Fundamental procedure

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| ./images/geom3.gif |

type (3)

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| ./images/geom2.gif |

type (2)

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| ./images/geom1.gif |

type (1)

**Objective:** We want to image reflections across layers where there is an impedance change.

**Reason for using many "redundant" echoes--to reduce noise:** We need to gather several versions of the experiment and stack.

**Logistics:** However, surveying with one shot and many geophones is more cost-effective.

**Therefore** Field work must be arranged as follows:

1. We gather data using the geometry of type (3). Data from one shot into many geophones ("common shot data") are shown below under the label Shot Record 14.
2. Next, sort these "common shot data" so that traces appear as if gathered using the geometry of type (2). All traces that reflected under one location are collected into a "common mid point gather", one from each of many common shot data sets. (See the panel under CMP loc. 27.)
3. Stack these traces to produce one trace which represents measurements obtained using the desired geometry of type (1). This is the CMP (common mid point) trace. This will require a "move-out" correction to be applied.
4. Then many of these CMP traces are combined into one cross section of the earth's structure. Traces are labeled **CMP number**, and the one trace shown is identified with arrows.
5. Interpretation in terms of geology is the final step. The procedures to accomplish these steps will be explained in subsequent pages of the notes.

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| ./images/processed\_shot\_gather.gif |

Note

From Kearey, Philip and Micheal Brooks, 'An Introduction to Geophysical Exploration'. 2nd ed. Blackwell Science: 1991.