

**Mobile turnout keyboard  
GCA123  
Bill Of Materials and mounting instructions**

**Revised: May 9, 2017  
Revision: 1.0**

**First start with drilling holes for buttons using the pboard as mould  
Fix the board inside top half of box using the small parkers.  
Each led- and button position has a 1mm center hole.  
use a drill to make a hole in each of these center holes.  
Se for picture here: [http://wiki.rocrail.net/doku.php?id=mgv\\_frec](http://wiki.rocrail.net/doku.php?id=mgv_frec)  
Remove pboard.  
Drill 16x button holes with 4mm drill.  
Drill 2x led hole with 3mm drill.**

**Now insert 16 buttons and two leds into board at BOTTOM SIDE.  
DO NOT USE CENTER HOLE FOR LEDS!  
before soldering anything, just slide board into its position in the box  
if buttons are free in movement.  
Also check the correct position of leds.  
Now solder all buttons and leds at the top pboard side, without taking  
Take board out of box and fix all resistors, and other parts in the foil  
Insert Crystal and C4, C6 and C7 at bottom side of board.  
Be sure that they are all as flat as possible on the pboard before soldering**

<b>Item</b>	<b>Quantity</b>	<b>Reference</b>	<b>Part</b>
2		R1, R2	resistor 33 $\Omega$
1		R3	resistor 68 $\Omega$
1		R4	resistor 47 K $\Omega$
1		R5	resistor 150 K $\Omega$
1		R6	resistor 220 K $\Omega$
1		R7	resistor 2,2 K $\Omega$
1		R8	resistor 22 K $\Omega$
9		R9, R12..R19	resistor 10 K $\Omega$
2		R10, R11	resistor 1 K $\Omega$
1		RP1	resistor network star 8 x 10 K $\Omega$ SIL9
1		C1	ELCO 10 uF minimum 16V radial
3		C2, C4, C5	capacitor 100 nF 2.5 mm pitch
1		C3	ELCO 22 uF minum 16V radial
3		C6..C8	capacitor 15 pF
2		D1, D2	DIODE 1N5818
1		T3	BC337/40
1		Led1	3mm led green

Blad1

<b>1</b>	<b>Led2</b>	<b>3mm led red</b>
<b>1</b>	<b>U1</b>	<b>PIC16F873A with 28 pin socket</b>
<b>1</b>	<b>U2</b>	<b>LM311 with socket 8pin</b>
<b>1</b>	<b>VR1</b>	<b>LM7805 TO220</b>
<b>16</b>	<b>S3..S18</b>	<b>push button 3301B</b>
<b>1</b>	<b>Q1</b>	<b>CRYSTAL 20 MHz</b>

**Now, last thing is to cut a square hole for the RJ12 connector.  
Then fix the board using 4 parkers, and close the box.**

**d.**

**li-en#assembling\_instructions**

**s, and check**

**ing the board out of box.  
llowing order as below.**

**ering these parts.**

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