LABORATORY NOTEBOOK

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NOTEBOOK NO. _____

ISSUED TO Danny Skelton

ON 11/4 **19** 96

DEPARTMENT CNWRA / GIS LAB

RETURNED 12/11 **19** 97

CNWRA QA

GIS Lab NoTEbooK

"mostly Earth Vision"

– D. SKELTON

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1. Given a scattered xyz (dat) file, build a 100x150 2grd file. View the 2grd and dat files in the 3DViewer, and print the view.

   a. Select, from the Modeling menu, "2-D Minimum Tension Gridding".

   b. Push the "scattered data" selection and select a scattered datat file from the file window.

   c. Once the file is selected in the 2-D Minimum Tension Gridding window, enter the grid size. For this example, enter 100 as grid size for x, and 150 as grid size for y.

   d. Under the "Calculate" window, select "Normal Minimum Tension".

   e. In the "Normal Minimum Tension" window, enter a file name in the Output file text box, with a .2grd suffix.

   f. Press the Now button at the bottom of the window, and calculations will begin.

   g. To view the file when calculations are complete, go to the main Earth Vision window and select the "Visualization" window.

      (1) Select the 3D viewer option.
      (2) On the menu, select 2-D Grid files.
      (3) Select the files desired for viewing, then select "no more files".
      (4) Desired file will appear, and any other selected files can be chosen through the files menu.

   h. To change background color of the file from black to white:

      (1) Select the color button from the main menu.
      (2) In the "Background Color" section, push the "Reverse black/white" button. Background color will reverse from black to white.

   i. To create a custom or grayscale color scheme:

      (1) Select the color button from the main menu.
      (2) In the "Color Control" section, select the "Color editors" button, or just push the "z" key. The Color Table Editor window should appear.
      (3) In the Color Table Editor window, use the color bars to generate the desired color for the start of the color legend.
      (4) When the desired color is in the "Current Color" box, use the left mouse button to highlight the desired index on the legend with the chosen color.
      (5) To create the entire legend, place the mouse pointer in the legend index where the new color is, and click the right mouse button. move the pointer to the top of the legend and click the right mouse button again. The legend should display a color ladder from your index point to the top of the legend. If there are more indices under the chosen index, return the pointer to the original index, and click the right mouse button. Move the pointer to the lowest index and push the right mouse button again. The color ladder is extended from the original index to the lowest index in the legend.
      (6) Once the legend is complete, push the Exit Color editor button in the "Functions" section.

   j. To edit the legend display:

      (1) Select the Screen button from the main menu.
      (2) In the Color Key section press the Edit color key button.
      (3) In the "Select color key info" menu, select the following:

         (a) Display name
         (b) Units label
         (c) Color Table

      (4) In the "Select color key info" menu, select "No more edits." Only

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```
        the selected properties will be shown in the color key legend.

k.  To add or modify labeling on the X, Y, ans Z axis;

    (1)  Select "axes" from the main menu.
    (2)  To add captions to the model;

         (a)  In the Axes' Captions section, select X, Y, or Z.
         (b)  Type the desired caption in the status window, and press
              return.

    (3)  To modify axes captions on the model;

         (a)  In the Axes' Caption section, select Edit axes' caption.
         (b)  In the pop up menu, select the desired axis to edit.
         (c)  Type the desired modification in the status window, or to
              delete the existing caption, leave status window blank,
              and press return.

l.  To print the file to the output;

    (1)  Select "output" from the main menu.
    (2)  Under "output options", select "output file".
    (3)  Under "Action", select "Send Output".
    (4)  Enter a file name with a .rgb suffix.
    (5)  Status window will show if the file name is accepted after entered.
    (6)  Open a window outside of the Earth View program.
    (7)  Type at the prompt, "convert [filename].rgb [filename].ps".
         This command converts the .rgb file to a postscript file for
         postscript printing.
    (8)  Enter the postscript print command for the file.
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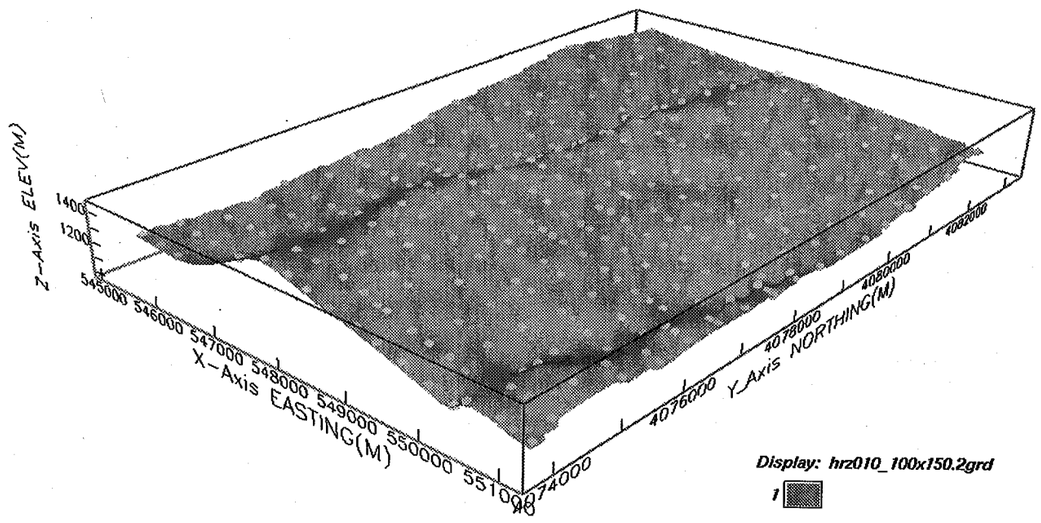
HRZ010_100x150.2grd file
with HRZ010_n3ptn_jan23.dat file



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2. Create a color filled contour map of the 2grd file with 10 meter contours. Add a N-arrow, title, scale bar, and tic marks to the countour map.

- Print the map as a PS file to 8.5x11 paper.

- Print the map as a HPGL file to the plotter.

a. Select the Edit menu on the EarthVision main window, and select "Graphic Editor".

b. In the Graphic Editor window, select "New" from the File menu.

(1) Enter a file name with the suffix .iplt. It's better to use a name similar to the .2grd file that you will be using.
(2) Once the file has been entered and appears in the "Data Currently in Editor" box, select "Done" on the File Select Window.

c. In the Graphic Editor window, select "Add plot box mode" from the Map menu.

(1) Insuring that the coordinates for X are less than 12 and the coordinates for Y are less than 10, make a box approximately 6x8.

d. In the Actions menu, select "Pick" and touch any edge of the created box.

e. In the File menu, select "Open...", and enter the desired .2grd file name in the Open Existing File Selection box.

f. The Contouring Information window will appear. Enter the desired interval in the Countour interval box.

(1) Press the "More" button and the Contour Parameters window will appear.
(2) Set the following parameters to the desired values:

(a) Label interval (dependent upon Z minimum and maximum).
(b) Index interval (dependent upon Z minimum and maximum).
(c) Light color.
(d) Index color.

(3) If color contouring zones are desired, select either Regular spacing or Variable spacing from the "Color-filled Contours" section.

(a) Select the "Edit contour list" button for color selection.
(b) In the Variably Spaced CFC Parameters window:

_1_. Push "Build list" button to start the list of colors to be used.
_2_. Adjust the number of times the colors will be stepped through (reused) with the "Step through color table" slide.
_3_. Use the "Starting color" slide to determine which will be the beginning color.
_4_. Use the cut buttons on the far right to remove any undesired ranges.
_5_. Use "Preview" until the desired imaging is achieved.
_6_. When desired image is achieved, push "Done".

(c) Push the "Done" button on the Contour Parameters window.

(d) Push "OK" in the Contouring Information window. Contouring should begin.

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(4) Close all extraneous windows, so that the Graphic Editing window and the EarthVision window are the only ones open.

g. To add a North Arrow:

(1) Insure there is adequate room, about 1 inch, beneath the map.
(2) From the Map menu, select North Arrow.
(3) The North Arrow window should open.

(a) Set color, label size, and desired font.
(b) Push "create" when finished.

(4) When arrow is created, highlight by clicking the left mouse button. Then, holding down the right mouse button, move the arrow to the desired position.

h. To create a Scale Bar:

(1) Insure there is adequate room, about 1 inch, beneath the map.
(2) From the Map menu, select Scale Bars.
(3) The Scale Bars window should open.

(a) Enter the appropriate position for the Units Label Position (try Below center of bar), by selecting the desired radio button.
(b) Enter the Scale Bar Labels and Ticks values:

_1_. Enter appropriate values dependent upon X and Y values and intervals.

_2_. Enter the Label interval, that is the number of ticks in a row to be labelled (1 = every tick, 2 = every 2nd tick, 3 = every 3rd tick, etc...).

(c) Enter desired colors for line and label, and select font. Label size should be arould .1 or less.

(d) When all information has been entered, press the "create" button. If information is already entered and is being modified, press the "calc" button.

(4) When scale is created, highlight by clicking the left mouse button. Then, holding down the right mouse button, move the scale to the desired position.

i. To print the map:

(1) From the File menu in the Graphic Editor window, select "Drag plot window".
(2) Drag a retangle around the existing map, starting from the 0, 0 coordinate. The size of the retangle should be the approximate size of the paper to be used for the printing.
(3) Click the map (or .iplt) box with the left mouse button.
(4) While holding down the right mouse button, move the map to the center of the retangle.

(a) Keep in mind that the arrow and the scale will move with the map window.

(b) When centering, center the entire group, not just the map.

(5) From the File menu, select "Plot window...".

(a) Select the Encapsulated PostScript option.

(6) Enter a name for the plot file, with the suffix ".ps".

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(7) In a regular shell, print the file to phaser or ps3825 as follows:

(a) For ps3825 (black and white), enter:

qpr -lps -Pps3825

(b) For Phaser printer (color), enter:

lpr -s -Pphaser

j. To plot map to plotter:

(1) From the main Earthvision window, select Base & Contour Maps under the Visualization menu.

(2) Push the "Grid or horizon table" button, and select the grid file from the Grids and tables pop-up window.

(3) Check the "Plot size" to ensure it is the same size as the plot paper you will be using.

(4) Under the Calculate menu, select calculate and edit.

(5) If necessary, edit the size of the image in the Graphic Editing window to ensure that it will properly fit on the plot paper.

(6) Under the File menu, select Plot Window.

(a) Under Plot window, select DGI plot file.

(7) Save the file as a .plt file, and exit Graphic Editing.

(8) Convert the .plt file to HPGL format as follows:

(a) Run the"plotev" program. The plotev command is located in the /usr/local/bin/ directory.

(b) Enter the DGI plot filename.

(c) For "plot scaling method:" choose 2.

(d) To enter the "desired x,y size", enter the size of the plot, in inches. The plot should already be sized to fit the size of the desired plot paper.

(e) Name the output file. "junk.file" is a name previously used, and readily identifiable as an HPGL plot file.

(9) Position paper in plotter, aligning the paper edge with the white strip on the plotter. Position the paper so that the paper rollers hold it secure, but not tight. Leave a tiny amount of space between the edge of the paper and the roller edge on the outside roller (the roller that moves).

(10) Check the plotter to ensure that it has pens installed.

(11) Enter the command "lpr -Pplotter junk.file" to begin plotting.

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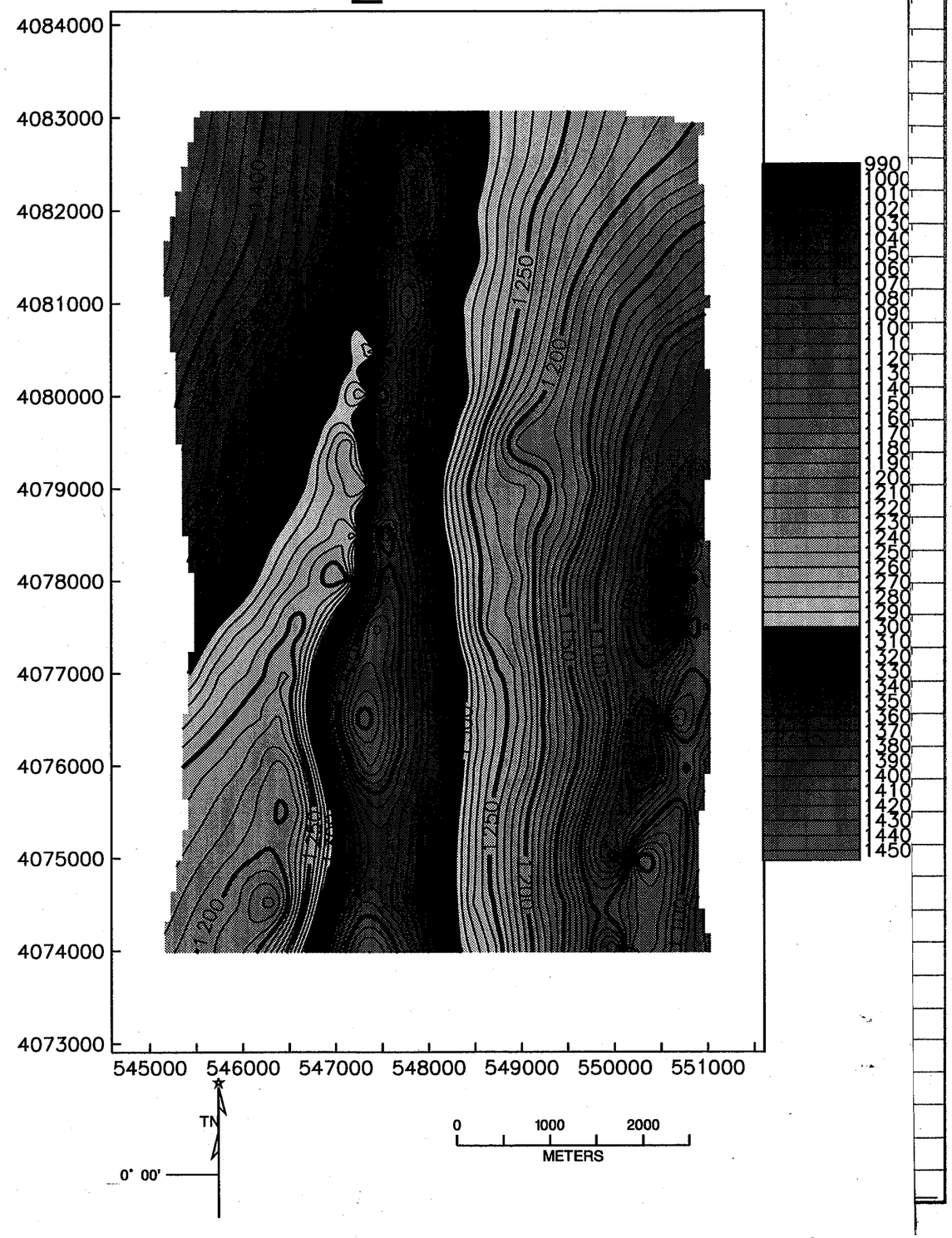
HRZ010_100x150bw



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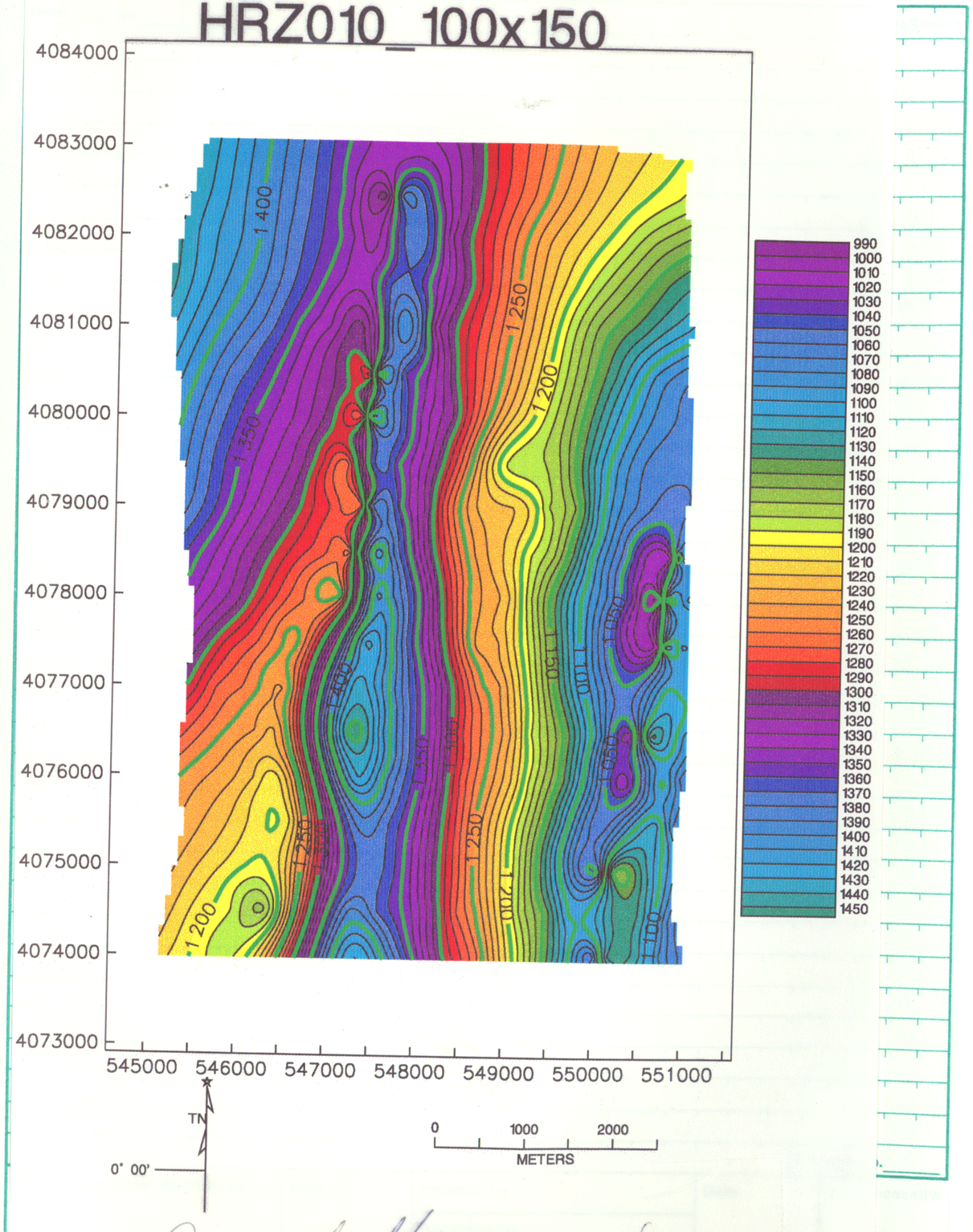
HRZ010_100x150



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```
3.  Smooth and recontour the contour map above and print to
    the printer.

    a.  From the main Earthvision window, select Utilities.

    b.  Select Grid Operations, and select Grid filtering.

    c.  Push the "Input grid" button, and select a .2grd file
        from the Input Grid file window.

    d.  Enter the number of passes, (approximately 10 should
        do).

    e.  Under the Calculate menu, select Filter grid.

    f.  Enter the output filename in the Filter Grid window,
        and push the now button.

    g.  When the filtered file has been calculated, exit the
        Grid Filtering window.

    i.  Either use the filtered grid file to create an .iplt
        file using the Graphic Editor, or go to the
        Visualization menu and select Base & Contour Maps to
        create a contoured map of the filtered file.

        (1)  If Base & Contour maps is used:

             (a)  Open the Base & Contour Maps window.

             (b)  Push the "Grid or horizon table" button, and
                  select a file from the Grids and Tables
                  window.

             (c)  Check that the Plot size is the same size as
                  the paper to be used for the plot (6.5 x 10
                  is good for regular printer type plotting).

             (d)  Select Contouring Paraameters from the
                  Customize menu.

             (e)  Set contour interval to desired value.

             (f)  Set Regular spacing in the Color-filled
                  contours section of the window, and
                  push the Edit contour list... button.

             (g)  Check the Contour interval, and set the
                  color table using the starting color and
                  the step through color table sliders.  If
                  a new color table is desired, click on a
                  color and the Color Selection window will
                  appear.  Select the New Color Table button,
                  and choose a new color table from the files.

             (h)  When color settings are complete, the contour
                  may be seen by pushing the Preview button.
                  If contour map is satisfactory, push Done.

             (i)  If all settings in the Contour Parameters
                  window are satisfactory, push Done.

             (j)  Map is ready to contour.  Select Calculate &
                  Edit from the Calculate menu.

             (k)  The contoured map will appear in the Graphic
                  Editor window when contouring is complete.
                  Edit desired features, and plot map to
                  printer as follows:

                  [1]  Under the Zoom window, select Range and
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Scale.

[2] Push the Preserve scale button, and push the Set button. Close the window.

[3] Under the File menu, select Plot Window, and select Encapsulated PostScript.

[4] Enter a file name with the .ps suffix, and push the Plot button.

[5] In a regular shell window, enter one of the following commands:

[a] For Phaser Color printer:

lpr -s -Pphaser <filename.ps>

[b] For Ps3825 black and white printer:

qpr -lps -Pps3825

[c] For Ps1725 black and white printer:

qpr -lps -Pps1725

(2) If Graphic Editor is used:

(a) Select Graphic Editor from the Edit menu of the main Earthview window, or type the command "evedit" from any shell.

(b) When the Graphic Editor window appears, it will prompt for a filename. Enter a name with a suffix of .iplt, and push the Store button.

(c) Under the Map menu, select Add Plot Box, and form a box approximately from the 1,1 coordinate to the 6,9 coordinate. It may be necessary to get the Display Coordinates window from the Operations menu, to best judge coordinate position.

(d) After the plot box is drawn, it must be picked. Do this by selecting the Pick option under the Actions menu, or by pushing the Pick button on the left of the display.

(e) Select Open from the file menu, and select a .2grd file from the Open Existing File window.

(f) Push store, and the Contouring Information window will appear. Set the contour interval to the desired level, and press the More... button.

(g) The Contour Parameters window should now be present. Check the Light color and Index color, and adjust by clicking on the current color. Choose a new color from the color chart that appears.

(h) Next, in the Color-filled Contours section of the window, select the Regular spacing or Variable spacing radio buttons. Push the Edit contour list... button, and the Regularly Spaced CFC Parameters window, or the Variably Spaced CFC Parameters window should appear, depending on the choice made.

(i) Check the Contour interval, and set the color table using the starting color and

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the step through color table sliders. If a new color table is desired, click on a color and the Color Selection window will appear. Select the New Color Table button, and choose a new color table from the files.

(j) When color settings are complete, the contour may be seen by pushing the Preview button. If contour map is satisfactory, push Done.

(k) If all settings in the Contour Parameters window are satisfactory, push Done.

(l) Map is ready to contour. Select Calculate & Edit from the Calculate menu.

(m) The contoured map will appear in the Graphic Editor window when contouring is complete. Edit desired features, and plot map to printer as follows:

[1] Under the Zoom window, select Range and Scale.

[2] Push the Preserve scale button, and push the Set button. Close the window.

[3] Under the File menu, select Plot Window, and select Encapsulated PostScript.

[4] Enter a file name with the .ps suffix, and push the Plot button.

[5] In a regular shell window, enter one of the following commands:

[a] For Phaser Color printer:

lpr -s -Pphaser <filename.ps>

[b] For Ps3825 black and white printer:

qpr -lps -Pps3825

[c] For Ps1725 black and white printer:

qpr -lps -Pps1725

(n) Exit the Graphic Editor by choosing exit from the File window. Graphic Editor will ask whether the present file should be saved. Select yes or no.

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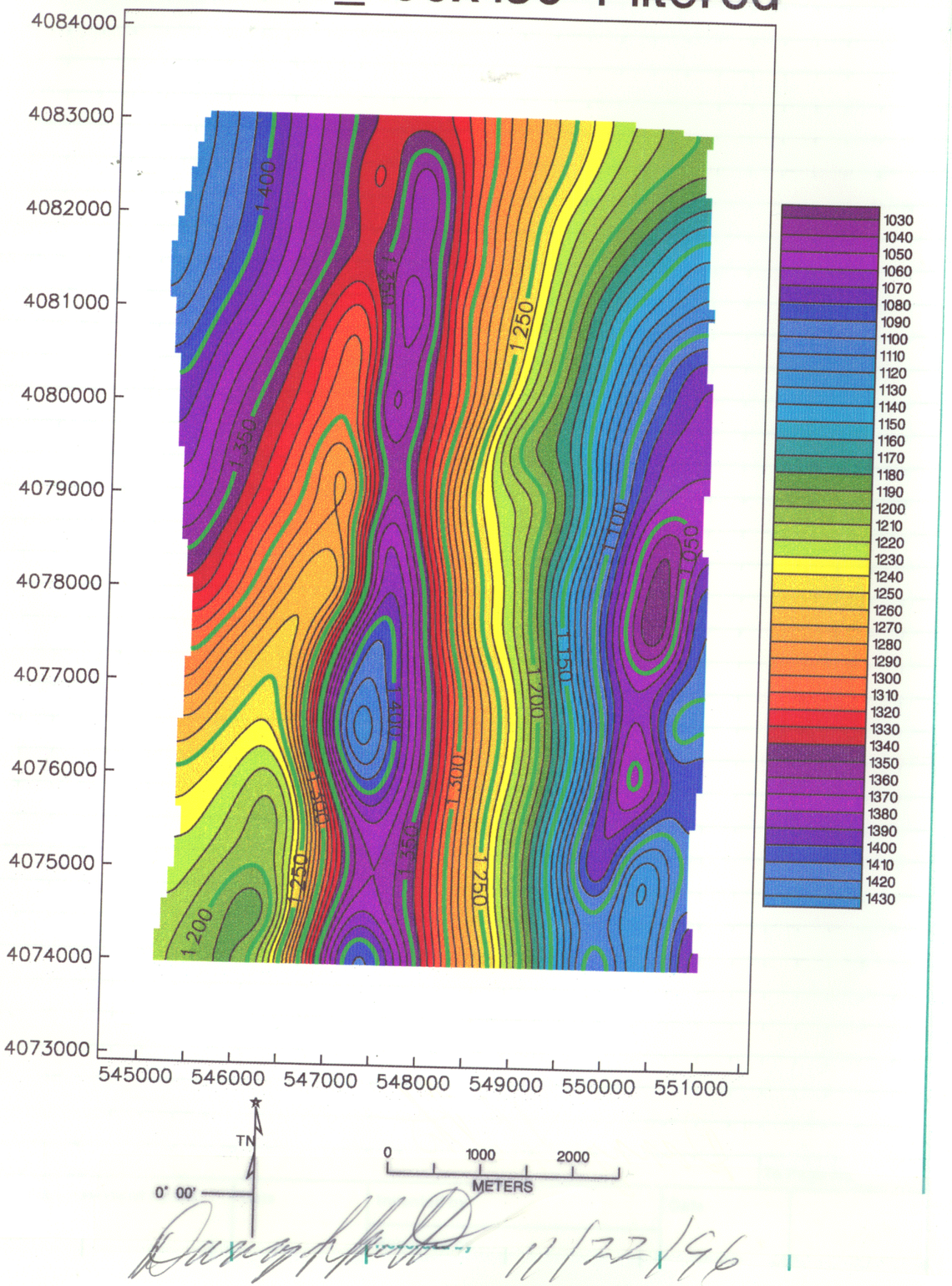
HRZ010_100x150 Filtered



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Sep 20 1996 11:57 **digitize_faults.txt** Page 1

```
4.  Digitize a fault map and display these faults on the contour
    map from step 3.  Print the contour map with the faults.

    a.  From the Edit menu in the EarthVision window, select
        Digital Editor.

    b.  As the Graphic Editing window opens a file selection
        window will also open.  Enter a name for the file, store
        it, and close the file selection window.

    c.  The next window that opens is the Edit Header window for
        the designated file name.  In the Description window,
        enter a description of the file, if desired.  Make the
        projection Local Retangualar, or push the Projection
        button to change to a known map projection.

        (1)  After Projection is selected, th Projection window
             appears.  To select a new projection, select the
             Projection button, and a selection of different
             projections will drop down.  Choose the proper
             projection.  (We usually use Universal Transverse
             Mercator or Local Retangular for the Yucca Mountain model).

        (2)  If the x and y units are known, enter them.  If the
             projection is Universal Transverse Mercator, X,Y
             units should be left as unknown.

        (3)  If Universal Transverse Mercator is used, the
             Ellipsoid selector stays constant, and the Clarke
             1866 selector should be changed to User defined.

        (4)  In the Zone text window, enter 11 for Yucca Mountain.
             If zoning for another location, push the zone button
             and select the proper zone from the world map.

        (5)  When finished adjusting projection, click Done to close
             the window.

        (6)  Select OK to close the Edit Header window.

    d.  Next, the Digitizer Setup window will appear.  If desired,
        enter a file name in the Setup file name window, or
        the name digsetup.dis will be automatically established for
        the setup file.

        (1)  Ensure the Digitizer tablet window displays
             "microgrid3" for the digitizer tablet.

        (2)  Tape the map or drawing to be digitized on the
             digitizer tablet.

        (3)  Click on the Initialize digitizer button to start
             setting up the digitizer window.

        (4)  To set the Menu Setup Points A and B:

             (a)  Ensure the A radio button has been pushed.

             (b)  On the digitizer tablet, put the crosshairs of
                  the mouse on the "A" in the lower left corner of
                  the EarthVision digitizer menu, and press the "1"
                  key.

             (c)  Move the mouse over to the lower right corner,
                  position the crosshairs on the letter "B", and
                  push the "1" key.

        (5)  Enter the first set of X, Y Map coordinates.  Go to the
             digitizer tablet and place the mouse crosshairs on the
             map, over the coordinates entered and press "1".  The
             digitizer enters the Digitized Coordinates for x and
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y automatically.

(6) Go to the next line and repeat the procedure for at least 3 or 4 sets of coordinates. It is better to choose the coordintes as follows to ensure that maximum and minimum values are used for both coordinates:

(a) highest x coordinate and a y.
(b) lowest x coordinate and a y
(c) lowest y coordinate and an x.
(d) highest y coordinate and an x.

(7) If the digitizer has failed to respond to these steps, check the following:

(a) Verify ttyd2 port.

Sample "cat < /dev/ttyd2" output:

cat < /dev/ttyd2	Actual button hit
02425,02960,AP0	1
02424,02961,AP1	2
02410,02969,AP2	3
02405,02970,AP3	C
02405,02970,AP4	4
02405,02970,AP5	5
02404,02970,AP6	6
02404,02970,AP7	D
02401,02969,AP8	7
02401,02969,AP9	8
02401,02969,APA	9
02398,02969,APB	E
02400,02968,APC	A
02400,02968,APD	0
02400,02967,APE	B
02400,02967,APF	F
123456789012345	

(b) Enter "ps -ef | grep ttyd2" in a shell window to ensure that getty isn't running on ttyd2 (the digitizer board device).

(c) If digitizer board is not responding to step (a), check connections to Performer Onyx, and insure that the digitizer keypad lights are on. If lights are not on, check power switches and sockets.

(d) Check the Summagraphics Microgrid III DIP switch settings:

Switch Bank	Sw	Attribute	Value
1	1	Baud 9600	1
	2	Baud 9600	0
	3	Baud 9600	0
	4	Parity Odd	0
	5	Parity Yes	1
	6	Stop bits No	0
	7	Data bits 7	0
	8	Format ASCII	1
2	1	ASCII Cnts	1
	2	Decimal No	0
	3	Return CR	0
	4	Units Inches	0
	5	Res 200 lpi	1
	6	Res 200 lpi	0
	7	Format Calcomp	1
	8	Format Calcomp	0

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3	1	Report mode Pnt	1
	2	Report mode Pnt	0
	3	Echo Off	0
	4	Out of Prox No	0
	5	Out of Margin No	0
	6	Dual input Select	1
	7	Input Select Curs	1
	8	Custom opt Off	0

(d) Ensure the Digitizer is properly configured according to the below listed procedures from the /soft1/dgl/ev3/etc/digitab.cfg file:

```
#Digitizer configuration format:
# Separate all of these by spaces:
# Name -- Digitizer name
# Line -- "SAME" for same line digitizing, or assignable line
#         number (VMS) or device file (Unix).
# Xcols -- Starting and Ending columns for X-coordinate.
# Ycols -- Starting and Ending columns for Y-coordinate.
# KeyPos -- Starting and Ending column indicating which key
#           or button on cursor was pressed.
#
# From here up to initStr each values should enclosed in
# double quotes.
# If you don't want to supply a string for any of the
# following up to but not including InitStr, enter "".
#
# String for send by digitizer for:
#    Digitize mode buttons
# 1. digitize a point, 2. snap and digitize a point
# 3. snap and highlight, 4. popup "Display Coordinates" box.
# 5. Location Only, 6. delete  7. end line, 8. start line over
# 9. switch to number entry mode, 10. begin drag of picking
# box, 11. digitize window 12. move, 13. ctrl, 14. shift
# 15. move point 16. rotate
#    Number entry mode buttons
# 0-9. digit buttons  (10 buttons)
# 11. negative sign, 12. decimal point, 13. delete last
# character, 14. delete whole string, 15. tab
# 16. return

# InitStr -- Initialization string to be sent to digitizer.
#            Enclose in quotes and denote control characters
#            by prefixing with tilde (e.g., "~X" for
#            Control-X or "~[" for Escape).
#            If there is no initialization string, and
#            commands past this position are needed, use "~"
#            as a place-holder.
# SCALE=UpInch -- Tablet scale factor (optional).  If the
#            digitizer to be used has native units other than
#            thousandths of inches, use the SCALE command to
#            pass the number of digitizer units per inch.
#            The default is 1000.
# The following are examples from DGI:

"microgrid3" "/dev/ttyd2" 1,5 7,11 15,15 "0" "1" "2" "3" "4" "5" "6" "7"
                                         "8" "9" "A" "B" "C" "D" "E" "F"
                                         "D" "0" "1" "2" "4" "5" "6" "8"
                                         "9" "A" "3" "7" "B" "C" "E" "F"
```

(1) To set up the z value of the points to be digitized, select Set Z display from the Scattered menu.

(2) In the Field display attributes window, select the radio buttons to post x, y, and z, in that order, then select the set button, and close the window by clicking the close button.

(3) A small Contour Level window should appear in the

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lower left corner of the screen. Enter a z value of at least 1, and select the close button.

(4) On the digitizer tablet, use the mouse crosshairs to select "Line" from the digitizer menu, and press the "1" button.

(5) Begin digitizing the desired map line by tracing the line with the crosshairs of the mouse, and clicking the "1" button to digitize the points along the line. Points should be digitized whenever the line changes direction from a straight path, or at least every 1/4 inch when digitizing a straight line.

(6) When a digitized line is complete, press button "6" to end the line.

NOTE: See the cursor buttons section on page GE-148 of the EarthVision User's Guide for more information on the mouse buttons for the digitizer.

(7) For each line or datapoint to be digitized, repeat steps (5) and (6).

(8) When digitizing is complete, select exit from the File menu of the Graphic Editor. When queried on whether file should be saved, answer yes to save file, no to delete file, or cancel if you don't want to exit yet.

f. Creating a fault file from the Digitized data file:

(1) Remove the header from the data file by running the following script in the format

runRemoveHeader datafile.dat

runRemoveHeader script:

```
#!/bin/sh

cp $1 tmp.dat
nawk 'BEGIN { }
        {
            if((NF>0)&&(substr($0,1,1)!= "#")) {
                printf "%s\n",$0
            }
        }
        END { }' tmp.dat > $1
rm tmp.dat
```

(2) Create a fault file of the data file by running the following script in the format

runMakeVflt datafile.dat datafile.vflt

runMakeVflt script:

```
#!/bin/sh

#Create Vertical Fault from scattered data

nawk -v fltnum=$3 'BEGIN {
            printf "# Type: vertical faults\n"
            printf "# Version: 3\n"
            printf "# Format: free\n"
            printf "# Field: 1 x\n"
            printf "# Field: 2 y\n"
            printf "# Field: 3 fltnum\n"
```


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```
            printf "# Projection: Local Rectangular\n"
            printf "# Units: unknown\n"
            printf "# End:\n"
        }
        {
            if(NF > 0) {
                printf "%8.4f\t%8.4f\t%d\n",$1,$2,fltnum
            }
        }
        END { }' $1 > $2
```

(3) The datafile.vflt is now a fault file.

g. Gridding the fault file.

(1) From the EarthVision window menu, select 2D-Minimum Tension Gridding from the Modeling menu.

(2) In the 2-D Minimum Tension Gridding window:

(a) Press the Scattered data button and select the scattered data file to contour with the fault.

(b) Press the Vertical faults button and select the newly created datafile.vflt.

(c) In the Range menu, select Get Range from Another Grid, and use that grid to determine gridding parameters. Gridding parameters can also be selected from the scattered data file.

(d) In the Calculate menu, select Normal minimum tension, or just push control+C on the keyboard.

(e) In the Normal Minimum Tension Grid window, enter a name for the Output grid file, and press now.

(f) When the gridding is finished, press OK in the Job Done window.

(g) Select exit from the File menu in the 2-D Minimum Tension Gridding window.

h. Contouring the fault to a grid file:

(1) In the earthVision window, select the Graphic Editor from the Edit menu.

(2) When the File name(s) window appears, enter a file name with the .iplt suffix, press Store, and Done.

(3) In the Graphic editor window, select the Add plot box mode from the Map menu. You may want to choose Display Coordinates from the Operations window first, to activate the coordinates window.

(4) To drag the plot box, start at coordinates 1,1, and drag the box to 6,9. This will create a 5x8 box for the contour. Close the Coordinates window if no longer needed.

(5) Press the Any button under Pick, and select the plot box so that it is highlighted.

(6) Under the File menu, select Open. In the Open Existing File window, select the file name of the newly created grid file. Select store (or hit return), and select Done.

(7) In the Contouring Information window, which should appear, change the contour interval to the desired range and select the More... button.

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(8) In the Contour Parameters window, in the Color-filled Contours section, push the desired radio button. If either variable or regular spacing is to be used, select that radio button and push the Edit contour list... button.

(9) In the Regulary or Variably Spaced CFC Parameters window, adjust the starting color and the Step through color table slides for the desired color and z range key. If desired, push the Preview button to check the map while adjusting the color. When finished, press Done.

(10) Press Done in the Contour Parameters window, and press OK in the Contouring Information window. Contouring should start in the plot box.

(11) Push "OK" in the contouring Information window. Contouring should begin.

(12) When contouring is complete, map should appear in the iplot window. Save the .plt file when complete, or add North arrow, scale bar, and print the map.

i. To add map layout:

(1) From the Map menu, select map layout.

(2) Annotate where ticks should appear, and the tick interval.

(3) Choose color and font, then press create. Push Close to exit Map layout window.

j. To add a North Arrow:

(1) Insure there is adequate room, about 1 inch, beneath the map.
(2) From the Map menu, select North Arrow.
(3) The North Arrow window should open.

(a) Set color, label size, and desired font.
(b) Push "create" when finished.

(4) When arrow is created, highlight by clicking the left mouse button. Then, holding down the right mouse button, move the arrow to the desired position.

k. To create a Scale Bar:

(1) Insure there is adequate room, about 1 inch, beneath the map.
(2) From the Map menu, select Scale Bars.
(3) The Scale Bars window should open.

(a) Enter the appropriate position for the Units Label Position (try Below center of bar), by selecting the desired radio button.
(b) Enter the Scale Bar Labels and Ticks values:

_1_. Enter appropriate values dependent upon X and Y values and intervals.

_2_. Enter the Label interval, that is the number of ticks in a row to be labelled (1 = every tick, 2 = every 2nd tick, 3 = every 3rd tick, etc...).

(c) Enter desired colors for line and label, and select font. Label size should be arould .1 or less.

(d) When all information has been entered, press the "create" button. If information is already entered

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and is being modified, press the "calc" button.

(4) When scale is created, highlight by clicking the left mouse button. Then, holding down the right mouse button, move the scale to the desired position.

l. To print the map:

(1) From the File menu in the Graphic Editor window, select "Drag plot window".
(2) Drag a retangle around the existing map, starting from the 0, 0 coordinate. The size of the retangle should be the approximate size of the paper to be used for the printing.
(3) Click the map (or .iplt) box with the left mouse button.
(4) While holding down the right mouse button, move the map to the center of the retangle.

(a) Keep in mind that the arrow and the scale will move with the map window.

(b) When centering, center the entire group, not just the map.

(5) From the File menu, select "Plot window...".

(a) Select the Encapsulated PostScript option.

(6) Enter a name for the plot file, with the suffix ".ps".
(7) In a regular shell, print the file to phaser or ps3825 as follows:

(a) For ps3825 (black and white), enter:

qpr -lps -Pps3825

(b) For Phaser printer (color), enter:

lpr -s -Pphaser

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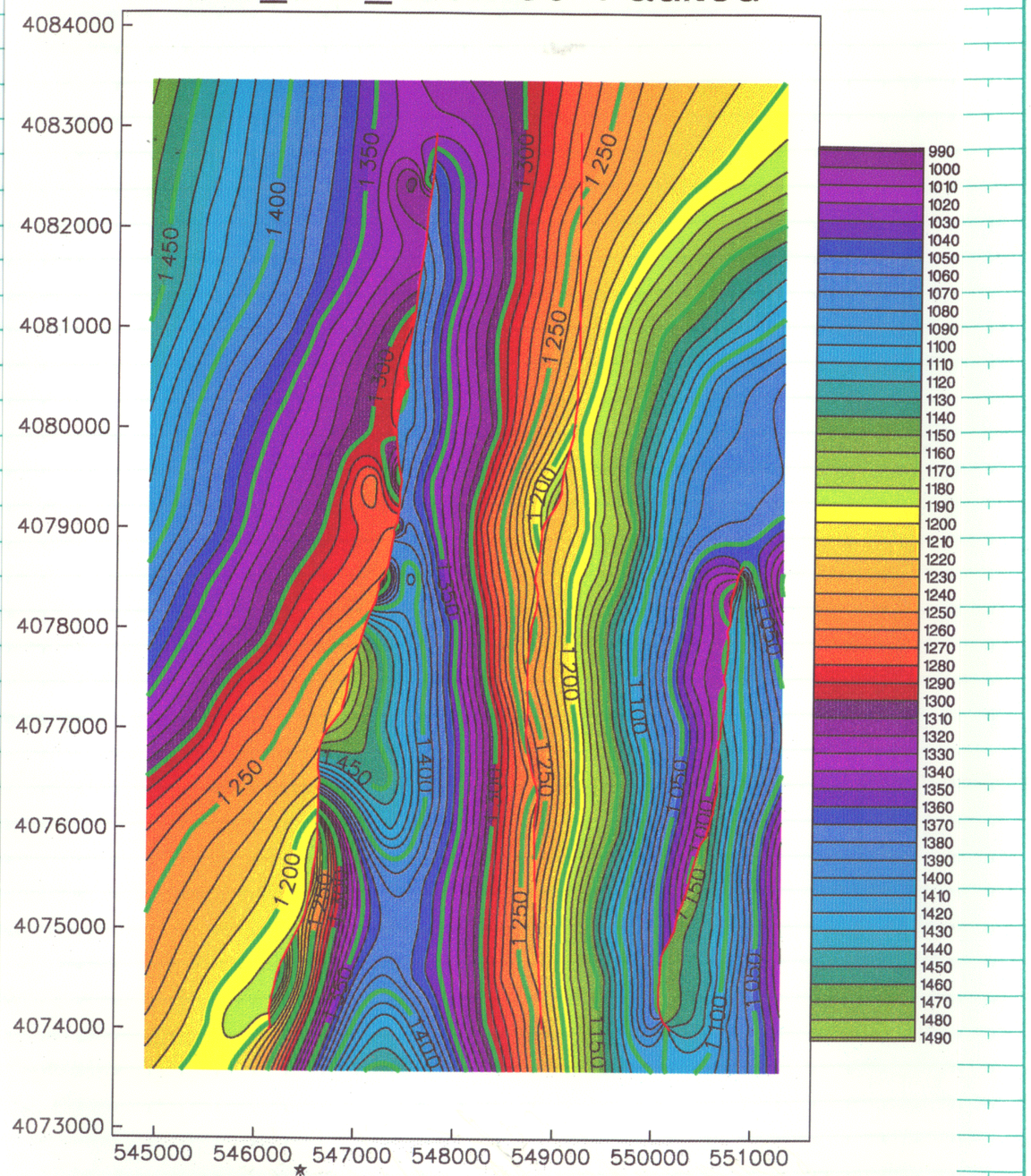
HRZ_010_100x150 Faulted



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Sep 20 1996 16:04 **build_3dgrid.txt** Page 1

```
5.  Given a scattered property xyzp (pdat) file, build a 100x150x10 3grd file.
    View the 3grd and pdat files in the 3dViewer.  Print the view from the
    3dViewer.

    a.  From the EarthVision window, select 3-D minimum tension gridding from
        the Modeling menu.

    b.  In the 3-D Minimum Tension Gridding window:

        (1)  Press the Scattered data button.  A file selection window will
             appear.  Select the desired .pdat file.

        (2)  In the Grid Ranges section, in the Grid Size row, enter x = 100,
             y = 150, and z = 10.

        (3)  Under the Calculate menu, select Normal minimum tension;

        (4)  In the Calculate window, enter a file name in the text box labeled
             Output file.  The best name to enter is the input file name
             with the .3grd suffix instead of the .pdat suffix.  Press Now
             when file name has been entered, and calculations will begin.

        (5)  When calculations are complete, press OK in the job done window.
             Exit the 3-D Minimum Tension Gridding window.

    c.  Enter the 3-D Viewer by typing "evview" in a unix shell, or selecting
        "3-D Viewer" from the Visualization menu of the Earth Vision window.
        Use the file selection menu to select the new .3grd file, then select
        the no more files entry at the bottom of the menu.

    d.  The image of the grid file should be in the display window.  To
        prepare the image for printing:

        (1)  To annotate the Axes on the display:

             (a)  Press ^6 on the keyboard or use the mouse to click the Axes
                  window.

             (b)  In the Axes' Caption section click on the X button.
                  In the Status window type; "X-Axis EASTING (M)".

             (c)  Click the Y button, and in the Status window type;
                  "Y-Axis NORTHING (M)".

             (d)  Click the Z button and in  the Status window type;
                  "Z-Axis ELEV(M)".

             (e)  Prss 1 on the keyboard or click the Main button under the
                  Menus section of the AXES window to return to the Main
                  Menu.

        (2)  To change the Title of the display or edit Color key:

             (a)  Press 8 on the keyboard, or use the mouse to select the Screen
                  window.

             (b)  To change the title:  Press F7 on the keyboard, or use the
                  mouse to select the "Edit display titles" button under the
                  Screen Annotation section.  In the Status window, enter the
                  desired title for the display, or press "Enter" on the
                  keyboard to blank out the present title.

             (c)  To choose the Color Key type:

                  [1]  Press "c" on the keyboard or click the Color key
                       display button to turn on the Color key selection pop_
                       up.

                  [2]  Select the applicable color key:

                       [a]  Property
```

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[b] Zone
[c] Z
[d] Feature
[e] Time

(d) To edit the Color Key:

[1] Press ";" on the keyboard or click the Edit color key display button to turn on the Edit Color Key pop-up window.

[2] Turn off all items except the Color Table and the Display Name.

(3) To change background color on the display:

(a) Press 9 on the keyboard, or use the mouse to select the Color button from the Main menu.

(b) Under the Background Color section of the menu, select the Reverse black/white button. The background on the display should be white for printing.

(4) To print the display to file, press the "Print Screen" key on the keyboard. In the Status Window, type the file name with a .rgb suffix.

(5) Minimize Earth Vision windows, in case the 3-D viewer is needed later.

f. Using Showcase to print image:

(1) Type "showcase &" at the shell window prompt.

(2) In the Page Menu, select the Page Gizmo

(a) Adjust the Page size for the applicable paper and printer to be used.

[1] The usual size for the ps3825 is 8 x 11 in.

[2] The usual size for the phaser color printer is 11 x 17.

(b) Close or minimize the Page Gizmo window.

(3) In the File menu select Insert, and under Insert, select Image.

(a) Select the applicable .rgb file from the Showcase File Browser.

(b) Push the accept button to select file and close window.

(4) The image should appear in the Showcase window.

(5) To resize the image so that it will fit on the page:

(a) Holding down the shift key on the keyboard, use the mouse to resize the display by clicking on a green dot in the corner of the display, holding down the left mouse button, and moving in or out to resize the display to the desired size.

(b) If the display has to be repositioned, release the shift key and position the cursor anywhere on the display. Hold down the left mouse button while moving the display to the desired location.

(6) To print the image to paper, select Print from the File menu. The Print Gizmo window should appear.

(a) To print to file:

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[1] Click on the Print to File box. A red checkmark should appear.

[2] Click on the Print button, or hit the return key on the keyboard.

[3] In the Showcase File Browser window, enter a file name with a .ps suffix. Click the Accept button, or press the return key on the keyboard.

NOTE: See step (7) below for another way to create a postscript file.

(b) To print to ps3825 or ps1725 printer:

[1] Use the mouse button to select the desired printer.

[2] Click the Print button, or press the return key on the keyboard.

(7) To save the image as a postscript file:

(a) Select Save As... from the File menu.

(b) Select ...As EPS from the Save As... sub menu.

(c) Enter a file name with a .ps suffix.

g. Printing files: In a regular unix shell, print the file to phaser color, or ps3825 and ps1725 black and white as follows:

(1) For ps3825 (black and whiter) enter:

qpr -lps -Pps3825 <filename>

(2) For ps1725 (black and white) enter:

qpr -lps -Pps1725 <filename>

(3) For phaser (color) enter:

lpr -s -Pphaser <filename>

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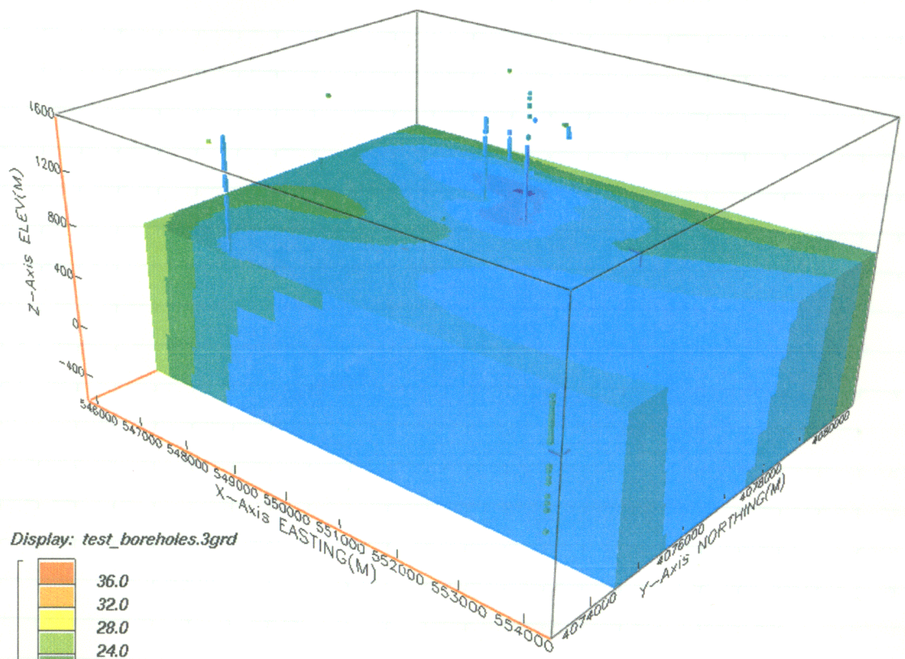
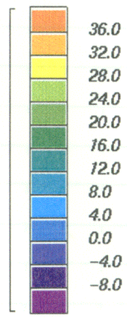
Borehole data from .pdat file
Displayed against .3grd file



Display: test_boreholes.3grd



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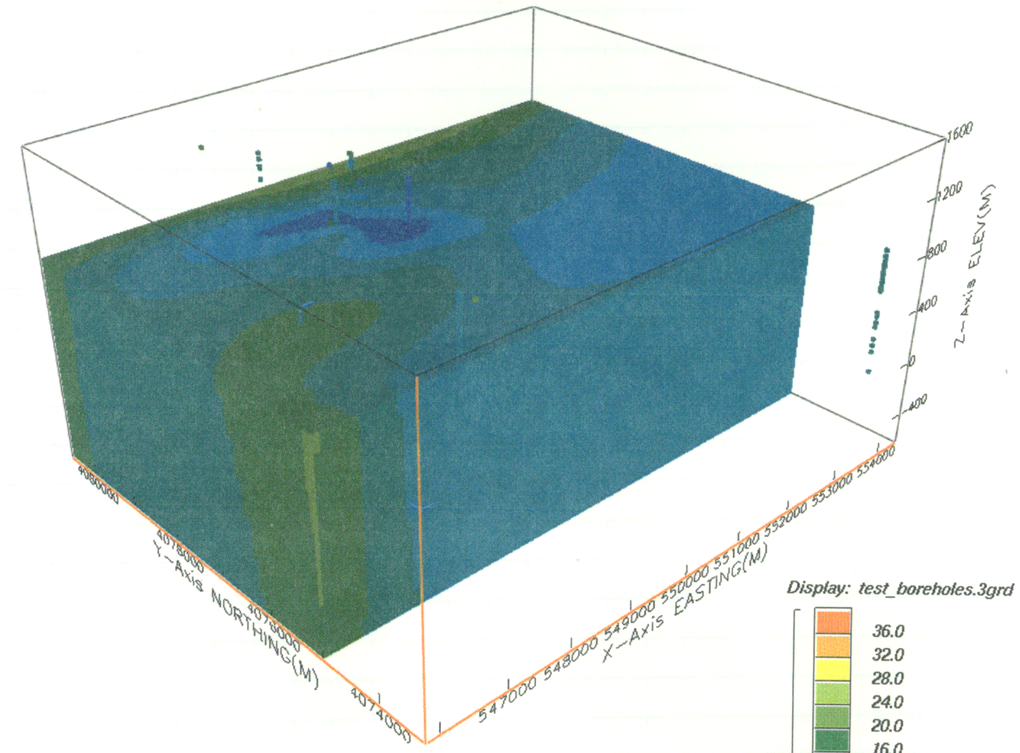
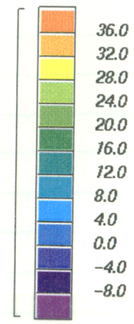
Borehole data from .pdat file
Displayed against .3grd file



Display: test_boreholes.3grd



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Sep 30 1996 15:42 **convert_2grd_to_faces.txt** Page 1

6. Convert two 2grd files to faces files, merge the faces files and view in the 3-DViewer. Print the merged faces file view.

   a. To accomplish this task, the 2grd files must be converted to .faces files and merged under a separate step.

   b. To convert the .2grd files to .faces files:

      (1) In the earthVision window, select the Modeling menu, and choose the "Faces Files Generation" option.

      (2) In the Faces File Generation window:

         (a) Click on the "Grid" button, and choose a 2grd or 3grd file.

         (b) In the section below, insure the Faces file radio button is on.

         (c) From the Range menu, choose one of the following, or enter the ranges in the Ranges section. If converting another file, it is best to use a common source for both files, to ensure the range is equal during the merge.

            [1] From a grid file.

            [2] From a faces file.

            [3] From a sequence file.

         (d) If only a small, specifically shaped display is to be made, use a Polygon to clip the structure. Select the desired polygon file by clicking on the "Polygon" button in the Lateral and Structural Clipping section of the window. Select the applicable polygon file from the Polygons file window. If no suitable polygon files are available, see the section on making polygon files.

         (e) From the Calculate menu, choose "Calculate faces file". The Calculate window will appear. Name the .faces file, preferably by just adding the .faces suffix to the original name. Click the "Now" button to begin calculations. A Monitor window will appear to show the status of the calculations.

         (f) When calculations are complete, a "Job Done" window will also appear. To view the file in the 3-DViewer, select the "View" button. It would be more expedient to view the file to check for accurate representation before the Faces File Generation window is closed. Otherwise, select "OK" to exit the "Job Done" window.

         (g) If there are no more files to convert, go to the File menu, and select Exit to close the Faces File Generation window.

   c. To merge two or more .faces files:

      (1) In the earthVision window, select the Modeling menu, and choose Faces File Merging. The window for Faces File Merging should appear.

      (2) In the Faces File Merging window:

         (a) Under the Edit mode:, press the "Add" radio button.

         (b) Click on the "Faces files" button to open the Faces Files selection window.

         (c) In the Faces Files selection window, select the first faces file for merging and click Select. As files for selected for merging, the Faces File Merging window adds spaces for faces files as long as the Edit Mode is in add or insert.

convert_2grd

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         (d) Select other faces files for merging until the desired number of files has been selected.

         (e) In the New Zone section of the window, insure that each file listed has a different number in this block, starting from one (1) and numbered in ascending order.

         (f) In the New Block section of the window, all files may have the same block number. However, do not use 0 or negative numbers for the block number.

         (g) When all files for the merge have been selected and properly marked for New Zone and New Block numbers, select "Merge" from the Calculate menu, to begin merging the files.

         (h) In the Calculate window, enter a file name for the merging faces file being created.

         (i) The Monitor window will appear to give the constant status of the calculation. When calculations are complete, the "Job Done" window appears and offers a choice of "OK", "View" or "Report". It is better to view the new file to insure that the image that of a proper merge. If not viewing, click "OK".

         (j) Select Exit from the File menu to close the Faces File Merging window.

   d. To view the image, select the View button in the "Job Done" window. Other options are to select "3-D Viewer from the Visualization menu of the "earthVision" window, or type "evview" in a unix shell. Select the image from the files displayed and the image should appear in the 3-D Viewer. To prepare the image for printing:

      (1) To annotate the Axes on the display:

         (a) Press ^6 on the keyboard or use the mouse to click the Axes window.

         (b) In the Axes' Caption section click on the X button. In the Status window type; "X-Axis EASTING (M)".

         (c) Click the Y button, and in the Status window type; "Y-Axis NORTHING (M)".

         (d) Click the Z button and in the Status window type; "Z-Axis ELEV(M)".

         (e) Prss 1 on the keyboard or click the Main button under the Menus section of the AXES window to return to the Main Menu.

      (2) To change the Title of the display or edit Color key:

         (a) Press 8 on the keyboard, or use the mouse to select the Screen window.

         (b) To change the title: Press F7 on the keyboard, or use the mouse to select the "Edit display titles" button under the Screen Annotation section. In the Status window, enter the desired title for the display, or press "Enter" on the keyboard to blank out the present title.

         (c) To choose the Color Key type:

            [1] Press "c" on the keyboard or click the Color key display button to turn on the Color key selection pop_ up.

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[2] Select the applicable color key:

[a] Property
[b] Zone
[c] Z
[d] Feature
[e] Time

(d) To edit the Color Key:

[1] Press ";" on the keyboard or click the Edit color key display button to turn on the Edit Color Key pop-up window.

[2] Turn off all items except the Color Table and the Display Name.

(3) To change background color on the display:

(a) Press 9 on the keyboard, or use the mouse to select the Color button from the Main menu.

(b) Under the Background Color section of the menu, select the Reverse black/white button. The background on the display should be white for printing.

(4) To print the display to file, press the "Print Screen" key on the keyboard. In the Status Window, type the file name with a .rgb suffix.

(5) Minimize Earth Vision windows, in case the 3-D viewer is needed later.

e. Using Showcase to print image:

(1) Type "showcase &" at the shell window prompt.

(2) In the Page Menu, select the Page Gizmo

(a) Adjust the Page size for the applicable paper and printer to be used.

[1] The usual size for the ps3825 is 8 x 11 in.

[2] The usual size for the phaser color printer is 11 x 17.

(b) Close or minimize the Page Gizmo window.

(3) In the File menu select Insert, and under Insert, select Image.

(a) Select the applicable .rgb file from the Showcase File Browser.

(b) Push the accept button to select file and close window.

(4) The image should appear in the Showcase window.

(5) To resize the image so that it will fit on the page:

(a) Holding down the shift key on the keyboard, use the mouse to resize the display by clicking on a green dot in the corner of the display, holding down the left mouse button, and moving in or out to resize the display to the desired size.

(b) If the display has to be repositioned, release the shift key and position the cursor anywhere on the display. Hold down the left mouse button while moving the display to the desired location.

(6) To print the image to paper, select Print from the File menu.

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The Print Gizmo window should appear.

(a) To print to file:

[1] Click on the Print to File box. A red checkmark should appear.

[2] Click on the Print button, or hit the return key on the keyboard.

[3] In the Showcase File Browser window, enter a file name with a .ps suffix. Click the Accept button, or press the return key on the keyboard.

NOTE: See step (7) below for another way to create a postscript file.

(b) To print to ps3825 or ps1725 printer:

[1] Use the mouse button to select the desired printer.

[2] Click the Print button, or press the return key on the keyboard.

(7) To save the image as a postscript file:

(a) Select Save As... from the File menu.

(b) Select ...As EPS from the Save As... sub menu.

(c) Enter a file name with a .ps suffix.

f. Printing files: In a regular unix shell, print the file to phaser color, or ps3825 and ps1725 black and white as follows:

(1) For ps3825 (black and whiter) enter:

qpr -lps -Pps3825 <filename>

(2) For ps1725 (black and white) enter:

qpr -lps -Pps1725 <filename>

(3) For phaser (color) enter:

lpr -s -Pphaser350 <filename>

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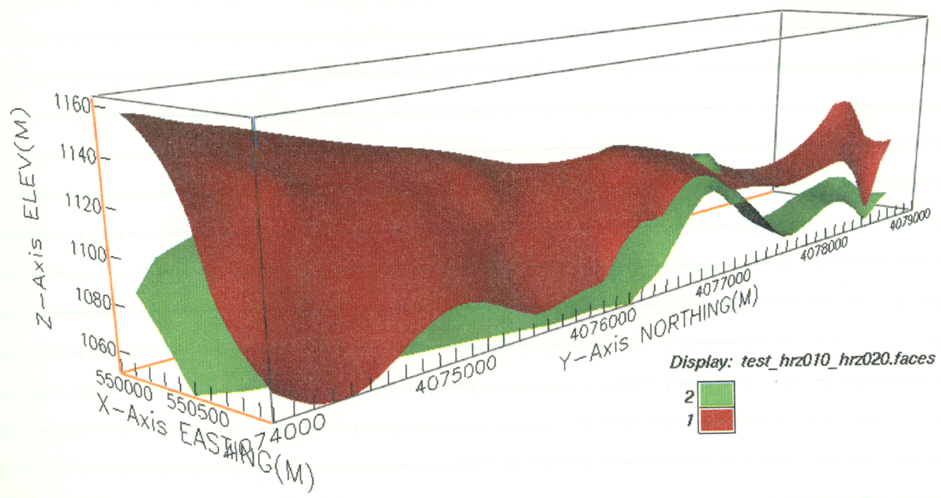

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Nov 8 1996 14:24 **struct_builder.txt** Page 1

7. Build a solid volume model using the Geologic Structure Builder (GSB) that contains several hoirzons and faults. Print the 3dViewer view of the volume model showing the calculated volume in the display.

   Note the geologic operation options in the GSB, (deposit, unconformity,..) try these out and note the differences.

   a. To begin, select the Modeling menu in the EarthVision window. Under the Modeling menu, select "Geologic structure builder". The Geologic Structure Builder window will open.

      (1) In the Geologic Structure Builder window, click the "ALL" block with the mouse pointer so that it is highlighted.

      (2) In the Model definition menu, select "Edit blocks..." to create an initial fault block. If no faults exist for the model, leave this section blank. To edit a fault block:

         (a) Open the Edit Fault Block window by selecting which location in the model to insert the fault block, and double clicking that location. Or simply highlight the location and choose "Edit blocks..." from the Model definition menu. To determine fault hierarchy, reference the EarthVision manual, Volume 3, page GSB-18.

         (b) In the "Name" section, enter the name to appear on the model to identify the fault location.

         (c) In the "Fault name" section, enter the name of the fault being entered in the location.

         (d) Press the "Fault surface" button and the Fault File window will appear. Select the applicable grid file for the fault.

         (e) If a boundary polygon file exists for the fault, click on the "Fault boundary polygon" button, and select the applicable polygon file from the window.

         (f) Enter the name of the above and below children, according to preference.

         (g) When all entries are satisfactory, click the "Apply" button, and highlight the next fault to be edited. When all faults are satisfactorily edited or entered, push the "Close" button.

      (3) To set the range of the model, select "Define Range" in the Model Definition menu. The "Define Range" window appears with the x, y, and z ranges, along with grid size. The range may be entered manually, or by file selection. The range must be smaller than or equal to the range of the smallest 2grd file being used in the model. The z range can be set to cover the lowest and highest anticipated values of the model, or it can be left blank. Choices for setting range are as follows:

         (a) Set XYZ Grid Range

            [1] Exact scattered data range

            [2] Scattered data range + 5%

            [3] From 3-D grid

            [4] From faces file

         (b) Set XY Grid Range

            [1] Exact scattered data range

            [2] Scattered data range + 5%

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[3] From 3-D grid

[4] From faces file

(c) Set Z Grid Range

[1] Exact scattered data range

[2] Scattered data range + 5%

[3] From 3-D grid

[4] From faces file

(4) When range is set, exit the Define Range window. From the "Model definition" menu, select "Select sequences". In the "Select Sequence window:

(a) In the Geologic Structure Builder window, click on the fault to be edited, so that the fault is highlighted in the window. Return to the Select Sequence window.

(b) In the Zone sections, enter names for each zone to be used in the model. Leaving the top zone space blank, enter the names of the zones with a grid.

(c) In the operation section, select Deposition, Unconformity, or Channel Erosion, to describe the zone property relating to the zone below it.

(d) Push the Grid button and a Grids window will appear to select the applicable grid files for each zone. Insure that the Edit mode (the radio buttons along the bottom of the Select Sequence window) is in the Select position, to select the zones to edit. After selecting the zone, select the .2grd file for that particular zone and fault position. Select a .2grd file for each zone.

(e) When settings have been made for the specified fault, go to the Geologic Structure Builder window and highlight the next fault. The zone names in the Select Sequence window will not change, nor will the operation settings change. However, new grids must be specified. Do this for every existing fault, according to the model being designed.

(f) When finished, select "Exit" from the "File" menu to close the window. All entries or changes will be saved in the model.

(5) When the model is complete, select the "Calculate" menu from the Geologic Structure Builder window.

(a) Select the "Structure Model" option of the Calculate menu, and select one of the following to create the desired model:

[1] Fault Surfaces - Creates a faces file of fault surfaces only.

[2] Fault Blocks - Creates a faces file containing fault blocks, with each fault block displayed as an individual solid object.

[3] Zone Surfaces - Creates a faces file of zone surfaces. Can also be used to create unfaulted models. Views of each zone resemble flying carpets.

[4] Zone Blocks - Creates a solid-model faces file of the geological framework. The display represents the zones in the model as solid objects in space that are limited by intersections with other zones or faults. This is

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the typical model created.

(b) After the proper model is selected for calculation, a window appears for naming the file with a .faces suffix. After the file is named and the calculate button is clicked the Checkpoint Monitor and the Calculating windows appear.

[1] The Calculating window allows for canceling the calculation, or rescheduling it. If the Reschedule option is used, the calculation will be scheduled for 10:00 pm.

[2] The Checkpoint Monitor window provides a way for checking calculation progress. As the calculations progress, the status displays under "Faces" will change for each Fault block from ToDo to Now, and from Now to Done.

(c) When calculations are complete, the Calculating window disappears and is replaced by the "Job Done" window. In this window, the new image can be seen in the 3-D Viewer by selecting the "View" option. The "Report" option may be used if the calculations failed to determine the area of failure.

b. To view the image, select the View button in the "Job Done" window. Other options are to select "3-D Viewer from the Visualization menu of the "earthVision" window, or type "evview" in a unix shell. Select the image from the files displayed and the image should appear in the 3-D Viewer. To prepare the image for printing:

(1) To annotate the Axes on the display:

(a) Press ^6 on the keyboard or use the mouse to click the Axes window.

(b) In the Axes' Caption section click on the X button. In the Status window type; "X-Axis EASTING (M)".

(c) Click the Y button, and in the Status window type; "Y-Axis NORTHING (M)".

(d) Click the Z button and in the Status window type; "Z-Axis ELEV(M)".

(e) Prss 1 on the keyboard or click the Main button under the Menus section of the AXES window to return to the Main Menu.

(2) To change the Title of the display or edit Color key:

(a) Press 8 on the keyboard, or use the mouse to select the Screen window.

(b) To change the title: Press F7 on the keyboard, or use the mouse to select the "Edit display titles" button under the Screen Annotation section. In the Status window, enter the desired title for the display, or press "Enter" on the keyboard to blank out the present title.

(c) To choose the Color Key type:

[1] Press "c" on the keyboard or click the Color key display button to turn on the Color key selection pop_ up.

[2] Select the applicable color key:

[a] Property
[b] Zone

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[c] Z
[d] Feature
[e] Time

(d) To edit the Color Key:

[1] Press ";" on the keyboard or click the Edit color key display button to turn on the Edit Color Key pop-up window.

[2] Turn off all items except the Color Table and the Display Name.

(3) To change background color on the display:

(a) Press 9 on the keyboard, or use the mouse to select the Color button from the Main menu.

(b) Under the Background Color section of the menu, select the Reverse black/white button. The background on the display should be white for printing.

(4) To print the display to file, press the "Print Screen" key on the keyboard. In the Status Window, type the file name with a .rgb suffix.

(5) Minimize Earth Vision windows, in case the 3-D viewer is needed later.

c. Using Showcase to print image:

(1) Type "showcase &" at the shell window prompt.

(2) In the Page Menu, select the Page Gizmo

(a) Adjust the Page size for the applicable paper and printer to be used.

[1] The usual size for the ps3825 is 8 x 11 in.

[2] The usual size for the phaser color printer is 11 x 17.

(b) Close or minimize the Page Gizmo window.

(3) In the File menu select Insert, and under Insert, select Image.

(a) Select the applicable .rgb file from the Showcase File Browser.

(b) Push the accept button to select file and close window.

(4) The image should appear in the Showcase window.

(5) To resize the image so that it will fit on the page:

(a) Holding down the shift key on the keyboard, use the mouse to resize the display by clicking on a green dot in the corner of the display, holding down the left mouse button, and moving in or out to resize the display to the desired size.

(b) If the display has to be repositioned, release the shift key and position the cursor anywhere on the display. Hold down the left mouse button while moving the display to the desired location.

(6) To print the image to paper, select Print from the File menu. The Print Gizmo window should appear.

(a) To print to file:

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[1] Click on the Print to File box. A red checkmark should appear.

[2] Click on the Print button, or hit the return key on the keyboard.

[3] In the Showcase File Browser window, enter a file name with a .ps suffix. Click the Accept button, or press the return key on the keyboard.

NOTE: See step (7) below for another way to create a postscript file.

(b) To print to ps3825 or ps1725 printer:

[1] Use the mouse button to select the desired printer.

[2] Click the Print button, or press the return key on the keyboard.

(7) To save the image as a postscript file:

(a) Select Save As... from the File menu.

(b) Select ...As EPS from the Save As... sub menu.

(c) Enter a file name with a .ps suffix.

d. Printing files: In a regular unix shell, print the file to phaser color, or ps3825 and ps1725 black and white as follows:

(1) For ps3825 (black and whiter) enter:

qpr -lps -Pps3825 <filename>

(2) For ps1725 (black and white) enter:

qpr -lps -Pps1725 <filename>

(3) For phaser (color) enter:

lpr -s -Pphaser350 <filename>

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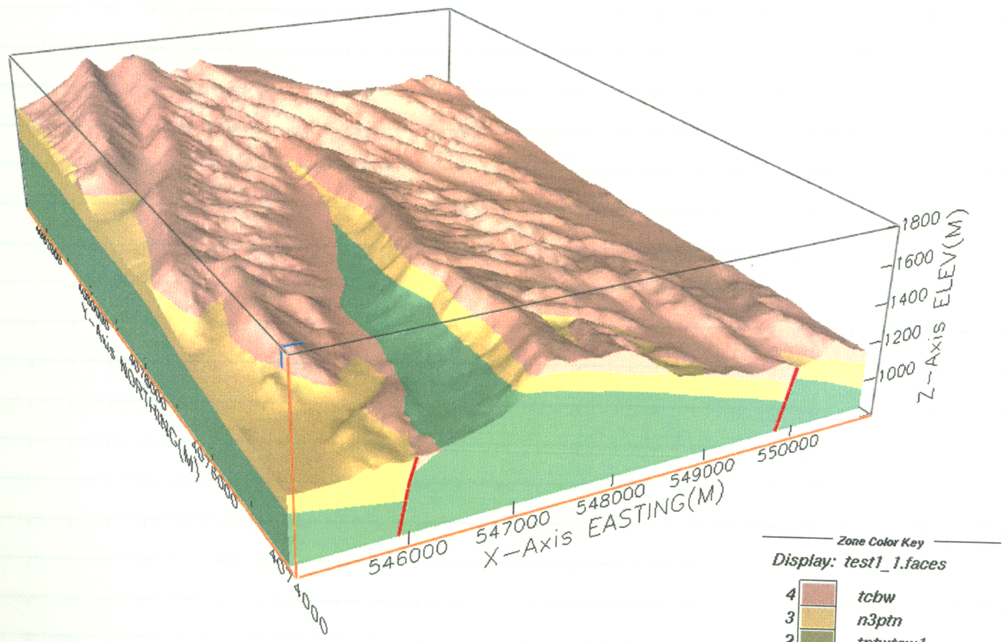
Block Structure, Channel corrosion of tptwtsw1 Layer



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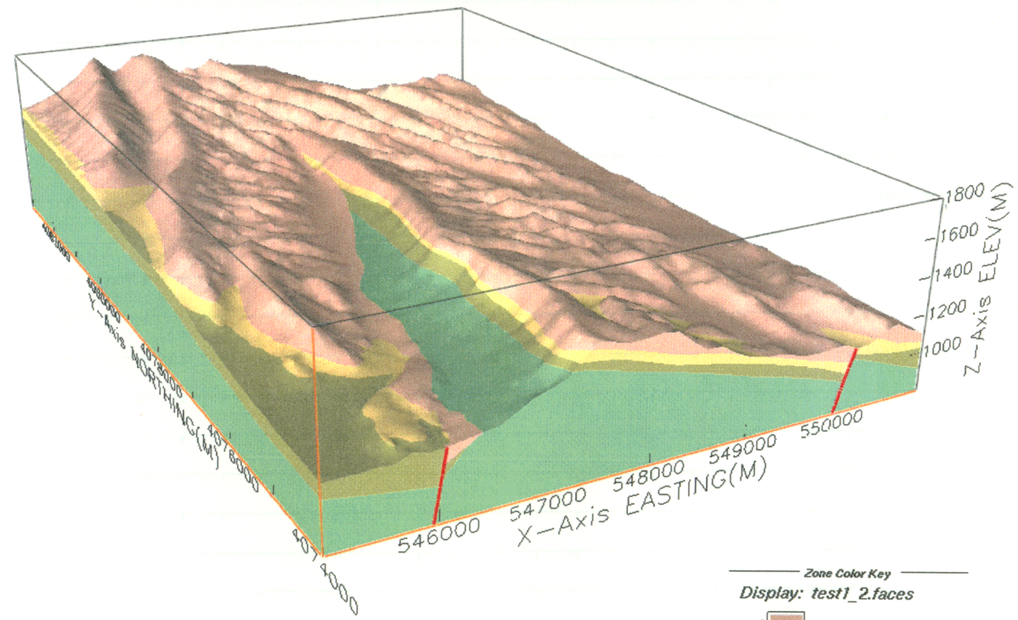
Block Structure, Unconformity



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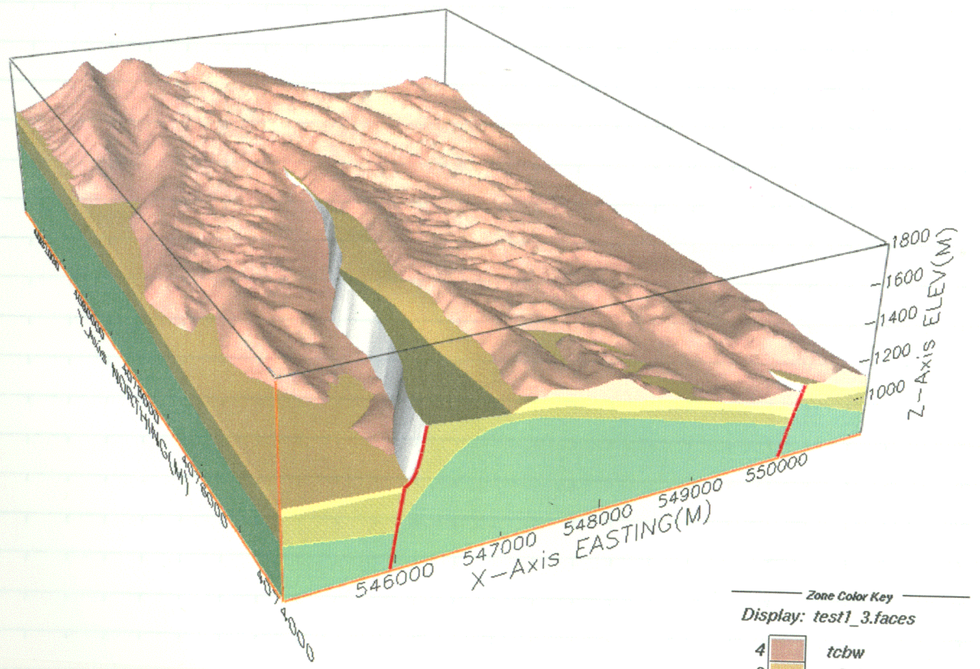
Block Structure, Deposition



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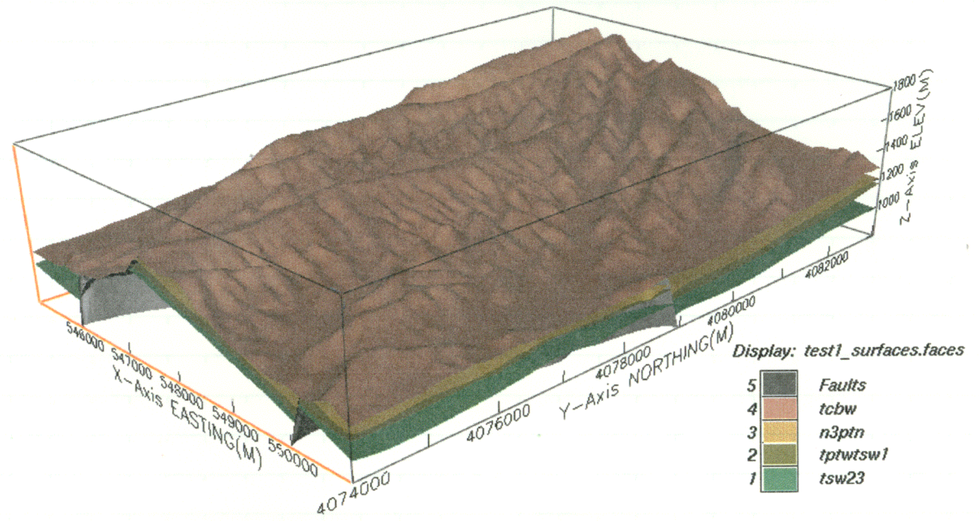
ZONE SURFACES STRUCTURE



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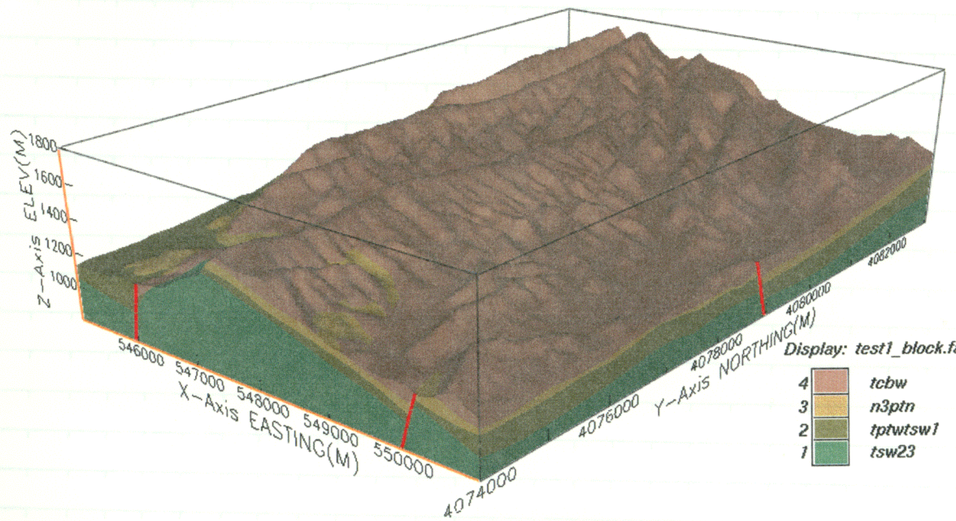
ZONE BLOCK STRUCTURE



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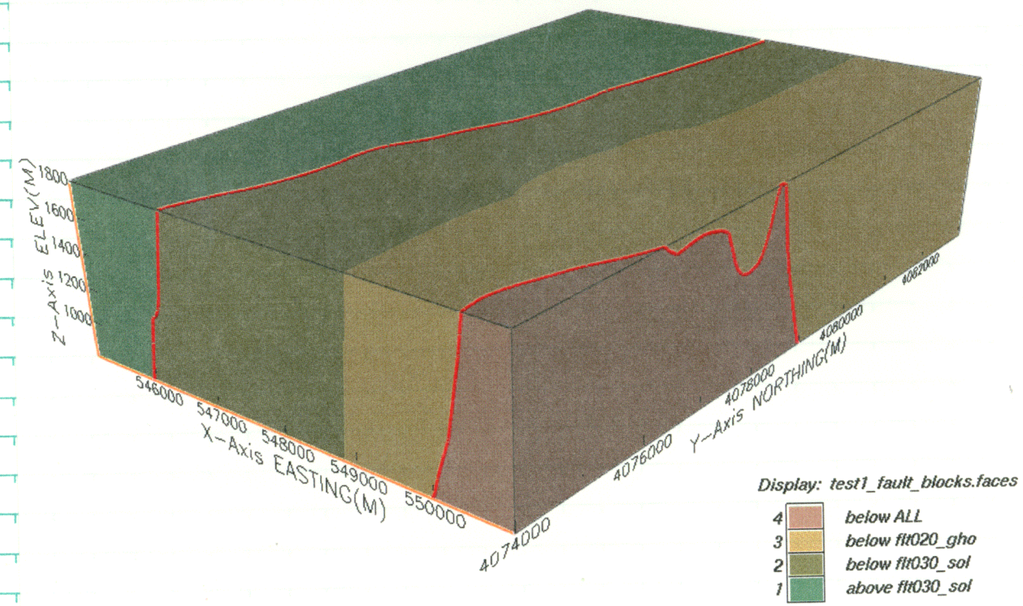
FAULT BLOCK STRUCTURE



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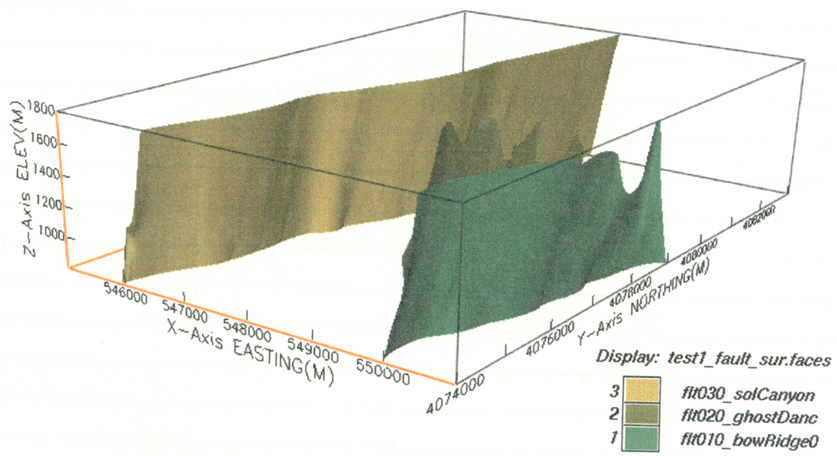
FAULT SURFACES STRUCTURE



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8. Create a cross section from the volume model above with a scale bar and legend. Print to the color printer.

   a. From the Earth Vision window, select Graphic Editor from the Edit menu, or type evedit on the command line of a unix shell window.

      (1) Select the following files to create a traverse line:

         (a) a07_3dmodel.ann - this file provides the model boundaries.

         (b) a31_3faults.ann - this file projects the three faults into the boundaries.

      (2) When all files selections are complete, press Done in the file selection window. The graphic display may have to be zoomed in or out for a full view of the boundary and fault displays.

      (3) In the File menu, select New. Name the file with a .trv prefix, and click the Store button. In the Edit Header window, click OK, and the window will close. In the Open New File window, insure that the new file is listed in the Data Currently in Editor box, and click Done.

      (4) In the File menu, select Files. Highlight the radio box next to the new file, and click the Make Active button. Next, click the Close button to close the Files Currently Stored in the Editor window.

      (5) To draw a traverse line, click on the Line box, and position the cursor to the coordinates where the line will start. Click the left mouse button to start the line, then draw the line to the desired location. The line must be drawn from top and left to bottom and right for proper facing of the resulting traversal line. When the line is properly positioned, click the left mouse button again to create the end point, then click the right mouse button to end the line.

      (6) Under the File menu, select the Save As.. option. Name the file, and give the file a .trv suffix.

      (7) Close the Graphic Editing window without saving changes to any other files.

   b. To generate the cross section annotation file:

      (1) From a unix shell, type "evfaces2xsec &" on the command line. The Cross Sections From Faces Files window should appear.

      (2) In this window, click on the Faces file button, and a file selection box will appear. Select the applicable .faces file.

      (3) Next click on the Traverse file button, and select the file created in step a(4). Push done in the file selection window to close it.

      (4) Enter the plot size as approximately 24" x 6", or a similar ratio.

      (5) Under the Calculate menu, select Cross section annotation..., and click it with the left mouse button.

      (6) In the Calculate window that appears, enter an appropriate file name suffixed by .ann, and click the Now button. When the calculations are complete, the Job Done window will appear. Select Edit to view the completed plot, or select OK to exit. It may be expedient to view the plot and check the colors and size. To change colors, select the zone to be changed from Cross Sections from Faces files window. Click the color of the zone to be changed, and a Zone color window will appear. Click on the desired color for the zone, and the colors will change. When finished with the Zone Color window, press done. Recalculate the file to ensure the changes take effect, and view again. When done, select exit from the File window.

   c. To create plot file from the annotation created:

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(1) Go to the Graphic Editor. In the File name(s) window, enter a file name with an .iplt suffix. Select Store, and Done. If the "View" has been chosen from the "Job Done" window, skip down to step (7).

(2) Under the Zoom menu, zoom out until the display is large enough to accomodate the plot size entered in step b(4).

(3) Under the Map menu, select Add plot box mode. Using the mouse, create a plot box by holding down the left mouse button, and dragging the mouse until the plot box is created in the display window. The plot box should be the approximate size of the plot specified in step b(4). If resizing is needed, select move vertex from the Action menu, or while positioned on a corner of the box, hold down the shift key and the right mouse button to reposition that corner and resize the box.

(4) Click on the Pick Any button on the side of the Graphic display, and click on the plot box to select it.

(5) Under the File menu, select open. In the Open Existing File window, select the .ann file previously created. Click the Store and Done buttons to select the file and close the window.

(6) To fill the plot box with the annotation file being displayed, under the Zoom menu select Range and Scale. Click the Exact button and the Set button to completely fill the plot box with the display.

(7) To add tick marks on the display, select the Map menu, and select Map layout. Select the Left and Bottom radio buttons to add tick marks to the left and bottom of map. Check intervals and changed to desired ranges. When done, press Create and Close to close window.

(8) To add a scale bar to the bottom of the display, select Scale Bar from the Map menu. In the Scale bar window, click the Below Center of Bar radio button. Check the sclae bar values and change if not satisfactory. When done, click the Create and Close buttons to create the scale bar and close the window.

(9) To add a pattern key (color legend) to the display, select Pattern key from the Map menu. In the Pattern Keys window, select the desired location and direction for the pattern text. Change font and label size if needed. Click the Create and Close buttons to exit window. In the Graphic Editing window, position the key to the desired location.

(10) Select Save from the File menu to save the .iplt file. If a print is desired, don't close the edit window, but go on to the next step. If no print is desired, close the edit window by selecting exit from the File menu.

d. To plot the annotation/iplt file to a printer:

(1) Drag a plot window around the display as follows:

(a) From the File menu, select Drag a Plot window, or hold down the Alt key and hold down the left mouse button as you drag the window around the display. Leave about a one inch margin in the plot box, on the left and bottom of the display.

(2) Once the plot window is in place, select, under the File menu, Plot Window. Under Plot Window, select Postscript. In the Plot File Name window, enter a file name with a .ps suffix.

(3) To check the file for an accurate display, use a unix shell and type "display <filename>" to display postscript file images. If the image is not satisfactory, make corrections in the Graphic Editing window, and check the display again.

(4) When satisfied with the display, minimize the Graphic Editing window and open a Showcase window for shaping output as follows:

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(a) Type "showcase" in a unix shell.

(b) In the Gizmos menu, select Page Gizmo.

[1] In the Page Gizmo, change the Page size by selecting the page size button, selecting English, and selecting 11 x 17.

[2] Minimize or close the Page Gizmo.

(c) Under the File menu, select Insert. Under Insert, select EPS. In the Showcase File Browser, enter the postscript file created in step d(2).

(d) To adjust position of the display, select Show Rotate Handles in the View menu, then from the View menu, select Rotate Snap.

[1] Select 45 degrees from the Rotate Snap submenu.

[2] Use the mouse to grab the rotate handle (the arrow on the green circle) and rotate the display 90 degrees.

[3] Click anywhere in display to grab it to reposition it to center of the page.

[4] To adjust the size of the display, grab the green corner of the display with the mouse, and hold down the shift key while adjusting. This allows resizing without affecting the display scale.

(e) Under the File menu, select Save As...EPS. The Showcase Print Gizmo will appear.

[1] In the Print Gizmo, click on the Print to File box, and a red check mark should appear.

[2] Click on the Print button, or hit return on the keyboard.

[3] In the Showcase File Browser window, enter a file name with a .ps suffix. Ensure that you can distinguish this file from the input file.

(4) Once the new .ps file is created, view it with ImageMagik by entering "display <filename>" in the unix shell. Problems in the image should be edited with Showcase or the Graphic Editor.

(5) To print the file, in a unix window, enter the applicable print command:

(a) For ps3825 (black and whiter) enter:

qpr -lps -Pps3825 <filename>

(b) For ps1725 (black and white) enter:

qpr -lps -Pps1725 <filename>

(c) For phaser (color) enter:

lpr -s -Pphaser500 <filename>

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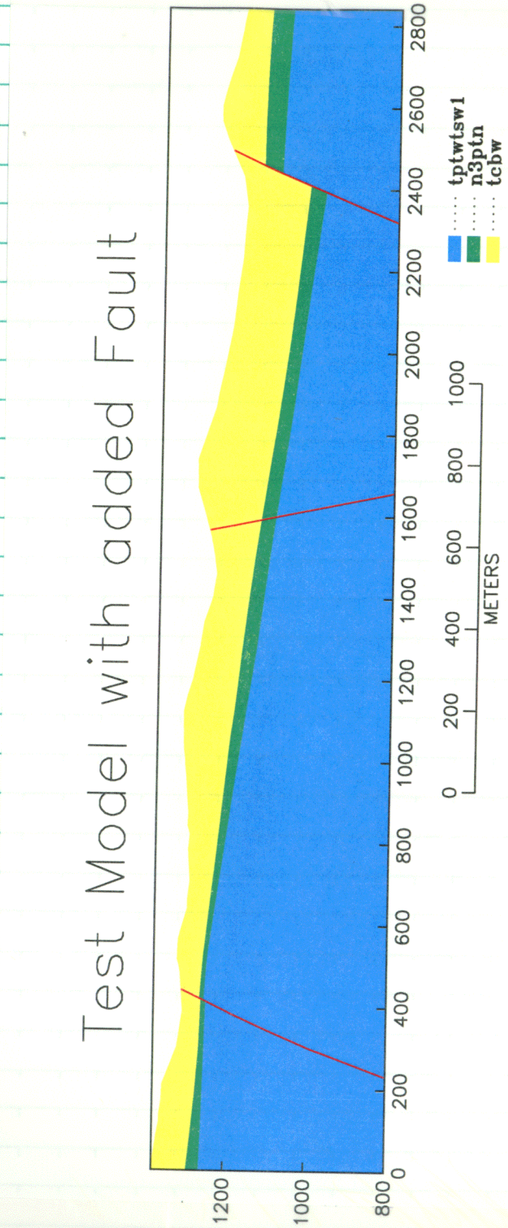

Nov 8 1996 08:54 **borehole_cross_section.txt** Page 1

9. Overlay the cross section with borehole data from a borehole that intersects the cross section.

   a. From the Earth Vision window, select Graphic Editor from the Edit menu, or type evedit on the command line of a unix shell window.

      (1) Select the following files to create a traverse line:

         (a) a07_3dmodel.ann - this file provides the model boundaries.

         (b) a31_3faults.ann - this file projects the three faults into the boundaries.

         (c) Select the applicable borehole file. Make this file the active file.

      (2) When all files selections are complete, press Done in the file selection window. The graphic display may have to be zoomed in or out for a full view of the boundary and fault displays.

      (3) To draw a traverse line, click on the Line box, and position the cursor to the coordinates where the line will start. Click the left mouse button to start the line, then draw the line to the desired location. The line MUST be drawn through the borehole. Also, line must be drawn from top left to bottom and rignt. When the line is properly positioned, click the left mouse button again to create the end point, then click the right mouse button to end the line.

      (4) If unused boreholes exist in the file, select Pick from the Graphic Editing buttons to the left, then delete extra boreholes by clicking them with the left mouse button, and then pressing the delete key on the keyboard.

      (5) Under the File menu, select the Save As.. option. Name the file, and give the file a .trv suffix. DO NOT allow changes in the borehole data file.

      (6) Close the Graphic Editing window without saving changes to any other files, or minimize, so that changes may be made later.

   b. To generate the cross section annotation file:

      (1) From a unix shell, type "evfaces2xsec &" on the command line. The Cross Sections From Faces Files window should appear.

      (2) In this window, click on the Faces file button, and a file selection box will appear. Select the applicable .faces file.

      (3) Next click on the Traverse file button, and select the file created in step a(4). Push done in the file selection window to close it.

      (4) Enter the plot size as approximately 24" x 8", or an appropriate ratio, so that the scale distance for the x-axis is equal to the scale distance for the y-axis.

      (5) Under the Calculate menu, select Cross section annotation..., and click it with the left mouse button.

      (6) In the Calculate window that appears, enter an appropriate file name suffixed by .ann, and click the Now button. When the calculations are complete, the Job Done window will appear. Select Edit to view the completed plot, or select OK to exit. It may be expedient to view the plot and check the colors and size.

         (a) To change colors, select the zone to be changed from Cross Sections from Faces files window. Click the color of the zone to be changed, and a Zone color window will appear. Click on the desired color for the zone, and the colors will change. When finished with the Zone Color window, press done.

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(b) To check the plot size and scale distance, first select Box Range and Scale from the Box menu of the Graphic Editor.

[1] In the Set Range and Scale of Plot Boxes menu, select the Exact button, then the Set button. Select Close to close the window. This causes the box to conform to the exact size of the drawing.

[2] In the Map menu, select Map Layout. In the Map Layout window, enter the desired Tick Intervals (200 is a suggested interval for both), and click the Left and Bottom radio buttons. Press the Create button to create the ticks, and the Close button to close the window.

(c) Recalculate the file from the Cross Sections From Faces Files window, to ensure the changes take effect, and reconfigure again. When done, select exit from the File window in the Graphic Editor, and close the window for the Cross Sections From Faces Files window.

c. To create a borehole annotation file from the borehole .pdat file:

(1) Open the Graphic Editor, and load the newly created annotation file for the cross section.

(a) Under the Operations menu select Display Coordinates.

(b) Move the cursor near the borehole crease in the cross section annotation, and push the Escape key on the keyboard. The cursor has moved to the crease, and the crease has been highlighted in the drawing. Note the x-axis reading in the Coordinates window. This reading will be used to position the borehole annotation file later. Once the x-axis reading is obtained, close the Graphic Editor.

(2) In the Main EarthVision window, select the Utilities menu. Under Utilities, select the SwRI Utilities menu, and select the "XYZ to XY" option.

(a) In the Convert XYZ to XY window, make the following entries:

[1] Enter the applicable borehole .pdat file in the Input xyz.pdat file section.

[2] For the Constant X value, enter the x-axis documented from step c(1)(b).

[3] For the Output xy.pdat file, enter a name for the new .pdat file. It is helpful if the name is similar to the old .pdat file used above.

(b) When all data is entered, select the Calculate option under the Calculate menu in the Convert XYZ to XY window. The Output xy.pdat file will be needed for the next step.

(3) In a unix shell window, run the following script command line:

runPdatToAnn xy.pdat

(a) If the script runPdatToAnn is not loaded, the below script can be entered:

```
#!/bin/sh

# Usage: runPdatToAnn <inFile.pdat>

# David W. Allen
# 10-26-95
# Convert borehole PDAT files with numeric property values
# into corresponding lithologic titles.
# Numeric values are listed in file "PROP_LIST.TXT"
```


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```
#
# Modified 11-6-96 by Danny Skelton
# added if($4 ~ /[A-z]+/) statement to convert files already annotated
# with lithologic titles in the fourth field.

outFile=`echo $1 | nawk -F "." '{print $1}'`.ann
outFile1=`echo $1 | nawk -F "." '{print $1}'`.ann1

echo "Convert from PDAT to ANN, $1, $outFile..."
nawk 'BEGIN{
        printf "# Type: annotation data\n"
        printf "# Version: 1\n"
        printf "# Format: free\n"
        printf "# Field: 1 x\n"
        printf "# Field: 2 y\n"
        printf "# Projection: Local Rectangular\n"
        printf "# Units: unknown\n"
        printf "# End:"
        printf "# Version_of_attributes: 2.1\n"
        printf "# Plotting_units: inches\n"
        printf "# Scale: 500\n"
        printf "# Attributes: \"Text 1\"\n"
        printf "#       type: text\n"
        printf "#       size: 0.1\n"
        printf "# Attributes: \"Symbol 1\"\n"
        printf "#       type: symbol\n"
        printf "#       size: 0.2\n"
        printf "# End_attributes:\n"
        printf "version 2.1\n"
        printf "setatr \"Text 1\"\n"
        }
        {
          if ((NF > 0)&&(substr($1,1,1) != "#")) {
             printf "srftxt 0\n"
             if($4 ~ /[A-z]+/)  {
                printf "%10.4f\t%10.4f\t\"%s\"\n",$1,$2,$4
             }
             else if($4 == 0.0) {
                printf "%10.4f\t%10.4f\t\"Alluvium\"\n",$1,$2
             }
             else if($4 == 1.1) {
                printf "%10.4f\t%10.4f\t\"Tiva Canyon\"\n",$1,$2
             }
             else if($4 == 1.2) {
                printf "%10.4f\t%10.4f\t\"Bedded Tuff\"\n",$1,$2
             }
             else if($4 == 1.3) {
                printf "%10.4f\t%10.4f\t\"Yucca Mountain\"\n",$1,$2
             }
             else if($4 == 1.4) {
                printf "%10.4f\t%10.4f\t\"Bedded Tuff\"\n",$1,$2
             }
             else if($4 == 1.5) {
                printf "%10.4f\t%10.4f\t\"Pah Canyon\"\n",$1,$2
             }
             else if($4 == 1.6) {
                printf "%10.4f\t%10.4f\t\"Bedded Tuff\"\n",$1,$2
             }
             else if($4 == 1.7) {
                printf "%10.4f\t%10.4f\t\"Topopah Spring\"\n",$1,$2
             }
             else if($4 == 1.8) {
                printf "%10.4f\t%10.4f\t\"Bedded Tuff\"\n",$1,$2
             }
             else if($4 == 2.1) {
                printf "%10.4f\t%10.4f\t\"Tuffaceous Beds\"\n",$1,$2
             }
             else if($4 == 2.2) {
                printf "%10.4f\t%10.4f\t\"Bedded Tuff\"\n",$1,$2
             }
             else if($4 == 3.1) {
```


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```
                printf "%10.4f\t%10.4f\t\"Prow Pass\"\n",$1,$2
             }
             else if($4 == 3.2) {
                printf "%10.4f\t%10.4f\t\"Bedded Tuff\"\n",$1,$2
             }
             else if($4 == 3.3) {
                printf "%10.4f\t%10.4f\t\"Bullfrog\"\n",$1,$2
             }
             else if($4 == 3.4) {
                printf "%10.4f\t%10.4f\t\"Bedded Tuff\"\n",$1,$2
             }
             else if($4 == 3.5) {
                printf "%10.4f\t%10.4f\t\"Tram\"\n",$1,$2
             }
             else if($4 == 3.6) {
                printf "%10.4f\t%10.4f\t\"Bedded Tuff\"\n",$1,$2
             }
             else if($4 == 4) {
                printf "%10.4f\t%10.4f\t\"Lava and Flow Breccia\"\n",$1,$2
             }
             else if($4 == 5) {
                printf "%10.4f\t%10.4f\t\"Lithic Ridge Tuff\"\n",$1,$2
             }
             else if($4 >= 5.1)  {
                printf "%10.4f\t%10.4f\t\"%2.1f\"\n",$1,$2,$4
             }

          }
       }
       END{  }' $1 > $outFile1

outFile2=`echo $1 | nawk -F "." '{print $1}'`.ann2

nawk 'BEGIN{
       printf "setatr \"Symbol 1\"\n"
       }
       {
         if ((NF > 0)&&(substr($1,1,1) != "#")) {
            printf "srfsym\n"
            printf "%10.4f\t%10.4f\n",$1,$2
         }
       }
       END{  }' $1 > $outFile2
cat $outFile1 $outFile2 > $outFile
rm $outFile1
rm $outFile2
echo "Finished. \007"
```

(b) The resulting output is an xy.ann file, using the name of the .pdat file, but changing the suffix to .ann.

(4) The new borehole annotation file will be used in the final plot file.

d. To create plot file from the annotation created:

(1) Go to the Graphic Editor. In the File name(s) window, enter a file name with an .iplt suffix. Select Store, and Done. If the "View" has been chosen from the "Job Done" window, skip down to step (7).

(2) Under the Zoom menu, zoom out until the display is large enough to accomodate the plot size entered in step b(4).

(3) Under the Map menu, select Add plot box mode. Using the mouse, create a plot box by holding down the left mouse button, and dragging the mouse until the plot box is created in the display window. The plot box should be the approximate size of the plot specified in step b(4). If resizing is needed, select move vertex from the Action menu, or while positioned on a corner of the box, hold down the shift

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key and the right mouse button to reposition that corner and resize the box.

(4) Click on the Pick Any button on the side of the Graphic display, and click on the plot box to select it.

(5) Under the File menu, select open. In the Open Existing File window, select the .ann file previously created. Click the Store buttons to select the file. Next, select the borehole annotation file created above, and click the store button. Finally, click the Done button to close the window.

(6) To fill the plot box with the annotation file being displayed, under the Zoom menu select Range and Scale. Click the Exact button and the Set button to completely fill the plot box with the display.

(7) To add tick marks on the display, select the Map menu, and select Map layout. Select the Left and Bottom radio buttons to add tick marks to the left and bottom of map. Check intervals and changed to desired ranges. When done, press Create and Close to close window.

(8) To add a scale bar to the bottom of the display, select Scale Bar from the Map menu. In the Scale bar window, click the Below Center of Bar radio button. Check the sclae bar values and change if not satisfactory. When done, click the Create and Close buttons to create the scale bar and close the window.

(9) To add a pattern key (color legend) to the display, select Pattern key from the Map menu. In the Pattern Keys window, select the desired location and direction for the pattern text. Change font and label size if needed. Click the Create and Close buttons to exit window. In the Graphic Editing window, position the key to the desired location.

(10) To move the labels around on the borehole annotation:

(a) From the File menu, select Files.

(b) In the Files Currently Stored in the Editor window, click the radio button opposite the borehole annotation file, then select Make active from the buttons on the bottom.

(c) Back in the Graphic Editing window, click the Pick Any button on the left side of the window. Select whatever attribute or label you wish to edit. To move the label, hold the right mouse button and position the cursor to the desired location. Release the mouse button and the label is repositioned.

(d) Labels may be repositioned slightly for better visibility if there are too many annotations in one area.

(e) When done, go to the Files Currently Stored in the Editor window and select the radio button opposite the .iplt file. Select the Make active button at the bottom to reactivate the .iplt file editing. Select Close to close the Files Currently Stored in the Editor window.

(11) Select Save from the File menu to save the .iplt file. If a print is desired, don't close the edit window, but go on to the next step. If no print is desired, close the edit window by selecting exit from the File menu.

e. To plot the annotation/iplt file to a printer:

(1) Drag a plot window around the display as follows:

(a) From the File menu, select Drag a Plot window, or hold down the Alt key and hold down the left mouse button as you drag the window around the display. Leave about a one inch margin in the plot box, on the left and bottom of the display.

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Nov 8 1996 08:54 **borehole_cross_section.txt** Page 6

(2) Once the plot window is in place, select, under the File menu, Plot Window. Under Plot Window, select Postscript. In the Plot File Name window, enter a file name with a .ps suffix.

(3) To check the file for an accurate display, use a unix shell and type "display <filename>" to display postscript file images. If the image is not satisfactory, make corrections in the Graphic Editing window, and check the display again.

(4) When satisfied with the display, minimize the Graphic Editing window and open a Showcase window for shaping output as follows:

(a) Type "showcase" in a unix shell.

(b) In the Gizmos menu, select Page Gizmo.

[1] In the Page Gizmo, change the Page size by selecting the page size button, selecting English, and selecting 11 x 17.

[2] Minimize or close the Page Gizmo.

(c) Under the File menu, select Insert. Under Insert, select EPS. In the Showcase File Browser, enter the postscript file created in step d(2).

(d) To adjust position of the display, select Show Rotate Handles in the View menu, then from the View menu, select Rotate Snap.

[1] Select 45 degrees from the Rotate Snap submenu.

[2] Use the mouse to grab the rotate handle (the arrow on the green circle) and rotate the display 90 degrees.

[3] Click anywhere in display to grab it to reposition it to center of the page.

[4] To adjust the size of the display, grab the green corner of the display with the mouse, and hold down the shift key while adjusting. This allows resizing without affecting the display scale.

(e) Under the File menu, select Save As...EPS. The Showcase Print Gizmo will appear.

[1] In the Print Gizmo, click on the Print to File box, and a red check mark should appear.

[2] Click on the Print button, or hit return on the keyboard.

[3] In the Showcase File Browser window, enter a file name with a .ps suffix. Ensure that you can distinguish this file from the input file.

(4) Once the new .ps file is created, view it with ImageMagik by entering "display <filename>" in the unix shell. Problems in the image should be edited with Showcase or the Graphic Editor.

(5) To print the file, in a unix window, enter the applicable print command:

(a) For ps3825 (black and whiter) enter:

qpr -lps -Pps3825 <filename>

(b) For ps1725 (black and white) enter:

qpr -lps -Pps1725 <filename>

(c) For phaser (color) enter:

lpr -s -Pphaser500 <filename>

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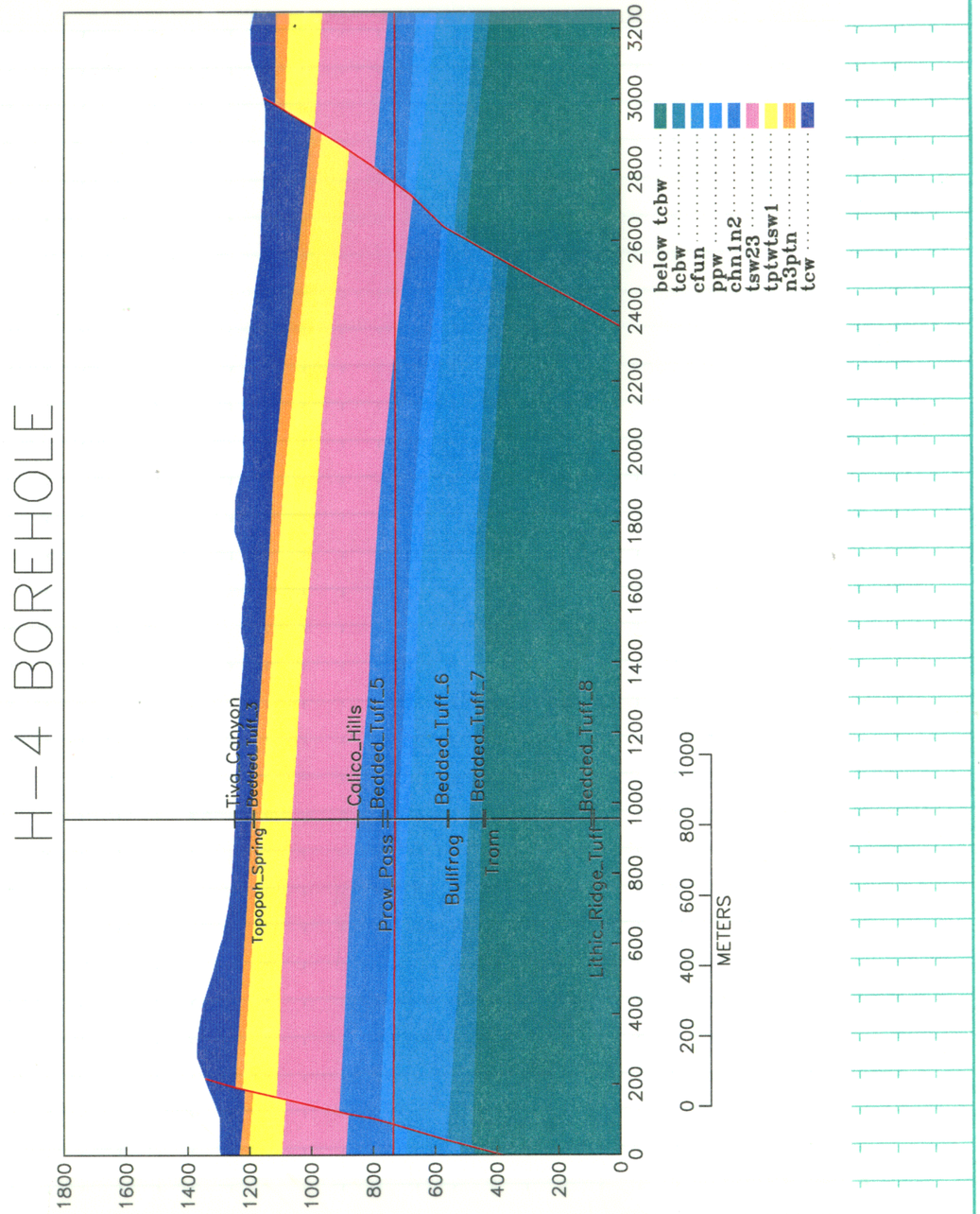

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10. Create a macro that accepts an input 2grd and a dat file. For each point in the .dat file find the z value of the grid at that point and print to a dat file.

a. Creating script for interpolating z data from a grid file:

(1) In the Utilities menu of the earthVision window, select the "Formula Processing" option.

(2) In the bottom section of the "evfp" window, select the "Grid Functions" button. A "Grid Functions" window will appear. Select the "bakint" button from this window, then close the window.

(3) The text section on the bottom of the "evfp" window now displays the format for bakint, or back interpolating a z value from a grid file. The upper text section displays the function "bakint()", and is ready for the variables to be inserted for calculation. Insert "outfile.dat<z>=" before "bakint()".

(a) With the cursor of the upper text window between the two parenthesis "()", click on the "2-D grids" button to select a 2-D grid file. Since only the script will be saved, the file selected is unimportant. put a comma (,) behind this entry in the text section of the window.

(b) Next, click on the "Scattered data" button. Once a file is selected from the "Scattered datas" window, a window for Field choices will appear. Select "x" and click OK. The selected file now appears in the text section, within the parenthesis, followed by "<x>". Put a comma behind this entry in the text section, and select the same file, with "y" for the Field Choice. The formula should similar to the following:

outfile.dat<z>=bakint(infile.2grd, infile.dat<x>, infile.dat<y>)

(c) In the "Calculate" meun of the "evfp" window, select "Formula".

(d) In the "Calculate" window, click on the "Delete Script" button and select "Keep script". Annotate the script name for later referral, or enter a desired name for the script. Select the "Now" button to begin calculations.

(e) The script is now created for use. The following is an example of the output script:

```
#!/bin/sh -e

ev_fpfp -u -F ev-gmx/svp  << 'EOF'
outfile.dat<z> = bakint(infile.2grd, infile.dat<x>,infile.dat<y>
)

EOF
```

b. Writing the macro from the script:

(1) Use the vi editor to draft the script by typing "vi scriptname" on the command line of a unix shell. The following references will be useful in writing scripts:

(a) sed & awk UNIX Power Tools book, by Dale Dougherty.

(b) The following man pages will be useful:

[1] man sh

[2] man test

macro_wr

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[3] man nawk

(2) The first line of the script should invoke a unix shell for the macro. Type "# !/bin/sh" for the first line of the script.

(3) This particular script needs two arguments for inputs, a grid file and a data file. To ensure the proper number of arguments are present for the input, type in the following lines:

```
if [ $# -ne 2 ]
then
   echo "Usage: $0 infile.dat infile.2grd"
   exit
fi
```

(4) Assign values to the input arguments with the following lines:

```
indat=$1
ingrd=$2
```

(5) There will be two nawk functions in the script. The first nawk converts the EarthVision script into a shell command and creates an output of the script and a z-value for each set of input coordinates from infile.dat. The second nawk function prints the x, y, and z values to an output file called outfile.dat.

```
////////////////////////////////////////////////////////////////////////////////
#!/bin/sh
# program runFindZ
# written by Brent Henderson and Danny Skelton
# 10-8-96
# This program accepts an input .2grd file and
# a .dat file.
# For each point in the .dat file, the macro finds
# the z value of the grid at that point and
# prints the results to a file called
# outfile.dat
#

if [ $# -ne 2 ]
then
   echo "Usage: $0 infile.dat infile.2grd"
   exit
fi

indat=$1
ingrd=$2

nawk '{
   if (substr($0,1,1) != "#") {
      cmd1 = sprintf("#!/bin/sh -e\nev_fpfp -u -F ev-gmx/svp << 'EOF'\nbakint(%s,
%f,%f)\nEOF\n", grd, $1, $2)
      system(cmd1)
   }
  }' grd=$ingrd $indat | \
nawk '{
      printf "%20.8f %20.8f %20.8f\n", substr($0, 21, 13), substr($0, 35, 14), $
3 > "outfile.dat"

      }'

exit
////////////////////////////////////////////////////////////////////////////////
```

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12. Given the existing model, create a data file gridded 50 x 50 x 10 meters, at x, y, and z coordinates respectively.

a. From the main EarthVision window menu, select, under Modeling, 2-D Minimum Tension Gridding.

(1) In the 2-D Minimum Tension Gridding window:

(a) Press the Scattered data button and select a scattered data file to grid.

(b) Under the Range menu, select "Get Range from Another Grid", and use the topo020.2grd to set the x and y range. The topo020.2grd file is the top grid for the model, and is the best file to use for a standard range.

(c) Set Grid spacing for x and y to 50.

(d) Under the Calculate menu, select Normal Minimum Tension.

(e) In the Calculate window, enter a name for the .2grd file, and push the Now button to begin calculations.

(f) When gridding is complete, exit the 2-D Minimum Tension Gridding window.

(2) Make note of the .2grd file name.

(3) If more than one data file is to be gridded, complete the above steps for each file.

b. To change the .2grd file to a gridded data file, select the Utilities menu from the main EarthVision window menu.

(1) From the DGI Gifts selection under the Utilities menu, select the Export Grids option.

(2) In the Export Grids window, enter the .2grd file name in the Grid window. Select a new name for the Output Scattered data file, and enter the name in the window. Make sure the radio buttons are annotated to Include header. Select Calculate from the menu and calculate the .dat file.

(3) If more than one .2grd file has been created, repeat the above steps for each file.

c. If more than one .dat file has been created, combined them into one data file.

(1) Under DGI Gifts in the Utilities menu, select Combine Data Files.

(2) In the Scattered Data Merge window:

(a) Push the Scattered Data Files button to bring up the Scattered Data Files select window.

(b) In the Scattered Data Merge window, set the Edit Mode to Add.

(c) Enter a name for the combined file in the Combined file name text window.

(d) Select a file to be included in the combined file and enter the name under the scattered Data Files window. After the file name has been entered, touch the radio button to the left to create a new file input text window. Repeat this until all input files have been selected.

(e) When all input Scattered data files have been entered, select Combine Data from the Combine menu.

Danny Skelton 1/27/97

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(3) To add zones to the files execute the runAddZone script from a unix shell window by redirecting the input file into the script and redirecting the output into a file as shown below:

runAddZone < combined_input.dat > output.dat

(a) The runAddZone script prints a header to the output file, selects the zones from the combined_data file, and prints the zone as a fourth column for the data. The script is written as follows:

```
#!/bin/sh
# program runAddZone
# written by Danny Skelton
# 01-17-97
# This program accepts an EarthVision combined data file and
# prints the x, y, z, coordinates and the zone into
# the output file.
# Files are input and out thru redirection.

printf "# Description: Combined from these scattered data files:\n"
printf "# (dskelton, 01/17/97)\n"
printf "# Description: hrz010_n3ptn.dat<z>\n"
printf "# Description: hrz020_tptwtsw1.dat<z>\n"
printf "# Description: hrz030_tsw23.dat<z>\n"
printf "# Description: hrz040_chn1n2.dat<z>\n"
printf "# Description: hrz050_ppw.dat<z>\n"
printf "# Description: hrz060_cfun.dat<z>\n"
printf "# Description: hrz070_tcbw.dat<z>\n"
printf "# Description: hrz080_cfmnn.dat<z>\n"
printf "# Format: free\n"
printf "# Field: 1 x\n"
printf "# Field: 2 y\n"
printf "# Field: 3 z\n"
printf "# Projection: Local Rectangular\n"
printf "# Units: unknown\n"
printf "# End:\n"
printf "#\n"


nawk '{
   if ((substr($1,1,1) == "#") && ($2 == "Start"))  {
      if (substr($4,1,6) == "hrz010" )  zone = 1
      else if (substr($4,1,6) == "hrz020" )  zone = 2
      else if (substr($4,1,6) == "hrz030" )  zone = 3
      else if (substr($4,1,6) == "hrz040" ) zone = 4
      else if (substr($4,1,6) == "hrz050" ) zone = 5
      else if (substr($4,1,6) == "hrz060" ) zone = 6
      else if (substr($4,1,6) == "hrz070" ) zone = 7
      else if (substr($4,1,6) == "hrz080" ) zone = 8
   }

   else if ((NF > 0) && (substr($1,1,1) != "#"))  {
      print $1 "\t"  $2 "\t"   $3  "\t"   zone
   }
}'

exit
```


Danny Skelton 1/27/97

Project No.
Book No.

TITLE Mac exodus configuration

From Page No.

Configured John Stamatatos Macintosh to display clients from performer and yosemite, with the exodus software previously installed. In the ~~edit comm~~ window of the client menu select edit comm and enter the following in the Command window

setenv DISPLAY $$ME$$ && jstam.cnwra.swri.edu
xterm -fn 6x9 -display jstam.cnwra.swri.edu:0 &

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Project No.
Book No.

TITLE David Allens Alluvium ~~Model~~

From Page No.

This alluvium modelling procedure was first tried by David Allen

Alluvium Modeling Procedure:

1. Sellect an alluvium outline both as a polygon and a data file.
   This will either be from some surface polygon coverage or determined directly from model data and contour maps.

2. Convert the outline polygon to a vertical fault file.
   Several scripts available to do this -
   Just need to change the header on the polygon file to that of a vertical fault.

3. Back interpolate the data file to the topography.
   In Earthvision formula processor - use the bakint fuction :
   data.dat<z> = bakint(topo.2grd, data.dat<x>,data.dat<y>)

4. Combine outline data and depth information into a single data file.
   The depth information will probably be from bore hole information and interpedation by user.

5. Created an alluvium grid.
   Earthvision minimum tension grid of the combined data file, also including the outline vertical fault file in the griding operation.

6. In the Earthvision Utilities choose grid operations, and use polygon filling to change the value of the grid nodes outside the outline polygon to a value larger than any elevation in model.

7. Edit model sequence file to include the alluvium grid just below the topography ~~either~~ as an unconformity ~~or channel erosion~~.
   DA DA

8. Rebuild model under a different file name.

David W. Allen 9/12/96
Duncan Sheldon 9/28/97

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Project No._____
Book No._____ TITLE Subarea Calculations pg 1

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Jul 28 1997 13:18 **repo_strat.txt** Page 1

```
CREATING STRATIGRAPHIC LAYER DATA FOR CENTER POINTS IN REPOSITORY
ZONES

1.  Created data file repo_ctr_pts_utm.dat for the repository
center point positions in utm.

2.  Gridded each stratigraphic layer data file from the 3d model.
Each grid is named for the data file used.  Range for each grid
was taken from the topo020.2grd file.

3.  The z value from each grid was determined by the runFindZ script
with repo_ctr_pts_utm.dat as the data file input, and the applicable
grid file for the second input.  The output was named for the grid
with "_repo_z.dat" as the suffix.

    a.  For the purpose of providing a constant length in the file
        name for runFindZ, each grid was renamed "level_*.2grd",
        with the "*" being the number of the level.

    b.  runFindZ is scripted as follows:

#!/bin/sh
# program runFindZ
# written by Brent Henderson and Danny Skelton
# 10-8-96
# This program accepts an input .2grd file and
# a .dat file.
# For each point in the .dat file, the macro finds
# the z value of the grid at that point and
# prints the results to a file called
# outfile.dat
#

if [ $# -ne 2 ]
then
   echo "Usage: $0 infile.dat infile.2grd"
   exit
fi

indat=$1
ingrd=$2

nawk '{
   if (substr($0,1,1) != "#") {
      cmd1 = sprintf("#!/bin/sh -e\nev_fpfp -u -F ev-gmx/svp << 'EOF'\nbakint(%s,
%f,%f)\nEOF\n", grd, $1, $2)
      system(cmd1)
   }
  }' grd=$ingrd $indat | \
nawk '{
         printf "%20.8f %20.8f %20.8f\n", substr($0, 21, 13), substr($0, 35, 14), $
3 > "outfile.dat"
#         printf "%s %20.8f\n", substr($0, 1, 80), $3 > "outfile.dat"

      }'

exit

    c.  Notes for running runFindZ:
        (1)  If script is run and the outfile has the wrong values
             for x and y columns, edit the file to comment out the
             first printf statement with a "#", and delete the "#"
             in the second print statement.

             (a)  Run the script with the data and grid files, then
                  open the outfile and count the number of positions
                  in the row, to find the x and y positions.

             (b)  Enter the x and y positions in the first printf
                  statement under the applicable substr() functiosn.
```

Danny Skelton 7/28/97

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```
    (c)  Comment out the second printf statement, and make
         the first printf active by deleting the pound
         sign.

    (d)  Rename all grid files with an equal number of
         characters in each name, and the script should
         run with no more modifications.

4.  Next, each grid layer was subtracted from the layer above, (with
the exception of the topo20.2grd and the water.2grd). The
level_*.2grd (* = a letter corresponding to the strategraphic layer)
is created to represent the thickness of the strategraphic layer.

5.  The data was combined in the cnwra_z.dat file, by:

    a.  Using the combine data file option under the EarthVision
        Utilities pack to combine the thickness data files together
        (cnwra_th_z.dat), and the layer elevation files together
        (cnwra_repo_z.dat).

    b.  The cnwra_z.dat file was copied from the cnwra_repo_z.dat
        file, and columns were set up as follows:

        (1)  Field 1 Repository zone ID number
        (2)  Field 2 x
        (3)  Field 3 y
        (4)  Field 4 z elevation
        (5)  Field 5 z thickness

    c.  The repository zone numbers were placed in column 1 to
        coorespond to the coordinates given by columns x and y.

    d.  The z elevation was copied over from the original
        cnwra_repo_z.dat file.

    e.  The z thickness was hand copied from the cnwra_th_z.dat
        file into column 5 of the cnwra_z.dat file.
```

Danny Skelton 7/28/97

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Aug 13 1997 13:18 **convertNspToUtm.txt** Page 1

```
Converting NSP to UTM

1.  The DOE model for Yucca mountain has been compiled in Nevada State
Plane (NSP) coordinates.  The current model used by the CNWRA is in
Universal Transverse Mercador (UTM).  In order to properly evaluate the
DOE model, some conversion was needed.  The only conversion found was
through the PROJ.4 cartographic projection software.

2.  Using the PROJ.4 cartographic projection software and a nawk script,
the following procedures are used to convert DOE /Export/ files from NSP
to UTM.

    a.  If a file is a grid file, Use the Export Grid feature to export the
        grid file into a data file.  Next, use the Decimate feature (located
        in the DGI Gifts section) to decimate the file by at least 10.
        Name the file using a 45 prefix instead of 44, which is usually found
        in the Export directory.

    b.  Execute the script "runNspToUtm" for each data file to be converted.
        The script is as listed below:

#!/bin/sh
# Usage:  runNspToUtm <inFile.dat>
# program runNspToUtm
# written by Danny Skelton
# 8-13-97
# This program accepts a data file in Nevada State Plane with elevation
# and coordinates in feet and converts the coordinates to universal
# transverse mercator, and converts elevation to meters.

PROJ_LIB=/usr4/dskelton/PROJ.4/nad
PROJ_BIN=/usr4/dskelton/PROJ.4/bin
export PROJ_LIB
export PROJ_BIN

# Convert from meters to feet:   multiply meters times 3.2808
#   200308.0000   263068.0000 meters
#   657170.4864   863073.4944 feet

# echo "\n\nspsc 2702, feet:"
# Convert from SPCS to UTM

# if [$# -ne 1 ]
# then
#    echo "Usage: $0 infile.dat"
#    exit
# fi
indat=$1
outFile=`echo $1 | nawk -F "." '{print $1}'`_utm.dat

nawk '{
   if (substr($0,1,1) == "#")  {
      if (($2 == "Grid_X_range:") || ($2 == "Grid_Y_range:"));
      else
         printf"%s\n", $0
   }
   else if (substr($0,1,1) != "#") {
      x=$1
      y=$2
      cmd1 = sprintf("$PROJ_BIN/nad2nad -i 27,spcs=2702,feet -o 27,utm=11 <<'EOF'\
n %f  %f  %20.8f   %3d   %3d\n", x, y,$3/3.2808,$4,$5)
      system(cmd1)
   }
 }
END { }' $1 > $outFile
echo "Finished, created $outFile\007"
# exit


*****************************************************************************
```

D Skelton 8-13-97

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Printed by dskelton from performer

Aug 13 1997 13:18 **convertNspToUtm.txt** Page 2

(1) Run no more than three files through the script simultaneously, because the script runs really slow with large files.

(2) Use the following syntax:

```
runNspToUtm infile.dat
```

a. Once all files have been converted, the coordinates are in UTM and the elevation is now in meters. Regular EarthVision manipulation can now be accomplished.

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Project No.
Book No.
TITLE Modification of runNspToUtm

From Page No.

modified script for runNspToUtm. This mod changes the "Units" "Projection", and "Zone" lines in the heading. The changes make the units unknown, the projection to Local Retangular, and deletes the zone.

Aug 20 1997 14:34 **runNspToUtm** Page 1

```
#!/bin/sh
# Usage:  runNspToUtm <inFile.dat>
# program runNspToUtm
# written by Danny Skelton
# 8-13-97
# This program accepts a data file in Nevada State Plane with elevation
# and coordinates in feet and converts the coordinates to universal
# transverse mercator, and converts elevation to meters.

PROJ_LIB=/usr4/dskelton/PROJ.4/nad
PROJ_BIN=/usr4/dskelton/PROJ.4/bin
export PROJ_LIB
export PROJ_BIN

# Convert from meters to feet:    multiply meters times 3.2808
#   200308.0000  263068.0000 meters
#   657170.4864  863073.4944 feet

# echo "\n\nspsc 2702, feet:"
# Convert from SPCS to UTM

# if [$# -ne 1 ]
# then
#     echo "Usage: $0 infile.dat"
#     exit
# fi
indat=$1
outFile=`echo $1 | nawk -F "." '{print $1}'`_utm.dat

nawk '{
   if (substr($0,1,1) == "#")  {
      if (($2 == "Grid_X_range:") || ($2 == "Grid_Y_range:"));
      else if($2 == "Units:")
         printf"# Units:  Unknown\n"
      else if($2 == "Projection:")
         printf"# Projection: Local Retangular\n"
      else if($2 == "Zone:")
         printf"\n";
      else
         printf"%s\n", $0
   }
   else if (substr($0,1,1) != "#") {
      x=$1
      y=$2
      cmd1 = sprintf("$PROJ_BIN/nad2nad -i 27,spcs=2702,feet -o 27,utm=11 <<'EOF'\
n %f  %f  %20.8f    %3d    %3d\n", x, y,$3/3.2808,$4,$5)
      system(cmd1)
   }
 }
END { }' $1 > $outFile
echo "Finished, created $outFile\007"
# exit
```

Witnessed & Understood by me,

Date

Recorded by 8/21/97

Project No.
Book No.
TITLE Building utm doe model

From Page No.

Tried to create a model using files ~~from~~ in the doe/Isosbores directory, but the z values were not coming out accurate.
When I use the files in the doe/Export directory, I can see fault outlines in the grids. The data files were exported from the doe model, and original data files are unavailable.
Attempting to build utm model from Export 45**.dat files.

To Page No.

Witnessed & Understood by me Danny Skelton

Date 9/4/97

Invented by

Recorded by

Date

Project No._____
Book No._____ TITLE _____

From Page No.____

I HAVE REVIEWED THIS SCIENTIFIC NOTEBOOK (# 119) AND FIND IT IN COMPLIANCE WITH QAP-001. THERE IS SUFFICIENT INFORMATION REGARDING PROCEEDURES USED FOR CONDUCTING MODEL CONSTRUCTION IN EARTHVISION SO THAT ANOTHER QUALIFIED INDIVIDUAL COULD REPEAT THE ACTIVITY. THIS SCIENTIFIC NOTEBOOK IS TO BE CLOSED OUT AND ARCHIVED EFFECTIVE 3/5/98

M. Lawrence McKenzie
3/5/98

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Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	