WalkAide Electrode Placement and Programming Techniques

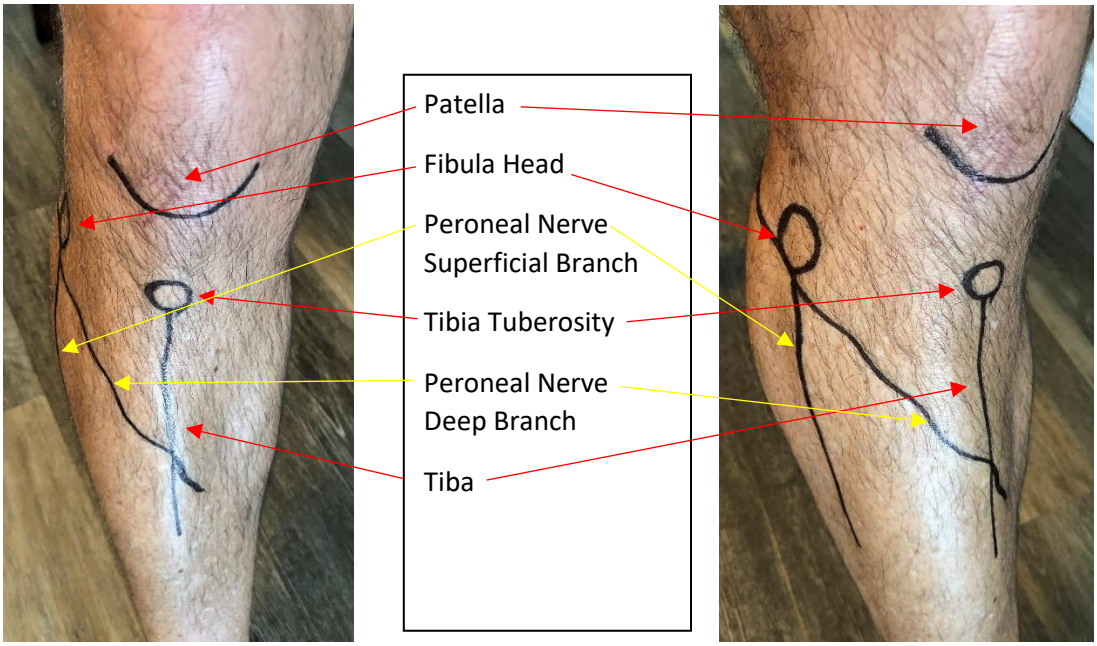
Electrode Placement:

We are attempting to innervate the common peroneal nerve branches (deep branch – inversion and dorsi flexion, superficial branch – eversion) to get a good balanced dorsi flexion motor response with a little bit of eversion.

Palpate and find the correct anatomical landmarks of the lower leg anatomy

Anterior View

Lateral/Anterior View



To get Less Eversion and pure Dorsi Flexion – Use the placements below when the only motor response you get is eversion.

1. Classic Placement

2. Less Eversion

3. Pure Dorsi with no Eversion

You will use the classic placement number 1 around 60% of the time with with the front 1/3 of the nerve electrode being placed on the fibula head and the back 2/3s of the electrode behind the fiblua head. Keep a 1 cm spacing between the electrdoes and keep the TA muscle electrode 1 cm lateral to the tibia. You will use placement 2 about 10% of the time and placement 3 about 10% of the time. As you move both electrdoes forward keep your 1 cm spacing between the electrodes and keep them off the tibia. With placement 2 you have the back 1/3 of the electrode on the fibula head and the front 2/3s of the electrode in front of the fibula head. Placement 3 is a motor point stimulation of the anterior tibialis with both electrodes placed on the TA. When you first turn on the stimulation you may get inversion but keep turning up the intensity and the movement will pull out into a dorsi flexion. With placement 3 you will have to use more engery as the nerve is deeper and it may not be as comfortable to the patient.

To get more Eversion - Use the placements below with patients that have significant inversion tone

1. Classic Placement

4. More Eversion

5. Pure Eversion

You will use the classic placement 1 around 60% of the time with the front 1/3 of the nerve electrode being placed on the fibula head and the back 2/3s of the electrode behind the fibula head. Keep a 1 cm spacing between the electrodes and keep the TA muscle electrode 1 cm lateral to the tibia. You will use placement 4 about 10% of the time and placement 5 about 10% of the time. As you move both electrodes backward keep your 1 cm spacing between the electrodes and keep them off the tibia. With placement 4 you have the electrodes bridging the fibula head. Placement 5 you place the nerve electrode in the popliteal area being careful not to go to medial as it will innervate the gastrocnemius if you do. For the lower electrode position for placement 5 put the back 1/3 of the electrode on the fibula head with the front 2/3s in front of the fibula head. For this position make sure the PW is turned down as it will not take as much energy to create a motor response and the patient may be more sensitive to the stimulation with this placement.

Remember to tell the patient you want the stimulation to be strong but not uncomfortable. It is okay for the stim to be strong. When testing the stimulation of a specific electrode placement press and hold the test stim button for at least 2-3 seconds to see the true response. Move the stimulation up from 1 to 2 to 3 when testing. Do not move in tiny amounts. The patient will tell you if it is too strong. MAKE SURE

THE STIMULATION IS STRONG BEFORE YOU MOVE THE ELECTRODES. If not you may be moving the electrodes away from the correct placement and not even know it because you did not turn the stimulation up high enough at the correct location.

Programming:

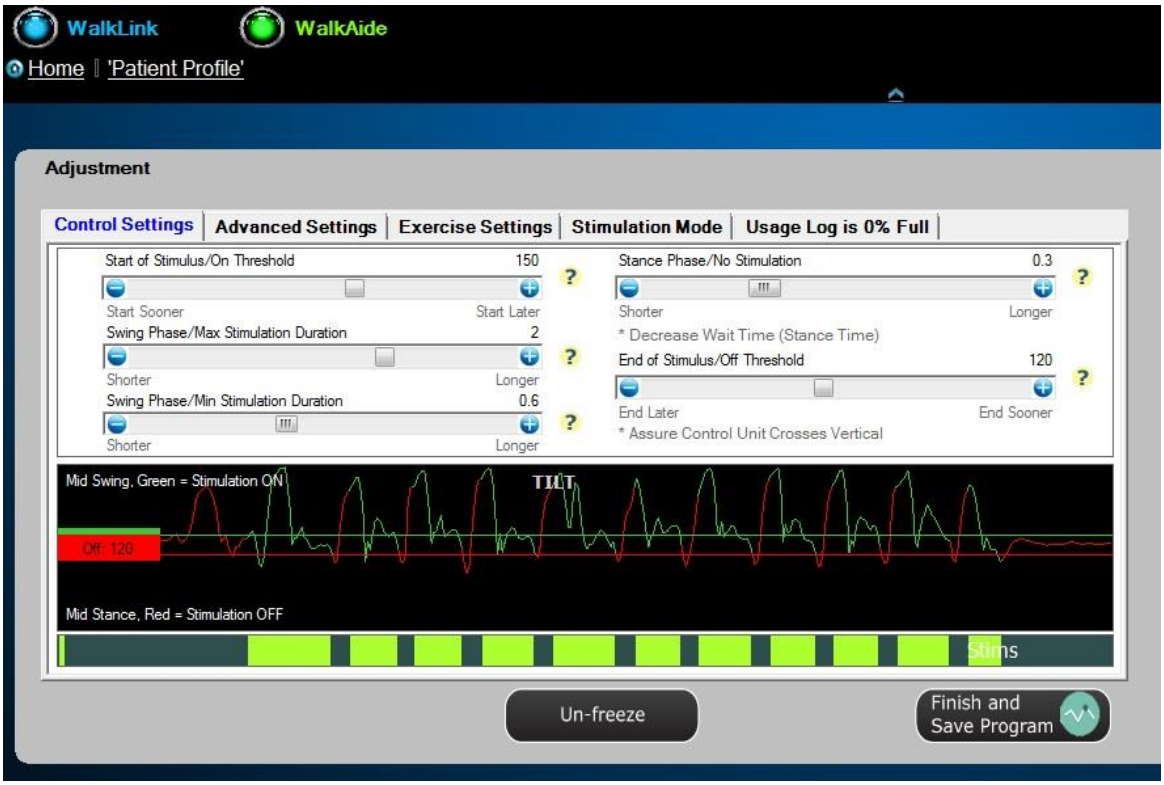
These simple rules will work for either Rapid + manual data collection or with Express default data for fine tuning the program. First send the program to the patient's WalkAide and then have them walk in audible beep mode. Collect a gait graph as they walk and then hit the freeze icon to freeze the data and have the patient stop. Then fine tune the program and have the patient walk again to collect new data. Repeat this process until you are satisfied with the program. A good program will work walking forward, sideways, backward, walking a figure 8 and on stairs.

What you see with the patient in audible beep mode is more important than the graph. The graph is a guide. When the patient is walking ask yourself three questions: Is the stimulation coming on every step? Is the stimulation coming on soon enough? Is the stimulation staying on long enough?

On the graph remember the mountains (swing) should be green and the valleys (stance) should be red.

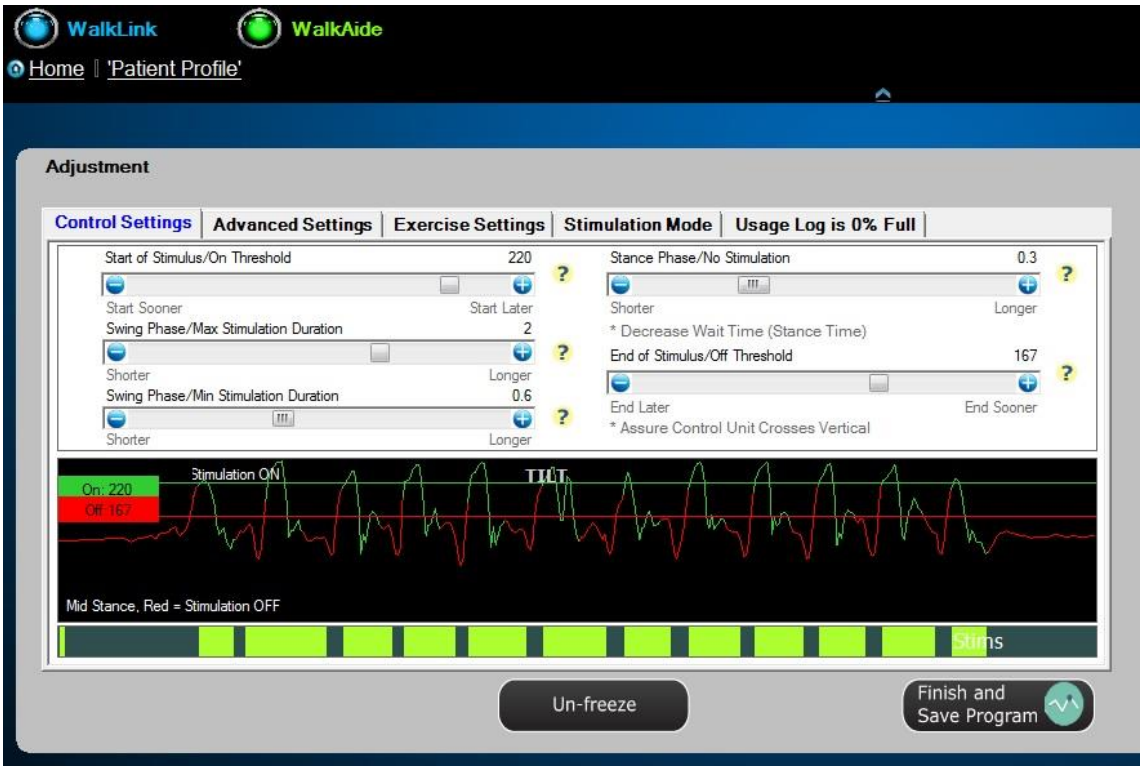
This is how you fine tune the program:

Below is a sample raw data graph from a normal gait cycle with an Express default program of 150 on threshold and 120 off threshold with a speed of .6 min time on during swing and .3 no stimulation during stance. The program needs to be adjusted.



First move the Green Line “On Threshold” up out of the way.

Second move the Red Line “Off Threshold” to just above stance.



Third move the Green Line “On Threshold” back down to just 20 digits above the Red Line off threshold.

And you’re done! You can fine tune the speed of the min time on as this was a fast walker, see below adjusted for time (changed from .6 to .4).

Speed Changes/General Rules:

For slow walkers like a slow circumduction stroke walk patient set the: Min Time On: .6, Off Time Stance: .4

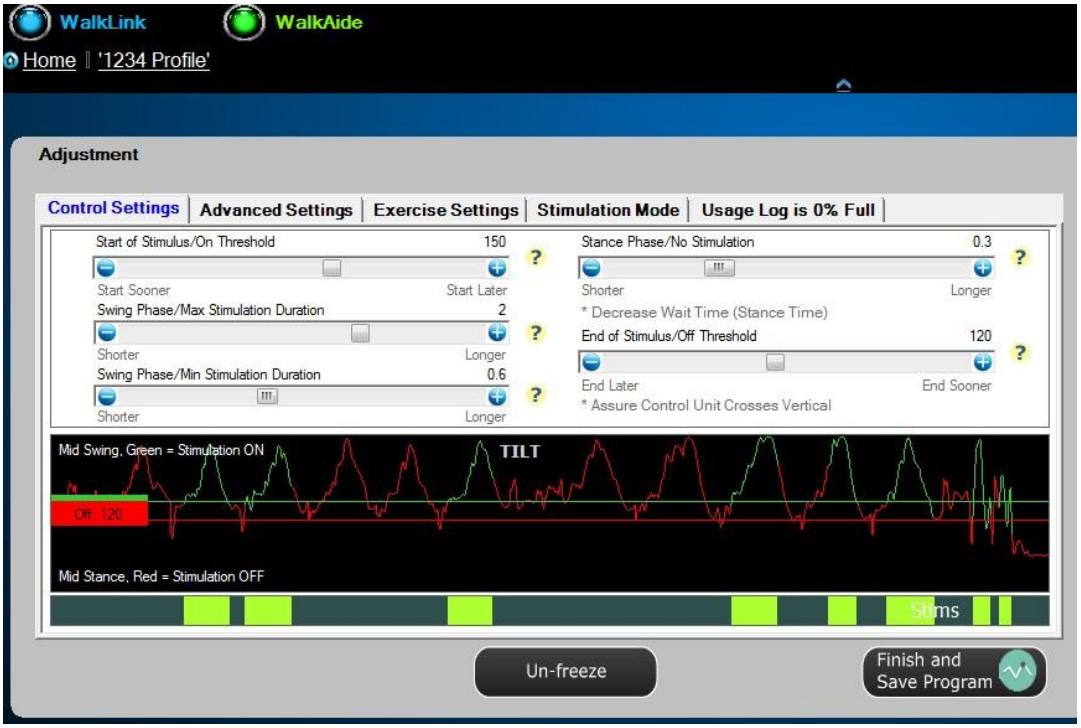
For a normal speed walk like an active MS walk patient set the: Min Time On: .5 or .4, Off Time Stance: .3

For a very fast walk or maybe able to (jog) like an active MS patient or a pediatric patient set the: Min Time On: .3, Off Time Stance: .2

Leave the maximum time on at 2.0 seconds unless they are a very slow walker and then move it to 3.0 seconds.

Classic Gait Patterns:

Slow Circumduction Gait Sample Graph:



First move the Green Line on threshold up out of the way.

Second move the Red Line off threshold just above stance.

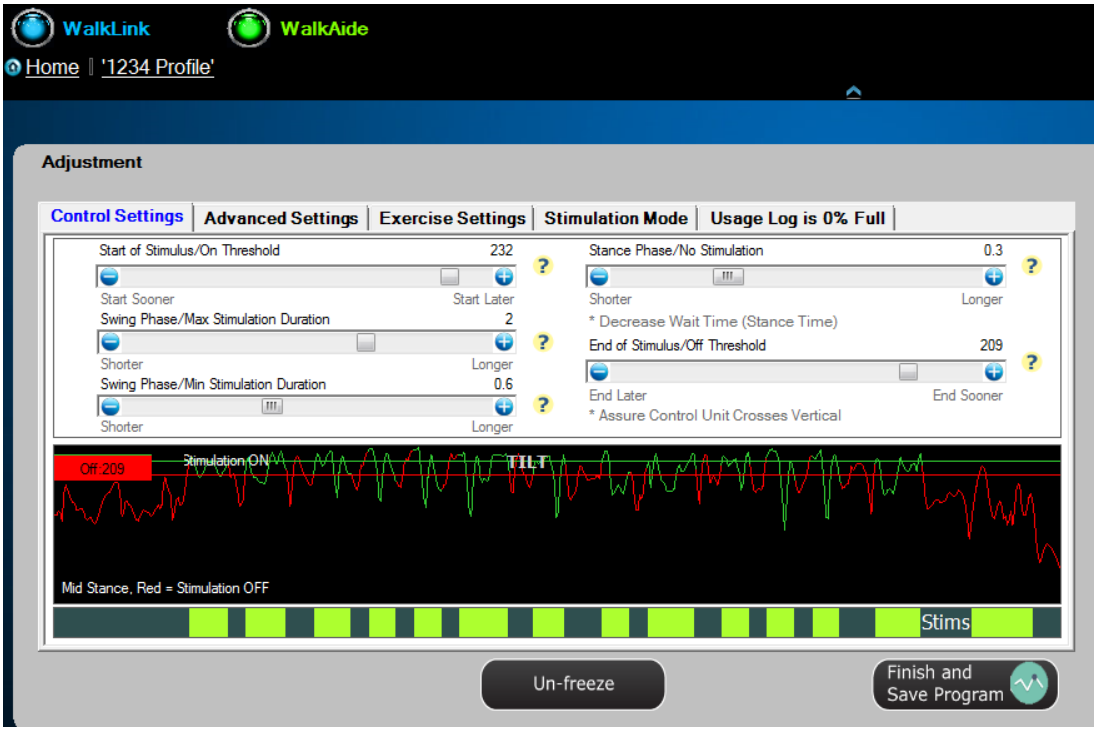
Third move the Green Line on threshold back down to 20 digits above the Red Line off threshold as there is good knee movement with this gait pattern.

Adjust for speed if you need to and you're done!

CP Crouch Gait Sample Graph:

First move the Green Line on threshold up out of the way.

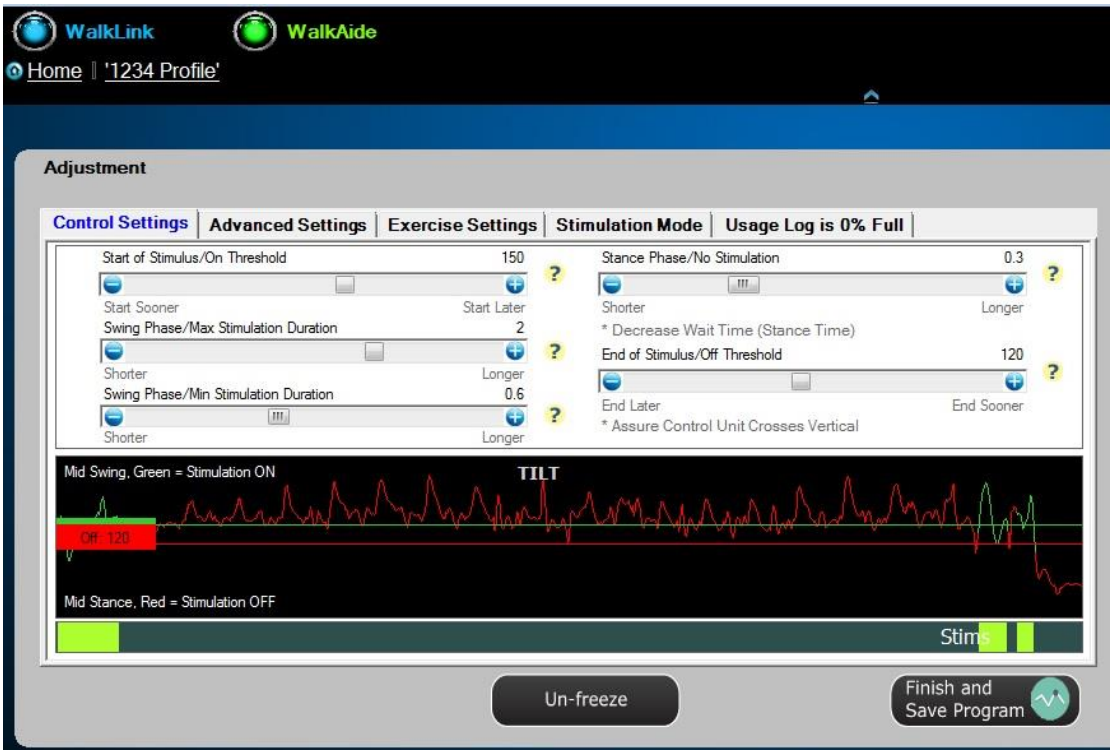
Second move the Red Line off threshold just above stance.



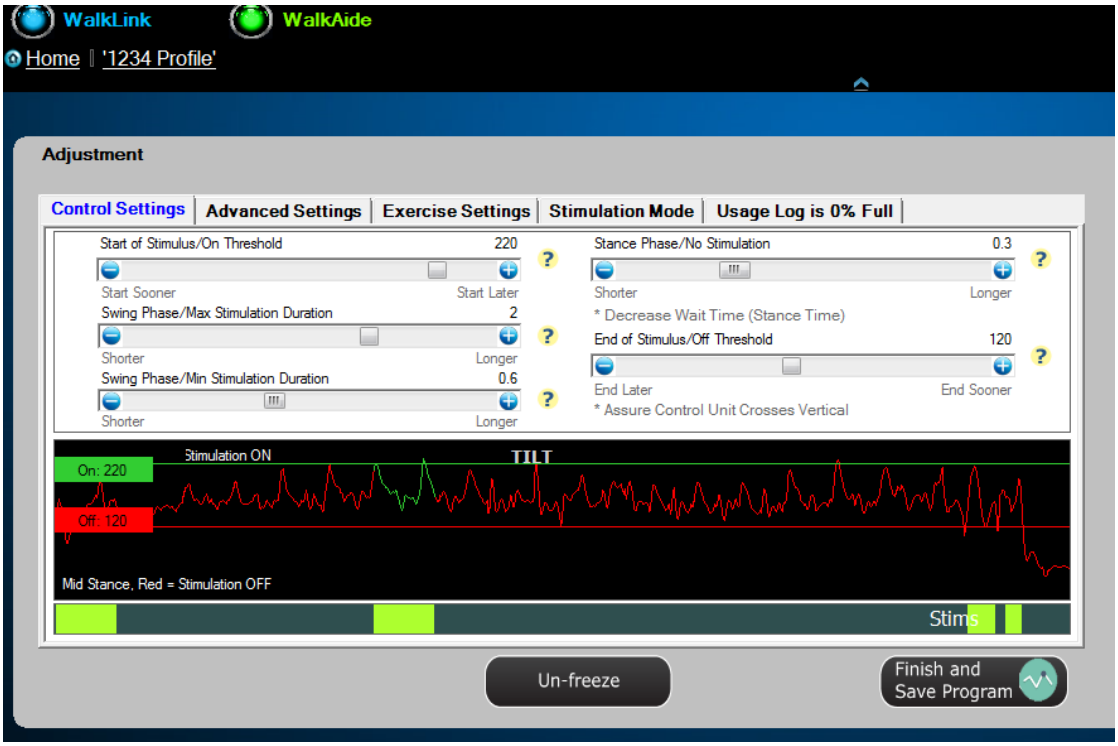
Third move the Green Line on threshold back down to 10 digits above the Red Line off threshold. You would have the on and off threshold only ten digits apart where there is very little knee movement such as a stiff legged or crouch gait.

Adjust for speed as these are short choppy steps. The parameters are now .4 and .2

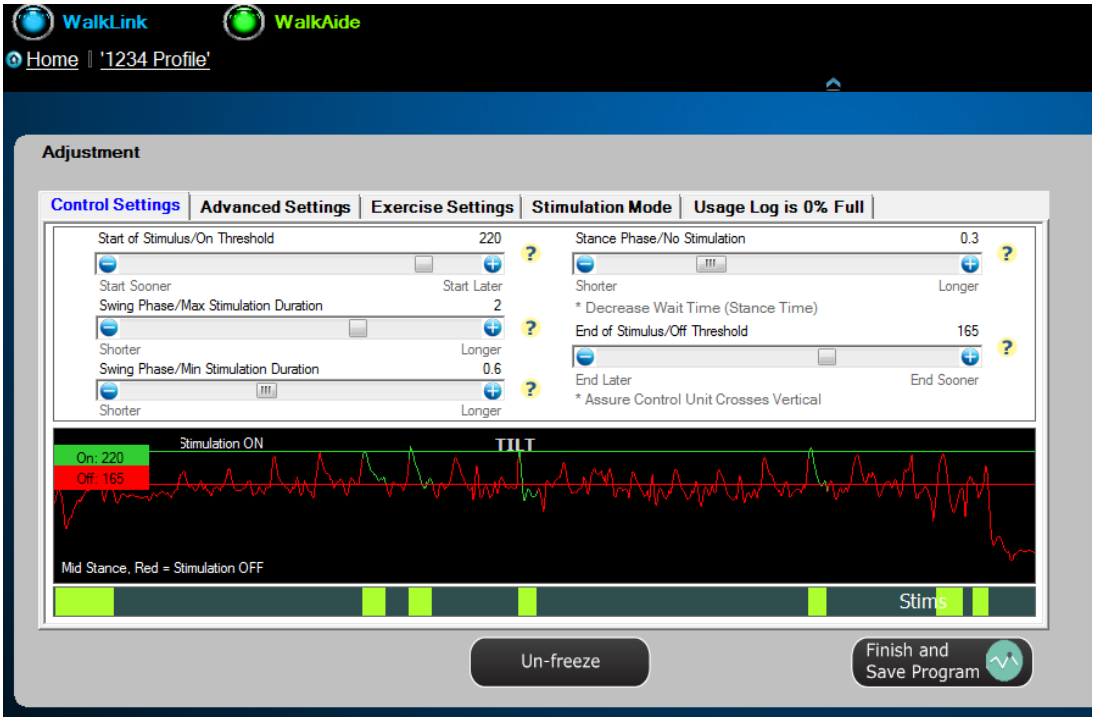
Stiff Legged Step (To) Gait Sample Graph:



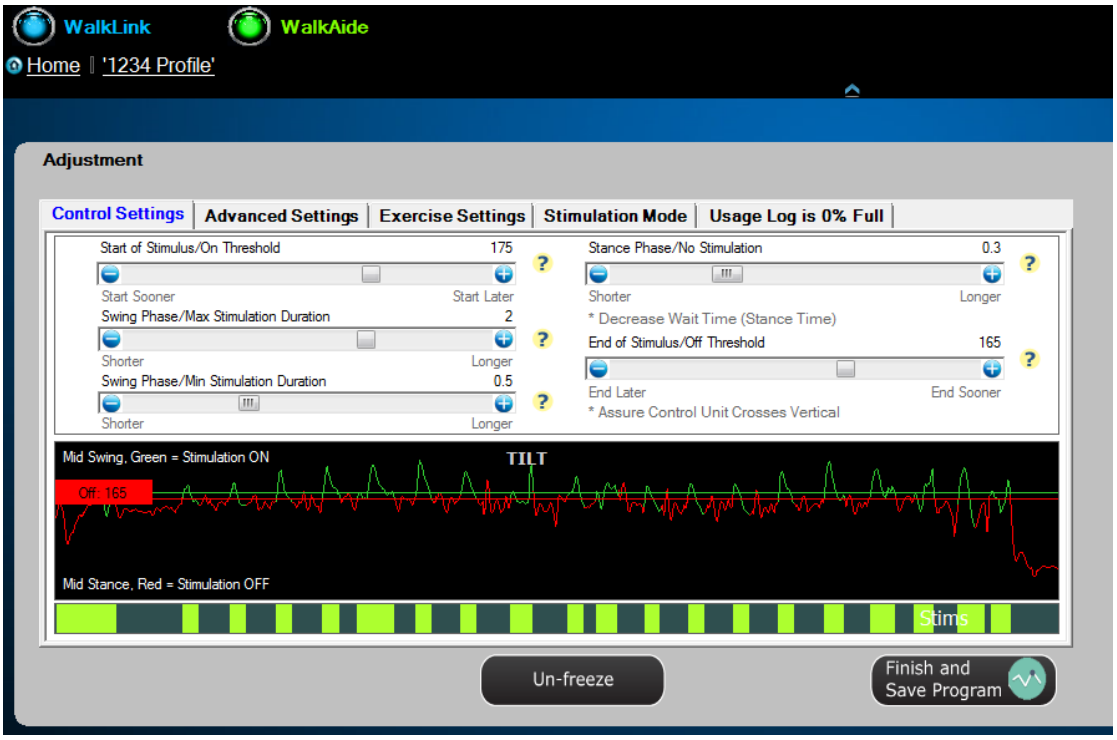
First move the Green Line on threshold up out of the way.



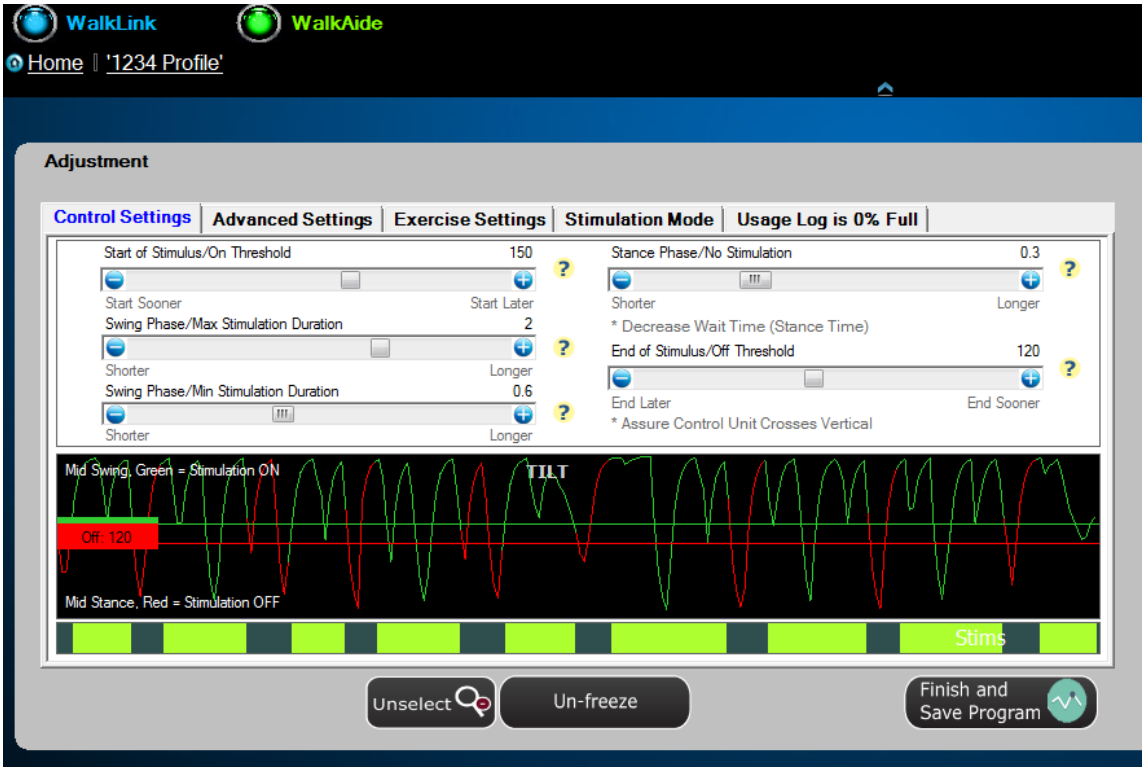
Second move the Red Line off threshold just above stance.



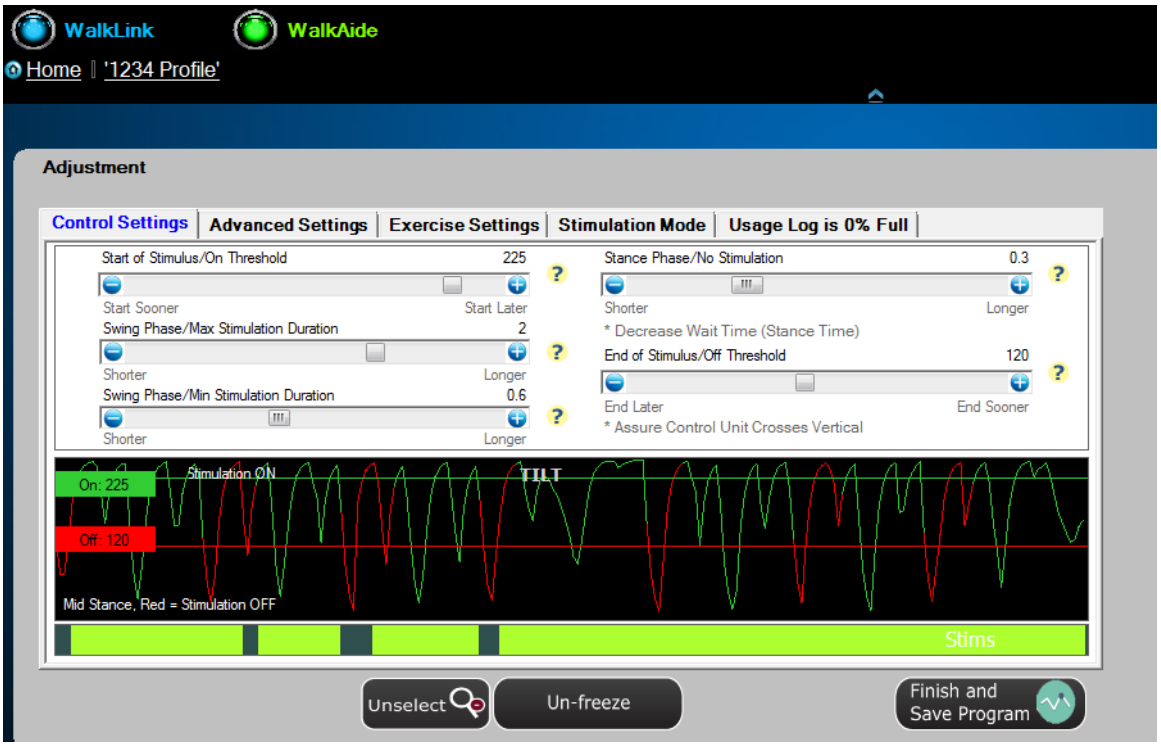
Third move the Green Line on threshold back down to 10 digits above the Red Line off threshold. You would have the on and off threshold only ten digits apart where there is very little knee movement such as a stiff legged or crouch gait. The min time was also adjusted to .5 as this was a faster than usual walker.



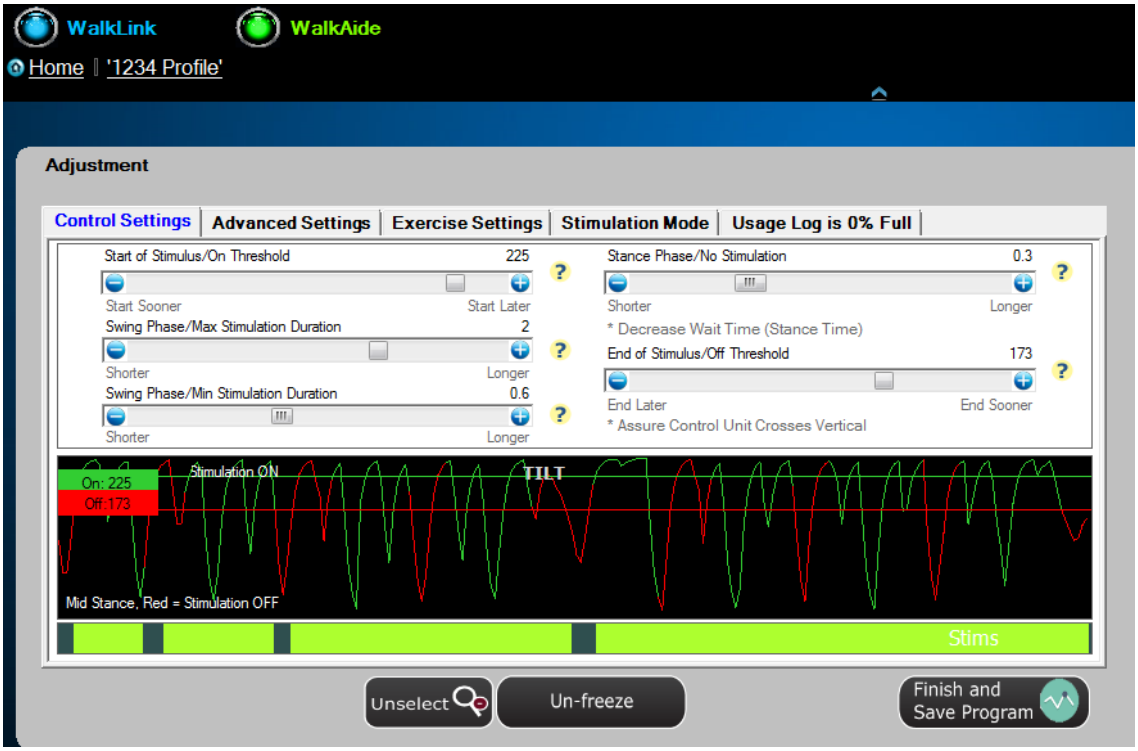
Jogging Gait Sample Graph:



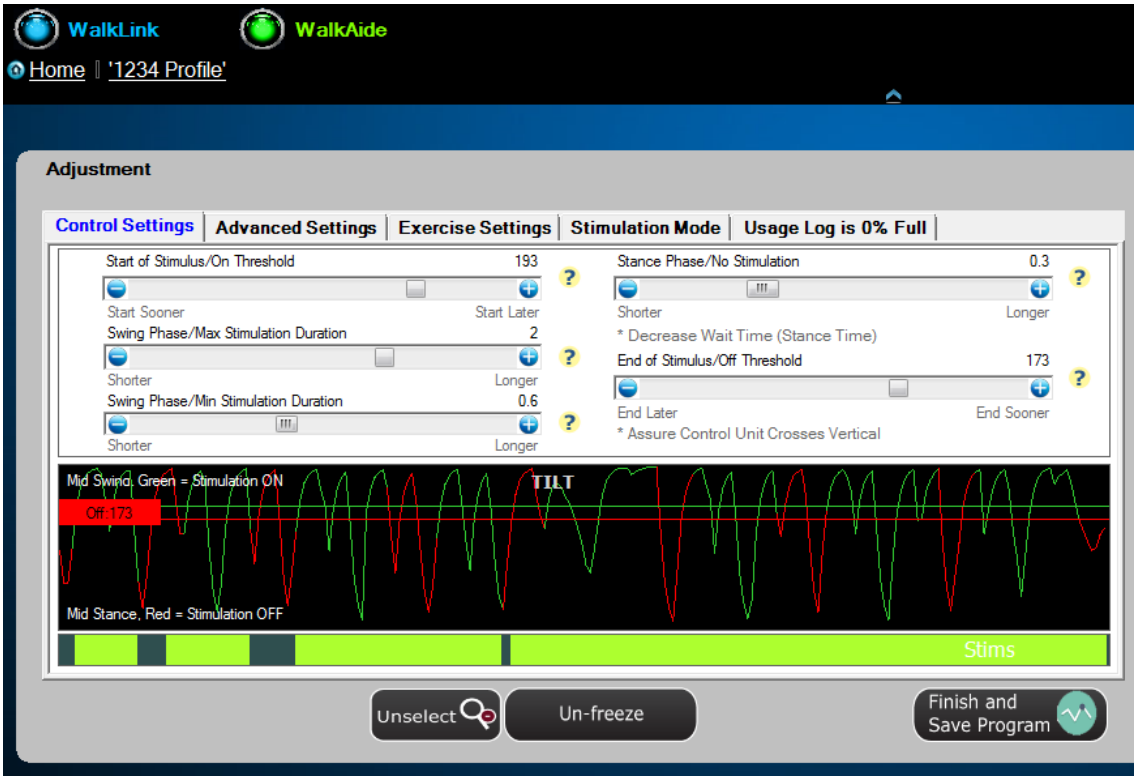
First move the Green Line on threshold up out of the way.



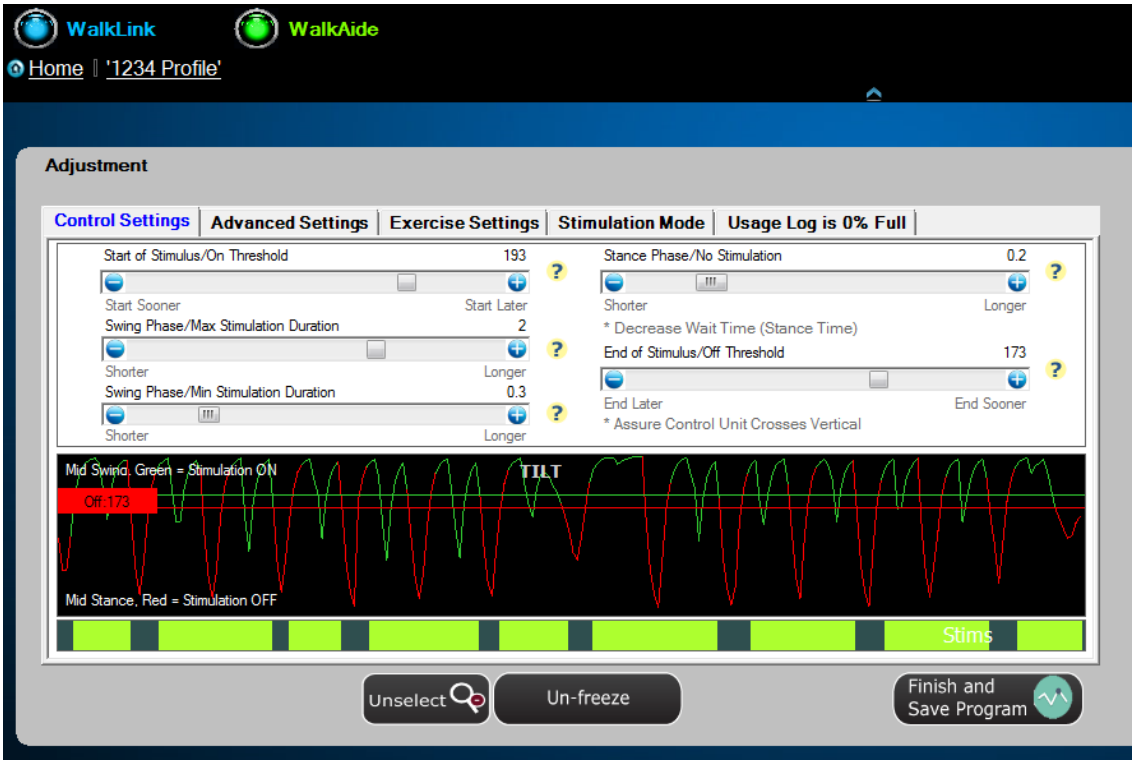
Second move the Red Line off threshold just above stance.



Third move the Green Line on threshold back down to 20 digits above the Red Line off threshold as there is good knee movement with this gait pattern.



Now adjust for speed as this is a jog. You can program the WalkAide for jogging speeds and it will still work when the patient walks. If you program the WalkAide speed for walking it will not work when the patient jogs. In this case the swing min time on is .3 and the stance off time if .2.



Other Parameters:

PW: when the patient gets a motor response at an intensity of 1 or 2 move the PW down. If the patient does not get a motor response until 5 or 6 move the PW up.

Frequency: Typically leave the frequency alone or move it to the right for more comfort.
Extra Stim: Turn this to 2.0 if you need a faster motor response
Ramp on: Turn this to 0.2 to reduce clonus
Ramp off: Turn this to 0.2 to assist with reducing foot slap and knee hyper-extension

Exercise mode: Always give your patient a home exercise program and adjust the on, off and duration to meet the needs of your patient. Such as concentrating on isometrics contractions or longer off times for patients with clonus. During exercise mode have the patient concentrate on volition assist during the stimulation. Then have the patient complete exercises like hip flex/ext. and knee flex/ext. when the stimulation comes on.

Always Remember:

The enemy of good is perfect. Sometimes accepting good is the best option. Perfection is not. Whatever you get in the first 15 minutes of electrode placement or programming is the best you are going to get. Do not spend an hour with either. It will frustrate you.