

# Dual Magneto Timer:

## Features:

- \* Computer controlled
- \* LEDs and audio
- \* Auto turnoff
- \* Low battery indication
- \* Indicates three states to reduce chance of errors.

Open points: Lights and tone on (detects inductance)

Closed points: Lights and tone off (detects short)

Unknown state: Lights blinking and tone pulsing (detects neither inductance or short)

The unknown state, normally means magneto timer is disconnected from magneto.  
Can also mean coil of magneto is missing or failure of magneto or magneto timer.  
Device must detect inductance before indicating points open.

Device turns off after about 10 minutes of inactivity.  
When battery is low device plays "taps" then shuts off.

Directions for timing magnetos:

Warning- Disable engine by disconnecting ignition wires from spark plugs or removing spark plugs.

1. Disconnect the negative terminal of the battery.
2. (Warning) Disconnect ignition wires from spark plugs or remove spark plugs to disable engine.
3. Locate timing marks or install protractor.
4. Position piston at TDC on cylinder #1 on the compression stroke.
5. Turn propeller backwards past the timing position for running.
6. Turn the magneto switch to the "both" position.
7. Connect the ground lead(black wire) of the mag timer to the case of a magneto or the engine.
8. Connect the other leads(red or green) of the mag timer to the primary leads (the ones going to the mag switch). In order to connect timer lead to magneto it may be necessary to disconnect the primary leads from the magnetos. Some magnetos have a safety grounding spring inside the mag which grounds the mag if the primary leads are disconnected. This must be defeated while timing mag.
9. Turn the prop in the direction of running. The lights should go from off to on(but not blinking) when the timing marks are reached. If not, adjust magnetos, repeat step #5 and check again.
10. Be sure that primary leads are connected to the mag switch and the mag switch is in the off position before returning aircraft to service.

## **Warning:**

Disable engine by removing spark plugs or wires from engine before using timing light.

Do not assume that points are open if lights are blinking.

## Steps for Assembly:

- 1: Read how to solder below.
- 2: Find paper with components taped on it. Read notes concerning LEDs, and zener diodes before soldering.
- 3: Solder in the IC socket observing notch.
4. Wire up circuit as shown on page 2.
5. Observing the dot or notch on the IC with the notch printed on the circuit board, Insert the IC into the socket.
- 6: Connect battery while avoiding touching the circuit. If circuit does not work, disconnect battery and see troubleshooting below.

### Troubleshooting:

Touching circuit can cause erratic behavior or the circuit to stop working completely.

First check quality of solder joints, Then:

*If fuse gets hot:*

*The IC or the battery leads may be backwards.*

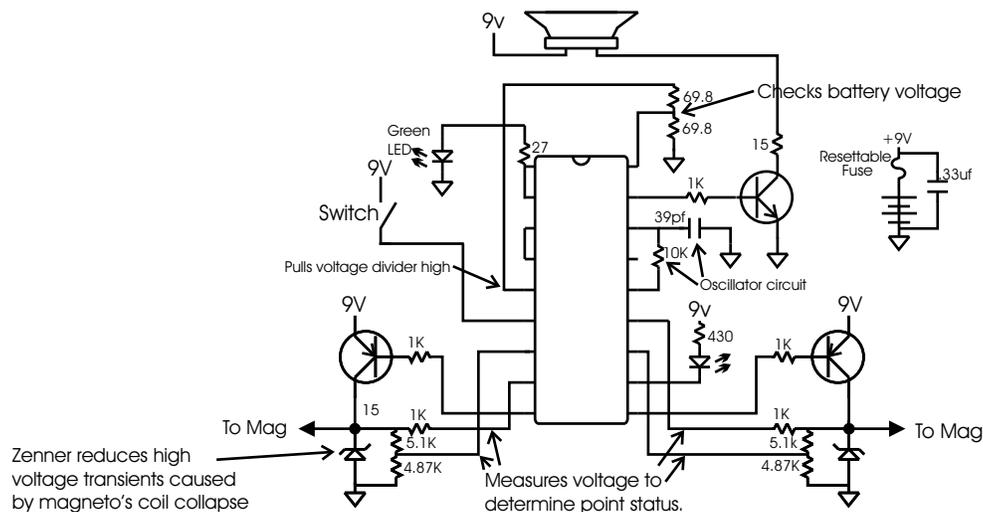
*If device plays "taps" (indicating low battery):*

A: The battery voltage, when timer is on, should be above 5.3V.

B: Check resistors R1 and R2.

### How to solder:

Use only rosin core solder. Keep soldering tip clean. Soldering iron and solder should be applied to connection at the same time, reducing the time heat is applied to the solder. Apply heat just long enough for the solder to flow well over the pad and component lead. Unless you are fast, solder should not be applied to soldering iron first. If the solder is heated too long the resin burns out leaving a poor solder joint. Sometimes adding new solder to old solder can fix the solder, but if you have too much then remove most of the solder and try again. Solder can be removed with solder wic. Use damp sponge to keep soldering tip clean. Overheating causes copper separation and may damage components.

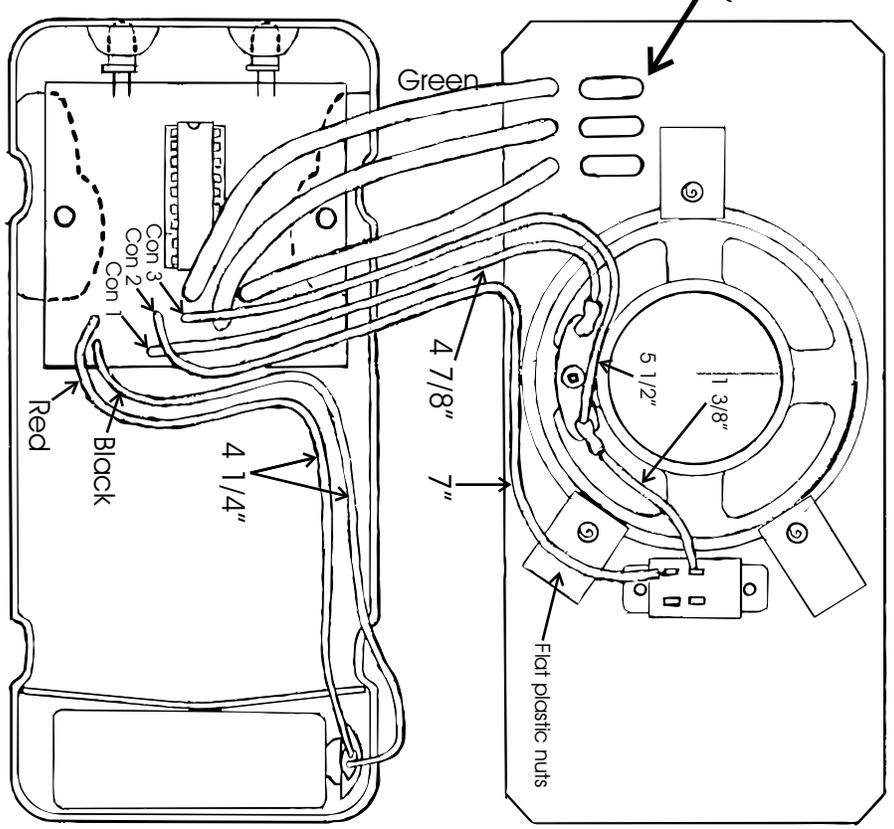
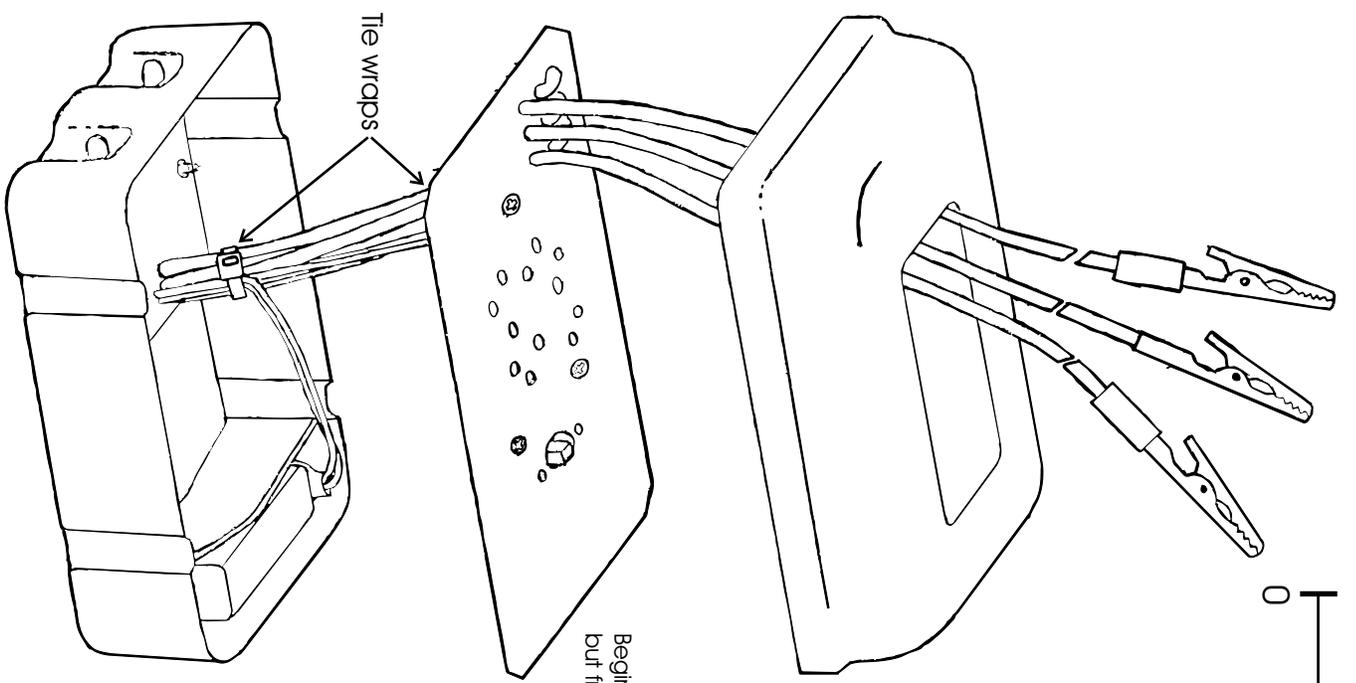


**Warning:** Disable engine by removing spark plugs or wires from engine before using timing light.



**Steps:**

- 1: Cut the small wire into these lengths 5 1/2", 4 7/8", 7", 1 3/8", 4.5". Cut battery leads to 4.5".
- 2: Insert the test lead wires (larger wires), by holding wires 4.5" from the end and insert into the divider from the top. Then weave the wire through the other two holes.
- 3: Mount the speaker and switch on the center divider.
- 4: Strip and tin the ends of all wires. Solder all wires as shown.



**Warning:** Disable engine by removing spark plugs or wires from engine before using timing light.

I

R4 15

Red LED

R3 430

R2 69.8

R1 69.8

Green LED

R9 24

C1 39pf

T1 2N4124

R10 10k

R6 4.87K

R7 5.1K

R7 5.1K

R11 1K

R11 1K

R11 1K

R11 1k

R11 1k

T2 2907A

T2 2907A

R6 4.87k

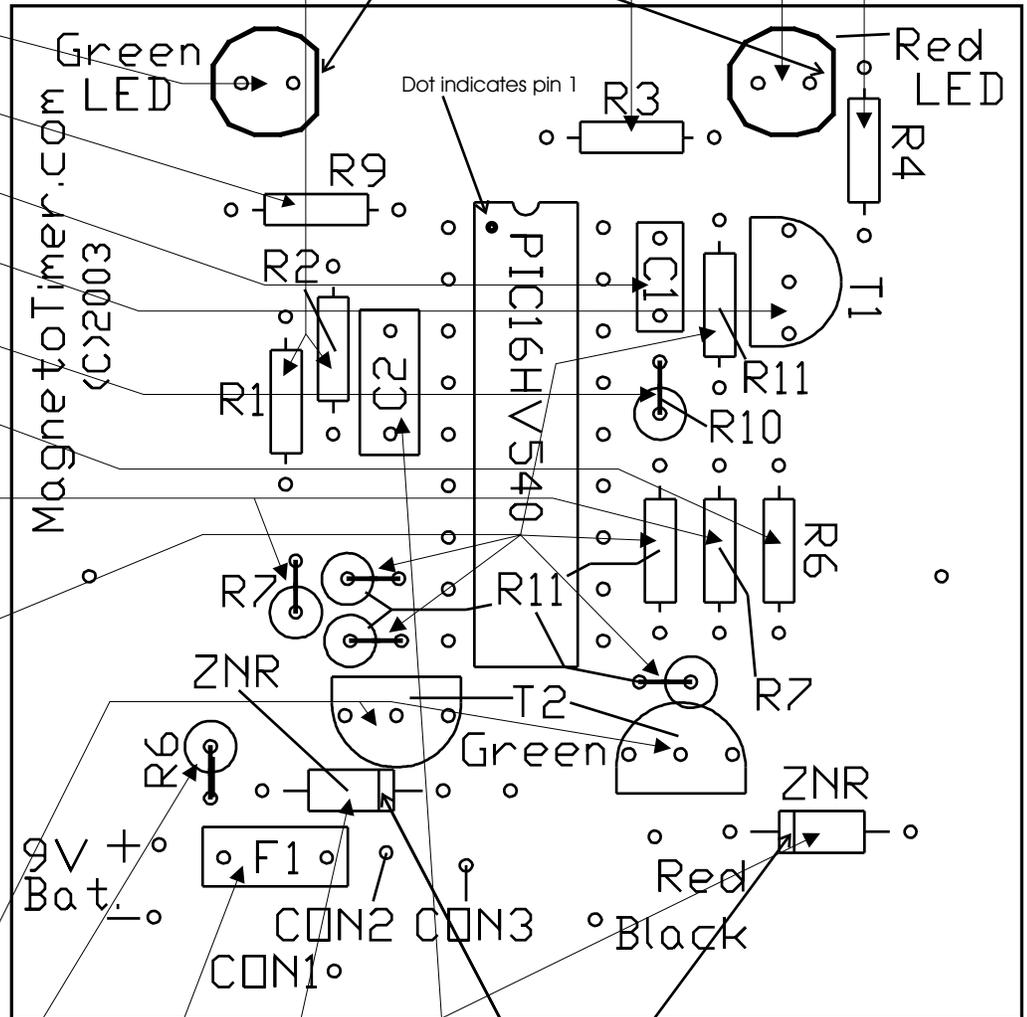
ZNR 1N4738A

ZNR 1N4738A

F1 R020 Resettable fuse

C2 .33uf

T



Leave 5/8" lead on LEDs so they can be bent forwards.  
Note: flat sides.

Dot indicates pin 1

Magne to Timer.com  
(C)2003

Note: bands

## PARTS LIST for magneto timer kit

### *Items on other side of paper:*

Blue resistor are 1%

- 1- R1 69.8 1% (blue,white,grey,gold,brown)
- 1- R2 69.8 1% (blue,white,grey,gold,brown)
- 1- R3 430 (yellow,orange,brown,gold)
- 1- R4, 15 (broun,green,black,gold)
- 2- R6 4.87K 1% (yellow,grey,violet,brown,brown)
- 2- R7 5.1K 1% (green,brown,black,brown,brown)
- 1- R9 24 (red,yellow,black,gold)
- 1- R10 10k 1% (brown,black,black,red,brown)
- 5- R11 1K (brown,black,red,gold)
- 1- T1 NPN (2N4124)
- 2- T2 PNP (2907A)
- 1- C1 39pf (39)
- 2- ZNR 8.2V zenner diode (1N4738A)
- 1- green LED
- 1- red LED
- 1- F1 .4amp PTC resettable fuse (R020, very small writing)
- 1- C2 .33uf (334)

### KITS with case:

Items in Zip Lock Bag:

- 1- switch
- 2- small switch screws
- 1- circuit board
- 1- PIC16HV540 microcontroler
- 1- IC socket 18 pin
- 1- battery clip
- 2- tie wraps
- 3- screws for speaker
- 3- plastic speaker nuts
- 6- plastic rivets

*Other items:*

- 3- alligator clips
- 1- speaker
- 1- green test lead wire
- 1- red test lead wire
- 1- black test lead wire
- 1- small hookup wire 20"
- 1- set of instructions
- 1- plastic battery retainer
- 1- plastic case (3 pieces)

### KITS without case

Items in Zip Lock Bag/s:

- 1- switch
- 2- small switch screws
- 1- circuit board
- 1- PIC16HV540 microcontroler
- 1- IC socket 18 pin
- 1- battery clip
- 2- tie wraps
- 3- alligator clips
- 2- LED holders(4 parts total)

*Other items:*

- 1- speaker
- 1- green test lead wire
- 1- red test lead wire
- 1- black test lead wire
- 1- small hookup wire 20"
- 1- set of instructions