

11-APR-2013

Roderick.

GOT NEW (OLD DATE CODE) ~~\$ 20~~ 12V 12AH SLA BATTERIES.
CHARGED W/ SEARS CHARGER, 2A. IN A FEW HOURS,
VOLTAGE GOT TO 15.3, BUT OVERNIGHT, FLOATED TO 15.9.
DISCONNECT CHARGER, VOLTAGE EXCEEDS 14V FOR A FEW
SECONDS, STABILIZES TO ~~13.4~~ 13.4 IN A FEW MINUTES.

EXPERIMENT: WHAT IS CURRENT DRAW OF PICAXE 20M2?

CONDITION 1: DEFAULT 4MHz CLOCK.

C.5 SET AS OUTPUT - NO LOAD

PROGRAM CONSISTS OF PAUSE IN A LOOP

~~0.8mA~~ 0.72 mA

CONDITION 2: ADD 40 KHz PWMOUT. - NO LOAD ON P1A1

STILL 0.72 mA

CONDITION 3: ADD 2000pF TO PWMOUT P1A1

1.50 mA

CONDITION 4: INCREASE CLOCK FREQ TO 32 MHz.

STILL 40 KHz OUT W/ 2000 pF LOAD

3.61 mA

CONDITION 5: INSTEAD OF PAUSE IN LOOP, READ ADC10 FROM

~~C.2, C.3, C.4 AS FAST AS POSSIBLE.~~

C.3, C.2, C.1 AS FAST AS POSSIBLE

3.72 mA

CONDITION 6: INSTEAD OF READ ADC, LOOP CONSISTS OF

$w0 = 60000$ $w1 = 243$ $w2 = w0/w1$

3.74 mA

CONDITION 7: ADD ANOTHER TASK, DOING SIMILAR COMPUTATION

2.11 mA - ~~SE~~ HAD TO REMOVE SET FREQ.

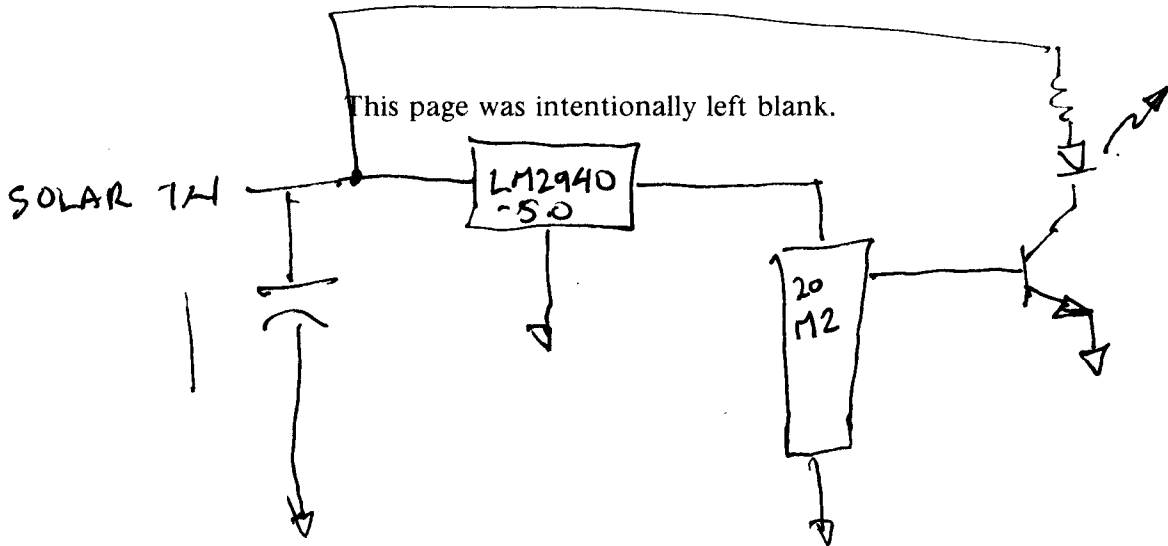
CONDITION 8: MULTITASK, BUT PWMOUT ASSUMES 4MHz CLOCK

3.65 mA

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FROM EXPERIMENTS, IT'S CLEAR THAT PICAXE WILL DRAW LESS THAN 5MA @ 5V NO MATTER WHAT. IN POWER CONTROLLER, BIGGEST DRAIN MAY BE IN DRIVING LED'S. MAYBE SHOULD PUT LED'S ON EXTERNAL POWER, SPARING LOAD ON THE REGULATOR.



VOLTAGE DROP ACROSS REGULATOR = 30V

IF CURRENT DRAWN IS 10MA (.01A), DISSIPATION IN REGULATOR IS 0.3W - NO NEED BIG HEATSIWK.

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PTC DESIGN WANTS

- USE COMMON COMPONENTS, OR AT LEAST DESIGN SO THAT COMMON COMPONENTS CAN BE USED. EXAMPLE: ~~WRAP~~ DUAL SCHOTTKY POWER RECTIFIER AT HALTED. SAME PRODUCT AS COMMON PART FROM Mouser OR Digi-Key, BUT CHEAP.

- PARALLEL MULTIPLE COMPONENTS IN THE MAIN POWER PATH, FOR BETTER CURRENT. ESPECIALLY STIFFENING CAPS. $2 \times 1000 \mu\text{F}$ INSTEAD OF $1 \times 2000 \mu\text{F}$

- GET 2oz COPPER PC BOARD IF POSSIBLE.

- DESIGN FOR FIELD REPAIRABILITY - 20M2 SHOULD BE SOCKETED. DO NOT SOCKET POWER COMPONENTS, POOR CURRENT FLOW. USE BOARD-TO-WIRE HIGH AMP CONNECTORS FOR POWER, IN CASE NEED TO CHANGE PANEL.

- LOW POWER USE OH 5V, TO AVOID HEAT SINK FOR LINEAR REGULATOR.

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