

## ZX Interface 2 - Service Manual

The ZX interface 2 connects directly to either the ZX interface 1 module or to the Spectrum expansion connector. It provides the interface for any joystick that has a standard 9-way D plug and enables the use of ZX ROM cartridge software. It also enables joysticks to be used with cassette-loaded programs and provides connector for ZX printer.

The interface comprises 1 printed circuit board upon which are mounted a single integrated circuit and all the input/output connectors.

With the interface 2 connected to either the Spectrum or interface 1 and with a ROM cartridge inserted, the /ROMCS2 signal disables the Spectrum ROM and enables the Spectrum to interface with the ROM cartridge. The Spectrum CPU then uses its address, data and control busses to access the ROM via the expansion connectors.

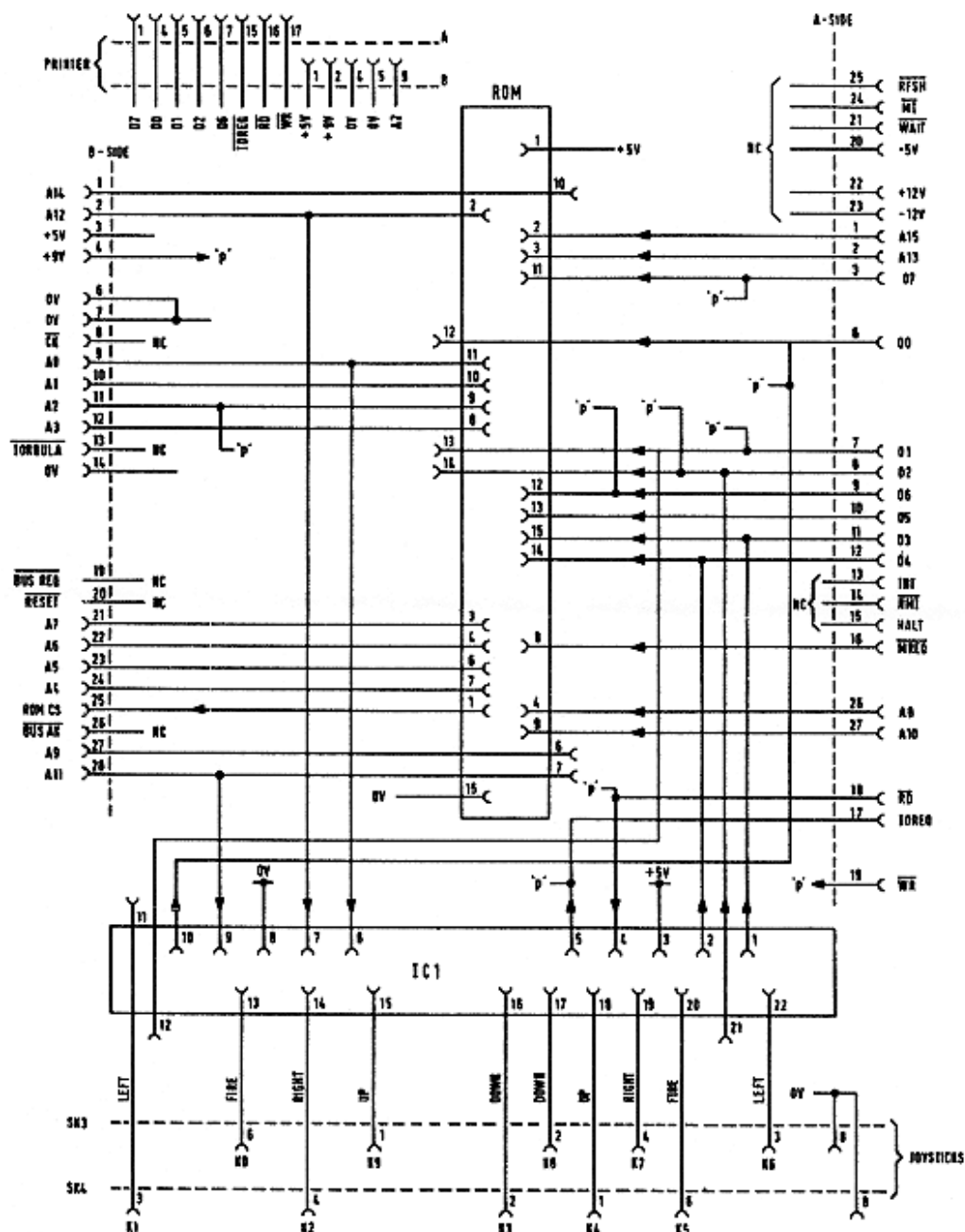
The interface 2 ULA is a custom-built CMOS integrated circuit which plugs into the p.c.board mounted socket. Figure 1.4 gives a schematic of the device. Address bits A0, A11 and A12 are used to address the 2 joysticks, with /IORQ and /RD performing their standard control functions. Lines K1 to K9 receive the control inputs from the 2 joysticks. The functions and connection details are summarized in the table below.

PIN NO.	SK3	SK4	FUNCTION
1	K9	K4	UP
2	K8	K3	DOWN
3	K6	K1	LEFT
4	K7	K2	RIGHT
5	-	-	-
6	K0	K5	FIRE
7	-	-	-
8	0V	0V	COMMON
9	-	-	-

NOTE: K1 to K9 correspond to keyboard keys 1 to 9

The rear edge connector provides connections for a ZX Printer.

# Section 1: Schematic



KEY:  
 'p' = CONNECTION TO 'PRINTER' EDGE CONNECTOR  
 NC = NO INTERNAL CONNECTION  
 A-SIDE = COMPONENT SIDE

## **Section 2: Disassembly/Assembly**

Turn the interface upside-down and remove 4 cross-head screws. After lifting the base clear, the p.c.board is easily separated from the top covers.

Assembly is the reverse of disassembly taking care to orientate the p.c.board correctly.

## **Section 3: System Test**

The most practical test for the ZX interface 2 is a functional check using a suitable ROM cartridge (e.g. Space Raiders) and a pair of industry-standard joysticks.

ZK interface 2 is plugged into the ZX Spectrum and the ROM cartridge software RUN in the normal way. Provided the game employs joystick controls it is a simple matter to determine whether the game is running correctly and the UP, DOWN, LEFT, RIGHT and FIRE control switches are operational.

If the game does not run, suspect the ZX interface 2 p.c.board and/or edge connectors. The same applies if the joysticks are non-operational but also include a check of the 9-pin D-type connectors and possible renewal of the ULA.

## **Section 4: Fault Diagnosis And Repair**

### ***Modification History:***

No problems have to date arisen with this unit.

### ***Fault Diagnosis:***

Since the ZK interface 2 comprises one integrated circuit and a number of connectors, fault finding is simple. Connect the unit to a Spectrum and connect a game ROM cartridge, two joysticks and a printer to the unit. Initiate the game and check out all functions.

If a fault is found, power-down and replace IC1. Printer faults must be due to discontinuity between input and output, since pin to pin connections are used.

Renewal of components should be carried out using recognized desoldering/heatsinking techniques to prevent damage to the component or the printed circuit board.

## Section 5: Parts List

Item	Description	Manufacturer/Type
IC1 (ULA)	Integrated Circuit	MCE HT62001
SK1	28-way edge connector	Pye
SK2	15-way edge connector	Pye
SK3,SK4	9-way 'D' type connector	ITT Cannon
Upper case	-	Canton-Hill SRC126
Lower case	-	Canton-Hill SRC127
Case lid	-	Canton-Hill SRC128
Screw (4 off)	C'sk,2.9 mm x 13 mm 1g	Plastite