

TOP SECRET

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CONFIDENTIAL

T O P S E C R E T 100338Z DEC 68 CITE [] 5212.

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CORONA

SUBJECT: MISSION 1105, PHOTOGRAPHIC EVALUATION INTERIM REPORT (PEIR)

REF: A. [] 1216

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B. [] 1238

1. NUMERICAL SUMMARY:

MSN NO AND DATES: 1105-1, 3-11 NOVEMBER 1968
1105-2, 11-21 NOVEMBER 1968

LAUNCH DATE AND TIME: 3 NOVEMBER 1968/2131Z

VEHICLE NUMBER: 1646

CAMERA SYSTEM: CR-5

PAN CAMERA NO.: FORWARD LOOKING, 311
AFT LOOKING, 310

DISIC CAMERA NO: THERE WAS NO DISIC CAMERA WITH MSN 1105

RECOVERY REVS: MSN 1105-1, 131
MSN 1105-2, 292

2. CAMERA SETTINGS

FWD-LOOKING: WRITTEN 25 FILTER (PRIMARY)

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WRITTEN-23A FILTER (ALTERNATE)

SLIT WIDTHS: 0.180, 0.229, 0.310, 0.340, AND

FAILSAFE SLIT 0.305 INCH

AFT-LOOKING: WRITTEN 21 FILTER (PRIMARY)

W/2E PLUS CC20C PLUS 0.4N.D. (ALTERNATE, FOR SO-12)

SLIT WIDTHS: 0.138, 0.149, 0.192, 0.271 AND A

FAILSAFE SLIT 0.198 INCH

3. PERFORMANCE SUMMARY: THE PET FEELS THAT THE IMAGERY FROM THIS MISSION, IN GENERAL, IS SIGNIFICANTLY DEGRADED WHEN COMPARED WITH MISSION 1104 (CR-4). THE IMAGE QUALITY IS EXTREMELY VARIABLE AND EVIDENCES SOFT FOCUS AND IMAGE SMEARING. THE BEST IMAGE QUALITY OF MISSION 1105 IS EQUIVALENT TO THE BEST PHOTOGRAPHY FROM MISSION 1104. HOWEVER, THE AMOUNT OF SUCH HIGH QUALITY IMAGERY IS LIMITED. IN GENERAL, THE OVERALL QUALITY IS ABOUT COMPARABLE TO THE J-1 SERIES, WITH THE WORST QUALITY BEING CONSIDERABLE POORER THAN NORMALLY EXPERIENCED WITH A J-1 CAMERA. THE PET ASSESSMENT IS IN GENERAL AGREEMENT WITH THAT OF THE PHOTOINTERPRETERS. THE PI'S REPORTED TO THE PET THAT, "THE IMAGERY PROVIDED BY MISSION 1105 IS GENERALLY SOFT AND INTERMITTENTLY DISPLAYS AREAS OF IMAGE SMEAR. THE IMAGE DEGRADATION ON THIS MISSION RESULTED IN THE INTERPRETABILITY OF

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MISSION 1105) BEING GENERALLY SIMILAR TO THAT OF A NORMAL J-1. HOWEVER, THE BEST QUALITY PHOTOGRAPHY OF MISSION 1105 IS BETTER THAN THE BEST OF ANY J-1 MISSION, WHILE THE MORE DEGRADED IMAGERY IS WORSE THAN THAT OF A NORMAL J-1 MISSION."

THE OVERALL IMAGE QUALITY OF MISSION 1105-2 WAS BETTER THAN THAT OF MISSION 1105-1. THIS IS ATTRIBUTABLE TO THE FACT THAT FWD CAMERA PERFORMANCE WAS LESS VARIABLE IN 1105-2 THAN ON 1105-1, WHILE THE AFT CAMERA IMAGERY GENERALLY REMAINED CONSTANT THROUGHOUT BOTH PORTIONS. FURTHER EVIDENCE OF THIS UNUSUAL CONDITION IS OBTAINED BY NOTING THAT THE MIP FRAME FOR MISSION 1105-1 WAS CHOSEN FROM THE AFT CAMERA, WHEREAS THE MIP FRAME FROM MISSION 1105-2 WAS CHOSEN FROM THE FWD CAMERA. MISSION 1105 WAS THE FIRST CORONA SYSTEM TO FLY WITH A FULL LOAD OF SO-380 (ULTRA THIN BASE - UTB) FILM. THE IMAGE QUALITY VARIATIONS ARE DIRECTLY ATTRIBUTABLE TO THE INTERACTION OF THE UTB WITH THE CR-5 SYSTEM (SEE NEXT SECTION). MODIFICATIONS WERE MADE TO CR-5 TO ENABLE RELIABLE HANDLING OF UTB. THE MAJOR MODIFI-

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Excluded from automatic
downgrading and
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CATION WAS A REDUCTION IN SYSTEM FILM TENSIONS. IT WOULD APPEAR THAT THIS REDUCTION IN TENSION CAUSED AN IN FLIGHT VARIABILITY IN FILM LIFT AND DYNAMICS IN THE SCAN HEAD AREA DURING EXPOSURE. THIS VARIABILITY WAS NOT OBSERVED IN EXTENSIVE SIMULATED ENVIRONMENTAL

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TESTING.

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SEVERAL FAVORABLE PHOTOGRAPHIC CONDITIONS WERE EVIDENT WHICH HELPED TO MITIGATE THE DEGRADING EFFECTS. FOR EXAMPLE, THE MISSION EXPERIENCED GENERALLY CLEAR WEATHER OVER DENIED AREAS. FURTHER, THERE WAS A LARGE PERCENTAGE OF LIGHT SNOW COVER WHICH RESULTED IN FAVORABLE HIGH CONTRAST IMAGERY WITH LONG SHADOWS.

A GOOD WAY TO ILLUSTRATE THE VARIABILITY EXPERIENCED ON MISSION 1105 IS TO EXAMINE THE FIXED CORN TARGETS AT EDWARDS AFB ON REV D161. THE BEST TARGET OBSERVED RESOLVED 5 FEET GRD, WHEREAS THE RESOLUTION TARGET 10 MILES AWAY (APPROXIMATELY 2 INCHES ON THE FILM) WAS BADLY SMEARED AND BARELY RESOLVED 25 FEET GRD.

4. DISCUSSION OF THE UTB ANOMALY: WHILE ALL ASPECTS OF THE UTB PROBLEM EXPERIENCED ON CR-5 ARE NOT COMPLETELY UNDERSTOOD, SEVERAL FACTORS HELP TO EXPLAIN THE PROBLEM.

A. UTB HAS RECEIVED EXTENSIVE TESTING WITH THE J-3 CAMERA SERIES. THIS TESTING HAS INCLUDED FILM HANDLING, TRACKING ENVIRONMENTAL AND FILM FLATNESS EVALUATIONS. IN PARTICULAR, CR-5 WAS SUBJECTED TO "DR. A" (FILM FLATNESS) TESTING IN THE HIVOS (HIGH VACUUM ORBITAL SIMULATOR) CHAMBER IN FULL FLIGHT CONFIGURATION. THIS WAS THE FIRST TIME THAT FILM FLATNESS TESTING HAD BEEN UNDERTAKEN AT [] IN A

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SIMULATED ENVIRONMENT. THE RESULTS OF THESE TESTS WERE CONSIDERED ACCEPTABLE. THE MISSION IMAGE QUALITY VARIATIONS INDICATE SIGNIFICANTLY GREATER FILM PLANE EXCURSIONS THAN WERE EXPERIENCED IN THIS SIMULATED ENVIRONMENTAL TESTING. THERE IS NOT, AT THE MOMENT, A CLEAR UNDERSTANDING OF WHY THE FLIGHT RESULTS WERE INCOMPATIBLE WITH THE SIMULATED ENVIRONMENTAL TESTS.

B. FILM TENSIONS ON CR-5 WERE SET LOWER THAN ANY PREVIOUS CORONA SYSTEM, BEING SET AT 36 OZ. STATIC TENSION VICE 46 OZ. FOR THE NORMAL CASE. (OTHER FACTORS SUCH AS THERMAL ANOMALIES AND EXCESSIVE FRICTION IN THE SYSTEM MAY HAVE FURTHER INFLUENCED CR-5 SYSTEM TENSIONS) FILM TENSIONS WERE SET LOWER AS A RESULT OF SYSTEM TESTING. THIS TESTING INDICATED THAT UTB HAD SEVERE STRAIN SENSITIVITY THAT CAUSED SERIOUS PLUS DENSITY MARKS ON THE FILM. THIS MARKING TOOK THE SHAPE OF BOTH CONTINUOUS "WAVY" LINES THROUGH THE CENTER OF THE FORMAT AND SPERM SHAPED MARKS. THIS MARKING WAS SERIOUS WITH NORMAL (I.E., 46 OZ.) TENSIONS AND CONSIDERABLY REDUCED WITH THE LOWER TENSIONS.

C. THE DIFFERENCE IN IMAGE QUALITY VARIABILITY BETWEEN THE FWD AND AFT INSTRUMENTS IS READILY EXPLAINABLE. THE FWD CAMERA (UNIT 311) CONTAINED A THIRD GENERATION LENS, WHEREAS THE AFT CAMERA (UNIT 310) HAD A SECOND GENERATION LENS. WHILE THE MAXIMUM RESOLUTION OF THE THIRD GENERATION LENS IS HIGHER THAN THAT OF THE SECOND, ITS DEPTH OF FOCUS IS CONSIDERABLY MORE CRITICAL. FOR EXAMPLE, IN ORDER TO MAINTAIN 80 PERCENT OF MAXIMUM SYSTEM RESOLUTION (140 L/MM - LOW CONTRAST) WITH UNIT 310, THE FILM PLANE MUST BE MAINTAINED TO WITHIN PLUS 0.0032 INCH. THIS IS OPPOSED TO UNIT 311, WHERE THE FILM PLANE HAD TO BE MAINTAINED TO WITHIN PLUS 0.0003 INCH TO PRODUCE 80 PERCENT OF PEAK RESOLUTION (190 L/MM-LOW CONTRAST). THAT IS, THE SECOND GENERATION LENS HAS A SIGNIFICANTLY GREATER TOLERANCE TO VARIATIONS IN FILM EXCURSIONS SINCE THE DEPTH OF FOCUS IS GREATER THAN THAT OF THE THIRD GENERATION LENS.

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D. A RE-EXAMINATION WAS MADE OF THE MISSION 1103 UTB TEST. THIS EXAMINATION INCLUDED EVALUATING COMPARABLE REVS FROM THE TWO MISSIONS. THE CONCLUSION WAS THAT MISSION 1103 DID NOT EXHIBIT THE VARIABILITY EXPERIENCED ON MISSION 1105. EVEN IN RETROSPECT, THERE ARE NO INDICATIONS FROM THE 1103 TEST THAT WOULD HAVE PRECLUDED FLYING SO-380 ON MISSION 1105.

5. PAN CAMERA ANOMALIES:

A. ANOMALY: THE FIFTH FRAME OF THE AFT CAMERA HAS A 0.5 INCH WIDE OUT OF FOCUS BAND ALONG THE BINARY EDGE. CAUSE: THE BINARY EDGE OF

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THE FIFTH FRAME OF MANY OPERATES SHOWS SEVERE VARIATION IN IMAGE QUALITY. THE IMAGE UNDULATES FROM GOOD TO BAD ON 1105-1 BUT WAS NOTICEABLY IMPROVED ON 1105-2. DURING CAMERA SHUTDOWN, FRAME FIVE OF THE NEXT OPERATION IS IN A TWIST CONDITION THUS CAUSING FILM DEFORMATION ALONG THE INBOARD EDGE. THE LACK OF THIS ANOMALY IN PART 2 SUGGESTS A FILM TENSION CHANGE AND/OR LESS FILM CURL (WEB DIFFERENTIAL). ACTION: EFFECTIVE ON CR-8 MODIFICATIONS WHICH LENGTHEN THE AIR TWISTS ARE EXPECTED TO REDUCE THIS EFFECT. NO FURTHER ACTION IS RECOMMENDED.

B. ANOMALY: BASE RUB REPORTED THROUGHOUT 1105-2. CAUSE: THE BASE RUB IS FAINTLY VISIBLE ON THE O/N MATERIAL ONLY WHEN VIEWED BY GRAZING LIGHT. THE ACTUAL CAUSE OF THIS MINOR ANOMALY IS UNKNOWN. ACTION: DEGRADATION IS SO MINOR THAT NO ACTION IS RECOMMENDED.

C. ANOMALY: A PLUS DENSITY (PLUS D) STREAK 0.1 INCH WIDE LOCATED ALONG THE TIME TRACK EDGE OF THE FILM BEGINS IN FWD FRAME 10 OF PASS D197 AND ENDS AT A MANUFACTURER'S SPLICE FRAME 73, PASS D198. THIS STREAK IS OUTSIDE THE ACTIVE FORMAT AREA. FRAMES 10 TO 19, PASS D197 EXHIBIT EDGE FLUTING ALONG WITH THE PLUS D STREAK. CAUSE: THE ULTRA THIN BASE WAS APPARENTLY RUBBING AGAINST A FLANGE. VARIATIONS IN EDGE TENSION ARE CONSIDERED THE CAUSE OF THE FILM PATH CHANGE.

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ACTION: THIS IS A NORMAL CHARACTERISTIC OF ULTRA THIN BASE FILM. NO ACTION REQUIRED.

D. ANOMALY: THERE IS AN INTERMITTENT EMULSION SCRATCH LOCATED ONE HALF INCH FROM THE DATA BLOCK EDGE BEGINNING IN PASS D64 AND CONTINUING TO THE END OF THE MISSION. THIS SCRATCH IS UP TO TEN INCHES LONG AND IS PRESENT AT THE TAKE-UP END OF THE FRAMES. CAUSE: THE MOST PROBABLE CAUSE OF THIS INTERMITTENT EMULSION SCRATCH WAS A STICKING DRUM ROLLER. ACTION: CONTINUING ATTENTION TO GENERAL INSTRUMENT ROLLER CONDITION DURING PRE-LAUNCH TESTING.

E. ANOMALY: FILM DEPLETION; CAMERA FAILURES. CAUSE: BOTH PANORAMIC CAMERA FAILURES WERE IN THE FILM TRANSPORT SYSTEM AND WERE DIRECTLY RELATED TO FILM DEPLETION. IN THE AFT LOOKING UNIT A FILM WRAP UP ON THE FRAME METERING ROLLER OCCURRED, WHICH SHEARED THE DRIVE PIN, BUT APPARENTLY ENOUGH DRAG WAS RETAINED IN THE GEAR DRIVE TO STALL THE UNIT. THIS STALLED CONDITION CAUSED AN ABNORMAL POWER CONSUMPTION. THE FORWARD LOOKING UNIT FAILED IN A SIMILAR MANNER BUT THE UNIT WAS FREE ENOUGH TO CONTINUE ROTATION. FILM WRAP-UP FOLLOWING FILM DEPLETION APPEARS TO BE A CHARACTERISTIC POSSIBLE FAILURE MODE FOR THE PANORAMIC CAMERAS. ACTION: THE PRIMARY ADVERSE EFFECT OF THIS ANOMALY IS THE CONTINUOUS POWER USAGE.

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A MODIFICATION TO THE INTERNAL CAMERA OPERATE COMMAND IS BEING INCORPORATED IN ALL FUTURE CR SYSTEMS. THIS MODIFICATION WILL REMOVE POWER AND ELIMINATE THE POSSIBILITY OF THIS ANOMALY OCCURING.

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F. ANOMALY: VEILING OF THE PORT HORIZON IMAGERY FROM BOTH PAN CAMERAS GRADUALLY DEVELOPED AS THE MISSION PROGRESSED. IMAGERY APPEARED SHARP AT THE BEGINNING OF MISSION 1105-1. THE HORIZON IMAGERY WAS STILL WELL DEFINED AND USABLE THROUGHOUT BOTH MISSION SEGMENTS. CAUSE: THIS IS THE FIRST 1100 SERIES MISSION TO EXHIBIT VEILED HORIZON IMAGERY AND THE FIRST MISSION INCLUDING THE 1000 SERIES TO PRODUCE VEILED IMAGERY ON THE PORT SIDE. INVESTIGATION HAS FAILED TO REVEAL ANY KNOWN CAUSE. ACTION: NO NEW ACTION IS CONTEMPLATED AT THIS TIME.

G. ANOMALY: HOLES WERE TORN IN THE FILM FROM BOTH CAMERAS NEAR THE WATER SEAL CUTS OF MISSION 1105-2. A HOLE, ABOUT ONE-QUARTER INCH BY ONE EIGHTH INCH, WAS TORN IN THE SO-121 FILM (AFT CAMERA) ABOUT 23 3/4 INCHES FROM THE WATER SEAL CUT. ADDITIONALLY, AN EMULSION SCRATCH, ABOUT ONE SIXTEENTH INCH BY TWO INCHES, IS LOCATED ABOUT 16 INCHES FROM THE WATER SEAL CUT. ON THE SO-380 FILM (FWD CAMERA) THERE ARE TWO HOLES: ONE IS ABOUT 1 5/8 INCHES BY ONE-EIGHTH INCH, AND IS LOCATED 61

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INCHES FROM THE WATER SEAL CUT; THE OTHER HOLE IS TRIANGULAR, ABOUT ONE-QUARTER INCH ON A SIDE, AND IS 30 1/2 INCHES FROM THE WATER SEAL CUT. THERE IS NO TRACE OF OTHER MECHANICAL DAMAGE IN THE VICINITY OF THE HOLES ON EITHER FILM. A CREASE ABOUT 10 INCHES LONG FOLLOWING THE LARGER HOLE ON THE SO-380 FILM, OCCURRED DURING PROCESSING. A THOROUGH SEARCH OF THE RECOVERY BUCKET PRODUCED NO TORN PIECES OF FILM. CAUSE:

A THOROUGH ANALYSIS OF SYSTEM OPERATION HAS PROVIDED NO CLUE TO THE CAUSE. ACTION: THESE ANOMALIES ARE UNIQUE IN THE HISTORY OF THE PROGRAM. NO FURTHER ACTION IS KNOWN OR RECOMMENDED.

H. ANOMALY: PLUS DENSITY MARKS APPROXIMATELY 0.01 TO 0.02 INCHES IN SIZE ARE PRESENT IN THE AFT LOOKING CAMERA RECORD FROM BOTH MISSION SEGMENTS. THE MARKS OCCUR WITH A REPEATING PATTERN NEAR THE CENTER OF THE FILM WITH A SPACING OF APPROXIMATELY 6 1/4 INCHES. A SECOND SEQUENCE OF MARKS OCCURS 3/8 INCHES IN FROM THE TIME TRACK. WITH A PATTERN REPETITION AT INTERVALS OF APPROXIMATELY 1 9/16 INCHES. USUALLY THE MARKS HAVE A CHARACTERISTIC SPIDER LIKE APPEARANCE OF FINE LINES EMANATING FROM A COMMON CENTER. THE MARKS ARE OFTEN ASSOCIATED WITH A SINGLE FINE EMULSION SCRATCH THAT BEGINS NEAR THE START OF SCAN AND TERMINATES

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JUST BEFORE THE END OF SCAN. THE SCRATCH IS INTERRUPTED BY THE SPIDER MARKS.

THE MARKS AND SCRATCHES ARE NOT OBSERVED IN THE HORIZON FORMAT AREA. IN ADDITION, THE FWD LOOKING CAMERA RECORD EXHIBITS A PLUS DENSITY MARK APPROXIMATELY 0.01 INCH IN SIZE REPEATING AT INTERVALS OF 2 5/16 INCHES. SIMILAR MARKS IN THE FWD LOOKING CAMERA RECORD ARE SOFT IN APPEARANCE AND ARE NOT ASSOCIATED WITH A COMMON SCRATCH. ALL MARKING HAS OCCURRED RANDOMLY THROUGHOUT BOTH MISSION SEGMENTS. AT THE START OF THE MISSION, NO MARKS WERE PRESENT IN EITHER THE FWD OR AFT CAMERA PHOTOGRAPHY. CAUSE: MARKING APPEARS TO BE AN ELECTRO-STATIC DISCHARGE ASSOCIATED WITH FOREIGN PARTICLE BUILD-UP ON VARIOUS ROLLER SURFACES. THE SCRATCHES NOTED IN THE AFT CAMERA RECORD APPEAR TO BE RELATED TO THE STATIC DISCHARGE MARKS. ACTION: CONTINUED ATTENTION TO CLEANLINESS PRIOR TO FLIGHT. PARTICLES CARRIED BY FILM CANNOT BE COMPLETELY ELIMINATED.

I. ANOMALY: A WAVY PLUS DENSITY (PLUS D) STREAK IS PRESENT INTERMITTENTLY THROUGHOUT THE MATERIAL FROM THE FWD AND AFT CAMERAS FROM MISSIONS 1105-1 AND 2. THE STREAK IS APPROXIMATELY 0.2 TO 0.3 INCHES WIDE. IN ADDITION, PHOTOGRAPHY FROM THE FWD CAMERA, MSN. 1105-2, CONTAINED AN INTERMITTENT MINUS DENSITY (MINUS D) STREAK APPROXIMATELY 0.2 INCHES WIDE. DEGRADATION TO

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THE IMAGERY IS MINOR IN BOTH CASES. CAUSE: NORMAL AIR TWISTS IN THE CAMERA FILM PATH INDUCE BUCKLES IN THE FILM THAT CAUSE STRAIN SENSITIZATION AND DESENSITIZATION. IN PARTICULAR, THE AIR TWIST FROM THE SUPPLY CASSETTE TO THE INPUT NOD ROLLER ON THE FWD INSTRUMENT AND THE SHORT FILM TWIST LOCATED ON THE OUTPUT SIDE OF THE SHUTTLE ASSEMBLIES, ARE CONSIDERED THE MOST LIKELY AREAS OF STRAIN INDUCED MARKING. THIS ANOMALY IS PECULIAR TO THE USE OF (UTB) SO-380 FILM. ACTION: LENGTHENING THE AIR TWIST ON THE OUTPUT SIDE OF THE SHUTTLE ASSEMBLY AND INCREASING PATCH LENGTH IN THE AREA OF THE WING BRACKET AND CONSTANT TENSION ASSEMBLY ON THE FWD LOOKING INSTRUMENT WITH EFFECTIVITY ON CR-8 AND UP IS EXPECTED TO ELIMINATE FILM STREAKING WITH UTB FILM. PLUS DENSITY STREAKING WAS CHARACTERISTIC OF THE FWD AND AFT LOOKING CAMERAS DURING PRE-FLIGHT TESTING WITH SO-380 UTB FILM.

J. ANOMALY: DENDRITIC STATIC IS PRESENT ALONG THE FILM EDGES OF A FEW FRAMES OF THE FWD AND AFT LOOKING CAMERA RECORDS OF BOTH MISSION SEGMENTS. IN MOST CASES, STATIC MARKING IS OUTSIDE THE ACTIVE FORMAT AREA. CAUSE: THESE MARKS ARE CHARACTERISTICS OF STATIC DISCHARGE BETWEEN THE FILM EDGE AND EITHER ROLLER OR SPOOL FLANGES DURING SYSTEM OPERATION OF DEFILMING.

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ACTION: THIS STATIC IS CHARACTERISTIC OF THE SYSTEM AND REQUIRES CONTINUAL MONITORING TO MINIMIZE ITS EFFECT.

K. ANOMALY: A MINOR LIGHT LEAK FOG BAND LOCATED WITHIN TWO INCHES OF THE TAKE-UP END OF THE FORMAT APPEARS ON THE FIRST FRAME OF BOTH PAN CAMERAS ON A FEW PASSES. OCCASIONALLY OTHER FRAMES WITHIN A PASS WERE SIMILARLY AFFECTED. THE DEGRADATION

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IS VERY MINOR. CAUSE: THESE FOG PATTERNS RESULT FROM THE UNIQUE LOCATION OF THE STEERING ROLLERS AT THE ENDS OF THE FORMATS ON THIS SYSTEM (CR-5). IMAGE-FORMING LIGHT PASSED THROUGH THE FILM IN THE PLATEN AND STRUCK FILM OF THE FOLLOWING FRAME JUST ABOVE THE HORIZON CAMERA GUIDE ROLLERS. ACTION: NO ACTION IS REQUIRED.

L. ANOMALY: MINUS DENSITY SPOTS ON ORIGINAL NEGATIVE OF 1105-2. CAUSE: INFREQUENT, RANDOM MINUS DENSITY SPOTS RANGING IN SIZE FROM .025 TO .050 INCH WERE OBSERVED ON BOTH THE SO-380 AND 3404 FILM. THESE SPOTS CONTAIN NO IMAGERY. THE CAUSE OF THIS ANOMALY IS CURRENTLY UNKNOWN. PROBABLE CAUSES INCLUDE DESENSITIZATION WITHIN THESE AREAS, OR FOREIGN MATERIAL ON THE SURFACE OF THE FILM PREVENTING PENETRATION OF THE VISCOUS DEVELOPER. ACTION: CONTINUE EVALUATING

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POTENTIAL CAUSES OF THIS ANOMALY.

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6. COMMENTS:

A. THE MISSION CONTAINED 500 FEET OF AERIAL COLOR FILM TYPE SO-121 AT THE END OF THE AFT CAMERA SUPPLY. THE EXPOSURE AND COLOR BALANCE OF THE SO-121 WERE GOOD. THE IMAGE QUALITY OF THE SO-121 RECORD WAS EXTREMELY VARIABLE, AND RANGED FROM GOOD TO VERY POOR. THE AMOUNT OF GOOD QUALITY IMAGERY IS LIMITED AND IS GENERALLY RESTRICTED TO THE EDGES AND ENDS OF THE FORMAT. THE CENTER PORTION OF THE FORMAT IS GENERALLY POOR. THIS CONDITION WOULD APPEAR TO HAVE BEEN CAUSED BY THE FILM BEING CURLED AWAY FROM THE FOCAL PLANE DURING EXPOSURE. THE BEST IMAGERY APPEARS TO BE COMPARABLE TO THE BEST THAT COULD BE ACHIEVED WITH THE CORONA CAMERA AND SO-121 FILM. THE BEST GROUND RESOLVED DISTANCE IS ESTIMATED TO BE ABOUT 15 TO 20 FEET. PRE-LAUNCH SYSTEM TESTING INDICATED THAT A POTENTIAL 15 FEET GRD (LOW CONTRAST) COULD HAVE BEEN ACHIEVED. WHILE BOTH GLOW AND DENDRITIC TYPE STATIC MARKING PATTERNS WERE EVIDENT ON THE SO-121, THEY ARE EXTREMELY MINOR IN NATURE.

B. A 50 FOOT STRIP OF FILM TYPE 3404 WAS INCLUDED BETWEEN THE SO-380 AND SO-121. THE PURPOSE OF INCLUDING THIS STRIP WAS TO PROVIDE A MORE GRADUAL CHANGE IN FILM THICKNESS WHEN PROCEEDING FROM THE UTB TO THE THICKER SO-121. UNFORTUNATELY, THE 3404 STRIP DOES NOT PROVIDE ANY CONCLUSIVE EVIDENCE THAT

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WILL ASSIST IN THE ANALYSIS OF THE UTB ANOMALY. WHILE THE IMAGE QUALITY VARIABILITY OF THE 3404 STRIP WAS LESS THAN THAT OF THE SO-380, ITS GENERAL IMAGE QUALITY WAS COMPARABLE. FURTHER, ANALYSIS OF THE 3404 WAS HAMPERED BY FILM TENSION CONSIDERATIONS; BY A LACK OF CULTURAL IMAGERY; AND BY AN APPARENT HAZE CONDITION OVER THE ENTIRE AREA EXPOSED ON THE 3404. IN ADDITION, IT CANNOT BE STATED THAT THE 3404 SHOULD HAVE BEEN CONSIDERABLY BETTER, IN ANY EVENT, AS IT WAS LOADED ON THE AFT CAMERA SUPPLY. AS WAS POINTED OUT IN SECTION 4, THE AFT CAMERA HAD A SECOND GENERATION LENS WHICH POSSES SIGNIFICANTLY GREATER TOLERANCE TO FILM LIFT CHANGES.

C. OBSERVATIONS SUGGEST FILM PLANE VARIATIONS DURING FLIGHT BUT THESE ARE NOT FULLY VERIFIED:

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(1) A FILM TENSION CHANGE BETWEEN 1105-1 AND 1105-2 MAY HAVE CAUSED THE NOTICEABLE IMPROVEMENT OF 1105-2 FWD IMAGERY, E.G., THE FIFTH FRAME ANOMALY DISAPPEARED.

(2) RUB MARKINGS ON THE BACK OF THE FILM BASE INDICATES GREATER THAN NORMAL BUCKING.

(3) IMAGE QUALITY CHANGE ACROSS THE WEB SUGGEST GREATER LIFT AT THE FORMAT CENTER LINE.

(4) REDUCED SMEARING OF IMAGERY ON THE 50 FOOT 3404 FILM SECTION WHEN COMPARED WITH ADJOINING UTB WAS APPARENT.

(5) A DIFFERENTIAL MOISTURE LOSS ACROSS THE FILM WEB, DUE TO OUTGASSING OF THE FILM MAY HAVE CAUSED FILM BUCKLE.

(6) RAIL SCRATCHING WAS SIGNIFICANTLY LESS THAN NORMALLY ENCOUNTERED.

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END OF MSG

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