Autonomous Operation

For All Vibroseis, Dynamite & Impact Sources

Why Autonomous?

No Radios - One of the most important parts in any crew are the radios. Crews depend on radios for the source equipment to communicate with the doghouse. Autonomous acquisition removes those limits.

No Limits - Removing the limits imposed by radios accelerates the acquisition process. Removing the limits frees the sources to shoot at their own rate. It also lets sources operate in locates with tough terrain and thick vegetation, terrain and vegetation that would halt a conventional crew.

How does it work?

GPS Times and Locations - Each source controller is equipped with GPS, data channels and 8 Gbytes of memory. Every time a pop is acquired, the location, T0 time and auxiliary data (if available) is captured and saved to memory.

Shoot in Time slots - Each source operates in it's own pre-determined time slot. Once a unit's time slot arrives, the operator is alerted and the source is free to fire.

Shoot Selected Source Points - Each source is pre-programmed with a range of source points, and each source can only acquire stations in it's range.

End of Day Reconciliation - Each source's data is offloaded and reconciled with the project database, providing QC and production reports.

Features and Benefits:

Simplicity - Autonomous systems are easy to operate.

Flexibility - Field crews can operate in tough locations and environments.

Speed - Field crews can acquire data whenever the recording system is ready. And nodal systems are always ready!

Autonomous Acquisition Mode

Seismic Source

Theory of Operation:

The acquisition day begins by configuring the decoders for data acquisition. First, it is given a time window for acquisition. The decoder will only fire at the beginning of the window to prevent multiple source units from shooting on top of each other.

Then, a list of viable source points is loaded into the decoder. The decoder will only fire the source once it is within a specified distance of a source station. This prevents the source from straying out of the active receiver spread.

Once the source is in the field it starts acquiring the list of points loaded into its memory. Running without radio interference, the source operator can concentrate on the job at hand.

To assist the operator, each source decoder unit is compatible with Navigator, SSC's source navigation system. This system guides the source to the next shot point, saving time and increasing efficiency.

As the source leaves the field its stored information is offloaded for analysis. Each SSC decoder has a GPS for precise timing and exact location, and 8 Gbytes to store time breaks and auxiliary information like pilot sweeps or uphole traces.

Load Stations into Decoder

Acquire Source Points

Recover Acquisition Data from Decoder

Reconcile Acquisition Data in SourceLink

Each decoder has an internal network adaptor, either cabled or Wi-Fi, for fast and error-free data transfer. In addition, several SSC decoders have removable, USB-based, memory for real-time data backup.

The acquisition day ends with reconciliation of the acquired source points and the development of a shooting plan, or operational plan, for the next day.

The process starts with the transfer of this information to the SourceLink database. This data includes shot time breaks and the associated PSS or PFS files. SourceLink examines the data and marks source points as acquired, showing the manager each source's progress, and indicating missed points.

The recording manager also has an opportunity to QC each source's performance. Vibrators can be evaluated, and reports can be made to chart each operator's progress throughout the day.
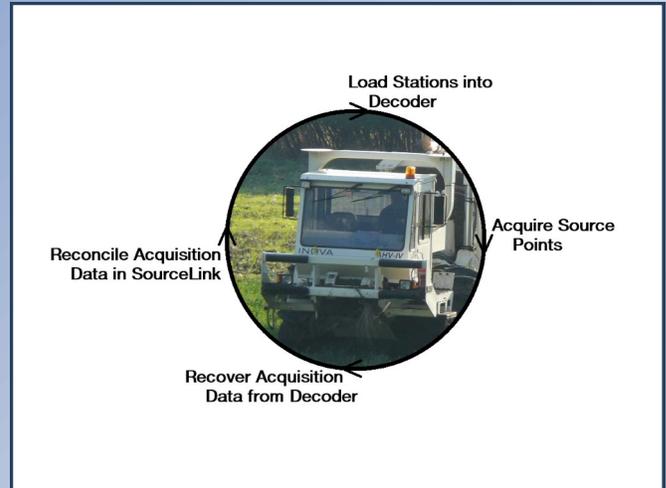
Running Established Crews with Legacy Sources in Autonomous Mode:

For established crews, crews with legacy source equipment, who wish to operate in autonomous mode, there is an inexpensive and straightforward path. Seismic Source builds the Source Signature Recorder for updating and converting existing source equipment to autonomous operation.

A SSR3 box has the same features as the other SSC products: GPS timing and positioning, three 24-bit data channels, and 8 Gbytes of memory for storing source point information. It also has removable USB memory for quick source turnaround.

Equipping a crew with Source Signature Recorders gives it all the features needed for high speed and high quality data acquisition operations.