



GEOSOFT 2.0

 *User Manual*



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INTRODUCTION

GEOSoft 2.0 software is a R&D simulation tool derived application. It processes measured speaker data with complex mathematical algorithms to assist the user in designing vertical GEO Tangent Arrays that provide even SPL throughout the depth of the audience. Due to the complexity of the interaction of multiple cabinets, it is simply not possible to reliably design curved vertical arrays without using the processing power of a computer to predict the optimum array structure for a given audience geometry. The design logic is far more complex than looking at a section drawing of the venue, measuring the overall angle needed to cover the audience from the cluster location, and dividing by 5degrees to determine the required amount number of S805 cabinets.

GEOSoft 2.0 is an easy to use tool that allows to shape the energy leaving the cluster to fit the audience. It predicts pressure levels radiated from the system to ensure enough cabinets are provided for the application, as well as mechanical constraints for safe flown systems.

In addition, it provides mechanical information for all clusters in agreement with Structural Analysis Reports (available in the Help section): dimensions, weight, gravity center position, forces, moments, working load and safety factor.

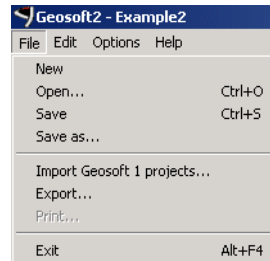
GeoS Structural Analysis Report has been validated by German Certification Organization RWTUV systems GmbH.

GeoT Structural Analysis Report is currently being examined by German Certification Organization RWTUV systems GmbH.

Please check the NEXO Web Site periodically (www.nexo-sa.com) for upgrades.

Any question or bug report please contact geosoft@nexo.fr

File Menu



New

Opens *default.nexo* file

Open

Opens previously saved configuration *filename.nexo*

Save

Saves the configuration as previously saved *filename.nexo*

Save As

Saves the configuration as *filename.nexo* (approximate size : 50 KB).

Import Geosoft 1 Projects

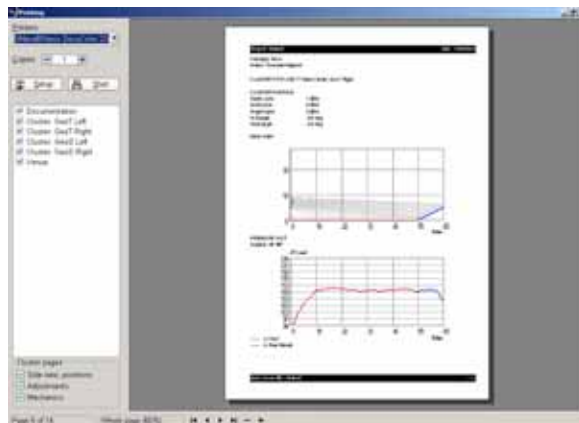
Imports Geosoft 1 .MAT file (extends Geosoft 1 2D lines to 3D 2 meters width planes)

Export

Exports the window in a JPEG format (approximate size: 100 kB).

Print

Opens Print Dialog Window and Preview

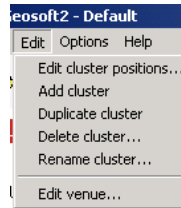


Exit

Ends the Geosoft 2.0 session.



Edit Menu



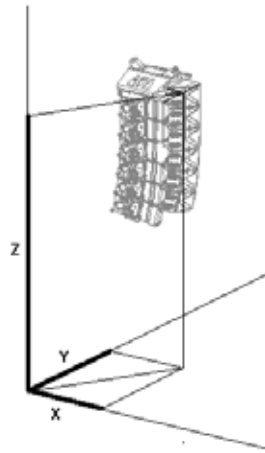
Edit Cluster

Cluster	Depth, x-pos (Meter)	Horiz, y-pos (Meter)	Height, z-pos (Meter)	Horiz angle (degree)	Vert angle (degree)	Show horiz coverage
GeoT Left	1	-9.5	9	2.5	-2.6	<input type="checkbox"/>
GeoT Right	1	9.5	9	-2.5	-2.6	<input type="checkbox"/>
GeoS Left	-3.5	-12	9	-45.00	1.00	<input type="checkbox"/>
GeoS Right	-3.5	12	9	45	-11	<input type="checkbox"/>

Opens the Edit Cluster Window:

- Depth, x-pos
when cluster flown, distance between top of first cabinet and venue geometry reference point 0 along X axis;
when cluster stacked, distance between bottom of first cabinet and venue reference point 0 along X axis;
- Horiz, y-pos
when cluster flown, distance between center of first cabinet and venue geometry reference point 0 along Y axis;
when cluster stacked, distance between center of first cabinet and venue reference point 0 along Y axis;
- Height, z-pos
when cluster flown, distance between top of first cabinet and venue geometry reference point 0 along Z axis;
when cluster stacked, distance between top of first cabinet and venue reference point 0 along Z axis;.
- Horizontal angle (Positive CCW looking from top) and Vertical angle (Positive going up) are for Cluster Orientation;
- Show Horizontal Coverage is for 3D Coverage display;

NEXO



- Add Cluster
- Adds Cluster (New Cluster Window)
- Duplicate Cluster
- Duplicates Selected Cluster
- Delete Cluster
- Deletes Selected Cluster (Deletes selected Cluster Window)
- Rename Cluster
- Renames Cluster in Tab
- Edit Venue

#	Audience	Annotation	Vertex 1	Vertex 2	Vertex 3	Vertex 4
1	Seated	Floor	50, -12.5, 0	50, 12.5, 0	0, 12.5, 0	0, -12.5, 0
2	Seated	Rear Stands	60, -12.5, 5	60, 12.5, 5	50, 12.5, 0	50, -12.5, 0
3	Standing	Right Stands	50, -12.5, 0	-5, -12.5, 0	-5, -22.5, 5	50, -22.5, 5
4	Disable	Left Stands	-5, 12.5, 0	50, 12.5, 0	50, 22.5, 5	-5, 22.5, 5

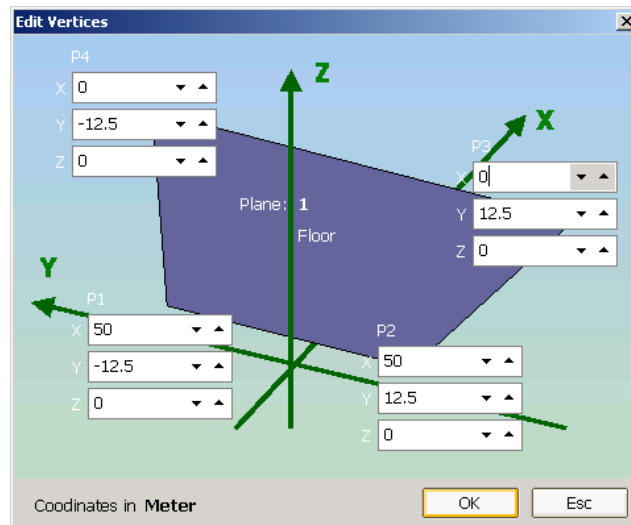
No audience
 Seated
 Standing
 Disabled

Menu Units: Meter Close

Opens the Edit Venue Planes Window:

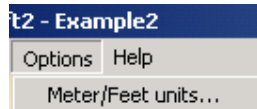
- Audience:
 - Seated* is 1.20 meter height mapping
 - Standing* is 1.60 meter height mapping
 - No audience* is no mapping, plane still be displayed
 - Disabled* is no mapping, no display
- Annotation is Plane name
- Vertex 1 to 4 are to enter 4 plane corners coordinates

Geosoft Reference System is defined as in the figure below:

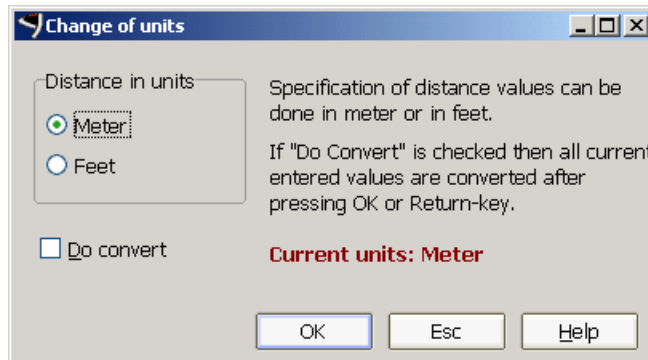


NEXO

Options Menu



Opens the Units Window:



- First Checkbox selected: the project is defined in the metric (m) - kilogram (kg) units system; switching from US to SI does not change the Venue Geometry field values, and scales up the project.
- Second Checkbox selected: the project is defined in the feet (ft) - pound (Lb) units system; switching from SI to US does not change the Venue Geometry field values, and scales down the project.
- Third Checkbox selected: Converts from SI units to US units, or from US units to SI units; the project remains the same, the Venue Geometry field values are changed accordingly.

Help Menu

Opens the current GeoSoft Help Manual (PDF format).

Structural Analysis

Opens NEXO GeoT or NEXO Geo S structural analysis PDF files

User Manual

Opens NEXO GeoT or NEXO Geo S User Manual PDF files, with all setup instructions

About Geosoft

Current GeoSoft Version.

NEXO

Geosoft2 - Default

File Edit Options Help

NEXO

Project Company Author Date

Default [] [] [] 11/09/2004

Enter your comments here

Project GeoT Left GeoT Right GeoS Left GeoS Right Venue

Project

Enter project name.

Company

Enter company name.

Author

Enter your name.

Date

Enter the date (default date is your today).

Text Window

Type your project comments here



GEO S & GEO T CLUSTER ACOUSTIC WINDOW

The screenshot displays the Geosoft2 software interface with the following sections:

- CLUSTER DESIGN:** Cluster Type: GEO T Flown Cluster. Speaker Quantity: Add Inverse.
- CLUSTER POSITION:** Depth x-pos: 1.00 m, Horiz y-pos: -9.50 m, Height z-pos: 9.00 m, Horiz angle: 2.5 deg, Vert angle: -2.6 deg.
- SPEAKER QUANTITY Table:**

Type	Name	Quantity
Main fill	T4805	17
Down fill	T2815	1
Sub	CD18	2
- INTER-ANGLE Table:**

Rig	Speakers	Angle	Step
1	T4805	0.12	0.9
2	T4805	0.20	0.9
3	T4805	0.31	1.1
4	T4805	0.31	1.1
5	T4805	0.31	1.1
6	T4805	0.31	1.1
7	T4805	0.31	1.1
8	T4805	0.31	1.0
9	T4805	0.50	1.3
10	T4805	0.31	1.0
11	T4805	0.31	2.4
12	T4805	0.31	4.7
13	T4805	0.50	5.3
14	T4805	1.25	7.7
15	T4805	2.00	7.5
- SIDE VIEW:** A graph showing speaker distribution over a 60-meter distance.
- PRESSURE PLOT:** A graph showing dB Level (94 to 124) vs. distance (0 to 60 meters). Legend: α Floor (red line), α Rear Stands (blue line).

Cluster Type

Flown / Stacked NEXO GEO S or GEO T clusters

Speaker Quantity

Defines NEXO GEO S805 / S830 or NEXO GEO T4805 / NEXO T2815 quantities

Add Inverse

When checked on, NEXO GEO S805 or NEXO GEO T4805 are added / subtracted from top cluster

Rig Angles Tab

Choices between the cabinets are :

- S805 to S805 : 0.31 - 0.50 - 0.80 – 1.25 – 2.00 – 3.15 – 5.00 degrees ;
- S805 to S830 : 17.5 degrees ;
- S830 to S830 : 17.5 -30 degrees ;
- T4805 to T4805 : 0.12 – 0.20 - 0.31 - 0.50 - 0.80 – 1.25 – 2.00 – 3.15 – 5.00 degrees ;
- T4805 to T2815 : 6.30 - 8.00 –10.00 degrees ;
- T2815 to T2815 : 6.30 - 8.00 – 10.0 - 12.5 – 15.0 degrees.

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Step

Non editable field ; gives the distance between targeted points on the audience.

Speaker Tab

CLUSTER DESIGN

CLUSTER TYPE:

SPEAKER QUANTITY Add inverse

Type	Name	Quantity
Main fill	T4805	17
Down fill	T2815	1
Sub	CD18	1

INTER-ANGLE		CDD	
Rig	Speakers	Angle	Step
1	T4805	0.12	0.8
2	T4805	0.20	0.9
3	T4805	0.31	1.1
4	T4805	0.31	1.1
5	T4805	0.31	1.1
6	T4805	0.31	1.1
7	T4805	0.31	1.1
8	T4805	0.31	1.0
9	T4805	0.50	1.3
10	T4805	0.31	1.0
11	T4805	0.31	2.4
12	T4805	0.31	4.7
13	T4805	0.50	5.3
14	T4805	1.25	7.7
15	T4805	2.00	7.5

Vertical Angle Configuration

INTER-ANGLE		CDD	
#	Speakers	Horiz coverage	
1	T4805	90	
2	T4805	90	
3	T4805	90	
4	T4805	90	
5	T4805	90	
6	T4805	90	
7	T4805	90	
8	T4805	90	
9	T4805	90	
10	T4805	90	
11	T4805	90	
12	T4805	90	
13	T4805	90	
14	T4805	90	
15	T4805	90	

Horizontal Dispersion Configuration

Cluster Position

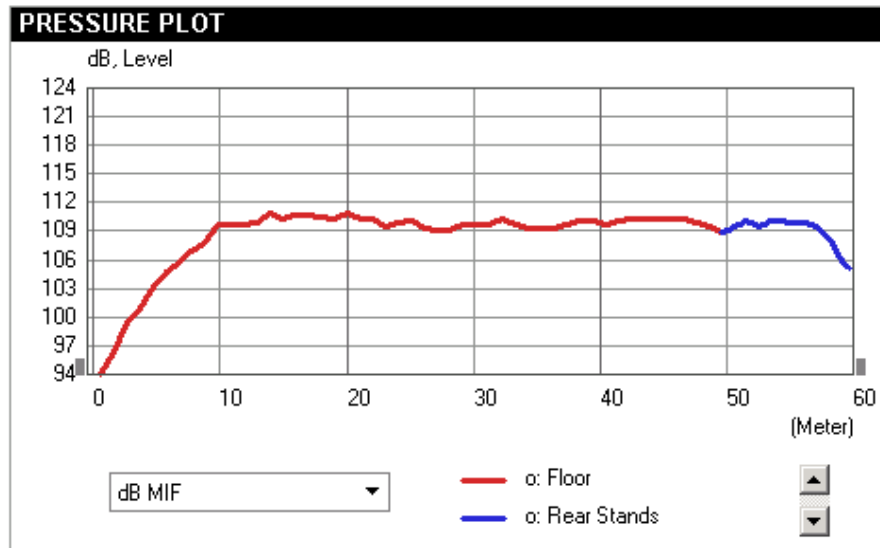
CLUSTER POSITION

Depth x-pos: 1.00 m
Horiz y-pos: -9.50 m
Height z-pos: 9.00 m
Horiz angle: 2.5 deg
Vert angle: -2.6 deg

Mouse Click inside the frame opens the Cluster Position Window (see above)



dB Level Plots



Simulation conditions

- test signal : IEC268 filtered Pink Noise (similar spectral content than music);
- free-field ;
- air absorption is not taken into account

Important : for distances superior to 80 meters (~260 feet), temperature, wind and hygrometry gradients do not allow to make any reliable acoustic prediction.

Displayed Pressure Levels curves are :

- dB MIF, stands for dB "Make It Flat" ; for good results, this curve has to fit within 3 dB on the audience area.
- dB Peak, computed from 300 Hz to 3000 Hz ;
- dBA, computed from 125 Hz to 8 kHz A-weighted ;
- dB SPL, summed from 125 Hz to 8 kHz, no weighting;
- dB SPL for each octave bands from 125 HZ to 8 kHz

Important : GeoSoft simulation does not take in to account any room contribution (floor reflection, reverberation...), nor another cluster contribution. Consequently, all dB values are default values that might increase from 3 to 6dB.



GEO S CLUSTER MECHANICAL WINDOW

Cluster Dimensions and Weight

CLUSTER	
Cluster type	GEO S Flown Cluster
S805 (Array) Qty	7
S830 (Array) Qty	1
CD12 (Sub) Qty	2
Bumper angle	-11.00 deg
Lower cabinet angle	-38.19 deg
Cluster height (H)	2.00 m
Cluster width (W)	0.60 m
Cluster depth (D)	1.50 m
Rear rigging point height	9.09 m
Front rigging point height	9.13 m
Lower cabinet height	7.09 m
Distance between rigging points (A)	1.35 m
Gravity center to front rigging point (A2)	0.54 m
Gravity center to rear rigging point (A1)	0.82 m
Clearance from front rigging point (C2)	0.10 m
Clearance from rear rigging point (C1)	0.10 m
Cluster weight (M)	209.00 kg
Weight on front rigging point (M2)	126.36 kg
Weight on rear rigging point (M1)	82.64 kg

- Cluster Type : as in Acoustic Page
- GEO Quantity: as in Acoustic Page
- CD12 Quantity: as in Acoustic Page
- Bumper Angle: Angle in relation to Horizontal Line, CCW.
- Lower Cabinet Angle;
- Cluster Height: Overall Height including rigging accessories;
- Cluster Width: Overall Width including rigging accessories;
- Cluster Depth: Overall Depth including rigging accessories;
- Rear Rigging Point Height: Front Bumper Rigging Point height referenced to Z=0;
- Front Rigging Point Height: Rear Bumper Rigging Point height referenced to Z=0;
- Lower Cabinet Height: referenced to Z=0;
- Distance between rigging points: horizontal distance from Rear to Front Bumper Rigging Points
- Gravity Center to Front Rigging Point: horizontal distance from Gravity Center to Front Rigging Point (must be positive, turns red if gravity center off rigging points)
- Gravity Center to Rear Rigging Point: horizontal distance from Gravity Center to Rear Rigging Point (must be positive, turns red if gravity center off rigging points)
- Clearance from Front Rigging Point: minimum free space required ahead of Front Rigging Point
- Clearance from Rear Rigging Point: minimum free space required behind Rear Rigging Point
- Cluster Weight: total cluster weight including rigging accessories
- Weight on Front Rigging Point: must be positive and less than total Cluster Weight (turns red if gravity center off rigging points)
- Weight on Rear Rigging Point: must be positive and less than total Cluster Weight (turns red if gravity center off rigging points)

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Mechanical Forces

FORCES	
Allowed loads on bumper rear points S1	-13.70 kN / 9.00 kN
Applied loads on bumper rear points S1	1.65 kN
Allowed loads on bumper front points S2	-13.70 kN / 7.10 kN
Applied loads on bumper front points S2	-0.84 kN
Allowed moment on extension bar	2.40 kNm
Applied moment on extension bar (M0)	0.53 kNm
Allowed moment on link bar	2.40 kNm
Applied moment on link bar (M0)	0.53 kNm
Allowed load on CD12 flying rails	1.90 kN
Applied load on CD12 flying rails (FS3)	0.36 kN
Applied wind force on cluster (Fw)	0.25 kN

- Allowed Loads on Bumper Rear Points S1: theoretical pressure/tensile force values confirmed with destruction tests
- Applied Loads on Bumper Rear Points S1: configuration applied value (turns red if off above limits)
- Allowed Loads on Bumper Front Points S2: theoretical pressure/tensile values confirmed with destruction tests
- Applied Loads on Bumper Front Points S2: configuration applied value (turns red if off above limits)
- Allowed Moment on Extension Bar (closed cross-section): theoretical maximum moment force before bending, confirmed with destruction tests
- Applied Moment on Extension Bar (closed cross-section): configuration applied value (turns red if off above limits)
- Allowed Moment on Link Bar: theoretical maximum moment force before bending, confirmed with destruction tests
- Applied Moment on Link Bar: configuration applied value (turns red if off above limits)
- Allowed Load on CD12 flying rails: theoretical tensile force values
- Applied Load on CD12 flying rails: configuration applied values (turns red if off above limits)
- Wind force applied on cluster:
 - Rear or Front force applied when wind is present (Beaufort Scale = 8)
- Wind Offset Angle: Vertical Cluster rotation related to wind forces



Configuration Settings

SETTINGS	
Rigging mode	CD12 link bar
Wind Beaufort 8	From rear
Cluster secured	No

Rigging Mode

NEXO GEO S:

- Bumper Only (GeoS without CD12)
- Extension Bar at the back (GeoS without CD12)
- Extension Bar at the Front (GeoS without CD12)
- CD12 Link Bar (GeoS with CD12 Only)

Wind Beaufort 8

Corresponds to a 20.7 m/s wind. Options are:

- No Wind
- Wind from the back of the cluster
- Wind from the front of the cluster

Lateral wind is considered to have no influence on investigated forces.

Cluster Secured

Windforce distribution on cluster depends on how it is secured. Investigated cases are:

- No (cluster can rotate freely)
- Bottom: cluster secured at the bottom to avoid vertical rotation
- Top: top bumper rigidly secured to avoid vertical rotation (bottom unsecured)

Angle Sequence

- Delta: Inter Cabinets Angle Sequence
- Sum: Cumulative Angle Sequence (which takes wind effect into account)

ANGLE SEQUENCE		
#	Delta	Sum
Bumper	-11.00	0.76
1	2.00	-1.24
2	3.15	-4.39
3	3.15	-7.54
4	3.15	-10.69
5	5.00	-15.69
6	5.00	-20.69
7	17.50	-38.19

NEXO



Working Load – Safety Factor – Lifting Factor

WORKING LOAD - SAFETY FACTOR	
% allowed working load (safety factor 1.5)	22
Safety factor for 100% allowed working load	6.8
Lifting factor	1.0

Percentage of Allowed Working Load

Is based on the ratio of all applied moments and forces to their limit

Is determined by the component which is the closest to its limits

Corresponds to a Safety Factor of 1.5 when is equal to 100%

Must not be above 100% (turns red if so)

Safety Factor for 100% of Allowed Working Load

Project configuration Safety Factor

Must not be below 1.5 (turns red if so)

Can be used to comply with local regulations

Lifting Factor

Is 1.2 if no wind (where setup typically occurs)

Is 1 if wind (where setup is forbidden)

Caution – Warning Messages

Warning Messages for Rigging feasibility and safety.

Permanently displayed messages

CAUTION
READ USER MANUAL PRIOR TO OPERATION
CHECK LOCAL REGULATIONS ON LOUDSPEAKER RIGGING SYSTEM
ENSURE ANGLES SETTINGS ARE IDENTICALLY ON BOTH SIDES
CHECK WITHOUT WINDFORCES

Conditional messages

These messages are related to unfeasible or unsafe loads:

FRONT RIGGING POINT NOT IN TENSION LOAD
UNSAFE LOADING
UNSAFE LOAD FOR LINK BAR
UNSAFE LOAD FOR GEO S BUMPER
SAFETY FACTOR TOO LOW



GEO T CLUSTER MECHANICAL WINDOW

Cluster Dimensions and Weight

CLUSTER	
Cluster type	GEO T Flown Cluster
T4805 (Array) Qty	17
T2815 (Array) Qty	1
CD18 (Sub) Qty	2
Bumper angle	-2.60 deg
Lower cabinet angle	-21.16 deg
Cluster height (H)	4.69 m
Cluster width (W)	0.90 m
Cluster depth (D)	1.07 m
Rear rigging point height	9.26 m
Front rigging point height	9.24 m
Lower cabinet height	4.58 m
Distance between rigging points (A)	0.55 m
Gravity center to front rigging point (A2)	0.39 m
Gravity center to rear rigging point (A1)	0.16 m
Clearance from front rigging point (C2)	0.11 m
Clearance from rear rigging point (C1)	0.41 m
Cluster weight (M)	975.00 kg
Weight on front rigging point (M2)	278.46 kg
Weight on rear rigging point (M1)	696.54 kg

- Cluster Type : as in Acoustic Page
- GEO Quantity: as in Acoustic Page
- CD18 Quantity: as in Acoustic Page
- Bumper Angle: Angle in relation to Horizontal Line, CCW.
- Lower Cabinet Angle;
- Cluster Height: Overall Height including rigging accessories;
- Cluster Width: Overall Width including rigging accessories;
- Cluster Depth: Overall Depth including rigging accessories;
- Rear Rigging Point Height: Front Bumper Rigging Point height referenced to Z=0;
- Front Rigging Point Height: Rear Bumper Rigging Point height referenced to Z=0;
- Lower Cabinet Height: referenced to Z=0;
- Distance between rigging points: horizontal distance from Rear to Front Bumper Rigging Points
- Gravity Center to Front Rigging Point: horizontal distance from Gravity Center to Front Rigging Point (must be positive, turns red if gravity center off rigging points)
- Gravity Center to Rear Rigging Point: horizontal distance from Gravity Center to Rear Rigging Point (must be positive, turns red if gravity center off rigging points)
- Clearance from Front Rigging Point: minimum free space required ahead of Front Rigging Point
- Clearance from Rear Rigging Point: minimum free space required behind Rear Rigging Point
- Cluster Weight: total cluster weight including rigging accessories
- Weight on Front Rigging Point: must be positive and less than total Cluster Weight (turns red if gravity center off rigging points)
- Weight on Rear Rigging Point: must be positive and less than total Cluster Weight (turns red if gravity center off rigging points)

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Mechanical Forces

FORCES	
Allowed load on bumper configuration rear point S1	57.25 kN
Applied load on bumper configuration rear point S1	6.48 kN
Allowed load on bumper configuration front point S2	57.25 kN
Applied load on bumper configuration front point S2	2.82 kN
Allowed pressure/tensile loads on T4805 rear point S1	-36.00 kN / 26.00 kN
Applied min/max loads on T4805 rear point S1	0.00 kN / 4.93 kN
Allowed pressure/tensile loads on T4805 rear point S2	-36.00 kN / 34.50 kN
Applied min/max loads on T4805 rear point S2	-0.35 kN / 0.32 kN
Allowed pressure/tensile loads on T2815 rear point S1	0.00 kN / 14.75 kN
Applied min/max loads on T2805 rear point S1	0.00 kN / 0.08 kN
Allowed pressure/tensile loads on T2815 rear point S2	-36.00 kN / 34.50 kN
Applied min/max loads on T2805 rear point S2	0.00 kN / 0.08 kN
Allowed load on Kelping chain	15.00 kN
Applied load on Kelping chain	0.00 kN
Allowed load on CD18 flying rails	1.90 kN
Applied load on CD18 flying rails	0.80 kN

- Allowed load on bumper configuration rear point S1: theoretical tensile force value limit
- Applied load on bumper configuration rear point S1: configuration applied value (turns red if off above limits)
- Allowed load on bumper configuration front point S2: theoretical tensile force value limit
- Applied load on bumper configuration front point S2: configuration applied value (turns red if off above limits)
- Allowed pressure/tensile loads on T4805 rear point S1: theoretical pressure/tensile force value limit
- Applied min/max loads on T4805 rear point S1: configuration applied value (turns red if off above limits)
- Allowed pressure/tensile loads on T4805 front point S2: theoretical pressure/tensile force value limit
- Applied min/max loads on T4805 front point S2: configuration applied value (turns red if off above limits)
- Allowed pressure/tensile loads on T2815 rear point S1: theoretical pressure/tensile force value limit
- Applied min/max loads on T2815 rear point S1: configuration applied value (turns red if off above limits)
- Allowed pressure/tensile loads on T2815 front point S2: theoretical pressure/tensile force value limit
- Applied min/max loads on T2815 front point S2: configuration applied value (turns red if off above limits)
- Allowed load on Kelping Chain: theoretical tensile force value limit
- Applied load on Kelping Chain: configuration applied value (turns red if off above limits)
- Allowed Load on CD18 flying rails: theoretical tensile force values
- Applied Load on CD18 flying rails: configuration applied values (turns red if off above limits)



Configuration Settings

SETTINGS	
Rigging mode	Bumper only (tens
Wind Beaufort 8	No wind
Cluster secured	-

Rigging Mode

NEXO GEO T

- Bumper Only (Tension Mode)
- Bumper + Half Keeping Beam (Tension mode), which allows greater distance between rigging points
- Compression Mode + 20° Keeping Beam
- Compression Mode + Half Keeping Beam

Wind Beaufort 8

Corresponds to a 20.7 m/s wind. Options are:

- No Wind
- Wind from the back of the cluster
- Wind from the front of the cluster

Lateral wind is considered to have no influence on investigated forces.

Cluster Secured

It is assumed that wind cannot rotate cluster, and that therefore cluster does not need to be secured

Angle Sequence

- Delta: Inter Cabinets Angle Sequence
- Sum: Cumulative Angle Sequence

ANGLE SEQUENCE		
#	Delta	Sum
Bumper	-11.00	0.76
1	2.00	-1.24
2	3.15	-4.39
3	3.15	-7.54
4	3.15	-10.69
5	5.00	-15.69
6	5.00	-20.69
7	17.50	-38.19

NEXO



Working Load – Safety Factor – Lifting Factor

WORKING LOAD - SAFETY FACTOR	
GEOT Cluster	
% allowed working load (safety factor 4)	19
Safety factor for 100% allowed working load	21.1
CD18 Cluster	
% allowed working load (safety factor 4)	42
Safety factor for 100% allowed working load	9.5

GeoT cluster - Percentage of Allowed Working Load

- Is based on the ratio of all applied moments and forces to their limit
- Is determined by the component which is the closest to its limits
- Corresponds to a Safety Factor of 4 when is equal to 100%
- Must not be above 100% (turns red if so)

GeoT cluster - Safety Factor for 100% of Allowed Working Load

- Project configuration Safety Factor
- Must not be below 4 (turns red if so)
- Can be used to comply with local regulations

CD18 cluster - Percentage of Allowed Working Load

- Is based on the ratio of all applied moments and forces to their limit
- Is determined by the component which is the closest to its limits
- Corresponds to a Safety Factor of 4 when is equal to 100%
- Must not be above 100% (turns red if so)

CD18 cluster - Safety Factor for 100% of Allowed Working Load

- Project configuration Safety Factor
- Must not be below 4 (turns red if so)
- Can be used to comply with local regulations



Caution - Warning Messages

Warning Messages for Rigging feasibility and safety.

Permanently displayed messages

CAUTION

**READ USER MANUAL PRIOR TO OPERATION
CHECK LOCAL REGULATIONS ON LOUDSPEAKER RIGGING SYSTEM
ENSURE ANGLES SETTINGS ARE IDENTICALLY ON BOTH SIDES
CHECK WITHOUT WINDFORCES**

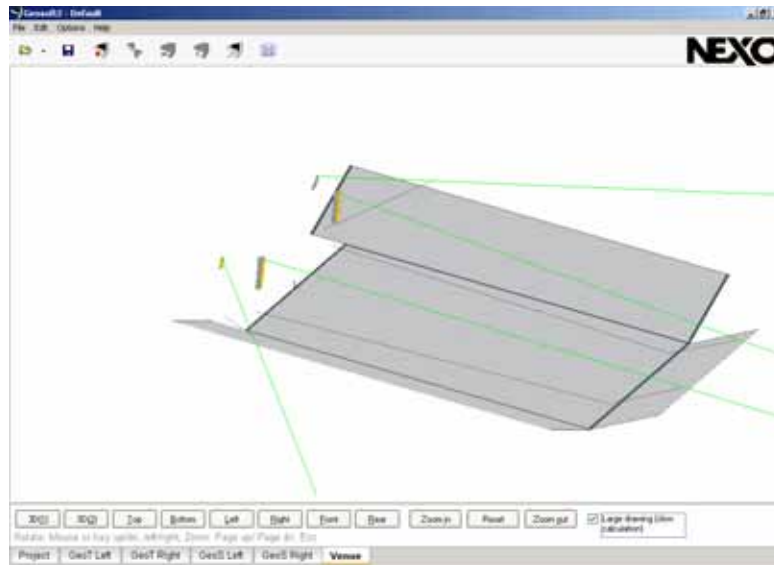
Conditional messages

These messages are related to unfeasible or unsafe loads:

**FRONT RIGGING POINT NOT IN TENSION LOAD
UNSAFE LOAD FOR GEOT CLUSTER
UNSAFE LOAD FOR CD18 CLUSTER
SAFETY FACTOR TOO LOW**

Cluster Drawings

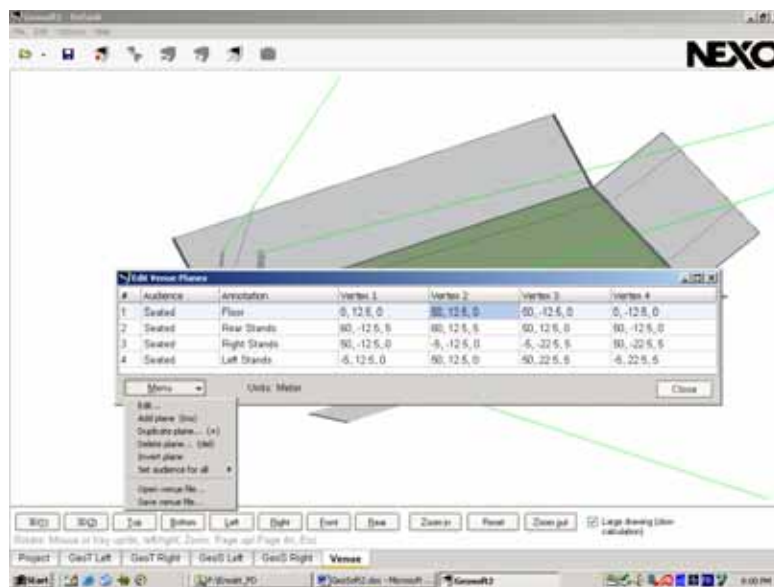
Drawings are displayed to show computed points and cluster setup configurations.



3D venue display

Edit Venue Planes

Opens table to edit planes as below



Edit Venue Planes Table



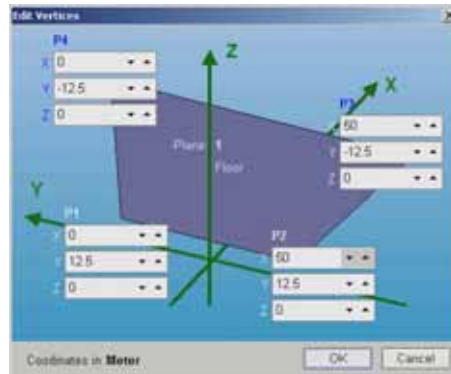
Menu

Edit Vertices

Edits plane vertex values as in figure below. Values must be entered P1 to P4 going counter-clockwise.

If vertexes are entered in the wrong order (ie clockwise), no values will be displayed in Cluster Pressure Plot. These planes can be easily inverted with the "Invert Plane" function.

Reversed planes can be easily identified as being white when seen from top (instead of grey).



Add Plane

Adds a plane with no vertex values defined

Duplicate Plane

Duplicates selected plane

Delete Plane

Deletes selected plane

Invert Plane

Reverses P1 to P4 in P4 to P1 for proper plane orientation

Set Audience for all

No audience / Seated / Standing / Disabled defined simultaneously for all planes

Open Venue File

Opens .txt file (Geosoft2 Venue text format) or .xar file (EASE4.1™ Audience Export text format)

Save Venue File

Saves .txt file (Geosoft2 Venue text format)