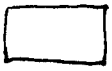
27 APR 13
Roderick

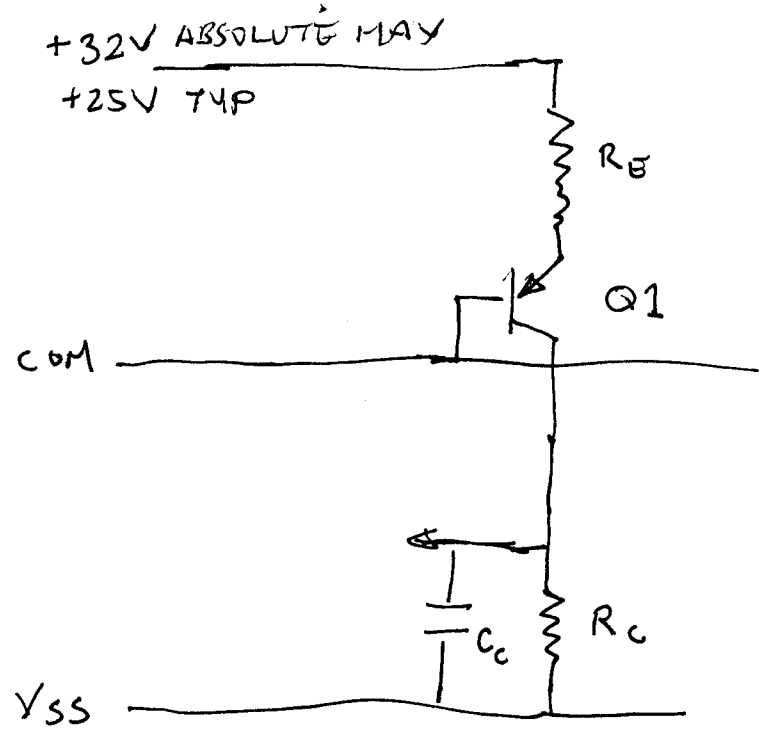
CURRENT SENSE RESISTOR.

WAS GOING TO USE LEADED 5W RESISTORS FROM HALTED - 9¢ FOR 0.05Ω. BUT IT SEEMS CAN GET 5W SMT RESISTORS SPECIFICALLY MADE FOR CURRENT SENSE. ABOUT $2 @ MOUSER, PACKAGE IS 2547 OR SO  WOULD HAVE HEAVY GROUNDED COPPER ANYWAY FOR HEAT SINK.

NEED TO MAKE LAND PATTERN IN DESIGNSPARK, DOUBTFUL THERE IS ONE.

30 APR 13; Roderick.

COMMON BASE CURRENT MIRROR.



EXPERIMENTS HAVE SHOWN THAT PICAXE ADC IS HIGH IMPEDANCE, 100μA THROUGH R_E SHOULD BE PLENTY.

IGNORE B-E DROP OF Q1. $R_E = \frac{E}{I} = \frac{32}{10^{-4}} = 320 \times 10^3 = 320k$

WILL USE 1.024V REFERENCE FOR PICAXE, DUE TO NEED TO MONITOR 500mV ELSEWHERE. $R_C = \frac{E}{I} = \frac{1.024}{10^{-4}} = 10k$

IGNORING SMALL LOSS OF CURRENT THROUGH BASE

Q1 MUST WITHSTAND 72V COLLECTOR-EMITTER. 80V OR 100V TRANSISTOR. HIGH GAIN AS POSSIBLE. NEED NOT BE FAST - SAMPLED 1x PER SECOND.

C_C NO LOAD OPTIONAL. PROTECT AGAINST NOISE.

IF $C_C = 1\mu F$, $\tau = RC = 10^4 \cdot 10^{-6} = 10mS$

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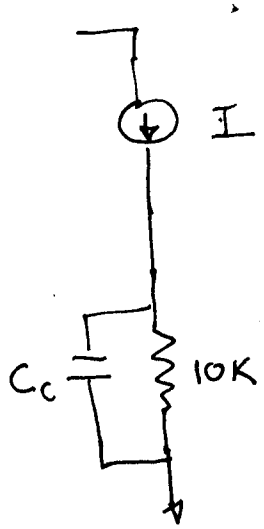
LOOKED AT ANOTHER WAY.



WHEN MOTOR TURNS ON, BATT GOES FROM (SAY) 24V TO 23V.

dV = 1V ~4%

dI = ABOUT SAME

SAY I = 65μA, CHANGE TO 62μA.

~~PERP~~ VOLTAGE CHANGE APPROX 30mV

IF ALL OF LOST 3μA GOES TO CHARGING CAPACITOR, HOW LONG TO SETTLE?

1μF 3μA τ = 3 SEC

.01μF 3μA τ = .03 SEC 5τ = 0.15 SEC

THIS IS VALID

PNP TRANSISTOR SELECTION – MOUSER. PNP, $V_{CEO} \geq 80V$, SOT-23, SORT BY PRICE

MOUSER INDEX WRONG – CHECK DATA SHEET

FJV992 (H) MTF – HIGH GAIN -120V, h_{fe} = ~~200~~ 300 MIN, $I_{C(MAX)}$ = 50mA

FJV992PMTF " , h_{fe} = 200 MIN, " "

MMBTA56 80V, h_{fe} = 100 MIN, I_C = 0.5A

DIGIKEY ONLINE INDEX NOT AS USER FRIENDLY AS MOUSER, BUT DATA WAS ACCURATE FOR FJV992FMTF

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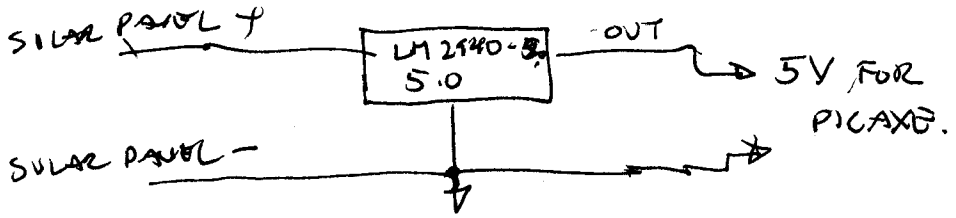
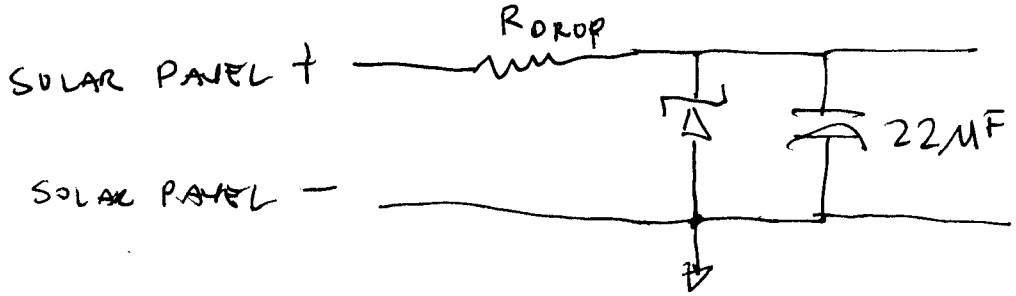
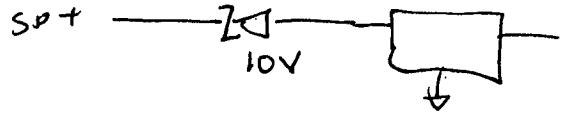
CURRENT REQUIRED BY PICAXE IS 5mA OR LESS.
BETTER TO USE ZENER DIODE FOR REGULATOR.
SHOULD BE GOOD ENOUGH. AND WOULD TOLERATE > 35V IN





BAD PART IS THAT TO DESIGN FOR POSSIBLE INPUT OF 12V, R_{DROP} WOULD BE 1/3 OF WHAT ~~IT~~ WAS ~~R~~ PREVIOUSLY PLANNED.
MEANS BURNING EXTRA POWER AT NOMINAL V_{IN}

MAYBE



10V 5mA
= .05 W

COLUSA RIDE

- 2 WATER BOTTLES
- HYDRO COURTISOLE
- SARNA
- EYEDROPS
- ~~TAIL GAS~~
- LUBE BIKES
- WHITE SHIRTS
- REGULAR SHORTS
- LUNCH DRINKS

- ~~TAKE SEAT OUT OF VAN?~~
- BIKE SHORTS
- GLOVES
- SUNGLASSES
- TOOTHBRUSH
- LAPTOP
- SHOES SOCKS
- ~~PRINT OUT MAPS~~
- REGISTRATION

CAMERA & BATTS CHARGED

FAST RAK

United States

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07MAY13.

SCHOTTKY DIODE IDEAL FOR SWITCHING POWER SUPPLY BECAUSE OF LOW FORWARD VOLTAGE, MEANS LESS POWER WASTED IN DIODE. ~~THE PTC NEEDS DIODE~~ PTC WILL HAVE AVERAGE CURRENT OF 10A WHEN MOTOR IS RUNNING. 1V ~~DROP~~ V_F ON DIODE MEANS ~~5W~~ 10 WATTS WASTED. IF CAN GET $V_F = 0.5V$, THEN ONLY 5 WATTS WASTED.

NEED V_R OF AT LEAST 80V. I_{AVE} > 10A.

- NOTICED THAT DIODES MADE TO HANDLE MORE CURRENT HAVE LOWER V_F. I CAN GET A 30A DIODE LIKE NTSJ30V100CTG. ~~4.55~~
- WHEN THERE ARE 2 DIODES IN A PACKAGE, PARALLEL THEM. THIS PUTS LOWER CURRENT THROUGH EACH, AND THUS LOWER V_F.
- V_F IS LESS WHEN $T_J = 125°C$, MAYBE SHOULD JUST LET THE DIODE HEAT UP?

~~POWER WASTE~~

COULD TEST DIODE HEATING W/ SHORT CIRCUIT CURRENT OF SOLAR PANEL.

POWER LOSS ELEMENTS - SWITCH, DIODE, CURRENT SENSE RESISTOR, INDUCTOR?