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 ANGLO PASS CLEAT
 CATOR PASS CHARGE

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~~TOP SECRET~~ 141627Z JUN 74 CITE 87500-6950
 IMMEDIATEBAIL INFO PRIORITY WHIG, CLEAT, CHARGE.
 HEXAGON
 FROM CHAIRMANEXSUBCOM FOR [] AND POWELL CHARGE
 REF: A. [] 5208 (NOT SENT CLEAT)
 B. COMIREX-D-15.10/5, TCS 900060/73, 26 DEC 73

1. REF BABOVE (SUPERSEDED BY COMIREX-D-15.10/7, 10 JUNE 74, TCS 889511-74, CURRENTLY BEING DISSEMINATED BUT WITHOUT CHANGE TO PROVISIONS OF PRIOR GUIDANCE) GIVES CLEAT THE RESPONSIBILITY FOR PROVIDING THE CONTRACTOR WITH ACCESS TO THE ST FILM WITHIN THE RIGIDLY DEFINED LIMITS AND PROCEDURES SET FORTH THEREIN. THE REBOUND-742ST PERTAINS SOLELY TO CUSTOMER REQUIREMENTS TO BE UNDERTAKEN BY [] AND IS NOT INTENDED TO COVER INDEPENDENT RESPONSIBILITIES OF CLEAT OR OTHER AGENCIES.
2. IN DIRECT RESPONSE TO YOUR MESSAGE, THE FOLLOWING IS APPLICABLE TO THE SPECIFIC REQUESTS LISTED YOUR PARA 2:

Handwritten note:
 Reply by Suchow

~~TOP SECRET~~
 TERRAIN:

- A. CLEAT (RATHER THAN []) IS AUTHORIZED TO EXTRACT DOMESTIC COVERAGE FOR CUSTOMER O AND PRIOR TO RELEASE (BY CLEAT) TO THE CUSTOMER WILL HAVE NEWHEAD AND TAIL IDENTIS ADDED AS PER INSTRUCTION.
- B. ALL ENGINEERING FRAMES, I.E., ALL 34-14 FILM, IF DOMESTIC MAY BE PROVIDED AS ABOVE. IF NOT DOMESTIC, ACCESS ONLY MAY BE PROVIDED THE CONTRACTOR, AT [] OR AT CLEAT, AFTER THE REQUIREMENTS HAS BEEN SUBMITTED HERE AND APPROVED CASE BY CASE.
- C. CALIBRATION FRAMES FALL WITHIN THE SAME GUIDELINES.
- D. ANOMALOUS FRAMES AS INDICATED. THESE LIKEWISE ARE COVERED BY PARA 2B ABOVE.

- STELLAR:
- A COMPLETE STELLAR DN IS NOT AUTHORIZED CUSTOMER O. AUTHORIZATION GUIDANCE IS SAME AS FOR THE TERRAIN MATERIAL.
 3. RESPONSE FURNISHED ABOVE DOES NOT DIFFERENTIATE BETWEEN DUPE NEGS OR POSITIVES. POLICY APPLIES EQUALLY.
 4. THIS MESSAGE HAS BEEN COORDINATED WITH WHIG.

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SPECTRE 100, GUARD 636, CATOR 544, ACORN 904

GUARD PASS WHIG

CATOR PASS CHARGE

~~TOP SECRET~~ 111445Z JUN 74 CITE [] 5208.

SPECTRE, WHIG INFO CHARGE, ACORN

HEXAGON

ATTN: SPECTRE FOR [], WHIG FOR W. OWENS, CHARGE FOR

W. POWELL, ACORN FOR M. BURNETT, [] FOR []

FROM W. POWELL

REF: R-742 ST

SUBJECT: ST FILM DISTRIBUTION

1. THE ST CONTRACTOR WAS INADVERTANTLY LEFT OFF THE THE DISTRIBUTION FOR 1208-5.
2. REQUEST YOU AUTHORIZE BAIL TO PROVIDE 1 EA DN OF THE FOLLOWING TO THE ST CONTRACTOR (C) FOR 1208-5 AND INCLUDE FOR ALL FUTURE 742 ST:

TERRAIN:

- A. ALL DOMESTIC COVERAGE. (CONTRACTOR WILL PROVIDE [] WILL LIST OF FRAMES DURING PFA.)
- B. ALL ENGINEERING FRAMES (ON 1208-5 SPECIFICALLY ALL 3414 FRAMES.)
- C. ALL 3401 CALIBRATION FRAMES.
- D. ANOMALOUS FRAMES AS INDICATED.

STELLAR:

1 DN OF ALL STELLAR MATERIAL.

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 CLEAT 270, ACORN 453, CARVE 239, [] 751, GUARD 629, HYPO 072,
 SPECTRE 435
 CARVE PASS FRAE
 GUARD PASS WHIG
 HYPO PASS SOLAR

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PRIORITY CLEAT, ACORN, FRAE, [] WHIG, INFO PRIORITY SOLAR,
 SPECTRE
 HEXAGON

FM: W. POWELL FOR: CLEAT/R. SMITH, [] ACORN/REUSCH, HULL
 FRAE/BURNETT []/STOWE [] WHIG/W. OWENS

SUBJECT: PFA- MISSION 1207-5

PFA WILL CONVENE 0800 HRS WEDNESDAY, 09 JAN 1974. CLEAT AND
 FRAE ARE REQUESTED TO HAVE PERSONNEL TO SUPPORT ROAD MAP
 DISCUSSIONS PRESENT AT BAIL TUESDAY, 08 JAN 1974. REQUEST []
 ENDEAVOR TO START PROCESSING MATERIAL FIRST THING WEDNESDAY
 MORNING IN ORDER THAT WE MAY COMPLETE THE ACTIVITY BEFORE THE
 WEEKEND.

THE SPO WILL BE REPRESENTED BY:

WILLIAM I. POWELL, JR. [] CERTIFIED SI/TK/P AND PHASE
 THREE BRAVO, GOLF, HOTEL, INDIA AND KILC.

JAMES P. COLLINS [] CERTIFIED SI/TK AND PHASE THREE
 GOLF AND HOTEL.

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CATOR 957 SPECTRE 536 GUARD 016 HYPO 089 CLEAT 251 OPCEN 355

WADDY 005 CALIMET 636 ACORN 840 CARVE 046

CATOR PASS CHARGE

GUARD PASS MANOR WHIG WAHOO

HYPO PASS SOLAR

CALIMET PASS MAGIC

CARVE PASS FRAE

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PRIORITY CHARGE, SPECTRE, MANOR, SOLAR, CLEAT, INFO PRIORITY PILOT

WHIG, WAHOO WADDY, MAGIC, ACORN, FRAE

SECTION ONE OF THREE

REBOUND 831 ST

A. CAMERA DATA

1. MISSION 1206-5

2. TERRAIN CAMERA SN 005, W-21 FILTER

 3. STELLAR CAMERAS PLUS Y SN 009, NO FILTER
 MINUS Y SN 011, NO FILTER

B. CAMERA OPERATIONS

1. THIS IS THE SECOND 12-INCH MAPPING CAMERA FLOWN ON THE HEXAGON PROGRAM.

2. THE TERRAIN CAMERA AND BOTH STELLAR CAMERAS WERE OPERATIONAL THROUGHOUT. THERE IS NO OBVIOUS DAMAGE DUE TO RADIATION WHILE ON ORBIT.

3. A TOTAL OF 2057 TERRAIN FRAMES AND 2057 PAIRS OF STELLAR FRAMES WERE EXPOSED DURING ON ORBIT OPERATION.

4. FILM MARKING: OCCURRING RANDOMLY THROUGHOUT BOTH THE STELLAR AND THE TERRAIN RECORDS WERE MINOR EMULSION DEGRADATIONS SUCH AS SCRATCHES, EMULSION CRACKING, AND PLUS AND MINUS DENSITY MARKINGS WHICH DO NOT SIGNIFICANTLY CONTRIBUTE TO DEGRADATION OF

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MISSION OBJECTIVES.

C. TERRAIN CAMERA

1. IMAGE QUALITY

THE OVERALL QUALITY OF THE STELLAR TERRAIN PHOTOGRAPHY ACQUIRED ON MISSION 1206 IS GOOD. SPECIFIC AREAS, DEPENDANT ON FAVORABLE ILLUMINATION CONDITIONS, WERE EXCELLENT AND CONSIDERED TO BE COMPARABLE TO THE BEST IMAGERY VIEWED ON MISSION 1205. AVERAGE RESOLUTION, AS DERIVED FROM A LIMITED VEM ANALYSIS, WAS 60 L/MM, WHICH IS SLIGHTLY LOWER THAN THE 70 L/MM REPORTED FOR MISSION 1205. CONDITIONS OF ILLUMINATION (SOLAR ELEVATION), WEATHER AND NORMAL LENS TO LENS VARIATIONS ARE CONSIDERED TO BE THE PRIMARY REASONS FOR THIS REDUCTION IN RESOLUTION LEVEL.

IMAGE QUALITY VARIES ALONG THE MAJOR AXIS OF MOST FRAMES, WITH THE BEST OCCURRING IN THE CENTER 30 PERCENT OF THE FORMAT AREA. THIS VARIATION IS PARTLY ATTRIBUTED TO THE HIGH SOLAR ELEVATIONS ENCOUNTERED DURING PHOTOGRAPHIC OPERATIONS RESULTING IN A LOWER PERCENTAGE OF SHADOWS. HIGH SOLAR ELEVATIONS AND SOLAR AZIMUTH WERE ALSO RESPONSIBLE FOR IMAGE DEGRADATIONS CAUSED BY SUB SOLAR POINT REFLECTIONS.

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AN EXPOSURE ANALYSIS OF THE TERRAIN CAMERA RECORD WAS MADE USING MICRODENSITOMETER RASTER SCAN DATA FROM IMAGERY OF NINE URBAN/INDUSTRIAL SCENES. SIX OF THESE AREAS WERE SURROUNDED BY VEGETATIONS WHILE THREE WERE IN DESERT AREAS.

IN GENERAL THE EXPOSURE WAS JUDGED TO BE GOOD. THE SAND SURROUND IMAGERY IS OVEREXPOSED BY ONE HALF STOP. A COMPARISON WITH THE VEGETATION SURROUND SCENES INDICATES THAT A SAND BIAS SIMILAR TO THAT GIVEN PAN CAMERA IMAGERY WOULD BE APPROPRIATE.

SINCE NO DETERMINISTIC TARGETS ARE AVAILABLE TO ASSESS THE SPECTRAL AND SPATIAL IMAGE QUALITY OF THE SO131 FILM, ONLY A SUBJECTIVE DETERMINATION IS POSSIBLE. THE COLOR BALANCE AND EXPOSURE OF THE MATERIAL APPEARS ADEQUATE ALTHOUGH FILTERED WITH A REDDER (WRATTEN 21) THAN NORMAL FILTRATION (WRATTEN 12). THE RESOLUTION OF THE IMAGERY IS ESTIMATED TO BE LESS THAN THAT OF THE BLACK AND WHITE 3400 PORTION OF THE MISSION. A BEST ESTIMATE OF THE LOW CONTRAST GROUND RESOLUTION IS APPROXIMATELY 50 TO 75 FEET. HOWEVER, THE UNIQUE SPECTRAL CHARACTERISTIC OF THE MATERIAL DOES PROVIDE SCENE INFORMATION NOT AVAILABLE ON THE HIGHER RESOLUTION 3400 FILM.

JHC

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2. PHOTO ELECTRICAL

A. DATA BLOCK IMAGERY IS GOOD AND COMPARABLE TO GROUND TEST QUALITY.

B. PROCESS MARKS (FRAME IDENTIFICATION MARKS) ARE GOOD THROUGHOUT THE MISSION.

C. THE FIDUCIAL IMAGERY IS GENERALLY GOOD. HOWEVER, ON FRAMES WHICH RECORDED HIGH DENSITY PHOTOGRAPHY THERE ARE SOME FIDUCIALS OBLITERATED OR DIFFICULT TO SEGREGATE FROM THE SURROUNDING PHOTOGRAPHY. CORRECTIVE ACTION HAS ALREADY BEEN TAKEN TO ELIMINATE THIS PROBLEM. A 0.090 IN. OPAQUE SPOT IS PRECISELY POSITIONED ON THE UNDERSIDE OF THE FIELD FLATTNER WHICH BLOCKS OUT THE IMAGERY IMMEDIATELY SURROUNDING THE FIDUCIAL. THIS CHANGE HAS BEEN INCORPORATED ON THE CAMERA FOR SV-9.

3. MECHANICAL/OPTICAL

A. THE FILM METERING FUNCTION WAS NORMAL FOR THE ENTIRE MISSION.

B. FILM MARKING

(1) A MINOR IDENTATION IN THE FILM BASE WAS NOTED FROM OPERATE 4, FRAME 22 TO OPERATE 5, FRAME 11. THIS WAS CAUSED BY AN ACCIDENTAL RELEASE OF THE PUCK ARM DURING DESPOOLING.

(2) EMULSION CRACKING ON THE TERRAIN FILM WAS FOUND

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TO BE INSIGNIFICANT.

(3) WEAK MINUS DENSITY BANDS WERE NOTED ON THE FIRST FRAME AND OCCASIONALLY THE SECOND AND THIRD FRAMES OF MOST OPERATES.

(4) CORONA MARKINGS OF THE DENDRITIC TYPE REPORTED IN THE MISSION 1205 831 ST REPORT ARE NOT PRESENT IN THE PROCESSED MATERIAL. IMPROVEMENTS IN HANDLING TECHNIQUES AT THE PROCESSING SITE CONTRIBUTED TO THE REDUCTION IN DENDRITIC STATIC MARKINGS.

CORONA MARKINGS WERE RECORDED ON THE FILM DURING FLIGHT AND ARE DISCUSSED IN SECTION 4.

C. THE RESEAU INTERSECTION QUALITY IS EXCELLENT.

D. THERE WERE NO LIGHT LEAKS.

4. ANOMALIES

A. TELEMETRY ANOMALIES RECORDED DURING FLIGHT OPERATIONS:

(1) TERRAIN FLATEN PRESS: ON REV 91 THE TERRAIN FLATEN PRESS MONITOR INDICATED LACK OF PRESS DURING THE LAST FRAME OF OPERATE TWO AFTER THIS INITIAL INDICATION, THE MONITOR CONTINUED TO INDICATE THE POSSIBILITY OF ABNORMAL FLATEN PRESS ACTUATION. AN ENGINEERING E-2 IMPDET

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CATOR 958 SPECTRE 537 GUARD 017 HYPO 090 CLEAT 252 OPDEN 356

WADDY 006 CALUMET 637 ACORN 841 CARVE 047

CATOR PASS CHARGE

GUARD PASS MANOR WHIG WAHOO

HYPO PASS SOLAR

CALUMET PASS MAGIC

CARVE PASS FRAE

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PRIORITY CHARGE, SPECTRE, MANOR, SOLAR, CLEAT, INFO PRIORITY PILOT

WHIG, WAHOO WADDY, MAGIC, ACORN, FRAE

SECTION TWO OF THREE

REBOUND 831 ST

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DIAGNOSTIC MANUAL OPERATE OF 7 FRAMES WAS PERFORMED ON REV 97. THE ANALYSIS OF ALL TELEMETRY DATA FROM THE ENGINEERING OPERATE CONCLUDED THAT IMPROPER OPERATION OF THE TM MICROSWITCH WAS THE MOST LIKELY CAUSE. DURING ENSUING REVS, THE FLATEN PRESS TM MONITOR RECORDED A VARIETY OF INDICATIONS RANGING FROM NORMAL TO "NO PRESS", UNTIL REV 207. TELEMETRY INDICATED NO FLATEN PRESS ON ALL EIGHT FRAMES. ANOTHER ENGINEERING DIAGNOSTIC MANUAL OPERATE WAS THEN PROGRAMMED FOR REV 211. THE TM FROM THE ENGINEERING MOP WAS SIMILAR TO THE REV 207 DATA. IN ORDER TO GAIN MORE DATA ON THE PROBLEM, THE SYSTEM WAS COMMANDED TO THE BACK UP (B) MODE ON REV 219. SINCE THERE WAS ESSENTIALLY NO CHANGE IN THE PRESS TELEMETRY THE SYSTEM WAS COMMANDED BACK TO NORMAL MODE ON REV 226. THROUGHOUT THE REMAINDER OF THE MISSION THE PRESS MONITOR SHOWED CONSIDERABLE VARIATION, EXCEPT FOR SEVERAL REVS STARTING WITH REV 399 DURING WHICH RECORDINGS WERE MOSTLY NORMAL. A CAREFUL VISUAL EXAMINATION OF THE MISSION PHOTOGRAPHY INDICATES NO EVIDENCE OF ABNORMAL OPERATION OF THE TERRAIN FLATEN PRESS; HOWEVER, THIS POTENTIAL PROBLEM WILL BE FURTHER INVESTIGATED BY CLEAT AND ACORN TO VERIFY THAT FILM FLATNESS MEETS SPECIFICATION.

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(2) PHASE LOCK DROP-OUTS: TELEMETRY DATA RECORDED 29 FRAMES OF PHASE LOCK DROP-OUTS STARTING ON THE FIRST OPERATE AND RECURRING RANDOMLY THROUGHOUT THE MISSION. THESE INCLUDED 14 ROTARY SHUTTER, 3 FMC, AND 17 TERRAIN TRANSPORT DROPOUTS (MORE THAN ONE PHASE LOCK DROPOUT CAN OCCUR ON ONE FRAME). PHASE LOCKS ARE REQUIRED TO BE STABLE BY THE FIRST FRAME EXPOSURE OF EACH OPERATE. THE SAMPLING RATE IN THE NORMAL TELEMETRY MODES IS SUCH THAT IT IS POSSIBLE TO RECORD AN OUT OF PHASE LOCK CONDITION PRIOR TO EXPOSURE BUT DOES NOT SAMPLE THE "IN" PHASE LOCK CONDITION WHEN EXPOSURE OCCURS. UNDER CERTAIN CONDITIONS IT IS POSSIBLE TO OBTAIN HIGHER SAMPLING RATE DIAGNOSTIC MODES AND CEC RECORDER RECORDS OF CAMERA PERFORMANCE. OF THE 29 FRAMES FOR WHICH DROPOUTS WERE INITIALLY RECORDED, DIAGNOSTIC DATA AVAILABLE FOR 9 FRAMES VERIFIED PHASE LOCKS "IN" PRIOR TO EXPOSURE. DIAGNOSTIC DATA FOR THE REMAINING 20 FRAMES IS NOT IMMEDIATELY AVAILABLE; HOWEVER PHOTOGRAPHY PERFORMANCE STRINGLY INDICATES THAT PHASE LOCKS CIRCUITS WERE STABLE DURING EXPOSURE IN ALL CASES. ADDITIONAL DATA FOR THESE FRAMES WILL BE RECOVERED FROM THE TELEMETRY RECORDS IN DATA STORAGE AND FURTHER ENGINEERING ANALYSIS WILL BE CONDUCTED.

B. CORONA MARKING

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CORONA DISCHARGE MARKINGS WERE OBSERVED ON APPROXIMATELY 25 PERCENT OF THE TERRAIN FRAMES. THERE IS A POTENTIAL DEGRADATIONS IN THE OVERALL EXPLOITATION OF THIS FILM TO THE CORONA MARKING. HOWEVER, THE IMAGERY DID NOT APPEAR TO BE MASKED OR OBLITERATED BY THE CORONA MARKS. MEASUREMENTS WILL BE CONDUCTED AT CLEAT AND ACORN TO DETERMINE THE EXTENT OF DEGRADATION.

C. MATERIAL CHANGE DETECTOR (MCD): THE MCD STRIP BETWEEN THE TERRAIN 3400 AND SO 131 FILM ACTUATED PROPERLY IN SPITE OF THE FACT IT WAS ONLY 18 INCHES LONG WHEN IT SHOULD HAVE BEEN 21 INCHES. THE MCD STRIP BETWEEN SO 131 AND 3401 FILM WAS ONLY 13 INCHES LONG, BECAUSE OF THE SHORT MCD STRIP THE CAMERA DID NOT RESPOND PROPERLY AFTER A NORMAL MCD SHUTDOWN. AS A RESULT 4 FRAMES OF CALIBRATE FILM WERE EXPOSED ON GROUND TARGETS.

D. STELLAR FILM

1. THE QUALITY OF THE STAR IMAGES ARE GOOD AND COMPARABLE TO IMAGES ACQUIRED IN PREFLIGHT CALIBRATION. EACH CAMERA RECORDED APPROXIMATELY 100 STARS ON THE FRAMES EXAMINED.

2. PHOTOELECTRICAL

A. DATA BLOCKS ARE RECORDED ON ALL FRAMES AND A RANDOM CHECK OF INTERNAL TIME VERIFIED PROPER OPERATION.

B. PROCESS MARKS (FILM IDENTIFICATION MARKS) ARE PRESENT

FRAMES AND ARE OF

C. THERE ARE NO ANOMALIES ASSOCIATED WITH THE RESEAU FLASH. BASED ON MSN 1205 RESULTS, EXPOSURE LEVELS WERE INCREASED FOR MSN 1206 PRODUCING EXCELLENT RESEAU IMAGES.

D. THERE WERE NO STELLAR INHIBITS DURING CAMERA OPERATIONS.

3. MECHANICAL/OPTICAL

A. FILM METERING WAS NORMAL FOR THE ENTIRE MISSION.

B. FILM MARKINGS

(1) CORONA - THERE WAS EXAMPLES OF VERY LIGHT CORONA MARKINGS ON ONLY 13 FRAMES. THESE MARKS WERE ALONG THE SAME EDGE EXTENDING ONE FOURTH TO ONE HALF INCH INTO THE FORMAT.

(2) PLUS AND MINUS DENSITY AREAS APPEARING OCCASIONALLY ARE RELATED TO REFLECTED LIGHT WITHIN THE LENS SYSTEM. THE SOURCE OF THIS LIGHT IS THE MOON.

(3) EMULSION CRACKING *EXAMPLE OP 5, FRAME 1) WAS NOTED THROUGHOUT THE STELLAR LOAD. THE CRACKING APPEARS TO ORIGINATE PREDOMINATELY FROM CENTER OF THE FILM STRIP, WITH CRACKING TO BOTH EDGES OF THE FORMAT (PARALLEL TO THE Y AXIS). IMAGE OR INTERSECTION MENSURATION DATA MAY BE LOST IN THE IMMEDIATE AREA OF THE EMULSION CRACKING.

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(C) THE RESEAU MARKS ARE PRESENT THROUGHOUT AND ARE OF EXCELLENT QUALITY.

(D) ANOMALIES

ON REV 137, FOR TWO FRAMES AND AGAIN ON REV 150, FOR ONE FRAME, TELEMETRY FROM THE STELLAR FLATEN PRESS MONITOR INDICATED ABNORMAL OPERATION. ON REV 156 THE SYSTEM WAS COMMANDED TO REDUNDANT ELECTRONICS FOR THE STELLAR CAMERAS. THE TM INDICATIONS REMAINED ESSENTIALLY THE SAME. THE REMAINDER OF THE MISSION WAS FLOWN IN THE REDUNDANT MODE WITH THE TELEMETRY GIVING VARYING INDICATIONS OF FLATEN PRESS. NO EVIDENCE OF A STELLAR FLATEN PRESS MALFUNCTION HAS BEEN DETECTED BY THE PFA TEAM, BUT FILM FLATNESS MEASUREMENTS WILL BE CONDUCTED.

(E) LIGHT LEAKS

THERE WERE NO LIGHT LEAKS

E. IN-FLIGHT CALIBRATION FILM FOR STELLAR AND TERRAIN CAMERAS

1. APPROXIMATELY TWENTY-THREE FEET OF 3401 FILM AND 10 FEET OF 2403 WERE INCLUDED AT THE END OF THE TERRAIN FILM LOAD FOR THE IN-FLIGHT CALIBRATION. THE VEHICLE ATTITUDE AND THE DISTRIBUTION OF THE RESULTING CALIBRATION FRAMES ARE AS FOLLOWS:

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CATR 959 SPECTRE 538 GUARD 018 HYPO 091 LEAT 253 OPEN 357

WADDY 007 CALUMET 638 ACORN 842 CARVE 048

CATR PASS CHARGE

GUARD PASS MANOR WHIG WAHOO

HYPO PASS SLAR

CALUMET PASS MAGIC

CARVE PASS FRAE

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PRIORITY CHARGE, SPECTRE, MANOR, SLAR, LEAT, INFO PRIORITY PILOT

WHIG, WAHOO WADDY, MAGIC, ACORN, FRAE

FINAL SECTION OF THREE

REBOUND 831 ST

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REV	OP	FRMS	FILM TYPE	PITCH (DEGREES)	ROLL (DEGREES)	YAW (DEGREES)
658	150	2,3	3401			
659	151	1,2	3401			
666	152	1-4	3401			
						GROUND EXPOSURE ORIENTATION
						GROUND EXPOSURE ORIENTATION
						-135.0
						0.0
						-180.0
667	153	1-4	3401			-141.0
						0.0
						-180.0
667	154	1,2	3401			-147.0
						0.0
						-180.0
667	154	3-8	2403			-147.0
						0.0
						-180.0

NOTE: THE VEHICLE ATTITUDE DURING THE CALIBRATE OPERATION
 WAS OPTIMIZED TO PHOTOGRAPH THE MILKY WAY WITH THE TERRAIN
 CAMERA.

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2. PRELIMINARY EVALUATION OF BOTH FILM TYPES, INDICATES STELLAR IMAGERY ON BOTH, BUT THE 2403 PROVIDES THE BETTER QUANTITY AND DISTRIBUTION OF STAR IMAGES. HOWEVER, AS PREDICTED THE 2403 FILM IS CONSIDERED NOT USABLE DUE TO LOSS OF RESEAU INTERSECTIONS AND OVER EXPOSED FIDUCIALS.

ABOUT 60 PERCENT OF THE CALIBRATION FRAMES HAVE LIGHT TO HEAVY CORONA MARKING. AN EVALUATION AT DMATC IS REQUIRED TO DETERMINE IF THERE ARE SUFFICIENT STARS ON THE 3401 TO PERFORM AN INFLIGHT CALIBRATION.

F. FILM PROCESSING

1. PRESPLICE: THE RV ARRIVED AT THE PROCESSING SITE IN GOOD CONDITION AT 1030 HOURS EDT, 25 AUGUST 1973. A PRELIMINARY INSPECTION WAS MADE BY REMOVING THE COVER AND MAKING A TOTAL DARK SEARCH FOR ANOMALIES. APPROX. 30 FT OF THE STELLAR FILM WAS OVER THE FLANGES AND SPILLED INTO THE DOME OF THE RV. THE ANTI-BACKUP SOLENOID DID NOT FUNCTION PROPERLY ON THE TERRAIN FILM TAKE UP. EVERYTHING WAS FOUND TO BE IN GOOD CONDITION. THE TOP OF THE RV WAS THEN REPLACED AND THE UNIT WAS STORED IN A CONDITION ENVIRONMENT UNTIL 27 AUG 1973, WHEN DESPOOLING OF BOTH RECORDS WAS ACCOMPLISHED. ONE HUNDRED FEET OF FILM FROM THE TAG END OF

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THE STELLAR RECORD WAS REMOVED AND PROCESSED SEPARATELY WHICH VERIFIED THAT THE RESEAU INTERSECTION DENSITY WAS AS PREDICTED NO STATIC DISCHARGES WERE NOTED AT ANY TIME DURING DESPOOLING. THERE WERE TWO MINOR BUCKLES AND TWO LONG MINOR INDENTATIONS MADE IN THE BASE OF THE TERRAIN FILM DURING DESPOOLING. THIS AFFECTED 12 FRAMES AND HAS BEEN ATTRIBUTED TO THE PUCK ARM ON THE RV FILM TAKE UP ACCIDENTALLY RELEASING AND HITTING THE FILM DURING DESPOOLING. THE TOTAL WEIGHT OF BOTH PAYLOADS IS 69 POUNDS.

2. PROCESSING DATA

PAYLOAD	PROCESSOR	DEVELOPER
3400/T	YARDLEIGH 5	DUAL GAMMA
2403/T	VERSAMAT	MX885
3401/T	VERSAMAT	MX885
SO-131/T	MP-2	E31-1 MP
3401/S	YARDLEIGH 5	17DN

3. OPTICAL TITLING

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ONLY 48 PERCENT OF THE TERRAIN FILM WAS OPTICALLY TITLED. THIS WAS CAUSED BY A SOFTWARE DIFFICULTY WHERE FIDUCIAL MARKS AREAS WERE BEING MISTAKEN FOR FRAME PROCESS MARKS. SOME FIDUCIALS HAD OPTICAL TITLING IMAGED OVER THEM AND IN A FEW INSTANCES, OR ITERATED THEM. THE SOFTWARE PROBLEM WAS RELATED TO A SOFTWARE MODIFICATION TO INCORPORATE PERCENT OVERLAP DATA INTO THE TITLES. THE PROBLEM WILL BE CORRECTED. THE

STELLAR FILM WAS 95 PERCENT OPTICALLY TITLED. THE MAJORITY OF THE FRAMES NOT OPTICALLY TITLED OCCURRED AFTER OP 122. THESE OPS WERE SHORT AND CAUSED SYNCHRONIZATION PROBLEMS.

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CHARGE 960 ACORN 843 CLEAT 254 SPECTRE 541 GUARD 020 CARVE 049
GUARD PASS WHIG
CARVE PASS FRAE

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HEXAGON

SUBJECT: HEXAGON MAPPING CAMERA PFA ACTION ITEMS

1. COORDINATE A CHANGE TO THE SPECIFICATION ON THE LENGTH OF THE
MCD STRIPS TO 24 INCHES.

CLEAT:

1. EVALUATE BOTH THE STELLAR AND TERRAIN FILM FOR FILM FLATNESS
AND REPORT FINDINGS TO CHARGE NLT 18 SEPT 73.2. DETERMINE THE EXTENT OF CORONA MARKING DEGRADATION, IF ANY,
ON THE TERRAIN FILM AND REPORT FINDINGS TO CHARGE NLT 18 SEPT 73.

ACORN:

1. USING THE TERRAIN RECORD MADE AVAILABLE, EVALUATE THEM FOR
CORONA MARKING DEGRADATION AND FILM FLATNESS.

2. EVALUATE THE STELLAR RECORD FOR FILM FLATNESS.

3. RECOMMEND AN IMPROVEMENT TO THE IN FLIGHT CALIBRATION
TECHNIQUE.

CHARGE:

1. INVESTIGATE THE OVEREXPOSURE CONDITION EXPERIENCED IN [REDACTED]

PAGE 2 [REDACTED] 3259 ~~TOP SECRET~~PHOTOGRAPHING SAND AREAS AND CONSIDER USING A BIAS IN THE
EXPOSURE CRITERIA.2. INVESTIGATE OPTIMIZING THE LAUNCH WINDOW TO REDUCE SUB SOLAR
REFLECTION.

E-2 IMPDET

~~TOP SECRET~~

BT

~~TOP SECRET~~
Handle via BYEMAN
Control System

13	3	
141	47	3-4
155	49	1-3
169	51	3-4
240	64	9-12

THE OVERALL APPEARANCE OF THE RESEAU INTERSECTIONS ARE GOOD TO EXCELLENT.

D. ANOMALIES

1. THE FIRST ANOMALY, NOTED EARLY IN THE MISSION, WAS AN ABNORMAL OPERATION OF THE TERRAIN THERMAL DOOR. THE LOSS OF PHOTOGRAPHY RESULTING FROM THIS PROBLEM IS INDICATED BELOW:

PAGE 4 2329 ~~TOP SECRET~~

REV	COMMANDED FRAME TOTAL	FRAME NOS. NOT EXPOSED
8	2	1-2
13	5	1-5
39	11	1-11
70	20	1-20
90 (1)	12	1-12
90 (2)	17	1-7
91	8	2-5

2. THE SECOND ANOMALY CAUSING LOSS OF PHOTOGRAPHY WAS FIRST OBSERVED ON REV 430 WHEN THE CAMERA TRANSPORTED MORE FRAMES THAN COMMANDED. THE CAUSE OF THIS ANOMALY WAS THE "TAPE STOP SWITCH" WHICH PROVIDES AN INTERNAL OFF COMMAND AND OTHER PHOTOGRAPHIC EVENT COMMANDS. THE FRAMES LOST DUE TO THIS MALFUNCTION ARE INDICATED BELOW:

REV	COMMAND FRAME TOTAL	TOTAL FRAMES TAKEN	FRAMES NO PHOTOS TAKEN	TOTAL FRAMES LOST FROM MISSION COMMANDED	REQUIREMENTS
430	18	23	18-22	1	6
436	2	ENG. DIAGNOSTIC		OVER BOX.	2

PAGE 5 2329 ~~TOP SECRET~~

438	5	ENG. DIAGNOSTIC	OVER COOK	5
444	8	9	NONE	-
446	17	19	16-19	2
447	7	7	NONE	-
462	8	9	NONE	-
470	11	12	NONE	-
478	13	13	NONE	-
479	8	10	1,9,10	1
494	14	16	1,13,14	2
		15, 16	-----	5
		TOTALS	6	25

3. AS THE FREQUENCY OF THIS FAILURE INCREASED A DECISION WAS MADE TO TRANSFER TO THE BACKUP (B) MODE OF OPERATION. THE B MODE, UTILIZING A SEPARATE TAPE STOP SWITCH, PLACES THE ST IN THE FOLLOWING FIXED OPERATING PARAMETERS:

- V/H EQUALS .0457
- EXP EQUALS 6.2 MS
- OVLP EQUALS BETWEEN 70-78 PERCENT
- TIME BETWEEN FRAMES EQUALS 8.9 SECS.

AFTER SWITCHING TO THE B MODE ON REV 503, NO MORE MALFUNCTIONS OCCURRED UNTIL CALIBRATION MODE WAS ATTEMPTED. THREE WERE NO DEGRADATION

E-2 IMPDET
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TOP SECRET
Handle via BYEMAN
Control System

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PP RUXQBAA
DE RUXQNA 978 1211820
ZNY XXXXX KKK ZNM
P 011810Z

BT

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CATOR 708 SPECTRE 299 HYPO 068 CLEAT 204 OPCEN 721 GUARD 783

WADDY 798 CALUMET 582 ACORN 799

CATOR PASS CHARGE

GUARD PASS MANOR WHIG WAHOO

HYPO PASS SOLAR

CALUMET PASS MAGIC

~~TOP SECRET~~

Handle via BYEMAN

Control System

(retransmitted to
FRAB for M. Burnett
1 May 73)
see CHARGE 2549

~~TOP SECRET~~ 011810Z MAY 73 CITE [REDACTED] 2329PRIORITY CHARGE, SPECTRE, MANOR, SOLAR, CLEAT INFO PRIORITY PILOT
WHIG, WAHOO, WADDY, MAGIC, ACORN

SECTION ONE OF TBO

REBOUND-831ST

ATTN: CHARGE PLEASE PASS TO M. BURNETT.

A. CAMERA DATA

1. 1. 1205-5

2. TERRAIN CAMERA SN-003, W-21 FILTER

3. STELLAR CAMERAS PLUS Y SN-006, NO FILTER.
MINUS Y SN-007, NO FILTER.

B. CAMERA OPERATIONS

1. THIS IS THE FIRST OF THE HEXAGON MISSIONS TO INCLUDE THE
12-INCH MAPPING CAMERA.2. THE TERRAIN CAMERA AND BOTH STELLAR CAMERAS WERE OPERATIONAL
THROUGHOUT. HOWEVER, A TOTAL OF 86 OPERATIONAL TERRAIN FRAMES
WERE LOST DUE TO ANOMALIES IN THE THERMAL DOOR AND TAPE STOP
SWITCH AS OBSERVED BY TM PRIOR TO RECOVERY.

C. TERRAIN CAMERA

1. IMAGE QUALITY

VEM AND SUBJECTIVE EVALUATION OF THE PHOTOGRAPHIC IMAGE
QUALITY INDICATED THAT THE RESOLUTION OF THE TERRAIN PHOTOGRAPHYPAGE 2 [REDACTED] 2329 ~~TOP SECRET~~IS BETTER THAN EXPECTED. VEM READINGS WERE MADE WHICH ARE
EQUIVALENT TO APPROXIMATELY 70 CYCLES PER MILLIMETER. GROUND
RESOLUTION DISTANCES BETWEEN 20 AND 30 FEET WERE ALSO OBSERVED.
THERE WAS NO OBSERVABLE SMEAR DUE TO VEHICLE MOTION OR THE CAMERA
B. MODE OPERATION.

2. PHOTO ELECTRICAL

A. DATA BLOCK IMAGERY IS GOOD AND COMPARABLE TO
GROUND TESTS.

B. FRAME MARKS WERE SLIGHTLY BLOOMED.

C. THE FIDUCIAL IMAGERY WAS GENERALLY GOOD, HOWEVER ON
FRAMES WHICH RECORDED HIGH DENSITY PHOTOGRAPHY, THE FIDUCIALS
WERE DIFFICULT TO SEPARATE FROM THE
SURROUNDING IMAGERY.

3. MECHANICAL/OPTICAL

A. THE FILM METERING FUNCTION WAS NORMAL FOR THE ENTIRE
MISSION.B. FILM MARKINGS: THERE WAS A LIGHT PRESSURE MARK OUTSIDE
THE ACTIVE FORMAT AREA OCCURRING INTERMITTENTLY THROUGHOUT THE
MISSION. ALSO, OCCURRING RANDOMLY THROUGHOUT THE MISSION WERE
MINOR EMULSION DEGRADATIONS, FINE SCRATCHES, PLUS AND MINUSPAGE 3 [REDACTED] 2329 ~~TOP SECRET~~

DENSITY MARKINGS, AND MARKINGS ASSOCIATED WITH FILM HANDLING.

C. CORONA MARKINGS WERE ALMOST EXCLUSIVELY OF THE
DENDRITIC TYPE NORMALLY ASSOCIATED WITH AMBIENT PRESSURE
CONDITIONS. APPROXIMATELY 90 PERCENT OF THE FRAMES HAVE
DENDRITIC STATIC ALONG ONE OR BOTH EDGES OF THE FILM, FREQUENTLY
EXTENDING INTO THE FORMAT UP TO A DEPTH OF ONE INCH. GLOW
TYPE CORONA MARKINGS WERE OBSERVED ON THE FOLLOWING FRAMES
CAUSING MINOR DEGRADATION:

~~TOP SECRET~~Handle via **BYEMAN**

Control System

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 PP RUXQBAA
 DE RUXQNA 979 1211820
 ZNY XXXXX KKK ZNM
 P 011810Z

BT
 XXXXX
 CATCR 709 SPECTRE 300 HYPO 068 CLEAT 205 OPCEN 722 GUARD 78
 WADDY 799 CALMET 583 ACORN 800
 CATCR PASS CHARGE
 GUARD PASS MANCR WHIG WAHOO
 HYPO PASS SOLAR
 CALMET PASS MAGIC

1 MAY 73
 8230
 (retransmitted to
 FRAE for M. Burnett,
 1 May 73)

SEE CHARGE 2549

008230

~~TOP SECRET~~ 011810Z MAY 73 CITE [REDACTED] 2329.

PRIORITY CHARGE, SPECTRE, MANCR, SOLAR, CLEAT INFO PRIORITY PILOT
 WHIG, WAHOO, WADDY, MAGIC, ACORN
 FINAL SECTION OF TWO
 REBOUND-831 ST

PAGE 6 [REDACTED] 2329 ~~TOP SECRET~~

TIONS OBSERVED AS A RESULT OF THE FIXED OPERATING PARAMETERS
 ASSOCIATED WITH THE B MODE.

4. ON REV 59, FRAME 38 AND REV 72, FRAMES 26 AND 27, THE
 D PLATEN PRESS MONITOR, S203, INDICATED - FAIL TO PRESS. THE
 CURRENT MONITOR, C-640, VERIFIED PLATEN PRESS OCCURRENCE IN
 ALL THREE FRAMES. THE ANOMALY WAS ATTRIBUTED TO AN INTER-
 MITTENT T/M SWITCH ACTUATION AND OPERATIONS WERE CONTINUED.
 REVIEW OF THE FILM CONFIRMED PROPER OPERATION OF THE D PLATEN
 PRESS.

5. A VERY NARROW DOUBLE BAND OF EXPOSURE OCCURS IN THE
 INTERFRAME SPACE OF ALL FRAMES. THIS EXPOSURE IS MORE NOTICABLE
 WITH HIGH INTENSITY IMAGERY. THE LIGHT RAYS THAT EXPOSE THESE
 IMAGES ARE BEING PASSED THROUGH THE BEVELED EDGES OF THE RESEAU
 GRID. THIS AESTHETIC DEFECT WILL PROBABLY BE CHARACTERISTIC
 ON FUTURE SYSTEMS.

E. LIGHT LEAKS

THREE WERE NO LIGHT LEAKS

F. RECOVERY VEHICLE ANOMALIES

A ONE BY FIVE INCH PIECE OF RUBBER CABLE WRAPPING AND
 A ONE HALF INCH DIAMETER RING WERE LOOSE IN THE RECOVERY BUCKET

PAGE 7 ~~2329 TOP SECRET~~

UPON ARRIVAL AT BAIL.

G. PROCESSING - TERRAIN

1. AT 140 HOURS EST ON 26 APRIL THE TYPE 3400, TERRAIN RECORD WAS STARTED ON THE YARDLEIGH PROCESSOR USING VISCOUS DUAL GAMA CHEMISTRY. THE BASE PLUS FOG DENSITY OF THE 3400 RECORD WAS MEASURED AT .18. THE FLIGHT LOAD SAMPLES MEASURED .10. THE SHORT SECTIONS OF TYPE 3401 AND TYPE 2403 MATERIAL ON THE TAG END OF THE TERRAIN RECORD WERE PROCESSED ON A VERSAMAT PROCESSOR USING SPECIALLY PREPARED SPECIFICATIONS. THE BASE PLUS FOG DENSITY OF THE TYPE 2403 FLIGHT MATERIAL MEASURED .72 WHILE THE CONTROL MEASURED .18. THE BASE PLUS FOG DENSITY OF THE TYPE 3401 NINE AND ONE HALF INCH FLIGHT FILM MEASURED .30 AND THE FLIGHT LOAD SAMPLE SENSITOMETRIC STRIP MEASURED .08.

PROCESSING - STELLAR

2. PROCESSING THE STELLAR RECORD WAS COMMITTED TO THE YARDLEIGH 5 PROCESSOR AT 2100 HOURS EST ON 26 APRIL. AFTER 230 FEET OF PROCESSING, THE FILM WAS CUT AT THE HEAD OF THE PROCESSOR DUE TO AN INABILITY TO ACCURATELY DETECT THE FRAME MARKS. POTENTIAL CAUSES INCLUDE HIGH OVERALL FOG, STATIC MARKINGS ALONG THE EDGE, AND "BLOOMED" FRAME MARKS. THE RE-

PAGE 8 ~~2329 TOP SECRET~~

MAINING SECTION OF THE STELLAR RECORD HAS BEEN SET ASIDE UNTIL THE POSSIBILITY OF SENSITOMETRIC COMPENSATION AND MODIFICATION OF SOFTWARE CAN BE ASSESSED. HEAVY DENDRITIC STATIC MARKS WERE OBSERVED IN SOME OF THE INITIAL STELLAR FRAMES.

H. IN-FLIGHT CALIBRATION WAS NOT ACCOMPLISHED DUE TO FAILURE OF THE TERRAIN THERMAL DOOR TO OPEN.

I. OPTICAL TITLING

72 PERCENT OF THE TERRAIN RECORD WAS SATISFACTORILY OPTICAL TITLED. THE POTENTIAL CAUSES FOR THE NON-TITLED 28 PERCENT INCLUDES INCORRECT ROADMAP DATA, FOG AND/OR STATIC IN THE MARGIN AREA AND OCCASIONALLY FIDUCIAL MARK IMAGERY WHICH APPROXIMATES FRAME MARK DENSITY PROFILES. THESE ANOMALIES EITHER SEPARATELY OR IN CONCERT CAUSED A LOSS IN SYNCHRONIZATION BETWEEN ADDRESS INFORMATION AND FRAME DETECTION. THERE IS NO CAPABILITY TO OPTICALLY TITLE ON THE VERSAMAT PROCESSOR. THEREFORE, THE NINE AND ONE HALF INCH TYPE 3401 AND TYPE 2403 TAG ENDS OF THE TERRAIN RECORD WILL BE MANUALLY TITLED.

J. PRESPLICE: THE RV ARRIVED AT THE PROCESSING SITE IN GOOD CONDITION AT 1230 HOURS EST ON 21 APRIL 1973. THE TOTAL WEIGHT OF THE RV WAS 182.5 POUNDS. A PRELIMINARY INSPECTION WAS MADE

OF REMOVING THE COVER AND MA
ANOMALIES, EVERYTHING WAS FOUND TO BE IN GOOD CONDITION.
BOTH RECORDS WERE WRAPPED WITH A SHORT SECTION OF LEADER
MATERIAL, THE TOP WAS REPLACED AND THE UNIT STORED IN A COOL
ENVIRONMENT. AT 1000 HOURS EST ON 24 APRIL DESPOOLING OF
BOTH RECORDS WAS ACCOMPLISHED. THE MAXIMUM DESPOOLING SPEED
OF BOTH THE STELLAR AND TERRAIN RECORDS WAS LIMITED TO 60 FPM.
DURING THE PRESPLICING OF THE STELLAR RECORD THE OPERATOR
NOTED ONE INSTANCE OF A STATIC DISCHARGE, WHICH OCCURRED AT
THE SPLICE BETWEEN THE RECORD AND LEADER MATERIAL AT THE HEAD
OF THE ROLL. DURING THE PRESPLICING OF THE TERRAIN RECORD
THERE WERE FOUR INSTANCES WHERE THE OPERATOR NOTED A SLIGHT
BUILD UP OF STATIC CHARGE AT WHICH TIME FILM TRANSPORT WAS
HALTED AND THE CHARGE ALLOWED TO DISSIPATE. ALL OTHER
DEFILMING OPERATIONS WERE ROUTINE. THE WEIGHT OF THE RV
MINUS THE PAYLOAD IS 14.0 POUNDS. THE TOTAL WEIGHT OF
FILM IS 68.5 POUNDS.

E-2 IMPDET

~~TOP SECRET~~

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Handle via BYEMAN
Control System

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Handle via BYEMAN
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Collins*

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CHARGE 707 ACORN 798 CLEAT 203 SPECTRE 298 GUARD 782

GUARD PASS WHIG

*g1. file
g2. 3 SP-7*

000224

~~TOP SECRET~~ 011810Z MAY 73 CITE [] 2328.

CHARGE INFO ACORN, CLEAT, SPECTRE, WHIG

HEXAGON

SUBJECT: HEXAGON MAPPING CAMERA PFA ACTION ITEMS

ATTN: CHARGE: PLEASE PASS TO M. BURNETT

KWBAIL

1. SEND FINAL PROCESSING DATA AND COMMENTS TO SPO
 2. SEND THREE SETS OF SAMPLE PHOTOS TO SPO.
 3. MAKE DUPE COPY OF PRE AND POST ENDS OF TERRAIN FILM, (INCLUDING MCD SPLICE) AND INCLUDE WITH DUPE COPY FOR ACORN.
 4. PERFORM TESTS IN PRESPLICE AND PROCESSOR USING FILM THAT HAS BEEN SUBJECTED TO SIMULATED FLIGHT CONDITIONS TO EVALUATE STATIC.
 5. EVALUATE FEASIBILITY OF CONDUCTING EXPERIMENT USING SO-136.
 6. INCLUDE ROADMAP AND CALIBRATION MATERIAL (3401, 2403) WITH O.N. SHIPMENT TO TOPO CENTER.
- CHARGE 1. REQUEST CAL FILM LOAD OF 20 FT FOR EACH TYPE OF CAL FILM.
2. ARRANGE MEETING WITH TRW AND TOPO CENTER TO DISCUSS MED.

CLEAT

1. MAKE MICRO SENSITOMETER MEASUREMENTS OF FIDUCIALS ON 2403 FILM TO DETERMINE ADEQUACY.

2. FORWARD BALANCE OF PLOT OVERLAYS TO ACORN.

3. MAKE FLATNESS CHECKS ON ALL THREE TYPES OF FILM.

ACORN

1. RECONCILE U&D DATA BLOCK TIME RECORDINGS.

2. DETERMINE FEASIBILITY OF SHIELDING IMAGERY ADJACENT TO FIDUCIAL MARKS.

3. INCREASE STELLAR RESEAU DENSITY ON NEXT UNIT.

SPECTRE

WELL DONE.

E-2 IMPDET

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BT

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Handle via BYEMAN
Control System

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Approved for Release: 2025/07/25 C05128914

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Control System*Johnson*

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 DE RUKQA 726 1171049
 ZNY XXXXX ZSZ ZIN
 R 271049Z
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27 APR 1973 10 10

709 SPECTRE 812 OPEN W5 CATOR 266 ACORN 277
 OPEN PASS PLOT
 CATOR PASS CHARGE

*008002 y2**y2,3 file*

~~SECRET~~ 271049Z APR 73 CITE WHIG 0511
 INFO SPECTRE PLOT CHARGE ACORN

SECUR

HANDLE VIA BYEMAN

FOR STONE, SPECTRE FOR SUCKOW, PILOT FOR COMREX,
 CHARGE FOR JOHNSON

SUBJECT: ADDITIONAL HMC OP FOR ACORN

REF: CHARGE 2123, 10 APR 73

TELECON SUCKOW/OWENS, 20 APR 73

DISCUSSION JOHNSON/STONE/OWENS, 26 APR 73

YOU ARE AUTHORIZED TO PROVIDE ACORN ONE COMPLETE OP
 ON 1205-5 IF DEEMED NECESSARY BY PFA CHAIRMAN (JOHNSON).
 THIS IS A ONE TIME APPROVAL AND ONLY APPLYS TO 1205-5.

E-2 IMPDET.

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 Handle via BYEMAN
 Control System

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20 JUL 1971 20

15

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 RR RUKQBA
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 ACORN 216 CATOR 738
 CATOR PASS CHARGE

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 Handle via BYEMAN
 Control System

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y1 - R-7
 y2 - file

~~TOP SECRET~~ 201710Z JUL 71 CITE CLEAT 0147

CHARGE INFO ACORN

HEXAGON

CHARGE FOR LTC. R. WILLIAMSON

ACORN FOR [REDACTED]

FROM [REDACTED]

1. REFERENCE MEETING HELD AT CLEAT 2 JULY 1971.
2. THIS MEETING WAS HELD PRIMARILY TO DISCUSS CLEAT'S POST FLIGHT ANALYSIS (PFA) ENGINEERING PROCEDURES. EMPHASIS WAS EUCLBE PLACED ON THE ADEQUACY OF THE VISUAL EDGE MATCH (VEM) SYSTEM FOR RATING THE QUALITY OF THE HEXAGON PHOTOGRAPHIC TAKE.
3. DURING THIS MEETING, THE CONTRACTORS PROPOSED EXPERIMENTAL PROGRAM WAS PRESENTED AND DISCUSSED. THE WORK STATEMENTS WERE DIRECTED TOWARD VALIDATION OF THE VEM BY SIMULATION. DURING THE DISCUSSION IT WAS INDICATED THAT THE EXPERIMENTAL PROGRAM COULD BE EXTENDED TO INCLUDE CLEAT'S PARTICIPATION WITH REGARD TO THE FUNCTIONAL RELATIONSHIP OF THE SYSTEM RESOLUTION AND THE ABILITY TO MAKE PRECISE STEREOSCOPE OBSERVATIONS.

PAGE 2 CITE CLEAT 0147 ~~TOP SECRET~~

4. A CRITIQUE OF OUR 2 JULY MEETING WAS HELD THE FOLLOWING DAY WHICH INDICATED DIFFERENCES OF OPINIONS AND SOME CONFUSION OF THE VEM PROBLEMS AMONG CLEAT PERSONNEL; IT WAS APPARENT THAT THERE IS A NEED FOR CLARIFICATION OF THE CLEAT POSITION. IT WAS ALSO APPARENT THAT A STATEMENT OF DESIRE BY CLEAT TO COOPERATE IN THE VEM EXPERIMENTAL PROGRAM WAS NEEDED. WE UNDERSTAND ALSO THAT OTHERS IN THE 2 JULY MEETING MAY HAVE LEFT WITH SIMILAR MISUNDERSTANDINGS. OUR APOLOGIES FOR THE CONFUSION THAT RESULTED FROM APPARENT POOR COMMUNICATION ON OUR PART.
 5. THE CLEAT PERSONNEL PRESENT AT THE 2 JULY MEETING WERE NOT FULLY PREPARED TO EVALUATE ALL ASPECTS OF THE PROPOSED EXPERIMENTAL TEST. WE HAVE, SINCE THE MEETING, CONDUCTED A CRASH STUDY WHICH RESULTED IN A POSSIBLE THREE PHASE PLAN
- PHASE I - UNAMACE CORRELATION: CLEAT WILL DEVELOP THE FUNCTIONAL RELATIONSHIPS BETWEEN AUTOMATIC CORRELATING EQUIPMENT AND SYSTEM RESOLUTION. A SET OF STEREO CHIPS WILL BE PLACED IN THE UNAMACE. A RELATIVE ORIENTATION WILL BE PERFORMED USING A FICTITIOUS

PAGE 3 CITE CLEAT 0147 ~~TOP SECRET~~

AS A BASE FOR ANALYZING CONTOUR AND ORTHOPHOTO OUTPUT DATA.

A SECOND SET OF STEREO CHIPS WITH A DIFFERENT RESOLUTION WILL ALSO BE PROCESSED IN THE SAME MANNER. THE TWO OUTPUTS WILL BE COMPARED TO IDENTIFY THE THRESHOLD FOR PRODUCING CLASS A, 1:50,000 SCALE MAPS.

PHASE II - STEREOSCOPIC TRANSFER: THE SAMPLE FILM CHIPS WITH VARYING RESOLUTIONS WILL BE PLACED ON A STEREO COMPARATOR AND A MINIMUM OF TEN STEREO SETTINGS WILL BE MADE ON EACH CHIP. THE RMS OF THE TRANSFER WILL BE COMPUTED FOR EACH SET OF CHIPS AND RESULTING COMPARISONS MADE. CLEAT FEELS THAT VALUABLE ENGINEERING DATA CAN BE DERIVED FROM THESE STEREO CHIPS WITH REGARD TO THE POINT TRANSFER ERROR BUDGET.

PHASE III - PLANIMETRIC CONTENT: SAMPLES OF STEREO FILM CHIPS WILL BE GIVEN TO THE COMPILERS FOR THE PURPOSE OF EXTRACTING PLANIMETRIC CONTENT. THE CONTENT DATA WILL BE COMPARED TO EXISTING LARGE SCALE MAPS OR HIGH RESOLUTION PHOTOS FOR DETERMINING THE PERCENT OF DETAIL DERIVED FROM THE SAMPLE CHIPS. THESE ENGINEERING DATA WILL BE USED BY CLEAT TO WRITE SPECIFICATIONS

PAGE 4 CITE CLEAT 0147 ~~TOP SECRET~~

AND TO DESIGN PROTOTYPE EQUIPMENT FOR EXPLOITATION OF THE HEXAGON SYSTEM.

6. AT THE 2 JULY 1971 MEETING, IT WAS DECIDED THAT CLEAT WOULD RESEARCH RECENT TK PHOTOGRAPHY FOR THE PURPOSE OF CHOOSING A BASE FOR THE SIMULATED PHOTOGRAPHY. THIS TASK HAS BEEN COMPLETED AND THE PHOTOGRAPHY WILL BE AVAILABLE FOR YOUR CONTRACTOR PERSONNEL TO STUDY ANY TIME AFTER 21 JULY 1971.

~~TOP SECRET~~

BT

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Handle via BYEMAN
Control System

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VCOMM SIG CVLOS 128
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B 301045
SWA XXXXX XXX
DE BUKOW 453 301104
B3 BUKOW
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Control System

21 APR 1971 23

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GUARD 359, ACORN 384, OPCEN 830

GUARD PASS CLEAT

OPCEN PASS BELLY

489.8 / cy / St /
ya - file~~SECRET~~ 212315Z APR 71 CITE CHARGE 2361.

CLEAT, ACORN INFO BELLY

HEXAGON

SUBJECT: PFA MINUTES

1. MINUTES OF THE PFA MEETING, 19 APRIL, BETWEEN CHARGE, CLEAT
ACORN, BELLY ARE AS FOLLOWS:

A. RESOLUTION

SINCE CORN TARGETS WILL NOT BE AVAILABLE FOR THE MAPPING
CAMERA, IT WAS TENTATIVELY DECIDED THAT THE VISUAL EDGE MATCHING (VEM)
METHOD OF DETERMINING RESOLUTION WOULD BE EMPLOYED. FIVE EDGES
WITHIN A FRAME AND FIVE FRAMES WOULD BE EVALUATED. HOWEVER, BEFORE
A FINAL DECISION IS REACHED, ADDITIONAL WORK IS REQUIRED.

(1) CLEAT TO REVIEW VEM METHOD AND ADVISE CHARGE OF THEIR
CAPABILITY TO USE THIS TECHNIQUE AND ITS USEFULNESS FOR DETERMINING

PAGE 2 CHARGE 2361 ~~SECRET~~

SYSTEM PERFORMANCE. IN THIS REGARD, IT WAS AGREED THAT ACORN WOULD
VISIT CLEAT IN THE NEAR FUTURE FOR A TUTORIAL MEETING ON VEM.

(2) CHARGE AND ACORN WILL INVESTIGATE THE USE OF SIMULA-
TION PHOTOGRAPHY TO CALIBRATE VEM FOR THE MAPPING CAMERA.

(3) A JUNE/JULY MEETING WILL BE HELD TO DETERMINE
DETAILED PROCEDURES OR CONSIDER AN ALTERNATE METHOD FOR DETERMINING
SYSTEM RESOLUTION.

B. INFLIGHT CALIBRATION

DUE TO THE INCOMPLETE STATUS OF THE DEVELOPMENT OF SOFTWARE
AND RELATED STUDIES REGARDING THE BAR XC, FINAL DETERMINATION OF THE
INFLIGHT CALIBRATION VERIFICATION PROCEDURES AND SOFTWARE WILL BE
MADE IN SEPTEMBER 71. CURRENT SCHEDULES INDICATE THAT DEFINITIVE
INFORMATION WILL BE AVAILABLE AT THAT TIME.

C. DISTORTION

A COMPLETE DATA REDUCTION USING ALL TERRAIN LENS RESEAU
MARKS AND THE CAMERA REFERENCE SYSTEM WILL BE ACCOMPLISHED ON AT
LEAST 30 FRAMES. STELLAR CAMERA DATA REDUCTIONS WILL BE MADE ON
60 - 80 FRAMES SPREAD THROUGHOUT THE MISSION.

D. VISUAL INSPECTION OF FILM

CLEAT WILL COMMENT ON ADEQUACY OF CAMERA EXPOSURES. WHEN

PAGE 3 CHARGE 2361 ~~SECRET~~

SAMPLES OF THE FIRST AND LAST PORTIONS OF THE MISSION ARE REQUESTED, THE FRAMES WILL BE SELECTED FROM THE FIRST SEQUENCE/LAST SEQUENCE OF PHOTOGRAPHY.

E. TIME LINES

THERE WILL BE A "QUICK LOOK" AT THE PROCESSING FACILITY BY THE BREAKOUT TEAM TO ASSIGN SPECIAL TASKS IF ANOMALIES ARE DETECTED. CLEAT WILL REPORT OUT OF TOLERANCE CONDITIONS TO CHARGE AS FOUND. AN ANALYSIS REVIEW MEETING WILL BE HELD AT CLEAT AT APPROXIMATELY R PLUS 60 DAYS. THE PURPOSE OF THIS MEETING WILL BE TO REVIEW FINDINGS AND CONCLUSIONS REACHED AS A RESULT OF THE PFA. THIS MEETING WILL BE KEPT TO A ONE DAY DURATION.

F. MISCELLANEOUS

(1) A DECISION WAS MADE TO EXPOSE THE TERRAIN AND STELLAR RESEAS ON THE DARK SIDE USING THE CALIBRATION MODE IN ORDER TO PROVIDE PROPERLY EXPOSED RESEAU PATTERNS FOR ANALYSIS. CHARGE WILL TAKE THE NECESSARY ACTION TO ADD THIS REQUIREMENT TO THE FLIGHT PLAN AND ASSURE THAT THE 3401 CALIBRATION FILM IS PROVIDED TO CLEAT.

(2) THE CLOUDCRAFT QUALIFICATION PHOTOGRAPHY WILL BE USED BY CLEAT TO PERFORM A DRY RUN OF THE PFA MEASUREMENTS AND PROCEDURE ON A LOW PRIORITY BASIS. THE PURPOSE OF THE DRY RUN IS TO VERIFY

PAGE 4 CHARGE 2361 ~~SECRET~~

MAN HOURS OF EFFORT AND TO DEBUG THE PROCEDURES.

(3) CLEAT WILL PREPARE A DRAFT OF THE DETAILED PFA MEASUREMENT PROCEDURES AND FURNISH A COPY TO CHARGE.

~~SECRET~~

BT

~~SECRET~~

Handle via BYEMAN
Control System

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SMA XXXXX KKK

DE BUXOBV #80 JJ5252

BB BUXOV BNEIMC BNEIMA

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HANDLE VIA BYEMAN
CONTROL SYSTEM

RR RUXQAA
DE RUXQBAA 207 0421330
ZNY XXXXX KKK
R 110005Z
BT
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GUARD 774
GUARD PASS CLEAT, WHIG

207.1 / y'12 Sk7
y2-fel

~~SECRET~~ 110005Z FEB 71 CITE CHARGE 0794.

CLEAT INFO WHIG
SECTION ONE OF TWO
HEXAGON

CLEAT FOR [REDACTED], WHIG FOR SCHOW.

SUBJECT: POST FLIGHT ANALYSIS.

1. REFERENCE A. MEETING OF 12 JAN AT CLEAT.
B. CHARGE MSG 2484.

2. THIS MESSAGE CONFIRMS ITEMS DISCUSSED IN REF A. THE CLEAT EFFORT IN SUPPORT OF THE HEXAGON MAPPING CAMERA OPERATION IS AS FOLLOWS:

- A. A REPFLIGHT CALIBRATION REPORT.
DUE PRIOR TO LAUNCH.
- B. A COMPARISON OF THE DOPPLER EPHEMERIS DATA WITH THE REAL TIME EPHEMERIS GENERATED BY THE STC.
DUE WITHIN 60 DAYS OF MISSION COMPLETION.

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- C. INITIAL POST FLIGHT ANALYSIS PER REF B.
- D. DETAILED POST FLIGHT ANALYSIS AS LISTED IN PARA 3 BELOW TO BE SUBMITTED TO CHARGE IN TWX FORM WITHIN 45 DAYS OF INITIAL PFA. WHERE ITEMS ARE INCLUDED IN BOTH THE BRIDGEHEAD EFFORT AND THE DETAILED PFA, IT IS INTENDED THAT THE LATTER BE IN GREATER DETAIL. THE REPORT TO CHARGE SHOULD CONTAIN ONLY OUT OF TOLERANCE CONDITIONS.
3. THE FOLLOWING LIST CONTAINS THE ENGINEERING MEASUREMENTS AND OBSERVATIONS REQUIRED BY THIS OFFICE FOR STELLAR AND TERRAIN CAMERA CONTRACT ADMINISTRATION. DETAILED CRITERIA WILL BE DETERMINED FROM FORMAT DRAWINGS AND SI SUBSYSTEM SPECIFICATIONS. THE NUMBER AFTER EACH ITEM IS THE MINIMUM NUMBER OF FRAMES TO BE SAMPLED FOR THE SPECIFIC MEASUREMENT OR OBSERVATION. TWO (2) REFERS TO THE FIRST AND LAST FRAME OF THE MISSION, EF REFERS TO EACH FRAME OF THE MISSION. IF DURING THE NORMAL DATA REDUCTION ACTIVITY FOR MAPPING, ANOMALIES ARE NOTED WHICH ARE NOT INCLUDED IN THE FOLLOWING LIST OR WHICH REQUIRE A LONGER TIME FOR INVESTIGATION, THOSE ANOMALIES WILL BE ANALYZED AND BRIEFLY REPORTED IN THE MISCELLANEOUS SECTION. ANY REPORTS REGARDING THOSE WILL BE PUBLISHED AND SUBMITTED WHEN THE IN-DEPTH ANALYSIS IS ACCOMPLISHED.

- A. VERIFY PREFLIGHT CAMERA CALIBRATIONS.

FOR A SEQUENCE OF TC FRAMES HAVING A COMMON GROUND
OBJECT POINT (LESS THAN 0.10 MS).

(3) RESEAU

- (A) NUMBER AND LOCATION OF OBLITERATED INTERSECTIONS (2)
- (B) NUMBER AND LOCATION OF ADJACENT OBLITERATED INTERSECTIONS (2)
- (C) INTERSECTION DENSITY (SPOT CHECK, 2)
- (D) INTERSECTION DIMENSIONS (SPOT CHECK, 2)
- (E) BACKGROUND DENSITY OF CALIBRATION FRAME (1)
- (F) ANY ANOMALIES PRECLUDING DATA REDUCTION FOR MAPPING.

(4) FRAMING

- (A) INTERFRAME DISTANCE (RANDOM, 30)
- (B) TRACKING MEASURED FROM KNOWN POINT ON FRAME SIDE (CONSECUTIVE, 30)
- (C) SIZE OF FRAME (1)

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(D) FRAME MARKS

PRESENCE (EF)

DENSITY (START OF FIRST OP, START OF LAST OP)

(5) FIDUCIAL IMAGES

- (A) DOT DIAMETER (2)
- (B) DOT AND LINE DENSITIES (2)
- (C) LINE WIDTH (2)
- (D) DOT TO LINE SPACING (2)
- (E) ANY EVIDENCE OF SMEARING (EF)
- (F) ANY MISSING, NOT REPORTED IN REBOUND MSG (EF)
- (G) ANY SHADOWING OR ILLUMINATION SPILLOVER INTO USEFUL FORMAT CAUSING A DENSITY INCREASE OF 0.1 OR MORE.
- (H) FIDUCIAL-TO-FIDUCIAL SPACING (2)

(6) DATA BLOCK

- (A) PEAK DENSITY OF EACH DOT WRT BACKGROUND FOG (2)
- (B) DENSITY BETWEEN EACH DOT WRT BACKGROUND FOG (2)
- (C) DIAMETER OF EACH DOT AT 0.3 DENSITY LEVEL (2)
- (D) ANY MISSING OR INADEQUATE DATA WORDS (EF)

(7) OVERLAP

- (A) ACTUAL OVERLAP VERSUS COMMANDED OVERLAP.

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(8) FILM

- (A) ANY FILM MARKING-FOGGING, STREAKS, PRESSURE MARKS, CORONA, TYPICAL DENSITIES.
- (B) TOTAL FILM DISTORTION.
- (C) FILM FLATNESS (EF).

C. STELLAR CAMERA

- (1) MIDPOINT OF SC AND TC FIDUCIAL EXPOSURE MUST BE WITHIN 4 MS OF EACH OTHER (EF)

(2) BACKGROUND DENSITY

- (A) ACROSS THE FORMAT BACKGROUND DENSITY (2) PAIRS.
- (B) ANY FRAMES WITHOUT SIXTH MAGNITUDE OR LESS STARS.
- (C) ANY NON-USABLE FRAMES DUE TO TOO HIGH BACKGROUND DENSITY OR INADEQUATE EXPOSURE.

(3) RESEAU

- (A) NUMBER AND LOCATION OF OBLITERATED INTERSECTIONS (2)
- (B) NUMBER AND LOCATION OF ADJACENT OBLITERATED INTERSECTIONS (2)
- (C) INTERSECTION DENSITY (SPOT CHECK, 2)
- (D) INTERSECTION DIMENSIONS (SPOT CHECK, 2)
- (E) ANY ANOMALIES PRECLUDING DATA REDUCTION FOR MAPPING.

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(4) FRAMING

- (A) INTERFRAME DISTANCE (RANDOM, 30)
- (B) TRACKING, MEASURED FROM KNOWN POINT ON FRAME SIDE (CONSECUTIVE, 30)
- (C) SIZE OF IMAGES AND FRAME (1)
- (D) DISTANCE BETWEEN FRAME PAIRS (2)
- (E) FRAME MARKS

PRESENCE (EF) Approved for Release: 2025/07/25 C05128914

(4) FRAMING

- (A) INTERFRAME DISTANCE (RANDOM, 30)
- (B) TRACKING, MEASURED FROM KNOWN POINT ON FRAME SIDE
(CONSECUTIVE, 30)
- (C) SIZE OF IMAGES AND FRAME (1)
- (D) DISTANCE BETWEEN FRAME PAIRS (2)
- (E) FRAME MARKS
PRESENCE (EF)
DENSITY (START OF FIRST OP, START OF LAST OP)

(5) DATA BLOCK

- (A) PEAK DENSITY OF EACH DOT WRT BACKGROUND FOG (2)
- (B) DENSITY BETWEEN EACH DOT WRT BACKGROUND FOG (2)
- (C) DIAMETER OF EACH DOT AT 0.3 DENSITY LEVEL (2)
- (D) ANY MISSING OR INADEQUATE DATA WORDS (EF)

(6) FILM

- (A) FILM MARKING-FOGGING, STREAKS, SCRATCHES, PRESSURE
MARKS, CORONA-TYPICAL DENSITIES.
- (B) TOTAL FILM DISTORTION.
- (C) FILM FLATNESS (EF).

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FINAL SECTION OF TWO
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CLEAT FOR [] WHIG FOR SCHOW

D. MISCELLANEOUS.

- (1) REFERENCES TO ANY GRAPHS, REPORTS, INFORMATION WHICH WILL BE SENT SEPARATELY.
- (2) ANY ANOMALIES REQUIRING FURTHER INVESTIGATION BEYOND THE SCOPE OF THIS MESSAGE.
- (3) COVERAGE OF BAR XO RANGE.
- (4) ANY OTHER ANOMALIES.

4. AS AGREED TO AT THE 12 JANUARY MEETING, CLEAT EFFORT IN SUPPORT OF THE BRIDGEHEAD ACTIVITY WILL BE LIMITED TO ONE OR TWO INDIVIDUALS FOR A PERIOD OF THREE TO FOUR DAYS PLUS TRAVEL TIME. THESE PEOPLE

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WILL ASSIST IN THE INITIAL EVALUATION OF THE MATERIAL AND PROVIDE CONTINUITY FOR THE FOLLOW-ON EFFORT TO BE CONDUCTED AT CLEAT.

5. REQUEST YOUR COMMENTS CONCERNING CLEAT'S ABILITY TO SUPPORT THE DESIRED P.F.A. AND TECHNIQUES TO BE EMPLOYED IN PROPOSED ANALYSIS TO INSURE THAT THE ACCURACIES CALLED OUT IN THE SI SUBSYSTEM SPECIFICATIONS ARE BEING MET. OF PARTICULAR IMPORTANCE ARE TIMING ACCURACIES AND THE CAMERA STABILITY ACCURACIES.

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HEXAGON

SUBJECT: RCM MESSAGE FOR SI MATERIAL.

THE PROPOSED RCM MESSAGE (RECESSIVE-31) FOR THE SI CAMERA SYSTEM
WILL CONTAIN THE FOLLOWING INFORMATION:

A. STELLAR FILM (PORT AND STARBOARD)

1. SUBJECTIVE EVALUATION OF STAR IMAGES (QUALITY,
DISTRIBUTION, AND NUMBER PER FRAME).

2. PHOTO ELECTRICAL

(A) DATA BLOCK (PRESENCE OF FORMAT AND IMAGE QUALITY)

(B) PROCESS MARKS (PRESENCE AND QUALITY)

(C) RESEAU FLASH (DENSITY AND OCCURRENCE)

(D) STELLAR INHIBITS (NUMBER OF)

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3. MECHANICAL/OPTICAL

(A) FILM METERING

(B) FILM MARKING (CORONA OR PRESSURE)

(C) QUALITY AND EXISTENCE OF RESEAU TICK MARKS

(D) ANOMALIES AND FAILURES IDENTIFICATION

(E) LIGHT LEAKS

4. PROCESSING CRITERIA

(A) TYPE, GAMMA

(B) DENSITY

(C) CONTRAST

B. TERRAIN FILM

1. SUBJECTIVE EVALUATION OF TERRAIN IMAGERY (EXPOSURE,
IMAGE QUALITY, SMEAR, ANOMALIES).

2. PHOTO ELECTRICAL

(A) DATA BLOCK (SAME AS STELLAR)

(B) PROCESS MARKS (SAME AS STELLAR)

(C) FIDUCIAL FLASHES (OCCURRENCE AND QUALITY)

3. MECHANICAL/OPTICAL

SAME AS STELLAR

4. PROCESSING CRITERIA

SAME AS STELLAR

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5. WEATHER EFFECTS (CLOUDS, HAZE, ETC.) GENERAL STATEMENT REGARDING IMAGE QUALITY DEGRADATION DUE TO WEATHER.

C. IN-FLIGHT CALIBRATION FILM (STELLAR AND TERRAIN CAMERAS)

1. RESEAU FLASH (DENSITY AND OCCURRENCE).
2. QUALITY & EXISTENCE OF RESEAU TICK MARKS.
3. QUALITY OF STELLAR IMAGES.
4. DISTRIBUTION OF STELLAR IMAGES.
5. PRESENCE AND QUALITY OF DATA BLOCKS AND FIDUCIALS.
6. FILM MARKING
7. METERING
8. ANOMALIES
9. PROCESSING CRITERIA.

D. OPERATIONS DATA (STELLAR & TERRAIN)

1. MISSION NUMBER
2. CAMERA SERIAL NUMBER
3. TOTAL NUMBER OF FRAMES
 - (A) TERRAIN
 - (B) STELLAR
 - (C) IN FLIGHT CALIBRATION

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REQUEST YOUR COMMENTS AND/OR RECOMMENDATIONS CONCERNING PROPOSED RECESSIVE 31 REPORT. FURTHER MANOR OBTAIN COORDINATED MC&G COMMUNITY COMMENTS.

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HEXAGON ?

FOR COL WILLIAMS FROM C. BORN

SUBJECT: DRAFT OF CLEAT PFA PROCEDURES TO BE DISCUSSED
 AT THE NEXT PFA MEETING

REFERENCE: CHARGE 2361

1. WHERE SPECIFICATIONS ARE KNOWN THEY ARE STATED,
 OTHERWISE CLEAT REQUIRES THIS INFORMATION.

2. NUMBER IN PARENTHESES REFERS TO NUMBER OF FRAMES TO
 BE SAMPLED.

(EF) REFERS TO EVERY FRAME

(2) REFERS TO A FRAME FROM NEAR THE BEGINNING AND A
 FRAME NEAR THE END OF MISSION.

(SR) SPECIFICATION NEEDS CLARIFICATION AND IS REQUESTED

3. VISUAL INSPECTIONS WILL GENERALLY BE MADE ON DUPE
 POSITIVES; ALL OTHER ANALYSES ON ONS.

4. COMPARATIVE MEASUREMENT FOR EVALUATION OF:

(A) RESEAU POSITION WRT TERRAIN CAMERA REFERENCE AXIS.

(B) TOTAL FILM DISTORTION.

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(C) FILM FLATNESS.

(D) STAR MAGNITUDES.

4.1 (30) RANDOMLY SELECTED FRAMES WILL BE USED FOR THIS
 ANALYSIS. THE FIRST AND LAST SEVERAL EXPOSURES FROM THE
 MISSION WILL NOT BE CHOSEN.

4.2 SINGLE COMPARATOR MEASUREMENT OF ALL RESEAU AND
 FIDUCIAL MARKS WILL BE MADE ON TERRAIN FRAMES SAMPLED.

4.3 SINGLE COMPARATOR MEASUREMENTS OF ALL RESEAU AND STAR
 IMAGES WILL BE MADE ON STELLAR FRAMES SAMPLED. SIXTY FRAMES
 WILL BE MEASURED, THIRTY BACYT AND THIRTY STARBOARD CORRESPONDING
 TO THE THIRTY TERRAIN FRAMES REFERENCED IN 4.1.

4.4 REDUCTION

(A) TRANSFORM INSTRUMENT MEASUREMENTS TO THE CALIBRATED
 RESEAU SYSTEM VIA A SIX-PARAMETER TRANSFORMATION.

(B) TOLERANCE CONDITION FOR RESEAU POSITIONING IS .03 TO
 .07 INCH AND .08 TO .12 INCH WRT FIDUCIAL DOT.

(C) THE FILM DISTORTION REQUIREMENT IS THAT 1.64 TIMES
 THE VECTOR SUM OF THE STANDARD DEVIATION IN X AND THE
 STANDARD DEVIATION IN Y BE LESS THAN OR EQUAL TO THIRTY
 MICROMETERS.

(D) CLEAT IS UNAWARE OF ANY CRITERIA FOR FLATNESS OR

FILM DISTORTION ON STELLAR FRAMES; HOWEVER, ANY APPARENT ABNORMALITIES WILL BE REPORTED. (SR)

(C) USING PHOTO COORDINATES OF STAR IMAGES AND CLEAT ALTITUDE PROGRAM, ALL STAR MAGNITUDES WILL BE DETERMINED. THE TOTAL NUMBER OF FRAMES WHICH DO NOT CONTAIN SIXTH MAGNITUDE STARS WILL BE REPORTED.

5. TIMING

5.1 SV TIME VS. TC RECORDED TIME (5 FRAMES). TELEMETRY TIME WILL BE COMPARED TO TIME READ FROM DATA BLOCK ON TERRAIN CAMERA. (SR)

5.2 MIDPOINT OF SC AND TC FIDUCIAL EXPOSURES (5 FRAMES). READ TIME ON DATA BLOCKS TO INSURE THAT MIDPOINT OF EACH STELLAR EXPOSURE IS WITHIN 4 MSEC OF TC FIDUCIAL EXPOSURE.

6. VISUAL INSPECTION (EF) INCLUDES:

6.1 ANOMALIES PRECLUDING DATA REDUCTION FOR MAPPING.

CLEAT WILL USE ITS DISCRETION TO REPORT ANY CONDITION IT FEELS WILL PREVENT OR REDUCE POSSIBILITY OF MAPPING WITH THIS PHOTOGRAPHY.

6.2 CLEAT WILL COMMENT ON ADEQUACY OF EXPOSURE FOR ENTIRE

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MISSION. THIS COMMENT IS BASED ON MAP COMPILATION AND ANALYTICAL REDUCTIONS TO BE MADE WITH THIS PHOTOGRAPHY.

6.3 EVIDENCE OF SMEARING

6.4 MISSING OR INADEQUATE FIDUCIALS, RESEAU, FRAME MARKS AND/OR DATA WORDS.

6.5 ANY SHADOWING OR ILLUMINATION SPILLOVER INTO USEFUL FORMAT CAUSING A DENSITY INCREASE OF 0.1 OR MORE. IF THIS IS SUSPECTED UPON VISUAL EXAMINATION, A CHECK WILL BE MADE ON DENSITOMETER OF FRAMES IN QUESTION.

6.6 ANY FILM MARKING, FOGGING, STREAKS, PRESSURE, MARKS, CORONA, ETC.

6.7 ANY NON-USABLE FRAMES DUE TO HIGH BACKGROUND DENSITY OR INADEQUATE EXPOSURE (STELLAR).

7. DENSITOMETER CHECKS. FOUR RESEAU INTERSECTIONS ON EACH OF TWO FRAMES WILL BE SAMPLED FOR FOLLOWING:

7.1 INTERSECTION DENSITY AND DIMENSIONS--MICRODENSITOMETER TRACES ACROSS RESEAU LINES AND WIDTH AND DENSITY NOTED (2 TO 10 MICRONS ON STELLAR; 8 TO 12 MICRONS ON TERRAIN) (SR FOR DENSITY)

7.2 BACKGROUND DENSITY OF CALIBRATION (1 FRAME). FOUR AREAS

PAGE 5 CLEAT 0139 ~~SECRET~~ *MACRO*

OF FRAME WILL BE SAMPLED WITH MICRODENSITOMETERS. THESE READINGS WILL BE AVERAGED. (SR)

7.3 DENSITY OF FRAME MARKS (2 FRAMES). THE MICRO-D WILL BE USED TO SCAN THE FRAME MARKS AND THE DENSITY AND SIZE OF EACH MARK WILL BE EVALUATED AGAINST SPECS SHOWN ON FORMAT DIAGRAM. SETS OF FOUR FRAME MARKS WILL BE SAMPLED.

7.4 FIDUCIAL DOT DIAMETER WILL BE SCANNED WITH MICRO-D. FOUR FIDUCIALS ON TWO FRAMES WILL BE SAMPLED. 15 TO 25 MICRONS (SPEC).

7.5 FIDUCIAL DOT AND LINE DENSITIES WILL BE SAMPLED AT THE SAME TIME DOT DIAMETERS ARE OBSERVED WITH MICRO-D. 1.3 PLUS OR MINUS 0.3 MICRON.

7.6 FIDUCIAL LINE WIDTH WILL ALSO BE SCANNED AT THE SAME TIME DOT DIAMETERS ARE SAMPLED WITH MICRO-D. 10 TO 20 MICRON WIDTH (SPEC).

7.7 FIDUCIAL DOT TO LINE SPACING WILL BE MEASURED ON FOUR FIDUCIALS OF TWO FRAMES WITH MICRO-D. (SR)

7.8 DATA BLOCK. A MICRO-D TRACE WILL BE MADE ON FOUR SAMPLE FRAMES DOWN THE DATA BLOCK FOR THE PURPOSE OF SAMPLING:

1. PEAK DENSITY OF EACH DOT WRT BACKGROUND FOG GREATER THAN 0.6.

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2. DENSITY BETWEEN EACH DOT WRT BACKGROUND FOR LESS THAN 0.25 MICRON.
3. DIAMETER OF EACH DOT AT 0.3 DENSITY LEVEL.
- 7.9 ACROSS THE STELLAR FORMAT DENSITY (BACKGROUND FOG) LEVEL OF TWO SAMPLE FRAMES WILL BE OBSERVED USING A MACRO-D IN FOUR AREAS OF EACH FRAME TESTED. (SR)
- 7.10 THE SIZE OF STELLAR IMAGES WILL BE MEASURED ON A MICRO-D. SEVERAL MAGNITUDES WITH ACCOMPANYING SIZES WILL BE REPORTED BASED ON A TWO FRAME SAMPLE. (SR)
8. THE DISTANCE BETWEEN STELLAR FRAMES (30 FRAMES) WILL BE MEASURED WITH A COMPARATOR (1.85 TO 1.95 INCHES BETWEEN FRAMES IS THE SPEC).
9. THE DISTANCE BETWEEN THE TERRAIN FRAMES (30 FRAMES) WILL BE MEASURED IN A SIMILAR MANNER. (SR)
10. THE SIZE OF THE STELLAR FRAME AND TERRAIN WILL BE MEASURED ON A COMPARATOR (1 FRAME EACH). (TERRAIN 18.220 X 9.000 INCHES; STELLAR 70 X 110 MM) (SR)
11. FIDUCIAL TO FIDUCIAL SPACING. ON TWO OF THE THIRTY FRAMES PREVIOUSLY MEASURED THE SPACING WILL BE COMPUTED FROM THE TRANSFORMED COMPARATOR MEASUREMENTS (15.220 TO 15.280 INCHES).

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12. TRACKING MEASURED FROM KNOWN POINT ON FRAME SIDE (30 CONSECUTIVE FRAMES). THE DISTANCE FROM THE EDGE OF FILM TO SOME KNOWN POINT ON THE FORMAT WILL BE MEASURED WITH A COMPARATOR. THIS WILL GIVE AN INDICATION OF HOW FILM IS TRACKING THROUGH THE CAMERA.
13. DISTANCE BETWEEN FRAME PAIRS (STELLAR). THE DISTANCE BETWEEN TWO CONSECUTIVE STARBOARD AND TWO CONSECUTIVE PORT EXPOSURES WILL BE MEASURED. (SR)
14. ACTUAL OVERLAP VS. COMMAND OVERLAP WILL BE SAMPLED FOR THIRTY PAIRS OF FRAMES. THE OVERLAP WILL BE MEASURED WITH A TEMPLATE AND COMPARED TO COMMAND OVERLAP. THE FRAMES CHOSEN WILL BE WHERE THE COMMAND OVERLAP CHANGES.
15. THE DYNAMIC RESOLUTIONS (VEM) WILL BE ADDRESSED IN FORTHCOMING MEETING.

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