

The sign convention for the survey was different from what the phins wants:

SURVEY CONVENTION:	(X) forward +		
**used in calculations above	(Y) STBD +		
	(Z) Down +		
Multibeam Convention:	(X) forward +		
	(Y) STBD +		
	(Z) Down +		
Phins Conventions:	XV1	forward +	vessel horizontal plane, pointing forward to bow
** offsets entered into Phins must	XV2	port +	vessel horizontal plane, pointing from Stbd to Port
use this convention	XV3	up +	is perpendicular to the vessel horizontal plane, pointing upward

The PHINS manual – Part II – Definitions, Conventions & Specifications page 12 defines the lever arm as:

*External sensor lever arm is the distance from PHINS center of measurement P to the center of measurement of the external sensor.

So the offsets to enter into Phins are as follows:

		Phins Offset (meters)
PRIMARY CNAV POSITION :	XV1	-10.140 aft is negative
	XV2	3.410 port is positive
	XV3	27.468 up is positive
1850 (GPS 1 - bridge/aft):	XV1	-10.705 aft is negative
	XV2	2.819 port is positive
	XV3	26.997 up is positive
1850 (GPS#2 - chrm / forward):	XV1	-9.665 aft is negative
	XV2	2.031 port is positive
	XV3	27.686 up is positive