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## ONLINE NASTRAN DOCUMENTATION

by

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### SUMMARY

The distribution of NASTRAN User Manual information has been difficult because of the delay in printing and difficulty in identification of all users. This has caused many NASTRAN users not to have the current information for the release of NASTRAN that is available to them. The User Manual updates have been supplied with the NASTRAN Releases, but distribution within organizations was not coordinated with access to releases. The Executive Control, Case Control, and Bulk Data sections are supplied in machine readable format with the 91 Release of NASTRAN. This information is supplied on the release tapes in ASCII format, and a FORTRAN program to access this information is supplied on the release tapes. This will allow each user to have immediate access to User Manual level documentation with the release. The sections on Utilities, Plotting, and Substructures are expected to be prepared for the 92 Release.

### INTRODUCTION

The main objective in this effort is to provide machine readable files of the User Manual sections of Executive Control, Case Control, and Bulk Data that can be used for both publication quality updates and online access with any terminal. To meet this object it was necessary to reformat parts of the manual to use only character information and to define a form of storing graphic information.

The process of creating the files and the features for access are discussed in the following sections:

DOCUMENTATION SCAN INTO ASCII FILE  
DOCUMENTATION FORMAT FOR STORAGE  
REQUIREMENTS FOR PRINTING  
METHOD OF ONLINE ACCESS

## DOCUMENTATION SCAN INTO ASCII FILE

The first step in preparation of the User Manual sections for online access was to scan the existing manual sections into machine readable format. This was done using a scanner integrated with a PC computer. The output of the scan was an ASCII file containing only character data. The figures and line data were dropped during the scan. The scanner used was a Kurzweil device located at a government facility in Huntsville, Alabama. The scanner software was able to read the reduced pages and different font styles that had been used in preparation of the User Manual over the years. The scanner software was trainable for recognition of overstrike characters as required in the User Manual.

## DOCUMENTATION FORMAT FOR STORAGE

To meet the objective of maintaining the User Manual sections in one database format for both publishing quality and online access, the following rules were used for the document storage format:

- Stored in page format by card type
- All lines reduced to 80 characters
- Page length is 82 lines
- All graphics removed
- All subscripts and superscripts replaced
- All equations written in FORTRAN notation
- PC box drawing codes are used to represent line data
- No embedded codes are used for formatting
- No overstrike or underline characters

The document is stored in line per record format with each section of the document in a separate file.

The Executive Control and Case Control sections required the most change in appearance of the pages. Attached is a sample page showing the replacement of the large "{}" by PC box drawing characters. This will allow for substitution of these characters on any terminal.

The Bulk Data section maintains most of its appearance with the lines and figures replaced by PC box drawing characters.

## REQUIREMENTS FOR PRINTING

The document can be printed on an HP LaserJet or compatible with legal size paper using 6 lines per inch and the native 10 character per inch Courier font containing PC box drawing characters. This page then has to be reduced to 85 percent to produce a standard 8.5 by 11 inch manual update page. To print on other devices the PC box drawing characters can be replaced. This replacement can be done with an editor or a program to translate the file.

## METHOD OF ONLINE ACCESS

A FORTRAN program to read and display the pages on the screen is supplied on the 91 Release tapes. This program allows the user to select the section and the key topic for display. The key topic is a Bulk Data, Executive Control, or Case Control card name. This program allows the user to set the number of lines for display on the output device and stops when that number of lines is displayed. At any time, the user can back up or advance a specified number of lines. This program assumes the terminal can only display standard ASCII characters, and therefore converts the PC box drawing characters to +, -, and | for display. The figures that can be stored in this format will be shown on the display.

```

490 IF I3<>ID GOTO 420      'SEARCH FOR REQUESTED PLOT NUMBER
500 I1=7: IE=0
510 CLS
520 IF J12=2 GOTO 590      'WHEN J12=2, CURRENT RECORD IS ALREADY READ
530 SCREEN 9              'EGC with EGD, Advanced screen A (640X350)
535 'SCREEN 2              'CGA and different valus for F,JX and JY
540 COLOR 6,0              'SET COLOR TO ORANGE AND BLACK
550 GOTO 600
560 INPUT#1, Z(1),Z(2),Z(3),Z(4),Z(5),Z(6),Z(7),Z(8),Z(9),Z(10),Z(11),Z(12),Z(
565 '      Z(1),Z(2),...,Z(30) ALL ON ONE LINE
570 IF EOF(1) GOTO 700
580 I1=1
590 J12=1
600 FOR I=I1 TO 30 STEP 6 'LOOP FOR 5 COMMANDS, 6 WORDS EACH
610 IC=Z(I)                'IC IS PLOT COMMAND
620 IF IC=1 GOTO 710       'A NEW PLOT IF IC IS ONE
630 IF IC>10 THEN IC=IC-10
640 IF IC<>5 AND IC<>6 GOTO 680
650 IP=Z(I+1)              'IP IS PEN CONTROL, SUCH AS COLOR.
660 JR=JX+Z(I+2)*F: JS=JY-Z(I+3)*F: JT=JX+Z(I+4)*F: JU=JY-Z(I+5)*F
670 LINE (JR,JS)-(JT,JU),IP
680 NEXT
690 GOTO 560
700 IE=1                    'EOF ENCOUNTERED AT END OF A PLOT
710 BEEP                    'END OF A PLOT
720 INPUT "",Q$            'C/R TO CONTINUE
730 IF IE=1 GOTO 800
740 CLS                      'CLEAR SCREEN
750 J12=2                    'RESET FLAGS. FIRST RECORD OF NEXT PLOT ALREADY READ
760 GOTO 400                  'LOOP BACK FOR NEXT PLOT
800 IF I3=0 THEN PRINT "EOF ENCOUNTERED. THERE IS NO PLOT IN ";FIL$
810 IF I3=1 THEN PRINT "EOF ENCOUNTERED. THERE IS ONLY ONE PLOT IN ";FIL$
820 IF I3>1 THEN PRINT "EOF ENCOUNTERED. THERE ARE ONLY";I3"PLOTS IN ";FIL$
830 INPUT "START ALL OVER AGAIN";Q$
840 IF Q$<>YES$ AND Q$<>Y$ AND Q$<>YSS$ AND Q$<>YSS$ GOTO 880
850 CLOSE #1
860 J12=1: I1 =1
870 GOTO 390                  'CYCLE BACK FOR MORE PLOT
880 PRINT "END OF JOB"
890 COLOR 7,0: CLS          'RESET COLORS TO BLACK AND WHITE
900 END

```

NASTRAN DATA DECK

Case Control Data Card - ACCELERATION - Acceleration Output Request.

Description: Requests form and type of acceleration vector output.

Format and Example(s):

$$\text{ACCELERATION} \left[ \begin{array}{ccc} (\text{SORT1} , \text{PRINT} , \text{REAL} ) \\ \text{SORT2} \quad \text{PUNCH} \quad \text{IMAG} \\ \phantom{\text{SORT2}} \phantom{\text{PUNCH}} \phantom{\text{IMAG}} \text{PHASE} \end{array} \right] = \left[ \begin{array}{c} \text{ALL} \\ n \\ \text{NONE} \end{array} \right]$$

ACCELERATION = 5

ACCELERATION(SORT2, PHASE) = ALL

ACCELERATION(SORT1, PRINT, PUNCH, PHASE) = 17

Option	Meaning
SORT1	Output will be presented as a tabular listing of grid points for each load, frequency, eigenvalue, or time, depending on the rigid format. SORT1 is not available in Transient problems (where the default is SORT2).
SORT2	Output will be presented as a tabular listing of frequency or time for each grid point. SORT2 is available only in Transient and Frequency Response problems.
PRINT	The printer will be the output media.
PUNCH	The card punch will be the output media.
REAL or IMAG	Requests real and imaginary output on Frequency Response problems.
PHASE	Requests magnitude and phase (0.0 <= phase < 360.0 degrees) on Frequency Response problems.
ALL	Accelerations for all points will be output.
n	Set identification of a previously appearing SET card. Only acceleratlons of points whose identification numbers appear on this SET card will be output (Integer > 0).
NONE	Accelerations for no points will be output.

- Remarks:
1. Both PRINT and PUNCH may be requested.
  2. An output request for ALL in Transient and Frequency response problems generally produces large amounts of printout. An alternative to this would be to define a SET of interest.
  3. Acceleration output is only available for Transient and Frequency Response problems.
  4. In a frequency Response problem any request for SORT2 output causes all output to be SORT2.
  5. ACCELERATION = NONE allows overriding an overall output request.