QL−SCANNER

MANUAL

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INTRODUCTION

CONTENTS

Description and maintenance

The QL-SCANNER is a high-quality set of independent components for high-resolution digitizing of pictures with the SINCLAIR QL or CST THOR computers together with nearly any printer.

It consists of the QL_A/D_1BJ interface for analogue voltage input (complete with measurement cables, software-toolkit and reference voltage), A/D_DS1 reflection sensor, a special adaptor for assembly of the sensor in a printer and a comfortable program for controling the printer as a scanner and creation of the picture.

The A/D interface itself is a high performance accessory part for measurement of analogue electrical signals with the computer. Further information, especially concerning the installation of the interface is given in the A/D interface manual.

The manual in hand will describe exactly the installation of the DS_1 sensor in your printer as well as installation and use of the scanner program. Beside scanning, the sensor may be used for lots of measurement applications together with the A/D-interface (rotation speed, distance, counting). Further notes are given in the appendix.

Avoid scratching the sensor's front window! For cleaning only use a soft cloth!

Scanner software

The cartridge/disk contains the special toolkit for the A/D interface (see A/D manual) and the following scanner software:

scanner boot
boot program to load toolkits and start program

scanner_cod
is the scanner toolkit. After installation, it expands Basic with some

useful new commands/functions, which you may use with your own programs.

scanner_hcop_cod
is the hardcopy-toolkit, which expands Basic with new commands for a powerful multitasking hardcopy-job.

scanner_start
set.s your systemspecific parameters and starts the scanner program. Change of the pre-def iced values allows to adjust the scanner individually to every configuration.

scanner_exe
is the scanner main program. It controls the printer and computation of the sensor data to create the pictures.

scanner_hcop_config_exe
allows the individual adjustment of the hardcopy-job-tool, if your printer doesn't work correctly with the pre-defined EPSON-compatible standards.

scanner_backup
makes a backup of the above listed software.

Create a copy of the original software immediately ! For this insert the original in device 1 and then start the backup program with

      lrun flp1_scanner_backup

The further instructions are given on the screen.

If you want to change the pre-defined devices, you can change these in line 120 of the backup program. This is also necessary, if you have only one disk-drive, in which case a temporary copy has to be made on microdrive or RamDisk.

This manual assumes you are using disk-drives with your QL. If you are working with microdrives, the device name flp should be replaced with mdv every occurence.

Important note

READ THE MANUAL CAREFULLY ! The installation of the scanner is simple if you are patient and read the manual carefully first, since comprehension of the scanner's function is useful for a quick and successful installation.

Sensor assembly in the printer

The sensor has to be inserted into the adaptor with the connection plug first from the opposite side of the nut of the clamp.

Before assembly in the printer, the clamp should be tightened, so that the sensor is kept fix, but little movement is still possible.

Now take the printing head and ribbon out of the switched **off** printer and insert the scanner-sensor instead of the printer head. **Please take notice of the hints, given for some special printers in the apendix!**

Adjust the sensor to a distance of about 5 mm to the paper and turn it, that the trimmer, accessible by the hole in the sensor body, is on the upper side. Move the printer head's sledge at the left end. Place the sensor cable carefully within the printer and control by moving the sledge, that the cable doesn't trouble or resist the sledge's movement. The cable

should form a proper loop just behind the sensor in any position of the sledge. If correct, fix the cable with the self-adhesive holder and lead it out of the printer, that the printer cover may be reassembled. Take care, that the cable's distance to the printer mechanics is large enough everywhere.

Switch on the QL and the printer and connect the sensor to the A/D interface. Type in the following line and survey, if the printer sledge runs without any resistance by the cable:

open **#3,serl : rep test** : print #3,fill$("x",80)

Disturbing resistance could be heard clearly by the motor's sound. Perhaps the cable's placement has to be changed a bit. If it's correct position is found, all future assembly of the sensor will take only a short time. If you don't find an ideal placement for the cable, a loop just upwards behind the body of the sensor will be the best. In this case the printer cover cannot reassembled, which however has no influence on the quality of scanned pictures of you avoid direct light of the sun or electric bulbs. If your printer doesn't run with a disassembled cover, look for the control switch and close it with some self-adhesive tape.

Sensor adjustment

After the first installation of the sensor, a precise adjustment of distance and contrast is necessary. This should be done with the Output report in the SCANNEROPTIONS of the scanner program. Start the program with the Basic command irun fipi_scanner_boot. After loading, you are in the MAIN MENU. Pressing key 0 will call the SCANNEROPTIONS.

Insert a blank, white paper in the switched off printer. Take care that the left margin of any original has to be at least 3 mm right to the scanner sensor in it's left—hand end position. Turn the contrast trimmer with a little screwdriver clockwise to it's end position and move the printer sledge in the middle of the paper.

Now you have to find the position of maximum Output reported, by varying the sensor's distance carefully (the two red beams of the sensor give a sharp image on the paper) and *fix* the sensor in it's adaptor there by turning the clamp nut. If the Output exceeds a value of about 200, reduce the amplification by turning the contrast trimmer anti-clockwise.

Dependent of the type of printer adaptor, the front cover of the sensor may/has to be opened some turns. Pressing the sensor as far into the adaptor as the sensor cover allows, enables you to a comfortable distance adjustment by turning the sensor cover clockwise, which will pull the sensor in direction to the paper.

Since the A/D_DS_l sensor is an extreme high-precision sensor, tiny changes in the distance will change the Output value immediately. However little changes are irrelevant. Finally the contrast trimmer should be adjusted to an Output value of about 200.

Take the paper out of the printer and insert a second one only as far, that the paper-end switch of the printer is closed, the sensor however only "sees" the printer mechanics. Enter the command **NEW**, the following short program and then the **RUN** command:

```
10 OPEN #3,serl     (or the device your printer is connected to)
20 REPeat test
30 FOR i=1 to 4 : PRINT #3,FILL$("x",30)
```

```
40 FOR i=1 to 80 : PRINT 255—PEEK(64512)
50 END REPeat test
```

Check now, if there are only values of 0 printed to the screen! This test is extremely important, since the precise synchronisation of the picture lines is done by the detection of the left margin of the picture.
If other values than 0 are printed, you have to reduce the amplification of the sensor by turning the trimmer anti-clockwise and repeat the test. It's no disadvantage, that the maximum output of about 200 adjusted before now will be reduced by reduction of the amplification.

Software adaptation

With the scanner hardware installed, you finally have to adapt the software to run correctly with your system. This will be done by the definition of the available device names and with the parameters prmax, wa1, wa2 and lang, which are defined in the lines 130 to 160 of the scanner start program.

Important notice:

The problem of line-synchronisation is extremly time—critical, so if you are scanning, no further programs may run on the QL/THOR. By the same reason, the program has to be started with the **EXEC_W** or **EW** command, don't use EXEC or EX. QRAM and any other jobs only may run on the system, if the scanner program is used just to look at pictures/change their contrast, which are already scanned.

For fine correlation, all originals must have a precise and straight left margin. Insert, originals always with the left margin at least 3 sin right to the left-hand end position of the sensor's beam.

The three printer device names store the max 9 characteis long names of the available printer devices, e.g. "serl". pl$ is the standard device, selected at the program start. With the port option of the scanner program you can choose one of the three devices at any time within the program's run. A printer device (only used for the hardcopy) also may be a file, flpl_xy for example.

The value for **prmax** tells the program the, number of characters (in standard size), which your printer may print per line. Usually these are 80 characters, large printers like EPSON FX-100 however may print 132 characters/line.

By lang you may select the program language, which is possible in german(lang=0) or english (=1).

For the simple definition of these informations, start the scanner program normally with **lrun flpl_scanner_boot** and select Q to quit the program immediately. You are back in SuperBasic and the command list will show you the start program, which is still stored in the Basic memory area. Now change line 130 and 150 like discussed above and re-start the program with run.

With the waiting parameters **wa**, defined in line 140 but also temporary within the scanner program, the program is adjusted to the working speed of your printer. By the individual adjustment of these values, the program may run with any printer.

Test the scanner's tunction with the following instructions and select the SCANNEROPTIONS by key O if necessary. Select the desired value by cursor-up/-down and change its value by cursor-left/-right.

For this test insert a picture with simple geometrical shapes of high contrast on white ground in your printer.

By **wa1** the program is slowed up to the mechanical speed of your printer, its value ensures, that the scanner sensor has been removed to the left margin, before the scanning of the next line will be started.

If the **wa1** value is too low, the scanning of the new line will begin just on the back movement and the lines aren't synchronous at all. If the value is selected is too high, the scanner will wait unnecessarily long, until the scanning of the next line. The correct value will be found within a few runs.

If you select other values for the width of the picture and printer (see later), it may happen, that suddenly little faults in line synchronisation happen. This will be corrected by enlarging the wa1 value.

Meanwhile you surely have remarked, that only a part of the original is scanned. The definition of the scanned area is done within the PICTUREOPTIONS of the scanner program, accessed by pressing P in the MAIN MENU. Here you can select the three format parameters **Begin, Width** and **Height** as well as the contrast parameters **Red, Green and White.** If you want to change a parameter select it by cursor-up or -down and change its value with cursor-left or -right.

Now enlarge Width to 255. Return with ESC and insert a wide original (take care of at least 3 mm left distance!) in the printer. Start the scanner and look, if now the whole width of the original will be scanned.

Dependent of the printer speed still only a part of the original will be scanned even with the maximum width of 255. In this case the digitizing routines should be slowed up by enlarging wa2. This determines the maximum width of scannable originals and so the maximum reduction the scanner will be capable of. With an increase of wa2 you oftenly can reduce wa1 a bit. If all parameters are defined correctly, remind the wa1 and wa2 values and leave the program. Adjust line 140 to the correct values and save your individual definition by

      delete fipi_scanner_start
      save flpl_scanner_start

Now the scanner installation is complete.

SCANNER PROGRAM

Program start

Like described above, the scanner program is started with the command

      lrun flpl_scanner_boot

If it should start automatically after power on and pressing the Fl-key, copy an additional boot-program on your scanner copy with:

```
      copy flpl_scanner_boot,flpl_boot
```

Transfer of a MDV-Version to disk

A microdrive-version of the software may be transfered simply to disk:
change the devicename **dest$** in the backup program in the devicename of your
floppy and start the program. Now you have to change the devicename mdv in
the loading instructions of scanner_boot and scanner_start into the
devicename of your floppy disk.

The Screen-mode

The scanner program has been developed for use with MODE-4 (four colour
resolution of the QL), but with the mode command of the PICTUREOPTIONS, you
also can select MODE-8 (eight colour-resolution).

However the picture is presented in real eight colours only within the
PICTUREOPTIONS, when the menu is invisible after execution of one of the
picture-creating commands. In the remaining parts of the program eight
stipples of different brightness, which are composed of the three MODE-4
colours red, green and white, are used.

By this little restriction, a further increase of the scanner program size
could be avoided, as well as an unprofessional screen-layout, inevitable
with the maximum of 40 characters! line in real MODE-8.

On principle, MODE-4 is dedicated for pictures with fine or lots of details
(construction drafts e.g.), where the high resolution of 512*256 pixels is
necessary. Pictures with less details (personal fotographs e.g.) however
get smoother and less synthetic by the use of more colours despite of the
lower resolution of 256*256 pixels.

Especially if you are scanning pictures with large areas of same colour or
photographs, the first impression may disappoint you. However changes of
the contrast and selection of the invert option will lead to a good result
not expected. Never break up such experiments if you are a beginner with
the QL-SCANNER. Use all the program's options, to get a good result. Some
experience will be necessary, to get the full capability of this product.

The MAIN MENU

After loading you are in the scanner program's MAIN MENU. From here, you
can select every part of the program. Just press the key marked with
brackets. If no picture has been scanned or loaded, some options are
presented darker and not available.

The PICTUREOPTIONS

This part allows the adjustment of the picture-defining parameters. With
the first three parameters, the picture format is controlled, the other
three ones define the contrast dependent of the sensor-returned voltage.

Start   defines the start of the picture relative to the left margin
          of the original
Width   defines the width of the picture
Height   defines the linefeed distance in units of the smallest printer
          linefeed
Red/Blue defines the smallest value for red/blue pixels
Green   defines the smallest signal value for green pixels
White   defines the smallest signal value for white pixels

Select the parameter to change (indicated by the arrow) with cursor-up or cursor-down and change its value with the cursor-left or cursor-right key. After a change of the colour-values, ENTER will show the picture scanned till now with the new contrast borders, since the program stores the full sensor-scanned brightness value for every pixel. Key I shows the picture inverted, useful especially to look at scanned photographs or to see the hardcopy result.

With key - you may delete the last line. This is useful, if the scanning has been continued after a printer error (paper out e.g.).

The graphic mode (4/8-colours) may be changed by key N, ESC returns to the MAIN MENU.

By the free definition of Start, Width and **Height, the** scanner is extremely flexible in the selection of parts of a picture as well as reducing, magnifying and distortion.

Remind: To scan with any distortion there is only one system- specific value for Width for every value of Height. These should be determined by the aid of chequered paper and noted.

With MODE-8 selected, you may not change the value for every one of the seven colours. The range defined between blue to green is divided into blue, red and magenta. The same is done for the range green to white, which is presented in green, cyan and yellow with rising contrast value. From the white-value on, the pixels are drawn in white, that means the scanner program's "dummy-white".

This enables you of a comfortable tuning of the picture, since like in MODE-4, only three parameters are to serve. The automatic division of the ranges to all available colours, will lead in most cases to the best result.

The FILEOPTIONS

With the selection of the FILEOPTIONS a sub—menu appears and you can select one of the options of the following list:

SAVE PICTURE
The actual contents of the screen is saved after you have entered the filename. The picture may be re-loaded in Basic by the command **lbytes flp2_filename,131072** or from any grafic program (for edit, movement, distortion, text insertion etc.).

PRINT HARDCOPY
A further sub-menu allows the selection between a 3-coloured DIN-A4-wide or black and white DIN-A5-wide hardcopy by key **4** or key 5, which will copy the screen inverted and without any distortion on the printer, connected to the highlightened port. Pressing P will switch to the next printer port, independant of the currently selected scanner port. By the ESC-key, the immediate return to the FILEOPTIONS without printing a hardcopy is possible.

The hardcopy is done using the powerful multitasking- abilities of the QL as a background-job and you can continue with further work.

However if you have two printers connected, you should not start scanning a new picture, whilst the hardcopy is running. Multitasking disturbs the

synchronisation of the scanned lines.

LOAD SCANNERFILE
A picture saved before will be loaded with all originally scanned
brightness values for every pixel after input of the filename. The scanner
files automatically get the extension scf, which may not be specified. The
picture will be shown with those picture parameters, selected at the time
of saving. You can change the contrast parameters like with a newly scanned
picture and look at the result. Else you can invert the picture or print a
hardcopy.

SAVE SCANNERFILE
After input of the filename, the current picture is saved with the full
brightness information of every pixel on the specified file with the
extension **_scf**. If there is too less memory on the storage medium, the file
may be divided in two parts (useful for microdrives). The program informs
you, and you may select between ESC to abort, or ENTER to save the first
half of the file. Thereafter the program orders a second medium with
sufficient free space, to save the final part of the file.

The scanner files are constructed of an 8 byte-header in front of the data
block, which consists of 512 bytes for each of the up to 256 screen lines.
So the file may contain up to 256*512+8 = 131080 bytes. The second half
(_scf2) of a divided file doesn't obtain a header of its own.

The header itself keeps the following: Byte 1 is 0, or the number of the
last line of the first half, if the file is divided, then a byte follows
for start, width, height, red, green and white. The last byte stores the
number of the last line of the complete picture.

CONTINUE SCANNING

If you have aborted the scanning with the ESC-key, you can change the
contrast parameters for example and look at the result. After this, the
scanning can be continued with the new parameters by pressing key C.

REMOVE MENU

Key R removes the menu and the whole picture is visible until the next key
is pressed.

The SCANNEROPTIONS

After the selection of the SCANNEROPTIONS with key 0 a further sub-menu
appears:

SELECT AND CHANGE VALUE
With the cursor keys you can select and change one of the waiting
parameters or the width.

This value for width accepts a value within the range of the maximum number
of characters/line (defined with **prmax**), your printer is capable of and at
least 10, in steps of 10. This parameter doesn't affect the format of **the
picture at all**, but it allows a speed-up of the scanner. If the scanned
picture, defined by the PICTUREOPTIONS start and width is completely in the
left range of the printer, movement all over the whole width of the paper
takes unnecessary long time. With width the right margin of the sensor
movement range may be positioned to the left and the scanner works more
quickly.

CHANGE PORT

Key P selects another one of the printer ports, defined in the scanner
start program. The scanner-port is independant of the hardcopy port.

The Output report is for the control of the scanner sensor's adjustment and
contrast trimming like discussed in the **INSTALLATION** chapter. Adjustment
and contrast should be controlled from time to time.

ESC leads back to the MAIN MENU.

START SCANNER
The scanner will be started by pressing S. The current picture is deleted.
With ESC a return to the main menu is possible at every time, e.g. to
change the format or contrast parameters.

Remind, that no job may run, if this part of the program is called.
Disregard will lead to faulty synchronised screens.

QUIT PROGRAM

By key Q the program will be left.

TOOLKIT AND HARDCOPY_JOB

New conwuands and functions of the scanner-toolkit
After the installation of the toolkit, done by line 140 of the scanner boot
program, the following new comands/functions are available in SuperBasic.
You also can use these commands in your own programs:

Functions:

A=ALLCH(x)   reserves x bytes in the Common Heap and returns the base
                    address of the reserved area to the variable a.
a=COMM_BU   returns the base address of a 512 byte large area, which
                    has been reserved at the toolkit installation. This area
                    is dedicated for the communication between jobs.
l=F_DAT(name$)   returns the length of dataspace of the file nameS or 0, if
                    it's no EXEC-File.
l=F_LEN(name$)   returns the file-length of name$ or a QDOS error code
                    number.
x=F_LOA(name$)   checks, if the file name$ may be loaded without any error
                    and returns the corresponding error code:

                    x= 0 No error, you may load the file
                    x=-3 OUT OF MEMORY
                    x=-7 File/device NOT FOUND
                    x=-9 File/Device IN USE
                    x=16 BAD OR CHANGED MEDIUM

x=F_SAV(name$)   checks like above, if the attempt to save the file nameS
                    will give an error:

                    x= 0 No error, you may save the file
                    x=-3 OUT OF MEMORY
                    x=-7 Device NOT FOUND
                    x=-8 File ALREADY EXISTS
                    x=-9 File/Device IN USE
                    x=-ll DRIVE FULL
                    x=-l6 BAD OR CHANGED MEDIUM

x=-20 Device READ ONLY

<u>Commands:</u>

RETCH a   returns the memory, reserved by ALLCH back to the Common
                 Heap.

Important Note: QLs of ROM-version JM or older, need a NEW, LOAD or LRUN-
command to complete the toolkit installation!

<u>**New commands and use of the scanner—hardcopy-toolkit**</u>

After loading of the scanner-hardcopy tool by line 150 of the boot program,
three new commands to create a comfortable screen hardcopy on the printer
are available in Basic.

Opposite to most other hardcopies, the print-out is done using the fine
multitasking-abilities of QDOS. After input of the hardcopy-command (see
below), a hardcopy-job is invoked, which copies the screen contents in a
buffer and makes the print-out from there. You can continue with your work
and change the screen contents, without the need to await the end of the
time-consuming hardcopy.

INV_SCR m,s,e
Like usual, the screen-hardcopy is printed as a negative by the hardcopy-
routine (white screen pixels are printed black). This command allows the
invertion of the screen from line s to line e easily. It doesn't note the
real screen mode, so "dummy-MODE-8" screens also may be inverted correctly.
For that, the screen mode must: be given by the mode-parameter m. Use of
the wrong mode gives interesting filter effects.

HCOP4 <dev$>
starts the hardcopy-job in A4-mode (full standard printer width), which
gives a fully undistorted, three-colour copy of the <u>whole screen </u>with the
pre-defined EPSON-compatible code sequences:

preamble: ESC "3" 4   4/216" line feed
graphics: ESC "*" 5   graphic with 576 dpl
left margin: 32 pixels

HCOP5 <dev$>
starts the quick hardcopy (reduced to A5-mode), which gives a little
distorted hardcopy on full EPSON-standard printers with the pre-defined
code sequences:

preamble: ESC "3" 24   24/216" line feed
graphics: ESC "*" 6   graphic with 720 dpl
left margin: 104 pixels

Both hardcopy-jobs finally send a postamble-seguence, which is pre-defined
to ESC "s" (clear printer).

By the optional String **dev$**, which may be up to 10 characters long, the
hardcopy can be directed to another (e.g. ser2, par or fipix) one than the
pre-defined hardcopy device.

The configuration program **scanner_hcop_config_exe** allows an individual
adjustment of the standard device as well as preamble, graphic, left margin
and postamble codes. This is necessary especially for printers, which don't
support the full EPSON-standard and the above listed code sequences won't
create a correct hardcopy.

If you start the hardcopy-job, printer translation may not be activated by the coninand TRA 1 with ROM-Versions MGG or JS!

<u>Configuration of the hardcopy for EPSON-incompatible printers</u>

If your printer doesn't give a correct hardcopy of the screen, you may change the used code sequences with the aid of your printer manual and the configuration program. It is started by

        exec_w flpl_scanner_hcop_config_exe

The program immediately asks for the filename of the hardcopy-toolkit, so enter

        flpl_scanner_hcop_cod

In the following you may define the standard output device (up to 10 characters) and for HCOP4 and HCOP5 each, the code sequences for preamble, graphic, number of spaces to be sent as left margin and the postamble-code. The program offers the codes of the actual loaded tookit to edit.

The code sequences (of up to 17 codes, devided by commas), have to be entered by their decimal ASCII-value. So the pre-defined HCOP4-graphic-sequence for example will be entered by

        27,42,5

The preamble should contain the adjustment of the line feed and further pre-definitions, if required.

The graphic sequence consists of the commands to select bit image printing. You may not enter here the two (last) codes, which define the number of graphic-data per line. These are calculated and done by the hardcopy-job itself.

Spaces accepts a value within the range 0 ... 255, to define a number of empty pixels printed, to adjust the hardcopy in the middle of the paper.

Postamble finally may reset the line feed to normal output of text. Most printers support a special code for a full reset (e.g. ESC "@").

If your printer doesn't support the EPSON-graphic modes used in the pre-defined toolkit version, you should select the available modes, nearest to the above listed ones. The resulting distortion oftenly can be reduced to a minimum by experiments with different values for the line feed.

If you have finished the code-definition, the destination filename for the patched toolkit has to be entered. The name of the loaded one is given to edit, and may be kept or altered.

COMMON HINTS

<u>Technical description</u>

The A/D_DS_1 sensor is an extreme powerful reflection sensor for direct connection to the A/D interfaces. By the optical lens-system integrated it allows a high resolution of up to about 0.15 mm and therefore is dedicated especially for scanning pictures. Furtherly the sensor can be used like any

other reflex sensor for the measurement of rotation speed or distance as well as for counting.

The sensor sends and receives red light of 700 nm wavelength. Dependant of the brightness of the medium, it's sensitivity can be adjusted with a little screw-driver by the trimmer accessible through the hole at its body. With growing sensitivity (trimmer turned clockwise) however, its sensitivity for strange light grows also, especially for light of electric bulbs. The distance range for detection is defined by the integrated optical system within 3.3 to 5.3 mm with the maximum at 4.3 mm. With the aid of the light of an electrical bulb however, the sensor can detect large objects in a considerable higher distance.

Signal detection

To read the sensor signal, toolkit and voltmeter program delivered with the A/D interface may be used. If the sensor only detects a low signal, the A/D interfaces detects a high voltage. Furtherly the oscilloscope program may be used, e.g. for examination of rotation speed measurement or surface quality of rough objects.

Use as a reflection sensor

The sensor is ideal also as a speedometer. Therefore the test object should have mounted a little arm or wing, whose reflections are detected, if they are just in front of the sensor. Another possibility are areas of differing brightness, e.g. black stripes on a bright cylinder. Patterns up to 0.15 mm could be resolved !

First the sensor has to be adjusted to a distance of about 4.3 mm to the object. By the aid of the voltmeter program the contrast trimmer then should be adjusted to a maximum voltage difference between both brightness conditions. Perhaps you have to change the sensor's position a little. If you have the JFC QOsc_l oscilloscope program, the adjustment may be done in a more comfortable way directly from the object, which already rotates. With the READ_AD and AD_FREQ commands of the tookit, you can write a short Basic program, to report the rotation speed of the object finally.

In the same kind the changing reflection behavior can be used to detect distance variations up to about 0.005 mm ! After a high precision distance gauging even an absolute distance report is possible. The signal maximum (lowest voltage) will be at a distance of about 4.3 mm. The signal then falls to the minimum (255 = 2.55 Volts) within a range of about +/- 1 mm linearly.

Use for digitizing pictures

By its high-precision features, the A/D_DS_1 sensor is dedicated for scanning pictures. For the required high precision mechanics nearly every dot matrix printer can be used. The scanner program does all the printer control and allows a high quality scanner system with your QL. If you have ordered the sensor complete with printer adaptor, read the special scanner manual for its installation.

Printer installation without original adaptor

For assembly of the sensor in the printer by yourself, please read the follwing hints carefully, so that the scanner program may work correctly. Further information is kept in the detailed scanner manual.

If possible, the printer head should be removed out of the printer, since it's located at the optimal position to the paper logically. If not possible or practicable, you have to find a method for fixing, that the sensor looks most possible vertically onto the original inserted in your printer. The distance between sensor and paper should be about 4.3 mm, little change of the distance should be possible.

If you won't remove the printer head, the ribbon, has to be removed anyway, since the scanner program sends printing commands to the printer to move the printer's sledge.

The sensor cable has to be placed, that it doesn't disturb the movement of the printer sledge.

Finally take care, that the sensor in its left end position must be at least 3 mm to the left of the original's left margin and get no signal (Output in the scanner program 0, AD_VOLT gives 255) from the printer barrel it looks to. That's necessary, since synchronisation of the received pixel-lines is done by the recognition of the change of the sensor signal at the left-hand margin of the original.

For further hints for the installation please read the scanner manual carefully.

Hints for practical use

The QL-SCANNER enables you of a high-resolution digitizing of nearly any pictures, which fit in your printer. Even stamps of fotographs may be digitized, if affixed onto a paper. Please note, that the scanned negative in the beginning always looks bad, but change of the contrast and inverting gives you a fine result in most cases.

Printers

Some printers (e.g. Centronics GLP II) put the printer head just in the middle after power on. This gives problems to the scanner program for the first line which could be avoided simply with the foliwing line included in the scanner start program:

155 open #3,serl:print #3,fill$(" ",79);"xx":close #3

If your printer needs special start sequences these should be included in the start program like the above line. The scanner program itself doesn't send a printer clear code.

If your printer isn't EPSON-compatible at all, the hardcopy-job should be adjusted with the hardcopy configuration program. If you are owning an EASEL printer driver running with your printer, you can use this one also to create hardcopies of QL screens.

Save the picture with the FILEOPTION Save picture and leave the program. By the following commands you load the EASEL hardcopy driver, the picture and start the printing:

adr=RESPR(2000) : LBYTES flp1_easelroutine,adr
LBYTES flpl_pictname,131072
CALL adr

Scanner software

This actual version 2.0 of the scanner software includes a great number of improvements to earlier versions. The program has been tested carefully and should be error-free. If you will find any error please write to JFC. We also would like to get suggestions for furthei improvements of this product.

Updates of further versions are delivered free, if the original software medium is sent to JFC together with return postage.

The scanner main program and the hardcopy configurator have been compiled with the QLiberator Compiler from Liberation Software.

All time-critical problems, which need highest calculation power, have been programmed directly in assembler.

SPECIAL HINTS FOR SOME PRINTERS

CD printer-adaptor

Before assembly into the adaptor, the cap has to be removed off the sensor. The adaptor is kept by an aluminum-holder, which should be pushed in the fitting just like the printer head. If there is great resistance or the adaptor isn't kept fix, the pins for assembly have to be bent <u>carefully</u> a bit inside or outside respectively. A first adjustment of the sensor's distance could be done by moving the plastic part of the adaptor on the metal holder. The front window of the sensor should be about beneath the pins.

The cable holder should be fixed at the inner side of the printer cover just about in the middle. By this, the sensor cable will be led from left to right and outside by the little space at the right front end of the cover. For the precise adjustment of the pictures, the cover must be assembled while scanning.

DE printer adaptor

For installation of the sensor in the Star Delta 10 printer, the metal plate with the printer ribbon guides has to be removed additionally to the printer head and ribbon. With little practice the disassembly and assembly of the plate will be done quickly in the future.

The plate is fixed with two round bolds of metal, pushed through the little rings at the left and right front corner. Remove these bolts with pliers and take out the plate by tilting at the bright ribbon guides in direction to the printer barrel. The self-adhesive cable-holder should be fixed at the inner front side of the printer case just in the middle between the two axles of the ribbon rolls. Form a loop of about 6 - 7cm straight upwards of the sensor's cable just behind the sensor and look, if it may not touch the axles.

On Reassembly of the metal plate you have to press the front part of the printer case a bit outside since remaining space is reduced by the cable-holder. Perhaps you have to move the guiding forks for the ribbon a bit left or right that the plate can slide in its correct position. Reassembly of the bolts is not necessary for normal printer use and so the next disassembly of the plate will be done much quicker.

By the two plastic pins for the printer head adjustment, this printer only offers a small room for the sensor. So remove front cover of the sensor's

body first. Cut off carefully the thread of the sensor's body with a sharp
knife. Test, if the sensor itself is still kept fixed, before you try to
insert it in the adaptor. In case of a complete set DS_l sensor and DE
printer adaptor ordered, this has be done already in advance of delivery.

GL printer adaptor

With this type of adaptor (for Brother M-1009/1109, Centronics GLP/II) an
additional holder made of aluminium is used for the sensor's assembly. If
it can be pushed into the printer head holder only under great effort, you
have to file some material of f the holder. A first adjustment of the
sensor's distance could be done by moving the plastic part of the adaptor
on the metal holder.

Some versions of the Brother M-1009 and Centronics GLP are not fully EPSON-
compatible. Test your printer first with the hardcopy option of the scanner
program and if it doesn't work (senseless text printing), the hardcopy
should be configured.

LX printer adaptor

Printers for use with this adaptor (e.g. EPSON LX 86) only give a small
room for the sensor. So remove the front cover of the sensor's body first.
Cut off carefully the thread of the sensor's body with a sharp knife. Test,
if the sensor itself is still kept fix, before insertion into the adaptor.
If you have ordered a complete set DS1 sensor and LX printer adaptor, this
has be done in advance of delivery by JFC.

NL printer adaptor

Printers for use with this adaptor (e.g. STAR NL 10) only give a small room
for the sensor. So remove the front cover of the sensor's body first. Cut
off carefully the thread of the sensor's body with a sharp knife. Test, if
the sensor itself is still kept fix, before insertion into the adaptor. If
you have ordered a complete set DS_1 sensor and NL printer adaptor, this
has be done in advance of delivery by JFC.

SP printer adaptor

Mounting the SP adaptor won't be done like the original printer head
assembly. The adaptor is fixed instead with the screws included at the
unused drill-holes in the printer head sledge.

In the backside room there is only little space for the placement of the
sensor cable and you should form a loop of it straight upwards just behind
the sensor. The printer cover has to be removed and the cable holder should
be fixed at the inner or outer side of the right hand part of the printer
case.