



Operating and Reference manual

Software Version 6.2g

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MESSAGE

Auslog is a manufacturer of geophysical borehole logging equipment to coal miners, mineral explorers, groundwater consultants, geotechnical engineers and management authorities.

Services provided by Auslog include;

- Manufacture of geophysical borehole logging equipment
- Sale of geophysical equipment
- Rental of geophysical equipment
- Contract logging services
- Training
- Log transcription services
- Geophone repair facility
- Software development

Auslog Pty Ltd was incorporated in August 1990 and is a wholly owned subsidiary of Lacoste and Romberg, Canada. Auslog operates from company owned premises at Rocklea, and consists of an administration centre, fully equipped electrical and mechanical production and workshop facilities.

Auslog is dedicated to constantly improving and adding new equipment to its product range and undertakes the bulk of R & D completed in-house. To this end, Auslog invites all users to offer suggestions as to how they would like current Auslog equipment modified or upgraded and what new tools should be added to our product range.

Your suggestions are welcomed.

Yours faithfully

Managing Director

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Screen Numbers

This manual is designed to support the user of the DLS2 Digital Logging System, the DLS2Plus logging systems, the DLS4 and DLS5 Digital Logging Systems manufactured by AUSLOG. The operating software provided with these systems is designed to be easy to use and understand. This manual may be used for further reference in the unlikely event that a screen prompt is not as clear as it could be.

The software is screen based and all screens have a number (the screen number) in the upper right hand corner. Use this number (eg S-600) as an aid when reading this manual. All information pertaining to a particular part of the program is grouped together under the appropriate screen numbers in this manual.

Typical screens and menus are numbered according to the function or activity being performed:

200	Logging
300	Calibration
400	Logging
600	Setup
700	Replay
800	Special function

When using the program you will find that most options are selected by pressing one of the special function keys (eg [F1]). The symbol **[F1]** in this manual implies that you must press the key with the label 'F1' on it. Some prompts require the use of the numeric and or the alphabetic keys. Normally one does not need to be concerned with the case of alphabetic keys as the program automatically converts to the correct case where it is important.

AUTOMATED PROGRAM INSTALLATION

The ALOG program disk includes a simple installation program. This program will create a directory called AUSLOG on a hard disk and copy all necessary files to C:\AUSLOG (or any hard drive letter specified during installation).

Version A.6.2 runs in protected mode unlike earlier versions of the Auslog software which ran in real mode. There should be no discernible difference to the use of the program for most operators.

It will not run on any machine with an 8088 or 8086 CPU. The 80286 is the minimum CPU required for this version. At least 2Mb of RAM is required to run this version. As of this version the SIE T500 logging unit is no longer supported.

To use the simple installation program on the program disk, enter the following command at your system prompt:

```
A:  
INSTALL C
```

Note: the drive letter 'C' can be substituted with any hard drive letter. There is no colon after the drive letter.

For 80386 and later processors that is all that is required.

When using an 80286 machine that is not known to the protected mode run time manager it will be necessary to run perform an additional step after installation and before running the ALOG program.

This additional step is described here and is invoked by typing the following commands at the system prompt, and then a machine type identification program will run.

```
CD\AUSLOG  
DPMIINST
```

MANUAL PROGRAM INSTALLATION

You can copy the files manually if you wish to install the software into another directory or onto another hard (or floppy) disk.

First create the directory you wish to use then copy all files from the AUSLOG directory on the supplied floppy disk to your new directory. Refer to the Windows (or DOS) manual that came with your computer for the command to create a directory and copy files.

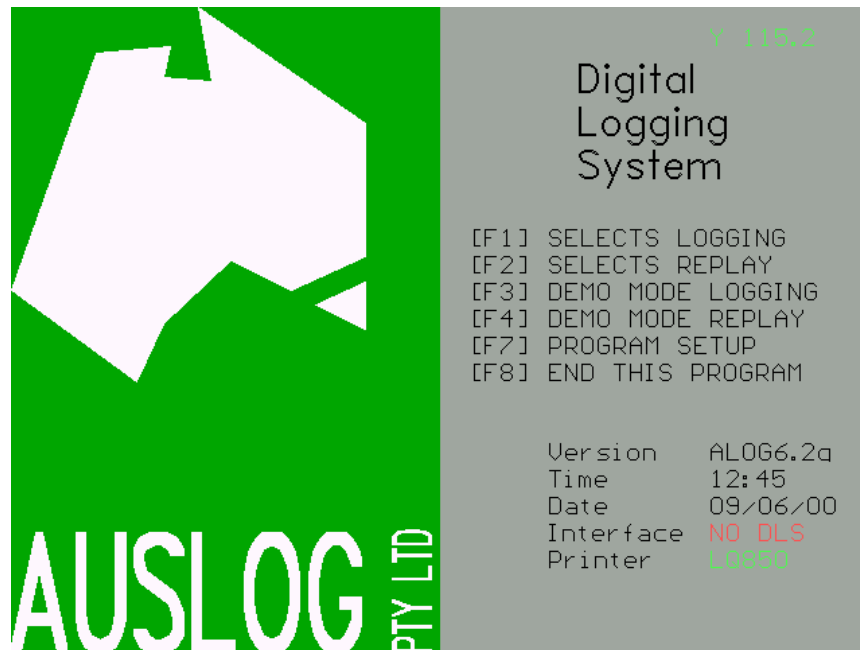
The installation program copies a number of batch files to the root directory of the hard drive. These are intended to facilitate access to the ALOG program. You may need to edit these files to represent your program directory name if you copy these to your root directory.

Problem reporting.

When reporting problems to us, it is useful to have the error number and the location at which the error occurs. This information should be displayed on the computer screen immediately after the program stops. Remember the conditions under which the problem occurs and let us know as soon as possible.

OPERATION - SOFTWARE

THE LOGO SCREEN



The screen displayed is called the *logo* screen and comes up under any of the following conditions

- 1 when the *computer* is turned on with the *ALOG program* inserted into the *boot* drive
- 2 the *ALOG program* is selected when using a *hard disk*.
- 3 from within the *ALOG program* when a return to the logo screen is requested.

The date and time displayed in the logo screen is read from the clock in the *computer*. If the date and or time are wrong it will be necessary to return to the operating system by pressing the [F8] key and making the necessary corrections. Refer to the Windows operating system, DOS manual or hardware reference guide for the time and date setting procedure for your computer.

Appearance of a **NO DLS** message (in red on colour screens) after the *Interface* prompt in the logo screen indicates that there is no interface connected, the interface is not turned on or is otherwise non-operational. The problem will have to be rectified before logging can proceed. If a DLS interface is connected, turned on and working correctly the NO DLS message changes to DLS 2, DLS 2+ or DLS 4 (in green on colour screens) depending on

which type of interface is attached. It is possible to replay logs without a DLS interface attached (assuming you have log data files on disk). **Check power is on.**

Similarly an **OFFLINE** appearing after the *printer* message means that the printer is not connected or not turned on etc. The program will operate normally but any function requiring selection of a printer will not be allowed unless the printer becomes available. When the printer is connected, turned on and online the currently selected printer driver type is displayed in place of the **OFFLINE** message.

- [F1] Initiates a *Logging* operation and will display the tool selection menu.
NOTE The programs for the Logging System are stored on the a single floppy disk (or on the *hard disk* if fitted). This disk contains both the logging and the replay software.
- [F2] Initiates the *replay* program. Control is transferred to the replay software at screen S-705.
- [F3] Demonstrates a typical logging operation. This mode may be terminated by pressing one of the valid keys shown on the display at the time.
- [F4] Demonstrates some of the replay capabilities of the software. This mode may be terminated by pressing one of the valid keys shown on the display at the time.
- [F6] Causes the program to enter *diagnostics mode*. Refer to Appendix C for a full description of this mode. This option is not displayed in the above screen.
- [F7] Enter the program setup screens via this key. Refer to screen S-600, as this is the first of the setup screens.
- [F8] Used to terminate the *ALOG program*. Selecting terminate in this screen will return you directly to the operating system.

LOGGING**TOOL SELECTION**

TOOL SELECTION MENU		S-200
1	GAMMA, EAL, LN REP	
2	GAMMA, EAL, LN LOG	
3	SP/PR	
4	ELOG	
5	GAMMA	
6	CALIPER -- 3 ARM	
7	NEUTRON	
8	DENSITY/CALIPER	
PRESS [F1] for more TOOLS		
F1 TOOLS		F8 QUIT F4 COMMENTS

This is the tool selection menu. Up to 8 tools may be displayed at any one time. The special key functions are shown at the bottom of the screen. To select a tool, press the NUMERIC KEY associated with the tool name. The COMPUTER will only accept one of the numbers associated with the tools displayed. When the tool has been selected, the program continues to the next screen S-201.

[F1] Will display more tools.

[F4] Allows the operator to create a comment file for printing and/or storage before running a log.

[F8] Pressing [F8] will return you to the starting (or logo) screen.

S-201	
TOOL : GAMMA	
SERIAL # 2300	
F5 QUICKLOG F1 NO Calibration F4 CALIBRATE	

This screen permits the entry of the tool serial number and continues logging using the current calibration data [F1]. The opportunity to calibrate the tool [F4] or use the Quicklog method of logging the borehole [F5].

When the screen is displayed, the cursor is positioned at the start of the serial number field. If the serial number is correct then it is only necessary to press the special function keys for the desired option. If the serial number is incorrect then the correct serial number can be entered. Entry of the serial number is confirmed by pressing either the ENTER key or a function key.

- [F1] The logging procedure will continue using the most recent valid calibration data for this type of tool.
- [F4] When selected the program advances to the calibration procedure for the tool. Calibration procedures start at screen S-300.
- [F5] This key is a short-cut way to record a log. It is intended for use where full header and chart scale parameter entry is not required. All parameters normally entered in subsequent screens are defaulted.

S-208

----- SELECT -----

[F1] CONTINUE LOGGING

[F2] SELECT new tool

[F3] REVIEW Sensor Offsets

[F8] RETURN TO MAIN MENU

This is the final screen of the tool selection/calibration phase of the logging function. The special function keys are used to select the next task. This is the last chance to correct a tool selection error or to do tool calibration before logging.

- [F1] Continues with the logging function. The tool may now be positioned at the top of the hole to allow the winch reference depth to be entered. The cablehead/tool junction is the tool reference point for all depth measurements.
- [F2] Return to the tool selection menu. The program disk contains a special file called the tool default file in which all the parameters of the Auslog range of tools are stored
- [F3] In some circumstances it may be desirable to alter the preset sensor offsets.
- The sensor offset is the distance between the cablehead/tool junction and the

measuring point of the sensor in the tool. For a standard gamma tool the sensor offset is 100 cm being the distance between the centre of the scintillation crystal and the cablehead/tool junction.

Sensor offset is always entered in cm and must include the length of any bridle used.

[F8] Pressing [F8] will return you to the starting (or logo) screen.



The screenshot shows a monochrome screen with the following text:

- Top right corner: **S-401** (cyan)
- Center: **----- REVISE or ACCEPT -----**
- Below center: **DEPTH is NOW : 0.23000 m**
- Bottom left: **F1 CONTINUE** (red)
- Bottom right: **F4 REPEAT** (red)

[F1] Accepts data on screen, continues to the next screen. When the program continues, the current winch depth is displayed on the screen. This screen is used to set the depth register internal to the DLS interface. If the winch is moving at this time, the depth will be in error.

[F2] Re-enter the data. [F4] can be pressed at any time during the entry of data.

The primary function of the screen is to check the winch reference depth. This should be done with the winch **STOPPED** and the tool positioned at the reference point for the hole. The reference point for the tool is the tool/cablehead junction. The winch depth is read from an internal register of the DLS interface as the screen is formed. If the winch is in motion at this time, an incorrect depth may be displayed.

The data displayed in each field of this screen represent the default values and may be left unchanged or altered as desired.

The data displayed in each field of this screen represent the default values and may be left unchanged or altered as desired.

To change a field, simply type in the new data (the field will be blanked when the first character is entered). The data entry is accepted by either a [ENTER] or [F1]. The value is checked for validity and if it is not acceptable, the word **BAD** is displayed after the data. The cursor is repositioned at the start of the field for re-entry of the data.

DEPTH Each time the screen is formed the current winch depth is read and displayed. It is necessary to check the winch depth with the tool positioned at the top of the hole or at the reference point for the hole. With the tool properly positioned, the winch depth is displayed and a new reference depth can be keyed into the system. Normally the winch reference depth would be zero, but any value may be used. The winch depth readings always increase downhole.

SPACERS This is an optional field and is only displayed for those tools that can have spacers added between the source and the sensor. If spacers are used, the TOTAL length of added spacers in centimetres (or 1/100th's of feet if using the Imperial depth measurement system) must be entered. The program computes the spacer adjustment based on this length.

After all data has been entered, the program waits for the operators response by pressing one of the labelled special function keys.

ENTER FILE NAME -----	S-482
C: DEMOLOG 2 -----^	
LAST FILE WRITTEN: DEMOLOG 1	
Available Space : 374176k	
F1 CONTINUE F2 Path	F8 NO RECORD F4 DOS Dir

This screen is for the entry of the filename under which your log data will be stored. The directory on which this file will be created is shown by pressing [F2]. The last file in the directory of the indicated device is shown as LAST FILE WRITTEN.

You will be unable to create a file with the same name as an existing file and any attempt to do so will cause the error message EXISTS! to appear. Simply select another name if this message appears.

In most instances the program will provide a sequential filename which you may accept or reject. If the LAST FILE WRITTEN has a suitable extension (ninth character in the range of 0..8) then a default filename will appear in the filename window. Due to the DOS directory structure it is possible that the suggested name already exists. In this case you will have to enter another file name.

- [F1] Accept the displayed filename, leave the file destination device (and directory) unchanged and continue to screen S-404.
- [F2] Will take you to screen S-650 for alteration of the default *data paths*. Refer to that screen for more information. Control will return to this screen S-402 when you are finished.
- [F4] Will present screen S-406 that is a catalogue of the (log) files in the current directory. Refer to that screen for more information. The program will return to screen S-404 on exit from screen S-406.
- [F8] Use this key to run a log *without storing* the log data. For example, during testing or training.

NOTES

A filename consists of nine characters. The *ALOG* program will allow embedded spaces but this is *not recommended* within the first eight characters. File names in this format will create difficulties for subsequent computer operations on these files.

The first eight characters of the filename will be used for the name part of the MS-DOS file while the ninth character forms the first character of the extension. The remaining two characters of the extension will be '-B'.

For example:

ALOG filename	MS-DOS filename	Comment
GAMMA 0	GAMMA.0-B	Ok
ELOGTEST1	ELOGTEST.1-B	Ok
NEW TOOL3	NEW TOOL.3-B	Difficult to use in DOS.

File Size Required.

The space required for a given log may be calculated roughly as follows :-

$$\mathbf{kB = ((2N+5)xD)/(10xI)}$$

Where **N** is the number of tool channels

D is the depth of the hole (in metres)

I is the (depth) scan interval (in cm)

EXAMPLE:

Gamma log of a 300m hole at recording interval of 5cm.

Gamma tool is single channel thus **N = 1.**

Hole is 300m thus **D = 300.**

Recording interval 5cm thus **I = 5.**

$$\begin{aligned}\text{Then kB} &= (((2 \times 1) + 5) \times 300) / (10 \times 5) \\ &= ((7) \times 300) / 50 \\ &= 2100 / 50 \\ &= 42\end{aligned}$$

We find that approximately **42kB** is required to store this log.

CATALOG of FILES on C:				S-486
NAME	SIZE	NAME	SIZE	
DEMOLOG 0	17k	DEMOLOG 1	0k	
DEMOLOG 2	0k			
End of Files on C:				
F5 PRINT F1 CONTINUE F2 ABORT F4 REPEAT				

If you select the [F4] DOS Dir option in screen S-402 then you will be presented with this screen. If there are too many files on the selected device to display on a single screen then the message 'End of Files on C:' will be replaced by 'Press [F1] for more Files'.

- [F1] Displays the remaining filenames if the message 'Press [F1] for more Files' is displayed. Otherwise this key will return you to screen S-402.
- [F2] This key will return you to screen S-402 immediately.
- [F4] Repeat will restart the display from the first file on the device.
- [F5] If a printer is attached (and online) then this option is offered. If selected it will print the filenames on the printer.


```
SELECT the Display Media      S-484
-----
[F1] Fast Printer
[F2] Hi Res Printer

[F4] SCREEN Only
```

Select the device on which the log data will be plotted while logging. This also selects the quality of presentation of the printout. Due to the necessary slower printing the selection of [F2] is **not recommended** during logging. The chart type and area is displayed on the screen in the same manner in which it is formatted for the printer. Refer to the SETUP section of the program.

- [F1] Will print the log in *draft* quality mode (fastest) on the attached printer (if available).
- [F2] Will print the log in *high* quality mode (fastest) on the attached printer (if available).
- [F4] Displays the log on the computer screen.

```
SELECT from FOLLOWING      S-485
-----
OK [F1] Logging UP by DEPTH
   [F2] Logging DOWN by DEPTH
   [F3] Logging by TIME

SAMPLE INTERVAL: 5.00 cm

F1 CONTINUE              F8 ABORT
F4 REPEAT
```

A log is recorded as a series of data points. The DLS interface needs to be told how often to send data to the computer for plotting and/or recording. The interface can send data based on depth intervals (normal) or at regular time intervals. This screen allows you to indicate to the DLS interface the *type* (depth or time based) of log you wish to record.

Having selected the *type* of log (and direction, in the case of depth based logs), you select the

logging interval. For time based logs the interval is selectable in 10ms increments. The minimum practical interval is 50ms and the maximum possible is 2550ms. A typical time based interval is 500ms.

For depth based logs the interval is selectable in 1cm (or 1 inch, if using imperial depth) increments and any value in the range 1cm (1 inch) to 255cm (100 inches) may be used. A typical depth based interval is 5cm (2 inches).

The screen is shown in its final form but it is actually formed in three stages:

Firstly The log type and direction is selected by pressing on of the special function keys [F1]-[F3]. Once one of the keys is pressed, they are no longer displayed in a highlighted colour. The chosen option is indicated by the appearance of an 'OK' to the left of the option selected.

NOTE: If the tool contains a caliper arm section, the option [F2] (logging down by depth) is not displayed.

Secondly When the log type and direction option has been selected, the screen asks for the logging interval in centimetres (DEPTH) or milliseconds (TIME). If at this point you decide the wrong option has been selected just press [F4] to enable reselection of the desired option.

Lastly Change the default interval (if required) then press [F1] to continue to screen S-409 or [F4] to repeat this screen or [F8] to abort the logging process and go to screen S-499.

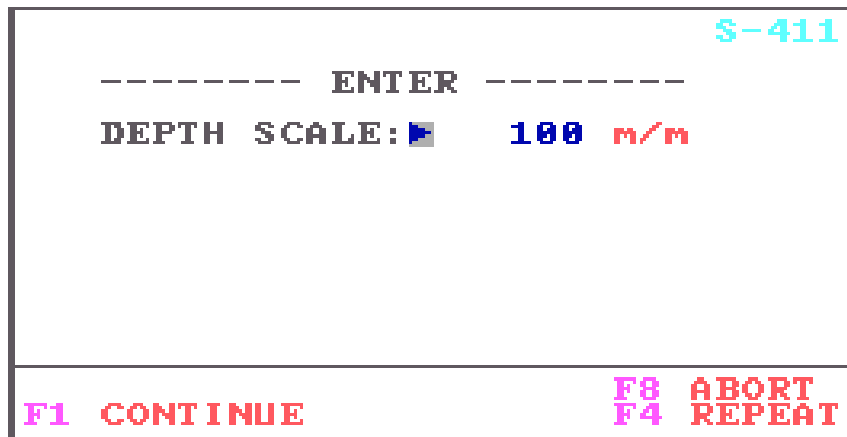
SUMMARY of LOGGING OPTIONS		S-409

FILE NAME:	C:DEMOLOG 4	
CHART TO :	PRINTER	
LOGGING :	UP by DEPTH	
INTERVAL :	5.00 cm	
F1 CONTINUE		F8 ABORT F4 REPEAT

This screen marks the end of the logging data entry section. This screen summarises the more important options and gives the operator the opportunity to continue or to re-enter data that may be incorrect.

If the log data is not being stored then **NOT RECORDING** is displayed.

- [F1] If [F1] is pressed, the program will continue to screen S-411.
- [F4] Pressing [F4] will allow the logging options to be re-entered by going back to the first screen of this section (S-401). If this option is taken, the logging option parameters may be reviewed prior to commencing the log.
- [F8] Abort the logging process and go to screen S-499 where you may elect to start again, choose another tool or finish for the day etc.



This screen is used to enter the depth plot scale for use when logging. It has no effect on the data recorded. The scale factor chosen, depends on the depth measurement system, the selected scan intervals and on the resolution desired.

The following suggestions can be used.

For ease of reading the chart, a depth scale that is an even multiple of 10 should be used. (ie. 100, 50, 20, etc). Scales such as 33, 42, etc should be avoided. The actual depth scale used is limited by the aesthetics of the graph produced. From experience it has been found that the following produce the best results:

For a scan interval of 5 cm's; a depth scale between 200 and 20.

For a scan interval of 2 cm's; a depth scale between 100 and 10.

As the scale decreases, the points are plotted further apart and a point is reached where the graph appears very piece wise.

As the scale increases a point is reached where the points begin to be plotted at the same depth due to the overall resolution of the output device. The latter situation can present difficulties in interpretation.

If a TIME BASED log has been selected this screen will ask for the time scale to use in plotting the log. Ten (10) seconds per centimetre would be a 'normal' value although you

may select any reasonable value you wish.

CHANNEL 1 GAMMA		S-412
AMPLITUDE (API) FROM: 0.0		
TO: 200.0		
CHART LOCATION, FROM: 0.00000		
(max 32) TO: 10.00000		
FILTER CONSTANT: 2.00000		
PLOT TYPE: 1.00000		
F1 CONTINUE		F4 REPEAT

This screen is used to enter the chart plot parameters for each channel. The channel name for which the parameters apply is displayed at the top of the screen.

The values displayed in each field are the default values or in the case of the hole being "relogged" the last values entered.

If the value of the field is correct, pressing ENTER will "accept" the value and move the cursor to the next field.

Should the value of the field need to be altered, type in the desired value (must be numeric), then press ENTER to enter the value.

If the data is invalid, the word BAD will be printed, and the cursor will be repositioned at the start of the field. In this case, enter valid parameters. It is not possible to proceed to the next screen if invalid data is entered.

[F1] This key will accept the parameters as shown. The program will immediately display the parameters for the next tool channel if there is one. Otherwise screen, S-419 will be displayed.

[F4] Allows re-entry of data for the screen

[F8] Use this key if you do not wish to plot this particular tool channel. Note that you must plot at least one channel to generate a log. The program will cycle through the tool channels until one is selected for plotting.

The data fields are described below:

AMPLITUDE The channel amplitude units of measure are shown in the brackets after the word: AMPLITUDE. The amplitude values are in tool units (i.e. inches, cps, mV, ohms).

The raw data readings from the tool are converted to these units for plotting by the calibration equation for the channel. When plotted the FROM value will be the leftmost chart value while the TO amplitude value will be the rightmost chart value.

LOCATION The two lines following the amplitude values are the chart location parameters. These define a "window" within the physical chart area in which the channel data will be plotted. The FROM value is the left margin of the area while the TO value is the right margin of the area. The physical chart areas depend on the output device being used and the printer width set in the printer setup section.

FILTER The filter constant is the time constant that is to be used in filtering the data. The value is in seconds. The value may range from 0 to 99999. The values usually used are:- 0.5, 1, 2, 5, or 10. As the filter constant increases, the degree of filtering increases.

This version of the ALOG program supports depth based filtering. To specify depth based filtering use negative integers for the filter constant. Typically values of -1, -3, -5 etc. up to -11 may be used. These constants represent the number of scan intervals over which to average the signal. The negative sign is simply to indicate that depth based filtering is required.

PLOT TYPE This parameter has two functions. One function is to define what happens when a log tries to go beyond its allotted plot area (on printed logs only). The other function is to define the amount of compression or expansion (if any) to apply to the log.

Log wrapping and truncation options are set with plot types of 2,3 or 4. One way compression/expansion is set by adding 4 to the basic plot type. Add 8 to the basic plot type for two way compression/expansion.

When using compression/expansion an additional parameter will appear on the screen. This is the COMP COEFF (compression coefficient) and defines the amount of compression/expansion that is to occur. Values between 0 and 1 will lead to compression whilst values greater than 1 will cause expansion. A negative value and zero itself are illegal, a value of 1 will have no effect and values greater than 1000 are not allowed.

See "Data" Chapter for more detail on the effects on presentation of data.

S-419	
CHART PARAMETERS ENTERED	
F1 CONTINUE	F8 ABORT F4 REPEAT

This screen is displayed when all chart parameter data has been entered. It allows one to review previously entered data and change the data if required.

- [F1] Continue to the next screen S-421.
- [F4] Return to the start of the chart parameter section. The chart parameters as entered will be "remembered" so this repeat function can be used to review the data and it is only necessary to enter new data where required.
- [F8] Aborts the logging process and advances to screen S-499.

LOG IDENTIFICATION EX		S-421
HOLE NO.:	AUSLOG TEST HOLE #2	
DATE	13/06/00	
TIME	13:42	
COMPANY	AUSLOG	
AREA	SUMNERPARK	
PROSPECT:	VERY GOOD	
OPERATOR:	CB	
--		
F1 Next		
## DRILLING DATA ##		
		S-421
DRILLED	23/4/98	
PERM DAT	GROUND	
ELEV	0M	
AZIMUTH	0	
INCLIN	0	
NORTHING	344556E	
EASTING	4451224N	
HOLE DIA	5"	
DEPTH	80M	
--- MORE TO FOLLOW ---		
F1 Next		F4 Previous

This screen is used to enter header information for storage with the log data. This information can also be printed out at the start of each log and every replay of that log if so desired.

The information is stored on the program disk between log sessions thus only information that actually changes between logs needs to be entered. To modify any of the data fields:

- Move the cursor to the line to be altered by pressing the [ENTER] key. Then type in the correct data.
- When the first character is entered, the remainder of the field is blanked.
- Errors can be corrected by using the BACKSPACE key to delete characters to the left of the cursor and then retyping the data.

The data is followed by one of two messages depending on whether the current screen is the last of the header screens or not.

-----MORE TO FOLLOW-----

or

----END OF HEADER DATA----

The special function keys allow the user to "browse" through the header data as follows:

- [F1] Displays the next section of header data. If the last of the data is already displayed then a terminating screen is displayed (S-422).
- [F4] The previous screen of header data will be displayed. If the current screen is the first then the same data is re-displayed.



This screen is displayed when all of the header data has been entered.

- [F1] Continue to the next step.
- [F4] Re-enter the display of the log header data starting from the beginning at screen S-421.
- [F8] Abort the current log and goes directly to screen S-499.

SELECT FUNCTION	S-423

[F2] HEADER DATA	: ON
F1 CONTINUE	

This screen offers the operator the option of printing the header data on the printer (or display the header data on the screen if that is the option chosen).

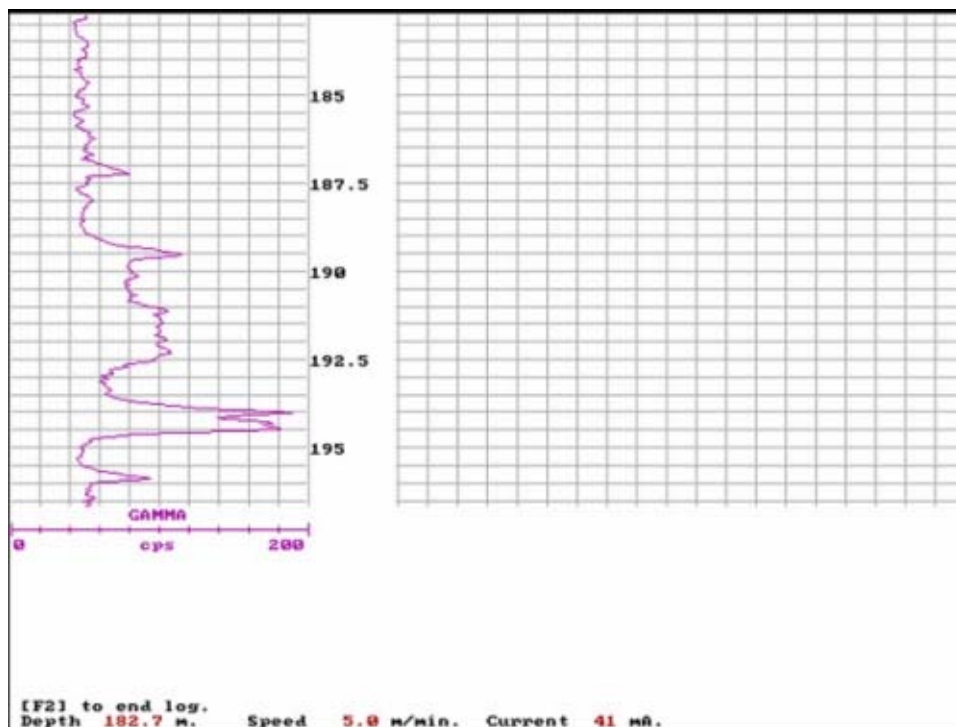
- [F1] Accepts the current setting of the header print (display) setting. The program will then continue to screen S-440.
- [F2] This key toggles the print (display) header flag between on and off.

S-440	
Lower TOOL to STARTING DEPTH	
press	
[F1] when READY	
Depth	0.29 Speed 0.1
F1 CONTINUE F4 SET DEPTH F8 ABORT	

This screen appears just prior to starting the log. This screen allows the operator to monitor the depth and speed of the tool while moving the tool to the intended log starting depth. This may not be necessary if intending to log while lowering the tool in the borehole. The screen provides a convenient last check on the depth of the tool in the hole with the provision to modify that depth if required.

- [F1] Will allow the log to start. The log will start immediately if time based or as soon as the winch moves in the correct direction if depth based. Everything should be ready before pressing [F1] when running a depth based log. **WARNING:** too long a delay between pressing [F1] and starting the winch when running a depth based log MAY result in corrupt data.

- [F4] The current depth is displayed in a window and the operator is offered the chance to change it. If the depth is correct then simply press the enter key. Control will return to this screen.
- [F8] Will terminate the current logging session and go to screen S-499.



If logging to the screen the log will displayed with the depth, speed and current shown on the bottom line of the display. The message Press [F2] to End is also displayed. This will terminate the log and save all data recorded to date (if data is being recorded). After pressing [F2] the message press [F1] to continue will appear. Pressing [F1] will then take the operator to screen S-499.

When logging to the printer the following screen is displayed while logging is in progress.

```
S-451

      Plotting Log

Hit [F2] to Terminate

Depth   397.1 m
Speed   5.0 m/min
```

The hole will be logged until the special function key [F2] is pressed. This will normally be at the top or bottom of the hole or where the logging was to finish.

```
S-499

-----
END OF LOGGING PROCESS
-----

SELECT FROM THE FOLLOWING

[F1] SELECT New Tool
[F2] RELOG the Hole
[F3] ADD Comments
[F8] RETURN TO MAIN MENU
```

This is the last screen of the logging system and is displayed at the completion of the logging process. The desired option is selected by pressing the special function key associated with the option.

- [F1] Return to the Tool selection menu. This option is used when it is desired to relog the same hole with a different tool. The program will repeat the steps for entering the logging options and the chart parameters.
- [F2] Relog the hole using the same tool. The program returns for re-entry of the logging options and the chart parameters.
- [F3] Enables comments to be entered. These comments can be printed (if a printer is attached) and/or written to a data file on the current destination device.

[F8] Restart the program from the main menu (or logo screen). From here you may elect to run another log, replay a log you have already run or terminate the program etc.

CALIBRATION

TOOL SELECTION MENU		S-200
1	GAMMA.EAL.LN REP	
2	GA	
3	SP	
4	EL	
5	GA	
6	CA	
7	NE	
8	DE	
PRESS [F1]		
F1 TOOLS		

S-201	
TOOL : GAMMA	
SERIAL #2300	
F5 QUICKLOG	
F1 NO Calibration	F4 CALIBRATE

[F4] Puts program into Calibration mode for the currently selected tool.

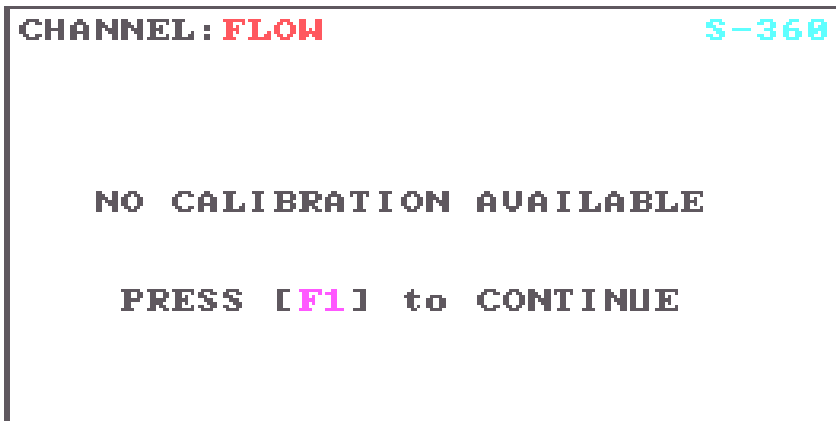
Calibration data for each tool is stored in the Tool Default File on the hard disk. This means the tool does not have to be calibrated each time it is used. If the tool is not calibrated the previous calibration values will be used.

Each tool channel is calibrated using one of several general calibration procedures. In general each of these procedures consist of:

- The positioning of one or more calibration devices.
- Averaging several readings taken at fixed intervals.

Using the data to compute the coefficients of a calibration equation for each channel. This equation is used to convert the channel raw-data readings to real units for plotting of the logs. The data stored in the log DATA file is raw data. Calibration data is also stored (in the header) which enables the readings to be similarly converted to 'real units' on replay.

Some tools are factory calibrated and require no field calibration. These tools do not have a calibration procedure and the ALOG program will indicate when no calibration is available by displaying screen S-360. Press [F1] to allow the program to return to the logging screen S-208 via screen S-399 (Calibration Complete).



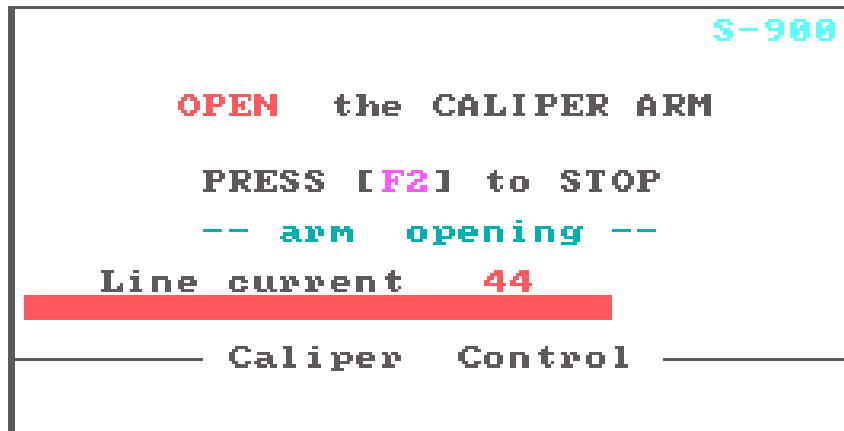
For assistance with individual tool calibration procedures. Refer to the operating instructions accompanying each tool.

The calibration procedure for a caliper tool will be described here, as it is reasonably typical.

Tools with a caliper arm need to have the arm opened before calibration. To allow opening (or closing) of the arm screen S-900 will appear before the first calibration screen of such a tool.

The actual control of the arm is provided by the special function keys that in this case act as switches that open the arm, close the arm or stop the arm movement.





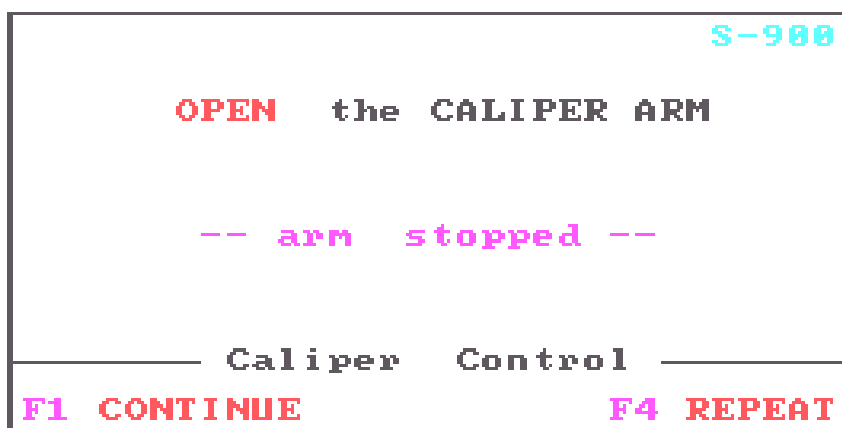
[F3] Will apply power to open the arm. When pressed the a message will be displayed as on the above:

The operator should monitor *bar graph* on the above screen. The current will be high while the arm is opening. When the current falls to a lower value, the arm is fully open and the operator *must* stop the arm by pressing [F2].

It is necessary to open the caliper arm before the program will continue with calibration.

A message in the centre of the screen is controlled by the program and tells the operator what state the arms should be in.

To *stop* the arm press the [F2] key. The tool power will be removed and a message will be displayed:



[F1] Return control to the program if the arm is stopped. Pressing [F1] will then return control to the calibration section (screen S-335). The program displays

the state of the arm (open or closed). If this does not agree with what the program expects then the screen will keep appearing until the arm is in the correct state. For example, the arm must be open in order to start logging and one may not proceed unless the arm is open. In this case press **[F4]**.

[F4] Return control to the screen S-900closed).

NOTE The program knows only that the operator made an attempt to open or close the arm. It is up to the operator to make sure that he has fully opened (or closed) the arm before continuing.

CHANNEL: CALIPER		S-335
Enter your CALIBRATION values.		
Small ring	101.6	mm
Large ring	203.2	mm
F1 CONTINUE		F8 ABORT F4 REPEAT

This screen allows the operator to make use of various known sizes (of pipe or plate etc) to calibrate the caliper arm. Two different sizes are required for calibration. Once the sizes available have been entered select one of the special function keys as follows:

[F1] Continue to screen S-336 for positioning of the first plate (or ring etc) and accumulation of the tool reading.

[F4] Restart this screen. Useful if a mistake has been made in specifying ring or plate sizes.

[F8] Exit this screen. No changes will be made to the calibration data stored in the Tool Default File. A log can still be run using the calibration from last time.


```
CHANNEL: CALIPER                                S-336

Position the SMALL calibrator.

F1 CONTINUE
```

The operator is required to place the calibrating device over the arm (or arms) of the caliper tool. The device should be placed in such a manner that the caliper tool arms assume the positions they would attain if held vertically in a borehole of the same diameter as the calibrating device. For the three-arm caliper tool this precludes lying the tool on a table or bench top unless the arms are allowed to protrude over the edge of the table.

[F1] Press [F1] when the proper size plate (or ring) is in position. Care should be used in positioning the plate (or ring) as inaccurate calibration could result from careless placement of the calibrator.

When the program is finished with the small plate the above screen will reform as screen S-337. It will ask you to apply the LARGE calibrating device and again press [F1] when ready. Another reading will be taken and then the program will go to screen S-338.

```
CHANNEL: CALIPER                                S-338

Calibration is complete.

101.6 MM = 2970 CPS
203.2 MM = 4349 CPS

MM=      0.073677      -117.1900

F1 CONTINUE                                F8 ABORT
                                           F4 REPEAT
```

This screen is displayed when the calibration is complete. The counts for the two calibration device are displayed along with the calculated calibration equation.

NOTE If either of the counts were zero or the count for the small calibrating device was the same as that for the large calibrating device, the following screen is displayed in place of the calibration equation:

```
CHANNEL: CALIPER                                     S-338

      Calibration is complete.

      101.6 MM = 0      cps
      203.2 MM = 0      cps

WARNING -- CALIBRATION INVALID

F1 CONTINUE      F8 ABORT
                  F4 REPEAT
```

The Tool Default File remains unaltered until valid data is obtained.

The COMPUTER waits for the operator to press one of the special function keys:

- [F1] Press [F1] if the calibration result is acceptable and the program will advance to the next tool channel. If this is the last (or only) tool channel the program will advance to screen S-399.
- [F4] Repeat the calibration for this channel.
- [F8] Abort the calibration of this and all subsequent channels in this tool. Screen S-398 will be displayed.

```
                                                                S-398

      CALIBRATION ABORTED

F1 CONTINUE      F4 REPEAT
```



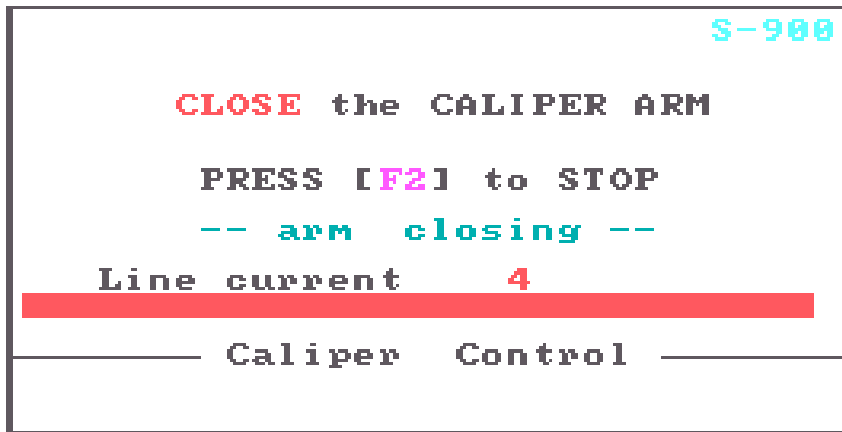
This is the final screen of tool calibration and is displayed after all channels for the tool have been calibrated. If any of the tool channels had an invalid calibration or the calibration for the channel was aborted then the previous calibration data for that channel remains unaltered.

The program pauses for the operator to respond:

- [F1] Return to the logging software at screen S-900. Before displaying screen S-900 the new calibration constants will be written into the tool default file.
- [F4] Repeat the COMPLETE calibration procedure for all channels of the tool.

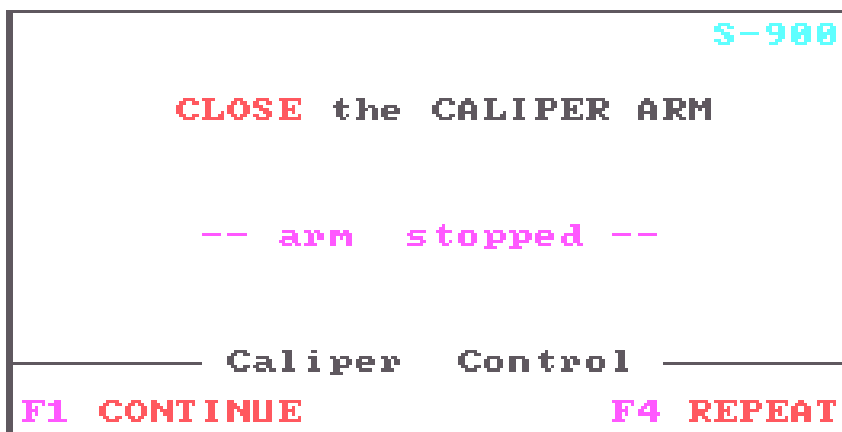


- [F4] Will apply power to close the arm. When pressed the following message will be displayed:



The operator should monitor *bar graph* on the above screen. The current will be high while the arm is closing. When the current falls to a very low value, the arm is fully closed and the operator can (must) stop the arm by pressing the special function key [F2].

To stop the arm press the [F2] key. The tool power will be removed stopping the arm and a message will be displayed:



[F1] Return control to the program if the arm is stopped. Pressing [F1] will then return control to the logging section of the program (screen S-208). The program displays the state of the arm (open or closed). If this does not agree with what the program expects then the screen will keep appearing until the arm is in the correct state. For example, the arm must be open in order to start logging and one may not proceed unless the arm is open. In this case press [F4].

[F4] Return control to the screen S-900.

REPLAY

S-705

ENTER NAME OF FILE TO REPLAY

E: S077LOG 0
-----^

F5 All Files
F1 CONTINUE

F6 Merge
F2 Path

F8 Quit
F3 Dos Dir

The ALOG program has a built in replay facility. Since only *raw data* is recorded, running a replay of a log is just like running the log again. The data may be plotted using different filters, merged with other logs or be copied to a floppy disk to name but a few of the many options available in this section of the program.

The screen is for entry of the file name of the log file to be replayed. The full file name must be entered exactly as it was when the log was recorded. A search is conducted on the default drive for the file specified. No directory information is shown on this screen.

If the file is not found then the computer displays NOT FOUND after the filename. The cursor will be repositioned at the start of the filename field for entry of another name.

When the requested file is found the header information is read. The program will then advance to screen S-707 if the file is a comment file or S-710 if the file is a log file.

- [F1] Accept the displayed filename and continue to the next screen.

- [F2] Replay a file on another device (disk drive or directory). The program will go to screen S-650 for entry of new data paths.

- [F3] Display the names and sizes of the (log) files on the default device. Screen S-706 is used for this purpose. After viewing (and/or printing) the catalogue, control will return to this screen for selection of the file to replay.

- [F5] Allows the automatic replay of all files in the current directory. The operator simply enters parameters for the first log and once the selected operation for the first log is complete, every other file in the directory is similarly replayed.

[F6] Enter the merge replay section of the program. Then screen S-708 will be displayed where up to five (5) filenames may be entered.

Data will be read from all files listed and all channels within those files will be available for plotting or autoscan etc. Typically this function would be used to plot multiple logs from one borehole or a series of logs from a series of boreholes on the same chart.

[F8] Returns to the main menu (or logo screen). From here the operator may return to the logging mode or terminate to DOS.

S-658

SET LOG DATA PATHS

SOURCE : C:\AUSLOG\LOGS
 DESTINATION: C:\AUSLOG\LOGS_

F1 CONTINUE F8 ABORT
F4 REPEAT

The above screen allows the operator to change the drive and directory for the log files.

S-706

CATALOG of FILES on C:

NAME	SIZE	NAME	SIZE
A941DEV 0	70k	A941DEV 1	69k
S037INGA1	17k	S037INGA2	17k
S037INGA3	2k	S077LOG 0	30k

End of Files on C:

F5 PRINT
 F1 CONTINUE F2 ABORT F4 REPEAT

If you select the [F4] CATALOG option in screen S-705 then you will be presented with this screen. If there are too many files on the selected device to display on a single screen then the message 'End of Files on C:', will be replaced by 'Press [F1] for more Files'.

- [F1] Use this key to display the remaining filenames if the message 'Press [F1] for more Files' is displayed. Otherwise this key will return you to screen S-705.
- [F2] This key will return you to screen S-705 immediately.
- [F4] Will restart the catalogue display from the first file on the device.
- [F5] If a printer is attached (and online) then this option is offered. If selected it will print the filenames on the printer.

NOTE: When cataloguing a *disk directory* only filenames with an extension ending in '?-B' will be displayed. This extension is automatically added to log files by the ALOG program. Only ALOG program log (or comment) files can be 'replayed' by the ALOG program.

Comment File: CALIPER 1 S-707
Created: 28/07/00 at 14:00
This a test log with a caliper
F1 CONTINUE F2 PRINT F8 quit

This screen is displayed if the file selected for replay is a comments file. The file-name, date & time of creation and the first page of comments is displayed. The COMPUTER waits for the operators response.

- [F1] Return to the file selection screen (S-705) for the entry of another file name.
- [F2] Print the *whole* comment file to the printer (if attached). This is the only way to read a multi page comment file.
- [F8] Will return the operator to the main (logo) menu screen.

NAME OF FILES TO MERGE		S-708

C:	S037INGA1	
	S037INGA2	
-----^		
MERGE INTERVAL :	5.000	cm

F1 CONTINUE	F3 CATALOG	F8 ABORT
	F4 REPEAT	

The above screen is the first seen after selecting the [F6] MERGE key in screen S-705. This is where the operator specifies the names of the files to be merged.

Up to five filenames may be entered. As each filename is entered, the computer looks to see if the file exists in the current directory. If it does not the message **NOT FOUND** is displayed after the name of the file. The cursor is positioned at the start of the filename to allow entry of the correct name.

[F1] Continues to the next screen (S-710).

[F3] Display the names and sizes of the (log) files on the default device. Screen S-706 is used for this purpose. After viewing (and/or printing) the catalogue, control will return to this screen for selection of the files to replay.

[F4] Repeat the screen should one of the filenames be incorrect.

[F8] Will return the operator to the main (logo) menu screen.

The [F3] key will give a catalogue of the available files.

If the file exists the cursor drops down to the next line for entry of the next filename. Should less than five files be required, other entries must be blanked out by

1. Pressing **the [F1]** or enter keys (if already blank).
2. Entering a space character as the first character (if not already blank).

When all filenames have been entered the [F1] CONTINUE key becomes active.

```
SELECT REPLAY FUNCTION          S-710
-----
[F1] REPLOT the LOG
[F2] AUTOSCAN FILE
[F3] PRINT RAW DATA
[F4] SEE HEADER DATA ONLY
[F5] COPY FILE to DISK
[F6] MODIFY HEADER DATA
[F7] PLOT/NEW SYNTHETIC FILE
[F8] RETURN TO MAIN MENU
```

This screen is the Replay Program function menu. At this point the operator has selected the file to be replayed. He now selects an operation from those available.

[F1] This function will replot the log. Having selected this function the program advances to screen S-711 for selection of the plot device.

[F2] This function will produce a summary of the log. The program goes to screen S-711 for selection of display device. The following information about the log is displayed by this function.

- Minimum/maximum depth values
- Number of data scans
- Minimum/maximum values for each channel
- Average value for each channel

If one of the channels is a caliper then the volume of the hole will also be displayed if the Caliper Conversion factor is correct. For more information refer to the Misc setup in the program setup section.

[F3] This function will print the raw data from a log. The program goes to screen S-711 for selection of the display device. The following data is displayed:

- Depth (in centimetres)

and your choice of the following three

1.
 - Time interval (in seconds).
 - Channel values (in counts).
2.
 - Channel values (in counts/second).
3.
 - Channel values in real units (where available).

[F4] This function prints the log chart header data that is comprised of:

- Data such as hole number, location data etc
- Tool data such as type, serial no. etc

[F5] Will copy a log from the source device to the destination device. If the default devices are unsuitable then screen S-650 is presented to allow alterations. Otherwise the program advances to screen S-780 while the copy operation takes place.

Note: This function is not available when replaying a merged log.

[F6] Allows the operator to edit the header data of a previously recorded log. The program will advance to screen S-720 to allow editing of the header data for the current file. The last screen of this function will be S-650 and will prompt you for a new destination directory. This new destination directory must be typed in, if not the cursor will stay at this point. The modified file will be written to this directory. It will have the same filename as the source file. In this way the original file is not over written.

[F8] Pressing [F8] will return to the main menu (logo) screen.

```
SELECT the Display Media      S-711
-----
[F1] Fast Printer
[F2] Hi Res Printer

[F4] SCREEN Only
```

This screen appears after screen S-710 if the function chosen will produce some output. You are required to indicate the display device for the output from the chosen function.

On selecting one of the above options the program will advance to screen S-712 for selection of the chart scale (where appropriate) and depth range for the replot.

The N/A indicators shown above will display if a printer is not connected or is offline. When these indicators are displayed you will be unable to select either of the two keys [F1] or [F2].

- [F1] Output to the printer (if available). This produces a 'draft' output of the log file. Refer to the *ALOG program setup* section of this manual for configuration information.
- [F2] Output to the printer (if available). The *high resolution* mode is used for plot data and *letter quality* for textual and graphical data.
- [F4] This key will replot the log to the *computer screen*. The chart area for this display is divided into a number of equal spaced divisions. The number of divisions is the same as that set for the printer width.

```
----- ENTER -----      S-712
DEPTH SCALE: ▀ 100 m/m
REPLOT FROM: 0.00
              TO: 9999.00

F1 CONTINUE      F8 ABORT
                  F4 REPEAT
```

This screen is used by the replay program to prompt the operator for the *depth range* of interest. If the log is being plotted then the *depth scale* prompt appears as well. If the log was a *time based* log then a *time scale* is requested instead.

RANGE The replot range specifies the range (metres) over which log data will be processed. This depth is relative to the tool/cablehead junction. The log will always be processed from the minimum depth (*from*) to the maximum depth (*to*). When plotting the chart will stop at the maximum depth. A (*to*) depth of 9999 defaults to the maximum depth logged.

Caution should be taken when replotting a section of a log to "bracket" the area of interest sufficiently so that important data is not lost. This is very important when using depth correction. The depths entered are taken as the cablehead depth. If depth correction is being used, the actual channel trace will not begin until the sensor depth (below the cablehead) is reached. This can be up to ten (10) metres for some tools.

SCALE Any value can be selected for the scale. Normal scale values range from 20 (:1) to 500 (:1). The (:1) is assumed. For a *time based* log a typical scale is 10 seconds/cm.

NOTE: As scale decreases, the points are plotted further apart and a point is reached where the graph appears very "chunky". As the scale is increased the vertical resolution of the display device becomes a limiting factor in log interpretation. Experience will indicate the most suitable scales for your logs.

CHANNEL 1 Induct Cond		S-714
AMPLITUDE (S/m)		FROM: 100.0
		TO: 200.0
CHART LOCATION, FROM:		12.0
(max 32) TO:		22.0
FILTER CONSTANT:		1.0
PLOT TYPE:		1.0
F1 CONTINUE		F4 REPEAT

This screen is used to enter the chart plot parameters for each channel. When the screen is formed, the channel name for which the parameters apply is displayed at the top of the screen.

The channel amplitude units of measure are shown in the brackets after the word: *amplitude*. The values displayed in each field are the default values or in the case of the file being repeated, the last values used last time. The cursor is positioned at the first field to be input (Amplitude (uuu), From).

To enter data :

- If the value of the field is correct, pressing <enter> will "accept" the value and move the cursor to the next field.
- If the field is to be altered, type in the desired value (must be numeric), then press < If enter> to enter the value.
- If the data is correct, the cursor will move down to the next line.

If the data is invalid, the word BAD will be printed, and the cursor will be repositioned at the start of the field. In this case, enter valid parameters.

The use of the special function keys is displayed at the bottom of the screen below the dashed line.

[F1] This key will accept the parameters as shown. The program will immediately display the parameters for the next tool channel if there is one. Otherwise screen S-715 will be displayed.

[F4] Whenever [F4] is pressed, the screen will be immediately reformed allowing the parameters for this channel to be re-entered. Very useful when an error is discovered in one of the fields. Any data already entered will be displayed in

its respective field, thus only the data actually in error needs to be re-entered.

- [F8] Use this key if you do not wish to plot this particular tool channel. Note that you must plot at least one channel to generate a log. The program will cycle through the tool channels until one is selected for plotting.

The data fields are described below:

AMPLITUDE The amplitude values are in tool units (i.e. inches, cps, mV, ohms). The raw data readings from the tool are converted to these units for plotting by the calibration equation for the channel. When plotted the *FROM* value will be the leftmost chart value while the *TO* amplitude value will be the rightmost chart value.

LOCATION The two lines following the amplitude values are the chart location parameters. These define a "window" within the physical chart area in which the channel data will be plotted. The *FROM* value is the left margin of the area while the *TO* value is the right margin of the area. The physical chart areas depend on the output device being used and the printer width set in the printer setup section.

FILTER Two types of filters are available with this version of the ALOG program.

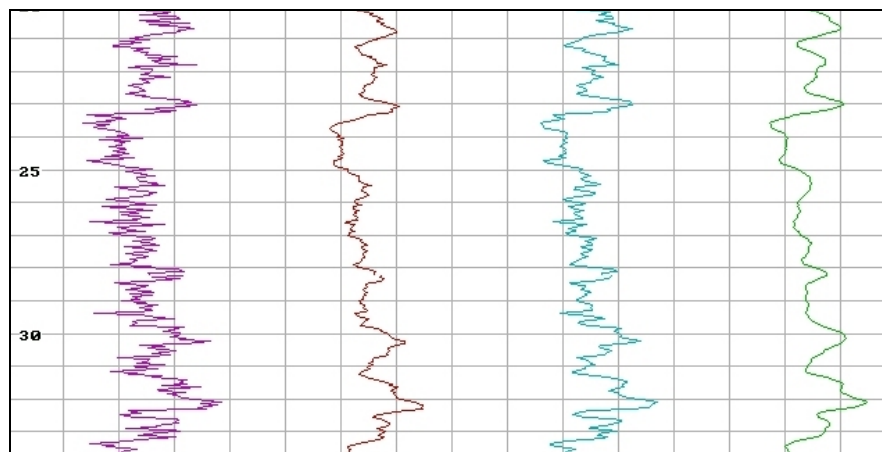
1. The first type, with positive values such as 0.5, 1, 2, 10, etc., is a digital equivalent of the old analogue 'time constant' where nuclear count rates were accumulated for a chosen number of seconds before recording. The value is in seconds. As the filter constant increases, the degree of filtering increases.
2. The second filter a depth based filter. It is designated as a negative odd number, is a weighted moving average digital filter. '-5' for example is the data value at a particular depth averaged with the two values above and below it. Typically values of -1, -3, -5, etc up to -11 may be used. These constants represent the number of scan intervals over which to average the value. The weighting factors may be changed if required.

Diagrammatically

Filter weight:	1	3	5	3	1
Observed value:	10	12	15	8	2
			↓		
Plotted value:			13.3		

$(1 \times 10 + 3 \times 12 + 5 \times 15 + 3 \times 8 + 1 \times 2) = 147 / 11 = 13.3$

Example of the effects of different filters



Filter#1 Zero filter Filter#2 2TC Filter#3 -3 Filter#4 -11

Above are some examples of the effect of different plot types based on the same data

PLOT TYPE This parameter has two functions. One function is to define what happens when a log tries to go beyond its allotted plot area (on printed logs only in this version of the software). The other function is to define the amount of compression or expansion (if any) to apply to the log.

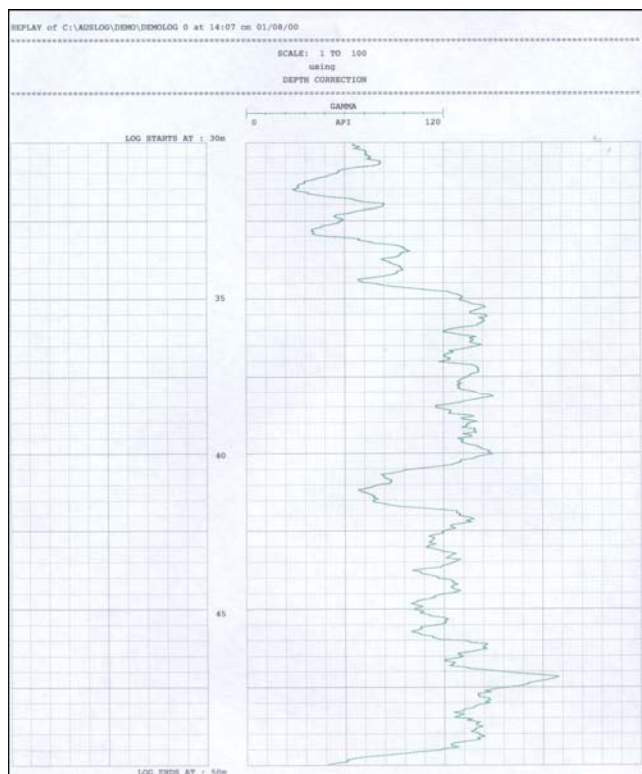
Log wrapping and truncation options are set with plot types of 2,3 or 4. One way compression/expansion is set by adding 4 to the basic plot type. Add 8 to the basic plot type for two way compression/expansion.

When using compression/expansion an additional parameter will appear on the screen. This is the COMP COEFF (compression coefficient) and defines the amount of compression/expansion that is to occur. Values between 0 and 1 will lead to compression whilst values greater than 1 will cause expansion. Negative values and zero are illegal, a value of 1 will have no effect and values greater than 1000 are not allowed.

<u>Basic plot type</u>	<u>Action</u>
1.	Truncation at edge of plot.
2.	Truncation at edge of channel area.
3.	Wrap at edge of plot.
4.	Wrap at edge of channel area.

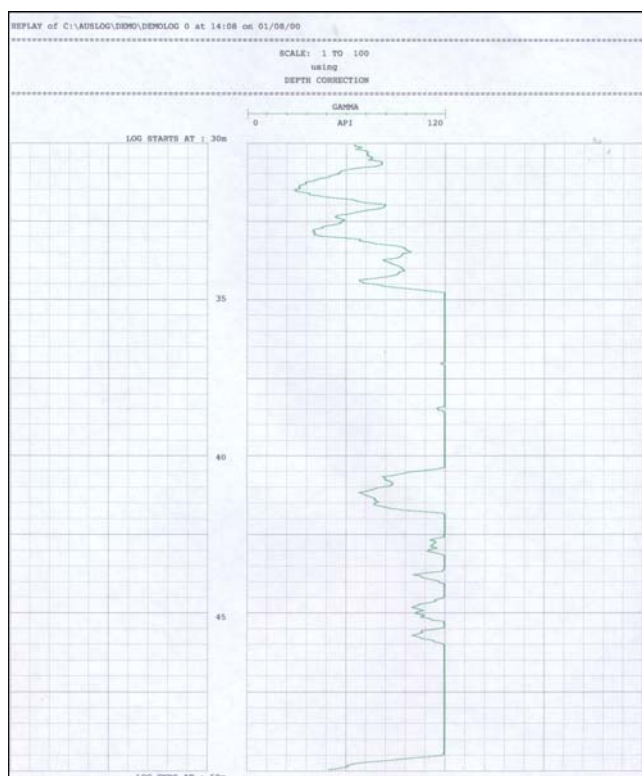
Zero (0) is also acceptable and is treated as for one (1) above.

PLOT TYPE 1 – Truncated at the edge of the Page



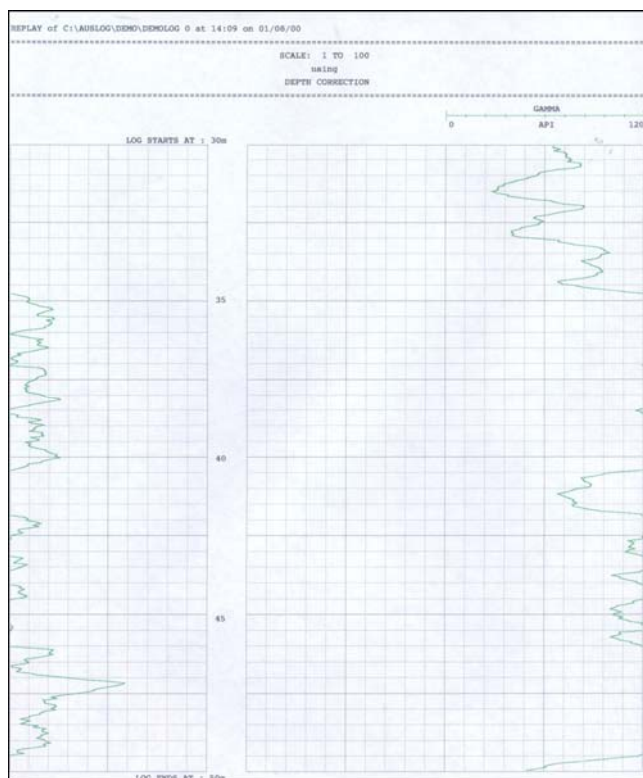
CHANNEL 1 GAMMA	S-714
AMPLITUDE (API) FROM:	0.0
TO:	120.0
CHART LOCATION, FROM:	12.0
(max 32) TO:	22.0
FILTER CONSTANT:	2.0
PLOT TYPE:	1.0
F1 CONTINUE	F4 REPEAT

PLOT TYPE 2 - Truncated at the edge of the channel area



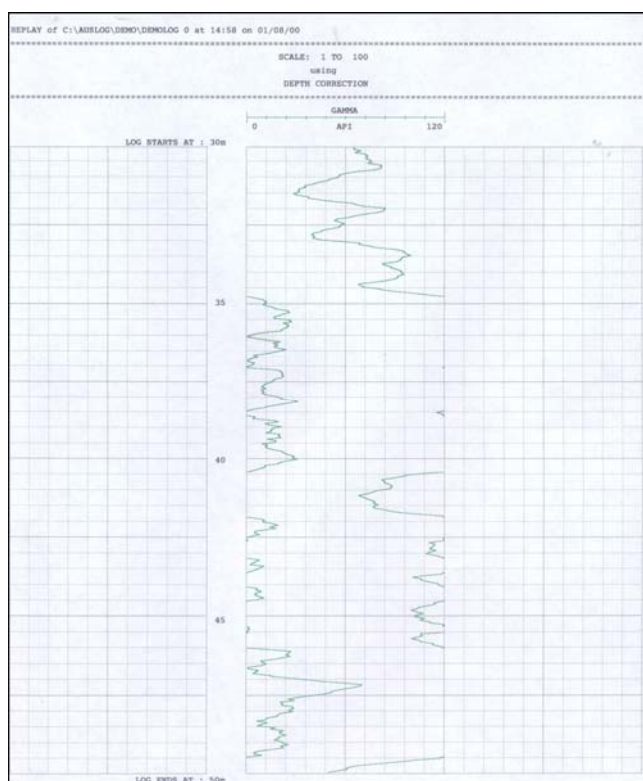
CHANNEL 1 GAMMA	S-714
AMPLITUDE (API) FROM:	0.0
TO:	120.0
CHART LOCATION, FROM:	12.0
(max 32) TO:	22.0
FILTER CONSTANT:	2.0
PLOT TYPE:	2.0
F1 CONTINUE	F4 REPEAT

PLOT TYPE 3 – Wrapped at the edge of the Page



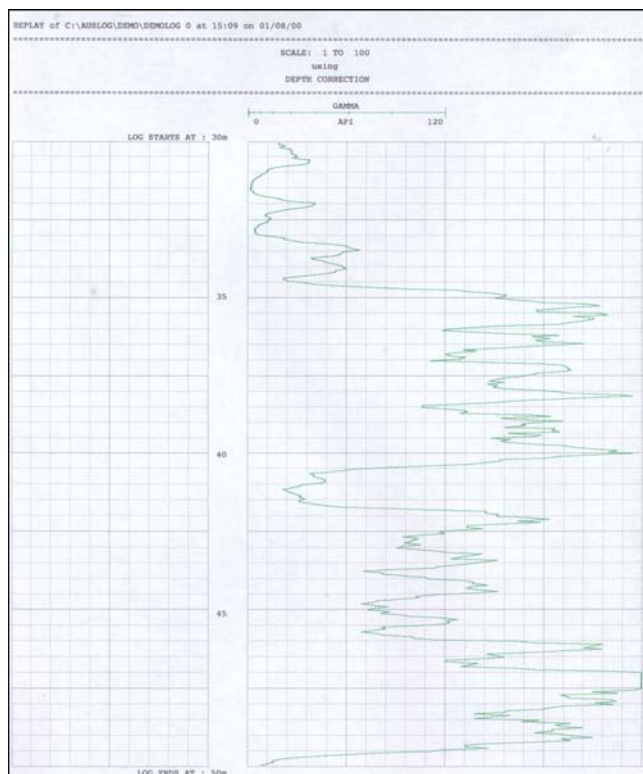
CHANNEL 1 GAMMA		S-714
AMPLITUDE (API) FROM:		0.0
TO:		120.0
CHART LOCATION, FROM:		22.0
(max 32) TO:		32.0
FILTER CONSTANT:		2.0
PLOT TYPE:		3.0
F1 CONTINUE		F4 REPEAT

PLOT TYPE 4 - Wrapped at the edge of the channel area



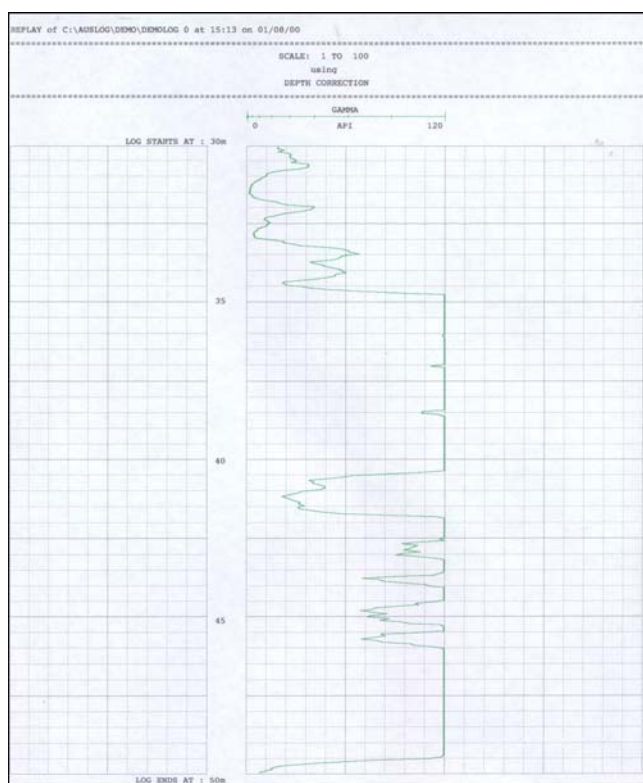
CHANNEL 1 GAMMA		S-714
AMPLITUDE (API) FROM:		0.0
TO:		120.0
CHART LOCATION, FROM:		12.0
(max 32) TO:		22.0
FILTER CONSTANT:		2.0
PLOT TYPE:		4.0
F1 CONTINUE		F4 REPEAT

PLOT TYPE 5 – One way expansion and truncated at the edge of the Page



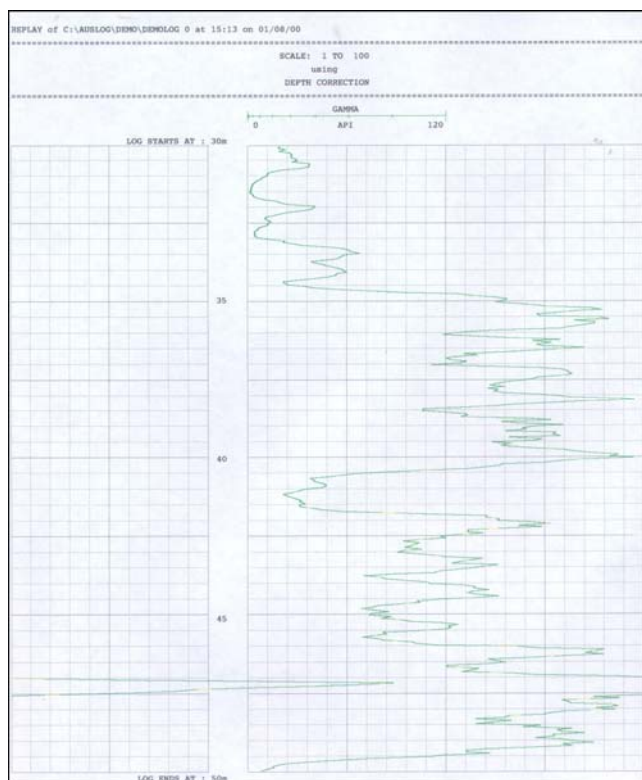
CHANNEL 1 GAMMA	S-714
AMPLITUDE (API) FROM:	0.0
TO:	120.0
CHART LOCATION, FROM:	12.0
(max 32) TO:	22.0
FILTER CONSTANT:	2.0
PLOT TYPE:	5.0
COMP COEFF:	3.0000
F1 CONTINUE	F4 REPEAT

PLOT TYPE 6 – One way expansion and truncated at the edge of channel area



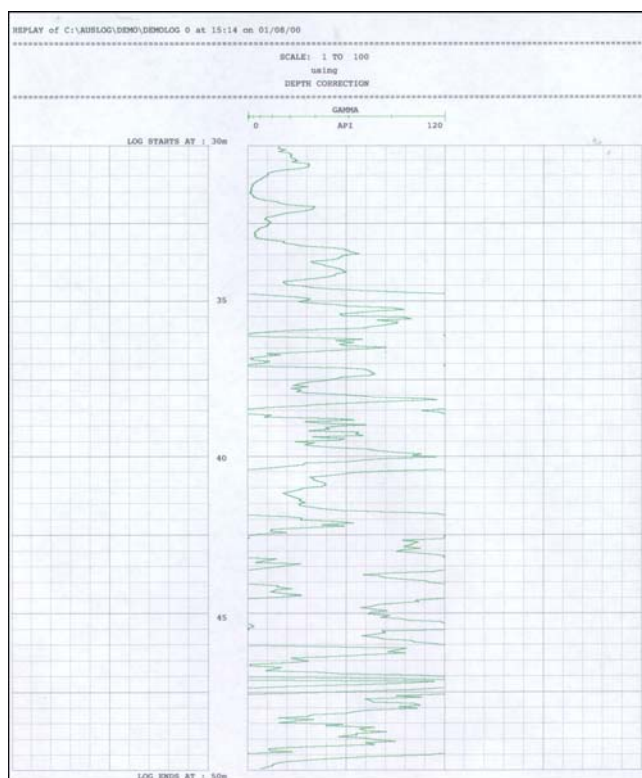
CHANNEL 1 GAMMA	S-714
AMPLITUDE (API) FROM:	0.0
TO:	120.0
CHART LOCATION, FROM:	12.0
(max 32) TO:	22.0
FILTER CONSTANT:	2.0
PLOT TYPE:	6.0
COMP COEFF:	3.0000
F1 CONTINUE	F4 REPEAT

PLOT TYPE 7 – One way expansion and wrapped at the edge of the Page



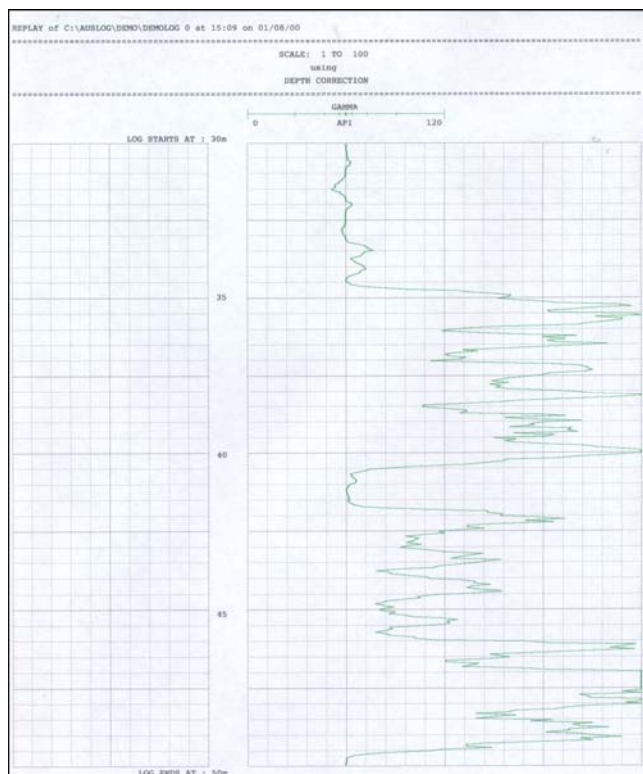
CHANNEL 1 GAMMA	S-714
AMPLITUDE (API) FROM:	0.0
TO:	120.0
CHART LOCATION, FROM:	12.0
(max 32) TO:	22.0
FILTER CONSTANT:	2.0
PLOT TYPE:	7.0
COMP COEFF:	3.0000
F1 CONTINUE	F4 REPEAT

PLOT TYPE 8 – One way expansion and wrapped at the edge of the channel area



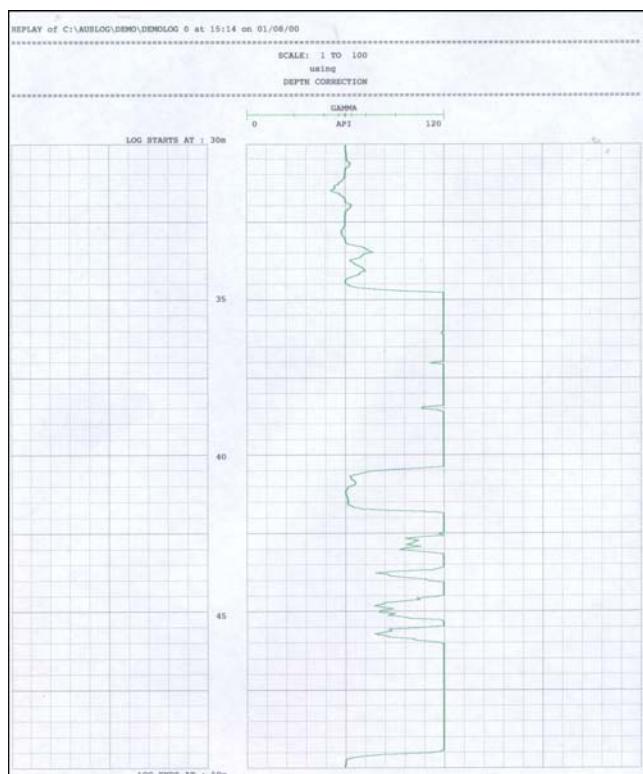
CHANNEL 1 GAMMA	S-714
AMPLITUDE (API) FROM:	0.0
TO:	120.0
CHART LOCATION, FROM:	12.0
(max 32) TO:	22.0
FILTER CONSTANT:	2.0
PLOT TYPE:	8.0
COMP COEFF:	3.0000
F1 CONTINUE	F4 REPEAT

PLOT TYPE 9 – Two way expansion and truncated at the edge of the Page



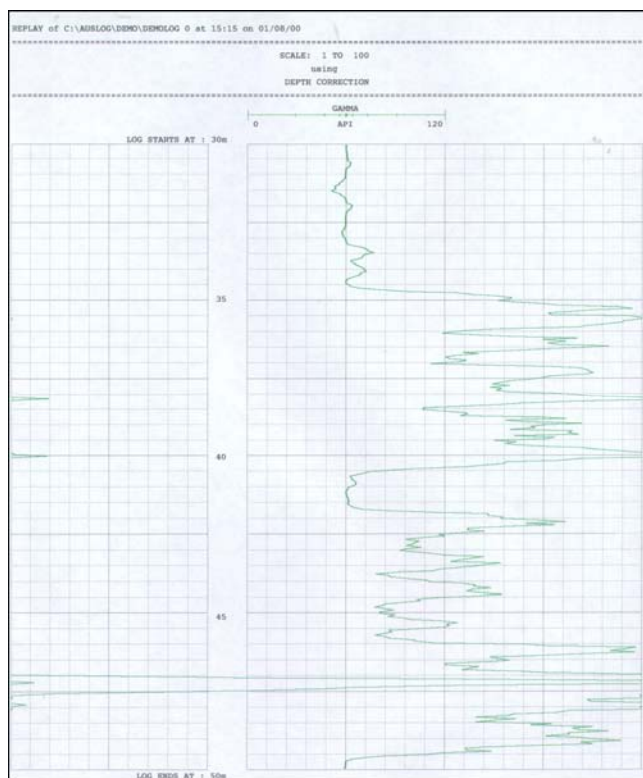
CHANNEL 1 GAMMA	S-714
AMPLITUDE (API) FROM:	0.0
TO:	120.0
CHART LOCATION, FROM:	12.0
(max 32) TO:	22.0
FILTER CONSTANT:	2.0
PLOT TYPE:	9.0
COMP COEFF:	3.0000
F1 CONTINUE	F4 REPEAT

PLOT TYPE 10 – Two way expansion and truncated at the edge of channel area



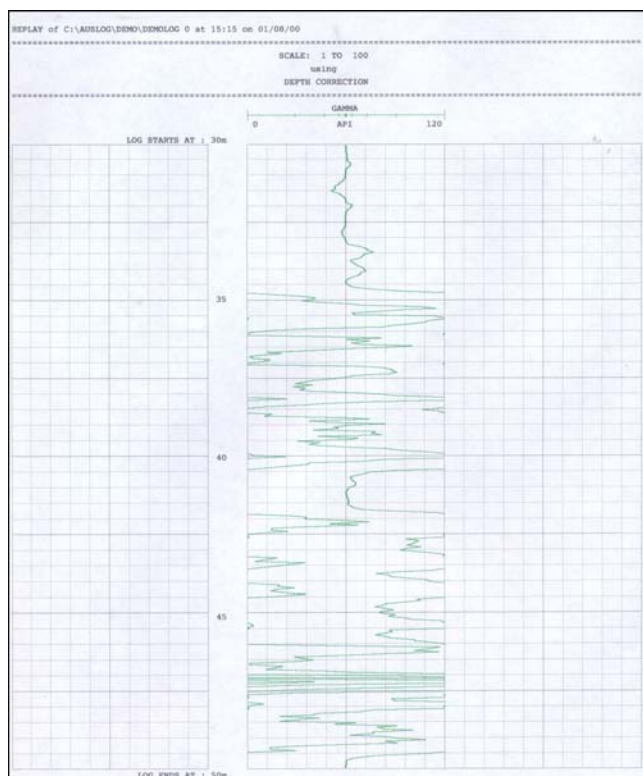
CHANNEL 1 GAMMA	S-714
AMPLITUDE (API) FROM:	0.0
TO:	120.0
CHART LOCATION, FROM:	12.0
(max 32) TO:	22.0
FILTER CONSTANT:	2.0
PLOT TYPE:	10.0
COMP COEFF:	3.0000
F1 CONTINUE	F4 REPEAT

PLOT TYPE 11 – Two way expansion and wrapped at the edge of the Page



CHANNEL 1 GAMMA	S-714
AMPLITUDE (API) FROM:	0.0
TO:	120.0
CHART LOCATION, FROM:	12.0
(max 32) TO:	22.0
FILTER CONSTANT:	2.0
PLOT TYPE:	11.0
COMP COEFF:	3.0000
F1 CONTINUE	F4 REPEAT

PLOT TYPE 12 – Two way expansion and wrapped at the edge of the channel area



The following screen appears after entry of chart parameters. At this point you must select one of the three options described below:

S-715	
CHART PARAMETERS ENTERED	
F1 CONTINUE	F8 ABORT F4 REPEAT

- [F1] Allow the program to continue.
- [F4] Pressing [F4] will allow review of all chart parameters. Any or all items may be changed as required.
- [F8] Will abort the current replay function and return the operator to the main menu.

Select as required	S-713
[F2] DEPTH CORRECTION : ON	
[F8] ABORT THIS REPLAY	
F1 CONTINUE	

This screen is used to set the depth correction option. If depth correction is used, the log plot traces will be corrected for the sensor offset relative to the cablehead. When using depth correction, the channel traces are plotted at their true depths.

The above screen is displayed for a both *depth based* and *time based* logs. If the log is a *time based* log it can not be depth corrected and any changes made here is ignored.

- [F1] Accepts the conditions shown on this screen.
- [F2] Changes the state of the depth correction function. Depth correction is not applicable to a time based log.

SELECT FUNCTION	S-718
[F2] HEADER DATA : OFF	
F1 CONTINUE	

This screen gives the operator the option to print (or display) the chart header data or to bypass it. The log header will be displayed on the screen if the log is being sent to the screen. Otherwise the header will be printed on the printer (if available).

- [F1] Print (or display) the chart header.
- [F2] Toggles the printing (or display) of the chart headers on or off.

	S-719
REPLAY COMPLETED	
F1 NEW-File	F8 QUIT F4 REPEAT

This is the last screen of the ALOG program replay subsection and provides the operator with the following options:

- [F1] When all processing on the current file is completed and it is desired to select a new log. The program goes back to screen S-705 (Entry of filename).
- [F4] Select the same log file again. Control is returned to screen S-710 (Replay function menu).
- [F8] Return the operator to the main menu (logo) screen.

AUTOSCAN

AUS

Digital Logging
Y 115.2

S-705

ENTER NAME OF FILE TO REPLAY

S-710

SELECT REPLAY FUNCTION

[F1] REPLOT the LOG

[F2] AUTOSCAN FILE

[F3] PRINT RAW DATA

[F4] SEE HEADER DATA ONLY

[F5] COPY FILE to DISK

[F6] MODIFY HEADER DATA

[F7] PLOT/NEW SYNTHETIC FILE

[F8] RETURN TO MAIN MENU

F5 All

F1 CONT

Autoscan is a special replay feature that instead of a graphical output of the log, a numerical values of minimum, maximum and average for each channel is given.

If one of the channels is a caliper tool then the hole volume will be calculated. (Refer to the caliper conversion factor in the misc setup of this manual).

The log file will be read until the From/To range (specified in screen S-712) is satisfied or the end of the file is encountered.

AUTOSCAN of A941DEV 1 S-731 From 0.00 m to 9999.00 m	
Channel: 1 MAG X	
Min:	-0.769 Units
Avg:	-0.461 Units
Max:	0.612 Units
There were 3 k scans. Lowest 159.84m Highest 0.04m Avg Logging Speed 8.24 m/min.	
F5 PRINT F1 Next F2 ABORT	

This screen appears when an *autoscan* is requested and the *screen* is selected for the output device. Most of the data fields are not filled in until the requested depth range has been processed.

If [F2] is pressed while the data is being processed, partial results are displayed (assuming *some* data in the required range has been found).

Where there is more than one channel of data in the file being processed, the [F1] key will be active and when pressed will display data for the next consecutive channel.

If the data displayed is not that of the first log channel the [F4] key will be active and when pressed will display data for the immediately preceding channel.

The [F5] PRINT prompt will be displayed if a printer is attached and online. Use this function to obtain a hardcopy of the *autoscan* results.

On successful completion of the *autoscan* pressing [F2] will take one to screen S-719

```

                                     S-800
Enter the LAS Filename
-----
The extension defaults to .LAS
-----
          A941DEV1
          -----
Current Path is :
      C:\AUSLOG\LOGS
Available Space :  68930k
-----
F1 Continue      F2 Change Path
F4 DOS Directory F8 NO RECORD
```

If the LAS export has been turned on (Refer to the program setup) this screen will appear after replaying or autoscan has finished. The cursor is positioned to allow the filename to be modified.

- [F1] Will continue to produce the LAS file with the information that is displayed on the screen.
- [F2] Write the file on another device (disk drive or directory). The program will go to screen S-650 for entry of new data paths.
- [F4] Display the names and sizes of the (log) files on the default device. Screen S-706 is used for this purpose. After viewing the catalogue, control will return to this screen S-800.
- [F8] Do not write a LAS file at this time.

Raw Counts

S-749

```
SELECT DATA FORMAT
-----
[F1] RAW COUNTS
[F2] COUNTS PER SECOND
[F3] REAL UNITS

[F8] ABORT DATA DISPLAY
```

This screen appears after selecting the display *device* and depth *range* to print, having originally selected the *raw data print* option in screen S-710.

As can be seen from the descriptions above you have three ways to look at the data in the log file. We will now examine the difference between these options.

RAW COUNTS

The *depth* is displayed in metres and the *time* is the time in seconds during which the counts were accumulated. The count readings are currently in counts per second.

To convert an SPR reading to OHMS it is necessary to multiply by the M value and add the B value. These (M and B values) are from the calibration equation (and are obtainable from the header data).

COUNTS PER SECOND

This display mode is similar to the above but the TIME values are not displayed. Instead the CPS values displayed are the counts per second as above.

REAL UNITS

This display mode goes one step further and takes the CPS values (as in the COUNTS PER SECOND) display mode and uses the M and B values from the log header to convert the channel readings to *real units* (where appropriate).

LOG DATA from A941DEV 1					S-741
DEPTH	TIME	CNT 1	CNT 2	CNT 3	
0.04	0.3800	-1311	10001	-1885	
0.09	0.3600	-1028	10032	-875	
0.14	0.3800	-262	10036	-214	
0.19	0.3700	-6343	10006	-1416	
0.24	0.3900	-6851	10004	-4121	
0.29	0.3600	-7661	9992	-2866	
0.34	0.3900	-7334	9979	-1566	
0.39	0.3800	-7168	9992	-471	
0.44	0.3700	-6506	10004	196	
F1 CONTINUE F2 ABORT					

This screen is displayed while the log data file is being read and printed on the printer in the format requested in screen S-740. During the course of the replay some of the indicated special function keys may be active. Only the active keys will be displayed.

The log file will be read until the From/To range (specified in screen S-712) is satisfied or the end of the file is encountered.

Pressing [F2] will terminate the RAW DATA PRINT at any time.

As explained in the description accompanying screen S-740 the format of the data display will change depending on whether you are looking at *count* values, *cps* values or *real units*.

The special function keys (when active) perform the following actions:

[F1] At the *end* of the log file or if at the *end* of the *depth range* specified in screen S-712, pressing [F1] will continue to screen S-719. At any other time [F1] will restart the display.

When data is scrolling on the screen pressing the [F1] key will freeze the display. When the display is frozen pressing the [F1] key again will allow the display to restart (except as noted above).

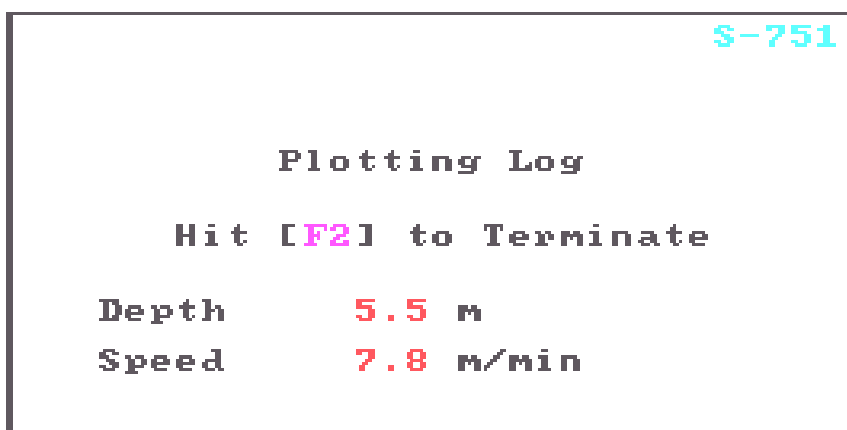
[F2] Will abort this function and go to screen-719.

[F5] Use the [F5] key to shift the displayed channels to the right. This option appears as long as there are channels off screen on the left.

[F6] The [F6] key will move the displayed channel data to the left. This prompt will appear as long as there are channels off screen on the right.



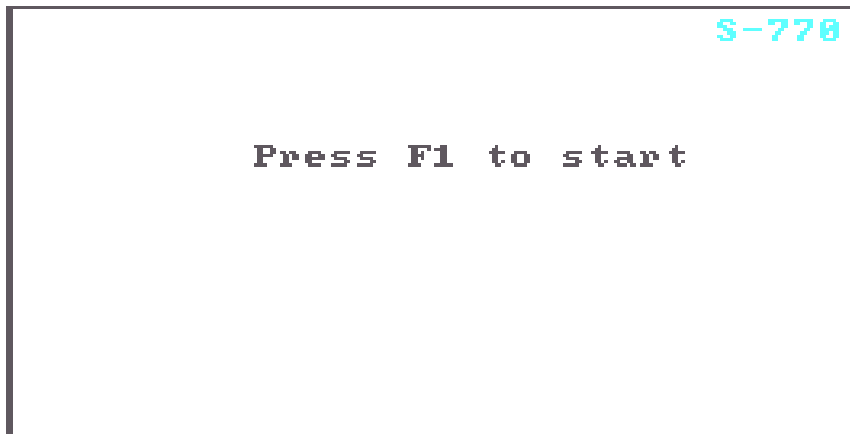
This screen is displayed just prior to starting the plot and plotting on the *printer*. Ensure the printer paper is correctly positioned then press [F1] to start the log.



This screen is displayed while the log is being plotted on the *printer*. Replay will continue until the depth range From/To values (specified in screen S-712) have been satisfied or the end of the file has been reached. The replay of the log may be terminated at any time by using special function key [F2].

During the replot the screen displays the depth being processed and the *logging* speed in effect (at that depth) when the log was recorded.

NOTE: The logging speed is not displayed for merged logs.



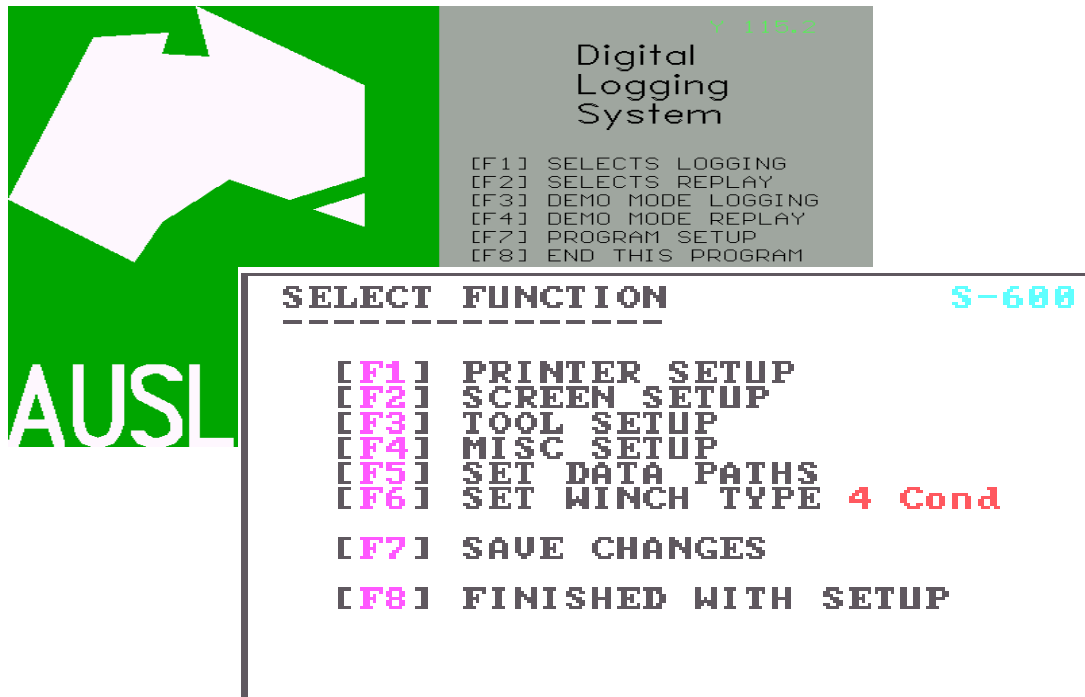
This screen is used to start the log when plotting to the *screen*. As soon as [F1] is pressed the screen is reformed into graphics mode ready for the replot.

[F1] When [F1] is pressed, the replot of the log will commence.

During a log replot to the screen a line at the bottom of the screen will say 'Hit [F2] to Abort'. When the log is finished (or if terminated by operator hitting [F2]) the screen will not clear immediately but a message will appear which says 'Hit [F1] to continue'.

When [F1] is pressed the program will go to screen S-719 (end of replot).

PROGRAM SETUP SCREENS



THE PROGRAM SETUP SCREENS

The 600 series screens provide configuration options to the *ALOG* program user. There are currently eight subsections to the *setup* section.

The subsections allow adjustment of different types of default parameters. Select the subsection appropriate to the area you are interested in after referring to the following summary.

- [F1] Go to the printer setup screen S-610 where you will be able to select a driver, toggle printer port or alter print grid style or alter the width of printer chart produced.
- [F2] To change the screen colour allocations. You will be presented with screen S-611 for further selection.
- [F3] Change the *tool default file*. The program will advance to screen S-630.
- [F4] This selection will take you to screen S-640 for selection of the port used for the DLS interface and other miscellaneous setups.
- [F5] You can alter the default *data paths* in screen S-650 with this selection.

- [F6] This selection will toggle through the various types of winches that can be connected to the system.
- [F7] Save changes made to any of the default parameters.
- [F8] Returns to the main (*logo*) screen.

Refer to the appropriate section of this manual for further information on the screens mentioned above.

Printer Setup

```
SELECT FUNCTION                               S-610
-----
[F1] SELECT DRIVER      (LQ850 )
[F2] CHANGE DEVICE     LPT1
[F3] GRID STYLE        1
[F4] EDIT GRID STYLE
[F5] TRACES ARE        Colour
[F6] PRINT via         Dos
[F8] QUIT PRINTER SETUP
```

The [F1], [F2], [F3], [F5] and [F6] keys will toggle through the available options for their respective parameters while the [F4] key will take you to screen S-611.

- [F1] The *ALOG* program was written to use the EPSON LQ series of printers. These printers have a good quality presentation of log data. Other printers supported are the Printrex range of printers. Other printers will be supported from time to time. You may select between any of the currently supported printers using the [F1] key. Auslog advises use of the EPSON LQ series of printers where possible.
- [F2] Some IBM compatible computers use different port assignments for the standard printer port. The *ALOG* program uses high-density printer graphics so to achieve reasonable speed in log printing it is necessary to write directly to the printer port. [F2] will toggle through the printer ports LPT1, LPT2 and LPT3.
- [F3] This key will toggle through five default plotting styles.
- [F4] This key will take you to screen S-611 for setting the width of printer plots, margins and line styles etc on any of the five default settings
- [F5] This key will toggle between black, colour or dotted output. On a standard black ribbon printer the dotted option may make distinguishing between different channels easier. If the colour option is selected and the output is directed to a black ribbon printer that all the traces will be black
- [F6] This key will toggle between Dos and Port. This tells the program whether to send printer data via the operating system (Dos) or direct to the printer port (Port). Direct printing to the printer port is usually much faster but it will not work on some printers. Use the (Dos) option if there are difficulties with the direct to port print option.
- [F8] This key will exit the back to the main (logo) screen.
- .

EDITING GRID STYLE		4	S-611
[F2]	Horizontal Scale	Imperial	
[F3]	Vertical Scale	Metric	

EDITING GRID STYLE		4	S-611
[F2]	Horizontal Scale	Imperial	
[F3]	Vertical Scale	Metric	
	Horiz. Divs /	(in)	4
	Vert. Divs /	(cm)	2
	Plot width	(1/4in)	32
	LOG margin	(1/4in)	6
	HEAD margin	(1/4in)	2
	Major Linetype	:	170
	Minor Linetype	:	136

F1 CONTI	F1 CONTINUE	F4 REPEAT
----------	-------------	-----------

This screen allows the operator to set up the plot routines for different sized printers and different grid types. At present EPSON LQ series printers, Printrex printers and *laser* printers compatible with the HP LaserJet are supported.

The Alog program allows different scales for both the vertical or horizontal axis.

- [F1] Will accept the vertical and the horizontal defaults and advance to the next screen.
- [F2] This key will toggle between Metric and Imperial for the Horizontal scales.
- [F3] This key will toggle between Metric and Imperial for the vertical scales. The vertical scale chosen will also reflect in the vertical units when logging. The defaults for metric is meters and for imperial it is feet.
- [F4] Will allow the [F2] and [F3] to be changed

HORIZ. DIVS/ The units after the slash will be either cm or in depending on the units chosen with the [F2] key. The value which is entered at the cursor indicates how the many divisions/unit selected for the horizontal scale.

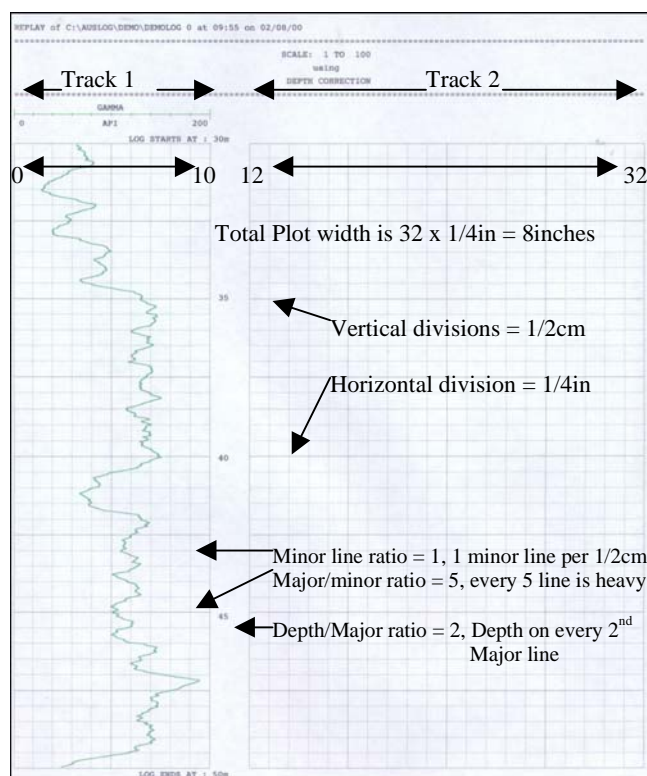
VERT. DIVS/ The units after the slash will be either cm or in depending on the units chosen with the [F3] key. The value which is entered at the cursor indicates how the many divisions/unit selected for the vertical scale.

PLOT WIDTH Is just that; the width of the plot in what unit were selected with the [F2] or [F3] key. Care must be taken to note the value in brackets. For example if the value in brackets is (1/2cm) and a total width of 16 cm is desired then the value that would be needed to be entered would be

32. Which is to say 16cm divided up in 1/2cm units would be 32 units.

LOG MARGIN is the spacing in units from the left-hand edge of the page to the left-hand edge of the log.

HEAD MARGIN is the spacing in units from the left-hand edge of the page to the left-hand edge of the header.



```
EDITING GRID STYLE 4 S-611
[F2] Horizontal Scale Imperial
[F3] Vertical Scale Metric
Horiz. Divs / (in) : 4
Vert. Divs / (cm) : 2
Plot width (1/4in) : 32
LOG margin (1/4in) : 0
HEAD margin (1/4in) : 2

Major Linetype : 170
Minor Linetype : 136

F1 CONTINUE F4 REPEAT
```

```
EDITING GRID STYLE 4 S-612
Number of Tracks : 2
Trk 1 Start : 0 Stop : 10
Trk 2 Start : 12 Stop : 32

Minor line ratio : 1
Major/Minor ratio : 5
Depth/Major ratio : 2

F1 CONTINUE F4 REPEAT
```

MAJOR Linetype dot pattern used to produce a heavy (MAJOR) grid line.

MAJOR Linetype dot pattern used to produce a heavy (MINOR) grid line.

The line type parameters tell the program how to print the MAJOR and MINOR grid lines. They are included here so that you may change the print density to suit your requirements.

The numbers used may range from 0 to 255. Using a value of zero (0) will result in NO grid lines of this type being printed. Using a value of 255 will result in solid (read HEAVY or DARK) lines being printed. Intermediate numbers will result in various levels of darkness between these two extremes.

To show how the values are used consider the following default values

136

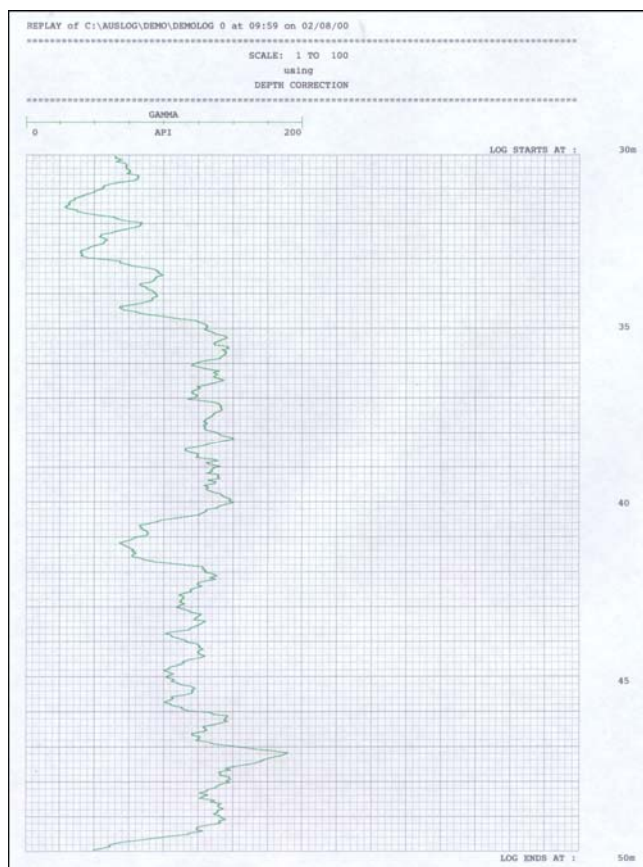
136 = 128+8 or 10001000 in binary
prints as '.etc' across the page

170

170 = 128+32+8+2 or 10101010 in binary
prints as '.....etc' across the page

- [F1] Allow the program to continue to Screen S-612.
- [F4] Pressing [F4] will allow review of all parameters. Any or all items may be changed as required.

GRID STYLE 1



```

EDITING GRID STYLE      1      S-611
[F2] Horizontal Scale   Metric
[F3] Vertical Scale     Metric
Horiz. Divs / (cm) : 1
Vert. Divs / (cm) : 1
Plot width (cm) : 16
LOG margin (cm) : 1
HEAD margin (cm) : 1

Major Linetype : 170
Minor Linetype : 136

F1 CONTINUE      F4 REPEAT
  
```

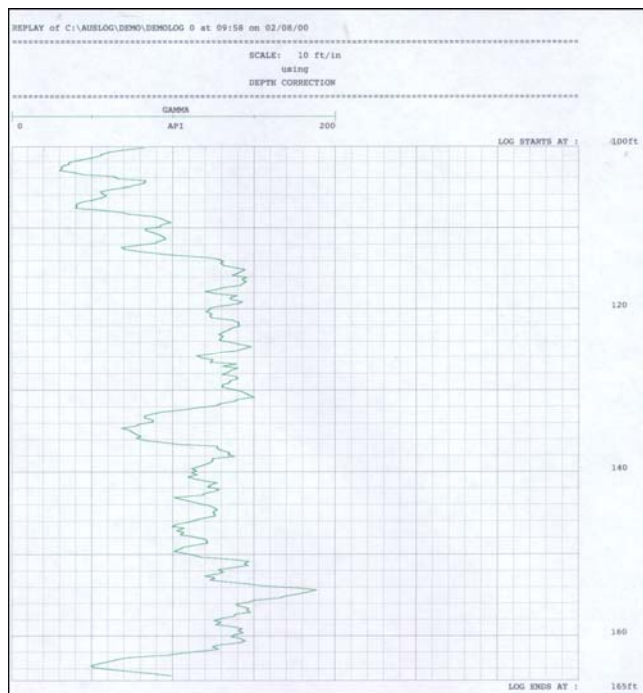
```

EDITING GRID STYLE      1      S-612
Number of Tracks : 1
Trk 1 Start : 0 Stop : 16

Minor line ratio : 5
Major/Minor ratio : 5
Depth/Major ratio : 5

F1 CONTINUE      F4 REPEAT
  
```

GRID STYLE 2



```

EDITING GRID STYLE      2      S-611
[F2] Horizontal Scale   Imperial
[F3] Vertical Scale     Imperial
Horiz. Divs / (in) : 1
Vert. Divs / (in) : 1
Plot width (in) : 7
LOG margin (in) : 0
HEAD margin (in) : 1

Major Linetype : 170
Minor Linetype : 136

F1 CONTINUE      F4 REPEAT
  
```

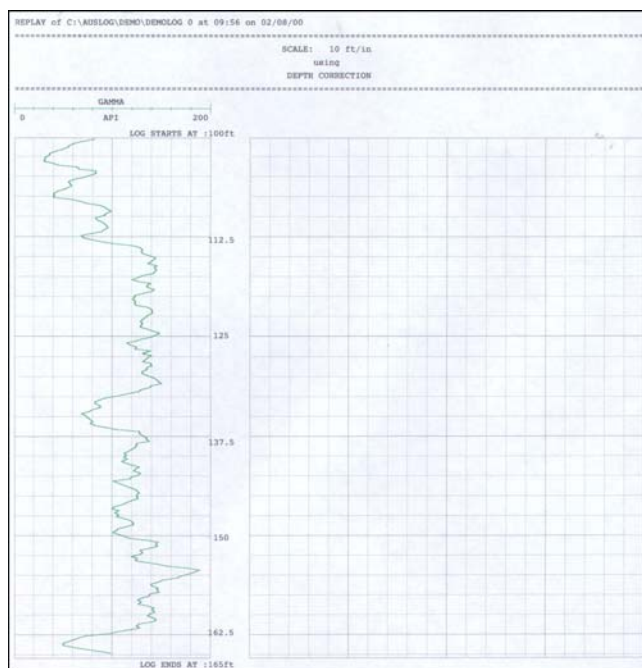
```

EDITING GRID STYLE      2      S-612
Number of Tracks : 1
Trk 1 Start : 0 Stop : 7

Minor line ratio : 5
Major/Minor ratio : 5
Depth/Major ratio : 2

F1 CONTINUE      F4 REPEAT
  
```

GRID STYLE 3



EDITING GRID STYLE 3 S-611

[F2] Horizontal Scale Imperial
[F3] Vertical Scale Imperial
Horiz. Divs / (in) : 4
Vert. Divs / (in) : 4
Plot width (1/4in) : 32
LOG margin (1/4in) : 0
HEAD margin (1/4in) : 4

Major Linetype : 170
Minor Linetype : 136

F1 CONTINUE F4 REPEAT

EDITING GRID STYLE 3 S-612

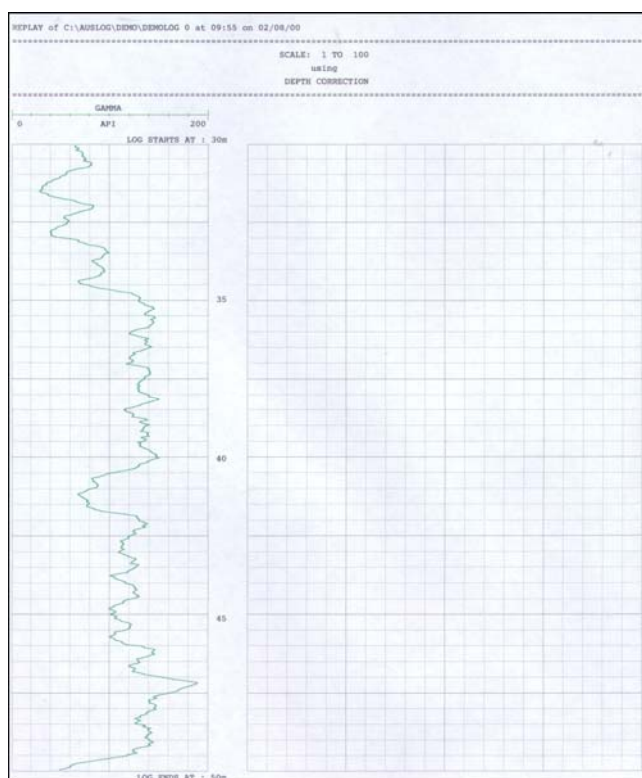
Number of Tracks : 2

Trk 1 Start : 0 Stop : 10
Trk 2 Start : 12 Stop : 32

Minor line ratio : 1
Major/Minor ratio : 5
Depth/Major ratio : 1

F1 CONTINUE F4 REPEAT

GRID STYLE 4



EDITING GRID STYLE 4 S-611

[F2] Horizontal Scale Imperial
[F3] Vertical Scale Metric
Horiz. Divs / (in) : 4
Vert. Divs / (cm) : 2
Plot width (1/4in) : 32
LOG margin (1/4in) : 0
HEAD margin (1/4in) : 2

Major Linetype : 170
Minor Linetype : 136

F1 CONTINUE F4 REPEAT

EDITING GRID STYLE 4 S-612

Number of Tracks : 2

Trk 1 Start : 0 Stop : 10
Trk 2 Start : 12 Stop : 32

Minor line ratio : 1
Major/Minor ratio : 5
Depth/Major ratio : 2

F1 CONTINUE F4 REPEAT

EDITING GRID STYLE		3	S-612
Number of Tracks		:	2
Trk 1	Start :	0	Stop : 10
Trk 2	Start :	12	Stop : 32
Minor line ratio		:	1
Major/Minor ratio		:	5
Depth/Major ratio		:	1
F1 CONTINUE		F4 REPEAT	

Number of Tracks This selects the number of tracks across the page. The minimum number of tracks is one

Trk Start/Stop This is the unit number (set in Plot Width) for the tracks to start and stop. By leaving a gap in the middle will allow the depth to be plotted between the two tracks.

Minor Line Ratio Indicates how many minor lines each centimetre (inch for imperial). The scale is set by vertical scale [F3] on screen s-611.

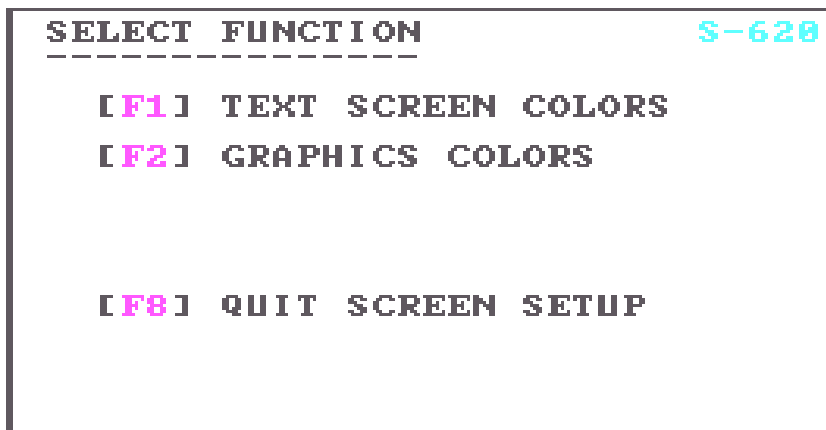
Major/Minor ratio Grid lines are either in heavy or light print. This parameter tells the program how often to print a heavy (MAJOR) line. For example using a RATIO of five (5) will result in heavy grid line at every 5th grid line position.

Depth/Major ratio The log depth is printed adjacent to the chart at intervals. This parameter tells the program how often to print the depth. For example using a RATIO of five (5) will print the depth on every 5th MAJOR grid line.

The first three parameters of this screen apply equally to both the *fastprint* mode and the *high-resolution* mode while the remainder of the parameters are only applicable to the *high resolution* mode. The *fastprint* mode still uses the older 'dot' type of grid.

Both *real time* and *replay* are affected by selections made on this screen. Changes made here *should* be saved on return to screen S-600 using the [F7] SAVE CHANGES option.

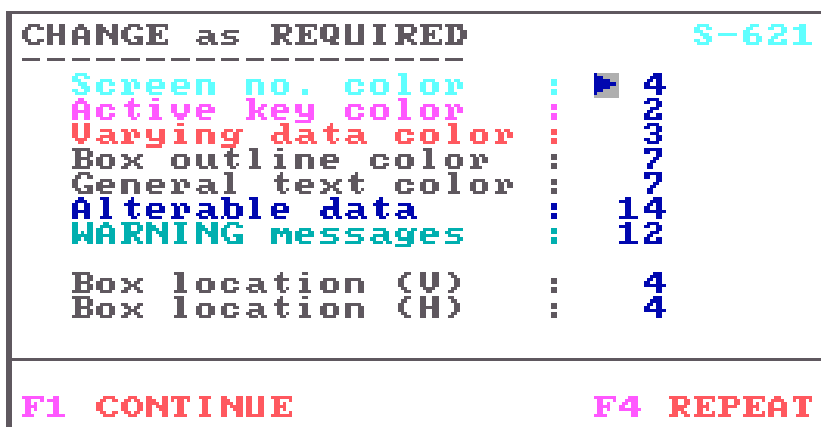
Screen Setup



Having selected [F2] in screen S-600, you will be presented with the screen shown above. The purpose of screen S-620 is to select either the text colours or graphics colours for alteration.

Text colours are used for all screens except the very first (*logo*) screen and when producing a log on the screen. On both these graphics colours are used. Select either [F1] or [F2] as required.

- [F1] To screen S-621 for alteration of the text screen colours.
- [F2] Advance to screen S-622 for alteration of the graphics screen colours.
- [F8] Exit and return to the screen S-600.



This screen allows alteration of text screen colour usage to give the clearest presentation. The prompt string gives a sample of the currently selected colour. If a colour printer is used for the output only colours nine to fourteen will appear as the indicated colours. All other number will be printed as black.

To change a colour selection, enter the required number opposite the appropriate prompt and press ENTER. The prompt will immediately be displayed in the colour you have entered. The range of colours is 0 to 15 inclusive. Zero (0) is black and thus any text displayed with this colour will not be seen (on the black background). Beware!

No	Colour	No	Colour	No	Colour	No	Colour
0	Black	4	Red	8	Grey	12	Orange
1	Dark Blue	5	Magenta	9	Light Green	14	Yellow
3	Light Blue	7	Light Grey	11	Light Blue	15	White

The last two entries on this screen alter the location of the text window. It can be moved horizontally and or vertically by changing the numbers after the appropriate prompt.

Smaller numbers will move it up (V) and to the left (H).

CHANGE as REQUIRED		S-622	
UGA	mode :	0	
Palette	:	2	
C (0)	CHANGE as REQUIRED		
Pixels/	UGA	mode :	0
Pixels/	Palette	:	2
	C (0) or BW (1):	:	0
	Pixels/inch U :	:	60
	Pixels/inch H :	:	64
F1 CONTINUE F2 COLORS F4 REPEAT			

This screen allows selection of the desired screen resolution. The mode parameter selects between CGA (2), EGA (1) and VGA (0) screen resolutions.

VGA is the best resolution and should be used if your hardware is capable of VGA operation. Earlier Laptop computers were CGA only and selection of anything other than CGA here will result in no log on the screen.

The palette prompt only affects CGA mode operation. It is irrelevant in the other modes. It allows changing between any of the four available colour groups. Changing this parameter will alter all of the CGA graphics colours. The range of this entry is 0 to 3.

Some compatible computer screens (especially *laptops*) have a rather poor aspect ratio. As a result the grid displayed when plotting a log on the screen is not square. By changing the

pixels/inch (V) parameter this problem can be corrected. A little experimentation will determine the most appropriate values.

There are only two recommended values for the *pixels/inch horizontal* parameter. These are 64 for EGA, VGA and CGA 64 modes and 32 for normal CGA mode. Selection of other than these values will generally give inferior log presentation.

CHANGE as REQUIRED				S-623	
Trace	1:	10	Trace	11:	14
Trace	2:	11	Trace	12:	15
Trace	3:	12			0
Trace	4:	13	Trace	14:	1
Trace	5:	14	Trace	15:	2
Trace	6:	15	Trace	16:	3
Trace	7:	10	Trace	17:	4
Trace	8:	11	Trace	18:	5
Trace	9:	12	Trace	19:	6
Trace	10:	13	Trace	20:	7
F1 CONTINUE				F4 REPEAT	

This screen allows alteration of graphics screen colour usage to give the clearest presentation. The prompt string gives a sample of the currently selected colour.

To change a colour selection, enter the required number opposite the appropriate prompt. The prompt will immediately be displayed in the colour you have entered.

The range of colours is dependent on the video mode selected in the previous screen. For CGA video mode the range is 0 to 3 inclusive. For EGA and VGA the range is 0 to 15. Colour numbers from 0 to 7 are low intensity and 8 to 15 are high intensity. See previous page for the colour list.

Zero (0) is black in all modes and anything displayed with this colour will not be seen (on the black background). Beware !

When printing the log to a colour printer only the values from 10 to 15 will be printed in colour. Any other valid number will be printed as black.

Tool Default File

SELECT FUNCTION ----- [F1] ADD A NEW TOOL [F2] REVIEW EXISTING TOOL [F3] DELETE A TOOL [F8] QUIT TOOL SETUP	S-630
---	--------------

To see this screen you must have selected [F3] TOOL SETUP in screen S-600. The options you now have are clearly indicated.

- [F1] Add a tool to the tool default file. The program will take you to screen S-631 for this purpose.
- [F2] Change (or simply look at) a tool already defined in the tool default file. Screen S-633 will follow for selection of the tool for review.
- [F3] To screen S-636 from where you select the tool for deletion.
- [F8] Exit and return to screen S-600, the main setup menu screen.

DEFINE NEW TOOL ----- Model No. : <input type="text"/> Name : <input type="text"/> Spacer Ch : <input type="text"/> Serial no : <input type="text"/> No. Chans : <input type="text"/> Caliper : <input type="text"/> Special : <input type="text"/>	S-631
F1 CONTINUE	F8 ABORT F4 REPEAT

When [F1] ADD NEW TOOL in screen S-630 is selected you will arrive at this screen. Entry of the tool parameters is quite simple and uses the same approach found throughout the package.

What perhaps may not be so simple is knowing what to enter! For help in this area you are referred to appendices A and B detailing the *interface* protocol between the *computer* and the

DLS interface. These appendices detail the effect the various parameters have on the log.

You will also need to know the requirements of the tool as far as operating voltage, whether positive, negative pulses (or both) or whether the tool is a digital tool and the relationship between pulse frequency and real units being measured.

- [F1] When finished and the program will continue to screen S-632 for entry of the first tool channel.
- [F4] Re-enter data.
- [F8] This key will abort the ADD TOOL function and return to screen S-630.

ENTER PARAMETERS		S-632
Name	:	
Offset	:	
Cal Rtn	:	
I cmd	:	Th :
P cmd	:	Ro :
Units	:	Ds :
M :		C2 :
B :		C3 :
C1 :		C4 :
F1 CONTINUE		F4 REPEAT

Screen S-632 will appear once for each tool channel. Enter the parameters required. When you have finished entering the tool channel parameters, press [F1] to advance to the next channel (or screen S-630 if the current channel is the last).

The purpose of each parameter is explained more fully in an appendix.

- [F1] When all the entries have been filled, use [F1] to continue to the next channel screen (or return to S-621 if the tool definition is complete).
- [F4] Re-enter data.

SELECT TOOL FOR REVIEW		S-633

1	Conduct/Mag sus	
2	Induct Cond/GAMMA	
3	Conduct/Mag sus	
4	Induct Cond/GAMMA	
5	CALIPER	
6	Fluid Resist	
7	FLOWMETER	
 PRESS [F1] for more TOOLS		
F1 TOOLS		F8 QUIT F4 COMMENTS

Select the tool you wish to review from those listed in this screen by typing the numeric key associated with that tool. Use [F1] to display the other tools in the tool default file.

[F1] will display other tools from the default file.

[F8] will return you to screen S-630.

SELECT FUNCTION	S-636

[F1] REVIEW REPLAY PARAMETERS	
[F2] REVIEW LOGGING PARAMETERS	
[F3] COPY LOGGING to REPLAY	
[F4] REVIEW TOOL SETTINGS	
 [F8] FINISHED THIS SECTION	

[F1] To review the tool replay parameters. These parameters will become the chart parameters when replaying a log.

[F2] To review the tool logging parameters. These parameters will become the chart parameters when logging a tool.

[F3] To copy the default logging parameters to replay chart parameters.

[F8] Exit and return to screen S-630, the main setup menu screen.

S-634

CHANGE as REQUIRED

Model No. : **A0008**
 Name : **CALIPER**
 Spacer Ch : **0**
 Serial no : **S112**
 No. Chans : **1**
 Caliper : **P1+A,A40**
 Special :

F1 CONTINUE **F4 REPEAT**

Having selected the tool for review (in screen S-633) you will arrive at this screen. Changing tool parameters is quite simple and uses the same approach found throughout the package.

Pressing the **ENTER** (or **[F1]**) key will leave the entry unchanged whilst any other key will clear the existing parameter for entry of a new one.

What perhaps may not be so simple is knowing what to change! For help in this area you are referred to Appendix A to this manual detailing the *interface protocol* by which the computer and the DLS interface communicate. Appendix B details the effect the various parameters have on the log.

[F1] Confirm entries and continue to the first channel screen S-635.

[F4] Re-enter data.

S-635

CHANGE as REQUIRED

Name : **CALIPER**
 Offset : **98**
 Cal Rtn : **C3ARM**
 I cmd : **A1**
 P cmd : **P1+A,A40**
 Units : **mm**

Th : **30**
 Ro : **N**
 Ds : **Y**

M : **508.0000** C2 : **0.000**
 B : **-1164844** C3 : **203.2**
 C1 : **101.6** C4 : **2292**

F1 CONTINUE **F4 REPEAT**

Screen S-635 will appear once for each tool channel. Change the required parameters. When finished press **[F1]** to advance to the next channel (or screen S-630 if the current channel is the last).

The purpose of each parameter is explained more fully in appendix A.

- [F1] When all entries have been confirmed use [F1] to continue to the next channel screen (or return to S-630 if the current tool channel is the last).
- [F4] Select this key if a mistake has been made. The cursor will return to the first entry on this screen for corrections. Remember typing the <enter> key will leave the present entry intact. Typing anything else will replace the existing entry.

SELECT TOOL TO DELETE		S-638

1	Conduct/Mag sus	
2	Induct Cond/GAMMA	
3	Conduct/Mag sus	
4	Induct Cond/GAMMA	
5	CALIPER	
6	Fluid Resist	
7	FLOWMETER	
PRESS [F1] for more TOOLS		
F1 TOOLS	F8	QUIT
	F4 COMMENTS	

Select the tool you wish to delete from those listed in this screen by typing the numeric key associated with that tool. Use [F1] to display the other tools in the tool default file.

- [F1] will display more tools from the default file.
- [F8] will return you to screen S-630.

S-639	
CONFIRM DELETE A008	
F1 YES	F4 NO

[F1] To delete the indicated tool from the tool default file.

[F8] Exit without deleting the tool.

The program will return to screen S-630 after taking the appropriate action.

Miscellaneous Setup

SELECT FUNCTION		S-640

[F1]	DLS INTERFACE	(COM1)
[F2]	DEPTH FACTOR	1.000000
[F4]	LAS EXPORT	OFF
[F5]	CALIPER CONVER	39.37
[F6]	DATE FORMAT	dd/mm/yy
[F7]	CLIENT NAME	
[F8]	QUIT MISC SETUP	

Selection of [F4] MISC SETUP in screen S-600 will bring up the screen shown here. A brief explanation will indicate the purpose of this screen.

[F1] The Digital Logging System consists of an interface and a computer. The interface sends data to the computer and the computer sends instructions to the interface. Some kind of connection is required to effect this communication.

This version of the software supports selection of either serial port one (COMM 1) or two (COMM 2). GBIP is no longer supported.

You should never need to change this parameter unless your system loses or corrupts one of the data files. Making the wrong selection here will do no harm but your computer will be *unable* to communicate with the DLS interface. This could be a reason for the appearance of the NO DLS message in the *logo* screen.

[F2] An Envirollog system requires a depth correction factor of 0.33 to be applied because of the different depth encoder used and a DLS4/DLS5 requires a depth factor of 0.25. Most other Auslog winches require a value of 1.00 here. Check the side of four conductor winches for the correct depth factor to use with your system. Correction for cable/depth wheel wear can also catered for with this value. Winches from different manufacturers are catered for by changing this value appropriately.

[F4] Turn this option on if you require LAS output of data for use in other programs. When this feature is enabled, anytime a log data file is replayed or autoscan is used a LAS format file is created. The extension of the LAS file is LAS.

[F5] Enter here the conversion factor for the caliper units. The value should be the number of caliper units in one metre. For example is the caliper units is inches then the conversion value should be 39.37 and is the caliper units are millimetres then the value will be 1000. Hole volume is calculated in m³.

- [F6] The date format can be toggled between mm/dd/yy and the Australian standard of dd/mm/yy.
- [F7] Press this key to access the current client name setting. This string is printed at the top of chart headers.
- [F8] Quit from this menu and return to the setup main menu S-600.

Data Paths

S-650	
SET LOG DATA PATHS -----	
SOURCE	: EC:\AUSLOG\LOGS
DESTINATION:	C:\AUSLOG\LOGS
F1 CONTINUE	
F8 ABORT F4 REPEAT	

There are many different ways to reach this screen. One is by selecting [F5] in screen S-600 of the setup menus, another is by selecting [F2] at filename entry time in either logging or replay programs. The last way is in the LAS export section of the replay software.

The purpose of this screen is to allow selection of the *source* and/or *destination* of *data* for the logging and replay software.

LOGGING Data is supplied by the DLS interface when logging. Thus one would specify DLS (the default) as the *source* device.

Data is recorded onto disk. If recording to disk the *destination* is set to the drive (and path, if required) to be used.

REPLAY Log data files are found on disk. When replaying a log the *source* should be set to the drive (and path, if required) on which the data file resides.

In the replay program the *destination* specifier is presently used only for the **COPY TO DISK** function.

NOTES: Permissible entries consist of a drive specifier and optionally a directory, or simply 'DLS:'.

It is not possible to have the DLS as a destination device.

When changing from logging mode to replay mode, the *source* specifier is automatically set to the *destination* specifier used when logging. This feature is intended to facilitate the replay of a log just completed. On return to logging mode the *source* again is set to DLS.

GLOSSARY

A

Active • Describes a screen that is selected; the screen to which the next keystroke or command will apply.

B

Backup • To make a copy of a file or disk for safekeeping.

Backup disk • A copy of any disk you make using the Diskcopy, Copy, or Backup commands.

Boot • To start up your computer, or to restart it, loading the DOS operating system.

Boot disk • A floppy disk which carries the DOS system files and is able to upload DOS from a floppy drive when starting the computer.

C

Choose • To perform an action that carries out a command in the menu or dialog box. To make a choice among actions listed in a menu or dialog box. Done by pressing a key or clicking a mouse. See also Select.

Command • A program that tells MS-DOS how to do a specific task. See also Menu.

Command prompt • The MS-DOS command prompt appears on the screen as the default drive letter followed by a greater-than (>) sign. The command prompt lets you know MS-DOS is ready to receive a command.

D

Disk • See Floppy disk; Fixed disk.

Disk drive • A piece of hardware attached to your computer. Typically, a disk drive is either a floppy or fixed disk drive. You insert floppy disks into floppy disk drives. Floppy disk drives are commonly referred to as drive A and drive B. Hard disk drives are usually built into the computer and are referred to as drive C. Your computer manual should tell you how your drives are labelled.

Disk Operating System • A group of programs that act as a translator between you and your computer. MS-DOS is a disk operating system. See also Operating system

E

Envirolog 1 • Auslog's first portable borehole logging system consisting of a fully integrated single conductor winch and control centre.

Envirolog 4 • Auslog's first portable borehole logging system consisting of a fully integrated four conductor winch and control centre.

F

File • A collection of related information. A file on a disk can be compared to a file folder in a desk drawer. For example, a file folder named friends might contain the names and addresses of your friends. A file on a disk could contain the same information, and could also be named friends. Programs are also stored in files.

Filename • The name of a file. MS-DOS uses specific file naming conventions: a filename can be from one to eight characters in length and can have an extension of up to three characters separated from the filename by a period (.). An example of a complete filename is BORE_102.X-B. See also Filename extension.

Filename extension • An addition to a filename. Extensions begin with a period and contain from one to three characters. Most application programs supply their own extensions for files they create. For example, all AUSLOG data files use a filename extension of .?-B. See also Filename.

Fixed disk • Sometimes called the hard disk, it is built into the computer. A fixed disk can store much more information than a floppy disk, and the computer can retrieve information from it faster.

Floppy disk • Used for storing programs and files. In this documentation, the term floppy disk includes 3.5-inch as well as 5.25-inch floppy disks.

H

Hard disk • See Fixed disk.

Hardware • The equipment that makes up a computer system, not to be confused with the programs, or software.

M

Menu • A listing of available commands. You use a command from the menu by selecting the designated key adjacent to the command description.

Mudpit • A small depression near the borehole, containing a mixture of moist soil (often drilling mud), which is used to earth an electrode for calibration of borehole tools.

O

Operating system • A group of commands that translate your commands to the computer, helping you to perform such tasks as creating files, running programs and printing documents. See also Disk operating system.

P

Print • A command that activates your printer.

Probe • See Tool.

Prompt • A symbol that usually consists of a default drive letter (usually A, B, or C) and a greater than sign.

S

Sondes • See Tool.

T

Tool • An instrument attached to a cable, which transmits data to a computer on the surrounding geological strata, as it is passed up and down a borehole.

Tripod • A frame incorporating a pulley located over a borehole, which supports and guides the cable.

W

Winch • A hand or mechanically powered device used to release or wind up the cable attached to the borehole tool.

APPENDIX A .. RS-232 Interface Protocol

This appendix describes the commands that may be issued by computer to the DLS interface. The DLS interface will send data to the computer in response to some of these commands while others produce no response. The purpose of each command and the data returned by each command is described here.

All numbers in commands are decimal numbers sent as an ASCII string. No embedded spaces are allowed in command sequences. Trailing space characters are ignored. A line feed character is used to terminate all commands.

The following notation is used in the message specifications:

{ } the 'curly' brackets are used to denote fields which are optional. When there is more than one field in a command they are separated by commas ','.

All commands listed in this document apply to the DLS 2 Plus interface. A subset of these commands apply to the older DLS 2 and T202 logging systems.

DEPTH COMMAND

Command : D<lf>

Response : ddd

Command : Dddd<lf>

- 3 There are two modes to this command. The simplest mode has no parameter and simply returns the depth. The number returned by the DLS interface is a three byte unsigned binary number representing the depth of the cablehead in centimetres. If the depth is negative (i.e. the cable head is above ground level) then the number returned will need to be subtracted from 16777216 to get the actual depth.
- 4 The other mode of the D command is used to set the DLS interface internal depth register. The number ddd above is in centimetres. If the depth is negative (i.e. the cable head is above ground level) then the depth should be given as 16777216-depth. This will correctly set the internal depth register.

SET THRESHOLD LEVEL

Command : !nnn{,nnn}<lf>

Where nnn is a number in the range of 0 to 255. The first number defines the threshold voltage to be used for the negative pulse detector. The second (and optional) parameter

APPENDIX A .. RS-232 Interface Protocol

defines the threshold voltage of the positive pulse detector.

1. Using a value of zero (0) will result in no change to that channels threshold level. Using any value in the range of 1 to 255 will set the threshold detector level to that proportion of the maximum possible level represented by the number 255.
2. The maximum level (set by 255) is about 6.9 volts. The voltage applied to the detector is therefore $(nnn * 6.9) / 255$ volts.

INITIALIZE DATA PATH

Command : IXnn{,Xnn}<lf>

- 1 for the DLS 2, X may be either of A or B

then nn has the following significance

- | | |
|----|----------------------|
| 1 | negative pulse count |
| 2 | positive pulse count |
| 15 | SP reading |
| 16 | SPR reading |

- 2 for the DLS 2 Plus, X may be any of A,B,F,G,H,I

then for A and B, the number nn can take either of the following two values

- | | |
|---|----------------------|
| 1 | negative pulse count |
| 2 | positive pulse count |

for F, nn has the following meaning

the period (in us) for nn negative pulses to occur

for G, nn has the following meaning

the period (in us) for nn positive pulses to occur

when X is H, we read the period (in us) over which nn cycles of the SP voltage to frequency convertor occur.

when X is I, we read the period (in us) over which nn cycles of the SPR voltage to frequency converter occur.

- 3 When using a multiplexed tool, a lower case 'i' command is available. The format of this additional command is similar to that shown here for the DLS 2 Plus. All characters in the

APPENDIX A .. RS-232 Interface Protocol

4 lower case set data path command are also lower case.

This command is sent to the multiplex tool and is used to set the data path in the tool. Refer to each tool for the actual format of these commands.

SET SCAN INTERVAL

Command : TD+nn<lf>

Command : TTmm<lf>

- 1 This command sets the logging interval. There are two forms TD and TT.
- 2 The TD command specifies a depth based log is required. Scans are built and sent to the computer every nn centimetres. The plus sign indicates that logging down is required. If it is intended to log up the plus sign should be changed to a negative sign.
- 3 A TT command requires one parameter mm. This sets the number of 10 ms increments to elapse between each time based scan. 10ms is the minimum scan allowable. 255 is the maximum number that can be sent and corresponds to a time based log interval of 2.55 seconds.

SELECT POWER

Command : P<lf>

Command : P1sX<lf>

Command : PAvv<lf>

- 1 This command has three different modes. The simplest is just the P character alone and this will turn off any power that has been applied to the line.
- 2 The P1 command has two parameters. The sign parameter is one of the characters + or -. This determines the sign of the power applied to the line. The second parameter can be either an A or an E. Use A to connect DC tool power to the line and E to connect an AC SPR measure current to the line.
- 3 The PA command has one parameter vv which may be any of 0 24 or 40. This applies zero (0), twenty four (24) or forty (40) [DLS 2] or fifty [DLS 2 Plus] volts to the internal power bus.

BEGIN LOGGING

Command : B<lf>

Command : V<lf>

APPENDIX A .. RS-232 Interface Protocol

Response : ddd,tt,nn{,nn}

- 1 Data is returned to the *computer* for plotting and or recording (if selected). Data is sent after the tool has traversed the previously specified depth in the hole or the specified time has elapsed. The B and V commands are synonymous.
- 2 The depth (ddd) is 24 bits of unsigned binary and represents the depth of the tool in centimetres.
- 4 The time (tt) is a 16 bit unsigned integer in units of 100's of microseconds over which the channel data was accumulated.
- 5 Channel data (nn) is 16 bits of data for each channel specified to be sent by the Set Data Path command. Refer to the Set Data Path command for information on the interpretation of the data for a given channel.

ABORT COMMAND

Command : X<lf>

- 1 Stops any log in progress. If not logging, resets all internal registers of the DLS interface.
- 2 Resets the DLS 2 internal status to the 'normal' value of 81 (hex).

GET STATUS COMMAND

Command : Q<lf>

Response : status

- 1 Returns the internal status of the DLS interface. Normal status is 81 (hex). A bad command will return 41 (hex). Loss of communication with a multiplex tool will return a status of 41,43 or 47.
- 2 The status returned by the Q command is useful in determining whether it is possible to communicate with a multiplex tool. Sending a set data path command to the tool will give a status of 81 (hex) if successful.
- 3 Resets the DLS 2 internal status to the 'normal' value of 81 (hex). The DLS 2 Plus internal status is not affected by this command.

APPENDIX B .. Tool Parameters

This appendix is for use with the *setup* section of the *ALOG program*. It is a guide to the use of the tool default file parameters that can be set by the operator.

A no Each tool is associated with an identifier. This identifier consists of the character T followed by up to three digits. The tool identifier may be used by the software to enable particular features if required for logging with the tool. Any four characters may be entered here although it is suggested that you do not alter the identifiers associated with AUSLOG tools nor do you use existing identifiers for new or non standard tools.

Name This is the name of the tool. Not used for any purpose other than printing in the header data. Up to twenty characters may be used.

Spacer Ch Enter the channel number on which spacers will have an effect. Mainly used for density and density caliper tools where spacers would affect the measure point used in depth correction calculations. Only used in replots when depth correction is enabled. Enter a value of zero (0) for tools for which spacers are not applicable.

No. Chans The number of channels in the tool. Enter one for single channel tools and the appropriate number for multi channel tools. Will affect the log produced in both replay and logging.

Caliper The power command used for opening and closing the caliper arms (if fitted). If this tool does not have a caliper arm the word NOCALIPER should be entered here.

Use uppercase letters and refer to appendix A for the correct syntax. A typical entry would be

P1+40,A40.

Name The name of the tool channel. No effect on the log. You may change at will. Up to twenty characters may be entered. Stored in the log header and printed in the log header each time log is plotted.

Offset The sensor offset for this channel. This is the distance in cm (Or 1/100 of a foot if imperial scale is chosen) from the cablehead/tool junction to the measure point for this channel. It is used in depth correction calculations in replay. Not used during logging. If too large, depth correction may be affected.

Cal Rtn This is the name of the calibration routine to be used for this tool channel if a calibration is requested. Should not be changed. If entering a new tool there will usually be no suitable calibration routine. Enter CNOREQ in this instance. Always use uppercase letters. Other valid entries can be found in the CAL.TXT file in the AUSLOG directory of your program disk.

The first character of the Cal Rtn parameter determines the TYPE of calibration to be

APPENDIX B .. Tool Parameters

performed. Additional calibration types may be added from time to time by Auslog.

The remaining characters of the Cal Rtn parameters determine the prompt strings that are displayed during the calibration routine. These characters should match entries in the CAL.TXT file supplied with the software. Users may add their own calibration routines based around the standard types.

A Single point operation check.

Eg ANEGNU

A simple check of operation (typically) for nuclear channels. Stores the reading obtained in the C1 parameter of the tool default file.

B Maximising single point check

Eg BMANUC

A simple check of operation (typically) for nuclear channels. Stores the reading obtained in the C1 parameter of the tool default file. Offers a screen display that allows the operator to adjust the position of the radioactive source before taking a reading.

C Two point calibration

Eg C3ARM

Allows entry of two known values (typically rings for a caliper). The values are stored in C1 and C3. Operator then applies the known values to the tool (one after the other). Routine takes two readings. Readings are stored in C2 and C4. Calculates M and B parameters for a straight line conversion.

D Simultaneous two point calibration of two channels.

Eg DLNSN

As above but does two channels at the same time.

E Centre type calibration

Eg ECCL

Finds the free running frequency of a channel and calculates the M and B values that would make this frequency give an output of zero. Displays deviation from this zero point in %.

F Simultaneous two point calibration of multiple (up to 6) channels.

Eg FEAL

The same as for C and D types but allows up to six channels to be calibrated simultaneously.

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- G** Single channel multi point calibration.

Eg GCAL

Multi point calibration routine. C2 is typically set to -1 in the tool default file. C3 and C4 store the filename and extension respectively of the filename used to store the multiple calibration data. The data form a lookup table. The table is stored within the header of the log data. If calibrated at the time the log is run then the C2 parameter becomes -2. If no lookup data is available at the time the log is run, the C2 parameter is set to -3. It is possible that lookup data may be available at replay time. If available at log time, lookup data will always be available at replay time since the data is stored in the log file header. There is currently no way to disable a lookup table once it is stored in the log file header.

- H** Special calibration routine for deviation section

Eg HDEV

Invokes a special calibration routine exclusively designed for calibrating the eight consecutive channels that come from a deviation tool or tool section. M and B parameters are fixed for the deviation section.

- I** API calibration of Gamma tool using API jig.

Eg IAPI

Used in combination with the API jig. Changes the M value to allow the Gamma channel response to be plotted in API units.

- K** Simultaneous two point calibration of two channels when using a DLS4/DLS5

Eg KSPPR

The same as for D type but uses the internal Analogue to Digital converters contained in the DLS4/DLS5 to produce to readings.

I cmd This is the signal source command for this particular tool channel. Refer to appendix A for exact command syntax. The 'I' should NOT be entered here. This field must be correct to obtain a log. Not used in replay mode. Use uppercase letters for pulse type tools and lower case letters for multiplex tools. SP and Pr also use upper case letters.

Th The means by which the Auslog DLS 2 set the threshold detector level for each tool channel. This parameter is operator entered and may range from 0 to 255. For a more detailed explanation of this parameter refer to appendix A of this manual.

P cmd Sets the tool power for this tool channel. Refer to appendix A for exact command syntax. The P MUST be entered here. This field must be correct to obtain a log.

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Not used in replay mode. Use uppercase letters.

Units The unit name for the data produced by this tool after application of the calibration equation. Not directly used to plot a log but if the incorrect name is used log interpretation may be difficult. This is the name printed on the scale bar on the log printouts.

M The multiplication factor applied to the raw tool data reading (in combination with the B value below) to obtain the units mentioned above. Should not be changed if no calibration is available for this tool (eg Temperature tool). Will be set by calibration procedure when one is available.

B Used with the M factor as explained above. The equation used is of the form

$$\text{Units} = M * \text{raw data} + B$$

Similar comments apply with regard to changing and setting of this parameter as for the M parameter.

C1 .. C4 - Calibration constants. The exact usage of these parameters is dependent on the particular tool. They have no effect on the log plotted and are simply reproduced in the printed header. For some tools (Caliper, SP/SPR etc) they are the data from which the M and B parameters above were determined.

APPENDIX C .. Diagnostics Program Usage

The *diagnostics* section of the program is intended for use by service and maintenance personnel. Proper use of this part of the program can be useful when problems occur in isolating which part of the equipment is faulty.

For a full description of the function of all commands refer to Appendix A.

A typical session with the diagnostics program when testing a gamma tool might look like the following

```
Enter command string ($ to end) ? !20
Enter command string ($ to end) ? IA1
Enter command string ($ to end) ? TT100
Enter command string ($ to end) ? P1+A,A24
Enter command string ($ to end) ? V
```

At this stage the DLS should respond with data like this

```
-1 10000  12 81 19
-1 10000  20 81 19
-1 10000  18 81 19
-1 10000  30 81 19
-1 10000  25 81 18
-1 10000  14 81 19
```

Press the [F1] key at any time to stop the display and restore the command prompt. When the command prompt is displayed, entering the '\$' character will return you to the program at the logo screen.

Looking at each column above in order we note

- 1 The depth recorded in the internal DLS depth register (in cm).
- 2 The time over which counts are accumulated (in 100's of us).
- 3 The number of counts accumulated since the last scan.
- 4 The internal status of the DLS interface (in hex).
- 5 The current drawn by the tool (in mA). This measurement is *not* calibrated and is approximate only.

Other command sequences can be used to test tools with two channels and multiplex tools. Refer to Appendix A and the manuals supplied with each tool for more details on the actual format of the necessary commands.