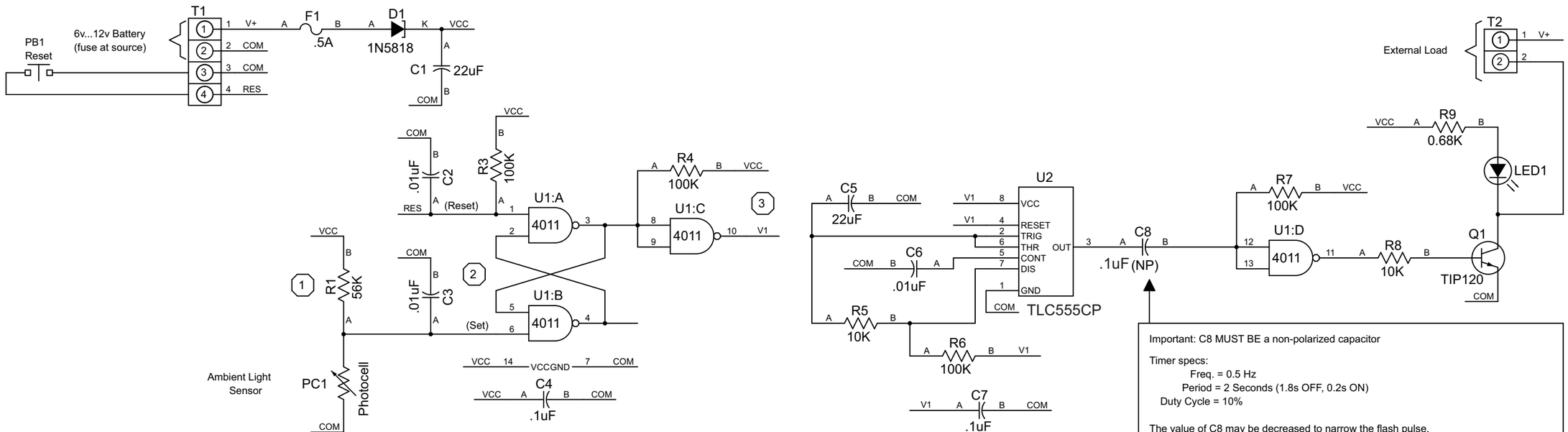
TAG	VENDOR	PART #	QTY.	DESCRIPTION
U1	Jameco	12634	1	4011B Quad 2-Input NAND Gates (MUST BE "B" suffixed)
C1 C5	Jameco	158326	2	22uF 35v electrolythic capacitor .1 lead cc
C2 C3 C6	Jameco	25507	3	.01uF (103) 50v monolythic capacitor
C4 C7	Jameco	25523	2	.1uF (104) 50v monolythic capacitor
C8	Jameco	94369(?)	1	10uF 35v non-polarized capacitor .1 lead cc .25 dia.
F1	Jameco	1710477	1	Picofuse .5A
LED1	Jameco	333973	1	LED Red (Round 5mm)
U2	Jameco	761272	1	TLC555CP Lo-Power Timer
Q1	Jameco	32993	1	TIP120 NPN Darlington Transistor 5A
R1	Jameco	?	1	Resistor 56K
R2..R4 R6 R7	Jameco	?	5	Resistor 100K (1/8W)
R5 R8	Jameco	?	2	Resistor 10K (1/8 Watt)
R9	Jameco	?	1	Resistor 680 Ohm
T2	Jameco	2094485	1	Terminal Strip (.197cc (5mm)) 2 Terms each piece, linkable
T1	Jameco	2094485	1	Terminal Strip (.197cc (5mm)) 2 Terms each piece, linkable
D1	Jameco	177957	1	Schottky Diode 1N5818
PC1	Jameco	1108144	1	TEPT5600 Ambient Light Sensor
PB1	Jameco	26623	1	NO Momentary Pushbutton (waterproof boot or O-Ring would help)

Description of Operation:

The purpose of this design is to flash an LED when mailbox is opened. Photocell PC1 has a high resistance at low ambient light levels. When the box is opened, PC1 resistance (& voltage drop) decreases, causing a Set condition on Lo transition. U1.10 goes Hi, supplying voltage to U2 (the TCL555 timer) & flashing is initiated.
The flasher is turned OFF by closing the box, then pressing the Reset button. U2.10 goes Lo, turning OFF power to the 555, putting the circuit into a Lo-power state (aprox. 40uA @ 12vdc)
Note that since Q1 is an open-collector output, the user has the option of adding an external LED or Bulb.
A 9v battery will last for months if not used to drive an external load.
The flasher is designed for a 2 second interval (1.8 seconds OFF, 0.2 seconds ON).

To use an external LED or Bulb, connect it between T2.1 & T2.2
The onboard transistor Q1 can handle up to 5A. The external fuse should be sized to handle the current draw of the attached load.

LED1 may be left out entirely if only the external flasher is visable (this will yield some additional battery life).



Important: C8 MUST BE a non-polarized capacitor

Timer specs:
Freq. = 0.5 Hz
Period = 2 Seconds (1.8s OFF, 0.2s ON)
Duty Cycle = 10%

The value of C8 may be decreased to narrow the flash pulse.
For example, a 0.1uF capacitor is very brief (similar to a camera flash)

1. Value of R1 depends on Photocell used. Reducing R1 makes PC1 less sensitive. However, PC1 will draw more current at low light levels.
2. NAND gates used as RS Flip-Flop
3. NAND Output used as power supply for U2

Title	Mail Box Flasher		
Size B	Number MBOX_FL1		Rev A
Date	Apr 10, 2014	Drawn by	M. Ballew
Filename	MBOX_FL1.S01	Sheet	1 of ?
Note:	Mailbox Alarm (Flashes when Mailbox has been opened)		

TAG	VENDOR	PART #	QTY.	DESCRIPTION
C1 C5	Jameco	158326	2	22uF 35v electrolythic capacitor .1 lead cc
C2 C3 C6	Jameco	25507	3	.01uF (103) 50v monolythic capacitor
C4 C7	Jameco	25523	2	.1uF (104) 50v monolythic capacitor
C8	Jameco	94369(?)	1	10uF 35v non-polarized capacitor .1 lead cc .25 dia.
D1	Jameco	177957	1	Schottky Diode 1N5818
D2 D3 D4 D5	Jameco	36038	4	Diode 1N4148
F1	Amazon	?	1	Picofuse 2A (Change fuse size if Needed)
H1	Jameco	?	1	IDC6 Female (2 x 3)
J1 JP	Jameco	?	2	IDC2 Male Header (1 x 2)
J2 J3 JL	Jameco	?	3	IDC3 Male Header (1 x 3)
PC1	Jameco	202366	1	CDS002-9001 Photocell (approx. Rmin 27K Rmax 300k)
Q1	Jameco	26489	1	NPN Darlington Transistor TO-92 MPSA13
Q2	Jameco	288542	1	TIP117 PNP Darlington Transistor 2A (TO-220)
R1	Jameco	?	1	Resistor 10Meg
R2	Jameco	?	1	Resistor 56K
R3 R4 R6 R7	Jameco	?	4	Resistor 100K (1/8W)
R5	Jameco	?	2	Resistor 10K (1/8 Watt)
T1	Jameco	2094485	1	Terminal Strip (.197cc (5mm)) 6 Terms each piece, linkable
T2	Jameco	2094485	1	Terminal Strip (.197cc (5mm)) 2 Terms each piece, linkable
U1	Jameco	893283	1	CD4011BE Quad 2-Input NAND Gates (MUST BE "B" suffixed)
U2	Jameco	761272	1	TLC555CP Lo-Power Timer

J1 Takes Photocell PC1 In/Out of Circuit
J2 selects Night-Lite (J2.2 to J2.3) or Normal (J2.1 to J2.2) Mode
J3 Selects Flash (J3.2 to J3.3) or On/Off (J3.1 to J3.2) for Output LED
JP allows use of on-board fuse or external voltage for output (load)
JL allows use of NO or NC Contacts on Input

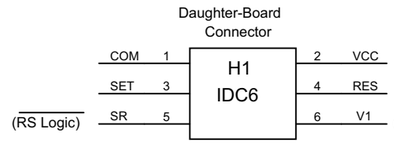
Operating Modes: (see sheet 2 for examples)

Mailbox Alarm: PC1 goes Lo when light is sensed Turning ON Flasher.
Light Flashes until Manually Reset (JL Out, J1 In, J2.1 to J2.2, J3.2 to J3.3)
(Very Low Standby Current: 5uA @ 9v)

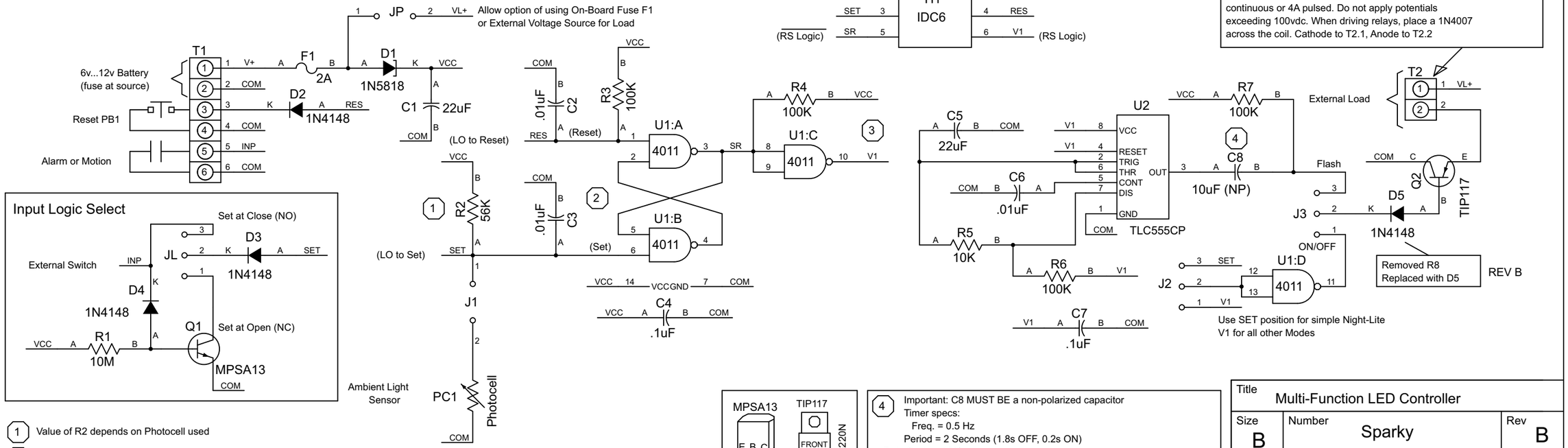
Night Light: PC1 goes Hi at dusk, Turning ON Light
Light goes OFF at sunrise (JL Out, J1 In, J2.2 to J2.3, J3.1 to J3.2)
(.4mA during day (depends on sunlight))

Security System: D3 is pulled Lo by Alarm System (NO or NC Logic)
Turning ON Flasher (JL In, J1 Out, J2.1 to J2.2, J3.2. to J3.3)
Light will Flash until Reset (Auto-Reset if Daughter-Board used)
(Very Low Standby Current: 4uA @ 9v NO or NC)

Motion Detector Light: D3 is pulled Lo by Motion Detector (NO or NC Logic)
Turning ON Light (JL In, J1 Out, J2.1 to J2.2, J3.1 to J3.2)
Light will go OFF when reset by Daughter-Board timer
(Very Low Standby Current: 4uA @ 9v NO or NC)



Note that (by leaving out Jumper JP) the Load may be powered by voltages higher or lower than V+.
This means (e.g.) that a +24v load could be controlled by a 9v battery powering the Sparky board.
However, the TIP117 should not be run at more than 2A continuous or 4A pulsed. Do not apply potentials exceeding 100vdc. When driving relays, place a 1N4007 across the coil. Cathode to T2.1, Anode to T2.2



1. Value of R2 depends on Photocell used
2. NAND gates used as RS Flip-Flop
3. NAND Output used as power supply for U2

4. Important: C8 MUST BE a non-polarized capacitor
Timer specs:
Freq. = 0.5 Hz
Period = 2 Seconds (1.8s OFF, 0.2s ON)
Duty Cycle = 10%
The value of C8 may be decreased to narrow the flash pulse.
e.g. a 0.1uF capacitor is very brief (similar to a camera flash)

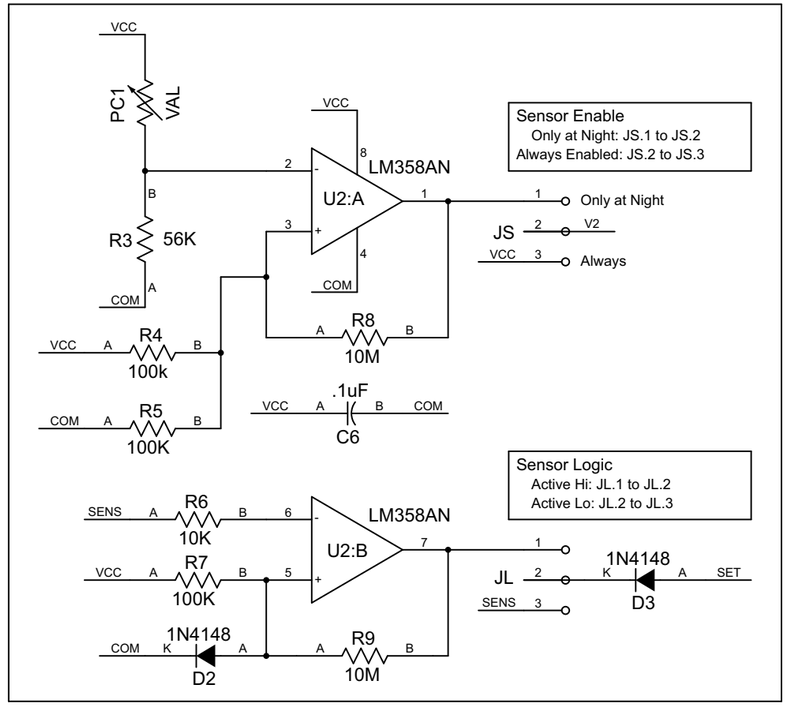
Title	Multi-Function LED Controller		
Size B	Number Sparky		Rev B
Date Jan 26, 2016		Drawn by M. Ballew	
Filename Sparky.S01		Sheet 1 of 2	
Note: Multi-Function LED Controller			

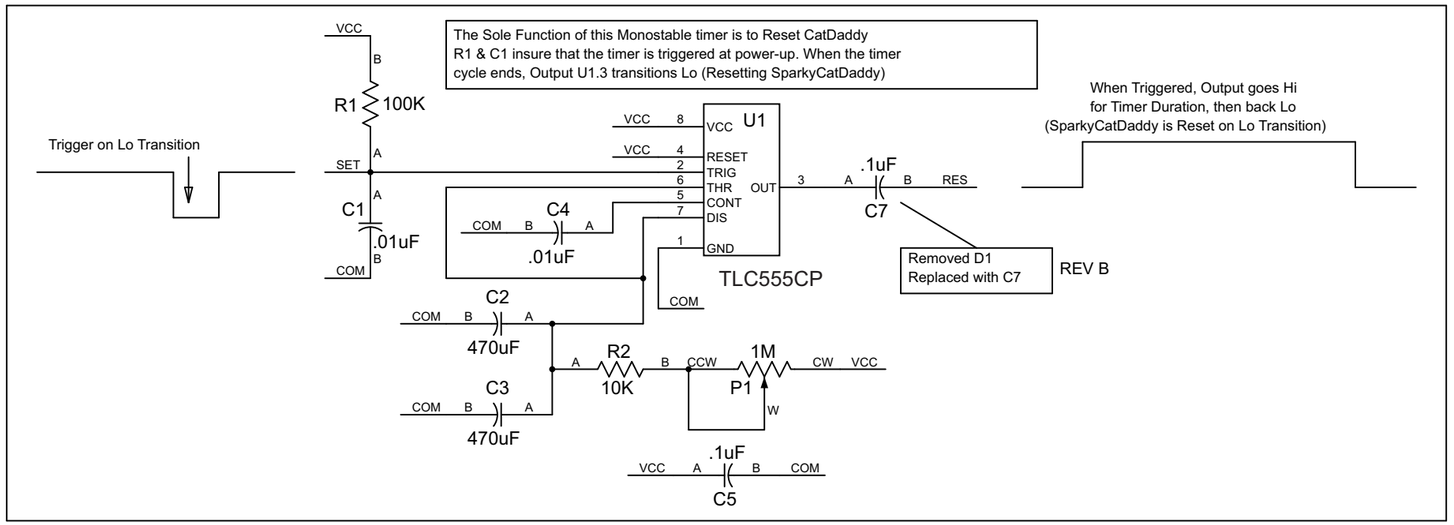
TAG	VENDOR	PART #	QTY.	DESCRIPTION
C1 C4	Jameco	25507	2	.01uF (103) 50v monolythic capacitor
C2 C3	Jameco	?	2	470uF 25v electrolythic capacitor .15 lead cc
C5 C6 C7	Jameco	25523	2	.1uF (104) 50v monolythic capacitor
D2 D3	Jameco	?	3	Diode 1N4148
H1	Jameco	?	1	IDC6 Male Post Header (2 x 3)
H2	Jameco	?	1	IDC6 Female Header (2 x 3)
JL JS	Jameco	?	2	IDC3 Male Post Header (1 x 3)
U2	Jameco	23966	1	LM358 Lo Power Dual Op Amp
U1	Jameco	761272	1	TLC555CP Lo-Power Timer
P1	Jameco	?	1	1M Single Turn Potentiometer
R1 R4 R5 R7	Jameco	?	4	Resistor 100K (1/8W)
R2 R6	Jameco	?	2	Resistor 10K (1/8 Watt)
R3	Jameco	?	1	Resistor 56K (1/8 Watt or 1/4 Watt)
R8 R9	Jameco	?	2	Resistor 10M (1/8 Watt or 1/4 Watt)
PC1	Jameco	202366	1	CDS002-9001 Photocell (approx. Rmin 27K Rmax 300k)

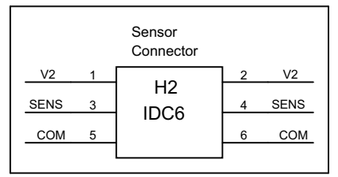
Description of Operation

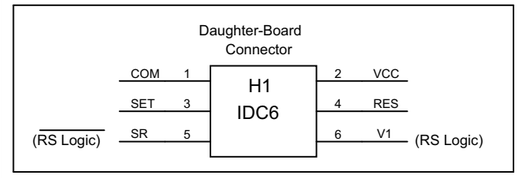
This daughter-board is used to interface common sensors (e.g. Motion Sensors, Hall Effects, etc.) to the SparkyCatDaddy Motherboard. Provision is made for selecting Sensor Logic as well as variable on-times. In addition, provision is made for enabling the sensor only in low-light conditions (as would be needed for a motion sensor used to activate a night light). Note that the SparkyCatDaddy input terminals work in conjunction with this board. e.g. manually activating a light.

This board would not be appropriate for bracket control. Use the Picaxe version for more complicated applications.









Title: Sensor Host + Auto-Reset Daughter-Board			
Size: B	Number: SparkyD2		Rev: B
Date: Jan 26, 2016		Drawn by: M. Ballew	
Filename: SparkyD2.S01		Sheet 1 of 1	
Note: Multi-Function LED Controller Daughter-Board			