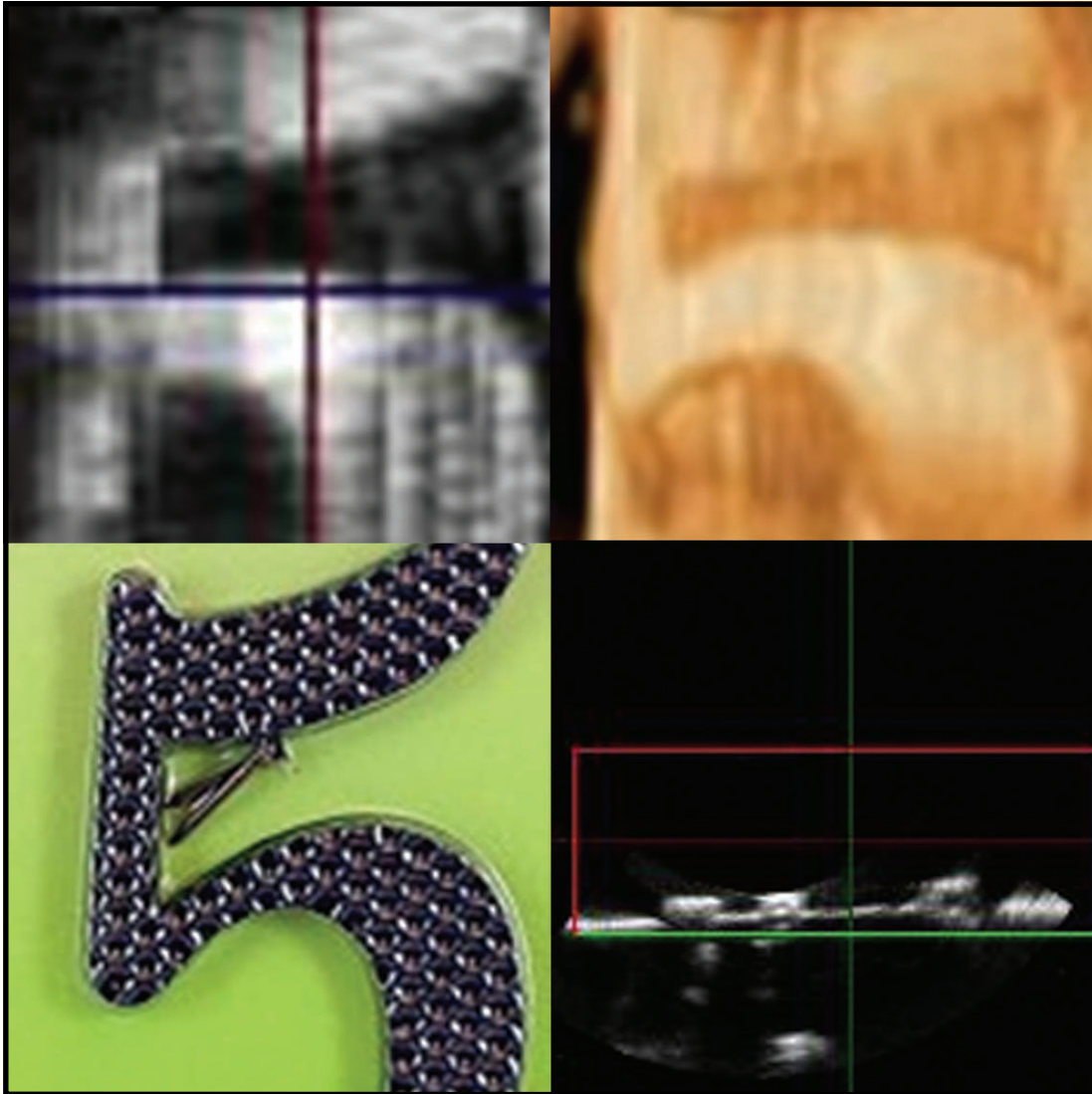


ACOUSTIC CAMERA™

High Resolution Imaging Tool



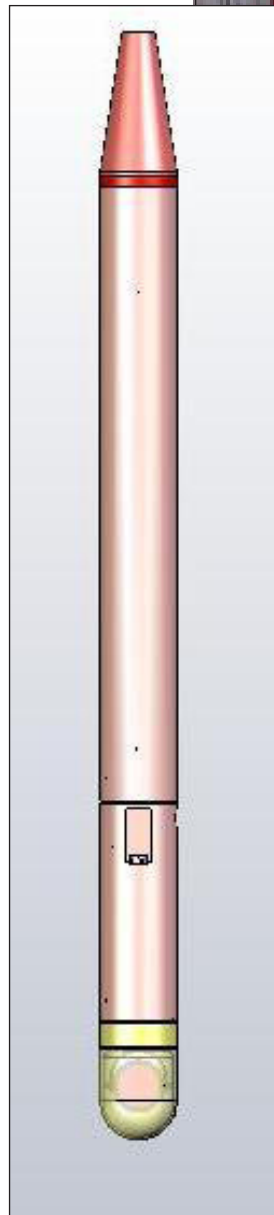
SONASEARCH

ACOUSTIC CAMERA™

The Acoustic Camera™ employs the benefits of advanced acoustic technology to the job of acquiring hi-resolution images in fluid-filled boreholes. Designed and manufactured by Sonasearch, this state-of-the-art sonar tool provides an extremely accurate image of features, anomalies and problem areas in fluid-filled boreholes - without the problems often encountered by current optical camera designs in mud-filled environments.

New advanced features only available in the Acoustic Camera have been designed to solve some of the industry's most common problems and make this tool rise above similar technology. For example:

- The ability to accurately ensound boreholes of 3½" – 13¾" diameter through either water or oil-based drilling mud, providing accurate, timely, unambiguous pictures of borehole condition, formation fractures, lost tools, etc.
- The ability to provide continuous, 360-degree survey coverage of the borehole wall at logging speeds of 60fpm or more.
- The advanced EHRS (Electronic Heading Reference System) allows accurate registration of borehole anomalies in a single pass. The updated system takes only one minute for reference calibration.
- State-of-the-art software runs on modern, Windows-based computers.



Operational Example

Background:

The desire to ‘get a good look’ at either 1) an object lodged in a borehole or 2) sections of the borehole wall itself is common enough to justify having the ‘right tool for the job’. Indeed, all too often the need is urgent enough that ‘second best’ simply won’t do. It’s simply too expensive.

The Acoustic Camera design eliminates the frustration of not being able to see through mud and removes the aggravation of trying to use an optical camera in an environment for which it was never intended.

Based on the latest in advanced technology and innovative acoustics, the Acoustic Surveyor design is purpose built specifically for rugged geophysical applications.

Case #1:

A bit breaks, a pipe twists or a tool goes missing. Regardless, the result is often a blocked borehole, an idle crew, frustrated management and lots of lost dollars. Clearing the blockage would be difficult enough if the precise location, shape and orientation of the obstruction were known but frequently that’s not the case.

It’s time to go fishing.

Sometimes lowering a camera and a flashlight on the end of a garden hose works ... sometimes it takes a while to try to overcome the turbidity and get a clear enough view of what’s what (and the dollars continue to burn). Sometimes things are so murky that a clear view is never achieved.

In contrast, the Acoustic Camera is designed to operate through mud, producing a sharp, gyro oriented picture of the situation with a minimum of lost time, lost patience and lost revenue.



Case #2:

The task at hand is examining – carefully examining – the borehole wall. What is the formation like at this depth/orientation? What are the characteristics at that depth/orientation?

It would be a great advantage if the wall could be viewed in a reliable way. It would be even better if the location and orientation of fractures, voids and other formation anomalies could be observed, measured and stored for later examination.

The Acoustic Camera is designed to efficiently acquire, display and store the level of detail required to enable team members to make operational decisions with confidence.

ACOUSTIC CAMERA™

Software Display Capabilities		Downhole (controlled via surface computer)	
Display Modes:	- Camera View gyro-oriented display allows for easy, quick and accurate detection of borehole anomalies - Isometric view allows the operator to select rotation angle 3-D view aids borehole structure visualization	Frequency:	2 - 8 mHz
Cursor Control:	Moveable to any point on the display	North Orientation:	Via internal heading reference system
Cursor Readout:	Range & bearing to cursor are displayed	Media Velocity:	Measured/corrected via continuously running internal velocimeter
Surface Command Capabilities		Construction:	C72900, Polypropylene
Display Mode		Physical Properties:	2.75" (7.0cm) dia. x 60.35" (153.3cm) Length x 115 Lbs.(52.1 Kg) Weight
Magnetic Variation		Operating Temp.:	-30° to +125° C
Heading Reference Selection		Operating Pressure:	0-12,000 psi
Recorded Depth		Input Power:	250 VAC—supplied by surface power supply
Acoustic Transmitter Power		Service:	Field-replaceable printed circuit boards
Acoustic Receiver Gain		Cable	
Acoustic Receiver TVG Slope		Fibre Optic	
Surface Power Supply/Communications Interface			
Remotely located			
Interface to computer via TCP/IP (1000Base-T)			
Contains power supply & proprietary communications interface			
Physical Properties: 6" (15cm) W x 7" (18cm) D x 12" (30cm) H x 10 Lbs.(4.5Kg) Weight			
Electrical Input: 120/240 VAC @ .5 A			

The **Acoustic Camera™** consists of the downhole probe, Console Interface Electronics Cabinet, custom shipping cases and is supplied with a Panasonic Toughbook®-52 notebook computer (or equivalent) meeting or exceeding the following minimum requirements:
 2.4GHz Intel® Core™ 2 Duo Processor
 P8600, 3MB L2 cache, 1066MHz FSB;
 4096MB SDRAM (DDR2); 160GB hard drive;
 15.4" widescreen 1920 x 1200 WUXGA
 LCD w/ ATI Radeon™ HD 3650, 512MB dedicated VRAM; Gigabit Ethernet (RJ-45);
 Windows XP® operating system and the Sonasearch Acoustic Camera software suite.

**For more information contact your
Sonasearch representative:**

**or visit: www.sonasearch.com
425-883-1984 (USA)**

SONASEARCH