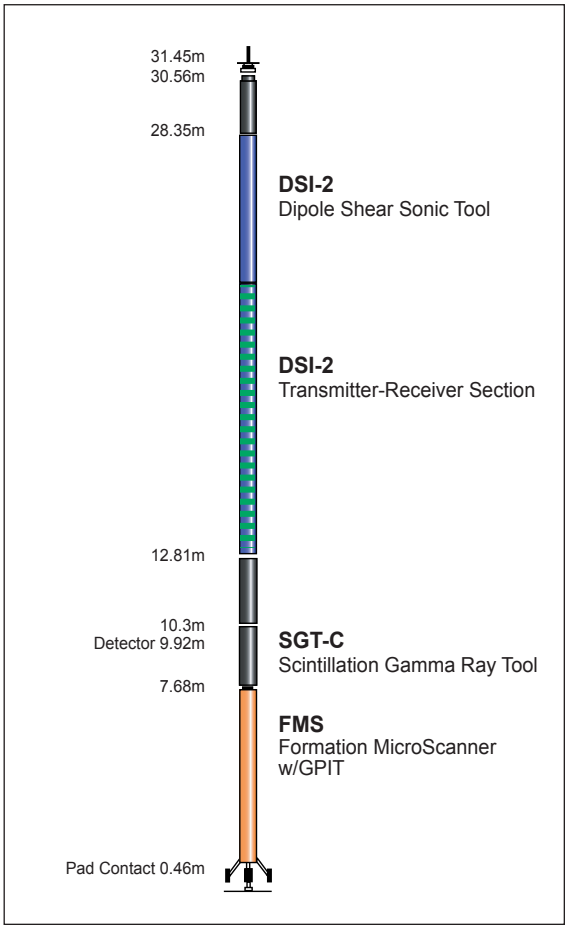
FMS/DSI-2 Tool String

Description

The Schlumberger Formation MicroScanner / Dipole Shear Sonic Imager (FMS/DSI-2) tool string provides both resistivity images and acoustic data from an open, fluid filled borehole. The FMS consists of four orthogonal imaging pads, each containing 16 microelectrodes that are in direct contact with the borehole wall during the recording of data. The button current intensity is sampled every 0.1 in (2.5 mm). The tool emits a focused current from the four pads into the formation, and produces oriented, two-dimensional, high resolution images of the variations in microresistivity around the borehole wall. The DSI-2 can acquire a wide array of acoustic data which are determined by transmitter firing sequences. It is a multi-receiver tool with a linear array of eight receiver stations, a monopole transmitter and two dipole transmitters. The receiver array provides multiple spatial samples of the propagating wavefield for full waveform analysis. The arrangement of the transmitters and receivers allows measurement of wave components propagating deeper into the formation.



Schematic illustration of the Formation MicroScanner/Dipole Shear Sonic Imager tool string.

Applications

Formation MicroScanner

- Mapping of formation structures
- Dip determination
- Correlation of coring and logging depths
- Precise positioning of core sections where core recovery is less than 100%
- Interpretation of depositional environments

Dipole Sonic Shear Imager

- Calculation of impedance logs for synthetic seismogram generation
- Porosity and pseudodensity estimation
- Fracture porosity determination

Deployment Notes

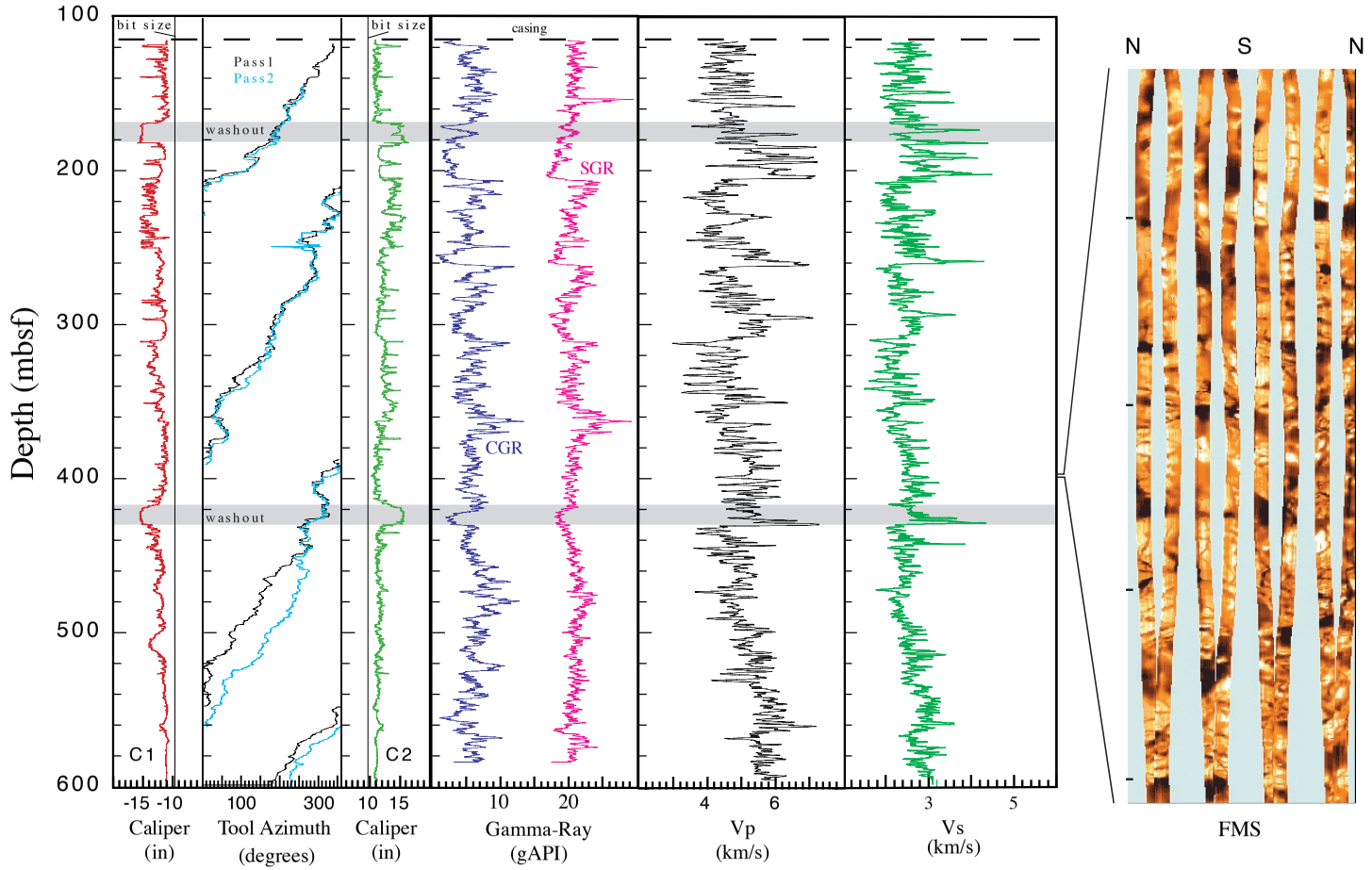
The FMS/Sonic tool string combination is always deployed after the Triple Combo tool string. This important safety precaution is necessary to safeguard the fragile FMS, which is rare and hard to replace. The FMS and sonic tools are combined for the purpose of providing ideal centralization. The FMS/Sonic string also includes a Scintillation Gamma Ray Tool (SGT) for depth correlation with other tool strings.

Tool String Specifications

Length:	31.45 meters
Diameter:	3.625 inches
Primary Measurements:	High resolution microresistivity images, Compressional wave velocity, Shear wave velocity, Natural gamma ray

OCEAN DRILLING PROGRAM

ODP Logging Services, Lamont-Doherty Earth Observatory, Rt. 9W, Palisades, NY 10964



Sample output of downhole logs obtained with the FMS/Sonic tool string. Shown are caliper (4-arm tool), computed and standard gamma-ray, compressional-wave, and shear-wave velocity logs, along with FMS images.

FMS/Sonic Tool Specifications

Tool Acronym	Tool Name	Maximum Temperature	Maximum Pressure	Diameter	Length	Sample Interval	Vertical Resolution	Logging Speed
DSI-2	Dipole Shear Sonic Imager	175° C	20,000 psi	3.625 in.	11.6 m	6 in.	3.51 ft	1800 ft/hr
SGT	Scintillation Gamma Ray Tool	149° C	20,000 psi	3.625 in.	2.61 m	6 in.	.75 - 1 ft	1800 ft/hr
FMS	Formation MicroScanner	176° C	20,000 psi	3.625 in.	7.72 m	0.009 in. (.25 mm)	0.19 in. (5 mm)	1800 ft/hr