IUE NEWS NOTES

Gyros Revisited We reported in the last News Notes that IUE's maneuver accuracy had greatly improved due to a recalibration of the gyro scale factors. This move had been largely prompted by a rise in the temperature of gyro #1 after a control thermistor apparently failed. Recently gyro #5 has experienced a similar rise in temperature, accompanied by a degradation in maneuver accuracy. The gyro scale factors have been recalibrated once again, on May 23, and maneuver accuracy is good.

Gyro #1 failed in early March. Four gyros (#2-5) remain viable; three are required for normal operations.

OBC Crashes Two crashes of the on-board computer occurred in February 1982. Recovery was rapid, largely due to a new attitude recovery program developed by Mike Myslinski of the Operations Control Center. In addition, a patch to the OBC has been made that should prevent a recurrence of the computer halt.

Command Decoder Error An error was seen in the spacecraft's command decoder during the Vilspa shift on May 25. The confusion of two separate commands put the SWP camera into an anomalous mode. The subsequent command to put the camera into standby mode was successful. No further problems have been seen. The previous error of this type occurred 2 years ago.

LWP Camera The directive for camera management has recently been modified. Cameras need not be standard prepped before being turned off. The overhead for use of the LWP camera has thus been reduced from about 80 minutes to 60 minutes. The overhead time is further reduced by another 20 minutes if the camera has recently been used so that a de-gas period and safety read are not required.

An expanded effort is now being made to evaluate and calibrate the LWP camera. Resident astronomers are working on software to deal with LWP scan anomalies, camera stability, resolution, noise characteristics, sensitivity, and wavelength calibrations. The camera is described in a user's guide by Settle, Shuttleworth, and Sandford in NASA IUE Newsletter No. 15. Further information may be obtained from the Resident Astronomers. The LWP camera may be used by Guest Observers with Project approval.

Betas! IUE has introduced a few new words into the astronomer's vocabulary - such as reseau, antisun, and beta. In particular the phrase "your target is not at a very good beta" has been known to cause stomach disorders in Guest Observers.

The beta is the angle between the antisolar point and a target. It may be computed for a given target and date from the equation

$$\beta = \cos^{-1}\left(-\sin\delta \sin\delta_{\odot} - \cos\delta \cos\delta_{\odot} \cos(\alpha - \alpha_{\odot})\right).$$

Here α (=15 times r.a. in hours) and δ are the right ascension and declination of the target in degrees and $\alpha_{\odot}$ and $\delta_{\odot}$ are the right ascension and declination of the Sun on the appropriate date. The beta of a target changes throughout the year due to the apparent motion of the Sun across the sky. An example is given in Figure 1 for HD 128220 (14h 32m 56.0, +19° 26' 00).

The beta may also be estimated roughly from a skymap. The antisun (A) lies at $\beta=0^{\circ}$. The $\beta=90^{\circ}$ line is marked as a series of small A's. The edge of the solar avoidance zone, marked by S's, is at $\beta=135^{\circ}$. With allowance for distortion due to the projection, betas may be roughly interpolated between these values. An example is given for June 14, 1982, in Figure 2.

The beta indicates the orientation of the spacecraft with respect to the Sun and thus pretty much dictates the environment affecting the instrumentation. The Guest Observer should take these limitations into account when planning his observations:

$\beta>135^{\circ}$	Within solar avoidance zone; no observations allowed.
$125<\beta<135$	Power drain on batteries, may limit exposure time allowed.
$55<\beta<95$	"Hot betas"; on-board computer temperature may rise, forcing a move to cooler betas after a few hours. Maximum power to solar arrays.
$\beta<30$	"Cold betas"; telescope focus may not be maintained over several hours. Maneuvering may be complicated by spacecraft constraints.
$\beta<20$	Power drain on batteries; may limit exposure time allowed.
$\beta<15$	Additional maneuvering constraints due to loss of Sun in the Fine Sun Sensor.

For long exposures the target should generally be located at optimum betas, i.e. $95<\beta<125$ or $30<\beta<55$, to insure that power or OBC temperature constraints do not force an interruption of the exposure. For short exposures at various targets, observations may usually be performed at nearly any beta less than 135°. In addition, observing at cold betas for an hour or two can cool off the OBC sufficiently to allow a long exposure at a hot target.

A more complete discussion of spacecraft orientation is given by Schiffer in NASA IUE Newsletter No. 9.

Staff Changes Dr. Yoji Kondo has become Project Scientist for IUE, replacing Al Boggess. Dr. Keith Kalinowski has become IUE Operations Scientist, taking over Don West's former duties. Many thanks to Al and Don for their efforts on behalf of IUE!

C.-C. Wu has left IUE to take a post at the Space Telescope Science Institute. Al Holm now oversees IUE science operations.

Nancy Oliversen has joined the telescope operations staff as Resident Astronomer. Dr. Oliversen comes to us from the University of Wisconsin where she worked on symbiotic stars.

Cathy Imhoff
June 17, 1982

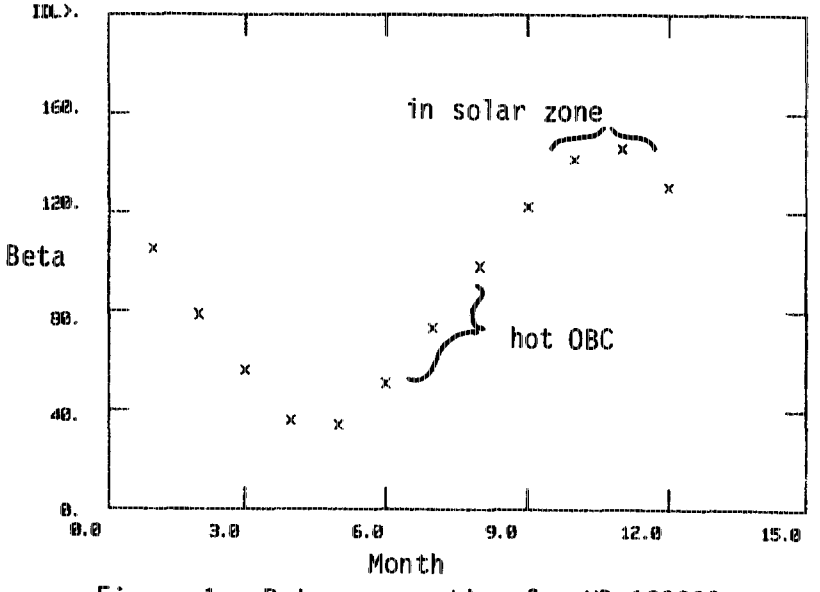

Figure 1. Beta versus time for HD 128220

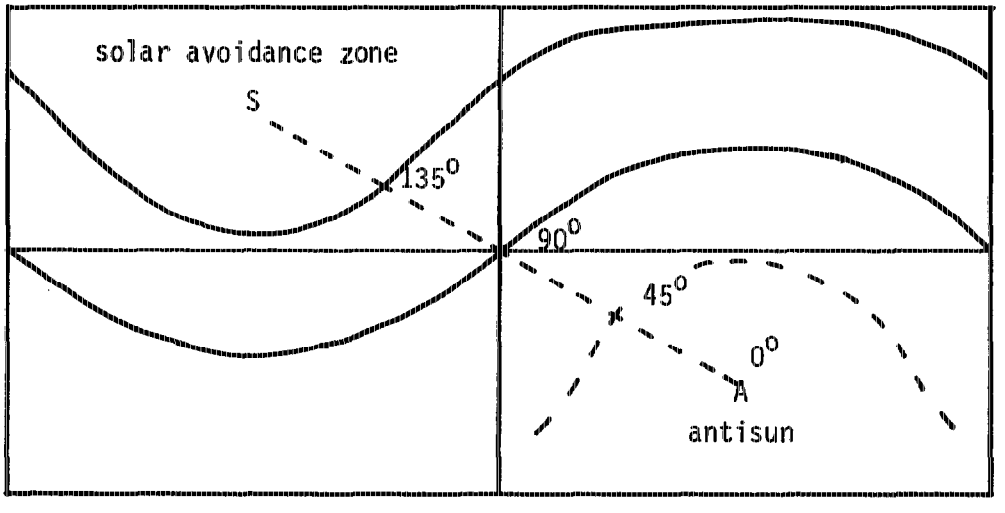

Figure 2. Betas as indicated by sky map markings.