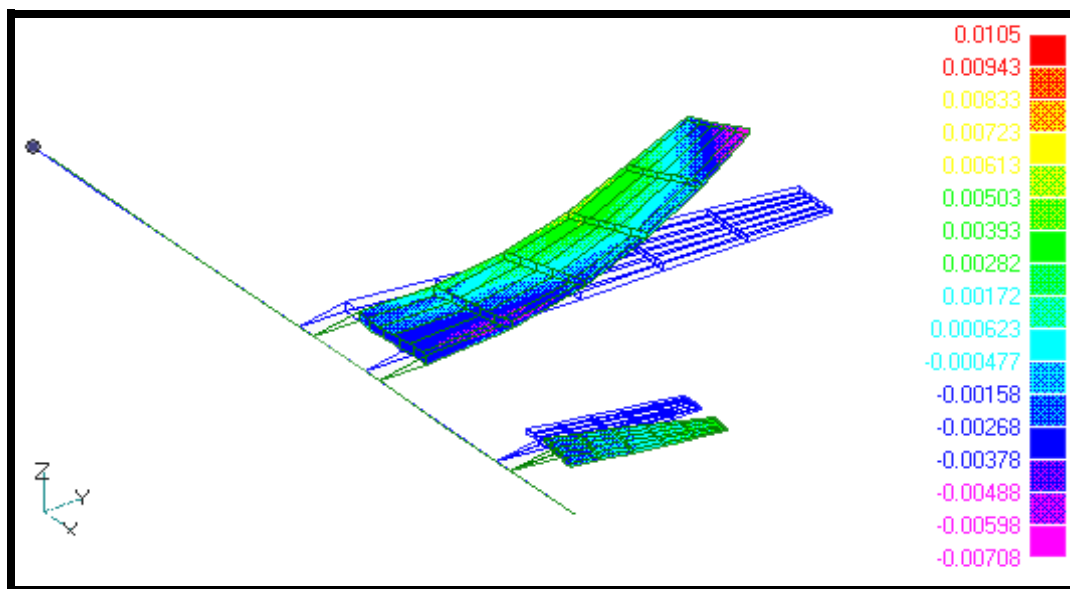


WORKSHOP 13a

Shock Response Spectrum of the Half Aircraft Model



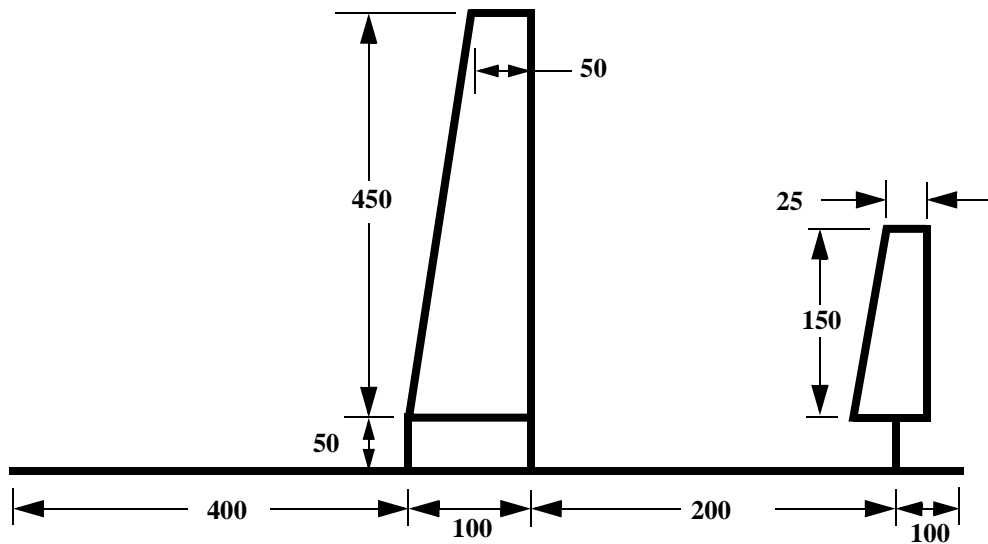
Objectives:

- Open the geometric representation of half an aircraft.
- Apply an impulse load on the aircraft.
- Submit the file for analysis in MSC.Nastran for Windows.
- Find the transient response of the tip of the fuselage due to the shock load with three different damping constants for the structure.
- Save the Response Spectrum Functions to a neutral file for subsequent analysis.

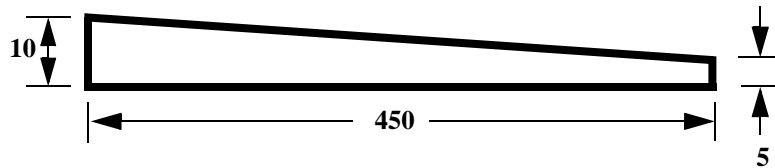
Model Description:

For this example, shock load will be applied to the center line of an existing aircraft model.

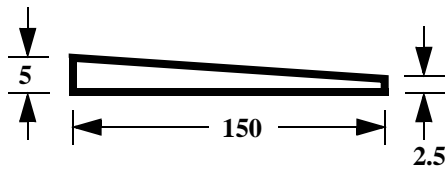
Description: Aircraft Dimensions



Wing: Side View



Tail: Side View



Exercise Procedure:

1. Start up MSC.Nastran for Windows 4.0 and open an existing model.
Double click on the icon labeled **MSC.Nastran for Windows V4.0**.
On the *Open Model File* form, open the model **Half_Aircraft**.

Open Model File:

half_aircraft

Open

2. Change the model view.

View/Select... <F5>

Model Style:

Draw Model

Deformed Style:

None

Contour Style:

None

OK

Ctrl+Q

All Entities On

Done

3. Select symmetric constraints and delete old result cases.

Model/Constraint/Set...

<highlight>

1.. symmetric

OK

Delete/Output/Set...

Select All

OK

Yes

4. Create the shock load function and set up the shock response solution functions.

Model/Function...

Title:

Type:

X:	<input type="text" value="0"/>	Y:	<input type="text" value="0"/>	<input type="text" value="More"/>
X:	<input type="text" value=".005"/>	Y:	<input type="text" value="0"/>	<input type="text" value="More"/>
X:	<input type="text" value=".006"/>	Y:	<input type="text" value="1"/>	<input type="text" value="More"/>
X:	<input type="text" value=".030"/>	Y:	<input type="text" value="1"/>	<input type="text" value="More"/>
X:	<input type="text" value=".031"/>	Y:	<input type="text" value="-1"/>	<input type="text" value="More"/>
X:	<input type="text" value=".055"/>	Y:	<input type="text" value="-1"/>	<input type="text" value="More"/>
X:	<input type="text" value=".056"/>	Y:	<input type="text" value="0"/>	<input type="text" value="More"/>
X:	<input type="text" value=".5"/>	Y:	<input type="text" value="0"/>	<input type="text" value="More"/>

Title:

Equation

Delta X:

X: Y: To X:

Title:

X:	<input type="text" value="0"/>	Y:	<input type="text" value="0"/>	<input type="text" value="More"/>
X:	<input type="text" value=".025"/>	Y:	<input type="text" value="0"/>	<input type="text" value="More"/>
X:	<input type="text" value=".050"/>	Y:	<input type="text" value="0"/>	<input type="text" value="More"/>

OK

Cancel

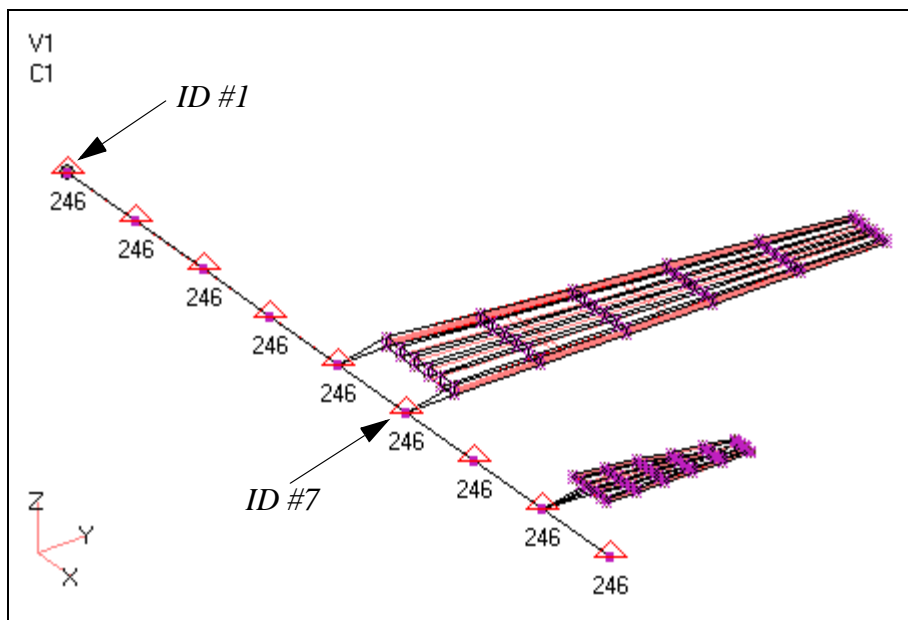
5. Create the shock load

Model/Load/Set...

Title:

shock

OK



Model/Load/Nodal...

<select nodes at second wing tie - ID # 7>

OK

FZ

100

Function Dependence:

1.. shock

OK

Cancel

Model/Load/Dynamic Analysis...

● Direct Transient

Number of Steps:

Time per Step:

Output Interval:

Frequencies:

Damping:

6. Submit the file for analysis.

File/Export/Analysis Model...

Type:

Filename:

Run Analysis

Output Requests: Acceleration

Absolute

Acceleration: T3

<Select the node at the front of the fuselage - ID #1>

WTMASS

Continue

7. Plot results for T3 applied load at node 7 and T3 acceleration at node 1 and 7.

View/Select... <F5>

XY Plot:

XY vs Set Value

XY Data...

Output Set:

1.. Case 1 Time 0

Vector Output:

44.. T3 Applied Force

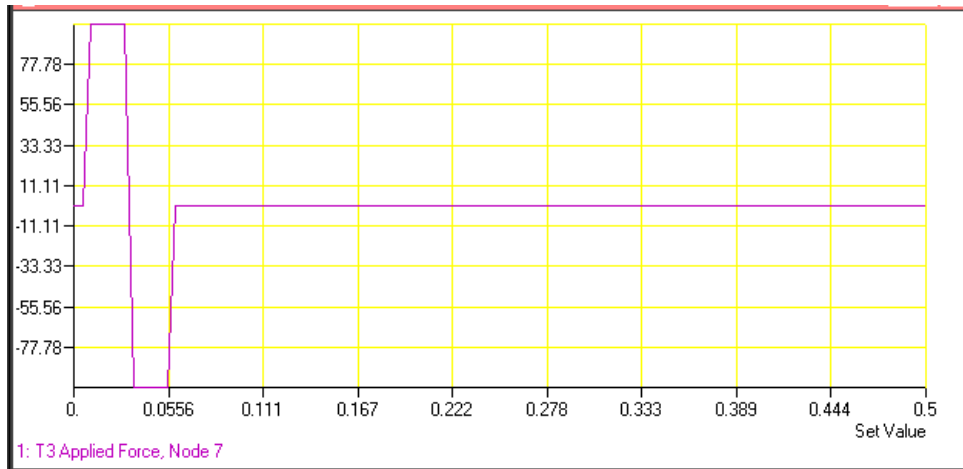
Output Location: Node:

7

OK

OK

The chart should look like the following:



View/Select... <F5>

XY Data...

Curve:

2

Output Set:

1.. Case 1 Time 0

Vector Output:

24.. T3 Acceleration

Output Location: Node:

7

OK

OK

View/Select... <F5>

XY Data...

Curve:

● 3

Output Set:

1.. Case 1 Time 0

Vector Output:

24.. T3 Acceleration

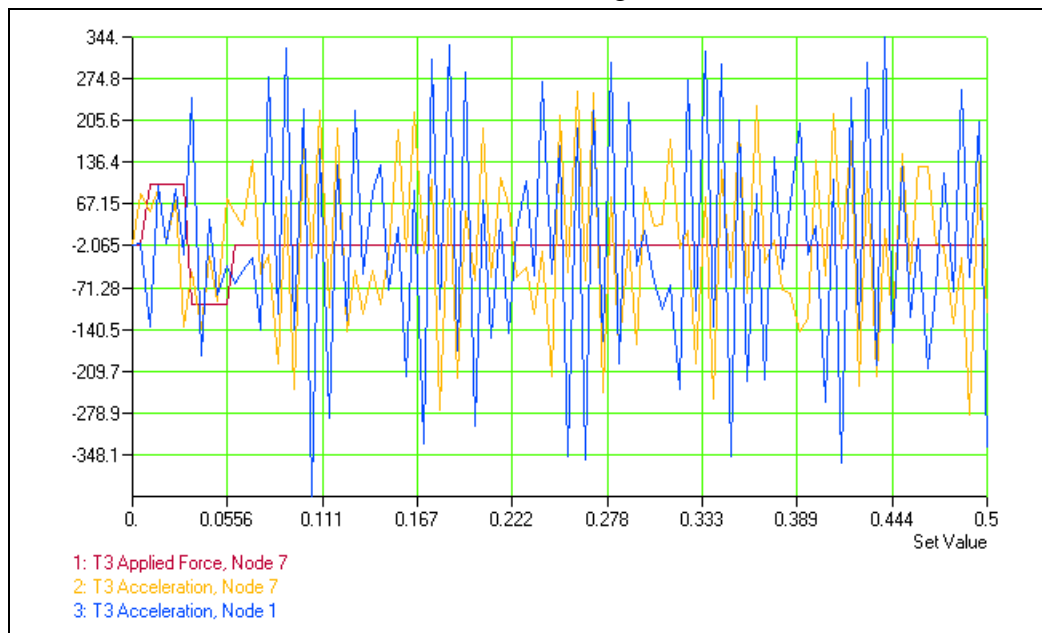
Output Location: Node:

1

OK

OK

The chart should look like the following:



8. Plot functions 4, 5, and 6.

View/Select... <F5>

XY Plot:

● XY of Function

Model Data...

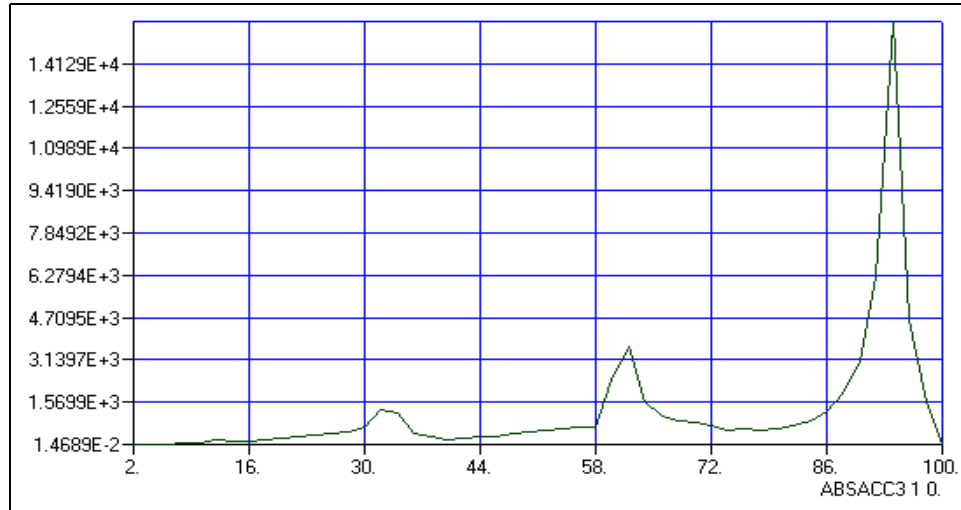
Function: Select:

4.. ABSACC3 1 0.

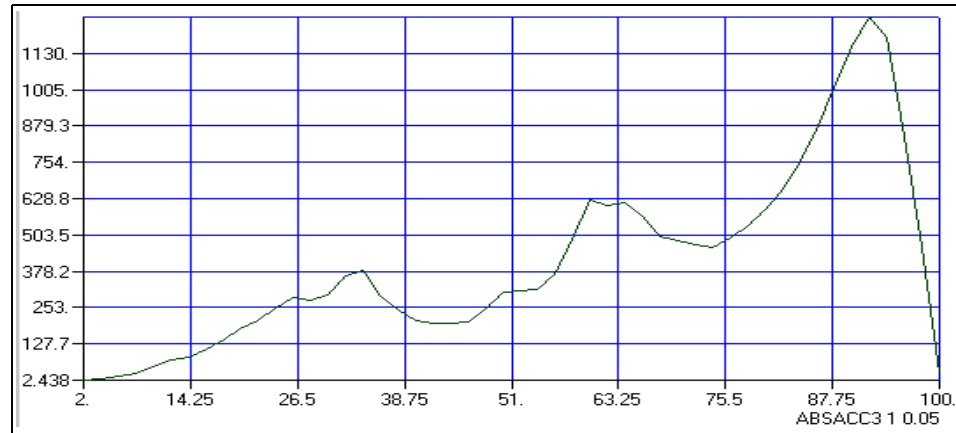
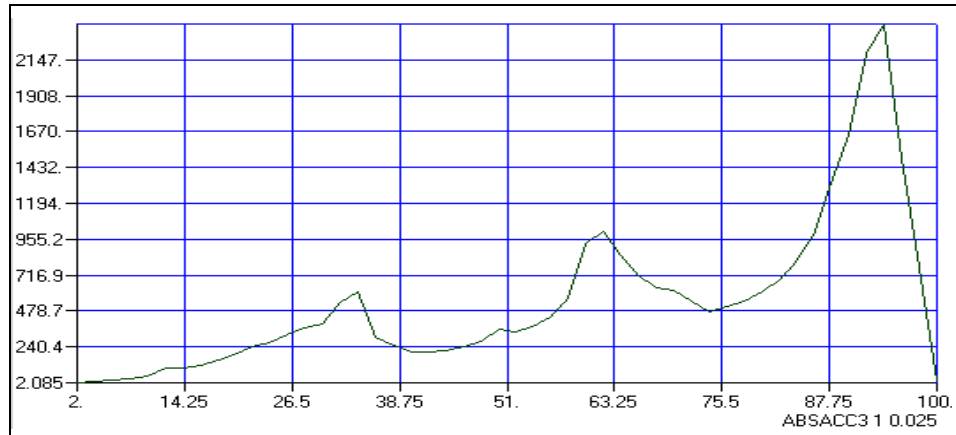
OK

OK

The absolute acceleration in the z direction of node 1 with no damping should look like:



Repeat step 8 for the remaining 2 functions. Function 5 and 6 should look like:



- Write functions to a neutral file for use in workshop 13b.

Group/Set...

Title:

dummy

OK

File/Export/FEMAP Neutral...

Filename:

prob13a_functions

Write

● Group Only

OK

File/Exit

