

A few weeks ago I received a curious phone call from the editor of **Treasure Hunting**. Although I wasn't in at the time, my wife who took the call said it was basically to: "enquire as to whether I could carry out a field test on a revolutionary new type of metal detector?" Needless to say I was more than intrigued by this request and promptly rang the editor to find out a bit more.

The new type of detector was called a Lorenz Pulse 5. And what was it about the Pulse 5 that could set it apart from any other type of Pulse Induction detector? Well, I was pretty staggered when he told me.

This Pulse Induction machine requires two people to operate it, has a depth capability of 8 metres, and not only that it has the ability to discriminate!

To say that I was excited by this new development is an understatement. I certainly jumped at the chance to carry out this field test. And when I later rang fellow team member Julian Evan-Hart he was also pretty excited and was more than willing to help me with the task.

Now, I've been detecting for 23 years, starting out as a beachcomber in Portsmouth when I was serving in the Royal Navy. In all those years I've only ever owned, and used, three detectors!

My first was a C-Scope IB300, which was a simple but excellent machine. It couldn't discriminate but it certainly found a lot of good things. It finally wore out after eleven years of loyal service. I replaced that in 1987 with a Tesoro Silver Sabre Plus which I am still using (believe it or not!). I also own a classic Arado 120b, which I use occasionally but mainly keep as a back-up machine.

I'm going to admit that I've always been a bit of a "techno-phobe". That is to say I have never been keen to upgrade to more sophisticated machines. My Silver Sabre has only two knobs on it, and that's enough for me! If a simple machine works well for me, then why go for something that's going to be complicated?

I've never used a Pulse Induction detector before although I've often been tempted to, mainly because of



*Julian Evan-Hart and Rachael Stuckey testing the Lorenz Pulse 5 on a Roman site*

their ability to detect things at greater depths than conventional machines.

Like most fellow detectorists, while I'm working my way across the fields swinging my detector, I often feel a sense of frustration at my detector's limited depth capability. Most conventional machines only ever detect objects that are up to about 6 or 7 in. below the surface. That is unless the object is fairly large, and then you might detect it at a couple of feet. I've heard many tales of detectorists claiming to have found a silver *denarius*, or other small objects, that were 18 in. down! Absolute coppers!! If they carried out an "in-air" test using the same coil, and same find, they would most probably discover that the detector wouldn't even register the object until it was within a foot of the coil!

The depth of 18 in., however, isn't

where the finds stop. It's probably the limit that a farmer would plough his field, though. Anything within those 18 in. we have the potential to find as the soil is turned over year after year. But anything below that seems doomed to be lost forever!

I've often thought that a powerful Pulse Induction machine might be a useful tool with which to try to find those unreachable targets. However, I have always been put off the idea by people saying that P.I.s are hopeless on inland sites because of their "intolerable" sensitivity to iron.

Most of us have machines that can discriminate and reject or ignore iron, making detecting a lot easier. Although the Lorenz Pulse 5 has a level of discrimination, it doesn't reject iron. It is still just as sensitive to it as normal P.I. units.

It discriminates by way of measuring the conductivity level of the metal, which has been detected, and displaying it visually on a meter on the control box. Different types of metal have different conductivity levels, but I'll go into this in more detail later.

While I was waiting for the Pulse 5 to arrive I tried to speculate as to what it actually looked like. Also, why did it require two people to operate it? When it was eventually delivered this soon became apparent!

## Reader's Field Test

David Stuckey & Julian Evan-Hart

## FIELD TEST

### The Standard Kit

The package that came with the Pulse 5 included the following:-

1. A tough plastic carrying case with foam padding.
2. Lorenz Pulse 5 electronics control box.
3. A tough leather case with adjustable straps for the control box.
4. Rapid charger with wide range AC-input (90-240v).
5. Detachable AC plug for rapid charger (for Europe, UK, USA, and Australia).
6. Operating manual (in English and German).
7. 10 in. (26 cm.) searchcoil with telescopic "S" pole.
8. Waterproof universal cable coil (8 m. perimeter).
9. Stereo headphones with 6.35 mm. jackplug.

### The Universal Cable Coil

The universal cable coil has an 8 m. perimeter which can be layered 0.7 m. x 0.7 m.; 1 m. x 1 m.; 2 m. x 2 m.; or as a compensated 1 m. x 2 m. frame mounted search coil. The ideal material to make a frame with is pvc waterpipe, which is readily available from DIY shops. Frames can also be ordered as accessories from the manufacturer.

For the purpose of this field test I was supplied with a 1 m. x 1 m. frame mounted coil. This has adjustable carrying straps attached so that two people can carry the frame.

### The Control Box

The control box (which also houses the rechargeable power unit) is housed in a tough leather case that can be worn round the neck or over the shoulder, and has an adjustable strap. The box weighs in at quite a hefty 4 lb. (1.8 kg.). There is also a leather attachment at the back of the case so that it can be attached to a belt if desired.

The front of the control box has four switches and a meter display with two LED lamps (red and blue).

### Mode Control

The mode control switch is also the on/off switch, but at the first setting allows a battery check. The Pulse 5 unit can only be turned on via the mode switch when a search coil is connected to the rear of the panel. When the battery is fully charged the meter should read 100.

#### Position Disc.

In this position the target classification of the Pulse 5 is selected. Any metal object detected will give a conductivity reading of between 0-100 in this mode. (A certain intensity of the



The Lorenz Pulse 5 with standard kit.

The Pulse 5 control box and power unit, 8 m. perimeter universal coil, recharger unit, headphones, and leather carry case.



target signal is necessary for a conductivity reading). The blue light situated at the top left-hand corner of the meter will illuminate to indicate when target classification is possible.

#### Position Disc.1

Position 1 offers no target classification but gives an intensity meter reading, which works in parallel with the audio. The closer the coil gets to a metal object the higher the reading, and the higher the audio increases in intensity also. This position is an all-metal mode offering the highest sensitivity to all metals of any size.

Position 1. and Disc. are the same in sensitivity, although no target classification is possible in the former mode.

The blue discrimination light will come on, however, when an object is detected.

#### Position Disc.2

The higher you go up the Disc. scale the less sensitive the Pulse 5 becomes. The higher settings are mainly employed when working on highly mineralised ground. High discrimination levels also result in the possible elimination of very small objects. Iron, copper-alloys, and silver objects will suffer a reduction in sensitivity even if they are slightly bigger than a coin. This mode would mainly be used when searching for large objects while ignoring bad ground conditions and very small objects.

### Position Disc.3

This position will offer even less sensitivity than Position 2. Most small objects will be totally eliminated in this mode and large targets will suffer some reduction in sensitivity. The Pulse 5 will operate with good stability on almost any ground condition in this mode. This is particularly useful when searching highly mineralised ground and trashy areas. Pinpointing of strong, deep targets will also be easier in this mode than any of the previous modes.

### Audio/Threshold Control

This switch allows the "tick rate" of the audio to be changed. When the Audio/Threshold is altered the Zero button must be pressed down until the alteration is complete. For most applications the control can be left in mid position. In this position the audio signal will register 1-2 clicks per second.

### Zero Pushbutton

This is the most important control of all the electronics. The Disc. and the Audio will be re-tuned when this button is pressed for 1-3 seconds. In fact when any adjustment or alteration is made using any of the controls the Zero push-button has to be pressed.

### Freq. Control

With this control the pre-set operating frequency of the Pulse 5 can be altered. This is mainly useful when low frequency interference is encountered (ie overhead power cables). The performance of the Pulse 5 will not be affected but interference can be greatly reduced.

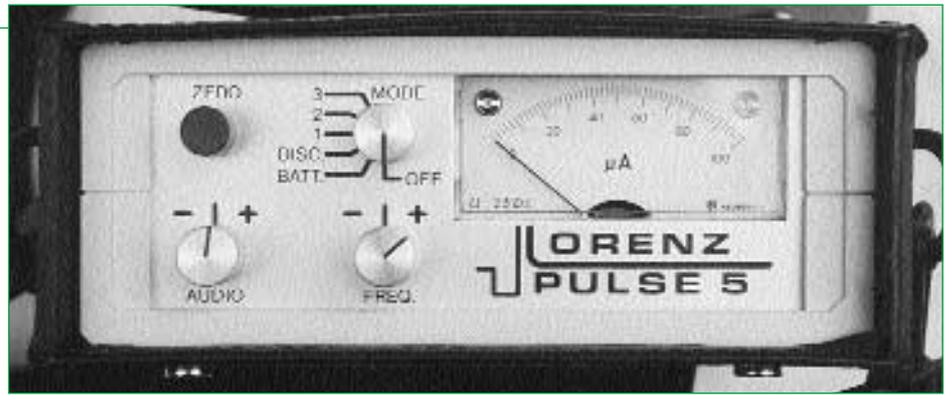
### Meter & Discriminator

The meter has three functions:-

1. Battery check. The battery's condition can be displayed on the meter when the Mode switch is turned to this position. Battery strength will be indicated as: 100 battery full, 50 battery half full, and 0-10 battery discharged. (NB The manufacturers recommend that the battery should never be allowed to discharge fully as this can result in serious damage to the battery).

2. Discriminator and Conductivity Reading. In the Disc. position the conductivity of the metal object will be displayed (see graph).

3. Intensity/Signal strength. The signal strength will be displayed when the mode switch is turned to settings 1, 2, or 3. The signal strength will be displayed on the meter as well as an audio response from the built-in speaker or headphones.



Front panel of control box.

### Instruction Manual

The instruction manual for the Lorenz Pulse 5 is in both English and German. The English section covers a staggering 20 plus pages. When I first read this I did find it difficult to grasp a lot of the technical details, so I found myself having to read it again and again in order to try and understand everything. But I soon found everything falling into place, especially after taking the Pulse 5 out for a few trial runs. (You may find it necessary, as I had to, to take the manual with you on the first few outings in order to operate the machine properly!)

### Operating Procedures

With the chosen coil connected to the Pulse 5 the Mode switch should first be turned to Battery Check. If the meter reads lower than 20, or the red light comes on in the top right hand corner of the meter, the unit should be switched off and recharged.

The Mode switch should then be turned to the Disc. position and the Audio/Threshold and Freq. controls set to mid-position.

If using a large frame coil this should be held preferably at about 2 ft. from the ground to avoid tuning whilst near any metal objects in the ground, or highly mineralised ground. Whilst doing this the Zero push-button must be pressed for about 3 seconds and then the coil can be gently lowered to the ground. An audio signal may occur at this stage, if so this should be cancelled out by pressing the Zero button again for another 3 seconds. The machine is now ready to use.

### In The Field

I was hoping to cover both coils that were supplied to me for this field test (that is the 1 m. x 1 m. frame coil and the 10 in. concentric coil). However, a couple of weeks after they arrived, and I had taken them both out for a test, I received another very large package through the post! This turned out to be the latest in the Lorenz Pulse 5's range of accessories .... the colossal 18 in. "spider" coil! Therefore I am only reporting on the results of our trials with the large frame coil in Part 1 of this field test. As we are now testing the "spider" coil, we will hopefully be able to report on both this and the 10 in. coil next month.

We first assembled the 1 m. x 1 m. frame coil in my back garden in order to try it out. However, this didn't turn out to be such a good idea! What is easy to forget is that houses were once building sites, and these are always strewn with rubbish such as nails, nuts and bolts, cans and no end of metal junk. Needless to say the Pulse 5 went crazy!

We therefore took the Pulse 5 out to a remote field where we weren't likely to encounter a great deal of rubbish.

When detecting with the larger frame coils it is best not to use headphones, as we found that it was easier for both operators to co-ordinate their movements if they can both hear the signals. This is particularly important when trying to pinpoint a target with the frame coil.

After holding the frame in the air we checked the battery and then we turned to the Disc. position. I pressed in the

### CONDUCTIVITY CHART

### (Target Classification)

Meter reading	Possible metal object
0-10	Coin/ring, ringpull, aluminium foil, gold.
10-20	Bronze coins, silver coins, nickel.
20-30	Soft drink can, small pieces of iron.
30-50	Ferrous metal objects, nails.
50-60	Iron box, weapons made of iron.
60-80	Medium sized bronze, copper, silver objects.
80-100	Large bronze, copper, silver objects.

## FIELD TEST

Zero button for 3 seconds and then we gently lowered the frame to the ground. Holding it about 6 in. from the ground we walked slowly out into the field. My wife Sylvie followed behind with a spade. (Lorenz recommend that operators keep metal objects on their person such as keys, watches, coins and jewellery to a minimum when using frame coils to avoid giving false signals).

Within seconds of starting out we encountered our first signal! I looked at the meter when the signal had reached its peak and the blue light had illuminated. The meter registered just under 10. As I had brought along the manual, we checked through the target classification graph to see what the likely target was.

The graph indicated that it could be a small coin, a ring pull, aluminium foil, or *gold!* (It did surprise me to find that gold had such a low conductivity level). Needless to say we didn't think we could be that lucky, so we assumed that our target was probably a ring pull. We then set about trying to pinpoint the object.

What you should bear in mind is that the large frame coils are specifically designed to hunt for large objects that are buried deep in the ground (up to 5.5 m. with the 1 m. frame coil). The frame coils are less sensitive to the smaller objects unless they are on or near the surface. Smaller objects will register as two signal peaks as the frame passes over the target.

The object we had located did register as two peaks as each side of the frame moved forward. As each signal peaked we knew within a metre where the object was. We then had to move the frame sideways in order to try and

*Silver denarius of Septimus Severus found at a depth of 7 in. using the 1 m. x 1 m. frame coil. The coin registered at 20 on the Pulse 5's meter.*



*My son and daughter helping with an "in air" test using a bag of copper wire to represent a hoard of bronze coins.*

pinpoint where along the front edge of the frame the object was located. We also found that moving diagonally helped as well. When we thought we had successfully pinpointed the object we moved the frame out of the way and let Sylvie dig for it. When digging for the smaller targets we found it necessary to keep the spoil well away from the hole being dug or you may not know when the object is out of the ground! (This could save you from digging all the way to Australia).

Our target came out in two digs with the spade but it turned out to be something not listed in the manual. It was the bane of all British detectorists - a shotgun cartridge!

We carried on along with the frame until we encountered our next target. This was much larger than the last one and the meter registered almost 60. Checking the graph wasn't necessary as this object was visible - a broken plough share.

We later decided to put the frame coil to the test for which it was designed. We took it to the site where a German Heinkel HE II had been shot down in 1941.

When we arrived at the site we studied old wartime photographs of the scene to try and locate the actual crash position. When this was done we assembled the frame coil and connected the Pulse 5 unit. Going through the same procedure as before to tune in the machine we then set off across the part of the field where the aircraft had come down.

It wasn't long before the Pulse 5

started to register objects on the ground. In fact, with the amount of crash debris scattered around the site, the Pulse 5 started to sound like R2D2 having an epileptic fit!

We decided to reduce the sensitivity of the machine by switching to Disc 2. and then trying again. We managed to locate a very large target, which registered as one very long peak signal. After marking the position we carried on further until another large peak signal was encountered. Again the position was marked and again we proceeded until a third target had been located.

We weren't allowed to excavate these targets, as a licence is necessary. But we did use the Pulse 5 to locate a number of surface targets that turned out to be pieces of crash debris from the Heinkel.

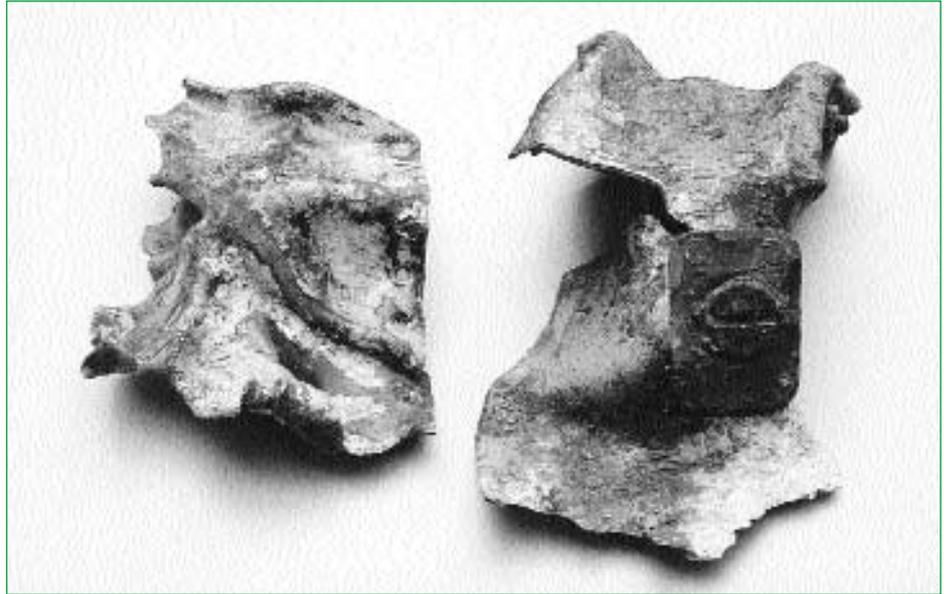
Comparing our marked targets with the photographs we felt confident that we had located an engine, a cockpit, and then another engine! But excavating these will have to wait until a licence is obtained.

I later decided to try out the frame coil as a potential hoard hunter. To do this I filled a large plastic bag with scraps of copper wire to represent a pot of bronze coins. I then swept this across the coil at varying heights until it registered. At a height of 5 ft. I got a pretty good signal. When the bag lowered to about 4 ft. the blue light came on and the meter registered 80.

## Summary

Despite the initial difficulty in understanding how to operate this machine (although that's probably me having problems in grasping new technology!) I was impressed by its performance. Clearly this apparatus was designed for professional applications (eg searching for pipelines, crashed aircraft debris, bombs etc). For the treasure hunter it would be ideal for hoard hunting or maybe searching for legendary "lost treasures" as its depth capability certainly gives it the edge over conventional P.I. units and magnetometers.

For general metal detecting the frame coil could best be used for actually hunting for sites, as it does enable the user to cover large areas of ground in a short period of time. We tried the frame coil on a worked out site to see if we could locate deeply buried objects but the concentration of iron (which hadn't been a problem using ordinary machines) did make things a little difficult. I must confess here though, that we did try this before we realised that we could reduce the Pulse 5's sensitivity to these smaller surface objects. Had we understood this fully before we pro-



*Large surface finds from the scene of the Heinkel crash (the object on the left is the nose cone of a propeller).*

ceeded we may have been rolling in goodies!

We did use this tactic when we later tried the same site with the 10 in. coil and made an excellent find.

This machine fitted with a frame coil certainly has great potential for the more patient treasure hunter who must realise that it does involve teamwork

with two or three people to operate it. I'm sure that some pretty spectacular finds could be made with this machine. I am certainly looking forward to telling you how we got on with the smaller coils next month. **TH**