

Horizontal and Vertical Control

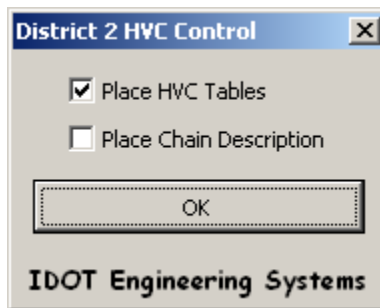
1.1 Introduction

HorzVertControl.mvba is a MicroStation visual basic application created to place the horizontal and vertical control points in a table format. This application will also place an alignment description of any chain stored in a Geopak file. All elements are drawn using the correct IDOT symbologies and level assignments. Each Table is placed as a separate graphic group.

The application is activated by use of the following key-in command:

vba load HorzVertControl.mvba;vba run Start

When the command is executed the main dialog is displayed.



Place HVC Tables - Choose this check box to place a Horizontal Control Points, Survey Work Points, Bench Marks, Reference Tie Points, Apparent Property Corners or Chain Curves table.

Place Chain Description - Choose this check box to place the description of the selected chain.

OK - Pressing this button will load the dialog box for selected HVC Control.

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This application uses a GEOPAK COGO Chain to determine the station, offsets, coordinates and chain description of the selected points or chain. GEOPAK must be activated in order for the application to find the .gpk file containing the COGO chains and points for the project. If GEOPAK is not activated a warning message is displayed as shown below and the program is unloaded.

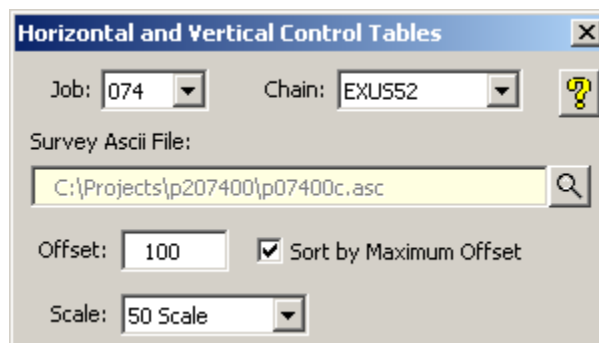


If the Working Directory is not set, GEOPAK will look in the directory of the active MicroStation dgn file for the .gpk file. If a GEOPAK job file is not found a warning message is displayed as shown below and the program is unloaded.



1.2 Operation – Place HVC Tables

The top portion of the dialog displays the various settings used for placing the Horizontal and Vertical control tables.



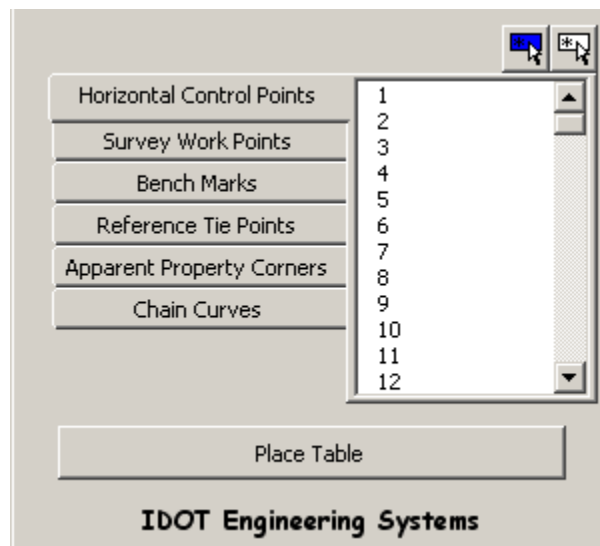
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- **Job** - The **Job Number** of the GEOPAK Coordinate Geometry Database that contains the points or chains.
- **Chain** - The GEOPAK COGO chain that will be used to determine the stations, offsets, coordinates, curve names and chain descriptions.
- **Survey Ascii File** - Click on the magnifying glass to browse to the Survey Ascii file that will be read to populate the tables.

Note: The columns in the *Survey Ascii File* must be separated by either a tab, space or comma.

- **Offset** - The number entered will be the maximum offset used in the calculations.
- **Sort by Maximum Offset** - Choose this check box to have the calculated offsets be sorted by the maximum value or less that is entered in the Offset text box.
- **Scale** - The scale that the tables will be placed at.

The bottom portion of the dialog displays the points sorted by category and the curves of the selected chain.



- **Horizontal Control Points** - All horizontal control points in the point number ranges of 1-99, 1000-1099 and 90000-91000000.
- **Survey Work Points** - All survey work points in the point number ranges of 100-199 and 1100-1199.

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- **Bench Marks** - All bench mark points in the point number ranges of 400-499 and 1400-1499
- **Reference Tie Points** - All reference tie points in the point number ranges of 500-699 and 1500-1699
- **Apparent Property Corners** - All apparent property corner points in the point number ranges of 700-999 and 1700-1999.
- **Chain Curves** - All curves that are part of the selected chain.

The **Place Table** button is used to draw the selected points in the proper HVC table format at a user defined data point in the design file.

1.2.1 Examples of HVC Tables

The illustrations below show the six different table formats.

Horizontal Control Points

| HORIZONTAL CONTROL POINTS | | | | | | | |
|---------------------------|--------------|--------------|-----------|--------|-----------|-------------|----------------------------|
| POINT | NORTH | EAST | ELEVATION | CHAIN | STATION | OFFSET | DESCRIPTION |
| 1 | 1975089.5710 | 2308861.1210 | 635.0360 | EXUS52 | 115+97.10 | 94.3216' RT | GPS CONTROL POINT, PIN |
| 2 | 1975543.7640 | 2306147.2890 | 637.0360 | EXUS52 | 123+29.47 | 23.444' RT | GPS CONTROL POINT, PK NAIL |
| 3 | 1976327.8620 | 2306296.0820 | 635.4140 | EXUS52 | 131+44.62 | 29.0963' LT | GPS CONTROL POINT, PIN |
| 4 | 1977790.5610 | 2306509.1440 | 632.0710 | EXUS52 | 149+83.80 | 81.8362' LT | GPS CONTROL POINT, PIN |
| 5 | 1978648.1420 | 2312681.6790 | 732.1900 | EXUS52 | 211+89.66 | 19.6324' LT | GPS CONTROL POINT, PIN |

Survey Work Points

| SURVEY WORK POINTS | | | | | | | |
|--------------------|--------------|--------------|-----------|--------|-----------|--------------|--------------|
| POINT | NORTH | EAST | ELEVATION | CHAIN | STATION | OFFSET | DESCRIPTION |
| 100 | 1972096.6510 | 2334647.5060 | 726.2930 | EXUS52 | 446+53.77 | 159.0662' LT | POC, PK NAIL |
| 101 | 1972166.2010 | 2334606.4660 | 734.8680 | EXUS52 | 446+03.03 | 249.4288' LT | POC, PK NAIL |
| 102 | 1972896.2970 | 2334611.0720 | 772.1450 | EXUS52 | 446+66.39 | 996.6848' LT | POT, PK NAIL |
| 103 | 1971939.6970 | 2336292.1490 | 719.8180 | EXUS52 | 452+64.49 | 0.0000' | POT, PK NAIL |
| 104 | 1971904.4870 | 2336625.7470 | 725.8880 | EXUS52 | 453+99.94 | 0.0000' | POT, PK NAIL |

Bench Marks

| BENCH MARKS | | | | | | | |
|-------------|--------------|--------------|-----------|--------|-----------|--------------|----------------------------------|
| POINT | NORTH | EAST | ELEVATION | CHAIN | STATION | OFFSET | DESCRIPTION |
| 401 | 1974653.8670 | 2305713.3100 | 626.0390 | EXUS52 | 116+96.99 | 622.4296' RT | HANDRAIL, DISK |
| 402 | 1975672.5200 | 2306082.0270 | 638.6060 | EXUS52 | 123+27.71 | 38.8279' LT | R.O.W. MARKER, TOP |
| 403 | 1976232.0020 | 2306216.0600 | 637.0500 | EXUS52 | 130+17.12 | 35.8399' LT | SIGN FOUNDATION, CHISELED SQUARE |
| 404 | 1977767.1850 | 2306537.7640 | 629.4660 | EXUS52 | 149+80.67 | 45.0301' LT | POWER POLE, RAIL ROAD SPIKE |
| 405 | 1978638.8570 | 2313143.8590 | 741.8140 | EXUS52 | 214+06.52 | 89.958' LT | POWER POLE, BENCH TIE |

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Reference Tie Points

| REFERENCE TIES | | | | | | |
|----------------|--------------|--------------|--------|-------------|-------------|------------------------------|
| Point | North | East | Code | Station | Offset | Description |
| 600 | 1975094.1250 | 2309940.3900 | EXUS52 | 108+03.2477 | 10.4178' RT | POWER POLE WITH LIGHT, SHNER |
| 620 | 1977442.3490 | 2315468.0640 | EXUS52 | 240+23.3609 | 25.0847' RT | GUTTER, CHISELED "X" |
| 621 | 1976984.9350 | 2316086.4390 | EXUS52 | 247+77.0221 | 35.5106' RT | GUARDRAIL, END |
| 622 | 1976973.4820 | 2316237.0310 | EXUS52 | 249+21.9676 | 56.2328' LT | HEADWALL, CHISELED SQUARE |
| 623 | 1976936.6630 | 2316279.1730 | EXUS52 | 249+78.4070 | 50.2078' LT | STEP, CORNER |
| 624 | 1976995.5990 | 2316596.3890 | EXUS52 | 254+24.8174 | 78.1390' RT | FENCE POST, SIGNER |
| 625 | 1976635.8840 | 2316529.9610 | EXUS52 | 253+47.6784 | 74.7978' RT | 12" TREE DECIDUOUS, SHNER |
| 667 | 1971980.3470 | 2329235.1180 | EXUS52 | 391+42.1674 | 98.1416' RT | R.O.W. MARKER, TOP |

Apparent Property Corners

| APPARENT PROPERTY CORNERS | | | | | | | |
|---------------------------|--------------|--------------|----------|--------|-----------|--------------|----------------------|
| Point | North | East | Station | Code | Station | Offset | Description |
| T01 | 1974008.2170 | 2348762.6040 | 912.2950 | EXUS52 | 595+14.00 | 72.5177' RT | PROPERTY CORNER, PIN |
| T03 | 1973919.4100 | 2348624.5530 | 904.3090 | EXUS52 | 591+67.42 | 134.8405' RT | PROPERTY CORNER, PIN |
| T06 | 1977019.0290 | 2334637.0400 | 906.3080 | EXUS52 | 448+11.39 | 5088.6206' L | QUARTER CORNER, MAIL |
| T09 | 1977063.9030 | 2337286.8310 | 751.0810 | EXUS52 | 472+04.20 | 5230.7079' L | SECTION CORNER, PIN |
| T10 | 1977009.8770 | 2339995.9820 | 778.7710 | EXUS52 | 499+42.32 | 5195.9837' L | SECTION CORNER, PIN |

Chain Curves

| CURVE POINT NUMBERS | | | | | |
|---------------------|-------|-----|-----|-----|-----|
| Code | Curve | PI | CC | PC | PT |
| EXUS52 | 200 | 200 | 201 | 202 | 203 |
| EXUS52 | 210 | 210 | 211 | 212 | 213 |
| EXUS52 | 220 | 220 | 221 | 222 | 223 |
| EXUS52 | 230 | 230 | 231 | 232 | 233 |
| EXUS52 | 240 | 240 | 241 | 242 | 243 |

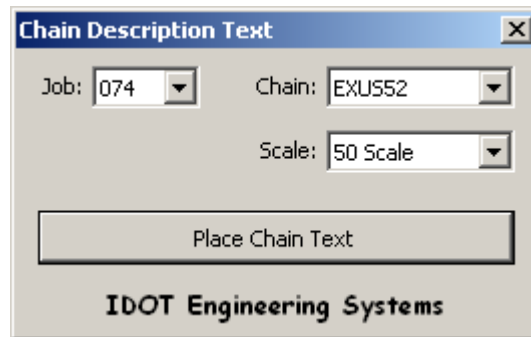
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1.3 Operation – Place Chain Description

If the **Place Chain Description** check box is selected on the main menu the following dialog will appear. Cogo must be open in order to place the chain description.



- **Yes** - Pressing this button will proceed and bring up the following dialog.
- **No** - Pressing this button will exit the application so Cogo can be activated.



- **Job** - The **Job Number** of the GEOPAK Coordinate Geometry Database that contains the chains.
- **Chain** - The GEOPAK COGO chain that will be used for the chain descriptions.
- **Scale** - The scale that the chain description will be place at.

The **Place Chain Text** button is used to draw the chain description text at a user defined data point in the design file.

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1.3.1 Examples of Chain Description

The illustration below shows a chain description.

```
Chain EX0552 contains
35 CUR 200 CUR 210 147

Beginning chain EX0552 description
=====
Point 35 N 1,175,045.8840 E 2,305,286.1930 Sta 113+41.24
Course from 35 to PC 200 75° 43' 24.70" Dist 212.0277'

Curve Data
=====
Curve 200
P.B. Station 111+06.67 N 1,975,174.8004 E 2,305,434.8249
Delta = 18° 38' 07.99" (L.T)
Degree = 5° 41' 18.89"
Tangent = 147.4048'
Length = 232.7311'
Radius = 1,007,205.4'
External = 10.7292'
Long Chord = 291.7019'
Mid. Ord. = 10.6161'
P.C. Station 115+43.27 N 1,975,130.1502 E 2,305,491.6735
P.T. Station 118+46.00 N 1,975,250.3620 E 2,305,160.9887
C.C. N 1,975,114.2934 E 2,305,243.2340

Course from PT 200 to PC 210 59° 04' 16.71" Dist 196.3248'

Curve Data
=====
Curve 210
P.B. Station 123+08.00 N 1,975,487.1182 E 2,304,197.2812
Delta = 31° 48' 13.38" (L.T)
Degree = 10° 29' 47.21"
Tangent = 265.0802'
Length = 483.8419'
Radius = 845.8867'
External = 60.9603'
Long Chord = 475.9012'
Mid. Ord. = 84.8363'
P.C. Station 120+42.82 N 1,975,364.4751 E 2,305,329.8834
P.T. Station 125+36.45 N 1,975,750.6702 E 2,304,890.8120
C.C. N 1,975,813.1119 E 2,305,649.3379

Course from PT 210 to 147 90° 30' 29.91" Dist 2,221.4404'
Point 147 N 1,977,205.8810 E 2,356,302.6340 Sta 147+57.90
=====
Ending chain EX0552 description
```

Note: The *Horizontal and Vertical Control Tables* dialog and the *Chain Description Text* dialog will reappear after each table or chain description is placed in the design file.