

**NanoFab**

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# **Instructions for Vibrations Analysis**

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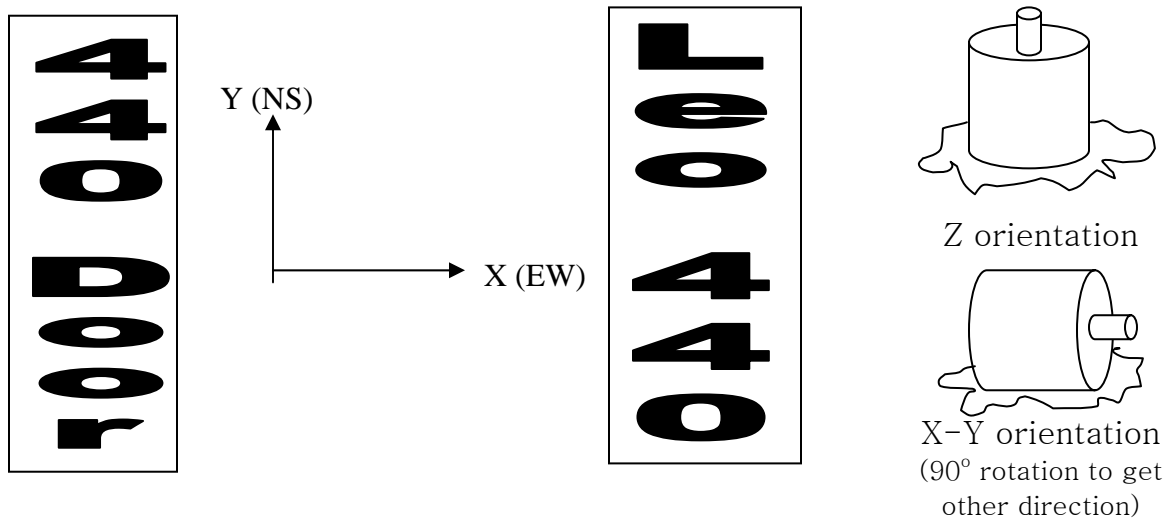
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## Materials

- Beeswax
- Accelerometer
- Network Analyser
- Signal Conditioner
- Heat Gun
- Cables with BNC jack
- Heavy Object
- Vibrations Disk

## Setup

- Remove a floor tile in the clean room.
- Plug in the heat gun.
- Place some beeswax on the cement floor and melt it with the heat gun to ensure a good coupling.
- Carefully take the Accelerometer out of its case, removing the cap from the electrical connection and the mounting screw bottom.
- Put the accelerometer on the warmed wax carefully. Do not slap the accelerometer down as it could damage the sensor. Make sure it is in the right orientation (x,y,z) for the measurement you are taking.



- Connect the system.
  - The Network Analyzer's **Input A** should be connected to the Signal Conditioner's **SCOPE** BNC jack.
  - The Signal Conditioner's **XDCR** (transducer) BNC jack should be connected to the electrical connection of the Accelerometer
  - The Network Analyzer should be plugged into an outlet.



- In order for the system to be more stable and less noisy, the cable should be anchored down with a heavy object (chemical bottle seen above works). The cable should be slightly loose coming from the accelerometer (less coupling) and then should be anchored. The cable from the signal conditioner to the anchor should be loose to avoid coupling as well.

### Powering On

Note: The accelerometer needs a constant current source so it must be used with the Signal Conditioner at all times.

- Turn on the Signal Conditioner and let it warm up 2 minutes so that the system is stabilized.



- The indicator on the Signal Conditioner should be in the green zone.
  - If it is in the red or yellow zone check the connections.
  - Depress the rocking switch to the right. It should go to the BATT OK region. If it does not, check the connections. If the connections are fine the battery may need to be changed (see manual).

### Loading the Proper Setting

The settings for the vibrations analysis are saved on the VIBRATIONS disk.

- Under *Menu* go to *Store Recall*.
- Then click on the *Recall Settings* button on the side of the screen
- Click on the *File Name* button and then the under *Entry* press the *ALT* button, and type out *VIBRATE*.
- Click on the *Enter* button followed by the *Recall Settings* button
- The screen is now frozen, so under *Control*, press the *Start* button
- Click the *Return* key followed by the *Freq* button under *Menu*

### Saving Data

Three sets of data must be saved corresponding to the x, y, and z directions. Please ensure that the accelerometer is in the right position corresponding to the right direction (see Setup)

- Insert the VIBRATIONS disk into the Spectrum Analyser
- Under *Menu* go to *Store Recall*
- Then click on the *Save Data* button, followed by the *File Name* button
- Under *Entry* click the *ALT* button and type TESTZ
- Press the *Enter* button, the *Save Ascii* button, followed by the *Return* button. Note: This overwrites the old TESTZ file.
- Change the orientation of the accelerometer and repeat this process in the x and y direction using TESTX and TESTY respectfully.

## Powering Down

- Turn off the Network Analyzer.
- After a minute, turn off the Signal Conditioner.
- Disconnect the cables and place the Accelerometer back in its case.

## Analysing Data

- Put the vibrations disk into your computer and open the Vibrations.xls EXCEL file
- A warning that the file contains macros will come up. Click *Enable Macros*.
- This will import the x, y, and z data from your floppy disk into your EXCEL document and produce narrowband and 1/3<sup>rd</sup> octave graphs from this data in each orientation.
- To save data and graphs, copy and paste the results into another spreadsheet, otherwise they will be overwritten the next time data is loaded.