

**CRAVG
DOCUMENTATION**

**ZONGE Data Processing
CR Averaging Program
version 7.2x**

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CRAVG Program Documentation

OVERVIEW

CRAVG averages GDP CR raw data. Several output files are available, including a log file (.LOG-file), listing file (.EL-file), plot file (.Z-file), and average files (.S-file and .AVG-file). CRAVG will handle data measured at any binary fundamental frequency provided by the GDP. Data for any component will also be handled, but some output files may not include the component (refer to the HEMA VG program).

INPUT FILES

Data files read by CRAVG include a data file (.FLD-file) and optionally a mode file (.MDE-file).

The data file is usually the result of using the SHRED program to read a GDP data dump file (.RAW-file), which writes a data file (.FLD-file). These data files include records, each containing data for one measurement. For CR data, one record contains data measured by one channel. The SHRED program uses the GDP data block entries for Tx, Rx, and N-Spacing, and includes updated values in each data record.

The records are sorted, so that the records that need to be averaged are grouped together. Refer to the SHRED program documentation for details of this procedure and for the formats of the input and output files.

An optional mode file includes entries that modify mode values defined by Zonge Data Processing (DATPRO) programs. A mode name is specified for several program variables that a user may modify. Each line in a mode file includes the program name, mode name, and value. When running CRAVG, help text and mode descriptions are also available at the MODE prompt. An appendix to this manual summarizes the use of mode variables and includes a description of each mode defined by CRAVG.

OUTPUT FILES

The log file (.LOG-file) includes a summary of the data processed. Notes are also included, concerning the progress of the CRAVG program. It is useful when reviewing the operation of the program.

The plot file (.Z-file) written by CRAVG uses a format expected by Zonge DATPRO plot programs. It contains header information and columns of data, each line including X,Y location and Z value for one parameter, optionally followed by sections for additional parameters. CRAVG includes Resistivity, Raw Phase and 3-Pt Phase for one component and frequency (specified by mode values).

The first average file (.S-file) includes one block of data for each set of averaged data. The file uses the format expected by programs that provide additional data processing (GDPHM and CRRED).

A second average file (.AVG-file) includes a variety of location and parameter data in columnar format, for all components and frequencies. The file is composed of sections, each of which has constant values for location and component. Undefined values are indicated by a "*". This format is expected of newer utility routines and some ZONGE modeling programs. The format is also suitable for use by spreadsheet, database, and plot programs.

SURVEY LOCATION CONVENTIONS

Zonge DATPRO programs assume that the GDP operator enters survey locations for the Dipole-Dipole configuration in a specific manner. First, the N-Spacing for each channel is entered for each channel. Then, the Tx and Rx entries indicate the dipoles for the channel with the SMALLEST N-Spacing. Also, Dipoles extend between two adjacent stations with the LOWEST numbered station entered for each dipole.

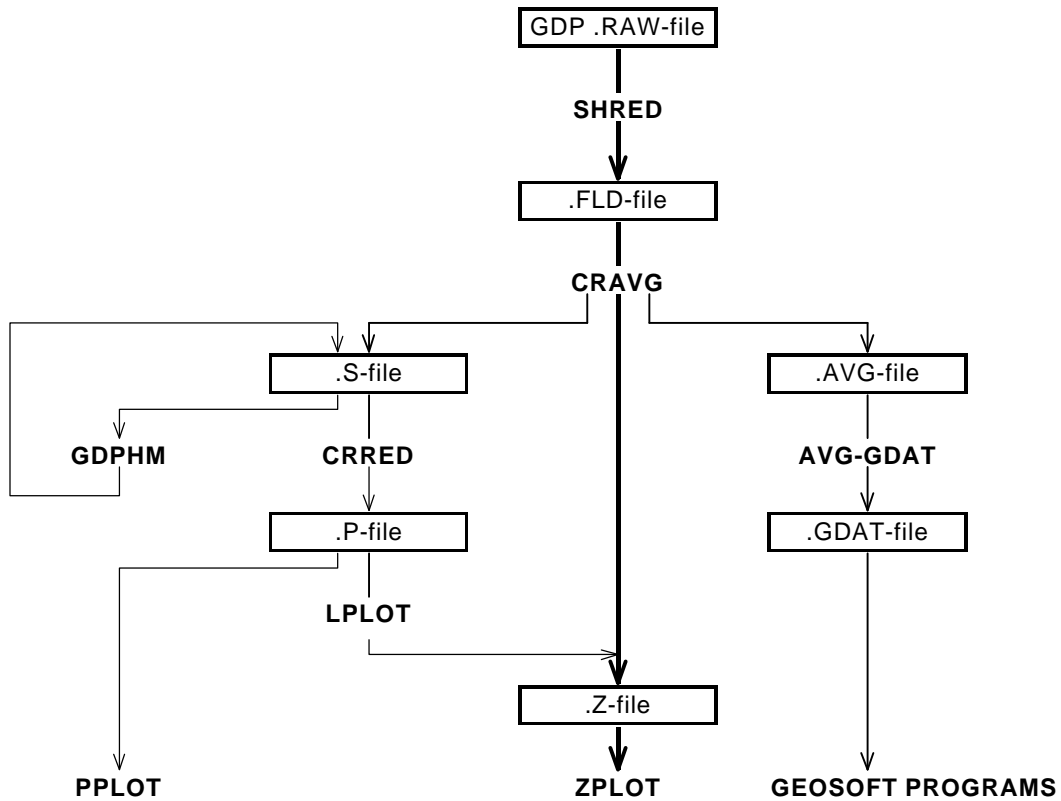
Station numbers are assumed to increase towards the north or east, and decrease towards the south or west (negative values when the station is south or west of the zero coordinate). Therefore, the Tx and Rx entries reflect the south or west end of each dipole.

CR DATA PROCESSING FLOW

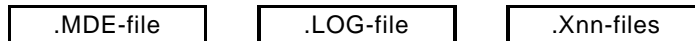
August, 1993

Program names are **CAPITALIZED**
File names are Boxed

Bold lines — show standard
GDP data processing flow.



Other files read or written:



CRAVG Usage

The GENERAL DATA PROCESSING DOCUMENTATION includes many details that are common to data processing programs.

Start the averaging program by typing "CRAVG" <RETURN>. Respond to the prompt with the name of the .FLD-file. Command line execution also allows the user to type "CRAVG" followed by the .FLD-filename <RETURN> to automatically load the data file.

Several variable parameters called "MODES" influence the operation of CRAVG. A brief explanation of each mode, as well as its current value, can be listed within the program. An appendix to this manual summarizes the use of mode variables and includes a description of each mode defined by CRAVG.

CRAVG MODE DISPLAY

PROCESSING MODE DEFAULT VALUES:

PROCESS MODES mode names mode values	AutoRun AUTO NO	LowFreq FMIN AUTO	HiFreq FMAX ALL	HarmLimit HARM NONE	GainAdj GAIN AUTO	Preview VIEW NONE
DISPLAY MODES mode names mode values	AvgFile DFILE YES	PlotFile ZFILE YES	AutoPause PAUSE NO	Prompts HELP NO	GridOrgX GORX NONE	GridOrgY GORY NONE

CRAVG ERROR MESSAGES

If errors or inconsistencies arise within the program, CRAVG may type a "NOTE" or an "ERROR" message. A "NOTE" message usually indicates some irregularity in the data file that is not fatal to program operation. Depending on the severity of the problem, an "ERROR" message may allow the program to continue to run or cause it to interrupt and wait for a response to a prompt to continue, restart the program, or to end. These messages are also included in a .LOG-file, which provides documentation of the program operation, which is especially useful when running several programs automatically from a batch file.

Note: a station whose data is split into different .FLD-files is processed as two separate stations.

CRAVG OUTPUT SELECTIONS

CRAVG will write average data (.S- and .AVG-files) and plot data (.Z-file). A .LOG-file is automatically created by CRAVG.

CRAVG MANUAL MODE OPERATION

Data points are processed in sequence as read from the input file. When mode AUTO=YES, no operator input is requested. When using mode AUTO=NO, two screens of information are displayed for each data point. The first provides a summary of data blocks. The operator may change the skip setting for any data block, select data acquired with a different filter setting, change mode values, or continue to the second screen. The second screen provides a listing of data in addition to various parameters. If mode VIEW=YES, this display is provided with a plot if the averaged data. In addition, if mode COPY=YES, the plot and data listing are provided on separate screens. The operator may accept the data and continue to the next data point, or may return to the first screen.

CRAVG MANUAL MODE OPERATION (continued)

Example of manual mode screens for data acquired at several fundamental frequencies (not part of the sample data file):

First screen:

```
CATALOG OF DATA BLOCKS
Tx: 4000. , Rx: 3400. , NSp: 2. , Ex Comp, D-D Data

*** D-D Array Data, Notch Filter OUT
Block# +82+83+80+81+78+79+76+77      *** Data block numbers
ALPHA  A B C D E F G H              *** Skip flag keys

Hz:2^n  10 10 7 7 4 4 -3 -3        *** 1024, 128, 16, 1/8 Hz
Filter   0 0 0 0 0 0 0 0          *** Notch filters were OUT

AvgFlg   1 1 1 1 1 1 1 1          *** Skip flags

ALPHA: SKIP FLAG flip      F6: New data file
      -: SKIP this data    : NOTCH FILTERS are all OUT.
      0: process this data F10: MODE prompt

OPTION change [0]:
```

Second screen (with plot of data when mode VIEW=YES):

```
Raw Field Data 02 Aug 93      CRAVG 7.20      Hz,Re,Im NORM. D-D Array
Job: 91101      90-12-28      Ex D-D Data 0.125 1. 0.0028
ASp: 61.0m Line: 2500 N      GainAdj ON 0.375 0.9973 0.0019
Tx: 4000.      Rx: 3400.      NSp: 2. 0.625 0.9959 0.0006
                                0.875 0.9954 -0.0008
                                1.125 0.9954 -0.0024
                                16 0.9979 -0.0023
                                48 1.0032 0.0086
                                80 1.0047 0.0178
S1 0.005 -0.004 0.12 -0.209    112 1.0036 0.0265
Ty  A      A      C      C      144 1.0008 0.0345
De 0.952 6.88 -1.092 3.292    128 1.0022 0.0273
Hz 0.125      16      128      1024 384 0.986 0.0791
                                640 0.9663 0.122
RHOa: 164.146 ohm-meters      896 0.9409 0.1541
Raw PFE: 0.5, Min SEM: 0. mr 1152 0.9174 0.1802
Raw PHASE: 2.8, Max SEM: 0.1 mr 1024 0.8822 0.1584
                                3072 0.7089 0.2594
                                5120 0.6017 0.2998
                                7168 0.5659 0.2547
                                9216 1.6168 1.4392

Satisfied [N,y]?      *** If N or <CR>, return to first screen
```

CRAVG MANUAL MODE OPERATION (continued)

The second screen includes additional parameters under the header block and 3-point DC Phase value:

Lines labelled "SI"opes, Spectral "Ty"pe, "De"rivatives, and "Hz" frequency are followed by additional labelled parameters.

"SI"ope values are provided for each of the curve segments that consist of a fundamental and related harmonic frequencies. These slopes are defined on the Real versus Frequency plane, over about a decade of frequency. When multiple fundamental frequencies were used, and there is overlap between curve segments, then the slope is calculated between the point at the first fundamental frequency, and a point on the second curve segment that is a decade of frequency above the first. When there is no overlap between curve segments, the second point is interpolated on the first curve segment.

Looking at the sample set of data above that uses fundamental frequencies of 1/8, 16, 128, and 1024Hz: The slope using the 1/8Hz fundamental uses the second point interpolated at 1.0Hz, since there is no overlap with the 16Hz data. The slope for 16Hz uses the second point as the 128Hz fundamental. The slope for 128Hz uses the second point as the 1024Hz fundamental. And the slope for 1024Hz uses the second point interpolated at 8192Hz.

"Ty"pe values are a representation of slope on the Imaginary versus Frequency plane, using characters.

	+-----+-----+-----+-----+-----+						
Slope: percent	-30	-20	-10	00	10	20	30
Type: integer	1	2	3	-3	4	5	
Type: character	A	a	B	b	c	C	

"De"rivative values are also provided for each curve segment. These values describe the slope of the curve segment on a Real versus Imaginary plot (change in Imaginary / change in Real).

CRAVG Sample Run

Input files: SAMCR.FLD, SAMCR.MDE

Output files: SAMCR.LOG, SAMCR.S , SAMCR.Z , SAMCR.AVG

*** NOTE: responses to prompts are in **bold type**; comments about program operation are enclosed in stars ***

C: > **CRAVG**

ZONGE ENGINEERING: 3322 E. Fort Lowell, Tucson AZ 85716, USA
 CRAVG 7.01: AVERAGING PROGRAM FOR FULL FREQUENCY CR DATA.
 MS-DOS version implemented 01 November, 1992.

CRAVG VERSION UPDATE INFORMATION
 5.00 Read GDP data using one record per measurement (SHRED format).
 7.00 Global Modes replace .I-file. Implement prioritized Modes.

Enter a data filename, or <CR> to EXIT.

Data filename [quit]: **SAMCR** *** Enter .FLD-file ***

MODE CLIENT =NATURAL RESOURCES AUTHORITY
 MODE PROJECT =WADI ALMARSAD
 MODE JOBNUMB =000
 MODE JOBDATE =SEP 91
 MODE JOBLINE =10
 MODE BRGLINE =N 85 E
 MODE BRGBACK =S 85 W
 MODE STNLO = -3.0
 MODE STNHI = 10.0
 MODE FRQLO = 1/8 Hz
 MODE FRQHI = 1/8 Hz

(Type MENU for assistance with MODEs.)

MODE Change [name?, name= value] : **LIST** *** List current modes ***

PROCESSING MODE LIST: (Type MENU for assistance)

PROCESS MODES	AutoRun	LowFreq	HiFreq	HarmLimit	GainAdj	Preview
mode names	AUTO	FMIN	FMAX	HARM	GAIN	VIEW
mode values	YES	AUTO	ALL	NONE	AUTO	NONE
DISPLAY MODES	AvgFile	PlotFile	AutoPause	Prompts	GridOrgX	GridOrgY
mode names	DFILE	ZFILE	PAUSE	HELP	GORX	GORY
mode values	YES	YES	NO	YES	NONE	NONE

MODE Change [name?, name= value] : <CR> *** Press RETURN ***

Reading "SAMCR.FLD" . . .
 Tx: 6. , Rx: 2. , N-Sp: 3.0, Comp: Ex DONE
 Tx: 6. , Rx: 1. , N-Sp: 4.0, Comp: Ex DONE
 Tx: 6. , Rx: 0. , N-Sp: 5.0, Comp: Ex DONE
 Tx: 6. , Rx: -1. , N-Sp: 6.0, Comp: Ex DONE
 Tx: 6. , Rx: -2. , N-Sp: 7.0, Comp: Ex DONE
 Tx: 6. , Rx: -3. , N-Sp: 8.0, Comp: Ex DONE
 Tx: 5. , Rx: 2. , N-Sp: 2.0, Comp: Ex DONE
 Tx: 5. , Rx: 1. , N-Sp: 3.0, Comp: Ex DONE

...

Tx: 4. , Rx: 7. , N-Sp: 2.0, Comp: Ex DONE
 Tx: 4. , Rx: 8. , N-Sp: 3.0, Comp: Ex DONE
 Tx: 4. , Rx: 9. , N-Sp: 4.0, Comp: Ex DONE
 Tx: 5. , Rx: 7. , N-Sp: 1.0, Comp: Ex DONE
 Tx: 5. , Rx: 8. , N-Sp: 2.0, Comp: Ex DONE
 Tx: 5. , Rx: 9. , N-Sp: 3.0, Comp: Ex DONE
 Tx: 6. , Rx: 8. , N-Sp: 1.0, Comp: Ex DONE
 Tx: 6. , Rx: 9. , N-Sp: 2.0, Comp: Ex DONE

Completing and closing files . . .

File "SAMCR.AVG" contains averaged data for 54 stations.

Appendix A ... MODE VARIABLES

Control of various aspects of many data processing programs is provided by names called "Modes". Each name refers to a specific program function. For example, the Mode name "AUTO" refers to the automatic mode of program operation, which the user may enable.

Mode changes are recognized when prompted by a program, when read from a Mode file, or when included in an input data file.

MODE PROMPTS, Manual entry

The first prompt after a data filename is requested is commonly a mode prompt. In the following example, user requests are in BOLD type, and the results are typical responses.

(Type MENU for assistance with MODEs.)

MODE Change [name?, name= value] : MENU

PROCESSING MODE MENU: Review and changing of mode values.
 Change value: type "NAME= value", where NAME is the variable name, followed by "=", then the value to be assigned to the variable called NAME.
 Description : type "NAME?" for description of value.
 This menu : type "MENU", or "M", to list this menu.
 List globals: type "GLOBL" or "G", to list global mode values.
 List values : type "LOCAL" or "L", to list local mode values.
 Version info: type "VRSN", or "V", for program version info.
 Back up : type <CTRL><Z> to back up in program.
 All done : type <RETURN>.

MODE Change [name?, name= value] : LIST

PROCESSING MODE LIST: (Type MENU for assistance)

CONTROL MODES	AutoRun	LowFreq	InitGain	GridOrgX	GridOrgY
mode names	AUTO	FMIN	(not yet)	GORX	GORY
mode values	YES	1/16 Hz	NONE	NONE	NONE

MODE Change [name?, name= value] : AUTO?

AUTO mode will automatically delete existing output files (if any), not prompt for MODE changes (if AUTO= YES is included in the .MDE-file, and exit when completed. Plots will be done as specified by entries in the .MDE-file (MODE PLOT and VIEW).
 Enter: AUTO= No, or Yes.

MODE Change [name?, name= value] : AUTO= yes

MODE Change [name?, name= value] : <RETURN>

(the program continues ...)

Display a definition of any Mode by typing the variable name and a question mark (as shown for Mode AUTO). Each program manual includes an appendix of mode definitions defined by that program.

Change the value of a Mode by typing the variable name, an equals sign, and a valid value. Press <RETURN> to indicate that the program should continue.

MODE CHANGE PRIORITIES

Mode changes may be manually entered, added to mode files or to input data files. Mode statements in files include the program name (optional), the Mode name, and the Mode value. Include a dollar sign (\$) in the first column, a colon (:) after the program name (if any), and an equal sign after the Mode name such as:

\$ ZPLOT: AUTO= yes

Modes will NOT be changed unless they are from a source with the same or higher priority as the entry to be replaced:

- 1: default mode values
- 2: Mode lines in input data files
- 3: Mode lines in Mode files (global or local)
- 4: Mode changes made at a MODE prompt

LOCAL MODE FILES

The program will read a Mode file (if it exists) with the same name as the data file and an extension of ".MDE" (like LINE10.MDE). Specify a different Mode file from the DOS prompt, by entering the program name, data file name, then Mode file name. Include the filename extension if not the same as the default. For example:

<u>Start ZPLOT by:</u>	<u>ZPLOT looks for files named:</u>
C:> ZPLOT LINE10	LINE10.Z LINE10.MDE
C:> ZPLOT LINE10 PROJECT	LINE10.Z PROJECT.MDE
C:> ZPLOT LINE10.ZZ PROJECT.MOD	LINE10.ZZ PROJECT.MOD

GLOBAL MODE FILES

Frequently used Mode statements may be included in a file named "DATPRO.MDE" and located in any subdirectory included on your PATH. Or, the environment variable DATMDE may specify any Mode file located anywhere on your computer. One of these files will be used automatically by the program, in addition to any local mode file. Your MS-DOS manuals describe environment variables and PATH.

DATA FILE MODE STATEMENTS

Mode statements may be included in an input data file (near the top of the file). Some programs will include Mode statements in output data files, for use by subsequent programs.

CRAVG MODE LIST
(v 7.2x)

PROCESSING MODE DEFAULT VALUES:

PROCESS MODES mode names mode values	AutoRun AUTO NO	LowFreq FMIN AUTO	HiFreq FMAX ALL	HarmLimit HARM NONE	GainAdj GAIN AUTO	Preview VIEW NONE
DISPLAY MODES mode names mode values	AvgFile DFILE YES	PlotFile ZFILE YES	AutoPause PAUSE NO	Prompts HELP NO	GridOrgX GORX NONE	GridOrgY GORY NONE

COMPANY

Company name (40 chr max)

Values: COMPANY= Name of survey company

Default: COMPANY= (blank)

BRGBACK

Line back bearing (10 chr max)

Values: BRGBACK= Back Bearing, to low stn.

Default: BRGBACK= (blank)

CLIENT

Client name (40 chr max)

Values: CLIENT= Company requesting the survey

Default: CLIENT= (blank)

STNLOW

Low station number, plot limit

Values: STNLOW= X-axis low station limit.

Default: STNLOW= NONE

PROJECT

Project name (40 chr max)

Values: PROJECT= Name of the survey project.

Default: PROJECT= (blank)

STNHIGH

High station number, plot limit

Values: STNHIGH= X-axis high station limit.

Default: STNHIGH= NONE

JOBNUMBER

Company job number (10 chr max)

Values: JOBNUMBER= Survey Job Number.

Default: JOBNUMBER= (blank)

STNDELT

Station number increment, plot scale

Values: STNDELT= X-axis station increment.

Default: STNDELT= 1.0

JOBDATE

Survey date (10 chr max)

Values: JOBDATE= Date of Survey.

Default: JOBDATE= (blank)

LBLFRST

Low station number, axis label

Values: LBLFRST= X-axis low station label.

Default: LBLFRST= mode STNLOW value.

JOBLINE

Survey line number (10 chr max)

Values: JOBLINE= Survey Line Number.

Default: JOBLINE= (blank)

LBLDELT

Station number increment, axis label

Values: LBLDELT= X-axis station label increment.

Default: LBLDELT= 1.0

BRGLINE

Line forward bearing (10 chr max)

Values: BRGLINE= Line Bearing, to high stn.

Default: BRGLINE= (blank)

FRQLO

Low frequency, plot limit

Values: FRQLO= None, or low frequency limit, Hz.

Default: FRQLO= NONE

FRQHI

High frequency, plot limit

Values: FRQHI= None, or high frequency limit, Hz.

Default: FRQHI= NONE

TXLEN

CSAMT Transmitter length (10 chr max)

Values: TXLEN= CSAMT Transmitter Length

Default: TXLEN= (blank)

TXBRG

CSAMT Transmitter bearing (10 chr max)

Values: TXBRG= CSAMT Transmitter Bearing

Default: TXBRG= (blank)

TXDIS

CSAMT Transmitter distance from survey line (10 chr max)

Values: TXDIS= Distance from Rx Line to Tx

Default: TXDIS= (blank)

TXCX

CSAMT Transmitter center, X-coordinate
If units in feet or meters are not included, mode UNITS will be used.

Values: TXCX=

X-coordinate of center of Tx dipole. (10 chr max)

Default: TXCX= (blank)

TXCY

CSAMT Transmitter center, Y-coordinate
If units in feet or meters are not included, mode UNITS will be used.

Values: TXCY=

Y-coordinate of center of Tx dipole. (10 chr max)

Default: TXCY= (blank)

RX2TX

CSAMT Receiver to Transmitter direction

Values: RX2TX=

Direction from Rx Line to Tx (10 chr max)

Default: RX2TX= (blank)

RXBRG

Receive dipole bearing, usually same as survey line orientation

Values: RXBRG=

Receiver Dipole Bearing (10 chr max)

Default: RXBRG= (blank)

COMWIRE

Communications wire type, used for decalibration of GDP-12 data

Values: COMWIRE=

NONE, 1WHITE, 2WHITE, or BLACK.

Default: COMWIRE= NONE

PLTREV

Plot X-axis reverse selection

Values: PLTREV= No, or Yes.

Default: PLTREV= NO

UNITS

Units for listed values, such as A-Spacing. Feet or meters.

Values: UNITS= Feet or Meters.

Default: UNITS= Meters

AUTO

AUTO mode will automatically delete existing output files (if any), not prompt for MODE changes (if AUTO= YES is included in the .MDE-file) and exit when completed.

Values: AUTO= No, or Yes.

Default: AUTO= No

FMIN

Resistivity and decoupled phase parameters are calculated using the lowest frequency acquired, by default specified as FMIN=AUTO. If the lowest frequency varies between data points, use mode FRQLO to specify a reference frequency and set FMIN=FRQLO.

Values: FMIN= Auto, or FRQLO

Default: FMIN= Auto

FMAX

Unusable high frequency values can be ignored. Set mode FMAX to a frequency limit.

The default frequency is specified by mode FRQLO. A fundamental or harmonic frequency may be entered, in Hertz. Specify the entry as an expression or as a numeric value, like:

(1): "0.375" or "3/8" (2) "24" or "3*8" (3) "3072" or "3*1024"

Values: FMAX=

ALL or frequency (Hz) (fraction or numeric)

Default: FMAX= ALL

HARMONIC

Limit the maximum harmonic to be processed by setting mode HARMONIC. Any value other than 1, 3, 5, or 7 will be set to 9 (displayed in the mode list as NONE).

Values: HARMONIC= NONE, 1, 3, 5, 7, or 9.

Default: HARMONIC=

NONE (same as HARMONIC= 9)

GAIN

If Receiver gains or Transmitter current are changed during acquisition at one data point, the resulting data are shifted. The curve segments (data for one frequency and its harmonics) can be adjusted to reduce these shifts. If the fundamental for one curve segment overlays the segment for a lower fundamental, the adjustment factor is the ratio of the Real Components of the data at that frequency.

For example, curve segments overlap for data measured at .125 and 1.Hz. The adjustment factor is the ratio of the 1.Hz Real component and the average of Real components at harmonics .875 and 1.125Hz. All Real and Imaginary values of the 1.Hz data are adjusted by this single factor.

A second adjustment can be made when the initial shift is inadequate. The difference between the Imaginary components at one frequency (1.Hz in the above example) is applied to only the Imaginary components.

Mode GAIN=AUTO is default: adjust data only when Rx gains or Tx current change. Mode GAIN=REAL adjusts data points of overlapped curve segments by the ratio of Real components at one frequency. Mode GAIN=BOTH also adjusts data points by the difference between Imaginary components. Mode GAIN=NONE disables all adjustments.

Values: GAIN= NONE, AUTO, REAL, or BOTH.

Default: GAIN= AUTO

GORX

Grid coordinates for Gradient and Schlumberger Arrays should be specified in meters. Values may be larger than can be included in reports and data files.

Mode GridORiginX (GORX) specifies the X-Coordinate of an alternate origin. Grid Coordinates will be specified relative to the alternate origin. The smaller coordinate values may be better suited for files.

Values: GORX=

Alternate GridOrigin, X-direction, meters.

Default: GORX= NONE

GORY

Grid coordinates for Gradient and Schlumberger Arrays should be specified in meters. Values may be larger than can be included in reports and data files.

Mode GridORiginY (GORY) specifies the Y-Coordinate of an alternate origin. Grid Coordinates will be specified relative to the alternate origin. The smaller coordinate values may be better suited for files.

Values: GORY=

Alternate GridOrigin, Y-direction, meters.

Default: GORY= NONE

DFILE

Averaged data may be written to a data file for use by other programs. Mode DFILE specifies writing .S- and .AVG-files.

Values: DFILE= No, or Yes.

Default: DFILE= No

ZFILE

The averaged data may be written to a plot data file for use by additional programs. Mode ZFILE specifies whether or not to write a .Z-file.

Values: ZFILE= No, or Yes.

Default: ZFILE= No

VIEW

Screen plots of averaged data may be selected by mode VIEW. This mode is recommended while not using AUTO mode, so that the effects of selecting or skipping various blocks of data may be observed.

Values: VIEW= NONE (No), or SCREEN (Yes)

Default: VIEW= No

PAUSE

Mode PAUSE interrupts the screen plots for review by the user, before the plot is overwritten by text data summaries.

Values: PAUSE= No, or Yes.

Default: PAUSE= No

HELP

Prompts may contain additional information to assist the user who is not familiar with the program by selecting mode HELP.

Values: HELP= No, or Yes.

Default: *HELP= No*

ERRORBARS

Error bars are available for averaged magnitude data only.

The variation (sigma) is displayed as a percentage (coefficient of variation). Error bars greater than a minimum value (10%) are drawn between $\log(\text{Avg}) + \log(1 \pm \text{Cvar}/100)$. The data curve symbol is displayed over the error bar endpoints.

Values: ERRORBARS= No, or Yes.

Default: ERRORBARS= Yes

Appendix B ... SAMPLE FILES

Sample .LOG-file (partial)

ZONGE ENGINEERING

Sample Data

CRAVG 7.20 02 Aug 93

GLOBAL MODE LIST:

COMPANY Zonge Engineering			JOBNUMB 000	TXLEN
CLIENT ZONGE ENGINEERING			JOBDATE Sep 91	TXBRG
PROJECT Sample Data			JOBLINE 10	TXDIS
BRGBACK S 85 W	RXBRG N 85 E	BRGLINE N 85 E	FRQLO 1/8 Hz	RX2TX
STNLO -3.0	STNDELTA 1.0	STNHI 10.0	FRQHI 1/8 Hz	TXCX
LBLFRST	LBLDELTA 1.0	PLTREV NO	UNITS METERS	TXCY

PROCESSING MODES USED:

PROCESS MODES mode names mode values	AutoRun AUTO YES	LowFreq FMIN AUTO	HiFreq FMAX ALL	HarmLimit HARM NONE	GainAdj GAIN AUTO	Preview VIEW NONE
DISPLAY MODES mode names mode values	AvgFile DFILE YES	PlotFile ZFILE YES	AutoPause PAUSE NO	Prompts HELP NO	GridOrgX GORX NONE	GridOrgY GORY NONE

Reading "SAMCR.FLD" . . .

```
Job 000      Date 91-09-20  Line 10      A-Spacing 200.0 meters
blk: line  freq  Tx  Rx  NSp  curr  G_mix  Sem  stks data CmpPolAvg
240:   3  .125   6.0  2.0  3.0  1.90  7  0  0.2  16 D-D Ex 0 1
241:   4  .125   6.0  2.0  3.0  1.90  7  0  0.1  16 D-D Ex 0 1
242:   5  .125   6.0  2.0  3.0  1.90  7  0  0.1  16 D-D Ex 0 1
```

```
Job 000      Date 91-09-20  Line 10      A-Spacing 200.0 meters
blk: line  freq  Tx  Rx  NSp  curr  G_mix  Sem  stks data CmpPolAvg
240:   7  .125   6.0  1.0  4.0  1.90  8  0  0.3  16 D-D Ex 0 1
241:   8  .125   6.0  1.0  4.0  1.90  8  0  0.2  16 D-D Ex 0 1
242:   9  .125   6.0  1.0  4.0  1.90  8  0  0.3  16 D-D Ex 0 1
```

```
Job 000      Date 91-09-20  Line 10      A-Spacing 200.0 meters
blk: line  freq  Tx  Rx  NSp  curr  G_mix  Sem  stks data CmpPolAvg
240:  11  .125   6.0  0.0  5.0  1.90  9  0  0.6  16 D-D Ex 0 1
241:  12  .125   6.0  0.0  5.0  1.90  9  0  0.4  16 D-D Ex 0 1
242:  13  .125   6.0  0.0  5.0  1.90  9  0  0.6  16 D-D Ex 0 1
```

...

```
Job 000      Date 91-09-21  Line 10      A-Spacing 200.0 meters
blk: line  freq  Tx  Rx  NSp  curr  G_mix  Sem  stks data CmpPolAvg
32:  189  .125   6.0  8.0  1.0  2.50  2  0  0.0  16 D-D Ex 0 1
33:  190  .125   6.0  8.0  1.0  2.50  2  0  0.0  16 D-D Ex 0 1
```

```
Job 000      Date 91-09-21  Line 10      A-Spacing 200.0 meters
blk: line  freq  Tx  Rx  NSp  curr  G_mix  Sem  stks data CmpPolAvg
32:  192  .125   6.0  9.0  2.0  2.50  4  0  0.1  16 D-D Ex 0 1
33:  193  .125   6.0  9.0  2.0  2.50  4  0  0.0  16 D-D Ex 0 1
```

File "SAMCR.AVG" contains averaged data for 54 stations.

STACKS values marked with a "*" are underaveraged.

The GDP default values listed below are MINIMUM:

```
freq:stks  freq:stks  freq:stks  freq:stks  freq:stks
          1/64:   4   1/2:  32   16: 512   512: 4096
1/1024:   4  1/32:   4   1:   64   32:1024 1024: 4096
1/512:    4  1/16:   8   2:  128   64:2048 2048: 4096
1/256:    4   1/8:  16   4:  256  128:4096 4196: 8192
1/128:    4   1/4:  16   8:  256  256:4096 8192:16384
```

GDP DATA PROCESSING MANUAL

Sample .FLD-file (partial: only data for Tx=6, N-Sp=3. to 8.)
(columns 1-129 followed by remaining columns)

```

Reference ruler line
-----1-----2-----3-----4-----5-----6-----7-----8-----9-----1-----1-----1-----
/* SHRED v3.20: *SAMCR.FLD*
H 1 0239 1 0 CR 0515 91-09-20 10:03:04 12.3 D-D 1 1 200.0 90999 10.0 W 1
D 1 0240 1 0 91-09-20 10:10:23 12.2 .125 16 1.90 6 2 Ex 0 3.0 6.1624e-3 4.3 96.03
D 1 0241 1 0 91-09-20 10:13:13 12.2 .125 16 1.90 6 2 Ex 0 3.0 6.1631e-3 4.2 96.04
D 1 0242 1 0 91-09-20 10:16:45 12.2 .125 16 1.90 6 2 Ex 0 3.0 6.1653e-3 4.2 96.08
H 1 0239 2 1 CR 0515 91-09-20 10:03:04 12.3 D-D 1 1 200.0 90999 10.0 W 1
D 1 0240 2 1 91-09-20 10:10:23 12.2 .125 16 1.90 6 1 Ex 0 4.0 2.7539e-3 2.7 85.83
D 1 0241 2 1 91-09-20 10:13:13 12.2 .125 16 1.90 6 1 Ex 0 4.0 2.7544e-3 2.3 85.85
D 1 0242 2 1 91-09-20 10:16:45 12.2 .125 16 1.90 6 1 Ex 0 4.0 2.7557e-3 3.0 85.89
H 1 0239 3 2 CR 0515 91-09-20 10:03:04 12.3 D-D 1 1 200.0 90999 10.0 W 1
D 1 0240 3 2 91-09-20 10:10:23 12.2 .125 16 1.90 6 0 Ex 0 5.0 1.6103e-3 2.5 87.83
D 1 0241 3 2 91-09-20 10:13:13 12.2 .125 16 1.90 6 0 Ex 0 5.0 1.6101e-3 2.8 87.82
D 1 0242 3 2 91-09-20 10:16:45 12.2 .125 16 1.90 6 0 Ex 0 5.0 1.6120e-3 4.3 87.92
H 1 0239 4 3 CR 0515 91-09-20 10:03:04 12.3 D-D 1 1 200.0 90999 10.0 W 1
D 1 0240 4 3 91-09-20 10:10:23 12.2 .125 16 1.90 6 -1 Ex 0 6.0 1.9684e-3 5.2 171.8
D 1 0241 4 3 91-09-20 10:13:13 12.2 .125 16 1.90 6 -1 Ex 0 6.0 1.9694e-3 1.0 171.9
D 1 0242 4 3 91-09-20 10:16:45 12.2 .125 16 1.90 6 -1 Ex 0 6.0 1.9724e-3 5.3 172.1
H 1 0239 5 4 CR 0515 91-09-20 10:03:04 12.3 D-D 1 1 200.0 90999 10.0 W 1
D 1 0240 5 4 91-09-20 10:10:23 12.2 .125 16 1.90 6 -2 Ex 0 7.0 2.0604e-3 7.1 269.7
D 1 0241 5 4 91-09-20 10:13:13 12.2 .125 16 1.90 6 -2 Ex 0 7.0 2.0617e-3 9.1 269.9
D 1 0242 5 4 91-09-20 10:16:45 12.2 .125 16 1.90 6 -2 Ex 0 7.0 2.0661e-3 9.6 270.5
H 1 0239 6 5 CR 0515 91-09-20 10:03:04 12.3 D-D 1 1 200.0 90999 10.0 W 1
D 1 0240 6 5 91-09-20 10:10:23 12.2 .125 16 1.90 6 -3 Ex 0 8.0 2.2971e-3 9.0 429.6
D 1 0241 6 5 91-09-20 10:13:13 12.2 .125 16 1.90 6 -3 Ex 0 8.0 2.2982e-3 7.8 429.8
D 1 0242 6 5 91-09-20 10:16:45 12.2 .125 16 1.90 6 -3 Ex 0 8.0 2.3050e-3 10.6 431.0

1 1 1 1 1 1 1 2 2 2 2 2 2 2
-3-----4-----5-----6-----7-----8-----9-----0-----1-----2-----3-----4-----5-----6-----
160 .15 -2.54 4.71e+3 1 6.1624e-3 -3.8 6.1428e-3 -3.3 6.1338e-3 -3.8 6.1344e-3 -4.1 6.1272e-3 -3.1
160 .10 -2.54 4.71e+3 1 6.1631e-3 -3.8 6.1440e-3 -3.6 6.1379e-3 -4.3 6.1326e-3 -3.0 6.1290e-3 -3.7
160 .13 -2.54 4.71e+3 1 6.1653e-3 -3.8 6.1457e-3 -3.6 6.1448e-3 -4.0 6.1355e-3 -1.9 6.1256e-3 -3.7

260 .34 15.93 5.34e+3 1 2.7539e-3 -2.1 2.7480e-3 -1.6 2.7453e-3 -2.1 2.7496e-3 -3.4 2.7453e-3 -2.7
260 .23 15.93 5.34e+3 1 2.7544e-3 -1.9 2.7490e-3 -2.1 2.7482e-3 -3.7 2.7474e-3 -1.7 2.7496e-3 -2.4
260 .34 15.93 5.34e+3 1 2.7557e-3 -2.0 2.7497e-3 -1.6 2.7524e-3 -3.3 2.7488e-3 -0.1 2.7424e-3 -3.4

360 .62 -28.47 22.3e+3 1 1.6103e-3 -1.6 1.6070e-3 -1.2 1.6050e-3 -2.6 1.6084e-3 -7.8 1.6083e-3 -6.6
360 .40 -28.47 22.3e+3 1 1.6101e-3 -1.3 1.6072e-3 -1.5 1.6112e-3 -5.8 1.6099e-3 -3.4 1.6092e-3 -5.4
360 .64 -28.47 22.3e+3 1 1.6120e-3 -2.1 1.6090e-3 -0.9 1.6139e-3 -4.3 1.6113e-3 1.8 1.6063e-3 -7.4

360 .97 -15.50 32.3e+3 1 1.9684e-3 -3.4 1.9620e-3 -2.8 1.9562e-3 -5.9 1.9654e-3 -11.8 1.9585e-3 -11.1
360 .60 -15.50 32.3e+3 1 1.9694e-3 -1.7 1.9625e-3 -4.6 1.9638e-3 -9.5 1.9638e-3 -5.4 1.9654e-3 -8.8
360 .84 -15.50 32.3e+3 1 1.9724e-3 -2.9 1.9654e-3 -2.8 1.9742e-3 -8.7 1.9699e-3 0.8 1.9555e-3 -12.9

360 1.19 17.90 18.5e+3 1 2.0604e-3 -5.1 2.0485e-3 -4.7 2.0412e-3 -9.1 2.0536e-3 -16.6 2.0444e-3 -16.6
360 1.24 17.90 18.5e+3 1 2.0617e-3 -5.3 2.0502e-3 -5.3 2.0499e-3 -15.1 2.0508e-3 -7.7 2.0535e-3 -14.7
360 1.09 17.90 18.5e+3 1 2.0661e-3 -5.4 2.0536e-3 -4.6 2.0662e-3 -13.8 2.0573e-3 -0.2 2.0390e-3 -18.8

260 1.65 7.47 7.05e+3 1 2.2971e-3 -6.1 2.2809e-3 -5.6 2.2706e-3 -11.9 2.2860e-3 -22.1 2.2713e-3 -20.9
260 1.10 7.47 7.05e+3 1 2.2982e-3 -5.6 2.2828e-3 -7.5 2.2827e-3 -18.0 2.2828e-3 -10.3 2.2887e-3 -21.3
260 1.44 7.47 7.05e+3 1 2.3050e-3 -6.5 2.2878e-3 -6.2 2.3054e-3 -16.8 2.2927e-3 -0.6 2.2679e-3 -25.9

*** end-of-sample ***

```


GDP DATA PROCESSING MANUAL

Sample .S-file

"SAMCR.S", from CRAVG 7.20

```
Rx: 2. Tx: 6. NSP: 3.0
0 0 0 5 5 96.052 200.0
SEM 1.0000E-04 1.5000E-04
0.125 1.0000E+00 3.8000E-03
0.375 9.9685E-01 3.4890E-03
0.625 9.9598E-01 4.0171E-03
0.875 9.9523E-01 2.9857E-03
1.125 9.9411E-01 3.4794E-03
Rx: 1. Tx: 6. NSP: 4.0
0 0 0 5 5 85.855 200.0
SEM 2.3000E-04 3.4000E-04
0.125 1.0000E+00 2.0000E-03
0.375 9.9791E-01 1.7630E-03
0.625 9.9781E-01 3.0267E-03
0.875 9.9780E-01 1.7295E-03
1.125 9.9677E-01 2.8242E-03
Rx: 0. Tx: 6. NSP: 5.0
0 0 0 5 5 87.857 200.0
SEM 4.0000E-04 6.4000E-04
0.125 1.0000E+00 1.6667E-03
0.375 9.9810E-01 1.1977E-03
0.625 9.9952E-01 4.2313E-03
0.875 9.9942E-01 3.1315E-03
1.125 9.9820E-01 6.4551E-03
Rx: -1. Tx: 6. NSP: 6.0
0 0 0 5 5 171.925 200.0
SEM 6.0000E-04 9.7000E-04
0.125 1.0000E+00 2.6667E-03
0.375 9.9656E-01 3.3883E-03
0.625 9.9726E-01 8.0115E-03
0.875 9.9811E-01 5.4564E-03
1.125 9.9473E-01 1.0876E-02
Rx: -2. Tx: 6. NSP: 7.0
0 0 0 5 5 270.02 200.0
SEM 1.0900E-03 1.2400E-03
0.125 1.0000E+00 5.2667E-03
0.375 9.9420E-01 4.8385E-03
0.625 9.9494E-01 1.2603E-02
0.875 9.9570E-01 8.1317E-03
1.125 9.9159E-01 1.6561E-02
Rx: -3. Tx: 6. NSP: 8.0
0 0 0 5 5 430.134 200.0
SEM 1.1000E-03 1.6500E-03
0.125 1.0000E+00 6.0667E-03
0.375 9.9293E-01 6.3879E-03
0.625 9.9387E-01 1.5472E-02
0.875 9.9434E-01 1.0938E-02
1.125 9.8927E-01 2.2460E-02
Rx: 2. Tx: 5. NSP: 2.0
0 0 0 5 5 105.053 200.0
SEM 3.0000E-05 4.0000E-05
0.125 1.0000E+00 3.1000E-03
0.375 9.9777E-01 3.1929E-03
0.625 9.9630E-01 3.1384E-03
0.875 9.9545E-01 2.6877E-03
1.125 9.9518E-01 2.4879E-03
Rx: 1. Tx: 5. NSP: 3.0
0 0 0 5 5 69.31 200.0
SEM 1.0000E-04 1.3000E-04
0.125 1.0000E+00 4.1500E-03
0.375 9.9740E-01 3.6405E-03
0.625 9.9543E-01 3.6831E-03
0.875 9.9394E-01 2.3855E-03
1.125 9.9465E-01 3.5310E-03
Rx: 0. Tx: 5. NSP: 4.0
0 0 0 5 5 64.962 200.0
SEM 2.3000E-04 9.6000E-04
0.125 1.0000E+00 3.3500E-03
0.375 9.9681E-01 2.7911E-03
0.625 9.9473E-01 4.1281E-03
0.875 9.9324E-01 2.7811E-03
1.125 9.9641E-01 3.3380E-03
continued next column ...
```

```
Rx: -1. Tx: 5. NSP: 5.0
0 0 0 5 5 121.75 200.0
SEM 3.6000E-04 1.0500E-03
0.125 1.0000E+00 6.0501E-03
0.375 9.9787E-01 6.1869E-03
0.625 9.9388E-01 6.9076E-03
0.875 9.8882E-01 4.1036E-03
1.125 9.9245E-01 8.9323E-03
Rx: -2. Tx: 5. NSP: 6.0
0 0 0 5 5 186.783 200.0
SEM 6.0000E-04 7.8000E-04
0.125 1.0000E+00 7.8002E-03
0.375 9.9635E-01 7.1240E-03
0.625 9.8996E-01 9.1574E-03
0.875 9.8432E-01 4.7248E-03
1.125 9.9132E-01 1.0806E-02
Rx: -3. Tx: 5. NSP: 7.0
0 0 0 5 5 294.275 200.0
SEM 7.7000E-04 1.0400E-03
0.125 1.0000E+00 8.8502E-03
0.375 9.9625E-01 8.3687E-03
0.625 9.8784E-01 1.1311E-02
0.875 9.8036E-01 5.2940E-03
1.125 9.8879E-01 1.3152E-02
Rx: 2. Tx: 4. NSP: 1.0
0 0 0 5 5 133.897 200.0
SEM 1.0000E-05 1.0000E-05
0.125 1.0000E+00 1.7000E-03
0.375 9.9855E-01 1.9472E-03
0.625 9.9779E-01 1.8459E-03
0.875 9.9727E-01 1.7452E-03
1.125 9.9668E-01 1.3954E-03
Rx: 1. Tx: 4. NSP: 2.0
0 0 0 5 5 89.295 200.0
SEM 3.0000E-05 3.0000E-05
0.125 1.0000E+00 4.2000E-03
0.375 9.9689E-01 3.9876E-03
0.625 9.9559E-01 3.7335E-03
0.875 9.9463E-01 3.6802E-03
1.125 9.9360E-01 3.4279E-03
Rx: 0. Tx: 4. NSP: 3.0
0 0 0 5 5 84.754 200.0
SEM 1.0000E-04 1.5000E-04
0.125 1.0000E+00 5.1000E-03
0.375 9.9650E-01 4.6337E-03
0.625 9.9512E-01 4.8761E-03
0.875 9.9394E-01 4.8207E-03
1.125 9.9313E-01 6.1078E-03
Rx: -1. Tx: 4. NSP: 4.0
0 0 0 5 5 164.601 200.0
SEM 1.1000E-04 1.4000E-04
0.125 1.0000E+00 7.0501E-03
0.375 9.9493E-01 7.1139E-03
0.625 9.9284E-01 6.9003E-03
0.875 9.9180E-01 7.3891E-03
1.125 9.8954E-01 7.8176E-03
Rx: -2. Tx: 4. NSP: 5.0
0 0 0 5 5 256.177 200.0
SEM 1.8000E-04 2.5000E-04
0.125 1.0000E+00 9.5503E-03
0.375 9.9291E-01 9.5819E-03
0.625 9.9029E-01 9.2594E-03
0.875 9.8872E-01 9.8875E-03
1.125 9.8497E-01 1.0786E-02
Rx: -3. Tx: 4. NSP: 6.0
0 0 0 5 5 412.136 200.0
SEM 2.3000E-04 3.2000E-04
0.125 1.0000E+00 1.0900E-02
0.375 9.9220E-01 1.0815E-02
0.625 9.8910E-01 1.0435E-02
0.875 9.8733E-01 1.1552E-02
1.125 9.8250E-01 1.2822E-02
continued next column ...
```

```
Rx: 1. Tx: 3. NSP: 1.0
0 0 0 5 5 88.347 200.0
SEM 2.0000E-05 2.0000E-05
0.125 1.0000E+00 2.0500E-03
0.375 9.9839E-01 2.1465E-03
0.625 9.9752E-01 2.0449E-03
0.875 9.9698E-01 1.6949E-03
1.125 9.9650E-01 1.6442E-03
Rx: 0. Tx: 3. NSP: 2.0
0 0 0 5 5 89.501 200.0
SEM 1.4000E-04 1.4000E-04
0.125 1.0000E+00 3.9500E-03
0.375 9.9741E-01 3.9398E-03
0.625 9.9621E-01 4.2339E-03
0.875 9.9732E-01 6.5325E-03
1.125 9.9441E-01 7.0107E-03
Rx: -1. Tx: 3. NSP: 3.0
0 0 0 5 5 193.83 200.0
SEM 1.6000E-04 1.7000E-04
0.125 1.0000E+00 5.6001E-03
0.375 9.9589E-01 5.6766E-03
0.625 9.9411E-01 6.3624E-03
0.875 9.9348E-01 6.9545E-03
1.125 9.9126E-01 7.6328E-03
Rx: -2. Tx: 3. NSP: 4.0
0 0 0 5 5 323.229 200.0
SEM 2.5000E-04 6.0000E-04
0.125 1.0000E+00 8.0002E-03
0.375 9.9430E-01 7.6066E-03
0.625 9.9183E-01 8.4804E-03
0.875 9.9067E-01 9.0153E-03
1.125 9.8691E-01 9.1785E-03
Rx: -3. Tx: 3. NSP: 5.0
0 0 0 5 5 553.527 200.0
SEM 4.0000E-04 9.5000E-04
0.125 1.0000E+00 1.0350E-02
0.375 9.9197E-01 1.0069E-02
0.625 9.8868E-01 1.0579E-02
0.875 9.8777E-01 1.1656E-02
1.125 9.8339E-01 1.3867E-02
Rx: 0. Tx: 2. NSP: 1.0
0 0 0 5 5 130.331 200.0
SEM 1.0000E-04 1.2000E-04
0.125 1.0000E+00 4.5000E-04
0.375 9.9918E-01 3.9967E-04
0.625 9.9758E-01 1.4964E-04
0.875 9.9830E-01 7.4872E-04
1.125 9.9660E-01 1.7441E-03
Rx: -1. Tx: 2. NSP: 2.0
0 0 0 5 5 336.156 200.0
SEM 4.0000E-05 4.0000E-05
0.125 1.0000E+00 2.8500E-03
0.375 9.9788E-01 3.3429E-03
0.625 9.9672E-01 3.6879E-03
0.875 9.9551E-01 3.4843E-03
1.125 9.9538E-01 3.5834E-03
Rx: -2. Tx: 2. NSP: 3.0
0 0 0 5 5 602.329 200.0
SEM 1.0000E-04 1.0000E-04
0.125 1.0000E+00 6.2501E-03
0.375 9.9547E-01 7.1675E-03
0.625 9.9335E-01 7.7483E-03
0.875 9.9104E-01 7.5816E-03
1.125 9.9052E-01 8.0729E-03
Rx: -3. Tx: 2. NSP: 4.0
0 0 0 5 5 1125.703 200.0
SEM 1.4000E-04 1.7000E-04
0.125 1.0000E+00 7.8502E-03
0.375 9.9455E-01 8.9014E-03
0.625 9.9182E-01 1.0167E-02
0.875 9.8851E-01 9.6878E-03
1.125 9.8790E-01 1.0867E-02
continued next page ...
```

Sample .S-file (page 2)

```

Rx:  -1. Tx:  1. NSP: 1.0
0 0 0 5 5 134.45 200.0
SEM 1.0000E-05 2.0000E-05
0.125 1.0000E+00 1.1000E-03
0.375 9.9909E-01 1.5486E-03
0.625 9.9851E-01 1.6975E-03
0.875 9.9821E-01 1.8467E-03
1.125 9.9780E-01 1.7960E-03
Rx:  -2. Tx:  1. NSP: 2.0
0 0 0 5 5 284.702 200.0
SEM 2.0000E-05 3.0000E-05
0.125 1.0000E+00 4.5500E-03
0.375 9.9654E-01 5.4312E-03
0.625 9.9478E-01 5.9687E-03
0.875 9.9364E-01 6.0613E-03
1.125 9.9259E-01 6.1541E-03
Rx:  -3. Tx:  1. NSP: 3.0
0 0 0 5 5 618.171 200.0
SEM 3.0000E-05 4.0000E-05
0.125 1.0000E+00 6.5001E-03
0.375 9.9533E-01 7.5646E-03
0.625 9.9282E-01 8.3895E-03
0.875 9.9124E-01 8.9710E-03
1.125 9.9012E-01 9.2084E-03
Rx:  5. Tx:  1. NSP: 3.0
0 0 0 5 5 66.619 200.0
SEM 5.1000E-04 7.8000E-04
0.125 1.0000E+00 5.8001E-03
0.375 9.9692E-01 3.3895E-03
0.625 9.9488E-01 3.0178E-03
0.875 9.9359E-01 4.1731E-03
1.125 9.9283E-01 3.7397E-03
Rx:  6. Tx:  1. NSP: 4.0
0 0 0 5 5 82.479 200.0
SEM 1.9000E-04 2.0000E-04
0.125 1.0000E+00 2.2333E-03
0.375 9.9849E-01 2.5295E-03
0.625 9.9759E-01 3.2921E-03
0.875 9.9834E-01 2.9617E-03
1.125 9.9661E-01 3.7539E-03
Rx:  7. Tx:  1. NSP: 5.0
0 0 0 5 5 114.302 200.0
SEM 2.8000E-04 4.0000E-04
0.125 1.0000E+00 2.9667E-03
0.375 9.9752E-01 4.0898E-03
0.625 9.9677E-01 5.3161E-03
0.875 9.9851E-01 5.0259E-03
1.125 9.9412E-01 7.6880E-03
Rx:  8. Tx:  1. NSP: 6.0
0 0 0 5 5 149.739 200.0
SEM 4.9000E-04 5.7000E-04
0.125 1.0000E+00 4.1000E-03
0.375 9.9677E-01 5.6152E-03
0.625 9.9567E-01 7.6336E-03
0.875 9.9737E-01 7.2476E-03
1.125 9.9291E-01 1.0128E-02
Rx:  9. Tx:  1. NSP: 7.0
0 0 0 5 5 166.572 200.0
SEM 6.1000E-04 6.9000E-04
0.125 1.0000E+00 5.0667E-03
0.375 9.9587E-01 6.9712E-03
0.625 9.9414E-01 1.0041E-02
0.875 9.9693E-01 9.0723E-03
1.125 9.9087E-01 1.2915E-02
Rx:  5. Tx:  2. NSP: 2.0
0 0 0 5 5 113.827 200.0
SEM 6.2000E-04 6.7000E-04
0.125 1.0000E+00 3.1000E-03
0.375 9.9642E-01 3.7366E-03
0.625 9.9685E-01 1.8940E-03
0.875 9.9562E-01 3.6340E-03
1.125 9.9418E-01 3.7779E-03
continued next column ...

```

```

Rx:  6. Tx:  2. NSP: 3.0
0 0 0 5 5 102.88 200.0
SEM 2.5000E-04 3.1000E-04
0.125 1.0000E+00 3.6500E-03
0.375 9.9698E-01 4.0378E-03
0.625 9.9536E-01 3.7824E-03
0.875 9.9424E-01 4.1758E-03
1.125 9.9206E-01 5.7044E-03
Rx:  7. Tx:  2. NSP: 4.0
0 0 0 5 5 137.629 200.0
SEM 5.0000E-04 8.0000E-04
0.125 1.0000E+00 4.9500E-03
0.375 9.9577E-01 5.1283E-03
0.625 9.9279E-01 6.2547E-03
0.875 9.9166E-01 7.3384E-03
1.125 9.8747E-01 1.1208E-02
Rx:  8. Tx:  2. NSP: 5.0
0 0 0 5 5 180.672 200.0
SEM 7.8000E-04 1.1500E-03
0.125 1.0000E+00 6.0501E-03
0.375 9.9449E-01 7.5085E-03
0.625 9.9138E-01 7.9312E-03
0.875 9.8947E-01 1.0340E-02
1.125 9.8222E-01 1.6355E-02
Rx:  9. Tx:  2. NSP: 6.0
0 0 0 5 5 201.98 200.0
SEM 1.0400E-03 1.7100E-03
0.125 1.0000E+00 6.8001E-03
0.375 9.9322E-01 8.9889E-03
0.625 9.8960E-01 9.4509E-03
0.875 9.8704E-01 1.3375E-02
1.125 9.7666E-01 2.2418E-02
Rx:  5. Tx:  3. NSP: 1.0
0 0 0 5 5 118.451 200.0
SEM 2.0000E-05 3.0000E-05
0.125 1.0000E+00 1.1333E-03
0.375 9.9886E-01 1.1653E-03
0.625 9.9830E-01 9.3174E-04
0.875 9.9797E-01 5.9878E-04
1.125 9.9740E-01 6.6493E-05
Rx:  6. Tx:  3. NSP: 2.0
0 0 0 5 5 77.889 200.0
SEM 8.0000E-05 9.0000E-05
0.125 1.0000E+00 3.2000E-03
0.375 9.9764E-01 3.0262E-03
0.625 9.9648E-01 2.8234E-03
0.875 9.9552E-01 2.4888E-03
1.125 9.9450E-01 1.6244E-03
Rx:  7. Tx:  3. NSP: 3.0
0 0 0 5 5 90.974 200.0
SEM 2.3000E-04 3.0000E-04
0.125 1.0000E+00 5.5001E-03
0.375 9.9560E-01 6.0401E-03
0.625 9.9286E-01 6.0234E-03
0.875 9.9203E-01 5.7538E-03
1.125 9.9102E-01 4.2284E-03
Rx:  8. Tx:  3. NSP: 4.0
0 0 0 5 5 116.43 200.0
SEM 4.2000E-04 5.0000E-04
0.125 1.0000E+00 6.9001E-03
0.375 9.9449E-01 7.5251E-03
0.625 9.9169E-01 7.6361E-03
0.875 9.9019E-01 7.6577E-03
1.125 9.8609E-01 3.8458E-03
Rx:  9. Tx:  3. NSP: 5.0
0 0 0 5 5 126.677 200.0
SEM 7.1000E-04 8.1000E-04
0.125 1.0000E+00 7.8002E-03
0.375 9.9380E-01 8.5469E-03
0.625 9.9065E-01 9.1142E-03
0.875 9.8868E-01 9.6894E-03
1.125 9.8287E-01 3.2435E-03
continued next column ...

```

```

Rx:  6. Tx:  4. NSP: 1.0
0 0 0 5 5 105.289 200.0
SEM 1.0000E-05 2.0000E-05
0.125 1.0000E+00 5.5000E-04
0.375 9.9859E-01-1.5977E-03
0.625 9.9770E-01-3.9409E-03
0.875 9.9725E-01-6.5819E-03
1.125 9.9691E-01-8.9226E-03
Rx:  7. Tx:  4. NSP: 2.0
0 0 0 5 5 118.16 200.0
SEM 8.0000E-05 2.5000E-04
0.125 1.0000E+00 3.9500E-03
0.375 9.9687E-01 4.8847E-03
0.625 9.9551E-01 4.8781E-03
0.875 9.9553E-01 4.9777E-03
1.125 9.9430E-01 4.8721E-03
Rx:  8. Tx:  4. NSP: 3.0
0 0 0 5 5 154.637 200.0
SEM 1.2000E-04 1.6000E-04
0.125 1.0000E+00 6.3001E-03
0.375 9.9515E-01 7.4638E-03
0.625 9.9252E-01 8.1388E-03
0.875 9.9200E-01 7.8370E-03
1.125 9.9054E-01 8.7665E-03
Rx:  9. Tx:  4. NSP: 4.0
0 0 0 5 5 176.787 200.0
SEM 2.1000E-04 2.7000E-04
0.125 1.0000E+00 7.5501E-03
0.375 9.9405E-01 9.3443E-03
0.625 9.9074E-01 1.0403E-02
0.875 9.9099E-01 9.6129E-03
1.125 9.8905E-01 1.1424E-02
Rx:  7. Tx:  5. NSP: 1.0
0 0 0 5 5 122.581 200.0
SEM 5.0000E-05 3.4000E-04
0.125 1.0000E+00 3.2000E-03
0.375 9.9721E-01 2.7257E-03
0.625 9.9605E-01 3.3866E-03
0.875 9.9503E-01 3.9470E-03
1.125 9.9393E-01 3.9426E-03
Rx:  8. Tx:  5. NSP: 2.0
0 0 0 5 5 174.9 200.0
SEM 6.0000E-05 7.0000E-05
0.125 1.0000E+00 5.5001E-03
0.375 9.9570E-01 6.4721E-03
0.625 9.9338E-01 6.8875E-03
0.875 9.9175E-01 7.3391E-03
1.125 9.9091E-01 7.3328E-03
Rx:  9. Tx:  5. NSP: 3.0
0 0 0 5 5 219.989 200.0
SEM 1.2000E-04 1.6000E-04
0.125 1.0000E+00 6.8668E-03
0.375 9.9462E-01 8.2887E-03
0.625 9.9156E-01 8.9904E-03
0.875 9.9000E-01 9.7683E-03
1.125 9.8912E-01 1.0551E-02
Rx:  8. Tx:  6. NSP: 1.0
0 0 0 5 5 254.35 200.0
SEM 2.0000E-05 3.0000E-05
0.125 1.0000E+00 5.5501E-03
0.375 9.9555E-01 6.0232E-03
0.625 9.9294E-01 5.9577E-03
0.875 9.9127E-01 5.4520E-03
1.125 9.8995E-01 4.7518E-03
Rx:  9. Tx:  6. NSP: 2.0
0 0 0 5 5 349.726 200.0
SEM 3.0000E-05 5.0000E-05
0.125 1.0000E+00 7.6001E-03
0.375 9.9419E-01 9.0474E-03
0.625 9.9095E-01 9.7116E-03
0.875 9.8877E-01 9.8880E-03
1.125 9.8705E-01 1.0019E-02
*** end of file ***

```

GDP DATA PROCESSING MANUAL

Sample .Z-file

```

/* 02 Aug 93
$ DATE= 91-09-20
$ ASPACE= 200.0m
$ ZPLOT: DATA= N-SP
CRAVG 7.20 Contour file.
Cl Cn Ce Ns Nd Yl Plot file 1      Cl Cn Ce Ns Nd Yl Plot file 2      Cl Cn Ce Ns Nd Yl Plot file 3
 1 5 0 3 0 0                        0 20 2 3 1 0                        0 20 2 3 1 0
CR-IP SURVEY DATA                   CR-IP SURVEY DATA                   CR-IP SURVEY DATA
Apparent RESISTIVITY                 Raw PHASE Angle                       3-PT DC PHASE
values in ohm-meters                 values in milliradians                 values in milliradians
0.125 Hz                              0.125 Hz                              .125,.375,.625 Hz
IIxxxxxxxxYYYYYYYzzzzzzzzzzzz AAA  IIxxxxxxxxYYYYYYYzzzzzzzzzzzz AAA  IIxxxxxxxxYYYYYYYzzzzzzzzzzzz AAA
2 4.5 3. 9.605E+01                    2 4.5 3. 3.800E+00                    2 4.5 3. 4.233E+00
2 4. 4. 8.586E+01                    2 4. 4. 2.000E+00                    2 4. 4. 2.667E+00
2 3.5 5. 8.786E+01                    2 3.5 5. 1.667E+00                    2 3.5 5. 3.200E+00
2 3. 6. 1.719E+02                    2 3. 6. 2.667E+00                    2 3. 6. 3.833E+00
2 2.5 7. 2.700E+02                    2 2.5 7. 5.267E+00                    2 2.5 7. 8.600E+00
2 2. 8. 4.301E+02                    2 2. 8. 6.067E+00                    2 2. 8. 9.133E+00
2 4. 2. 1.051E+02                    2 4. 2. 3.100E+00                    2 4. 2. 3.000E+00
2 3.5 3. 6.931E+01                    2 3.5 3. 4.150E+00                    2 3.5 3. 4.600E+00
2 3. 4. 6.496E+01                    2 3. 4. 3.350E+00                    2 3. 4. 4.350E+00
2 2.5 5. 1.217E+02                    2 2.5 5. 6.050E+00                    2 2.5 5. 6.250E+00
2 2. 6. 1.868E+02                    2 2. 6. 7.800E+00                    2 2. 6. 9.250E+00
2 1.5 7. 2.943E+02                    2 1.5 7. 8.850E+00                    2 1.5 7. 1.035E+01
2 3.5 1. 1.339E+02                    2 3.5 1. 1.700E+00                    2 3.5 1. 1.500E+00
2 3. 2. 8.930E+01                    2 3. 2. 4.200E+00                    2 3. 2. 4.250E+00
2 2.5 3. 8.475E+01                    2 2.5 3. 5.100E+00                    2 2.5 3. 5.600E+00
2 2. 4. 1.646E+02                    2 2. 4. 7.050E+00                    2 2. 4. 6.900E+00
2 1.5 5. 2.562E+02                    2 1.5 5. 9.550E+00                    2 1.5 5. 9.250E+00
2 1. 6. 4.121E+02                    2 1. 6. 1.090E+01                    2 1. 6. 1.070E+01
2 2.5 1. 8.835E+01                    2 2.5 1. 2.050E+00                    2 2.5 1. 1.950E+00
2 2. 2. 8.950E+01                    2 2. 2. 3.950E+00                    2 2. 2. 4.050E+00
2 1.5 3. 1.938E+02                    2 1.5 3. 5.600E+00                    2 1.5 3. 5.800E+00
2 1. 4. 3.232E+02                    2 1. 4. 8.000E+00                    2 1. 4. 8.700E+00
2 0.5 5. 5.535E+02                    2 0.5 5. 1.035E+01                    2 0.5 5. 1.065E+01
2 1.5 1. 1.303E+02                    2 1.5 1. 4.500E-01                    2 1.5 1. 3.000E-01
2 1. 2. 3.362E+02                    2 1. 2. 2.850E+00                    2 1. 2. 2.600E+00
2 0.5 3. 6.023E+02                    2 0.5 3. 6.250E+00                    2 0.5 3. 5.750E+00
2 0. 4. 1.126E+03                    2 0. 4. 7.850E+00                    2 0. 4. 7.350E+00
2 0.5 1. 1.344E+02                    2 0.5 1. 1.100E+00                    2 0.5 1. 7.500E-01
2 0. 2. 2.847E+02                    2 0. 2. 4.550E+00                    2 0. 2. 4.000E+00
2 -0.5 3. 6.182E+02                    2 -0.5 3. 6.500E+00                    2 -0.5 3. 5.900E+00
2 3.5 3. 6.662E+01                    2 3.5 3. 5.800E+00                    2 3.5 3. 7.667E+00
2 4. 4. 8.248E+01                    2 4. 4. 2.233E+00                    2 4. 4. 2.300E+00
2 4.5 5. 1.143E+02                    2 4.5 5. 2.967E+00                    2 4.5 5. 2.367E+00
2 5. 6. 1.497E+02                    2 5. 6. 4.100E+00                    2 5. 6. 3.567E+00
2 5.5 7. 1.666E+02                    2 5.5 7. 5.067E+00                    2 5.5 7. 4.567E+00
2 4. 2. 1.138E+02                    2 4. 2. 3.100E+00                    2 4. 2. 1.800E+00
2 4.5 3. 1.029E+02                    2 4.5 3. 3.650E+00                    2 4.5 3. 3.200E+00
2 5. 4. 1.376E+02                    2 5. 4. 4.950E+00                    2 5. 4. 5.150E+00
2 5.5 5. 1.807E+02                    2 5.5 5. 6.050E+00                    2 5.5 5. 4.950E+00
2 6. 6. 2.020E+02                    2 6. 6. 6.800E+00                    2 6. 6. 4.950E+00
2 4.5 1. 1.185E+02                    2 4.5 1. 1.133E+00                    2 4.5 1. 1.033E+00
2 5. 2. 7.789E+01                    2 5. 2. 3.200E+00                    2 5. 2. 3.233E+00
2 5.5 3. 9.097E+01                    2 5.5 3. 5.500E+00                    2 5.5 3. 5.000E+00
2 6. 4. 1.164E+02                    2 6. 4. 6.900E+00                    2 6. 4. 6.367E+00
2 6.5 5. 1.267E+02                    2 6.5 5. 7.800E+00                    2 6.5 5. 7.333E+00
2 5.5 1. 1.053E+02                    2 5.5 1. 5.500E-01                    2 5.5 1. 1.550E+00
2 6. 2. 1.182E+02                    2 6. 2. 3.950E+00                    2 6. 2. 3.050E+00
2 6.5 3. 1.546E+02                    2 6.5 3. 6.300E+00                    2 6.5 3. 5.350E+00
2 7. 4. 1.768E+02                    2 7. 4. 7.550E+00                    2 7. 4. 6.350E+00
2 6.5 1. 1.226E+02                    2 6.5 1. 3.200E+00                    2 6.5 1. 3.800E+00
2 7. 2. 1.749E+02                    2 7. 2. 5.500E+00                    2 7. 2. 4.800E+00
2 7.5 3. 2.200E+02                    2 7.5 3. 6.867E+00                    2 7.5 3. 5.833E+00
2 7.5 1. 2.543E+02                    2 7.5 1. 5.550E+00                    2 7.5 1. 5.100E+00
2 8. 2. 3.497E+02                    2 8. 2. 7.600E+00                    2 8. 2. 6.600E+00
9999.0                                9999.0                                9999.0

```


.S-file Format (v2.0) CR / RPIP Averaged Data File

```

1: "936L50S.S", from CRAVG 5.00
2: Rx: 2.0 Tx: 4.0 NSP: 1.0
3: 1 0 4 18 18      82.7 588.0
4: SEM 0.0000E+00 0.0000E+00
5: 1.4219 0.0693 171.
6: 0.0747 0.2285 15.7
7: 0.0426 0.4133 4.80
8: -0.0026 1.4776 0.375
9: 2.955 -0.306 0.719
10: 0.125 1.0000E 00 5.7426E-03
    0.375 9.9734E-01 1.1810E-02
    0.625 9.9471E-01 1.7281E-02
    0.875 9.9243E-01 2.2393E-02
    1.125 9.8993E-01 2.6757E-02
    1.375 9.8754E-01 3.1019E-02
    1.000 9.9118E-01 2.4446E-02
    3.000 9.7520E-01 5.1194E-02
    5.000 9.6105E-01 7.4148E-02
    7.000 9.4681E-01 8.9063E-02
    9.000 9.3649E-01 1.0505E-01
    11.000 9.2290E-01 1.1720E-01
    8.000 9.4165E-01 9.7557E-02
    24.000 8.6712E-01 1.7926E-01
    40.000 8.0799E-01 2.3717E-01
    56.000 7.5174E-01 2.8224E-01
    72.000 6.9981E-01 3.1128E-01
    88.000 6.5208E-01 3.3569E-01

```

DESCRIPTION OF SAMPLE FILE VALUES, BY LINE NUMBER:

The .S-file is composed of a two line header, followed by blocks of data, each containing data for one pseudosection data point. Each block begins with a line indicating the specific point, several lines of parameters, followed by an array of data that includes frequency, real components, and imaginary components for a number of points that describe a curve. The data in this file are always raw, averaged, decalibrated field data normalized to the low frequency real component.

1. File header line generated by the averaging program.

NOTE: Header line 1 occurs only at the beginning of the file.

2. Rx and Tx indicate the receiver and transmitter dipoles that were used for this block. Dipoles extend between two adjacent stations with the lowest numbered station entered for each dipole.

The 2 in this file indicates that the receiver dipole was positioned between stations 2 and 3.

The 4 in this file indicates that the transmitter dipole was positioned between stations 4 and 5.

-3 would indicate that the dipole was positioned between stations -3 and -2.

N-SP = N-Spacing = the number of A-Spacings between transmitter and receiver dipoles.

3. 1 Comm wire flag (0 = white wire #2, 1 = black wire (W21C))
 0 Times to pass the data curve through a harmonic filter
 4 Levels of coupling coefficients
 18 Harmonics to use when decoupling
 18 Harmonics in data block array
 82.7 Apparent Resistivity, RHO (ohmmeters)
 588.0 A-Spacing (meters).
 (Values included for LAB rock measurements are noted below)

RHO: dipole-dipole resistivity in ohmmeters =

$$\frac{\text{MAG}}{4/\pi} * \frac{C}{\text{FPGAIN}} * \frac{\text{ASPACING}}{\text{CRT}} * \pi * \text{NSP} * [\text{NSP} + 1] * [\text{NSP} + 2]$$

MAG = raw Fourier magnitude, in volts
 4/pi corrects MAG from the Fourier magnitude to the Square-Wave magnitude
 C = Communications-wire attenuation
 This corrects for the voltage drop that occurs in the wire between the field preamp and the GDP
 FPGAIN = field preamp gain
 ASPACING = the A-spacing, in meters
 CRT = Current, in amps
 NSP = N-spacing

Comm-wire attenuation factors at 0.125 Hz (W21C wire)
 The GDP is not concerned with these factors.

#Reels	Attenuation	#Reels	Attenuation
0	1.0000	5	1.2585
1	1.0505	6	1.3116
2	1.1025	7	1.3635
3	1.1542	8	1.4160
4	1.2070		

NOTE: RHO has been corrected to DC for decoupled data.

RHO: laboratory rock measurements in ohmmeters =

$$\frac{\text{MAG}}{4/\pi} * \frac{1}{\text{CRT}} * \frac{\text{AREA}}{\text{LENGTH}} * \frac{1 \text{ m}}{100 \text{ cm}}$$

MAG = raw Fourier magnitude, in volts
 4/pi corrects MAG from the Fourier magnitude to the Square-Wave magnitude
 CRT = Current, in microAmps
 LENGTH = Length of rock sample, in cm
 AREA = Area of rock sample, in cm*cm

NOTE: for laboratory rock measurements, RESISTOR, LENGTH, AREA, and CRT are included on this data line, following the A-spacing.

4. Minimum and maximum SEM values, respectively. SEM: Standard Error of the Mean for Channel 1 (receiver dipole), at the fundamental frequency, in radians (for frequencies of 1.0 Hz and below only)
- 5,6,7,8. Coupling coefficients, levels 1, 2, 3, 4, respectively. The number of levels varies according to the third value on line 4, as determined during manual decoupling. If the third number on line 4 is zero, the station has not been manually decoupled.
9. Hilbert response parameters: phase, slope 1, and slope 2.
10. The following lines are harmonic data with the 1st, 2nd and 3rd columns listing frequency, real and imaginary components, respectively. The number of lines varies according to the fourth value on line 4.

.Z-file Format (v2.0) Plot File For All Data

```

1: $ ZPLOT: DATA= FLOG
2: /* 29 Jul 93
3: AMTAVG 7.20 Contour file.
4: C1 Cn Ce Ns Nd Y1 Plot file 1
5: 1 5 0 3 1 1
6: CSAMT SURVEY DATA
7: CAGNIARD RESISTIVITY
8: values in ohm-meters
9: IIxxxxxxxxxYYYYYYYYzzzzzzzzzzzz AAA
   2 0.0 22.00 2.719E+02
   2 0.0 21.00 2.365E+02
   2 0.0 20.00 2.221E+02
   2 0.0 19.00 1.937E+02
   2 0.0 18.00 1.644E+02
   : : : :
99: 9999.00
    
```

DESCRIPTION OF VALUES IN SAMPLE FILE BY LINE NUMBER:

Line # Explanation:

- 2: \$ ZPLOT: DATA= FLOG Mode line, Y-value data type (log Freq)
- 3: AMTAVG 7.20 Program name and version that generated this file.
- 4: C1 Label for contour type: 0 = linear
 1 = logarithmic
 2 = pseudo-log
 Pseudo-log contours: positive and negative values contoured separately, using
 log₁₀(abs(value)), plus a zero contour.
 Cn Label for number of contours per interval.
 Ce Label for exponent of the contour interval.
 The "interval" is an integer power of ten: 10^{Ce}
 Ns Label for number of significant digits when posting values.
 Values: -1, 3, 4, 5. (-1 = free format for small values)
 Nd Label for the number of digits after the decimal.
 Y1 Label for vertical axis: 0 = none
 1 = linear frequency (log spacing)
 2 = log frequency (linear spacing)
 3 = linear depth
- 5: 1 Value of C1: logarithmic contours
 5 Value of Cn: 5 contours per "interval"
 0 Value of Ce: interval = 10⁰ = 1
 3 Value of Ns: use 3 significant digits for contouring
 1 Value of Nd: plot 1 digit after the decimal
 1 Value of Y1: linear frequency axis (log spacing of freqs)
- 6-8: Data description for this Plot File. Two to six lines are available, NOT including the first column. Plot programs may plot these lines as title information.

9: Header line for the data that follows:

II - Command flag:

- 0 = Skip this line of data.
- 1 = Omit for contouring, but post the bracketed value.
- 2 = Use for contouring and post the value (most common).
- 3 = Label a point or station by plotting a symbol under the X-axis at the X-coordinate.
- 4 = Use for contouring, post the symbol and not the value.
Used for depth plots where values are interpolated for the bottom of the plot to improve the gridding.
- 5 = Use to set plot limits, do not contour or post.
Used for depth plots to set zero depth. Used to provide a margin around the data, as for plan maps.

xxxxxxxx - X-coordinate, usually station coordinate.

YYYYYYYY - Y-coordinate, not used for Flag = 3

zzzzzzzz - Value to be plotted at X-Y for Flags 1, 2, 4.

AAA - For Flag 1 or 2, ZPLOT posts any characters in the AAA column instead of the value in the **zzzzzzzz** column.

For Flag 3, ZPLOT plots a symbol below the X-axis at the x-value, according to an integer in column AAA. A zero or positive integer refers to symbols in TABLE 1 of the PLOT Manual. A negative integer refers to topographic symbols in the CTOPO Manual.

99: **9999.0** - End-Of-Plot indicator.

Transient ElectroMagnetic data append profile plot data. Points at a single time (Y) for one frequency (f) and window (w) are connected from station to station by a profile line.

YYYYYYYY - Time in milliseconds for a particular window.

ffffffff - Frequency at which data was acquired.

www - Window number.

II	xxxxxxxx	YYYYYYYY	zzzzzzzzzzzz	AAA	ffffffffwww
2	100.00	0.121-9.10488E+02			*32* Hz W 1
2	100.00	0.243-1.34988E+03			*32* Hz W 2
2	100.00	0.364-3.91872E+02			*32* Hz W 3