VIT

# Vibration Isolated Television

JOIDES Resolution Science Operator

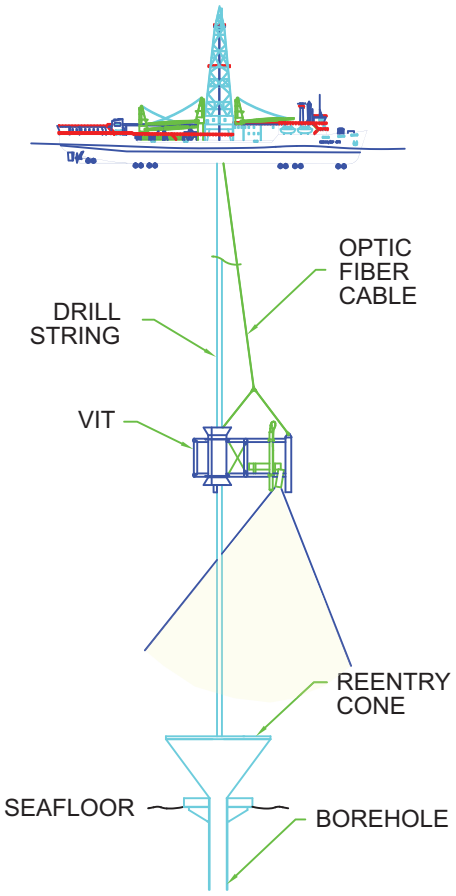
## Scientific Application

The Vibration Isolated Television (VIT) Optic Fiber equipment is primarily used to provide visual observation of the seafloor during reentry of an existing borehole. Sonar capability is used to locate objects initially out of camera range, such as reentry cones. A low-light, black and white, underwater camera is used to position the ship and drill pipe for reentries once a hole is located. An underwater color camera with pan, tilt, and zoom functionality is used to reenter a hole. The color camera is also used for surverying the seafloor, examing mechanical devices (e.g., CORKs), locating telecommunications cables, etc.

## Operation

The VIT is deployed by latching its guide sleeve around the drill string. The drill string is used as a guide as the VIT is lowered to the seafloor by means of an armored fiber-optic cable attached to a special winch located in the ship's moonpool area. Power and control are transmitted down the fiber-optic cable to operate the underwater lights, cameras, and sonar. The camera and sonar signals are then transmitted up the fiber-optic cable for display and recording on board the ship.

An acoustic beacon can be attached to the VIT, which allows the ship's dynamic positioning system computers to fix the position of the VIT frame relative to the ship. This is useful in high currents, where the end of the drill pipe can be a considerable lateral distance from the ship.




**Schematic of VIT deployment.**

## Features

### Underwater Lights

- 3 Remote Ocean Systems Lighting LEDs
- Two lights mounted on frame, third mounted on pan/tilt device
- 10,000 lumens per flood LED
- Dimmable from 10% - 100% via RS-485 control

### Standard-Definition Black and White Range Camera

- Type: OE13-125 by Kongsberg
- Sensing Device: 9 mm x 6.6 mm CCD
- Horizontal Resolution: 576 TVL/ph
- Faceplate Light Sensitivity: 1 x $10^{-5}$ Lux (limiting)
- Operating Temperature: -5°C to +40°C
- Video: Composite 1v pk-pk

### High-Definition Color Inspection Camera

- Type: Sony FCB-H11
- 1/2 type CMOS imager
- Video Output = HD-SDI
- Mounted on pan/tilt device
- Minimum illumination: 1.0 Lux (ICR-on, Mode-F1.8 50 IRE)
- 10X Optical Zoom
- Operating temperature: 0°C to +45°C

### Pan and Tilt Device (Color Camera)

- Type: Sidus SS110
- Torque: 10 ft-lb for both axes
- Max payload: 50 lb
- Operating Temperature: -20°C to +50°C

### Telemetry System

Ship LAN extended to telemetry pod via fiber-optic umbilical

### Single-Axis Fiber Optic Gyro

Type: DSP-3000 FOG
Stability: < 1°/hr
Operating Temperature: -40°C to +75°C

### Sonar Head

- Type = Seeking side-scan by Tritech
- Dual Frequency CHIRP
  - 300 kHz up to 300 m range
  - 670 kHz for high definition
- Scanning = 360° continuous or locked
- Operating Temperature: -10°C to +35°C

**VIT being deployed in the moonpool.**

### Umbilical Cable

Triple armored electro/optical cable

## Operating Range

### Maximum Depth

6,000 m

### Maximum Payload to 6000 m

2000 lb