Checklist for Experimental Modal Analysis Testing
June 21 2013

#	Description (For details see [1].)	Check
1	Plan the test by determining suitable measurement DOFs, reference points, etc.	
2	Build the geometry description up in your software.	
3	Support the structure according to your decision (free-free or alternatively supported).	
4	Mark all measurement nodes on the structure. If necessary measure the exact location.	
5	For a shaker test	
5.a	Mount the accelerometers and possibly dummy masses, draw cables to the measurement system.	
5.b	Mount the force sensor(s), align the stinger/shaker(s) and attach it/them.	
5.c	Select your choice of excitation signal. The preferred excitation signal should be pseudo random (single shaker) or periodic random (multiple shakers). Turn the amplifier's volume knob all the way down and turn the signal generator(s) on. Then slowly turn the amplifier volume up until you (barely) hear your excitation signal if you put your ear against the structure (note! this is of course not always possible, for example if the frequency range is below the audible range.). This is the preferred level, increasing the excitation level increases the risk of nonlinearities!	
5.d	Look at the voltage levels of your accelerometer signals and ensure they are close enough to 5 V, assuming you are using IEPE sensors. If you are using some other sensors, you may need to change the input range of your measurement system for each channel.	
5.e	Try out measurement settings (frequency range, excitation signal, blocksize, perhaps other settings like burst length for burst random excitation) until the quality of each FRF is good (assessed by ensuring the coherence function is near unity)	
5.f	When the right measurement parameters are found, check reciprocity. If not in order, try disconnecting all shakers, realigning, and connect again, until the reciprocity is good.	
5.g	Look at the imaginary part of each driving point FRF (if accelerances; real part if mobility) and ensure that all peaks point in the correct direction (which depends on the individual directions of the force sensor and accelerometer; if both point in the same direction, the imaginary part should peak in positive direction).	
5.h	Next, investigate the correlation between the force signals, to avoid unreliable FRF estimates. There are different ways to this, depending on your measurement system. I personally prefer to investigate the virtual coherences.	
6	For impact testing, instead do the following (for simplicity we assume a roving hammer test!)	
6.a	Mount the reference accelerometers.	
6.b	Test out the right hammer tip and measurement settings. Follow the instructions in [2].	
6.c	Check another excitation location far from the first one, to ensure the settings work also for other impact locations.	
7	You are now ready to carefully start acquiring data.	
8	Once your data are acquired, proceed with the modal parameter extraction.	

[1] A. Brandt, Notes On Using the ABRAVIBE Toolbox for Experimental Modal Analysis, http://www.abravibe.com

[2] A. Brandt. Noise and Vibration Analysis – Signal Analysis and Experimental Procedures. John Wiley and Sons, 2011