

Model Explorer



- Encapsulates most Case Information Displays
- Provides means of navigating through almost all of the data in the model
- Available from a few places
 - Case Information Ribbon Tab
 -  – Tools Ribbon Tab
 - Quick Access Toolbar



Model Explorer



Explore Pane

Options Pane

Recent Tabs

Object Types with no data grayed-out

Case Information Toolbar

Note: The option available on the Case Information right-click local menu are now all available on the Case Information Toolbar directly above the display

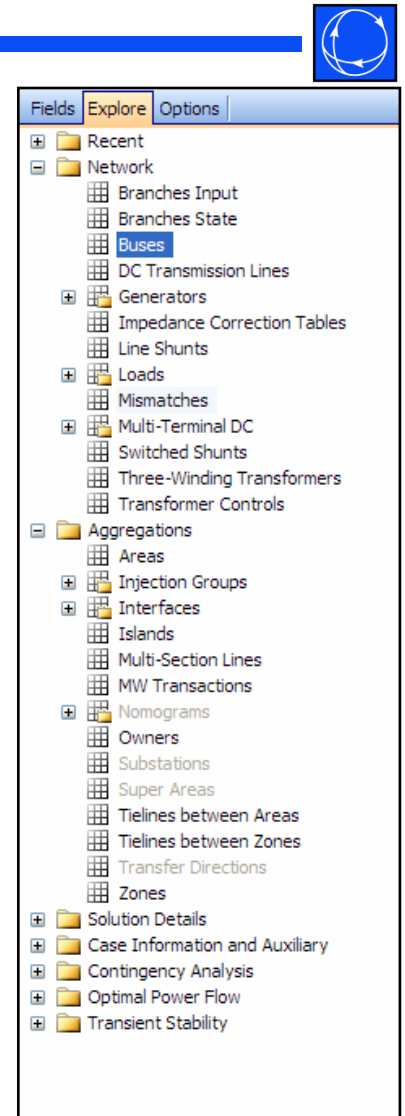
Search Toolbar

Number of Bus	Name of Bus	ID	Status	Gen MW	Gen Mvar	Set Volt	AGC	AVR	Min MW	Max MW	Min Mvar	Max Mvar	Cost Model	Pa	
5	0053 WLDHRS 2	1	Open	0.00	0.00	1.02500	YES	YES	0.00	39.00	-13.00	13.00	None	1.40	
6	0052 WLDHRS1	1	Open	0.00	0.00	1.00500	YES	YES	0.00	126.50	-42.00	42.00	None	1.00	
7	0081 WHRLWIND1A	1	Open	0.00	0.00	1.03000	YES	YES	0.00	60.00	-20.00	20.00	None	1.00	
8	245 WHITNYDM02	2	Closed	1.51	0.00	1.03500	NO	YES	0.00	1.51	-5.00	7.00	Piecewise Linear	0.17	
9	244 WHITNYDM01	1	Closed	1.51	0.00	1.03500	NO	YES	0.00	1.51	-5.00	7.00	Piecewise Linear	0.17	
10	1482 WFCOGEN_2G	1	Open	8.80	13.20	-8.00	15.00	Piecewise Linear	0.25	4.40	6.60	-8.00	15.00	Piecewise Linear	0.25
11	1483 WFCOGEN_1G	2	Open	4.40	6.60	-8.00	15.00	Piecewise Linear	0.25	4.40	6.60	-8.00	15.00	Piecewise Linear	0.25
12	1479 WFCOGEN_1G	1	Open	8.80	13.20	-8.00	15.00	Piecewise Linear	0.25	4.40	6.60	-8.00	15.00	Piecewise Linear	0.25
13	1479 WFCOGEN_1G	2	Open	4.40	6.60	-8.00	15.00	Piecewise Linear	0.25	4.40	6.60	-8.00	15.00	Piecewise Linear	0.25
14	1349 WESTXWIN_1G	1	Open	0.00	0.00	1.03500	NO	YES	0.00	0.00	0.00	0.00	0.00	0.00	
15	5920 WELSH 7	1	Open	0.00	0.00	1.03500	NO	YES	0.00	0.00	0.00	0.00	0.00	0.00	
16	60016 WDWDU1	1	Open	0.00	0.00	1.03500	NO	YES	0.00	0.00	0.00	0.00	0.00	0.00	
17	1455 WCPWRCO_3G	3	Closed	120.00	60.00	60.00	60.00	Piecewise Linear	0.25	120.00	60.00	60.00	Piecewise Linear	0.25	
18	1454 WCPWRCO_2G	2	Closed	60.00	30.00	30.00	30.00	Piecewise Linear	0.25	60.00	30.00	30.00	Piecewise Linear	0.25	
19	1453 WCPWRCO_1G	1	Closed	60.00	30.00	30.00	30.00	Piecewise Linear	0.25	60.00	30.00	30.00	Piecewise Linear	0.25	
20	5439 WBT4	4	Open	0.00	0.00	1.03500	NO	YES	0.00	0.00	0.00	0.00	0.00	0.00	
21	5438 WBT3	3	Open	0.00	0.00	1.03500	NO	YES	0.00	0.00	0.00	0.00	0.00	0.00	
22	5437 WBT2	2	Open	0.00	0.00	1.03500	NO	YES	0.00	0.00	0.00	0.00	0.00	0.00	
23	5436 WBT1	1	Open	0.00	0.00	1.03500	NO	YES	0.00	0.00	0.00	0.00	0.00	0.00	
24	48929 WAPGT21_GT1	81	Open	0.00	0.00	1.03623	YES	YES	0.00	0.00	0.00	0.00	0.00	0.00	
25	48928 WAP_GN8_8	8	Closed	60.00	30.00	30.00	30.00	Piecewise Linear	0.25	60.00	30.00	30.00	Piecewise Linear	0.25	
26	48927 WAP_GN7_7	7	Closed	60.00	30.00	30.00	30.00	Piecewise Linear	0.25	60.00	30.00	30.00	Piecewise Linear	0.25	
27	48926 WAP_GN6_6	6	Closed	60.00	30.00	30.00	30.00	Piecewise Linear	0.25	60.00	30.00	30.00	Piecewise Linear	0.25	
28	48925 WAP_GN5_5	5	Closed	183.00	654.00	0.00	326.20	Piecewise Linear	8.16	183.00	654.00	0.00	326.20	Piecewise Linear	8.16
29	48924 WAP_GN4_4	4	Open	195.60	667.00	-56.00	180.70	Piecewise Linear	0.00	195.60	667.00	-56.00	180.70	Piecewise Linear	0.00
30	48923 WAP_GN3_3	3	Open	133.80	178.00	0.00	300.00	Piecewise Linear	6.45	133.80	178.00	0.00	300.00	Piecewise Linear	6.45
31	48922 WAP_GN2_2	2	Open	79.40	139.00	0.00	145.80	Piecewise Linear	3.52	79.40	139.00	0.00	145.80	Piecewise Linear	3.52
32	48921 WAP_GN1_1	1	Open	42.30	82.50	-62.00	115.50	Piecewise Linear	1.76	42.30	82.50	-62.00	115.50	Piecewise Linear	1.76
33	80225 VISTRONG2	2	Open	0.00	0.00	1.01000	YES	YES	0.00	23.00	0.00	13.30	None	0.26	
34	80224 VISTRONG1	1	Open	0.00	0.00	1.01000	YES	YES	0.00	15.00	0.00	7.20	None	0.17	
35	5028 VHB3	3	Open	0.00	0.00	1.02500	YES	YES	105.00	140.00	-50.00	200.00	Piecewise Linear	4.90	
36	5027 VHB2	2	Open	0.00	0.00	1.02500	YES	YES	61.20	117.00	-20.00	120.00	Piecewise Linear	2.96	



Model Explorer: Explore Pane

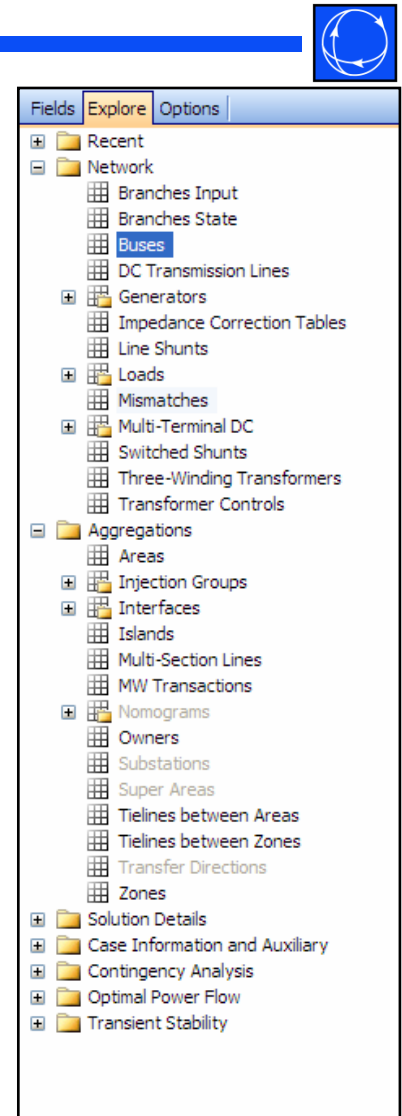
- Explore Pane: The Explore Pane contains a hierarchical list of most of the objects contained in the power system model
 - Eight Primary Folders, with only Network and Aggregations folder expanded by Default
 - Network Folder
 - physical devices
 - Aggregations Folder
 - groups of objects

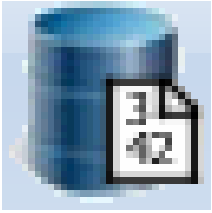




Model Explorer: Explore Pane Tips

- Grayed out entries indicate that objects of that type are not presently defined in model
- To open a new separate Model Explorer Window
 - Hold down the CTRL key and then left-click on an entry in the Explore Pane





Model Explorer



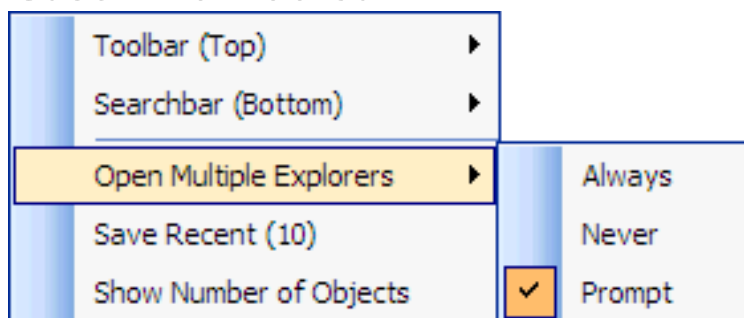
- Fields Pane
 - Provides access to all the potential fields available to show on the active case information display
- Options Pane
 - Access to commonly used case information display actions
 - Same options available on the Case Information Toolbar or case information right-click local menu
- Recent Tabs
 - List of the most recently viewed case information displays
 - Easier to manage than multiple windows
 - Kind of like “tabbed browsing”



Model Explorer Options

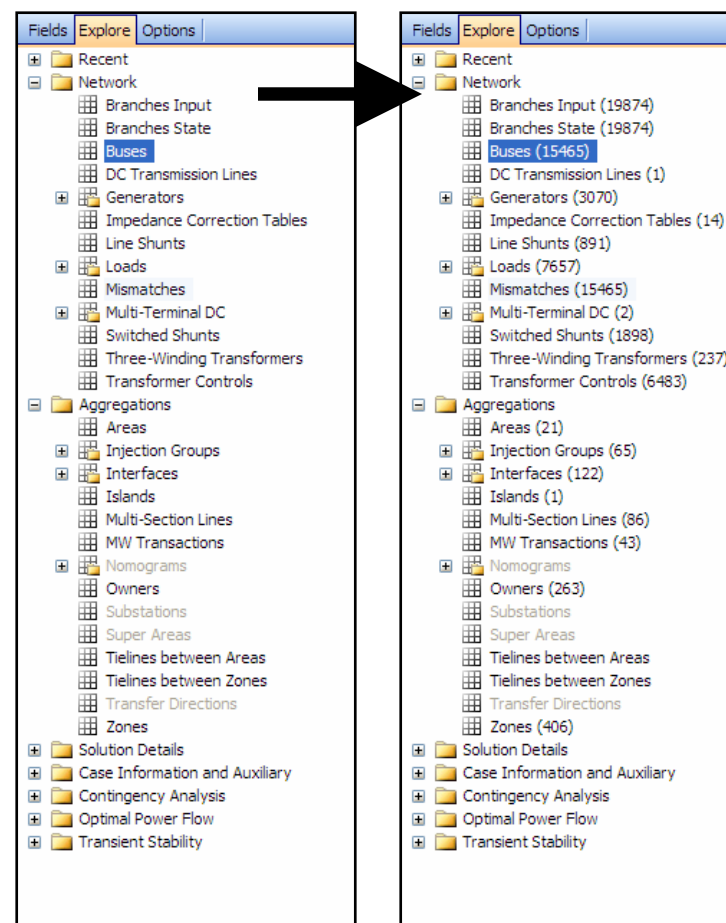


- To access options, right-click on
 - Explore or Fields Pane
 - Search Toolbar
 - Case Info Toolbar



- Specify location of Toolbar and Search Toolbar
- Specify whether to Open Multiple Model Explorers
- Specify the number of Recent Tabs to maintain
- Show Number of Objects

Show Number of Objects





Display Explorer



- Very similar to the Model Explorer
- Contains case information displays for one-line display objects
- Provides means of navigating through data contained on a one-line in tabular form
- Available from the **Onelines** ribbon tab → **Active** ribbon group → **List Display** menu → **All Display Objects** option





Display Explorer



List only objects selected on one-line

Display Explorer: All Objects

Explore Options

Recent All Objects

Network

- Buses
- DC Transmission Lines
- Generators
- Loads
- Series Capacitors
- Switched Shunts
- Transformers
- Transmission Lines

Aggregations

Background

Branch Symbols

Fields

Geo Data View

Other

Pie Charts

Text Links

☐ Show Only Objects Selected

How to list grouped objects

- ☐ List objects only
- ☐ List groups only
- ☐ List both objects and groups

Save Complete Display to AXD

Search

Search Now Options

	Type	X/Longitude Location	Y/Latitude Location	Layer Name	Layer Shown	Selectable In Edit Mode	Use Condi... Zoom
1	DisplayBus	9.000	63.000	Default Layer	YES	YES	NO
2	DisplayBus	19.000	42.000	Default Layer	YES	YES	NO
3	DisplayBus	37.000	63.000	Default Layer	YES	YES	NO
4	DisplayBus	72.000	57.000	Default Layer	YES	YES	NO
5	DisplayBus	68.000	36.000	Default Layer	YES	YES	NO
6	DisplayGen	10.000	63.000	Default Layer	YES	YES	NO
7	DisplayGen	24.000	42.000	Default Layer	YES	YES	NO
8	DisplayLoad	23.000	42.000	Default Layer	YES	YES	NO
9	DisplayLoad	41.000	63.000	Default Layer	YES	YES	NO
10	DisplayLoad	76.000	57.000	Default Layer	YES	YES	NO
11	DisplayLoad	73.000	36.000	Default Layer	YES	YES	NO
12	DisplayBus	15.000	15.750	Default Layer	YES	YES	NO
13	DisplayGen	16.000	15.750	Default Layer	YES	YES	NO
14	DisplayBus	54.000	15.750	Default Layer	YES	YES	NO
15	DisplayGen	60.000	15.750	Default Layer	YES	YES	NO
16	DisplayTransmissionl	14.000	63.000	Default Layer	YES	YES	NO
17	DisplayTransmissionl	14.000	63.000	Default Layer	YES	YES	NO
18	DisplayTransmissionl	26.000	42.000	Default Layer	YES	YES	NO
19	DisplayTransmissionl	29.000	42.000	Default Layer	YES	YES	NO
20	DisplayTransmissionl	29.000	42.000	Default Layer	YES	YES	NO
21	DisplayTransmissionl	41.000	63.000	Default Layer	YES	YES	NO

Save one-line to display auxiliary file

Same as Model Explorer I3-8

Case Information Displays



- Case Information Displays show the power system model data and results in tabular format
- Case information displays show information about
 - buses
 - generators
 - lines/transformers
 - loads
 - areas, zones
 - and everything else

Model Explorer: Generator Case Information Display



Model Explorer: Generators

Explore Options

Recent Network

- Branches Input
- Branches State
- Buses
- DC Transmission Lines
- Generators
- Impedance Correction Table
- Line Shunts
- Loads
- Mismatches
- Multi-Terminal DC
- Switched Shunts
- Three-Winding Transformer
- Transformer Controls

Aggregations

Solution Details

Case Information and Auxiliary

- Contingency Analysis
- Optimal Power Flow
- Transient Stability

Gen Records

Records Geo Set Columns

	Number of Bus	Name of Bus	ID	Status	Gen MW	Gen Mvar	Set Volt	AGC	AVR	Min MW	Max MW	Min Mvar	Max Mvar	Cost Model	Part. Factor
1	30	CONE G1	H	Closed	444.71	77.40	1.00055	YES	YES	262.00	445.40	-21.00	236.00	None	5.45
2	30	CONE G1	L	Closed	403.97	70.31	1.00055	YES	YES	238.00	404.60	-19.00	214.00	None	4.95
3	31	CONE G2	2	Open	0.00	0.00	1.00055	YES	YES	0.00	10.80	0.00	0.00	None	1.00
4	31	CONE G2	H	Closed	444.71	77.40	1.00055	YES	YES	262.00	445.40	-21.00	236.00	None	5.45
5	31	CONE G2	L	Closed	403.97	70.31	1.00055	YES	YES	238.00	404.60	-19.00	214.00	None	4.95
6	32	KEYS G1	2	Open	0.00	0.00	1.03369	YES	YES	0.00	10.80	0.00	0.00	None	1.00
7	32	KEYS G1	H	Closed	431.93	194.96	1.03369	YES	YES	254.50	432.60	-21.00	236.00	None	4.81
8	32	KEYS G1	L	Closed	416.75	188.11	1.03369	YES	YES	245.50	417.40	-19.00	214.00	None	4.64
9	33	KEYS G2	H	Closed	400.00	28.60	0.98048	YES	YES	254.50	432.60	-21.00	236.00	None	4.81
10	33	KEYS G2	L	Closed	400.00	28.60	0.98048	YES	YES	245.50	417.40	-19.00	214.00	None	4.64
11	34	PCHBTM 2	1	Closed	1109.43	216.89	1.01000	YES	YES	200.00	1112.00	-319.00	541.70	None	12.80
12	35	PCHBTM 3	1	Closed	1110.26	217.47	1.01000	YES	YES	200.00	1112.00	-319.00	541.70	None	12.80
13	36	SALEM-G1	1	Closed	1174.00	145.63	0.98260	YES	YES	1100.00	1174.00	-250.00	550.00	None	13.00
14	37	SALEM-G2	1	Closed	1128.24	273.99	1.00185	YES	YES	1100.00	1130.00	-250.00	550.00	None	13.00
15	38	SUSQ 2	1	Closed	1138.60	105.15	0.98457	YES	YES	1140.00	1140.00	-258.00	560.00	None	12.80
16	39	HOPE CG1	1	Closed	1098.28	491.07	1.03184	YES	YES	1031.00	1100.00	-363.00	528.00	None	13.00
17	40	C CLF G1	1	Closed	871.64	-150.00	1.03960	YES	YES	835.00	873.00	-150.00	400.00	None	10.20
18	41	C CLF G2	1	Closed	860.65	-65.00	1.03960	YES	YES	840.00	862.00	-65.00	400.00	None	10.03
19	42	LIMERCK2	1	Closed	1133.59	155.47	1.01000	YES	YES	200.00	1134.00	-442.00	276.00	None	12.65
20	44	BETH CT1	1	Closed	120.81	29.53	1.07732	YES	YES	60.00	121.00	-25.00	50.00	None	1.39
21	45	BETH CT2	1	Closed	120.81	29.53	1.07732	YES	YES	60.00	121.00	-25.00	50.00	None	1.39
22	46	BETH CT3	1	Closed	120.81	29.53	1.07732	YES	YES	60.00	121.00	-25.00	50.00	None	1.39
23	47	BETH CC4	1	Closed	182.71	29.84	1.06873	YES	YES	20.00	183.00	-65.00	130.00	None	2.30
24	48	BETH CT5	1	Closed	120.81	29.53	1.07732	YES	YES	60.00	121.00	-25.00	50.00	None	1.39
25	49	BETH CT6	1	Closed	120.81	29.53	1.07732	YES	YES	60.00	121.00	-25.00	50.00	None	1.39
26	50	BETH CT7	1	Closed	120.81	29.53	1.07732	YES	YES	60.00	121.00	-25.00	50.00	None	1.39

Search Search Now Options

Case Information Displays



- Most case information displays can be opened from the Model Explorer
 - Case info displays also are integrated into many Simulator dialogs.
- Case Information Features
 - Find, Search For Text
 - Sorting
 - Filtering
 - Copy/Paste to/from a spreadsheet
 - Column Contouring
 - Column Metrics
 - Etc...
- Custom Case Info Display
 - Show different fields, change colors
 - Create entire custom workbooks showing specific information

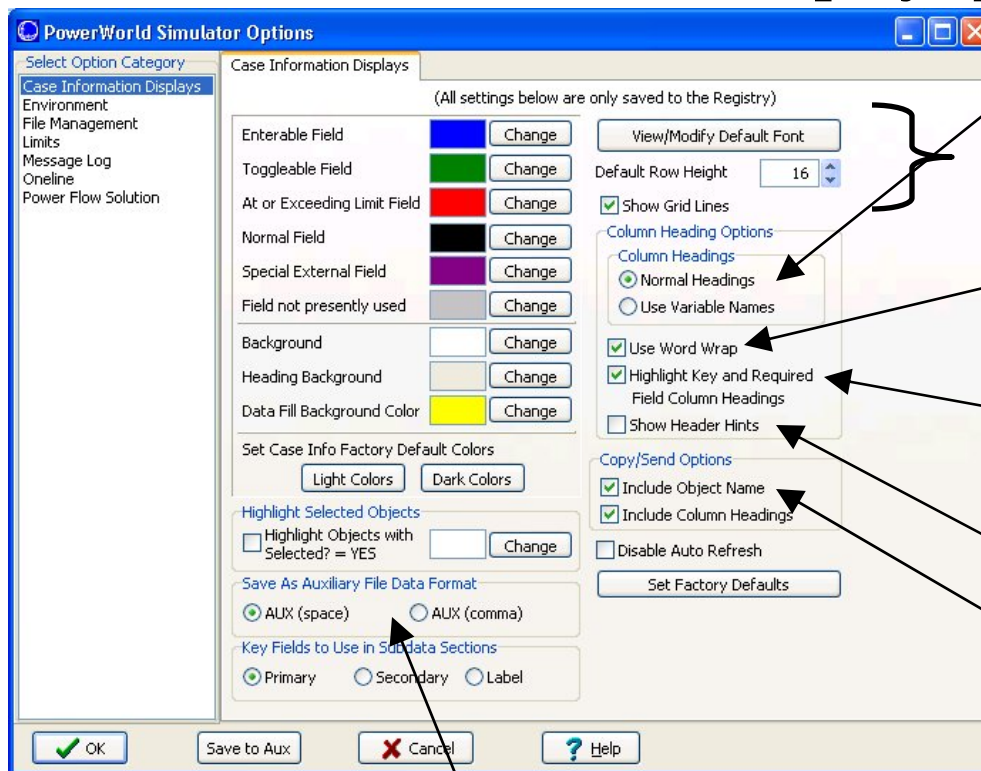
Case Information Displays Options



- From the **Options** ribbon tab select **Simulator Options...**
- Go to **Case Information Displays** page

Use *Normal Headings* or *Variable Names*

See “Auxiliary File Data Sections” for description of Variable Names



Default Font and Row Height for all case info displays

Word Wrap long column headings

Highlight the column headings of object key fields (yellow) and required fields for new records (green).

Hints explain field when mouse floats over column heading.

Options when using the Copy and Send local menu options

When saving an AUX file DATA Section, this delimiter is used

Color Schemes



- Field Colors.
 - Enterable Field
 - Fields that you can edit directly on the case info display
 - Toggleable Field
 - Double-click on these fields to change their value
 - Special External Field
 - Fields that cannot be entered inside Simulator, but can via Paste from Excel or AUX file read
 - Field not presently used: data is not applicable for some reason (e.g. when a generator is open, all the fields appear gray)
 - Normal and At or Exceeding Limit are self-explanatory
- Background Colors
 - Background and Heading Background are self-explanatory
 - Data Fill Background
 - When filling in data the same as another piece of data

Default Case Information

Light Color Scheme



Heading Background

Heading Key Field

Heading Req'd Field

Toggleable Field

Enterable Field

At Limit Field

Field not presently used

Normal Text

Background

Data Fill Background

	Number	Name	ID	Status	Gen MW	Gen Mvar	Min MW	Max MW	!
1	30	CONE G1	H	Closed	445.40	1.08	262.00	445.40	
2	30	CONE G1	L	Closed	404.60	1.02	238.00	404.60	
3	31	CONE G2	H	Closed	445.40	1.08	262.00	445.40	
4	31	CONE G2	L	Closed	404.60	1.02	238.00	404.60	
5	32	KEYS G1	H	Closed	432.65	194.12	254.50	432.60	
6	32	KEYS G1	L	Closed	417.35	176.03	245.50	417.40	
7	33	KEYS G2	H	Open	0.00	0.00	254.50	415.30	
8	33	KEYS G2	L	Open	0.00	0.00	245.50	400.70	
9	34	PCHBTM 2	1	Closed	1085.05	498.40	1093.00	1117.00	
10	35	PCHBTM 3	1	Closed	1093.00	497.63	1093.00	1093.00	
11	36	SALEM G1	1	Open	0.00	0.00	1100.00	1100.00	
12	37	SALEM G2	1	Closed	1119.00	498.10	1100.00	1119.00	
13	38	SUSQ 2	1	Closed	1105.00	469.96	1144.00	1144.00	
14	39	HOPE CG1	1	Closed	1043.00	498.10	1031.00	1043.00	
15	40	C CLF G1	1	Closed	838.00	400.00	835.00	838.00	
16	41	C CLF G2	1	Open	0.00	0.00	840.00	840.00	
17	42	LIMERCK2	1	Closed	1150.00	208.01	1150.00	1150.00	

Default Case Information

Dark Color Scheme

Heading Background

Heading Key Field

Heading Req'd Field

Toggleable Field

Enterable Field

Normal Text

At Limit Field

Field not presently used

Background

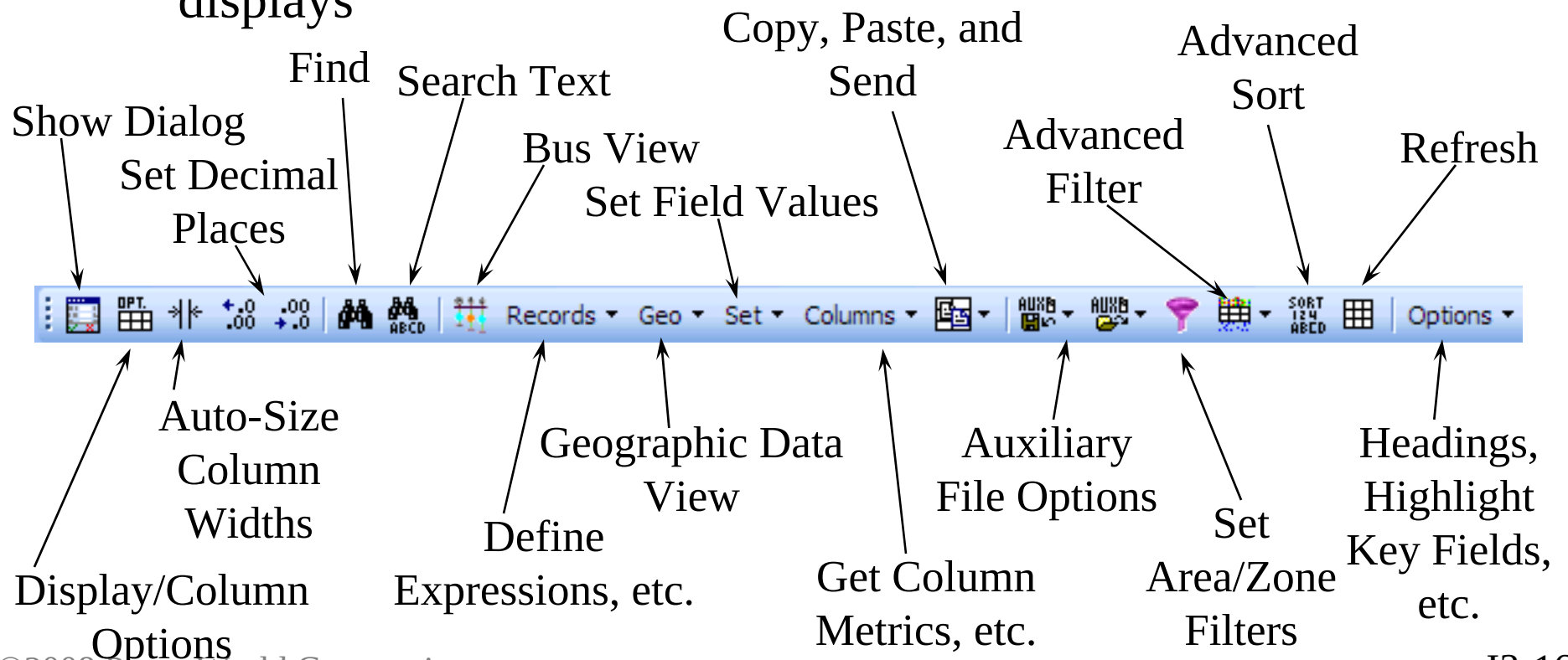
Data Fill Background

	Number	Name	ID	Status	Gen MW	Gen Mvar	Min MW	Max MW
1	30	CONE G1	H	Closed	445.00	226.73	262.00	445.00
2	30	CONE G1	L	Closed	405.00	205.60	238.00	405.00
3	31	CONE G2	H	Closed	445.00	-21.00	262.00	445.00
4	31	CONE G2	L	Closed	405.00	-19.00	238.00	405.00
5	32	KEYS G1	H	Closed	433.00	4.99	262.00	433.00
6	32	KEYS G1	L	Closed	417.00	4.57	238.00	417.00
7	33	KEYS G2	H	Open	0.00	0.00	262.00	433.00
8	33	KEYS G2	L	Open	0.00	0.00	238.00	417.00
9	34	PCHBTM 2	1	Closed	1093.00	193.91	1093.00	1093.00
10	35	PCHBTM 3	1	Closed	1093.00	194.50	1093.00	1093.00
11	36	SALEM G1	1	Open	0.00	0.00	1086.00	1106.00
12	37	SALEM G2	1	Closed	1118.56	257.53	1086.00	1124.00
13	38	SUSQ 2	1	Closed	1110.00	64.34	1094.00	1110.00
14	39	HOPE CG1	1	Closed	1031.00	2.10	1031.00	1031.00
15	40	C CLF1	1	Closed	844.00	6.49	835.00	844.00
16	41	C CLF2	1	Open	0.00	0.00	837.00	840.00
17	42	LIMERCK2	1	Closed	1115.00	98.22	1115.00	1115.00

Case Information Toolbar



- Many common Case Information Display actions are available from the Case Information Toolbar
- By default, this toolbar is visible with all case information displays





Show Dialog



- Bring up any object's dialog by choosing **Show Dialog**.
- Example:
 - Generator



Display/Column Options

Column Options

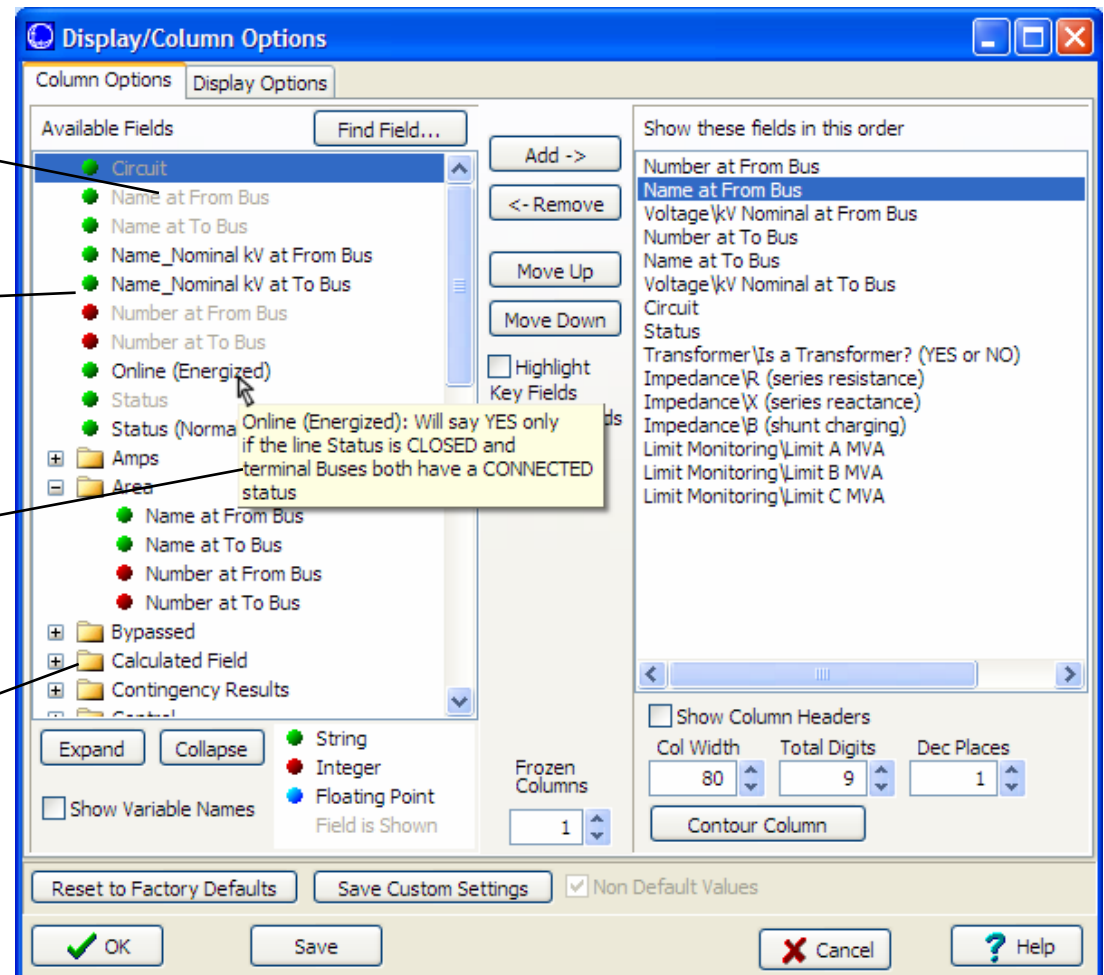


Gray text mean the field is already shown

Colored Dots represent the field type

Hints automatically appear giving a description of the field

Fields organized by folder





Display/Column Options

Column Options



- Choose fields from the **Available Fields** list. Then left-click and drag into the **Show these fields in this order** list

Also can click the **Add →** or **← Remove** Buttons to modify the fields shown

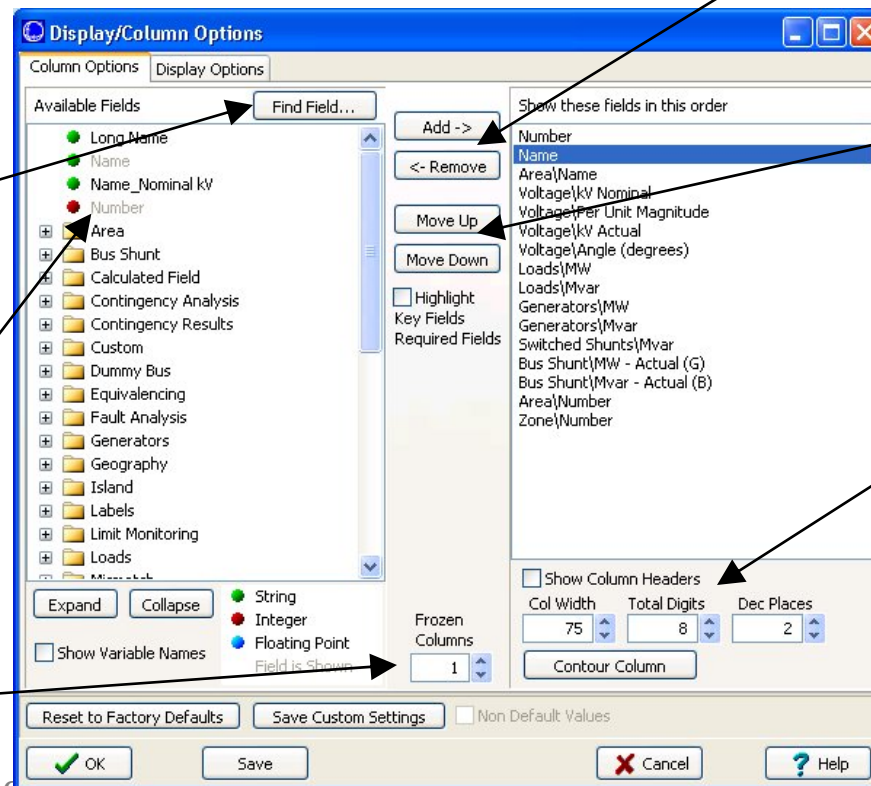
Click **Move Up** and **Move Down** to change the order of the columns

Change attributes of the display columns.
Also, use toolbar buttons

Use a wildcard find for a particular field

Fields grayed out if already in display

Number of frozen columns





Display/Column Options

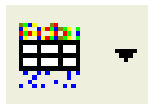
Display Options



Will disable the area/zone filtering for a single case info display. Also available via a toolbar button

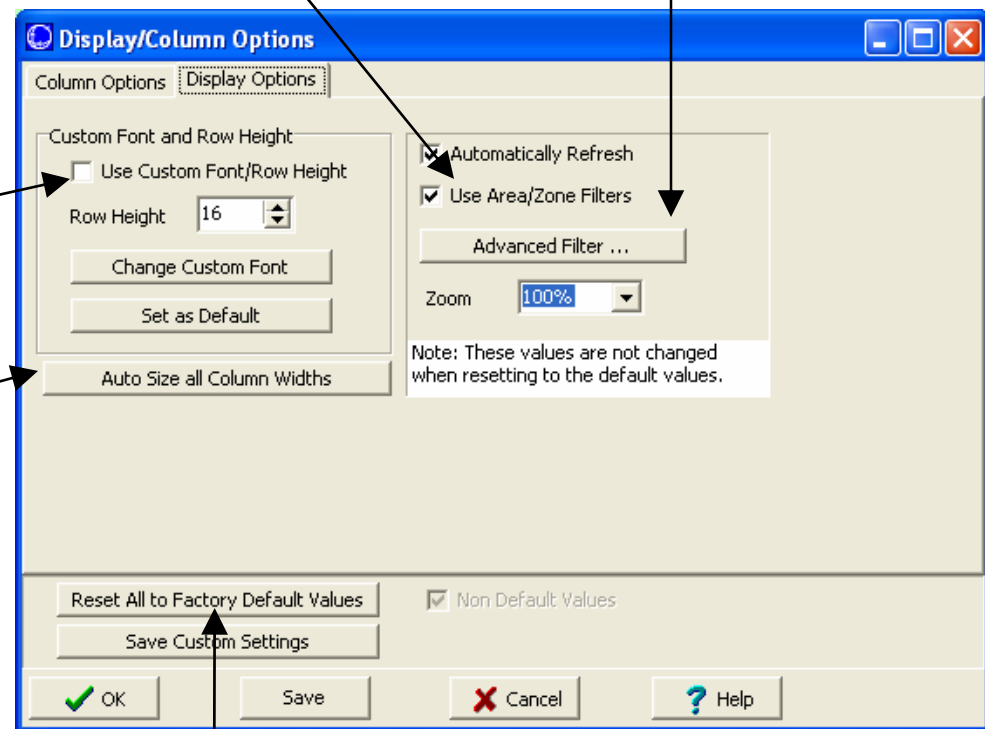


Define a custom filter
Also available via a toolbar button



Change custom fonts and row heights

Auto resize all column widths. Also available via a toolbar button



Reset all values to default



Alternative Display/Column Options

Model Explorer: Fields Pane



- Fields Pane: Directly modify the columns shown by dragging from the Fields Pane onto the case information display
 - Location of new field is highlighted by a **red** line
- Also using CTRL Left-Click to reorder columns on any case information display
 - Column being moved is highlighted by red box
 - Location being moved to is highlighted by a **red** line

Model Explorer: Loads

Fields | Explore | Options

Find Field... Add -> <- Remove

Available Fields

- ID
- Name of Bus
- Name_Nominal kV of Bus
- Number of Bus
- Online (Energized)
- Status
- Area
- Benefit
- Calculated Field
- Custom
- Geography
- Island
- Labels
- MVA
- Mvar
- MW
- OPF
- OPF Input
- Owners
- Substation
- Voltage
- Zone
- Name of Load
- Num of Bus
- Num of Load
- Key Fields
- Required Fields
- Secondary Key Fields

Expand Collapse

Frozen Columns 1

Reset to Factory Defaults

Search

	Number of Bus	Name of Bus	Area Name of Load
1	7016	BML69	PEPCO
2	7033	METZ E69	PEPCO
3	7025	NORBK 69	PEPCO
4	7087	RITCH 69	PEPCO
5	4985	FAIRLAWN	PSE&G
6	7065	PALM 69	PEPCO
7	7007	QUINC 69	PEPCO
8	4961	BERGEN	PSE&G
9	3202	JENKINS	PP&L
10	3405	QUARRY	PP&L
11	7158	BETH 34	PEPCO
12	7073	C69 WEST	PEPCO
13	7072	C69 EAST	PEPCO
14	4981	ALDENE	PSE&G
15	4986	GLOUCSTR	PSE&G
16	3413	WESCO	PP&L
17	5013	NEWARK	PSE&G
18	4994	LAWRENCE	PSE&G
19	5025	TRENTON	PSE&G
20	4980	EST RUTH	PSE&G
21	3230	S.AKRON	PP&L
22	7149	HAWK 69	PEPCO
23	5026	W.ORANGE	PSE&G
24	7133	HEWTSME	PEPCO
25	6526	GRENE ST	BG&E
26	7051	CHALSM69	PEPCO
27	4973	CAMDEN	PSE&G
28	3408	SIEGFRIE	PP&L
29	7038	TAK 34	PEPCO
30	4964	BRIDGWTR	PSE&G
31	7090	BENN 69E	PEPCO
32	7089	BENN 13	PEPCO



Find...



- Use wildcard searches to find an object

Brings up a dialog list of all objects that meet the wildcard string

Sort List by name or number

Filter the List

Wildcard string. Use:
* - several unknown characters
? - a single unknown character

A list of all the objects

Choose a Gen

517 entries

☐ Sort by Name ☒ Sort by Number

Search Next Define Filter

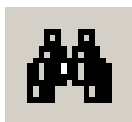
Search All ☐ Use Area/Zone Filters

You can use wildcard characters * or ?

123

11021 (TIECT11G)#1 [18 KV]
11022 (TIECT12G)#1 [18 KV]
11023 (TIECT21G)#1 [18 KV]
11024 (TIECT22G)#1 [18 KV]
11025 (TIE ST2G)#1 [18 KV]
12322 (TRACEN1G)#1 [16 KV]
12323 (TRACEN2G)#2 [13.8 KV]
13116 (GATEWY1G)#1 [18 KV]
13117 (GATEWY2G)#2 [18 KV]
13118 (GATEWY3G)#3 [18 KV]
13119 (GATEWY4G)#4 [18 KV]

OK Help Cancel



Example Wildcard Searches



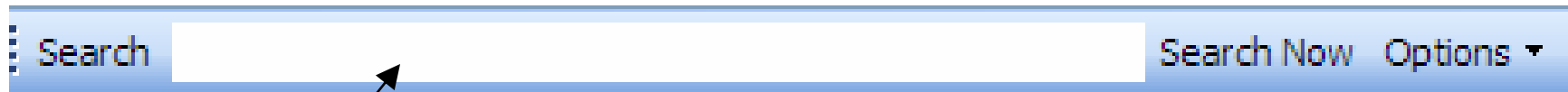
- On both the Find and Search for Text Dialogs, you can use wildcard searching
 - * several unknown characters
 - ? a single unknown character
- * Examples
 - *pw* would find “abcpw123”, “pw123”, and “abcpw”
 - pw* would only find “pw123”
 - *pw would only find “abcpw”
- ? Examples
 - ?pw* would find “apw123” and “apw”
 - ?pw* would NOT find “abcpw123”



Search for Text...



- Search through the text shown on the case information display for a particular string
- Feature can also be accessed directly on the Search Toolbar at the bottom of the Model Explorer



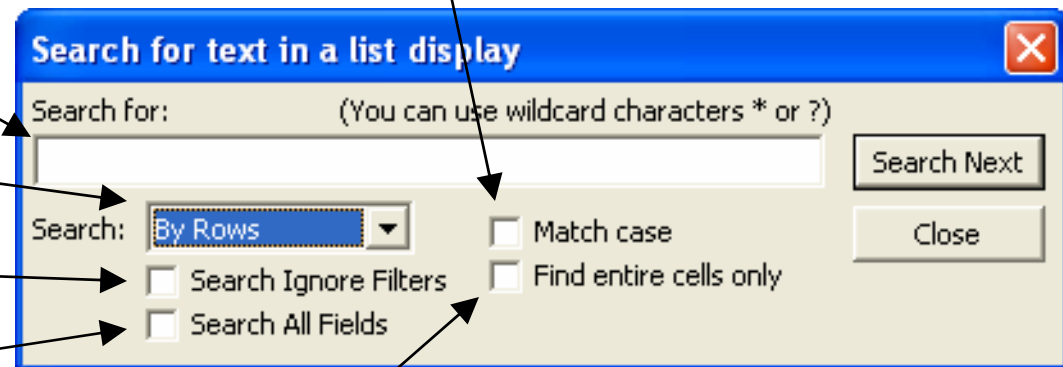
Enter Search String

Search by
columns or rows

Search records
filtered out

Search fields not displayed

Match upper/lower case letters



Only search if entire cell matches 13-24



Search for Text Options



- Search Ignore Filters
 - Choose this option to search through all records of the object type shown on the case information display regardless of the present filtering applied.
 - If the text is found outside of the presently shown objects, then you will be prompted to remove filtering
- Search All Fields
 - Choose this option to search through all fields of the object type shown on the case information display regardless of the presently shown fields.
 - If the text is found in a field not presently shown, then you will be prompted to show the column.

Records Menu



- Contains a list of actions related to the specific kinds of records displayed in the case information display
- Common choices available here
 - **Insert** and **Delete**: to insert and delete objects
 - **Bus View** and **Substation View**
 - **Area/Zone/Owner Filters**
 - **Define Expression** – discussed next
 - **Pan to Object on Online** – choose to pan to a display object that represents the active row
- Typical other choices
 - Automatically creating objects from the selection

Define Expression



- To open the Custom Expression Dialog, select the **Records** toolbar menu and choose **Define Expression...**
- Then click **New** to make a new expression

Creating a Custom Expression



Specify the fields used in the expression

Write the expression as a function of x1, x2, ...

Choose Add Column... as a quick way to add the column to the Case Info Display

Operators Available in Custom Expressions



()	>=	COS	CSCH	LOG
!	<=	TAN	ASINH	LOG2
%	<>	ASIN	ACOSH	LOG10
^	NOT	ACOS	ATANH	CEIL
*	AND	ATAN	ACOTH	RND
/	OR	SEC	ASECH	INT
\	XOR	CSC	ACSCH	SGN
MOD	EQV	COT	ABS	SQR
+	IMP	SINH	EXP	
-	IIF	COSH	EXP2	
>	MIN	TANH	EXP10	
<	MAX	COTH		
==	SIN	SECH		

- Details available in Help files



Geo Menu



- Geo Menu provides access to options related to the automatic creation of Geographic Data Views.
 - There must be latitude/longitude information populated in either the bus records or the substation records for this to work.
 - This will be discussed more in the Advanced Visualization Section later in the training.

Set Menu



- Set Menu contains options for changing values in the presently selected column
 - **Toggle All Yes, No, Closed, Open, etc...**
 - **Set All Value to...**
 - Choose this option to set all values in the active column to a particular value. A dialog will appear allowing you to specify the value to which to set the values.
 - **Set All Values to Field...**
 - Choose this option to set all values in the active column to the values in another column.
 - For example, you may change the voltage set-point of a generator to be equal to the terminal voltage of the generator. A dialog will appear asking you to choose the field.
- Actions only apply to objects presently being shown on the display – *Filtering is important*

Set Values to Field... Another Way

Enter Data from Another Field



- When typing, append the @ symbol to copy data from another field
- Fields must be identified with Variable Names (See “Auxiliary File Data Sections” for description of Variable Names)
- Example: Type **@BusPUVolt** into the generator setpoint voltage and it will change the setpoint to the terminal voltage.
- This also works in auxiliary files or when pasting from Excel
 - Note: When entering in Excel, you may need to add a single quote (‘) before the @ symbol

	BusNum ⁽¹⁾	BusName	GenID ⁽²⁾	GenStatus ⁽³⁾	GenMW ⁽⁴⁾	GenMVR ⁽⁵⁾	BusPUVolt	GenVoltSet ⁽⁶⁾	GenAGC#
1	1	One	1	Closed	101.85	5.25	1.05	@BusPUVolt	YES
2	2	Two	1	Closed	170.08	33.24	1.04	1.04	YES
3	4	Four	1	Closed	95.03	19.99	1.00	1.00	YES
4	6	Six	1	Closed	200.33	-6.59	1.04	1.04	YES
5	7	Seven	1	Closed	200.65	51.29	1.04	1.04	YES

Value will be set to 1.05 on enter



- Several options generally available
 - **Select Columns** and **Select Rows**
 - **Get Column Metrics**
 - Get statistical information about the data shown
 - **Contour Columns**
 - Color the background of the cells in the column
 - **Plot Columns**
 - Plot the data in the columns.



Get Column Metrics



- Available under the **Columns** toolbar menu
- Choose to get the statistical information about the column you click (only for those values that are presently displayed)
 - Sum
 - Average
 - Variance
 - Standard Deviation
 - Maximum
 - Minimum
 - Total Items
 - Total Non-Zero Items

Grid Metrics

Start Column: 7
End Column: 7
Start Row: 1
End Row: 10452

Treatment of blank cells:
☒ Treat blank cells as zero
☐ Ignore blank cells for calculation

☐ Use Absolute Values

Click Calculate Metrics to determine the grid metrics to determine metrics with a new set of options

The metrics for column Load MW are
387934.13 = Sum
37.12 = Average
17487.29 = Variance
132.24 = STD Deviation
5100.77 = Maximum
-2490.94 = Minimum

Close Update Metrics

Contour Column



- To open the Contour Column Dialog, select the **Columns** toolbar menu and choose **Contour Column...**

Choose your color map

Choose the fields to use for the contouring (normally the same as the column being contoured)

Column being contoured

Choose how the values map to colors

Options regarding the Color Key

Contour Column - Voltage: Per Unit Magnitude

Contour Type Custom Color Map

Color Map

Blue=low, Red=High

Reverse Color Map Colors

Brightness

Darker Normal Lighter

Choose a Field to Color By

Use cell values directly

Use the specified field below

Value Find Value ...

Voltage: Per Unit Magnitude

Color Key

Draw Color Key

Title

Entry Labels Dec.Pts. Scalar

0 1.0000

Use Equal Spacing

Values

Use absolute value

Maximum 1.0583 pu

Break High 1.0316 pu

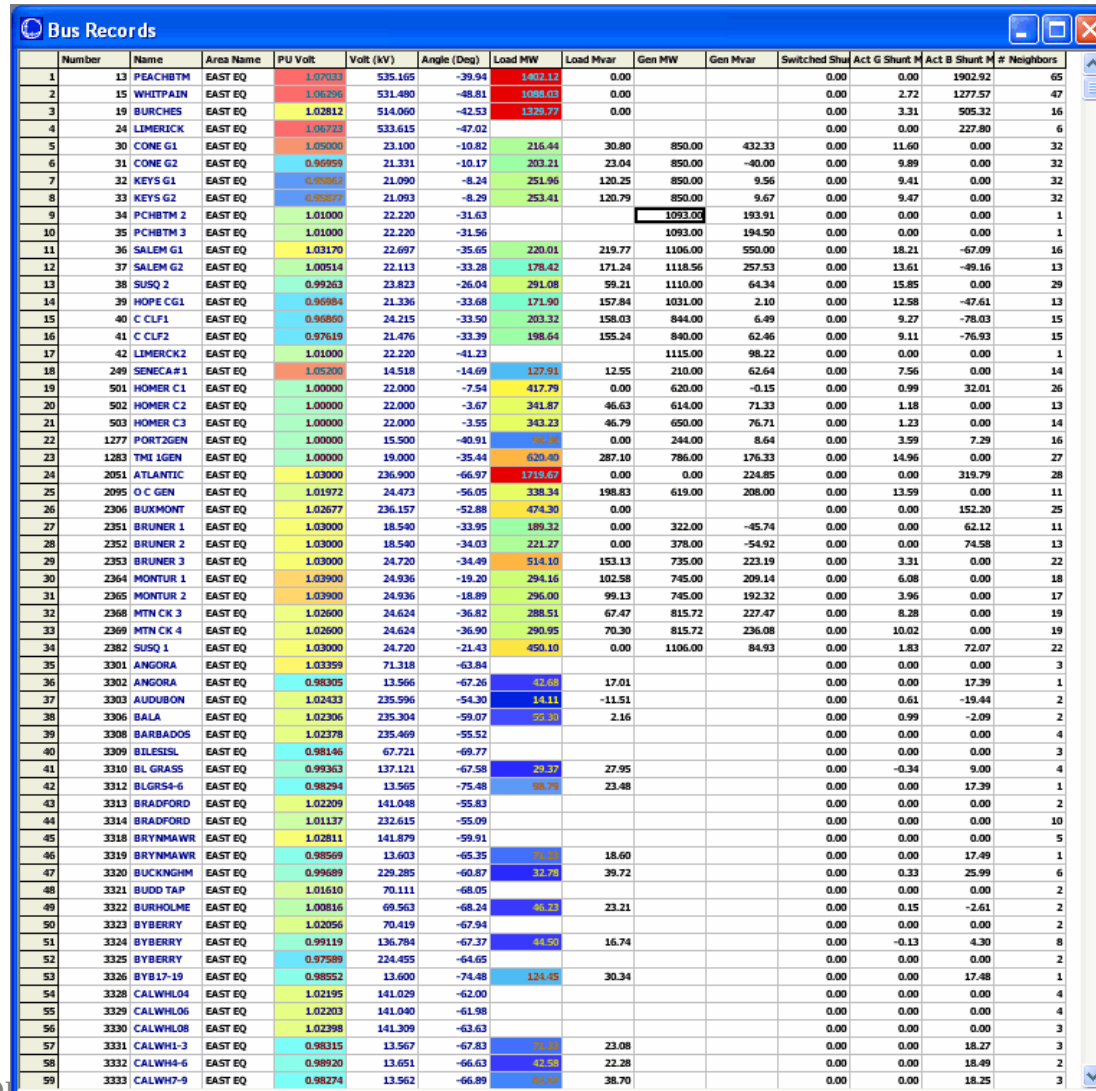
Nominal 1.0049 pu

Break Low 0.9782 pu

Minimum 0.9515 pu

OK Remove Cancel Help

Example Display with Contoured Columns



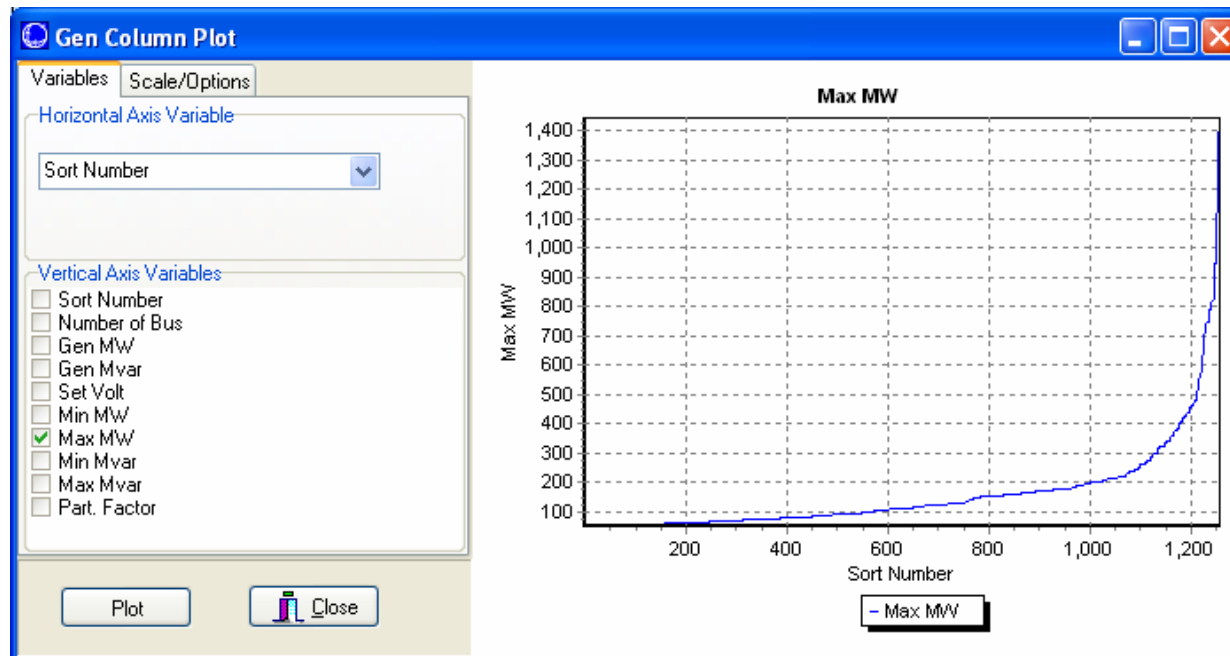
The screenshot displays a software window titled "Bus Records" containing a table of bus data. The table has 14 columns: Number, Name, Area Name, PU Volt, Volt (kV), Angle (Deg), Load MW, Load Mvar, Gen MW, Gen Mvar, Switched Shunt, Act G Shunt, Act B Shunt, and # Neighbors. The data is organized into rows, with some rows highlighted in yellow and others in light blue. The table is scrollable, and the window includes standard Windows controls (minimize, maximize, close) in the top right corner.

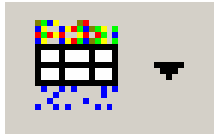
Number	Name	Area Name	PU Volt	Volt (kV)	Angle (Deg)	Load MW	Load Mvar	Gen MW	Gen Mvar	Switched Shunt	Act G Shunt	Act B Shunt	# Neighbors
1	13 PEACHBTM	EAST EQ	1.07033	535.165	-39.94	1402.12	0.00			0.00	0.00	1902.92	65
2	15 WHITPAIN	EAST EQ	1.06296	531.480	-48.81	1088.03	0.00			0.00	2.72	1277.57	47
3	19 BURCHES	EAST EQ	1.02812	514.060	-42.53	1328.77	0.00			0.00	3.31	505.32	16
4	24 LIMERICK	EAST EQ	1.06723	533.615	-47.02					0.00	0.00	227.80	6
5	30 CONE G1	EAST EQ	1.05000	23.100	-10.82	216.44	30.80	850.00	432.33	0.00	11.60	0.00	32
6	31 CONE G2	EAST EQ	0.96959	21.331	-10.17	203.21	23.04	850.00	-40.00	0.00	9.89	0.00	32
7	32 KEYS G1	EAST EQ	0.95863	21.090	-8.24	251.96	120.25	850.00	9.56	0.00	9.41	0.00	32
8	33 KEYS G2	EAST EQ	0.95877	21.093	-8.29	253.41	120.79	850.00	9.67	0.00	9.47	0.00	32
9	34 PCHBTM 2	EAST EQ	1.01000	22.220	-31.63			1093.00	193.91	0.00	0.00	0.00	1
10	35 PCHBTM 3	EAST EQ	1.01000	22.220	-31.56			1093.00	194.50	0.00	0.00	0.00	1
11	36 SALEM G1	EAST EQ	1.03170	22.697	-35.65	220.01	219.77	1106.00	550.00	0.00	18.21	-67.09	16
12	37 SALEM G2	EAST EQ	1.00514	22.113	-33.28	178.42	171.24	1118.56	257.53	0.00	13.61	-49.16	13
13	38 SUSQ 2	EAST EQ	0.99263	23.823	-26.04	291.08	99.21	1110.00	64.34	0.00	15.85	0.00	29
14	39 HOPE CG1	EAST EQ	0.96984	21.336	-33.68	171.90	157.84	1031.00	2.10	0.00	12.58	-47.61	13
15	40 C CLF1	EAST EQ	0.96860	24.215	-33.50	203.32	158.03	844.00	6.49	0.00	9.27	-78.03	15
16	41 C CLF2	EAST EQ	0.97619	21.476	-33.39	198.64	155.24	840.00	62.46	0.00	9.11	-76.93	15
17	42 LIMERCK2	EAST EQ	1.01000	22.220	-41.23			1115.00	98.22	0.00	0.00	0.00	1
18	249 SENECA#1	EAST EQ	1.05200	14.518	-14.69	127.91	12.55	210.00	62.64	0.00	7.56	0.00	14
19	501 HOMER C1	EAST EQ	1.00000	22.000	-7.54	417.79	0.00	620.00	-0.15	0.00	0.99	32.01	26
20	502 HOMER C2	EAST EQ	1.00000	22.000	-3.67	341.87	46.63	614.00	71.33	0.00	1.18	0.00	13
21	503 HOMER C3	EAST EQ	1.00000	22.000	-3.55	343.23	46.79	650.00	76.71	0.00	1.23	0.00	14
22	1277 PORT2GEN	EAST EQ	1.00000	15.500	-40.91	60.39	0.00	244.00	8.64	0.00	3.59	7.29	16
23	1283 TMI 1GEN	EAST EQ	1.00000	19.000	-35.44	620.40	287.10	786.00	176.33	0.00	14.96	0.00	27
24	2051 ATLANTIC	EAST EQ	1.03000	236.900	-66.97	1719.67	0.00	0.00	224.85	0.00	0.00	319.79	28
25	2095 O C GEN	EAST EQ	1.01972	24.473	-56.05	338.34	198.83	619.00	208.00	0.00	13.59	0.00	11
26	2306 BUXMONT	EAST EQ	1.02677	236.157	-52.88	474.30	0.00			0.00	0.00	152.20	25
27	2351 BRUNER 1	EAST EQ	1.03000	18.540	-33.95	189.32	0.00	322.00	-45.74	0.00	0.00	62.12	11
28	2352 BRUNER 2	EAST EQ	1.03000	18.540	-34.03	221.27	0.00	378.00	-54.92	0.00	0.00	74.58	13
29	2353 BRUNER 3	EAST EQ	1.03000	24.720	-34.49	514.10	153.13	735.00	223.19	0.00	3.31	0.00	22
30	2364 MONTUR 1	EAST EQ	1.03900	24.936	-19.20	294.16	102.58	745.00	209.14	0.00	6.08	0.00	18
31	2365 MONTUR 2	EAST EQ	1.03900	24.936	-18.89	296.00	99.13	745.00	192.32	0.00	3.96	0.00	17
32	2368 MTN CK 3	EAST EQ	1.02600	24.624	-36.82	288.51	67.47	815.72	227.47	0.00	8.28	0.00	19
33	2369 MTN CK 4	EAST EQ	1.02600	24.624	-36.90	290.95	70.30	815.72	236.08	0.00	10.02	0.00	19
34	2382 SUSQ 1	EAST EQ	1.03000	24.720	-21.43	450.10	0.00	1106.00	84.93	0.00	1.83	72.07	22
35	3301 ANGORA	EAST EQ	1.03359	71.318	-63.84					0.00	0.00	0.00	3
36	3302 ANGORA	EAST EQ	0.98305	13.566	-67.26	42.68	17.01			0.00	0.00	17.39	1
37	3303 AUDUBON	EAST EQ	1.02433	235.596	-54.30	14.11	-11.51			0.00	0.61	-19.44	2
38	3306 BALA	EAST EQ	1.02306	235.304	-59.07	25.15	2.16			0.00	0.99	-2.09	2
39	3308 BARBADOS	EAST EQ	1.02378	235.469	-55.52					0.00	0.00	0.00	4
40	3309 BILESISL	EAST EQ	0.98146	67.721	-69.77					0.00	0.00	0.00	3
41	3310 BL GRASS	EAST EQ	0.99363	137.121	-67.58	29.17	27.95			0.00	-0.34	9.00	4
42	3312 BLGRS4-6	EAST EQ	0.98294	13.565	-75.48	53.75	23.48			0.00	0.00	17.39	1
43	3313 BRADFORD	EAST EQ	1.02209	141.048	-55.83					0.00	0.00	0.00	2
44	3314 BRADFORD	EAST EQ	1.01137	232.615	-55.09					0.00	0.00	0.00	10
45	3318 BRYNMAWR	EAST EQ	1.02811	141.879	-59.91					0.00	0.00	0.00	5
46	3319 BRYNMAWR	EAST EQ	0.98569	13.603	-65.35	71.25	18.60			0.00	0.00	17.49	1
47	3320 BUCKNGHM	EAST EQ	0.99689	229.285	-60.87	32.78	39.72			0.00	0.33	25.99	6
48	3321 BUDD TAP	EAST EQ	1.01610	70.111	-68.05					0.00	0.00	0.00	2
49	3322 BURHOLME	EAST EQ	1.00816	69.563	-68.24	46.21	23.21			0.00	0.15	-2.61	2
50	3323 BYBERRY	EAST EQ	1.02056	70.419	-67.94					0.00	0.00	0.00	2
51	3324 BYBERRY	EAST EQ	0.99119	136.784	-67.37	44.50	16.74			0.00	-0.13	4.30	8
52	3325 BYBERRY	EAST EQ	0.97589	224.455	-64.65					0.00	0.00	0.00	2
53	3326 BYB17-19	EAST EQ	0.98552	13.600	-74.48	124.45	30.34			0.00	0.00	17.48	1
54	3328 CALWHL04	EAST EQ	1.02195	141.029	-62.00					0.00	0.00	0.00	4
55	3329 CALWHL06	EAST EQ	1.02203	141.040	-61.98					0.00	0.00	0.00	4
56	3330 CALWHL08	EAST EQ	1.02398	141.309	-62.63					0.00	0.00	0.00	3
57	3331 CALWH1-3	EAST EQ	0.98315	13.567	-67.83	71.25	23.08			0.00	0.00	18.27	3
58	3332 CALWH4-6	EAST EQ	0.98920	13.651	-66.63	42.65	22.28			0.00	0.00	18.49	2
59	3333 CALWH7-9	EAST EQ	0.98274	13.562	-66.89	42.67	38.70			0.00	0.00	18.25	3

Plot Columns



- Choose the Plot Columns option to allow yourself to plot any column that is presently shown on the case information display.
- An example using generator Maximum MW outputs is shown below

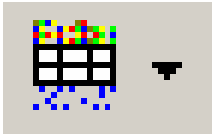




Area/Zone/Owner Filtering



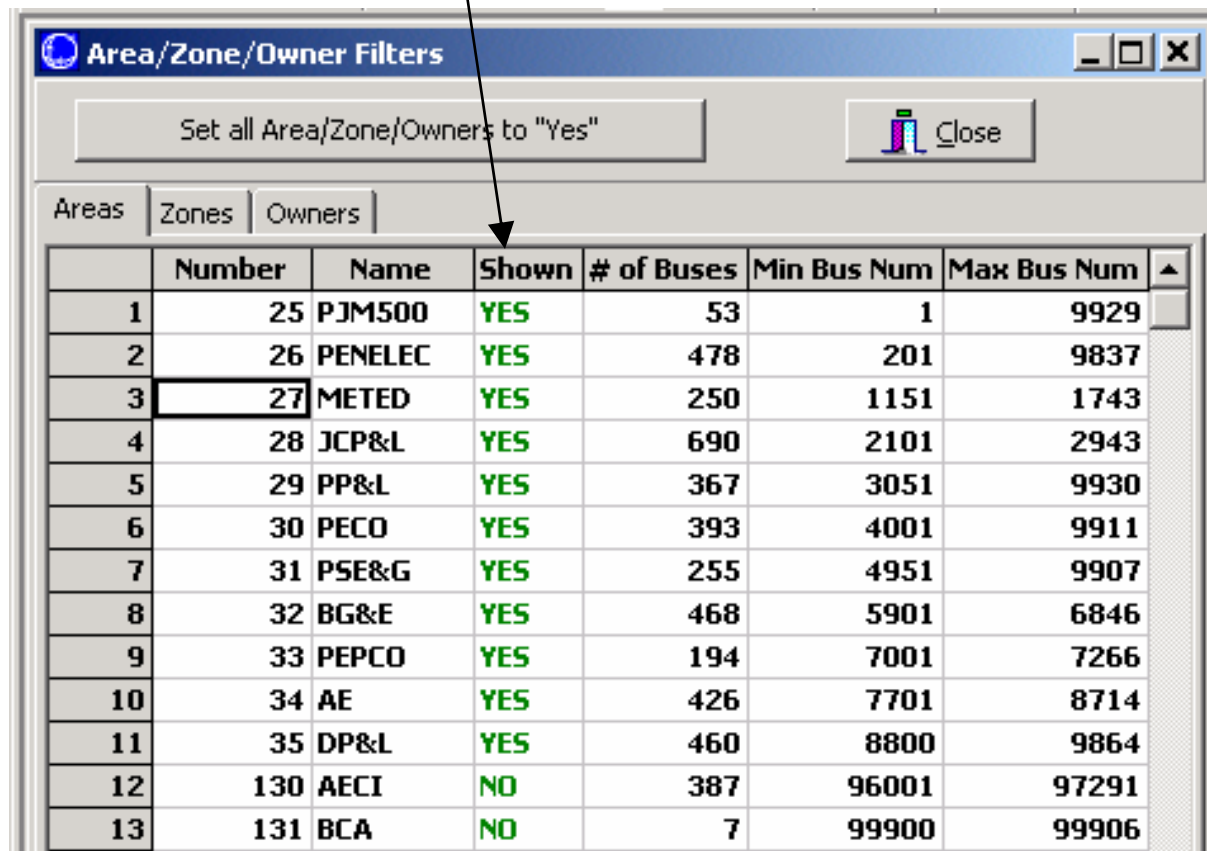
- Area/Zone/Owner Filtering is a GLOBAL setting
 - They apply to all case information displays
- Use Area/Zone/Owner Filtering to limit what is shown in Case Information Displays to only those elements whose:
 - Area is set to be shown
 - AND**
 - Zone is set to be shown
 - AND**
 - Owner is set to be shown



Area/Zone/Owner Filters



Toggle the Shown field



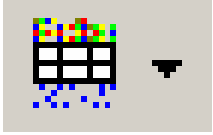
Area/Zone/Owner Filters

Set all Area/Zone/Owners to "Yes"

Close

Areas Zones Owners

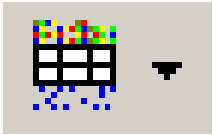
	Number	Name	Shown	# of Buses	Min Bus Num	Max Bus Num	
1	25	PJM500	YES	53	1	9929	
2	26	PENELEC	YES	478	201	9837	
3	27	METED	YES	250	1151	1743	
4	28	JCP&L	YES	690	2101	2943	
5	29	PP&L	YES	367	3051	9930	
6	30	PECO	YES	393	4001	9911	
7	31	PSE&G	YES	255	4951	9907	
8	32	BG&E	YES	468	5901	6846	
9	33	PEPCO	YES	194	7001	7266	
10	34	AE	YES	426	7701	8714	
11	35	DP&L	YES	460	8800	9864	
12	130	AECI	NO	387	96001	97291	
13	131	BCA	NO	7	99900	99906	



Advanced Filtering



- Click on the **Advanced Filter** toolbar button and choose **Advanced Filter...**
 - Note: Drop-down menu of the toolbar button will show a list of Advanced Filters that have already been defined for the respective kind of object.
- When you open this dialog, the default is to see filters that have been defined for the type of object you are trying to filter (e.g. Bus, Generator, Interface, etc...).



Advanced Filter Dialog

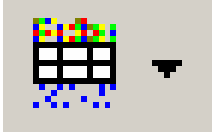


Check to Limit
the Fields
available to
those which
are shown on
the case info
display

Type of object being filtered

Conditions

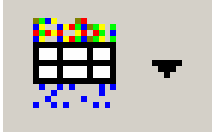
Click to delete a condition



Advanced Filtering



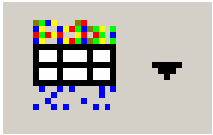
- Some objects allow the use of filters defined for related objects
 - Change **Select Filter Type** to select/define filters for related objects
 - Example: Use bus filter for nominal voltages greater than 138 kV to filter generators
- No Maximum Amount of Conditions
 - Choose the field, then the comparator, then the values to compare the field to.
 - Fields are the same as those available for Case Info
- You can optionally “pre-filter” using the Area/Zone/Owner Filters



Advanced Filter



- Logical Comparison specifies the filter logic.
 - Comparison applies across ALL conditions
 - AND – filter is met if ALL conditions are met
 - OR – filter is met if ANY condition is met
 - NOT AND – filter is NOT met if and only if ALL conditions are met
 - NOT OR – filter is NOT met if and only if ANY condition is met
- Other advanced options
 - Absolute value (ABS) compare for numeric conditions
 - Case Sensitive compare for string conditions
 - Field-to-field comparisons
 - Using another filter as a filter condition



Field-To-Field Comparisons



- Users have the option to include Field-To-Field comparisons

Advanced Filters for Bus

Select Filter Type: Bus

Filter Name: Name of an Advanced Filter

Buttons: Save, Save As, Rename, Delete

☐ Pre-filter using Area/Zone/Owner Filters

☒ Limit Fields to Columns ☐ Show All Fields

Logical Comparison: ☒ AND ☐ OR ☐ Not AND ☐ Not OR

Condition 1

☒ Condition 1

Find... Voltage\kW Nominal between 100 and 345 ☐ ABS

☐ Use Another Filter

Constant Find Constant Find

Condition 2

☒ Condition 2

Find... Generators\MW less than or equal to Loads\MW ☐ ABS

☐ Use Another Filter

Field Find

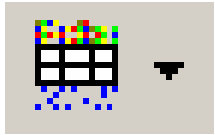
☒ Enable Field to Field Comparisons

Buttons: Add >>, Delete ...

Buttons: Filter, Remove, Help, Cancel

Click the **Find** Button to choose another field to compare to instead of a constant value.

Check the box for **Enable Field to Field Comparisons**

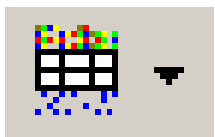


Using a Filter as a Condition

X AND (Y OR Z)



- As described, filters are very flexible, however you can not create the comparison
 - *X and (Y or Z)*
- In order to do this you must first create a filter that represents “Y or Z”
- Then create a second filter which uses this filter as a condition
 - Check the box **Use Another Filter** under the list of fields for the condition
 - This changes the dialog to have choices of meets filter or not meets filter



Using a Filter as a Condition

$X \text{ AND } (Y \text{ OR } Z)$



Check Box
Use Another Filter

Specify the
name of the
other filter

Advanced Filters for Bus

Select Filter Type: Bus

Filter Name: X and (Y or Z)

Save Save As Rename Delete

☐ Pre-filter using Area/Zone/Owner Filters

Logical Comparison: ☐ AND ☒ OR ☐ Not AND ☐ Not OR

☒ Limit Fields to Columns ☐ Show All Fields

Condition 1: ☒ Find... UseAnotherFilter meets filter Y or Z ☒ Use Another Filter Find

Condition 2: ☒ Find... Loads\MW greater than 100 ☐ Use Another Filter Find

Add >> Delete ...

Enable Field to Field Comparisons ☒

Filter Remove Help Cancel

- Note: you must be careful of circular references

Advanced Filtering: Across Object Types

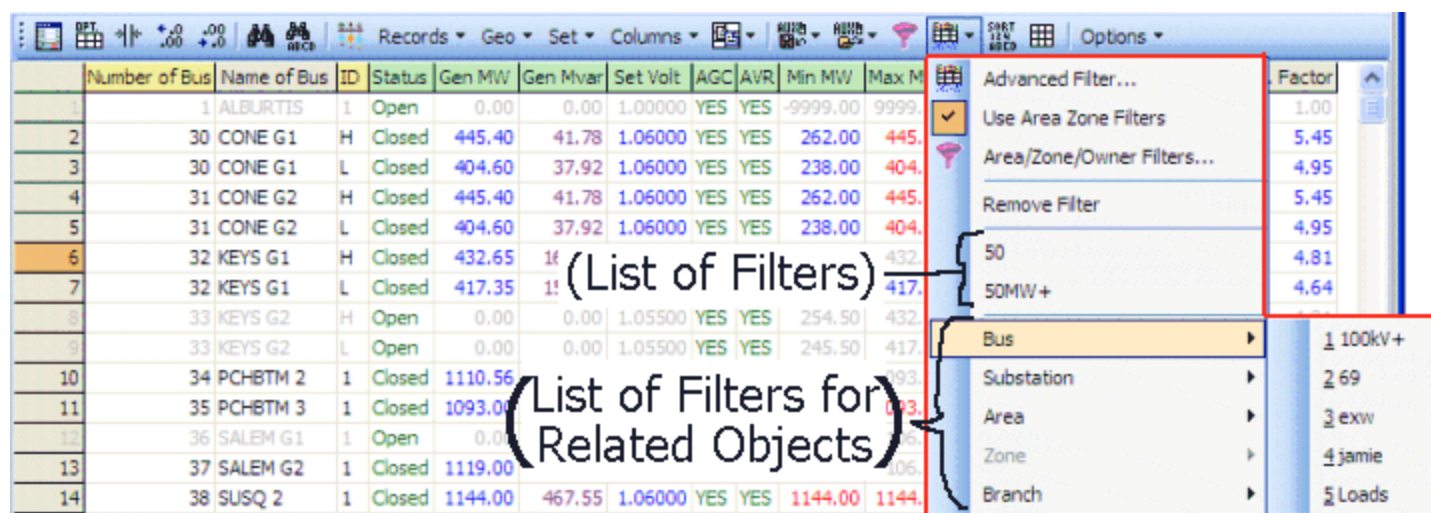


- Use advanced filters across object types
 - For example: define a Bus filter and then use this bus filter on a generator, load, or switched shunt object
 - If the object being filter contains many of the filter object type, then OR is assumed.
 - If a bus object uses an area filter, the bus meets the filter if the area of the bus meets the filter
 - If an area object uses a bus filter, the area meets the filter if ANY single bus in the area meets the filter

Case Information Toolbar : Filters Menu



- Provides access to the old **Advanced Filter...** button and **Area/Zone/Owner Filters**
- Also provides submenu access to advanced filters defined for related object types



Simple Sorting



- To sort a column, left-click on the column heading. Click again to sort in the opposite direction

Sorted Descending by Gen MW

Note: Arrow showing sort direction

Gen Records								
	Number	Name	ID	Status	Gen MW ▼	Gen Mvar	Min MW	Max MW
1	42	LIMERCK2	1	Closed	1150.00	208.01	1150.00	1150.00
2	3163	SUSQ 1	1	Closed	1140.00	163.88	0.00	1160.00
3	4159	LIMERCK1	1	Closed	1134.00	276.00	1134.00	1134.00
4	37	SALEM G2	1	Closed	1119.00	498.10	1100.00	1119.00
5	38	SUSQ 2	1	Closed	1105.00	469.96	1144.00	1144.00
6	35	PCHBTM 3	1	Closed	1093.00	497.63	1093.00	1093.00
7	34	PCHBTM 2	1	Closed	1085.05	498.40	1093.00	1117.00
8	39	HOPE CG1	1	Closed	1043.00	498.10	1031.00	1043.00
9	40	C CLF G1	1	Closed	838.00	400.00	835.00	838.00
10	1733	TMI 1GEN	1	Closed	831.00	169.80	831.00	831.00
11	3151	MTN CK 4	4	Closed	820.00	301.37	0.00	860.00
12	3150	MTN CK 3	3	Closed	817.15	301.37	0.00	860.00
13	3147	MONTUR 2	1	Closed	766.00	135.91	0.00	775.00
14	3146	MONTUR 1	1	Closed	759.00	135.91	0.00	775.00
15	3135	BRUNER 3	3	Closed	749.00	205.38	0.00	800.00
16	603	HOMER C3	1	Closed	650.00	83.09	300.00	650.00
17	5902	BRANDNG2	1	Closed	650.00	317.52	400.00	650.00

Advanced Sorting



- Click on the **Advanced Sort** toolbar button to open the Advanced Sorting Dialog

Check to Limit the Fields available to sort by to those which are shown on the list display

Click to delete condition

Sort Order for Bus

☒ Limit Fields to Columns ☐ Show All Fields

X Sort by (Condition 1)
Find... Area Name ☒ Ascending ☐ Descending ☐ Case Sens.

X Then by (Condition 2)
Find... Choose a Field ☒ Ascending ☐ Descending ☐ ABS

X Then by (Condition 3)
Find... Choose a Field ☒ Ascending ☐ Descending ☐ ABS

☒ Sort ☒ Cancel

Advanced Sorting



- Choose the sort order you desire
- Can be either ascending or descending
- No Maximum Amount of sort conditions
- Other advanced options
 - Absolute value (ABS) compare for numeric conditions
 - Case Sensitive compare for string conditions



Save As



- Save As
 - Auxiliary File...
 - This will save **ALL** information shown in the present case information display as a DATA section in an auxiliary file
 - **ALL** fields being displayed will be saved
 - Auxiliary File (only selected records)...
 - Same as previous, but
 - **Only Selected** records will be saved
 - Again **ALL** fields being displayed will be saved
 - Auxiliary File (only selected records/columns)
 - Same as previous, but
 - **Only Selected** records will be saved
 - **Only Selected** fields will be saved



Save As



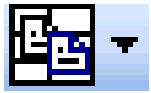
- Save As
 - CSV (Comma delimited)...
 - This will save **ALL** information shown in the present case information display in a comma-separate value (CSV) text file
 - The first line of text will be the object type
 - The second line of text will be the list of all fields
 - The rest will be values of all displayed fields for all objects shown separated by commas.
 - CSV (only selected records/columns)...
 - Same as previous but **Only Selected** Records and columns will be saved
 - HTML...
 - This will save the case info as an HTML file
 - Other formats (depending on the display)
 - Some case information displays have other formats available. Often these are formats from older versions of Simulator.



Load



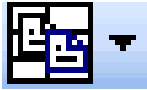
- Load
 - Auxiliary File (any data)...
 - Will load all DATA sections from an auxiliary
 - Auxiliary File (only *specific* data)...
 - Will load only specific kinds of data from an auxiliary file.
 - Other formats (depending on the display)
 - Some case information displays have other formats available. Often these are formats from older versions of Simulator.



Copying from and Pasting to Case Information Displays



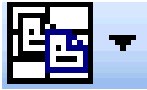
- There are five Copy/Send options
 - Copy All: copy all contents of display
 - Copy Selection: copy selection
 - Send All to Excel: send all contents directly to excel (this will open a session of Excel and populate a worksheet)
 - Send Selection to Excel: send only selection
 - Copy/Send Special



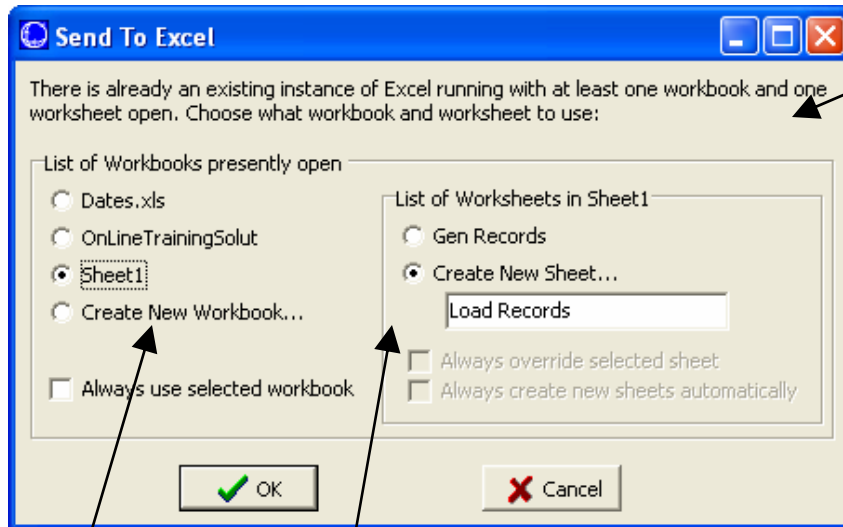
Copy/Send Special



- Provides the same options as the other four Copy/Send options
- Allows you to specify whether to use the column headings from the case info display or variable names from the DATA section of the auxiliary file format.
- Allows you to specify whether to copy the two informational rows (described next).
- Send/Copy the transpose of the data will send/copy the column information to rows and the row information to columns.



Copy/Send to Excel



Dialog Occurs only if session of Excel is already running.

Cell A1 describes the kind of data

Select existing or new workbook and worksheet for sending data

	A	B	C	D	E	F	G
1	Load Records						
2	Number	Name	ID	Status	MW	Mvar	MVA
3	1	One	1	Closed	120.0	20.0	121.7
4	2	Two	1	Closed	120.0	20.0	121.7
5	3	Three	1	Closed	120.0	20.0	121.7
6	4	Four	1	Closed	120.0	20.0	121.7
7	5	Five	1	Closed	120.0	50.0	130.0
8	6	Six	1	Closed	120.0	10.0	120.4

Row 2 describes which fields are being pasted

For Loads, *Number* and *ID* are the key fields

Description of Data: (Cell A1)



- The first entry in Cell A1 (highlighted) is a description of the data.
 - It is VERY important
 - Keep this description and DO NOT modify
 - When pasting back into the case information display Simulator reads this line to find what kind of data is being pasted.
 - Besides the string that is written by Simulator, you may also use the *Object Name* of the type of data being pasted. See DATA sections of the auxiliary file format for more information.

Description of Fields: (Second Row in Table)



- The second row (highlighted) provides a list of the fields in the data.
 - Also VERY important.
 - When pasting back into simulator the second row is used to determine what kind of fields are being pasted.
 - Note that if Simulator does not recognize a field heading, it ignores this field in the paste.
 - You may alternatively use the *Variable Names* from the DATA section of the auxiliary format

Data Record Key Fields



- Each kind of data record has a few columns that serve as *key fields* for Simulator.
 - Buses: *Number*.
 - Lines: *From Number*, *To Number*, and *Circuit*.
 - Loads: *Number* and *ID*.
- If you want to paste data back into Simulator you **MUST** keep these columns intact.
- You can get a list of the key fields by choosing **Export Case Object Fields → Text File** from the Window ribbon tab.
 - The key fields will be denoted in this output with asterisks (*1*, *2*, and *3*)

Secondary Key Fields



- There are also secondary key fields
 - Often represent a combination of Name/Nominal kV for bus-related objects
 - The secondary key fields will be denoted in this output with asterisks (*A*, *B*, and *C*)
- When pasting into Simulator, we first look to see if the key fields are available. If they are not, then we look for the secondary key fields and use them instead.

Use the Spreadsheet



- You can now utilize the power of your spreadsheet in any manner you wish. Just make sure the final format of the spreadsheet meets the requirements of having the two header rows EXACTLY correct and keep the columns which represent the key.
- Outside of these requirements, you can delete columns and rows of the spreadsheet however you wish.

Select the Spreadsheet



- When you have completed your spreadsheet use and want to paste back into Simulator:
 - Select the entire spreadsheet (the easiest way to do this is to click on the top left square between the Row A and Column 1 headers).
 - Select **Copy**.
- You can alternatively select only part of the spreadsheet as long as you capture all of the required format.

Pasting into Simulator



- Go back to Simulator, click on the **Copy, Paste, and Send** toolbar menu and choose **Paste**
 - Note: if the clipboard format is not correct, then Simulator will disable the Paste option
- A few last notes: you can only paste values into the case information displays if the values are enterable. This means they will be displayed as **blue** (by default).

Pasting NEW objects



- You can also paste in new objects from the spreadsheet
- Be careful. You must provide all required data regarding the object.
- For instance, if you create a bus you should include an area number and a zone number.
- Required Fields can be highlighted in green by using the **Highlight Key/Required** fields options
 - In the Display/Column Options
 - In the heading caption of the case info display

Redundant Data



- Also, be careful about pasting redundant data. For example, in the Bus Records both voltage in *per unit* and voltage in *kV* are enterable, but they specify the same information.
- Make sure you only copy ONE of these columns into Simulator. Otherwise you may not get what you expect. Simulator will paste the information in twice, and whatever value was 2nd will show up

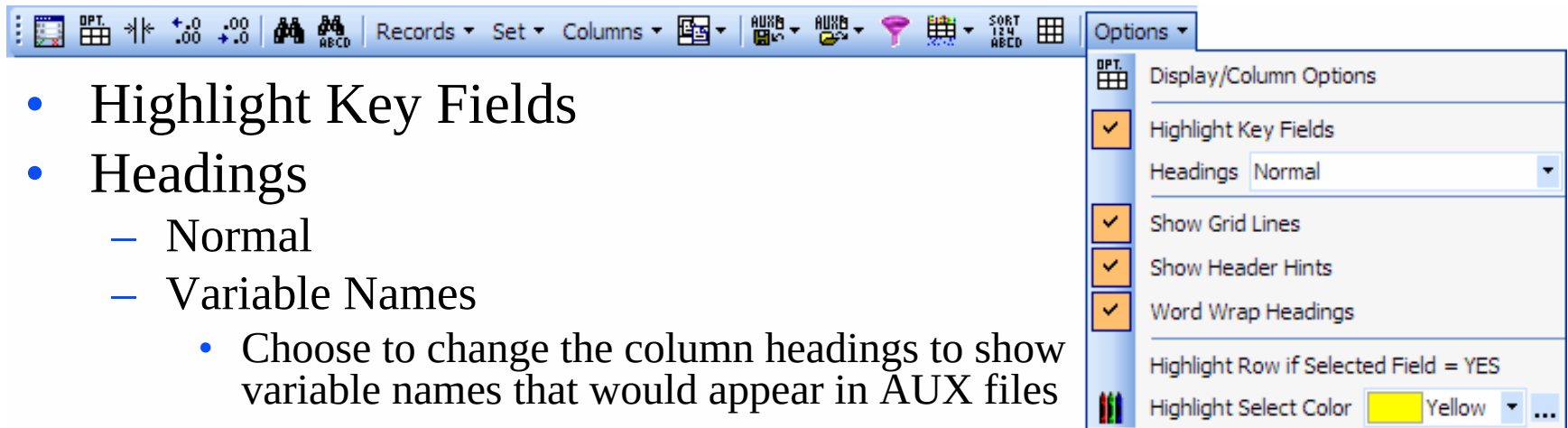
Example Redundant Data



- Load Records represent an example of redundant data. The MW value is a function of the S MW, I MW and Z MW values
 - $MW = S\ MW + I\ MW * V_{pu} + Z\ MW * V_{pu}^2$
- Thus if you do the following nothing happens because the S MW, I MW and Z MW columns get pasted in separately
 - Send All the display out to Excel
 - Modify the MW columns
 - Copy All and then paste back into Simulator

Load Records													
	Number	Name	ID	Status	MW	Mvar	MVA	S MW	S Mvar	I MW	I Mvar	Z MW	Z Mvar
1	2	Two	1	Closed	40.00	20.00	44.72	40.00	20.00	0.00	0.00	0.00	0.00
2	3	Three	1	Closed	110.00	40.00	117.05	110.00	40.00	0.00	0.00	0.00	0.00
3	4	Four	1	Closed	80.00	30.00	85.44	80.00	30.00	0.00	0.00	0.00	0.00
4	5	Five	1	Closed	130.00	40.00	136.01	130.00	40.00	0.00	0.00	0.00	0.00
5	6	Six	1	Closed	200.00	0.00	200.00	200.00	0.00	0.00	0.00	0.00	0.00
6	7	Seven	1	Closed	200.00	0.00	200.00	200.00	0.00	0.00	0.00	0.00	0.00

Case Information Displays: Options Menu



- Highlight Key Fields
- Headings
 - Normal
 - Variable Names
 - Choose to change the column headings to show variable names that would appear in AUX files
- Word Wrap Headings
- Show Header Hints
 - When hovering mouse over the column heading, a hint appears describing the column
- Show Grid Lines
 - Check to show grid lines between cells in the case information display
- Highlight Row if Selected Field = YES

Case Information Display

Local Menu



- Local menu can be opened by right-clicking on a case information display
- Most of the options and actions available are identical to the options available on the Case Information Toolbar
- Options on Local Menu not available on the Case Information Toolbar
 - Why is this field or line disabled?
 - Displays message indicating why a field is disabled
 - Option is only present if a field is actually disabled
 - Form Control
 - Provides options for printing and showing the case information display

Case Information Display

Local Menu



	Number of Bus	Name of Bus	ID	Status	Gen MW	Gen Mvar	Set Volt	AGC	AVR	Min MW	Max MW	Min Mvar	Max Mvar	Cost Model	Part. Factor
1	1	ALBURTIS	1	Open	0.00	0.00	1.00000	YES	YES	-9999.00	9999.00	-9999.00	9999.00	Cubic	1.00
2	30	CONE G1	H	Closed	445.40	41.78	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
3	30	CONE G1	L	Closed	404.60	37.92	1.06000	YES	YES	238.00	404.60	-19.00	214.00	Cubic	4.95
4	31	CONE G2	H	Closed	445.40	41.78	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
5	31	CONE G2	L	Closed	404.60	37.92	1.06000	YES	YES	238.00	404.60	-19.00	214.00	Cubic	4.95
6	32	KEYS G1	H	Closed	432.65	168.59	1.05500	YES	YES	254.50	432.60	-21.00	236.00	Cubic	4.81
7	32	KEYS G1	L	Closed	417.35	152.88	1.05500	YES	YES	245.50	417.40	-19.00	214.00	Cubic	4.64
8	33	KEYS G2	H	Open	0.00	0.00	1.05500	YES	YES	254.50	432.60	-21.00	236.00	Cubic	4.81
9	33	KEYS G2	L	Open	0.00	0.00	1.05500	YES	YES	245.50	417.40	-19.00	214.00	Cubic	4.64
10	34	PCHBTM 2	1	Closed	1110.56	282.69	1.01000	YES	YES	1093.00	1093.00	-319.00	541.70	Cubic	12.80
11	35	PCHBTM 3	1	Closed	1093.00	282.69	1.01000	YES	YES	1093.00	1093.00	-319.00	541.70	Cubic	12.80
12	36	SALEM G1	1	Open	0.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
13	37	SALEM G2	1	Closed	1119.00	282.69	1.01000	YES	YES	1093.00	1093.00	-319.00	541.70	Cubic	12.80
14	38	SUSQ 2	1	Closed	1144.00	282.69	1.01000	YES	YES	1093.00	1093.00	-319.00	541.70	Cubic	12.80
15	39	HOPE CG1	1	Closed	1043.00	282.69	1.01000	YES	YES	1093.00	1093.00	-319.00	541.70	Cubic	12.80
16	40	C CLF G1	1	Closed	838.00	282.69	1.01000	YES	YES	1093.00	1093.00	-319.00	541.70	Cubic	12.80
17	41	C CLF G2	1	Open	0.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
18	42	LIMERCK2	1	Closed	1150.00	282.69	1.01000	YES	YES	1093.00	1093.00	-319.00	541.70	Cubic	12.80
19	204	C.SLOPE	1	Closed	88.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
20	204	C.SLOPE	2	Closed	50.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
21	295	WRREN #1	1	Closed	41.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
22	307	WRREN #2	1	Closed	41.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
23	312	PINEY #1	1	Closed	9.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
24	312	PINEY #1	2	Closed	9.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
25	312	PINEY #1	3	Closed	9.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
26	318	GNERAL E	1	Closed	24.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
27	319	HAMMERML	1	Closed	31.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
28	334	TITSVL#1	1	Closed	25.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
29	335	WAYNE CT	1	Open	0.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
30	336	WARRN CT	1	Open	0.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
31	343	IUP CO-G	1	Closed	16.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
32	349	SENECA#1	1	Closed	210.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45
33	350	SENECA#2	1	Closed	195.00	0.00	1.06000	YES	YES	262.00	445.40	-21.00	236.00	Cubic	5.45



Custom Field Descriptions: Custom Floats, Integers, and String



- Previously, with each object Simulator allowed the following
 - 5 custom floating points
 - 5 custom strings
 - You could not give these fields their own name
- Simulator 13 now allows
 - Any number of floating points
 - Any number of strings
 - Any number of integers
 - You can now give these fields names
- By default, Simulator is configured to allow 2 custom floats, 2 integers, and 2 strings
 - Use Custom Field Descriptions to add more

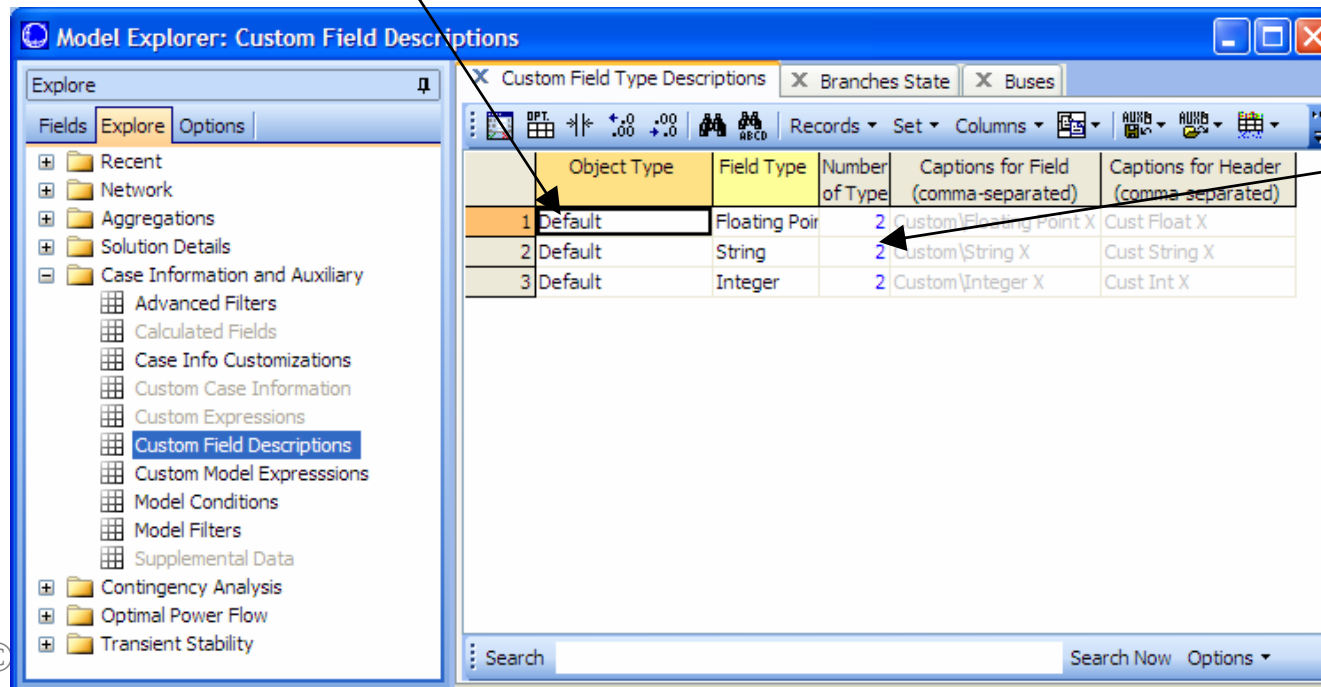
Custom Field Descriptions:

Custom Floats, Integers, and String



- Access these definitions on the Model Explorer Explore Pane under *Case Information and Auxiliary/Custom Field Descriptions*

Default object types are always listed



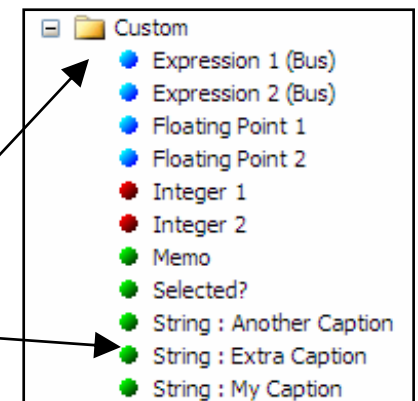
You can change the default number of fields directly here.

Custom Field Descriptions: Custom Floats, Integers, and String

- Right-Click and choose Insert
 - Choose the Object Type
 - Choose the Field Type
 - Choose the Number Type
 - Define Field Captions
 - Define Header Captions,

	Object Type	Field Type	Number of Type	Captions for Field (comma-separated)	Captions for Header (comma-separated)
1	Default	Floating Poir	2	Custom\Floating Point X	Cust Float X
2	Default	String	2	Custom\String X	Cust String X
3	Default	Integer	2	Custom\Integer X	Cust Int X
4	Bus	String	3	My Caption,Another Caption,Extra Caption	My Header,Another Header,Extra Header

Folder View of
Available Bus
Fields Becomes



Integration of Custom Fields into User Interface Dialogs



- Custom Tab is available on Information Dialogs throughout
 - Access to Custom Fields, Memo, and Selected Field

Bus Information for Current Case

Bus Number: 5491
Bus Name: PAVEPAW2
Nom. Voltage: 69.00

Find By Number Find ...
Find By Name

Device Info OPF Geography Custom

To add new fields, see Custom Field Type Descriptions on the Model Explorer

Custom Fields Memo

☐ Selected?

Floating Points	Strings	Integers
Cust Float 1	My Header	Cust Int 1
Cust Float 2	Another Header	Cust Int 2
	Extra Header	

View All Flows at Bus

OK Cancel Help Print

Load Options

Bus Number: 13
Bus Name: KEITH
ID: 2
Labels: no labels

Find By Number Find ...
Find By Name

Status: ☐ Open ☒ Closed

Number	Name
Area: 11	BEPC_TSP
Zone: 11	BEPC
Substation: 36000600	Keith
Owner: 101	BEPC

Load Information OPF Load Dispatch Custom

To add new fields, see Custom Field Type Descriptions on the Model Explorer

☐ Selected?

Floating Points	Strings	Integers
Cust Float 1	Cust String 1	Cust Int 1
Cust Float 2	Cust String 2	Cust Int 2

OK Save Cancel Help

Custom Case Info Displays



- Create spreadsheet-like case info displays with any type of information of interest
- Select **Custom Case Information** from the Model Explorer

Default Custom Case Information

	A	B	C	D	E
1					
2					
3		Type to enter custom string			
4			Top	Gen 4 Area Name	
5		double-click on a cell to enter	95.0325 MW	Gen 4 MW	
6		a model field	YES	Gen 4 AGC Status	
7					
8					
9					

Custom Case Info Mode

☒ Define Fields/Strings ☐ Show Fields Primary

☐ Change Field Data ☐ Show Fields Secondary

Rename Sheet New Sheet Delete Sheet Close Help



Custom Case Info Displays



- Sheets may be added, renamed, or deleted
- Four Modes
 - Define Fields/String
 - Change Field Data
 - Show Fields Primary
 - Show Fields Secondary
- Double-click in a cell to add data from case (any mode except Change Field Data)

Define Fields/String Mode



- Plain Text Cell
 - type any text or numbers in a blank cell to create a plain text cell
 - Text color matches Enterable Field Color (blue by default)
- Model Field Cell
 - Double-click on cell to open a dialog to define the model field

Plain Text Cell

Model Field Cell

	A	B	C	D	E
1					
2					
3		Type to enter custom string			
4			Top	Gen 4 Area Name	
5		double-click on a cell to enter a model field	95.0325 MW	Gen 4 MW	
6			YES	Gen 4 AGC Status	
7					
8					
9					

Custom Case Info Mode

☒ Define Fields/Strings ☐ Show Fields Primary

☐ Change Field Data ☐ Show Fields Secondary

Rename Sheet New Sheet Delete Sheet Close Help

Change Field Data Mode



- Blank Cell and Plain Text Cell
 - May not be edited
 - Text color matches Field Not Presently Used Color (gray by default)
- Model Field Cell: behaves according to the field it represents (read-only, enterable, toggleable)

Plain Text Cell

Model Field Cells

	A	B	C	D	E
1					
2					
3	Type to enter custom string				
4	double-click on a cell to enter a model field		Top	Gen 4 Area Name	
5			95.0325 MW	Gen 4 MW	
6			YES	Gen 4 AGC Status	
7					
8					
9					

Custom Case Info Mode

☐ Define Fields/Strings ☐ Show Fields Primary

☒ Change Field Data ☐ Show Fields Secondary

Rename Sheet New Sheet Delete Sheet Close Help

Show Fields Primary Mode



- Blank Cell and Plain Text Cell
 - Behave the same as in Define Fields/Strings Mode
- Model Field Cell
 - display string representation of Model Field link

Plain Text Cell

Model Field Cells

The screenshot shows a dialog box titled "Default: Custom Case Information" with a spreadsheet interface. The spreadsheet has columns A, B, C, and D. Row 3 contains the text "Type to enter custom string" in column B. Row 4 contains the text "'Gen<KEY1>4</KEY1><KEY2>1</KEY2>' AreaName 8 4 YES" in column C and "Gen 4 Area Name" in column D. Row 5 contains the text "double-click on a cell to enter a model field" in column B and "'Gen<KEY1>4</KEY1><KEY2>1</KEY2>' GenMW 8 4 YES" in column C and "Gen 4 MW" in column D. Row 6 contains the text "a model field" in column B and "'Gen<KEY1>4</KEY1><KEY2>1</KEY2>' GenAGCable 8 4 YES" in column C and "Gen 4 AGC Status" in column D. The dialog box also includes a "Custom Case Info Mode" section with radio buttons for "Define Fields/Strings", "Change Field Data", "Show Fields Primary" (selected), and "Show Fields Secondary". There are buttons for "Rename Sheet", "New Sheet", "Delete Sheet", "Close", and "Help".

	A	B	C	D
1				
2				
3		Type to enter custom string		
4			'Gen<KEY1>4</KEY1><KEY2>1</KEY2>' AreaName 8 4 YES	Gen 4 Area Name
5		double-click on a cell to enter a model field	'Gen<KEY1>4</KEY1><KEY2>1</KEY2>' GenMW 8 4 YES	Gen 4 MW
6			'Gen<KEY1>4</KEY1><KEY2>1</KEY2>' GenAGCable 8 4 YES	Gen 4 AGC Status
7				
8				
9				

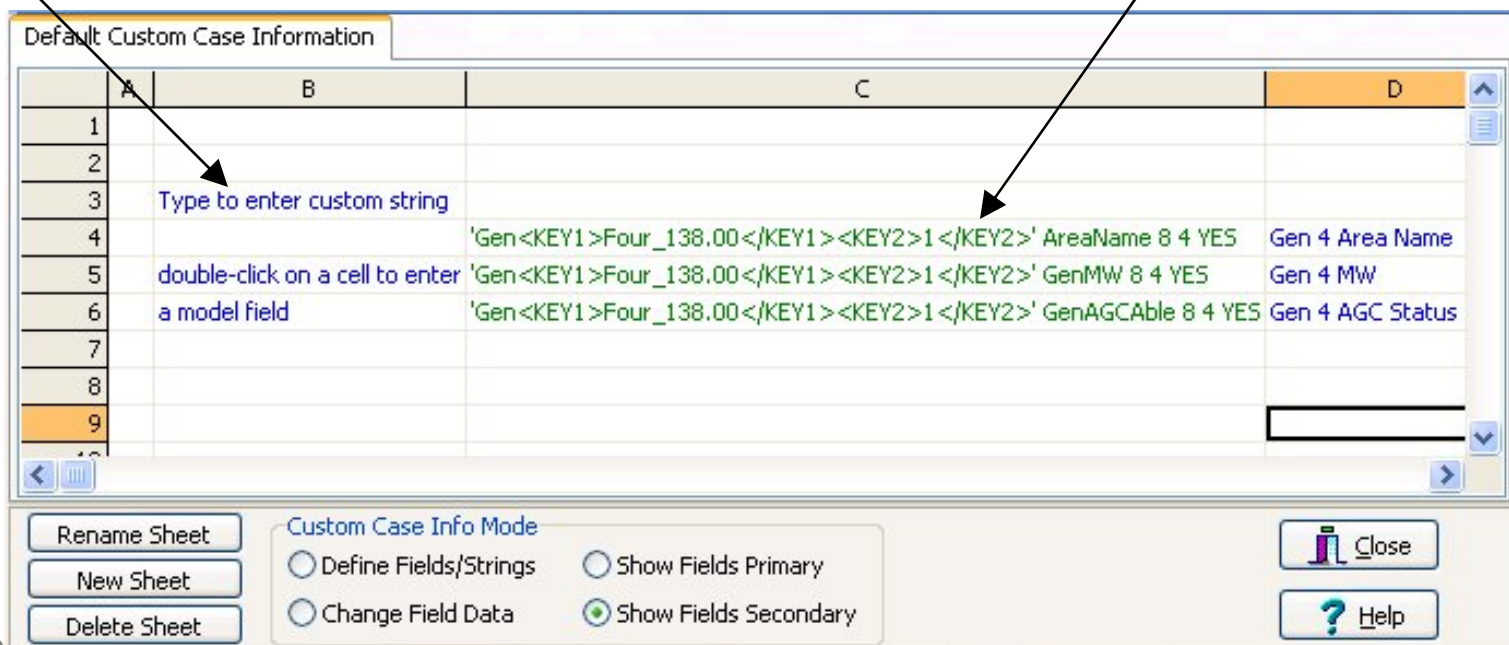
Show Fields Secondary Mode



- Similar to the Show Fields Primary Mode, except Model Field string uses secondary field representation (e.g. Name and Nom_kV for bus)

Plain Text Cell

Model Field Cells



Custom Case Info Display



- Local Menu
 - Contains “spreadsheet-like” commands for manipulating cells and workbooks
- Custom Case Info Menu
 - Switch mode or change appearance of display

