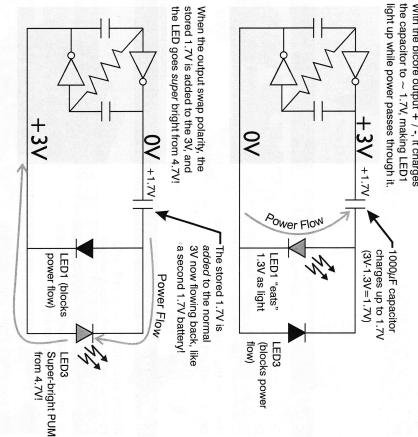
CIRCUIT I HEORY

actual Pum circuit. Let's start with the Pum circuit! There's two parts to the PumLantern. The "dark turn-on" circuit, and the

voltages. which is simply an oscillator that has two outputs that change voltage. When one is "high" (3V), the other is "low" (0V). Every so often, they trade The Pummer is based around a very simple BEAM circuit called a "Bicore",

than what it normally has access to. Here's how it works (showing only one pair of LEDs in operation): is a fancy way of saying we're building something that makes more voltage We're using this "trade voltage" behavior to create a charge-pump, which

With the bicore output + / -, it charges the capacitor to ~ 1.7V, making LED1



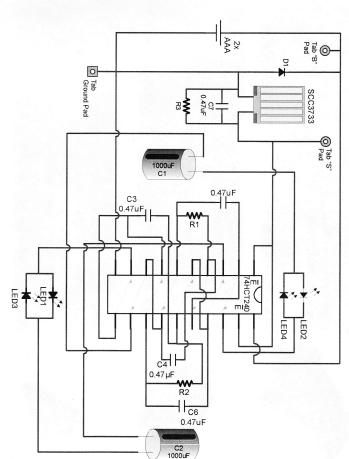
100kOhm resistor forces the chip on. That simple! the solar cell, and when it stops generating power (sun goes down), the line, which means when it sees zero volts, it turns on. We attach this line to The "dark turn-on" circuit is pretty simple. The chip has an "enable-low"

www.solarbotics.com Page 14

1-866-276-2687

SCHEMATIC

build a second out of parts. useful for those of you who might want to modify your PumLantern, or Here's the actual circuit diagram of the PumLantern's circuit. It's more



ADDITIONAL ENHANCEMENTS

ground pad that connects to common grounds in the circuit. of your PumLantern. Once side has a single square pad, which is the You might have noticed that there are little pads on the tabs that stick out

The other tab has two pads: One labeled "S" and one "B'

whole string of lanterns at the same time. (+) and the ground pad). This lets you use a large cell and have it power a The "S" pad lets you add an additional solar cell (connected between "S"

for easy recharging, or measuring voltage The "B" pad lets you directly connect to the battery (with the ground tab)

www.solarbotics.com Page 15 1-866-276-2687

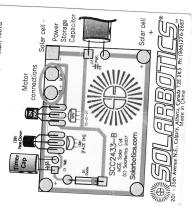
Use the Miller Solarengine circuit to make useful bursts of energy for your motor or device!

NP.N. - 2n22zz or Zn-304 transister 1. - 2020uf or there electrotric power storage capacitor C2 - 1ufr to 41uf discharge durant inne capacitor D1 - 1N914-style signal diode (1N914) Connect your load (motor/LED/etc) to the pads * 7Mtr - * and * 7Mtr + *

Performance Tips:

1989 C1 — more power stored, but means longer recharge time
1999 C2 — more time MSC stays on, but needs more time to recharge
Low 1381 tingger (C2 – more time MSC stays on, but needs more time to recharge
than a 1381-U (4.8)/

Becommended default settings (please experiment): Short bursts / quick recharge (-3sec): Cl = 4700d, C2 = 4.1/6; 1381E Long bursts / slow recharge (-2min): Cl = 0.33; C2 = 22d, 1.381G



This page is intentionally left semi-blank.

Yeah, it was going to be *completely* blank, but we needed to put that boring legal-type stuff somewhere. We were going to say "use this marvelous empty page as your blank canvas with which to create such illustrations or notes as to change the very fabric of society." Instead it's now a partially text-populated page with a large and awkward empty portion in the middle. Feel free to use it however you want.

Boring Legal-Type Stuff:

"SOLARBOTICS" is a trademark of Solarbotics Ltd. Reg. CIPO / USPTO.

Disclaimer of Liability

Solarbotics Ltd. is not responsible for any special, incidental, or consequential damages resulting from any breach of warranty, or under any legal theory, including lost profits, downtime, good-will, damage to or replacement of equipment or property, and any costs or recovering of any material or goods associated with the assembly or use of this product. Solarbotics Ltd. reserves the right to make substitutions and changes to this product without prior notice.

www.solarbotics.com Page 2

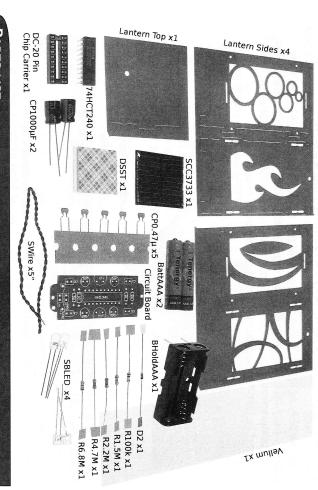
1-866-276-2687

www.solarbotics.com

1-866-276-2687

CARTS

Let's get started. Start by opening your bag of parts, and dumping them into a safe place like an egg-container (remove eggs), pie-plate (eat the pie), or cat-food bowl (give cat away to gypsies). Don't simply spread them about on a table-surface where they'll roll away, because then you'll think we forgot something in the kit and have to call us. Then we'll tell you to look under your chair, and you'll find it there and think we have magic powers. In short, keep your parts safe when you dump them out - they're small, and will try their hardest to hide from you!



PARTS LIST

Н		•																			e)	ğ	tar	ec.	<u> </u>	875	2	Vellum (8"x2.875" rectangle)	3	e e
Н	:	:		:	:	:	:	Ė	:				:	:	:	:		:	:	e.	~	٥	ste	₹.	σſ	5" of Twisted Wire			ē	SWire
4																				Ĭ	ED	t	gh	Bri	ēr	Super Bright LED	,,		ED	SBLED
1	:	:		:	:									Cel	ar (37 x 33mm Polycrystalline Solar Cell	e s	Ħ	sta	Š	3	Ро	$\vec{\exists}$	3π	ω	37		ũ	SCC3733	2
۲				•									2	ee	G	6.8M ohm resistor (Blue, Grey, Green).	Gn	le,	BIU	ĭ	sto	esi	7	hn	2	.8	_		≊	R6.8M
1	:	:		:		:						n)	ree	ر و	ole	4.7M ohm resistor (Yellow, Purple, Green)	,< T	0	<u></u>	ĭ	sto	esi	7	'n	2	1.7	_		ž	R4.7M
1		•												en)	re	2.2M ohm resistor (Red, Red, Green)	Rec	d, I	Re	ĭ	sto	esi	7	hn	S	2.2			ž	R2.2M
Н	:	:		:	:	:			ŀ			(u	ree	G	en,	1.5M ohm resistor (Brown, Green, Green)	٦, ٥	JWC	Bro	ĭ	sto	esi	2	'n	S	5	_		3	R1.5M
\vdash		•										3	0	ř	CK,	100k ohm resistor (Brown, Black, Yellow).	n, E	IMC	Bro	ĭ	sto	esi	7	'n	K	00			읒	R100k
Н	:	:	ŀ	:	:	:						ŀ		:	:	:				÷	:		:	:	:			ф	Lantern	an
4															•												les	Lantern Sides	err	an
Н	Ŀ	ŀ			:	:			Ŀ	ŀ		ŀ		:	:	PumLantern PCB		:	:	:	В	P	ern	Į,	٦	ŭ	_	w	KPL-PCB	P
ш													()	are	qu	Double-Sided Sticky Tape (1" Square)	(1	pe	1	ક્ર	Sti	ď	ide	5-5	ಠ	200	_		-1	DSST
ш			ŀ		:	:	:							:	:	:	:	ier	20 Pin DIP Socket Carrier	C	Ke.	00	PS	₽	ᆰ	0		ž	DC-20 Pin	ç-
۲																			Schottky Barrier Diode .	Dic	er	3.	Ba	\$	ott	Sch				D2
2	:	:	:	:	:	:	:			Ŀ	ŀ	Ė	-	:	:	1000μF Electrolytic Capacitor	Cit	pa	Ca	Ę.	₹	=	ec	H	윋	00	_	두	CP1000µF	P1
5																	tor	aci	0.47µF Monolithic Capacitor.	00	E i	읖	on	3	μF	4	_	F	CP0.47μF	PO
ш	:	:	ŀ	÷	:	:	:	:						:	:	:	:	-	2 x AAA Battery Holder	F	₹	tei	3at	A	₹	×	N 1	₽	BHoldAAA	F
2		•		•													?	ter	Rechargeable AAA Batter	>	3	ē	ab	ge	ha	ec.	_	_	BattAAA	att
Н		:		:	:	:	:	:	:			:	:		:	:	:	:	Octal Inverting Buffer	uff	В	ing	ert	Ž	<u>a</u>	Ct	_	40	74HCT240	4 H
4	. Qty		•			:	:		•		:	•	:	:		:			•					٠	ne	Name	_			SKU