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SYSTEM  
PERFORMANCE EVALUATION REPORT  
(Flight Mission Characteristics)

MISSION 4003

8 November 1963

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PERFORMANCE EVALUATION TEAM  
REPORT NO. 4003/63

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FOREWORD

THIS REPORT PREPARED FOR AND BY DIRECTION OF  
THE DIRECTOR OF SPECIAL PROJECTS  
OFFICE OF  
THE SECRETARY OF THE AIR FORCE

Preparing Unit:

Performance Evaluation Team  
AF Unit Post Office  
Los Angeles 45, California

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PUBLICATION REVIEW

This report has been reviewed and is approved.

*Victor H. Genez*  
VICTOR H GENEZ  
LtColonel, USAF  
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REPORT NO. 4003/63

#### ABSTRACT

The GAMBIT Flight Vehicle No. 953 was launched on 25 October 1963, and was recovered on 27 October 1963, after two days of payload operations. The results of this mission were evaluated by the Director of Special Projects Performance Evaluation Team, assisted by personnel of the National Photographic Interpretation Center, the Aeronautical Chart and Information Center, and the 6594th Test Squadron (AFSPPL) (AFSC). The evaluation was carried out during 29 October through 8 November 1963.

The photographic product of this mission is excellent, although somewhat sparse due to considerable cloud cover. Imagery is equal to or better than any so far obtained in previous missions, with an average Reciprocal Edge Spread (RES) function of 97 for the mission. Small objects are readily resolved, including individual rails, grave markers, and individual football players.

Most of the technical deficiencies found in the two previous missions were not evident during this mission. A static discharge along the edge of the film was observed for the first time on a GAMBIT mission.

Geopositioning was good, with a small northerly bias along track; this may be due to an ephemeris error.

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PERFORMANCE EVALUATION TEAM  
REPORT NO. 4003/63

TABLE OF CONTENTS

	Page
TITLE PAGE	
FOREWORD . . . . .	ii
PUBLICATION REVIEW . . . . .	iii
ABSTRACT . . . . .	iv
TABLE OF CONTENTS . . . . .	v
LIST OF PHOTOGRAPHS . . . . .	vi
LIST OF ILLUSTRATIONS . . . . .	vii
SAFSP PERFORMANCE EVALUATION TEAM . . . . .	viii
SECTION I - DESCRIPTION OF MISSION 4003 . . . . .	1
SECTION II - OBJECTIVES OF THE PERFORMANCE EVALUATION TEAM . . . . .	5
SECTION III - COMMAND . . . . .	7
A. Performance of the Command System . . . . .	7
B. Geopositioning . . . . .	9
SECTION IV - SPPL TECHNICAL EVALUATION REPORT 101-1-17 (Photographic Physical Characteristics Evaluation)	
Summary . . . . .	15
(Report 101-1-17 bound separately)	
SECTION V - OBSERVATIONS AND SUMMARY . . . . .	18
APPENDIX A - TECHNICAL DATA . . . . .	A-1
APPENDIX B - PHOTOGRAPHS . . . . .	B-1
APPENDIX C - ILLUSTRATIONS . . . . .	C-1

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PERFORMANCE EVALUATION TEAM

REPORT NO. 4003/63

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## LIST OF PHOTOGRAPHS

Number		Page
1	Photo Enlargements (10X and 40X) Rev D16, Frame 006	B-2, B-3
2	Photo Enlargement (20X) Rev D16, Frame 008	B-5
3	Photo Enlargements (10X and 40X) Rev D16, Frame 006	B-7, B-8
4	Photo Enlargement (40X) Rev D16, Frame 008	B-10
5	Photo Enlargements (10X and 20X) Rev D16, Frame 006	B-12, B-13
6	Photo Enlargement (40X) Rev D16, Frame 005	B-15
7	Photo Enlargement (40X) Rev D16, Frame 006	B-17
8	Photo Enlargement (20X) Rev D15, Frame 014	B-19
9	Photo Enlargement (10X) Rev D15, Frame 014	B-21
10	Photo Enlargements (10X and 40X) Rev D15, Frame 012	B-23, B-24
11	Photo Enlargements (10X and 40X) Rev D15, Frame 009	B-26, B-27
12	Photo Enlargement (10X) Rev D15, Frame 013	B-29
13	Contact Print Rev D16, Frame 006	B-31

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vi

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BYE 15470

Controls Only

PERFORMANCE EVALUATION TEAM

REPORT NO. 4003/63

LIST OF ILLUSTRATIONS

Number		Page
1	Geoplot . . . . .	C-2
2	Stereo Deviations due to Attitude . . . . .	C-4
3	Film Speed vs Time - Rev D16, Frame 10 . . . . .	C-5
4	Film Speed vs Time - Rev D15, Frame 12 . . . . .	C-6
5	Stereo Mirror Differential Temperature . . . . .	C-7
6	RES Distribution in Format . . . . .	C-8
7	RES Distribution Frequency of Occurrence . . . . .	C-9
8	Log $E_{min}$ vs Sun Angle . . . . .	C-10
9	Intermediate Processing Curve . . . . .	C-11
10	Full Processing Curve . . . . .	C-12

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PERFORMANCE EVALUATION TEAM  
REPORT NO. #003/63

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REPORT NO. 4003/63

## SECTION I

## DESCRIPTION OF MISSION 4003

Mission 4003 was launched into eccentric orbit from Point Arguello Launch Complex II, Pad 3, at 1859:27Z on 25 October 1963.

The satellite vehicle consisted of the Gambit Camera and the Orbital Control Vehicle System. This satellite was boosted into orbit by an Agena D/Atlas combination with the following sequence of launch events:

	<u>Nominal(Seconds)</u>	<u>Actual(Seconds)</u>
Booster Engine Cut-off	138.95	135.52
Sustainer Engine Cut-off	276.44	273.48
Vernier Engine Cut-off	293.48	290.60
Atlas/Agena Separation	296.0	296.10
A Agena Ignition	375.45	369.35
Agena Engine Cut-off	616.87	610.50

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PERFORMANCE EVALUATION TEAM

REPORT NO. 4003/63

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The orbit achieved by the satellite vehicle had the following initial parameters:

	<u>Nominal</u>	<u>Actual</u>
Inclination	98.96 Degrees	99.19 Degrees
Period	89.29 Minutes	89.98 Minutes
Apogee	183.69 NM	183.6 NM
Perigee	98.72 NM	78.2 NM
Eccentricity	.012	.0147

The primary flight objectives were to conduct a limited reconnaissance mission in the hitch-up mode to obtain maximum information from high resolution photography during the first two days of operations and following recovery of the photographic payload, to conduct two days OCV sole operations to demonstrate OCV stabilization functions.

Despite the existence of severe constraints imposed by the hitch-up mode of operations, the primary objectives were obtained and high resolution photography was obtained in both monocular and stereo camera operations.

Mission planning philosophy by NRO (WAB001) for camera operations provided for optimum photographic coverage of operational targets, consistent with weather conditions and

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PERFORMANCE EVALUATION TEAM

REPORT NO. 4003/63

certain operating constraints imposed by engineering considerations, with the maximum number of these targets to be photographed in the stereo mode.

During operations, it was determined that vehicle perigee was lower than nominal; however, good ephemerides were generated and command messages were prepared to replace the pad load. Command message 101 (pad load) operated the camera on Rev 4 and obtained one monocular strip. The pad load was replaced during ascending Rev 5 by command message 105 and successfully operated the camera to obtain five monocular and six stereo frames on Revs 5, 6 and 7. Command message 106 was loaded on Rev 8 and successfully operated the camera to obtain 19 monocular and 22 stereo frames on Revs 8, 9, 10, 11 and 12. Command message 108 was loaded on Rev 14 and obtained two stereo frames on Rev 14. Command message 107 was loaded on Rev 15 and successfully operated the camera to obtain 21 monocular and 12 stereo frames for engineering purposes on Revs 15 and 16. Command message 109, loaded on Rev 21, provided for successful camera operations on Revs 21, 22, 23 and 24 to obtain four monocular and 10 stereo frames. Command message 110 was loaded on Rev 25 and successfully operated the camera on Revs 25, 26, 30, 31 and 32 to obtain 24 monocular and 32 stereo frames.

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REPORT NO. 4003/63

On Mission 4003, camera operations were conducted on a total of 21 revolutions of which eight revolutions were engineering passes. Total photographic coverage on this mission consisted of 74 monocular and 84 stereo frames. Of the 74 mono frames 62 were for engineering purposes whereas 30 of the 84 stereo frames were of engineering targets.

74  
84  
158  
168  
74  
242

Final run-out of film was made on Rev 32 and the recovery sequence was initiated on Rev 34. The recovery vehicle de-orbited as programmed and aerial recovery was made in the recovery area. Following separation and re-entry of the photographic payload, two days of OCV solo operations, including roll maneuvers and two orbit adjust maneuvers, were successfully conducted. At the conclusion of the OCV solo exercise, the OCV was de-orbited and impacted in the predicted impact area.

An innovation to this mission was the inclusion of color film which was exposed on Revs 31 and 32. At the time of publication of this report, the material was not ready for evaluation. An addendum to this report, covering evaluation of the color product, will be issued at a later date.

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REPORT NO. 4003/63

## SECTION II

## OBJECTIVES OF THE PERFORMANCE EVALUATION TEAM

After recovery of Mission 4003, the Performance Evaluation Team convened at the 6594th Test Squadron (AFSPPL), as in previous Gambit missions, for the purpose of evaluating system operations. The Deputy Director of Special Projects for Test Operations [ ] managed the team effort and was responsible for overall evaluation. Team members from SAFSP monitored operations of the mission, obtained copies of the ephemeris, command summary and other pertinent data, and delivered this material for use by the team. The Aeronautical Chart and Information Center (ACIC) assisted in the evaluation of the mission by performing the photographic map match. The National Photographic Interpretation Center (NPIC) provided support in the photogrammetric evaluation, and the 6594th Test Squadron (AFSPPL) assisted with the photographic and photogrammetric studies.

The team compiled data from an analysis of the photographs and selected sample photographs for submission to associate contractors and for inclusion in a final performance report which will be submitted to selected members of the community. The analysis of this mission encompasses the areas of command,

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PERFORMANCE EVALUATION TEAM

REPORT NO. 4003/63

geoposition and photography to determine how well the results obtained compare with the planned mission. Whenever available, telemetry was used to confirm system operation. Typical analysis consists of correlation of data of the command summary which depicts camera operations at specified times, the "best-fit" ephemeris locates actual satellite position at a given system time and observation of the record indicates actual geoposition. Additionally, the record was evaluated to estimate yaw and obliquity from the double yaw slits, time of camera operations from time tracks on film, actual and commanded film velocities and burst times, and finally, resolution and film densities.

Preliminary evaluation and comments were submitted to associate contractors in accordance with strict "need-to-know" limits established by their assigned function.

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REPORT NO. 4003/63

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## SECTION III

## COMMAND

## A. Performance of the Command System

1. The Command and Control Computer Program is capable of generating camera payload commands with two modes of input:

a. Test Controller (TC) mode in which the target data is calculated and formatted by hand and input directly to the Command and Control Program.

b. Automatic (AUTO) mode in which the Mission Profile Generation Program selects targets and supplies the calculated vehicle and camera parameters to the Command and Control Program.

2. For this mission all camera payload commands were generated with the TC mode. Target selection was performed by NRO and the data was sent to the STC by TWX. The input to the computer consisted of the standard target cards plus the addition of rev number, type, and duration of photography for each target. The output of the Command and Control Program is a paper tape containing commands

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REPORT NO. 4003/63

which, when transmitted to the vehicle, are capable of operating the camera payload and vehicle equipment according to a pre-calculated time sequence controlled by the vehicle clock. The command system functioned in a completely normal manner throughout the mission. Command loadings were accepted and transmitted by all tracking stations without any technical difficulties.

3. The camera on and off times were read from the time track at the edge of the film and compared with the commanded "on" and "off" times. All of the times appear to be consistent; however, there is a slight lag between the actual times and the commanded times. The camera starts an average of .3 seconds after the commanded "on" times and stops an average of .2 seconds after the commanded "off" times.

4. The computers and computer programs functioned quite well. However, the map-matching operation turned up an error in a GTELIM command list. The actual command contained a two degree crab angle and the original GCOMMAND list had two degrees for the command. The GTELIM list dropped some digits and the command generated a zero degree crab angle. This caused no operational problem.

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REPORT NO. 4003/63

5. The Rev 4 operation was performed using the pad load which was based on a nominal ephemeris, and thus was off in position by approximately five degrees of latitude and used the wrong film velocity. The Rev 4 loading, which was based on Revs 1 and 2 tracking data, could not be loaded because of an error in the orbital and vehicle information data package. The error was not discovered in time to regenerate for a Rev 4 load. The regenerated load was sent to the vehicle on Rev 5.

#### B. Geopositioning

1. The geopositioning phase of the PET evaluation consists of determining the location of the photography for every frame with useable detail. The photography is positioned by matching with available charts and then comparing this match with the predicted position.

2. A more accurate method of geopositioning was used to determine miss-distances during Mission 4003 than in Missions 4001 and 4002. On those bursts with useable detail, ACIC personnel selected and plotted from one to four photo bench marks (PBM). PBM's used included identifiable cultural features such as highway and railroad intersections, bridges, etc. Where no culture was available,

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PERFORMANCE EVALUATION TEAM  
REPORT NO. 4003/63

river bends and intersections and other relatively unique topographical features were used. Questionable and uncertain PBM's are marked with an asterisk in the Technical Data Sheets.

3. The in-track (X) miss-distance was computed by using the best-fit ephemeris and the command list correlated with the observed time the PBM was photographed. The cross-track (Y) miss-distance was computed by measuring distance of the PBM from the edge of the film. Illustration 1 shows a typical plot of miss-distance for two PBM's on a stereo pair.

4. The miss-distances for each measured PBM are shown in the Technical Data Sheets. Although the directions N and S are used for in-track (X) miss-distance, and E and W are used for cross-track (Y) miss-distance, the measurements are made parallel and perpendicular, respectively, to the vehicle nadir line. For example, a measurement of 1.0S means the actual PBM location is 1.0 n.m. downtrack from the calculated position; and 1.0E means the actual location is 1.0 n.m. to the left (looking in the direction of flight) of the calculated position. For stereo pairs, a PBM common to both frames was selected, if possible. These common

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PERFORMANCE EVALUATION TEAM  
REPORT NO. 4003/63

PBM's are noted by a common letter. Thus, for the stereo pair frames 13 and 14, PBM 13-A, PBM 14-A are the same physical point on the ground, although two different calculated positions resulted.

5. ATC Series 200 charts (scale 1:200,000) were used when available for the measurements and plotting. AMS charts (scale 1:250,000) were used for some of the plots on Revs 15 and 16 over the United States. Where no larger scale chart was available, ONC and WAC Series charts (scale 1:1,000,000) were used. Detail on these charts is sparse and plotting uncertainties are greater than on the ATC and AMS charts; measurements made from these charts are marked with a double asterisk on the Technical Data Sheets. The mean uncertainties of the PBM position with respect to the local datum and the local datum to the WGS datum were calculated by ACIC personnel and are recorded on the data sheets as Map Accuracy.

6. One-hundred and fifty PBM's were plotted. The average in-track (X) miss-distance was 1.47 n.m. The average cross-track (Y) miss-distance was .70 n.m. These miss-distances are caused by one or more of these four factors:

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REPORT NO. 4003/63

- a. Inaccuracy in best-fit ephemeris
- b. Map error
- c. Vehicle attitude error
- d. Stereo mirror position error

It is difficult to determine which of the causes apply for isolated cases, but an examination of the data shows definite patterns.

7. Almost all of the in-track calculated positions are up-track from the true PBM position. This indicates an ephemeris error of about 1 n.m., a map error, a vehicle pitch bias, or mis-alignment of the stereo mirror. A cursory examination of vehicle telemetry data and mirror position calibration data showed no errors which would cause miss-distance of this magnitude, so the error is presumably due to ephemeris bias. The in-track miss-distance is generally about the same for the poorer charts as well as the better ones with probable errors of  $\pm 500$  feet; therefore, ephemeris bias appears to be the answer. However, there is a consistent difference between in-track miss-distances measured for each frame of a stereo pair on a single PBM. In all but one of 23 stereo pairs the calculated position associated with the aft-looking frame was farther up-track

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REPORT NO. 4003/63

than the calculated position for the forward-looking frame (see Illustration 1). This average difference between the two miss-distances was 1.22 n.m., with a very low standard deviation. This cannot be attributed to ephemeris bias and is probably due to vehicle attitude (pitch) or mirror position. The average in-track miss-distances for 43 measurements on vertical strips was 1.17 n.m. For 63 forward-looking strips and forward-looking frames of stereo pairs, the average was 1.17 n.m.; for 43 aft-looking strips and aft-looking frames of stereo pairs, the average was 2.23 n.m. with a very low standard deviation. Indications of causes for these greater miss-distances on aft-looking frames were not present in the telemetry available at the time of this report.

8. Cross-track miss-distances showed a more random distribution about the true PBM than did the in-track miss-distances. Ninety-five calculated positions were to the right of the true PBM position; 37 to the left and 18 coincided with the true position. The errors are generally so low that they approach the combined uncertainty of the measurement techniques, map accuracy, and PBM locations. There is probably also a slight cross-track ephemeris bias.

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REPORT NO. 4003/63

9. Cross-track error was excessive on Frames 06/002 and 23/003. Only 1:1,000,000 charts were available and no cultural detail was observed that could be located on the chart. No indications in vehicle telemetry could be found of a vehicle roll rate which could cause such an error. The conclusion was reached that the topographical features used for these particular PBM's were very inaccurate.

10. There was a trend noticed on cross-track miss-distance differences between measurements on a single PBM from each frame of a stereo pair. Of 40 measurements made, 31 show a relative change to the right, only 6 to the left, and only 3 were unchanged. This could possibly be due to a small, unobservable change in vehicle roll between frames. The approximations used in computing earth rotation in the time between frames of a stereo pair do not introduce enough error to account for this difference in the majority of cases.

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REPORT NO. 4003/63

#### SECTION IV

#### PHOTOGRAPHIC CHARACTERISTIC EVALUATION SUMMARY

(SPPL Report No. 101-1-17)

Analysis of the original negative (black and white) obtained during the nineteen normally operated passes of Reconnaissance Satellite Mission 4003 leads to the following observations and remarks.

##### A. Physical Degradations

Imaged degradations were similar to those noted on Mission 4002 and did not degrade image quality significantly. Film, in general, was clean with only infrequent kinks, scratches, and abrasions encountered.

##### B. Film Processing

The bulk of the film received full processing with intermediate processing on D06, D07, and D08 as indicated by a reduction in both fog level and image densities on these three passes.

##### C. Sensitometry

The characteristics of mission film samples agreed with SPPL control stock when corrected for measurement of Printing Diffuse Density (blue light densitometry).

##### D. Image Analysis

1. All measured densities were excessively high for

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REPORT NO. 4003/63

the majority of the Mission, exceeding the levels considered optimum for highest resolution on Type 4404 film. Densities on Passes D06, D07, and D08, which received intermediate processing approach optimum levels. Diffuse Printing Densities for the Mission are summarized in the following table:

	<u>Range</u>	<u>Av.</u>
Image Minimum Density (Dmin)	0.27 - 1.65	0.73
Image Maximum Density (Dmax)	0.58 - 2.64	1.73
Image Average Density ( $\bar{D}$ )	0.46 - 1.80	1.23
Image Density Difference ( $\Delta D$ )	0.00 - 2.01	1.09
Fog Density (Base plus Fog)	0.12 - 0.32	0.21
Cloud Maximum Density (Dmax Clouds)	1.57 - 2.75	2.38

Maximum densities are higher for this Mission, partially due to the change in measuring printing densities. However, fog and minimum densities are unaffected by the measuring technique and are abnormally high due to fogging exposure in the camera or to overdevelopment during processing.

#### E. Density versus Latitude and Sun Angle

1. The plots of Density versus Latitude shows a decrease in both Dmin and Dmax, with increasing latitude between 30°N and 60°N.

2. The plots of Density versus Sun Angle show an

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REPORT NO. 4003/63

increase in Dmin and Dmax, with an increase in Sun Angle from +15° to +50°.

F. Reciprocal Edge Spread (RES)

1. The Frequency Distribution chart of RES values shows a normal distribution ranging from 31 to 157 with an average of 97. At a scale of 1:100,000, this corresponds to edge spread on the ground ranging from 10 feet to 1.9 feet with an average of three feet.

2. Mission averages of RES show values approximately 3% higher in the center of the format than at the edges. RES values during the stereo mode are about 10% higher than those during the mono mode. Values with and across the line of flight are nearly equal, indicating very little image motion.

3. Plots of RES versus Latitude and Sun Angle fail to reveal any significant functional relationship.

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REPORT NO. 4003/63

## SECTION V

## OBSERVATIONS AND SUMMARY

## A. Introduction

This section is primarily concerned with on-orbit aspects of the mission and does not cover specifically an evaluation of the physical characteristics of the film as affected by ground processing and other ground handling. Such a complete evaluation will be found in Section IV of this report, bound separately.

## B. Intelligence Value

A qualitative evaluation by NPIC of photographic interpretation suitability of flight vehicle #953 reveals that the product of this mission is excellent photography and is slightly better than the photo product of flight vehicle #952. While the volume of information obtained is limited, the quality is high, providing positive identification. Mission photography provided significant detail, including:

1. The ribbing structure of radomes and their positive identification.
2. Identification by type of railroad cars and motor vehicles.

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REPORT NO. 4003/63

3. Linear objects such as painted highway line stripes, parking lot dividers, and individual railroad rails.
4. Football teams on a playing field.
5. Cattle pens at a stockyard.

C. On-Orbit Operation

1. From the engineering standpoint, results of this mission are the best by far of any yet achieved. Image quality, uniformly fine through the mission, resulted in an average RES (Reciprocal Edge Spread) of 97 for all of the frames capable of measurement. Many of the technical problems previously encountered have been eliminated or reduced to acceptable levels. These are:

a. Field Tilt. No evidence of this with vehicle #953.

b. Starting Transient and Film Velocity. The banding at start-up was damped out in 1.5 seconds within plus or minus 0.3 - 0.5% of the programmed IMC speed. The starting transient decayed within the specification limit but should be further reduced to clean up the imagery at the start of the frame. The average RES at position #1 (1.5 inches from start of frame) was 85 compared to 96 to

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REPORT NO. 4003/63

103 for the rest of the format. The value of 85 would have been considerably lower if measurements had been made in areas of heavy banding. The lowest RES values for the mission (RES 31 to 37) were obtained in the position #1 area. The film velocity, although approaching the specification requirement, is still too variable to permit achievement of maximum system capability.

c. Slit Defects and Density Streaks. The major slit defects have been eliminated and the number of density streaks reduced to a maximum of approximately 20 across the format width.

d. Image Light in Time Track. The image-forming light in the time track has been eliminated while the film is in motion. A bright spot still burns through in the region of the adjacent slit while the film is stationary.

2. Certain deficiencies previously encountered were repeated on this mission. These include:

a. "Curlycues". Numerous small curved scratches, previously identified with a "wobble" roller, are still evident to at least the same degree as in the two previous missions.

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REPORT NO. 4003/63

b. Adjacent Slit Flare. The flare from the adjacent slit is still evident approximately  $5/16''$  to  $3/8''$  into the frame. The flare pattern width is wider than on the two previous missions. This increased size was expected due to the change in the operational slit width. The flare pattern is approximately .050 to .060 inches wide.

c. Vignetting of the double yaw slit occurs on the time track side. The title side has a satisfactory image.

3. Patterns caused by static discharge were encountered for the first time. The marks were produced along the edge of the film and were scattered through the film length. The static discharge was produced during the despooling of the film prior to processing. The patterns were widely scattered and had no effect on mission performance as intrusions into the format area were minor and occurred only in isolated cases. The cause of the static buildup has not been determined and further investigation is required.

4. The time tracks were not as clear as those of vehicles #951 and #952. Although readability was adequate in the original negative and 2d generation positive, it is

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REPORT NO. 4003/63

believed that the readability would be marginal in any copies made from a duplicate negative. The trimming of the time track lamps for the next flight should be at the level set for the first two flights.

5. Although it was evident throughout the mission that vehicle motion, particularly roll and yaw, was undesirably high, no attempt was made to correlate objectively the OCV telemetry with double yaw slit images. In many cases, three feet of smear was measured in the "Y" direction (across the format). The "X" smear was generally less, sometimes zero. On this mission, the satellite was again under Agena attitude control during hitch-up; no Agena telemetry was available to the PET group.

6. During the flight of vehicle #953, an operational constraint of 300 seconds maximum door open operation was exercised, in an attempt to avoid high excursions of the stereo mirror differential temperature and consequent image degradation. An examination of the temperature differentials from OCV playback telemetry for Revs 9, 12 and 15 was made as these revs included payload operations which exceeded 300 seconds in length by considerable amounts. In all cases, the mirror temperature differentials increased significantly.

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REPORT NO. 4003/63

short period, then leveled off at values from plus 0.25 to 0.5 degrees. On Rev 12, the environmental door was open for over 1300 seconds, but the track was over a "cold" surface for the entire operation; this may account for the small temperature differential increase. However, there is no explanation at present for the small increases shown on Revs 9 and 16, whose tracks carried the vehicle over normal terrain. On the most recent mission (#952), stereo mirror temperature differential excursions of a degree or more were not uncommon. This problem is being investigated by the payload contractor at this time.

#### D. Post Recovery Operations

The Performance Evaluation Team was represented by a member present during removal of the film from the capsule. The general appearance of the capsule was good. No digs or dents in the capsule or the hatch were observed. The beacon light was not flashing, indicating either a loss of power or that the battery was disconnected. The cutter/sealer was closed and properly sealed. The sticky lubricant on the cutter/sealer base plate had trapped a few curlings of aluminum. The parachute harness was discolored in some areas and the hatch was slightly blistered.

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REPORT NO. 4003/63

The film was well wound, dry and appeared to be in good condition. During despooling prior to pre-processing operations, a heavy static discharge forced a slow unwinding of the film.

No major problems were encountered during the defilming operation. It was necessary to cut one wire off the reel assembly and two wires leading to the power pack. The "wobble" roller had numerous scratches and a few sleeks on its surface but had no imbedded particles and displayed a free operation. A few aluminum drillings and numerous black paint particles were lying in the bottom of the capsule.

#### E. Original Negative Processing

Preflight calculations indicated that the 0.0166" (1/200th second) slit was more operationally suitable than the .0083" (1/400th second) slit. Further such calculations showed that Intermediate processing should be used on all photography south of 58°N latitude. With the exception of Revs 6, 7 and 8 and the first frame of Rev 23, "Full" processing was used on the mission material. Densities measured in frames receiving "Full" processing were lying on the upper region of the "Full" processing curve. Densities measured in frames receiving "Intermediate" processing lie on the lower region of the "Intermediate"

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REPORT NO. 4003/63

Highlight regions of frames with "Full" processing above  $30^{\circ}$  of sun altitude show loss of low contrast detail. Since Revs 6, 7 and 8 covered a range of sun angles ( $22^{\circ}$  thru  $76^{\circ}$ ) representative of the mission material receiving "Full" processing and displayed no loss of highlight detail, the tentative conclusion is that the majority of the mission was overprocessed. This conclusion requires intensive study to be proven conclusively and this study is continuing. Another conclusion is that the same slitwidth (adjusted for removal of the filter effect) should be used on vehicle #954.

#### F. Engineering Operations

1. Rev D11. Frames 001 to 008 covered a sun line experiment. Eight-second nadir strips were obtained, beginning at  $-1^{\circ}$  sun altitude and continuing southward each  $2^{\circ}$  to  $3^{\circ}$  increase in sun altitude. This was an attempt to check quality of imagery at varying degrees of underexposure. The experiment was unsuccessful due to 100% cloud cover.

2. Rev D12. Frames 001 to 011 covered an experiment to verify the relative value of sun illumination as a function of sun altitude. Five-second nadir strips were taken each  $5^{\circ}$  or  $10^{\circ}$  of change in vehicle latitude over water. The concept was the use of the sea surface as a tone target with

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PERFORMANCE EVALUATION TEAM  
REPORT NO. 4003/63

a constant reflectivity. This was largely unsuccessful. Of the eleven frames, six had 100% cloud cover and two occurred over land.

3. Rev D15. Frames 002 to 012 included an IMC experiment. Various amounts of known IMC error from  $\pm 10\%$  to 0 were programmed to measure the effect on image quality. Five of the ten frames had about 100% cloud cover. Edge traces were taken on the good frames using the Mann Micro-Analyzer, and the traces will be reduced at a later date to provide the quantitative effect on resolution. Measurements were obtained from the time track to evaluate film velocity variations. The double yaw slit images were measured to determine image velocity vectors. All this data will be correlated. Frames 001, and 013 to 020 were used to evaluate domestic imagery. Four of these had 100% cloud cover, two had 60%, and two had 40%.

4. Rev D16. Frames 001 to 013 were attempts to obtain domestic target imagery. Four of these frames had 80% to 100% cloud cover. The others had useable imagery.

5. Rev D30. Frames 001 to 003 concerned a focus change experiment. It was necessary to forego the experiment to insure verification of a recovery command message to the vehicle.

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REPORT NO. 4003/63

6. Rev D31. Frames 001 thru 017 exposed the experimental aerial color film. Although heavy cloud cover was present, apparently enough clear imagery was obtained to show resolution of one-half to two-thirds that obtained with the 4404 emulsion.

7. Rev D32. Frames 001 thru 018. Eight-second frames were taken, beginning at  $-2^{\circ}$  sun angle to  $25^{\circ}$  sun angle with the color film to evaluate image quality in the presence of underexposure. The frames from 012 to 018 were stereo and mono images of domestic targets. At this writing, the color film has not been released from the processing center and the degree of success and cloud cover is not known.

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27

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PERFORMANCE EVALUATION TEAM

REPORT NO. 4003/63

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APPENDIX A

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COMMAND INFORMATION

Rev D04

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001*	3329.5	100.0	59 02N	160 44E	54 22N	158 25E	3.3921	3.4156	0	2.0
PBM-A	3349.7									
PBM-B	3355.5									
PBM-C	3360.9									
PBM-D	3373.4									

Note:

\* This command position was from padload and based upon before flight ephemeris.

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A-1

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PHOTO-MAP POSITIONING

Rev D04

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Controls Only

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
PBM-A	53	01.3N	.8S	.7W	86.6	9.55	3.02	5000
PBM-B	52	38.4N	.8S	.4E	86.7	9.55	3.02	6000
* PBM-C	52	16.8N	.7N	1.1W	87.0	9.64	3.04	6000
** PBM-D	51	26.3N	2.5N	.5E	87.5	9.66	3.05	7000

Note:

- \* Questionable PBM
- \*\* Plotted on CNC (Small scale chart)

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PHOTOGRAPHIC EVALUATION

Rev D04

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
001	.63	2.64	- 13.20	24°-30°	338.3	4.35

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A-3

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PHOTOGRAPHIC EVALUATION

Rev D04

R. E. S.

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001	86	90	72	82	90	85	78	85		99	78	85	85	104	99		82	92
Note: The following RES measurements made in Looper Banding Areas.																		
	11	12	13	14	15	16	17	18	19	11	12	13	14	15	16	17	18	19
001	75	54	85			68				63	54	75			68			

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A-4

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COMMAND INFORMATION

Rev D05

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	8809.0	4.1	44 55N	131 54E	44 55N	131 54E	3.3253	3.3310	+15	2.5
PBM-A	8810.3									
PBM-B	8812.7									
002	8820.5	4.1			44 09N	131 36E	3.2924	3.3006	-15	2.5
PBM-A	8821.6									
PBM-B	8824.0									
003	8831.7	8.0	43 23N	131 19E	43 24N	131 20E	3.2924	3.3024	+15	2.5
PBM-A	8833.6									
PBM-B	8837.6									

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A-5

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PHOTO-MAP POSITIONING

Rev D05

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
PBM-A	44	49.8N	.6S	.3E	90.6	10.4	4.99	700
PBM-B	44	40.1N	.3S	.6W	90.6	10.4	4.99	700
002								
PBM-A	44	04.3N	2.3S	.8W	90.6	10.4	2.91	700
PBM-B	43	54.6N	2.4S	.9W	90.6	10.4	2.91	700
003								
PBM-A	43	16.1N	.7S	.9E	91.5	10.5	4.06	1000
PBM-B	42	59.8N	.9S	.9E	91.5	10.5	4.06	1000

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A-6

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PHOTOGRAPHIC EVALUATION

Rev D05

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
001	.51	1.56	3.02	34	12.53	4.64
002	.68	1.71	2.63	34	12.75	5.51
003	.64	1.84	3.24	34	25.28	3.74

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A-7

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PHOTOGRAPHIC EVALUATION

Rev D05

R. E. S.

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001	94	157	118	157	94					94	134	145		104				
002	72	90		157	157					99	118		118	157				
003	94	90	85	85	104	104	120	104		78	94	99	82		104	111	82	

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A-8

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COMMAND INFORMATION

Rev D06

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	14007.3	60.0	54 14N	113 54E	54 12N	113 54E	3.4603	3.4745	+15	2.0
PBM-A	14012.3									
002	14182.4	60.0	42 32N	108 48E	42 30N	108 47E	3.2275	3.2321	+15	2.5
PBM-B	14192.5									
PBM-A	14195.5									
PBM-C	14242.6									
003	14733.3	45.0	05 26N	98 57E	05 25N	98 57E	2.4671	2.4618	+15	3.5
PBM-A	14749.5									
PBM-B	14775.2									

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A-9

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PHOTO-MAP POSITIONING

Rev D06

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft -
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
** PBM-A	53	52.5N	.7S	0	86.1	9.9	3.83	5000
002								
PBM-B	41	49.8N	.1S	5.6E	92.4	10.6	5.13	3500
PBM-A	41	37.7N	.9N	7.0E	92.4	10.6	5.13	3500
** PBM-C	38	27.8N	2.5S	8.3E	93.8	10.8	5.37	6000
003								
PBM-A	4	19.5N	3.2S	.7E	119.0	13.6	9.17	2000
** PBM-B	2	36.3N	2.3S	1.0E	120.8	13.9	9.31	4000

Note: \* Questionable PBM  
 \*\* Plotted on OMC (Small scale chart)

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A-10

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PHOTOGRAPHIC EVALUATION

Rev D06

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
001	1.48	2.12	2.00	24	206.6	4.40
002	.47	1.69	3.39	36	192.4	4.47
003				73	278.55	2.39

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A-11

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PHOTOGRAPHIC EVALUATION

Rev D06

R. E. S.

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001								79									75	
002	104	118	118	115	125	78	83	99	122	99	114	111	94	115	80	90	104	118
003																		
Note: The following RES measurements made in Looper Banding Areas.																		
	11	12	13	14	15	16	17	18	19	11	12	13	14	15	16	17	18	19
001																		
002		61	104	104				94		66	93	93			78			
003																		

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A-12

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COMMAND INFORMATION

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Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	19307.2	4.1	56 44N	93 07E	56 40N	93 05E	3.5299	3.5332	+15	2.0
PBM-A	19310.8									
002	19318.7	4.1			55 54N	92 38E	3.5299	3.5217	-15	2.0
PBM-A	19321.5									
003	19335.2	40.0	54 53N	92 03E	54 49N	92 01E	3.4603	3.4571	+15	2.0
PBM-A	19342.4									
PBM-B	19364.0									
004	19443.3	4.1	47 41N	88 34E	47 37N	88 33E	3.3585	3.3554	+15	2.5
005	19454.8	4.1			46 51N	88 14E	3.3585	3.3581	-15	2.5

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A-13

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PHOTO-MAP POSITIONING

Rev D07

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft - Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
PBM-A	56	25.5N	0.4S	.7E	85.1*	9.8	3.73	3500
002								
PBM-A	56	05.3N	1.6S	.7E	85.1	9.8	2.21	3500
003								
PBM-A	54	20.1N	0.2N	0	86.3	9.95	3.84	3500
PBM-B	52	54.1N	0	.1E	87.0	10.0	3.89	3500
004								
005								

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A-14

PHOTOGRAPHIC EVALUATION

Rev D07

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	D <sub>min</sub>	D <sub>max</sub>				
001	.70	1.14	1.51	22	13.6	6.35
002	.46	1.21	2.14	22	13.6	5.56
003	.36	1.18	2.51	23	137.2	4.70
004				31	12.5	4.55
005				31	13.0	3.70

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A-15

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PHOTOGRAPHIC EVALUATION

Rev D07

R. E. S.

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001		84			85						94			78				
002	78		104	94								85	84					
003	75							95										90
004																		
005																		
Note: The following RES measurements made in Looper Banding Areas.																		
	11	12	13	14	15	16	17	18	19	11	12	13	14	15	16	17	18	19
003	63									58								

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A-16

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COMMAND INFORMATION

Rev D08

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	24708.6	5.5	52 23N	68 31E	52 22N	68 31E	3.4260	3.4293	+15	2.0
PBM-A	24711.2									
PBM-B	24713.6									
002	24719.4	5.5			51 39N	68 10E	3.4260	3.4294	-15	2.0
PBM-A	24722.2									
PBM-B	24724.5									
003	24812.1	5.5	45 28N	65 28E	45 28N	65 28E	3.2924	3.3010	+15	2.5
PBM-A	24813.9									
PBM-B	24814.3									
004	24822.9	5.5			44 44N	65 11E	3.2924	3.2962	-15	2.5
PBM-A	24825.3									
PBM-B	24825.7									
005	24920.4	5.5	38 12N	62 54E	38 11N	62 54E	3.1639	3.1700	+15	3.0
006	24933.3	5.5			37 19N	62 37E	3.1326	3.1412	-15	3.0

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A-17

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PHOTO-MAP POSITIONING

Rev D08

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy ± Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
PBM-A	52	11.6N	1.1S	.1W	87.1	10.0	3.91	750
PBM-B	52	02.4N	1.3S	.2W	87.1	10.0	3.91	750
002								
PBM-A	51	28.1N	2.1S	.2E	87.1	10.0	2.17	750
PBM-B	51	18.7N	2.1S	.1E	87.1	10.0	2.17	750
003								
PBM-A	45	20.3N	1.4S	.2E	90.6	10.4	4.99	5000
PBM-B	45	18.9N	1.4S	.2E	90.6	10.4	4.99	5000
004								
PBM-A	44	34.6N	2.5S	.3E	90.6	10.4	2.91	5000
PBM-B	44	33.0N	2.5S	.2E	90.6	10.4	2.91	5000
005								
006								

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A-18

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PHOTOGRAPHIC EVALUATION

Rev D08

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
001	.29	.63	1.78	26	17.68	5.70
002	.27	.70	2.04	26	18.05	5.33
003	.40	1.84	4.47	33	16.98	5.32
004	.42	1.84	4.37	33	17.38	5.21
005	1.44	1.76	1.35	38	16.30	4.57
006	1.65	1.83	1.20	38	16.50	3.52

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BYE  
15470

PHOTOGRAPHIC EVALUATION

Rev D08

R. E. S.

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001		78	125	99	104						87	94	111	115				
002		145	82	90	104						125	90	96	118				
003		104	104	104	90						118	99	111	96				
004		118	94	109	85						111	98	99	90				
005	104	94								99	78							
006		94	109								85	94						

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT  
A-20

Handle Via BYEMAN  
Controls Only



COMMAND INFORMATION

Rev D09

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	29938.0	5.5	59 27N	50 30E	59 25N	50 28E	3.5652	3.5597	+15	2.0
	PBM-A 29939.2									
	PBM-B 29942.8									
002	29948.8	5.5			58 43N	49 59E	3.5652	3.5765	-15	2.0
	PBM-A 29949.8									
	PBM-B 29953.4									
003	29974.4	5.5	57 03N	48 55E	57 02N	48 54E	3.4949	3.4998	+15	2.0
004	29984.8	5.5			56 20N	48 29E	3.4949	3.4995	-15	2.0
005	30049.7	5.5	52 04N	46 09E	52 02N	46 09E	3.4260	3.4300	+15	2.0
006	30060.5	5.5			51 19N	45 48E	3.4260	3.4293	-15	2.0
007	30091.3	5.5	49 18N	44 52E	49 16N	44 51E	3.3921	3.3971	+15	2.5
	PBM-A 30096.3									
	PBM-B 30096.3									

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT  
A-21

Handle Via BYEMAN  
Controls Only

COMMAND INFORMATION

Rev D09 (Contd)

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
008	30102.1	5.5			48 33N	44 32E	3.3585	3.3572	-15	2.5
PBM-A	30107.5									
PBM-B	30107.5									
009	30192.6	5.5	42 31N	42 10E	42 29N	42 09E	3.2275	3.2304	+15	2.5
PBM-B	30194.7									
PBM-C	30197.3									
010	30205.5	5.5			41 37N	41 51E	3.2275	3.2289	-15	2.5
PBM-B	30206.3									
PBM-C	30208.9									

Handle Via BYEMAN  
Controls Only

~~TOP SECRET - GAMBIT~~

BYE 15K/70

~~TOP SECRET - GAMBIT~~  
A-22

Handle Via BYEMAN  
Controls Only

PHOTO-MAP POSITIONING

Rev D09

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
PBM-A	59	20.1N	.4S	.5W	84.5	9.72	3.67	3000
PBM-B	59	06.3N	.6S	.4W	84.5	9.72	3.67	3000
002								
PBM-A	58	38.5N	1.8S	.6E	84.5	9.72	2.23	3000
PBM-B	58	24.6N	1.9S	.6E	84.5	9.72	2.23	3000
003								
004								
005								
006								
007								
PBM-A	48	56.0N	1.0S	.2E	88.7	10.2	4.81	700
PBM-B	48	55.9N	1.0S	0	88.7	10.2	4.81	700

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15479

~~TOP SECRET~~ - GAMBIT

A-23

Handle Via BYEMAN  
Controls Only

PHOTO-MAP POSITIONING

Rev D09 (Contd)

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy ± Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
008								
PBM-A	48	11.3N	2.2S	.4E	88.7	10.2	2.93	700
PBM-B	48	11.0N	1.9S	.3E	88.7	10.2	2.93	700
009								
PBM-B	42	20.6N	.9S	.3W	92.2	10.6	5.15	1400
PBM-C	42	10.2N	.9S	.3W	92.2	10.6	5.15	1400
010								
PBM-B	41	33.8N	2.0S	1.0E	92.2	10.6	2.91	1400
PBM-C	41	23.2N	1.9S	.9E	92.2	10.6	2.91	1400

Handle Via BYEMAN  
Controls Only

~~TOP SECRET - GAMBIT~~

BYE 19470

~~TOP SECRET - GAMBIT~~  
A-24

Handle Via BYEMAN  
Controls Only

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D09

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
001	.44	1.02	2.00	19	18.5	5.9
002	.45	1.54	3.24	19	18.7	6.3
003				20	17.9	5.5
004				20	18.4	5.35
005	.94	.94	0	26	17.5	5.1
006	.91	.91	0	26	18.1	4.8
007	.70	1.90	3.16	29	17.4	4.6
008	.75	1.90	3.02	29	17.7	4.6
009	.77	1.32	1.70	36	16.5	4.49
010	.79	1.31	1.66	36	16.96	3.7

~~TOP SECRET~~  
A-25  
GAMBIT

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~  
GAMBIT

BYE 15470

PHOTOGRAPHIC EVALUATION

Rev D09

R. E. S.

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001	111	85	118	104	108		111	111	104	94	85	111	118	104		111	111	99
002	104	118	111	104	125		125	134	99	90	118	118	120	118		118	118	115
003																		
004																		
005																		
006																		
007					118									118				
008					111									94				
009	104	83	90		99					94	78	82		85				
010	67	82	94	94	85					72	82	104	104	78				

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15170

~~TOP SECRET~~ - GAMBIT  
A-26

Handle Via BYEMAN  
Controls Only

COMMAND INFORMATION

Rev D10

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	35300.4	5.5	57 43N	27 07E	57 40N	27 05E	3.5299	3.5430	+15	2.0
PBM-A	35301.3									
002	35311.2	5.5			56 57N	26 39E	3.4949	3.5031	-15	2.0
PBM-A	35311.9									
003	35370.9	5.5	53 04N	24 27E	52 59N	24 25E	3.4260	3.4349	+15	2.0
004	35381.7	5.5			52 17N	24 04E	3.4260	3.4390	-15	2.0
005	35432.9	5.5	48 56N	22 29E	48 52N	22 28E	3.3585	3.3639	+15	2.5
006	35443.7	5.5			48 09N	22 09E	3.3585	3.3640	-15	2.5

Handle Via BYEMAN  
Controls Only

~~TOP SECRET - GAMBIT~~

BYE JAN 70

~~TOP SECRET - GAMBIT~~  
A-27

Handle Via BYEMAN  
Controls Only

PHOTO-MAP POSITIONING

Rev D10

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001 PBM-A	57	36.2N	1.3S	.3W	85.1	9.91	3.72	500
002 PBM-A	56	54.1N	2.4S	.6E	85.1	9.91	2.22	500
003								
004								
005								
006								

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 151120

~~TOP SECRET~~ - GAMBIT  
A-28

Handle Via BYEMAN  
Controls Only



PHOTOGRAPHIC EVALUATION

Rev D10

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
001	.57	1.05	1.70	20	18.25	5.72
002	.39	1.11	2.46	20	18.28	5.63
003				24	17.50	5.42
004				24	18.02	5.25
005				30	17.25	4.95
006				30	17.70	3.88

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15170

~~TOP SECRET~~ - GAMBIT  
A-29

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D10

R. E. S.

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001	125	108								118	104							
002	118	99		118						118	90		120					
003																		
004																		
005																		
006																		

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 14920

~~TOP SECRET~~  
A-30

GAMBIT

Handle Via BYEMAN  
Controls Only

COMMAND INFORMATION

Rev D11

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	40262.7	8.0	79 28N	50 59E	79 25N	50 31E	3.7845	3.7843	+15	0.5
002	40317.9	8.0	77 07N	35 52E	77 03N	35 34E	3.7845	3.7911	+15	0.5
003	40362.6	8.0	74 47N	27 21E	74 43N	27 08E	3.7470	3.7484	+15	1.0
004	40405.8	8.0	72 19N	21 17E	72 14N	21 07E	3.7470	3.7479	+15	1.0
005	40448.8	8.0	69 44N	16 40E	69 39N	16 32N	3.7099	3.7158	+15	1.0
006	40493.2	8.0	66 58N	12 55E	66 53N	12 49E	3.6732	3.6822	+15	1.5
007	40538.5	8.0	64 05N	9 51E	63 59N	9 47E	3.6368	3.6405	+15	1.5
008	40585.1	8.0	61 04N	7 16E	60 58N	7 12E	3.5652	3.5727	+15	1.5
PBM-A	40586.2									
PBM-B	40592.5									

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT  
A-31  
Handle Via BYEMAN  
Controls Only

PHOTO-MAP POSITIONING

Rev D11

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
002								
003								
004								
005								
006								
007								
008								
** PBM-A	60	54.1N	.5S	.3E	84.0	9.64	2.86	3000
** PBM-B	60	29.4N	.3S	.6E	84.0	9.64	2.86	3000

Note: \*\* Plotted on ONC (Small scale chart)

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE - 15470

~~TOP SECRET~~ - GAMBIT  
A-32

Handle Via BYEMAN  
Controls Only

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D11

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
001				-1	28.77	6.93
002				1	28.40	7.20
003				3	28.30	6.30
004				6	28.30	6.15
005				9	28.05	6.02
006				8	27.80	5.67
007				14	27.75	5.81
008				17	27.13	4.48

~~TOP SECRET~~ - GAMBIT  
A-33

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

## COMMAND INFORMATION

Rev D12

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	45688.8	5.0	75 17N	6 40E	75 10N	6 20E	3.7845	3.7888	+15	0.5
002	45772.1	5.0	70 28N	4 22W	70 20N	4 34W	3.7099	3.7078	+15	1.0
003	45928.8	5.0	60 31N	15 21W	60 23N	15 27W	3.5652	3.5785	+15	1.5
004	46085.1	5.0	50 11N	21 22W	50 03N	21 25W	3.6368	3.6421	0	2.0
005	46234.4	5.0	40 11N	25 16W	40 03N	25 19W	3.4260	3.4301	0	2.5
006	46383.1	5.0	30 10N	28 19W	30 03N	28 20W	3.1955	3.1985	0	3.0
007	46531.3	5.0	20 11N	30 53W	20 03N	30 55W	2.9805	2.9818	0	3.0
008	46680.0	5.0	10 10N	33 14W	10 03N	33 15W	2.7525	2.7520	0	3.5
009	46829.1	5.0	0 10N	35 28W	0 02N	35 29W	2.5419	2.5401	0	3.5
010	46903.8	5.0	4 50S	36 35W	4 58S	36 36W	2.4671	2.4660	0	3.5
PBM-A	46905.2									
011	46978.9	5.0	9 50S	37 42W	9 58S	37 43W	2.9708	2.3722	0	3.5
PBM-A	46983.9									

Handle Via BYEMAN  
Controls Only~~TOP SECRET - GAMBIT~~

BYE 15470

~~TOP SECRET - GAMBIT~~  
A-34Handle Via BYEMAN  
Controls Only

PHOTO-MAP POSITIONING

Rev D12

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft - Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
002								
003								
004								
005								
006								
007								
008								
009								
010								
** PBM-A	5	03.18	1.5S	.5E	127.5	14.2	7.76	3500
011								
** PBM-B	10	18.0S	1.3S	1.3E	131.7	14.5	8.03	3500
Note:	** Plotted on ONC (Small Scale Chart)							

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT  
A-35  
Handle Via BYEMAN  
Controls Only

COMMAND INFORMATION

Rev D14

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	57186.4	5.5	20 49N	75 07W	20 56N	75 06W	2.8078	2.8163	+15	3.5
PBM-A	57189.8									
PBM-B	57191.4									
PBM-C	57192.2									
002	57199.3	5.5			20 03N	75 19W	2.7800	2.7841	-15	3.5
PBM-A	57203.3									
PBM-B	57204.9									

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ · GAMBIT

BYE 15A20

~~TOP SECRET~~ · GAMBIT  
A-36

Handle Via BYEMAN  
Controls Only



PHOTO-MAP POSITIONING

Rev D14

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft - Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
PBM-A	20	41.6N	1.2S	.7E	106.0	12.3	8.06	500
PBM-B	20	35.1N	1.0S	.8E	106.0	12.3	8.06	500
PBM-C	20	32.0N	1.2S	1.0E	106.0	12.3	8.06	500
002								
PBM-A	19	47.2N	2.5S	.2W	106.0	12.3	4.86	500
PBM-B	19	40.8N	2.2S	.3W	106.0	12.3	4.86	500

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT  
A-37

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D14

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
001	.86	2.40	5.37	20	14.56	4.48
002	.89	2.12	3.47	20	14.68	3.10

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT  
A-38

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D14

R. E. S.

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001		111	104	99	104					94	104	108	104	94				
002	85	104	104	99	99					85	115	94	94	99				

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 25470

~~TOP SECRET~~ - GAMBIT  
A-39

Handle Via BYEMAN  
Controls Only

COMMAND INFORMATION

Rev D15

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	61901.0	8.0	62 14N	80 35W	62 17N	80 33W	3.6008	3.6030	-15	1.5
002	62132.8	5.0	46 55N	89 22W	46 58N	89 21W	3.7845	3.7947	0	2.5
003	62142.9	5.0	46 14N	89 38W	46 17N	89 37W	3.7845	3.7989	0	2.5
004	62152.9	5.0	45 34N	89 54W	45 37N	89 53W	3.6732	3.6861	0	2.5
PBM-A	62155.2									
PBM-B	62157.4									
005	62162.8	5.0	44 54N	90 10W	44 56N	90 09W	3.6008	3.6090	0	2.5
PBM-A	62165.6									
PBM-B	62165.9									
006	62172.7	5.0	44 15N	90 25W	44 17N	90 24W	3.5652	3.5782	0	2.5
PBM-A	62175.7									
007	62182.7	5.0	43 34N	90 40W	43 37N	90 39W	3.4949	3.5033	0	2.5

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~  
A-40

GAMBIT

Handle Via BYEMAN  
Controls Only

COMMAND INFORMATION

Rev D15 (Contd)

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
008	62192.4	5.0	42 55N	90 54W	42 58N	90 53W	3.4603	3.4700	0	2.5
PBM-A	62193.7									
PBM-B	62197.5									
009	62202.5	5.0	42 15N	91 09W	42 17N	91 08W	3.3921	3.3990	0	2.5
PBM-A	62204.5									
PBM-B	62206.9									
010	62212.5	5.0	41 34N	91 23W	41 37N	91 22W	3.3253	3.3291	0	2.5
PBM-A	62214.0									
PBM-B	62216.9									
011	62222.4	5.0	40 54N	91 37W	40 57N	91 36W	3.2598	3.2645	0	2.5
PBM-A	62226.5									
PBM-B	62234.3									

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT  
A-41  
Handle Via BYEMAN  
Controls Only

Handle Via BYEMAN  
Controls Only

COMMAND INFORMATION

Rev D15 (Contd)

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
012	62232.3	5.0	40 15N	91 50W	40 17N	91 49W	3.1015	3.1070	0	2.5
	PBM-A 62234.3									
	PBM-B 62236.9									
013	62253.0	5.5	38 51N	92 18W	38 54N	92 17W	3.1639	3.1662	+15	3.0
	PBM-A 62256.4									
	PBM-B 62257.5									
014	62265.9	5.5			38 02N	92 34W	3.1639	3.1735	-15	3.0
	PBM-A 62268.3									
	PBM-B 62269.4									
015	62294.9	5.5	36 02N	93 12W	36 05N	93 11W	3.1015	3.1059	+15	3.0
	PBM-A 62297.3									
016	62307.8	5.5			35 13N	93 27W	3.1015	3.1082	-15	3.0
	PBM-A 62309.4									

TOP SECRET - GAMBIT  
A-42  
Handle Via BYEMAN  
Controls Only

TOP SECRET - GAMBIT  
BYE 15470

COMMAND INFORMATION

Rev D15 (Contd)

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
017	62337.1	5.5	33 11N	94 03W	33 14N	94 02W	3.0404	3.0404	+15	3.0
PBM-A	62339.1									
PBM-B	62340.5									
018	62350.0	5.5			33 22N	94 17W	3.0404	3.0463	-15	3.0
PBM-A	62351.5									
PBM-B	62352.8									
019	62382.1	5.5	30 09N	94 54W	30 12N	94 54W	2.9805	2.9899	+15	3.0
PBM-A	62383.9									
PBM-B	62384.9									
020	62395.0	5.5			29 20N	95 08W	2.9805	2.9900	-15	3.0
PBM-A	62396.6									
PBM-B	62397.6									

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT  
A-43

Handle Via BYEMAN  
Controls Only

PHOTO-MAP POSITIONING

Rev D15

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
002								
003								
004								
PBM-A	45	27.4N	1.1S	.3E	90.9	10.1	3.96	710
PBM-B	45	18.9N	1.5S	.3E	90.9	10.1	3.96	710
005								
PBM-A	44	45.9N	1.3S	.2E	91.0	10.1	3.96	710
PBM-B	44	36.8N	1.4S	.2E	91.0	10.1	3.96	710
006								
PBM-A	44	05.1N	1.2S	0	91.4	10.2	3.98	710
007								
008								
PBM-A	42	52.7N	1.3S	.6E	92.1	10.2	4.02	840
PBM-B	42	37.5N	.8S	.3E	92.1	10.2	4.02	840

Handle Via BYEMAN Controls Only

~~TOP SECRET~~ - GAMBIT

BYE, 15470

~~TOP SECRET~~  
A-44

GAMBIT

Handle Via BYEMAN Controls Only



PHOTO-MAP POSITIONING

Rev D15 (Contd)

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
009								
PBM-A	42	09.1N	.9S	.3E	92.5	10.3	4.03	710
PBM-B	41	59.6N	1.0S	.4E	92.5	10.3	4.03	710
010								
PBM-A	41	31.0N	1.0S	.1W	93.0	10.3	4.05	840
PBM-B	41	19.1N	.7S	.1E	93.0	10.3	4.05	840
011								
PBM-A	40	52.3N	.9S	.2E	93.3	10.4	4.07	840
PBM-B	40	40.6N	.9S	.4E	93.3	10.4	4.07	840
012								
PBM-A	40	09.1N	.6S	.3E	93.5	10.4	4.08	840
PBM-B	39	58.6N	1.0S	.4E	93.5	10.4	4.08	840
013								
PBM-A	38	39.8N	.3S	0	94.5	10.9	6.14	420
PBM-B	38	35.6N	.6S	0	94.5	10.9	6.14	420

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT  
A-45  
Handle Via BYEMAN  
Controls Only

PHOTO-MAP POSITIONING

Rev D15 (Contd)

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
014								
PBM-A	57	52.0N	2.0S	.4E	94.5	10.9	3.76	420
PBM-B	37	47.6N	2.1S	.6E	94.5	10.9	3.76	420
015								
PBM-A	35	54.9N	1.0S	.3W	96.0	11.1	6.27	840
016								
PBM-A	35	06.0N	1.7S	1.2E	96.0	11.1	3.77	840
017								
PBM-A	33	05.9N	.9S	.4W	97.8	11.2	6.44	710
PBM-B	33	00.6N	1.1S	.4W	97.8	11.2	6.44	710
018								
PBM-A	32	16.1N	2.4S	.8E	97.8	11.2	3.80	710
PBM-B	32	10.6N	2.4S	.9E	97.8	11.2	3.80	710

Handle Via BYEMAN Controls Only

~~TOP SECRET - GAMBIT~~

BYE 15470

A-46

~~TOP SECRET - GAMBIT~~

Handle Via BYEMAN Controls Only

PHOTO-MAP POSITIONING

Rev D15 (Contd)

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy ± Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
019								
PBM-A	30	04.8N	1.1S	.2E	99.8	11.5	6.61	900
PBM-B	30	00.8N	1.2S	.2E	99.8	11.5	6.61	410
020								
PBM-A	29	13.7N	2.2S	.7E	99.8	11.5	3.83	900
PBM-B	29	09.4N	2.0S	.8E	99.8	11.5	3.83	410

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT  
A-47

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D15

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
001				16	27.46	6.42
013	.87	1.99	2.96	39	16.29	4.07
014	.92	2.09	3.09	39	16.64	3.90
015	.95	1.72	2.09	42	15.98	4.00
016	1.10	1.65	1.66	42	16.33	3.98
017	.99	1.94	2.51	45	15.68	3.87
018	1.07	2.07	2.69	45	16.03	3.68
019	.97	2.26	3.84	48	15.30	3.63
020	.89	2.39	5.01	48	15.67	3.16
Note: The following measurements are from Eng. IMC stair-step experiment.						
002				30	17.17	6.58
003				31	17.58	6.65
004	.45	1.18	2.29	33	17.13	5.84
005	.71	1.78	2.82	33	16.83	5.40

Handle Via BYEMAN  
Controls Only

~~TOP SECRET - GAMBIT~~

BYE

~~TOP SECRET - GAMBIT~~

A-48

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D15 (Contd)

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
006	.67	1.09	1.51	34	16.57	5.25
007				34	16.25	4.80
008	.77	1.41	1.82	35	16.12	4.75
009	.69	2.11	4.17	36	15.80	4.55
010	.61	1.89	3.55	37	15.53	4.47
011	.57	1.69	3.09	37	15.25	4.20
012	.68	1.90	3.24	38	14.52	3.80

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15W79

~~TOP SECRET~~ - GAMBIT  
A-49

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev. D15

R. E. S.

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001																		
013	72	111	118	85	94					78	118	111	90	85				
014	94	99	99	104	82					82	96	94	111	85				
015	*43	90	94	94						*47	85	99	90		* Heavy Haze			
016										67			54					
017	94	94	78	78	67					99	100	82	75	70				
018	72	78	75	78	85					78	85	78	75	92				
019	51	104	111		94					49	111	104		96				
020	67				78					70				75				
Note: The following measurements are from Eng. IMC stair-step experiment.																		
002																		
003																		
004	104	85			78	61				82	78	78		78	82			
005	47	85	94		94	82				63	90	67		85	72			
006		94	70								78	82						

Handle Via BYEMAN  
Controls Only

~~TOP SECRET - GAMBIT~~

~~TOP SECRET - GAMBIT~~

A-50

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D15 (Contd)

R. E. S.

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
007																		
008				78	94		70	94	94				92	78		90	63	94
009	90	78	104		85	78				94	94	99		80	85			
010	21	63	94		82	85				85	85	94		94	75			
011	94	61	85		94	59				99	111	99		75	90			
012	82	67	59		94	51				59	75	104		75	72			

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 13470

~~TOP SECRET~~ - GAMBIT  
A-51

Handle Via BYEMAN  
Controls Only

COMMAND INFORMATION

Rev D16

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	67304.8	8.0	57 35N	106 09W	57 39N	106 07W	3.7845	3.7905	0	2.0
002	67330.7	8.0	55 53N	107 12W	55 56N	107 10W	3.7470	3.7545	0	2.0
003	67366.4	8.0	53 31N	108 30W	53 34N	108 29W	3.7099	3.7182	0	2.0
PBM-A	67371.4									
PBM-B	67373.0									
004	67393.7	8.0	51 42N	109 25W	51 46N	109 24W	3.6732	3.6822	0	2.0
PBM-A	67395.1									
PBM-B	67401.3									
005	67447.7	6.2	48 06N	111 04W	48 10N	111 02W	3.3585	3.3600	+15	2.5
PBM-A	67450.0									
PBM-D	67451.2									
PBM-B	67453.1									
PBM-C	67453.8									

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15479

~~TOP SECRET~~ - GAMBIT

A-52

Handle Via BYEMAN  
Controls Only



COMMAND INFORMATION

Rev D16 (Contd)

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
006	67459.2	6.2			47 24N	111 22W	3.3253	3.3160	-15	2.5
PBM-A	67461.2									
PBM-D	67462.4									
PBM-B	67464.3									
PBM-C	67465.0									
007	67474.0	8.0	46 20N	111 47W	46 24N	111 46W	3.3253	3.3280	-15	2.5
PBM-A	67475.8									
PBM-B	67477.9									
PBM-C	67480.6									
008	67508.2	8.0	44 03N	112 41W	44 07N	112 40W	3.5299	3.5359	0	2.5
PBM-A	67509.3									
PBM-D	67510.2									
PBM-B	67512.5									

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE

1972

~~TOP SECRET~~ - GAMBIT

A-53

Handle Via BYEMAN  
Controls Only

COMMAND INFORMATION

Rev D16 (Contd)

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
PBM-C	67515.6									
009	67520.6	8.0	43 13N	112 59W	43 17N	112 58W	3.4949	3.5000	0	2.5
PBM-A	67522.1									
PBM-B	67525.6									
PBM-C	67527.6									
010	67552.5	8.0	41 05N	113 45W	41 08N	113 44W	3.4603	3.4640	0	2.5
PBM-C	67555.1									
PBM-A	67557.8									
PBM-B	67558.2									
011	67659.4	8.0	33 53N	116 02W	33 57W	116 01W	3.2924	3.2981	0	3.0
PBM-A	67664.7									
PBM-B	67664.9									
012	67681.0	6.2	32 26N	116 27W	32 30W	116 27W	3.0404	3.0426	+15	3.0

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 1. 15170

~~TOP SECRET~~ - GAMBIT  
A-54

Handle Via BYEMAN  
Controls Only

COMMAND INFORMATION

Rev D16 (Contd)

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
PBM-A	67683.9									
PBM-B	67686.2									
013	67694.6	6.2			31 35N	116 42W	3.0103	3.0162	-15	3.0
PBM-A	67696.2									
PBM-B	67698.6									

Handle Via BYEMAN  
Controls Only

~~TOP SECRET - GAMBIT~~

BYE 15420

~~TOP SECRET - GAMBIT~~

A-55

Handle Via BYEMAN  
Controls Only

PHOTO-MAP POSITIONING

Rev D16

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
002								
003								
** PBM-A	53	14.5N	.8S	.5E	87.1	9.66	3.04	3000
** PBM-B	53	08.3N	.8S	1.0E	87.1	9.66	3.04	3000
004								
** PBM-A	51	40.2N	.5S	1.5E	87.9	9.78	3.08	3000
PBM-B	51	15.5N	1.5S	1.5E	87.9	9.78	3.08	3000
005								
PBM-A	48	00.6N	1.7S	.3W	89.6	10.3	4.87	500
PBM-D	47	55.5N	1.2S	.1W	89.6	10.3	4.87	500
PBM-B	47	48.0N	1.5S	.1W	89.6	10.3	4.87	500
PBM-C	47	45.3N	1.7S	.1W	89.6	10.3	4.87	500

Note: \*\* Plotted on ONC (Small Scale Chart)

Handle via BYEMAN  
Controls Only

~~TOP SECRET - GAMBIT~~

BYE 15110

~~TOP SECRET - GAMBIT~~  
A-56

Handle via BYEMAN  
Controls Only

## PHOTO-MAP POSITIONING

Rev D16 (Contd)

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft - Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
006								
PBM-A	47	15.5N	2.2S	1.4E	89.6	10.3	1.95	500
PBM-D	47	10.7N	2.2S	1.4E	89.6	10.3	1.95	500
PBM-B	47	03.0N	2.3S	1.5E	89.6	10.3	1.95	500
PBM-C	47	00.2N	2.3S	1.4E	89.6	10.3	1.95	500
007								
PBM-A	46	17.0N	2.3S	1.1W	90.2	10.4	2.93	800
PBM-B	46	08.6N	2.3S	.6E	90.2	10.4	2.93	800
PBM-C	45	57.4N	2.3S	.1E	90.2	10.4	2.93	800
008								
PBM-A	44	55.8N	1.0S	.2E	91.5	10.2	3.99	500
PBM-D	43	58.8N	1.1S	.2E	91.5	10.2	3.99	500
PBM-B	43	49.0N	0.7S	.2E	91.5	10.2	3.99	500
PBM-C	43	36.9N	1.1S	.5E	91.5	10.2	3.99	500

Handle Via BYEMAN  
Controls Only~~TOP SECRET - GAMBIT~~

BYE 15/7/01

TOP SECRET - GAMBIT  
A-57Handle Via BYEMAN  
Controls Only

PHOTO-MAP POSITIONING

Rev D16 (Contd)

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
009								
PBM-A	43	10.7N	.6S	0	91.9	10.2	4.01	500
PBM-B	42	56.8N	1.1S	.2E	91.9	10.2	4.01	500
PBM-C	42	48.5N	1.2S	0	91.9	10.2	4.01	500
010								
PBM-C	40	57.7N	.8S	.3E	93.0	10.3	4.06	500
PBM-A	40	46.9N	1.1S	.2E	93.0	10.3	4.06	500
PBM-B	40	45.3N	.8S	.3E	93.0	10.3	4.06	500
011								
PBM-A	33	35.4N	.7S	.4E	93.4	10.5	4.88	800
PBM-B	33	34.2N	.7S	.3E	93.4	10.5	4.88	800

Handle Via BYEMAN  
Controls Only

~~TOP SECRET - GAMBIT~~

gxc 151/21

~~TOP SECRET - GAMBIT~~

A-58

Handle Via BYEMAN  
Controls Only

PHOTO-MAP POSITIONING

Rev D16 (Contd)

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + - Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
012								
** PBM-A	32	18.0N	.5S	1.0W	98.4	11.3	6.48	3000
** PBM-B	32	08.5N	.5S	1.0W	98.4	11.3	6.48	3000
013								
** PBM-A	31	28.0N	1.2S	0	98.4	11.3	3.80	3000
** PBM-B	31	18.2N	1.2S	0	98.4	11.3	3.80	3000
Note: ** Plotted on ONC (Small Scale Chart)								

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 14470

~~TOP SECRET~~ - GAMBIT

A-59

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D16

Handle Via BYEMAN  
Controls Only

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
001				20	28.80	6.93
002				22	28.40	7.20
003	.57	1.46	2.51	24	28.00	6.20
004	.68	2.07	3.89	26	27.85	5.85
005	.55	1.80	3.55	30	19.60	4.44
006	.75	1.57	2.19	30	17.85	4.20
007	.54	1.95	4.07	32	25.45	4.28
008	.56	2.10	4.90	34	26.80	5.75
009	.55	1.86	3.80	35	26.70	5.33
010	.58	2.50	8.91	37	26.21	4.90
011	.85	2.21	3.98	44	25.12	4.48
012	.60	2.18	5.01	46	17.75	3.60
013	.66	2.52	8.51	46	18.05	3.80

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT

A-60

Handle Via BYEMAN  
Controls Only



PHOTOGRAPHIC EVALUATION

Rev D16

R. E. S.

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001																		
002																		
003								104										85
004																		
005	118	118	78	111	118	145	111	125		85	94	104	125	104	94	118	99	
006	78	85	99	90	99	94	80	90	104	67	82	99	111	111	118	99	85	111
007	85	83	104	118	85	85	74	90	99	104	99	104	94	94	99	99	104	94
008	85	79		118				94		90	98		104				94	
009				99	111		104	104	85				85	90		118	98	78
010		82	85		85						85	75		111				
011		85	87	72	115	100					75	85	78	94	104			
012		118	111	94	118						134	125	104	134				
013		125	130	118	111						130	125	104	104				

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT  
A-61

Handle Via BYEMAN  
Controls Only

COMMAND INFORMATION

Rev D21

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	7620.7	5.5	53 45N	140 40E	53 44N	140 40E	3.4260	3.4361	+15	2.0
PBM-A	7622.9									
002	7631.5	5.5					3.4260	3.4296	-15	2.0
PBM-A	7634.5									
003	7717.2	5.5	47 19N	137 40E	47 18N	137 40E	3.3253	3.3365	+15	2.5
PBM-A	7719.1									
004	7728.0	5.5			46 35N	137 22E	3.2924	3.2972	-15	2.5
PBM-A	7730.4									

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT

A-62

Handle Via BYEMAN  
Controls Only

PHOTO-MAP POSITIONING

Rev D21

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft - Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001 PBM-A	53	34.8N	4.8S	.4W	87.1	10.1	3.87	2000
002 PBM-A	52	48.6N	3.1S	.2E	87.1	10.1	2.21	2000
003 PBM-A	47	10.2N	1.5S	.3E	90.0	10.3	4.90	5500
004 PBM-B	46	24.7N	3.8S	1.0E	90.0	10.3	2.96	5500

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT  
A-63

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D21

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
001	.46	.90	1.74	24	17.68	6.03
002	.47	1.26	2.46	24	18.06	5.32
003	.45	2.29	7.41	30	17.13	5.39
004	.56	1.53	2.63	30	17.39	4.08

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15479

~~TOP SECRET~~ - GAMBIT  
A-64

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D21

R. E. S.

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001			125	118	99							118	115	94				
002			104	111	111							90	104	94				
003		90	94	94	104					85	94	94	99	99				
004		94	90	111	99					94	99	104	104	104				

Handle Via BYEMAN  
Controls Only

~~TOP SECRET - GAMBIT~~

BYE 15470

~~TOP SECRET - GAMBIT~~  
A-65

Handle Via BYEMAN  
Controls Only

COMMAND INFORMATION

Rev D22

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE

15470

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	12993.9	5.5	50 54N	117 04E	50 52N	117 03E	3.3921	3.4011	+15	2.0
PBM-A	12998.9									
PBM-B	12999.1									
002	13004.3	5.5			50 09N	116 43E	3.3921	3.3940	-15	2.0
PBM-A	13009.6									
PBM-B	13010.2									

~~TOP SECRET~~ - GAMBIT

A-66

Handle Via BYEMAN  
Controls Only

PHOTO-MAP POSITIONING

Rev D22

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy ± Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
PBM-A	50	32.5N	.5S	.3W	88.5	9.83	3.99	1600
PBM-B	50	31.2N	.6S	.3W	88.5	9.83	3.99	1600
002								
PBM-A	49	48.2N	1.8S	.1E	88.5	9.83	2.17	1600
PBM-B	49	45.6N	1.9S	0	88.5	9.83	2.17	1600

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT  
A-67

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D22

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
001	.82	2.32	4.79	27	17.50	5.53
002	.62	2.32	6.03	27	17.85	4.50

Handle via BYEMAN  
Controls Only

~~TOP SECRET - GAMBIT~~

BYE 15470

~~TOP SECRET - GAMBIT~~  
A-68

Handle via BYEMAN  
Controls Only



PHOTOGRAPHIC EVALUATION

Rev D22

R. E. S.

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001	75	47	75	94	99					54	47		94	94				
002	*38	111	104	107	99					*31		104		99	* Landing Area			

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT

A-69

Handle Via BYEMAN  
Controls Only

COMMAND INFORMATION

Rev D23

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	18211.0	60.0	58 19N	99 01E	58 17N	98 59E	3.4949	3.5011	+15	2.0
PBM-C	18229.3									
PBM-A	18257.6									
PBM-B	18260.8									
002	18410.6	80.0	45 03N	92 24E	45 01N	92 23E	3.2275	3.2361	+15	2.5
PBM-A	18416.8									
PBM-B	18431.0									
PBM-C	18485.6									
003	18539.3	60.0	36 25N	89 25E	36 22N	89 25E	3.1326	3.1385	+15	3.0
PBM-A	18558.9									

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT

A-70

Handle Via BYEMAN  
Controls Only

PHOTO-MAP POSITIONING

Rev D23

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
** PBM-C	57	04.2N	0	.5E	85.6	9.82	3.74	15000
** PBM-A	55	12.5N	0	.5E	86.4	9.95	3.80	15000
** PBM-B	54	59.6N	.3S	.7E	86.5	9.96	3.84	15000
002								
** PBM-A	44	35.7N	3.5S	2.3E	91.2	10.4	4.84	15000
** PBM-B	43	38.7N	4.0S	4.5W	91.6	10.5	4.87	15000
** PBM-C	39	59.0N	4.0S	1.0W	93.4	10.7	5.04	15000
003								
** PBM-A	35	03.2N	0	11.6E	96.2	11.0	6.26	15000

Note: \*\* Plotted on ONC (Small Scale Chart)

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 25470

~~TOP SECRET~~ - GAMBIT  
A-71

Handle Via BYEMAN  
Controls Only

Handle Via BYEMAN  
Controls Only

~~TOP SECRET - GAMBIT~~

BYE 21000

PHOTOGRAPHIC EVALUATION

Rev D23

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Min	Max				
001				20	208.62	5.00
002	.98	2.54	6.61	33	257.21	4.21
003	.76	2.47	6.61	42	187.06	3.55

~~TOP SECRET - GAMBIT~~

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D23

R. E. S.

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001																		
002	85	78	94	78		67	94	99	94	90	67	72	72		70		82	99
003	94	78	70		54		84	75		85	82	67		68			80	
Note: The following RES measurements made in Hooper Banding Areas.																		
	11	12	13	14	15	16	17	18	19	11	12	13	14	15	16	17	18	19
002	70	82	94			78				61	90	78			82			
003		90				94					78				99			

Handle via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT

A-73

Handle via BYEMAN  
Controls Only

COMMAND INFORMATION

Rev D24

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	23648.3	5.5	51 09N	72 48E	51 06N	72 48E	3.3921	3.4023	+15	2.0
002	23659.1	5.5			50 23N	72 28E	3.3585	3.3522	-15	2.0
003	23713.0	5.5	46 50N	70 56E	46 47N	70 55E	3.2924	3.2997	+15	2.5
PBM-A	23714.2									
PBM-B	23717.6									
004	23723.0	5.5			46 04N	70 37E	3.2924	3.2956	-15	2.5
PBM-A	23725.6									
PBM-B	23728.9									
005	23754.0	50.0	44 06N	69 51E	44 03N	69 50E	3.2275	3.2316	+15	2.5
PBM-A	23772.0									
PBM-B	23786.3									
PBM-C	23799.6									

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15479

TOP SECRET - GAMBIT  
 A-74  
 Handle Via BYEMAN  
 Controls Only

PHOTO-MAP POSITIONING

Rev D24

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-MM)		Crab Correction Data (MM)			Map Accuracy + Ft - Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
002								
003								
PBM-A	46	42.4N	1.5S	.2E	90.5	10.4	4.94	750
PBM-B	46	28.8N	1.7S	.2E	90.5	10.4	4.94	750
004								
PBM-A	45	56.7N	2.9S	.3E	90.5	10.4	2.96	750
PBM-B	45	43.1N	3.2S	0	90.5	10.4	2.96	750
005								
PBM-A	42	50.0N	1.4S	.1E	92.2	10.6	5.11	760
PBM-B	41	52.4N	1.1S	0	92.8	10.7	5.16	620
PBM-C	40	59.2N	1.6S	.2W	93.1	10.7	5.19	4000

Handle Via BYEMAN  
Controls Only

~~TOP SECRET - GAMBIT~~

BYE 15470

~~TOP SECRET - GAMBIT~~  
A-75

Handle Via BYEMAN  
Controls Only

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D24

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
001				27	17.53	5.75
002				27	17.72	4.71
003	1.04	2.22	3.31	30	16.96	4.72
004	1.19	2.16	2.76	30	17.38	4.82
005	.88	1.26	1.45	34	160.33	3.59

~~TOP SECRET~~ - GAMBIT

BYE 15870

~~TOP SECRET~~ - GAMBIT

A-76

Handle Via BYEMAN  
Controls Only



PHOTOGRAPHIC EVALUATION

Rev D24

R. E. S.

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001																		
002																		
003	111	118	140	111	104					118	134		104	99				
004	118	111	134	118	134						108	145	104					
005																		

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE

15119

~~TOP SECRET~~ - GAMBIT

A-77

Handle Via BYEMAN  
Controls Only

COMMAND INFORMATION

Rev D25

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	28916.9	50.0	55 02N	52 40E	55 04N	52 41E	3.4260	3.4292	+15	2.0
002	29000.2	5.5	49 30N	49 54E	49 32N	49 54E	3.3585	3.3635	+15	2.5
003	29011.0	5.5			48 49N	49 35E	3.3253	3.3320	-15	2.5
004	29038.4	5.5	46 57N	48 48E	46 59N	48 49E	3.2924	3.3011	+15	2.5
PBM-A	29040.5									
PBM-B	29043.6									
005	29049.2	5.5			46 16N	48 31E	3.2924	3.3010	-15	2.5
PBM-A	29051.9									
PBM-B	29055.0									
006	29091.2	5.5	43 25N	47 26E	43 27N	47 26E	3.2275	3.2320	+15	2.5
007	29104.1	5.5			42 35N	47 07E	3.2275	3.2359	-15	2.5
008	29123.3	5.5	41 15N	46 40E	41 18N	46 40E	3.1955	3.2011	+15	2.5
PBM-A	29125.7									
PBM-B	29128.5									

TOP SECRET - GAMBIT  
 A-78  
 Handle via BYEMAN  
 Controls Only

Handle via BYEMAN  
 Controls Only

TOP SECRET - GAMBIT

BYE 11110

COMMAND INFORMATION

Rev D25 (Contd)

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
009	29136.2	5.5			40 26N	46 22E	3.1955	3.2011	-15	2.5
PBM-A	29137.5									
PBM-B	29140.2									

Handle via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 154920

~~TOP SECRET~~ - GAMBIT

A-79

Handle via BYEMAN  
Controls Only

PHOTO-MAP POSITIONING

Rev D25

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft -
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
002								
003								
004								
PBM-A	46	50.9N	1.0S	0	90.4	10.4	4.89	900
PBM-B	46	38.2N	.8S	.2W	90.4	10.4	4.89	1100
005								
PBM-A	46	05.1N	2.2S	.7E	90.4	10.4	2.96	900
PBM-B	46	52.3N	2.0S	.4E	90.4	10.4	2.96	1100
006								
007								
008								
PBM-A	41	08.3N	1.6S	.3E	93.3	10.7	5.10	900
PBM-B	40	56.8N	1.0S	.5E	93.3	10.7	5.10	900

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15179

~~TOP SECRET~~ - GAMBIT

A-80

Handle Via BYEMAN  
Controls Only

PHOTO-MAP POSITIONING

Rev D25 (Contd)

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
009								
PBM-A	40	20.7N	2.9S	0	93.3	10.7	3.03	900
PBM-B	40	09.6N	2.7S	.3E	93.3	10.7	3.03	900

Handle via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BVE 154/70

~~TOP SECRET~~ - GAMBIT

A-81

Handle via BYEMAN  
Controls Only

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D25

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
001				23	169.88	5.37
002				28	17.28	4.33
003				28	17.52	4.35
004	.68	1.63	2.46	30	16.96	4.31
005	.70	1.75	2.69	30	17.35	4.29
006	.83	.92	1.10	34	16.48	4.15
007	.76	2.06	3.55	34	16.92	4.11
008	.89	1.60	1.95	37	16.40	4.01
009	.68	2.06	3.89	37	16.80	3.50

~~TOP SECRET~~ - GAMBIT  
A-82

~~TOP SECRET~~ - GAMBIT

Handle Via BYEMAN  
Controls Only

BYE

PHOTOGRAPHIC EVALUATION

Rev D25

R. E. S.

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001																		
002																		
003																		
004	*38	85	111	70	104					*42	111	157	90	118	*	Banding Area		
005	*38	104	111	99	90						111	104	94	82	*	Banding Area		
006																		
007					104									94				
008	118	111	99	78	78					99	78	78	85	94				
009			111	125	94							94	125	118				

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

~~TOP SECRET~~ - GAMBIT

A-83

Handle Via BYEMAN  
Controls Only

BYE 15

COMMAND INFORMATION

Rev D26

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	34148.2	5.5	61 24N	34 43E	61 24N	34 43E	3.5652	3.5689	+15	1.5
002	34159.0	5.5			60 42N	34 11E	3.5652	3.5622	-15	1.5
003	34192.3	5.5	58 31N	32 37E	58 31N	32 37E	3.4949	3.4990	+15	2.0
004	34203.1	5.5			57 49N	32 9E	3.4949	3.4965	-15	2.0
005	34244.8	5.5	55 03N	30 30E	55 04N	30 30E	3.4603	3.4599	+15	2.0
PBM-A	34249.5									
006	34255.6	5.5			54 21N	30 07E	3.4603	3.4593	-15	2.0
PBM-A	34260.5									
007	34299.0	5.5	51 27N	28 38E	51 28N	28 38E	3.3921	3.3957	+15	2.0
008	34309.8	5.5			50 45N	28 18E	3.3585	3.3588	-15	2.0
009	34326.9	15.0	49 36N	27 46E	49 37N	27 46E	3.3585	3.3603	-15	2.0

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15420

~~TOP SECRET~~ - GAMBIT

A-84

Handle Via BYEMAN  
Controls Only



PHOTO-MAP POSITIONING

Rev D26

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy + Ft - Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
002								
003								
004								
005								
PBM-A	54	45.1N	1.1S	.2W	86.6	9.98	4.00	690
006								
PBM-A	54	01.7N	2.0S	.4E	86.6	9.98	4.00	690
007								
008								
009								

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 151170

~~TOP SECRET~~ - GAMBIT

A-85

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D26

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
001				16	18.42	5.65
002	.54	.58	1.07	16	18.78	5.62
003				20	17.77	5.31
004				20	18.35	5.22
005				22	17.62	4.69
006				22	18.18	4.75
007				26	17.30	4.39
008			1.55	26	17.70	4.34
009			2.04	29	49.22	3.91

Handle Via BYEMAN  
Controls Only

~~TOP SECRET - GAMBIT~~

BYE 151/73

~~TOP SECRET - GAMBIT~~  
A-86

Handle Via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D26

R. E. S.

Acc.  
No.

With Line of Flight (W)

Across Line of Flight (A)

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001																		
002																		
003																		
004																		
005																		
006																		
007																		
008																		
009																		

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT

A-87

Handle Via BYEMAN  
Controls Only

COMMAND INFORMATION

Rev D30

Acc No.	System Time Sec	Burst Time Sec	Command Position		Best Ephemeris		Film Velocity in./sec.		Stereo Deg	Crab Deg
			Lat Deg Min	Long Deg Min	Lat Deg Min	Long Deg Min	Command	Actual		
001	55565.4	5.0	54 05N	58 42W	54 06N	58 42W	3.4260	3.4250	+15	2.0
002	55694.8	5.0	45 28N	62 38W	45 29N	62 38W	3.5299	3.5329	0	2.5
	PBM-A 55697.9									
	PBM-B 55699.4									
003	56075.2	22.0	19 53N	70 15W	19 54W	70 15W	2.9510	2.9514	0	3.5
	PBM-A 56078.5									
	PBM-B 56085.5									
	PBM-C 56088.6									
	PBM-D 56095.5									

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ GAMBIT

BYE 15N70

~~TOP SECRET~~ GAMBIT

A-88

Handle Via BYEMAN  
Controls Only

PHOTO-MAP POSITIONING

Rev D30

Acc No.	Nadir Lat for PBM Position		Predict to Actual (Miss Dist-NM)		Crab Correction Data (NM)			Map Accuracy ± Ft
	Deg	Min	X	Y	Alt	Strip Width	Dist Off Nadir	
001								
002								
** PBM-A	45	16.3N	2.0S	0	91.0	10.1	3.97	3500
** PBM-B	45	10.5N	2.5S	.5E	91.0	10.1	3.97	3500
003								
PBM-A	19	40.5N	2.0S	.5E	106.3	11.8	6.48	3500
PBM-B	19	12.1N	2.0S	.5W	106.9	11.9	6.51	3500
PBM-C	18	59.5N	2.0S	1.0W	107.0	12.0	6.53	3500
PBM-D	18	31.8N	2.0S	0	107.4	11.9	6.55	3500
<p>Note: ** Plotted on ONC (Small Scale Chart)</p>								

Handle Via BYEMAN Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15470

~~TOP SECRET~~ - GAMBIT

A-89

Handle Via BYEMAN Controls Only

PHOTOGRAPHIC EVALUATION

Rev D30

Acc. No.	Density		Brightness Range	Sun Angle	Total Frame Length	Stopping Dist. (in)
	Dmin	Dmax				
001				24	15.95	4.19
002	.74	1.20	1.55	32	16.35	6.62
003	.80	1.58	2.04	58	63.70	3.80

Handle via BYEMAN  
Controls Only

~~TOP SECRET - GAMBIT~~

BYE 15470

~~TOP SECRET - GAMBIT~~

A-90

Handle via BYEMAN  
Controls Only

PHOTOGRAPHIC EVALUATION

Rev D30

R. E. S.

Acc.  
No.

With Line of Flight (W)

Across Line of Flight (A)

001

002

003

Note: The following RES measurements made in Looper Landing Areas.

003

Acc. No.	With Line of Flight (W)									Across Line of Flight (A)								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
001																		
002		75	94		85						68	94	75	78				
003		99	90	94		104		104	94		99	82	78		100		94	90
	11	12	13	14	15	16	17	18	19	11	12	13	14	15	16	17	18	19
003	70		70			85				67	94	65			85			

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~ - GAMBIT

BYE 15M70

~~TOP SECRET~~ - GAMBIT  
A-91

Handle Via BYEMAN  
Controls Only

Handle Via BYEMAN

Controls Only

~~TOP SECRET - GAMBIT~~

BYE 15470

PERFORMANCE EVALUATION TEAM

REPORT NO. 4003/63

APPENDIX B

~~TOP SECRET - GAMBIT~~

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Controls Only



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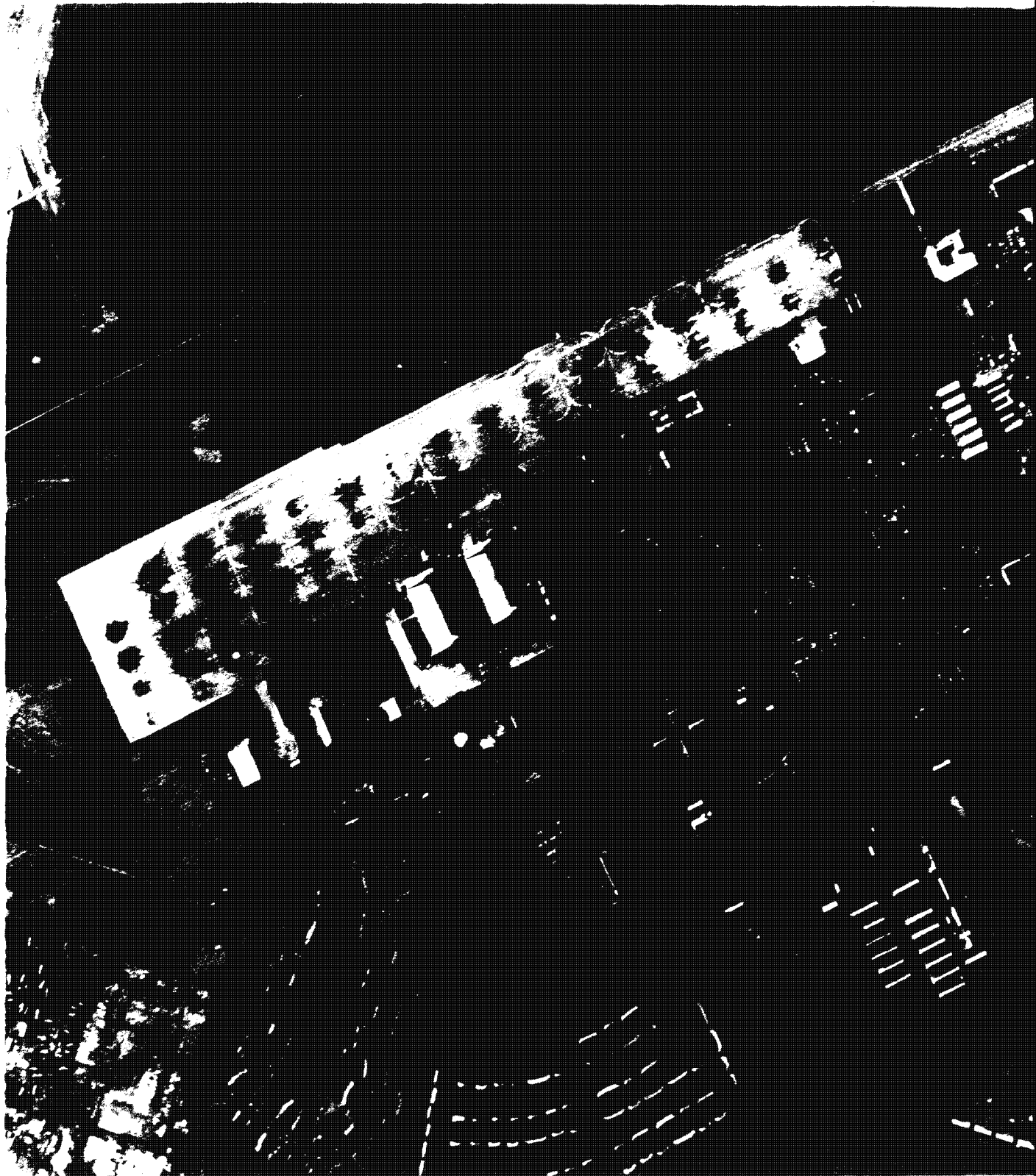
PHOTOGRAPH 1

Rev D16, Frame 006

A section of Malmstrom Air Force Base,  
Montana  
(10X and 40X)

Engine nacelles, wing pods, visible  
and measurable.

~~TOP SECRET - GAMBIT~~



~~TOP SECRET~~

Vehicle Number 953  
Rev. 016 Frame 006 10X

~~TOP SECRET~~

BYE 15470



~~TOP SECRET~~

P. COGRAPH 1

Vehicle Number 953  
Rev D16 Frame 006 40X

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PHOTOGRAPH 2

Rev D16, Frame 008

Farmhouse and barn.  
(20X)

Note farm animals, probably cattle,  
lined up at feed trough.

~~TOP SECRET~~ - GAMBIT

B-4

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Controls Only

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~~TOP SECRET~~

PHOTOGRAPH 2

Vehicle Number 953  
Rev D16 Frame 008 20X<sub>5</sub>

B-5

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PHOTOGRAPH 3

Rev D16, Frame 006

Cemetery, Great Falls, Montana  
(10X and 40X)

The varying size of the grave  
markers is emphasized.

~~TOP SECRET~~ - GAMBIT  
B-6

Handle Via BYEMAN  
Controls Only

~~TOP SECRET~~

BYE 15470



~~TOP SECRET~~

PHOTOGRAPH 3

Vehicle Number 953  
Ray 016 Frame 006 10X B-7

~~TOP SECRET~~

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~~TOP SECRET~~

PHOTOGRAPH 3

Vehicle Number 953  
Rev D16 Frame 006 40X B-8



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BYE 15470

PHOTOGRAPH 4

Rev D16, Frame 008

Another farm.  
(40X)

Animals and farm vehicles are visible.

~~TOP SECRET~~ GAMBIT

Handle Via BYE MAN  
Controls Only

~~TOP SECRET~~



~~TOP SECRET~~

PHOTOGRAPH II

Vehicle Number 953  
Rev D16 Frame 008 40X

Handle via BYEMAN  
Controls Only

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BYE 15470

PHOTOGRAPH 5

Rev D16, Frame 006

Football stadium, Great Falls, Montana.  
(10X and 20X)

Note presence of players on field.  
Windshield breaks on parked cars  
can also be seen.

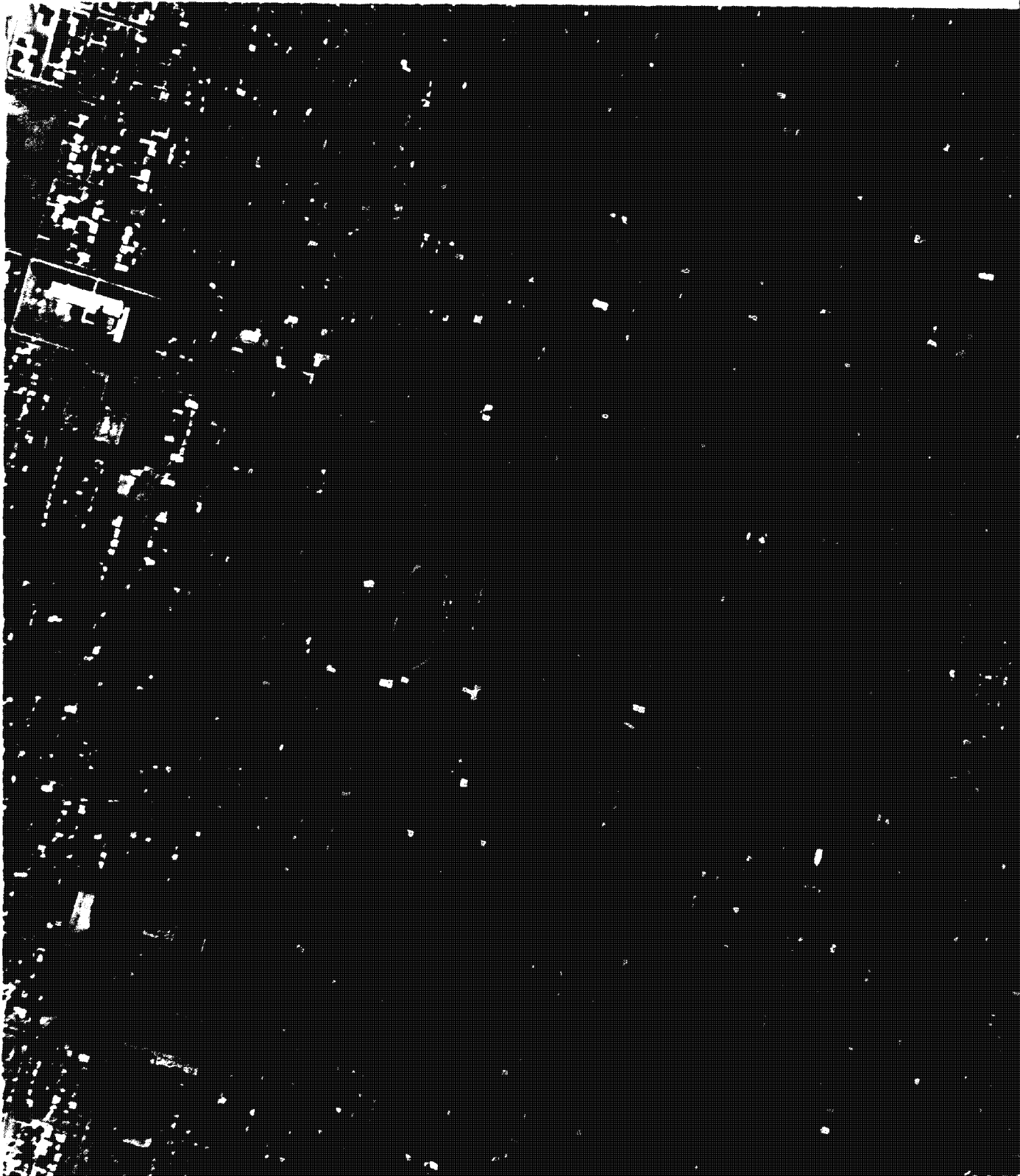
~~TOP SECRET~~ GAMBIT

B-11

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Controls Only

~~TOP SECRET~~

BYE 15470



~~TOP SECRET~~

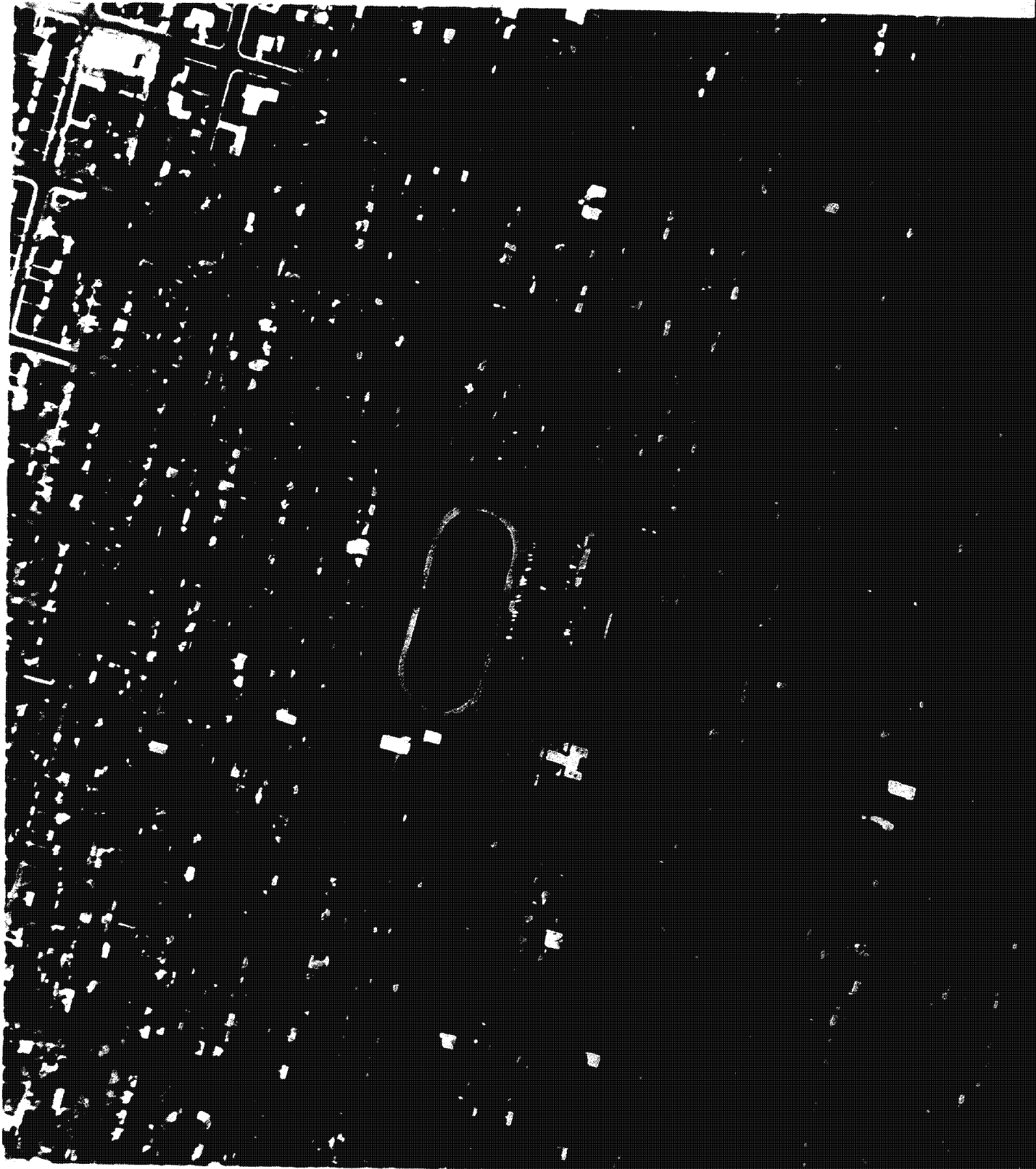
PHOTOGRAPH 5

Vehicle Number 953  
Rev D16 Frame 006 10X B-12

~~TOP SECRET~~

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~~TOP SECRET~~

PHOTOGRAPH 5

Vehicle Number 953  
Rev D16 Frame 006 20X

B-13

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Controls Only

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BYE 15470

PHOTOGRAPH 6

Rev D16, Frame 005

Football Stadium, Great Falls, Montana.  
(40X)

Note player teeing up ball  
on 40 yard line prior to kick-off.

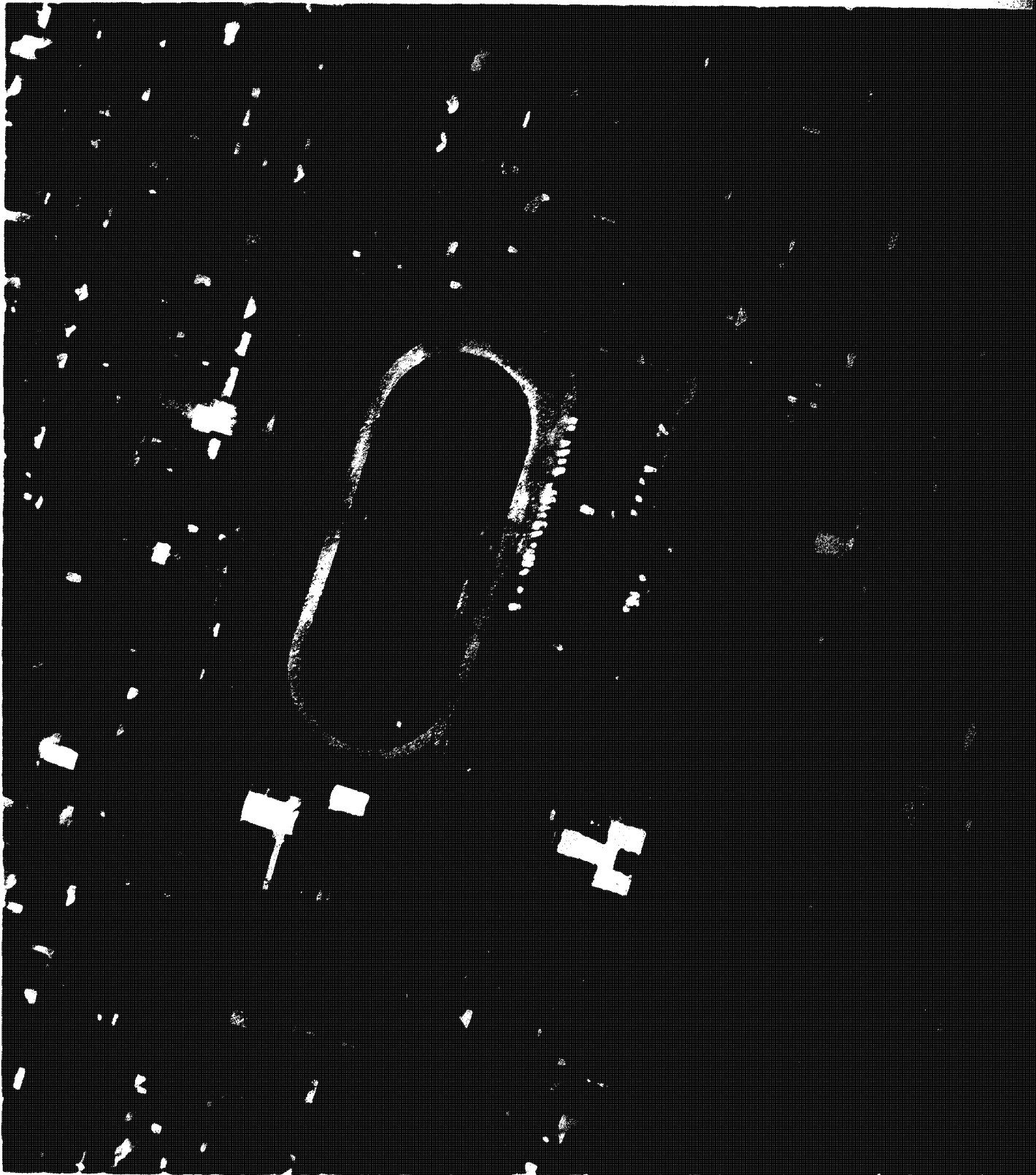
~~TOP SECRET - GAMBIT~~

Handle Via BYEMAN  
Controls Only

B-14

~~TOP SECRET~~

BYE 15470



~~TOP SECRET~~

PHOTOGRAPH 6

Vehicle Number 953  
Rev D16 Frame 006 40X

4-15

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PHOTOGRAPH 7

Rev D16, Frame 006

Football Stadium, Great Falls, Montana.  
(40X)

This photograph was taken about eight seconds  
after the previous photograph (Photograph 6).

Note that the offensive team has lined up for  
the kick-off. Most of the defensive players  
can be seen.

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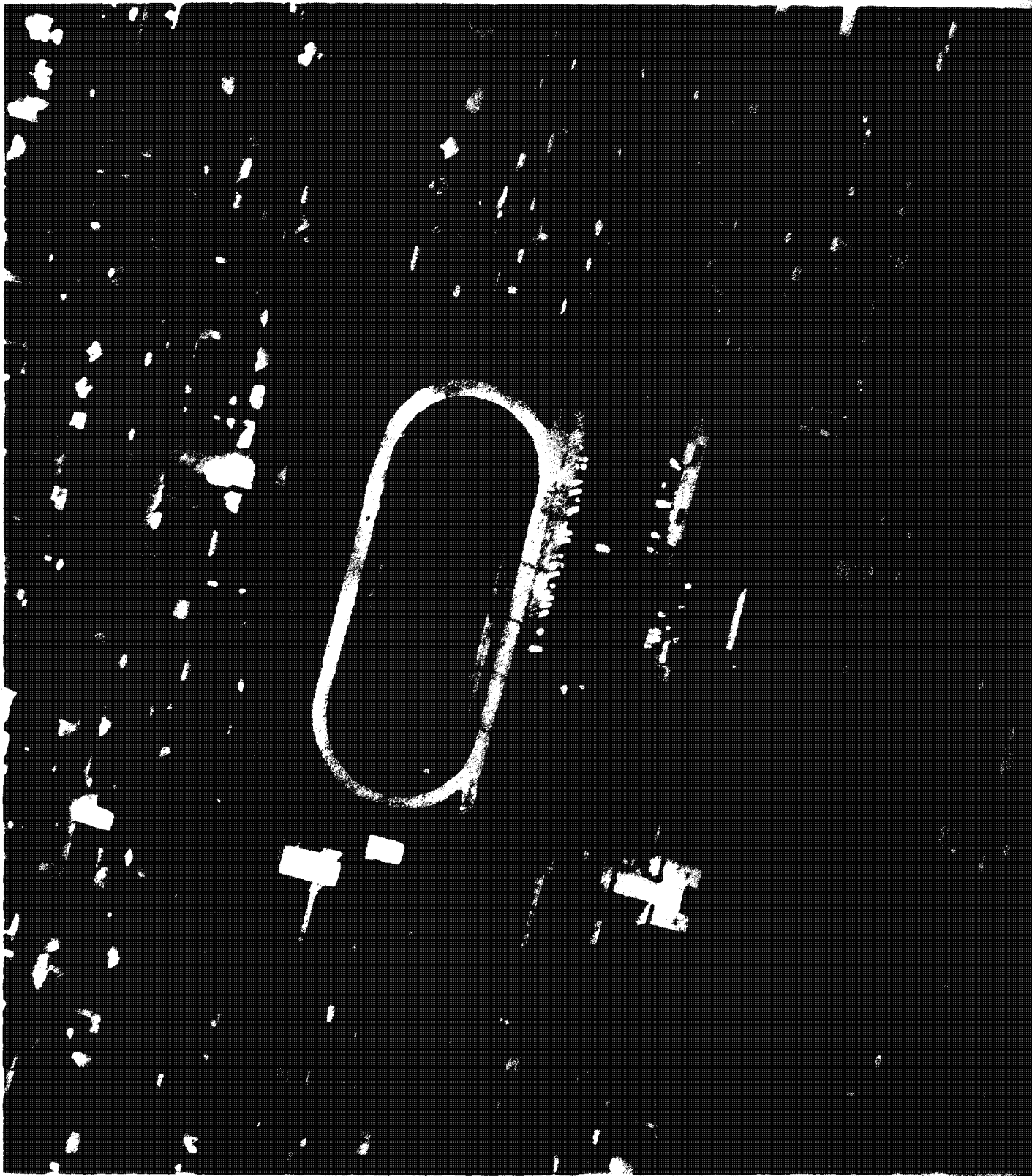
B-16

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Controls Only



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BYE 15470



~~TOP SECRET~~

PHOTOGRAPH 7

Vehicle Number 953  
Rev D16 Frame 006 40X

B-17

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PHOTOGRAPH 8

Rev D15, Frame 014

Highway and buildings.  
(20X)

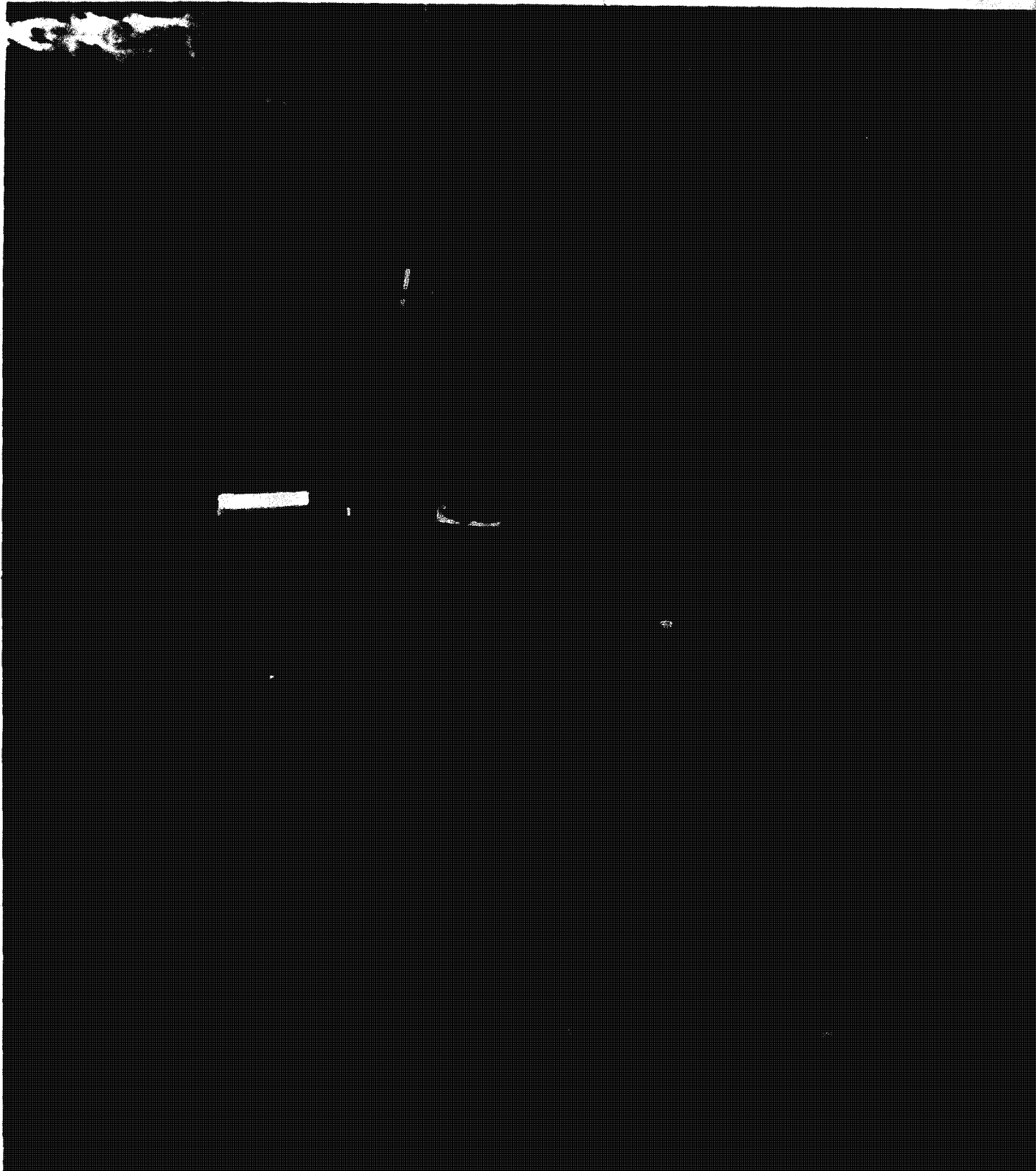
This scene was simultaneously covered by the "Blackbird" flight. The satellite photograph was enlarged 20X to bring it to the same scale as a 10X enlargement of the Blackbird photo. The images are reversed due to the reflecting mirror used in the Gambit system.

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~~TOP SECRET~~

PHOTOGRAPH

Vehicle Number 953  
Rev D15 Frame 014 20X

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Controls Only

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PHOTOGRAPH 9

Rev D15, Frame 014

Blackbird  
(10X)

Same scene shown in Photograph 8. The Blackbird aircraft took this picture from 20,000 feet, using a KA-2 twelve inch focal length camera. The satellite used a 77 inch focal length camera from approximately 95 nautical miles altitude.

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~~TOP SECRET~~

PHOTOGRAPH 9

Blackbird Mission 27 Oct 1963

B-21

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Controls Only

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B-22 15470

PHOTOGRAPH 10

Rev D15, Frame 012

Midwestern town.  
(10X and 40X)

An error of 10% in Image Motion Compensation  
was programmed to determine effect on image.

Note degradation at 40X.

~~TOP SECRET~~ - GAMBIT

B-22

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~~TOP SECRET~~

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~~TOP SECRET~~

PHOTOGRAPH 10

Vehicle Number 953  
Rev D15 Frame 012 10X

B-23

~~TOP~~

~~SEC~~

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~~TOP~~

~~SEC~~

PHOTOGRAPH 10

Vehicle Number 953  
Rev D15 Frame 012 40X

B-24



~~TOP SECRET~~ GAMBIT

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PHOTOGRAPH 11

D15, Frame 009

Western town.  
(10X and 40X)

Another programmed error in IMC, this time 2%.

Compare this image at 40X with Photograph 10 at  
the same magnification.

~~TOP SECRET~~ GAMBIT

B-25

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~~TOP SECRET~~

PHOTOGRAPH 11

Vehicle Number 953  
Rev D15 Frame 009 10X B-26

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~~TOP SECRET~~

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~~TOP SECRET~~

PHOTOGRAPH 11

Vehicle Number 953  
Rev D15 Frame 009 40X

B-27

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BYE 15470

PHOTOGRAPH 12

Rev D15, Frame-013

Static discharge, which occurred during re-  
spooling prior to processing of the original  
negative. A number of frames are affected,  
but rarely did the discharge enter the image area.  
(10X)

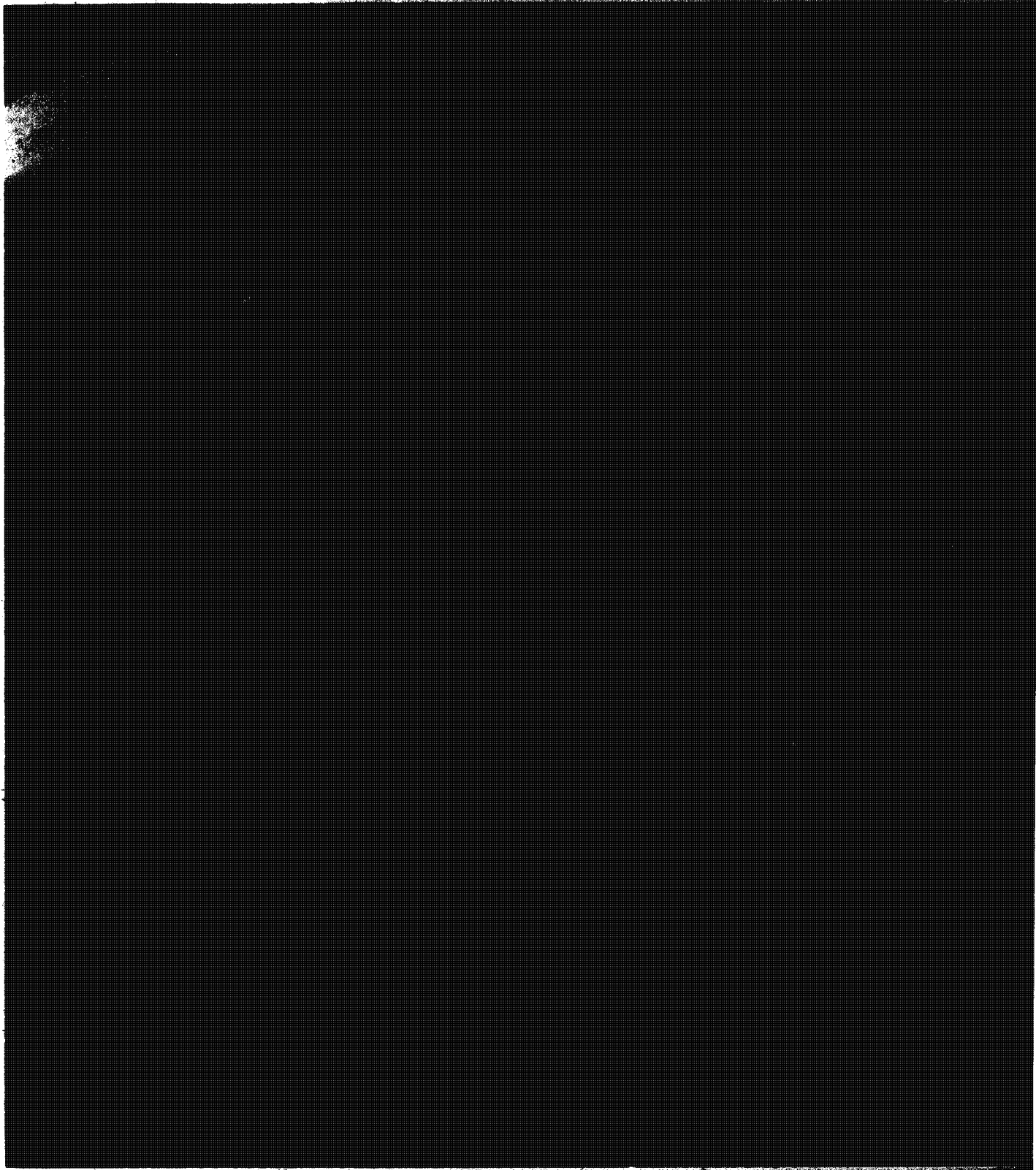
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B-28

~~TOP SECRET~~

BYE 15470



~~TOP SECRET~~

PHOTOGRAPH 12

Vehicle Number 953  
Rev D15 Frame 013 10X

B-29

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PHOTOGRAPH 13

Rev D16, Frame 006

An example of the banding caused by film speed variations which occur during camera startup. This banding damped out in 1.5 seconds, in accordance with design specifications.

~~TOP SECRET - GAMBIT~~

B-30

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TOP SECRET 38 01 83

D 18 008

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P

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PERFORMANCE EVALUATION TEAM  
REPORT NO. 4003/63

APPENDIX C

~~TOP SECRET~~ - GAMBIT

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Controls Only  
PERFORMANCE EVALUATION TEAM  
REPORT NO. 4003/63

ILLUSTRATION 1

Rev D15, Frames 013 and 014

Geoplot

This characteristic plot shows the miss distance between the photo bench mark and the calculated positions of bench mark. Note the larger miss distance of the second frame and the trend of the calculated bench mark position in the second frame to drift to the west.

~~TOP SECRET - GAMBIT~~

C-1

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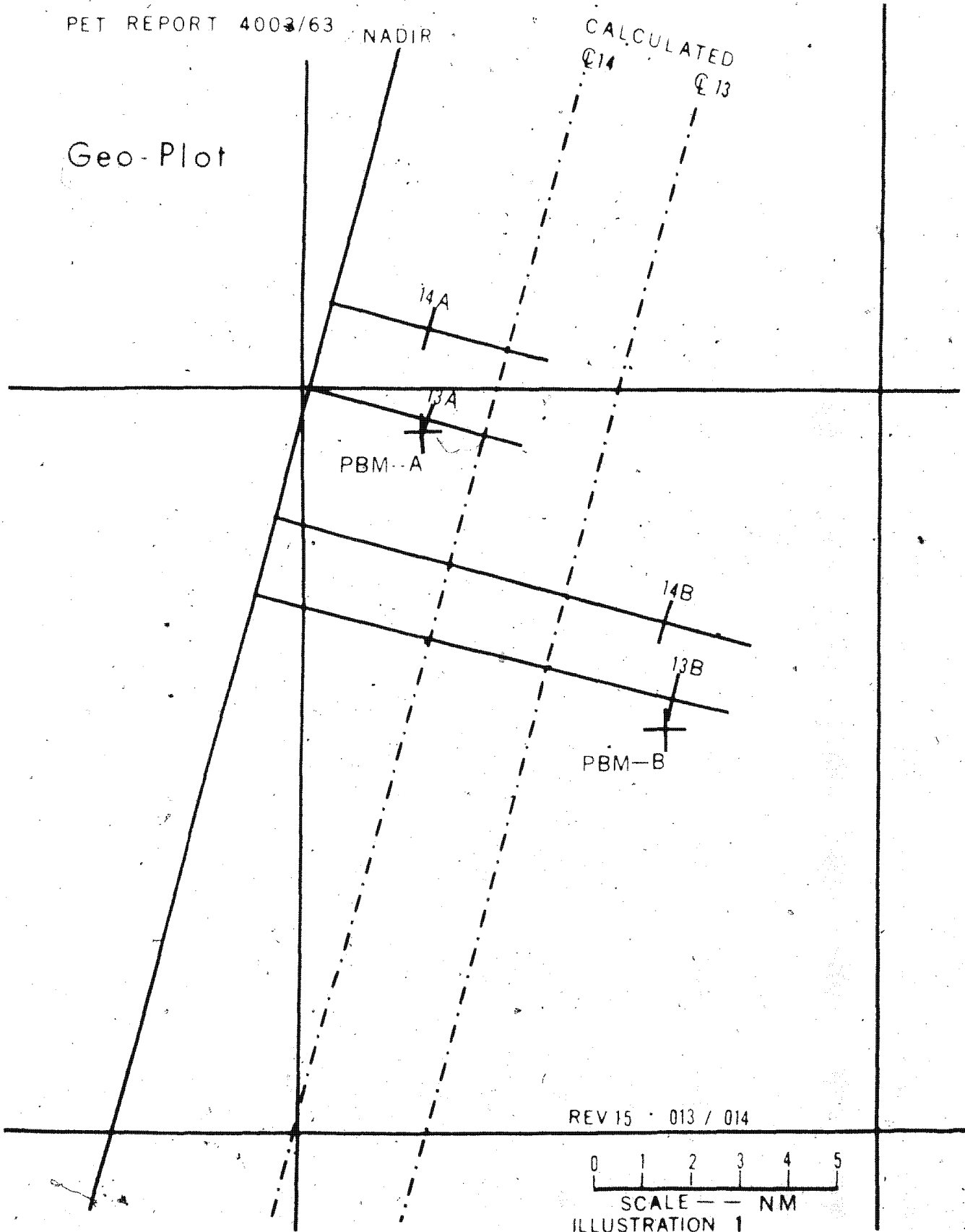
~~TOP SECRET - GAMBIT~~

BYE 15470

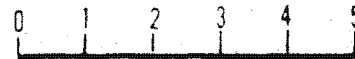
PET REPORT 4003/63 NADIR

Geo-Plot

CALCULATED  
Q14  
Q13



REV 15 013 / 014



SCALE — — NM  
ILLUSTRATION 1

~~TOP SECRET - GAMBIT~~

C-2

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REPORT NO. 4003/63

ILLUSTRATION 2

Rev D16, Frames 005 and 006

Stereo Deviations Due to Attitude

This illustration outlines the major terrain features of stereo frames 005/006. Between the two frames the film velocity was decreased to compensate for the increase in vehicle altitude. This may be noted by the variance in time track shown along the edge of the frame. The variation in scale can be attributed to attitude changes in the camera system.

~~TOP SECRET~~ - GAMBIT

C-3

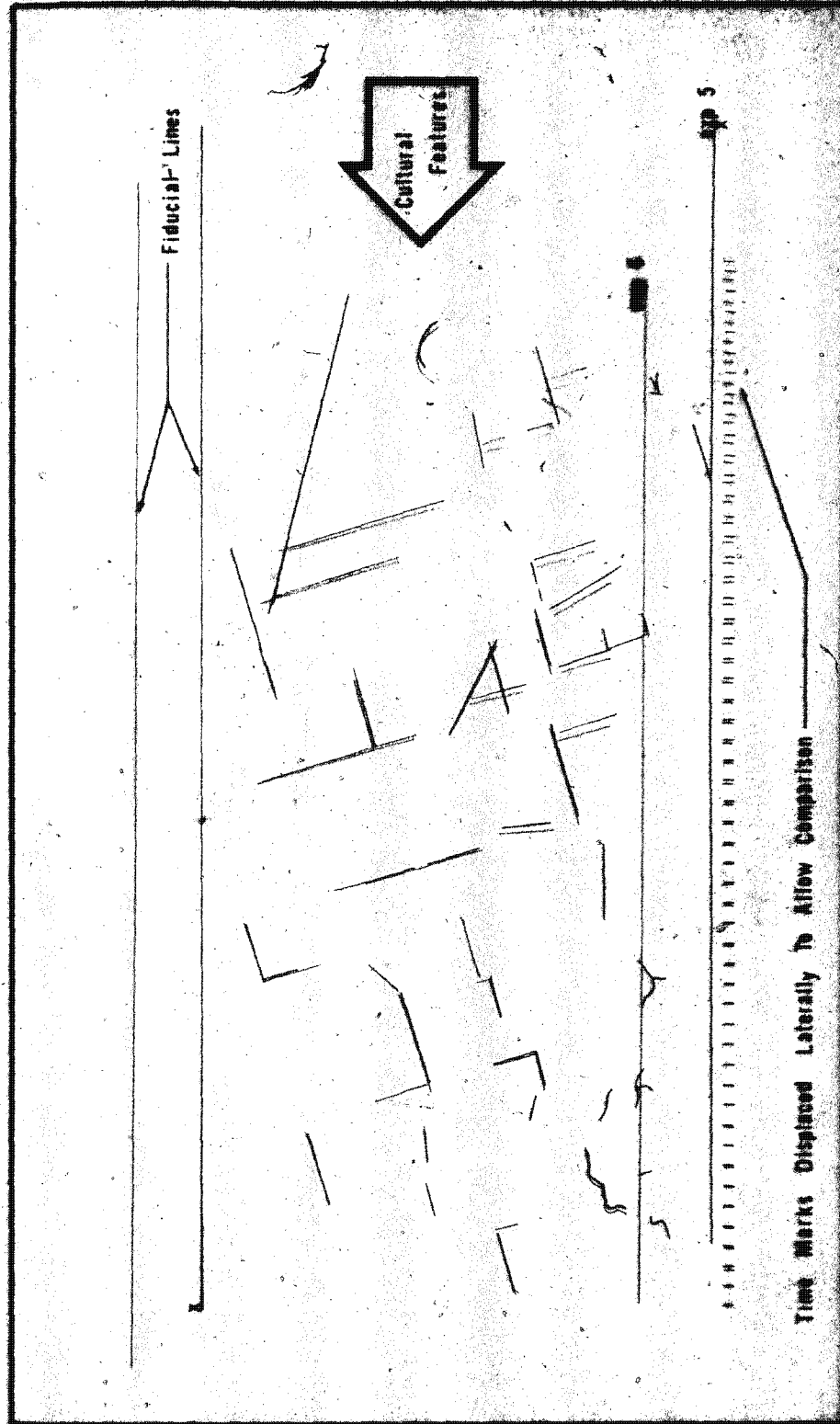
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STEREO DEVIATIONS DUE TO ATTITUDE



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ILLUSTRATION

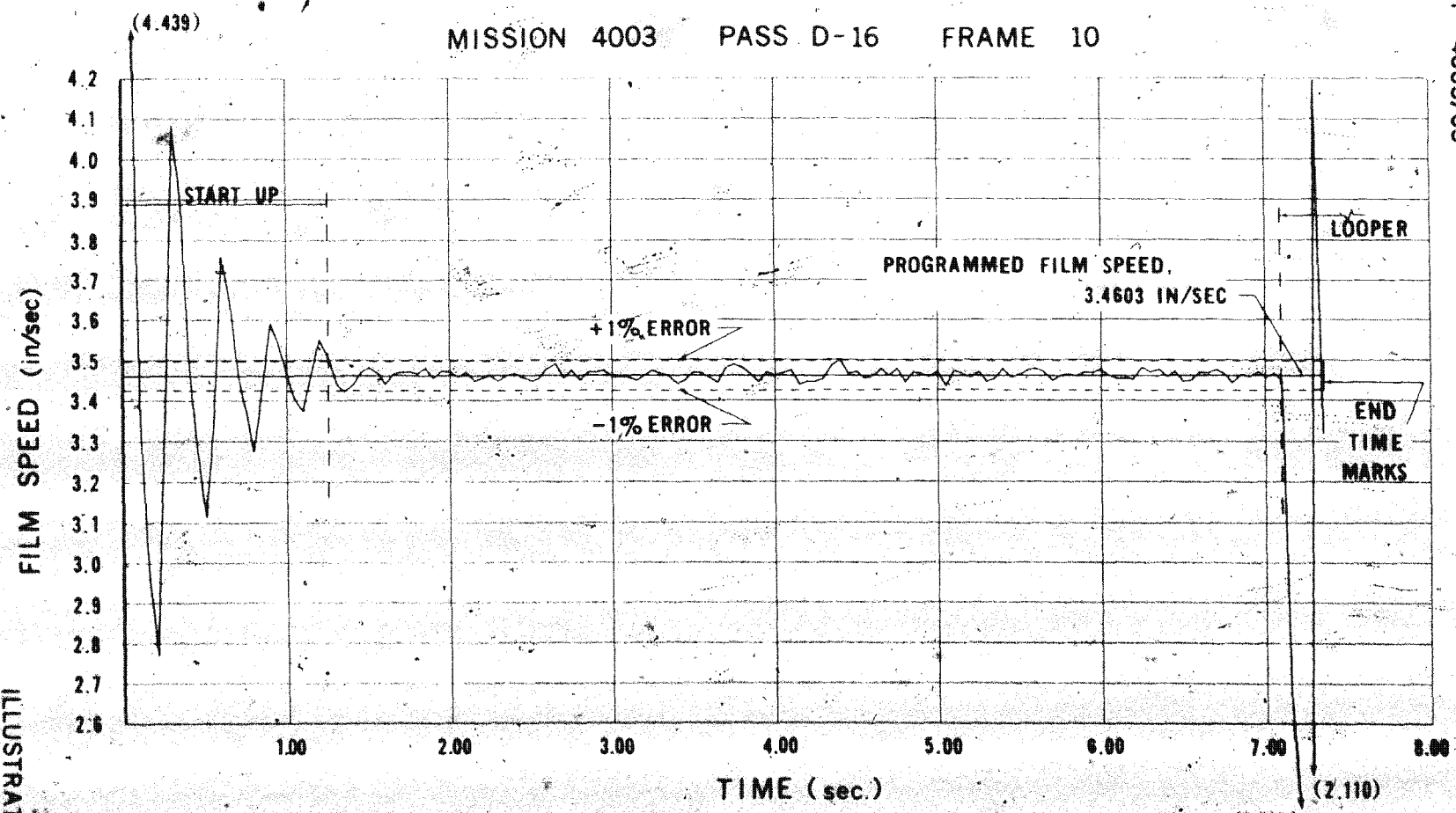
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# FILM SPEED VERSUS TIME

MISSION 4003 PASS D-16 FRAME 10



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C-5

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ILLUSTRATION 3

Handle Via BYEMAN  
Controls Only

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FILM SPEED VERSUS TIME

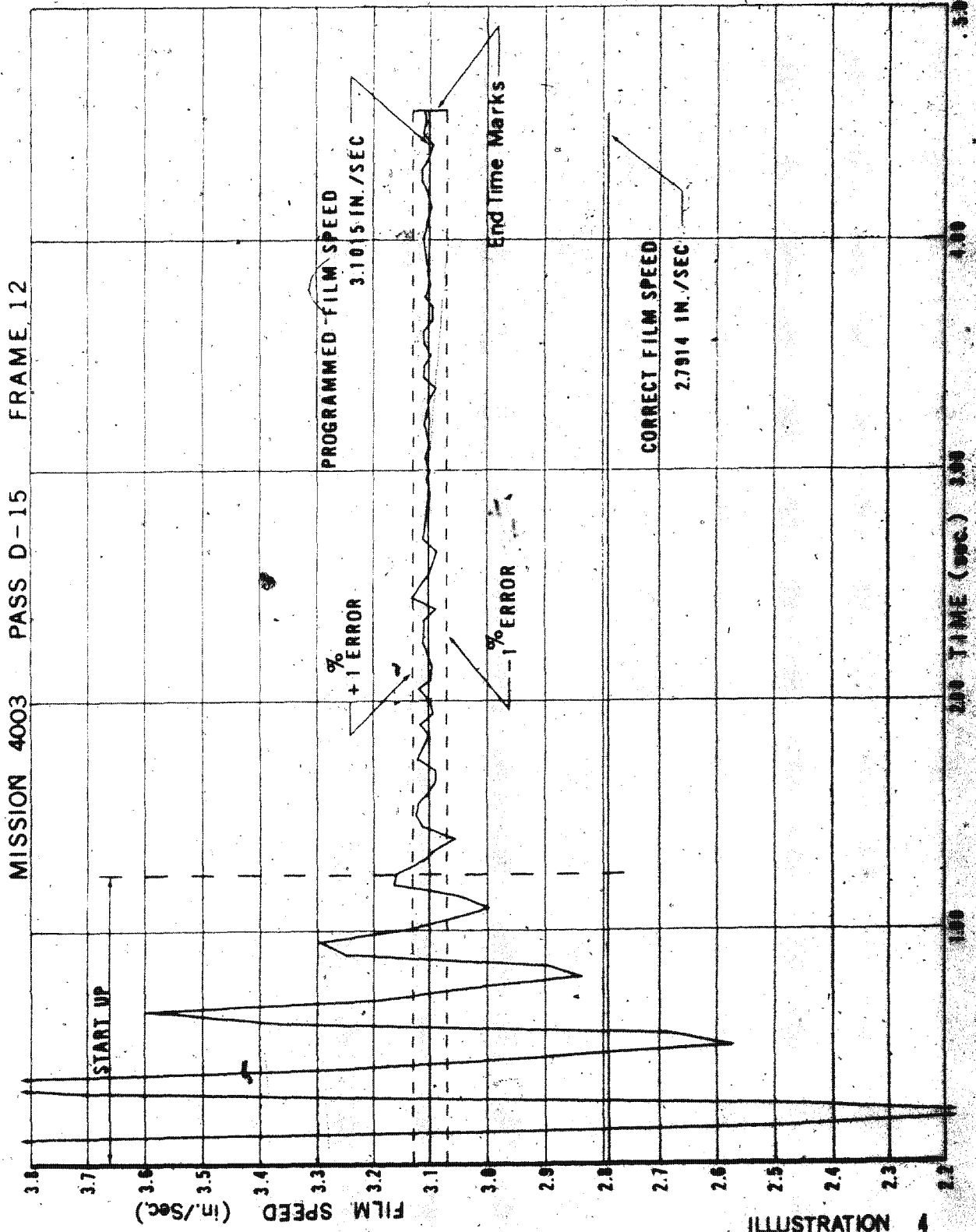


ILLUSTRATION 4

~~TOP SECRET - GAMBIT~~

Handle Via BYEMAN  
Controls Only

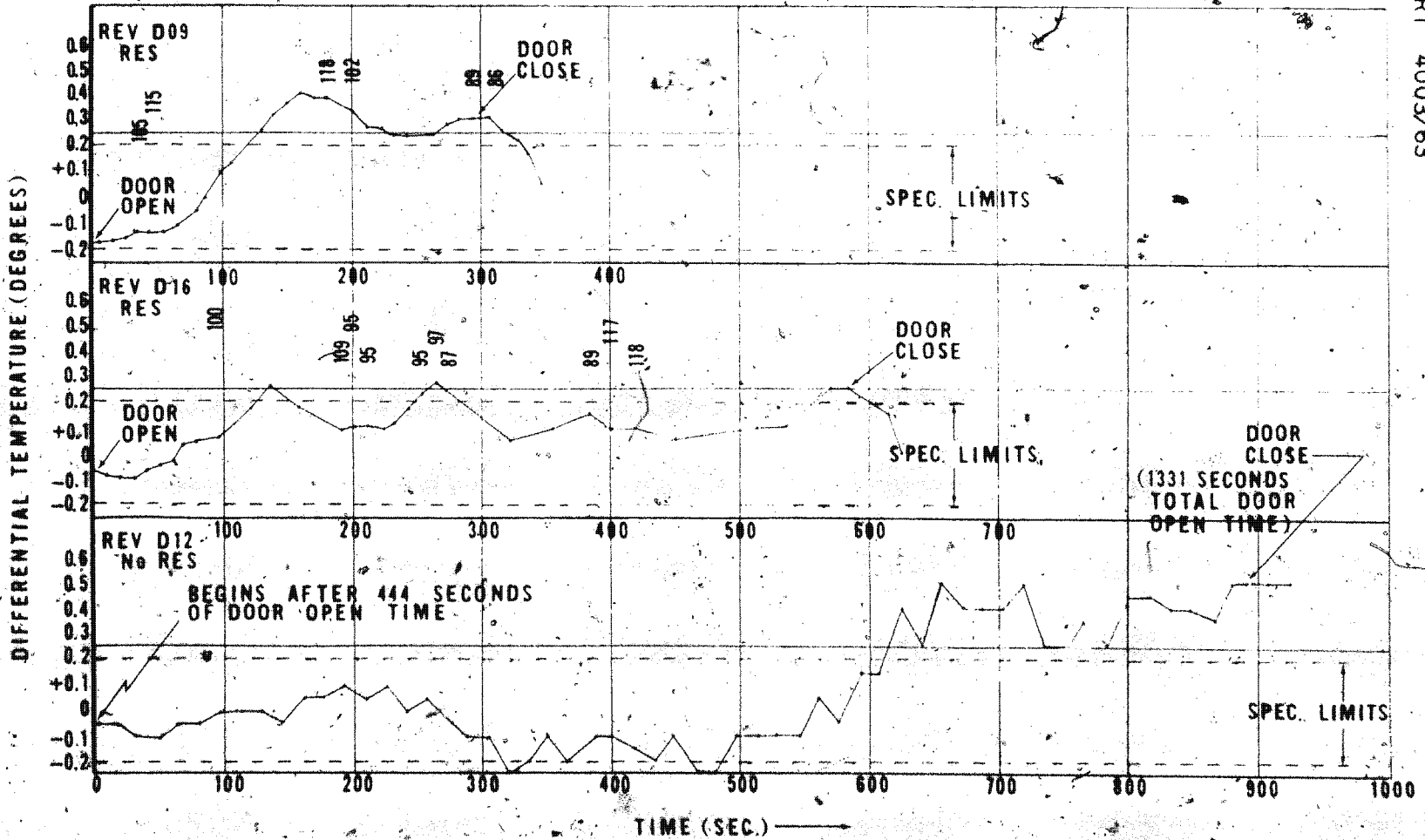
C-6

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STEREO MIRROR DIFFERENTIAL TEMPERATURE



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C-7

ILLUSTRATION 5  
Handle Via BYEMAN  
Controls Only

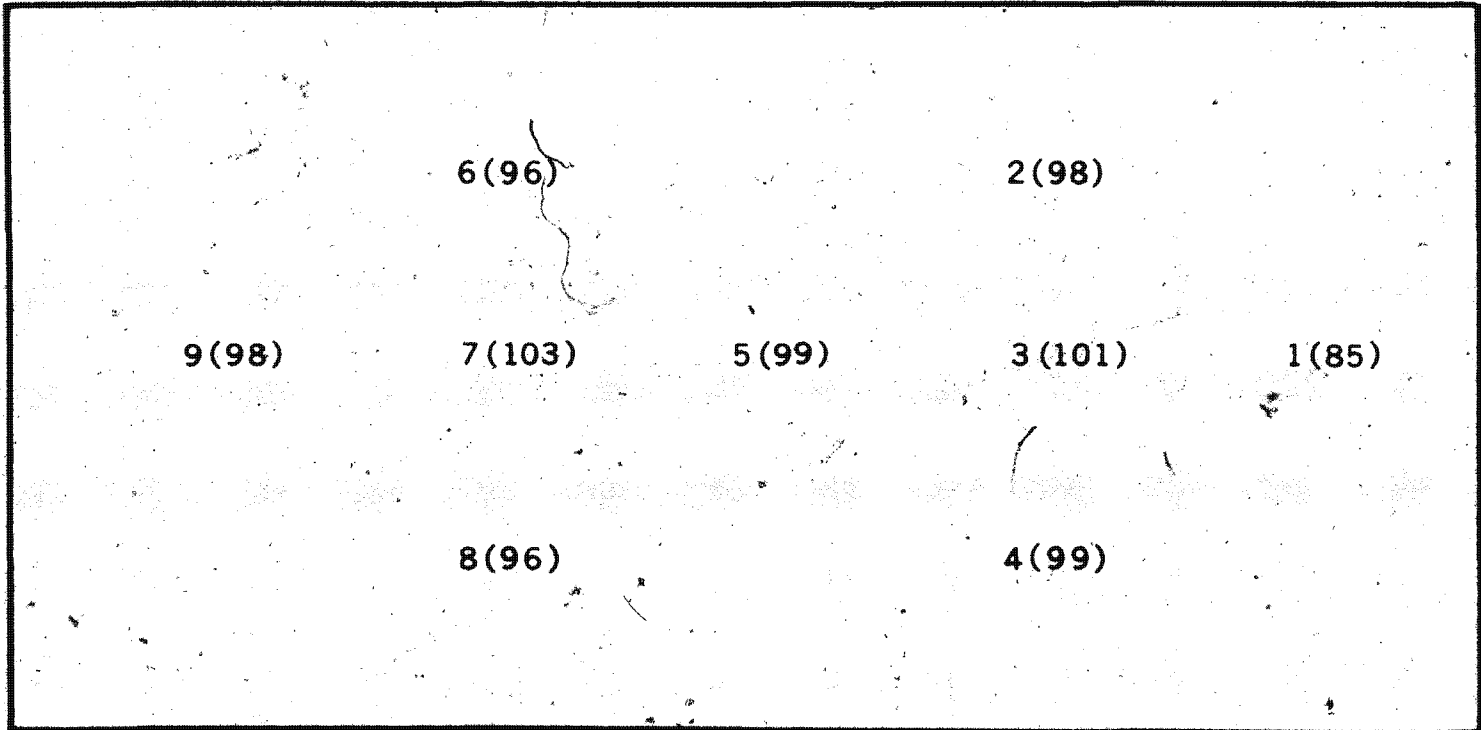
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BYE 15420

RES DISTRIBUTION IN FORMAT  
(by Area)  
Title Side



End of  
Frame

Time Track Side

Start of  
Frame

Average RES in Parenthesis( )

~~TOP SECRET - GAMBIT~~

C-1

ILLUSTRATION 6

Handle Via BYEMAN  
Controls Only



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RES DISTRIBUTION

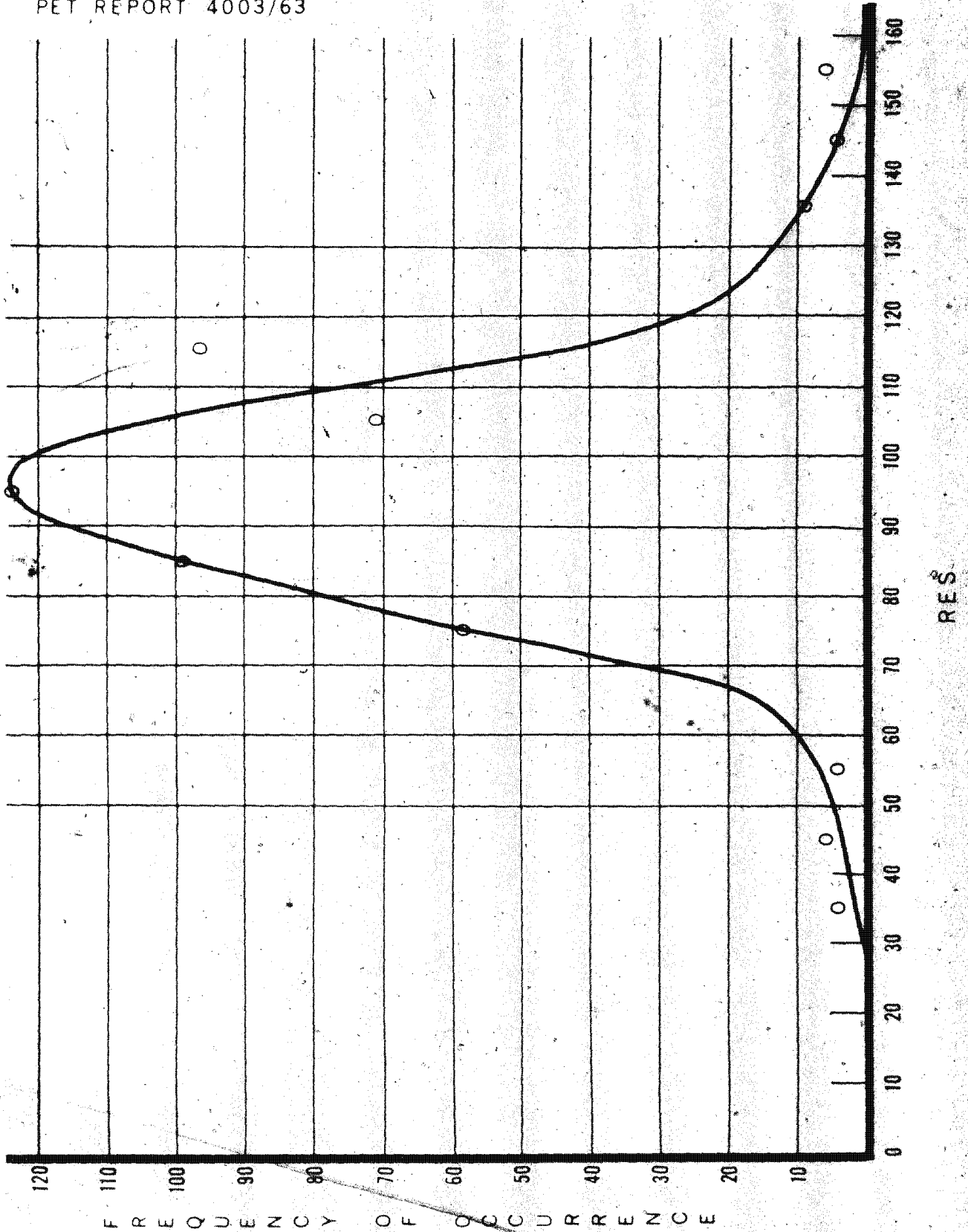


ILLUSTRATION 7

~~TOP SECRET - GAMBIT~~

Handle Via BYEMAN  
Controls Only

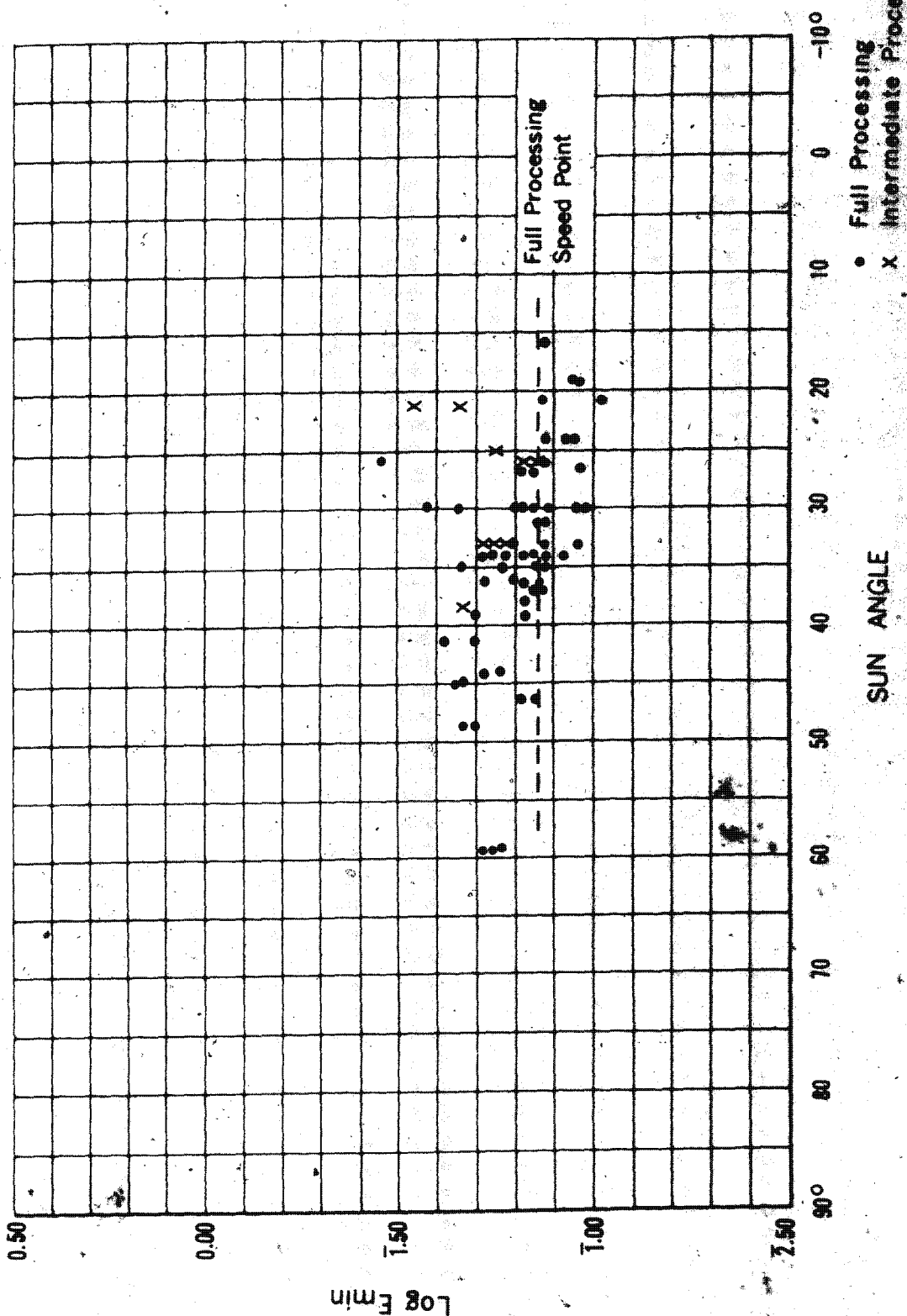
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Log E<sub>min</sub> VERSUS SUN ANGLE



ILLUSTRATION

~~TOP SECRET - GAMBIT~~

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C-10

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Controls Only

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### INTERMEDIATE PROCESSING CURVE

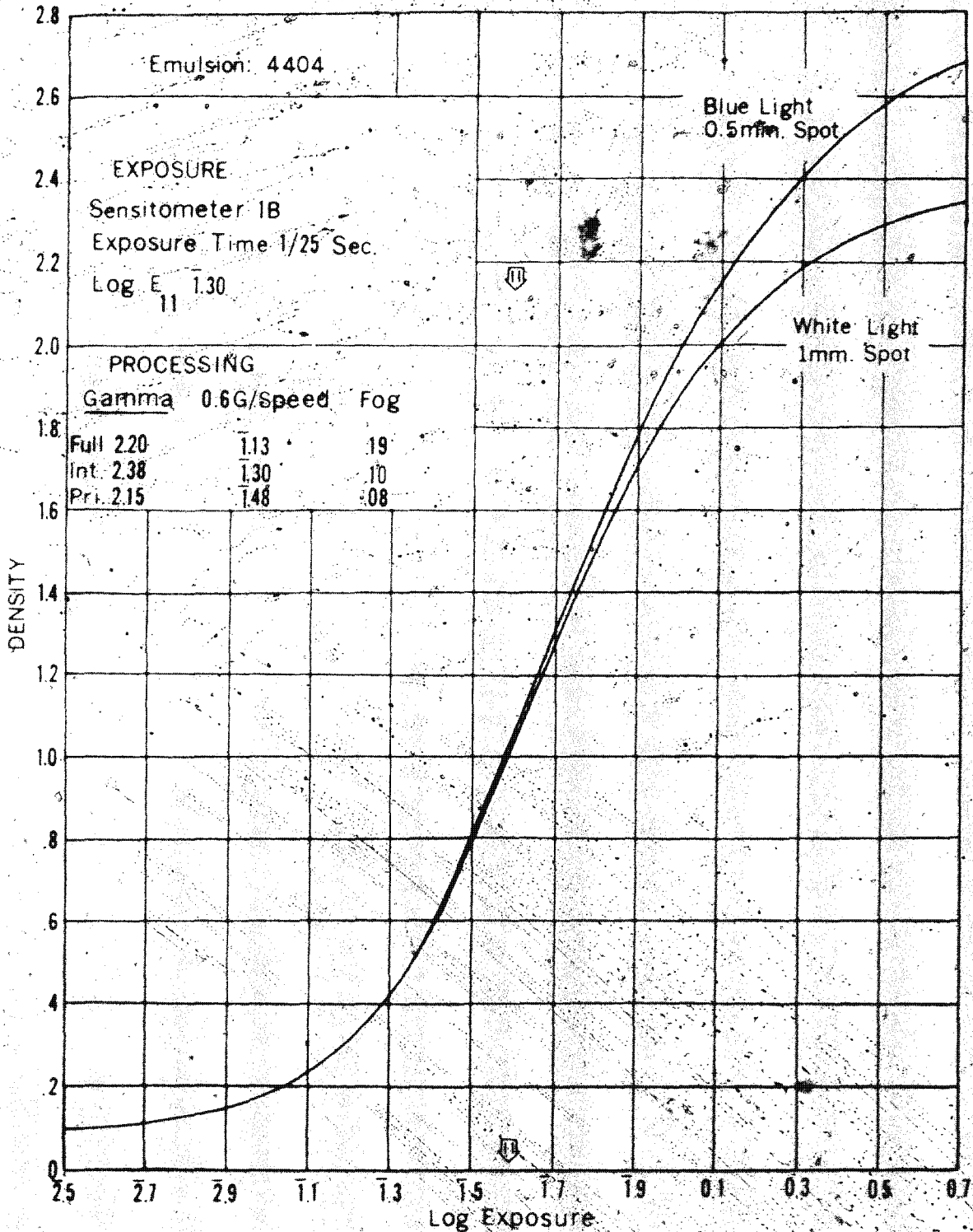


ILLUSTRATION 9

~~TOP SECRET - GAMBIT~~

C-11

Handle Via BYEMAN  
Controls Only

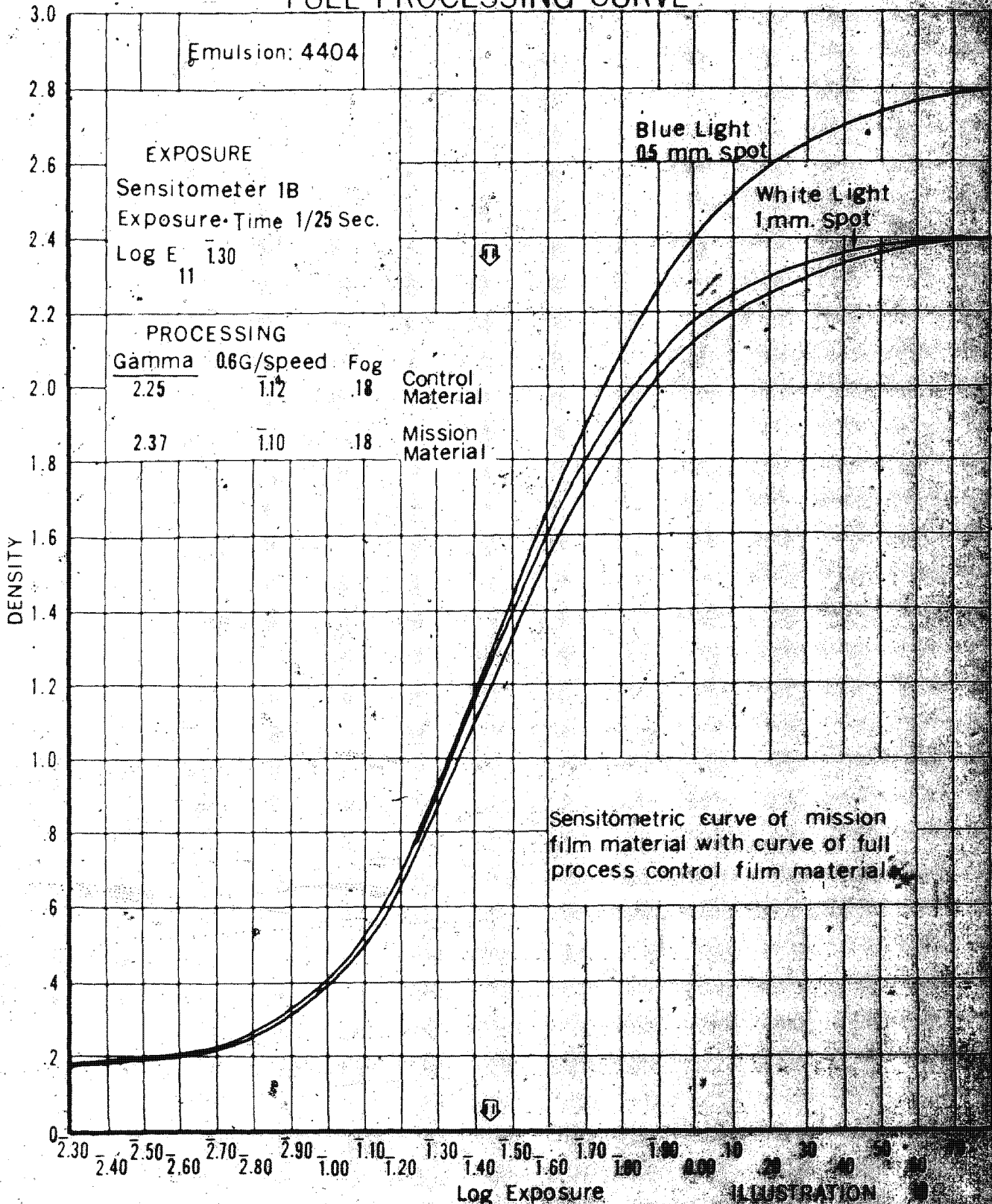
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### FULL PROCESSING CURVE



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C-12

ILLUSTRATION