Scan-Light Supplement

Fitting instructions and hardware details

For Mitsubishi MH105AG and MH216CG scanners

Computer Concepts Ltd

Contents

Introduction

This supplementary leaflet should accompany the main Scan-Light Plus manual. It describes the installation of the expansion board in an Archimedes and a BBC A3000 computer.

The accompanying Scan-Light Plus manual details the operation of the software. Since the software is general purpose and is designed to work with a variety of scanning and digitising hardware the main manual does not cover any particular hardware. This leaflet therefore covers the particulars of the hand-held scanners supplied by Computer Concepts.

Installation in A310,410,420,440,540 machines
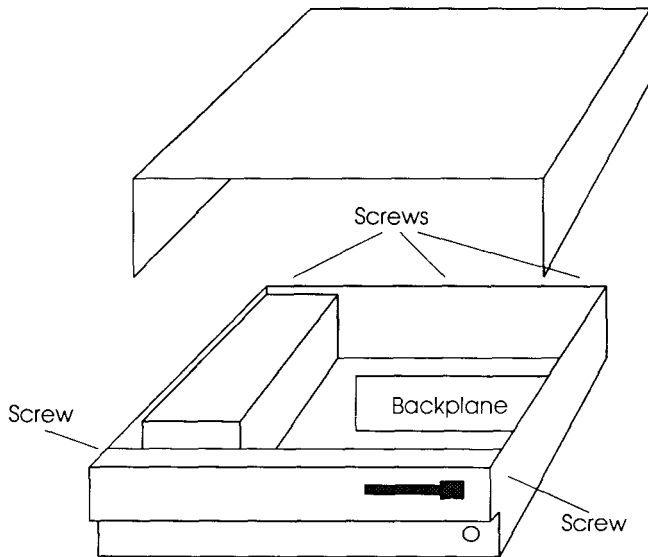
Caution!

Whilst no special skills are required to fit the Scan-Light expansion board, the suppliers can accept no responsibility for any damage that may result from incorrect installation. If in doubt, consult you local dealer or supplier.

The only tool required is a No.2 cross-head screwdriver.

1) Disconnect the power lead and all peripherals.
2) Remove cover from case. This is secured to the main unit by five screws, one on each side of the case and three along the rear of the machine. Remove all five screws. The cover should then slide back off the computer.
3) Ensure a backplane is fitted. This is a vertically mounted circuit board, positioned approximately half-way across the main circuit board. It provides two or four sockets into which expansion boards may be fitted. This should be factory fitted on all 410, 420, 440 and 540 machines although some older 300 series machines (305 and 310) may not include one.

Expansion board positioning.

With no expansion boards fitted, the rear panel of the main unit consists of three metal blanking plates, each secured to the case by screws at both ends.

The lowest plate (containing various sockets) is secured to the main circuit board and should not be removed during expansion board installation. The upper two plates are temporary fitments that are removed when expansion boards, such as the Scan-Light board, are installed.

The Archimedes rear panel, indicating possible expansion board positions. A two-way backplane will only have positions 0 and 2 available
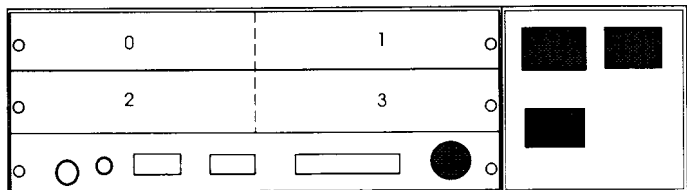
One standard width expansion board occupies half the width of the back panel. The numbers 0...3 on the diagram above indicate the positions in which expansion boards may be fitted. With a two-socket backplane only positions 0 and 2 are available.

If the Scan-Light expansion board is fitted adjacent to another board, their rear panels should be bolted together after installation. However, if no adjacent board is present, the

half-width blanking plate supplied should be screwed to the Scan-Light rear panel.

Fitting the Scan-Light expansion board.

Unscrew and remove the chosen blanking plate from the rear of the case. The Scan-Light board should be fitted into any position, whichever suits the user.

The Scan-Light expansion board may now be inserted (usually from the rear) and, whilst held horizontally, pushed into a corresponding backplane socket. The backplane is supported by a strong metal bar; however it is advisable to support it with one hand whilst pushing the expansion board into place with the other hand.

Secure the expansion board and replace any screws that may have been removed from the blanking plate, ensuring that the Scan-Light expansion board is screwed to an adjacent expansion board or the supplied half-width blanking plate.

The Scan-Light board is now fitted ready for initial testing. Replace the cover by sliding it back onto the computer from the rear. Replace the five securing screws.

Initial testing

Re-connect any peripherals and the power. There is no need to connect the scanner at this time. Turn the power on in the usual way. The computer should give the usual start-up bleep. If the computer fails to bleep at this stage, refer to the section entitled 'If problems occur...' at the end of this chapter.

Assuming the machine starts correctly, list the details of the expansion boards fitted by entering the following 'star' command. If your machine starts in the desktop it is possible to enter a star command by pressing f12.

*PODULES   and press Return

This will display a list of the expansion boards fitted into the computer, and their positions from 0 to 3. The list should include 'Scan-Light' or 'Scan-Junior'.

Installation in A3000

The Archimedes A3000 cannot be used with the normal external expansion board, since the this computer does not provide a 12v power supply needed to drive the scanner. Unlike the A3000, the Archimedes 300 and 400 series machines provide 12v internally and so do not required external adaptors.

The internal version of the Scan-Light expansion board should be supplied with an additional external 12v mains adaptor, which plugs into the back of the expansion board.

Warning!
Whilst no special skills are required to fit the Scan-Light expansion board the installation can be quite fiddly. Computer Concepts can accept no responsibility for any damage that may result from incorrect installation. If in doubt consult you local dealer or supplier.

Warning!
Disconnect the A3000 from the main before attempting to fit the Scan-Light expansion board.

Opening the A3000
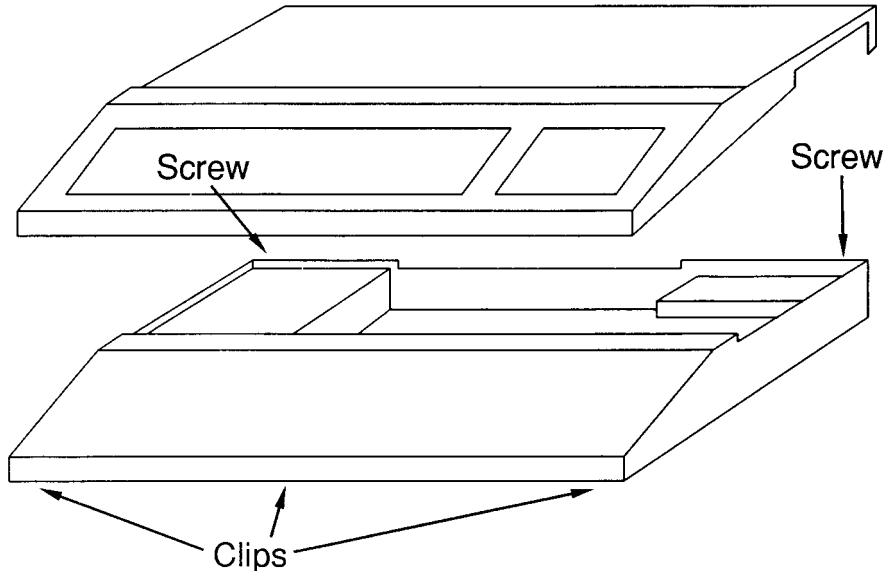
Screw

Screw

Clips

The cover can be removed by undoing two screws at the rear of the computer and unclipping three retaining clips at the front of the computer.

The clips at the front can be quite awkward to undo. In cross section the front clips look like this.

A3000 cover

Front

Rear

Insert screwdriver
and twist
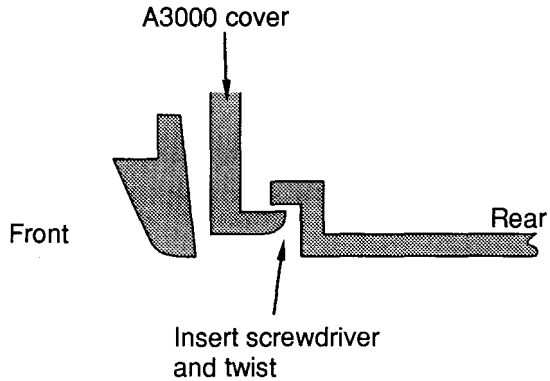
It has been found that inserting a flat headed screwdriver and twisting is the best way to unclip each fastener. Once all three have been unclipped, the front of the cover can be gently lifted.

The two screws at the rear also hold two clips in place. Once the screws have been removed, and the front of the cover lifted, the clips at the rear can be pushed in and the cover completely removed from the computer.

Fitting the Scan-Light board

Once the cover has been removed it should be a simple matter to remove the blanking plate held by two screws from the rear panel of the computer.

The Scan-light board has three rows of pins that should be inserted into matching rows of sockets on the main circuit board. When pushing the board into place it is vital that the pins are correctly positioned in their respective sockets. See the diagram on the following page.

Once the board is in place its back plate can be screwed into the back panel of the A3000.
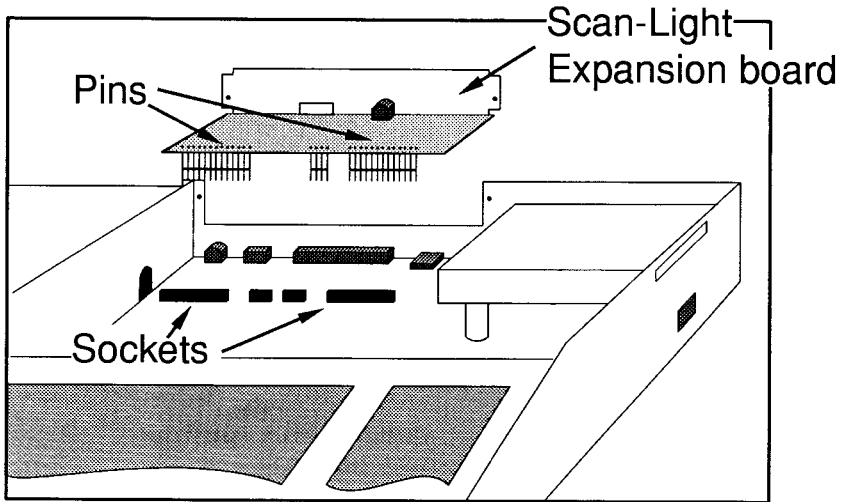
Once you are sure the board is correctly fitted, the cover of the A3000 can be replaced and clipped back into position. The front clips should quite clearly snap back into the original position by firmly pushing the two front sections together.

The unit is now ready for initial testing. Refer to the appropriate heading on page 3.

If problems occur

All boards are tested before despatch so problems should be rare. However, if there are problems then check the following:

That the backplane is correctly installed and working.

That the podule is fully inserted into the backplane socket.

That the commands have been accurately entered.

If things still do not work then it might be worth trying the Scan-Light podule in an alternative backplane socket.

If this still does not solve the problem then contact Computer Concepts providing details of the test and results.

The scanner connection

The scanner plugs into the appropriate socket on the back of the Scan-Light expansion board.

NEVER connect or remove the scanner from the expansion board while the computer is switched on.

The scanner is shipped in a protective anti-static bag within polystyrene mouldings. Be sure to keep the packaging and use it to protect the scanner from electrostatic or mechanical damage whenever the scanner is to be transported.

The scanner is made using precision electronic and mechanical components. Be careful not to drop it or to subject it to strong shocks. Avoid using the scanner in places that are unusually dusty or humid.

The scanner 'sees' images through a glass panel so be sure not to place finger prints on it. The panel can be wiped with a suitable anti-static cloth as used on spectacles, or a damp cloth.

Avoid scanning over dirty surfaces since the roller may collect debris which can eventually get inside the mechanism. Do not take the scanner apart since this will void any warranty.

The A3000 provides no 12 volt power to drive the scanners and so Scan-Light A3000 is supplied with an additional external power supply. This should be plugged into the power socket at the rear of the A3000 Scan-Light expansion board.

Scanning

Memory requirements

Scanned images can require a very large amount of memory. A full A4 page at 400 dpi on a monochrome scanner would need about 2Mbytes of RAM and so obviously this is not possible in any machine with only 2Mbytes or less. Grey-scale scanners require even larger amounts of memory. For example an A4, 256 grey-level 300 dpi scanner would need 8Mbytes of RAM for a full page scan. However this sort of resolution and number of grey-levels is rarely, if ever, required, but it does illustrate that for higher quality images large amounts of RAM can be required.

Lower resolutions require correspondingly less memory and, of course, with hand held scanners it is possible to scan only the required portion of a page. Scan-Light Plus also has the ability to crop images prior to saving on file, thereby throwing away parts of the image not required.

The following sections describe the procedure for scanning for each of the different scanners that can be fitted to the Computer Concepts Scan-Light boards. The model of the scanner should be indicated on or under the scanner.

The basic procedure for scanning is described in the main Scan-Light manual. The following sections assume the expansion board is installed and working.

Loading the Scan-Light Plus Software

The Scan-Light Plus application should be provided on a disc accompanying the scanner package. This can be copied in the normal manner to other discs and, indeed, it is recommended that a back-up of the program is made in case the main disc becomes corrupted.

The Scan-Light Plus software will not function without a scanner expansion board being installed in the computer.

The program can be started in the normal RISC OS manner by double clicking on the icon. Once installed a new scanner icon (representing a flat-bed scanner) should appear on left of the icon bar.

Selecting the correct scanner

The Scan-Light application is supplied with drivers for a variety of different models. It is vital that the correct driver is selected for the particular scanner attached to the computer.

Clicking on the scanner icon on the icon bar should display the following dialogue box. This is the main scan dialogue and is described in detail in the main manual.
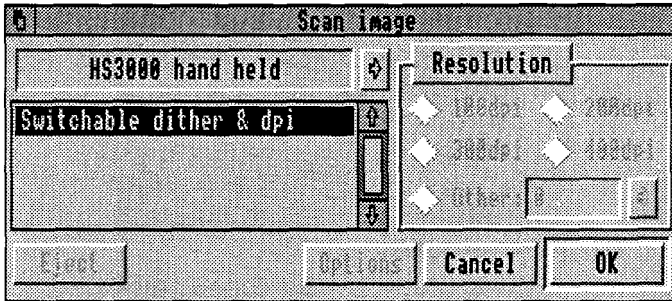
Initially it shows the HS3000 model selected. By using the menu mouse button over the model name, a list of alternative scanners will be displayed that may include any of the following:

Check the model number of the scanner attached to the computer and select the correct option. The model number should be shown on the top or underneath the scanner itself.

Brightness

All the scanners have a thumb-wheel brightness adjustment. This can be set as required to obtain the best possible brightness range or to compensate for too-dark or too-light pictures.

As a rule of thumb the brightness control should be adjusted so that the lightest area of the scanned image appears as pure white on the resulting scan, and that the darkest area appears as solid or almost solid black.

Some scanners have a very wide range of brightness levels so that at full brightness scanned images always appear white, while at the darkest setting they will appear solid black, therefore initially the brightness control should be set to its centre value.

Patterning

These scanners are all able to scan at 300 and 400 dpi. On printed material such as photographs from magazines and the like, the dot pattern that makes up the printed image can be at the same sort of resolution as the scanner. In this case it is possible that there will be interference resulting in patterned images.

This can usually be overcome in two ways. Firstly, by scanning at a different angle, the printed dots will align differently with the scanner head so possibly reducing the patterning. Secondly, scanning at a different resolution (usually lower) can improve the results.

There is no doubt that photographic prints, either black and white or colour, have the potential to produce better results than photographs from magazines.

MH 105AG model

This is the half width (105 mm) Mitsubishi scanner. It offers four resolutions and three different dither patterns in addition to a B/W (monochrome) mode. Once the MH105AG option has been selected the Scan dialogue should look like this:
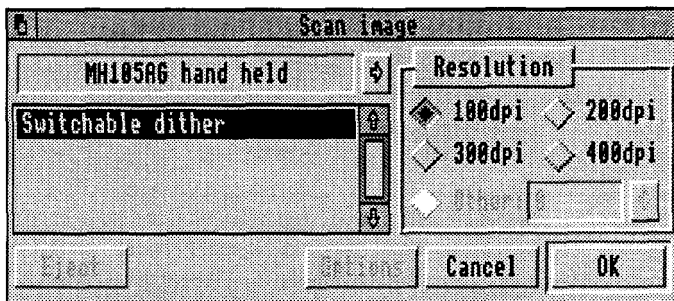
With this scanner it is necessary to select the resolution on the dialogue *and* the scanner *before* scanning proceeds. The resolution switches are on the right side of the scanner next to the brightness control.

Important
The software resolution selection and the switch resolution selection on the scanner must match to obtain correct results. These must be selected before the scanning is initiated by pressing the OK button.

Scanning

Once the OK button has been pressed, a small preview window will appear in the centre of the screen. Scanning can proceed by placing the scanner at the top of the image to be scanned, pressing the SCAN button, and slowly pulling the scanner down over the image (towards the trailing wire).

Note
At 300 and 400 dpi resolutions this scanner is very sensitive to the speed of scan. To obtain the best scans it is necessary to move the scanner very slowly and deliberately. A small red light on the top of the scanner will blink if it thinks the scanning is proceeding too fast. However the fact that it doesn't blink does not always mean a perfect scan - the only

way to be sure the scan is OK is to examine the full size resultant image.

Scanning can be terminated either by pressing the Esc key on the keyboard, (in which case it will be cancelled) or by releasing the SCAN button and waiting a couple of seconds. After this the 'Original view' window will be opened showing a full size view of the scan.

The 'Altered view' window can be opened by double clicking on this window, as described in the main Scan-Light Plus manual.

Dither options

A small switch on the left side of the scanner allows the selection of three different dither modes and a black and white monochrome option. The latter (left most) should be used for any purely black and white image such as text, hand writing or line art.

Any of the three dither options can be used for photographs and will produce different results on screen.   As to which dither setting is best, this depends on the sampling operations that are going to be performed on the image.

Sampling options

This scanner produces a variety of different dither cell sizes depending on the resolution and dither pattern selected. Therefore, when the grey-scale 'Altered view' is shown, it may appear to be patterned. As a result of tests, we have found the following dither settings and sampling options are best.

At 300 and 400 dpi

The right-most dither option works well with 4*4, 6*6 and 8*8 sampling. As described in the main Scan-Light manual, the larger the sampling size the smaller the resultant image, but the more grey-levels it has.

The centre dither option suits an 8*8 sampling size.

The left most dither option works well with 4*4, 6*6 and 8*8 sampling.

At 100 and 200 dpi

At these resolutions the scanner produces a different dither pattern, that seems to suit a sampling of either 4*4 or 8*8.

MH216CG model

This full width A4 hand-held scanner offers a wide choice of resolutions and dither patterns. Upon selection of this model, the Scan dialogue should look like this;
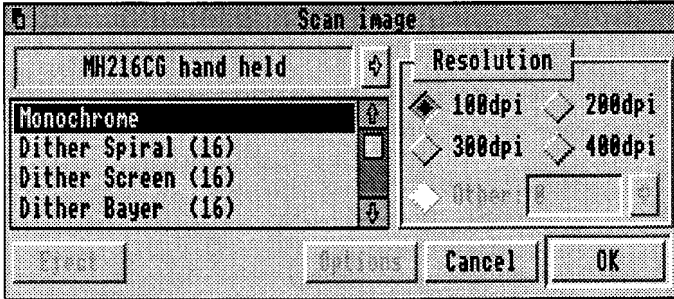
The resolution and dither pattern is selected entirely under software control, from the scrolling list. Initially the 'Monochrome' option is selected, as illustrated.

Three different dither patterns are available, referred to as Spiral, Screen and Bayer. The number in brackets indicates the number of grey levels being simulated by this dither pattern at the selected resolution.

The resolution selections available depend on the dither pattern selected. For example, the monochrome scan is allowed at any of the four resolutions. However the 'Dither Spiral (16)' is not available at the higher resolutions and so the 300 and 400 dpi buttons are disabled if this dither pattern is selected.

Scanning

Once the required dither pattern has been selected from the list on the left, and the resolution from the buttons on the right, pressing the OK button will open the preview window. At this point the scanner should be placed at the top of the image to be scanned (with the trailing wire coming from the left of the scanner). The SCAN button should be held down while the scanner is dragged down over the image. As this happens the preview window should indicate the progress of the scan.

Pressing ESC on the keyboard will cancel the scan operation. Simply releasing the SCAN button or holding the scanner still for a few seconds will complete the scanning process.

Dither and sampling

It has been found that 4*4 and 8*8 sampling sizes are nearly always best when wanting to produce a grey-level altered image with this scanner, although at some resolutions 6*6 sampling can produce satisfactory results.

The Spiral dither pattern tends to produce the best Original view images.

MH216CG with `feeder`

This is the same model as the MH216CG but fitted with its optional sheet feeder. The various resolution and dither pattern selections are described on the previous pages.

The feeder is connected simply by resting the scanner on the sheet feeder until it clicks in place. The wire from the left side of the feeder is connected into the covered slot on the left of the scanner. The scanner can be released by exerting a rightwards pressure while lifting it from the feeder.

If the feeder is attached then it is recommended that an additional power supply is connected to the Scan-Light expansion board in order to reduce the current being drawn from the computer. If this power supply is not supplied with the feeder, then contact Computer Concepts.

Once the feeder is attached it is necessary to select the 'MH216CG with feeder' option from the menu. At this point the power light on the feeder should illuminate red.

Paper to be scanned is fed, face up, under the scanner as indicated on the feeder. It will be necessary to pre-feed the paper a small way into the scanner by pressing the SCAN button on the scanner. This will move the paper into position for scanning. The power light on the feeder should now change to green to indicate that it is ready for scanning.

When the power light is green then simply pressing the OK button on the scan dialogue will start the scan.