Index-velocity Quick Sheet
ADVM Cell Size

1. After site reconnaissance, estimate the maximum cell end by using a conservative Aspect Ratio (A.R.).
   NOTE: This value will only be used as a maximum range estimate. The actual cell end will be determined by a signal beam check.
   - **R = A.R. * D**; where R is the range to the end of the cell and D is distance to nearest vertical surface from the transducers (water surface or bottom)
   - An A.R. of 10 is conservative
   - Consider an A.R. of <8 if there is a rough bottom or stratification

2. Set cell beginning so that it is beyond bridge pier wake turbulence zone (b)
$$b = c(dx)^{0.5}$$
   b - lateral distance from pier centerline to edge of wake zone
   d - pier width
   x – distance from ADVM to upstream face of pier
   c – factor for pier shape
   > 0.62 - round nosed
   > 0.81 – rectangular nosed

   Remember to make sure the cell end location is not in a turbulence zone.

3. With ADVM in the water, run a beam amplitude check (SonUtils BeamCheck for an Argonaut).

   The cell end should be set so that:
   - beam amplitudes at the cell end are at least 10 counts above the instrument noise level **and**
   - the cell end is at least ½ the pulse length from any boundary, **and**
   - the cell end is at least 0.10*D from any boundary, where D is the distance from the ADVM to the boundary
     (use signal increase as location of boundary, not the peak)
     - Multi-cells should be configured to overlap range-averaged cell for Argonauts. Set BD = CB and (Ncells * Cell Size) = Cell End.

       Example: CB = 1 meter => BD = 1 meter
       > **CE = 11 meters based on Beam Check**
       > **CS = 1 meter and Ncells = 10**
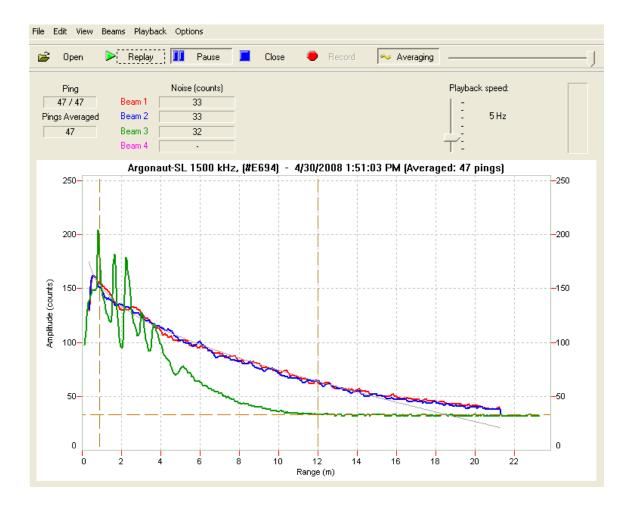
       So multi-cell data starts at 1 meter and ends at
       CS * Ncells + BD = 1 * 10 + 1 = 11 meters

      o   Run a beam amplitude check with ADVM out of water to obtain an initial instrument noise level (noise should be near 30 counts).

Good initial beam check with cell begin and cell end set appropriately.

REMEMBER: the ADVM cell **must** be in a zone of stable velocity to have a stable index velocity relation. This may require an adjustment to cell begin and blanking distance after the initial installation and configuration. Collect time series velocity data and then use the multi-cell velocity data to verify range-averaged cell is in stable flow field.

Keep good notes and document all field observations and instrument configurations. Use dedicated field forms for installation and for routine field inspections.