

UFO Detector

Unit detects electromagnetic disturbances often held to be associated with UFO's.

EVERY YEAR MANY thousands of people see objects in the sky which they cannot explain in terms of their previous experience. In this sense the existence of unidentified flying objects (UFO's) is not a matter for debate — people see

flying things they cannot identify, thus, by definition, these things are unidentified flying objects.

The vast majority of sightings are caused by various objects or phenomena perceived in an unusual manner: cloud

formations, meteors, satellites, planets, an unusually bright star, temperature inversions, etc. There is also a substantial number of hoax devices.

Most people are satisfied if presented with a rational explanation for what they have seen.

But a minority are not — they are 'conspiracy theorists' who deny totally the principle of Occam's Razor. Faced with 99 probable explanations for an unusual happening — and just one explanation which complies with a previously accepted set of concepts — they will inevitably choose the odd one out.

No explanation or proof will convince the dedicated conspiracy theorist to think otherwise — a classic example of this is the oft-repeated story that the results of the USA Department of Air Force UFO Investigation 'Project Blue Book' have been suppressed. This is not really true. The Blue Book Project Files were declassified in 1970, and the USA Department of Air Force Office of Information state that the files are available to *all bona-fide researchers and media representatives*.

The conspiracy theory was well summed up by Salvador Freixedo at the UFO Conference in Acapulco (April 1977). 'The basic appeal of ufology (for the masses) is that it is a belief system rather than a field of scientific investigation'.

A further large number of classic cases quoted by ufologists has been well and truly debunked by Philip Klass (a technical journalist working with Aviation

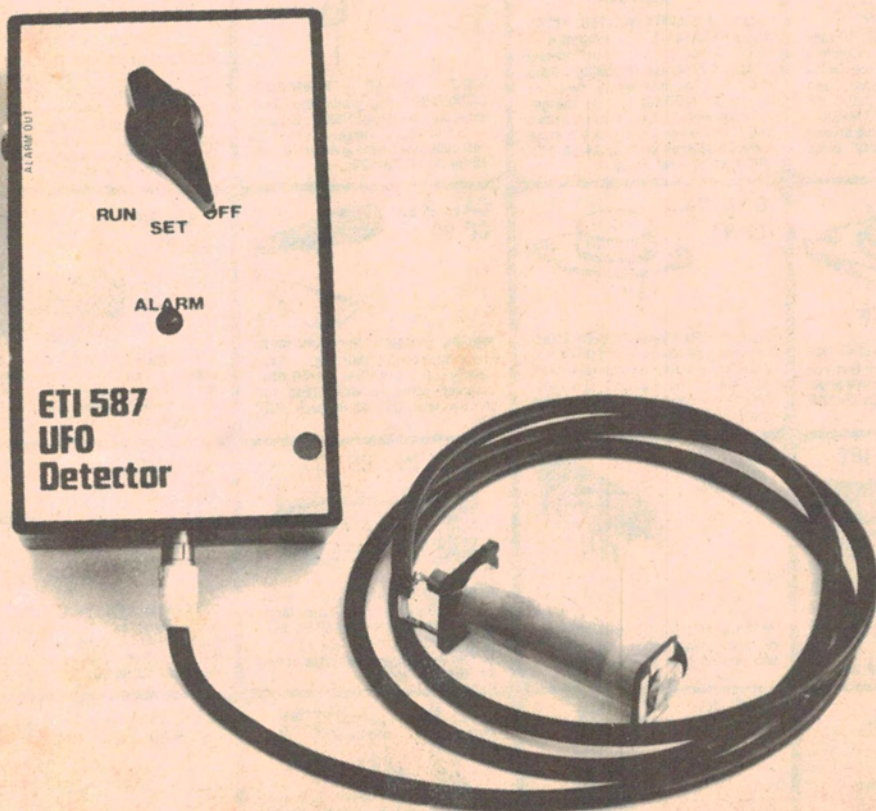


Fig. 1. The UFO Detector, attached to the solenoid.

Week and Space Technology magazine).

Klass's book ('UFO's Explained') thoroughly demolishes the most classic cases and provides evidence which casts major doubt on those few remaining. Consider for example the often quoted 'UFO landing' in Socorro, New Mexico in 1964. It now turns out that the 'landing' was set up as a publicity stunt by the local mayor, who just happened to own that bit of land where the UFO 'landed'.

It is perhaps significant that no serious challenger has ever taken up the USA's National Enquirer's offer to pay one million US dollars for proof that UFO's are unnatural phenomena emanating from outer space.

A small minority of ufologists should however be taken more seriously. These are dedicated people who investigate reported sightings as thoroughly as they are able. Unfortunately most of their investigations tend to be 'unscientific' in the sense that they lack the rigorous discipline which truly scientific investigation demands. Nevertheless, it is to the movement's great credit that they realise their investigational limitations and are currently doing their best to check out as thoroughly as they can a number of previously accepted classic sightings.

In fact magazines such as the authoritative US publication 'UFO' currently feature exposes of previously 'proven' situations.

In the light of this recent background, Electronics Today International was extremely interested to learn of a UFO magnetic anomaly detector recently developed by one of our contributors.

The basis of this device is that many UFO sightings are claimed to have coincided with major magnetic disturbances. In many reported situations, electrical equipment is claimed to have ceased to operate whilst the UFO was in the vicinity.

Thus, claim some ufologists, it may well be possible to sense the approach of a UFO by detecting abnormal perturbations of the earth's magnetic field.

The unit described here has been designed by Mr. F.C. Gillespie (6 Reginald Ave., Findon, SA), who has considerable expertise in this field.

UFO literature indicates that magnetic disturbances associated with some UFO activity are of such a magnitude that they should be detectable by relatively simple equipment. Naturally the more sensitive the equipment the further away a disturbance could be detected — however an upper practical limit for sensitivity is set in most areas

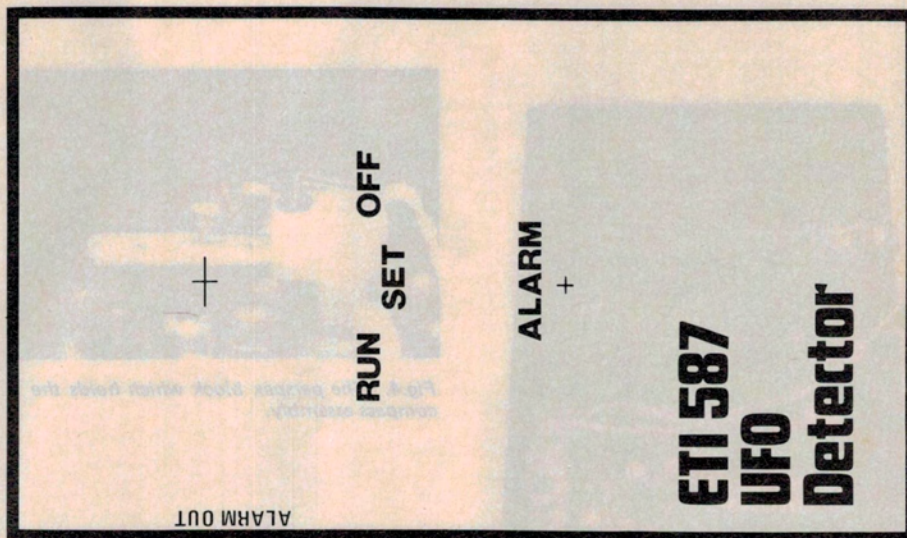
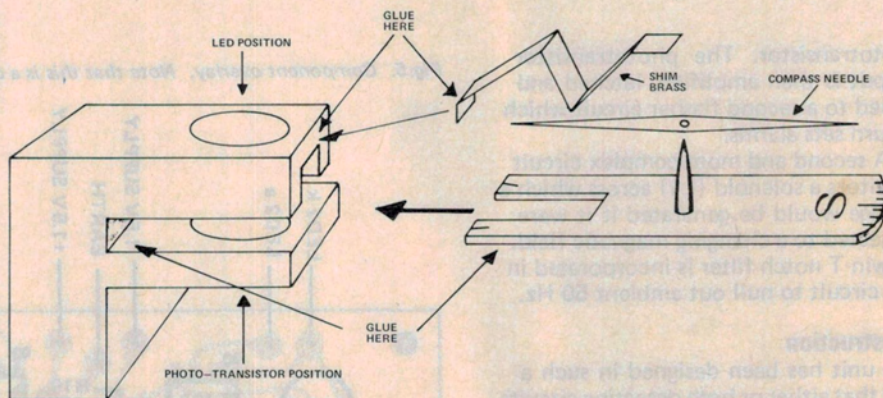


Fig.2.a) Front panel artwork for the UFO Detector (half size). b) Construction of the perspex compass block.



by the generally high level of background noise associated with civilisation — and which, ironically, is often postulated as attracting UFO's to this planet.

It is not at all difficult to detect the magnetic disturbance caused by a light switched on 20 m away — or a car 100 or more metres distant; but one can rarely find a sufficiently magnetic-noise-free environment in which to set up an instrument of such sensitivity.

The detector described here has adjustable sensitivity and in all but the very 'quietest' of areas the sensitivity can be set so that the noise just fails to trigger it. It is only in very rare and remote locations that the detector itself is the limiting factor.

Operating Principles

There is anecdotal evidence that the magnetic disturbances associated with UFO's may be transient in nature or may build up and decay over a period of time or may also be of an oscillatory nature.

For this reason the magnetic anomaly detector has two detecting systems capable of responding to all three types of disturbance.

The simpler of the two systems responds to minor movements of a very sensitive compass. The compass needle is set up so that when undisturbed it blocks the passage of light from a flashing LED, the light output from which would otherwise fall on a sensitive

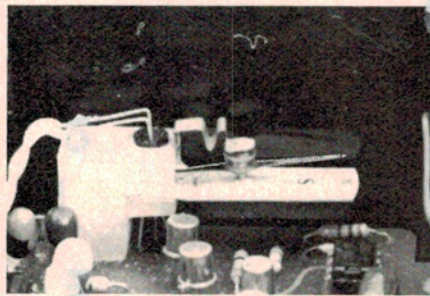
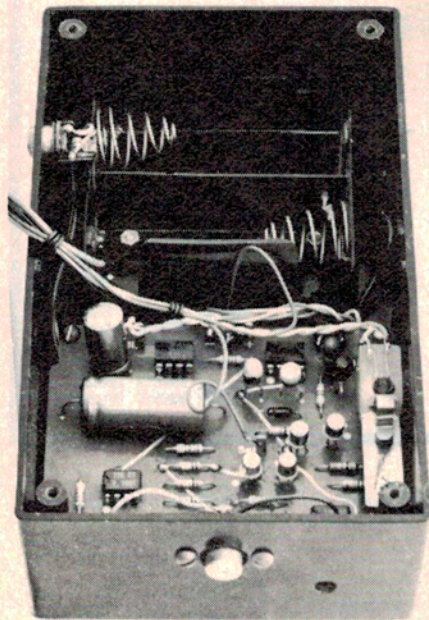


Fig.4. The perspex block which holds the compass assembly.

Fig.3. Internal shot of the UFO Detector.

phototransistor. The phototransistor output is then amplified, latched and passed to a second flasher circuit which in turn sets alarms.

A second and more complex circuit monitors a solenoid (L1) across which a voltage would be generated if it were subjected to a changing magnetic field. A twin-T notch filter is incorporated in this circuit to null out ambient 50 Hz.

Construction

The unit has been designed in such a way that either or both detecting circuits may be used, or indeed, duplicated if required.

Circuit construction is relatively straightforward, especially if the printed circuit board is used. The solenoid is the actuating coil from a Post Office type 3000 relay (5 kohms). Many people will have such a device in their junk boxes – otherwise it can be obtained from disposal stores or other outlets handling Post Office surplus bits and pieces. The solenoid is located external to the unit and connected to it by a screened cable,

The block holding the LED and phototransistor associated with the compass mechanism is a little tricky to make. It may be built up from pieces of wood or plastic – or if you have the facilities it may be milled out of a block of brass or other non-magnetic material. The main requirements are that the

HOW IT WORKS – ETI 587

Any voltage output resulting from a changing magnetic field around L1 is passed to the two-stage amplifier formed by IC1 and IC2. Fifty Hz background noise is greatly attenuated by the twin-T notch filter formed by the components between L1 and the amplifier. The frequency of the notch is adjustable by RV1.

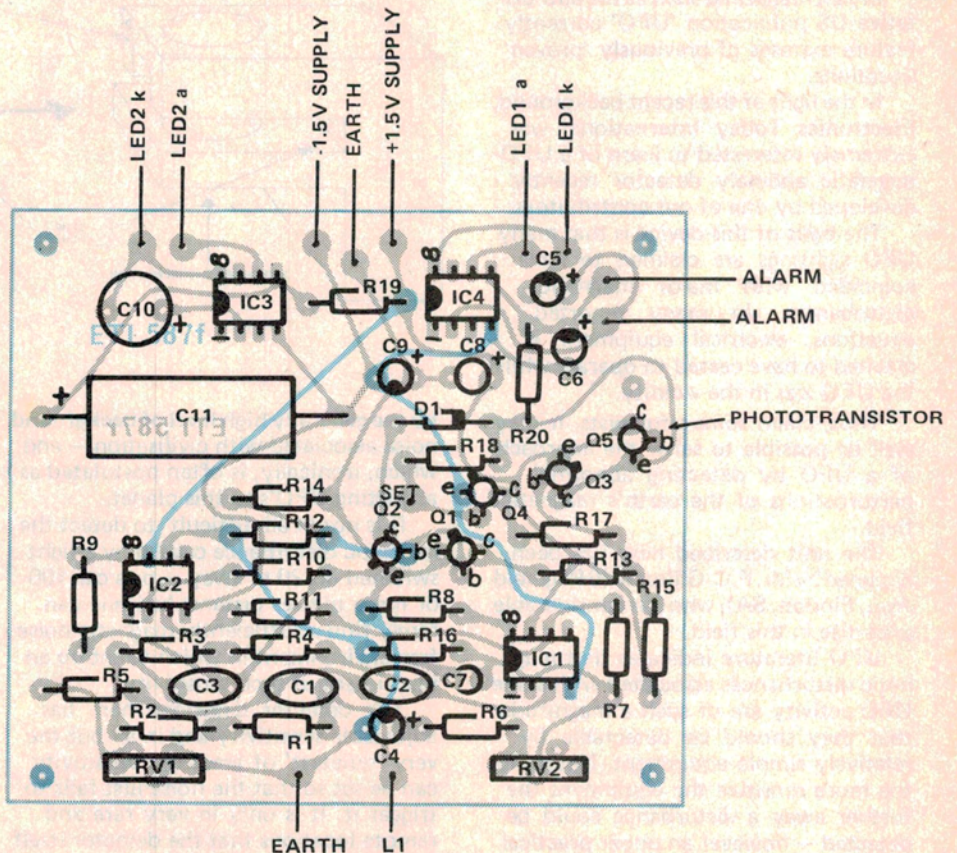
The gain of the amplifier IC1/IC2 is varied by RV2. Output signals from the amplifier are passed to Q1/Q2/Q3/Q4 which form two latching circuits (each functioning depending on the polarity of the output signal).

The output of the latching circuitry is then passed to IC4. This is a National LM3909 LED flasher. This causes the alarm LED to flash at about 3 Hz.

An external alarm output is also provided.

The compass circuitry is quite straightforward. IC3 is used to extend battery life. Any output from the phototransistor Q5 triggers the latching mechanism thus initiating the alarm sequence.

Fig.5. Component overlay. Note that this is a double-sided board.



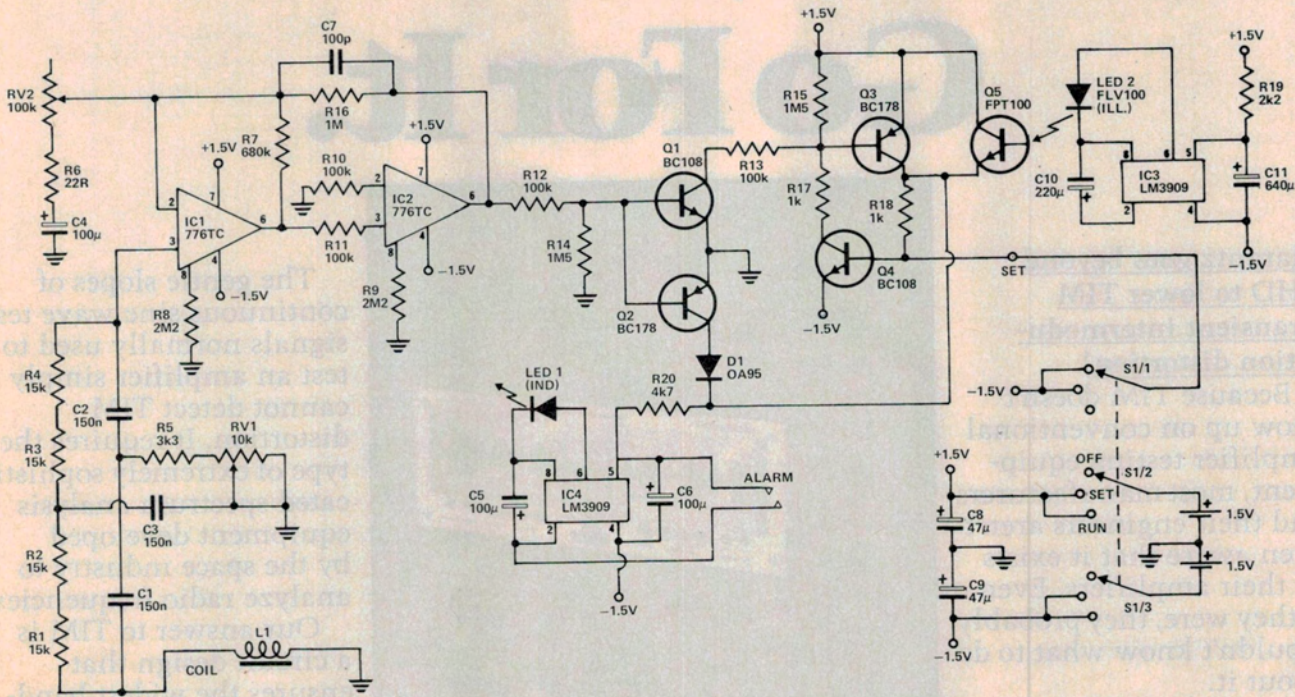


Fig.6. Circuit diagram of the UFO Detector.

LED and phototransistor *must* be very rigidly located and that the compass needle should just — but only just — block the light from the LED. The simplest way to make this section is to rebuild an old compass.

We suggest that you build the unit in sections checking out each section as it is completed.

No matter how you build the device it is absolutely essential to make sure that the compass assembly is mounted very rigidly — if there is any freedom of movement random mechanical disturbances will be registered as alarms.

Setting Up

The compass circuitry is quite straightforward. Provided it has been made correctly the phototransistor should be blocked by the compass needle when the complete detector assembly has been aligned precisely along the magnetic North/South line. Bringing a magnet or iron bar near the assembly should cause the needle to move slightly, thus allowing light to pass from the LED to the phototransistor, triggering Q3 and Q4, actuating the alarm.

The solenoid circuit is slightly more complex in that the twin-T rejection filter must be adjusted to optimise 50 Hz rejection. This may be done by observing the output from IC2 on a CRO while adjusting RV1 for maximum rejection. If a 'scope is not available, then RV1 must be adjusted so that the circuit is

not triggered by 50 Hz — increasing circuit gain via RV2 until the optimum setting is obtained. There is no need to inject 50 Hz into the circuit whilst setting up — in most places there's more around than you'll need!

Once the initial adjustments are made there will be little need to change anything except the sensitivity (gain) control RV2. This should be adjusted so that the unit is just short of triggering under normal conditions.

Local thunderstorms may occasionally trigger the unit but this is inevitable unless you use the unit on low sensitivities.

Well, there it is — the device *will* detect magnetic anomalies. Whether it will consistently detect UFO's is another matter — we were unable to obtain a DIN standard UFO for calibration purposes! Until we do, we refrain from making any claims as to the efficacy of this device!

PARTS LIST — ETI 587

Resistors all ¼ W, 5%

- R1-R4 . . . 15k
- R5 . . . 3k3
- R6 . . . 22R
- R7 . . . 680k
- R8,9 . . . 2M2
- R10-R13. 100k
- R14,15. . 1M5
- R16. . . 1M
- R17,18. . 1k
- R19. . . 2k2
- R20. . . 4k7

Potentiometers

- RV1 . . . 10k trimpot
- RV2 . . . 100k trimpot

Capacitors

- C1-C3. . . 150n
- C4-C6. . . 100µ 3.6 V tantalum
- C7. . . 100p
- C8,9 . . . 47µ 6.3 V tantalum
- C10. . . 220µ 10 V electrolytic
- C11. . . 640µ 16 V electrolytic

Semiconductors

- IC1,2 . . . 776TC op amp (or LM4250CN)
- IC3,4 . . . LM3909 flasher (National)
- Q1 . . . BC108
- Q2,3 . . . BC178
- Q4 . . . BC108
- D1 . . . OA95, or similar germanium diode
- LED1 . . . Red LED with mounting clip
- LED2. . . FLV100 (or NSL100)

Miscellaneous

- L1. . . . Solenoid (e.g. the coil from a 5k PO3000 type relay).
- S1. . . . 3 pole 3 position 'F' switch
- Magnetic compass, 40 mm maximum needle length (e.g. 'An Outdoor Must' No. 120).
- Input and output plugs and sockets, pc board ETI 587, dual battery holder for two 'C' cells, two 1.5 V 'C' cells, 1 knob, case 155 x 90 x 45 mm (approx) internal, coax cable, shim brass, perspex, glue, black paint, wire.