EHIP SPECIAL

Pocket Calculators



DIY Expansions, Knowledge, Programming, Software. Oliver Knill - Translation by MvC, 2020

Switching Interface For TI-59, TI-58, TI-57

Chip has already published many good instructions for switching interfaces. Why build another one? I was looking for a circuit which allows to control multiple channels. The calculator display is especially well suited for this task.

A seven segment display has a simple construction. If, for example, line 1 and line 8 are asserted then the upper segment is turned on. On the other hand, if the upper segment is lit a voltage can be picked up between line 1 and line 8.

This voltage is then amplified to trigger a relay. The display can show the numbers from 1 to 9. Let us just consider the upper and the middle horizontal segment. The digits 1, 4, 7 and 8 suffice to control two channels independently. In theory, 20 channels can be controlled but not without problems:

- Cost and effort for 20 channels are quite high.
- 22 wires need to be routed out of the calculator.
- In the extreme case, 20 relays need to be switched.

Therefore I decided to stick to two channels.



Segment layout and control

The Circuit

The schematics are pretty simple and can be assembled by computer

enthusiasts without much experience in electronics.



Prototype assembly of the switching interface with two relays



Openend case with battery for the switching interface



The pocket calculator is mounted on its printer cradle. The cable leaving the calculator is the connection to the switching interface.

View of the full installation with the pocket calculator, the printer cradle and the switching interface with all connections





The circuit schematics show the relatively simple construction of the switching interface. The calculator circuit board shows the connections to the switching interface.

External Flag for TI-58/59

Which TI-59 gamer hasn't had a jealous look at the joysticks connected to TV gaming consoles which allow to control the action with no need to touch a keyboard? With very little effort this is a valid option for TI-59 owners now! This is the principle: An oscillator is pressing key A or B repeatedly, depending on the position, left or right, of the stick. Consider the following programm:

LBL A + 1 = R/S LBL B - 1 = R/S

It counts up or down at its masters will. Here is a typical program for this interface:

A Mars Lander (TI-59)

You are sitting in a spaceship and have the order to land on marsian ground over which you are hovering at an altitude of 2000 m. On the screen (the printer roll) you watch the situation. At the left edge you can see the surface of Mars. With the stick you control the speed of the decend. Have fun! It's not easy! You start the game with key C. For the connectiors I chose types which are common in RC model planes.



Add-on device to expand the calculator TI-58/59



Opened case case for the add-on device

Opened calculator case, view from the backside





Schematics of the add-on device with labels for the connection ti the calculator. Use a very small soldering iron!

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000 001 002 003 004 005 006 007 008 009 010 011 012 013 014 012 013 014 015 016 017 018 019 020 021 022 023 024 025 026 027 028 029 030 031 032	76 LBL 11 A 93 5 5 44 SUM 00 00 16 LBL 12 B 93 5 22 INV 44 SUM 00 8 00 16 16 LBL 93 5 22 INV 44 SUM 00 8 01 43 RCL 01 01 43 RCL 01 01 43 RCL 01 01 25 RCL 01 22 77 357 EQ 39 39	035 036 037 038 040 041 042 043 044 045 045 045 045 051 052 054 055 055 055 055 055 055 055 055 055	00 0 95 R/S 8/S 91 R/S 91 R/S 91 R/S 91 R/S 91 R/S 91 R/S 91 R/S 91 R/S 90 00 43 CL9 00 A3 DP 01 R CL9 02 RCL7 69 00 43 R 5P 02 RS 90 02 43 R 5P 03 0P 043 RS 90 02 43 R 5P 043 RS 043 RS 044 RS 044 RS 044 RS 044 RS 044 RS 044 RS 045 RS 0	070 071 072 073 074 075 076 077 078 079 081 082 083 084 085 084 085 088 084 085 088 089 090 091 093 094 095 096 096 097 098	42 STD 00 00 25 CLR 03 66 PRU 99 PRT 25 CLR 02 2 66 PRU 99 PRT 25 CLR 01 1 66 PRU 99 DP 00 00 43 CL 50 0P 03 0P 03 0P 03 CL 50 0P 03 0P 03 CL 50 0P 03 CL 50 0P 03 CL 50 0P 03 CL 50 0P 03 CL 50 0P 043 RCL 55 CLR 55 0P 01 43 RCL 55 0P	105 54 54 106 69 DP 107 03 03 108 69 DP 109 05 05 110 61 GTC 111 34 FX 112 76 LBL 113 35 1/2 114 43 RCL 115 53 53 116 69 DP 117 01 01 118 43 RCL 119 52 52 120 69 DP 121 02 02 122 43 RCL 123 51 51 124 69 DP 125 03 03 126 69 DP 127 05 05 128 61 GTC 129 34 FX 2232007300, 312200000. 2713311641. 1435411523. 1641312200. 1700271331. 4317241523.	555555555555555555555555555555555555555	
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Programm for a landing on Mars with the TI-59 pocket calculator