

# Quality Control in the Field



## Bird Dog 4-24

### Independent Acceptance Testing for Field Equipment

#### All New Hardware Featuring:

- 24 data channels for testing sources and sensors
- High-Speed ADC circuits for precise measurements of any signal
- Specialized connections for easy use
- Includes lifetime software license for vibrator, geophone and accelerometer testing



#### Bird Dog 4 Options

- **Vibrator Testing**
  - \* Tests on multiple vibrators simultaneously
  - \* Industry standard vibrator QC reporting
- **Geophone Testing**
  - \* Simultaneously test three 1C geophones or strings; or else one 3C geophone
  - \* Tests sensor response
- **Optional Hydrophone Testing**
  - \* Test single hydrophones or streamer sections
  - \* Tests electrical and acoustic properties
- **Optional Load Cell Testing**
  - \* Utilize one to four load cells per system
  - \* Analyze amplitude and phase performance

Test Field Equipment Onsite

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*All new connections, features, and capabilities*

Connectors with internal power provide constant current excitation for sensors like accelerometers or transducers

Single point connection for 24 channels input

BNC connectors for true reference and time breaks

Ethernet network for configuring unit and offloading data plus results

10 to 28 volt DC power

GPS module for precision timing and location information

Standard connectors for running wireline tests on five vibrators

Connector for running geophone and hydrophone tests

Status LEDs for operation confirmation



*All in a rugged aluminum case with a convenient handle for carrying!*

# Quality Control in the Field



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### Precision testing of multiple vibrators

#### BD4 Vibrator QC:

- Run wireline tests on five vibrators simultaneously
- Includes two magnetic accelerometers for independent testing and analysis
- Includes lifetime software license for vibrator testing and reporting
- Measure vibrator performance in field
- Portable unit is easily moved between fleets
- GPS time and location saved for every test

#### Independent Vibrator QC:

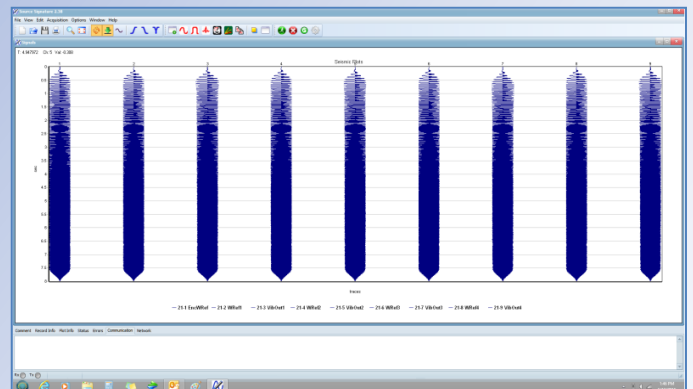
- QC vibrators independently of recording or source control system
- Utilize independent accelerometers to verify:
  - Polarity of accelerometers
  - Baseplate and reaction mass weights
  - Phase error
  - Force output
- Assures clients that vibrators are running correctly

#### Vibrator QC Test Software:

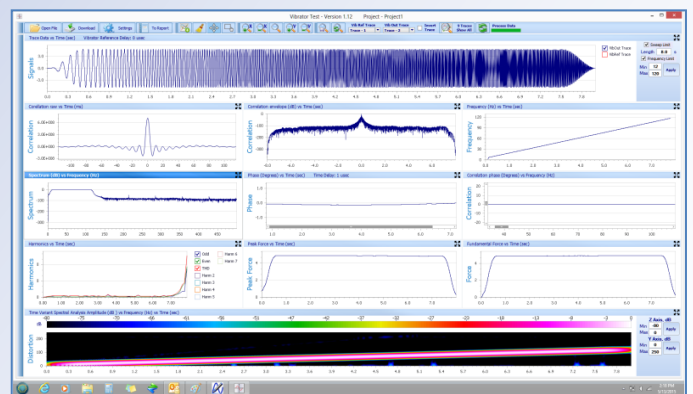
- Controls BD4 unit, plus offloads test data files
- Runs Time and Frequency Domain Tests
- Analyzes source signature files from Seismic Source, Pelton, and Sercel vibrator electronics
- Display and analyze data from long sweeps
- Generates and saves reports



QC Vibrators in the Field



Pilot Traces from all Accelerometers



Analyze Individual Tracks



# Quality Control in the Field

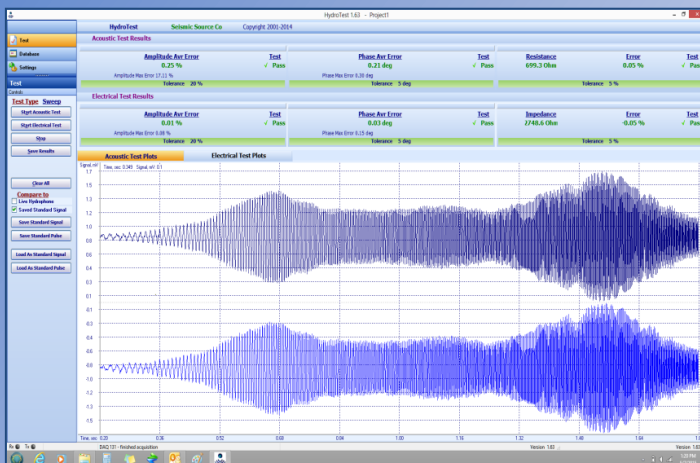
## Bird Dog 4-24



### Preparing hydrophones for the water

#### BD3 Hydrophone Test Option:

- Measures electrical and acoustic properties
- Includes Sound Tube and Amplifier for independent testing and analysis
- Included PC software utilizes MS Excel compatible interface for statistical analysis and report creation

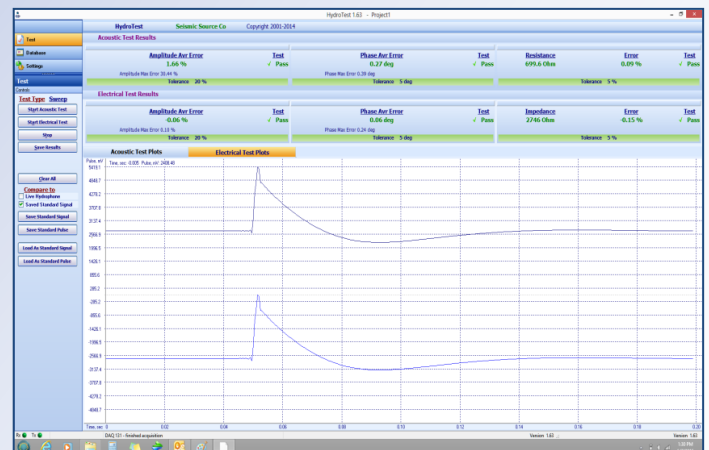


#### Hydrophone Testing Features:

- Measure hydrophone performance in the shop or field
- QC individual hydrophones or streamer sections
- Assures clients that hydrophones are functioning correctly
- GPS based test time and location saved for every record

#### Hydrophone QC Software:

- Controls BD3 unit, plus offloads test data files
- Measures electrical and acoustic properties
- Verifies hydrophone accuracy and output
- Generates and Stores reports



# Quality Control in the Field

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### Testing a source's amplitude and phase output

The SSC portable Load Cell System is designed to measure vibrator performance where they are operating in the field or at the shop. Depending on the size of the vibrator, four of the SSC Load Cells are placed under the pad of the Vib and the sweep is recorded using a 24 channel DAQlink.

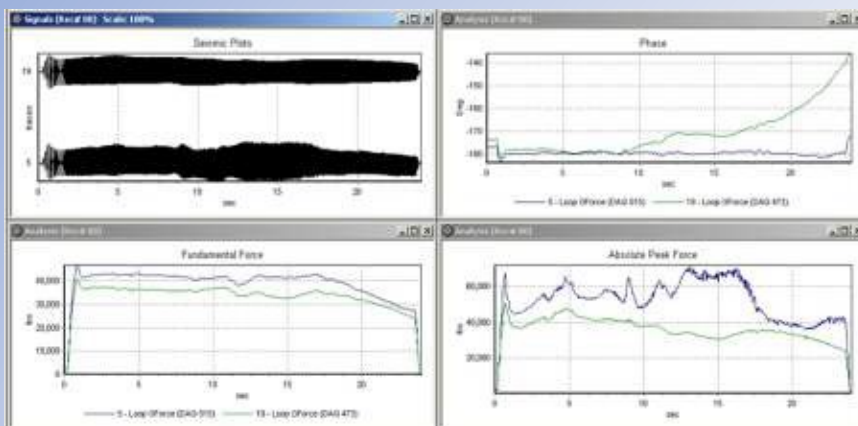


#### Portable Load Cell System features:

- Easy to use Software
- Robust Database
- GPS for Time and Location of test
- For use with any Seismic Vibrator
- 12 VDC operation

Each Load Cell System uses an Interface Box to gather data from the Loads Cells and transmit it to a recording device for interpretation by the provided VSCOPE software.

A typical system includes four base plates with each containing three load cells. The total weight capacity of the system depends on the type of load cells installed. Typical load cell capacities include 25,000 lbs. per cell and 50,000 lbs. per cell



The difference between the Load Cell output (green color) and the Weighted Sum output from the accelerometers (blue color).

