

~~TOP SECRET~~

HANDLE VIA
BYEMAN
CONTROL SYSTEM

~~(S)~~ NATIONAL RECONNAISSANCE OFFICE
WASHINGTON, D.C.

THE NRO STAFF

5 March 1968

MEMORANDUM FOR THE RECORD

SUBJECT: Briefings on MOL Error Budget and Target Location
Uncertainties, 27 February 1968

On 27 February 68 briefings were presented to Gen Stewart by the MOL SPO on the MOL Error Budget and by ACIC on Target Location Uncertainties. Attendees for the two briefings are shown in attached listing.

The SPO briefing reviewed the three major components of the pointing error: ephemeris uncertainty, tracking mirror pointing uncertainty and target location uncertainty. Current ephemeris prediction accuracies are about 8800 ft (2 sigma, in-track) for periods of high solar activity. The MOL specs request the SCF to provide ephemeris prediction accuracies of 1800 ft in-track, 2 1/2 revs after orbit determination span. The SPO reviewed the plans for achieving this accuracy which include SGLS, AOES and collection of data from LOGAX which can be used with the MOL low-g accelerometer. Current MPSS analysis by GE indicate that the tracking mirror pointing errors will be less than the spec value of 6 arc-minutes. The third error component, target location uncertainty was discussed in considerable detail and the results of parametric analyses were presented. Preliminary analysis of the parametric studies indicate that the probability of target acquisition within the total field-of-view (FOV) is not very sensitive to target location error; however, the probability of acquisition within the center half of the format is considerably less than probability of acquiring the target in the total FOV. Since the best resolution is obtained in the center of the format it is necessary to have the target near the center if high quality photography is required. In the manned systems, the crewman can increase the probability of getting high quality photography by centering the target provided the target position is accurate enough to insure that target is acquired within the total FOV and that the desired center point is specified.

BYE-68369/69

1A

S



HANDLE VIA
BYEMAN
CONTROL SYSTEM

~~TOP SECRET~~
EXCLUDED FROM AUTOMATIC REGRADING
DOD DIRECTIVE 5200.10 DOES NOT APPLY

CONTROL NO. ~~INTERNAL~~
COPY 2A OF 01 COPIES
PAGE _____ OF _____ PAGES

TAB B

Bye 68369-69

~~TOP SECRET~~

HANDLE VIA
BYEMAN
CONTROL SYSTEM

The SPO presented the following summary and recommendations:

a. Ephemeris prediction capabilities are pushing the state-of-the-art. LOGAX is critical in obtaining data for the MOL LGA. Work should continue in both LOGAX and development of the LGA.

b. MPSS error is below spec value. System analysis by GE will continue to be reviewed each month.

c. Target descriptions are inconsistent between various sources in terms of location, location uncertainty and physical description of item of interest.

The ACIC briefing reviewed past support given to the MOL program, methods used to determine positions, current accuracy capabilities and a recommended system which would provide an integrated method for designating targets, determining accurate coordinates and preparing visual cues for the crewmen. The briefing pointed out that maps/charts cannot be used for accurate positioning due to inherent errors in producing maps and in measuring from maps. The most accurate positions can only be provided by a base map plant such as ACIC or AMS which has the best available source material and equipment. The accuracies required by the MOL can only be achieved by determining coordinates on a point-by-point basis and cannot be done on an area basis. ACIC recommended that a Master Photo Chip (MPC) be developed for each installation of interest. This MPC would be prepared from KH-4 photography on which a fine reseau would be superimposed. The relationship of this grid to the World Geodetic System would also be determined. If all users have a copy of the MPC, the collection requirement can be stated in terms of the reseau coordinates. These reseau coordinates can be sent to ACIC for preparation of cues and the SPO can convert them to WGS coordinates for accurate pointing. Support of this effort at ACIC will require an increase of personnel (total of 71 spaces) and development and procurement of certain equipment and software. ACIC presented a schedule which would require that personnel recruitment be initiated in the 4th quarters of FY 68.

ACIC recommended that the MPC be approved as a concept for defining targets for the MOL, determining coordinates and obtaining cues. The MOL Program should also develop and procure certain equipment and software. ACIC will provide technical assistance in this development.

HANDLE VIA
BYEMAN
CONTROL SYSTEM

~~TOP SECRET~~
EXCLUDED FROM AUTOMATIC DECLASSIFICATION
DOD DIRECTIVE 5200.10 DOES NOT APPLY

CONTROL NO. ~~INTERNAL~~
COPY 1 OF 1 COPIES
PAGE 1 OF 1 PAGES

Bye 68369-69

~~TOP SECRET~~

HANDLE VIA
BYEMAN
CONTROL SYSTEM

General Stewart stated that he had received a letter from General Bleymaier on this subject. It was estimated that \$1.5 million would be needed over the next three years for equipment and software. General Stewart agreed that the MOL Program would fund this effort. He also agreed to discuss with General Thomas, ACSI, any MOL Program support that he might need in obtaining a manpower increase for ACIC.

Colonel Howard recommended that both of these briefings be presented to COMIREX. It was agreed that he would sponsor on 29 February a SPO briefing on the MOL error budget and Col Kane would sponsor on 7 March an ACIC briefing on the MPC concept.

It is recommended that the MOL Program Office:

- a. Review General Bleymaier's letter and recommendations on the concept and support proposed by ACIC.
- b. Review plans to fund development and procurement of equipment and software.
- c. Follow-up on any additional support required after the discussion between General Stewart and General Thomas.

Daniel L. Lycan
DANIEL L. LYCAN
Lt Colonel, USA

1 Atch
Attendees

cc: Col Battle
Col Howard/Sweeney

HANDLE VIA
BYEMAN
CONTROL SYSTEM

~~TOP SECRET~~
EXCLUDED FROM AUTOMATIC REGRADING
000 DIRECTIVE 5200.10 DOES NOT APPLY

CONTROL NO. ~~INTERNAL~~
COPY *Just copy* COPIES
PAGE OF PAGES

Bye 68369-69

~~TOP SECRET~~

HANDLE VIA
BYEMAN
CONTROL SYSTEM

ATTENDEES AT BRIEFINGS ON 27 FEB 68

SAFSL

Maj Gen Stewart
Dr. Yarymovych
Col Battle
Col Ford
Lt Col Sullivan
Lt Col Loret
Lt Col Lycan
Maj Campbell (SPO briefing only)
Maj DeLong (SPO briefing only)

SAFSS

Colonel Howard
Mr. Schadegg
Maj Williamson
Maj Finkle (SPO briefing only)

SAFSL-7B

Col Buchanan (SPO briefing only)
Lt Col O'Toole
Maj Prochko
Capt Gooch

AFNIN

Col Kellan (ACIC briefing only)
Col Kane (ACIC briefing only)
Lt Col Hodgson
Maj Allman (ACIC briefing only)
Mr. Eldridge (ACIC briefing only)
Mr. Holben (ACIC briefing only)

ACIC

Col Maxwell
Mr. Finnie
Dr. Mahoney

HANDLE VIA
BYEMAN
CONTROL SYSTEM

~~TOP SECRET~~
EXCLUDED FROM AUTOMATIC REGRADING
DOD DIRECTIVE 5200.10 DOES NOT APPLY

CONTROL NO. ~~TOP SECRET~~
COPY *Ver A* OF *Cy 1* COPIES
PAGE _____ OF _____ PAGES

Bye 68369-69