Jefferson Lab Alignment Group
DATA TRANSMITTAL

TO: Joe Preble, Bill Schneider, Tim Whitlatch, Kurt Macha **DATE:** December 5, 2000

FROM: Kelly Tremblay **Checked:** **# :** DT_642

DETAILS:

A quarter cryomodule was surveyed on September 28th, 2000 and again on December 6th, 2000, in order to evaluate the effects road shipping a cryo-unit to Oak Ridge would have on the location of internal flanges. The data from the 1st survey was used to establish the centerline of the cryomodule, based on its location relative to the granite piers / Taylor-Hobson control points. The cryomodule assembly fixture was included in the survey to establish the location of the flanges relative to the determined cryomodule centerline. The flanges are the basis for determining if any movement could be detected in the second survey, after a test transportation of the cryomodule.

Three comparisons were examined. The 1st comparison was to see if there was any appreciable deformation of the outer skeleton. The last 2 comparisons use the cryomodule assembly fixture to check the horizontal (2.) and vertical (3.) location of flanges.

1. Sixteen alignment targets (foils and slant-view targets) on the exterior skin of the cryomodule were coordinated using our theodolite system. These points were then used to transform the second survey data onto the first data set, and thereby establishing a common coordinate system for both surveys. There was no significant movement between these exterior points between the two surveys. The small changes are within the tolerance limits of our equipment (±0.05 mm). From this it can be inferred that the outer shell did not move during transportation.

2. The following table shows the transverse (beam left/right horizontally) distance, in millimeters, that the alignment fixture center was found from the calculated centerlines for both surveys. A positive value indicates the center is to the beam left, (looking downstream). The standard survey error in locating the centers is approximately ±0.1 mm.

Transverse Location	Survey 1	Survey 2	Delta (srv2-srv1)
Centerline upstream	0.1	0.1	0.0
Centerline downstream	0.0	0.1	-0.1

3. The flange heights for both surveys were also determined via cryomodule assembly fixture and are shown below. The units are millimeters and a positive number indicates amount above the calculated beamline.

Vertical Location	Survey 1	Survey 2	Delta (srv2-srv1)
Centerline upstream	0.9	1.0	0.1
Centerline downstream	0.7	0.4	-0.3