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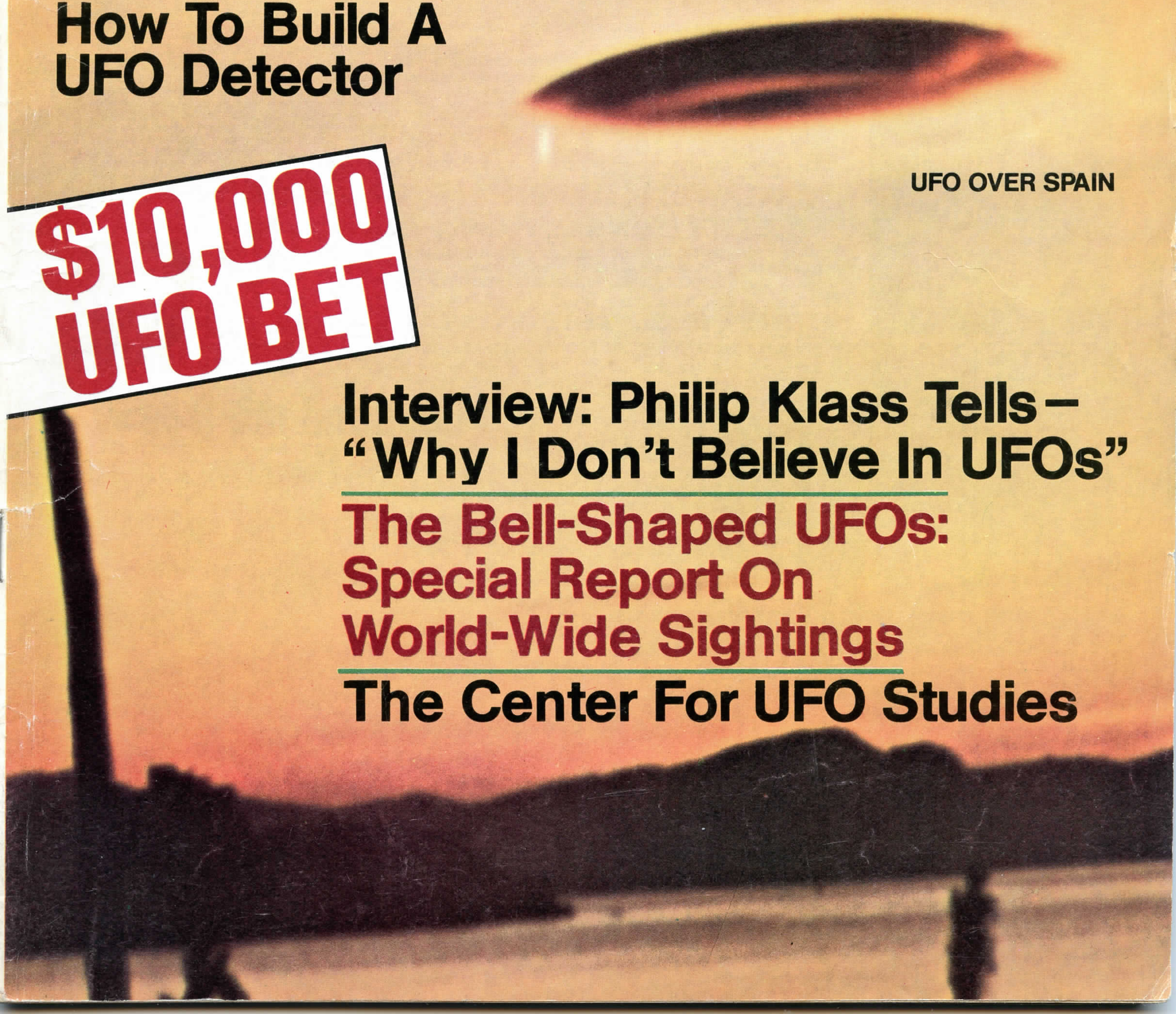
How To Build A UFO Detector



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The Center For UFO Studies

THE MAGNETIC DETECTION OF UFOs

HOW TO BUILD A UFO DETECTOR

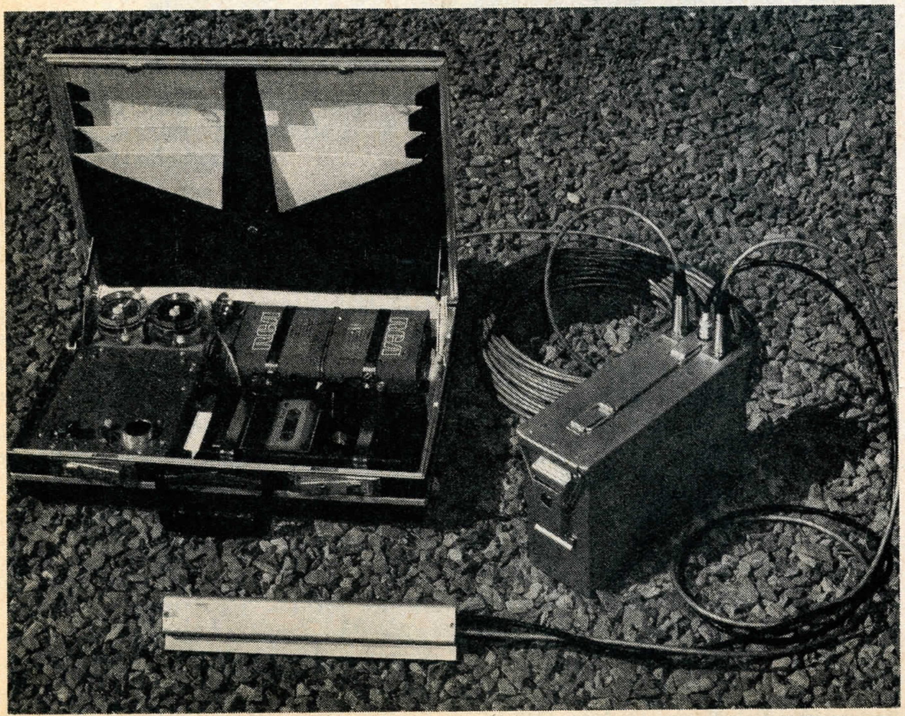
By Jim Lorenzen, Director of the Aerial Phenomenon Research Organization (APRO)

■Since many UFO case reports over the years indicate magnetic effects such as, for example, a momentary change in compass deviation, many have felt that it is feasible to detect many otherwise unobserved UFOs utilizing this fact. The Bob Allen (Achzehner) detector distributed by APRO in the 1960s is an example. This detector used a magnetic pendulum terminating in a vertical contact surrounded by a metallic ring. When these two elements touched, an electrical circuit was completed which sounded an alarm. John Oswald has taken the similar concept of a compass needle and contact ring and added the feature of a coil which is energized on contact, locking the detector in the detection mode. This allows awareness of detections when no observer is present.

The main problem with these detectors is that the metal contacts become oxidized and resistive and the sensitivity is thereby greatly reduced. (A solution to this problem is presented later in this article.)

Richard Gerdes, President of Optical Electronics, Inc. and a member of the Board of Directors of APRO, Inc., initiated the design of a magnetic-type UFO detector using readily available electronic components. The author made some modifications and the plans were made available to APRO members as shown in the diagram, drawn by Vance Dewey and incorporating some additional improvements.

Wido Hoville, APRO Field Investigator in Canada, has independently produced a design similar in concept.



FIELD INSTRUMENTATION KIT — Photo by Jack W. Carroll

Eventually, this basic design was developed and refined by a technically based group in San Diego calling themselves Precision Monitoring Systems (PMS). PMS produced a battery-powered field version for a field research trip sponsored by the National Enquirer. In this model, automation has been added to the extent that when a detection occurs a tape recorder is turned on which records the detector output (and the output of a spin field detector designed by APRO Research Director Dr. James A. Harder) through voltage-controlled oscillators.

A subsequent version of this design was furnished to Dr. Poher of France, Director of the High Altitude Sounding Rockets Division of the French National Center for Space Studies, for his use, and a still later version was purchased by Project Starlight International (PSI) Incorporated of Austin, Texas, and is currently in use at their monitoring site.

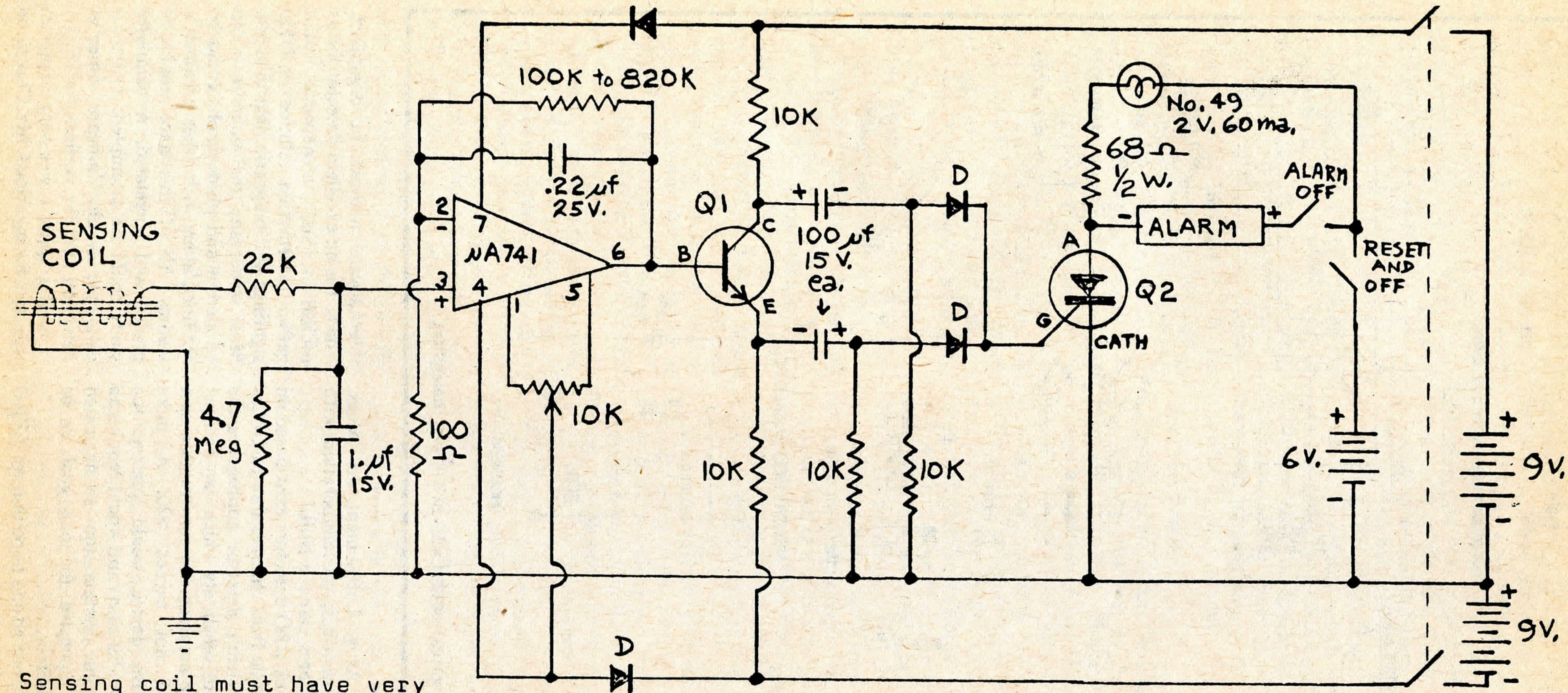
However, the cost and complexity of this class of detector places it beyond the reach of the average citizen, and since, in any case, detection is limited by normal fluctuations in the earth's magnetic field, it is felt by many theorists that a large distribution or network of single detectors would be a more effective research tool.

A letter received from APRO's representative in France expresses this idea:

"When I accepted the position of French representative of the Aerial Phenomena Research Organization, Inc. 3910 East Kleindale Road, Tucson, Arizona 85712, U.S.A., I had the wonderful experience of collaborating with the late Dr. Rene Hardy, APRO's consultant in physics and well-known European authority on UFOs.

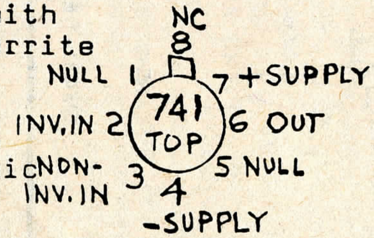
"It became quite evident that the establishment of an international detector network would achieve a wealth of information dealing with this phenomenon.

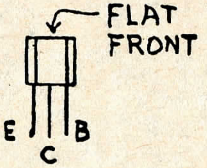
"Dr. Hardy suggested several designs for UFO detectors. Just prior to Dr. Hardy's death, I met Mr. Christiano Klein, who is keenly interested in the

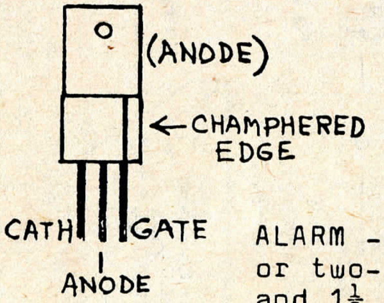


Sensing coil must have very large number of turns, with straight OPEN iron or ferrite core.

1. and .22 uf capacitors should be Mylar or ceramic ONLY.







D's (4) 1N270, 1N281, or equal germanium diode (not old point-contact 1N34, etc.)

Operational amplifier Fairchild uA741
Use P/N U5B7741393 for use above 32° F.,
use P/N U5B7741312 for operation at temperatures below 32° F.

Null pot - set for zero volts pin 6 to ground.

Q1 - 2N3417, 2N3711 or equal

Q2 - IR 106Y1-C or equal, sensitive-gate SCR.

Feedback resistor - larger value increases sensitivity but may cause instability.

ALARM - Mallory Sonalert or two-transistor oscil. and 1½ or 2 inch speaker.

UFO DETECTOR

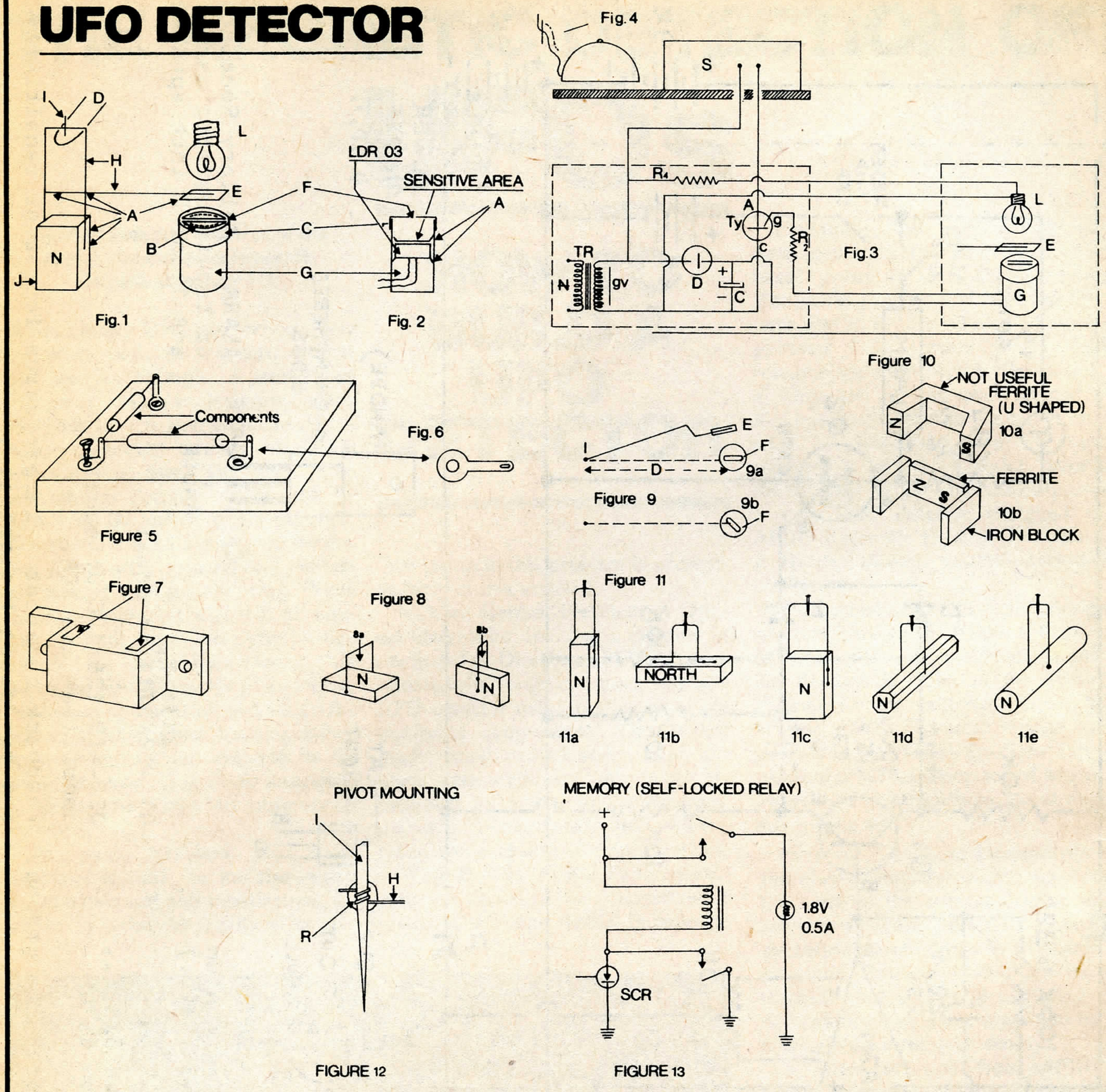


FIGURE 13—THE SCR CAN BE REPLACED BY A POWER TRANSISTOR.

detection problem. At my suggestion there was an exchange of information between these two individuals. The result was Mr. Klein's original solution to the detector Dr. Hardy had suggested in 'Lumieres Dans la Nuit,' No. 118, June 1972, published by Mr. R. Veillith, Les Pins, 43400 Le Chambon-Sur-Lignon, France.

"In France, progress did not stop. In memory of Dr. Hardy, a network named after him was organized by Mr. Jean Chasseigne using the name 'Association Pour la Detection et l'Etude des Phenomenes Spatiaux,' Villa Arpy, Lotissement des Aloes, 06600-Antibes, in collaboration with 'Lumieres Dans la Nuit.'

"Many UFO detectors exist based on magnetic field changes due to UFOs. Mr. Klein's detector approaches the limit of sensitivity which can be used by the amateur. Its construction cost should not exceed $20. A more sensitive device would present too many false alerts and would require an electronic system too sophisticated and expensive for our goal to be satisfactory.

"It is our strong hope that an APRO international network be organized. The K-1 is an excellent detector for its utilization. Such a network would gather information relative to UFO sightings and magnetic field changes. Most important, the amateur would be alerted and photographs could be obtained along with other parametric studies. All of this data would be pooled and correlated. A computer study could be attempted. A typical catalogue would indicate time of detection and observations.

"In this spirit I was very happy to translate for my friend, Mr. Christiano

Klein, the K-1 detector from French to English.

Richard Niemtzow
Montpellier, France"

DETECTOR K-1
By Christiano R. Klein

Introduction

The principle of this detector is identical to that of the model designed by the late Dr. Rene Hardy which appeared in "Lumieres Dans la Nuit," No. 118, June 1972. This review is published by Mr. R. Veillith, Les Pins, 43400 Le Chambon-Sur-Lignon, France. Originally, Dr. Hardy used a compass pointer and then a ferrite rod as the magnetic detector element.

Mr. Klein proposes an original solution for the realization of the magnetic element. Thus, the reader finds detailed mechanical and electronic schematics along with the results of the sensitivity measurements obtained with the laboratory prototype.

System Analysis

The miniature light bulb L is permanently illuminated. The detector is oriented in such a fashion that the window slit F is in the shadow of the Screen E (see Figure 1). The magnetic block J is oriented in a north-south direction like that of a compass needle. One must orient the detector in such a manner that the Screen E completely masks the window slit F. The distance between E and F should not exceed one millimeter.

When the screen is properly oriented, there is no light in the interior of Tube G. Consequently the photo cell in Tube G is at its maximum resistance. In other words, in this position the instrument is active but in rest-state.

If the local magnetic field is modified (by the passage of a UFO), the magnetic block J which links the screen E by a small stiff wire changes its orientation and exposes the window slit F to the light L of the lamp. The penetrating light reaches the photo cell. The photo cell circuit reacts with an increase of current due to the decreased resistance and the thyristor (SCR) is triggered. The SCR provides a current to drive the alarm system (i.e. a door buzzer).

The Electronic Circuit (Figures 3 and 4)

The SCR is the controlling element of current to the alarm. When light does not reach the photo cell its resistance is very high—about 1 megohm. Therefore a very feeble current travels through the photo cell circuit and also through that of the electrode control G of the SCR. Under these conditions the SCR is at rest-state of non-conduction.

When the photo cell is exposed to light due to the displacement of the screen E, its resistance falls to several hundred ohms, the SCR conducts, and the alarm functions. The alarm system stops functioning when the cell is no longer illuminated because the SCR is powered by A.C. current.

Practical Details

To obtain the maximum sensitivity, the screen E, the two pieces B, the interior of tube G and even the cover C should be blackened and non-reflecting. The length of the slit should be approximately equal to the diameter of the useful region of the photo cell. In the case of the model LDR 03, it should be 8mm in length and 1mm in width. The screen E should have the dimension of 1.5mm for the width and 10mm for the length.

It is not easy to make a slit 8 x 1mm without special equipment. One should therefore make a round hole of 8mm in diameter and then cover this hole with black paper to reduce the circular form to a slit 8mm x 1mm (see Figure 1).

No iron or magnetic parts should be placed within one meter of the magnet J. A minimum distance of three meters must separate the magnet J and the buzzer (alarm) system to avoid magnetic interaction with the ferrite J.

The pivot I is composed by the use of a sewing needle point. A phonograph needle may be substituted but this has not been experimented with by the author.

The support D is brass with a round dented circle which receives the pivot I.

One must not heat J to accelerate the hardening of the glue because the heat will demagnetize J. The same precaution holds for the photo cell. One must wait 48 hours for the epoxy glue to dry. Other types of glue may be used, but have not been tried with the prototype.

R_1 is selected in such a fashion that the lamp voltage will be slightly reduced. This prolongs the life of the bulb and the viability of the detector.

On the prototype the components have been mounted on a piece of wood. The electronic position (Figure 3) has been realized in the same fashion.

Notice that the entire instrument actually consists of two separate units. One contains the electronic components, output for alarm system, and input for AC voltage sector. The second unit contains the mechanical elements consisting of the magnet J and its pivot system along with the bulb L and photo cell assembly. Four insulated non-shielded wires connect the two units: two wires for lamp connection and two for the photo cell. Remember that the buzzer system should be at least three meters from the magnet J.

The wood mounting technique is very solid, easy and inexpensive. It gives total satisfaction concerning reliability. One uses spade terminals for supports (Figure 5). These terminals are fixed by screws in the electrical unit and must not be of iron in the magnetic unit. The components are soldered on the terminals. For the electrical unit one may use printed circuit techniques.

The vibration of the buzzer serves to actuate a detector memory when the owner is absent. One bends and glues a paper clip in such a manner that a rubber washer or bead displaces and falls during an alarm (Figure 4). A ping-pong ball could be used too.

One may desire a more sophisticated electronic memory system. An electronic diagram is indicated in Figure 13.

The magnetic unit must be placed in a closed box, non-transparent and non-magnetic. Plastic or cardboard is indicated. Without a protective box, the smallest displacement of air or the smallest insect touching the magnetic system will trigger a false detection.

This K-1 detector is simple and its function very reliable. Anyone able to handle a solder gun and willing to follow the directions can easily accomplish the construction.

The Magnetic Piece J

J is a ferrite magnetic block retrieved from a magnetic latch used on many types of placard doors to keep them closed. These latches can be found at a very low price in hardware stores, etc. The exterior aspect is that of a small plastic box with a base for fixation C (Figure 7).

The ferrite bloc which interests us is found in the interior between two iron *(Continued on page 60)*

KLASS—I feel that they have done it as a publicity gimmick because they like to carry UFO stories. But I am delighted that they did it, and for this reason: I have devoted a good deal of my life to investigating cases, seemingly unexplainable cases about which people have said, "This is the best case" or "This one can't be explained away," and as soon as I spend weeks or months—sometimes it takes half a year—and I explain the case and publish my explanation in one of my little "white papers," then people say, "Oh well, you picked an easy case." And frankly, in the last eight years I have devoted probably 90 percent of my spare time to this activity. So I am delighted that the *National Enquirer* has picked this distinguished panel of experienced ufologists—Dr. Hynek, Dr. Harder, Dr. Salisbury, and others —who have spent a lot of time studying UFOs. Now, when they pick a case and say this is the "Best Case of 1973," then I can go to work on it, and when I explain that case, as I do in my book with their "Bests" of 1972 and 1973, no one can accuse me of picking an easy case.

EARLEY—Then you plan to wait until each "Best Case" or "completely unexplainable case" is put forth by the ufologists and then you'll solve it?

KLASS—Exactly!

* * *

We ended our discussion at that point. It is clear that Klass is convinced that if he waits to investigate and solve the ufologists' "Best Cases," he thereby demonstrates that all other sightings are cases of "illusion, delusion, or hoax." Only time will tell if his view, or that of the ufologists who believe in, or lean towards, the extraterrestrial visitation theory, will prove correct. But one thing is certain. If *you* produce a UFO report that is generally thought to be convincing, Phil Klass, the "Sherlock Holmes of Ufology," will come calling with *his* solution to your mystery. ●

UFO DETECTOR

(Continued from page 25)

plates. The exterior exposure of these two iron plates is shown by the arrows in Figure 7 (see also Figure 10b).

Important

During dismounting of these latches it is necessary to locate the "faces" of the ferrite block which are in contact with the iron plates. These are the magnetic poles.

The reader must realize the importance of locating these two faces. All of this is for a simple reason: these faces must be mounted in the vertical position as in Figure 8b. In this mounting one of the faces will turn spontaneously toward the earth's magnetic north and the opposite face to the south.

It is very important to assemble the magnetic block correctly. A block mounted by error with the magnetic pole in an up-and-down position like Figure 8a does not permit the normal functioning of the detector.

One should assemble the block as demonstrated in Figure 8b without the "arm" supporting the screen. Determine experimentally the spontaneous orientation of the block and then finish the construction by assembling the "arm." Remember that this arm consists of rigid thin copper wire. This arm is represented by a line in Figure 1, but it should be curved.

The distance D (Figure 9a) measured in a straight line between the vertical defined by the pivot I and that defined by its (arm and screen E) sweeping through the axis of tube G influences sensitivity. The orientation of the slit is important. Figure 9a shows the correct orientation for maximum sensitivity. This sensitivity is *less* in an orientation shown in Figure 9b. The maximum sensitivity of the assembly is not affected by the fact that the arm which supports the screen E is curved.

The distance between the lamp and the slit is not very critical—about 10mm in the prototype. But the screen should be as close to the slit as possible. The construction should be very precise and the final bending regulation is accompanied by the arm supporting the screen or by regulating the height of tube G.

The Sensitivity (Figure 11)

The geometry of the magnetic block and the magnetic direction varies according to the fabrication of the latch. Each producer presents a latch with different sizes. Finally, the same block can be mounted in two different manners. See Figures 11a & b.

The problem of the sensitivity presents two more or less distinct aspects:

1) What is the smallest field $\overrightarrow{\mathbf{BC}}$ capable of overcoming the resistance of the pivot to turn the block?

2) What is the smallest angle 0 capable of detection by the electronic system?

During the trials, the smallest field $\overrightarrow{\mathbf{BC}}$ used was a milligauss. At this value, the pivot functioned in an ideal manner without resistance to rotation. Consequently, the sensitivity depends only on the second question.

In the prototype, the alarm sounds without fail for a field **BC** of 5 milligauss. This sensitivity can be increased in several manners:

1) Elongating the support arm of the screen E.

2) Increasing the intensity of the lamp.

Nevertheless, for urban utilization it is futile to increase this sensitivity for the reason that many false alerts will occur. It is equally futile to descend below the natural terrestrial field which is about 100 to 200 gammas (1 gauss = 100,000 gammas). For increased sensitivity, the adjustment will be most difficult and the system will be disturbed by vibrations.

A study has been made with a support arm of 15 centimeters. As anticipated, the sensitivity increased, but the adjustment was very difficult. Another problem, in this case, is that one cannot use a plastic box to house the components. The electrostatic charges in the plastic have been noticed to give false alerts.

It seems that the sensitivity indicated in this project is already excellent. To increase it would require the use of other systems of detection, pivot, etc.

The field is open to experimentation. One is able, for example, to assemble a small mirror on block J, an optic system focusing a light ray on the mirror. The ray is reflected on a photo cell at a distance of several meters. The sensitivity would be enormous. The stability of the assembly would have to be perfect to avoid false alerts.

Another project: The screen E should be metallic (aluminum foil); its movement would change the capacitance of a capacitor. The variation of capacitance would change the frequency of an oscillator. An electronic system would be constructed to give an alert when the frequency of the oscillator changes. This system would be fantastically sensitive.

Other projects can be proposed. Mr. Klein would enjoy corresponding with interested people.

Nevertheless, understand that the hypersensitive detector will always have a delicate problem of construction to solve: adjustment, location, stability, freedom from parasites, price, etc.

For research, a dense network of acceptable detectors is more interesting than a few very sensitive devices. The distance from which one is able to detect a UFO is not proportional to the sensitivity of the detector. If a detector can detect a UFO at 1 km, it is not certain that a device 100 times more sensitive could detect the same UFO at 10 km.

The prototype described achieves an excellent balance of sensitivity, easy construction, adjustment, low price, durability, stability of functions, etc. to permit the establishment of a detection network.

LEGEND

Figure 1 and Figure 2

A: Drop of epoxy glue
B: Non-transparent black paper (non-reflecting)—see text
C: Plastic or non-magnetic cover (non-transparent)
D: Brass support
E: Non-reflecting black paper screen 1.5mm x 10mm
F: Slit
G: Non-transparent plastic, cardboard or non-magnetic metal tube
H: Very thin copper wire, extracted from a multi-wire conductor
I: Sewing needle point or phonograph needle (new)
J: Magnetized ferrite block (see text)
L: Lamp or bulb (see electronic Figure 3)

Figure 3

Component List

TR: Buzzer transformer; type used for door buzzers in homes. Primary 110 volts or 220 volts according to the local AC power source. Secondary 9 volts, 10 watts. A model less powerful may be used provided that it is capable of activating the buzzer.
D: Diode 100 milliamps 20 volts minimum inverse.
C: Capacitor (electrolytic) 100 MF/ 25 volts minimum.
R¹: Resistance 82 ohms +−20% 2 watts. (For lamp 6.3 volts, 100 ma, and transformer 9 volts.)
R²: Resistance 1200 ohms 1 watt +− 20%
S: Buzzer 9 volts
TY: SCR 2N1599
L: Lamp 6.3 volts 100 milliamps. One may use other lamp or other secondary voltages with the condition to correctly modify the value of R¹. The light from a lamp 6.3 volts is sufficient, even when the lamp is underpowered. The lower voltage prolongs considerably the life of the lamp.
G: Tube housing the photo cell LDR03.

SCR 2N1599

Characteristics

I rms 1.6 amp
I g Max: starter 10 Ma
I g typical 3 Ma
V g Max: "to trigger": 3 volts
V g typical 250 millivolts

The SCR 2N1599 may be replaced by other models having 1 g maximum up to 10 milliamps or 15 milliamps and 1 rms of 1 ampere or a little more.

An infra-red light-emitting diode (LED) and an infra-red sensitive photo transistor are suggested as alternate detection elements. Radio Shack stores have these for around $1 each.

Instead of dismantling a door latch, one can obtain a suitable magnet from a hobby shop or from the Miami Magnet Company, 7846 West 2nd Court, Hialeah, Florida 33014. (Write for catalogue.)

Another point: If, in the K-1 detector, the return wire from the alarm bell is connected to the opposite side of the diode D through a normally closed (NC) push button, the detector will "latch" when triggered and the alarm will sound continuously until the button is pushed.

In this way, triggerings of an unattended detector will not be missed.

Following Mr. Niemtzow's suggestion, APRO has undertaken the task of expanding the detector work in the Americas. ●