

# Masthead Strobe

Improve your visibility with this project.

TO A YACHTSMAN, one of the greatest fears of either a long ocean passage or negotiating busy coastal waters is being hit by another, and probably much bigger ship at night. A large fast ship on computer steerage could pass over the top of a small craft without knowing it.

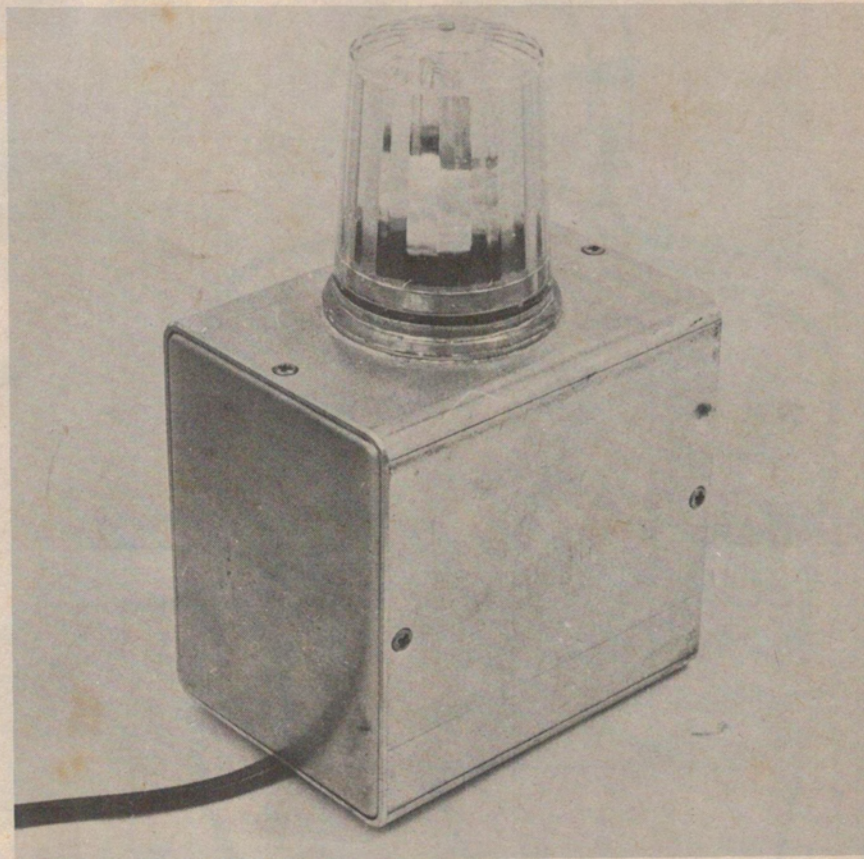
Conventional masthead lights are barely adequate, being typically 5 to 25 watts, and almost useless in a storm or fog. As the wattage of the light is increased the current drawn from the ship's limited battery capacity becomes prohibitive. The answer is to use a xenon flash tube giving an intense white flash about every two seconds.

Equivalent to many thousands of watts, the flash can be seen for large distances, even in bad conditions. The average power of this beacon is only about 1.5 watts, similar to a torch bulb. The unit can be permanently mounted on the mast or kept portable for emergency use.

## Construction

The assembled pcb together with the two storage capacitors are mounted in a Horwood Instrument case type 34/4/D. Styrofoam is used to hold the pcb in position to avoid having to drill extra holes in the case. The transformer used is a commonly available Ferguson type PL30/5VA, which mounts directly onto the pcb.

The storage capacitors used are designed for operation in fluorescent lights and are rated at 240 Vac. These capacitors which can withstand a high

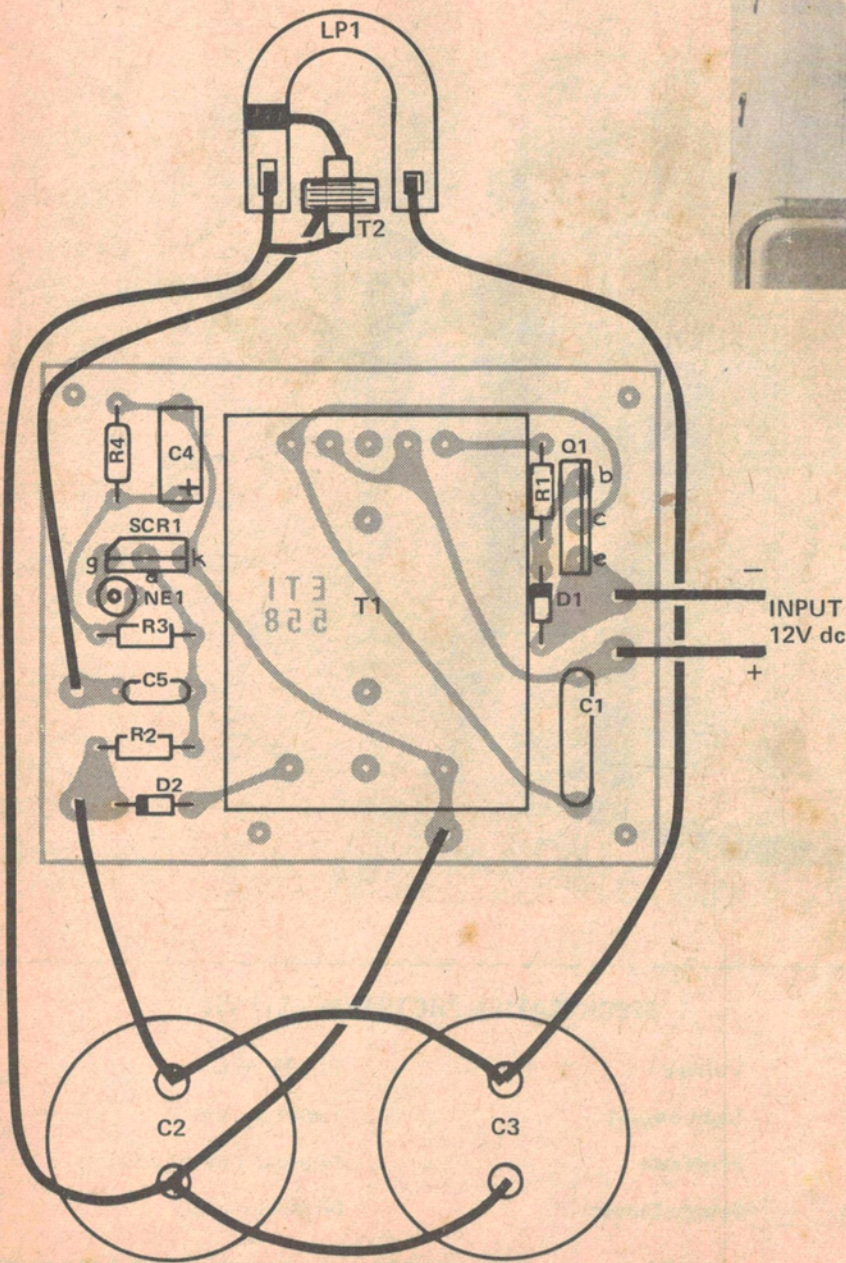
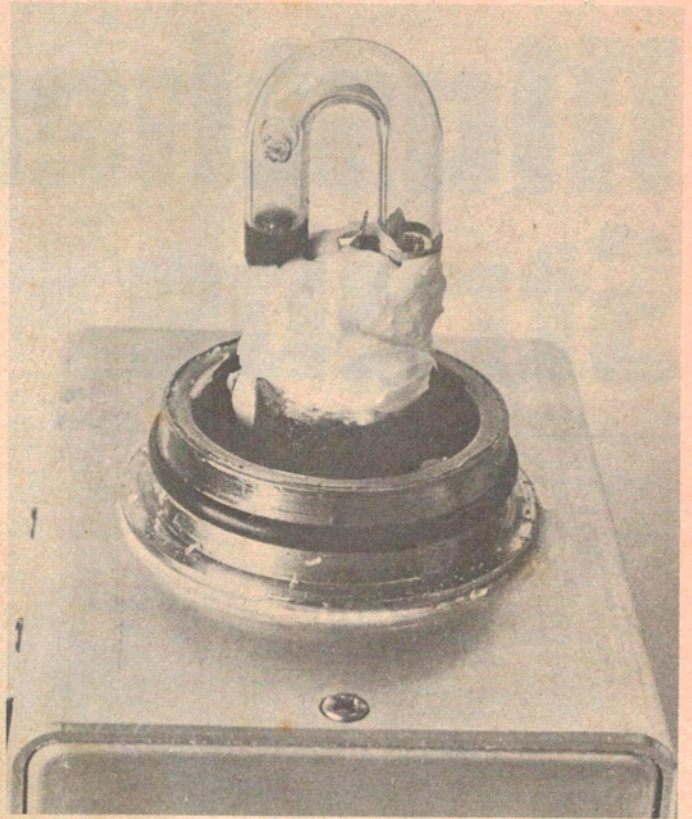
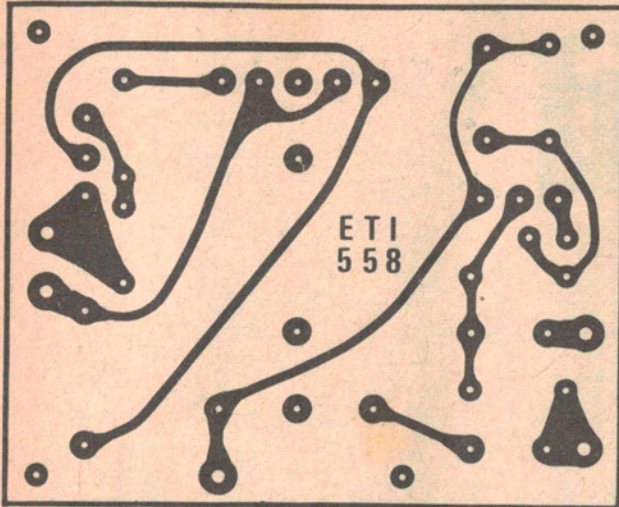


## SPECIFICATION PROTOTYPE - ETI 558

Voltage	11 - 15 volts
Light output	1 watt per sec
Flash rate	Approx. 1 every 2 sec
Supply Current	80 mA average



# Project 558



## PARTS LIST – ETI 558

### Resistors all ¼W, 5%

- R1 . . . . . 12k
- R2 . . . . . 2M2
- R3 . . . . . 1M5
- R4 . . . . . 4M7

### Capacitors

- C1 . . . . . 270n greencap
- C2, 3 . . . . . 6µ5 250 Vac (see text)
- C4 . . . . . 1µ0 350 V electrolytic
- C5 . . . . . 100n 400V polyester

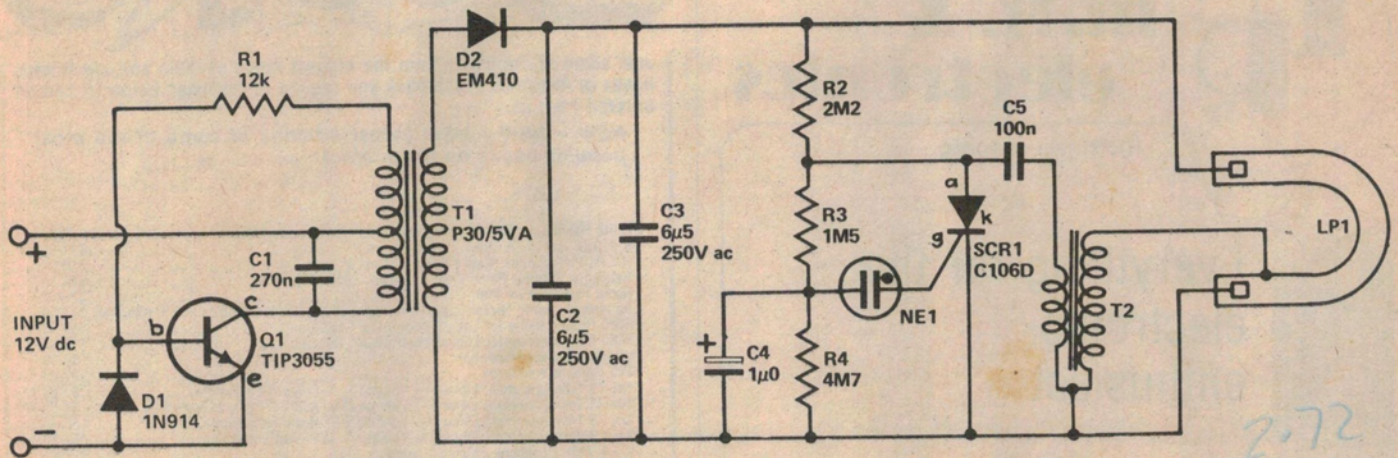
### Semiconductors

- Q1 . . . . . MJ3055
- SCR1 . . . . . C106D
- D1 . . . . . 1N914
- D2 . . . . . EM410

### Miscellaneous

- T1 . . . . . Ferguson P30/5VA transformer
- T2 . . . . . trigger transformer to suit strobe tube
- NE1 . . . . . NE2 neon
- Strobe tube see text
- Horwood box type 34/4/D, light fitting (see text), pcb ETI 558, Silastic adhesive/sealant.





2.72  
4.69 +15%

dc voltage, are suitable for use in fast discharge applications and are available in a variety of values from any electrical supplier or from Dick Smith Electronics.

Special attention must be paid to the light housing if the unit is to be left out in the open in all weathers. We purchased an easily available Hilite Marine masthead light from a local marine shop.

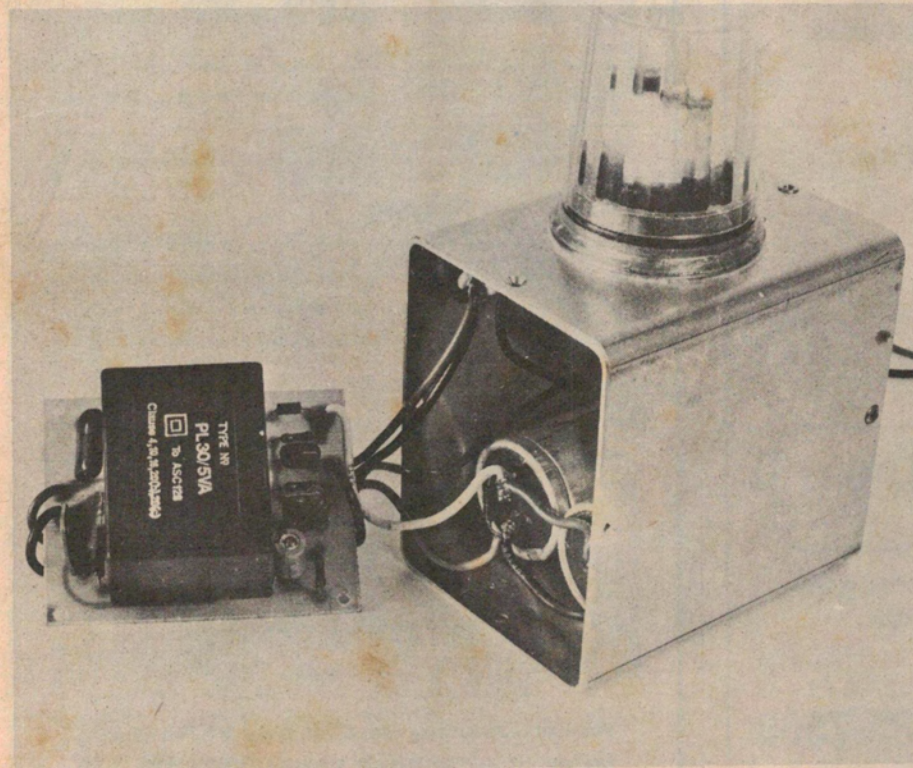
The tungsten light and its socket were removed and the strobe tube to-

gether with its trigger transformer were fixed into the base of the fitting with Silastic rubber. This light fitting has a lens which focusses the light, and a rubber 'O' ring which should be covered with silicon grease to prevent moisture penetration. If the beacon will not be left out in all weathers a cheaper automotive light fitting could be used.

To ensure long life from the strobe tube we used a 10 watt per sec. tube run at only a fraction of its full output. The

tube we used was a CZT127 available together with a trigger transformer from *Circuit Components, 383 Forest Rd, Bexley, NSW.*

Finally the ends of the box and the light fitting were fixed into position with copious amounts of Silastic rubber to prevent moisture penetration. The battery lead should be taken out through a hole in the bottom of the box which also allows drainage if any water manages to get in.



## HOW IT WORKS - ETI 558

The power transistor Q1, together with the transformer, T1, form an oscillator with a frequency of about 1kHz. Feedback is provided by one half of a centre tapped 30 volt winding. The output is taken from the normal 240 volt primary winding of the transformer. The amount of feedback and hence the output voltage is set by R1.

Output from the transformer is rectified by D2 and then charges the storage capacitors C2 and C3. The value of R1 should be selected to give a peak voltage across the storage capacitors of about 350 - 400 volts.

As the voltage across the storage capacitors builds up the trigger capacitor, C5, charges through R2 and the primary of the trigger transformer, T2. The timing capacitor, C4, is also charged through R2 and R3 until the voltage across the neon, NE1, reaches about 120 volts, when the neon fires, dumping the charge from C4 into the gate of SCR1. This fires SCR1 which then discharges C5 through the primary of the trigger transformer, producing a high voltage pulse to initiate the discharge of C2, 3 through the strobe tube.

The storage capacitors are then recharged and the process repeated for the next flash.