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Field Test Report Fisher F5

Reviewing any metal detector these days, in this hobby's crowded market, is challenging unless the unit has some unique feature that differentiates it from others.

Why then my interest in the Fisher F5?

Simple answer: it was primarily because of the live "Phase" indicator, the tactile control panel, and the attractive visual interface.

I presently own and use the F75. Prior to that, it was the T2. Those predecessors of the F5 are legendary for several reasons, not least of all performance, power, efficiency, and ease of use.

Their user interface and precise digital electronic controls set a standard that other machines could only imitate, but rarely exceed. So, with its mixture of analogue and digital features, how then will this lower priced derivative compare performance-wise, in our UK detecting environment?

Let's open the box, put it together, and give it a whirl.

Assembly

Assembling the parts was easy – the hardest bit was inserting the supplied PP9 alkaline batteries!

Opening the handbook, the first thing I see printed in big letters was "Use only alkaline batteries'. Mmm? What's wrong with the modern equivalent rechargeable NiMetalHydrides?

Memories of field testing the F2 for **Treasure Hunting** magazine in 2008 trickled back through my degenerating grey matter. I remembered it was to do with the irregular size of different makes of batteries. Experience in using the NiCad variety reminded me of how they could swell over time, especially if left on charge for too long a period. They were poor in many ways. Nowadays, we have the superior capacity PP9 Nickel Metal Hydride rechargeables.

Let's get on with the job. Powering the F5 on, via the Gain control, the lower left panel on the display become active as the knob is rotated. For indoor test purposes I returned the gain to the 12 o'clock position, which is roughly 50% of the 99%. The unit was very stable indoors even at the 80% level despite TV, laptop and WiFi paraphernalia nearby.

Discrimination Control

This is the same type of control as that used for the Gain, but in this case the On-Off switch puts the detector in either All Metal (off) or Discrimination mode (on). Further control rotation sets the level of discrimination (1 to 65).

Once again the little panel on the left takes on its adaptive role as the F5's "universal indicator" whereby it temporarily displays the level of any adjustments made, which in this case is rejection.

At the same time, the black cursor steps across the segmented arc of the Disc categories printed at the top of the screen. In the illustration (coloured for

reference only) we also see the Notch function has been brought into play. The pink coloured section is notched as acceptable in the otherwise brace of rejected segments. The darkened 5 cent sector indicates a 30 VDI target's acceptance.

Threshold Control

The handbook states that this control has a dual role, dependent on the mode selected.

In All Metal mode, it behaves as a normal threshold control with zero as the neutral position (-9>0<+9).

In Discrimination mode it appears to have a split functionality, where the first half of the control's rotation (-9 to zero in the indicator panel) has a secondary sensitivity affect on the signal. It is useful for controlling EMI or small iron chatter.

The second half (zero to +9) adjusts the audio output level, especially for weak signals. It is a very dynamic control and should be used to optimise the searching efficiency of the machine as well as the listening comfort, especially in Disc mode for it has subtle effects on the audio.

Ground Balance Control

The Ground Balance control gives you direct control of the detector's ground cancelling reference point. Any movement of it on the F5 will immediately change the GB point. This easy adjustment allows the operator to manually match the detector's GB point to coincide with the average level observed in the GND DATA panel. Alternatively, you may do a formal ground balancing procedure by switching the Discrim control to off, putting the F5 into All Metal mode while pressing and holding the Phase Lock pad, and pumping the search-head over a clear patch of soil. The Status and Phase panel numbers should then synchronise, and when beeps are heard you release Phase Lock and the job is done.

Referring to the handbook once again, it tells you that the default GB setting is about 82.

GB Phase 82 and very low Fe is comparable with a site having docile ground conditions. It is simply a starting value. While detecting the ground conditions will vary, as you can see by observing the GND Data panel. The two digit phase reading will change in sympathy with *all* that the search head senses, including the mixture of ground and target phase. So what you are seeing is not just the soil, but rather the summation of ground and all the "bits" in it.

When targets are involved in your sweep, VDI number will appear and remain until the next one registers its presence. There may be audio beeping also, depending on your discrimination settings. The point is that GND Data phase figures are not necessarily a measure of ground phase only, but rather the "potpourri" of target minutia and soil. A discrete ground-soil reading should rarely produce a VDI. Wet sand will, because it is a conductive nature.

Let's acquire some typical values such as those found in my garden, and see what the wet lawn produces in terms of ground phase and Fe levels. Basically the local geology is a thin covering of soil over boulder clay deposited during the Ice Age, when glacial flows brought it down from the Lake District. Okay, let's check it out. The book states that measuring the ground's parameters is best done in All Metal mode. Accordingly, I switched to that mode by turning the Discrim control fully anti-clockwise and off. I then began pumping the search head up and down above the grass in a spot clear of any junk etc.

The ground phase read 62, and the graph showed one bar of Fe activity. That's typical of the top lawn.

For comparison, I then went over to my constructed mineralised area. There the ground Phase increased to 73 and the Fe graph peaked to maximum on the bar graph.

Placing a modern 20p coin on the surface of that same patch demonstrated what effect strong mineralisation has on a coin's identity. The results are shown in the table.

Cupro 20p	VDI	Phase
Target In-Air	37	07
On top of mineral	24	10
Differences	13	03

So the Fe mineralisation caused a 13 point reduction (-35%) in VDI, and 3 points increase in Ground phase (+42%). The significance of such an experiment is that the lower a target's in-air VDI, the more susceptible the VDI is to degradation in mineralised soils.

Correspondingly, the higher mineralisation involved causes an *increase* in the Phase reading.

That is why an experienced detectorist will reduce his discrimination level to the lowest feasible, consistent with limiting as much iron break through as possible. That methodology helps to catch small hammered coins and low conductive targets that have their identities masked by Fe contamination.

One of my 30 years of seeded coins was the next to be interrogated by the F5.

A small silver Victorian threepenny piece, originally buried at approximately 6 inches, registered VDI 64 and Phase 23. The F5 also clearly resolved a small ferrous fragment very close by, therefore comparing well with the capabilities of my higher spec detectors!

Just when I was ready to log some of the other old targets the rains came and I had to hurry inside.

As I wiped the rain off the off the unit's face, I mused how the F5's chubby facia presented a user-friendly image, reminiscent of the days when potentiometer controls were still the norm.

Its operational simplicity should appeal to those who shy away from the menu orientated, more expensive "4 wheel drive" detectors.

Back in the warmth of the kitchen, I added the data obtained in the garden to a list on my computer.

Accompanied by brief notes, it provided a very useful collection of facts that I felt should help me to analyse the functional character of this detector. For the moment, let's return to the remaining F5's controls.

Notch

You can use this function in two ways. Firstly, to simply reject any or all of the five sequential categories, iron to zinc. The sixth notch is the 50+ category at the extreme end of the scale.

The second method is used to place "breaks" in the contiguous rejection band that the rotary discrimination control creates. You activate a notch by pressing the pad and causing the flashing cursor to step through the categories; pausing for several seconds over the chosen section the flashing marker will become permanent, indicating that the sector is now logically active. So, if it was originally clear to accept, it now becomes rejected. If it was a rejected section prior to notch, then it becomes an accepted one.

Phase Lock

This touch pad requires little explanation, for its single purpose is to up-date the existing ground cancelling reference point used by the F5 to that value showing in the dynamic GND Phase indicator panel on the right hand side of the screen.

That is simple enough regarding the pad's function, but any lack of care in maintaining good correlation between the stored value on the left, and the varying value on the right, will in a subtle way affect the performance of the detector. If and when the ground differs markedly compared to your detector's current reference shown on the left of screen, then the outcome affects the accuracy of the discriminator's assignment of target VDI.

The complexities of ground tracking and its affects relate to *all* detectors. It is the way each designer chooses to tackle the problem that is interesting. Their quandary is whether to automate the whole process, and so limit user intervention, or not. It does affect costs and adds significantly to the design complexities to automate ground tracking. The designer of this detector has left the choice of when and where to ground balance, in the hands of the operator. This can be used to good effect if done wisely. Be aware, though, as when the GB point approaches that of any target, the detector's sensitivity to that target diminishes.

Frequency Pad

Again, a simple explanation will suffice. Radiated interference (EMI), caused by external sources of transmissions can heterodyne with the F5's frequency of 7.8kHz, so causing an audible "beat frequency". The simple action of tapping the Frequency touch pad changes the operational frequency by a small amount, and can alleviate the problem. You have the choice of two extra frequency offsets. Avoidance of EMI such as those caused by pulsed electric cattle fences or incoherent, random electrical radiation, may not be possible. Only by reducing Sensitivity, and Threshold, or putting distance between you and the cause, may cure the problem.

Tones Touch Pad

In All Metal mode the Tones pad simply provides a "no frills" choice of any one of four tones.

Alternatively, in Disc mode, the Tone pad offers the choice of one singular tone for all targets, or a selection of three differing "Tone ID" audio choices. No further comment is worthwhile.

Back to Testing

Looking out of the window I could see that the rain has stopped, and it was time to get back out there again.

I took another ground reading for the lower, damper part of the garden, which has a greater depth of soil. Pumping the search head over a clear patch stimulated the Ground Phase Monitor and produced a reading of 60. Doing the same test over the loose soil of the cultivated flower beds produced a higher reading in the 70s level. Why the difference? Well it is mainly due to the fact that the loose nature of the soil in the flower bed means less contact between the damp particulate, and so a higher inter particle resistance. Drying soil will further increase that resistance and hence increase the phase. Also, loose soil allows more oxygen to enter the matrix, increasing the activity of any residual ferrite matter.

Singularly or in combination, these effects increases the phase reading. As a rider to that brief explanation for increases in phase, I think it helpful to add the typical causes for a decrease of ground phase. The common causes are moisture, and conductive organic matter. Night soil from the past century is a typical scenario. Cattle urine, chemicals, and stagnant water, are all factors that contribute to this.

Field Testing

Testing a detector requires discipline. It is important to make notes of significant facts, and there are many in any active session. Taking related photos is helpful, but also tedious under adverse conditions.

On this particular day I intended to carry out some serious testing. It was midweek, the grandchildren were safely delivered to the school's tender care, and I had a few precious hours to indulge myself. With my mobile phone on in vibratory mode and tucked in my shirt's breast pocket, I was able to don the headphones and start detecting, confident that any emergency calls from school or family wouldn't be missed. That prompts a comment: my mobile has never caused problems with any of my detectors.

I was soon sweeping my way through the undergrowth of the local woods. The F5's moderately size search head (9 x 5 inches, concentric) was coping well with the tangle of vegetation.

I slowly made my way to a previously discovered spot of interest. It was an area where there had been surface quarrying of sand stone over a hundred years ago. Coins dating back to Georgian times were the period markers. I had also previously recovered day-to-day working tools such as stone splitting chisels, heavy sledge hammer heads, etc. On this occasion, being late winter, pools of water filled the depressions. I therefore pushed the F5's head down to rebalance and noticed the change from an initial phase 75 in the leafy humus to a low phase 55 in the wet, red sandstone stratified soil.

Also, the actual Fe graph was kicking up a few bars, so I kept the discrimination at zero.

First came a huge signal, which turned out to be the remnants of a shovel. The only other target of note was a copper penny that produced a VDI of 60.

The struggle to recover other small targets out of the boggy areas convinced me to move on to more accommodating ground. The next couple of hours passed by quickly, and I had a pouch of finds that reflected the 7.8 kHz nature of the F5. This frequency is ideal for moderately mineralised soils.

In these woods my finds were mostly odd metal remnants: mouthorgan reeds, an old penknife, a corroded 1800s style whistle, a 2 shilling piece, a sixpence, and copper coins from Victoria to George VI. I was glad that I remembered to take my little hand saw, for several finds were below root level. Depths varied from 3 to 7 inches generally.

I rarely pursued any target that was apparently deeper than the F5's depth indication after struggling to locate one or two promising ones beyond the indicated range. One turned out to be a large padlock and the other the brass hinges on a disintegrated wooden box. Alas, no "treasure".

It was soon time to weave my way out of the tangle of bushes and find a path that would get me back to my vehicle.

Several such outing in various field locations established the characteristics

of the F5 for inland use. Field searching with this detector is a genuine pleasure. Regarding target separation, it needs about 3 inches spacing between a coin and a 2 inch nail for a positive hit on the coin, providing their line-up is in the same direction as the sweep.

Audio

I like the audio of this machine. It's honest in its reporting and very definitive regarding iron. The audio amplitude meaningfully decreases with depth.

In general the sounds do convey an indication of the target's character – especially thin section trash.

In All Metal mode I personally found the depth modulated sound very informative, and with the excellent threshold control and precision ground balancing, plus target ID, I'm sure it will make finds in situations that may frustrate other less stable detectors.

On the Beach

I also undertook a few obligatory beach sessions. I say that tongue in cheek, because the first such outing was futile on the wet sand, if judged by the coins finds rate alone.

Winter winds had deposited several feet of extra silt over the normal levels. I did find a few modern 2ps etc but none at notable depths. Drinks cans and other unreachable items registered positively and exceeded 12 inches or more. The unit ground balanced easily on the wet sand, but I still needed to use sensible levels of sensitivity and resist the temptation to push the unit into an uncomfortable chattery mode. Once again I noted how effective the threshold was, especially in this environment of wet rippling sand and puddles.

The scarcity of finds changed when I left the sand swamped tidal reaches and retreated to the cosier, drier haven of the sand dunes that lined the shore. There were pounds to be found and pull-tabs by the plenty. In fact, the first run there netted four £2 coins, seven £1s, and a fist-full of lower denomination coins.

It turned into a turkey shoot once I latched onto their VDI for this machine. The sensitivity of the F5 in this situation was mentally exhilarating but also physically debilitating. I had to do a lot of digging into and under the overlying high vegetation to get at those coins lost several seasons ago.

The secret? I switched to All Metal mode!

This mode just grabbed the targets as I pushed the search head over and into the long grasses, especially after I set the threshold level to be just audible.

With VDI readout it was all so easy. The zippy sound of foil meant I could confidently ignore it without the need to look at the display. I can honestly say it was the most enjoyable coin hunting sand romp I've experience for several years!

I eventually came away exhausted, but several pounds richer. That was convenient, for I noticed how the high audio activity had taken its toll on the battery's capacity. So I purchased a couple of packs of PP9 alkaline batteries while on the way home, using my finds money.

I conducted a dedicated ring test in the damp sand during a later session on a different beach. Using a 9 carat gent's gold ring of medium thickness, it was positively identified up to 7 inches and deteriorated to a marginal report at 9 inches. After that the numbers were unrepresentatively high with erratic audio.

The wet sand phase reading was 35 at that spot. Sensitivity was around 70% and the threshold again at zero to maintain a quiet level over the ripples of water left by the ebbing tide

If I set only the 6th notch to reject and maximised the F5's sensitivity, I could run the machine "hot" in Disc mode. That seemed to suppress the wet sand

ripple responses, and then coincidently I achieved three separate finds at depths of around 8 inches in the wet sand, all coins being the old large 50p cupro-nickel pieces. That's not a fluke happening, but rather a revealing notification of the operational frequency characteristic of the F5. The 7.8kHz frequency must suit thick, low conductivity cupro-nickel coins. A few words of caution. The 6th notch will reject large, highly conductive silver, such as halfcrowns. Therefore, only use notch 6 in the most desperate of situations.

After any beach work always thoroughly wash the metal stem and head joint of the F5, for residual salt water and sand could eventually damage any exposed aluminium, or moving plastic joints.

Batteries

Later at home, when replacing the batteries, I spent some time examining the F5's power requirements, for I contend that battery consumption is a relevant factor in any detector's assessment. Who wants to spend money on throw away inefficient alkaline batteries, when today's modern Lithium Hydride rechargeables can provide better sustained capacity – and at a lower cost.

The F5's handbook emphatically states "Use alkaline batteries only."

Enquiries suggest that they really mean, "Use alkaline rather than carbon because of their superior capacity." They do mention that the F5 can run on one battery if necessary.

In my personal opinion it's okay to install rechargeable batteries, providing in doing so they fit the compartment without the need for undue force. Just be sure that they don't exceed 48mm in total length.

For the purpose of the many hours of testing that I have undertaken, I have used both a single and a pair of rechargeable NiH PP9 style batteries without any apparent problems.

I did make sure though that both batteries were equitably charged, and never allowed to markedly discharge below two bars lower than max reading. Do not try installing any battery that exceeds 48mm in total length including terminals.

Before I close this account of the Fisher F5 I recommend that any new owner devotes time to doing some experimental searching it in All Metal. This mode may only appeal to those with the necessary temperament for such hunting, but in the right hands this detector has great potential – especially when used for inland searching.

Conclusion on Phase Meter

- It is the third dimension in terms of metal detecting practice.
- The F5 gives you the target's VDI, and now its Phase at 7.8 kHz.
- With that data, you have the best information possible, to determine the ferrous nature of a target.
- It is all clearly displayed on the F5's very readable display.
- Target VDI (Conductivity).
- Target phase (Inductance effect).
- Ground Fe level.

From the data I've accumulated I provisionally conclude:-

If the phase number is higher than the VDI, then the target is most likely to be ferrous. Now you can use that powerful tool when in All Metal, as well as motion discrimination.

I hope this review has provided an alternative insight to the functionalities of the Fisher F5.

The handbook produced by Fisher for this unit is one of the best I have had the pleasure to study.

Even if you do not presently own an F5 detector, I recommend reading this manual, for it will improve your general knowledge on the subject matters it covers. Why not download it from Fisher's web site? (http://www.fisherlab.com/hobby/fisher-f5-metal-detector.htm)

As for the unit itself, it worked fine, discovering targets at depths commensurate with its head size and ground conditions, and hitting well all my test bed items. In the field it handled wet sand and "hot and cold" stones, when using sensible sensitivities, due to the excellent ground balancing facilities provided on the F5.

Physically, it is a little "nose heavy" in my opinion. But if you are interested, then try it before you buy it, for detectors are "different strokes to different folks'. TH