UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

COMPUTER PROGRAM DESIGNED TO DRAW BAR GRAPHS FROM OIL SHALE
FIOSCHER ASSAY OR SALINE MINERAL DATA

By

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This report is preliminary and has not been edited or reviewed for conformity with U.S. Geological Survey standards.
**SHALE/SALINE BAR GRAPH PROGRAM**

* * * * * * SHALE/SALINE BAR GRAPHS = USGS * * * * * *
PROGRAM NUMBER 8625
U S GEOLOGICAL SURVEY
GEOLOGIC DIVISION, DENVER, COLORADO
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THIS PROGRAM IS USED TO PREPARE A GERBER 622 PLOT TAPE OF BAR GRAPHS USING ANY SELECTED COLUMN VERSUS DEPTH FROM A SHALE/SALINE MATRIX. THE PROGRAM REQUIRES THAT THE DATA HAVE BEEN STORED ON MAGNETIC DEVICES BY PROGRAM D0102 (SHALE/SALINE DATA ANALYSIS) IN THE SHALE/SALINE DATA BASE.

SUBROUTINES PLOTSET, SCALE, NEATLN, LINE, CHAR, XAXIS, YAXIS, & ENDPIT ARE ROUTINES FOR THE USGS GERBER 622 PLOTTER. THESE ROUTINES WERE WRITTEN BY GEORGE T. EVANDEN, GEOLOGIC DIVISION, DENVER, COLORADO.

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DECK SETUP FOR THIS PROGRAM:

1. HEADER CARD

   | COL | PUT AN ASTERISK(*) IN THIS COLUMN. |
   | CORE NAME | COL 2-6 | THE FILE NAME OF THE CORE. |
   | CORE WM | COL 7 | (NOT USED). |
   | DISK | COL 8 | = 0 DISK TO 018: WILL BE USED FOR INPUT. |
   | = 1 DISK DISK: WILL BE USED FOR INPUT. |
   | (NOT USED) |
   | IY | COL 10-11 | THE COLUMNS OF SHALE/SALINE MATRIX TO BE PLOTTED ALONG Y-AXIS, IF BLANK OR ZERO, THEN COL. 7 IS USED. |
   | XIN | COL 12-16 | (NOT USED) |
   | SCALE ALONG THE X-AXIS (DEPTH AXIS) IN UNITS PER INCH OF PLOT. IF BLANK OR ZERO, THEN A VALUE OF 20.0 IS USED. |
   | YIN | COL 22-26 | SCALE ALONG THE Y-AXIS IN UNITS PER INCH OF PLOT. IF BLANK OR ZERO, THEN A VALUE OF 40.0 IS USED. |

2. STEP 1 MAYBE REPEATED AS MANY TIMES AS NECESSARY.

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REAL*8 DATE
LOGICAL CONT
DIMENSION X(10), YV(2), XP(4), YP(4), ID(2), RID(2),
1 A(2), B(2), AA(2), BB(2), XVT(2), YVT(2), XPT(4), YPT(4)
COMMON /BLTN/ NOLINE, XXXX(5000), YYYY(5000)
DATA ITAPE/3,10/ IBLANK/1 DDATE/07/01/75/1
DATA XV,YV,XP,YP/3.0,43.0,0.0,80.0,40.0,1.0,2.0,4.0,1.0,1.0,1.0,1.0,2.0,1.0,4.0,0.0,1.0,7.0,0.0,3.0,1.7,1.0,1.0,0.4,0.0,1.0,2.0
 DATA XVT,YVT,XPT,YPT/0.0,1.7,0.0,3.0,1.7,1.0,0.4,0.0,1.0,2.85,1.0,0.4,0.0
CALL PLTSET (O, XRD, YRD, 1)

C ... READ NEW DATA FOR PROCESSING A CORF.
C
100 READ (1, 270, END=260) NAME, IY, IX, XM, YM
110 IF (NAME.EQ.'I') GO TO 260
120 CALL OPEN (ITAPE, NAME, IU)
130 NLINE=0
140 READ(ITAPE, IN, NN, MM)
150 WRITE (LIST, 280) DATE, ID, N', MM
160 IF (IY.EQ.0) IY=7
170 IF (IX.EQ.0) IX=20.0
180 IF (YM.EQ.0) YM=20.0
190 WRITE (LIST, 290) IY
200 WRITE (LIST, 310) IX
210 WRITE (LIST, 320) YM

C ... BEGIN PROCESSING CORF.

C
C ... DETERMINE THE MINIMUM AND MAXIMUM DEPTHS AND MAXIMUM YIELD.

210 YMAX=-100.0
220 DO 110 I=1, NN
230 READ(ITAPE, IN, X)
240 IF (X(IY).GT. YMAX) YMAX=X(IY)
250 IF (I.EQ.1) NSTR=X(11)
260 IF (I.EQ.NN) NEND=X(2)
270 110 CONTINUE

C ... COMPUTE PARAMETERS AND INITIALIZE PLOTTER FOR ALL STRIPS.

280 REWIND ITAPE
290 READ (ITAPE)
300 XV(1)=3.0
310 XV(2)=43.0
320 XV(2)=80.0
330 XP(1)=40.0
340 XP(4)=XP(1)+XP(3)+1.0
350 YP(1)=2.25
360 YP(3)=1.0
370 YP(4)=YP(1)+YP(3)+1.0
380 XA=IFIX(DPSTR+0.5)
390 XM2N=XA-AMOD(XA, XM2N)
400 XA=IFIX(DPEND+0.5)
410 YMAX=XA-AMOD(XA, XM2N)*XM2N
420 NOSTR=(XMAX-XMIN)/(XM2N*XP(1))+0.999999
430 WRITE (LIST, 330) NOSTR
440 WRITE (LIST, 340)
MAIN PROGRAM

45 \( X_1 = X_{\text{MIN}} \)
46 DO 120 \( I = 1, N_{\text{STR}} \)
47 \( X_2 = \text{AMIN1}(X_1 + 40.0 \times X_{\text{IN}}, X_{\text{MAX}}) \)
48 ALC = \( X_2 - X_1 \)/\( X_{\text{IN}} \)
49 WRITE(LIST, 350) \( I, X_1, X_2, ALC \)
50 120 \( Y_1 = X_2 \)
51 \( X_{V(2)} = \text{AMIN1}(X_{V(1)} + 40.0 \times X_{\text{IN}}, X_{\text{MAX}}) \)
52 \( Y_{V(2)} = 2.25 \times Y_{\text{IN}} \)
53 \( Y_P(1) = (X_{V(2)} - X_{V(1)}) / X_{\text{IN}} \)
54 \( X_P(4) = X_P(1) + X_P(3) + 1.0 \)
55 \( Y_P(4) = N_{\text{STR}} \times 4.0 \)
56 CALL SCALE(\( X_V, Y_V, X_P, Y_P, 4, I_{\text{CODE}} \))
57 IF(I_{\text{CODE}}.LT.0) GO TO 250
58 NS = 0

C ... START PLOTTING EACH STRIP.

C ... INITIALIZE PLOT FOR EACH NEW STRIP OF CORE.

60 DO 230 \( I = 1, N_{\text{NN}} \)
61 READ(INTAPE, END=2201) \( I_{\text{NN}}, X \)
62 IF(X(IY).EQ.0.0) \( X(IY) = 1.0 \)
63 \( R(1) = X(IY) \)
64 \( R(2) = X(IY) \)
65 A(2) = X(2)
66 IF(I.EQ.1) GO TO 130
67 IF(A(2).GT.X(2)) CONT = .TRUE.
68 GO TO 210

C ... DRAW DEPTH ANNOTATION ACROSS BOTTOM EDGE OF EACH STRIP.

78 CALL HEATLN
79 MD = \( (X(2) - X(1)) / X_{\text{IN}} \times 10.0 = 0.95 \)
80 DO 160 \( J = 1, N_{\text{NO}} \)
81 IF(MOD(J, 2).EQ.0) GO TO 140
82 BB(1) = YV(1)
83 BB(2) = YV(2)
84 GO TO 150
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85 140 RB(1)=YV(2)
86 RB(2)=YV(1)
87 150 XX=XV(1)+J*XIN/10.0
88 AA(1)=XX
89 AA(2)=XX
90 160 CALL LINE(AA,BR,2.0,0)

C
C ... DRAW ANNOTATION TO THE LEFT OF 1ST STRIP.

91 IF (NS.NE.1) GO TO 170
92 CALL SCALE(XVT,YVT,XPT,YPT,3,ICODE)
93 IF (ICODE.LT.0) GO TO 250
94 CALL NEATLN
95 AA(1)=0.5
96 AA(2)=AA(1)
97 RB(1)=YVT(1)
98 RB(2)=YVT(2)
99 CALL LINE(AA,BR,2.0,0)
100 AA(1)=0.9
101 AA(2)=AA(1)
102 CALL LINE(AA,BB,2.0,0)
103 AA(1)=1.3
104 AA(2)=AA(1)
105 CALL LINE(AA,BB,2.0,0)
106 AA(1)=0.9
107 AA(2)=1.3
108 RB(1)=YVT(2)/2.0
109 RB(2)=RB(1)
110 CALL LINE(AA,BB,2.0,0)
111 AA(1)=1.3
112 AA(2)=XVT(2)
113 RB(1)=YVT(2)/3.0
114 RB(2)=RB(1)
115 CALL LINE(AA,BB,2.0,0)
116 RB(1)=2.0*BR(1)
117 RB(2)=RB(1)
118 CALL LINE(AA,BB,2.0,0)
119 CALL CHAR(0.44,0.10,'COMPANY',7.2,0.06,1.5708,0.0,0.0)
120 CALL CHAR(0.84,0.10,'WELL NO.',8.2,0.06,1.5708,0.0,0.0)
121 CALL CHAR(1.24,0.1,'STATE',5.2,0.06,1.5708,0.0,0.0)
122 CALL CHAR(1.24,1.6,'COUNTY',6.2,0.06,1.5708,0.0,0.0)
123 CALL CHAR(1.64,0.1,'T.',2.2,0.06,1.5708,0.0,0.0)
124 CALL CHAR(1.64,1.1,'R.',2.2,0.06,1.5708,0.0,0.0)
125 CALL CHAR(1.64,2.1,'S.',2.2,0.06,1.5708,0.0,0.0)

C
C ... INITIALIZE DATA AREA FOR EACH STRIP PLOT.

126 170 YP(1)=2.25
127 YP(3)=YP(3)+0.6

C
CALL SCALE(XV,YV,XP,YP,3,ICODE)
IF(ICODE.LT.0) GO TO 250
CALL XAXIS(XV,YV,XP,XIN/10,0,10,0,06,'(FS,0,10X)',14)
CALL YAXIS(YV,YV,YP,YIN/4,0,1,0,06,'(FS,1)',6)
ENCODE (8,370,RID) ID
DECODE (8,360,RID) ID
CALL CHAR(XV(1),0.5*(Y(1)+Y(2)),ID,6,2,0,10,1.5708,-0.1*R/2,2.8)
C ... DRAW YIELD ANNOTATION IN DATA AREA.
DO 200 J=1,8
YY=J*YIN/4.0
IF(MOD(J,2).EQ.0) GO TO 180
AA(1)=XV(1)
AA(2)=XV(2)
GO TO 190
180 AA(1)=XV(2)
190 RB(1)=YY
RB(2)=YY
CALL LTNE(AA,BR,2,0,0)
YY(1)=XV(2)
IF(I.NE.NN) GO TO 230
CALL STOLNE(A,YV(1),1,0,0)
CALL STOLNE(A,B,2,1,0)
IF(CONT) CALL FINLIN
IF(CONT) GO TO 130
A(1)=A(2)
IF(I.NE.NN) GO TO 230
CALL STOLNE(A,YV(1),1,1,0)
CALL FINLIN
GO TO 240
CONTINUE
C ... TERMINATE PLOT AND RECYCLE FOR NEW CORE.
240 CALL ENDPLT(0)
CALL SHUT
GO TO 100
C ... ERROR IN SCALING DATA FOR PLOTTER.
250 WRITE(LIST,360)
CALL ENDPLT(0)
STOP 'ABNORMAL TERMINATION'
STOP 'NORMAL TERMINATION'
SHALE/SALINE BAR GRAPH PROGRAM

MAIN PROGRAM

166 270 FORMAT(A5,1X,I1,1X,I2,5X,2F5.0)
167 280 FORMAT('SHALE/SALINE BAR GRAPHS = USGS',A10,10X,'CORE ID = ',
167 12A4,10X,NO INTERV = ',I8,10X,NO VARS = ',I8,10X)
168 290 FORMAT(10X,'Y=VAR COL = ',I8)
169 310 FORMAT(10X,'X-SCALE FACTOR = ',F7.2,' UNITS/IN')
170 320 FORMAT(10X,'Y-SCALE FACTOR = ',F7.2,' UNITS/IN')
171 330 FORMAT(5X,'THE NO OF STOPS IN THIS CORE = ',I3)
172 340 FORMAT(9X,'NO STP DP END DP LG')
173 350 FORMAT(9X,12F9.1)
174 360 FORMAT('ERROR...CANNOT SCALE PLOTTER WITH THE GIVEN PARM')
175 370 FORMAT(2A4)
176 380 FORMAT(A5,A3)
177 END
SUBROUTINE STOLNE(A, B, N, N1, N2)
C
THIS SUBROUTINE STORES YIELD DATA FOR SUBSEQUENT PLOTTING AND THEN
C
PLOTS IT.
C
COMMON /BLTLINE/ NOLINE, X(5000), Y(5000)
3
DIMENSION A(1), B(1)
4
DO 100 I=1, N
5       NOLINE=NOLINE+1
6       X(NOLINE)=A(I)
7 100   Y(NOLINE)=B(I)
8       RETURN
9       ENTRY FINLIN
10      CALL LINE (X,Y,NOLINE,0,0)
11       NOLINE=0
12      RETURN
13      END
SUBROUTINE FILES

C THIS SUBROUTINE IS USED TO OPEN AND CLOSE INPUT FILES. IT IS
C MACHINE DEPENDENT AND WOULD REQUIRE MODIFICATION IF THIS PROGRAM
C WERE EXECUTED ON A NON "DEC" MACHINE.

2 DIMENSION NAMDSK(IOPT)
3 ENTRY OPEN(IN,NAM,IOPT)
4 OPEN (UNIT=IN,DEVICE=NAMDSK(IOPT),ACCESS='SEQIN',FILE=NAM)
5 RETURN
6 ENTRY SHUT
7 CLOSE (UNIT=IN,DEVICE=NAMDSK(IOPT),ACCESS='SEQIN',FILE=NAM)
8 RETURN
9 END