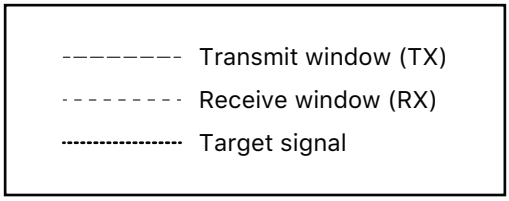
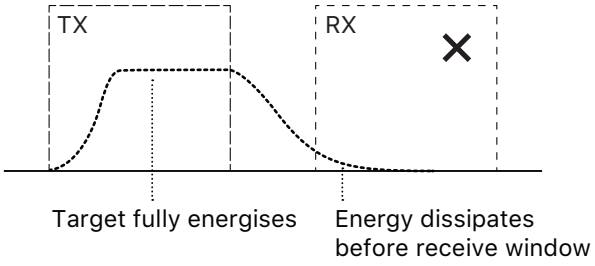
Understanding variable frequency

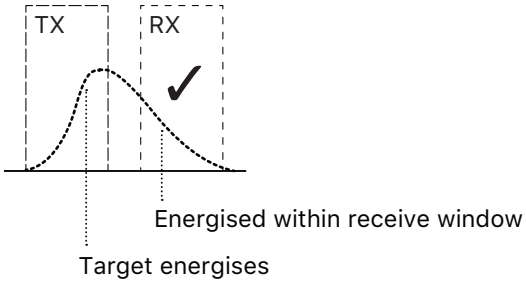
The diagrams on this page represent the timing of the transmit/receive windows and how variable frequency can affect your yield.



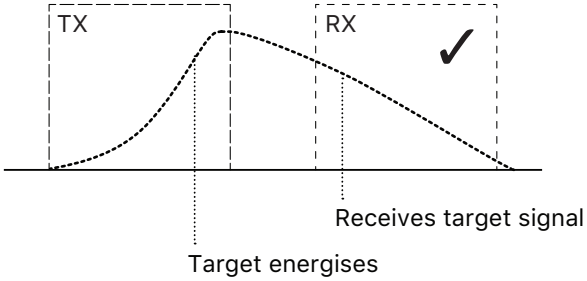
Small target—low frequency



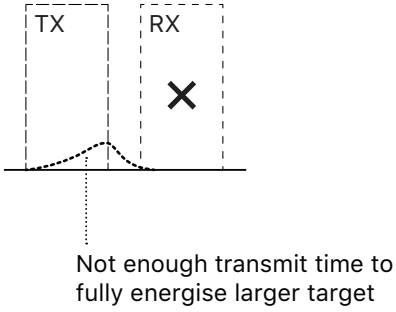
Small target—high frequency



Big target—low frequency



Big target—high frequency



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An introduction to variable frequency

The variable frequency control replaces the factory “Manual Tuning” control in the LCD back menu.

Variable frequency can aid in optimal performance for targeting gold of a certain size/depth, as well as help mitigate interference.

When should I set the variable frequency?

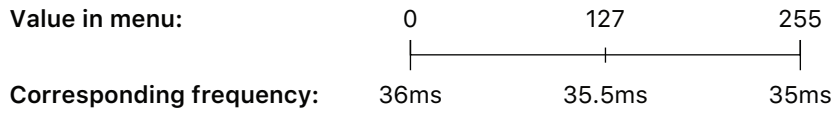
- When you want to target gold of a certain size/depth
- If the detector is noisy due to interference

Setting the variable frequency

If you’re setting the variable frequency due to noise/interference, you only need to adjust the manual tuning by one click to mitigate the interference. For example, if you’re manual tuning is set to 200, try setting it from 198 to 202. If the problem remains through most frequencies, you may need to adjust your variable gain.

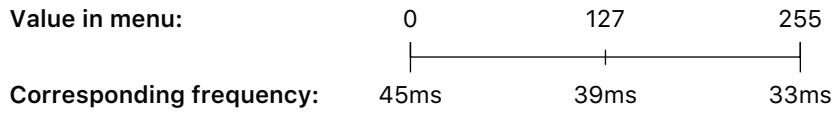
If you want to target gold of a certain size/depth refer to the table at the bottom of this sheet.

Standard (un-modified) manual tuning setting



Range: 35–36ms (1ms)
Interval: 0.004ms

Modified variable frequency setting



Range: 33ms–45ms (12ms)
Interval: 0.048ms

Manual tuning value	Corresponding frequency (ms)	Ideal for
0–59	45–42	big, deep gold
60–119	42–39	larger targets
120–190	39–36	general prospecting for larger targets
191–212	36–35	general prospecting/factory range
213–255	35–33	small, shallow gold

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An introduction to variable front end gain

The new variable gain control on your machine should always be adjusted to best suit your current conditions.

Conditions such as ground type, interference and detector settings can affect the performance of your variable gain, so it is important to be able to set it correctly.

In the steps below you will learn how to properly adjust your variable gain.

When should I set the variable gain?

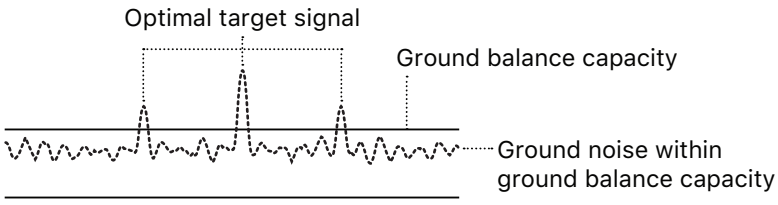
- After turning your detector on
- After changing settings on your detector, including variable frequency
- Before working new ground
- If the ground is noisy or unworkable

Setting the variable gain

1. Turn your variable gain (VG) control completely counter-clockwise.
2. Rotate the VG control clockwise by 10% and attempt to ground balance ground balance your machine.
4. Repeat step #2 until the detector becomes slightly noisy.
5. Once the detector is running slightly noisy, turn the VG control down slowly until the noise is gone.
6. Ground balance your machine again. This will be the maximum amount of gain you can run for your current conditions.

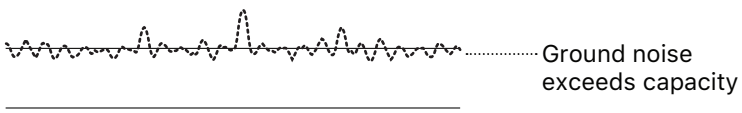
✓ Correctly set variable gain

Ground noise kept within range



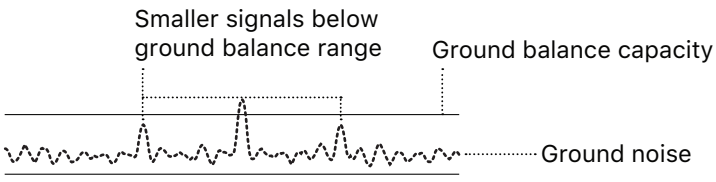
✕ Variable gain set too high

Target signals lost within the ground noise



✕ Variable gain set too low

Too quiet, target signals will be quiet



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In Practice

The best way to handle setting up your metal detector is to decide what you are going to look for, choose a large coil for big deep gold, a small or *sensitive* coil for tiny or hard to detect pieces. For smaller gold, set the manual tune control higher on GPX machines, turning further clockwise on GP machines. When using flat wound coils, you will only be able to take the frequency so high until you will start to lose sensitivity, its best to check how high you can take the frequency on your machine, until you start to lose depth. When using small coils with a low frequency, you may obtain extra depth on multi-gram nuggets, at a loss of sensitivity on sub-gram pieces. When using large coils, it's almost always advisable to use lower frequencies, unless the coil is a long skinny elliptical.

Setting your variable gain should be done with the intention of getting it as high as possible, without the machine misbehaving. The variable gain is a sensitive control, each little fraction of a clockwise turn you can achieve gets you more depth, however, if you go too far and make the machine noisy, then the targets will be lost in the noise.

Exclusive to the GPX series machines, you can offset RX-gain against variable gain, taking one higher while lowering the other, this is done to achieve depth advantages on tricky soil types. There are no perfect gain settings for all the world's soils; experimentation is the best way to see what works on your coil conditions, the easiest way to set the gain is to leave the RX on factory preset while taking the variable gain as high as possible.

All other detector controls still perform the same as before; these can layer well with the new controls. For example, the gain can be run higher in DD than mono, as DD coils are usually used to reduce noise in an area, yet using a mono in a noisy place with lower gain can be advantageous.

While the front end gain control is essentially the same for all models, the frequency is not in a digital menu for the SD and GP series. A single turn pot similar in appearance to the gain is used to control the frequency on GP series machines; clockwise is a faster, more sensitive pulse while counter-clockwise is a slower-deeper pulse. SD series machines will likely have a switch to control the frequency — labeled according to what size they are optimised.

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