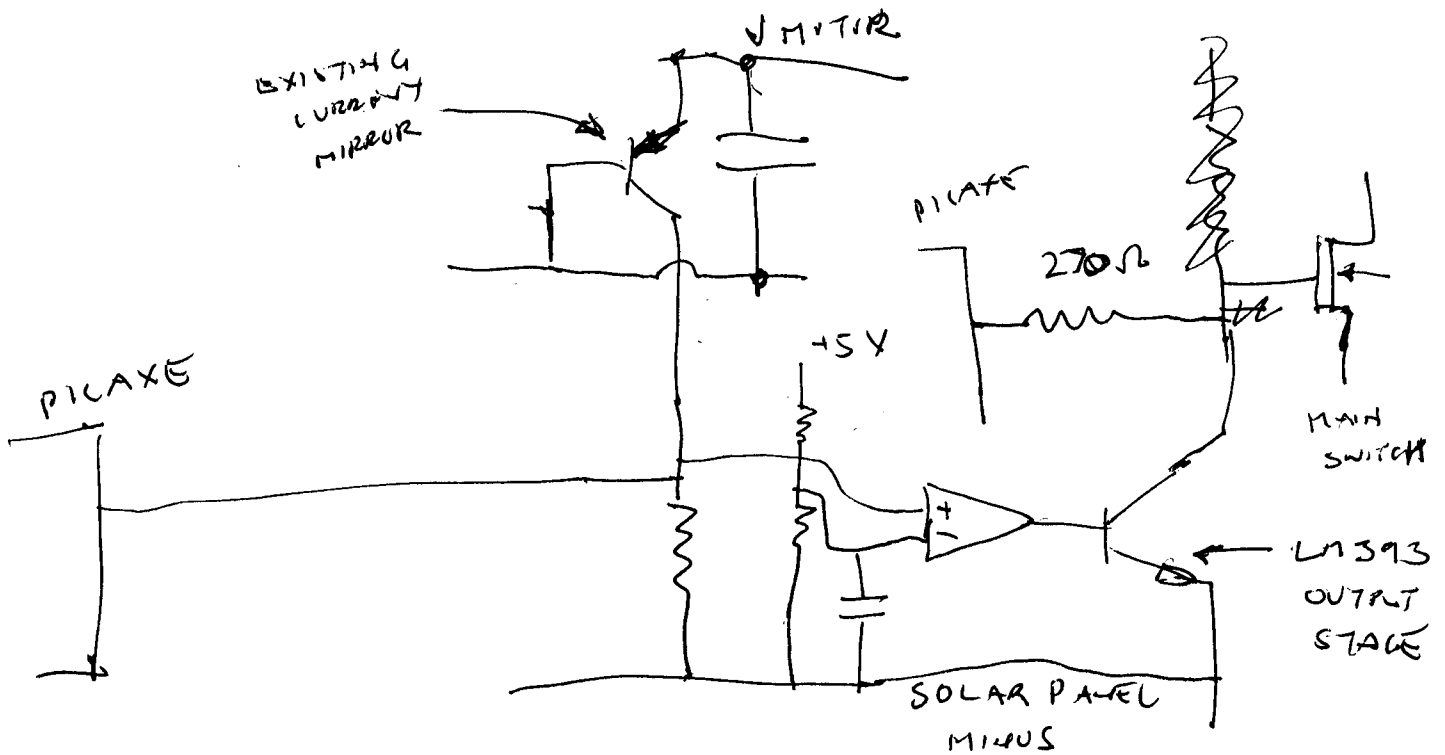


05 JUL 2013

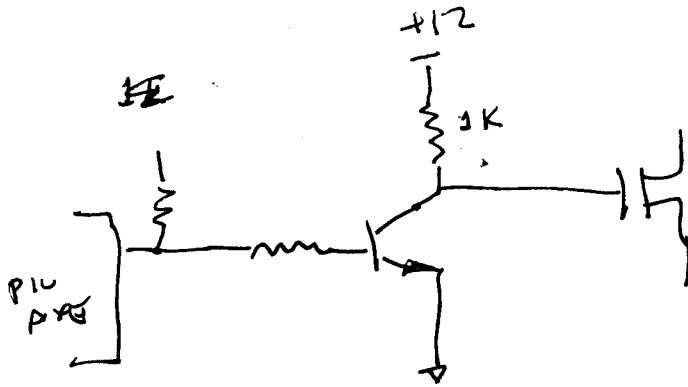
Roderick

TO RUN WITHOUT BATTERY, THERES A CHANCE THAT OUTPUT CAPACITORS WILL OVERVOLTAGE WHEN MOTOR CUTS OUT. SINGLE PULSE FROM INDUCTOR AT HIGH CURRENT CAN RAISE 1000 MF CAP VOLTAGE BY 4V. NEED OUTPUT PROTECTION. PICAXE MONITORS THE OUTPUT VOLTAGE, BUT WOULD TAKE MILLISECONDS TO RESPOND, NEED ANALOG PROTECTION.



11 JUL 2013

Rudertck



USING 1K PULLUP ON DRIVER TO MOSFET, MIGHT BE TOO SMALL TO CHARGE GATE CAPACITANCE QUICKLY,

ADC READING = 197, STABLE AFTER 18 PULSES,
A PEAK DETECTOR

TRY REPLACING PULL UP W/ 261Ω
NOW GET 199 AFTER 22 PULSES.
WHAT CURRENT DOES THAT REFLECT?

$$199 / 1024 \cdot 5V = 0.97V$$

$$.97V / .05\Omega = 19.4A$$

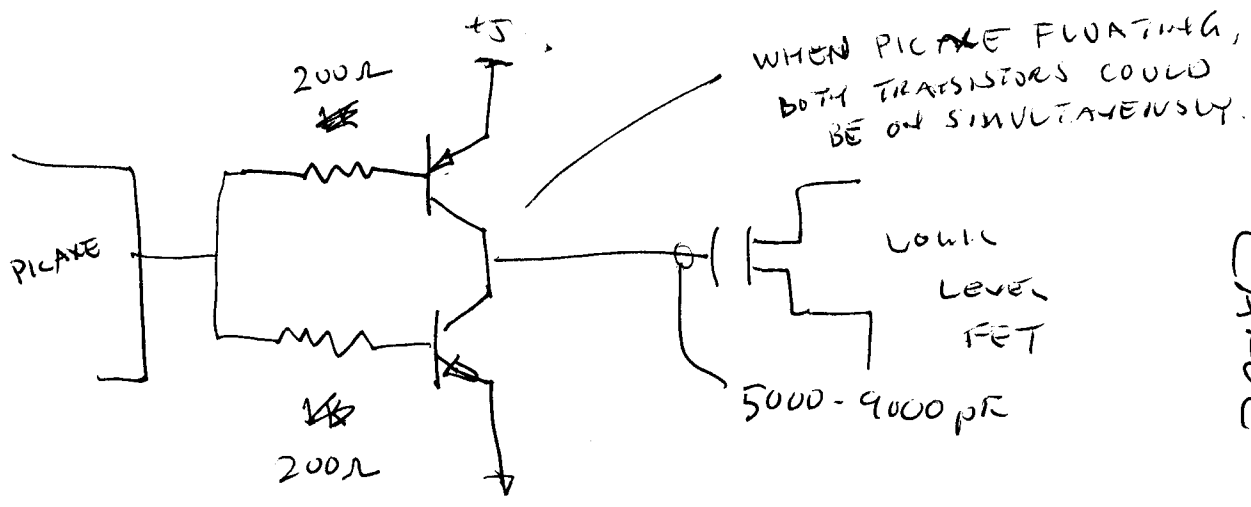
WILL HAVE TO CHECK ACTUAL VOLTAGES W/
VOLTMETER - 24V SUPPLY MAY NOT BE 24V
~~TRY~~ 5V " " " " 5V
12V " " " " 12V

TRY ~~137~~ 137Ω PULLUP - IT'S WARM TO TOUCH,
READING ~~194~~ AFTER 20 REFS 219 AFTER 25 REFS
CORRESPONDS TO 21.4A .

TRY PNP-NPN TOOTH POLE DRIVE - GET READING
OF 221, 20 REFS

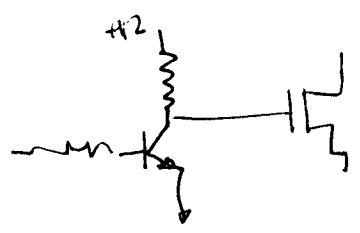
TRY DIRECT DRIVE OF MOSFET FROM PICAF -
READING 223, 17 REFS

11 JUL 13;
Roderick.

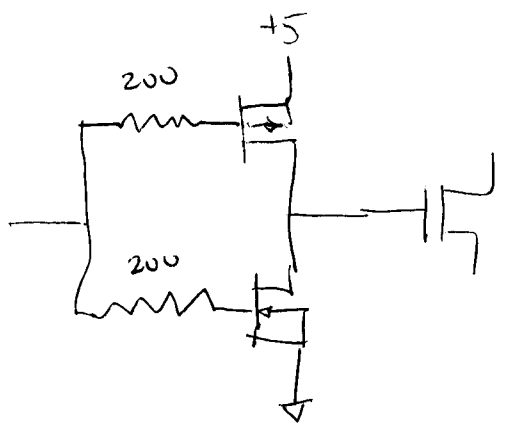


CAREFUL - DANGER w/ MAXIMUM

INDUCTANCE MEASUREMENT EXPERIMENT SHOWED THAT DRIVE CURRENT TO THE BASE OF THE MAIN SWITCH IS IMPORTANT.



w/ 150Ω AS PULLUP, CURRENT SHOULD BE ABOUT 80mA TO START. TRIED 1K AT FIRST 12mA EFFECTIVE PULSE WIDTH MUCH SHORTER.

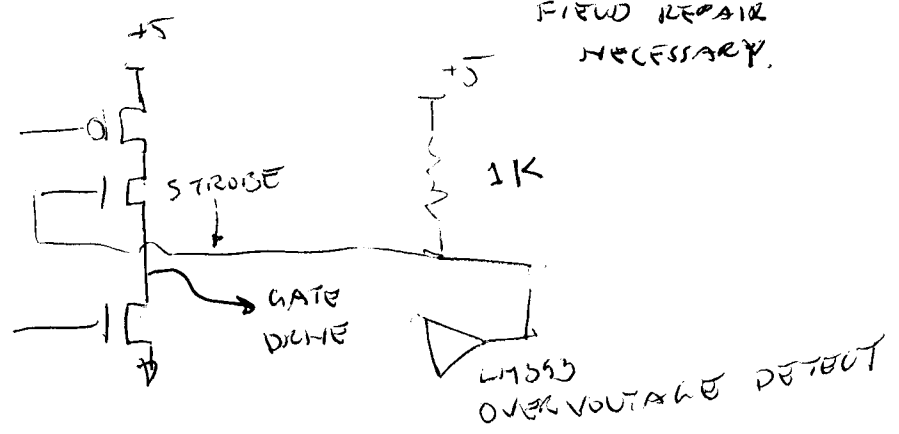


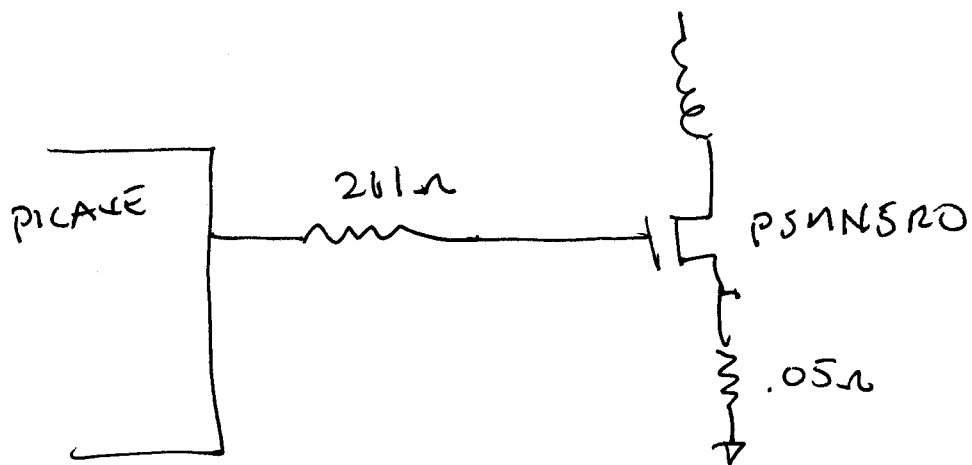
500mA MOSFET PAIR, LESS CURRENT

FET'S COULD BE REPLACED w/ BIPOLAR IF FIELD REPAIR NECESSARY.

SAME FOOTPRINT SMT-23 FOR MOS OR BIPOLAR.

$$200\Omega \cdot 80\text{pF} = 1600\text{ pS} = 1.6\text{ns}$$





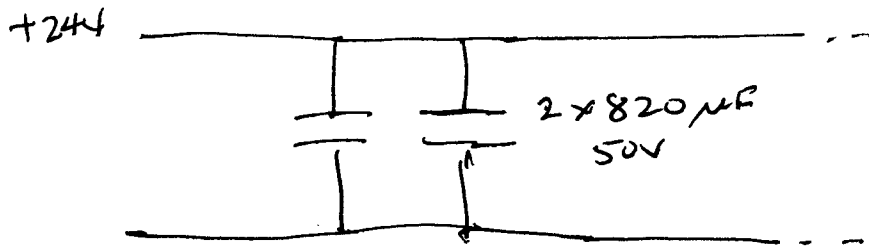
DRIVE w/ 261Ω IN SERIES - AMAZINGLY, GET
READING OF 269, 49 REFS.

TRY 1K INSTEAD OF 261Ω WON'T TURN ON AT ALL.

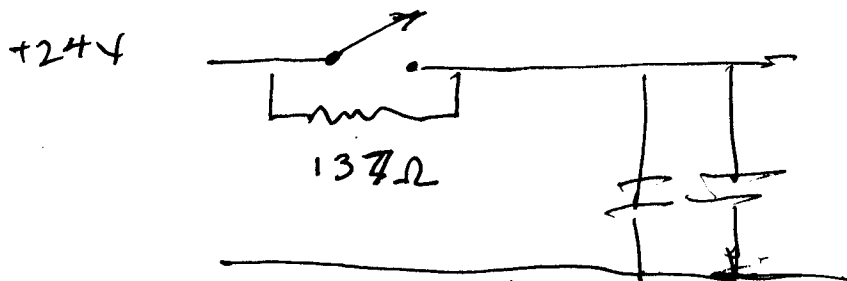
TRY 147Ω, READING 264, 46 REFS.

08 JUL 18; Roderick

BUILT INDUCTANCE TEST CIRCUIT.



BIG SPARK WHEN LEAD ACID BATTERY FIRST CONNECTED. CAPS WERE A DEAD SHORT, REWIRED:



DOUBLED UP CAP IN SAMPLE PEAK DETECTOR FROM 0.1 uF TO 2 x 0.1 uF. OBJECT TO GET A LITTLE MORE STABILITY FROM INPUT BIAS CURRENT.

TEST PROGRAM ZERO PEAK DETECTOR

TAKE READING

PULSE INDUCTOR

TAKE ^{ADC} READING

IF READING IS WITHIN 1 COUNT OF LAST_READING, QUIT

LAST_READING = READING

GO TO TAKE READING

REPORT RESULTS

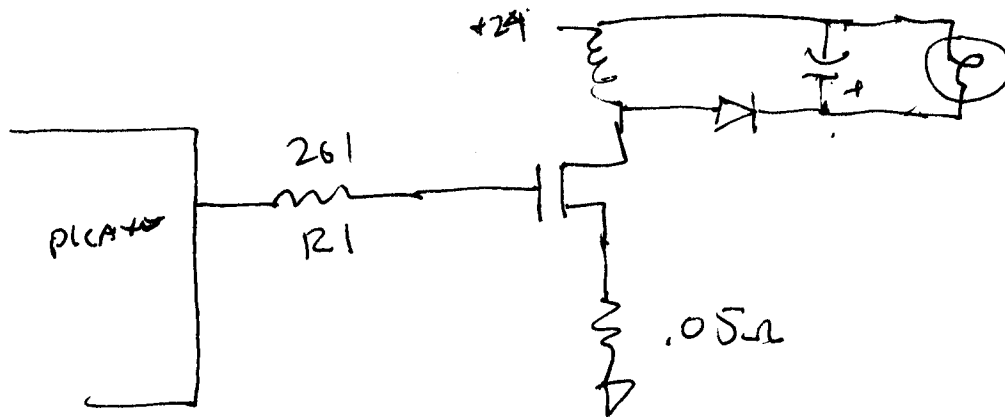
14 JUL 13; Roderick,

EXPERIMENTS ARE SHOWING THAT DIRECT DRIVE FROM PICAXE IS FINE FOR MOSFET GATE, AT LEAST W/ PSMN5R0.

NEED TO TRY A MORE CONTINUOUS DRIVE, THOUGH - MAYBE PICAXE CAN PRODUCE A SINGLE PULSE WELL, BUT PWN CIRCUIT DOESN'T HAVE THE LEGS FOR A CONTINUOUS PULSE TRAIN. INDUCTANCE MEASUREMENT TEST SETUP IS ALREADY CAPABLE OF THE EXPERIMENT, WITH A CHANGE IN FIRMWARE

14 JUL 13; Roderick.

TRIED CONTINUOUS PWM TO GATE OF MOSFET,
DUMMY LOAD IS 1 AUTOMOTIVE INCANDESCENT TAIL
LIGHT WITH ~~1000V~~ 820 μ F 50V ACROSS IT,
SET FREQ M32 ON PICAXE (32 MHz)



GOT VOLTAGE ACROSS LIGHT BULB TO ABOUT 0.11 VOLT
WITH DUTY OF 200 TO PWM, PERIOD = 255
WHEN DUTY REACHED 170 ~~OR~~ 170 - 200 OR SO,
MOSFET UNSOLDERED ITSELF, NO HEAT SINK,
NEXT TIME, I SHOULD SEE EFFECT OF R1 ON
HEATING OF MOSFET, AT MUCH LOWER DUTY CYCLES.

$$\text{PERIOD} = \frac{255 + 1}{32 \text{ MHz}} = \frac{256}{8 \text{ MHz}} = 32 \mu\text{S}$$

$$\text{DUTY} = \frac{200}{32 \text{ MHz}} = 6.25 \mu\text{S}$$

MAY NEED FET DRIVER AFTER ALL.