LOOP BACK TEST

The purpose of the loop back procedure is to determine the state of the main control system circuitry found in the computer control tower.
This is achieved by isolating the test station hardware from the main control computer system. Failure to meet the requirements specified in this section would lead one to troubleshoot the analogue & digital control system.

1.a Parts necessary for set-up include: Two BNC cables and one BNC " Tee" junction connector

1.b Open the front door on the control tower, this will expose the three BNC connector ports located at the lower right hand-side of the control tower : FORCE, STRAIN & COMMAND

1.c Remove the three existing BNC connector cables from their respective ports

1.d Connect the bottom part of the "Tee" connector into the vacant COMMAND port and connect the two BNC cables to either side of "Tee "connector running one side to the FORCE port and the other side to the STRAIN port

1.e Using Orchestrator software click on UTILITIES and scroll to SERVICE click on TRANSDUCER. The transducer table will be displayed – make note of the following parameters and their values: INERTIA, COMPLIANCE & PHASE CORRECTION

1.f Delete the values found in step 1.e and replace the those values with zero

1.g Using Orchestrator click on the Start Tab; this will open up the test set-up and geometry fields . Select parallel plate and select Edit Geometry. Enter a radius of 1 and gap of 1. Select dynamic frequency sweep field and select Edit test and enter the following data.

Strain = 25%, Temperature = 0.0 degrees, Sweep type logarithmic, Initial frequency 1 rad/s, Final Frequency 500 rad/s, Points/Decade = 5, Delay before test 0.0s, Correlation delay = 0.0 Cycles , 1 cycle Correlation = NO

1.h From the toggle/plot spreadsheet select G*, Torque, Phase angle, Strain %, & Frequency

1.i Click on Begin Test and run test

1.k Observe the results at all frequencies and determine the success of the Loop back test, based on the following table of requirements

PARAMETER	TRANSDUCER	VALUE
STRAIN	ALL	2.5E+1
PHASE ANGLE	ALL	<+/- 0.1 Degrees
TORGUE	ALL	50% Full Scale
G*	2000 gm-cm	2.5E+9 Dynes/cm2
G*	200 gm-cm	2.5E+8 Dynes/cm2
G*	100 gm-cm	1.25E+8 Dynes/cm2
G*	10 gm-cm	1.25E+7 Dynes/cm2

1.l In conclusion: If the generated data from the loop back test falls within the specified requirements of the table found in step 1.k, this would indicate, that the digital and analogue circuitry found in the control computer tower is running to specification. At this point, further trouble-shooting of the hard-ware found within the test station would be necessary.

1.j Reset the original values for Compliance, Inertia & Phase angles made in step 1.b

1.k Remove the BNC “Tee” connector and restore BNC cables to their original positions