

# ♥first beat<sup>®</sup> facts

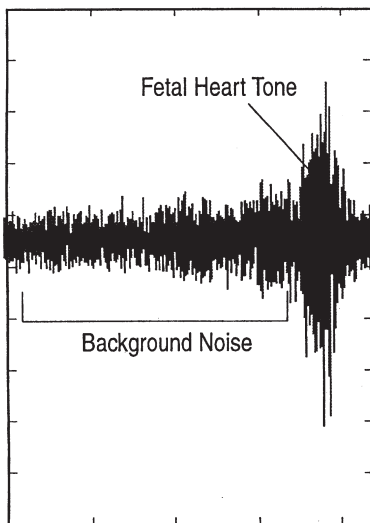
Our customers tell us that there are two key qualities a Doppler must possess: 1) It must be easy to use and 2) It must be reliable. MedaSonics laid the foundation for this standard over 25 years ago when it presented the first fetal Doppler at the convention of the American College of Obstetricians and Gynecologists in 1972. This first Doppler, the FP3A, was very easy to use and extremely reliable—many customers have used the same Doppler unit for over 20 years.

Technology has advanced. Customers needs are more sophisticated. In 1996 MedaSonics introduced the First Beat<sup>®</sup> fetal Doppler, creating a new standard for Doppler performance. Not just a second speaker—not just an additional probe to keep track of— but an innovative approach to fetal heart detection. So, when our customers ask why First Beat is different, here's what we tell them.

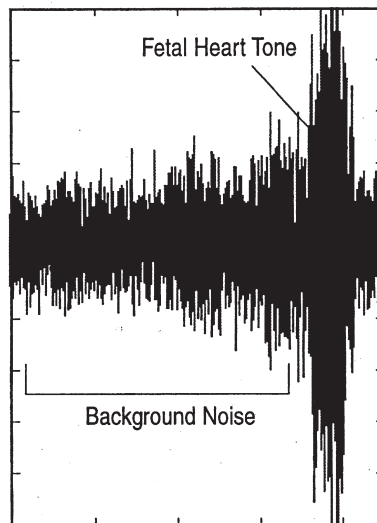
## Increased Sensitivity—Increased Overall Volume

Some clinicians may notice a higher background noise level with the First Beat than they are used to with the MedaSonics FP3B or similar units. They are correct! One component of providing the increased sensitivity our customers requested was to slightly increase the overall volume level of the Doppler. Even though the background noise is higher, the signal is higher too. Compare the typical signal shown below.

FP3B Doppler Signal



First Beat Doppler Signal



An analogy would be to compare the Doppler Signal to a radio signal, and the fetal heart tone to a specific radio station. If you are trying to tune in a weak radio station, it helps to turn up the volume of the radio. The static may be louder, but the instant you locate the radio station, the static disappears and the station comes in loud and clear.

The same principal applies to the First Beat signal—the background noise is higher because the overall volume is higher which in turn produces a stronger fetal heart signal.

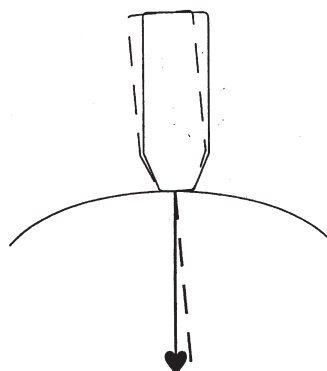
## Signal Acquisition—A Little Movement Makes a Big Difference

Locating a fetal heart tone is a precise, learned technique. Small changes in the angle of the Doppler can cause the signal to completely bypass the fetal heart. Take a look at the examples below.

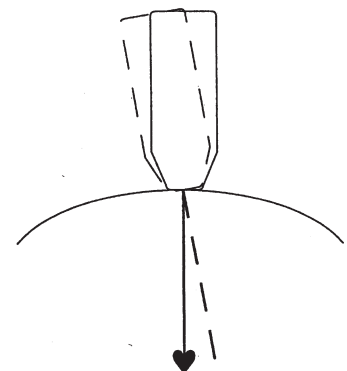
The heart of a 12-week old fetus is approximately 1.5cm in size. Given a depth of 10cm, a 10° shift in the angle of the Doppler causes the signal to completely miss the heart. Even a 5° shift can make the difference between locating and missing a signal.

Technique is developed and refined based on the size and shape of the Doppler used during training. Using a different model Doppler requires minor adjustments in movement and angle. With a little patience, speed of signal acquisition will be regained.

5° Shift in Doppler Angle



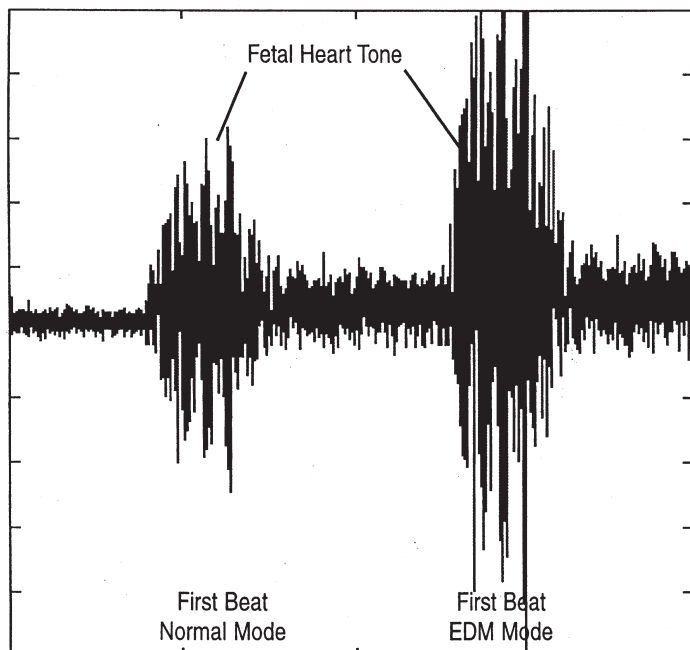
10° Shift in Doppler Angle



### Early Detection Mode—Extra power at Your Fingertips

First Beat's exclusive Early Detection Mode (EDM) increases the sensitivity of your Doppler at the touch of a button, without switching probes. First Beat uses the optimum frequency of 2.36 MHz and utilizes EDM to increase the power of the Doppler as needed. This feature is especially useful with obese patients, where the distance from Doppler to the fetus is greater than normal, and for early term patients, where the uterus may be genuflexed toward the spine. Additionally, the use of EDM with an early term fetus makes the small blood flow signal from the tiny developing heart easier to pickup, allowing for the earliest possible detection.

#### Comparison of Doppler Signals



The graph at left compares First Beat signals in normal and Early Detection Mode targeted on the same Doppler source. EDM provides the extra power required in difficult cases and early term pregnancies.

#### How to Use EDM

To activate EDM mode, hold down the Doppler's On/Off Button for 2 seconds, then release it. The red light on the end of the Doppler (labeled "Low Battery") will remain solidly lit to indicate the doppler is in EDM mode.

Note: If the batteries are low, the "Low Battery" light will flash. If you attempt to activate EDM mode when the batteries are low, the light will flash and the Doppler will remain in normal mode.

#### Heart Rate Display—Watch the Flashing Heart

The fetal heart rate calculation displayed on the calc was designed to be extremely accurate and may be susceptible to extraneous noise caused by movement of the probe and/or the fetus.

By watching the heart shaped icons on the LCD display, the user can verify the accuracy of the heart rate display numbers. If the inner (black) heart icon flashes in sync with the heart tones emitting from the speaker, the the calc has "locked on" to the heart rate signal and will accurately display the rate. If the inner heart icon flashes randomly in comparison to the heart rate tones, the unit is erroneously identifying noise as a heart rate. When this happens, one way to assist the unit in locking onto the heart rate is to raise the volume level on the Doppler. This increases the audio signal upon which the algorithm can operate.

**Note:** The degree of fetal movement during labor and delivery may make it difficult to obtain an accurate heart rate calculation. Manual heart rate calculation using the audible heart tones located by the Doppler may provide the best alternative during labor.