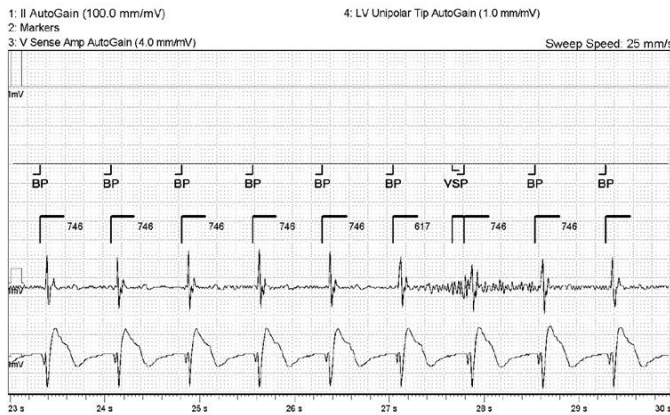


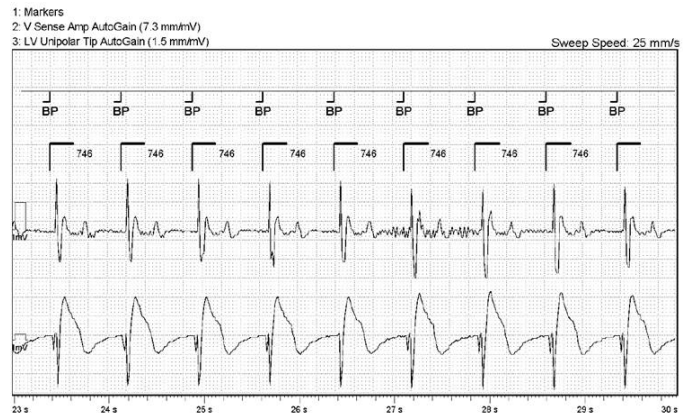
## Low Frequency Attenuation Filter – Design & Performance

The Low Frequency Attenuation (LFA) filter was designed to help mitigate T-wave oversensing and was first incorporated in the Fortify and Unify family of ICDs. When the LFA filter is programmed on (the nominal setting), the filter attenuates, or decreases the amplitude of, low-frequency signals. As a result, there is a significant improvement in the prevalence of T-wave oversensing.

As with any “band-pass filter”, in addition to attenuating specific frequencies, they may also enhance or amplify other event frequencies, such as EMI, myopotential, R-waves, and far p-waves. In order to ensure that the devices meet specific EMI rejection requirements, the nominal setting for the maximum sensitivity was increased from 0.3 mV to 0.5 mV. Testing was performed to ensure there was no significant change in the device’s ability to detect VF with the LFA filter “OFF” versus “ON”. As a result of the LFA filter’s band-pass characteristics, there is a chance of seeing high-frequency, myopotential, or diaphragmatic signals on the RV channel. In some cases, the amplitudes of these signals are large enough to be sensed by the device. **Figure 1** shows an example of the signals seen with the LFA filter programmed “ON”. The oversensed signal has an amplitude of approximately 0.8 mV. When the LFA filter is programmed “OFF” (**Figure 2**), the signals are still present but measure approximately 0.27 mV, below the programmed sensitivity setting and are therefore not sensed.

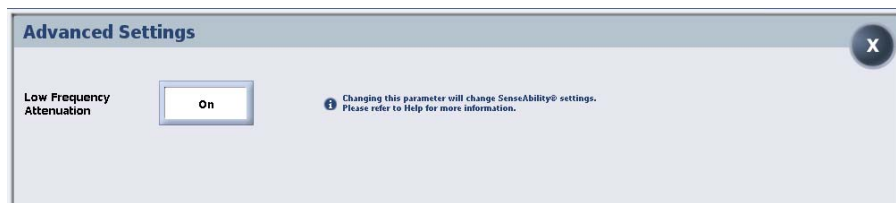


**Figure 1.** Myopotential signals (~0.8 mV) are oversensed with the LFA on.



**Figure 2.** Signals (~0.27 mV) are still present but not being oversensed.

If a patient presents with oversensing similar to that seen above, the LFA filter can be tested in both the ON and OFF settings while the patient performs isometrics and deep breathing. Technical Services can also help provide programming considerations by reviewing real-time EGMs or Stored EGMs. The LFA filter setting can be accessed by navigating from the Brady Parameters → Capture & Sense → SenseAbility Settings → Advanced Settings:



If you have any questions or would like to discuss this topic in greater detail, please contact CRM Technical Services.