

# Jefferson Lab Alignment Group

## DATA TRANSMITTAL

**TO:** Joe Grames, Joe Mitchell, Charlie Sinclair

**DATE:** 6 October 2000

**FROM:** Chris Curtis

**Checked:** # : L634

**DETAILS:**

Following on from the August 2000 gyro-theodolite survey (Data Transmittal L625), ties to beamline elements have been made in the south linac, line A and Line C. In lines A and C existing observations to the superharps were used in separate adjustments combined with the gyro observations in order to determine beam azimuths. In the south linac a transfer survey was made to two quads (QB2L16 and 20) on the beamline. In each case the azimuth between the elements was calculated and error ellipses (1 sigma) were generated relative to the gyro line. The component of the error ellipse transverse to the beamline indicates how well the beamline elements are defined relative to the gyro line. These are shown below in millimeters ("U/s" and "D/s error"). The equivalent azimuth error between the elements is given in degrees and in seconds (Az. error).

These surveys are to fiducials on each element. The accuracy of fiducialization is typically in the order of 0.05mm. The accuracy of the original gyro measurements was estimated at 3 seconds.

Angles between element lines can be calculated using the transfer azimuths.

	Line	T/fer Az. (deg)	U/s error (mm)	D/s error (mm)	Az. error (deg)	Az. error (sec)
SL	QB2L16-20	270.0005	0.04	0.04	0.0001	0.4
A	S'harp01-02	273.1998	0.05	0.06	0.0016	5.7
	S'harp03-04	307.4913	0.03	0.03	0.0009	3.3
C	S'harp01-02	266.8045	0.06	0.07	0.0030	10.7
	S'harp05-06	232.5226	0.08	0.07	0.0046	16.5