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SYSTEM
PERFORMANCE EVALUATION TEAM
(FLIGHT MISSION CHARACTERISTICS)
MISSION 4008/64

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SPB 4 045

TOTAL PAGES 7

CY 1 of 7

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SYSTEM
PERFORMANCE EVALUATION TEAM
(FLIGHT MISSION CHARACTERISTICS)
MISSION 4008/64

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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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PERFORMANCE EVALUATION TEAM

REPORT NO. 4008/64

PUBLICATION REVIEW

This report has been reviewed and is approved.

Victor M. Genez

VICTOR M. GENEZ
Colonel, USAF
Team Manager

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SAFSP PERFORMANCE EVALUATION TEAM

SAFSP

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PERFORMANCE EVALUATION TEAM

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SECTION I

RESUME OF MISSION 4008

Mission 4008, consisting of the GAMBIT Camera, the Stellar/Index Unit, and the Orbital Control Vehicle System, was launched into orbit from Point Arguello Launch Complex, Pad 3, at 1920:35Z on 19 May 1964.

The satellite vehicle was boosted into orbit by an Atlas D/Agena D combination with the following sequence of ascent events:

	Nominal (sec)	Actual (sec)
Baro Switch Closure	88.9	91.1
Booster Engine Cut-off	137.9	136.1
D Timer Start	272.1	273.1
Sustainer Engine Cut-off	275.7	274.1
Vernier Engine Cut-off	293.0	291.1
Agena Ignition	351.2	352.1
Agena Cut-off	592.3	(not available)

Initial perigee was approximately 55NM, so an emergency orbit-adjust maneuver was executed on Rev 02 to raise both perigee and apogee. Subsequent to this orbit-adjust, the satellite vehicle (OCV) achieved the following orbital parameters compared to preflight nominals:

	Nominal	Actual
Inclination (degrees)	101.0	101.0
Period (minutes)	89.9	89.88
Apogee (nautical miles)	218.0	223.0
Perigee (nautical miles)	93.0	82.2
Eccentricity	.01730	.0196

Following the first day of operational photography, an additional orbit-adjust maneuver was executed to lower perigee. After orbit-adjust, the satellite vehicle had the following orbital parameters:

Inclination (degrees)	101.1
Period (minutes)	89.6
Apogee (nautical miles)	222.2
Perigee (nautical miles)	70.4
Eccentricity	.0195

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At lift-off, 2,709 feet of Eastman Type 4404 film was in the supply spool. Of this amount, 648 total feet of film was expended in operational and R&D photography.

The operational objectives of Mission 4008 were to conduct a four-day photographic mission to obtain high resolution photography of selected targets, demonstrate software capability to optimize targets to be photographed and to continue evaluation of vehicle stabilization and pointing capabilities. These mission objectives were only partially realized due to a vehicle stabilization anomaly subsequent to Rev 15 followed by command anomalies. The capsule was recovered by the primary system on Rev D34 and air-snatch of the payload capsule was accomplished on 21 May 1964.

Operational target selection was accomplished by the (S) NRO Staff, basing their selections on computer runs made by the STL Mission Profile Generation Program (MPGP). All operational photograpl was obtained through commands generated by the STL MPGP. The total photographic take consisted of 32 stereo pairs and 58 mono strips, including lateral pairs. Clouds obscured approximately 40 percent of the frames exposed.

Photography obtained prior to Rev 16, when the vehicle became unstable, generally is excellent.

Illustrations 1 and 2 which follow present a graphic display of photographic coverage as derived from Mission Correlation Data (TDATA).

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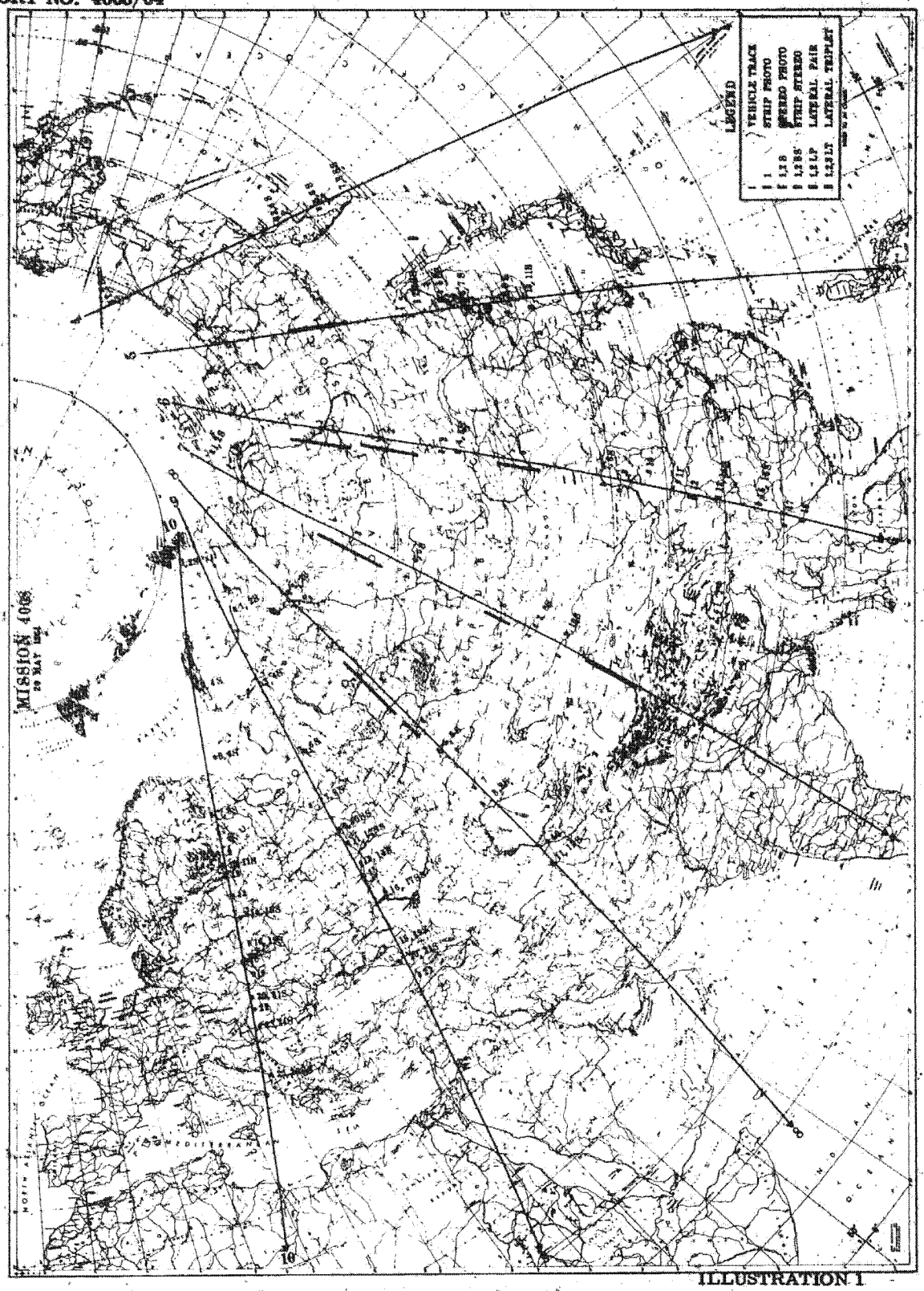

ILLUSTRATION 1

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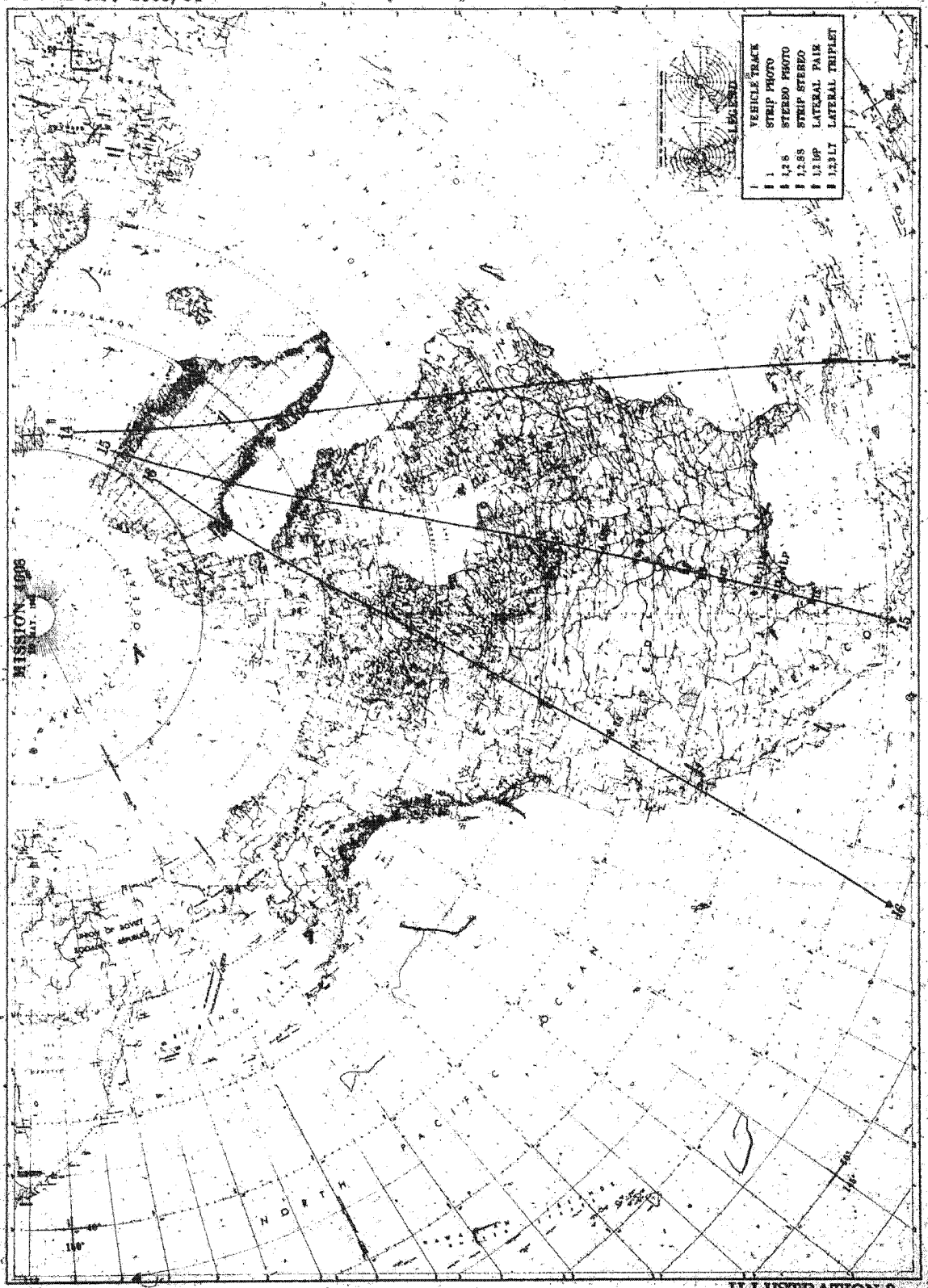

ILLUSTRATION 2

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SECTION II

FLIGHT PROGRAM

A. Performance of the Command System

1. Command Load Summary

Due to the anticipated prediction anomalies associated with the fly-low environment, and thrusting due to vehicle maneuvering, frequent command loading was performed on Mission 4008 as it was on Mission 4007.

The payload commands on Revs D04 through D07 had an error of 0.4 seconds, or approximately 1.6 NM in-track, due to an improper system time-vehicle time correlation which was introduced in the computer at lift-off. This error was insignificant since, on the same revs, there was a prediction error of approximately 50 NM. The prediction error was due to a limited amount of tracking data, the two orbit-adjusts on Rev 02, and the low altitude of the vehicle. On Rev 08, an incorrect vehicle time-system time slope was inadvertently introduced in the computer which produced a maximum error of 0.4 seconds, or 1.6 NM in-track, on Rev 10.

a. Command message 103 was loaded at Thule Tracking Station (TTS) on Rev 04 for operational photography on Revs D04 through D07 to obtain 13 stereo pairs and 22 strips. Ephemeris information was based on updated data to the second orbit-adjust maneuver on Rev 02.

b. Command message 104 was loaded at Vandenberg Tracking Station (VTS) on Rev 08 for operational photography on Rev D08 to obtain 2 stereo pairs and 8 strips. Tracking data updated to Rev 06 was used.

c. Command message 105 was loaded at Kodiak Tracking Station (KTS) on Rev 09 for operational photography on Revs D09 and D10 to obtain 15 stereo pairs and 18 strips. Tracking data updated to Rev 07 was used.

d. Command message 107 was loaded at New Hampshire Tracking Station (NHS) on Rev 14 for R&D photography on Revs D14 and D15 to obtain 2 stereo pairs, 2 lateral pairs, and 8 strips. Ephemeris information was based on updated data to the orbit-adjust maneuver on Rev 12.

e. Command message 108 was loaded at TTS on Rev 16 for R&D photography on Rev D16 to obtain 1 stereo pair and 2 strips. Tracking data from Revs 14 and 15 was used.

2. During Mission 4008, the GE computer program GMINT eliminated one target on Rev 10 passed by the STL computer program. The elimination was an Error 1C, "Time to Roll Less than Zero", which occurred due to a limitation of the STL computer program. With the increased target

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density, and the capability of the program to consider multiple targets, only eight targets were exceeded.

3. "Insufficient Time to Roll" error notes were generated by the GE computer program GMINT for framed targets even though no change in roll angle existed. This is a program error and should be corrected. The following table contains a complete summary of all "Insufficient Time to Roll" error notes.

INSUFFICIENT TIME TO ROLL ERROR

Rev No.	Acc No.	Insufficient Time (in seconds)
D04	008	*1.36
D05	003	*1.11
	005	*0.71
D06	005	*1.30
D08	008	0.17
	009	*1.09
	012	*2.03
D09	010	*1.35
	017	*1.04
D15	006	0.95
	012	1.30 (lateral pair)
	014	1.30 (lateral pair)

* Framed Stereo - no change in roll

4. Several commands were generated with film speeds below the minimum value available. The following table contains a summary of these commands.

FILM SPEED ERROR

Rev No.	Acc No.	Value of Vf Below Minimum (%)
D05	002	1.15
	003	2.41
D06	010	9.37
D07	001	0.20
	002	0.69
D09	001	4.60
	002	4.89
	016	5.57
	017	6.94
D10	014	2.88
	015	3.87

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5. The shutdown times observed on the film are consistently long by 0.1 second for T_2 and 0.3 second for T_4. GE has studied the problem and agrees that the observed times are correct and consistent with their data. For both shutdown times, 0.1 second can be accounted for by a difference between the actual time word as used by the vehicle and the time word used in the system software. The least significant bit which is always in the one state has been counted as part of the word and is equal to 0.1 second. The vehicle used this bit only as a reference mark and counts it as a zero. The additional 0.2 second delay in T_4 is accounted for by the fact that the counter recycles after T_2 and again after T_3, and each time it loses a .1 second time mark while the recycle is taking place. If this problem cannot be taken care of in the hardware and is to be accounted for in the software, only the STL programs would be affected but would require extensive programming.

B. Geopositioning

1. The objective of this phase of the system evaluation was to determine how well the actual photographic positions agreed with the calculated positions. Stereo photographs selected for analysis were those having good cultural features, few clouds and corresponding 200 Series Charts with accuracies better than 1,000 feet. Because of the mission duration, stereo selection was limited; therefore, a few strip photographs were chosen in order to distribute the measurements through all revs. All photographic frames on Rev 15 were analyzed in order to evaluate the attitude stability. On Rev 16, only Frame 004 had detail which could be recognized and plotted. A total of 47 frames were plotted and analyzed, of which 24 were stereo photographs and 23 were strip photographs.

2. The miss distances were determined by two methods, both requiring that Photographic Bench Marks (PBM's) be identified on the photography and on the corresponding 200 Series Charts. The times for the PBM's were read from the film and used for locating the corresponding predicted positions. In one method, these positions were plotted on the maps and all measurements made directly thereon; the results are listed on the technical data sheets under "Positioning Error" - Manual Plot Method. The second method used the PBM's, their times, the latitudes and longitudes, and the predicted camera orientation. Using the equations described in PET Report 4007, these data were input to the computer program, results of which are shown on the technical data sheets under "Positioning Error" - Computer Method. The accuracy of these attitude computations should be very good since the same PBM's were used for each frame of the stereo pair. Therefore, the mapping inaccuracy should be reduced. The close correlation of the results of the two methods can be seen by examination of the data presented.

3. The results of this phase of the map match were input to the Pointing Error Program (PEP) which determines errors in pitch, roll and yaw (see PET Report 4006). The value of in-track and cross-track, as determined by the computer method, were used for computing the pitch, roll and yaw

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angles, which are entered in the data sheets under "Attitude Error".

4. The graph shown in Illustration 3 is a plot of the selected photo frames in which the obliquity angles, miss distances, and attitude errors are displayed. This graph is not plotted as a function of time; therefore, caution should be observed in interpreting the trends. Also, the scale of the pitch, roll and yaw angles has been expanded to improve the value of the quantities recorded. It should be noted that none of the attitude errors computed were greater than one degree through Rev 15.

5. The geopositioning miss distances give no indication of how accurately the target has been positioned with respect to the photography. The geopositioning uses the best-fit ephemeris (Mission Correlation Data) which is determined from the tracking data after-the-fact. This best-fit ephemeris, shown in the technical data sheets, when compared with the Command Position (also shown in the data sheets), gives a good indication of how far the target was missed because of errors in predicting the ephemeris position. As can be seen from the data sheets, the Command Position improves as more tracking data is acquired, evidenced in Revs 8 through 14. A detailed explanation of how the target is centered, considering such factors as burst time, delay time, and speed-up time, has been described in detail in PET Report 4007.

6. An attempt was made to perform geopositioning on Rev 16; however, Frame 004 was the only photograph having identifiable cultural features. The miss distances varied considerably throughout the frame. A more detailed analysis is being performed on this rev in order to evaluate the vehicle attitude.

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CALCULATED VEHICLE ATTITUDE

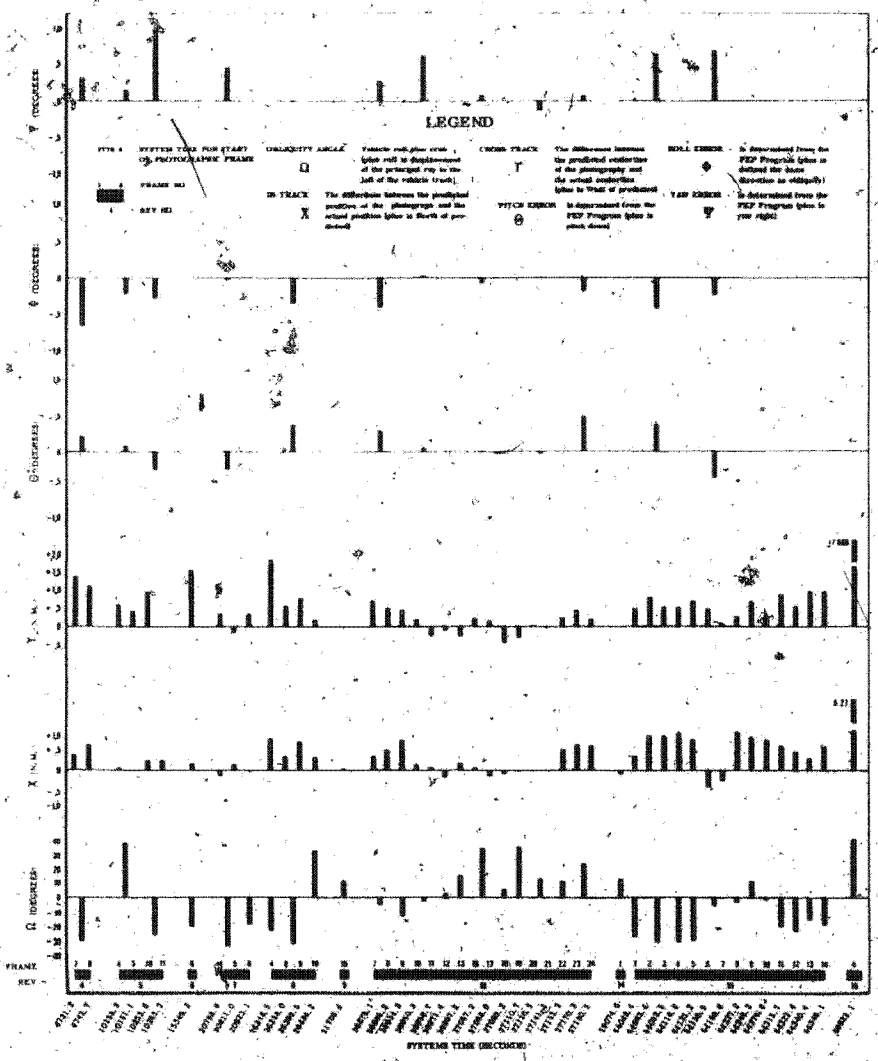

ILLUSTRATION 3

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SECTION III

PHOTOGRAPHIC CHARACTERISTIC EVALUATION SUMMARY

(SPPL Report No. 101-1-24)

Inspection of the original negatives obtained from Reconnaissance Satellite Mission 4008 resulted in the following observations:

A. A continuous minus-density line paralleling the film edge and located 2" in from the non-titled edge.

B. A fine emulsion scratch 1/8" from the titled edge was present on most frames.

C. The minute, chatter-like emulsion digs which were present on Mission 4007 were also found on Mission 4008 on three occasions.

D. Film was free of lint and foreign particles.

E. Random pinholes and minor emulsion scratches.

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SECTION IV

CAMERA SYSTEM OPERATIONS

A. Primary Camera

1. Film Transport: No malfunctions observed. The banding in the first frame of Rev D15, caused by film set, is plotted in Illustration 4. The result of using Frame 001, Rev D15, as a take up to eliminate this banding is plotted in Illustrations 5 and 6.

2. Mirror Movement: The stereo mirror start-up transients were timed to start at the film drive power off time, as shown in Photograph 1, stopping transient. The mirror stopping transient appeared in the following frame in the film drive starting transient but did not go beyond this starting transient. Apparently, the mirror movement time and the stereo interframe time are well-synchronized.

3. Slit Quality: The slit had only a few minor imperfections which caused one 0.2/mm wide minus density streak 1/8" in from fiducial mark on side opposite time track side, a very light negative density streak 1 7/8" in from time track side, and a small band of three very light negative density streaks in 3 1/4" from the time track side.

4. Double Yaw Slits: Images are very clear, indicating the vignetting problem on previous missions has been solved.

5. Footage Utilization: The flight load consisted of 2,932 feet of Type 4404 film, of which 223 feet was utilized in ground tests and 123.4 feet was used for wrap-up between revs. The remaining 524.6 feet was consumed by operational take and payload health check.

6. Light Leakage: The slit aperature configuration was burned at the stopping points on the film being transported, with the doors closed, during the on-orbit payload health check, indicating some source of light (see Photograph 2). The source of light has not been determined as of the date of this report, but it appears as if the doors may not have been fully closed. Further analysis is being undertaken to isolate this leakage.

7. Processing: The processing development level for most of the mission was Full, with Intermediate being used on five frames on each of two revs (D04 and D05). The majority of the mission was photographed at solar altitudes of 50° or greater. There were a few scenes with light snow cover but these same scenes were generally affected by some cloud cover, thus negating the need for changing processing levels.

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FILM VELOCITY VERSUS TIME - MISSION 4008 PASS D15 FRAME 1

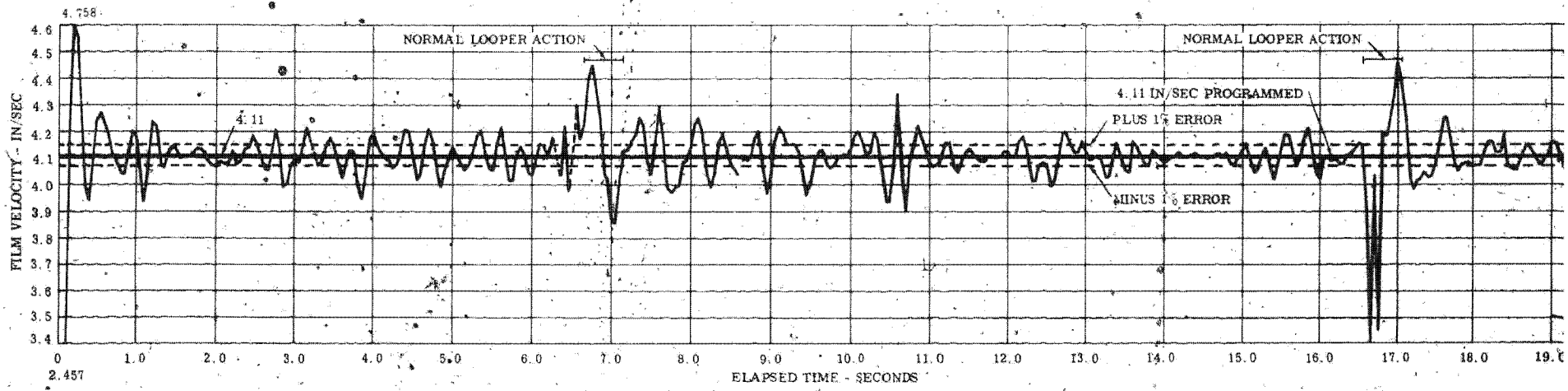

ILLUSTRATION 4

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FILM VELOCITY VERSUS TIME - MISSION 4008 PASS D15 FRAME 2

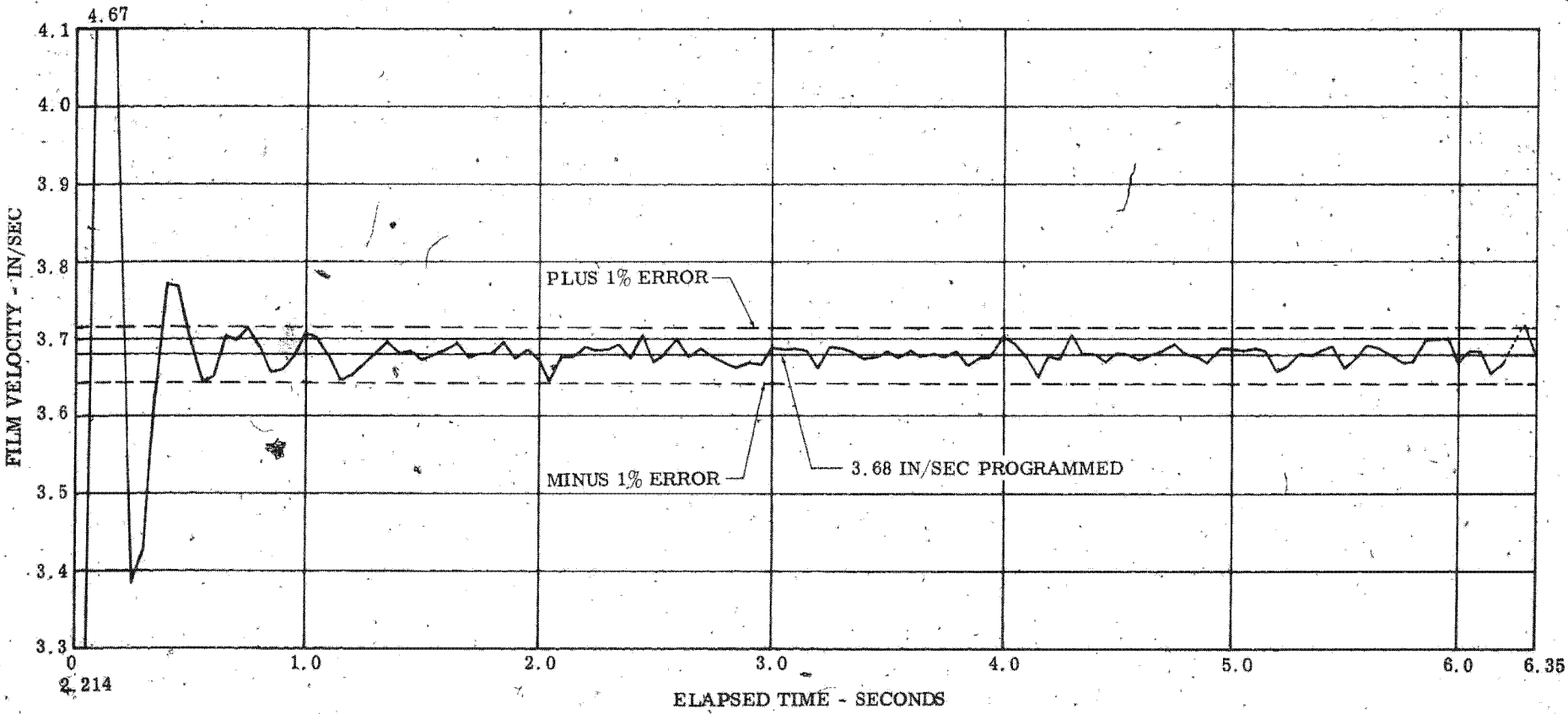

ILLUSTRATION 5

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FILM VELOCITY VERSUS TIME - MISSION 4008 PASS D15 FRAME 3

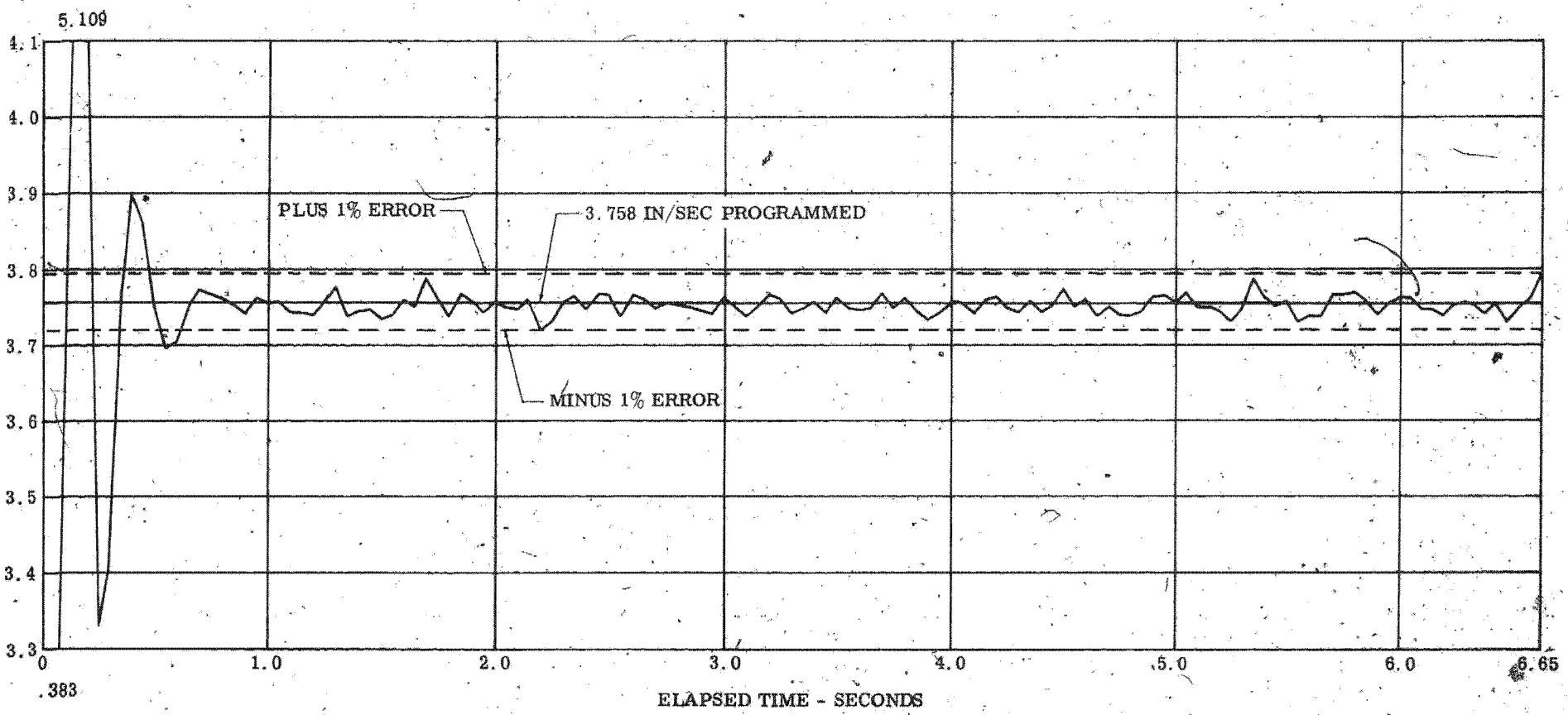

ILLUSTRATION 6

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PHOTOGRAPH NO. 1

Stopping Transient

Rev D15, Frames 011/012, Contact Print

Altitude: 77.4NM Obliquity: -21.98°
Scale: 1/62,000 Stereo Photo

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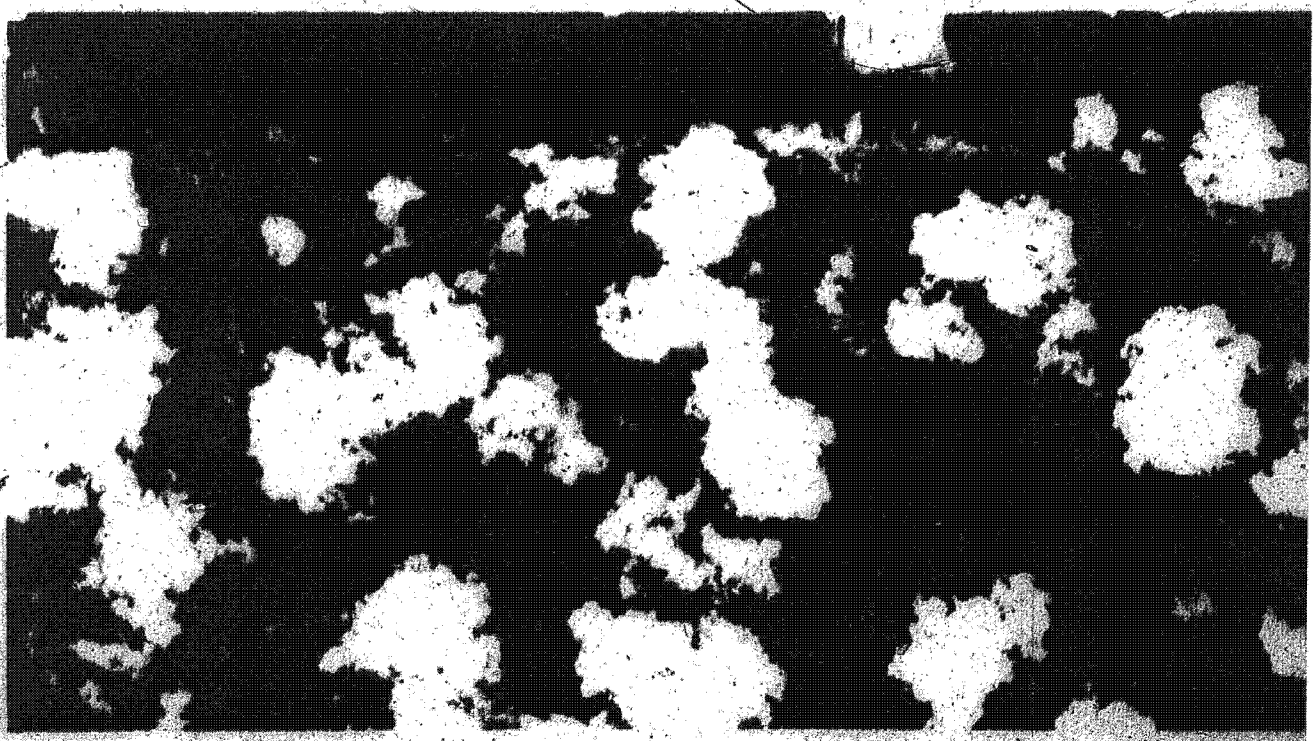

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PHOTOGRAPH NO. 2

Slit aperture with door apparently open.

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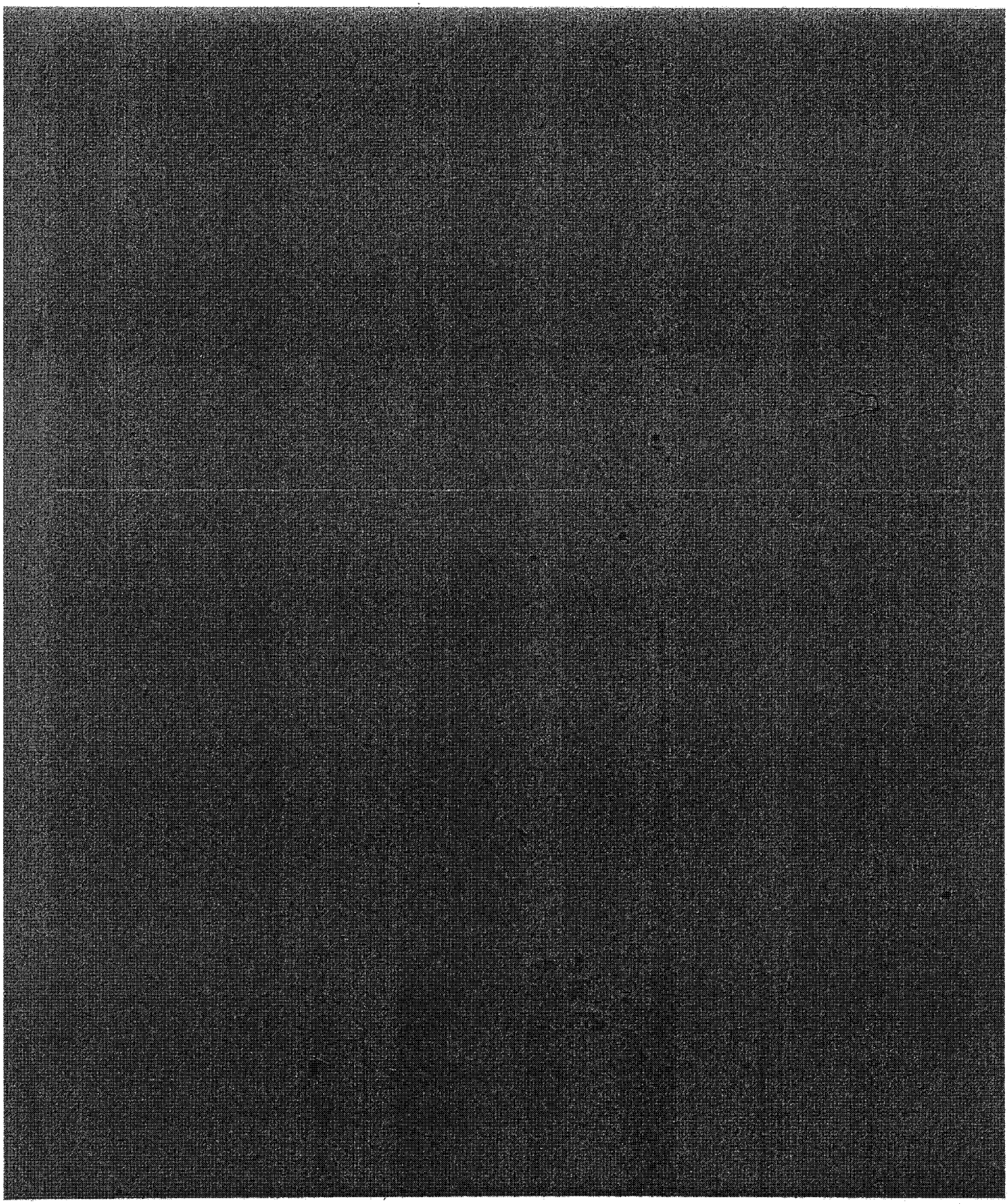

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8. Exposure: Overall, the exposure was considered to be close to desirable, thereby resulting in normal densities except in a few cases of underexposure. In the latter, some detail was lost but this appeared only in a few frames. Illustrations 7, 8 and 9 show brightness, exposure and densities obtained for various sun angles.

9. Tone Analysis: Continued experimental work is being accomplished in the tone analysis by way of density measurement and traces in an effort to derive an improved method of evaluating tonal range and what ranges vs. exposure will attain the highest acuity. The difference of tonal quality between stereo pairs is shown in Photographs 3 and 4. As noted, there is a difference in acuity resulting from a different reflectance angle of the light energy and possibly some difference as a function of haze.

B. Resolution

1. Edge traces were taken throughout the mission photographs as further data for MTF/AIM resolution research.

2. CORN Targets: This mission proved very successful in obtaining photographs of the CORN Targets. There is some blooming of the prints due, possibly, to some overexposure; however, these photographs provide a method of quantitatively evaluating the resolution capability of the system. Readings on these photographs by members of the PET Team indicated resolution of 2.0 - 2.3 feet. Further evaluation of these targets by edge traces is being accomplished (See Photographs 5 and 7).

3. BLACKBIRD Comparison Coverage: The Blackbird aircraft was actually photographed, by the GAMBIT system. Photography taken by the Blackbird camera system is good and provides an excellent comparison of photography from the two systems for resolution and quality evaluation (See Photographs 9 and 10).

C. Stellar-Index Camera

The Stellar-Index Camera failed after Frame 005, Rev D05. Initial TLM evaluation indicates the camera was not receiving power. As determined from the electrical schematic diagram, the most logical cause is a blown fuse.

a. Stellar Analysis: The stellar exposure has been reduced below that of the last mission, but there is still too much energy being collected by the stellar film thereby obscuring all imagery. This overexposure is most likely due to a baffling problem.

b. Index Analysis: The index photography obtained through Rev 05, Frame 005, was good. There was some obscuration at the edges of most of the frames by excessive fog, apparently caused by a light leak. There was some dendritic static marks on the film edge. The first 15 feet of leader was involved in processing machine trouble, thereby causing many creases. No imagery was lost

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through this malfunction.

D. Capsule Condition: The capsule was opened without difficulty. The exterior and interior were inspected for heat damage, and the condition of all components and areas appeared quite normal.

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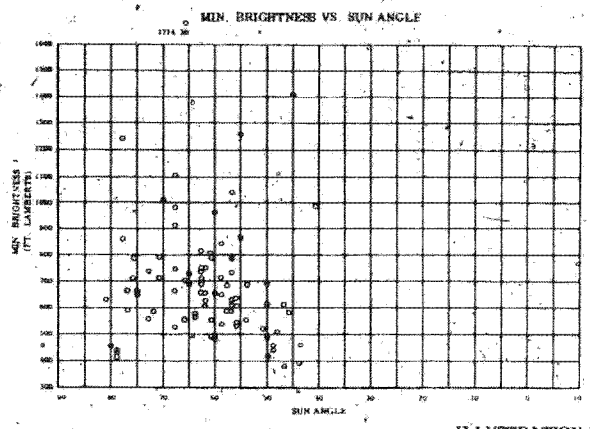

ILLUSTRATION 7

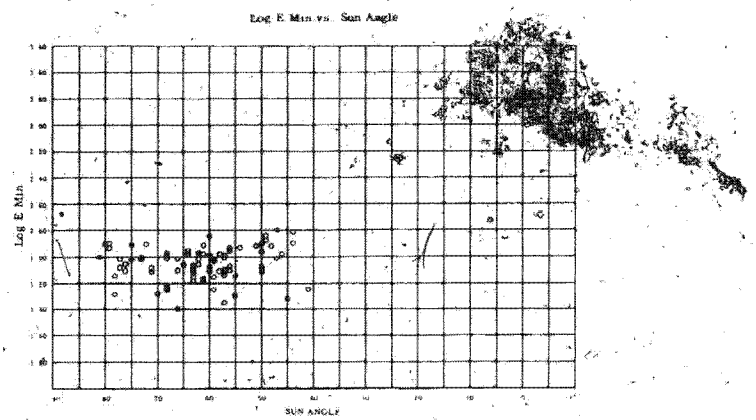

ILLUSTRATION 8

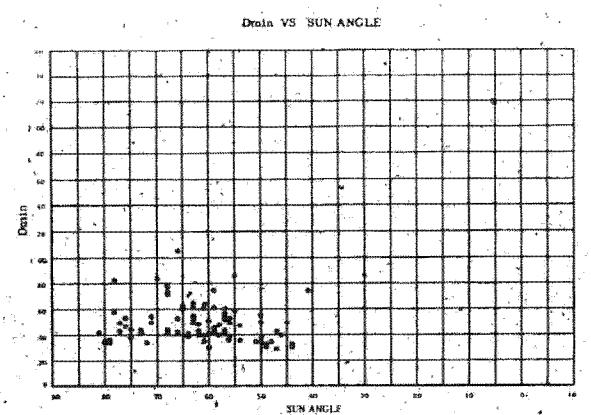

ILLUSTRATION 9

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PHOTOGRAPH NO. 3

The first half of a stereo pair taken of Duluth, Minnesota, airfield to illustrate the difference of resolution in stereo pairs due to change in angle of reflected light.

Rev D15, Frame 002, 10X

Altitude: 70.7NM
Scale: 1/81,000

Obliquity: -31.90°
Stereo Pair

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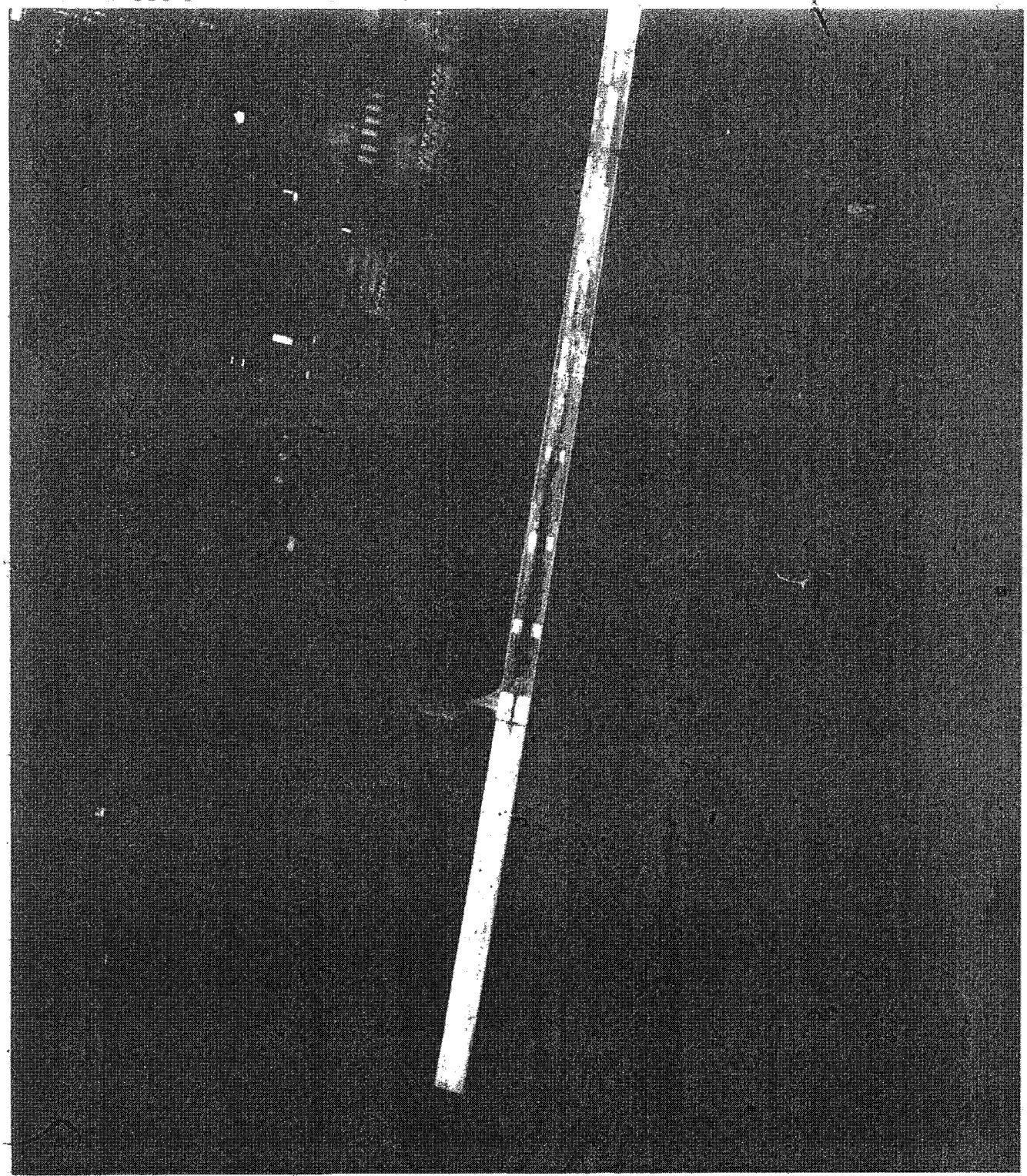

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PHOTOGRAPH 3

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PHOTOGRAPH NO. 4

Second half of a stereo pair taken of Duluth, Minnesota, airfield to illustrate the difference of resolution in stereo pairs due to the change in angle of the reflected light.

Rev D15, Frame 003, 10X

Altitude: 70.7NM
Scale: 1/81,000

Obliquity: -31.90°
Stereo Pair

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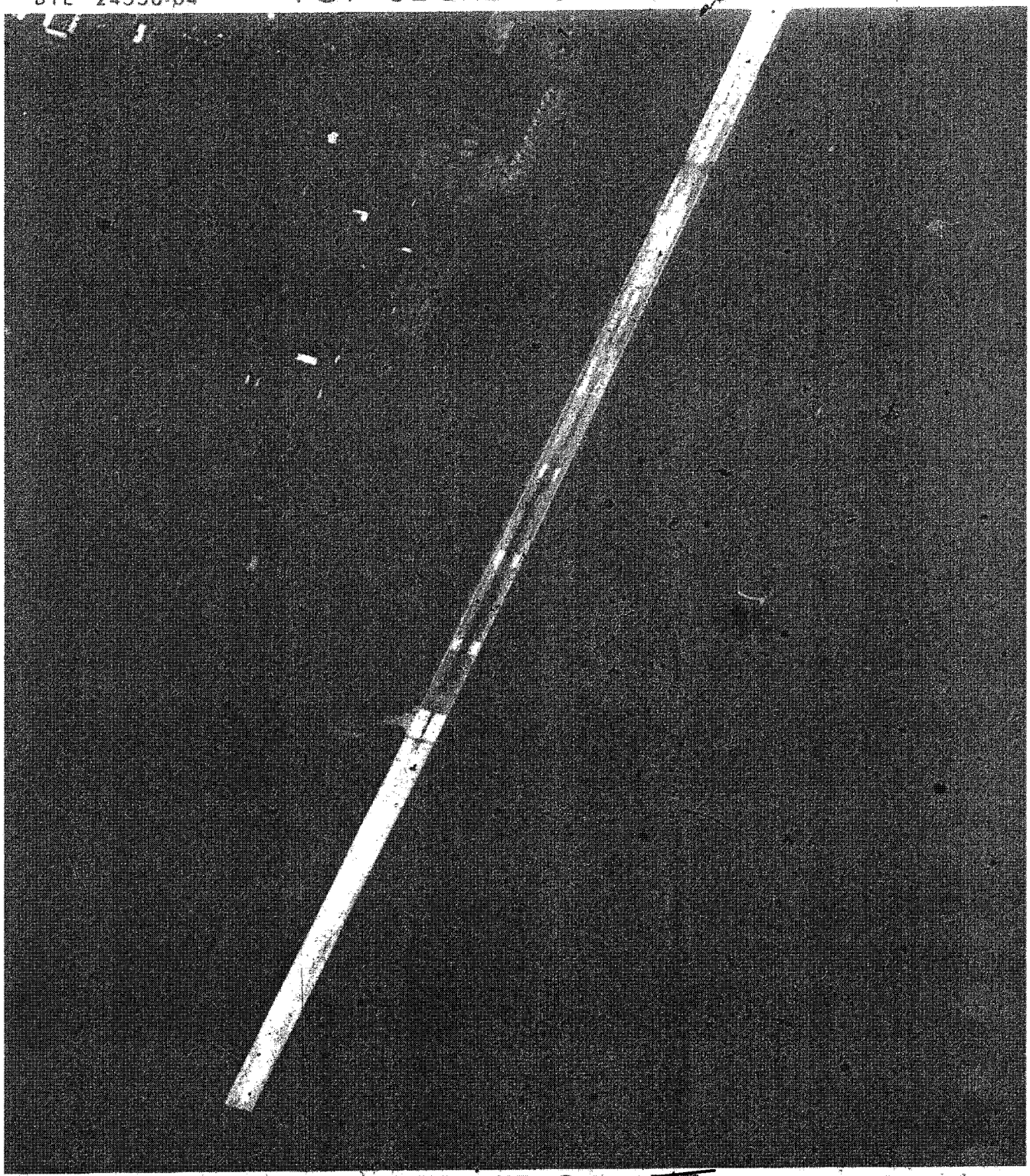

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PHOTOGRAPH 4

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PHOTOGRAPH NO. 5

CORN Target at Edna Airfield, Kansas

Rev D15, Frame 008, 10X

Altitude: 74.0NM
Scale: 1/71,000

Obliquity: -6.38°
Strip Photo

~~PHOTO - MAP POSITIONING DATA~~

REV D15

ACC/PBM No	AZIMUTH OF PHOTO	POSITIONING ERROR IN-TRACK	CROSS-TRACK
010A	0	.8N	.3W
B		.8N	.4W
C		.8N	.3W
D		.6N	.4W
E		1.0N	.3W
F		1.0N	.3W

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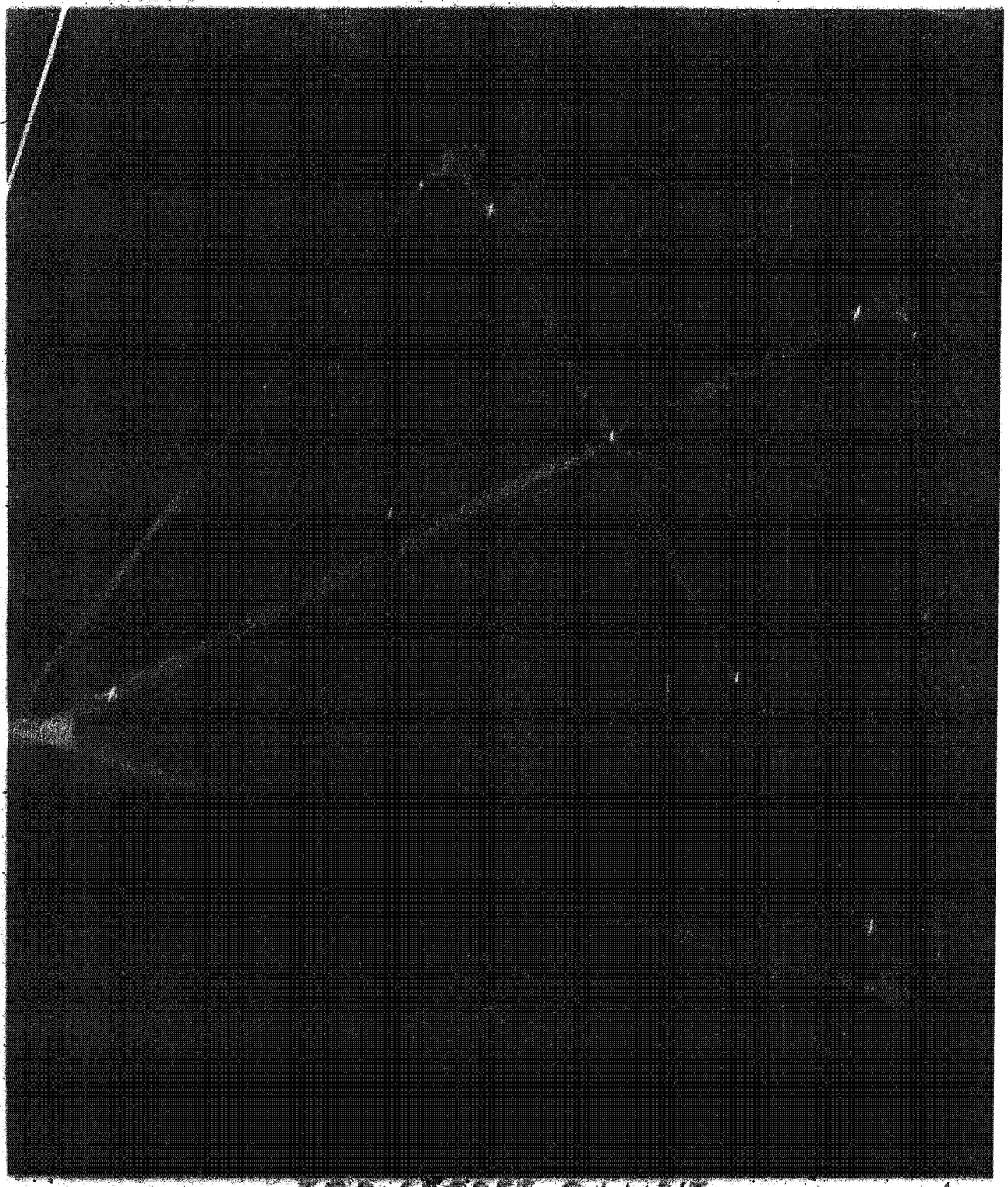
BYE 24558 64

~~TOP SECRET GAMBIT~~



~~TOP SECRET GAMBIT~~

PHOTOGRAPH

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PERFORMANCE EVALUATION TEAM

REPORT NO. 4008/64

PHOTOGRAPH NO. 6

(Bull Target at Edna Airfield, Kansas (with resolution overlay)

Rev 1115, Frame 008 40X

Altitude 74 NMM Obliquity 6 10

Scale 1/74,000 Strip Mode

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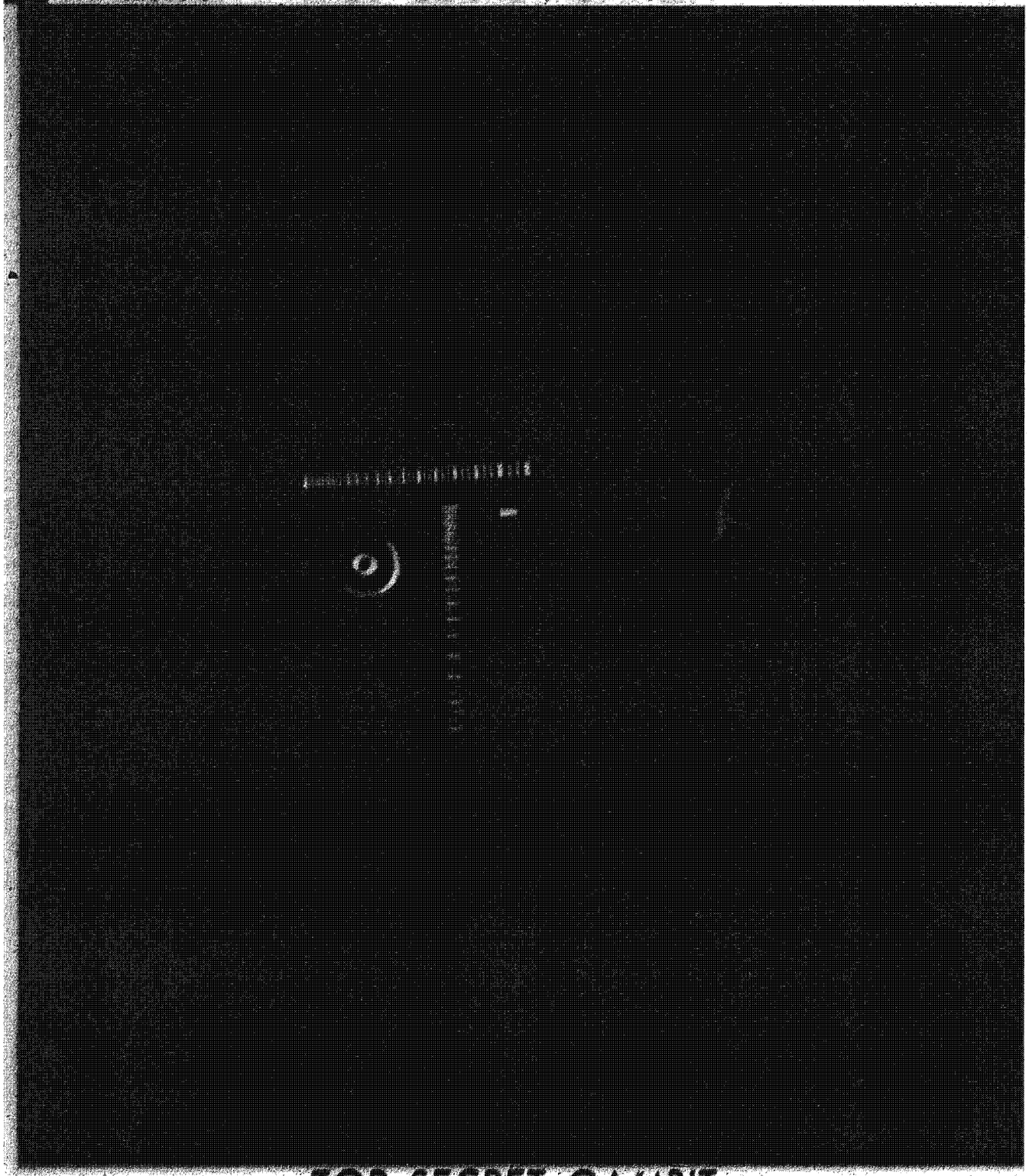

PHOTOGRAPH 6

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PHOTOGRAPH NO. 7

CORN Target in field southeast of Sherman, Texas

Rev D15, Frame 010, 10X

Altitude: 75.7NM Obliquity: -4.96°
Scale: 1/72,000 Strip Photo

~~PHOTO - MAP POSITIONING DATA~~

REV D 15

ACC/PBM No	AZIMUTH OF PHOTO (DEG)	POSITIONING ERROR IN-TRACK	CROSS-TRACK
008A	0	1.1N	.3W
B		1.0N	.3W
C		.9N	.3W
D		1.1N	.3W
E		1.1N	.2W

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~~TOP SECRET GAMBIT~~

~~TOP SECRET GAMBIT~~

PHOTOGRAPH 7

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PHOTOGRAPH NO. 8

CORN Target in field southeast of Sherman, Texas

(with resolution overlay)

Rev D15, Frame 010, 40X

Altitude: 75.7NM
Scale: 1/72,000

Obliquity: -4.96°
Strip Photo

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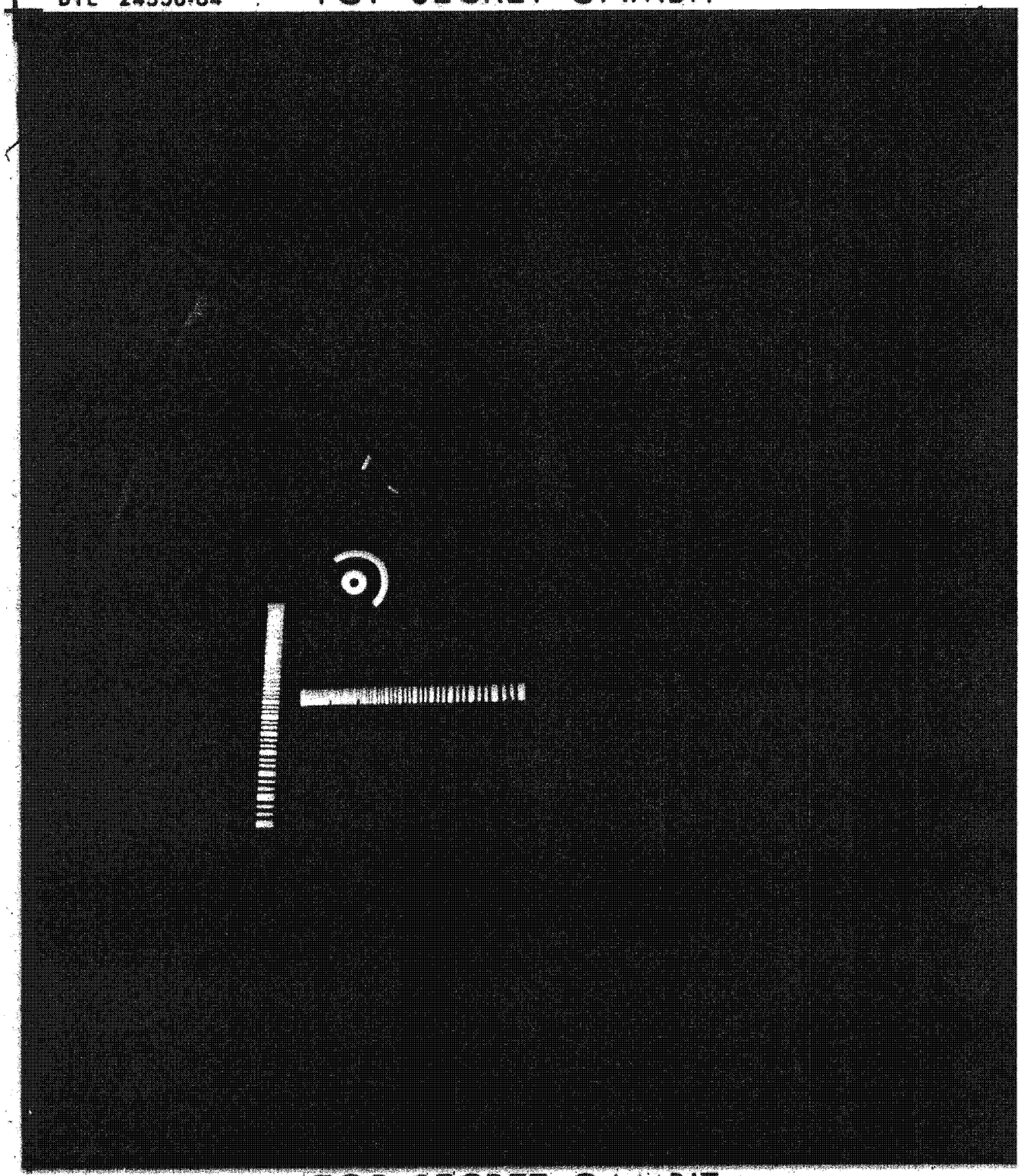

PHOTOGRAPH 8

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PHOTOGRAPH NO. 9

Photo BLACKBIRD Aircraft taken after it had passed over the CORN Target at Edna, Kansas, airfield

Rev D15, Frame 008, 40X

Altitude: 74.0NM
Scale: 1/71,000

Obliquity: -6.38°
Strip Photo

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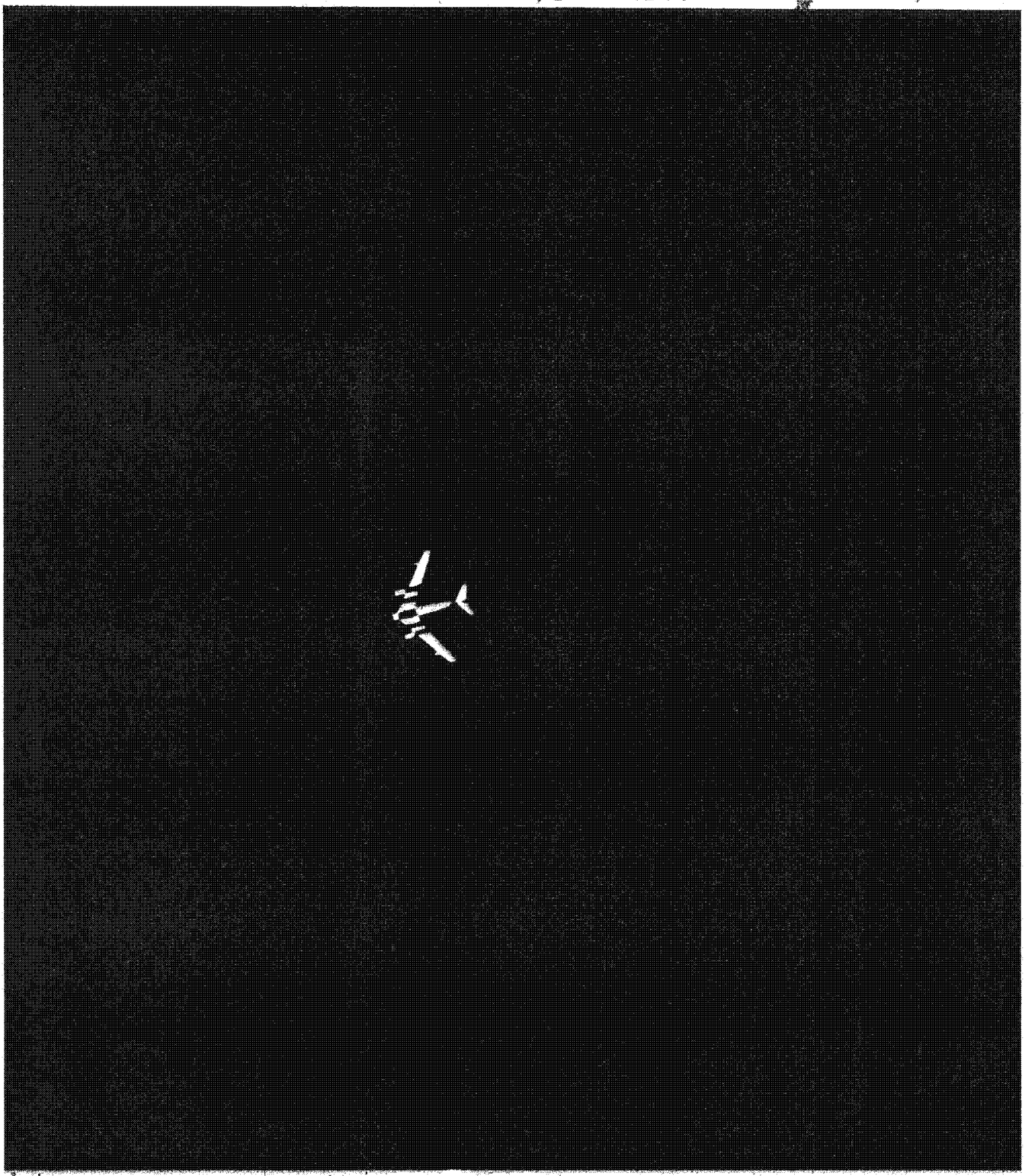

PHOTOGRAPH 9

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PHOTOGRAPH NO. 10

CORN Target at Edna Airfield, Kansas, photographed by KA-2, 12" focal length camera aboard BLACKBIRD from altitude of 16,500', 10X

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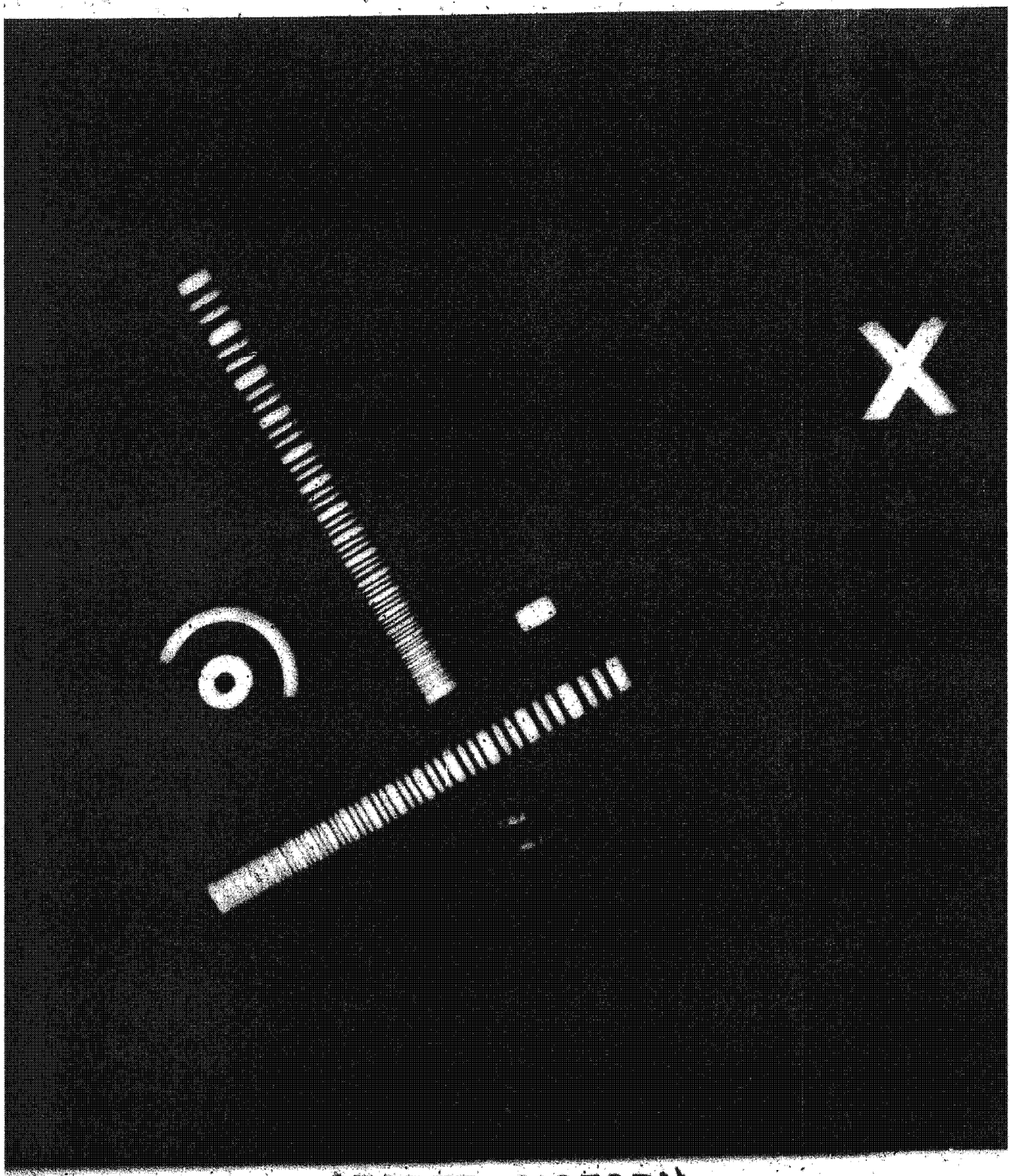

PHOTOGRAPH 10

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SECTION V

EXPERIMENTAL OPERATIONS

1. CORN. Due to the system anomalies experienced subsequent to Rev 15, payload I photography was limited to that conducted on Rev 15 and are represented primarily by photography of Control Resolution Targets (CORN) from orbit. The first of the CORN targets photographed was an mobile layout deployed at Edna Airfield, Kansas, (Rev. D15, Frame 008) consisting of a bull's-eye, t tone panel and T-bar (See Photograph 6). The second of the CORN targets photographed was a grou mobile unit deployed southeast of Sherman, Texas, (Rev D15, Frame 010) consisting of a bull's-eye T-bar (See Photograph 8). PET Team measurements of these targets indicate ground resolution do 2.24 feet. Tone trace measurements were taken through the three tone panel and bull's-eye targets, edge trace measurements were taken through both arms of the T-bar targets. Analysis of these measurements were not available at the time of preparation of this report.

2. BLACKBIRD. A Blackbird (RB-47) aircraft was programmed over the CORN tar Edna Airfield, Kansas, at the time the satellite vehicle was programmed to take a photograph. The Blackbird carried a KA-2, 12" focal length camera for good ground resolution from an altitude of 16,500 feet (See Photograph 10). The Blackbird aircraft was also photographed by the satellite vehic camera system (See Photograph 9).

3. Radiation Experiment. Four film chits were variously located in the recovery c for the purpose of measuring radiation. The object of this experiment was to determine if radiation level high enough to affect the film load while in orbit. Results of this experiment are unknown at th

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APPENDIX A

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COMMAND INFORMATION

Rev 1004

Acc No.	System Time Sec	Burst Time Sec	Command Position Lat Deg	Lat Min	Long Deg	Long Min	Best Ephemeris Deg	Min	Deg	Min	Film Velocity in /sec Command	Actual	Mis-for Post	Crab Deg	Roll Angle
*007	4731 2	6 3	61	07N	157	40E	52	9 31N	158	15 5E	3 1694		15° E	3.0	-31.90
*008	4742 7	7 6	60	31N	157	14E	51	23 9N	157	48 6E	3 2011		15° A	3.0	-31.90

*Not selected for complete analysis

PHOTO MAP POSITIONING

Rev 1004

Acc/ PBM No.	Δ Azimuth of Photo ℄ (deg)	Positioning Error (NM) Manual Plot Method In-Track	Manual Plot Method Cross-Track	Computer Method In-Track	Computer Method Cross-Track	Film Velocity Error (%)	Attitude Error (deg) Pitch	Roll	Yaw	Map Accuracy (± ft)
007A	0	.5N	1.3W	31N	91W		0.21	-0.67	0.32	6,000
B		5N	1.3W	58N	1.55W					
C		5N	1.3W	43N	1.77W					
008A	0	5N	2.0W	61N	77W		0.21	-0.67	0.32	6,000
B		5N	2.0W	86N	1.34W					
C		5N	2.0W	73N	1.57W					

PHOTOGRAPHIC EVALUATION

Rev D04

Acc. No.	Density Dmin	Density Dmax	Density Base + Fog	Sun Angle (degrees)	Brightness Range	Cloud Dmax	Altitude (NM)
007	.67	1.99	.26	57	5.609	2.00	81.9
008	.60	1.93	.25	57	4.875	2.01	81.9

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COMMAND INFORMATION

Rev D05

Acc. No.	System Time Sec	Burst Time Sec	Command Position Lat Deg	Lat Min	Long Deg	Long Min	Best Ephemeris Lat Deg	Lat Min	Long Deg	Long Min	Film Velocity in sec Command	Actual	Mirror Pos.	Crab Deg.	Roll Angle
004	10138.2	9.7	49	38N	134	27E	51	13.6N	135	17.0E	2.8726	2.871	15° F	2.0	36.87
005	10151.1	7.7	48	47N	134	00E	50	22.5N	134	48.1E	2.8132	2.816	15° A	2.0	36.87
010	10253.6	8.3	41	56N	130	48E	43	32.7N	131	26.2E	3.2337	3.233	15° F	2.5	-28.36
011	10265.3	8.3					42	46.6N	131	06.1E	3.2337	3.232	15° A	2.5	-28.36

PHOTO-MAP POSITIONING

Rev D05

Acc/ PBM No.	Δ Azimuth of Photo ℄ (deg)	Positioning Error (NM) Manual Plot Method In-Track	Manual Plot Method Cross-Track	Computer Method In-Track	Computer Method Cross-Track	Film Velocity Error (%)	Attitude Error (deg) Pitch	Roll	Yaw	Map Accuracy (± ft)
004A	0	.1S	.3E	.25S	.09W	.06	0.08	-0.22	0.15	5,000
B		.2N	1.0W	.28N	1.02W					
C		.1S	1.0W	.17N	.77W					
005A	0	.5S	.7E	.60S	.07E	.09	0.08	-0.22	0.15	5,000
B		.2N	.7W	.05N	.77W					
C		.1N	.7W	.07N	.53W					
010A	-1	.8N	1.3W	.29N	.91W	.03	-0.25	-0.27	1.00	700
B		.3N	1.1W	.32N	1.01W					
011A	-1	.1N	.3W	.27N	.09E	.06	-0.25	-0.27	1.00	700
B		.6N	.2W	.33N	.07W					

* Bad Bench Mark

PHOTOGRAPHIC EVALUATION

Rev D05

Acc. No.	Density Dmin	Density Dmax	Density Base + Fog	Sun Angle (degrees)	Brightness Range	Cloud Dmax	Altitude (NM)
004	.62	1.15	.25	59	1.876	2.10	82.0
005	.76	1.18	.26	59	1.609	2.18	82.0
010	.43	.80	.22	66	1.829	1.94	83.1
011	.54	.91	.22	66	1.668	2.01	83.2

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COMMAND INFORMATION

Rev D06

Acc. No.	System Time Sec	Burst Time Sec	Command Position Lat Deg	Lat Min	Long Deg	Long Min	Best Ephemeris Deg	Min	Deg	Min	Film Velocity in./sec. Command	Actual	Mirror Pos.	Crab Deg.	Roll Angle
006	15549.2	60.1	47	52N	111	08E	50	01.5N	112	10.8E	3.6801	3.672	0°	3.5	-22.69

PHOTO-MAP POSITIONING

Rev D06

Acc/ PBM No.	Δ Azimuth of Photo ℄ (deg)	Positioning Error (NM) Manual Plot Method In-Track	Manual Plot Method Cross-Track	Computer Method In-Track	Computer Method Cross-Track	Film Velocity Error (%)	Attitude Error (deg) Pitch	Roll	Yaw	Map Accuracy (± ft)
006A	0	.8N	.8W	.61N	1.67W	- .23	NOT	COMPUTED		3,000
B		.2N	1.1W	.26S	1.48W					

PHOTOGRAPHIC EVALUATION

Rev D06

Acc. No.	Density Dmin	Dmax	Density Base + Fog	Sun Angle (degrees)	Brightness Range	Cloud Dmax	Altitude (NM)
006	.44	1.81	.24	59	5.637	2.12	82.1

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COMMAND INFORMATION

Rev D07

Acc. No.	System Time Sec	Burst Time Sec	Command Position Lat Deg	Lat Min	Long Deg	Long Min	Best Ephemeris Deg	Min	Deg	Min	Film Velocity in./sec. Command	Actual	Mirror Pos.	Crab Deg.	Roll Angle
004	20798.8	6.9	56	42N	94	07E	59	21.6N	98	04.9E	3.1695	3.169	15° F	1.5	-31.90
005	20811.0	6.9					58	34.5N	95	25.4E	3.2011	3.200	15° A	1.5	-31.90
006	20923.1	40.1	48	32N	89	05E	51	45.5N	90	25.2E	3.7165	3.691	0°	2.0	-20.56

PHOTO-MAP POSITIONING

Rev D07

Acc/ PBM No.	Δ Azimuth of Photo ℄ (deg)	Positioning Error (NM) Manual Plot Method In-Track	Manual Plot Method Cross-Track	Computer Method In-Track	Computer Method Cross-Track	Film Velocity Error (%)	Attitude Error (deg) Pitch	Roll	Yaw	Map Accuracy (± ft)
004A	0	.1S	.3W	.09S	.30W	- .02	-0.25	-0.04	0.47	1,100
B		.1S	.3W	.18S	.43W					
C		.2S	.3W	.18S	.33W					
005A	0	0	.3E	.10N	.32E	- .04	-0.25	-0.04	0.47	1,100
B		.1N	.2E	.18N	.11E					
C		.1N	.2E	.16N	.15E					
006A	0	*	*	*	*	- .69	NOT	COMPUTED		3,000
B		1.1N	.7E	1.01N	.23E					
C		1.7N	.3E	1.50N	.30W					
D		0	.6W	2.60S	1.02W					

* Bad Bench Mark

PHOTOGRAPHIC EVALUATION

Rev D07

Acc. No.	Density Dmin	Density Dmax	Density Base + Fog	Sun Angle (degrees)	Brightness Range	Cloud Dmax	Altitude (NM)
004	.35	1.81	.22	50	7,476	2.00	81.7
005	.39	1.86	.21	50	6,997	2.03	81.6
006	.40	1.31	.21	58	3,512	2.14	81.6

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PERFORMANCE EVALUATION TEAM

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COMMAND INFORMATION

Rev D08

Acc. No.	System Time Sec	Burst Time Sec	Command Position Lat Deg	Lat Min	Long Deg	Long Min	Best Ephemeris Lat Deg	Lat Min	Long Deg	Long Min	Film Velocity in./sec. Command	Actual	Mirror Pos.	Crab Deg.	Roll Angle
004	26248.5	30.1	55	39N	70	49E	55	40.4N	70	48.4E	3.6082	3.610	0°	2.0	-24.81
008	26388.0	7.3	46	27N	65	30E	46	28.6N	65	29.3E	3.0460	3.047	15° F	2.0	-34.03
009	26399.5	8.0	45	41N	65	08E	45	42.6N	65	07.4E	3.0766	3.079	15° A	2.0	-34.03
010	26484.2	6.9	40	01N	62	41E	40	02.8N	62	40.6E	2.9856	2.987	15° F	2.0	31.20

PHOTO-MAP POSITIONING

Rev D08

Acc/ PBM No.	Δ Azimuth of Photo ℄ (deg)	Positioning Error (NM) Manual Plot Method In-Track	Manual Plot Method Cross-Track	Computer Method In-Track	Computer Method Cross-Track	Film Velocity Error (%)	Attitude Error (deg) Pitch	Roll	Yaw	Map Accuracy (± ft)
004A	0	.2N	1.3W	.56N	1.30W	.04	NOT	COMPUTED		1,800
B		.8N	1.2W	.69N	1.32W					1,600
C		.1N	1.4W	.31N	1.75W					1,600
D		1.1N	1.1W	1.10N	1.55W					1,700
E		1.2N	1.2W	1.28N	1.67W					1,700
F		1.3N	1.2W	1.27N	1.74W					1,700
G		1.2N	1.5W	1.07N	1.91W					1,700
H		0	1.3W	1.37N	1.49W					1,700
I		1.1N	1.5W	1.31N	1.56W					1,700
008A	-1	.3N	.7W	.34N	.65W	.03	0.37	-0.36	0	1,600
B		.5N	.5W	.44N	.61W					
009A	-1	.6N	1.0W	.77N	.91W	-.20	0.37	-0.36	0	1,600
B		.8N	.6W	.85N	.77W					
010A	N/A	.2N	.2W			.04	NOT	COMPUTED		1,000

PHOTOGRAPHIC EVALUATION

Rev D08

Acc. No.	Density Dmin	Density Dmax	Density Base + Fog	Sun Angle (degrees)	Brightness Range	Cloud Dmax	Altitude (NM)
004	.48	.82	.21	54	1.697	2.10	82.2
008	.61	1.46	.23	63	2.657	2.16	83.0
009	.66	1.69	.21	63	3.258	2.10	83.2
010	.38	1.39	.22	70	1.791	2.13	84.6

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COMMAND INFORMATION

Rev D09

Acc. No.	System Time Sec	Burst Time Sec	Command Position Lat Deg	Lat Min	Long Deg	Long Min	Best Ephemeris Deg	Min	Deg	Min	Film Velocity in sec Command	Actual	Mirror Pos.	Crab Deg.	Roll Angle
015	31709.4	6.0	51	11N	45	33E	51	11.1N	45	32.1E	3.5718	3.571	15"A	2.0	9.93

PHOTO-MAP POSITIONING

Rev D09

Acc/ PBM No.	Δ Azimuth of Photo ℄ (deg)	Positioning Error (NM) Manual Plot Method In-Track	Manual Plot Method Cross-Track	Computer Method In-Track	Computer Method Cross-Track	Film Velocity Error (%)	Attitude Error (deg) Pitch	Roll	Yaw	Map Accuracy (± ft)
015A	0	.1N	.2E	0	.06E	.03	NOT	COMPUTED		600
B		.1N	.1E	.04N	.07E					
C		.1S	.2E	.01S	.04E					
D		.2N	.1E	.14N	.10W					

PHOTOGRAPHIC EVALUATION

Rev D09

Acc. No.	Density Dmin	Density Dmax	Density Base + Fog	Sun Angle (degrees)	Brightness Range	Cloud Dmax	Altitude (NM)
015	.48	1.04	.22	58	2.168	2.13	82.4

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COMMAND INFORMATION

Rev D10

Acc. No.	System Time Sec	Burst Time Sec	Command Position Lat Deg	Lat Min	Long Deg	Long Min	Best Ephemeris Deg	Min	Deg	Min	Film Velocity in./sec. Command	Actual	Mirror Pos.	Crab Deg.	Roll Angle
007	36879.1	6.9	65	28N	35	17E	65	28.4N	35	17.6E	3.6082	3.610	15° F	1.5	- 7.09
008	36889.2	6.9					64	51.1N	34	29.7E	3.6427	3.645	15° A	1.5	- 7.09
009	36934.8	5.3	62	00N	31	17E	62	00.2N	31	17.1E	3.8285	3.829	0°	1.5	-14.18
010	36950.3	6.2	61	01N	30	19E	61	01.3N	30	19.2E	3.6801	3.681	15° F	1.5	- 3.54
011	36959.7	6.2					60	25.4N	29	45.6E	3.6801	3.678	15° A	1.5	- 3.54
012	36971.4	9.0	59	40N	29	05E	59	40.5N	29	05.5E	3.6801	3.689	15° A	1.5	2.13
013	36997.2	5.1	58	01N	27	42E	58	01.0N	27	42.5E	3.7912	3.790	0	1.5	14.18
016	37057.2	7.6	54	07N	24	54E	54	07.0N	24	54.1E	3.0163	3.019	15° F	1.5	34.03
017	37068.0	7.6					53	24.5N	24	26.9E	2.9559	2.959	15° A	1.5	34.03
018	37089.2	5.1	52	01N	23	36E	52	00.9N	23	35.7E	3.6427	3.645	15° A	2.0	4.25
019	37110.7	6.2	50	35N	22	47E	50	35.9N	22	46.6E	2.9559	2.958	15° A	1.5	34.03
020	37130.5	5.5	49	17N	22	04E	49	17.3N	22	03.7E	3.5718	3.571	15° F	2.0	11.34
021	37141.3	5.5					48	34.4N	21	41.1E	3.5364	3.537	15° A	2.0	11.34
022	37152.3	5.3	47	50N	21	19E	47	50.6N	21	18.7E	3.8285	3.827	0	2.0	9.93
023	37170.2	6.9	46	39N	20	43E	46	39.2N	20	43.3E	3.3314	3.335	15° F	2.0	22.69
024	37180.3	6.9					45	58.9N	20	24.0E	3.2663	3.265	15° A	2.0	22.69

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TOP SECRET - GAMBIT

PHOTO-MAP POSITIONING

Rev D10

Acc/ PBM No.	Δ Azimuth of Photo ℄ (deg)	Positioning Error (NM) Manual Plot Method In-Track	Manual Plot Method Cross-Track	Computer Method In-Track	Computer Method Cross-Track	Film Velocity Error (%)	Attitude Error (deg) Pitch	Roll	Yaw	Map Accuracy (± ft)
007A	0	.8N	.6W	.59N	.69W	.04	0.29	-0.41	0.28	700
B		.4N	.5W	.20N	.76W					
C		.8N	* 1.1W	.43N	.65W					
008A	0	.8N	.3W	.79N	.49W	.06	0.29	-0.41	0.28	700
B		.3N	.2W	.36N	.56W					
C		.6N	* .7W	.57N	.45W					
009A	0	1.0N	.5W	1.13N	.59W	.01	NOT	COMPUTED		700
B		.9N	.4W	.90N	.45W					
C		.8N	.5W	.90N	.50W					
010A	0	.2N	.1W	.22N	.20W	.02	0.06	0.03	0.62	400
B		.2N	.2W	.07N	.25W					
C		.2N	.2W	.20N	.14W					
011A	0	.2N	.4E	.11N	.32E	.06	0.06	0.03	0.62	400
B		.1N	.2E	.01N	.19E					
C		.1N	.3E	.13N	.34E					
012A	0	.2S	0	1.50S	.06E	.24	NOT	COMPUTED		400
B		.3S	0	.29S	.14E					
C		.2S	0	.16S	.04E					
D		0	.1W	.13S	.09E					
E		.3S	0	.13N	.20E					

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PHOTO-MAP POSITIONING

Rev D10

Acc/ PBM No.	Δ Azimuth of Photo ℄ (deg)	Positioning Error (NM) Manual Plot Method In-Track	Manual Plot Method Cross-Track	Computer Method In-Track	Computer Method Cross-Track	Film Velocity Error (%)	Attitude Error (deg) Pitch	Roll	Yaw	Map Accuracy (± ft)
013A	- 1	0	.2E	.17N	.13E	- .04	NOT	COMPUTED		500
B		0	.5E	.28N	.47E					
016A	0	.1N	.3W	.08S	.22W	.08	0.01	-0.08	0.08	400
B		.1S	.2W	.22N	.22W					
017A	0	.3S	.1W	.25S	.13W	.10	0.01	-0.08	0.08	400
B		.4S	.1W	.12S	.13W					
018A	0	.2S	.5E	.10S	.44E	.06	NOT	COMPUTED		400
B		.4S	.5E	.13S	.50E					
C		.2S	.4E	.10S	.42E					
019A	0	.3S	.3E	.23S	.30E	.07	NOT	COMPUTED		600
B		.3S	.3E	.02S	.32E					
C		.1S	.4E	.11N	.38E					
020A	0	0	0	.02N	.15E	- .03	-0.04	0.02	-0.14	600
B		0	0	.02N	.08E					
C		0	0	.04S	.03E					
021A	0	0	0	.03S	.04E	.01	-0.04	0.02	-0.14	600
B		0	0	.05S	.06W					
C		0	0	.02N	.09W					
022A	0	.5N	.25W	.52N	.15W	- .04	NOT	COMPUTED		700
B		.3N	.25W	.57N	.20W					
[illegible]		.0N	.25W	.74N	.35W					

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PHOTO-MAP POSITIONING

Rev D10

Acc/ PBM No.	Δ Azimuth of Photo ℄ (deg)	Positioning Error (NM)				Film Velocity Error (%)	Attitude Error (deg)			Map Accuracy (± ft)
		Manual Plot Method		Computer Method						
		In-Track	Cross-Track	In-Track	Cross-Track		Pitch	Roll	Yaw	
023A	0	.7N	.6W	.78N	.55W	.10	0.49	-0.19	0.08	700
B		.6N	.6W	.67N	.49W					
C		.6N	.6W	.78N	.35W					
024A	0	1.0N	.3W	.73N	.28W	.04	0.49	-0.19	0.08	700
B		.8N	.3W	.67N	.19W					
C		.9N	.4W	.73N	.14W					

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PHOTOGRAPHIC EVALUATION

Rev D10

Acc. No.	Density		Density Base + Fog	Sun Angle (degrees)	Brightness Range	Cloud Dmax	Altitude (NM)
	Dmin	Dmax					
007	.31	1.14	.22	44	4.197	1.57	83.2
008	.34	1.00	.23	44	3.092	1.64	83.1
009	.30	.62	.23	47	2.465	1.67	82.6
010	.32	.86	.22	49	2.866	1.41	82.5
011	.36	1.03	.23	48	2.980	1.45	82.4
012	.33	1.22	.23	49	4.058	1.72	82.4
013	.36	1.03	.23	51	2.980	1.98	82.3
016	.50	1.17	.23	56	2.395	2.12	82.3
017	.54	1.12	.23	56	2.092	2.08	82.3
018	.43	1.22	.23	57	2.914		82.4
019	.46	1.25	.25	59	2.832	2.10	82.5
020	.36	1.18	.24	61	3.504		82.7
021	.40	1.34	.22	61	3.627		82.8
022	.41	1.04	.22	62	2.535		82.9
023	.50	1.16	.22	63	2.369		86.1
024	.56	1.20	.23	63	2.190		83.2

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PERFORMANCE EVALUATION TEAM

REPORT NO. 4008/64

COMMAND INFORMATION

Rev D14

Acc. No.	System Time Sec	Burst Time Sec	Command Position Lat Deg	Lat Min	Long Deg	Long Min	Best Ephemeris Lat Deg	Lat Min	Long Deg	Long Min	Film Velocity in sec Command	Actual	Mirror Pos	Crab Deg	Roll Angle
001	59074.6	30.0	22	19N	77	41W	22	17.3N	77	42.0W	3.7538	3.754	0°	3.0	10.63

PHOTO-MAP POSITIONING

Rev D14

Acc/ PBM No.	Δ Azimuth of Photo ℄ (deg)	Positioning Error (NM) Manual Plot Method In-Track	Manual Plot Method Cross-Track	Computer Method In-Track	Computer Method Cross-Track	Film Velocity Error (%)	Attitude Error (deg) Pitch	Roll	Yaw	Map Accuracy (± ft)
001A	0	2S	1E	02N	19W	0	NOT	COMPUTED		600
B		1S	2E	06S	03W					
C		2S	5E	03S	21W					
D		3S	3E	04S	15W					
E		0	2W	24N	12W					
F		2S	2W	01S	05W					
G		2S	2W	05S	0					
H		1S	1E	02N	08W					
I		1S	1E	05S	09W					
J		1S	1E	19N	05W					
K		1N	1E	31N	90E					
L		2S	0	19N	02W					

PHOTOGRAPHIC EVALUATION

Rev D14

Acc. No.	Density Dmin	Density Dmax	Density Base + Fog	Sun Angle (degrees)	Brightness Range	Cloud Dmax	Altitude (NM)
001	.42	1.06	22	81	2.507	1.94	82.9

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TOP SECRET CAMBIT
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COMMAND INFORMATION

Rev D15

Acc. No.	System Time Sec	Burst Time Sec	Command Position Lat Deg	Lat Min	Long Deg	Long Min	Best Ephemeris Deg	Min	Deg	Min	Film Velocity in./sec. Command	Actual	Mirror Pos.	Crab Deg.	Roll Angle
001	64048.4	20.0	49	30N	89	47W	49	24.1N	89	49.5W	4.1053		0°	2.0	-29.07
002	64082.4	6.9	47	14N	90	57W	47	07.9N	90	59.4W	3.6801		15° F	1.5	-31.90
003	64092.5	6.9					46	27.4N	91	19.1W	3.7538		15° A	1.5	-31.90
004	64110.8	6.9	45	19N	91	52W	45	13.8N	91	53.8W	3.6427		15° F	2.0	-32.61
005	64121.2	6.9	44	38N	92	11W	44	31.9N	92	13.0W	3.7165		15° A	2.0	-31.90
006	64159.5	6.9	42	03N	93	18W	41	57.4N	93	20.2W	4.1868		15° F	2.5	- 7.80
007	64169.6	6.9					41	16.6N	93	37.2W	4.2299		15° A	2.5	- 7.80
008	64227.2	12.0	37	29N	95	07W	37	23.4N	95	08.6W	4.4042	4.400	0°	2.5	- 6.38
009	64249.3	10.0	35	59N	95	40W	35	53.7N	95	41.5W	4.3582	4.358	0°	2.5	- 9.22
010	64279.8	10.0	33	55N	96	24W	33	49.8N	96	25.3W	4.3151	4.312	0°	3.0	- 4.96
011	64313.7	5.5	31	37N	97	11W	31	31.9N	97	12.0W	3.6801	3.679	15° F	2.5	-21.98
012	64322.4	5.5					30	56.5N	97	23.7W	3.6427	3.642	15° A	2.5	-24.81
013	64340.4	5.5	29	49N	97	46W	29	43.2N	97	47.4W	3.7165	3.715	15° F	3.0	-18.43
014	64349.1	5.5					29	07.8N	97	58.8W	3.6801	3.673	15° A	3.0	-21.27

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~~TOP SECRET - GAMBIT~~

Rev D15

PHOTO-MAP POSITIONING

Acc/ PBM No.	Δ Azimuth of Photo ℄ (deg)	Positioning Error (NM)				Film Velocity Error (%)	Attitude Error (deg)			Map Accuracy (± ft)
		Manual Plot Method		Computer Method						
		In-Track	Cross-Track	In-Track	Cross-Track		Pitch	Roll	Yaw	
001A	0	.5N	1.0W	.39N	.27E		NOT	COMPUTED		600
B		0	1.0W	.21S	.51W					
C		0	1.0W	.37N	.78W					
D		1.0N	1.0W	.66N	.67W					
E		.5N	1.0W	.46N	.84W					
002A	0	1.2N	.8W	.99N	.86W		0.38	-0.43	0.65	600
B		1.1N	.8W	1.03N	.88W					
C		1.1N	.8W	.98N	.90W					
003A	0	1.0N	.5W	.91N	.50W		0.38	-0.43	0.65	600
B		.9N	.6W	.96N	.55W					
C		1.1N	.5W	1.09N	.61W					
004A	0	1.1N	.5W	1.12N	.26W		NOT	COMPUTED		600
B		1.0N	.6W	1.01N	.49W					
C		1.1N	.5W	1.07N	.50W					
005A	0	.9N	.8W	1.01N	.61W		NOT	COMPUTED		600
B		.9N	.7W	.90N	.75W					
C		.8N	.7W	.93N	.67W					
006A	0	.6S	.5W	.52S	.56W		-0.37	-0.25	0.69	600
B		.5S	.5W	.57S	.62W					
C		.5S	.5W	.45S	.51W					

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TOP SECRET - GAMBIT

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PHOTO-MAP POSITIONING

Rev D15

Acc/ PBM No.	Δ Azimuth of Photo ℄ (deg)	Positioning Error (NM) Manual Plot Method In-Track	Manual Plot Method Cross-Track	Computer Method In-Track	Computer Method Cross-Track	Film Velocity Error (%)	Attitude Error (deg) Pitch	Roll	Yaw	Map Accuracy (± ft)
007A	0	.5S	0	.34S	.05W		-0.37	-0.25	0.69	600
B		.3S	.1E	.33S	.12W					
C		.3S	.1E	.27S	.05W					
008A	0	1.1N	.3W	1.06N	.06W	- .10	NOT	COMPUTED		600
B		1.0N	.3W	.69N	.01W					
C		.9N	.3W	1.01N	.14W					
D		1.1N	.3W	1.21N	.22W					
E		1.1N	.2W	1.34N	.26W					
009A	0	.9N	.5W	.98N	.67W	- .01	NOT	COMPUTED		600
B		.9N	.6W	1.04N	.56W					
C		1.1N	.8W	1.26N	.77W					
D		.8N	.5W	.71N	1.36W					
E		.8N	1.0W	.75N	.86W					
010A	0	.8N	.3W	.78N	.31W	- .08	NOT	COMPUTED		600
B		.8N	.4W	.81N	.41W					
C		.8N	.3W	.95N	.29W					
D		.6N	.4W	.96N	.33W					
E		1.0N	.3W	1.00N	.25W					
F		1.0N	.3W	.92N	.29W					
011A		.7N	.8W	.65N	.77W	- .03	NOT	COMPUTED		600
B	0	.7N	.9W	.59N	.79W					

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~~TOP SECRET - CAMBIT~~

Rev D15

PHOTO-MAP POSITIONING

Acc/ PBM No.	Δ Azimuth of Photo ℄ (deg)	Positioning Error (NM)				Film Velocity Error (%)	Attitude Error (deg)			Map Accuracy (± ft)
		Manual Plot Method		Computer Method						
		In-Track	Cross-Track	In-Track	Cross-Track		Pitch	Roll	Yaw	
012A		.2N	.5W	.49N	.55W	- .02	NOT	COMPUTED		600
B	0	.4N	.6W	.52N	.62W					
C		.4N	.5W	.59N	.60W					
013A		.2N	.8W	.35N	.83W	- .05	NOT	COMPUTED		600
B	0	.3N	1.0W	.32N	.93W					
C		.3N	1.0W	.43N	.82W					
014A		.2N	1.1W	.43N	.75W	- .20	NOT	COMPUTED		600
B	0	.5N	.7W	.58N	.74W					
C		.5N	1.1W	.62N	.82W					

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PHOTOGRAPHIC EVALUATION

Rev D15

Acc. No.	Density		Density Base + Fog	Sun Angle (degrees)	Brightness Range	Cloud Dmax	Altitude (NM)
	Dmin	Dmax					
001	.32	.80	.23	60	2.653		70.3
002	.41	1.20	.22	62	3.013		70.7
003	.44	1.16	.23	62	2.677		70.9
004	.40	1.65	.22	64	5.160		71.2
005	.39	1.07	.22	64	2.805		71.4
006	.41	1.00	.22	68	2.428		72.2
007	.44	1.23	.23	68	2.887		72.4
008	.35	1.18	.22	72	3.627	1.96	74.0
009	.42	.99	.23	73	2.324	1.89	74.6
010	.39	1.27	.22	75	3.481	2.10	75.7
011	.48	1.18	.23	76	2.521	2.12	76.9
012	.54	1.09	.23	76	2.025	2.10	77.2
013	.84	1.44	.23	78	1.915	2.04	77.9
014	.58	1.50	.22	78	2.910	2.09	78.3

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PERFORMANCE EVALUATION TEAM

REPORT NO. 4008/64

COMMAND INFORMATION

Rev D16

Acc. No.	System Time Sec.	Burst Time Sec	Command Position Lat Deg	Lat Min	Long Deg	Long Min	Best Ephemeris Lat Deg	Lat Min	Long Deg	Long Min	Film Velocity in. sec. Command	Actual	Mirror Pos.	Crab Deg.	Roll Angle
002	69510.2	6.9	43	31N	115	01W	43	32.6N	115	00.4W	3.9856	3.985	15° F	2.0	-22.69
003	69520.3	6.9					42	51.9N	115	18.1W	4.0249		15° A	2.0	-22.69
004	69622.1	30.0	35	58N	118	01W	35	59.7N	118	00.3W	3.1695	3.171	0°	2.0	41.12

PHOTO-MAP POSITIONING

** Rev D16

Acc/ PBM No.	Δ Azimuth of Photo ℄ (deg)	Positioning Error (NM) Manual Plot Method In-Track	Manual Plot Method Cross-Track	Computer Method In-Track	Computer Method Cross-Track	Film Velocity Error (%)	Attitude Error (deg) Pitch	Roll	Yaw	Map Accuracy (± ft)
002						- .02				600
004A		7.2N	15.0W	8.61N	14.11W	.04	NOT	COMPUTED		600
B		6.5N	17.2W	7.51N	16.81W					
C		*	*	3.34N	20.68W					
D		7.5N	15.0W	8.86N	14.47W					
E		7.8N	15.5W	8.52N	14.90W					
F		*	*	2.34N	22.07W					
G		9.1N	14.1W	9.81N	13.41W					
H		6.6N	17.0W	7.26N	16.90W					
I		3.1N	18.0W	3.95N	18.60W					
J		2.7N	19.5W	3.56N	20.52W					
K		5.9N	16.8W	6.68N	18.80W					
L		5.2N	17.0W	6.32N	16.90W					
M		5.4N	17.0W	6.27N	16.06W					
N		5.6N	16.3W	6.59N	16.15W					
O		3.9N	17.5W	4.42N	17.92W					

* Bad Bench Mark

** Vehicle Attitude Unstable

PHOTOGRAPHIC EVALUATION

Rev D16

Acc. No.	Density Dmin	Density Dmax	Density Base + Fog	Sun Angle (degrees)	Brightness Range	Cloud Dmax	Altitude (NM)
002	.41	1.78	.22	60	2.325	1.67	71.6
003	1.06	1.32	.22	66	5.822		71.8
004	.44	1.45	.21	73	3.660		74.4

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APPENDIX B

Approved for Release: 2021/05/05 C05133958

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PHOTOGRAPH NO. 11

Tennis courts in Des Moines, Iowa.

Rev D15, Frame 006, 40X

Altitude: 72.5NM Obliquity: -7.8°

Scale: 1/71,000 Stereo Photo

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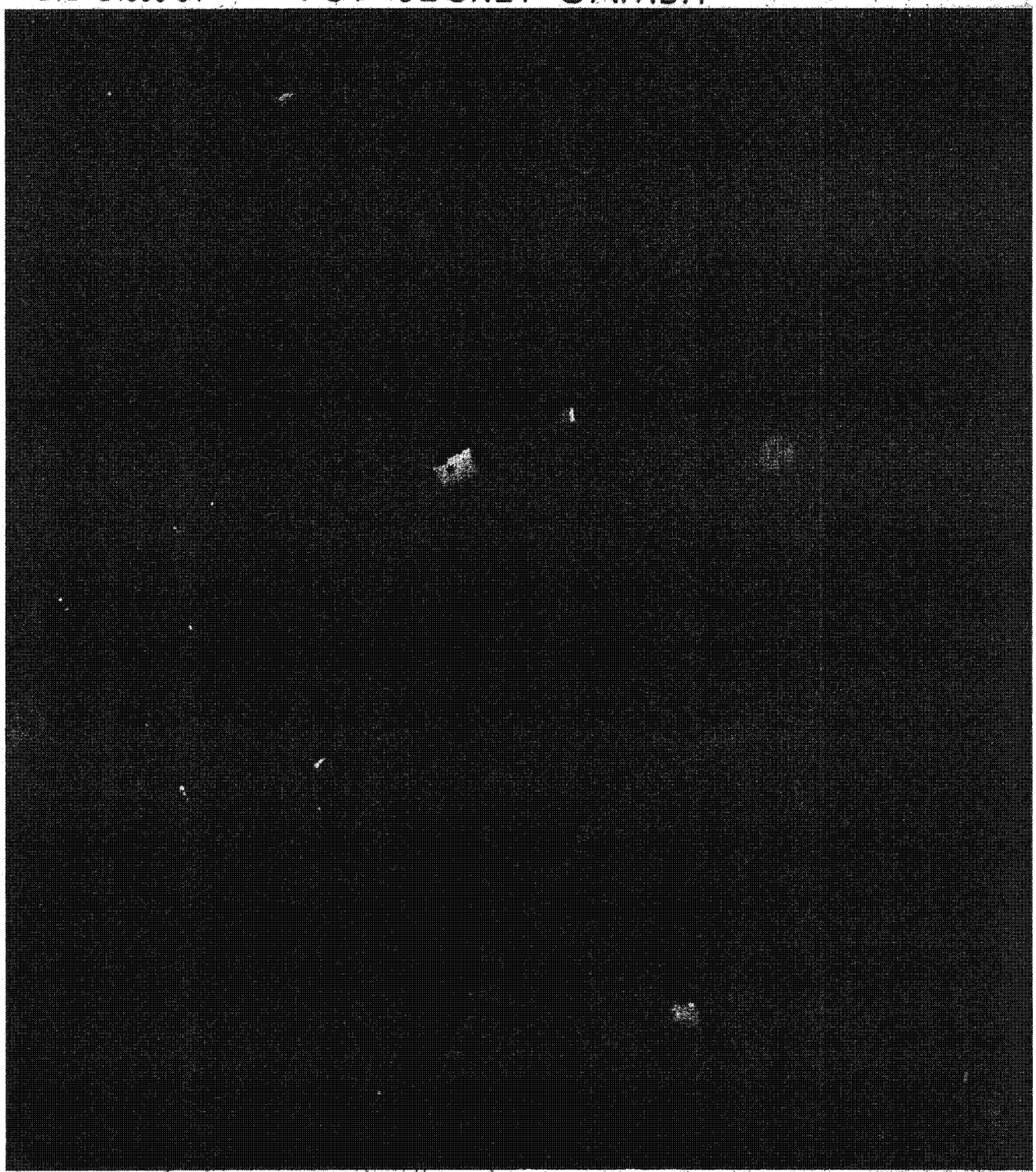

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PHOTOGRAPH NO. 12

Administration/Terminal Building at Des Moines, Iowa, airport.

Rev D15, Frame 006, 40X

Altitude: 72.5NM Obliquity: -7.8°
Scale: 1/71,000 Stereo Photo

Approved for Release: 2021/05/05 C05133958

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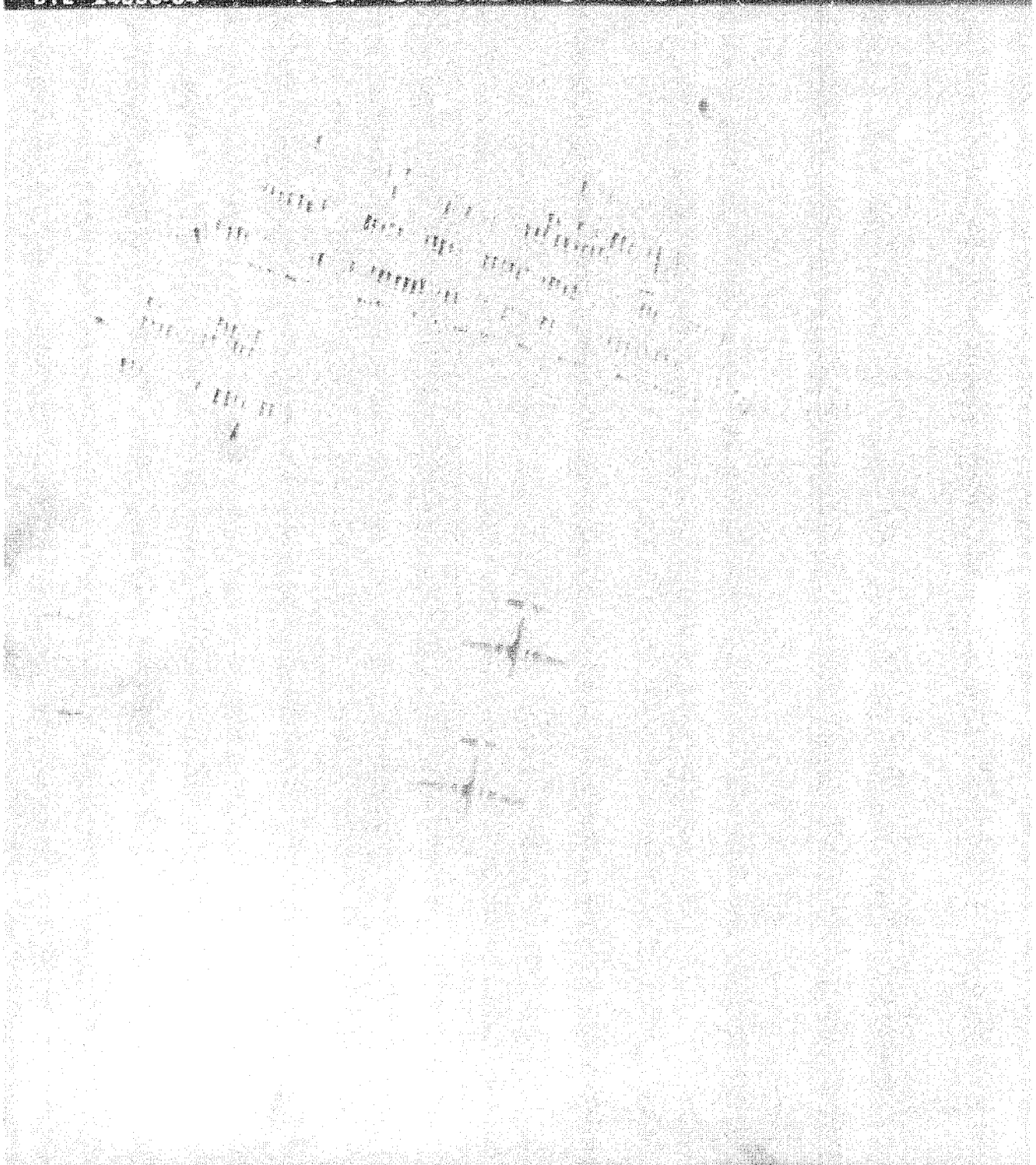

PHOTOGRAPH 12

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PERFORMANCE EVALUATION TEAM
REPORT NO. 4008/64

PHOTOGRAPH NO. 13

Aircraft parked on portion of Des Moines, Iowa, airport

Rev D15, Frame 006, 40X

Altitude: 72.5NM. Obliquity -7.8°
Scale: 1/71,000 Stereo Photo

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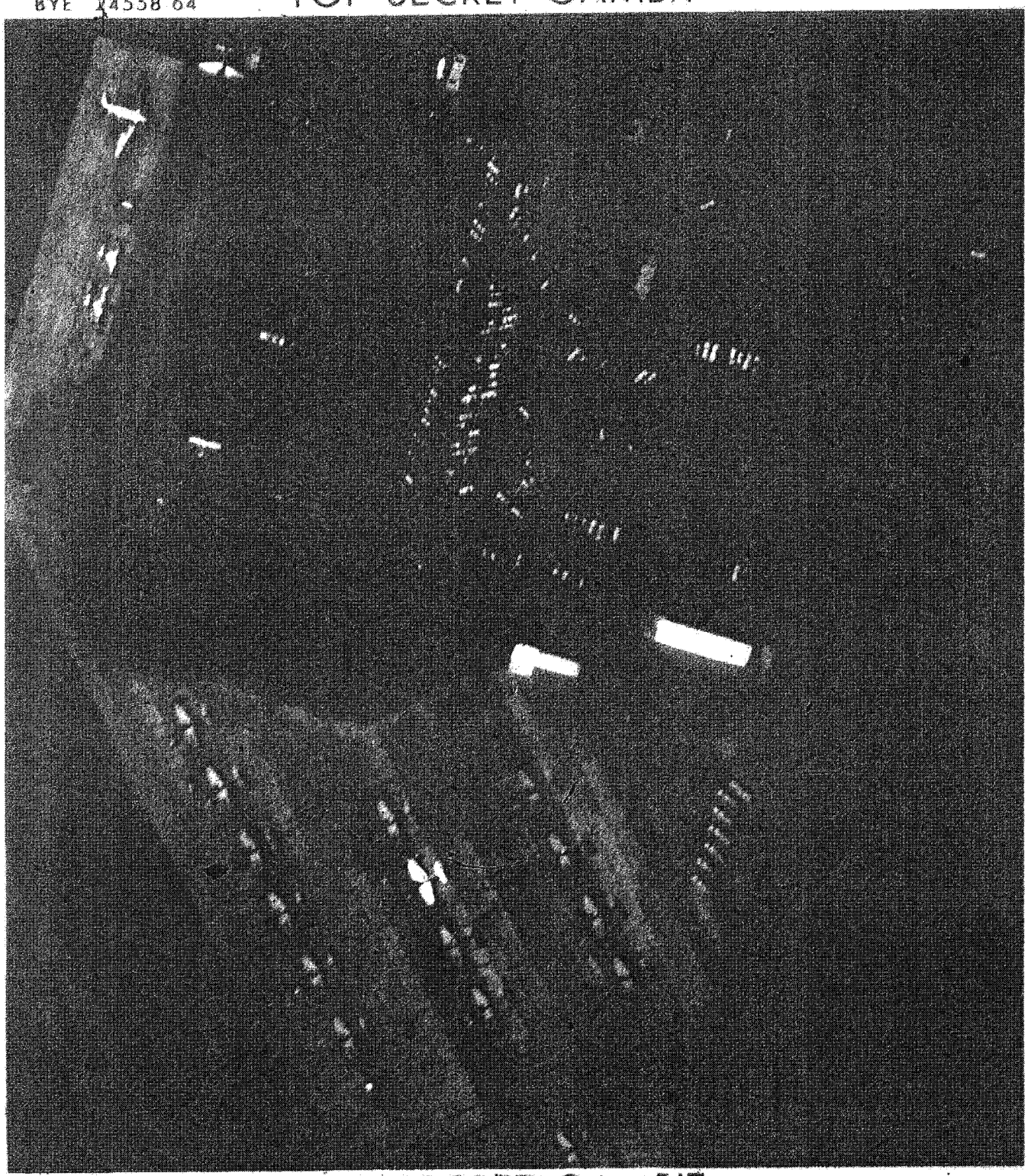
~~TOP SECRET GAMBIT~~



~~TOP SECRET GAMBIT~~

PHOTOGRAPH 13

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PHOTOGRAPH NO. 14

Downtown City Area - Parsons, Kansas

Rev D15, Frame 008, 40X

Altitude: 74.0NM Obliquity: -6.38°
Scale: 1/71,000 Strip Photo

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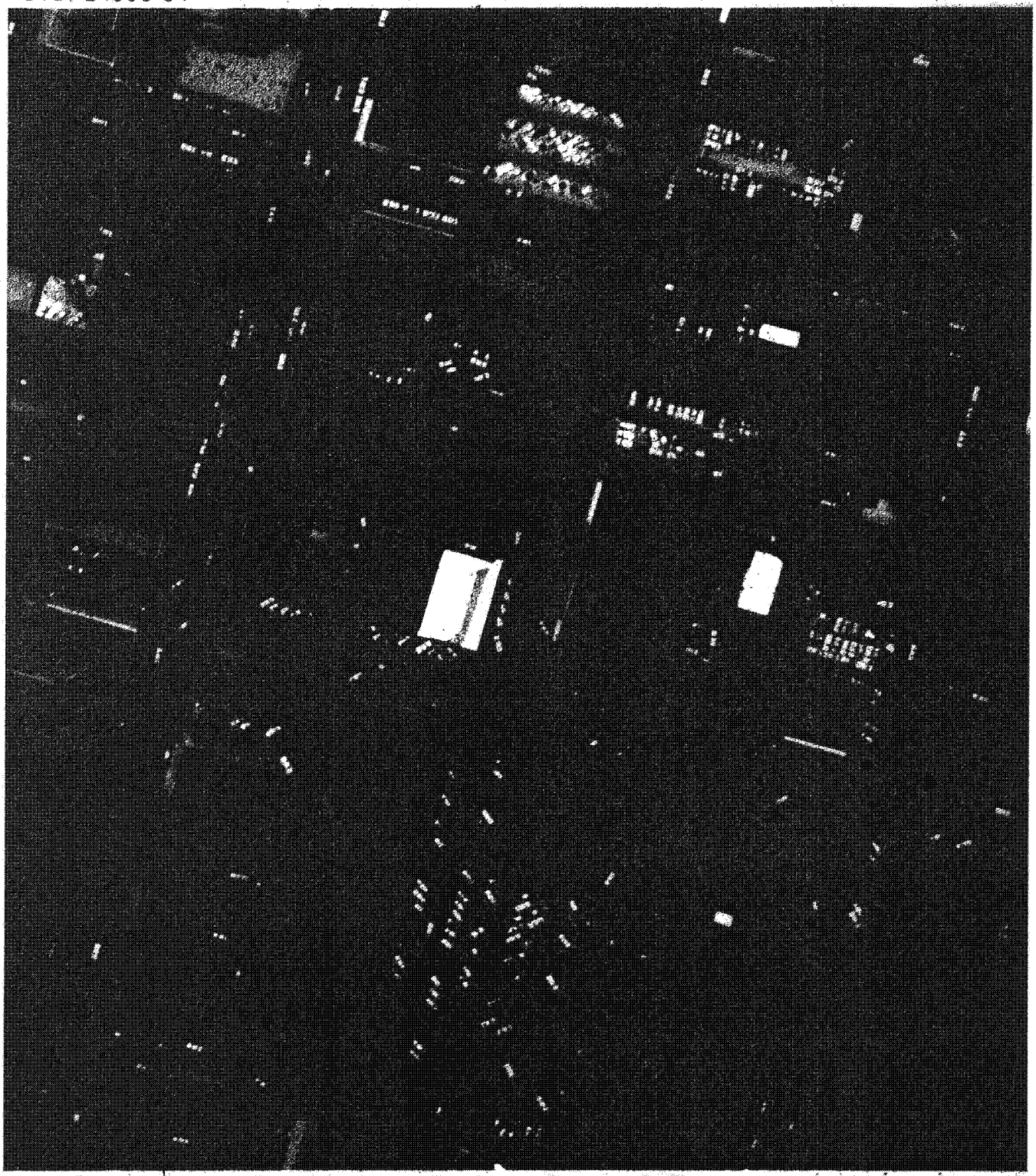
Approved for Release: 2021/05/05 C05133958



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PERFORMANCE EVALUATION TEAM

REPORT NO. 4008/64

PHOTOGRAPH NO. 15

Marshalling yards - Parsons, Kansas

Rev D15, Frame 008, 40X

Altitude: 74.0NM
Scale: 1/71,000

Obliquity: -6.38°
Strip Photo

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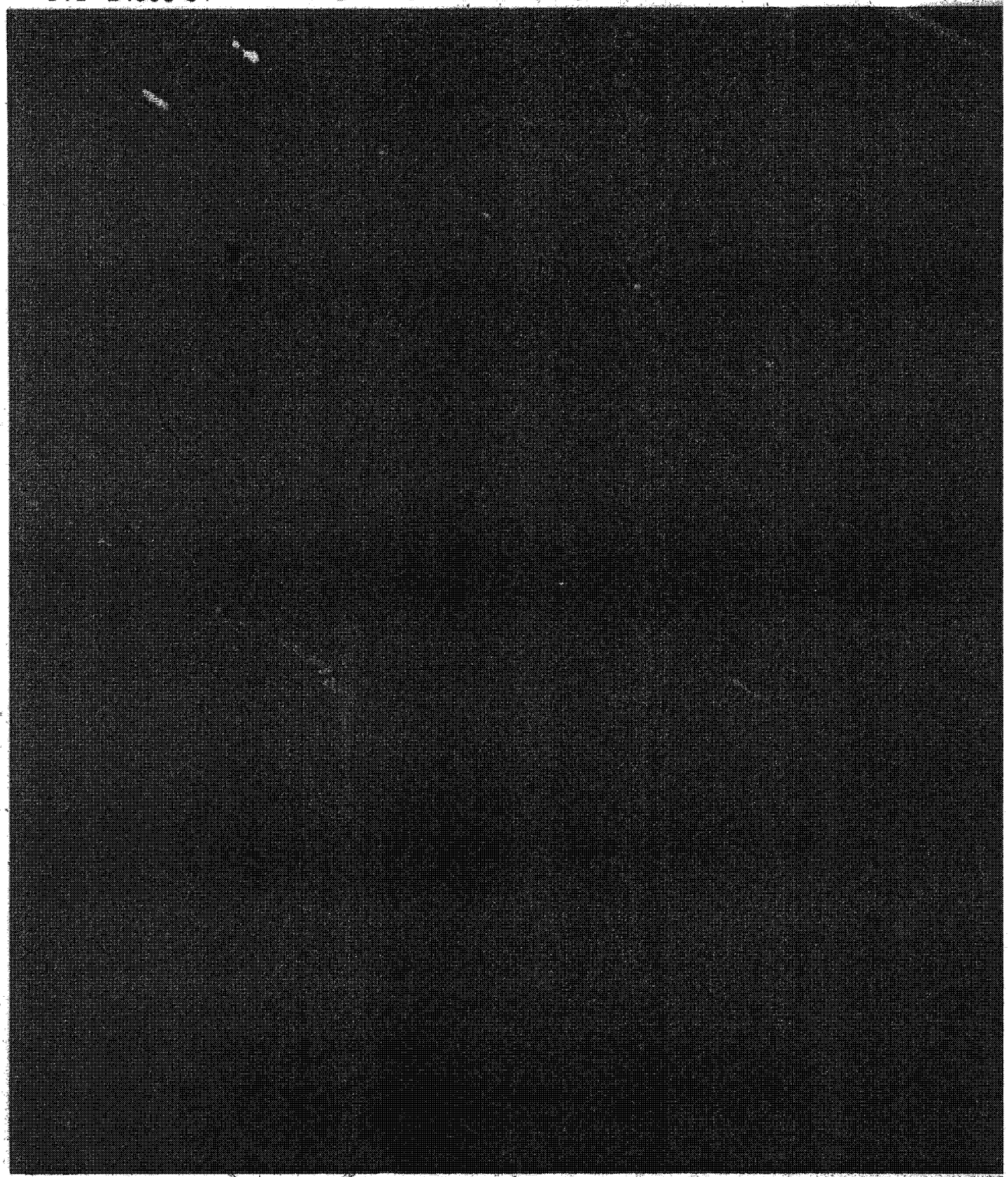

TOP SECRET GAMBIT

PHOTOGRAPH 15

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PHOTOGRAPH NO. 16

Marshalling yard and storage area - Sherman, Texas

Rev D15, Frame 010, 40X

Altitude: 77.0NM Obliquity: -4.96°

Scale: 1/72,000 Strip Photo

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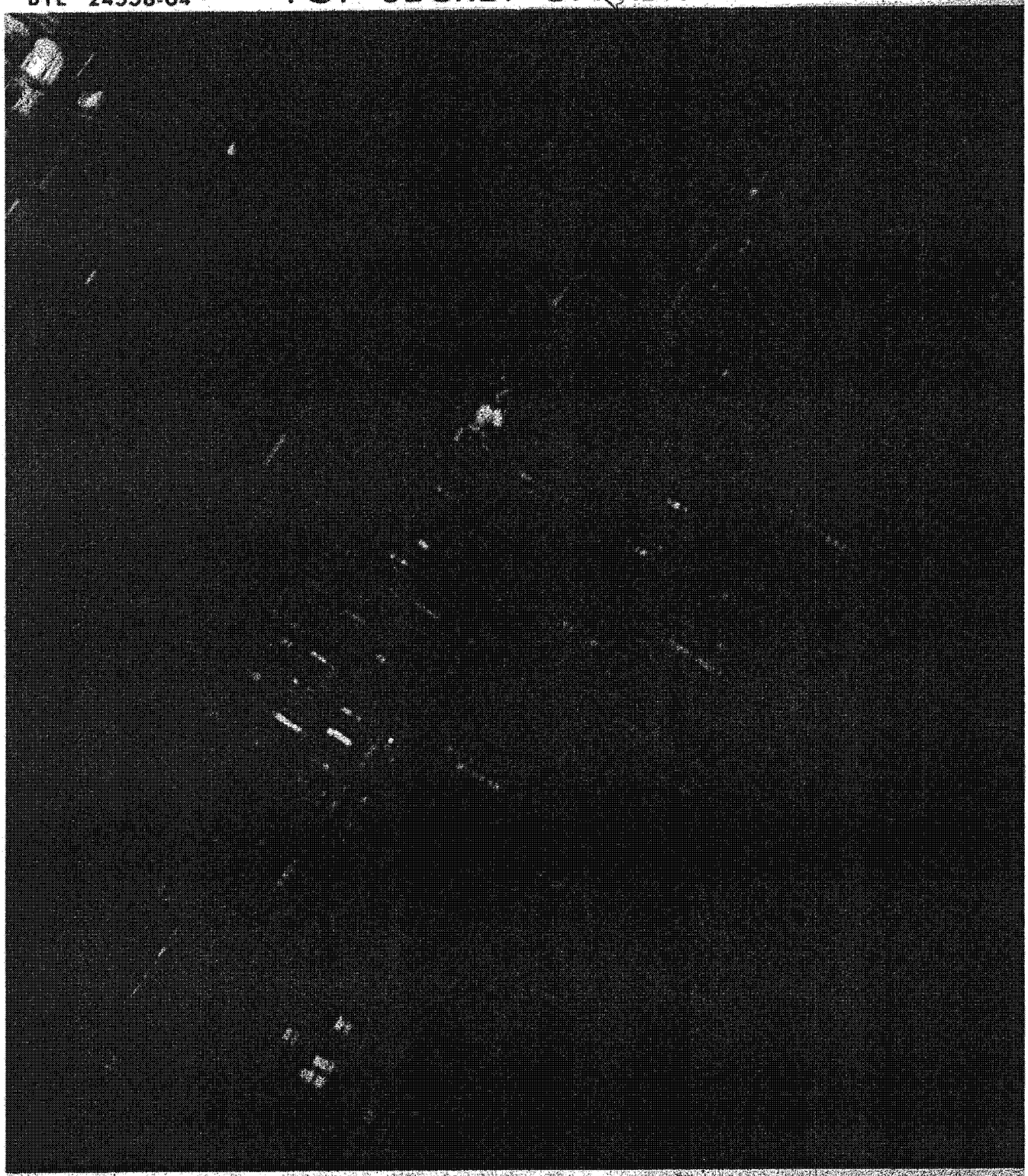

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