

# Robertson Geologging News

## Robertson Geologging (USA) Inc

### Special points of interest:

- New Hi-OPTV for advanced borehole imaging
- PS Suspension Logger—consultants measurement of choice
- Elastometer II— Pressure Meter makes new ground in Gulf and Europe
- As Mining continues to boom—ensure you choose the right tools for the job
- RG Training Courses
- RG Direct Global Support strengthen with Hong Kong regional hub
- Record sales continue into 2008—North American sales reach new highs

## Improved Borehole Imaging with the NEW Hi-OPTV

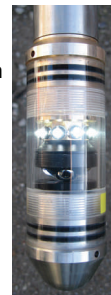
The Hi- OPTV probe provides a continuous, detailed and orientated 360° image of the borehole walls using a unique optical imaging system. This can be rapidly interpreted, using data from the internal orientation module, to obtain a complete feature analysis that includes dip, strike, frequency and fracture aperture.

One popular visual data display option is the projection of features onto an imaginary core that can be rotated and viewed from any orientation.

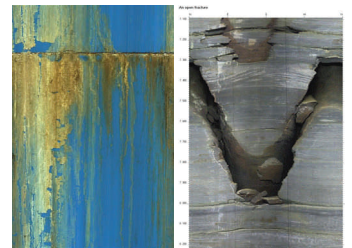
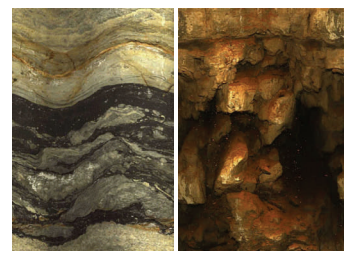


Features of the New Hi-OPTV include:

- Full operator control of lighting, exposure, capture rate and resolution
- 24bit RGB Colour Resolution
- High logging speeds upto 8m/ min
- Vertical resolution unlimited
- Horizontal resolution upto 1440 pixels
- Can run on; mono, coax or multi-conductor cable
- Borehole range upto 20"
- Export to Bmp, Tiff or Jpg
- Export to LAS



Technical references and case studies for the RGLDIP processing software can be found on our website: [www.geologging.com](http://www.geologging.com)



A selections of borehole images from the Hi-OPTV

In fact, an OPTV survey can often replace expensive coring with its associated problems of incomplete core recovery and offers much greater flexibility and convenience for data interpretation than a conventional borehole television survey.

A choice of RG-DIP or Wellcad interpretation software is available for detailed analysis of the displayed features and includes conventional arrow (tadpole) plots, stereograms of feature orientations and synthetic core images.

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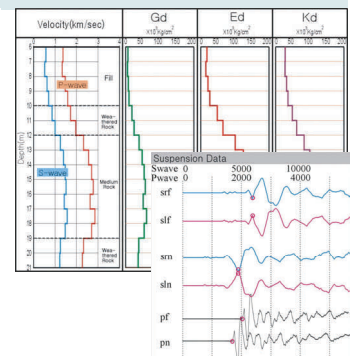
## RG PS Suspension Logger - measurement of choice

The PS Suspension Logger is widely becoming the consulting engineers measurement of choice. After wide spread use in Asia and California, the measurement is now routinely used in the Persian Gulf and Europe.

The PS Logger provides invaluable information in soft formations where other sonic methods give poor results. It provides

properties of soils including shear modulus, compressibility, bulk modulus and Poisson's Ratio.

Applications include; tall buildings, bridges, dam investigations, nuclear power stations, foundation studies, characterization of strong motion sites, etc.



## Maximizing your Exploration Potential



Coal Exploration in Indonesia

Borehole logging is a simple cost effective method for exploration and mine studies. It can also provide valuable information for in-mine safety studies. Logging has a vital role not only in initial drilling but also in monitoring to identify geotechnical and hydrological problems before they lead to costly and possibly fatal failures.

RG's Micrologger 2 digital logging equipment is small, easy-to-use and highly reliable. With over 500 units sold worldwide, the unit has a proven track record for reliability and technology. In addition to well known logging service companies, users include exploration companies, drillers, hydro geologists, geotechnical engineers, aid agencies, the military and universities.

- Coal and mineral exploration
- Location of ore bodies
- Mineral identification
- Fracture detection and analysis
- In-mine geotechnical studies
- Borehole verticality
- Mine related hydro geological and contamination studies

### Micrologger 2:

The smallest and lightest member of the RG equipment range, the RG Micrologger 2 digital surface system packs a powerful punch. It requires only a standard notebook PC, a basic winch and one or more probes from the extensive RG water-well range to be ready to use. 12VCD operated, the Micrologger 2 is powered from a vehicle battery or a small generator.

Despite its small size, the Micrologger 2 is equally at home as a portable system or with 3000m of cable in a large truck. Its many advanced features including fully digital technology ensures long term reliability and freedom from drift or errors. The unit is self-contained and no external interface is needed for any RG probe or television camera.

### Winch:

RG produces a range of winch designs for all requirements. From the battery-powered 150m Miniwinch to the heavy-duty 3000m electro-hydraulic unit,

each is precision engineered for reliable operation under arduous field conditions. RG winches are feature-laden and include auto-levelwind, tension measurement, integral depth encoder and remote control from a PC, depending on the model. All RG winches are compatible with the Micrologger 2.

### RECOMMENDED PROBES

#### Sidewall Density Probe

The sidewall density probe uses multiple detectors to provide an accurate borehole-compensated density measurement with excellent bed-boundary resolution.

This can be used to determine lithology, density and porosity, ash content in coal, rock strength and elasticity parameters when combined with the sonic probe and detection of weathered or fractured zones. The probe is regarded as a classic coal exploration tool.

#### Dual Neutron Probe

The dual neutron probe provides an accurately calibrated borehole compensated neutron porosity measurement in mud-filled open holes. It is the probe of choice for quantitative formation-fluid studies. The measurement can help determine lithology identification, location of aquifer and aquitard, shale content and fracture analysis in coal.

#### 1024 Ch Spectral Gamma Probe

The spectral gamma probe analysis the energy spectrum of gamma radiation from the naturally occurring or man-made isotopes in the formation surrounding the borehole. The probe can determine the concentrations of natural emitters, potassium, uranium and thorium, and can give a 1024 channel spectrometer for in-situ isotope studies. The probe is ideal for mineral detection, sedimentology, lithology determination and improved shale content computation.

#### Magnetic Susceptibility

The magnetic susceptibility probe is a low frequency device and is specifically designed for mining applications. It is particularly used for uranium exploration. Susceptibility logs are highly sensitive to iron and show large contrasts accordingly to its ox-

idation state. The frequent occurrence of iron with other redox-sensitive metals can be a valuable indicator of the presence of other minerals.

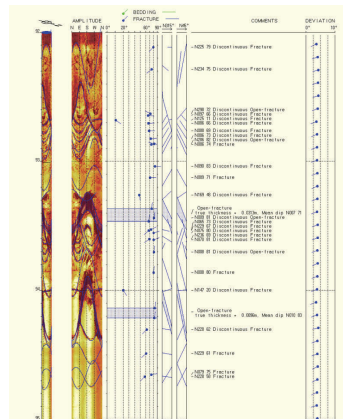
#### Full-Waveform Sonic

The probe can be used in three modes depending on application; compensated sonic, full-wave form or cement bond mode. The probe can help determine lithology, porosity, rock strength and elasticity properties, correction of seismic velocity, fracture and permeability induction in hard rock, and poor and missing cement behind casing.

#### High Resolution Acoustic Televiewer (HRAT)

The high resolution acoustic televiewer (HRAT) is used for borehole imaging in fluid and mud filled boreholes. The probe provides a 360° unwrapped; and orientated ultrasound image of the borehole walls. The probe measures the amplitude and travel time of the reflected acoustic signal. The amplitude can help determine opened and filled fractures, whereas the travel time provides an accurate 360-arm caliper of the borehole and can help show diameter changes in open fractures and breakouts.

The probe also includes magnetometer, so full directional information of the features can be determined. The probe is ideal for fracture identification and orientation (dip and direction), stratigraphic studies, local stress analysis (breakouts) and core orientation.



#### Guard Log (GLOG)

A focused resistivity measurement with excellent vertical reso-

**“Choosing the right probes can help you maximize the potential of your study, as well as save costs and improve safety”**



Portable Logging System

lution and reasonable depth of investigation. The probe is less effected by mud in the borehole, unlike normal resistivity logs. The probe can be used for strata correlation between boreholes, indication of permeable zones, bed-boundary and thickness measurements and moisture determination in coal.

**Verticality**

The verticality of a borehole is key to determining the actual location and depth of a potential order body, as the vertical depth is often be different to the drilled depth, as is therefore critical for mine design. Provided the borehole does not contain steel casing, a standard verticality survey, based on a probe containing record of borehole inclination and drift. An alternative, the

gyroscopic verticality probe provides the same information in the presence of steel casing.

**Caliper probe**

The caliper probe measures the diameter of the borehole as a continuous record against depth. It is used as a check of borehole condition before casing operations or before running more expensive logging probes. It also provides a borehole volume for grout quantity design. Provided the borehole does not contain steel casing, a standard verticality survey, based on a probe containing record of borehole inclination and drift. An alternative, the gyroscopic verticality probe provides the same information in the presence of steel casing.

**Other probes**

Further probes of use in mineral investigation and hydrological analysis related to exploration studies include:

- Induced Polarization
- Gyro Magnetometer
- 4 Arm Dipmeter
- Optical Televiwer
- Electric Log
- Temperature/Conductivity
- Flowmeter
- Water/Gas Sampler
- Borehole Television

Please contact RG for further advice and recommendations.



Sidewall Density Probe

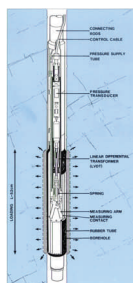
## Pressuremeter makes new ground in Europe and Gulf

RG leads the way with the OYO Elastometer 2 Pressure Meter. Over the last 3 years the system has become standard in entire Persian Gulf region, with numerous systems in daily use in the United Arab Emirates, Qatar, Bahrain and Kuwait. Sales in Europe are also taking off.



The unit was introduced on prestigious projects such as the Burj Dubai—the world tallest building.

It is indispensable for designing the foundation for the construction of large scale structures such as buildings, dams or bridges to grasp the characteristics of deformation under a certain stress.



The Elastmeter-2 is new version of lateral load tester capable of testing wide range ground from soft rock to hard rock. Highly accurate transducers and related electrical circuitry are built in the

probe to improve the measurement accuracy, reliability and operability. With the two arms stretched inside the rubber packer, the system converts the displacement with the inner radius of the rubber packer into that representing the deformation with the borehole diameter.

- Both pressure and displacement are measured directly in the probe using electrical transducers.
- Mechanical arm is used for the measurement of displacement making maintenance easier.
- Applied pressure is measured by precise semi-conductor transducer in the probe.

**“It is indispensable for designing the foundation for the construction of large scale structures”**

## RG Training Courses

Do not forget to sign-up for this years training courses to be held in Houston and North Wales. Expert trainers for RG’s headquarters provide basic and high levels training and advice to cater for all levels of operators.

The training courses gives hand’s experience for new users, as well as helping existing users refine their operations and get the very best out of their RG technology.

The courses also acts as an important forum for users to get together and share ideas and experiences.



The 3 day course covers basic operation, calibration, processing and general maintenance. A 2 day image processing course aimed at operators of Acoustic and Optical Televiwers follows the basic course.

Borehole demonstrations are included, and trainees are encouraged to get hand’s on.

Courses are generally held in May and October. Contact RG



RG Training Course in Houston

## NEW RG Package Prices

RG package prices are back! Please call RG USA or your local agent for prices and availability.

<b>Uranium Package A:</b>	RG Micrologger-2, 150M Mini Winch and Triple Gamma Probe
<b>Uranium Package B:</b>	RG Micrologger-2, 150M Mini Winch and 1024 Channel Spectral Gamma Probe
<b>Water Package A:</b>	RG Micrologger-2, 500m Winch and Elog/Gamma Probe
<b>Imaging Package A:</b>	RG Micrologger-2, 150M Mini Winch, HRAT Probe and RGLDIP Processing Software
<b>Imaging Package B:</b>	RG Micrologger-2, 150M Mini Winch, DOPTV Probe and RGLDIP Processing Software
<b>Imaging Package C:</b>	RG Micrologger-2, 150M Mini Winch, Hi-OPTV Probe and RGLDIP Processing Software

## Agents Profile - Brazil

### DRILL CENTER

TUDO PARA POÇOS ARTESIANOS

Founded in 1989, DRILL CENTER is a national supplier to the drilling industry in Brazil. The company supplies all products necessary for water well construction, and ensures reliable quality and competitive pricing for their clients. Drill Center is also well known in the Brazilian mining community, providing exploration equipment and technical support to the university and private sectors. Since 1996, Drill Center has served as the exclusive agent of Robertson Geologging in Brazil.

Drill Center is led by its Director, Mr. Apolo Oliva Neto. A geologist by trade, Mr. Neto's extensive experience in the Groundwater and Mining sectors enable to him to provide a level of local support that is unmatched in the



industry. His expertise in these industries is a valuable complement to the regional and global support offered by Robertson Geologging, and a benefit to all of our Brazilian clients.

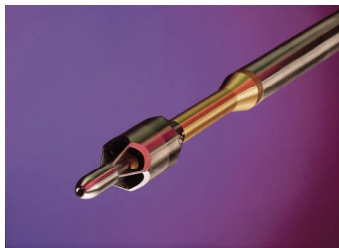
## RG Rentals

Existing US customers can benefit from RG USA's rental pool, which is exclusively for RG them.

Probes include:

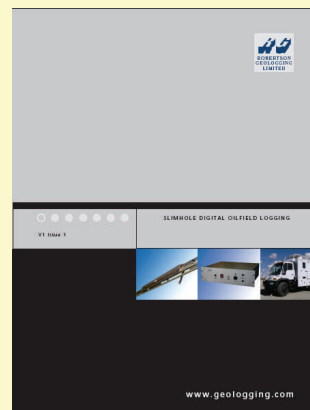
- HRAT (Acoustic Televiwer)
- Slimline Induction
- Electric Log
- Temperature/Conductivity/Nat. Gamma Probe
- Heatpulse Flowmeter
- 3 Arm Caliper

Plus various winches, backup Micrologger-2 systems and other probes from time to time.



## NEW OIL FIELD COMBINATION PROBE

RG launches it's New Oil Field Technology!



Contact RG today for our Brochure

## RG Regional News

### HONG KONG REGIONAL HUB

RG now has direct sales support in Hong Kong, to support our clients and representatives in the Middle East, Asia and Australia. This new development means, RG now offers its customers access to RG staff 24hrs a day. RG is the only slimline logging company offering such an international service.



### SALES AND SUPPORT

RG has 50 representative worldwide, and regional support centre's in the USA, UK and Hong Kong. During 2008 we will continue to try to improve our sales and after-sales service support to you, and look forward to receiving your comments on how you feel we can improve things further. Your comments matter!

### RGGA AUSTRALIA

RG's Joint Venture contract logging partner provides a comprehensive range of logging services throughout Australia. The Brisbane based operations use the very latest RG technology.

### RECORD GROWTH

2007 was another exceptional year for RG, with business growing 49% globally. At the beginning of 2008, we are confident of achieving another record year with a record number of orders already booked. We thank you for your continued support!



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