APGAR Timer Power Consumption.

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Date: 21st October 2004

Assumptions:

1 The timer will never be turned OFF – there will always be some LCD activity.

2 The timer will be used twice a day, 365 days a year.

3 The sounder will operate at the 1, 5 and 10 minute points. Each operation will be for 5 seconds at a 50/50 duty cycle.

4 The LCD will be updated every second, 365 days a year.

5 The battery will be monitored once every hour with 5 ADC cycles per sample.

Power Consumption Calculation:

Number of hours in a year:	24 x 365	8760	

ST7LITE15

CPU (Estimated):			
Active Halt mode	200uA		
Run (Slow) mode	200uA		
Consumption:	200uA x 8760	1752 mAh	(1)
LVD/AVD	245uA		
	245uA x 8760	2146 mAh	(2)
RC Oscillator (Not used)		0 mAh	
PLL (Not used)		0 mAh	

12-bit Timer AT2		50uA		
		50uA x 2(Use) x (3(Times) x 5 (Seconds) / 3600(Hours) x 365) / 2(Duty)	0.076 mAh	(3)
SPI (Not used)			0 mAh	
ADC	1.2mA			
		1.2mA x 5(Samples) x 0.5mS(Conversion time) / 3600(Hours) x 8760	0.0073 mAh (4)	
Flash Memory				
No Read/Write		100uA		
		100uA x 8760	876 mAh	(5)
Read		2.6mA		
		2.6mA x (256 / 32768)(Instructions) x 8760	178 mAh	(6)
Ports (Leakage)		1uA		
		1uA x 15(Pins) x 8760	131 mAh	(7)
PCF8576D LCD Driver				
Supply		20uA		
		20uA x 8760	175 mAh	(8)
LCD Supply		60uA		
		60uA x 8760	526 mAh	(9)
Sounder		2.5mA		
		2.5mA x 2(Use) x (3(Times) x 5 (Seconds) / 3600(Hours) x 365) / 2(Duty)	3.8 mAh	(10)
I2C interface		2(Lines) x 3V / 2700 Ohms x 1 / 1000(duration) / 3600(Hours) x 8760	0.00 mAh	(11)

Battery Potential Divider	10uA			
	10uA x 8760		88 mAh	(12)
LTC1877 Regulator (1/5mA Load)	100uA			
	100uA x 8760		876 mAh	(13)
		Total (1 – 13):	6752 mAh	

Battery capacity required: 6752 mAh

"AA" Battery capacities by manufacturer:

Varta 4106	2600 mAh
Duracell MN1500	2700 mAh
Energizer Ultra Alkaline	2850 mAh

Number of batteries required:	6752 / 2600	3 batteries