

# QL-KEYBOARD-90

Manual



Computer Technik

---

**JÜRGEN FALKENBERG**

Thanweg 36

D-7539 Ersingen

☎ 07231/81058

No part of this product may be reproduced in any form without permission by JFC !

3<sup>rd</sup> Edition 5/91



## INTRODUCTION

QL-KEYBOARD-90 a completely new interface that gives the QL user the advantage of being able to plug in and use keyboards for the IBM XT AT and compatibles. These keyboards are available in different performances with much improved quality and a more comfortable layout than offered by the QL.

The interface uses a microprocessor of its own to receive the data from the PC keyboard and control the interface circuit. This emulates the QL keyboard membrane, so that QLKEYBOARD-90 is not appearant for the QDOS system. No changes are done to the QL system except for the installation of a second keyboard membrane.

Because its design QL-KEYBOARD-90 does not have any of the problems previously associated with replacement keyboards. There are several further features that enable the user to maximise the usage of a PC keyboard. These are as follows:

- full compatibility with the QL-keyboard,
- the QL behaves like with its original keyboard,
- which may be used simultaneously
- no additional commands necessary for its activation,
- no changes are done to the QL operating system, and so the interface is compatible with all ROM versions including MINERVA
- No incompatibility with any hardware or software components
- independant of all peripherals used on your QL system
- no reduction of the QL operating speed
- full support for XT- and AT-keyboards with 84 or 102 key layout with correct interpretation of the numerical/cursor keys and the special extra cursor keys
- frequently used key combinations (e.g. CTRL & right) are available now by the additional PC keys
- 100% crash-safe keyboard reset
- 55 character erasable key buffer
- auto-repeat with the full speed controlled by the QL
- interface board is easily installed inside the QL, so
- no mechanical sensitivity and accompanying crashes,
- no soldering necessary and
- no QL expansion port occupied

The QL-KEYBOARD-90 is the first perfect replacement for the QL keyboard.

For the users of internal RAM-expansions and/or the QIMI internal mouse interface, the internal assembly of QL-KEYBOARD-90 is not possible. In this case, the interface may be supplied with an external assembly kit (cable and case) so that the unit can be mounted externally.



## ASSEMBLY

Installation of the QL-KEYBOARD-90 is easy, does not require any soldering or special skills and takes only about ten minutes. Please follow these installation instructions **Carefully**. Please note however, that opening the machine may terminate the warranty of your computer and is therefore undertaken at your own risk. If you ship your QL to us we will install QL-KEYBOARD-90 at no charge. To cover return post and packing a charge of DM 30.-, (DM 60.- overseas) is applicable. Please enclose your XT or AT keyboard if not supplied by us.

To install the interface assembly you will need good light, a medium flat blade screwdriver, a Phillips screwdriver, self-adhesive tape and some books.

Remove all peripherals and disconnect all cables from your OL. Turn the QL upside down and unscrew the eight Phillips screws located along the front and rear edge. Do not undo the two Phillips screws located underneath the microdrive assemblies. Turn the QL over to its normal position and place the books by the back of the machine. Carefully, lift the front and open the case pivoting it against the back, and rest against the books. Ease the two membrane tails out of their sockets. Avoid disturbing the six LED wires that are located into a connector block. If one becomes disconnected it is necessary to release them all by carefully pulling up the body of the block, inserting the wires and pressing the block down again. However you will need four hands at least to accomplish this procedure. The connecting order of the wires, starting at the rear is: red, black, white, black, grey, black. The black leads are grounded, don't worry about an order between them.

The 8049 co-processor is located left hand side of the microdrive one. Remove it from its socket by carefully pushing the flat blade screwdriver between its body and the socket and refit into the socket on the QL-KEYBOARD-90 interface. Please note that the notch on the 8049 has to correspond with the notch on the interface socket. It has to look always to the back side of the QL. AVOID all contact of the pins of this chip with fingers!

It is not recommended to continue using the standard QL keyboard. If however its use is required, carefully bend the membrane's sockets towards the rear of the machine, Shorten the membrane to about 12cm and strengthen it with some layers of the self-adhesive tape on the top and bottom side. Note that a free end of about 0.5cm is required for the electrical contact in the sockets. Then reinsert the membrane tails into the sockets. Please note that the membrane tails will become bent on British QLs (and some other) that are fitted with board issues 5, 6 or 7, which may dramatically reduce its life. If you are not going to use the QL keyboard remove the six Phillips screws retaining the aluminium back plate and remove the backing plate, keyboard membrane and bubble mat.



Cover the bottom side of the KEYBOARD-90 interface, with strips of adhesive tape, and then carefully insert into the 8049 socket. Please ensure that all pins are located into the socket contacts and ensure that the interface is pressed carefully but firmly into the socket. Interface and 8049 are inserted correctly, if the 8049 chip does not look over the top edge of the QL bottom case. Take the keyboard lead and DIN socket and pass either through the left hand expansion port or above the TV socket at the rear.

If QL-KEYBOARD-90 should be assembled outside the machine with the external kit, the cable end with the 40-pin socket on its top has to be inserted in the empty 8049 socket instead, and the 8049 chip in the cable's socket. The connector at the opposite end of the cable has to be inserted carefully into the QL-KEYBOARD-90 socket.

The installation is now complete and the following function test should be performed before reassembly of the QL case. If you have retained the QL keyboard please ensure that the aluminium back plate is not in contact with any component that is likely to cause a short circuit. Connect your monitor cable and switch on your monitor only. Wait until the usual warm-up time of your monitor has passed and then power up the QL. The standard reset screen should be visible immediately. If not, switch off the QL immediately and check the installation again. After a successful test, switch off the QL and plug in your PC-keyboard to the QL-KEYBOARD-90 DIN socket.

On the left hand side of the interface there are two DIP switches to match the interface on your PC keyboard. Switch 2 selects the keyboard type (left AT, right XT). Switch 1 defines the keyboard layout (left for keyboards used with MS-DOS 3.1 or earlier versions, right for use with MS-DOS 3.2 or later versions). Incorrect settings will not cause any damage but may disturb or prevent your keyboard from running correctly. Set the DIP switches to match your keyboard and power up the QL. Check the function of the keyboard, especially keys: and \. If your keyboard does not work at all, switch 2 is incorrect. Please note that the DIP switches may be set whilst your QL is powered up but you will have to power off and power on to reinitialise the system. If the new keyboard fails to respond to either setting of switch 2 the fault is probably due to the faulty (i.e. not located or bent pins) or insufficient insertion of the interface into the 8049 socket. When the DIP switches are correctly set, switch everything off. Reassemble the top case of the QL, the reverse of the disassembly instructions. Refit all peripherals and cables previously removed.

If you reinserted the membrane tails you may now input from both keyboards. This may be useful if your QL and PC keyboard are located at a distance from each other, or if you wish to use the PC keyboard on other QLs or PCs. However please note, that the PC keyboard may only be connected or disconnected when the QL is powered OFF.



## APPLICATION

QL-KEYBOARD-90 replaces the QL keyboard and is fully compatible. In practical use it behaves identically with the exception of CTRL & F5 and forbidden multiple key presses listed below. For technical reasons the parallel connected original keyboard may not use the improved facilities of the interface (buffer, status LEDs, reset, ScrLock).

The interface requires an XT/AT keyboard, key compatible to the QL keyboard it is replacing. Due to the large number of different XT/AT keyboards available there may be some keys, or their location, differing from the national layout of your QL. Sometimes this can be overcome by carefully moving the key caps to suit. In principle all keys depressed together with SHIFT, CTRL or ALT will produce the same character like used from the original QL keyboard.

### Additional keys

Two styles are normally found with XT or AT keyboards. A small (usually 84 keys) or 'large' (102 keys) layout. This means that there are several additional keys that are not available on the standard QL keyboard with 65 keys. These keys are used for specific functions i.e., the numeric pad, or for frequently used key combinations, i.e. DEL instead of CTRL & Right. These keys are interpreted as follows:

Function keys	F6... F10	Shift & F1... F5	
	F11,F12	Ctrl & F11,F12	
Edit keys	Back	Ctrl & Left	delete left char
	Del	Ctrl & right	delete right char
	Ins	Alt & Enter	repeat last command, TK2/ HotKey 2 only
Cursor/numeric	Home	Alt & Left	supported by some editors and Minerva
	End	Alt & Right	supported by some editors and Minerva
	PgUp	Alt & up	supported by some editors
	PgDn	Alt & down	supported by some editors
Control keys	NumLock		defines cursor/numeric key block for use as cursor- or numeric- keys
	ScrLock	Ctrl & F5	stop screen and keybuffer output
	PrtScr	Ctrl & C	next job
	SysReq	Ctrl & C	next job
	Break	Ctrl & Space	break and delete key buffer
	Pause	Ctrl & Space	break and delete key buffer



Pause and SysReq are only available on some 84 key keyboards. F11 and F12 are only available on 102 key keyboards.

Besides the above keys you will find an additional special cursor-key block on the 102 key keyboards, giving cursor functions independent of the NumLock status.

### **Key buffer**

QL-KEYBOARD-90 has an internal key buffer that allows the input of up to 55 characters, if, for example, during FORMATTING no input (exceeding the QL internal 7 key buffer) is possible or if ScrLock has been pressed. The output of the key buffer may be stopped with ScrLock at any time; Break, Pause or Ctrl & Space will delete the buffer. The auto-repeat function, for keys depressed, is disabled during the buffering to simplify "blind" input. The storage capacity of 55 characters is ample for all applications and should not be exceeded. Under some circumstances a buffer overflow may lead to a fault and the last character (the 55th) is auto repeated continuously. Pressing any key (except for Shift, Ctrl and Alt) terminates this fault.

### **Keyboard-reset**

By pressing the keys Ctrl, Alt and Del simultaneously, QL-KEYBOARD-90 resets the QL immediately. This keyboard reset is instigated by the interface and hence will always work, even if the QL has completely crashed.

### **Pause output: CTRL F5 respectively ScrLock**

The procedure to freeze the QL screen output has been completely revised. The previously used CTRL & F5 key combination has been replaced with the ScrLock key, which also shows the screen status (locked or not) with a LED. To continue the screen output, ScrLock has to be pressed again. Pressing any key, whilst screen output is paused, will be buffered and not terminate the freeze screen like previously used. You will become familiar with this change and prefer its advantages soon.

In the AT mode the break function (Ctrl & Space or Break key) will delete the internal key buffer, terminate the activated ScrLock and give a break. In XT mode however a break, during ScrLock, will delete the internal buffer only.

A QL screen freeze, self-managed by the QL using Toolkit 2 (for example a long directory) may not be recognized by QL-KEYBOARD-90. So pressing ScrLock will switch on the ScrLock LED and redirect any keyboard input, to the buffer, whilst the screen freeze itself has been terminated.

Users of Toolkit 2 should press any key to cancel a screen freeze activated by the machine itself.

### **ScrLock, NumLock and CapsLock**

ScrLock (freeze screen and buffer keyboard input), NumLock (cursor/numeric key pad) and CapsLock (capitals on/off) are status keys. Their active function is indicated by a



LED. In the XT-mode of the interface, none of these keys have an auto repeat function. However in AT mode ScrLock and NumLock are auto repeated if they are kept down. Hence keeping ScrLock pressed allows you a useful reduction of quick screen outputs, without the need to freeze the output completely. If your keyboard allows XT/AT mode selection, you may choose according to your requirements. Please avoid the key combination of Shift & CapsLock if the AT mode is used. This will lead to a swap of the Caps- Lock-LED status whereas the QL does not recognize the CapsLock command.

### **Forbidden multiple key presses**

The QL input routines (INPUT, INKEY\$) only allow key combinations of one letter, function or cursor key (non-control key) with one or more of the control keys (Shift, Ctrl and Alt), e.g. B or SHIFT & cursor left or SHIFT & CTRL & ALT & F3. With KEYROW however any number of non-control keys pressed simultaneously (F1 & A & cursor up e.g.) may be recognized by the machine.

Pressing any non-control key together with one or more of the control keys is supported by QL-KEYBOARD-90. However the interface behaviour changes, if combinations of letter, function and cursor keys (non-control keys) are pressed simultaneously. In a key combination, like the above example, the interface always will delete a previously pressed non-control key if a new non-control key follows, so that only the last non-control key in such a **forbidden key combination** will remain active (cursor up in the above example).

This restriction is not applicable for the keys of keyrow 1. The cursor keys, \, SPACE, ENTER and ESC may be combined without any problems as is necessary in graphics programs or in QRAM / QPAC 2 (e.g. cursor down & cursor left). In practice however this should not be a real restriction. We are not aware of any QL software that supports, or needs, key combinations of letter and function keys (e.g. A & F5) pressed simultaneously except for the allowed combinations of cursor keys, \, SPACE, ESC and the ENTER key.

Please note however that some XT/AT keyboards only support two or three non-control keys pressed simultaneously.