Diagnostic Rev. 586220 Harness - User Port

Module Description

The User Port module is the central part of the Diagnostic Rev. 586220 harness. It provides the required feedback connections for testing the C64's CIA U2, which is connected to the user port. It also holds the analog switches, which are required to test the Control Ports and the feedback connections for testing the cassette port.

The MOTOR output signal of the cassette port has approximately a 6V level. To use it as a control signal for operating logic devices, a voltage divider consisting out of a 150Ω resistor and a 320Ω (316Ω works here, 330Ω should work as well) resistor is required, which has a ratio of about 0.7.

This way, the MOTOR signal is fed back to the WRITE pin and is also used for switching the analog switches between the joystick signals of both control ports.

Pin Outs

User Port

J1- Edge Connector (2x12, 3.96mm pitch)

Pin	Signal	Pin	Signal
1	GND	A	GND
2	+5V	B	/FLAG2
3	/RESET	C	PB0
4	CNT1	D	PB1
5	SP1	E	PB2
6	CNT2	F	PB3
7	SP2	H	PB4
8	/PC2	J	PB5
9	ATN	K	PB6
10	9VAC(1)	L	PB7
11	9VAC(2)	M	PA2
12	GND	N	GND

Cassette Port

J2 – 2x3 pin header for a ribbon cable connected to the cassette port PCB (project number 114).

Pin	Signal	Pin	Signal
1	GND	2	n.c.
3	MOTOR	4	READ
5	WRITE	6	SENSE

Control Port #1

J3 – 2x5 pin header for a ribbon cable which connects via a D-SUB 9 (female) to the control port.

Pin	D-*SUB*	Signal	Pin	D-*SUB*	Signal
1	1	JOYA0 (up)	2	6	FIREA
3	2	JOYA1 (down)	4	7	+5VCTR1
5	3	JOYA2 (left)	6	8	n.c. (GND)
7	4	JOYA3 (right)	8	9	POTXA
9	5	POTYA	10	-	n.c.

Control Port #2

J4 – 2x5 pin header for a ribbon cable which connects via a D-SUB 9 (female) to the control port.

Pin	D-*SUB*	Signal	Pin	D-*SUB*	Signal
1	1	JOYB0 (up)	2	6	FIREB
3	2	JOYB1 (down)	4	7	+5VCTR2
5	3	JOYB2 (left)	6	8	n.c. (GND)
7	4	JOYB3 (right)	8	9	POTXB
9	5	POTYB	10	-	n.c.

Interconnects

User Port

Pin	Signal		Signal	Pin
4	CNT1	↔	CNT2	6
5	SP1	↔	SP2	7
8	/PC2	↔	/FLAG2	B
9	ATN	↔	PA2	M
C	PB0	↔	PB4	H
D	PB1	↔	PB5	J
E	PB2	↔	PB6	K
F	PB3	↔	PB7	L

Cassette Port

Pin	Signal		Signal	Pin
3	MOTOR	Volt.div.	WRITE	5
4	READ	↔	SENSE	6

Control Ports

Signal		Signal
FIREA	switched by MOTOR	FIREB
JOYA0	switched by MOTOR	JOYB0
JOYA1	switched by MOTOR	JOYB1
JOYA2	switched by MOTOR	JOYB2
JOYA3	switched by MOTOR	JOYB3
POTXA	via 120kΩ (R1)	+5V (CTR 1)
POTYA	via 120kΩ (R2)	+5V (CTR 1)
POTXB	via 120kΩ (R5)	+5V (CTR 2)
POTYB	via 120kΩ (R6)	+5V (CTR 2)

The digital signals of the control ports are connected by an analog switch. A HIGH level of the MOTOR signal will switch on.

The POT (paddle) signals are tested with a fix resistor of 120k, that is connected to the +5V provided by the respective control port.

Cables

User Port/Cassette Port Cable

One cable as shown in Doc.-No. 113-3-01-00 is required. It connects to J2.

User Port/Control Cables

Two cables as shown in Doc.-Nr. 113-3-02-00 are required. They connect to J3 and J4.

The IEC-Dongle

The IEC-Dongle is not attached to the PCB, it is an extra built.

6p. DIN plug, connect according to Doc.-No. 113-3-03-00

Pin	Signal		Signal	Pin
1	SRQ	↔	DATA	5
3	ATN	↔	CLK	4