# Getting Started: What's Needed

In order to have a good ultrasonic measurement the right preparations must be made and the correct equipment for the job obtained. The type of fastener greatly changes the scope of the job and the steps that must be taken.

## Transducer Selection

The radio is only as good as it's antenna…

Picking the right transducer is a complex task. For many applications many transducers will do the job just fine. For difficult applications, the right transducer can really make a difference.

A basic rule of thumb is to use the largest diameter transducer that will fit on the bolt, and the lowest frequency that gives you a noise free signal. For a whole lot of information on why that's generally the case, look at the tutorial we have on transducer selection.

## Instrument Characteristics

Get the right tool for the job.

## Pulser Types

There are two basic types of pulsers. You either have a wideband pulser or you don't. A wideband pulser has been used for thickness gauges for years. It sends out a very highly damped pulse which starts the resonant nature of the crystal ringing. If you are trying to resolve thin surfaces, a circuit like this is important.

On the other hand, if you want to get a lot of energy into the bolt, you will get much more output if you apply an alternating voltage at the right frequency.

Itís like tapping a wine glass and getting a little ring out of it, versus rubbing your finger on the top until it starts to sound.

Short pulse widths should be used when trying to resolve between parts of an echo, for example if there is a step or slot in the end. Long pulses are great for putting a burst of energy into hard to measure situations.

## Pitch Catch

Pitch Catch refers to the practice of using two transducers, one at either end of the bolt. This is excellent for measuring attenuative materials. . Pitch Catch is very useful in cases of bending and also long and narrow bolt geometries.

## Data Formats

Pay attention to the available data formats of you equipment. What kind of information is stored for each bolt? Can you enter multiple readings for each bolt?