

***ANEXO II: CATALOGOS DE ALGUNAS COMPAÑIAS  
ESPAÑOLAS (Continuación)***



# COGEMA

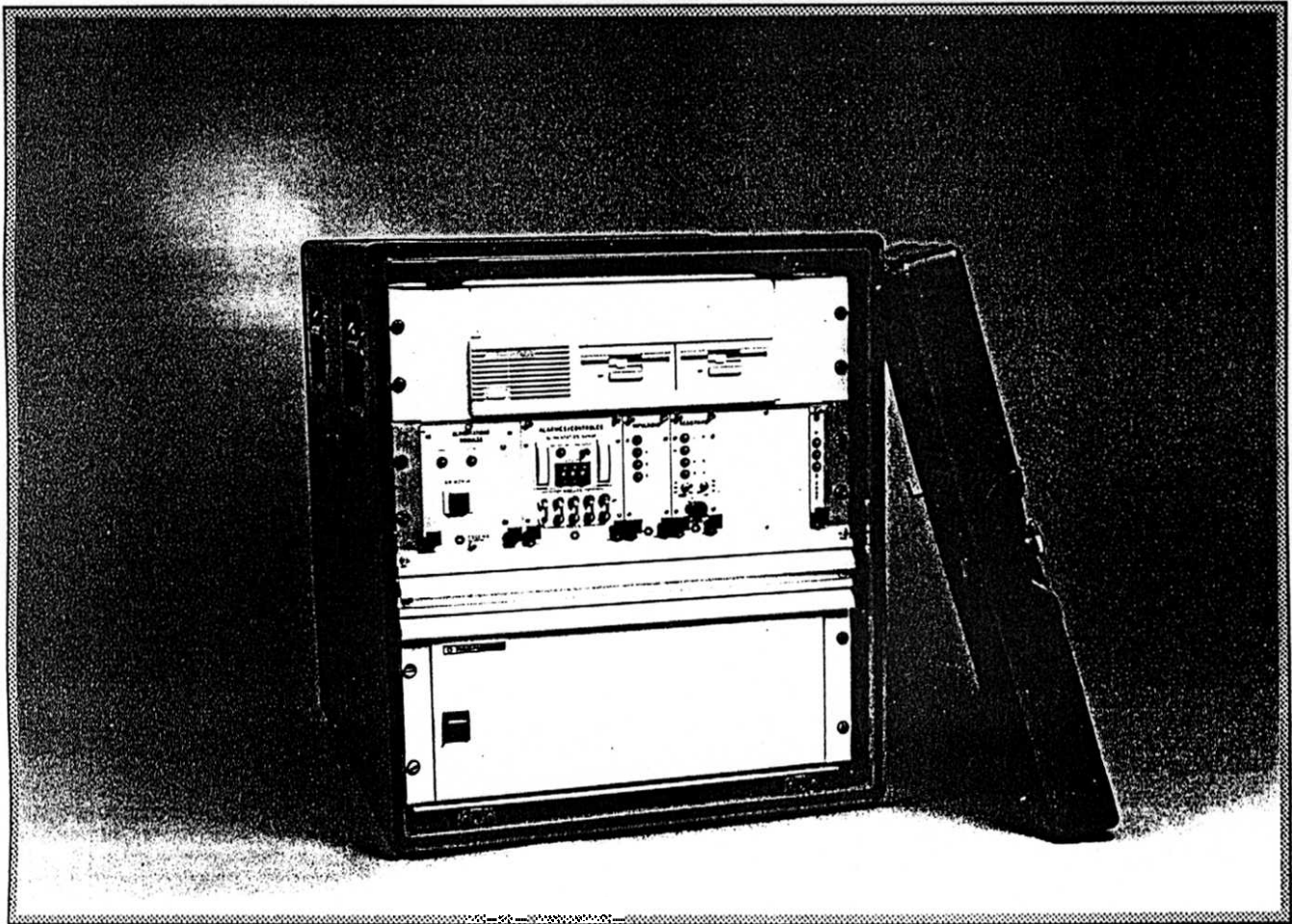
GROUPE CEA

BRANCHE URANIUM NATUREL.

SECTION DE RADIOMETRIE

## SYSTEME NUMERIQUE DE DIAGRAPHIE DIGITAL LOGGING SYSTEM

### COG BAN



**INSTRUMENTATION NUCLEAIRE - DIAGRAPHIES**

Etudes - Production - Vente

Prestations de services

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**COMPAGNIE GENERALE DES MATIERES NUCLEAIRES**

2, RUE PAUL DAUTER .BP 4. 78141 VELIZY-VILLACOUBLAY CEDEX FRANCE. Tél:(1)39.46.96.41. TELEX COGEM 699845 SA CAPITAL 5 000 000 000 F. RC VERSAILLES B 305 207 169

## SYSTEME NUMERIQUE DE DIAGRAPHIE

**PRINCIPE** : Systbmed'acquisition numérique embarqué sur camion pour diagraphies différées dans les sondages.

### **CARACTERISTIQUES :**

1) **Mécaniques** : Monté dans coffret porteur étanche avec chassis interne résistant aux vibrations : Dimensions hors tout : profondeur : **690 mm** ; hauteur : **620 mm** ; largeur : **540 mm**

Température de fonctionnement de **10° C à 40 °C**  
Poids **50 Kg.**

Refroidissement de l'ensemble réaiisé par turbine tangentielle : débit **320 m<sup>3</sup>/H**

2) **Electriques** : **220V 50 Hz** protégée par alimentation secourue (**300 VA**) : autonomie **30 minutes**. Fournit aussi les alimentations sondes de 0 à 60 V et de 0 à 500 mA.

3) **Electroniques** : transformation de toutes grandeurs analogiques ou impulsionnelles numériques :

• **Constitution** : chassis 19" ; H = 3 U

• **Modèle de base** :

1)  tiroir alimentations    2)  tiroir impulsions

3)  tiroir profondeur.

• **Options** :

Tiroir résistivité + P.S.\* ; tiroir P.P.\* ; tiroir déviation; et autres sur demande.

Tensiombtre (tension du câble)

Proximité (sonde hors trou).

• **Echantillonnage** : de 1 à 15 cm.

4) **Informatiques** :

Ordinateur HP **9000** serie **200** type **9920**

Ecran monochrome / clavier HPHIL

Lecteur de disquette **3" 1/2 (630 Ko)**

Carte A/D 8 voies (tension + courant sonde, PS, Résistivité, PP)

Interface IEEE

Liaison série (RS 232)

Carte comptage : 4 voies de comptage et 8 E/S.

### **OPTIONS :**

1) Imprimante **THINKJET** (IEEE)

2) Traceur numérique **A4** à déroulement de papier continu (IEEE).

\*P.S. = polarisation spontanée

\*P.P. = polarisation provoquée

## DIGITAL LOGGING SYSTEME

**PRINCIPE** : Digital acquisition system loadable on a vehicle for deferred drill logging.

### **CHARACTERISTICS :**

1) **Mechanical** : Mounted in sealed carrying case with vibration resistant internal chassis :

Overall dimensions : depth : **690 mm** ; height : **620 mm** ; width : **540 mm**

Operating temperature from **10 °C to 40 °C**

Weight **50 kg.**

Cooling of assembly by tangential turbine : **output 320 m<sup>3</sup>/H**

2) **Electrical** : **220 V 50 Hz** protected by standby power supply (**300 VA**) : autonomy **30 mn.** Feeds **0-60 v** and **0-500 mA** for the probes.

3) **Electronics** : transformation of all digital pulses or analog signals :

• **Composition** : chassis 19" ; H = 3 U

• **Basic model** :

1)  Power supply module    2)  Pulse module

3)  Depth module.

• **Options** :

S.P.\* + resistivity module ; I.P.\* module ; deviation module ; and others on request.

Tension meter (cable tension)

Proximity (probe outside hole).

• **Sampling** : from 1 to 15 cm.

4) **Computer** :

HP **9000** series **200** type **9920** computer

Monochrome screen/HPHIL keyboard

**3" 1/2** diskette drive (**630 kbyte**)

8 channel A/D card (voltage + current probe, SP, Resistivity, IP)

IEEE interface

Serial link (RS 232)

Counting card with **4** counting channels and **8 I/O.**

### **OPTIONS :**

1) **THINKJET** printer (IEEE)

2) **A4** digital continuous paper supply IEEE plotter.

\*S.P. = spontaneous polarization

\*I.P. = induced polarization



Otros :

- Calibre
- Temperatura

MOUNT SOPRIS 3000 NB-474

Parámetros

Eléctricos :

- Resistividad Normal Corta (AM = 16")
- Resistividad Normal Larga (AM = 64")
- Resistividad Lateral (AO = 72")
- Resistencia monoelectródica
- Conductividad
- Potencial Espontáneo

Radioactivos:

- Gamma natural
- Gamma-Gama
- Neutrón-Neutrón

Otros :

- Calibre
- Temperatura

Ambos equipos disponen de registrador analógico con capacidad de registro simultáneo de cuatro parámetros independientes y control digital de velocidad y profundidad, pudiéndose alcanzar una profundidad máxima de registro de 1000 m. Cabe destacar también que el diámetro de las sondas permite testificar incluso por el interior del varillaje de perforación, en el caso de que la existencia de margas u otros materiales expansivos así lo requiriesen. A continuación se exponen unas fotografías de dichos equipos con sus respectivas sondas.

actualmente el Grupo de Trabajo e Investigación del Departamento de Geofísica Aplicada de la E.T.S. de Ingenieros de Minas de Madrid, -- dispone de dos **equipos** autónomos de testificación geofísica montados en -- vehículos todo-terreno (Marca Land-Rover, 6 cil.), lo cual facilita el -- acceso de los mismos a casi la totalidad de las zonas donde se realizan -- los sondeos sin demoras añadidas.

### CARACTERISTICAS

A continuación les adjuntamos información de las características de los equipos:

#### GEOLOG-1000 Digital de ROBERISON RESEARCH

##### Parámetros

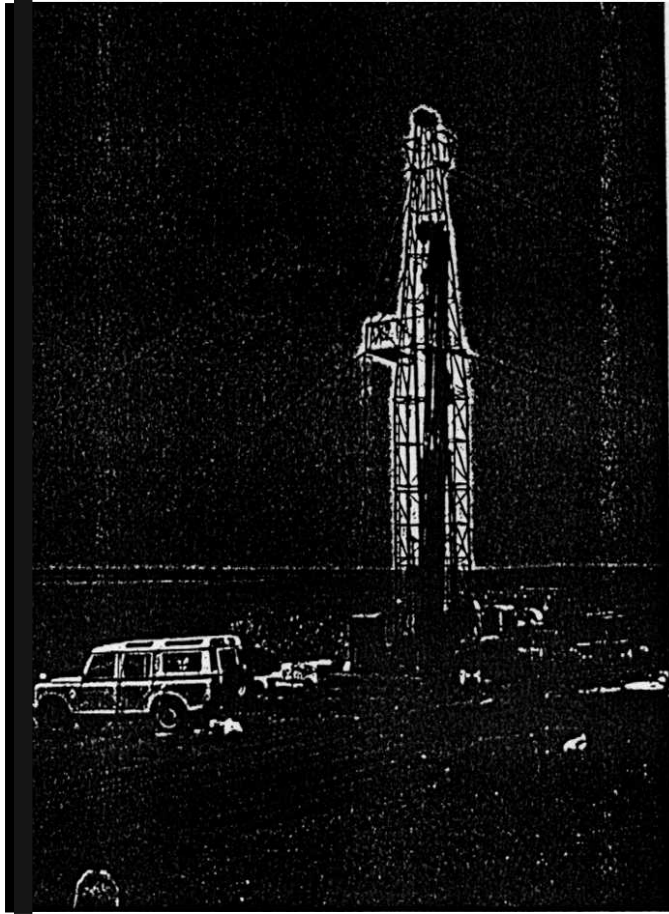
##### Eléctricos :

- Resistividad Normal Corta (AM = 16")
- Resistividad Normal Larga (AM = 64")
- Conductividad
- Potencial Espontáneo

##### Radioactivos :

- Gama Natural
- Gamma-Gamma (doble espaciado)

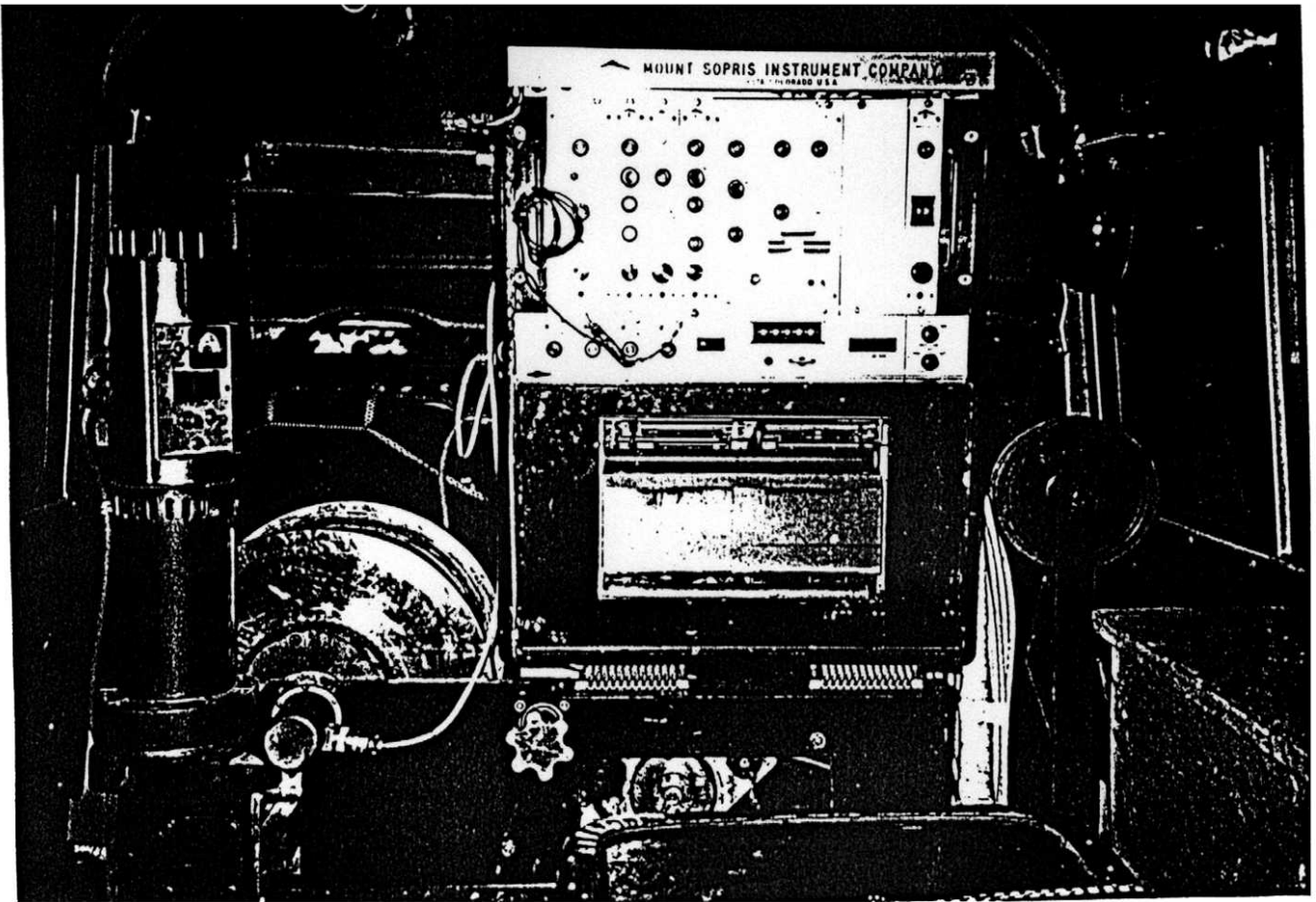
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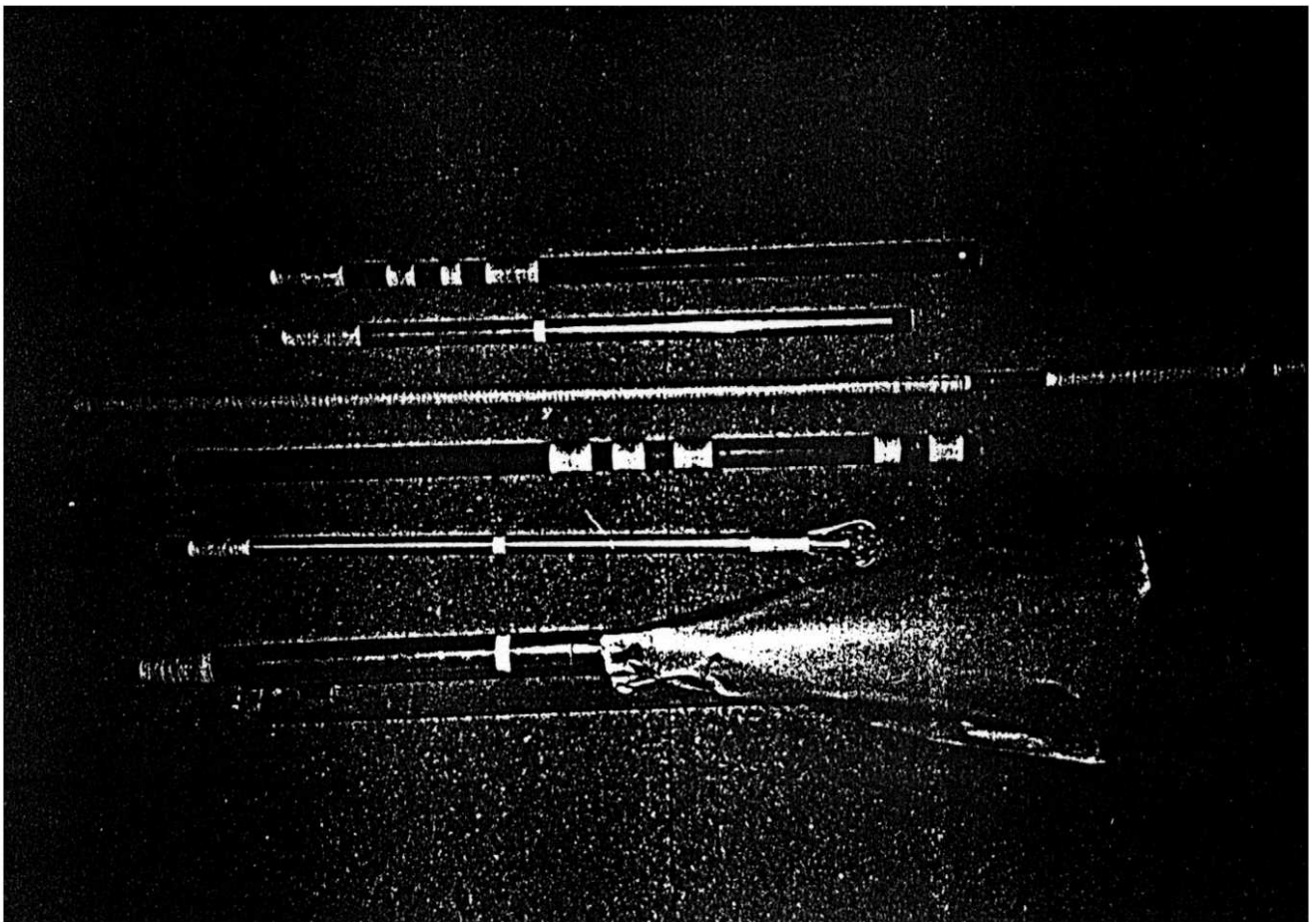
Testificando durante las labores  
de perforación con la máquina de sondeos



Testificación de sondeos abiertos en montaña



Equipo de testificación MOUNT SOPRIS 3000

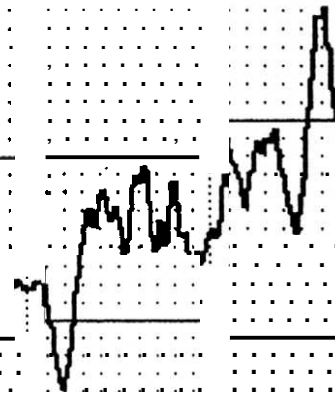
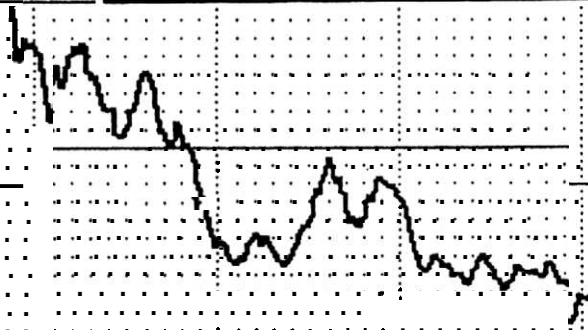
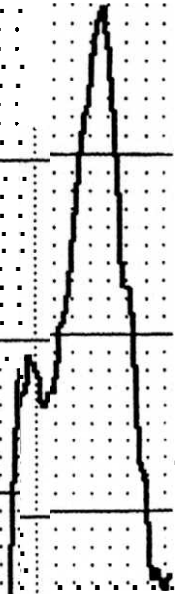


Sondas de testificación

# Compu-Log

a new generation of digital well logging systems from

**CENTURY GEOPHYSICAL CORPORATION**



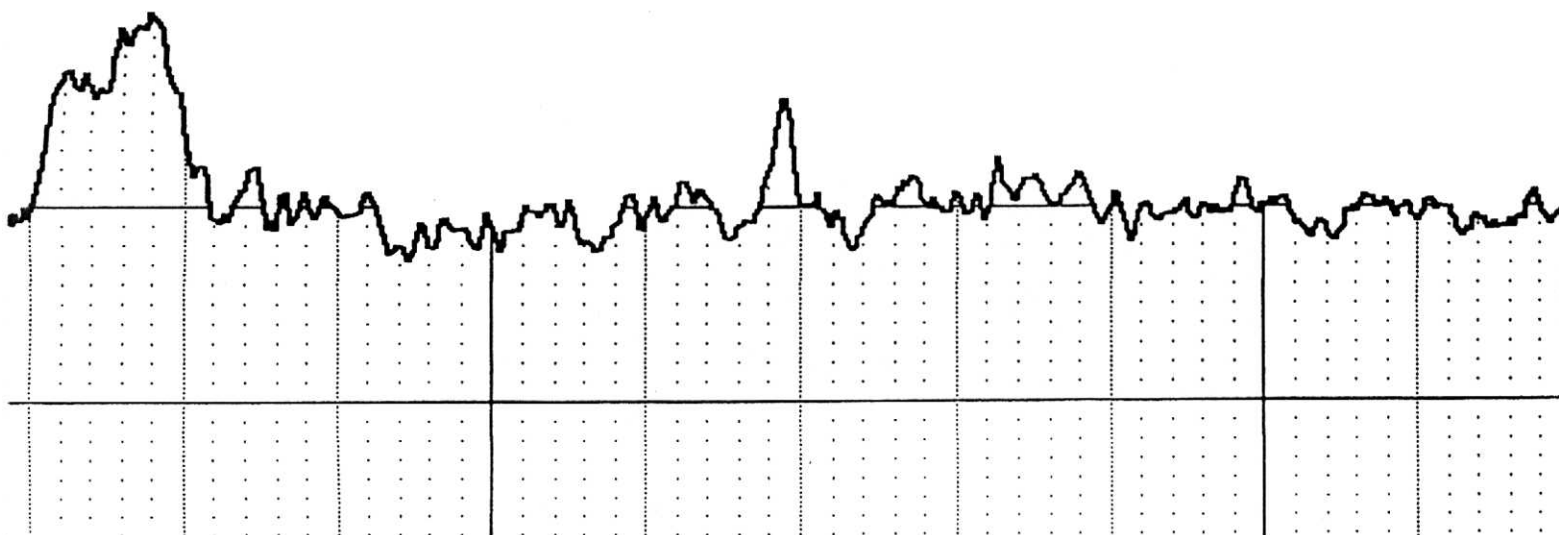
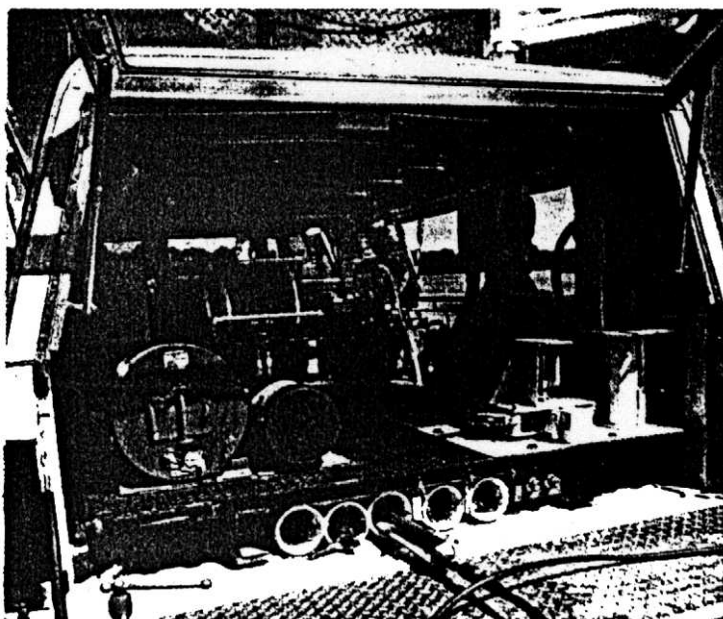


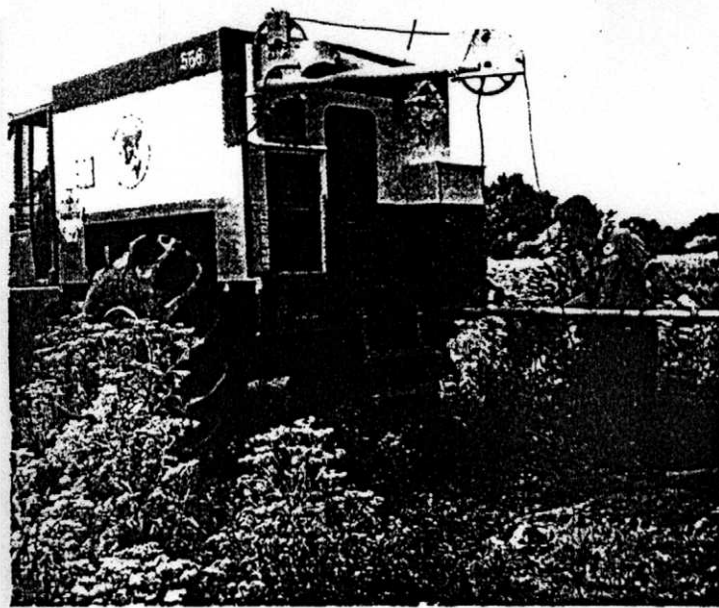
Century first brought the power of a mini-computer and the accuracy of fully digital systems to the logging industry in 1977. Century continues the tradition of constant improvement and engineering excellence by the development of the new Compu-Log system. Taking advantage of modern advances in computer technology, the new Compu-Log system offers even greater power in a more compact and rugged package.

The more compact and rugged packaging allows for a smaller and more mobile logging system. The Compu-Log system may be mounted in a variety of configurations including portable, trailer, or truck style units. Century's capable manufacturing team can customize the Compu-Log system to fit most any application.

In contrast to older analog units, the Compu-Log system needs no specialized uphole electronic "modules", or "patch-panels", to support any of our numerous tools. In addition, sensitive calibrations and conversions are controlled by the computer, insuring accurate logs every time. Furthermore, the Compu-Log system contains no "gain" or "bias" control knobs, which improperly used by the inexperienced operator, may alter log data results.

The Compu-Log system combines the best in production computer components with specialized equipment and downhole instrumentation designed and built by Century's experienced engineering staff. The hardware is coupled with easy to use menu-driven software written and supported by Century. This combination provides a proven and reliable fully digital logging system available for rental, sales, or service.



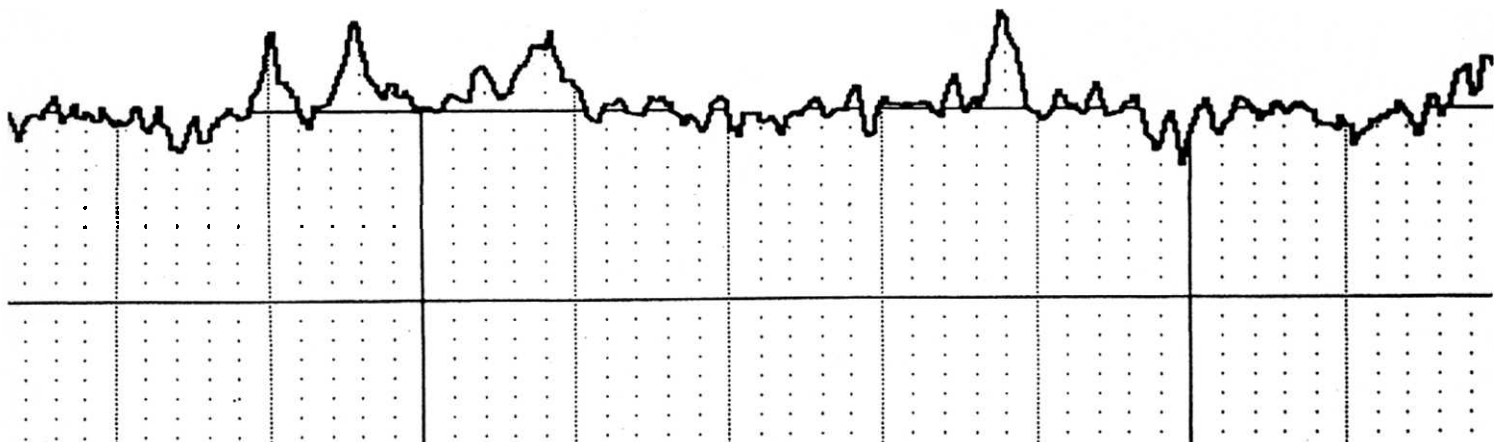


The surface processing equipment contains a high-speed computer which records the data in full floating-point precision for optimum accuracy and computational precision. The operator may select a variety of recording depth intervals to suit particular needs.

Downhole, Century's advanced digital logging tools collect data from multiple sensors, then transmit the digital data to the surface processing and recording equipment. This downhole digitization, perfected at Century, insures maximum accuracy and dynamic range in the data. The digital telemetry system minimizes data degradation and provides optimum noise immunity, which is generally associated with analog style systems.

For chart displays, Compu-Log's digital matrix graphics printer allows for a variety of presentation formats. The log chart may be created while logging, insuring the results recorded are as desired. Generating the scale grid along with the data traces eliminates the mechanical zeroing problems inherent in strip-chart type devices. Using multi-part paper produces additional log copies simultaneously for cost and time efficiency.

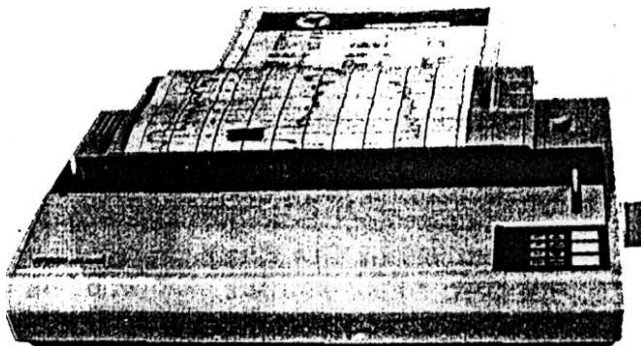
Once recorded on the system's hard drive, the log data from one or multiple logging runs can be re-plotted, merged, processed, listed out in tabular form, and transferred to other media, such as the standard floppy disc. This flexibility allows Century log data to be used with numerous log interpretation, subsurface mapping, or other sophisticated analysis packages.





Compu-Log offers fully digital processing capability, including:

- Bore Hole Compensated
  - Density
  - Neutron
  - Sonic
- Multi-point Calibration of Logs
- Real Time Plot & Merge
- Editing of Logs
- Merging of Logs
- Processing
  - Uranium Ore Grade
  - Coal Quality
  - Rock Strength
  - Hydrocarbon Saturation
  - Flowmeter Analysis
- Header Plot & Editing
- Editors
  - Plot Application
  - List Application
  - Paper Form
- Vertical Deviation Survey
- Shading of Logs



The Compu-Log is capable of handling everything from induction to single point resistance, high resolution to compensated density, uranium ore grade to coal quality analysis, dipmeter to borehole deviation, without any modifications or additions to uphole hardware or software.

The reliability of the Compu-Log is continually being proven on projects in harsh environments ranging from the tundra of Northern Canada to the desert of Central Australia.

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*Century*  
**GEOPHYSICAL CORP.**

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