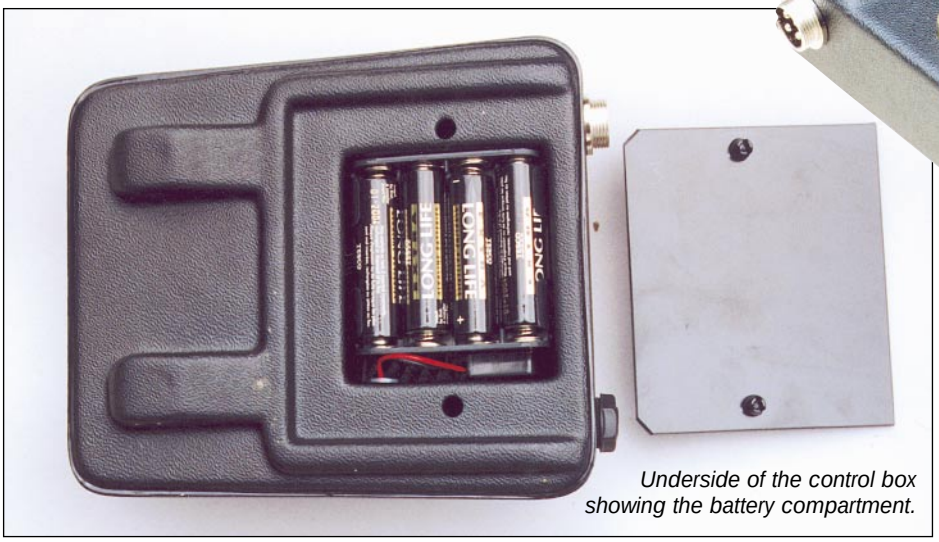
Field Test

Red Heat Lightning 4

The control box of the Lightning 4.



Underside of the control box showing the battery compartment.

Recently I was asked by Treasure Hunting to test the latest machine from Red Heat, the Lightning 4.

Until then I knew very little about this particular range of metal detectors as they never seem to have been publicised to the same extent as most other brands. But I was told that they were supposed to be very good on contaminated sites and mineralised ground (ie the Thames foreshore). I eagerly accepted the task and waited for the detector to arrive.

A week later, when it did, I was pretty surprised when I was handed the box. "There can't possibly be a detector in it!" I thought. The box seemed too light. I had always assumed that the heavier the machine the better its quality and durability. But maybe that's because I've always been used to heavy machines that end up making your arms feel like you've just spent hours in the gym working out. I took the Lightning 4 and weighed it on some very accurate industrial scales. It came out at only 1.5k with batteries fitted!

I didn't receive any instructions on how to assemble the Lightning 4, but soon found that I didn't really need any. Assembly was pretty straightforward once all the components had been laid out.

The Lightning 4 is powered by 8 AA penlight batteries for normal use. However, in the event of an emergency (ie battery failure) it can be fitted with a single PP3 9 volt battery. In the unlikely event that this should become necessary the machine must only be operated in the Low Power mode.

The Lightning 4 is not fitted with an internal speaker therefore it is necessary to use headphones. Volume controlled headphones are recommended by Red Heat as the audio output is set pretty high and may need adjusting down to a level comfortable to the user.

Controls

The Lightning 4 has five controls, which are as follows:-

1. On/Off and Sensitivity.
2. High Power/Low Power switch.
3. Ground Balance (for use in High Power mode only).
4. Boost control.
5. Discrimination control.

When switching on the Lightning 4 it is not advisable to have the headphones on as a result of the high audio signal that is emitted briefly to begin with.

For most sites the Lightning 4 should be used in the Low Power mode with the white dot on the Ground Control lined up with the red pre-set mark. Ground effect will be controlled automatically in this position and the detector should work well on up to 90% of your sites. If you do start digging up coke etc, then you only need to turn up this until it is eliminated.

Manual Ground Balance (High Power Mode Only)

Before switching the Lightning 4 into the High Power mode it is advisable to turn down the volume control on your headphones as the audio sound increases considerably.

First, set your discrimination control to the desired level of iron reject. Raise and lower the coil vertically and bring in ground effect by turning the Ground control clockwise. During this process it is important that the coil does not come into contact with the ground. Still raising and lowering the

coil, you then turn the Ground control anti-clockwise until ground effect just disappears.

Suggested Use In High Power

Set the machine up as detailed above but then reduce the Sensitivity to zero. This should not incur any loss of detection depth but signals will be sharper. (I shall test this at some stage.)

Chattering is likely to be encountered if the machine is used with full sensitivity and full boost together. It is not recommended that the machine should be run in High Power with full boost or full sensitivity.

The High Power mode is best suited for fieldwork and deep searching for small targets. For most general use and searching contaminated sites (beaches, river foreshores, etc) the Lightning 4 should be used in the Low Power mode. This is also best for conserving battery power.

Setting Up For Fieldwork

Set the Discrimination to low. Then place a nail, or any other thin iron object, on "clear" ground at a perpendicular angle (right angle) to the sweep of the coil (Fig.1.). A single bleep should be heard. Placing the nail horizontal to the sweep of the coil should result in a double bleep (Fig.2.).

Gradually increase the discrimination until the nail has been rejected. You should then be able to place a coin or non-ferrous object next to the nail and the machine will discriminate between them (Fig.3.).

In-Air Test

I carried out three in-air tests on the Lightning 4. The first two were conducted in the Low Power mode. The first of these was using zero Boost while the second test was with the Boost on full. Both of these tests were carried out with Discrimination on minimum and Sensitivity on maximum.

Tests 1 & 2

Low Power Mode (Using minimum discrimination and maximum sensitivity).

	Zero Boost	Full Boost
Penny (pre-decimal)	8in	11in
Large silver ring	7in	11in
Pre-1947 silver shilling	7in	11in
Medieval hammered penny	6in	9in
Roman bronze AE3	6in	9in

High Power Mode (Using zero boost and maximum sensitivity).

Penny (pre-decimal)	9in
Large silver ring	7in
Pre-1947 silver shilling	7in
Medieval hammered penny	6in
Roman bronze AE3	6in

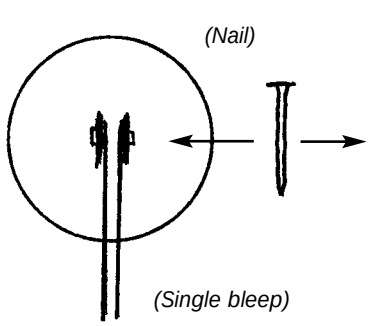


Fig.1.

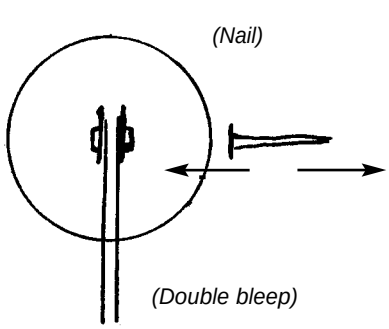


Fig.2.

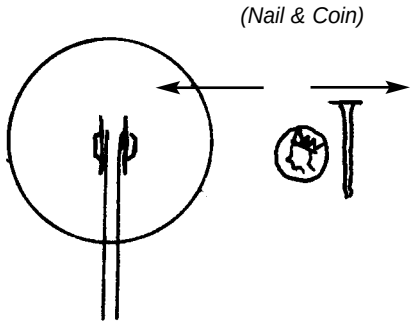


Fig.3.

Setting up for Beach-Wet Sand

Firstly, switch the Lightning 4 to Low Power mode and set the Discrimination to low. (If using in High Power the Ground Balance control should be set to the red pre-set mark). Then set the Sensitivity control to the 12 o'clock position.

Begin detecting on the wet sand to try and see whether you are picking up any false signals or not. If you do find that you are getting signals from the wet sand then increase the Discrimination by degrees and reduce the Sensitivity until no false signals are detected.

When you have reached this stage you can then proceed to test the machine by throwing down a coin or ring onto the wet sand to see if you get clear strong signals. If using in the High Power mode you can adjust the Ground Balance control to bring targets into audio range.

The third test was conducted with the machine switched to High Power mode. The Ground Balance control was aligned with the red pre-set mark and both Sensitivity and Boost were set to zero.

The readings I've given here are for "depths" where clear signals are achieved (in inches).

In The Field

Even though one shouldn't expect readings from in-air tests to be duplicated in the field, I did find them quite encouraging and couldn't wait to get out and try the machine.

Unfortunately, I happen to live several light years from the nearest beach so I wasn't able to try the Lightning 4 on wet sand. Nor do I live near any tidal foreshore, such as the Thames, where this sort of machine is reputed to perform outstandingly. But I do have a site where an old coaching road passes through an old medieval fair site. Metalling from the old road has left the site highly mineralised and it is very hard to locate the smaller hammered coins due to the overwhelming number of false signals that this causes.

But before I took the detector out to that site I wanted to try it on a field that wasn't contaminated to any great extent. This was simply so that I could get used to handling the machine.

With the help of my son, Mathew, I tried the Lightning 4 in a field adjacent to a wood where we have been carrying out extensive searches for remains of an old B17 bomber that had crashed in 1944. We expected to find numerous fragments from the aircraft scattered around the field.

When we arrived at the site we found that the field was covered in stubble. Some areas of the stubble had been flattened extensively so this made things a little easier.

Two jettons and a 17th century token.

Finds from the contaminated site: cylindrical weight, dagger pommel (?), and small finger ring.

Fragment of B17 bomber showing the part number and the name "Boeing".

The two hammered coins, one heavily clipped.

Mathew Stuckey using the Lightning 4.

With instructions in one hand and my son Mathew beside me with the trowel I walked into the field and switched on. That was a *big mistake*!

I had forgotten what the instructions had said about the very loud audio signal and my headphones were set on full volume! The instructions said that the audio was loud, and by heck it was!

I rapidly turned down the volume controls and then tested the machine over my trowel. It was still loud! I thought that it would be easier if I just left the headphones loose around my neck, that way we would both be able to hear any signals.

Believe it or not, team mate Julian Evan-Hart, who accompanied us, could actually hear the Lightning 4 every time it picked up a signal. And that was from half way across the field! That is how loud the audio really is. Anyone who already has one of these machines will know what I'm talking about.

With the machine in Low Power mode I kept the discrimination fairly low. Even though there were many small iron targets present I didn't want to reject the aluminium fragments from the aircraft.

One thing that I found pretty amazing was the strength of the signals I received from very small objects. Even the tiny fragments measuring around 5mm across gave signals that made you think you'd found something bigger than an old halfcrown!

The soil was bone dry and the lack of any moisture certainly didn't help in locating any small deeply buried objects. I therefore switched to High Power mode and turned down both the boost as well as the sensitivity. My in-air test showed that by doing this I should get an extra inch or two in depth seeking capability.

One signal we picked up seemed quite strong so my son set to work with the trowel. Finding the ground a bit too hard to dig, I had to go back to the car to fetch my homemade spade that I had constructed from stainless steel. Pretty soon we were able to excavate down to a good 10in, which was where we found the object. It was a section of the B17's airframe, which even had the name "Boeing" embossed on it along with the part number.

We also found another object, which we thought at first came from the B17 crash. However, we soon found out that it didn't. I will try and investigate this further in a bid to establish where it came from and perhaps how it came to be where we found it.

The following weekend we took the Lightning 4 to try out on the medieval fair site. Like the previous site, this was also under stubble. However, the ground here is much softer so there wasn't going to be any problem with digging. Even though this site had been extensively searched during the earlier season, I thought that it would be a good opportunity to see if the Lightning 4 could locate any deeper targets that were missed previously.

I decided to use the machine in Low Power mode with boost set to full and discrimination just set to knock out iron. I also turned the sensitivity down slightly to reduce chatter.

Again, I soon started to pick up very small targets, which gave very loud signals. The first of these turned out to be a small bronze finger ring that is possibly Tudor. Then we found a small lead cylindrical weight, which was at least 5in deep. Within half an hour we had found two jettons, a 17th century token, and a small bronze object that could possibly be a medieval dagger pommel.

The day was rounded off with two hammered coins that we found quite close to each other. One was an Edward penny, but the other was so small I thought it might be a halfpenny, or even a farthing. However, after examining it more closely we found that it was in fact another heavily clipped penny! I have never come across such a badly clipped penny before.

Conclusion

I've got to be fair about this detector as it turned out to be a bit of a wolf in sheep's clothing. I'm going to admit that there were certain aspects about the Lightning 4 that I did not like from a detectorist's point of view. Primarily, this was the actual design and construction of the machine.

I didn't really like the way that the control box was situated directly under the armrest. To me, this posed certain problems.

The coil lead is in an awkward position.

When the control box is fitted under the arm-rest access to the controls can be awkward.

Firstly, it made the control switches awkward to operate. And then I was concerned about what happens if you needed to set the machine down on wet or muddy ground while digging up a target. Even though the control box is a sealed unit, the battery compartment isn't and moisture or dirt could possibly get into it. Thirdly, it meant that the coil lead was also in an awkward position as it came close to the "S" bend on the handle before it connected to the control box. Some users may find this not to their liking.

But after that, I am going to admit that anything that may have been "wrong" about the construction of the Lightning 4 was certainly compensated for in other ways. It is extremely light and very well balanced, and I found it very comfortable to detect with in that respect. But I'll also admit that I was very impressed by the performance of this machine. It certainly lives up to its reputation for picking out good targets on contaminated sites especially those hard-to-find small targets. TH