



Version 5.1

Release Notes

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A) Enhancements in CDH/OPTRAN Version 5.1

1) Frequency dependent CAABSF

Optran 5.1 has extended the capability of fast computations for frequency dependent elements by supporting frequency dependent CAABSF elements with direct usage of FastFRS.

2) LFREQ

Nastran parameter LFREQ is now supported in the request file. In case of AUTOREQUEST, the LFREQ value is picked up automatically from the Nastran files and transferred to Optran.

3) Output multiple PUNCH files

New “pch=” on request line allows user to create multiple punch files where certain results can be directed to a specified punch file.

For example,

```
PRESSURE GRID=9001 DLOAD=1001  
PANEL GRID=9001 FREQ=0:100 DLOAD=1001 PCH=panonly  
output punch
```

will create a regular punch file with pressure output and a 2nd punch file with _panonly added to its name which will have the output from the panel computations.

This keyword works with all regular fixed requests (PANEL, ERP, SMPF, GPPF, etc.). Dynamic requests of the form panel=2 on a response request line will go to the default punch file.

4) New “FREQFILTER=” command

Optran v5.1 introduces FREQFILTER= to optionally specify a frequency range for extraction of peak responses for OP SHAPES, PPF etc. FREQFILTER=N activates the filter and refers to a TABLER2 N. The table specifies the frequency ranges for peak filtering. A table value of zero (0.0) for a frequency will exclude that frequency from the search for peak responses. A value of one (1.0) will include the frequency. The table input resembles step function vs frequency where the zero values exclude the

frequencies from the peak search. As the table has transition regions between 0.0 and 1.0, a value above 0.1 is considered as 1.0 and below 0.1 it is considered as 0.0.

For example,

```
PRESSURE GRID=9001 DLOAD=1001 OPSHAPE=5 GRID=9001  
FREQ=0:100 DLOAD=1001 FREQFILTER=100  
TABLER2 100 (49.9 0) (50.0 1) (80.0 1) (80.1 0)
```

will extract peak response for top 5 OPSHAPES from 50Hz to 80Hz.

This keyword works with ACCE, DISP, VELO, DSTIFF and PRESS.

5) **GRIDSET for MSHAPE output**

GRIDSET=setxxx is added as an option on the MSHAPE request line. The program then outputs the values of the mode shapes restricted to this set (op2 output). Specifying csv as output with this option gives a csv file with these modal translational values. MSHAPE output from GRIDSET (and only when GRIDSET is present) can be sent to a csv file. Currently this feature is limited to output of structural eigenvectors only (not fluid).

6) **Request SDISP output**

Modal coordinates (SDISP) can be output by a SDISP request line in csv format. In case of a coupled fluid-structure simulation, separate csv files are exported for both the structural and fluid response.

7) **Performance improvement for SMPF**

Performance improvements for calculations with a large number of modes.

8) **Command line parameter NASTAUTH=**

NASTAUTH= is added to the command line. This is useful in case the user wishes to use an alternate Nastran license, for example when testing Optran. When NASTAUTH=nnn@xxx is specified on the command line, the Optran script executes an “export MSC_LICENSE_FILE=nnn@xxx” allowing the alternate licensing to be used when Optran calls Nastran.

9) **Performance improvements for ROA=YES**

The alternate reduction method (ROA=YES) was updated in v5.0. This (internal) parameter controls the method of converting fluid-structure interaction matrices to modal coordinates. Since then numerous benchmarks were carried out to investigate the optimal default value for ROA. These investigations have shown that ROA=YES is generally the most efficient setting. Therefore the default value of ROA is changed from NO to YES starting from the current v5.1 release.

10) **New parameter NASOUT=**

Optran v5.1 introduces a new command line parameter NASOUT=[NO,YES] to configure where to store Nastran f06, f04 and log files. NO, files saved in job submitting directory; YES, file saved in Optran OUTDIR. NASOUT can be set in the CDHoptran.defaults file or on the command line.

11) **Override_CLI command in request file**

Optran v5.1 introduces a new command in the request file that allows users to override the parameters set through the Optran command line or by the Optran.system file. This new option allows end-users, who do not have sufficient permissions to change Optran parameters already set by system administrator, to optimize the running environment for Optran. For example, if the installation default is AUTOREQUEST, YES and the user does not have access to the command line for Optran job submission, it can still be changed using the request file:

OVERRIDE_CLI, AUTOREQUEST, NO

This also holds for the setting: PARALLEL, NASTSMP, AMLSODS, AMLS_DIR, FASTFRS_DIR etc. Parameters allowed for user to override are managed by a file called CDHoptran.override_cli located in the configuration folder of Optran installation. System administrator can decide which parameters are allowed for override.

12) **Support of ATV inclusion**

An alternate version of ERP/NVELO computations using acoustic transfer vectors (ATV), e.g. obtained from test data, has been implemented. This feature is triggered by specifying the “atv” and “force_spectrum” files.

13) **Improved csv output for SMPF and FMPF**

Output of SMPF and FMPF (structure and fluid mode participation factors) to csv by Optran 5.1 now contains magnitude and phase information and not just magnitude data.

14) **Enhanced support for NASTFREQS= and NASTSUBID=**

Optran 5.1 enhanced support of compatibility with NASTFREQS= and NASTSUBID=. These are the keywords needed when the forcing frequencies change from subcase to subcase as occurs typically for engine run-up simulations. In previous versions, support is limited only for punch output for responses and ERP. Now other features such as csv output and dynamically chosen operational shapes, MPFs, PPFs and GPPFs are compatible with different forcing frequencies per subcase.

15) **Minor improvements**

Optran 5.1 added a date-stamp of start of Optran in .optran.log file and an identification line whether Optran completed successfully at the end of the .optran.log file.

Default memory setting for Nastran NASTMEM increased from 4gb to 16gb in configuration file CDHoptran.defaults

B) Bug-Fixes

- 1) Corrected/Added Residual vectors for SPCD and fluid calculations.
- 2) SDAMP (modal damping) with SPCD gave incorrect answers. This has been fixed.
- 3) B2PP matrices in presence of SPCD gave incorrect answers. This has been fixed.
- 4) SDAMP (modal damping) accuracy in connection with FastFRS has been improved.
- 5) K2PP matrices were not added correctly in presence of fluid-structure interaction. This has been fixed.
- 6) Response for grids at RBEs in modal tire runs gave zero answers. This has been fixed.
- 7) ESUM did not pick up PANELSETS correctly. This has been fixed.
- 8) PSD/RANDPS was not functioning correctly. An error in reading the request file crept in between v4.4 and v5.0 which is now fixed in v5.1.
- 9) Certain restart features were not working as they should. In particular, user could not get a response in the restart run for a grid supposedly saved in the cold/first run. This has now been fixed.

- 10) If the set defining ELFORCE output in the request file was not ordered, some element output was missing. This has been fixed.
- 11) In case of punch output for SMPF of type RESP=VELO or RESP=ACCE, the conversion to VELO and ACCE was not applied. This has been fixed.
- 12) In case of certain instances of frequency dependent CBUSH elements, the FASTFRS=YES option gave answers that showed numerical instabilities. This has been fixed in combination with the latest versions of FastFRS.
- 13) Results obtained with setting FASTFRS=NO have been corrected for certain runs with frequency dependent CBUSH elements.
- 14) A regression error in case of SOL 103 lead to, for certain decks configurations, corrupted natural frequency output. This did not occur in Optran v4.3 but it emerged as error in v5.0. This has been fixed.
- 15) In case of csv output of responses with a given REFDB, the REFDB value was ignored. This is a regression and was fixed.
- 16) In case of labels that contain the keyword “set”, even if put inside parenthesis (), Optran tried to interpret it as a set definition and reported an error it cannot find the set id. This has been fixed.

C) Supported Nastran Versions and CDH software

MSC.Nastran™

MSC.Nastran Version 2014.1 (i4/i8); 2016.1 (i4/i8), 2016.1.1 (i4/i8); 2017.1 (i8); 2017.1.2 (i8), 2018, 2018.1, 2018.2, 2019.0, 2019.1

CDH Software:

CDH/AMLS Version 5.1 r354+ & CDH/FastFRS Version 2.1 r354
CDH/AMLS Version 5.2 r086 & CDH/FastFRS Version 2.2 r086

D) Contact Information

For any technical issues associated with CDH/OPTRAN, please contact your local CDH office or send an e-mail to support@cdh-ag.com.