

Jefferson Lab Alignment Group

DATA TRANSMITTAL

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FROM: Chris Curtis

Checked:

: L625

DETAILS:

During the second half of the August shutdown several measurements of the main survey network were made using a gyro-theodolite. This instrument allows measurements to be made directly from a north reference (+/-3sec), thus eliminating the propagation of angular errors through a survey network. A total of fifteen lines were measured around the accelerator and in Hall A. Each measurement consisted of two observations of north at one end of the line, then a further two at the other end. A baseline was established in the south linac, which was typically measured at the beginning and end of each day. Six full measurements were made of the baseline. These measurements were used to define the mean difference between our survey grid and the north reference from the gyro ("Az. Diff"). This difference was then applied to the remaining lines in order to determine the effective difference between the gyro azimuth and our grid azimuth. This is given in degrees ("v (deg)"), and arc seconds ("v (sec)").

It should be realized that it has been several years since any of the survey network has been measured (specifically 8 years in the case of the injector). There is, therefore, a good possibility that individual monuments have moved from their last surveyed location. The August 2000 survey of superharps in line A measured between the HBS0097 and the HBS0642 lines. The angle from this recent survey agrees to within 3 seconds of the gyro value, illustrating that the disagreement shown below is with the original network observations.

It should also be remembered that these illustrate the difference between specific lines of our survey network and the determination made by the gyro-theodolite. It is not, therefore, a direct measurement of the beamline components. In order to get the angles between beamline components, a transfer to those components would have to be made, and the angle calculated between the resulting azimuths.

	Line	Grid Az.	Gyro Az.	Az. Diff	v (deg)	v (sec)
SL	HSL0210-260	269.9927	243.6455	-26.3472	0.0001	0.4
	HSL0210-260	269.9927	243.6450	-26.3477	-0.0004	-1.6
	HSL0210-260	269.9927	243.6454	-26.3473	0.0000	0.0
	HSL0210-260	269.9927	243.6458	-26.3469	0.0004	1.3
	HSL0210-260	269.9927	243.6456	-26.3471	0.0001	0.5
	HSL0210-260	269.9927	243.6452	-26.3475	-0.0002	-0.8
			Mean:	-26.3473		
INJ	HIJ0040-HIJ0081	88.1774	61.8283	-26.3491	-0.0018	-6.6
	HIJ0095-HNL0015	88.7343	62.3859	-26.3484	-0.0011	-4.0
NL	HNL0210-260	90.0024	63.6555	-26.3469	0.0004	1.4
BSY	HBS0035-055	270.0032	243.6580	-26.3452	0.0021	7.6
	HBS0097-125	272.9016	246.5511	-26.3505	-0.0032	-11.5
A	HBS0642-655	307.5470	281.1993	-26.3477	-0.0004	-1.5
	HSA0004-008	307.4930	281.1448	-26.3482	-0.0009	-3.4
C	HBS0237-256	232.4882	206.1396	-26.3486	-0.0013	-4.8
	HBS0241-253	232.4084	206.0589	-26.3495	-0.0022	-8.1