DesTest MAX-Switch (v2.t)

Assembly Notes

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Revision 1

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Building the DesTest MAX-Switch Board

Most parts for this board are readily available from the larger national suppliers as well as the discount off-shore providers. The recommended 28F512 Flash Memory (PROM) will likely need be bought from such off-shore providers. It is recommended that the 74LS chips specified be sourced directly from reputable national suppliers as it is common for off-shore suppliers to rebrand slightly incompatible chips and sell them as real.

I recommend soldering the components into the board in shortest-to-tallest order:

Diodes, Resistors, Capacitors, ICs/Sockets, Headers,Tactile Switch and lastly the LEDs.

Some attention needs to be paid with a couple of the components:

IC Sockets

The use of an IC socket for the PROM is necessary both since it is a PLCC-32 and that you need to be able to remove it to reprogram it. The use of an IC socket for the 74LS02 and two 74LS74s is optional (though recommended).

Jumper blocks

The jumper marked 16K can be left disconnected for the time being. In future it may be used to select larger MAX-Switch ROM images.

The jumper-blocks marked A14 and A15 may have header-posts installed should the PROM installed be larger than 16K (such as a 28F256 or 28F512). In this event, the jumpers may be used to select between different 16K ROM images installed on the PROM:

A15	A14	PROM Image Address	
		28F256	28F512
On	On	-	$0000
On	Off	-	$4000
Off	On	$0000	$8000
Off	Off	$4000	$C000

You will have room for 2 or 4 complete ‘Switch images on your PROM. If you put multiple versions of the same binary back-to-back on the PROM then you don’t need to worry about the A14 and A15 jumpers.

If you are a little adventurous, you might consider visiting the “Updated C= Diags” page on the FactorOfMatt website. There you can download updated versions of the Commodore DeadTest and Diagnostics cartridge images that have be modified to work together as a ‘Switch image. If you place

both the DesTestMAX-Switch and the dead-diags-screen-sparkle-switch.rom image into your PROM then you may use the A14 and A15 jumpers to switch between the tests as described in the table above.

LEDs

The LEDs must be placed into the board in the correct orientation. The PCB silkscreen shows the LEDs with one flat-side. This corresponds to the flat side on your LED which will also have the shorter leg. All LEDs on this PCB are oriented the same way: flat-side / short-leg to the right, long-leg to the left. You may wish to place 5mm standoffs under the LEDs if you plan on printing a case for your ‘Switch cartridge. Files for printing both are included on the FactorOfMatt website and the DesTestMAX-Switch 2.t resource archive.

IO1 IO2

Towards the bottom of the front of the PCB are some exposed pads marked “IO1 IO2”. These pads are there to allow the possibility of changing the base I/O address of the cartridge. The address is set correctly when the PCB is built and these pads can be safely ignored.

Bill of Materials

#	RefDes	Qty	Manufacturer	Mfg Part #	Description/Value
1	C1, C2, C3, C4	4	Kemet	C320C104M5R5TA	CAP CER 0.1UF 50V X7R RADIAL
2	D1, D2	2	ONSemi	1N4148	DIODE STANDARD 100V 200MA DO35
3	J2	1	Wurth Elektronik	61300311121	CONN HEADER VERT 3POS 2.54MM
4	J7	1	Wurth Elektronik	61300211121	CONN HEADER VERT 2POS 2.54MM
5	LED1	1	Kingbright	WP7113ID	LED RED DIFFUSED T-1 3/4 T/H
6	LED2	1	Kingbright	WP7113GD	LED GREEN DIFFUSED T-1 3/4 T/H
7	R3, R4, R7	3	Yageo	MFR-25JR-52-10K	RES 10K OHM 5% 1/4W AXIAL
8	R5, R6	2	Yageo	MFR-25JR-52-390R	RES 390 OHM 5% 1/4W AXIAL
9	SW1	1	Same Sky	TS02-66-110-BK-100-SCR-D	SWITCH TACTILE SPST-NO 0.05A 12V
10	U1, U3	2	Texas Instruments	SN74LS74AN	IC FF D-TYPE DOUBLE 1BIT 14PDIP
11	U4	1	Texas Instruments	SN74LS02N	IC GATE NOR 4CH 2-INP 14DIP
12	U5	1	Mill-Max Manufacturing Corp.	940-44-032-24-000000	CONN SOCKET PLCC 32POS TIN
13	U99	1	ST	M28F512	IC FLASH 512KBIT PARALLEL 32PLCC (28F512)

While the Manufacturer and Mfg Part # are based upon items available from Digikey, these components are generic and items from any manufacturer or distributor should be acceptable.

Using your new DesTest MAX-Switch cartridge

There's not much to it really: plug it in and power-on your C64. With any luck you'll see the "DesTestSwitch – 4K Memory Pre-Test" banner-screen and testing will begin. Once the first 4K has tested OK, the switch to "DesTestSwitch – 64K Memory Test" is made automatically and the entire 64K will be tested forever (or until a failure is discovered). Full details for how errors are indicated can be found in the DesTestSwitch documentation (factorofmatt.com).

The power LED built-in to the MAX-Switch cartridge can be very useful to determine if your C64 is powered on when the keyboard is removed (as it often is when diagnosing faults).

The green LED on the cartridge indicates the state of the reset (/RST) signal. Under normal circumstances, this LED will illuminate for a short time at power-up then extinguish. (It will also illuminate while the RESET button is pressed). If the reset LED doesn't illuminate or if it doesn't then extinguish after a short period of time, then something is most likely wrong with the reset circuit on the C64 or '128.

Reference Pictures