User Manual

How to wire up the AVR board

Firstly connect the speaker between the pin labelled PB3 and the pin labelled GND. Then, wire up the board as described in 'Board Test Procedure'.

AVR Pins (top and bottom row)		Input/Output Device Pins (middle row)	
Port Group	**Pin**	**Port Group**	**Pin**
PORT F	PF0	LCD DATA	D0
PORT F	PF1	LCD DATA	D1
PORT F	PF2	LCD DATA	D2
PORT F	PF3	LCD DATA	D3
PORT F	PF4	LCD DATA	D4
PORT F	PF5	LCD DATA	D5
PORT F	PF6	LCD DATA	D6
PORT F	PF7	LCD DATA	D7
PORT K	PK8	INPUTS	POT
PORT K	PK9	INPUTS	LDR
PORT K	PK10	AUDIO	MiO
PORT E	PE5	LCD CTRL	BL
PORT E	PE3	AUDIO	Ain
PORT E	PE2	MOTOR	Mot
PORT D	TDX2	MOTOR	OpO
PORT D	RDX3	INPUTS	PB1
PORT D	RDX4	INPUTS	PB0
PORT A	PA2	-	-
PORT A	PA3	MOTOR	LED
PORT A	PA4	LCD CTRL	BE
PORT A	PA5	LCD CTRL	RW
PORT A	PA6	LCD CTRL	E
PORT A	PA7	LCD CTRL	RS
PORT C	PC0	LED BAR	LED2
PORT C	PC1	LED BAR	LED3
PORT C	PC2	LED BAR	LED4
PORT C	PC3	LED BAR	LED5
PORT C	PC4	LED BAR	LED6
PORT C	PC5	LED BAR	LED7
PORT C	PC6	LED BAR	LED8
PORT C	PC7	LED BAR	LED9
PORT G	PG0	-	-
PORT G	PG1	AUDIO	ASD
PORT G	PG2	LED BAR	LED0
PORT G	PG3	LED BAR	LED1
PORT L	PL0	KEYPAD	C3
PORT L	PL1	KEYPAD	C2
PORT L	PL2	KEYPAD	C1
PORT L	PL3	KEYPAD	C0
PORT L	PL4	KEYPAD	R3
PORT L	PL5	KEYPAD	R2
PORT L	PL6	KEYPAD	R1
PORT L	PL7	KEYPAD	R0
P11	+5V (any)	MOTOR	OpE

How to play the game

Board setup

Connect the board to a stable power supply and press the reset button. You should see the 'Safe Cracker' title screen. The '?' will be the difficulty level as described below.

2121 16s1
Safe Cracker (?)

Setting the difficulty

On the title screen, press the letter keys to set the amount of time you will have to find the correct potentiometer position.

Difficulty Level	Time Limit
A	20 seconds
B	15 seconds
C	10 seconds
D	6 seconds

Starting a new game

Press PB1 (the left push-button) to start the countdown timer to begin a new game.

Find POT

In this stage, you will have to set the potentiometer to the correct position before the time runs out. The time remaining will be displayed on the LCD. The correct position is a secret and will be different every time.

If the potentiometer is not set to 0, you will see the 'Reset POT' screen. The '?' will be the amount of time you have remaining.

Reset POT to 0
Remaining: ?

Rotate the potentiometer anti-clockwise as far as possible and leave it there for 500ms until you see the 'Find POT' screen.

Find POT Pos
Remaining: ?

Now rotate the potentiometer clockwise to find the correct potentiometer position without going past it. If you go too far, you will have to reset the POT and the correct position will be changed! As you approach the correct position, the LEDs will light up. The closer you are to the correct position, the more LEDs will be lit.

Once all the LEDs are lit, leave the potentiometer for 1 second in that position to advance to the 'Find Code' screen.

Find Code

Position found!
Scan for number

In this stage you need to find the correct key on the keypad. The correct key is secret and will be different every time. Whenever the correct key is held, the motor will spin.

Find and hold the correct key for 1 second to advance to the next stage. If you've found the correct key 3 times in a row you will advance to the 'Enter Code' stage. Otherwise you'll return to the 'Find POT' stage.

Enter Code

Once you have found the correct key 3 times in a row, you will reach the 'Enter Code' screen. Enter the 3 secret keys you found in order to win the game!

Winning or losing the game

If you successfully find and enter the 3 secret keys, you will reach the victory screen.

Game complete
You Win!

Otherwise, if you run out of time while finding the correct potentiometer position, you will reach the game over screen.

Game over
You lose!

From either of these screens, press any button to return to the title screen.

Restarting the game

At any time, you can press PB0 (the right push-button) to return to the title screen.

References

Board Test Procedure, http://webapps.cse.unsw.edu.au/webcms2/course/showfile.php?cid=2435&color=orange&addr=Labs/Board%20Test%20Procedure.pdf

COMP2121 Project specifications, http://webapps.cse.unsw.edu.au/webcms2/course/showfile.php?cid=2435&color=orange&addr=Assignments/Project%2016s1.pdf