1 **Set up. This is superseded by FlexTest method for controller in B321.**

2 Log in. User name comes up Administrator. Password from Jacob. For each step, write down what you do.

3 Launch *system loader*. The icon is found on the desktop. Alternatively, go to Start - Programs - MTS Systems - System Loader. Let it load. Do not mount a specimen until you have some practice in controlling the motion of the test frame in displacement control.

4 Open *station manager* using icons in folder or by the above path. Open the station. For the 100 kip system use 100 kip generic. For 12 kip system use 12 kip system cfg. System parameter, 12 kip initial. Hit OK, then a group of windows will open including a scope module. **Safety Warning:** Make sure control variable is equal to the actual reading, or the machine will move suddenly when started. Once the system is activated, do not put your hands between the grips. They can move rapidly and apply a great deal of force. Everyone else keep away from the control computer. If the system starts to move before everyone is clear, you may hit the red panic button to shut the hydraulics. To reset it, twist.

5 **Turn on hydraulics** using the control panel. Hit reset to clear the interlocks. Hit HPS (hydraulic power supply), first low button, then high button. Select HSM (manifold) using the arrow, then hit low button, then high button to activate. Circles in the control panel light up green to show hydraulics are on. If the interlock is tripped, it will not start. Hit reset, then try again. If using the 100 kip frame, turn on the hydraulic valve by the back wall.

6 **Grips.** Hydraulics must be on for the grips to work. When installing compression or bending fixtures, use a metal spacer so the metal tang does not go into the grip all the way, otherwise it may stick. Install the lower fixture first, then place the upper one on it to align, then install the upper one; tighten the grip on the protruding tang.

7 **Zeroing.** Channels can be zeroed using *manual control*: turn on by clicking to check the *Enable* box. Use slider or key in desired displacement or force depending on which is being controlled. Larger numbers (plus) means a lower position. Be careful. *Input Signals* panel at the bottom allows you to zero the force or the displacement channel. If this panel does not appear, turn it on with the station manager panel, Display menu, input signals. *Warning*: if you later begin a test starting at zero, with zero mean, this is the zero!

8 **Safety and limits.** If your specimen is brittle, use a plastic shield to prevent injury from flying fragments. Use safety glasses to prevent injury from broken pieces. Only one person should be involved in mounting a specimen. Everyone else keep away from the control computer. If the system starts to move before everyone is clear, you may hit the red panic button. One can **set limits** to the allowable force or displacement. The third icon from the left in the Station Manager brings up the *Adjust Input Signals* window. Program interlock will terminate the program but may leave a residual force. Disable does nothing. Indicate makes a red dot go on in Detectors window if it is open. *Interlock* will shut the hydraulics. If the program terminates, start again by hitting *reset interlock* in the control panel. Do this after the cause of the interlock triggering has been resolved. The *Adjust Input Signals* window also allows one to set the range for force and displacement. For example if the force range is set to 2 kip, then that (2000 pounds) is the maximum; an experiment attempting higher force will be truncated.

9 The ***Scope*** module allows **display** of force and displacement versus time; hit the button at upper left to go to continuous sweep. Set channel A as force, B as displacement. Change scales if needed. If there is no time trace at first, check the Graph option icon. If it is set as plot A/B (an x-y plot), then no time trace will be seen. Un-check this button to get a time trace. Count the divisions to determine the peak to peak force and displacement. Write down the divisions and the scale.

10 **Testing; scope screen display.** Turn off manual control via the check box *enable manual command*. Turn on *Station Exerciser* (second icon from right in the Station Manager panel). Use it before mounting a specimen to warm everything up in displacement control, and to practice controlling the instrument motion.

Station Exerciser can also be used for a test, provided you write down the readings on the scope or digitize the trace rather than expect a digital file. Before starting, make sure grip position is properly adjusted using manual command. Then use the input signals panel to zero the channels. If you do not do this the grip may move a great deal during the test. Turn off manual command. Set a wave-form amplitude and frequency using the station exerciser. Look at the scope output on the computer screen. Adjust sensitivity scales to display the wave-form. Write down the signal amplitude for force and displacement. Mean is the same as set point in analog system. Amplitude is the same as span in analog system.

The scope module, though it is digital, does not provide direct digital export of data. Digital data may be obtained from scope traces as follows. If you choose to export a screen shot of the scope display, keep in mind that floppy disks only have 1.4 Mb capacity. Zip compression may help. As an alternate, photograph the screen. Even so, a screen shot is not a professional graph. The curve must still be digitized and plotted. Software can be used to digitize plots but the quickest way is to measure distances with a micrometer and convert via proportions. **Cryptic messages** include, *This channel is currently in use*, manual control may have been left on. Turn it off, then try again. Other bug messages can be handled by

refraining from restoring views. Open windows from bar at top, one at a time.

11 **Testing, digital output.** To do a test with digital output, turn on *Basic Testware* (third icon in `\Profiles \Administrator` window).

12 Open test method after turning on *Basic Testware*. For example rsl1.tst will generate a sine wave 0.5" displacement control at 1 Hz. Alternatively create a new test method. This window allows you to control data acquisition. Choose *timed*. Use arrows to select what you want to save in the data file. The function generator control, FG Definition, allows you to specify mean value, amplitude, frequency, as well as displacement control or load control. To give a file name, check *user specified*. **Use a new name for each data set. Digital data** can be saved on the hard disk. data.dat represent data. Anything with a .tst ending is a test method, not data. Go into My Documents to verify the data file is present. The computer likes to save it to a folder called **tsis**, and a folder called **jwd**. Copy the file to a floppy disk. For each test, open a new test method, otherwise prior tests done under a file name will be saved to the same file, over-writing the prior test data.

13 Find your data on disk. Click shortcut to btw in `C:\WINNT\Profiles\Administrator`. Look at the data. Do they make sense? Copy to a floppy disk.

14 **Shut down procedure.** When you are done testing, turn off the hydraulics using the Control Panel. Then exit Basic Testware.

15 Close station manager: File menu, hit *Exit*.

16 Go to start menu. Choose shut down. If the start menu is not visible, put cursor at the bottom, or hit control alt delete to get a dialogue box. If you get a message *cannot close station, in use by another application*, then hit control option delete to get task manager. Close Basic Testware first, then close Station Manager. Then shut down.

17 Turn off the computer using terminal switch when it says it is safe to do so.