS.

These are programs which take over complete control of the computer. The Basic ROM, which is part of the computer, is an example of a foreground ROM. It controls what happens and can call on other Roms to carry out extra tasks, such as controlling the disc drive.

2. Background ROMS.

These are programs which are always available for use, either on their own, or by other programs. Most utility Roms are background Roms, as they are required to be available at any time. The CP/M ROM which controls the disc drive on the CPC range is an example of a background Rom. It does not do anything until called into action, most commonly by the Basic foreground Rom, but also by any other Rom or program which requires access to the disc drive.

3. Extension ROMS.

These are used for the purpose of extending the space available for a program which is too big to fit onto one Rom.

3. ROM SOCKET SELECTION

The Amstrad CPC range of computers are capable of utilising an extra 252 sideways Roms in theory, though the realistic maximum is far less, for a number of reasons. Firstly, the computer's power supply would be incapable of supplying the needs of so many Roms, though it is quite capable of supporting a considerable number and secondly the amount of memory required to initialise so many Roms would be unacceptably high.

There are a number of rules that must be obeyed when deciding which sockets are to be selected and the rules for the CPC664 and CPC6128 are slightly different from those for the CPC464.

The BASIC Rom is automatically allocated to the first available empty Rom select number, whilst the CP/M (Disc drive) Rom is always allocated to 7.

Only one Rom may be allocated to each Rom select number, so care must be taken not to install a Rom in a socket which has already been allocated to another Rom, even if that Rom is not actually fitted to the ROMBO. For example, if a disc drive is installed, it uses select number 7 and this socket must not be used on the ROMBO, as th Rom is already present, either in the disc interface, or on the main circuit board. The same situation can apply with peripherals which may have their own Rom software, such as an RS232 interface.

CPC664 and CPC6128

There are few restrictions on what type of Rom can be used in which socket

1. **Only a foreground Rom may be used in socket 0. Normally socket 0 will be empty, in which case BASIC will be allocated to it. If a foreground Rom is installed, then when the computer is switched on, it will automatically utilise that program instead of BASIC. BASIC will automatically be allocated to the next empty socket. This may be useful either for an alternative language Rom, or a 'Rom management' Rom.**
2. **Sockets 1 to 15 may be used for any type of Rom. There is no requirement for sockets to be used consecutively and foreground and background Roms may be mixed. The only restriction is that an extension Rom must be located in the socket number immediately above its 'parent'.**
3. **Sockets 16 to 252 may only be used by foreground Roms and these must be installed in consecutive sockets. It is not permitted to leave any empty sockets.**

CPC464

The restrictions on the use of Roms with the CPC464 are slightly more complicated than for the other models.

1. Only a foreground Rom may be used in socket 0. Normally socket 0 will be left empty, in which case BASIC will be allocated to it. If a foreground Rom is installed, then when the computer is switched on, it will automatically utilise that program instead of BASIC. BASIC will be allocated to the next empty socket. This may be useful either for an alternative language Rom, or a 'Rom management' Rom.
2. Sockets 1 to 7 may be used by any type of Rom but there must be no empty sockets prior to a foreground Rom, or else it will not be initialised. Background Roms may be used in any of the sockets 1 to 7 and will still be initialised, even with empty sockets in lower select positions. Any extension Roms must be located in the socket immediately higher than their 'parent' Rom.
3. Sockets 8 to 252 may only be used by foreground Roms and they must be located in consecutive sockets.

Selecting the order of Roms.

It is worth giving some consideration to the order in which Roms are to be installed, to ensure that the maximum use and benefit can be gained from them.

1. Some programs require that they are installed with a select number lower than that of a program that they work in conjunction with, whilst others, often utilities, require that they have a select number lower than the CP/M disc Rom, so that they can intercept calls to the CP/M Rom before they get to it.
2. CPC664 and CPC6128 users who have a number of accessories which have their own Roms, such as RS232 Interfaces might consider it preferable to configure the sockets as 8-15, in order that all the ROMBO sockets may be used, but care should be taken to ensure that none of the Roms require to be positioned with a number lower than 8. See item 1 above.
3. Occasionally there may be a clash of Rom command names between Roms, in which case it may be preferable to allocate the lower select number to the Rom which contains the command used most frequently.

4. FURTHER EXPANSION AND ACCESSORIES

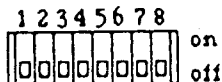
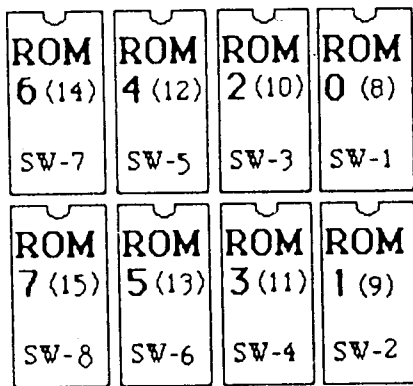
It is possible to add a second ROMBO to the computer to permit the use of more Roms and this can be done simply by connecting the second board to either of the duplicate expansion connectors. The second board must be set with the sockets selected as the other bank of sockets from the ones selected for the existing board.

In addition to the duplicate expansion connectors already described, the ROMBO also has another, smaller, expansion connector. This duplicates the connections to socket 1 (or 9) on the ROMBO and has a number of uses.

An accessory board is available which plugs on to this connector and contains a ZIF socket. Zero Insertion Force sockets permit the easy insertion and removal of Roms, enabling users to swap Roms quickly and without effort. The ZIF board may be particularly useful for CPC464 owners who are only able to utilise sockets 1-7 for background Roms. Users should note that Roms must not be inserted or removed whilst the computer is switched on.

A Sideways RAM board is also available, providing 16K of sideways RAM. The primary use of this is for the development of Rom software, as it permits dynamic debugging of Rom Based routines, without the need to repeatedly 'blow' and erase Eproms. A write protect switch is provided on the board.

REMEMBER - DAMAGE may be caused by inserting or removing ROMS with power on, OR inserting ROMS the wrong way round.



ROM SELECT



ROMBO - 107 Raeburn Rigg, Livingston, EH54 8PH.