

Re: New Laboratory

Monday, March 14, 2016 5:01 PM

From: "Filippo Dacarro" <filippo.dacarro@eucentre.it>

To: "Rod Larson" <rodlarson100@yahoo.com>

.....

- a. As I see it, you have a 2-axis table with short stroke vertical actuators (+/-100 mm ?). There are 2 (two) hold-down actuators used to hold the table against the 4 vertical actuators.

Everything correct.
The total vertical stroke is 140mm

.....

- b. You have 2 (two) actuators w/ 3 servo-valves on each actuator driving a platen for the damper tester like the 2500KN machine you already have at Pavia.

It is exactly the 2500kN, I mean the same machine, we will move the DTS on the new laboratory, we're NOT going to install a new one, we'll move the one we already have, everything except the controller (it will remain for the BTS).

Now, my questions and observations:

I think that you basically have a uniaxial table if you use the products stated. You can only get good waveforms out of the vertical actuators IF you use a hold-down force of 50% of the vertical actuator force. If you do not, the distortion will be very significant on the vertical axis. However, you do NOT have big enough hold-down actuators (1250KN each) if you use the ones specified to get good vertical waveforms. The 2500KN total falls short of the 4000KN required to get good waveforms (4x200 Ton actuators). Of course, you can take the weight of the table and specimen into account for the 4000KN total. But, I don't think you have that kind of weight (150 Tons) in this system, do you ?

The total weight (shaking table + specimen mass) could be something like 40tons, so we're still far away from what you suggest, unfortunately I think that it is too late to change the force capability of the hold-down actuators, for sure MTS will ask a lot more money...
Do you think that we will have very bad distortion on the vertical axis? What could be the worst set-up and what could be the best one? (I mean: heavy specimen? light specimen? time histories with high frequencies\low frequencies? high velocity?...). There is the possibility to limit the use of the vertical axis only for adequate tests (it is not the optimal solution but, if we can not turn back time?...)

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The 469D software is not suitable for the Damper Tester. Don't you need to have load (force) control ?

.....

Yes, we need Force Control, remember that we also have the Impulse Test on the DTS which is very important in testing procedure fo dampers.

.....

The 469D does not do that. If the damper test does not need force control, yes, you can use the 469D to run the damper test, BUT you cannot get more than 2 valve drivers to use. The 4 vertical valve drivers are NOT hooked to the same axis - they are on the vertical axis. So, you have 3 options:

1. Ask MTS to make a 6-valve on 2 actuators configuration of the X-Axis of the BTS software using 494 hardware.
(NOTE: 494 hardware will not run and cannot run the existing 493 version of the BTS)
2. Just use the single valve-driver available for each damper test actuator and parallel the other 2 valves. Definite valve balance problem. (Like what you have now).
3. Put in an option in the 469D to have 6 output D/As in the system that you can use to output the servo-valve error signal. You then get the ability to have gain/offset adjustment on each valve command. Cheap to add 8-channel D/A that is used as analog outputs - these (as a standard product in the 469D) can output any signal in the 469D as a +/-10 Volt signal. BUT, you do not have Load (Force) control with this option.

Obviously, the choices should be ordered #1, #3 and last #2 as the best solution.

Otherwise, I think you guys can do the work. The hairiest work is to get the 2 old hold-down actuators modified to add the servo-valve and LVDT.

The \$ figure for my time and travel you have is close to right as long as we don't have difficulties with your pumps and/or hardline.

What you should realize is that the OLD BTS s/w cannot run on the new hardware. The 494 hardware is NOT compatible with the 493. It will have to be changed. All that MTS says it is going to do is the 469D. That is not adequate to run the 6 valves as discussed above. The 493 is now officially obsolete from MTS.

The standard 469D can easily be made to use the 6 D/As to driver the damper test valves. The valve drivers would not be used at all, but the s/w would drive them. The control loop will work cuz the valves will run and the feedback will come back into the control loop. You could even request that MTS add one extra D/A board just for this purpose.

Now, I would suspect that Brad could be the one to do the s/w. You could even ask that he does it. He would like to go to Pavia anyway (just not when I would be there...hehehe).

.....
 For sure we can ask Brad (and I agree that he is the right guy) but, just to be clear, you mean, to ask him as itself or to him as an MTS man? We are open for whatever solution, just in order to know which way to run

You cannot under any circumstances have anything to do with STEX Pro -- it is a total pile of junk. It cannot compensate for any high Q resonance below 20 Hz. It is actually malware - if installed on your PC - you have to wipe the disk to get rid of it....

We really DON'T want to purchase STEX Pro!!!

Just ask for compatibility for Stex III since you already have that. That is a very legitimate request. Just say you got it as a part of the last site software upgrade. you pick the date...if they ask....

I will act stupid when they ask me - just tell me the date you tell them so I can agree with it.....hehehe....

Thank you very much for this, I think that we will have a meeting in Minneapolis not later than the end of April, we will try to ask, smoothly, about Stex III compatibility. Do you need me to check about your last work trip in Pavia as an MTS man? I think that everything could be more credible if referable to something real, don't you think so? Just let me know if you think that could be useful or not.

And last, but not least - do NOT under any circumstances use 793 s/w for any of the new lab. You actually want 469D and X-axis BTS - both running on 494 hardware.

OK.

Rod, everything that you wrote is really of great usefulness, really thank you. Unfortunately nobody in MTS has advised us about potential mistakes in the preliminary design, this means that nobody there, has spent some time just to check roughly the parameters of the installation and, for sure, this is not a good thing. They've only spent time in quotations....:-)

Good to know that \$ foreseen could be adequate (I confirm, no problem for small changes), the pumps and piping must be accepted before the MTS stuff installation, therefore, hopefully we will not experience any trouble on that, but things happen...so, for sure we will make balance on your extras.

keep in touch soon, I will keep you updated
 Filippo



MEng Filippo Dacarro

Technical Coordinator Shaking Table, BTS, Tests on Dampers and Shock Transmitters, Structural Monitoring Systems

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Il giorno 14 mar 2016, alle ore 17:09, Rod Larson <rodlarson100@yahoo.com> ha scritto:

Filippo,

1. I have reviewed all the documents and I have the following comments.

- a. As I see it, you have a 2-axis table with short stroke vertical actuators (+/-100 mm ?). There are 2 (two) hold-down actuators used to hold the table against the 4 vertical actuators.

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Feel free to ask any questions as we go along. I will look at any detailed drawings you will create as well (no charge).

Sorry it too almost a week, but I had to look at the system about 3 times before I figured it all out. At 1st I thought you had 4 hold-downs and 2 vertical actuators.....and I had a hard time seeing how 493 BTS s/w was going to be used on the damper tester...but I finally figured it all out.

Rod

On Tue, 3/8/16, Filippo Dacarro <filippo.dacarro@eucentre.it> wrote:

Subject: New Laboratory
To: "Rod Larson" <rodlarson100@yahoo.com>
Date: Tuesday, March 8, 2016, 3:58 AM

Hello Rod, hope everything is fine with you and Jovie. I'm attaching a more detailed draft of the new laboratory. The construction yard will probably start in few weeks (hopefully mid April), enclosed you will find: Update version of the drawings (whole laboratory); Update version of the steel table; Update version of the piping (it is not enough detailed but I will send an update version in few weeks); Copy of the contract proposal issued by MTS (CONFIDENTIAL). please, if you have some free time, take a look and just email me in case you figured out something wrong or, in your opinion, improvable. I have some issues on which I need your advice: As you know we will move the DTS in

the new building (see drawings of the whole laboratory), therefore, we should move ALL the software stuff on a NEW system PC which will communicate with the NEW controller with the NEW version of the 469D, do you see any critical point? I think that we should have no problem in having 469D and BTS software sharing the same PC, BUT we must change all the configuration of the DTS2500.set redirecting the software to the new controller (new DUCs and new VALVE DRIVERS), please let me know for any doubts on that, we really don't want to ask MTS for this migration, because, not least, we're pretty sure that they don't have a single person who could be in charge of that;On the new controller, we will have enough Valve Drivers in order to control the six proportional valves of the DTS separately, this would be a great improvement, because we should be able to balance each valve with very high accuracy, and this will significantly lower the leakage. Is this ok for you? In the early operational phase of the new laboratory, we will have only TWO PUMPS running, so we really need to lower the leakage as much as we can;For the connections of the DTS signals to the new controller, we will have ten/twelve patch cables from MTS (in order to hook to RJ50);Do you think that it is possible to send the readouts through the SCRAMnet? CONFIDENTIALI don't want to hide anything, I'm not in deep involved in the management of the project (from the money point of view), but I will be in charge of all the technical stuff so I want that everything will be done as best as we can; As far as I've understood, Alberto kept something like 30.000,00€ for your part, but If you think that it is not enough I can try, at the moment, to find some extras adjusting some parts of the budget, in order of the 10% don't mind, is not important, but if you think that your part could be something like 30-40% more, please advice and we will find an arrangement.
Take care my friendKeep in touch soonFilippo

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