

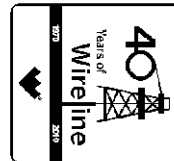


Weatherford

HOLE VOLUME

CALIPER

LOG



COMPANY

WEXPRO COMPANY

WELL

JACK DRAW UNIT #19

FIELD

JACK DRAW UNIT

PROVINCE/COUNTY

MOFFAT

COUNTRY/STATE

U.S.A. / COLORADO

LOCATION

SHL: 1342' FSL & 2264' FEL

SEC

TWP

10

11N

97W

RGE

Other Services

MAI

MDN/MPD

CMI

Permit Number

05-081-07616

Permanent Datum G.L., Elevation 6894 feet

Log Measured From KB

Drilling Measured From K.B.

Date

8-OCT-2011

Run Number

ONE

Depth Driller

9373.00

feet

Depth Logger

9375.00

feet

First Reading

7320.00

Last Reading

538.00

Casing Driller

535.00

feet

Casing Logger

538.00

feet

Bit Size

7.875

inches

Hole Fluid Type

LSND

Density / Viscosity

10.20

lb/USg

44.00

CP

PH / Fluid Loss

9.60

7.00

ml/30Min

Sample Source

FLOWLINE

Rm @ Measured Temp

7.63 @ 54.0

ohm-m

Rmf @ Measured Temp

6.10 @ 54.0

ohm-m

Rmc @ Measured Temp

9.16 @ 54.0

ohm-m

Source Rmf / Rmc

CALC

CALC

Rm @ BHT

2.23 @190.0

ohm-m

Time Since Circulation

8 HOURS

Max Recorded Temp

190.00

deg F

Equipment Name

COMPACT

Equipment / Base

13037

RK SPR

BOREHOLE RECORD

Last Edited: 08-OCT-2011 10:44

Bit Size
inches

7.875

Depth From
feet

535.00

Depth To
feet

9373.00

CASING RECORD

Type

Size
inches

9.625

Depth From
feet

0.00

Shoe Depth
feet

535.00

Weight
pounds/ft

36.00

REMARKS

SOFTWARE VERSION 11.03.4044.

TOOLS RUN 1: SHA, MCG, MDN, MPD, MIS-A, SKJ, MIS-B, SKJ, MIM, MIE, MFE, MAI RAN IN COMBINATION.

HARDWARE: MDN: DUAL BOWSPRING USED.
MPD: 8" PROFILE PLATE USED.
MAI: TWO 1.0" STANDOFFS USED.

2.65 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY.

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.

TOTAL HOLE VOLUME FROM T.D. TO SURFACE CASING = 3110 CUBIC FEET.

ANNULAR VOLUME WITH 4.5 INCH PRODUCTION CASING = 2130 CUBIC FEET.

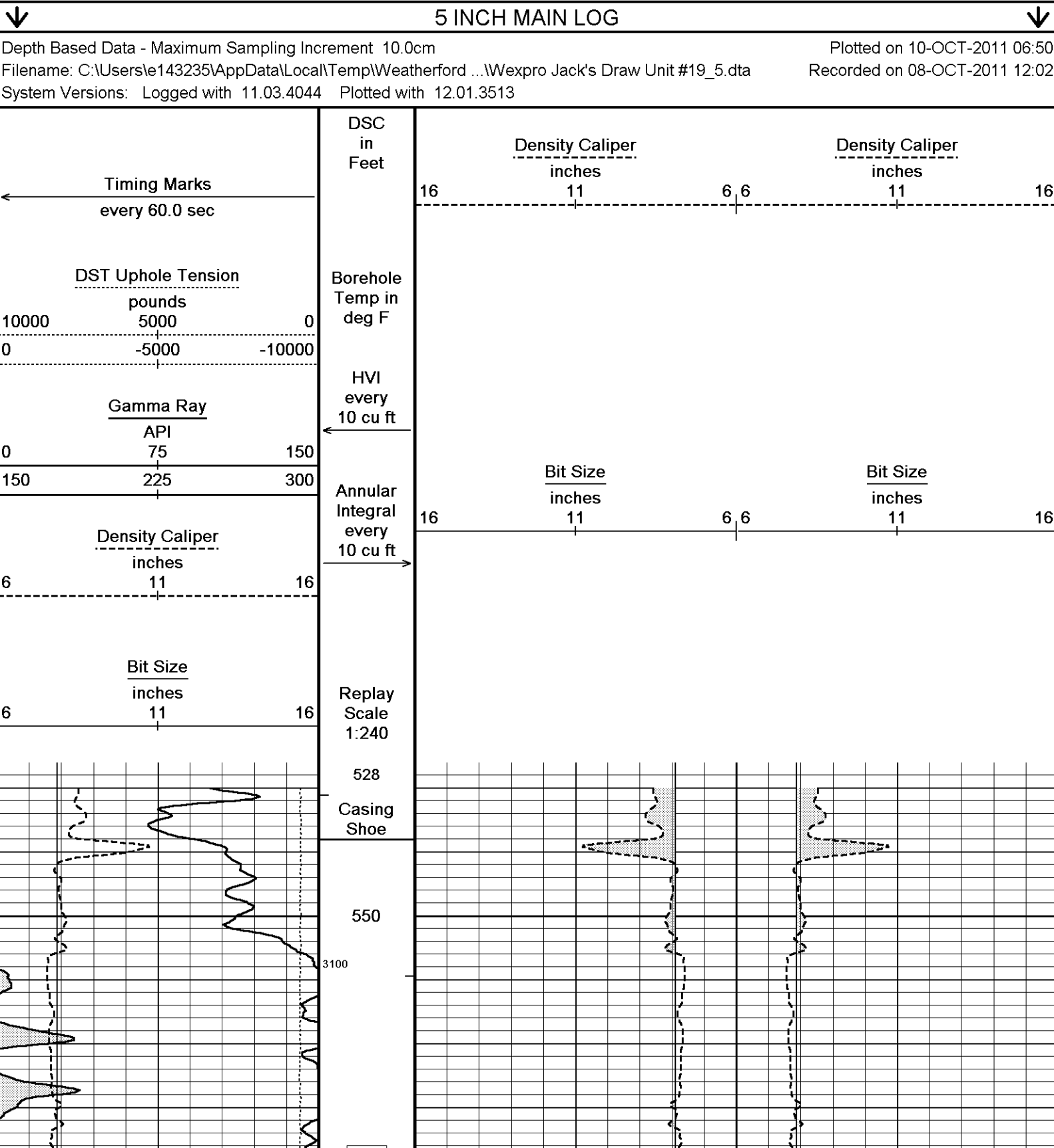
TIGHT PULLS, BOREHOLE SIZE AND RUGOSITY WILL AFFECT REPEATABILITY AND DATA QUALITY.

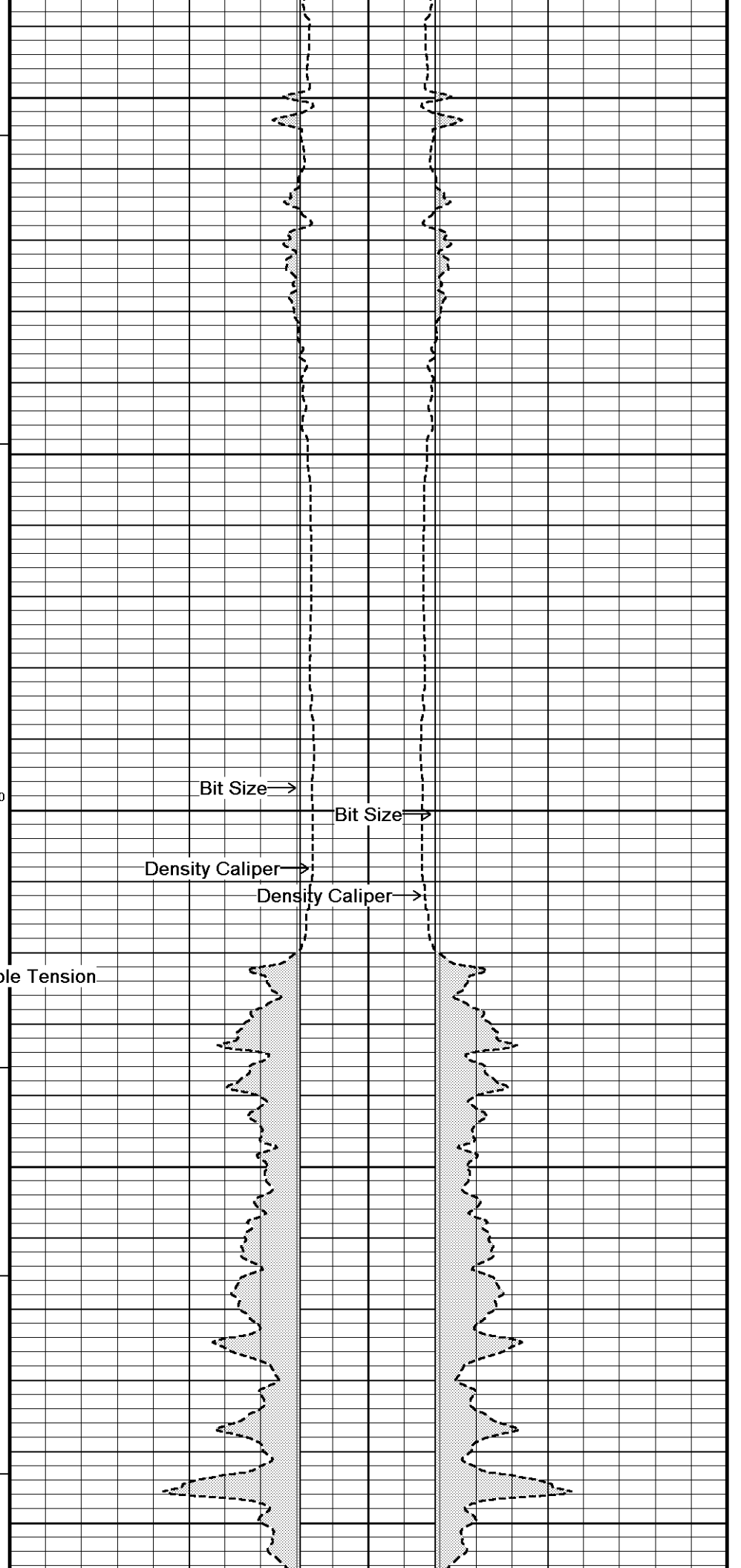
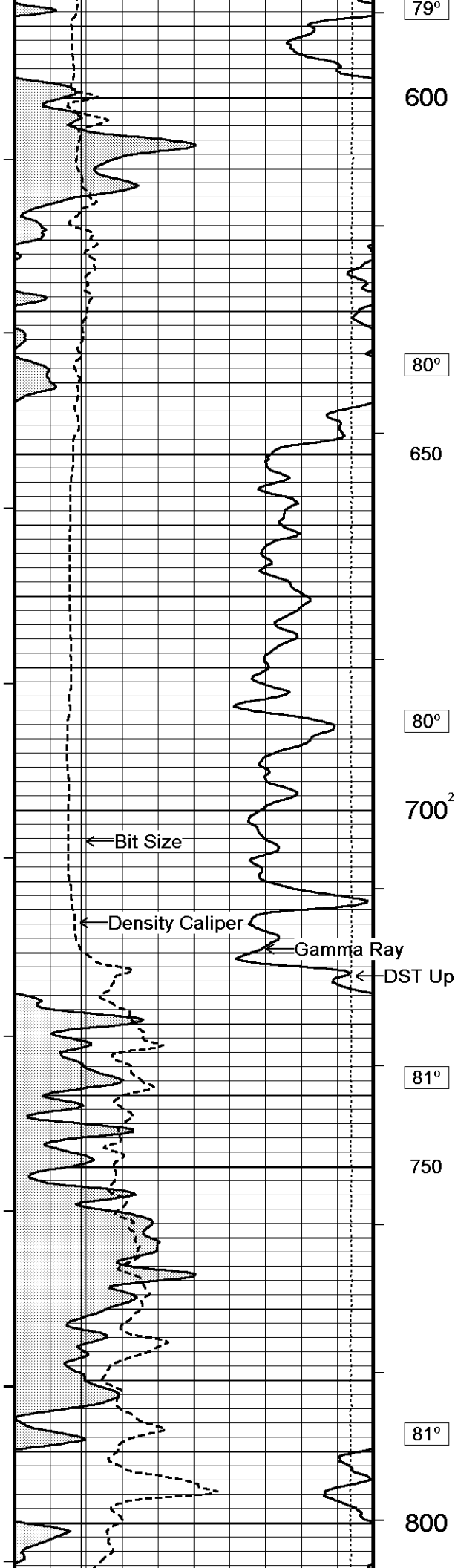
OPERATOR: D. SMITH.

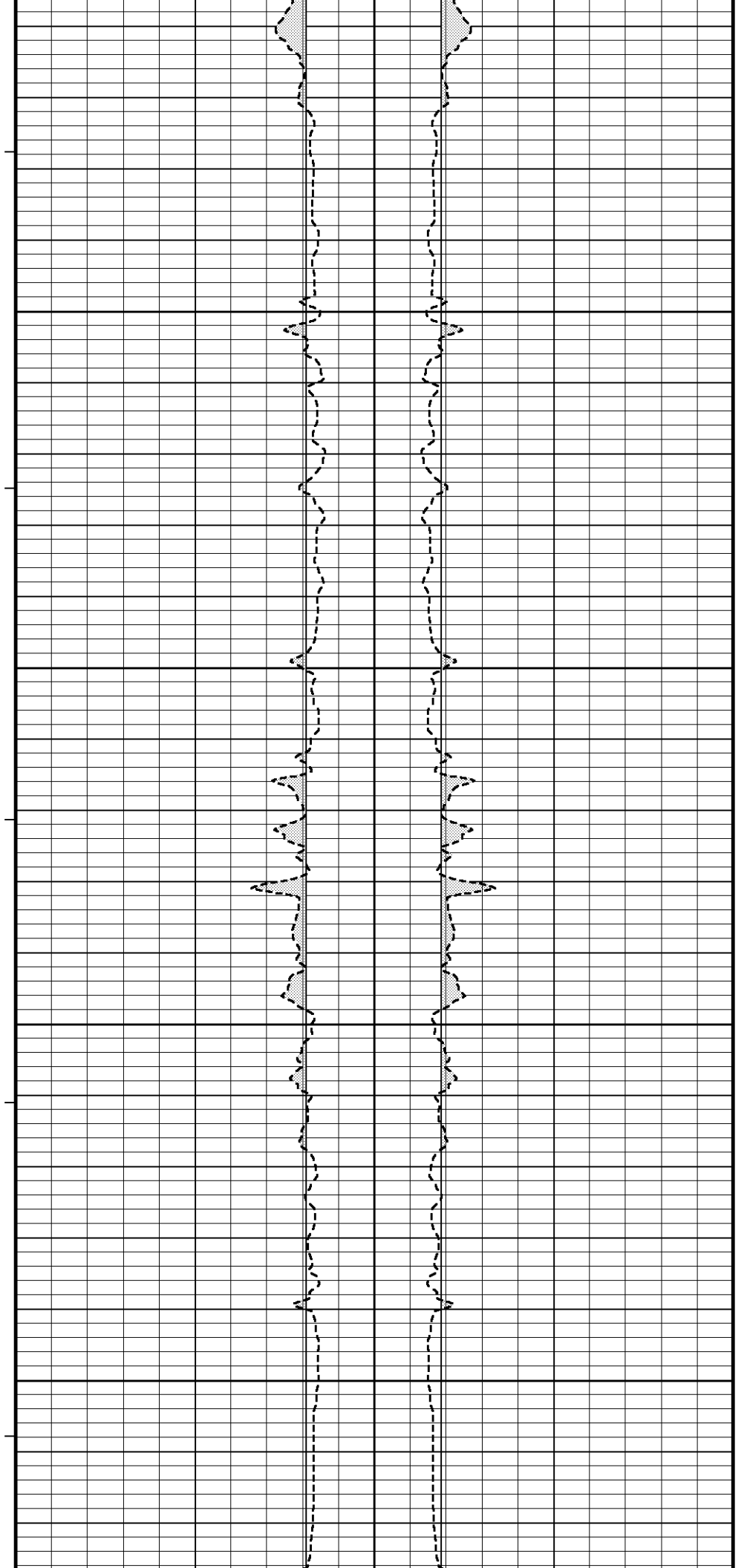
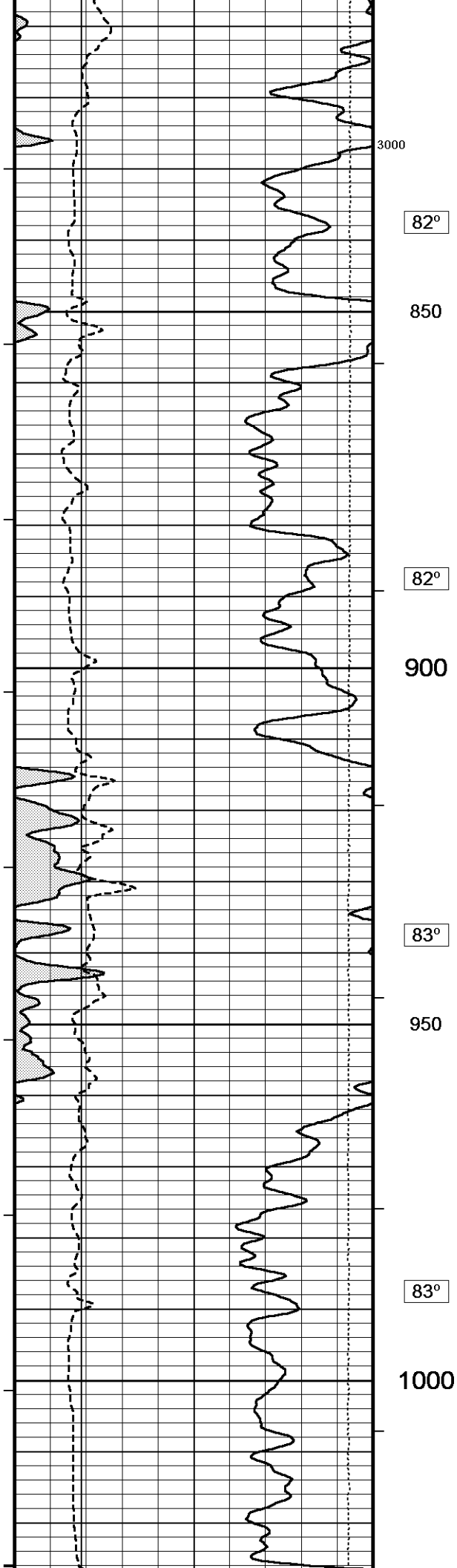
SERVICE ORDER: #3529731.

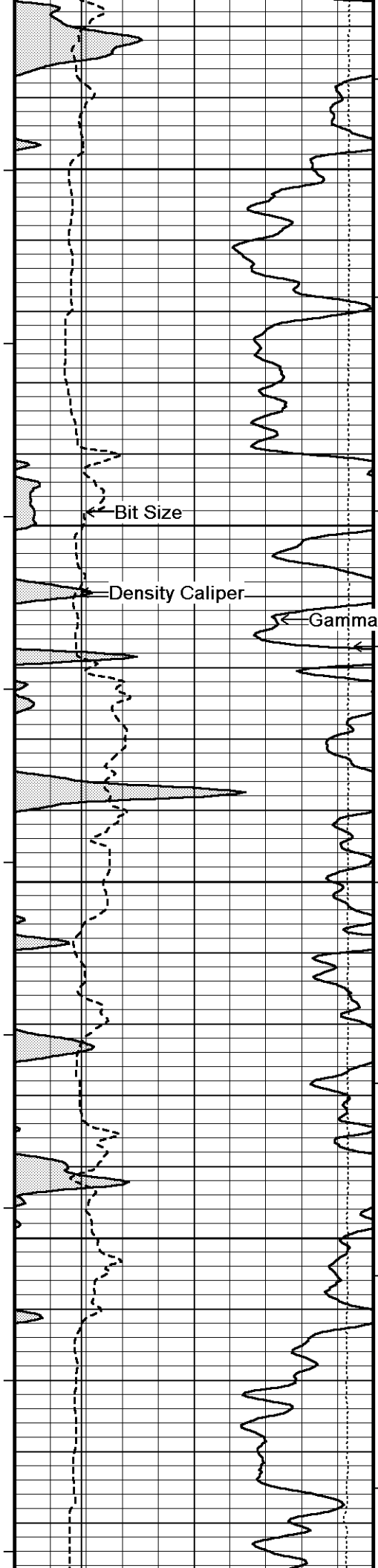
RIG: SST #88.

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions in our price schedule.

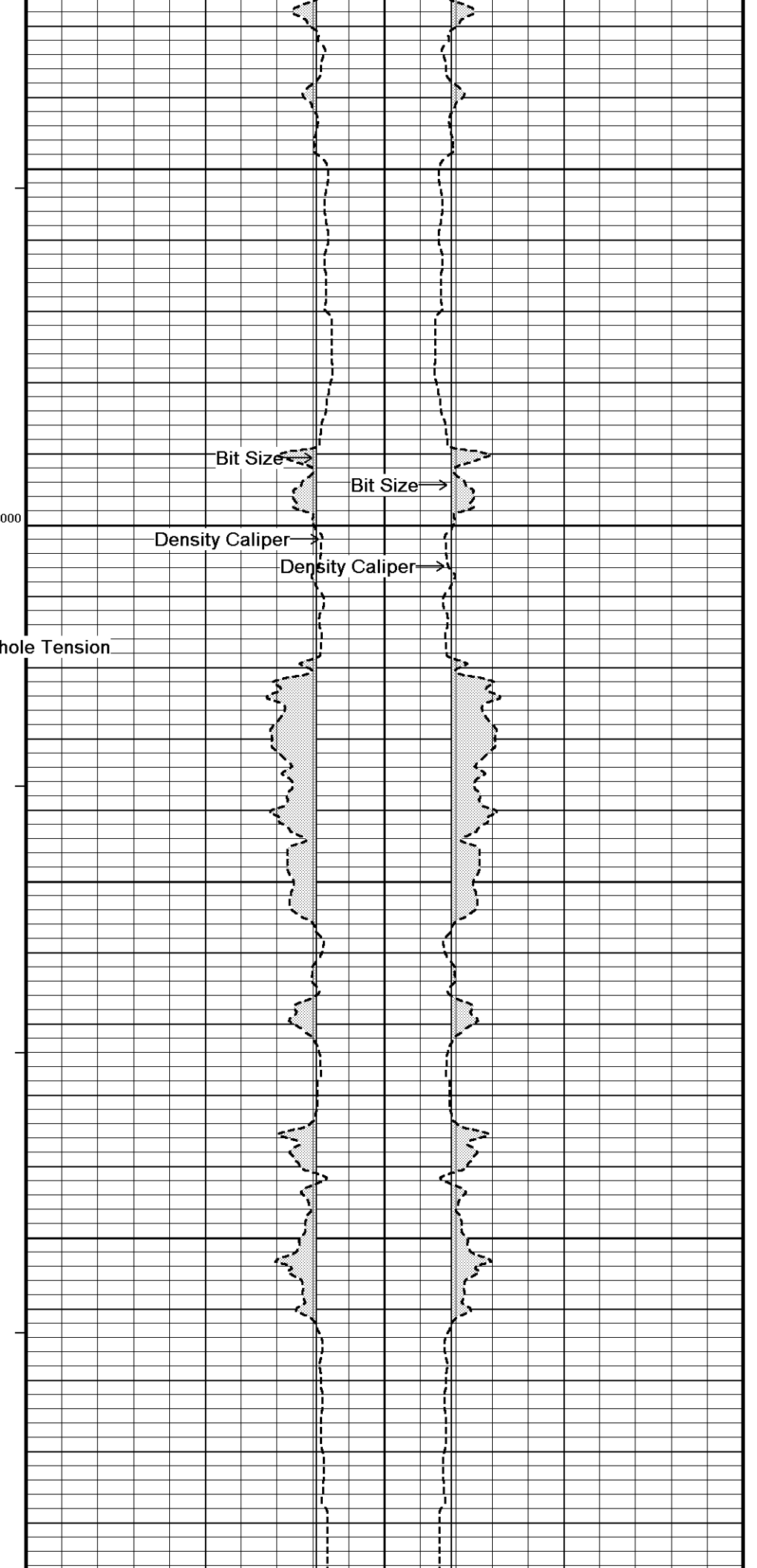








83°
1050
84°
1100
2900
84°
1150
85°
1200
85°



Bit Size

Bit Size

Density Caliper

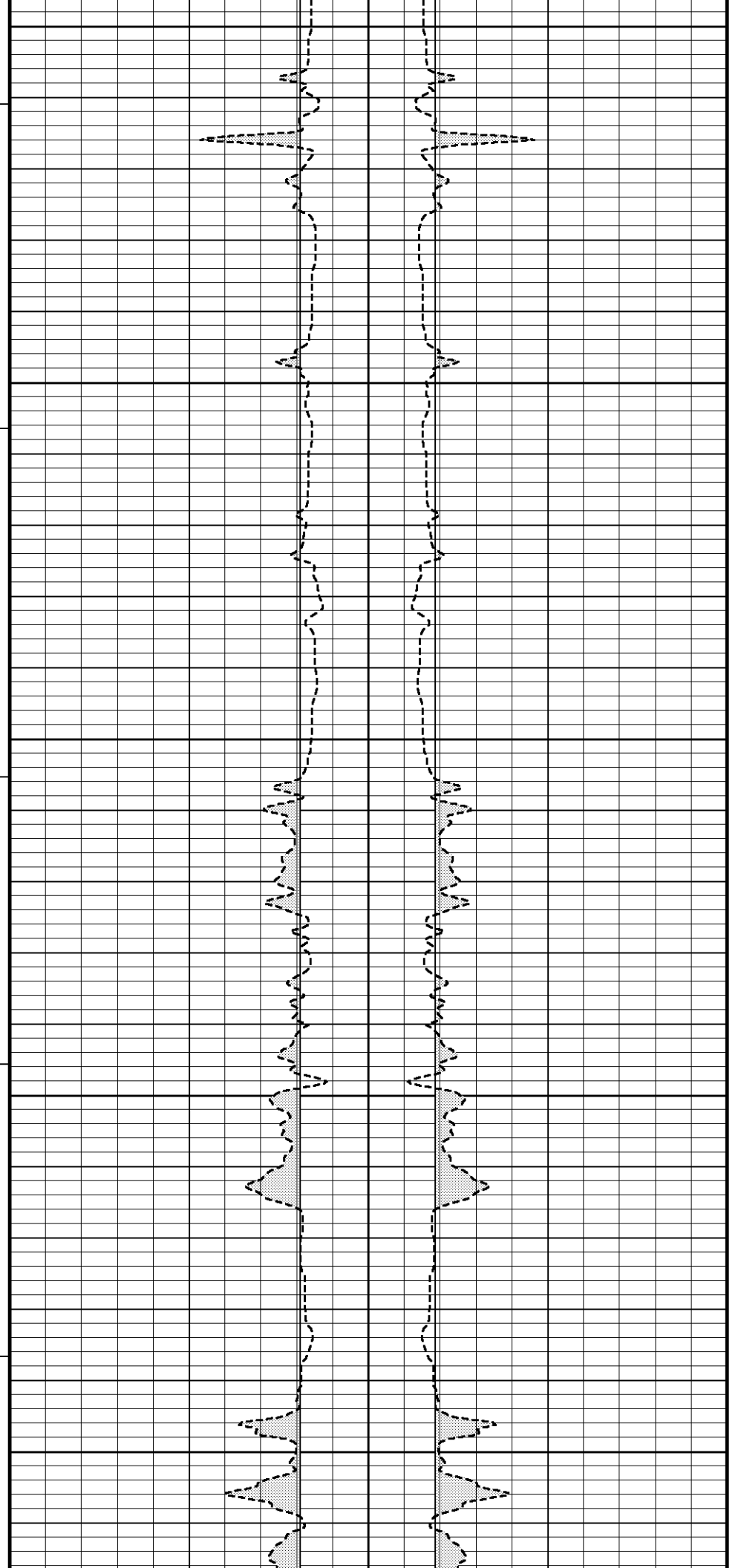
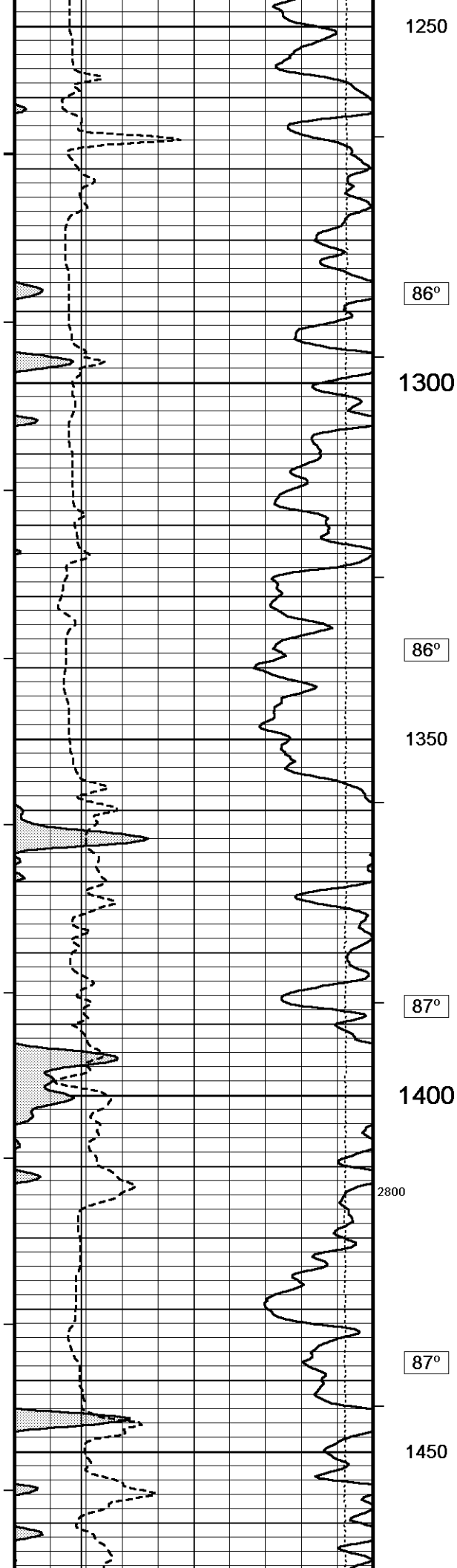
Density Caliper

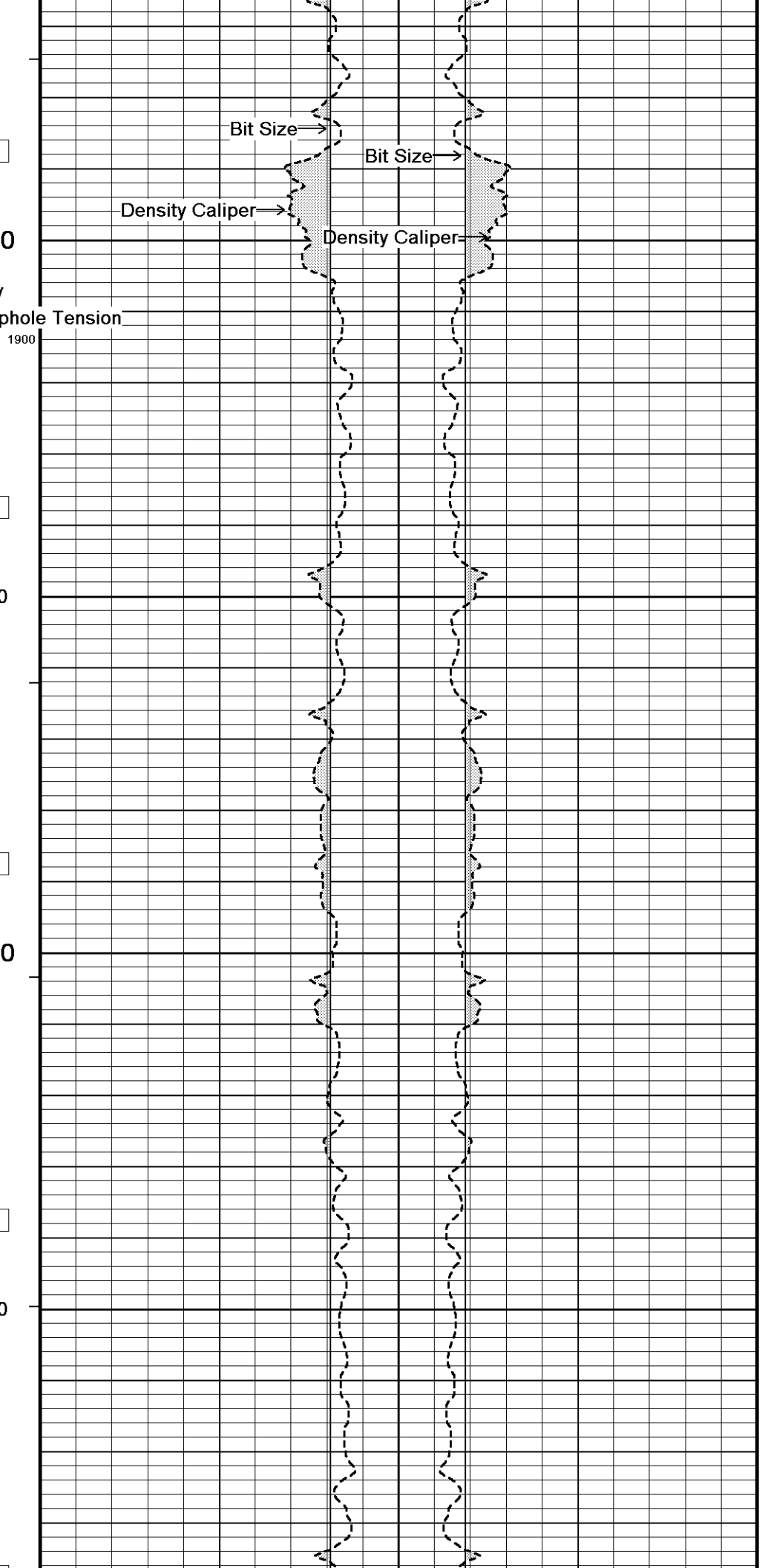
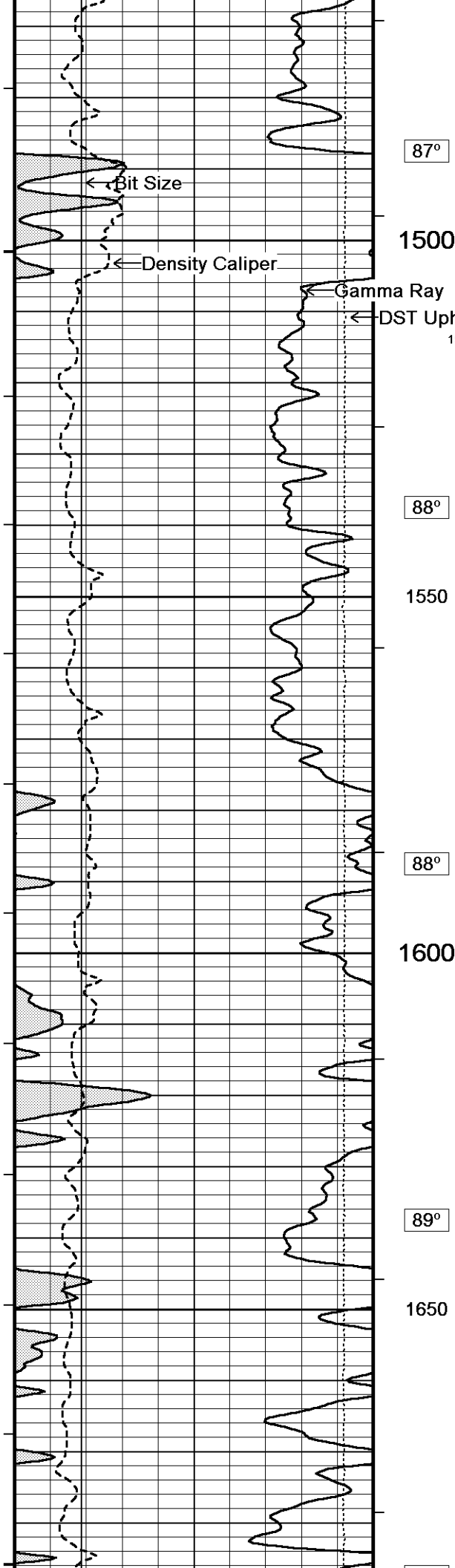
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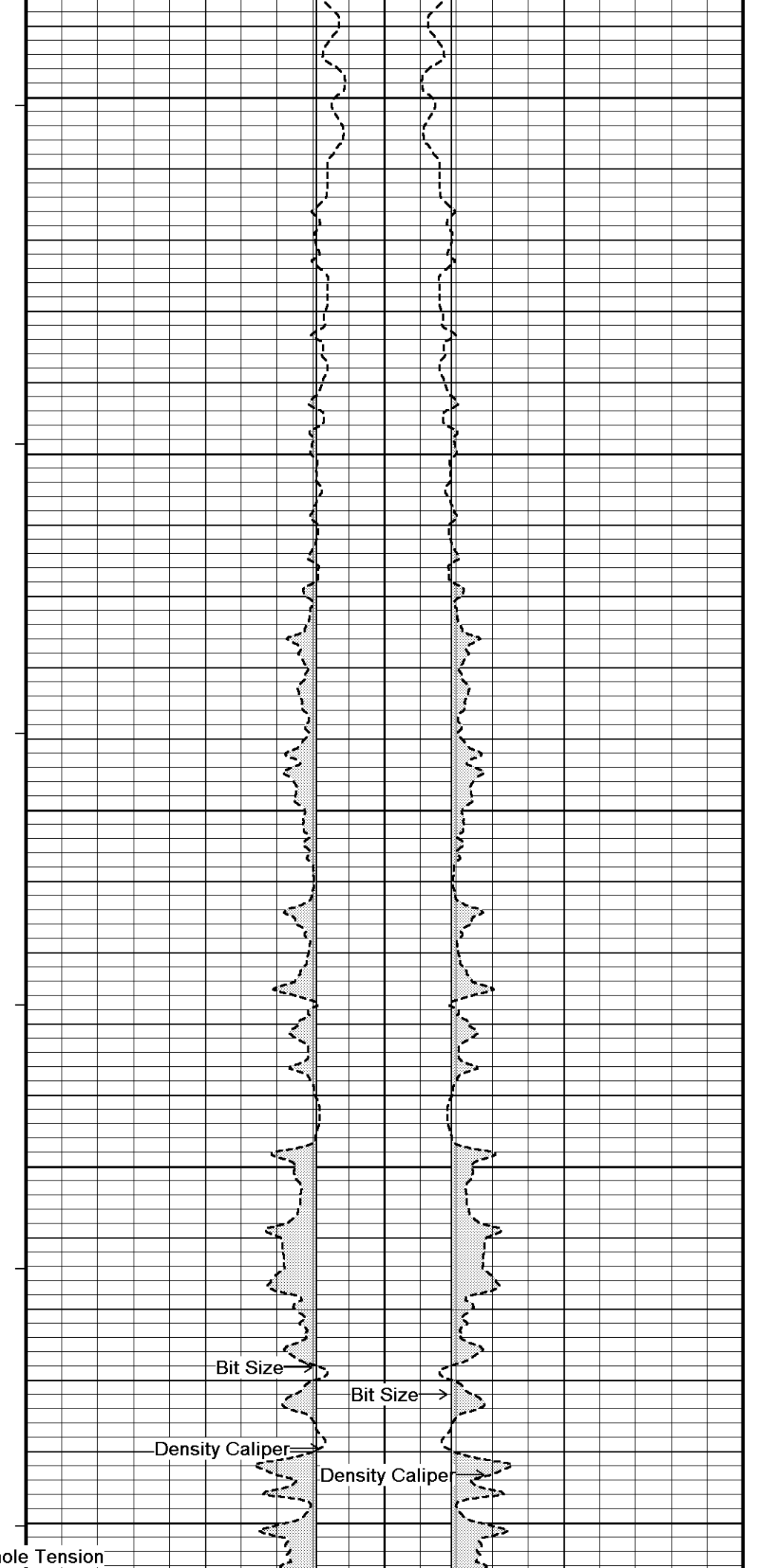
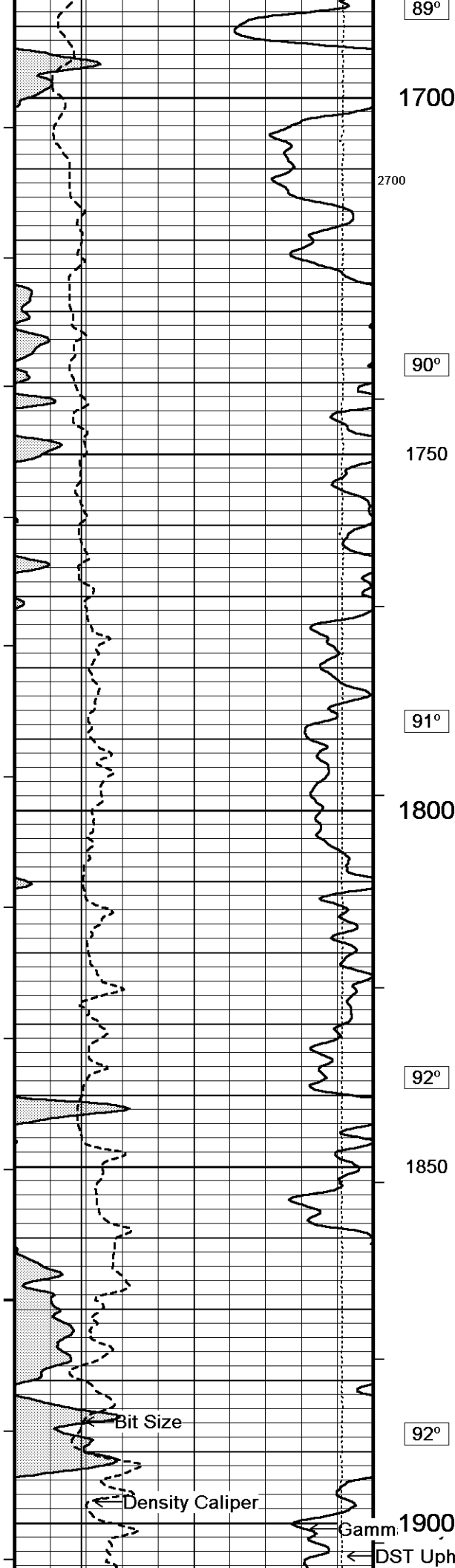
Density Caliper

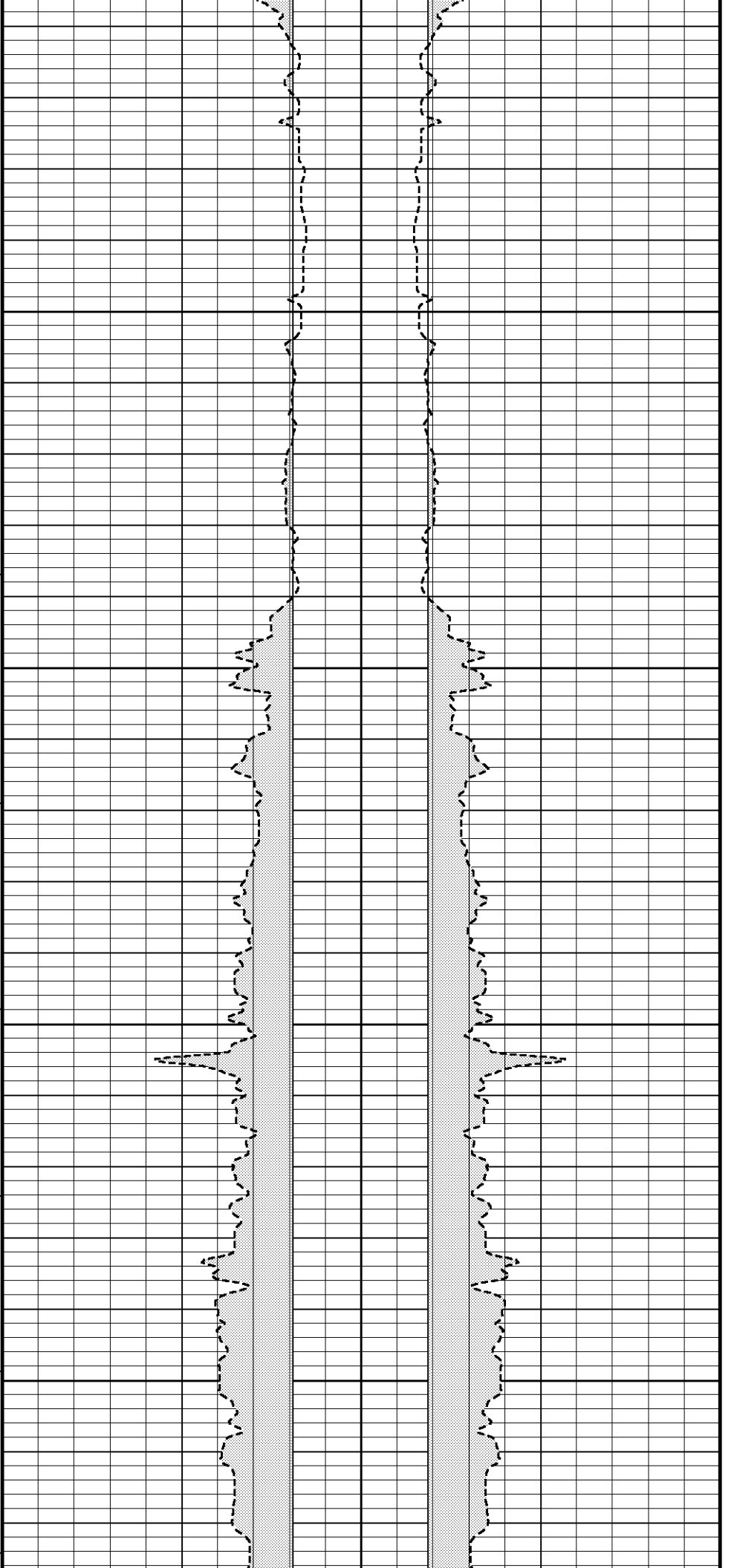
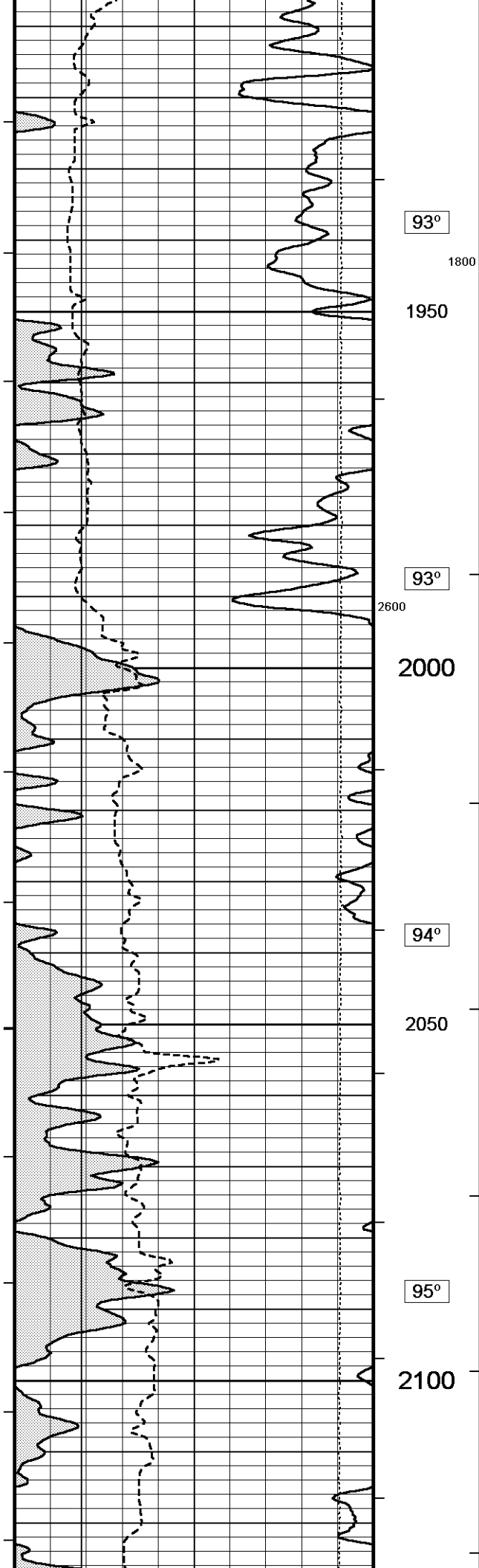
Gamma Ray

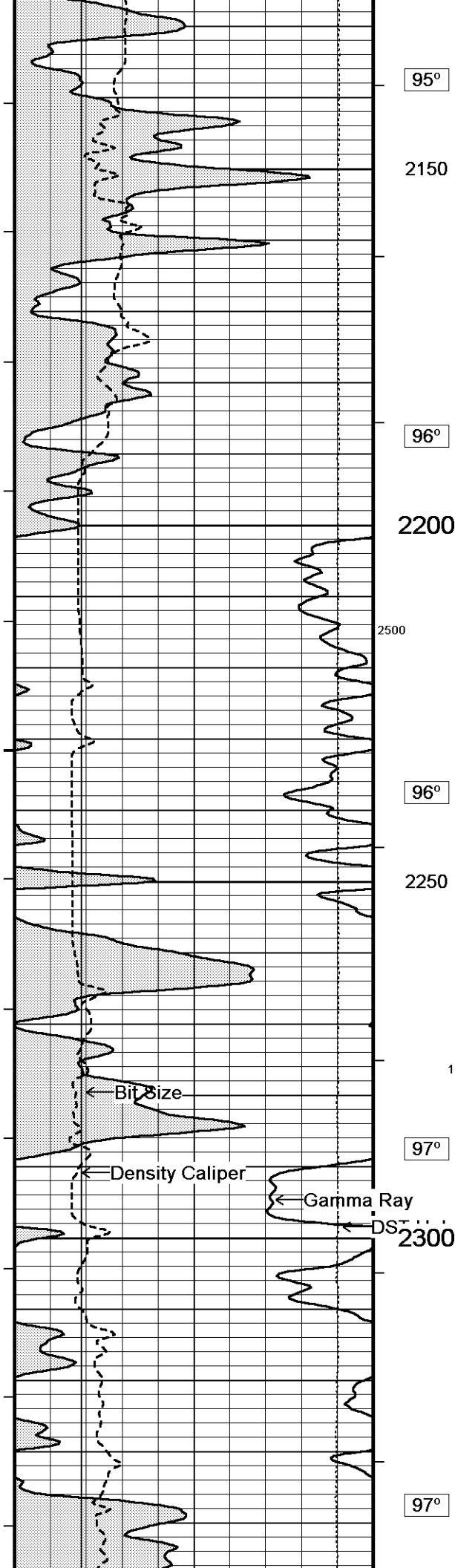
DST Uphole Tension











95°

2150

96°

2200

2500

96°

2250

1700

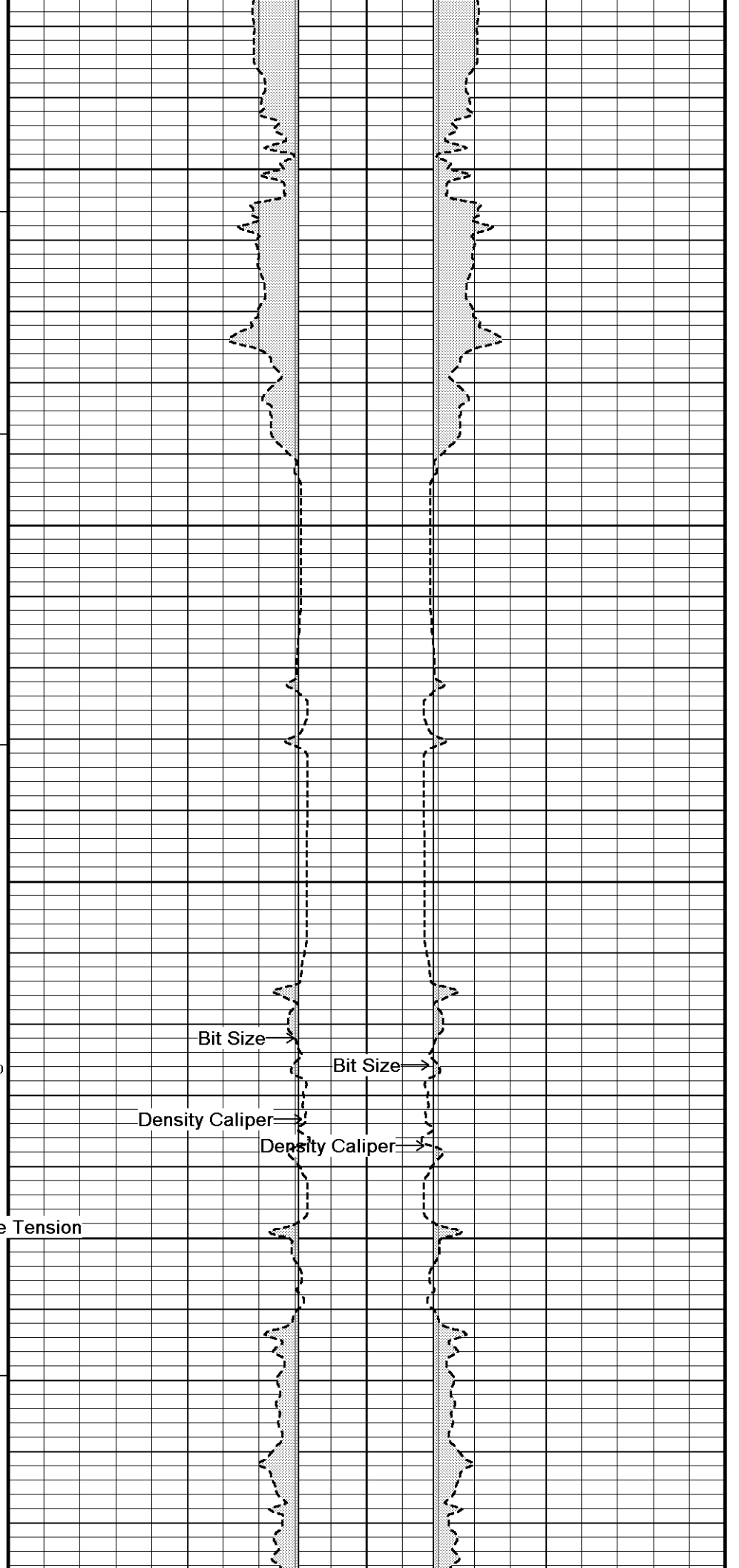
97°

2300

DST

Well Tension

97°

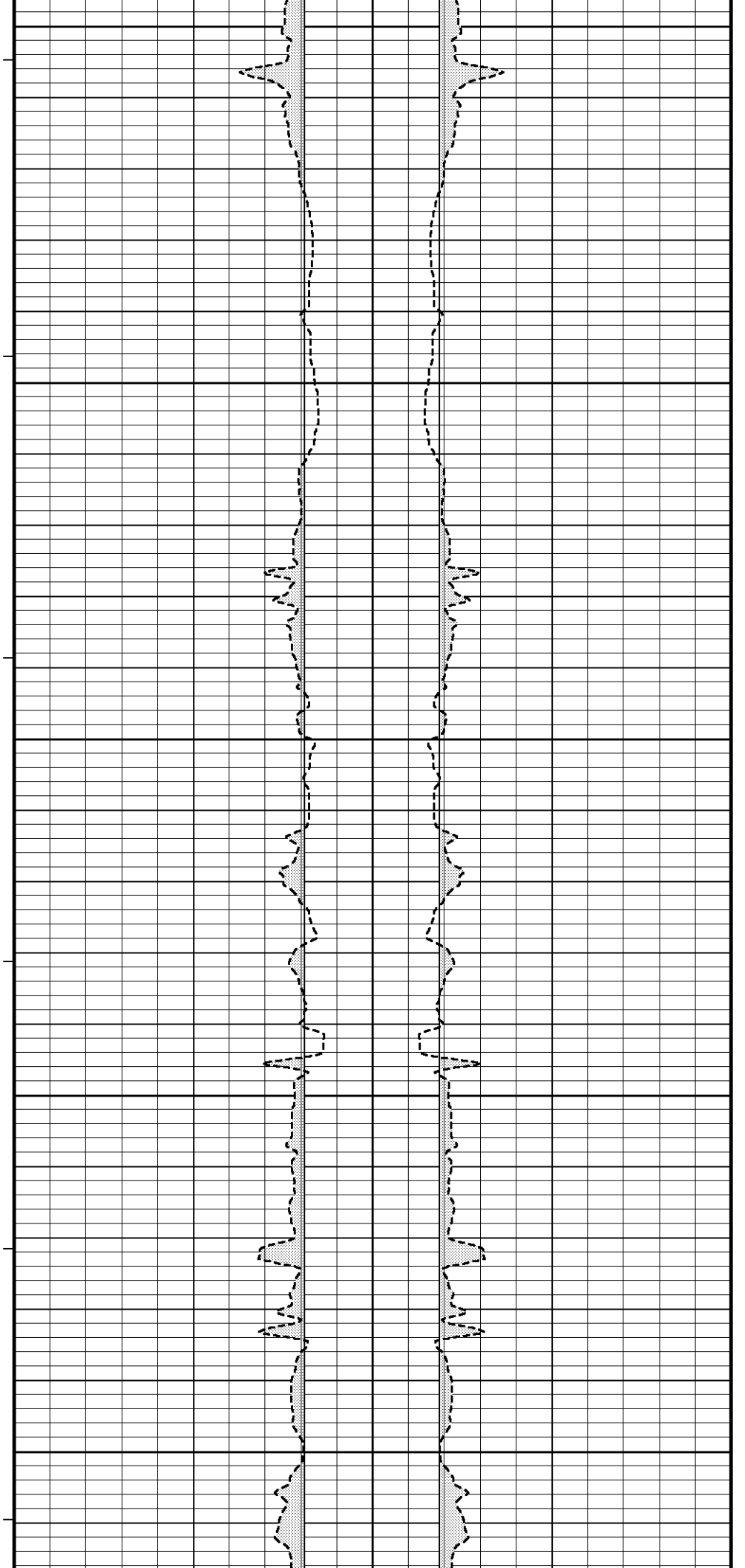
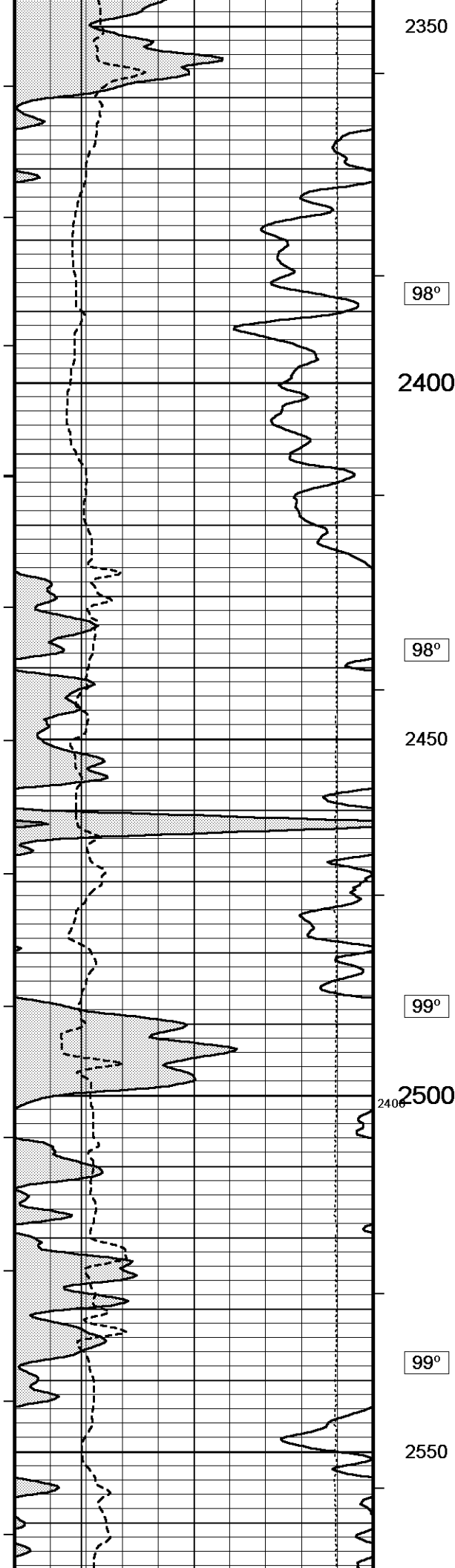


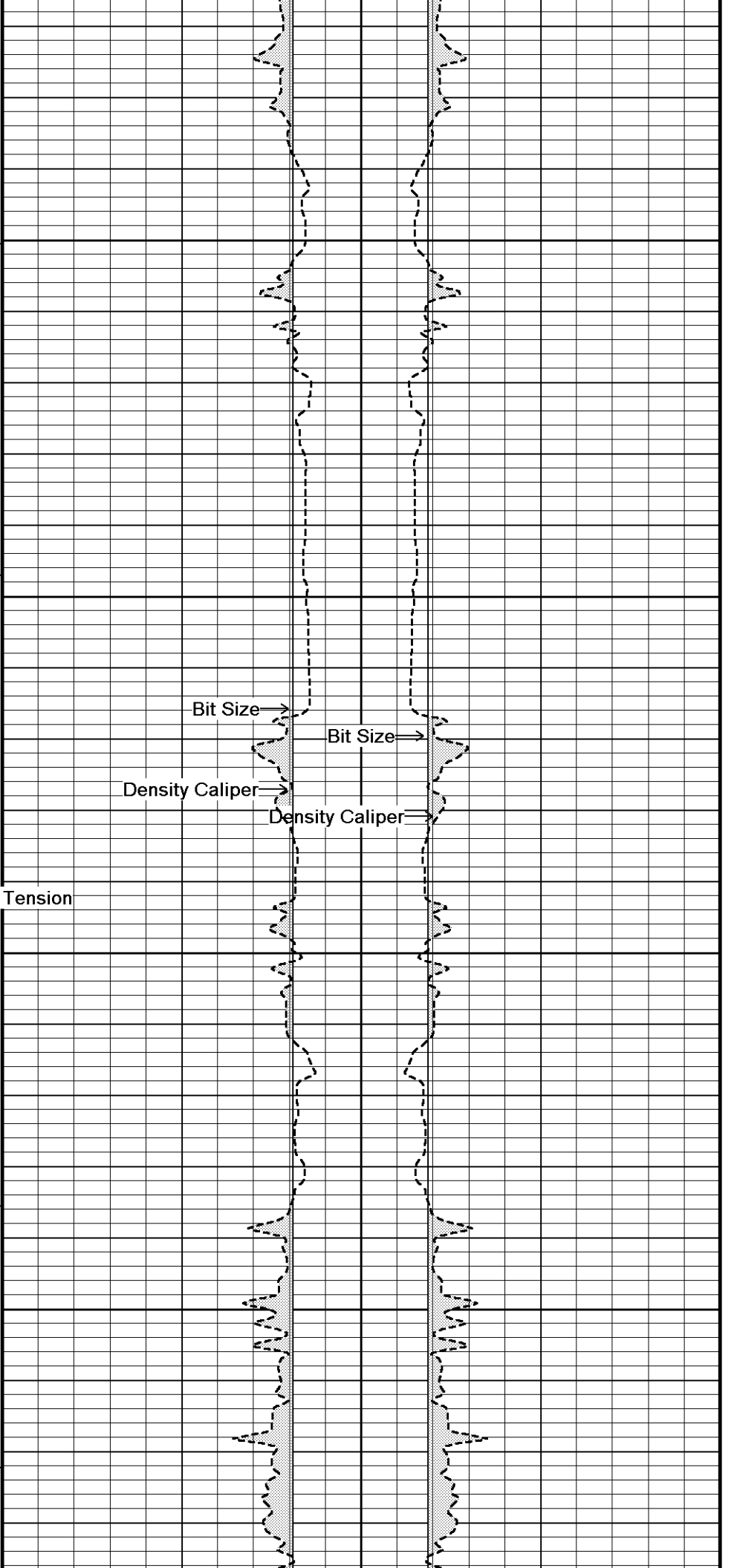
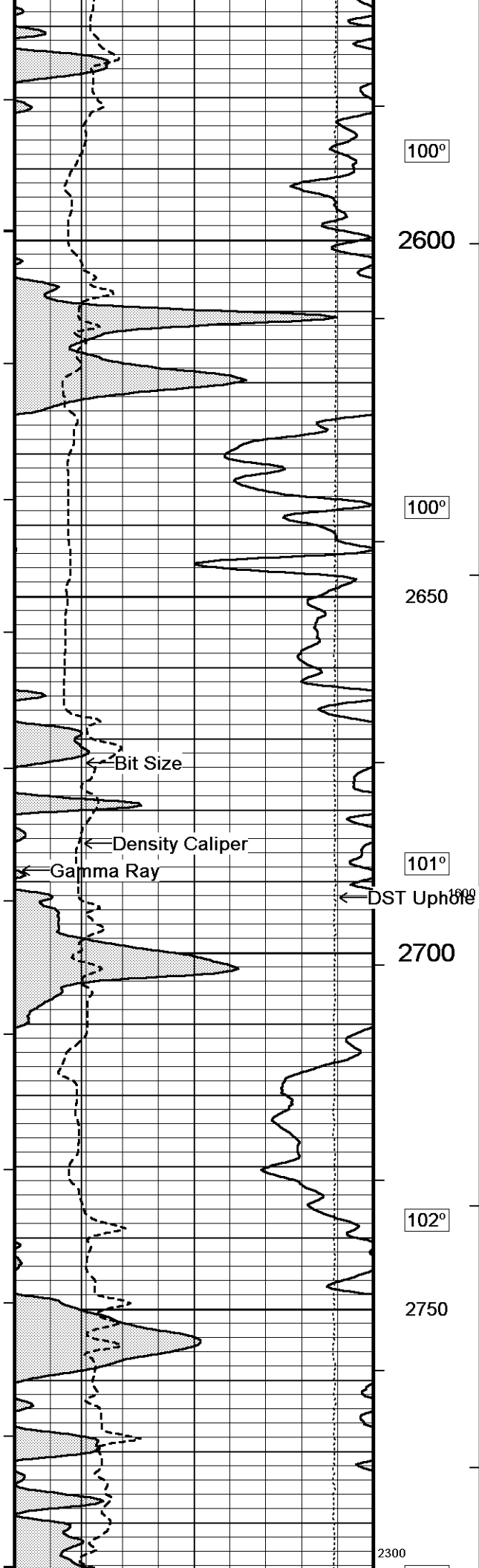
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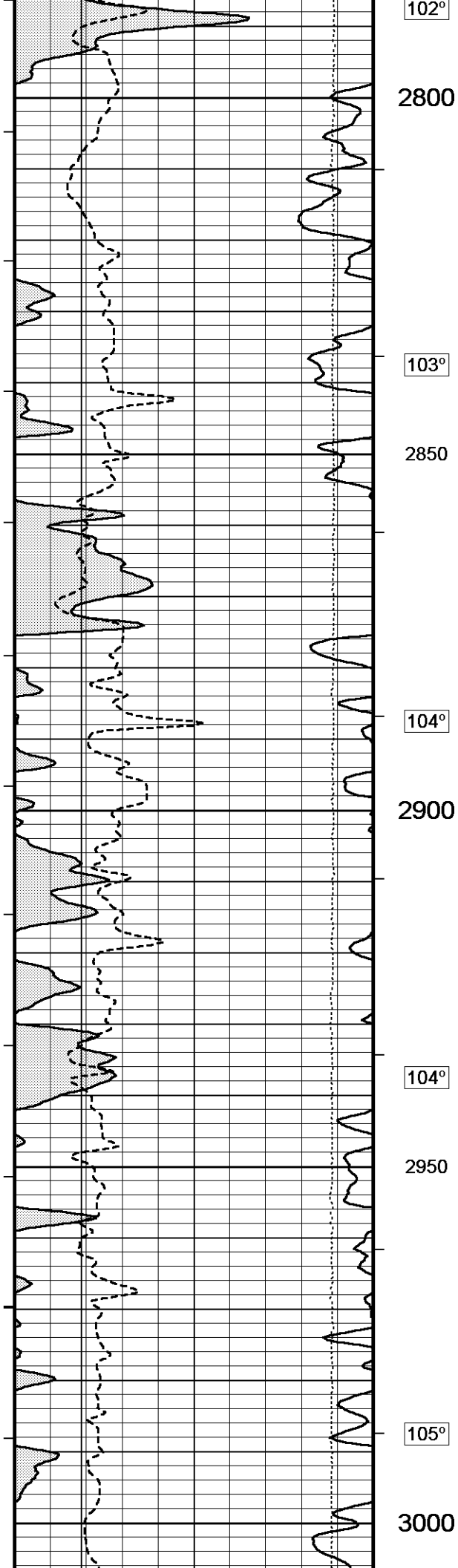
Density Caliper

Bit Size

Density Caliper







102°

2800

103°

2850

104°

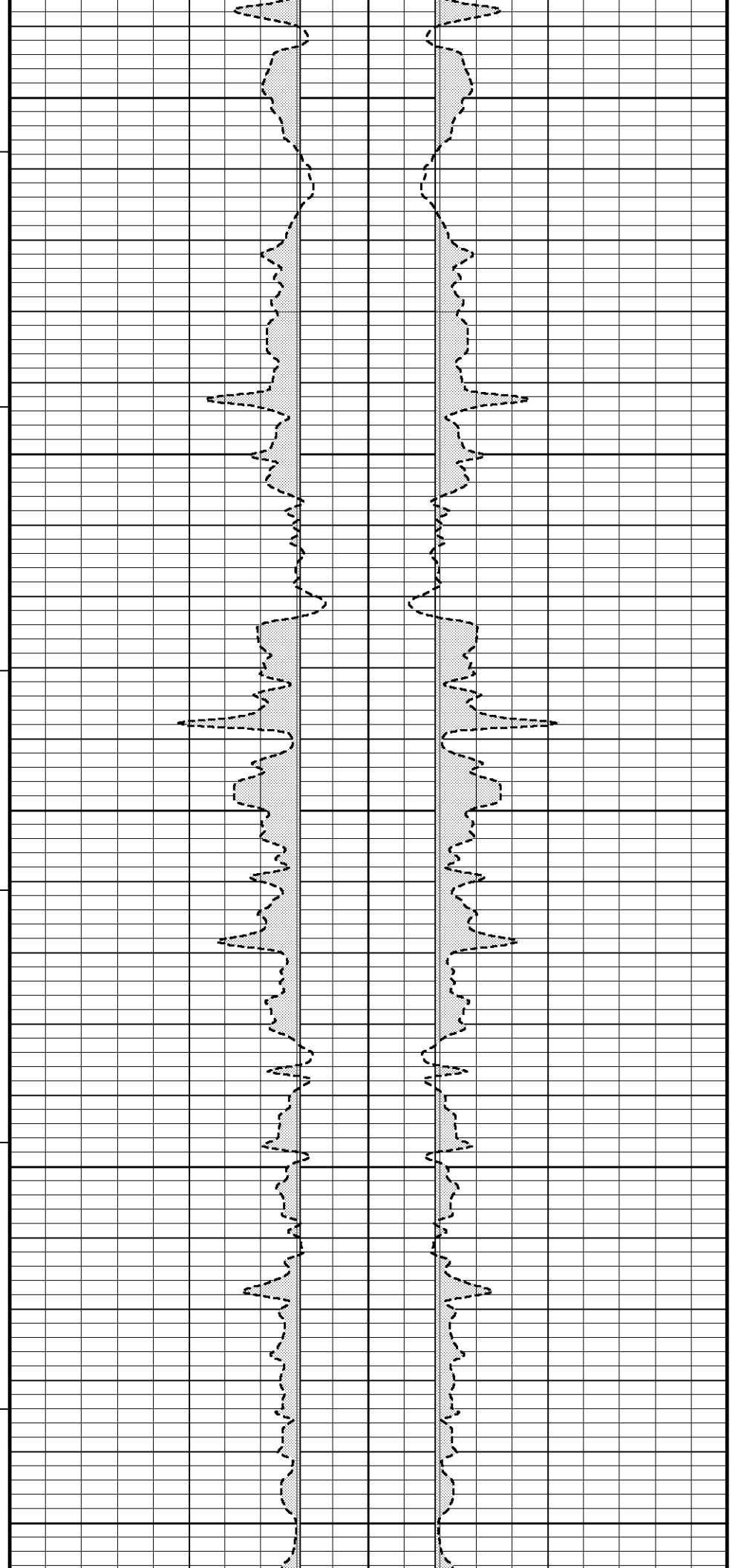
2900

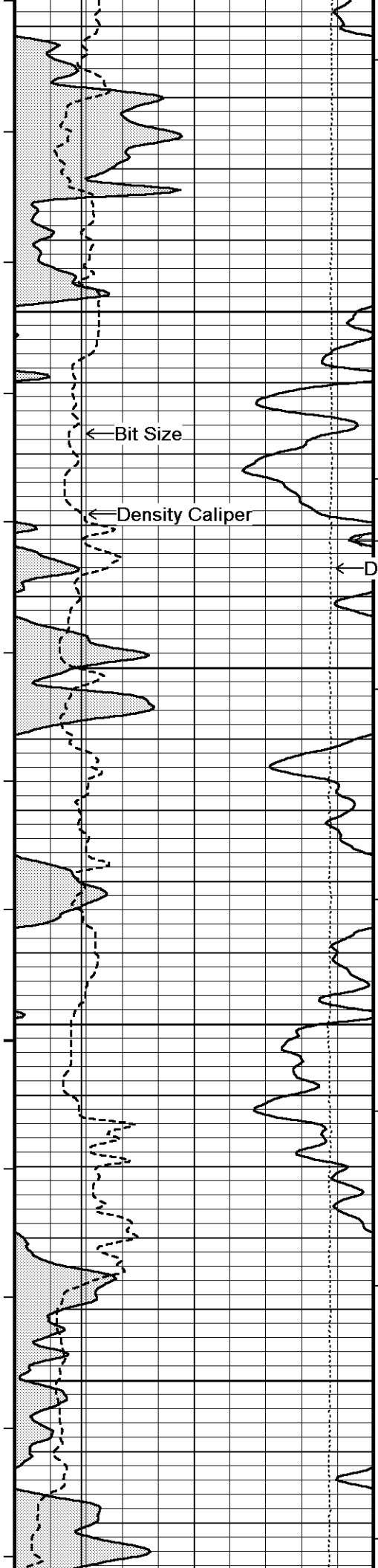
104°

2950

105°

3000





105°

2200

3050

1500

Bit Size

Density Caliper

Density Caliper

Gamma Ray

DST

106°

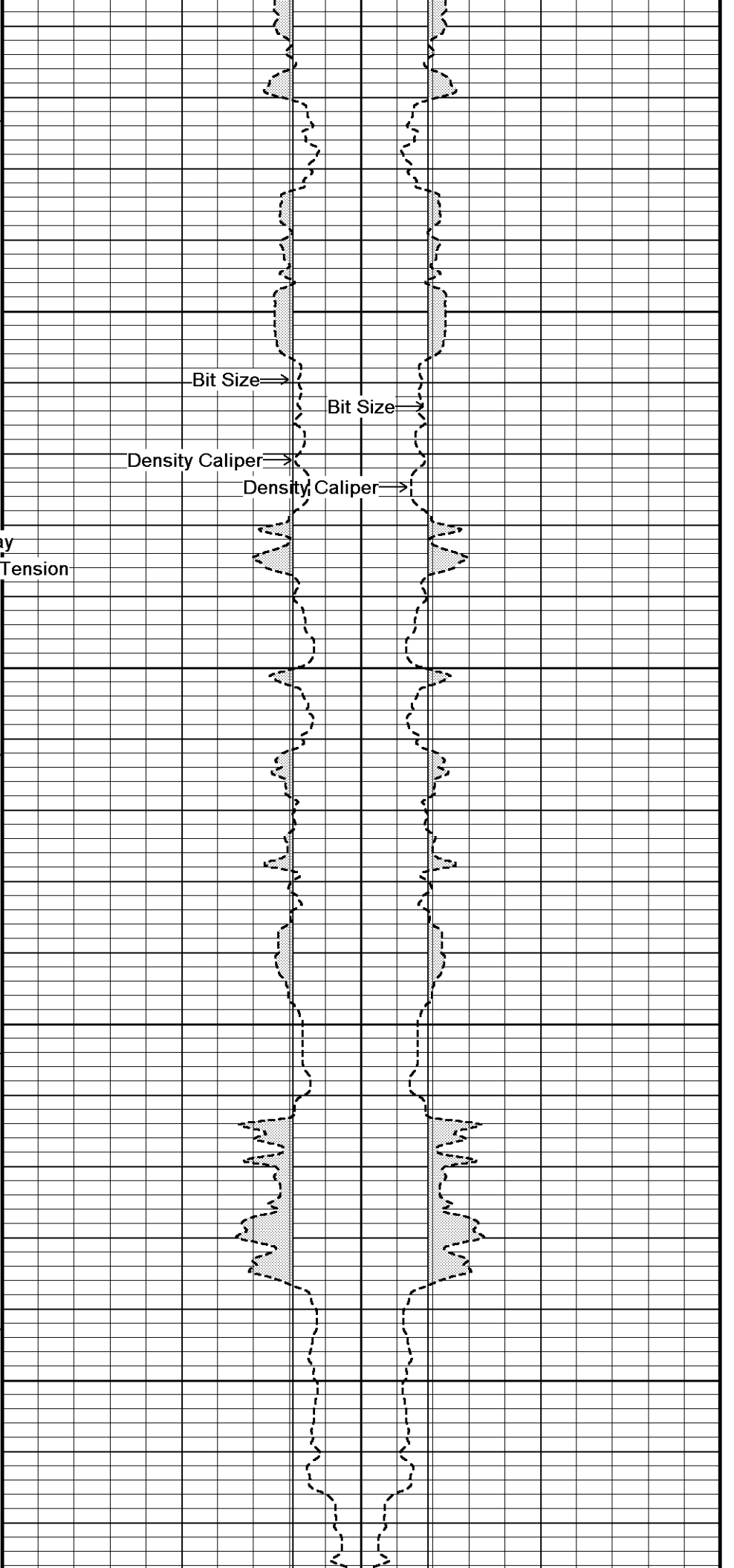
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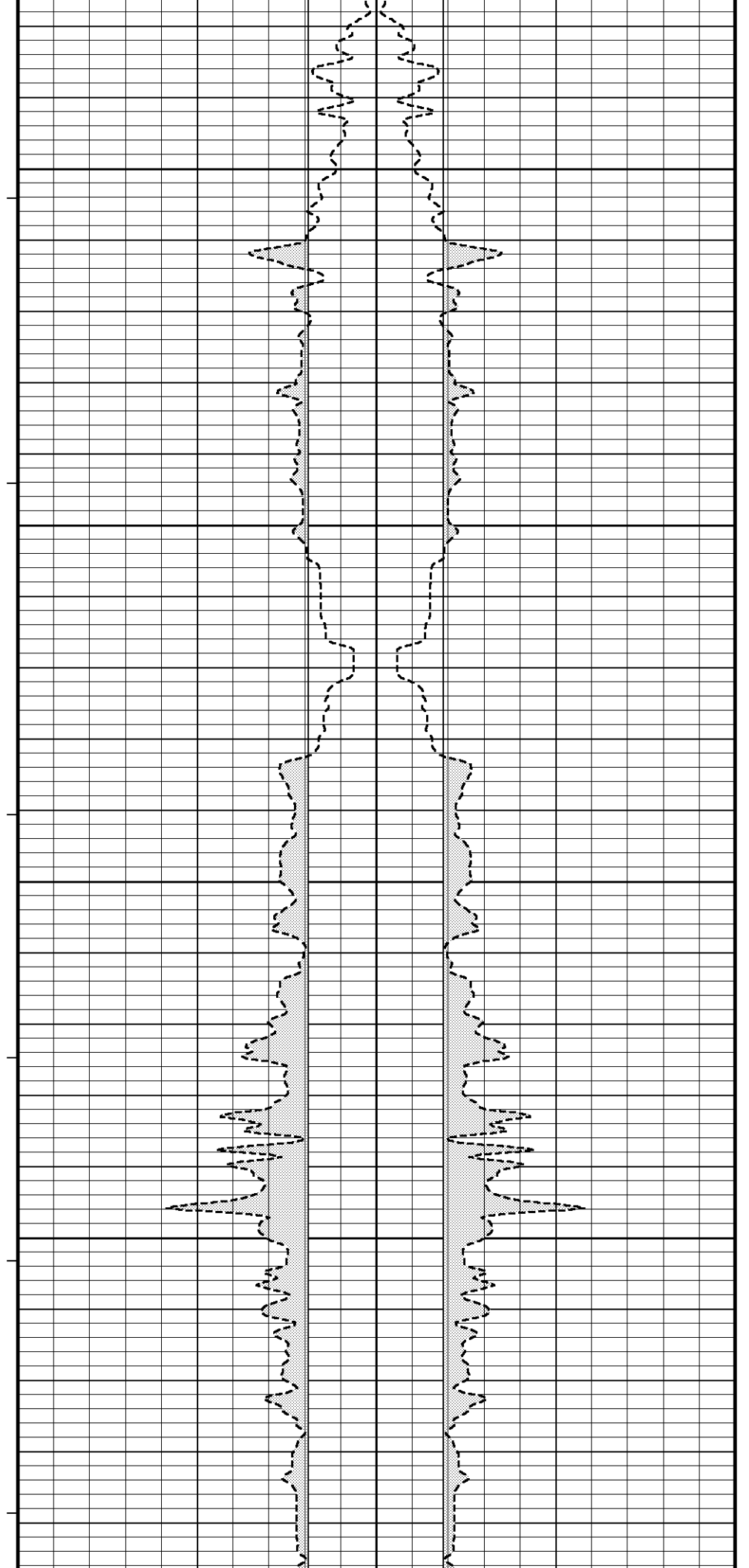
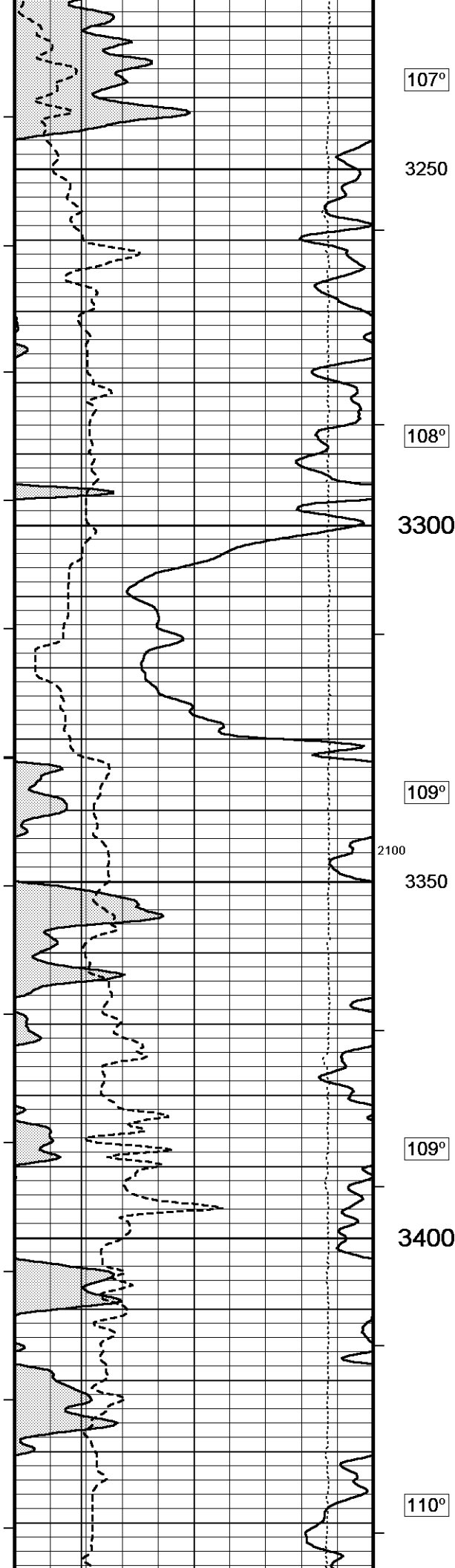
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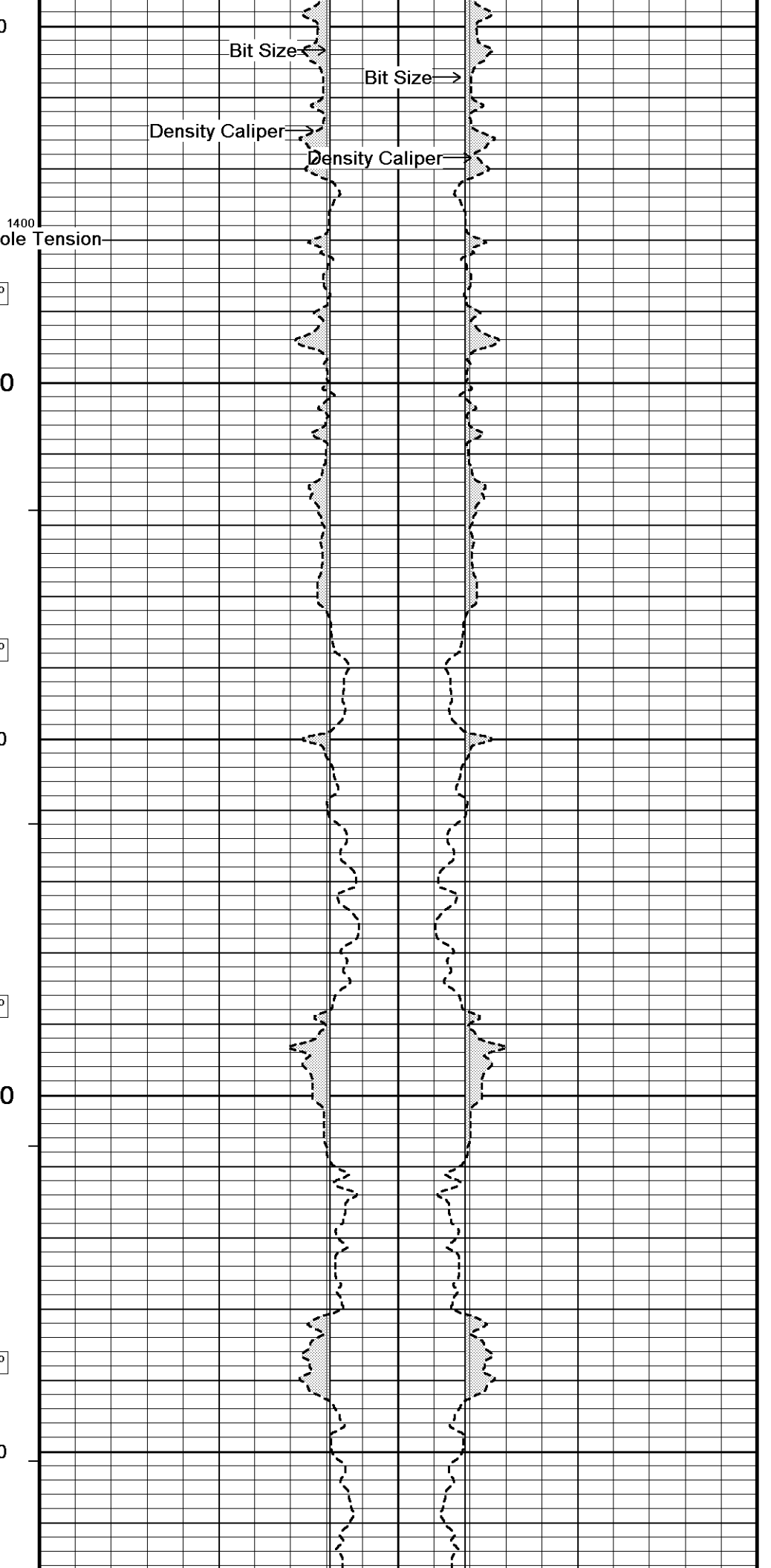
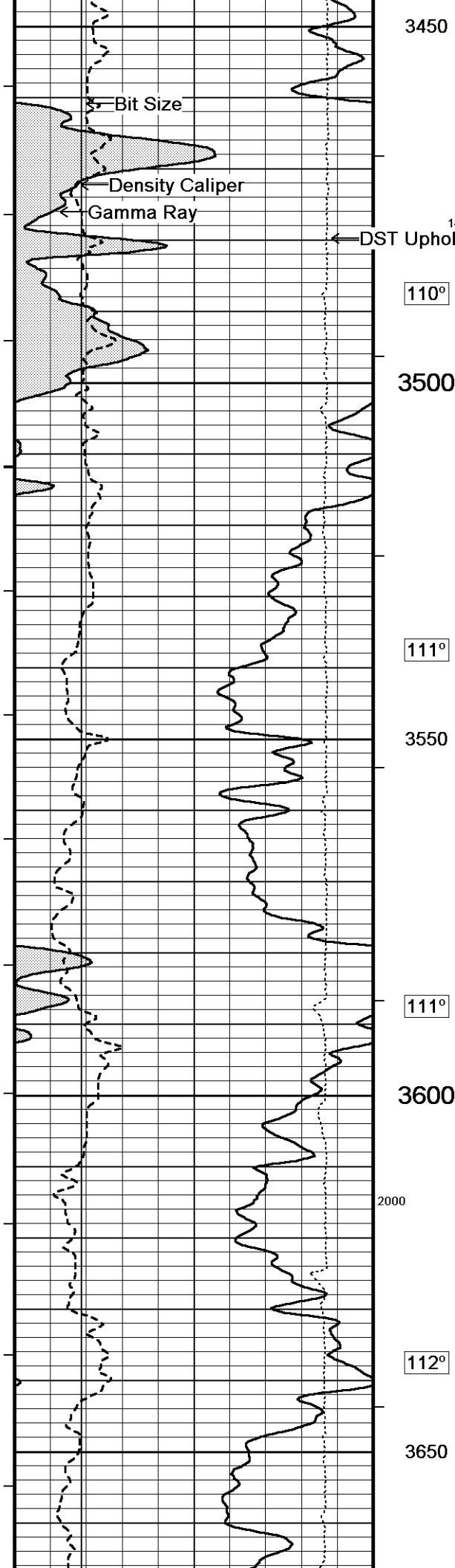
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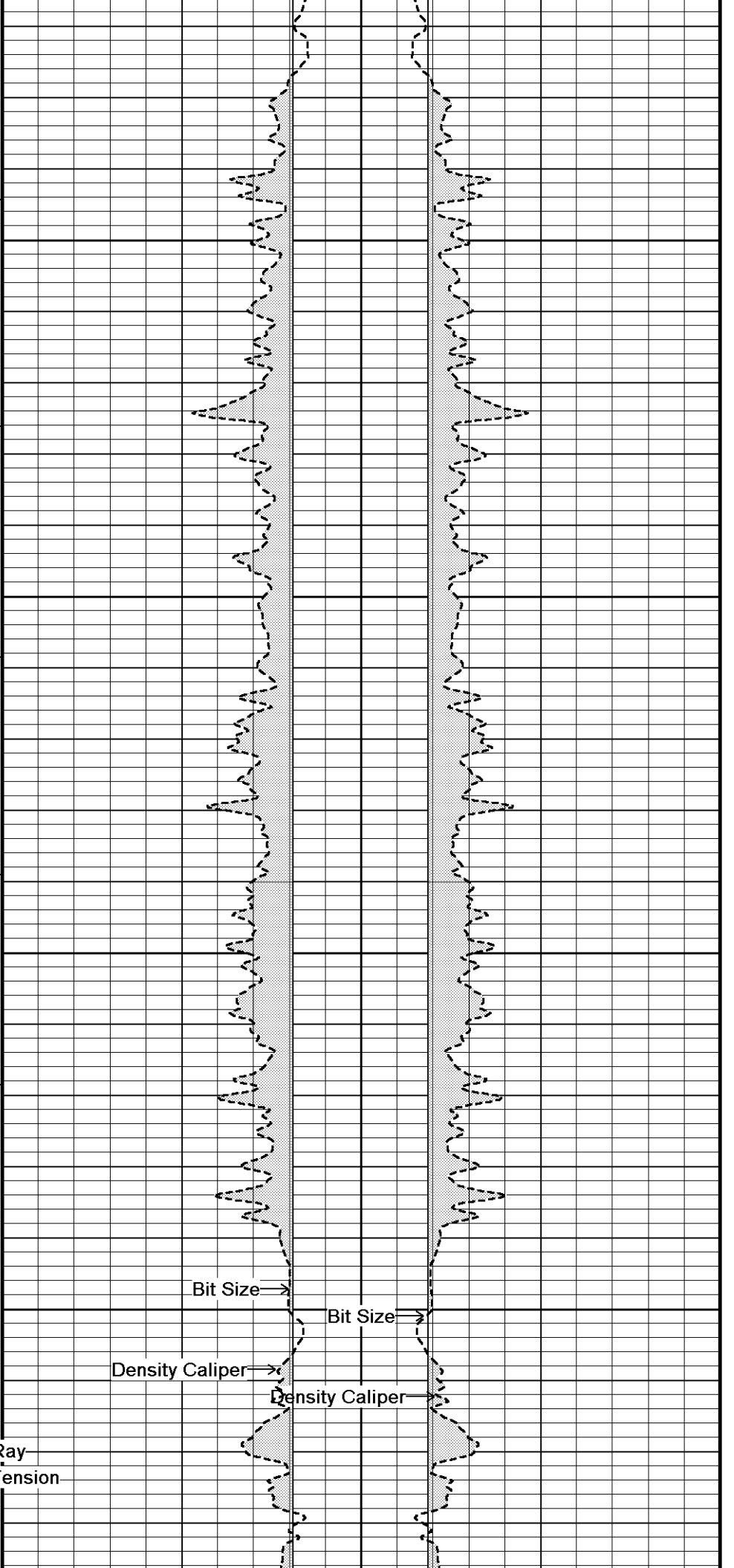
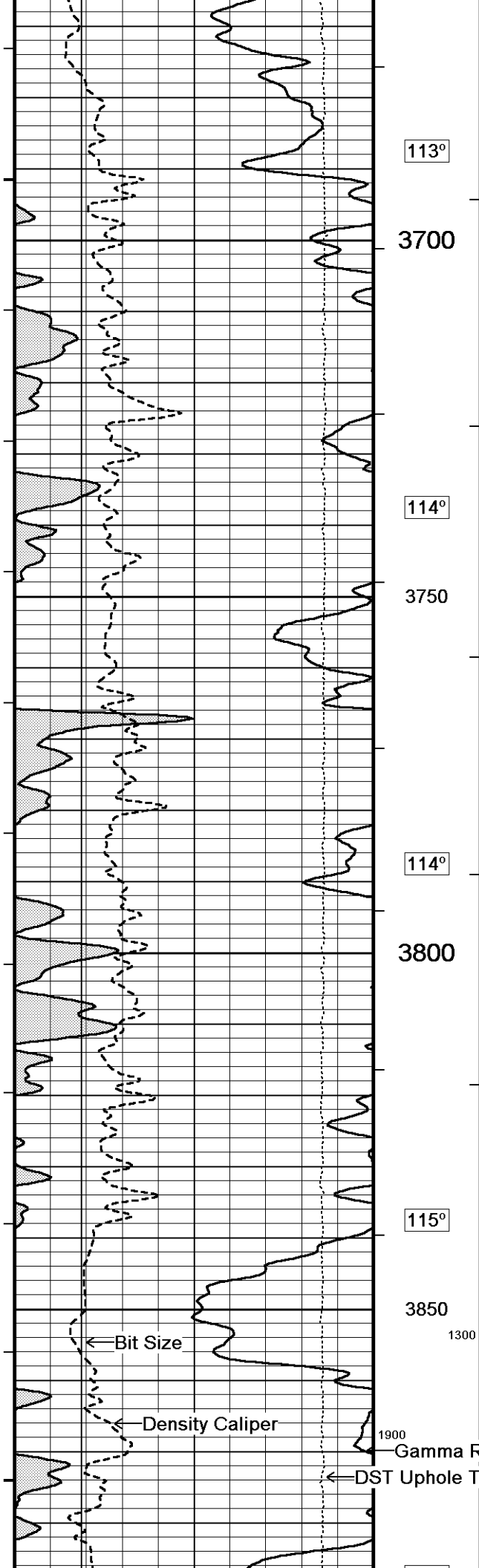
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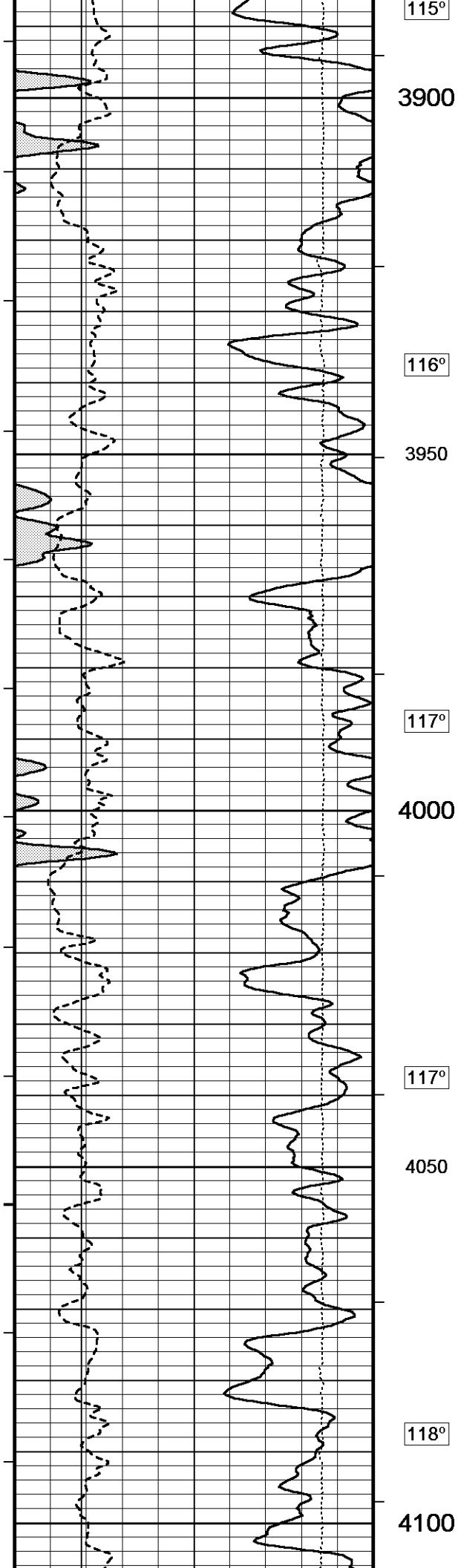
3200











115°

3900

116°

3950

117°

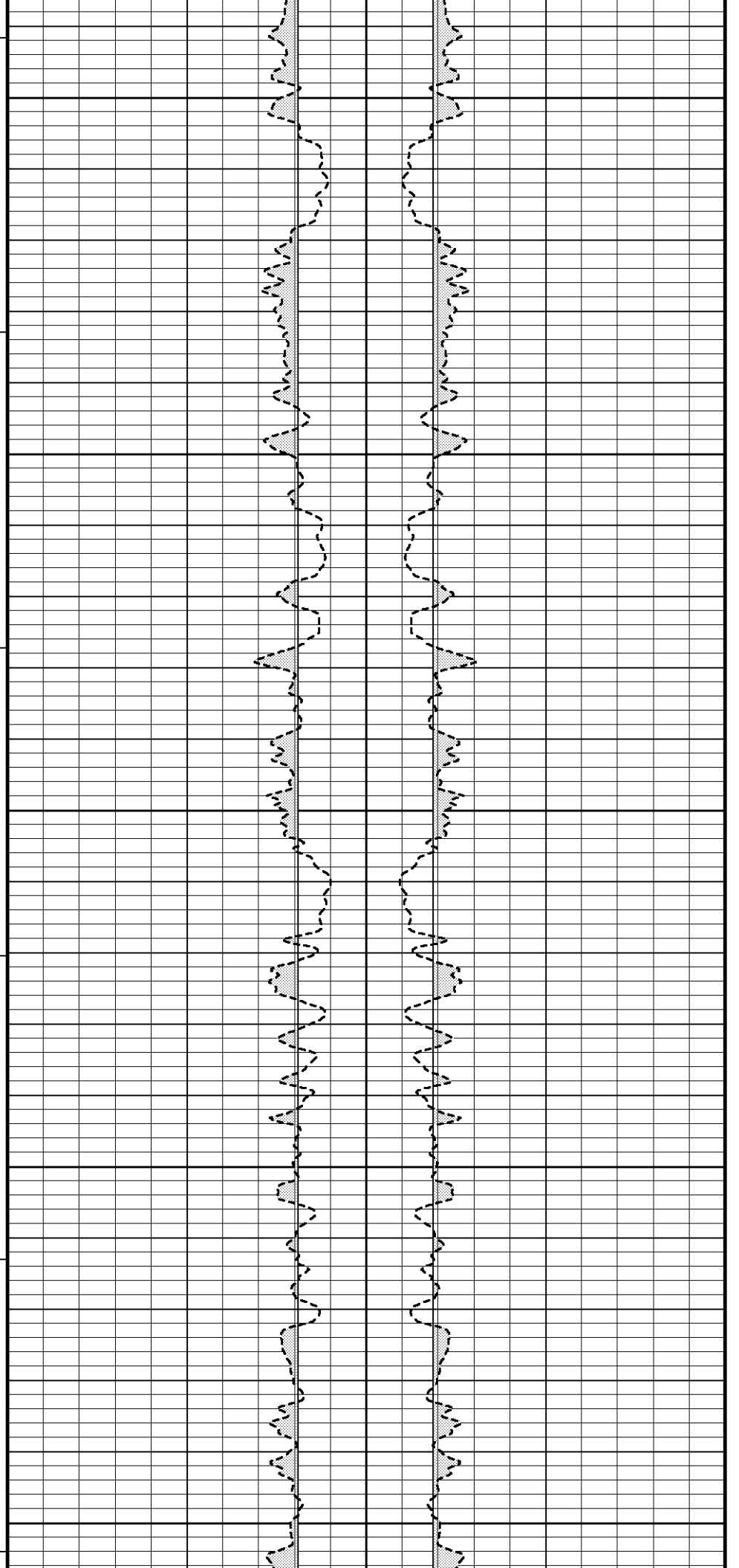
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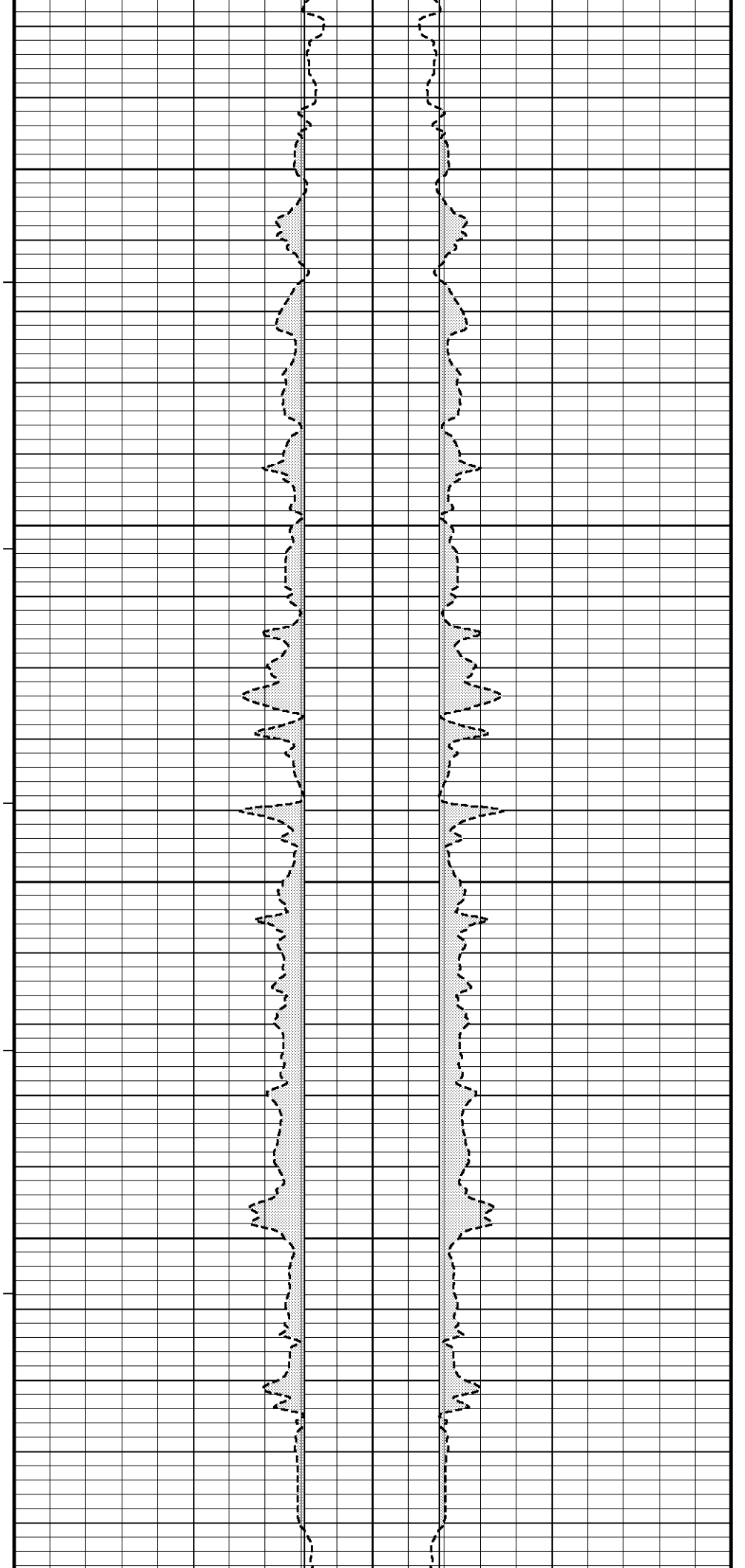
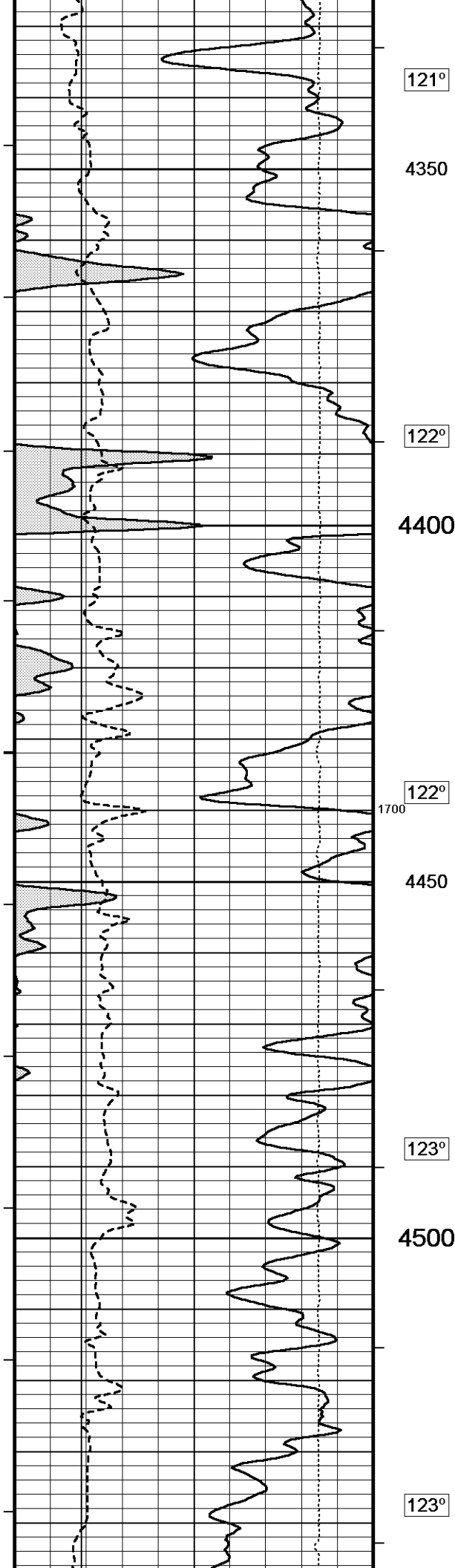
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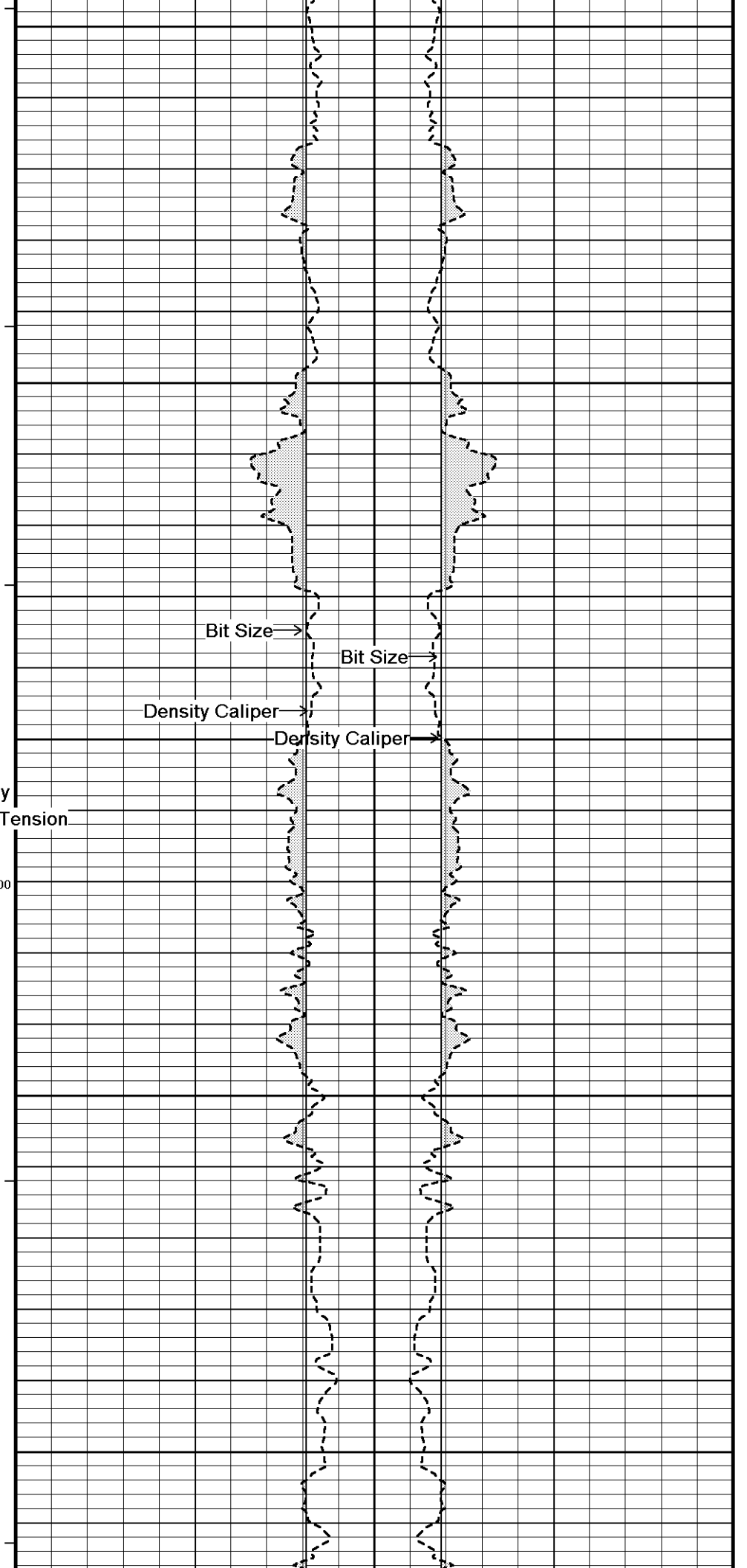
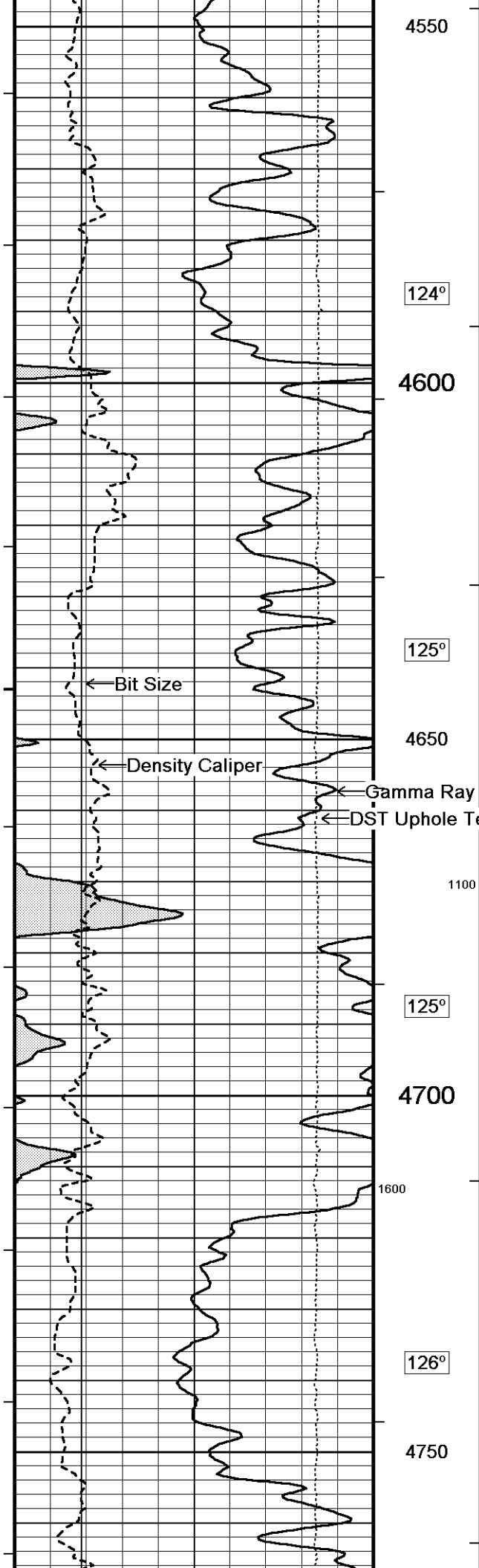
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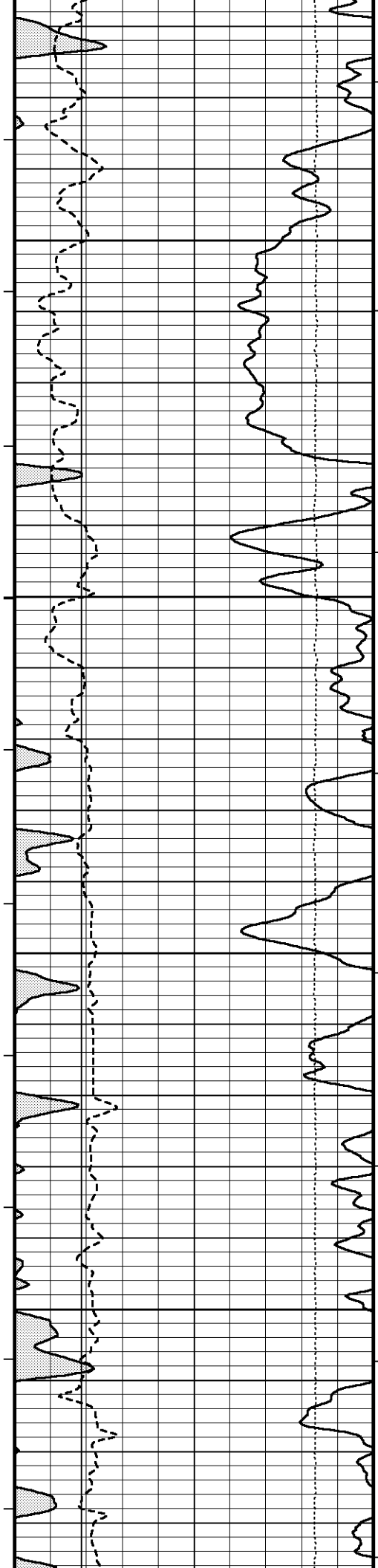
118°

4100









126°

4800

127°

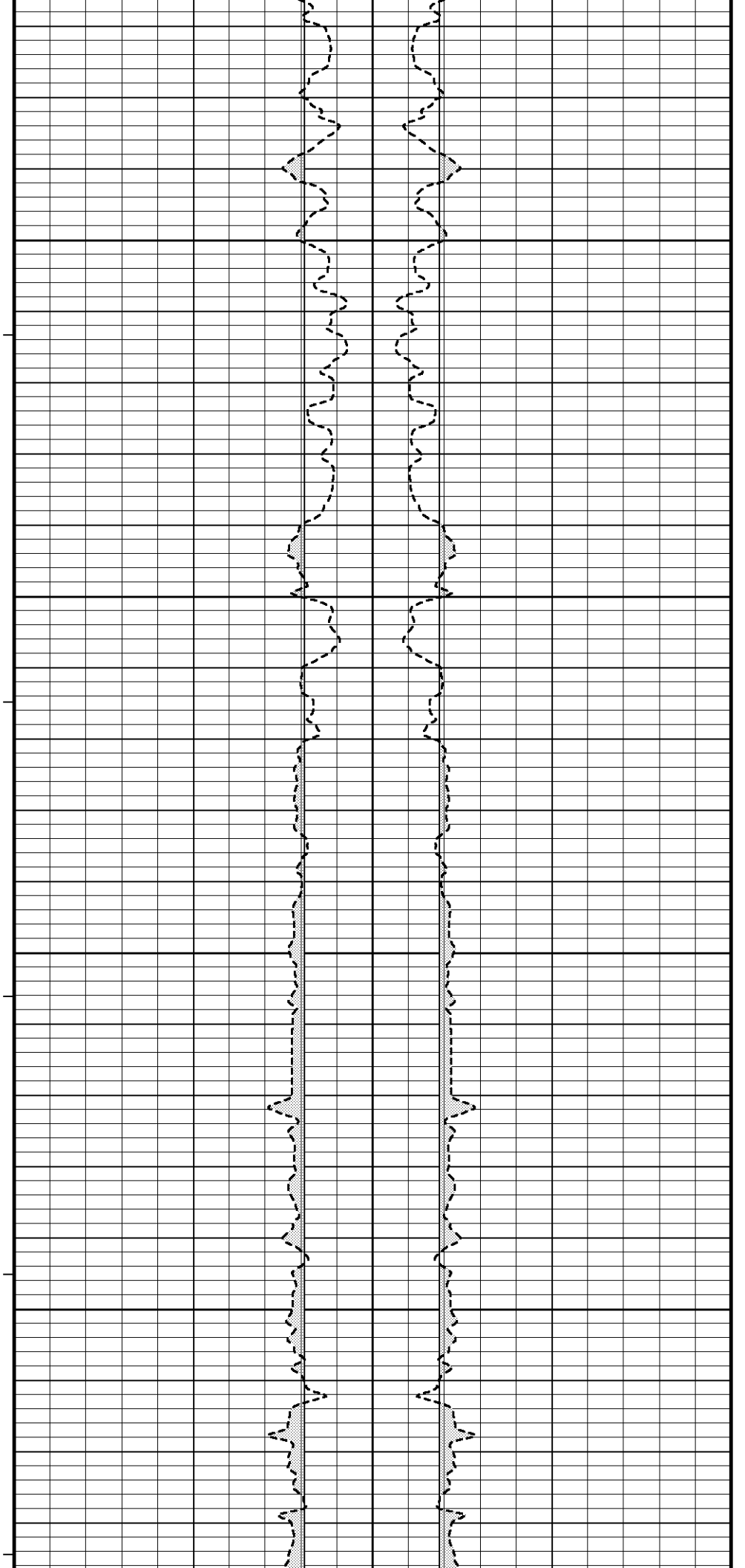
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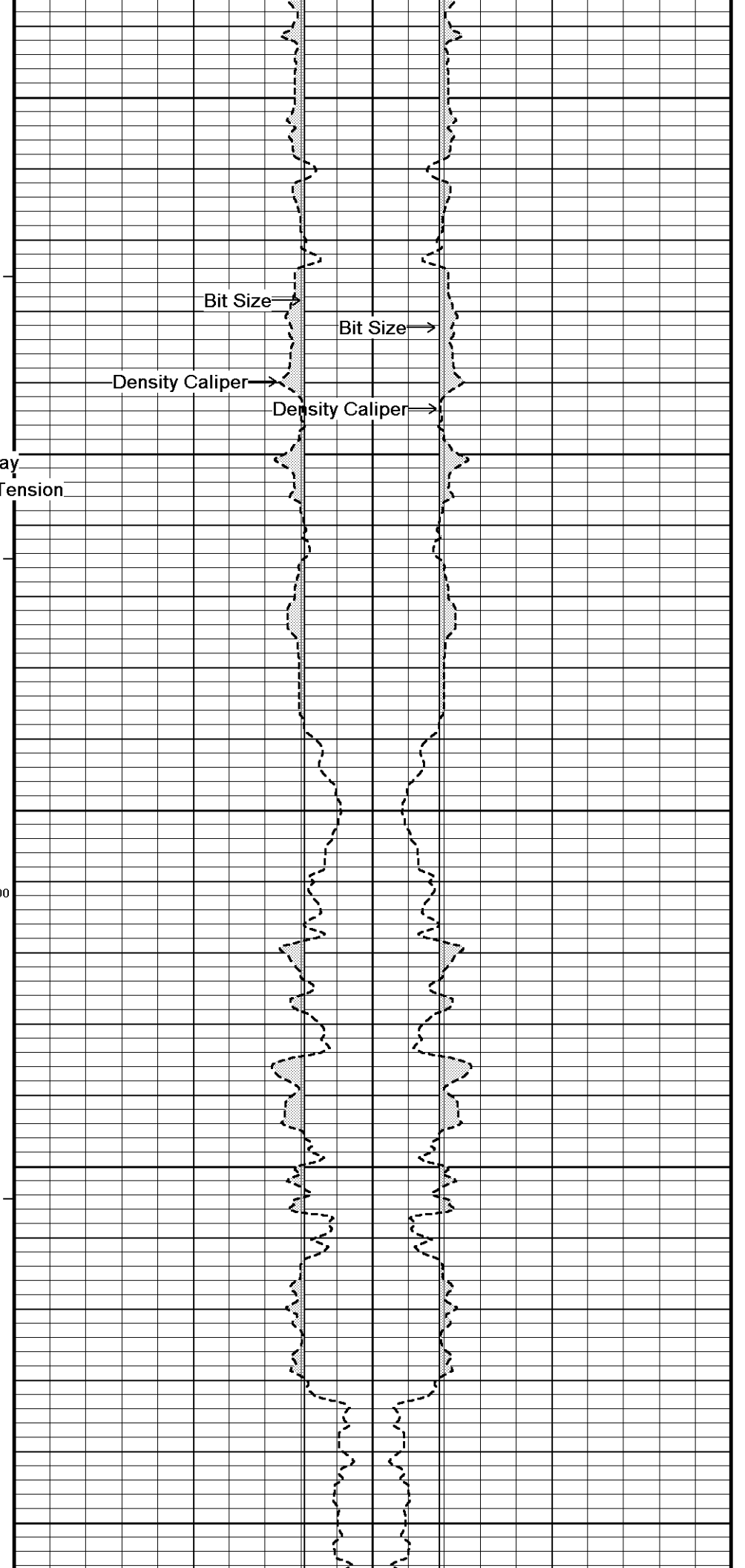
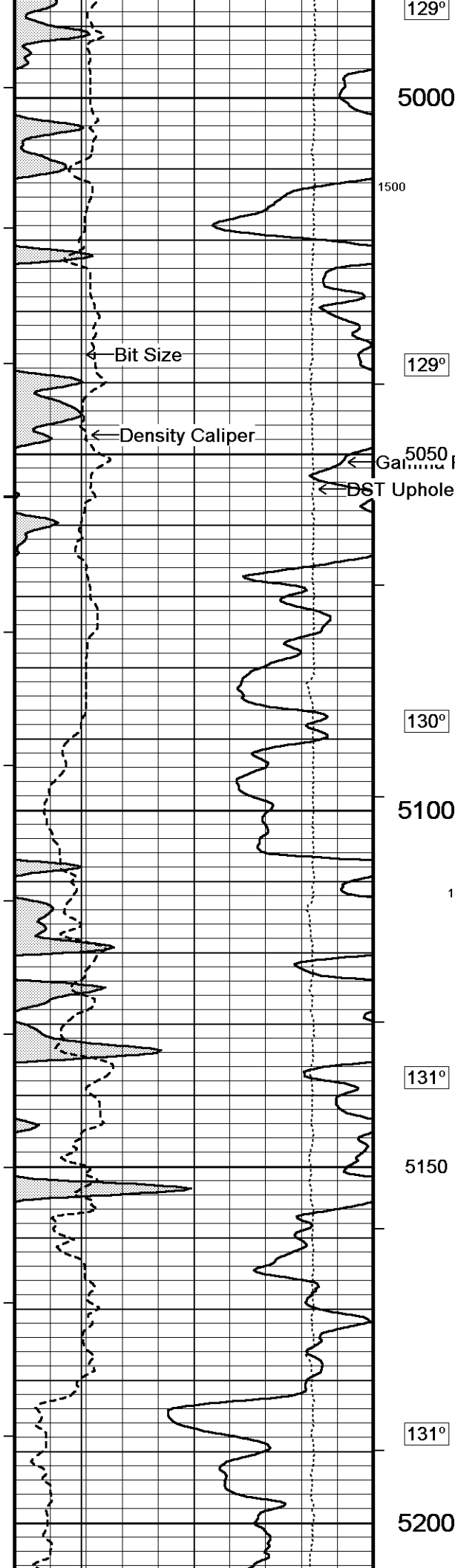
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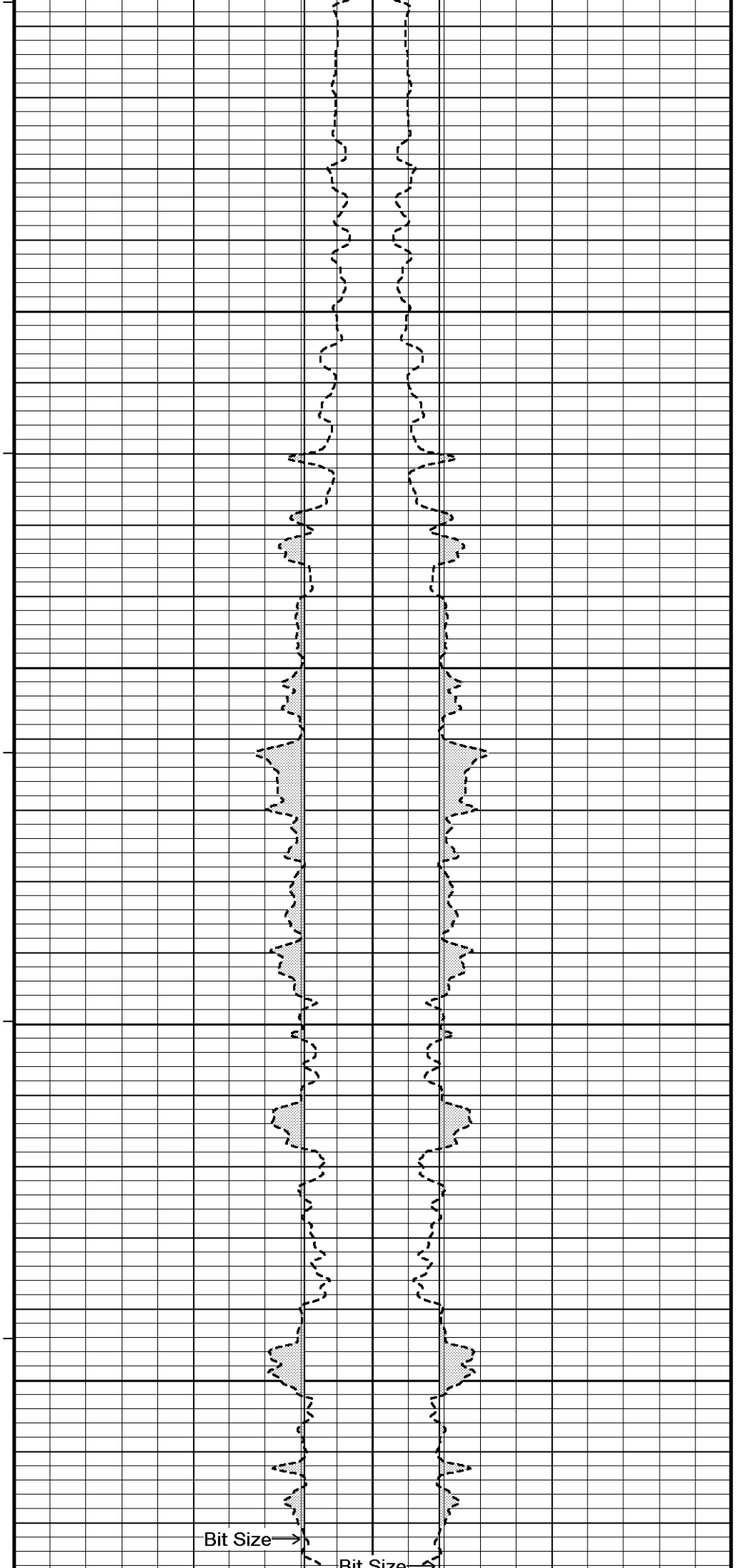
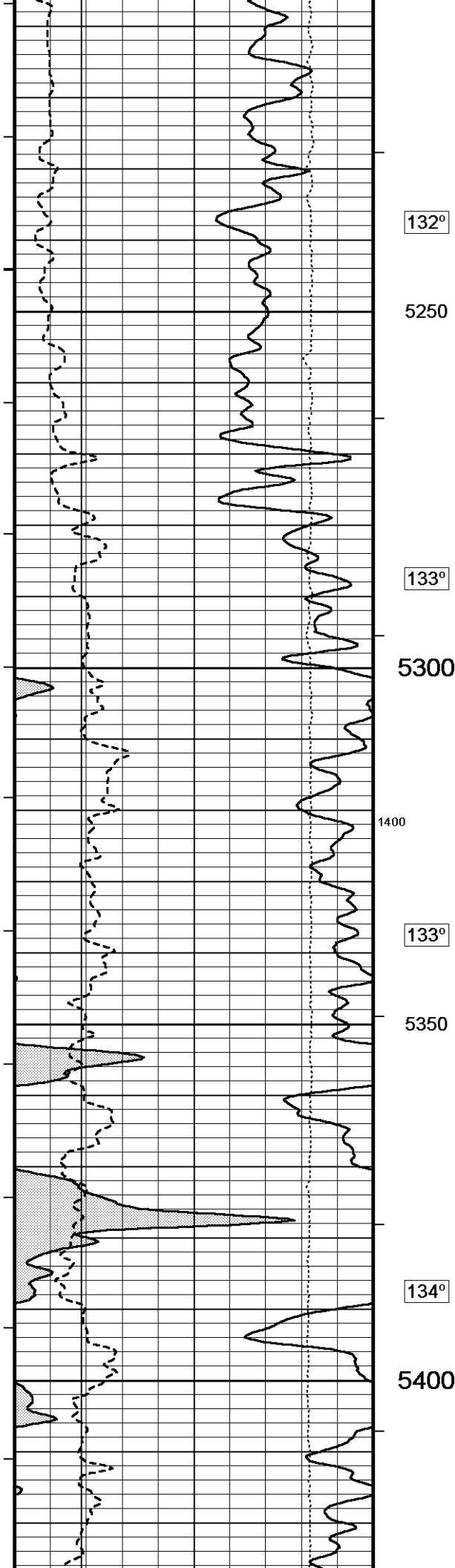
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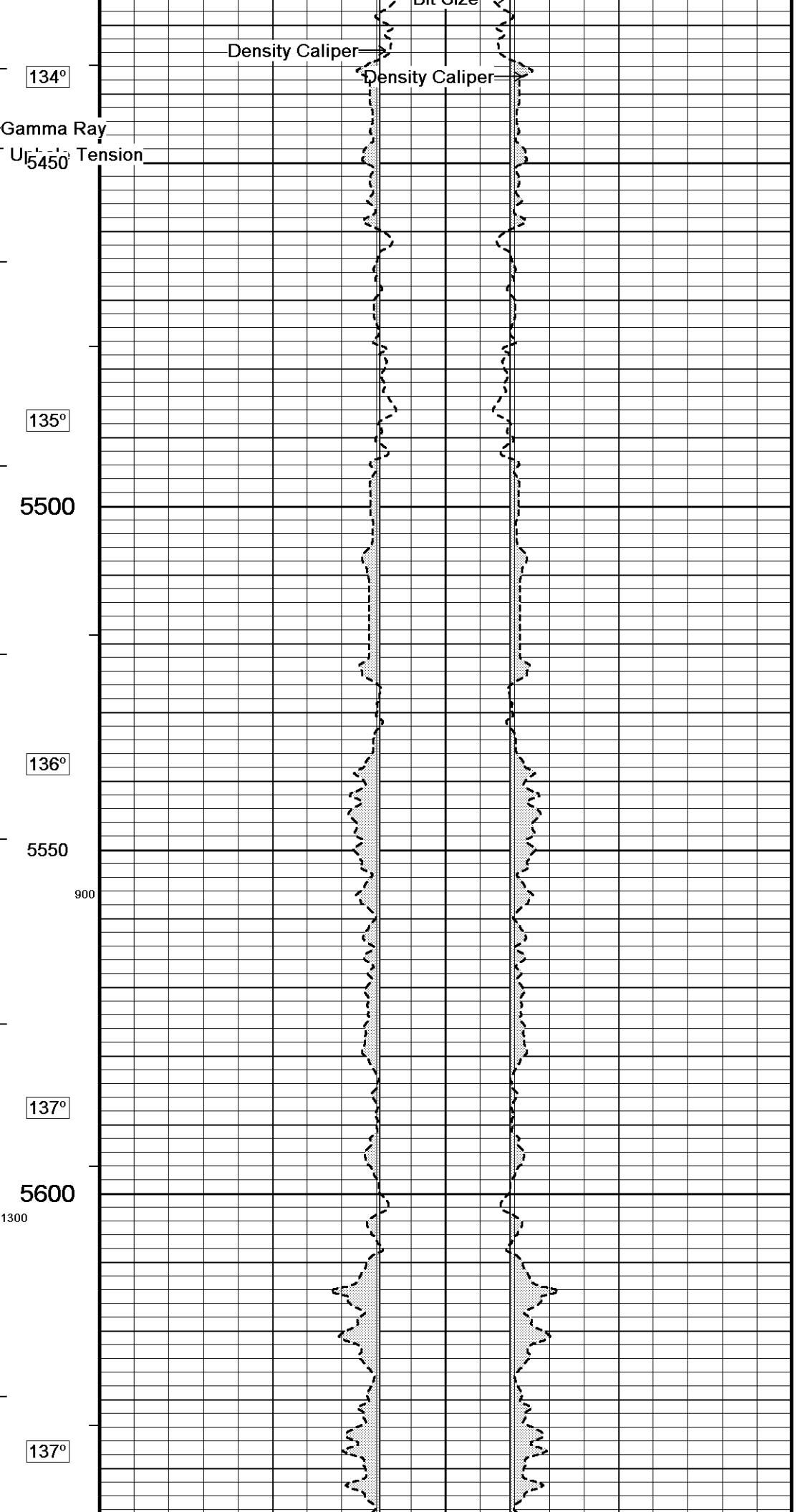
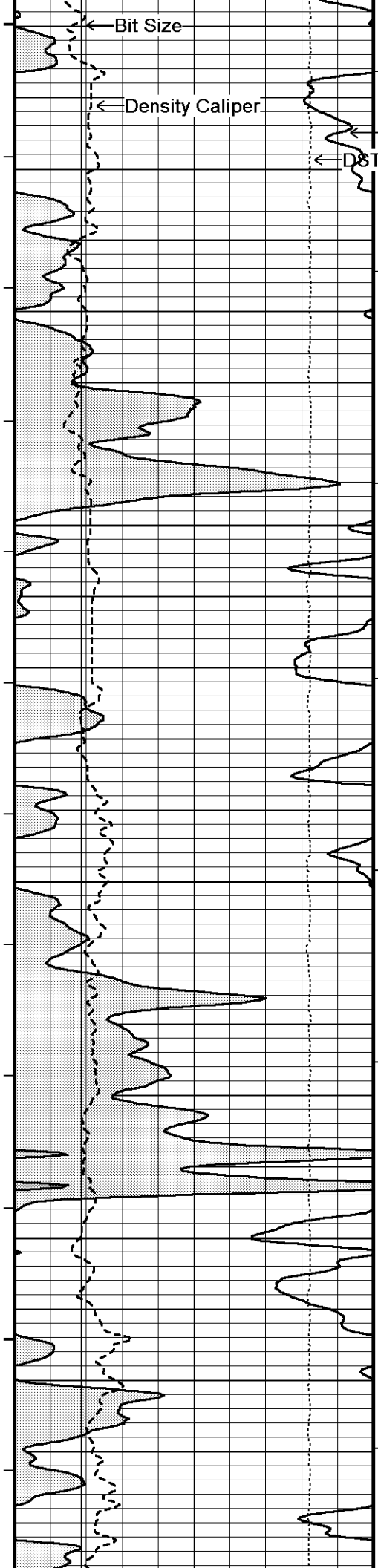
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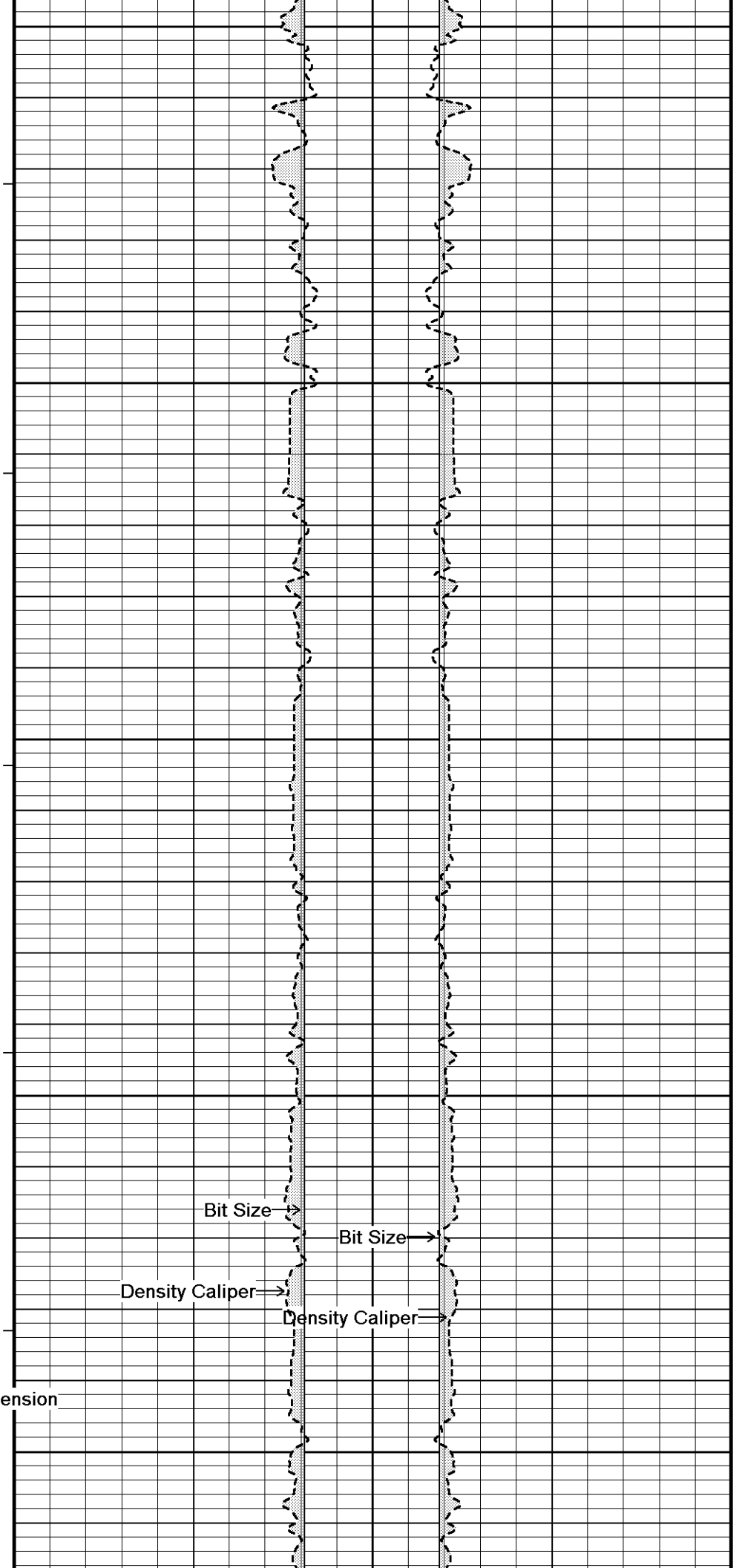
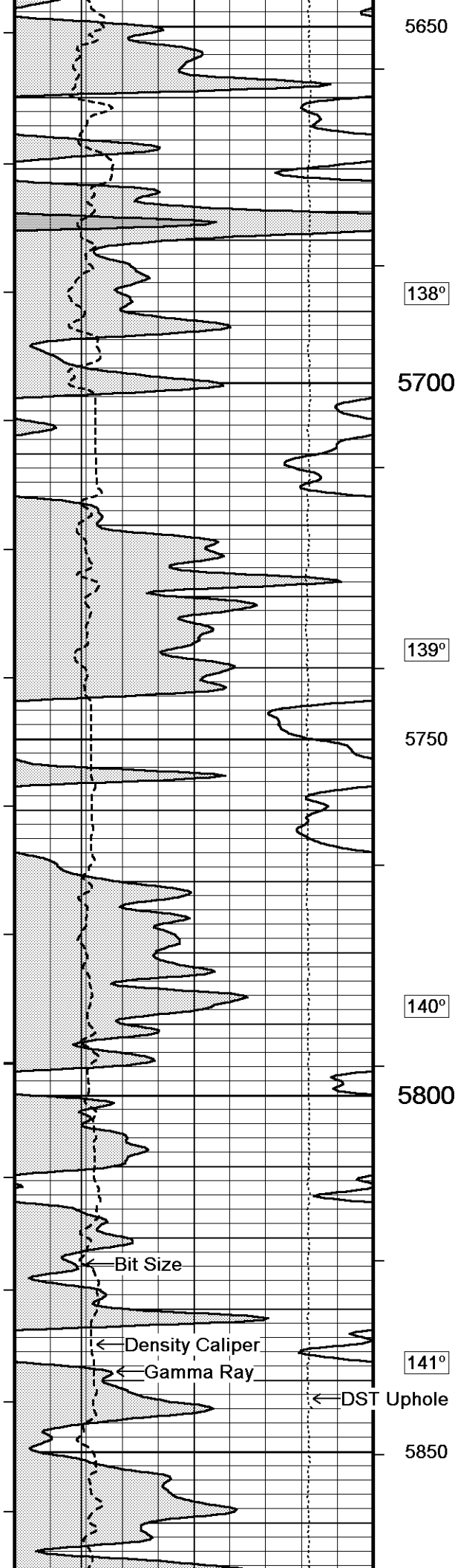
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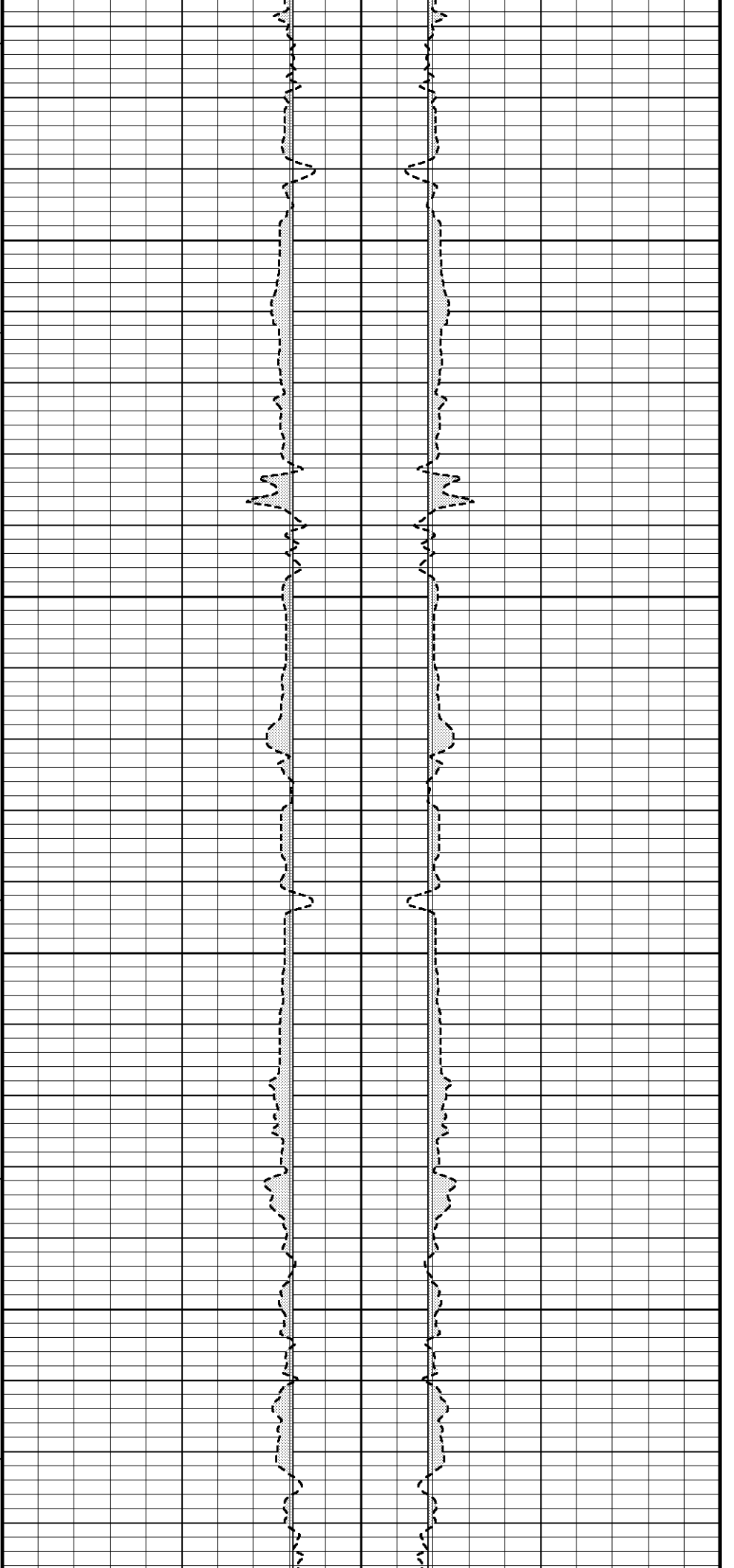
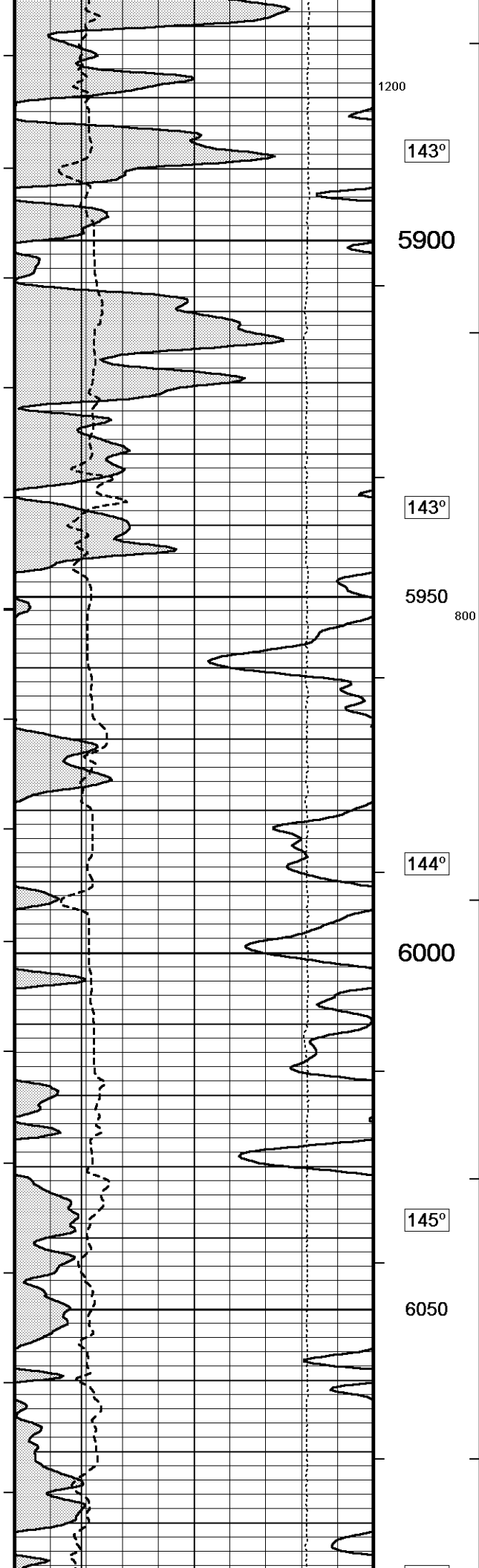


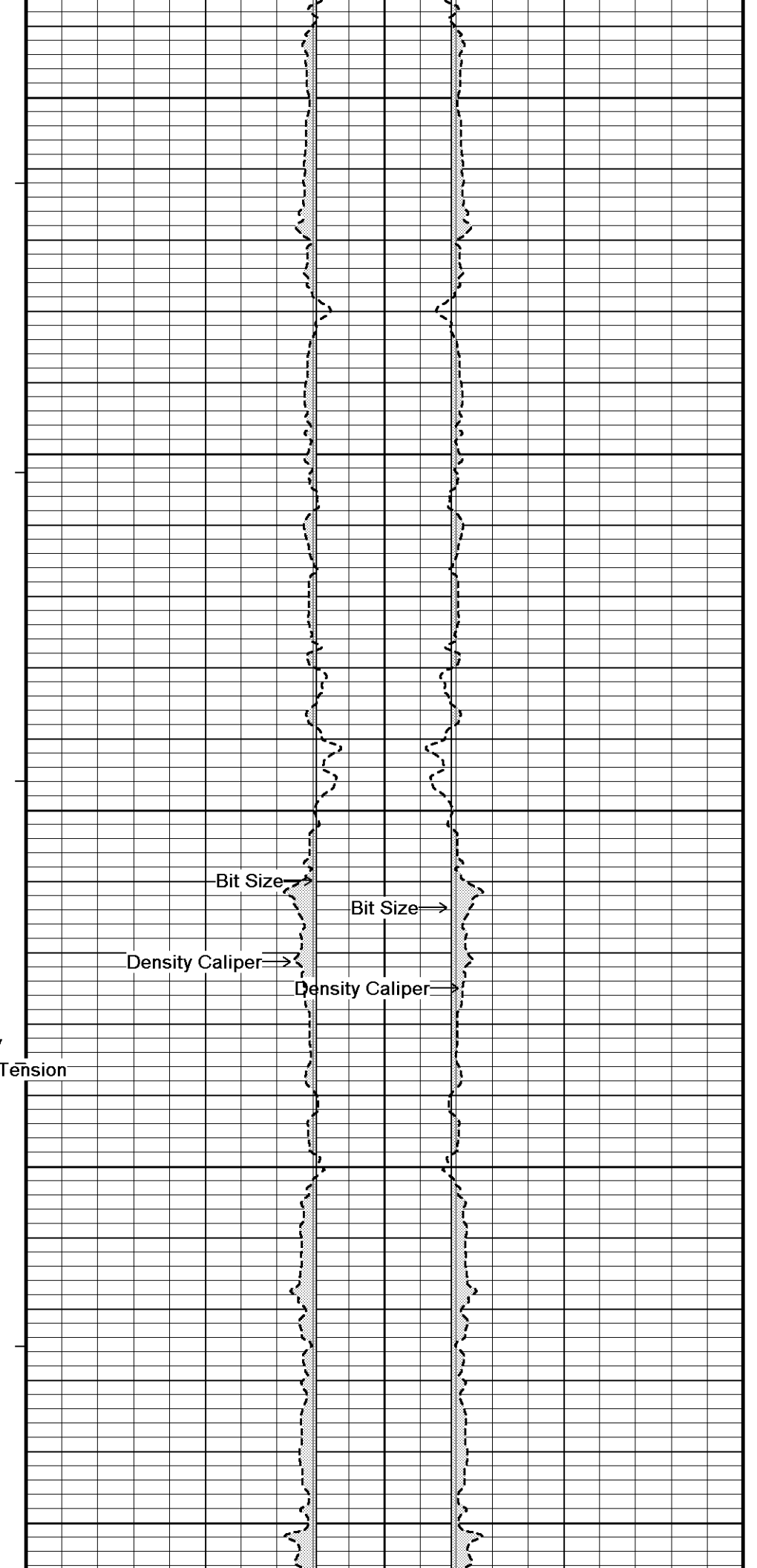
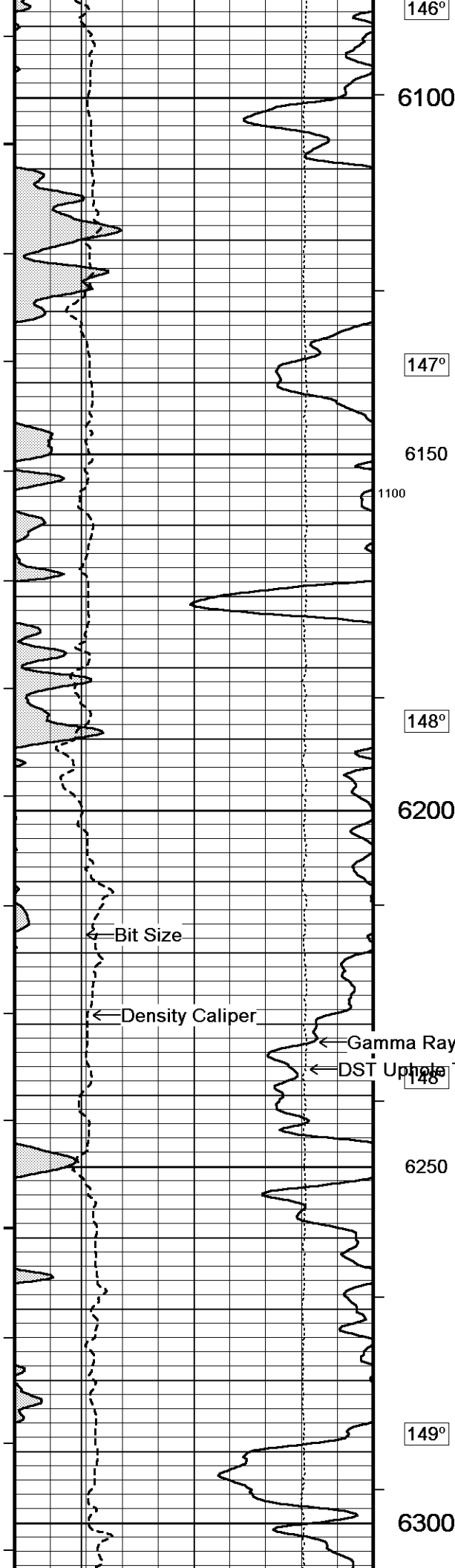


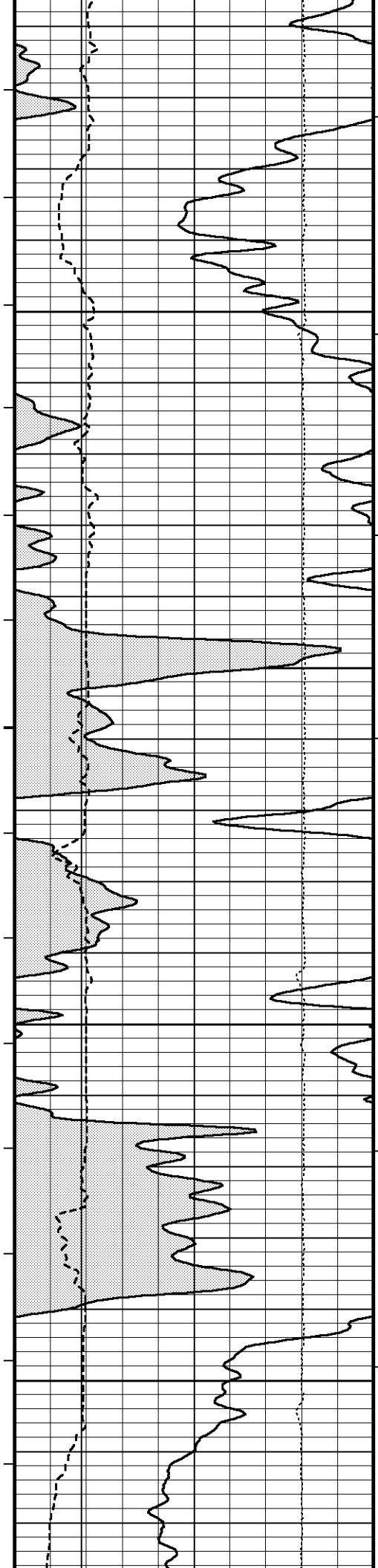












150°

6350

700

150°

6400

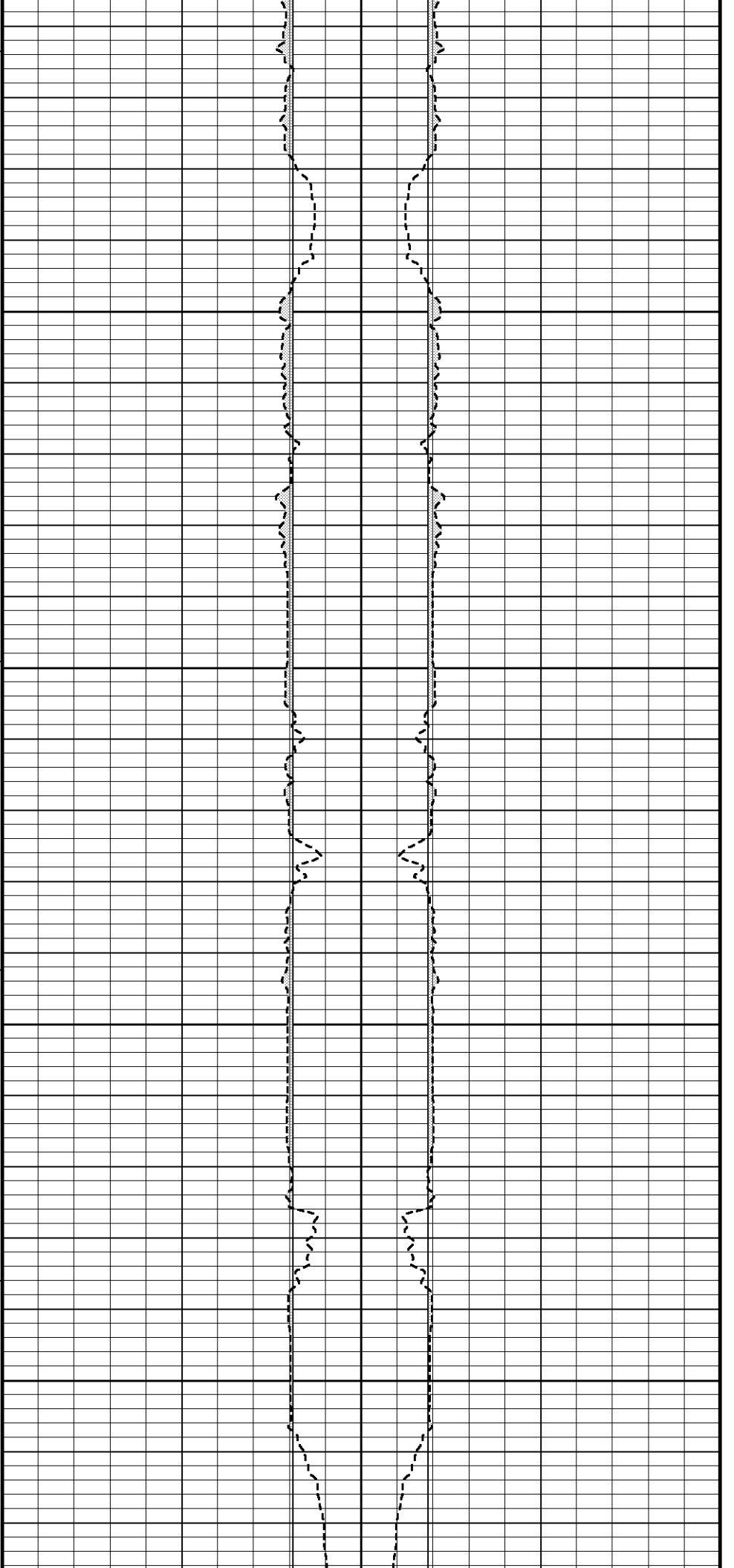
151°

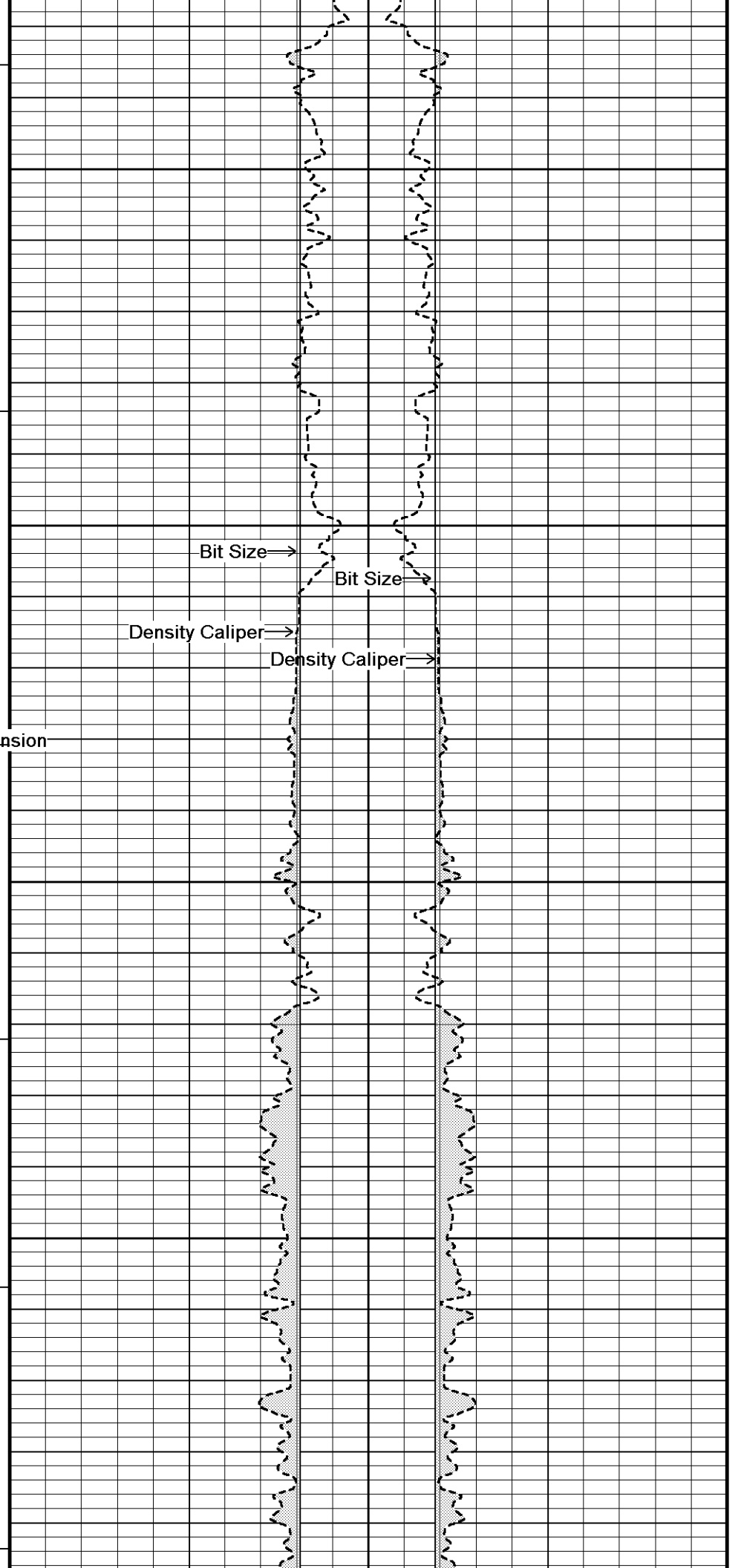
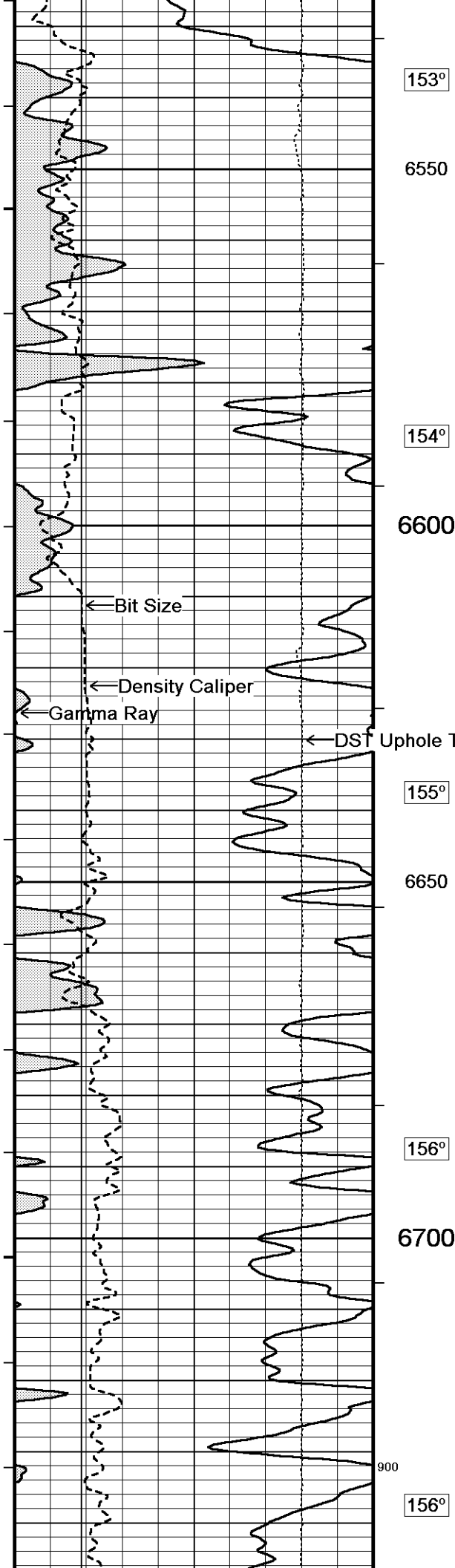
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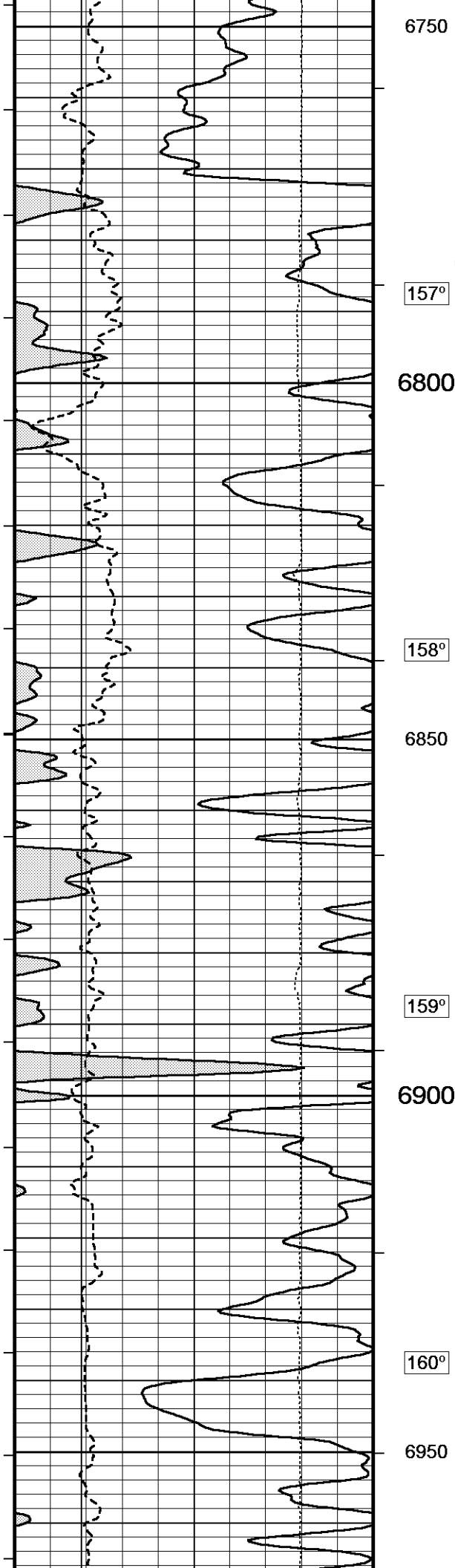
6450

152°

6500







6750

157°

6800

158°

6850

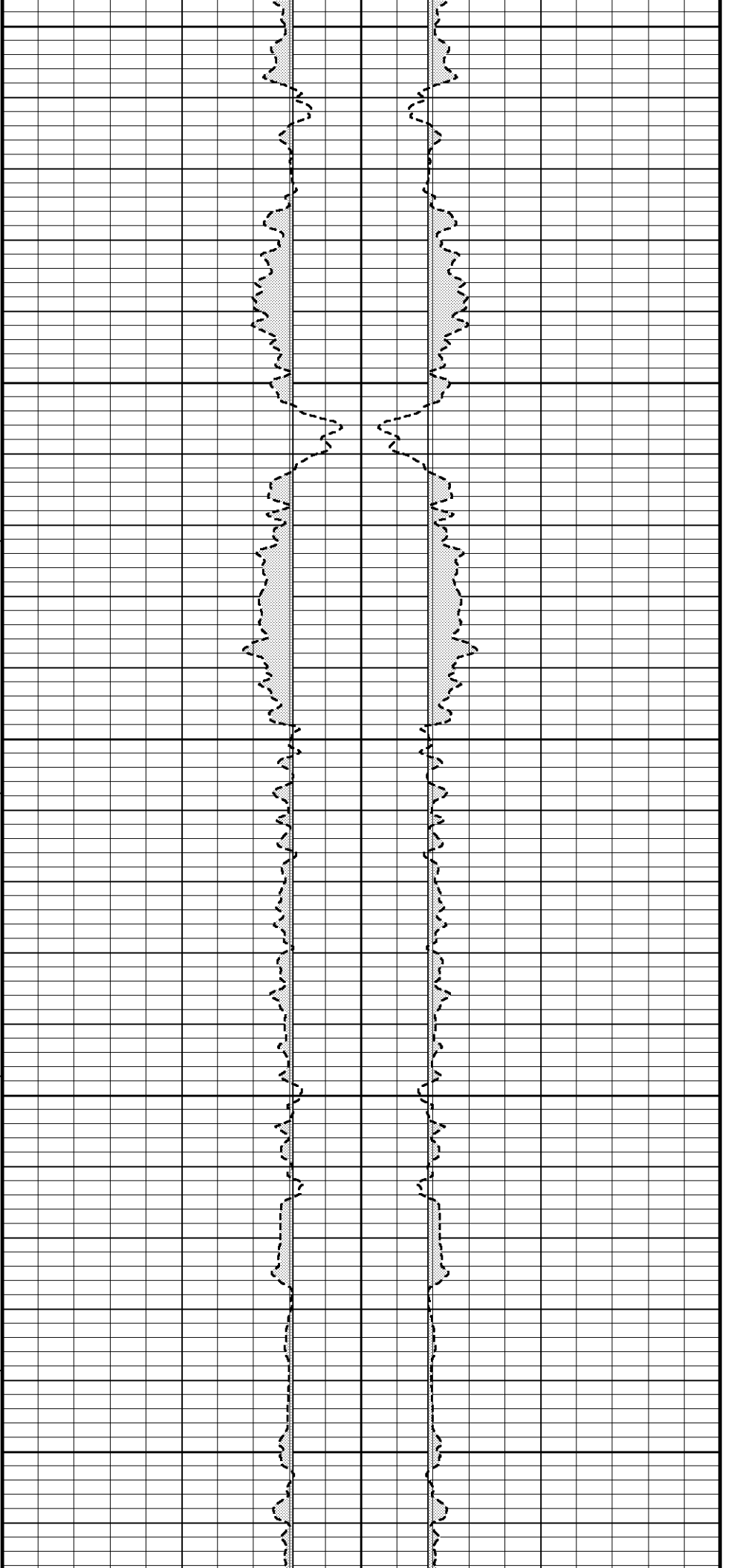
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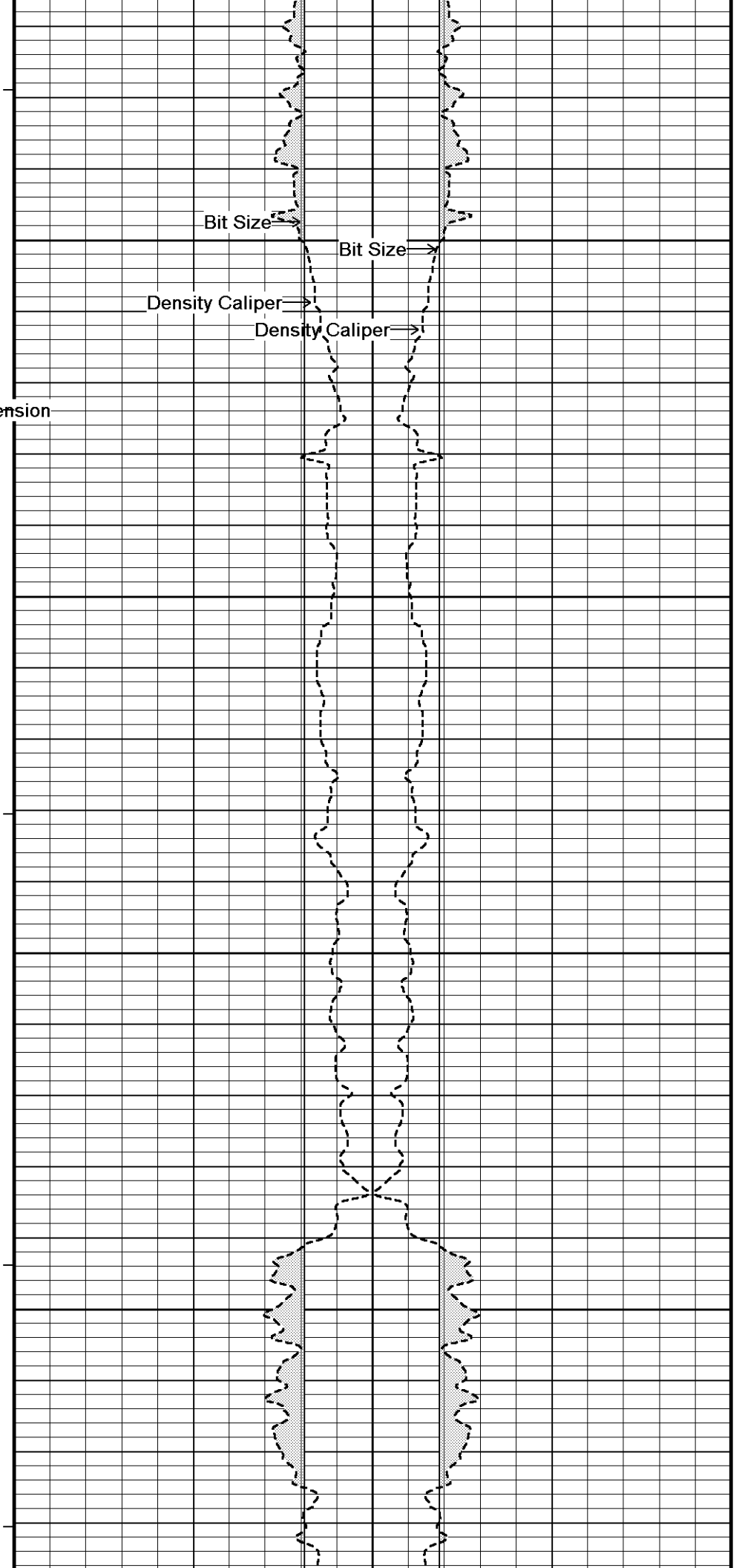
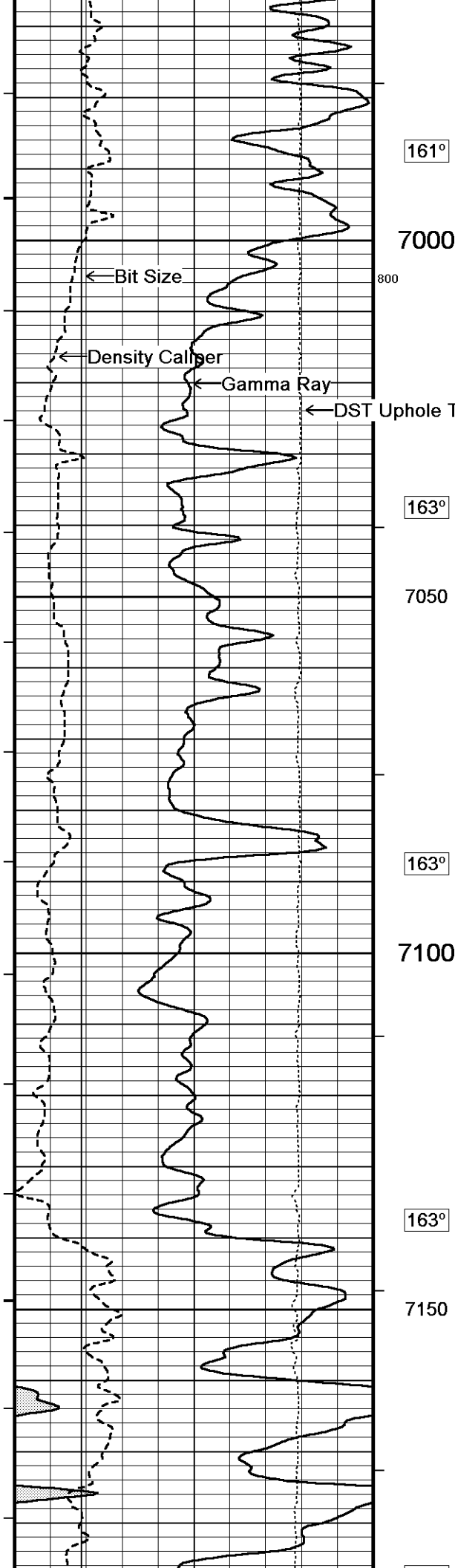
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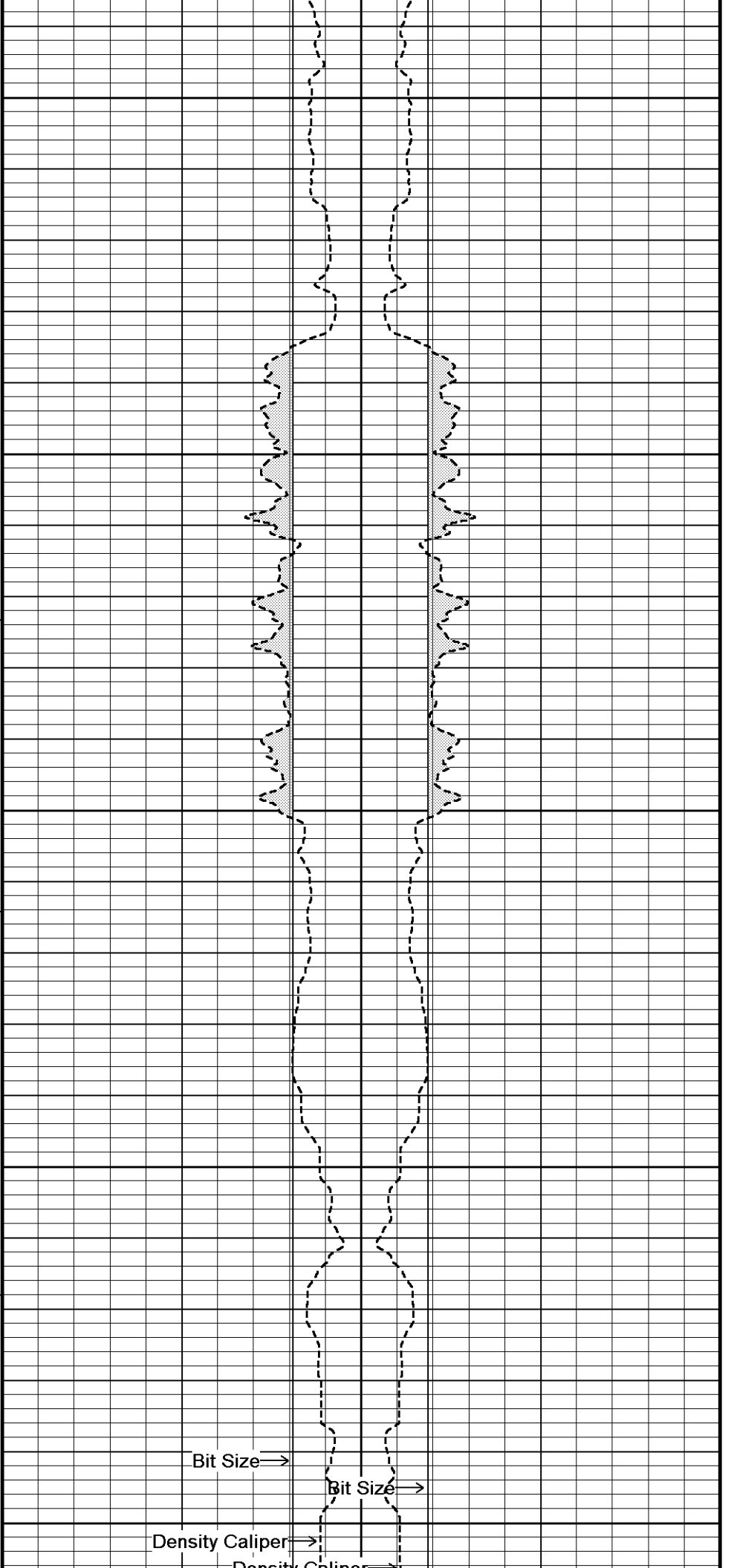
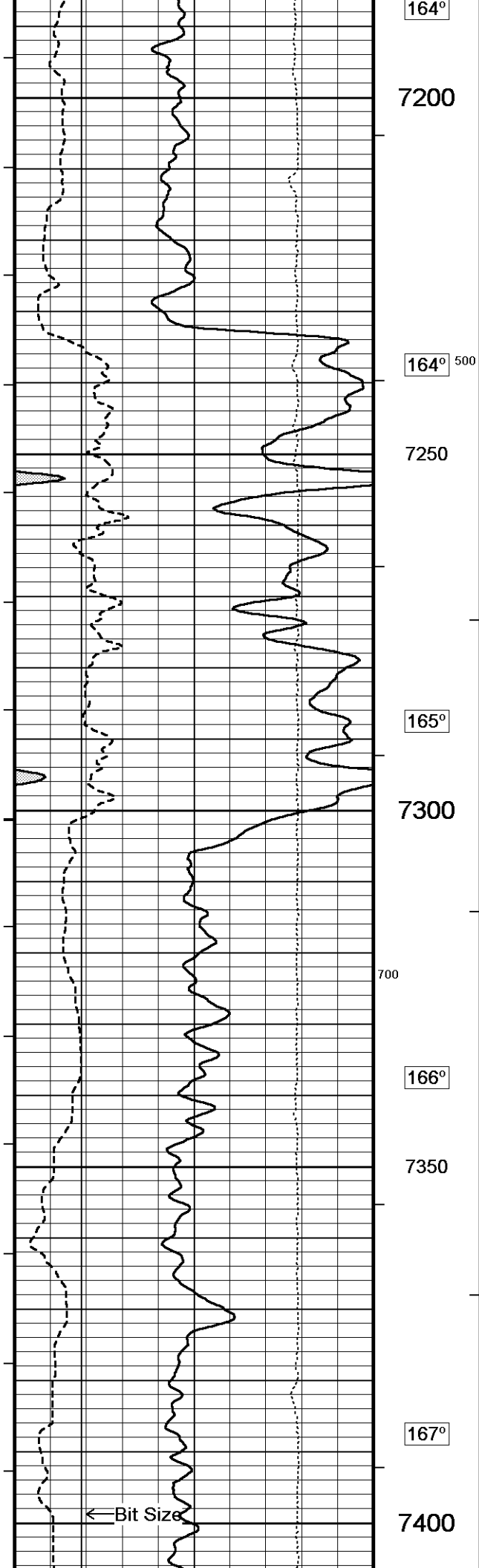
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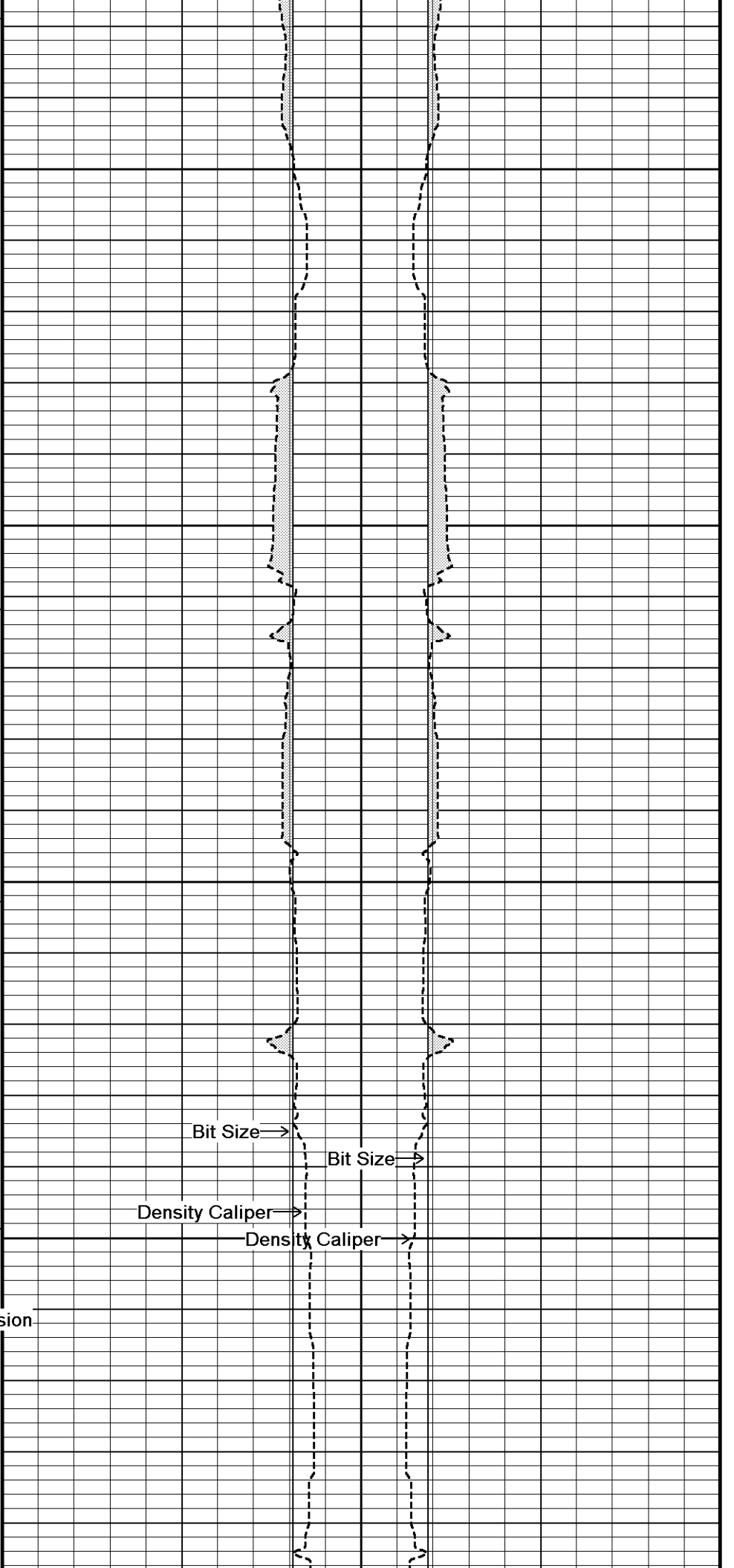
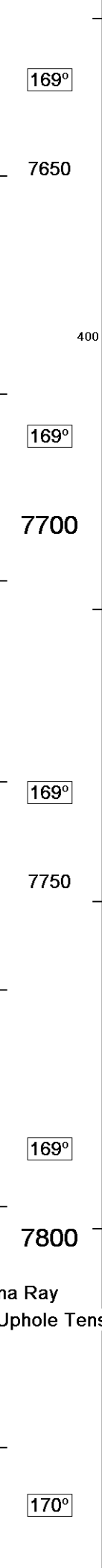
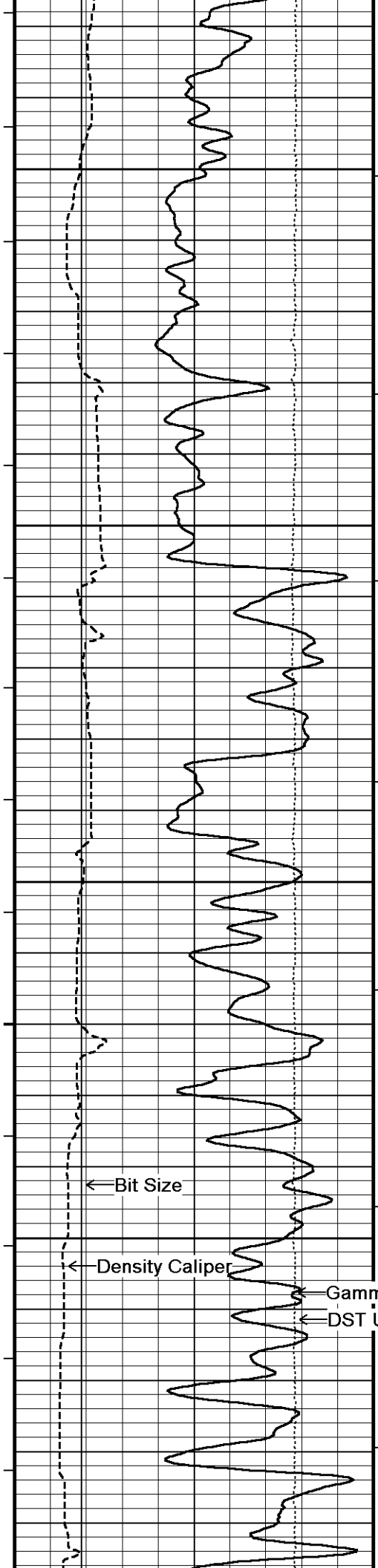
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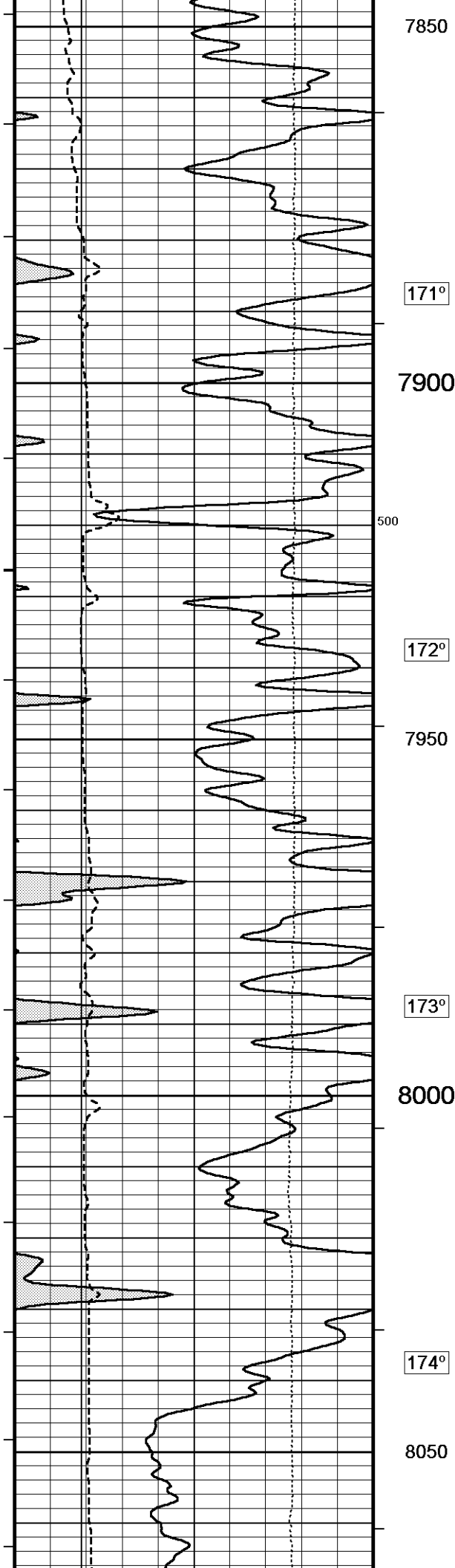
600











7850

171°

7900

500

172°

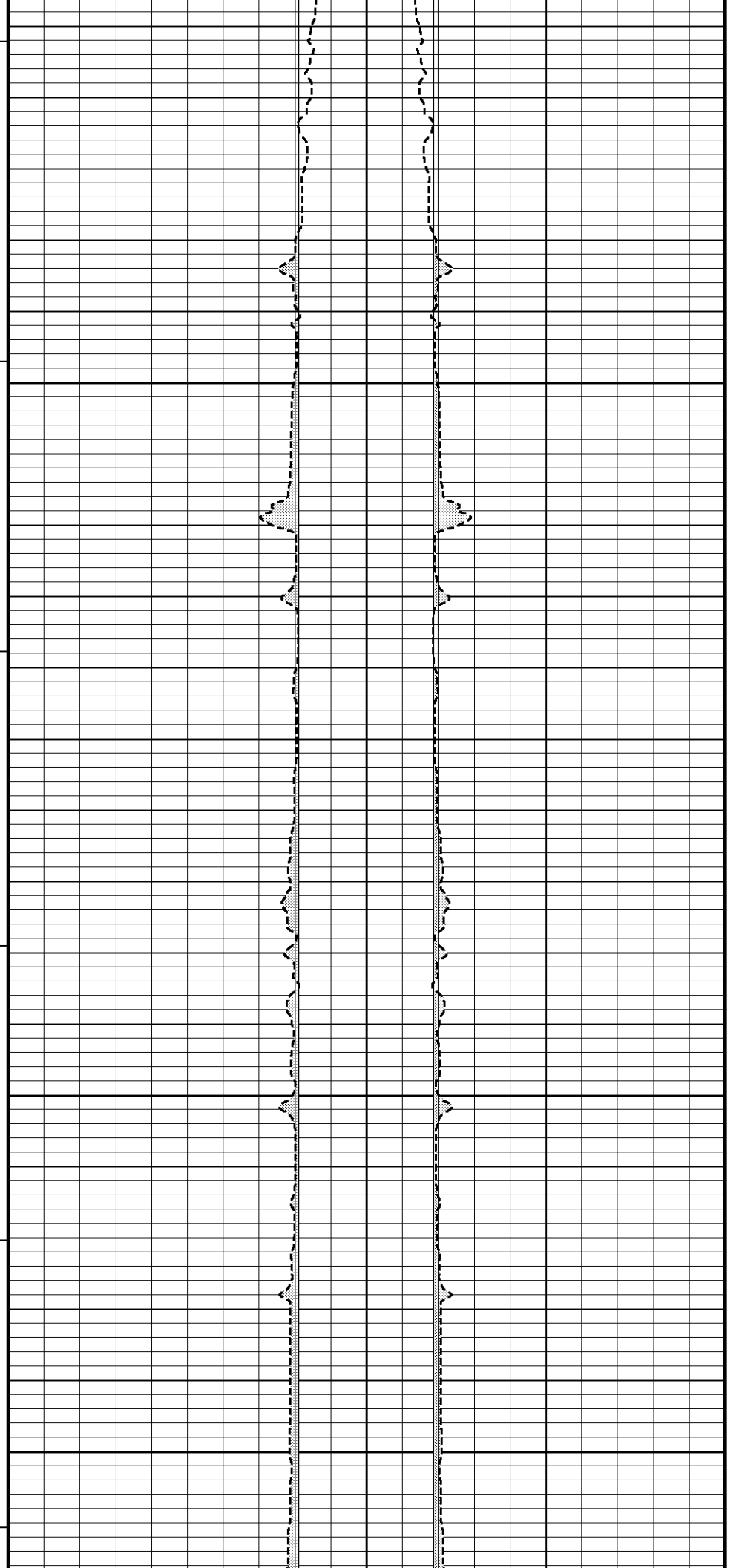
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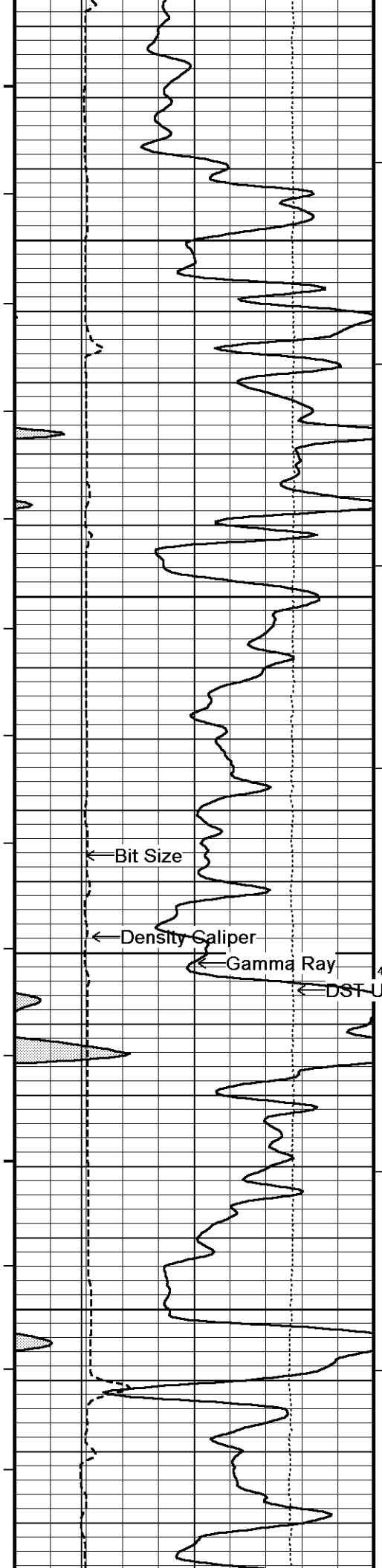
173°

8000

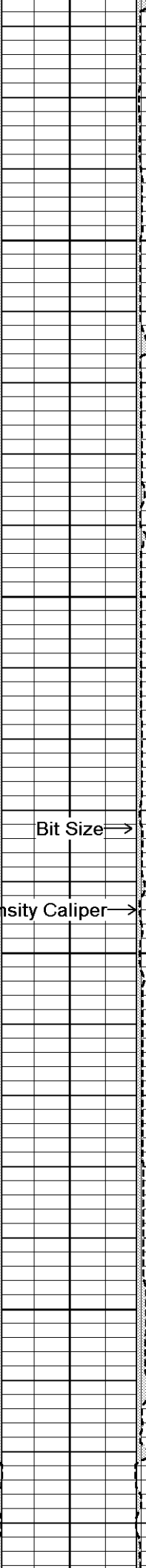
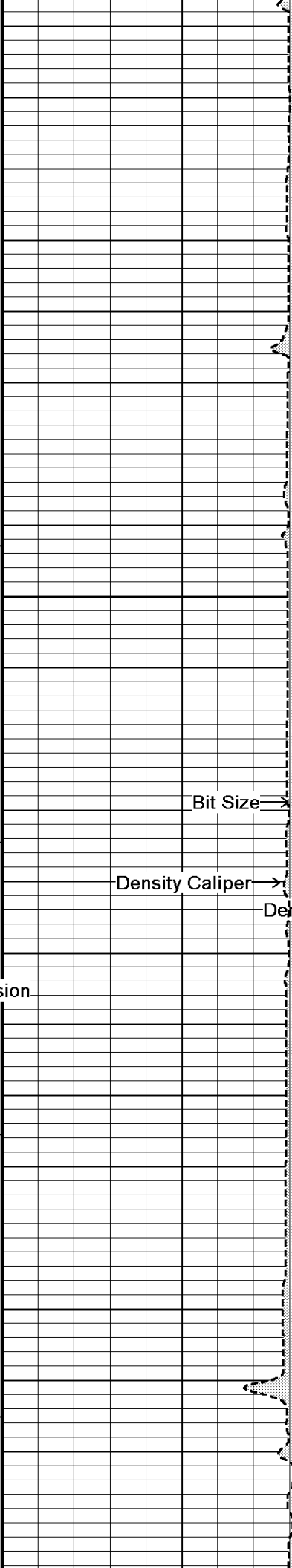
174°

8050





174°
8100₃₀₀
175°
8150
176°
8200₄₀₀
176°
8250



← Bit Size

← Density Caliper

← Gamma Ray

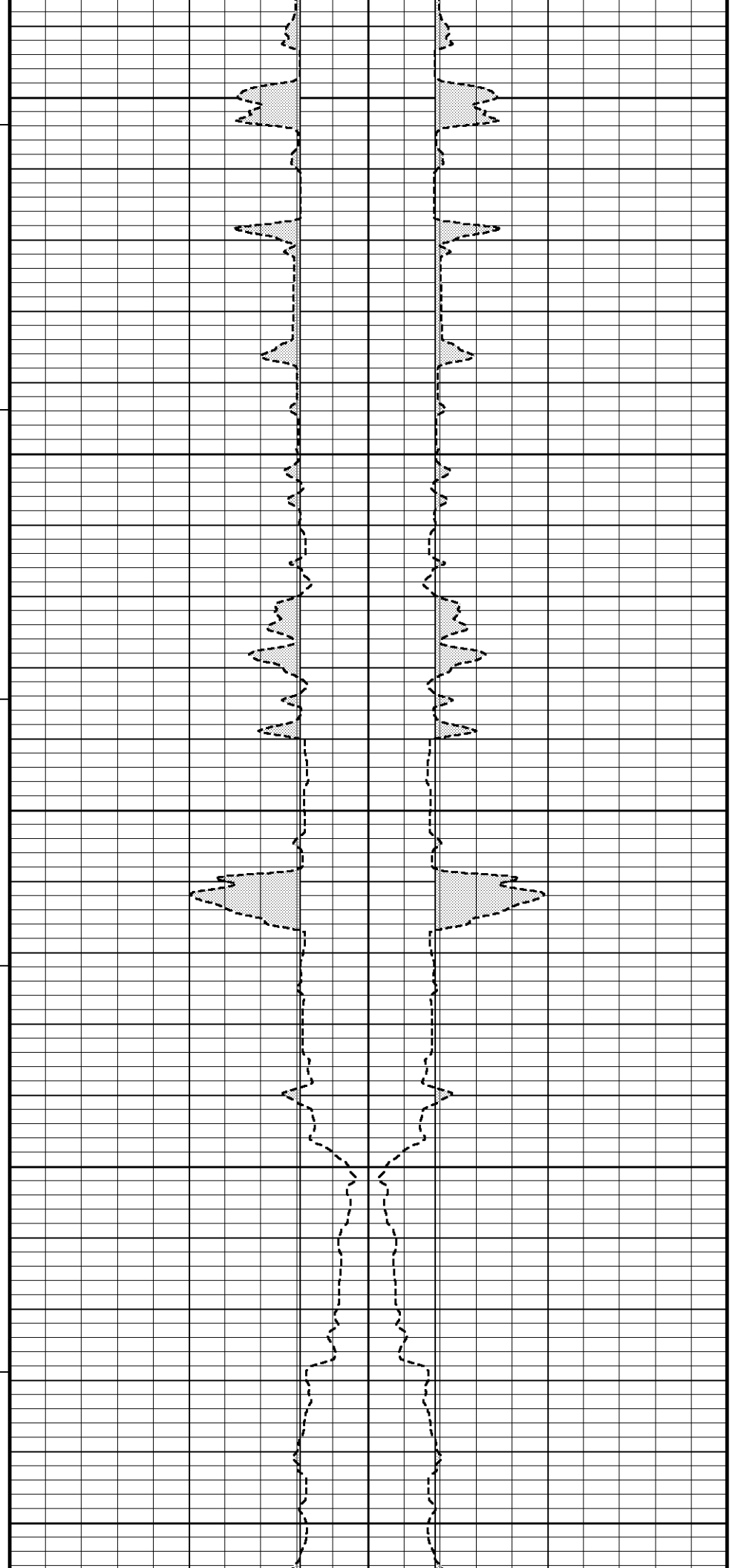
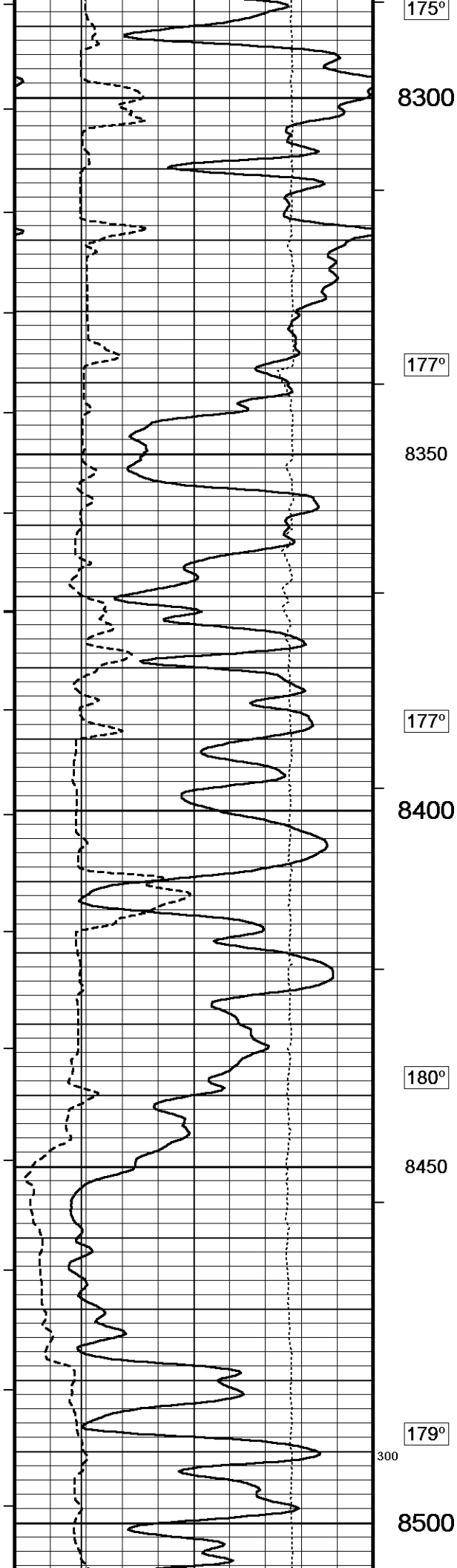
← DST Uphole Tension

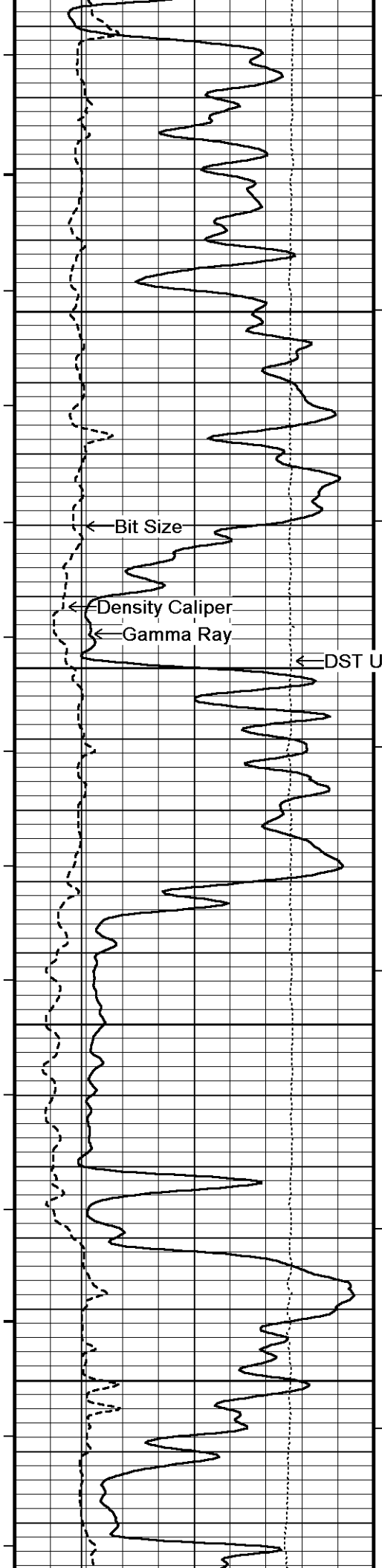
Bit Size →

Density Caliper →

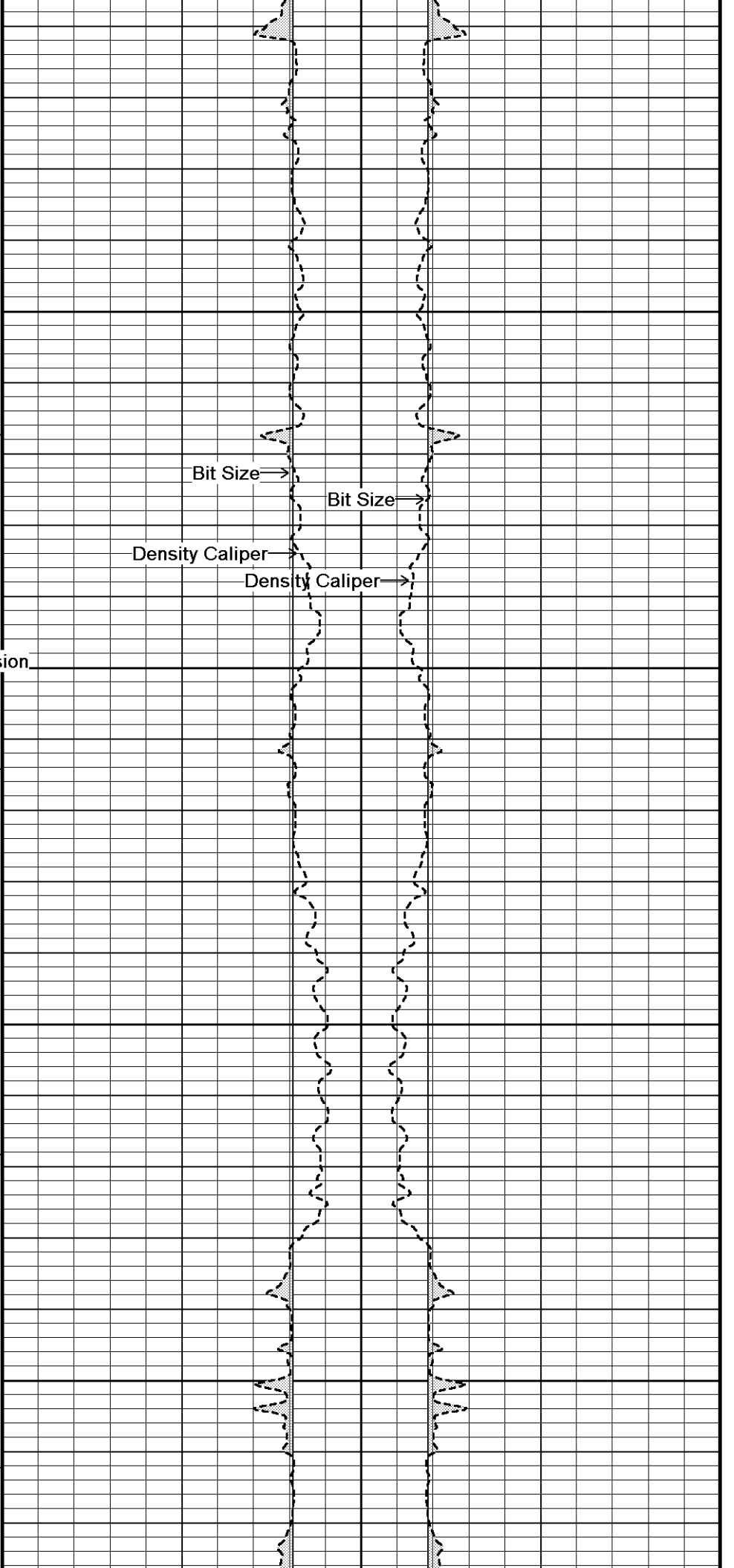
Bit Size →

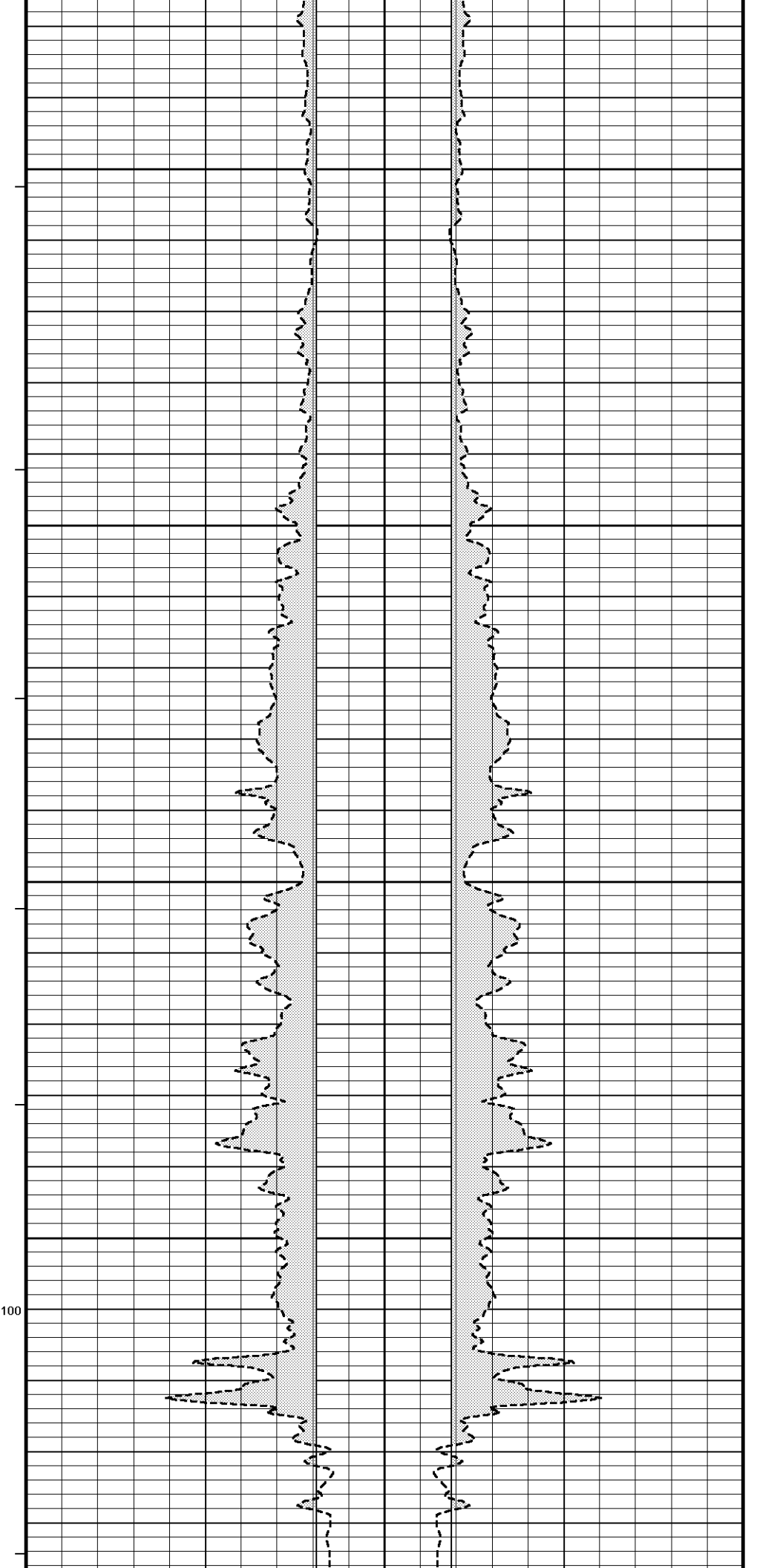
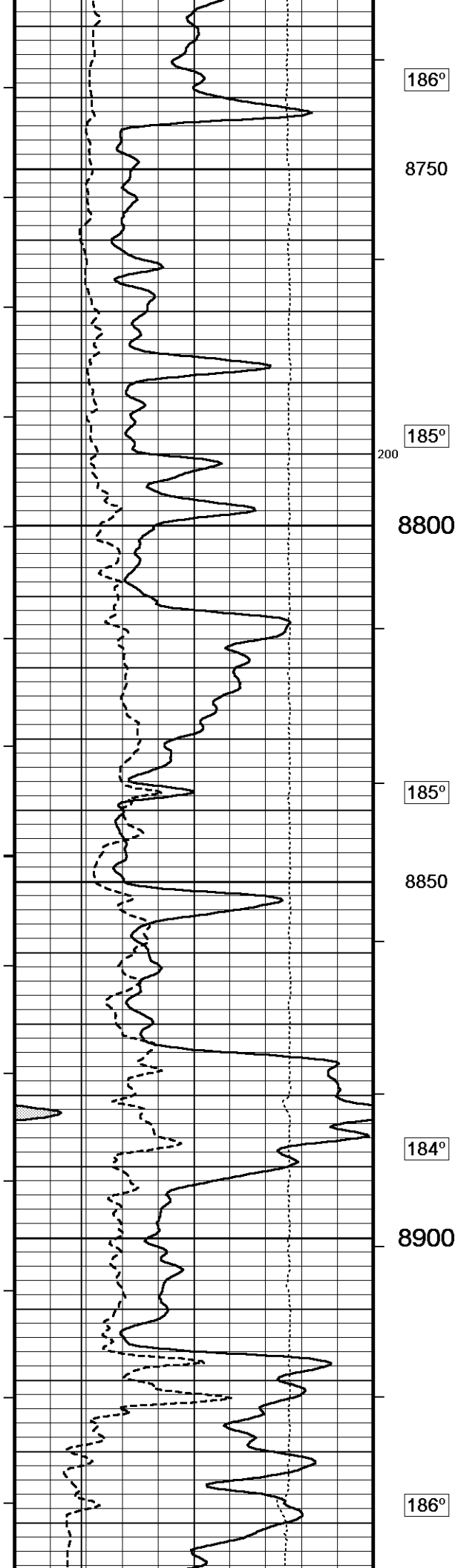
Density Caliper →

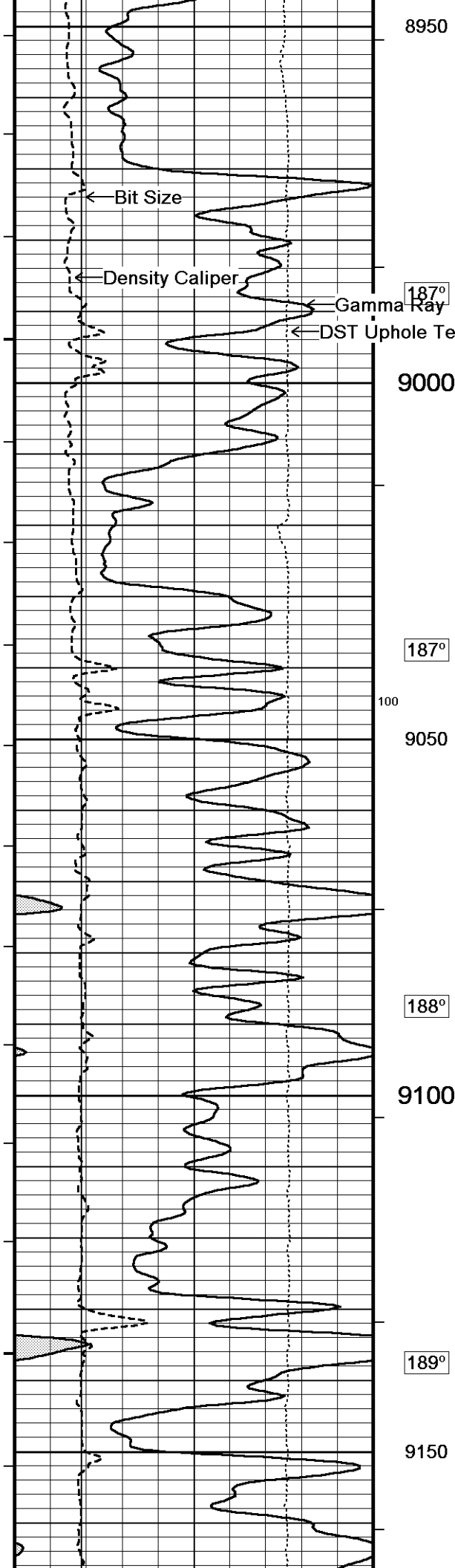




200
181°
8550
183°
8600
184°
8650
184°
8700







8950

Bit Size

Density Caliper

Gamma Ray

DST Uphole Tension

9000

187°

100

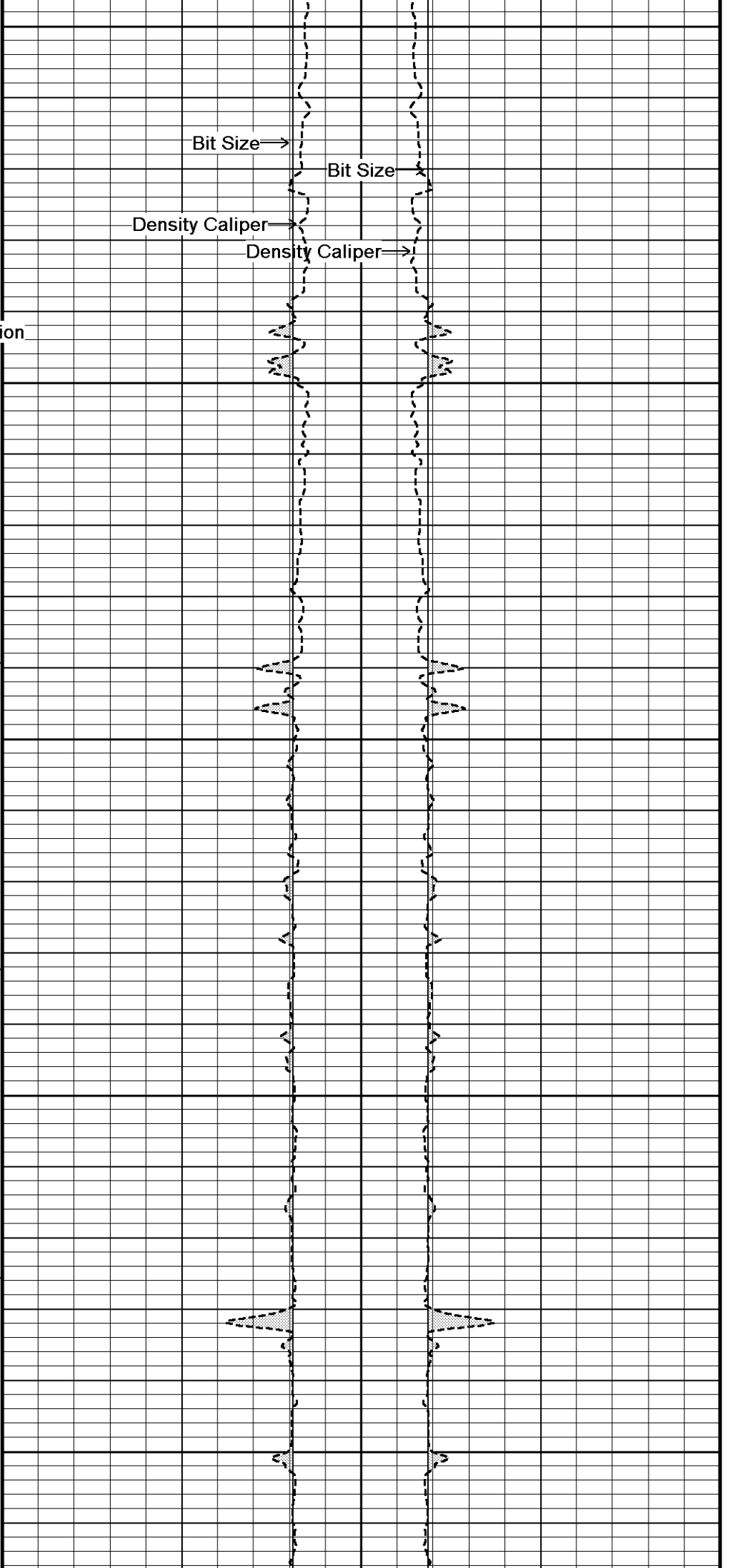
9050

188°

9100

189°

9150

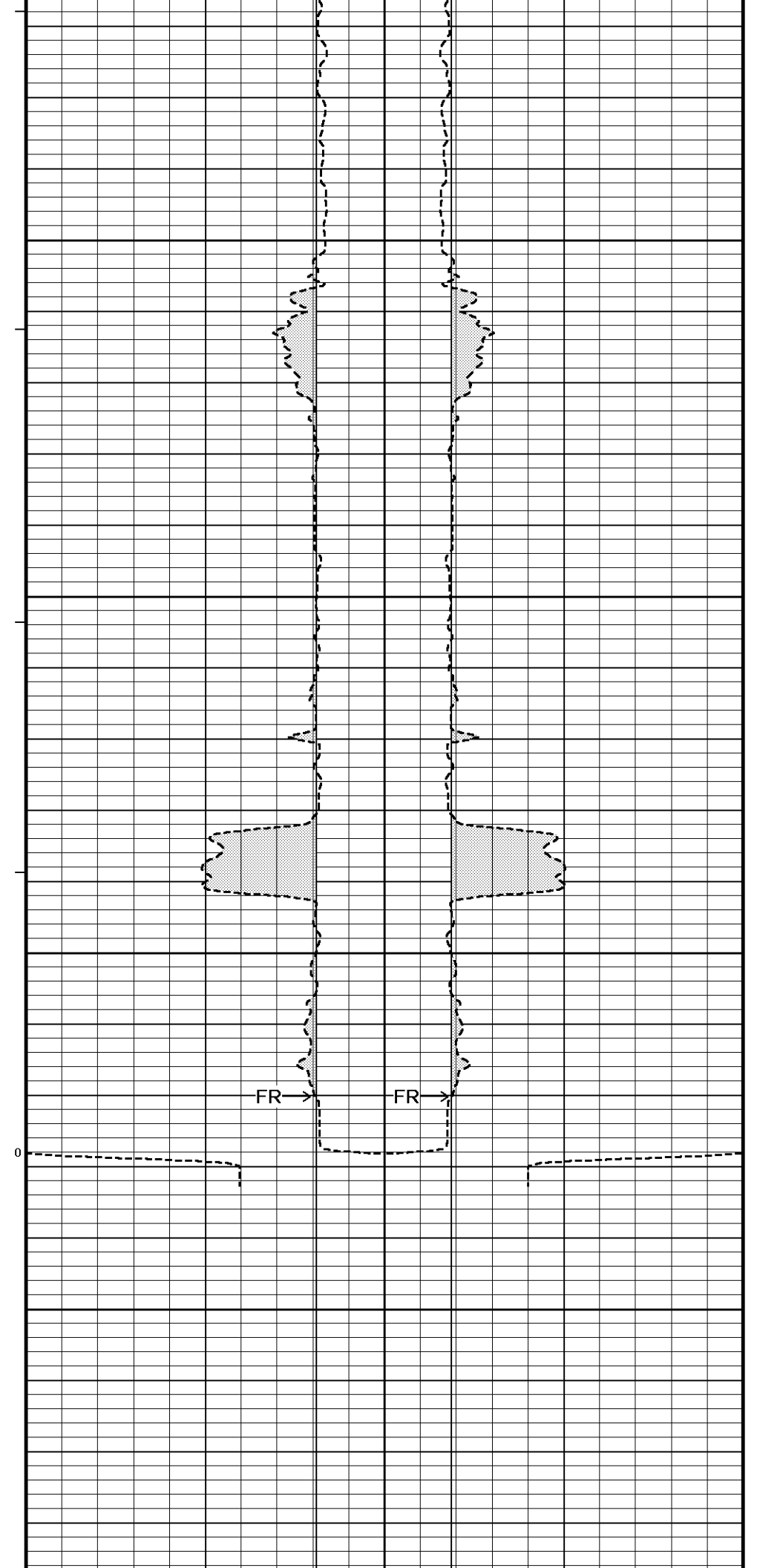
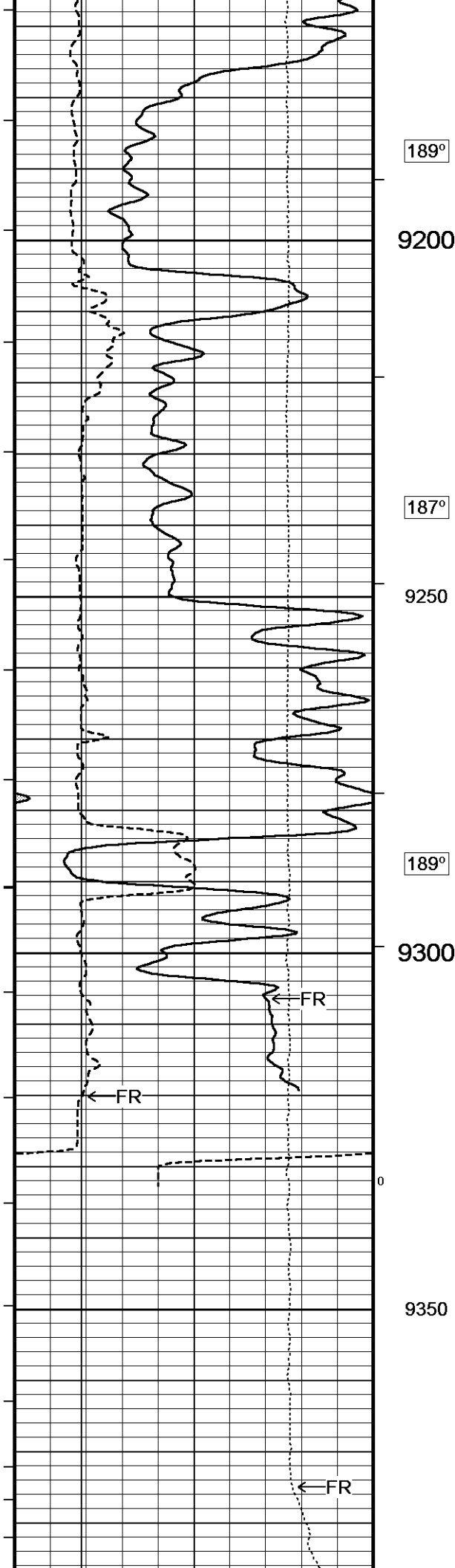


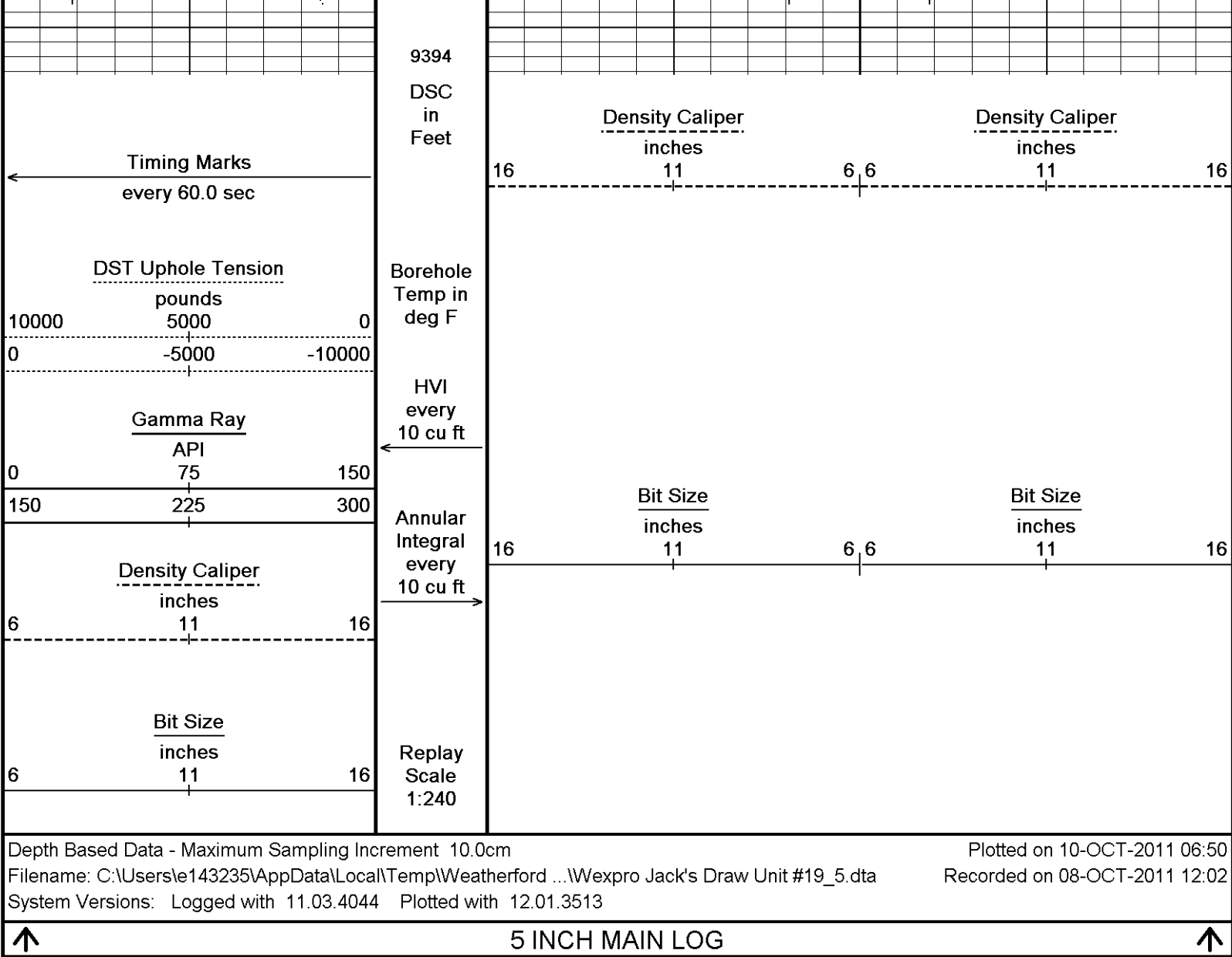
Bit Size

Bit Size

Density Caliper

Density Caliper





BEFORE SURVEY CALIBRATION		
C:\Users\le143235\AppData\Local\Temp\Weatherford PreView\0\Wexpro Jack's Draw Unit #19_4.dta		
General Constants All 000		Last Edited on 08-OCT-2011 11:18
General Parameters		
Mud Resistivity	7.630	ohm-metres
Mud Resistivity Temperature	54.000	degrees F
Water Level	0.000	feet
Density/Neutron Processing	Wet Hole	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	4.500	inches
Caliper for Differential Caliper	None	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. One Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	
Down-hole Tension Calibration SMS 0		
Reading No	Measured	Calibrated (lbs)
1	14215.00	8.22
		Field Calibration on 08-OCT-2011 10:28

1	14215.89	0.00
2	15592.64	432.00
SP Calibration MCG-D.J 424		
	Measured	Calibrated (mV)
Reference 1	100.5	100.0
Reference 2	-99.7	-100.0
Field Calibration on 07-OCT-2011 12:01		
Gamma Calibration MCG-D.J 424		
	Measured	Calibrated (API)
Background	76	52
Calibrator (Gross)	768	532
Calibrator (Net)	692	480
Field Calibration on 07-OCT-2011 12:00		
Gamma Constants MCG-D.J 424		
Last Edited on 07-OCT-2011 11:54		
Gamma Calibrator Number	GRCC-112	
Mud Density	1.00	gm/cc
Caliper Source for Processing	Bit Size	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm
High Resolution Temperature Calibration MCG-D.J 424		
	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00
Field Calibration on 28-SEP-2011 08:58		
High Resolution Temperature Constants MCG-D.J 424		
Last Edited on		
Pre-filter Length	11	
Micro Normal and Micro Inverse Calibration MDN-B.A 191		
Base Calibration on 03-MAY-2007 20:21		
Field Check on		
Base Calibration		
	Measured	Calibrated (ohm-m)
Channel	Resistor 1 Resistor 2	Resistor 1 Resistor 2
Micro Normal	8.2 41.0	10.0 50.0
Micro Inverse	8.2 41.2	10.0 50.0
Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	0.0	0.0
Micro Inverse	0.0	0.0
Micro Normal and Micro Inverse Constants MDN-B.A 191		
Last Edited on 13-FEB-2007 11:14		
Pad Type	0	
Micro Normal K Factor	1.0000	
Micro Inverse K Factor	1.0000	
Standoff Offset	N/A	inches
Neutron Calibration MDN-B.A 191		
Base Calibration on 07-SEP-2011 11:49		
Field Check on 07-OCT-2011 11:42		
Base Calibration		
	Measured	Calibrated (cps)
	Near Far	Near Far
	2846 88	3714 110
Ratio	32.378	33.764
Field Calibrator at Base		
	Calibrated (cps)	
	1678 2451	
Ratio	0.685	
Field Check		
	Calibrated (cps)	
	1653 2458	
Ratio	0.673	
Neutron Constants MDN-B.A 191		
Last Edited on 08-OCT-2011 10:12		
Neutron Source Id	P44382B	
Neutron Jig Number	6531NK	
Epithermal Neutron	No	
Caliper Source for Processing	Density Caliper	

Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches
Mud Density	1.00	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	7.00	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	None	
Formation Pressure	N/A	kpsi
Temperature Source	None	
Temperature	N/A	degrees F
Mud Salinity	0.00	kppm
Formation Fluid Salinity Source	None	
Formation Fluid Salinity	N/A	kppm
Barite Mud Correction	Not Applied	

Magnetometer Parameters MIE-A.A 102				
Date Of Last Magnetometer Calibration		28-SEP-2011,08:24		
	X Magnetometer	Y Magnetometer	Z Magnetometer	
Slope	-1.000000	-1.004500	-0.999600	
Offset	0.015350	-0.015800	0.020450	

Magnetometer Constants MIE-A.A 102				Last Edited on
Magnetometer Calibrator Number		000		

Accelerometer Parameters MIE-A.A 102				
Date Of Last Accelerometer Calibration		24-AUG-2011,18:36		
	X Accelerometer	Y Accelerometer	Z Accelerometer	
Slope	-1.112160	-1.118700	-1.117220	
Offset	0.004104	0.007024	0.002394	

Accelerometer Constants MIE-A.A 102			Last Edited on 24-AUG-2011 19:34	
Accelerometer Calibrator Number		000		
Accelerometer Temperature Characterisation				
X Accelerometer				
Serial Number	540			
Calibration Date	21-Feb-2008			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	2.02767e-005	-8.30191e-009	9.17037e-011
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.90781e-004	3.79264e-007	7.42536e-010
Y Accelerometer				
Serial Number	221			
Calibration Date	01-Nov-2007			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	1.86127e-005	-2.25929e-008	8.31895e-011
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.66396e-004	6.50784e-007	-5.38601e-010
Z Accelerometer				
Serial Number	856			
Calibration Date	03-Feb-2009			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	7.72617e-006	-4.86834e-008	1.03554e-010
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.74795e-004	4.10666e-007	4.39253e-010

Caliper Calibration MIE-A.A 102					Base Calibration on 28-SEP-2011 09:19
					Field Calibration on 28-SEP-2011 09:23
Base Calibration					
Reading No	Pads 1-5 Meas.	Pads 3-7 Meas.	Calibrator Size (in)		
1	26529	26004	5.97		
2	36837	36313	7.96		
3	46406	45939	9.86		
4	57787	57043	11.92		
5	0	0	0.00		
Reading No	Pad 2 Meas.	Pad 4 Meas.	Pad 6 Meas.	Pad 8 Meas.	Calibrator Size (in)

1	24685	25537	25965	25308	5.97
2	33436	33979	33941	34201	7.96
3	41582	42687	41522	42138	9.86
4	51827	53233	50353	51022	11.92
5	0	0	0	0	0.00
Field Calibration					
	Measured Pads 1-5 Caliper(in) 7.93	Measured Pads 3-7 Caliper(in) 7.97		Actual Caliper(in) 7.96	
	Measured Pad 2 Caliper(in) 3.96	Measured Pad 4 Caliper(in) 3.98	Measured Pad 6 Caliper(in) 3.99	Measured Pad 8 Caliper(in) 3.97	Actual Caliper(in) 7.96
Caliper Constants MIE-A.A 102				Last Edited on 24-AUG-2011 19:32	
Caliper Difference for BRKT		0.120	inches		
Navigation Constants MIE-A.A 102				Last Edited on 28-SEP-2011 09:24	
Magnetic Declination		9.42	degrees	East	
Imager Pad Check MIE-A.A 102				Field Check on	
Pad 1	Pad Not Tested	Pad 5	Pad Not Tested		
Pad 2	Pad Not Tested	Pad 6	Pad Not Tested		
Pad 3	Pad Not Tested	Pad 7	Pad Not Tested		
Pad 4	Pad Not Tested	Pad 8	Pad Not Tested		
Compact Micro Imager Constants MIE-A.A 102				Last Edited on 28-SEP-2011 09:25	
Sonde Configuration		Imager Mode	degrees		
Arm-Pad Kit		Normal Pads (12.25 in)			
Centre Pad 1 Rotational Offset		0.00			
Image/Borehole Ovality Reference		Azimuth of Pad 1	degrees		
Non Active Buttons		Omit	feet		
Search Angle		0.00	feet		
Correlation Interval		3.28	mAmp		
Correlation Step		1.64	mAmp		
Current Offset		0.0000			
Squasher Start		N/A			
Image Processing		Enabled			
FE Calibration MFE-B.A 220				Base Calibration on 02-SEP-2011 13:53 Field Check on 07-OCT-2011 11:45	
Base Calibration		Measured	Calibrated (ohm-m)		
Reference 1		0.0	0.0		
Reference 2		963.9	126.8		
Base Check			280.8		
Field Check			281.2		
FE Constants MFE-B.A 220				Last Edited on 08-OCT-2011 10:04	
Running Mode		No Sleeve			
MFE K Factor		0.1268			
Caliper Source for FE correction		Density Caliper			
Caliper Value for FE correction		N/A	inches		
Rm Source for FE correction		Temperature Corr			
Temp. for Rm Corr.		MCG External Temperature			
Stand-off		1.0	inches		
Induction Calibration MAI-B.J 362				Base Calibration on 02-SEP-2011 15:29 Field Check on 07-OCT-2011 10:26	
Base Calibration		Measured	Calibrated (mmho/m)		
Test Loop Calibration					
Channel	Low	High	Low	High	
1	16.0	468.7	9.3	966.2	
2	6.2	374.5	7.6	821.4	
3	3.6	258.3	5.2	566.0	
4	1.8	122.1	2.6	270.2	

4	1.8	155.1	2.6	279.2
Array Temperature	74.8	Deg F		
Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	13.9	3873.0
2	0.0	0.0	30.3	3605.8
3	0.0	0.0	28.4	3069.5
4	0.0	0.0	19.7	2079.2
Deep	0.0	0.0	17.4	1954.2
Medium	0.0	0.0	41.2	4077.5
Shallow	0.0	0.0	45.3	5400.8
Array Temperature	0.0		44.9	Deg F

Induction Constants MAI-B.J 362

Last Edited on 08-OCT-2011 10:04

Induction Model		RtAP-WBM	
Caliper for Borehole Corr.		Density Caliper	
Hole Size for Borehole Correction		N/A	inches
Tool Centred		Yes	
Stand-off Type		N/A	
Stand-off		N/A	inches
Number of Fins on Stand-off		N/A	
Stand-off Fin Angle		N/A	degrees
Stand-off Fin Width		N/A	inches
Borehole Corr. Rm Source		Temperature Corr	
Temp. for Rm Corr.	MCG External Temperature		
Squasher Start		0.0020	mhos/metre
Squasher Offset		N/A	mhos/metre
Borehole Normalisation			
DRM1	0.0000	DRC1	0.0000
DRM2	0.0000	DRC2	0.0000
MRM1	0.0000	MRC1	0.0000
MRM2	0.0000	MRC2	0.0000
SRM1	0.0000	SRC1	0.0000
SRM2	0.0000	SRC2	0.0000
Calibration Site Corrections			
Channel 1		0.00	mmhos/metre
Channel 2		0.00	mmhos/metre
Channel 3		0.00	mmhos/metre
Channel 4		0.00	mmhos/metre
Apparent Porosity and Water Saturation Constants			
Archie Constant (A)		1.00	
Cementation Exponent (M)		2.00	
Saturation Exponent (N)		2.00	
Saturation of Water for Apor		100.00	percent
Resistivity of Water for Apor and Sw		0.05	ohm-m
Resistivity of Mud Filtrate for Sw		0.00	ohm-m
Source for Rt		0.00	
Source for Rxo		0.00	

High Resolution Temperature Calibration MAI-B.J 362

Field Calibration on 28-SEP-2011 09:20

	Measured	Calibrated(Deg F)
Lower	10.00	50.00
Upper	100.00	212.00

High Resolution Temperature Constants MAI-B.J 362

Last Edited on

Pre-filter Length	11
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Caliper Calibration MPD-C.A 215

Base Calibration on 02-SEP-2011 17:36

Field Calibration on 07-OCT-2011 11:32

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	17727	3.99
2	26543	5.96
3	35429	7.99

4	43601	9.86
5	52880	11.93
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
8.00	7.99

Photo Density Calibration MPD-C.A 215

Base Calibration on
Field Check on 07-OCT-2011 11:30

Density Calibration

Base Calibration

	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	45233	15264	52994	19128
Reference 2	21253	2466	25185	2558

Field Check at Base

1297.2	1375.3
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Field Check

1299.5	1382.1
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PE Calibration

Base Calibration

	WS	Measured		Calibrated
		WH	Ratio	Ratio
Background	237	1157		
Reference 1	14848	45047	0.333	0.309
Reference 2	5938	21107	0.286	0.274

Field Check at Base

237.1	1156.8
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Field Check

236.2	1162.7
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Density Constants MPD-C.A 215

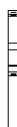
Last Edited on 08-OCT-2011 10:05

Density Source Id	2859GW
Nylon Calibrator Number	DNC-E-527
Aluminium Calibrator Number	DAC-D-527
Density Shoe Profile	8 inch
Caliper Source for Processing	Density Caliper
PE Correction to Density	Not Applied
Mud Density	1.22 gm/cc
Mud Density Z/A Multiplier	1.11
Mud Filtrate Density	1.00 gm/cc
Dry Hole Mud Filtrate Density	1.00 gm/cc
DNCT	0.00 gm/cc
CRCT	0.00 gm/cc
Density Z/A Correction	Hybrid
Matrix Density (gm/cc)	Depth (ft)
2.71	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00

DOWNHOLE EQUIPMENT

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SHA-J.A Compact Swivel Head Adaptor
SHA-J.A 225 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in



Compact Comms Gamma

68.42 ft GRGC - Gamma Ray

Compact Gamma Camera
MCG-D.J 424 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Neutron
MDN-B.A 191 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-C.A 215 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

MIS-A.A Compact Inline Bowspring sub
MIS-A.A 70 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 143 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MIS-B Compact Inline Standoff sub
MIS-B 26 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 89 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SHA-F Compact Swivel Head Adaptor
SHA-F 38 LG: 2.74 ft WT: 26.5 lb OD: 2.24 in

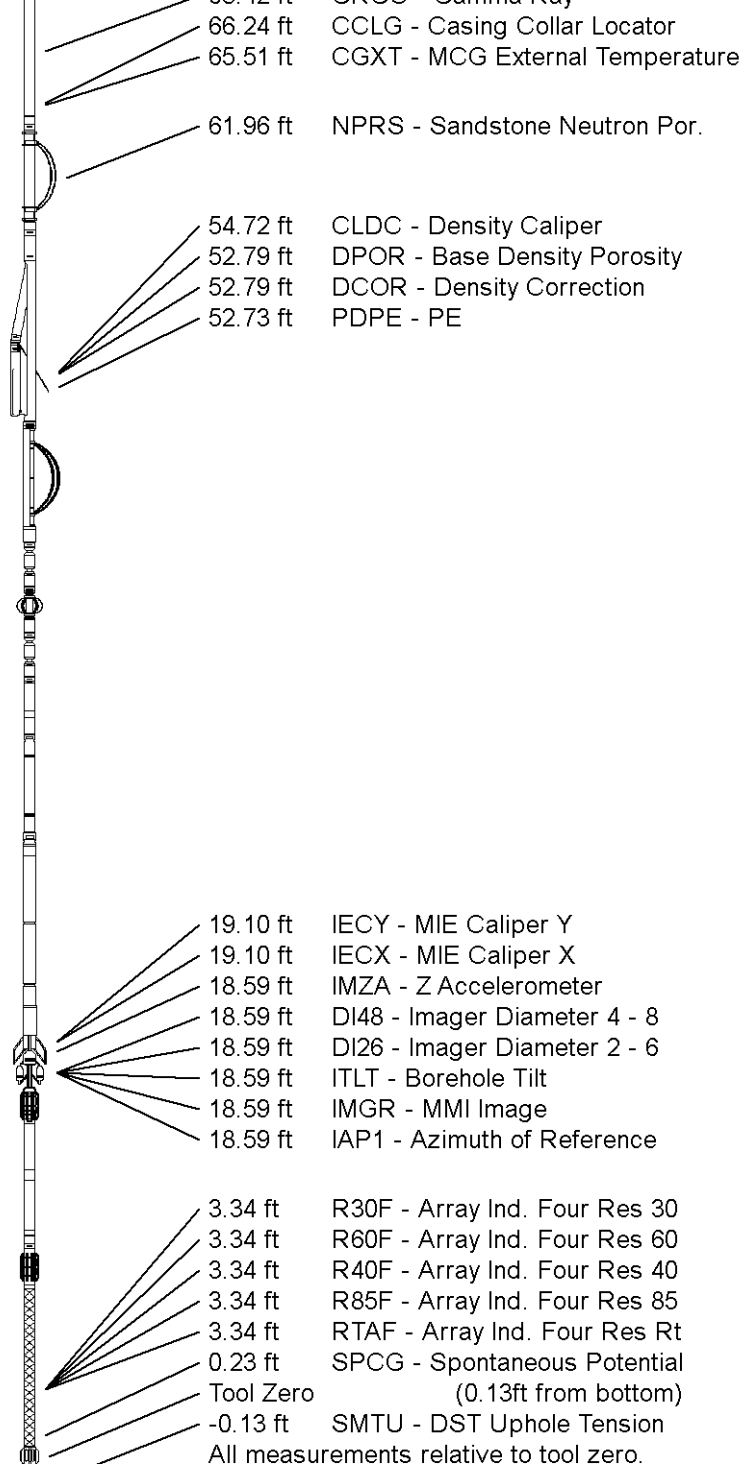
Compact MMI Memory Section
MIM-A.A 102 LG: 4.65 ft WT: 26.5 lb OD: 2.24 in

Compact MMI Electrode Section
MIE-A.A 102 LG: 13.96 ft WT: 99.2 lb OD: 4.09 in

Compact Focussed Electric
MFE-B.A 220 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-B.J 362 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 76.00 ft Weight: 573.2 lb



COMPANY	WEXPRO COMPANY
WELL	JACK DRAW UNIT #19
FIELD	JACK DRAW UNIT
PROVINCE/COUNTY	MOFFAT
COUNTRY/STATE	U.S.A. / COLORADO

Elevation Kelly Bushing	6923.00	feet	First Reading	7320.00	
Elevation Drill Floor	6922.00	feet	Depth Driller	9373.00	feet
Elevation Ground Level	6894.00	feet	Depth Logger	9375.00	feet



Weatherford®

HOLE VOLUME
CALIPER
LOG

