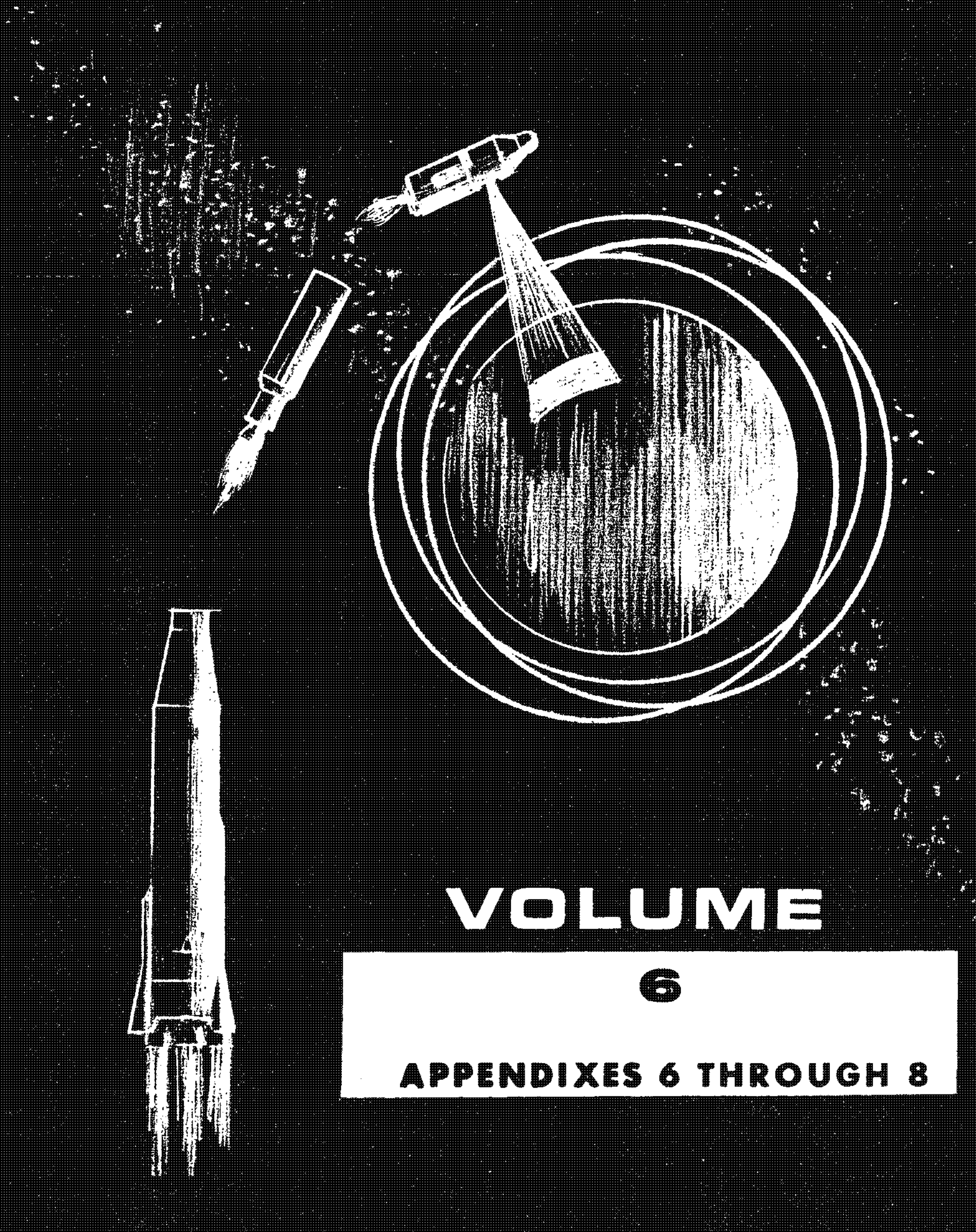
206 PROGRAM REPORT



VOLUME 6

APPENDIXES 6 THROUGH 8

THIS DOCUMENT CONTAINS 308 PAGES
NOVEMBER 1967

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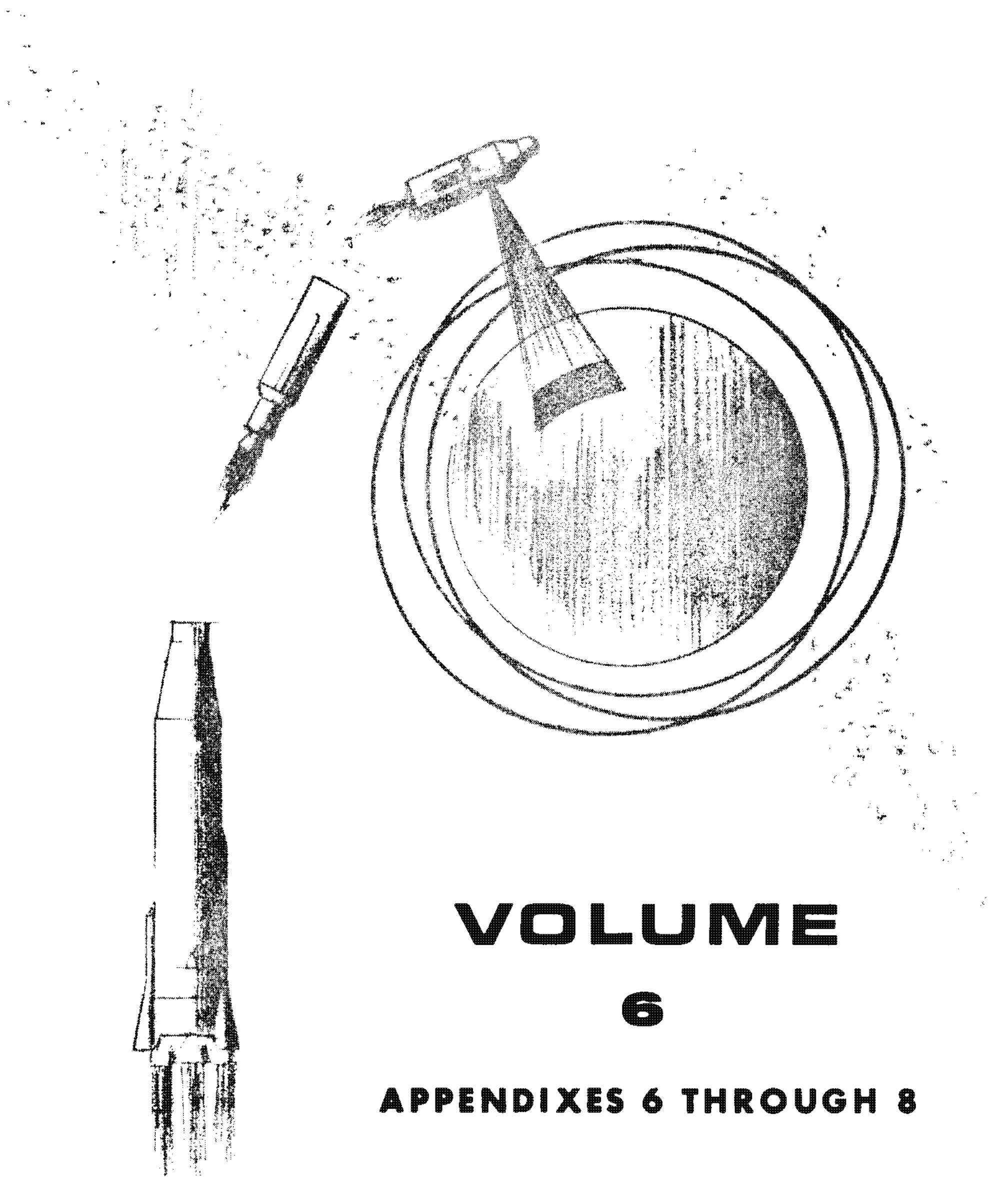
PROGRAM REPORT



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Approved for Release: 2024/01/30 C05098942

APPENDIX 6

PAYLOAD SUBSYSTEM SPECIFICATION

Approved for Release: 2024/01/30 C05098942

Sheets 86

Copy No. ______

Phase II

Photographic Subsystem

Specification No. 702-145

Prepared by
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Release Date 2/5/62

Revision	Pages Affected	Date	Approved by
F	DCO's E-1, E-2, & E-3 Inc. Retyped pp: 3,6,7,11,12,15,17,19,20,23,		
	26,31,32,33,34,60,63,64,65,66, 67,68,69,70,71,72,73		
	Revised pp: 16,42,43,44,47,49,51,59 Renumbered pp: 13 thru 73		
	Table of Contents-Completely Revised and Retyped (P/R) P.D. & E.G. eg	6-27-66	6-27-66 A.J. Skinner

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1. SCOPE AND MISSION

1.1 Scope - This specification defines the Photographic Subsystem of the Recoverable Satellite Reconnaissance System. It includes the performance and environmental requirements, and defines the quality assurance provisions required to determine compliance of the subsystem to these requirements. This specification also defines related items necessary for the performance of the task. This specification shall reference subsidiary specifications of the photographic subsystem, and to that extent serve as an index for this larger group of documents.

1.2 Mission - It shall be the mission of the photographic subsystem to obtain high resolution photographs of selected areas of the earth from an orbiting satellite in accordance with the requirements outlined in this document.

2. APPLICABLE DOCUMENTS

2.1 This specification is in accordance with the requirements of Work Specification - Exhibit "A" to contract AF33(616)7704 Part I - Statement of Work and those Military Standards and Specifications as specified therein.

2.2 The following specifications, standards, and publications of latest issue in effect, form a part of this specification. Applicability of the listed documents shall depend on their specific reference in this specification and shall be in conformance with 2.1. In the event of conflict between the listed documents and this specification, this specification shall take precedence.

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SPECIFICATIONS

Military

MIL-Q-9858	Quality Control System Requirements

Eastman Kodak Company

401-101	Instructions for Preparation of Drawings by Subcontractors
401-102	Technical Requirements for Proposals and Subcontracts
401-106	Subcontractor Reliability Requirements
401-119	Design and Manufacturing Standards
502-115	Cable Assemblies
502-118	Environmental Design Criteria Including Qualification and Acceptance Test Levels for RSRS Payload
502-146	GE-EK Program 206 Interface Specification
502-154	Focus Control Electronics Assembly
502-158	Cable Test Point Board (Set)
502-161	Breakout Box
502-162	Secondary Standard
502-181	Operating Equipment (Ground Equipment Functional Specification)
502-208	Electric Simulator
602-100	Elevation Servo Assembly (Stereo Servo Assembly)
602-101	Azimuth Servo Assembly (Crabbing Servo Assembly)
602-126	Cradle

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702-145

602-128	Electrical Distribution Component
602-132	Erector
602-144	Package Shipping Container (Payload Shipping Container)
602-157	Leak Rate Test Set
602-168	Purging Equipment
602-171	General Purpose Mobile Hoist
602-174	Space Chamber Integration Lifting Yoke (Camera Payload Integration Lifting Yoke)
602-217	Command Monitor
702-102	Motor Speed Drive (Film Drive Electronics Assembly)
702-110	Record Viewer
702-127	Record Storage Bracket
702-135	Forward Record Storage Assembly
702-139	Film Supply Cassette Assembly
702-141	Record Loading and Unloading Kit
702-143	Integration Accessory Kit
702-147	Handling Accessory Kit
702-173	Record Storage Assembly Test Set
702-175	Record Splicer
702-176	Handling Specification for Recovered Record
702-183	Accessory Shipping Container
702-184	Final Product Specification

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702-213	Record Advance Control
702-214	Air Supply and Record Storage Alignment Measuring Equipment (Film Supply Cassette and Record Storage Alignment Measuring Equipment)
702-221	Forward Storage Table and Lifting Yoke
702-226	Record Travel Viewer
802-103	Structural Mock-up
802-107	Test Console
802-108	Portable Test Set
802-114	Truck
802-122	Camera Assembly
802-123	Thermal Model Payload
802-124	Forward Record Storage Drop Test Assembly (Dummy Forward Record Storage Assembly)
802-125	Lens and Flat Mirror Assembly (Lens Assembly)
802-129	Structure Assembly
802-134	Target for Moving Target Assembly
802-137	Space Chamber Lifting Yoke (Camera Payload Assembly Lifting Yoke)
802-148	Flight Payload Qualification Test Plan
802-149	Collimator Assembly
802-150	Engineering Model
802-153	Flight Payload Model
802-156	Line of Sight Test Set

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802-163	Record Dolly
802-177	Test Record Support Equipment
802-179	Aerospace Ground Equipment (Includes Environmental Criteria)
802-207	Dynamic Simulator
802-238	Test Record Transfer
802-243	Programmable Slit Mechanism for Camera Assembly

STANDARDS

Military

MIL-STD-150A	Photographic Lenses

Eastman Kodak Company

401-108	Design Standard for Human Factors, Engineering

DRAWINGS

Eastman Kodak Company

501-113-3	GE-EK Electrical Interface Program Z
501-114-3	Instrumentation Information Payload Program Z
703-100	Lens and Flat Mirror Alignment and Adjustment Procedure

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801-112-3	Test Point Information, Camera Payload
801-116-1) 801-116)	GE-EK Payload Interface
804-104	Flight Payload Acceptance Test Procedure for the Camera Payload Subsystem
804-105	Aerospace Ground Equipment Acceptance Test Procedure
805-101	Space Chamber Assembly
805-110	Lens and Camera Adjustment Procedure
808-103	Film Format "B"
808-501	Plate, Slit Aperture
813-227	Shield "B" Assembly, Dust, External Interface

OTHER PUBLICATIONS

USAF Bulletin

WDT 56-5 Rev. C	Technical Manual Program

Eastman Kodak Company

554-121	Film Handling and Film Handling Assemblies
554-132	Operational Procedures for Post Mission Smear Analysis

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3. REQUIREMENTS

The Photographic Subsystem shall provide the design, fabrication, test, and support necessary to obtain high resolution photography from an orbiting satellite. The record thus obtained shall be returned to specified recovery site after a five day operational life time.

3.1 Definitions - For the purpose of this Photographic Subsystem specification the following definitions are given:

3.1.1 Camera Payload - The camera payload (C/P) is a generic term that may include the engineering, reliability test, S/V compatibility and flight payload models. The C/P portion of the photographic system consists of the flight equipment required to collect visual information on a photographic film, store the film prior to exposure, wind the exposed record onto the forward record storage assembly in the recoverable portion of the vehicle, and the electrical subsystems necessary to both control and monitor the performance of the photographic system by means of the command and telemetry susbsystem in the OCV + SRV. The C/P is the equipment that consists of the following assemblies (See Table I) and mechanisms required for orbital operation or demonstration of such capability for the system except those assemblies and mechanisms which are the responsibility of other subsystems. In the text, a flight model C/P is referred to as a flight payload for brevity.

TABLE I

Item	Specifications
(a) Camera Assembly	802-122
(b) Lens and Flat Mirror Assembly (Lens Assembly)	802-125
(c) Film Supply Cassette Assembly	702-139

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TABLE I (CONT'D)

Item		Specifications
(d)	Forward Record Storage Assembly	702-135
(e)	Structure Assembly	802-129
(f)	Elevation Servo Assembly (Stereo Servo Assembly)	602-100
(g)	Azimuth Servo Assembly (Crabbing Servo Assembly)	602-101
(h)	Focus Control Electronics Assembly	502-154
(i)	Motor Speed Drive (Film Drive Electronics Assembly)	702-102
(j)	Electrical Distribution Component	602-128
(k)	Cable Assemblies	502-115
(l)	Programmable Slit Mechanism for Camera Assembly	802-243

3.1.2 Configuration - The system configuration at launch is shown in Figure I. The parts of this configuration which concern this photographic subsystem are as given in 3.1.2.1 through 3.1.2.4.

3.1.2.1 Orbital Control Vehicle (OCV) - The OCV is that portion of the S/V that establishes structural continuity between the S/V booster system and SRV. The OCV houses part of the C/P, the satellite programmer, the battery supply and other systems, subsystems and major elements.

3.1.2.2 Satellite Re-entry Vehicle (SRV) - The SRV is that portion of the satellite which houses the exposed film, the retrieval subsystem and other subsystems and major elements. (Eastman Kodak Company Forward Record Storage Assembly is attached to but is not considered to be part of the SRV). The SRV protects the film during the terminal phases of the mission, descent from orbit through retrieval.

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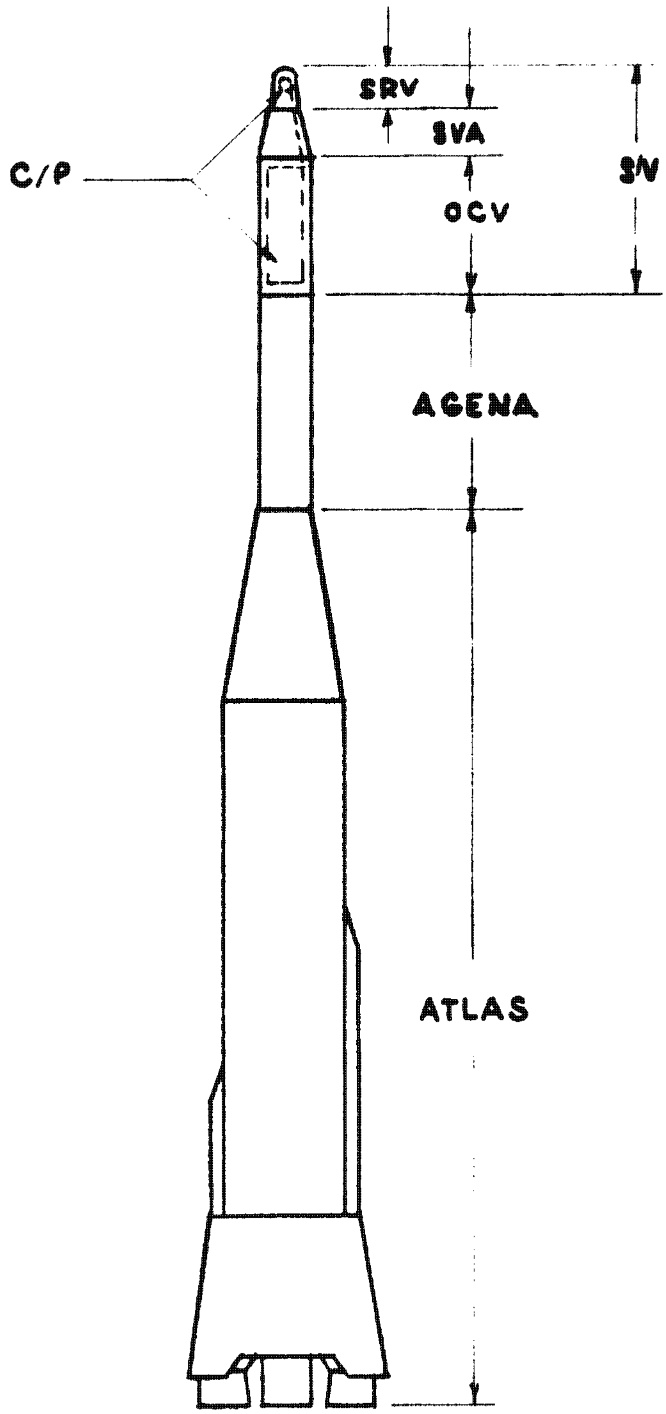

Figure I

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3.1.2.3 Satellite Vehicle Adapter (SVA) - The satellite vehicle adapter section is interposed between the OCV and SRV sections of the S/V. This section contains no C/P hardware but shall provide a light tight film chute for the transport of film from the film handling assembly to the forward record storage assembly in the SRV.

3.1.2.4 Satellite Vehicle (S/V) - The flight system consisting of the OCV and the SRV when they are connected into one unit with the C/P installed.

3.1.3 Component - A component is an assembly of parts, the aggregate weight of which does not exceed 75 pounds, arranged within a single package designed to perform a specific function.

3.1.4 Assembly - An assembly is a combination of parts and components.

3.1.5 Smear - Degradation of image quality caused by uncompensated image motion relative to the film is called smear. This is usually specified in equivalent feet at ground level.

3.1.6 Subsystem - The subsystem or photographic subsystem consists of:

(a) All those airborne equipments - payloads, models, mock-up, etc., specified in this document.

(b) The Aerospace Ground Equipment and spares required to support the airborne equipment.

3.1.7 System - The system consists of the integration of all those subsystems and facilities required to fulfill the system objective.

3.1.8 Associate Contractor - An associate contractor is one of several major contractors associated with the production of the complete system; a contractor having direct responsibility to the Air Force for one or more complete subystems.

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3.1.9 Interface - An interface is the physical, or abstract boundary between two subsystems. such an interface defines the areas of mutual responsibility, interest, or limitations of concern to the associated contractors involved. These interfaces may be mechanical, electrical or environmental; as an example: the physical surfaces and spacings in the mating of several parts, modules, components or subsystems; or an activity, for example loading of flight film into the S/V. The GE-EK Program 206 Interface Specification SVS 105Z/502-146 and GE-EK Payload Interface, 30S2000/801-116 or 30S2000-I/801-116-1 control the GE-EK interface. Both documents are under GE change control.

3.2 Electrical Requirements

3.2.1 Photographic Subsystem (Electrical Requirements) - The general photographic subsystem electrical requirements are specified in the following paragraphs. The details of the electrical requirements are given in the individual component specifications for the airborne deliverable hardware, and the Aerospace Ground Equipment. Airborne deliverable hardware and Aerospace Ground Equipment shall be electrically compatible.

3.2.1.1 Instrumentation - The C/P shall provide instrumentation outputs to the satellite vehicle for recording and/or telemetering to a ground station during orbital operation. These instrumentation outputs shall be available at the Launch Operations Building (LOB), Vehicle Support Building (VSB), Missile Assembly Building (MAB), and Tracking Station (TS) during ground testing at the launch site. The available instrumentation shall provide data on camera operation, temperature, slit position, stereo and crab position of the stereo mirror, film handling, focus detector operation, and the status of the port opening (Port open telltale). The instrumentation points shall conform to Eastman Kodak Company Specification 502-146. The schedule by which the payload instrumentation shall be changed from payload to payload is reflected in the revision and effectivity schedule of GE-EK Program 206 Interface Specification GE SVS 1053/EK 502-146, Revision F.

3.2.1.2 Power - Electrical power from the OCV shall be supplied to the C/P as unregulated plus 28 volt d.c. (nominal) for environmental control and C/P operation, and plus 5 volts d.c. (nominal) for instrumentation. All power shall be supplied through the interface. Unless otherwise required by component specifications the ground equipment shall be capable of operating satisfactorily on commercially available power.

3.2.2 Camera Payload - The electrical requirements for the C/P shall be in accordance with the applicable component specification of 3.1.1, Table I. A short description of these follows:

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3.2.2.1 Camera Assembly - The electrical requirements for the camera assembly shall be in accordance with Eastman Kodak Company specification 802-122 which includes the requirements for connectors, instrumentation, electromagnetic interference, and wiring of the assembly.

3.2.2.2 Lens and Flat Mirror Assembly (Lens Assembly) - The electrical requirements for the lens assembly shall be in accordance with Eastman Kodak Company specification 802-125, this specification covers the requirements for the temperature instrumentation.

3.2.2.3 Film Supply Cassette Assembly - The electrical requirements for the film supply cassette assembly shall be in accordance with Eastman Kodak Company specification 702-139.

3.2.2.4 Forward Record Storage Assembly - The electrical requirements for the forward record storage assembly shall be in accordance with Eastman Kodak Company specification 702-135.

3.2.2.5 Structure Assembly - The electrical requirements for the structure assembly shall be in accordance with Eastman Kodak Company specifications 502-146 and 802-129. These requirements are concerned with temperature, port door instrumentation and grounding.

3.2.2.6 Elevation Servo Assembly (Stereo Servo Assembly) - The electrical requirements for stereo servo assembly which positions the stereo mirror in each of three positions in response to electrically coded commands received from an external source shall be in accordance with Eastman Kodak Company specification 602-100.

3.2.2.7 Azimuth Servo Assembly (Crabbing Servo Assembly) - The crabbing servo assembly shall be capable of rotating the stereo mirror to any one of two sets of eight preselected crab positions. These positions are determined in part by the location of the servo and may be chosen to satisfy the photographic requirements of orbits which result in northbound or southbound photographic orbits. The crab servo is positioned on the right side or +Y side of the stereo mirror bridge to produce a negative crab correction for orbits with southbound photographic passes. The crab servo is positioned on the left or -Y side of the stereo bridge to produce positive crab correction for orbits with northbound photographic passes. The electrical requirements of this assembly shall be in accordance with Eastman Kodak Company specification 602-101. This assembly shall operate in response to electrically coded commands received from an external source.

3.2.2.8 Focus Control Electronics Assembly - The focus control electronics assembly shall provide, in its primary mode of operation, information for transmission to ground facilities to permit an operator to command the camera focus mechanism. This assembly may, in closed mode, provide intelligence to control power to drive the focus mechanism. The OCV shall be required to position the vehicle to a predetermined obliquity angle for a focus sequence to allow operating of the focus control electronic assembly within its design range. The electrical requirements for the focus control electronics assembly shall be in accordance with Eastman Kodak Company specification 502-154.

3.2.2.9 Motor Speed Drive (Film Drive Electronics Assembly) - The film drive electronics assembly shall provide two phase power, at the specified voltage and frequency to the camera film drive in response to the binary coded command. The 64 film drive speed steps corresponding to this binary code structure shall be in accordance with Eastman Kodak Company drawing 502-146. This assembly shall also amplify data signals and provide power to operate the data lamps in the camera assembly. The electrical requirements for the film drive electronics assembly shall be in accordance with Eastman Kodak Company Specification 702-102.

3.2.2.10 Electrical Distribution Component - The electrical distribution component shall act as a junction point for all input commands; distribute primary power, and environmental power, regulate instrumentation power, and house instrumentation circuitry. The requirements for the electrical distribution component shall be in accordance with Eastman Kodak Company Specification 602-128.

3.2.2.11 Cable Assemblies - The cable assemblies shall provide the appropriate connections to each electrical package and functional unit. The electrical requirements shall be in accordance with Eastman Kodak Company Specification 502-115.

3.2.2.12 Programmable Slit Mechanism (Slit Positioner) - The electrical requirements of the slit positioner which locates the camera slit in each of four positions in response to electrically coded commands received from an external source shall be in accordance with Eastman Kodak Company Specification 802-243.

3.2.3 Deliverable Hardware and AGE

3.2.3.1 Airborne Models - The electrical requirements for the deliverable hardware airborne models shall be in accordance with the following Eastman Kodak Company specifications:

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TABLE II

Item		Specifications
(a)	Engineering Model	802-150
(b)	Structural Mock-up	802-103
(c)	Forward Record Storage Drop Test Assembly (Dummy Forward Record Storage Assembly)	802-124
(d)	Thermal Model Payload	802-123
(e)	Flight Payload Model (Includes S/V Compatibility Models and Reliability Test Model)	802-153
(f)	Dynamic Simulator	802-207
(g)	Electric Simulator	502-208

3.2.3.2 Aerospace Ground Equipment

3.2.3.2.1 Payload Test Equipment - The power requirements for the payload test equipment shall be in accordance with 3.2.1.2. Additional requirements shall be in accordance with the applicable Eastman Kodak Company component specification of 3.8.2, Table III.

3.2.3.2.2 Payload Support Equipment - Electrical requirements for the payload support equipment shall be in accordance with the individual Eastman Kodak Company specifications of 3.8.2, Table III.

3.2.3.2.3 Photo Support Equipment - The electrical requirements of the photo support equipment shall be in accordance with the individual Eastman Kodak Company specifications of 3.8.2, Table III.

3.2.3.2.4 Operating Equipment - This equipment is to be supplied by an associate contractor in accordance with Eastman Kodak Company specification 502-181. This equipment is part of the complete focus control equipment and is located in an associate contractor's operating console at the TS.

3.2.4 Interfaces

3.2.4.1 Airborne Electrical - The flight payload electrical interface shall conform to the requirements of Eastman Kodak Company Specification 502-146. This specification shall contain the following information:

(a) Interface inter-connections and pin assignments

(b) Conducted noise specification

(c) Test plug requirements, display and recording information

(d) Umbilical cord requirements, display and recording information

(e) Overload protection requirements

(f) Power requirements

(g) Time data signal configuration

(h) Instrumentation signal information

(i) Command structure

3.2.4.2 Aerospace Ground Equipment - The aerospace ground equipment electrical interface requirements shall be in accordance with Eastman Kodak Company Specification 802-179.

3.2.4.3 EMI Compatibility - The design of the Photographic Subsystem shall reflect the requirements of Eastman Kodak Company Specification 502-146 and this specification with regards to Electromagnetic Interference (EMI).

3.3 Environmental Requirements

3.3.1 Photographic Subsystem (Environmental Requirements) - The subsystem shall be designed to complete a mission successfully in the encountered environments. These environmental requirements shall include all periods starting with shipment from the manufacturer's plant and ending with recovery and processing of retrieved film after orbital flight.

3.3.2 Camera Payload

3.3.2.1 General - The flight payload shall comply with the environmental requirements of Eastman Kodak Company specifications 501-118 and 502-140. Included in these specifications are environmental conditions relating to the following life phases:

(a) Storage and Transportation

(b) Handling and Mating

(c) Pre-flight

(d) Powered Flight

(e) Orbital Flight

(f) De-orbit and Separation

(g) Re-entry

(h) Parachute Deployment to Impact

(i) Air Snatch

(j) Water Impact and Recovery

The environmental characteristics considered are:

(a) Vibration

(b) Acceleration

(c) Shock

(d) Acoustic Noise

(e) Temperature

(f) Pressure

(g) Humidity

(h) Explosive or Corrosive Atmosphere

(i) Life - (Duration)

(j) Precipitation

(k) Salt Spray, Sand and Dust

(l) Fungus

(m) Electromagnetic Interference (EMI)

3.3.2.2 Lens - Provisions shall be made by Eastman Kodak Company and associate contractors to control the lens environment in accordance with Eastman Kodak Company specifications 502-146 and 802-125.

3.3.2.3 Stereo Mirror - Provisions shall be made by Eastman Kodak Company and associate contractors to control the stereo mirror environment in accordance with Eastman Kodak Company specification 502-146 and 802-125.

3.3.2.4 Flight Payload View Port Door Operation - The design, fabrication, installation and operation of the flight payload view port door shall be the responsibility of an associate contractor who shall accomplish the tasks so as to introduce the minimum thermal input to the stereo mirror and lens assembly. Details of port door operation are specified in 3.7.5.2 and Eastman Kodak Company drawing 502-146.

3.3.2.5 Re-entry - The associate contractor supplying the SRV is responsible for the maintenance of all environmental conditions required in the SRV. It is of particular importance that the film environment during re-entry and recovery sequences be proper. This environment shall be as specified in Eastman Kodak Company specifications 502-118 and 502-146. Particular attention should be devoted to preventing the injection of contaminants due to possible pressure differentials during this phase of the mission.

3.3.3 Deliverable Hardware and AGE

3.3.3.1 Airborne Models - The environmental requirements for the deliverable hardware airborne models shall be in accordance with the applicable specifications of 3.2.3.1, Table II.

3.3.3.2 Aerospace Ground Equipment - The environmental requirements of the aerospace ground equipment shall be in accordance with Eastman Kodak Company specification 802-179.

3.3.4 Interfaces

3.3.4.1 Airborne Models (Environmental) - The environmental interface requirements to insure satisfactory orbital operation of the integrated system shall be in accordance with Eastman Kodak Company specification 502-146.

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3.4 Mechanical Requirements

3.4.1 Photographic Subsystem (Mechanical Requirements) - The photographic subsystem shall correlate and integrate the mechanical requirements of the airborne equipment and the aerospace ground equipment in a manner which insures the compatibility necessary for the subsystem to meet its performance requirements.

3.4.2 Camera Payload - The mechanical requirements shall be in accordance with applicable Eastman Kodak Company specification of Table I of 3.1.1.

3.4.2.1 Axes Orientation - The orientation and nomenclature of the flight payload axes are as follows:

Roll Axis X	Parallel to the longitudinal axis of the vehicle. Negative in the direction of the vehicle velocity vector.
Yaw Axis Z	Perpendicular to the roll axis and in the orbit plane. Negative in the direction of the earth.
Pitch Axis Y	Defined by the right-hand rule. Mutually perpendicular to the yaw and roll axes at their intersection.

Positive rotation about any of these axes shall be defined by the right-hand rule.

3.4.2.2 External Dimensions - The over-all dimensions and station
E positions of the C/P shall be in accordance with Eastman Kodak Company drawings
F 801-116-1 and 801-116. The subsystem shall extend from about station 21.5 to station 211 as defined by the associate contractor. The component support tube portion of the payload which extends from station 125 to station 211 shall be approximately 36 inches in diameter. The forward record storage assembly provided as a part of the C/P subsystem shall nominally occupy

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the volume between stations 21.5 and 39.8. The Satellite Vehicle Adapter provided by an associate contractor shall provide structural continuity between the SRV and OCS station 82. The volume between station 82 and station 125 shall include the stereo mirror, its servos and support mechanisms. The above dimensions are nominal. Additional and more detailed information may be obtained by referring to the sections on configuration, space envelope, and interfaces of Eastman Kodak Company Specification 802-129.

3.4.2.3 Weight and Center of Gravity - The maximum weight of the Camera Payload shall be in accordance with Eastman Kodak Company Specification 502-146. The center of gravity of the C/P shall meet the requirements of Eastman Kodak Company Specification 502-146.

3.4.2.4 Moment and Products of Inertia - Calculated values of moments and products of inertia shall be supplied by Eastman Kodak Company in accordance with Eastman Kodak Company Specification 502-146.

3.4.2.5 Unbalanced Angular Momentum - The C/P shall meet the unbalanced angular momentum requirements of Eastman Kodak Company Specification 502-146.

3.4.2.6 Material - All materials used for the film enclosure of the camera payload shall be chosen from a list of materials which do not adversely affect the photographic properties of the film. The materials used for the C/P shall be of the lightest weight possible consistent with good engineering practices. The material requirements for each component and assembly shall be in accordance with component drawings.

3.4.2.7 Mechanical Alignment - The mechanical alignment tolerances of the C/P shall be in accordance with Eastman Kodak Company drawing 703-100, 801-116-1, and 805-110, and specifications 502-146, 802-122 and 802-129. The smear produced by variations in alignment shall be less than that allowed in 3.7.4.2

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3.4.2.8 Structural Requirements - The structural requirements for the C/P shall be in accordance with Eastman Kodak Company Specification 802-129.

3.4.3 Deliverable Hardware and AGE

3.4.3.1 Airborne Models - The mechanical requirements for the deliverable hardware airborne models shall be in accordance with applicable Eastman Kodak Company Specifications in 3.2.3.1, Table II.

3.4.3.2 Aerospace Ground Equipment - The aerospace ground equipment mechanical requirements shall be in accordance with the applicable Eastman Kodak Company Specifications of 3.8.2, Table III.

3.4.4 Interfaces

3.4.4.1 Airborne Models - The C/P (OCV + SRV) interface shall be in accordance with Eastman Kodak Company drawing 801-116-1. The mechanical requirements for this interface shall be in accordance with Eastman Kodak Company Specification 502-146.

3.5 Optical Requirements

3.5.1 Photographic Subsystem (Optical Requirements) - The photographic subsystem shall correlate and integrate the optical requirements, of the airborne equipment and aerospace ground equipment in a manner which insures conformance of the subsystem to its performance requirements.

3.5.2 Camera Payload - The C/P optical requirements shall be as follows:

3.5.2.1 Lens and Stereo Mirror

3.5.2.1.1 Focal Length - The focal length of the lens system shall nominally be 77 inches and shall be in accordance with Eastman Kodak Company Specification 802-125.

3.5.2.1.2 Aperture - The aperture of the C/P lens assembly shall be such that this aperture in conjunction with the focal length shall produce a nominal F-number of 4. The T-stop of the lens system for white light shall be 5.6 and when bandpass filter and film effects are included shall be 6.4, as demonstrated by appropriate calculation and appropriate reflectance and transmission measurements. There shall be a stereo mirror whose nominal orientation is at an angle of 45 degrees to the optical axis of the lens. There shall be an aperture attached to the sterro mirror with dimensions that limit the axial beam to no less than 19.50 inches diameter. The aperture, in conjunction with the stereo mirror, shall not cause any axial vignetting when the photographic subsystem is rolled into any obliquity position and no more than 0.5 per cent when the stereo mirror is moved to any of its three positions.

3.5.2.1.3 Alignment (Lens) - The lens assembly shall be aligned in accordance with Eastman Kodak Company drawing 703-100.

3.5.2.1.4 Alignment (Lens and Stereo Mirror) - The alignment of the C/P lens and stereo mirror assembly shall not cause a loss of image quality greater than allowed by this specification. The detail alignment tolerances on this alignment shall be in accordance with Eastman Kodak Company Specification 802-125.

3.5.2.1.5 Resolving Power - The On-axis resolution of the lens and stereo mirror shall be adequate to supply the photographic subsystem with the capability to meet the resolution requirements of section 3.7.

3.5.2.2 Camera

3.5.2.2.1 Focus Provisions - The C/P shall provide focusing in accordance with Eastman Kodak Company Specifications 502-146 and 502-154. A prefocus correction shall be made to compensate for the shift in focus caused by the difference in object distance between operations at orbital altitude in a vacuum and the collimator setting at infinity in air in the laboratory.

3.5.2.2.2 Slit Aperture Plate - Flight Payloads 1 through 12 shall contain a slit aperture plate consisting of three photographic slits and two test slits. The slit aperture plate shall be capable of being manually positioned from outside the camera case. Flight Payloads 13 and on shall contain a programmable slit aperture plate consisting of four operational slits (three photographic and one ground test slit) and an independently controlled test slit. This slit aperture plate shall be capable of being commanded through the S/V command subsystem to any of the four operational slits. The test slit position shall be programmable through independent circuitry only from pieces of AGE hardware designated in Eastman Kodak Company Specification 802-153. Associated with each of the photographic slits shall be a pair of smear slits at each end of the main slit. The use of the smear record produced by these slits is described in 3.7.3.4.

3.5.2.2.3 Filter - The filter shall be minus-blue glass filter chosen for haze reduction purposes and reduction of lens chromatic aberrations. It is part of the slit aperture plate assembly (Eastman Kodak Company drawing 808-501).

3.5.2.2.4 Camera Drive Specification - The camera shall drive the film at any of 64 film drive speeds upon receipt of the appropriate signals from the motor speed drive of 3.2.2.9. The appropriate film drive speed shall be that speed which most closely approximates the predicted rate of motion of the image of the ground scene. It shall move the film with sufficient accuracy to prevent image degradation, due to banding and smear, as required in Eastman Kodak Company

Specification 802-122 and this specification.

3.5.2.2.5 Data Signals - 20 pps and 500 pps time marks shall be provided to the Camera Payload from an external source. A time label shall also be provided with the 20 pps signal. These pulses will illuminate neon lamps exposing the data signals on the film through an auxiliary optical system in the camera. The character and arrangement of the data signals on the film shall be in accordance with Eastman Kodak Company Specifications 502-146 and 802-153.

3.5.2.3 Lens and Camera Alignment - The lens and camera shall be aligned in accordance with Eastman Kodak Company drawing 805-110.

3.5.3 Deliverable Hardware and AGE

3.5.3.1 Airborne Models - The optical requirements for the deliverable airborne models shall be in accordance with applicable Eastman Kodak Company Specifications of 3.2.3.1, Table II.

3.5.3.2 Aerospace Ground Equipment - The aerospace ground equipment optical requirements shall be in accordance with Eastman Kodak Company Specification 802-179.

3.5.3.2.1 Collimator Assembly - The collimator shall require a parabolic mirror and associated optical equipment capable of meeting the requirements of Eastman Kodak Company Specification 802-149, for testing the optical characteristics of the photographic payload.

3.5.4 Interfaces

3.5.4.1 Airborne Models - The optical interface requirements to insure satisfactory orbital operation of the integrated system shall be in accordance with Eastman Kodak Company Specification 502-146.

3.5.4.2 Aerospace Ground Equipment - The aerospace ground equipment optical interface requirements shall be in accordance with Eastman Kodak Company Specification 502-146.

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3.6 Film Requirements

3.6.1 Film Type - The film shall be a composite material consisting of a thin flexible sheet with a light-sensitive emulsion coating. The film used shall be Kodak High Definition Aerial Film, (Estar Thin Base).

3.6.2 Physical Characteristics - The subsystem will use commercially available film (see 3.6.1). The photographic subsystem has been designed to operate with this film and the physical characteristics of the film are as given in Eastman Kodak Company Specification 702-184.

3.6.3 Photographic Characteristics - The film shall have the photographic characteristics given in Eastman Kodak Company Specification 702-184.

3.6.4 Film Quantity - The C/P shall have a capacity of 3000 feet of Estar thin base film whose maximum thickness including emulsion coating is not greater than 0.0033 inch.

3.7 General Requirements of the Photographic Subsystem

3.7.1 Launch and Injection into Orbit - The environmental conditions during the launch and injection into orbit shall be in accordance with Eastman Kodak Company Specification 502-118. All components and assemblies within the flight payload portion of the satellite vehicle shall be inactive during the launch sequence, with the exception of the film supply reel torque motor which shall be energized prior to lift off. This voltage shall be maintained throughout all powered flight sequences associated with launch, orbit injection, and on orbit powered flight sequences.

3.7.2 Orbital Requirements

3.7.2.1 Environmental - The flight payload shall be capable of operating within the environmental conditions in accordance with Eastman Kodak Company Specification 502-118.

3.7.2.2 Standard Orbit for Photographic Operations - During photographic operations a minimum perigee altitude of 70 n mi should be utilized. The apogee altitude should be compatible with lifetime, number of orbit adjusts required, molecular heating rates and maximum altitude during photography.

3.7.2.2.1 Altitude - The flight payload shall maintain full obliquity capability when operating in an altitude range of 80 ± 11 nautical miles above its nadir. Operations at higher altitudes will be accompanied by a reduced obliquity capability. See paragraph 3.7.3.2. The maximum altitudes for nadir and stereo photography are 122 n mi and 112 n mi respectively.

3.7.2.2.2 Inclination - The flight payload shall meet the requirements of this specification when in orbits whose orbital inclinations may vary between 80° and 105°.

3.7.2.2.3 Eccentricity - The flight payload shall meet the requirements of this specification when operating in any eccentric orbit whose altitude range is consistent with the altitude limits of 3.7.2.2.1 over the area of interest.

3.7.2.2.4 Time of Launch - The flight payload shall meet the requirements of this specification when launched into an orbit whose daylight equator crossing occurs between 1000 hours and 1400 hours local solar time. (This requirement establishes the thermal design parameters and the limits of illumination under which the C/P shall be required to produce acceptable photographic results).

The flight payload shall therefore meet these requirements for an equivalent midnight launch.

3.7.2.3 Orbit Particularity - The flight payload shall comply with the requirements of this specification only when the satellite is operating in the orbit specified in 3.7.2.2, and shall not comply during maneuvers required to return the payload to the specified orbit. (Maintaining the satellite in the specified orbit shall be the responsibility of an associate contractor).

3.7.2.4 Attitude Control - The flight payload shall be capable of meeting the requirements of this specification only when the S/V attitude is held within the limits which produce smear less than equal to the tolerance given in this specification. (Attitude control shall be the responsibility of a subsystem supplied by an associate contractor).

3.7.2.5 Communications - The flight payload shall receive commands from, and transmit instrumentation voltages to a communications subsystem which shall have the responsibility of maintaining a radio frequency link with tracking stations.

3.7.2.6 Tracking - Tracking and vehicle ephemeris shall be supplied by an associated subsystem. The responsibility for which belongs to an associate contractor.

3.7.3 Coverage

3.7.3.1 Area of Interest - The flight payload shall be capable of photographing areas within certain political boundaries located in the Northern Hemisphere between 30 and 80 degrees North Latitude.

3.7.3.2 Obliquity Aiming - The flight payload shall be capable of photographing areas to the left and right of the satellite vehicle ground track when rotated up to 42 degrees from the vertical about its longitudinal axis when the vehicle is in the specified altitude range as given in 3.7.2.2.1. Operation of the flight payload at higher altitudes shall be accompanied by a loss in the capability of the flight payload to operate at higher obliquity angles as limited by the range of film drive speeds required in Eastman Kodak Company Specification 802-122 and this specification.

This obliquity motion shall be accomplished by another subsystem.

3.7.3.3 Modes of Operation - The flight payload shall be capable of taking three types of photographs. These types are: Stereo pairs, lateral pairs, and continuous strip. Other hybrid modes such as stereo triplets and lateral triplets, which are extentions of the 3 basic modes, are also possible.

3.7.3.3.1 Stereo Pairs - A stereo pair consists of two photogographs of the same area. These photographs are taken looking forward and aft with respect to the local vertical from consecutive positions along the orbit track.

3.7.3.3.2 Lateral Pairs - A lateral pair consists of two photographs of different target areas. These target areas are spaced laterally with respect to the ground track and will normally be located at approximately the same latitude. A lateral pair consists of one photograph taken on a forward looking stereo angle and some obliquity angle, and a second photograph taken at an aft looking stereo angle and at a different obliquity angle than the first photograph.

3.7.3.3.3. Continuous Strip Photography - A continuous strip photograph is a single strip photograph nominally taken at a zero stereo angle of a target area located within the obliquity range of the vehicle.

3.7.3.4 Photographic Format - The photographic format shall be in accordance with Eastman Kodak Company drawing 808-103. The resultant time data tracks of this format shall have a minimum density of .5 at the slowest film speed (IMC) and a minimum density above fog of at least .3 at the fastest film speed (IMC) after the completion of intermediate processing in accordance with Eastman Kodak Company Specification 702-184. The film format shall also record images through the smear slits. This smear record provides a means of

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checking the obliquity aiming angle with respect to the nadir within ± 1° when the appropriate measurements are made and reduced in accordance with Eastman Kodak Company Utility Manual 554-132.

3.7.3.5 Quantity of Photography - The flight payload shall be capable of taking 600 stereo pairs or the equivalent amount of lateral pairs or continuous strip photography during a five day photographic lifetime. The subsystem shall be capable of this amount of photography while in photographic contact with the areas defined in 3.7.3.1.

3.7.4 System Ground Resolution - The camera payload (assuming nominal system smear contributions) will have a ground resolution range of 1.7 to 2.1 feet for vertical on axis photography at 70 n.mi. with an apparent contrast ratio of 2:1 as viewed from above the atmosphere. Specific camera payload performance is given in paragraph 3.7.4.1.

3.7.4.1 Camera Payload Resolution - The camera payload resolution shall be determined utilizing a 2:1 low contrast target of the type defined in Figure 7 of MIL-STD-150A. When tested with this standard, the average value of the geometric mean resolution on axis shall not be less than the following values:

Resolution	Effectivity
104 lines/mm	FM-1 to FM-16
110 lines/mm	FM-17 or 4 Nov. 64 (whichever is later)
115 lines/mm	FM-18 or 2 Dec. 64 (whichever is later)
120 lines/mm	FM-19 or 2 Jan. 65 (whichever is later)
125 lines/mm	FM-20 or 30 Jan. 65 (whichever is later)
130 lines/mm	FM-21 or 27 Feb. 65 (whichever is later)
130 lines/mm	FM-22 to FM-34 (provided after 27 Feb. 65)

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With C/P performance at 104 lines/mm, ground resolution for vertical photography will vary between 2.1 and 2.8 feet over the altitude range of 70 to 90 nautical miles as a function of altitude. (Assumes S/V smear contributors as given in paragraph 3.7.4.2).

With C/P performance at 130 lines/mm, ground resolution for vertical photography will vary between 1.7 and 2.2 feet over the altitude range of 70 to 90 nautical miles as a function of altitude. (Assumes S/V smear contributors as given in paragraph 3.7.4.2.)

3.7.4.2 Smear Tolerances - The total smear produced at the center of the field by all smear contributors and measured on the ground shall be as follows for operations at 70 n.mi. and a 0.0085 inch slit width. (Total smear is defined as that on-axis smear which will be exceeded in less than 5% of the frames from a single mission, with a confidence level of 95%.) Proportionately larger smear levels will be obtained for operatinns at higher altitudes due mainly to the increased scale factor.

<u>Camera Payload</u>

Vertical Photography	30° Obliquity/15° Stereo
S_x = 0.49 foot	S_x = 0.77 foot
S_y = 0.26 foot	S_y = 0.36 foot

<u>Orbital Control Vehicle</u>

Vertical Photography	30° Obliquity/15° Stereo
S_x = 0.17 foot	S_x = 0.52 foot
S_y = 0.37 foot	S_y = 0.62 foot

<u>Ephemeris Prediction</u>

Vertical Photography	30° Obliquity/15° Stereo
S_x = 0.21 foot	S_x = 0.26 foot

(F)

The symbols S_x and S_y represent the intrack and crosstrack smear levels respectively. A listing of the separate smear contributors and their individual smear contribution is provided in Table V.

3.7.4.2.1 Target Acquisition - Target acquisition requirement shall be considered to be the acquisition of the target within 50 percent of the field of view or the stereo overlap area. Conformance to this requirement can be assured if the following obliquity aiming capability is provided:

(a) Roll attitude position accuracy ± 0.7°

(b) Maximum obliquity interval ± 1.0°

In addition the following programming information is required:

1. Knowledge of satellite position over the target.

Altitude	± 0.5 nautical mile
Cross track	± 1.5 nautical miles
In track	± 5.8 nautical miles

2. Knowledge of target position ± 1.0 nautical mile.

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3.7.5 Flight Payload Programming and Sequence of Operations

3.7.5.1 Supply Spool Torque Motor - The torque motor supply film tension shall be turned on prior to launch and shall remain on throughout the powered flight portion of the launch and injection into orbit sequence, and during all powered flight sequences for orbit maintenance or adjustment.

3.7.5.2 Flight Payload View Port Door - The flight payload view port door shall be the responsibility of the associate contractor in charge of the payload vehicle. When the port is open it shall not vignette the light beams to the lens mirror system. The view port door shall be opened for as short a time as is consistent with the achieving of the photographic mission. The door will be opened just prior to the start and closed immediately after the completion of a photographic or focus pass. The view port door shall be completely open during any photographic operation or focus sequence. Details of the view port door operation shall be in accordance with Eastman Kodak Company specification 502-146.

3.7.5.3 Camera Operation - The camera shall be programmed to operate for as long a time as possible for each target, commensurate with the physical limitations of the system, such as looper capacity, and the necessity for preparing for the next photograph to be taken in orbit. Reduced resolution will result when the dynamic capacity of the film supply looper is exceeded, causing the film handling system to operate simultaneously with the camera drive mechanism. The command system shall command the camera "ON" in the stereo mode for times from 3.5 to 9.5 seconds in 0.5 second increments, and "OFF" times between stereo pairs shall range from 3.0 to 11.4 seconds in 0.8

second increments. In the strip mode the commands shall provide for camera "ON" times from 0.1 - 102.4 seconds in 0.1 second increments.

The starting and stopping times required for stabilization of film velocity shall be as required by Eastman Kodak Company Specification 802-153.

3.7.5.4 Stereo Mirror Motion - The stereo mirror shall be capable of being positioned to three positions which will allow photography at angles of 0° or ± 15° from vertical. The resolution requirements are applicable only when commands for stereo mirror movement are satisfied prior to the time when the camera has achieved the commanded image motion compensation speed. The stereo mirror shall take no more than 4 seconds to move from one extreme position to the opposite extreme position and no more than 2 seconds to move to an adjacent mirror position.

3.7.5.5 Crab Motion - The flight payload shall be capable of positioning the stereo mirror in crab to one of two sets of eight selected positions for N/S or S/N orbits for the purpose of compensating for cross track image velocity.

A selection method, accessible before the C/P is mated to the OCV in the MAB shall be provided to select the proper set of eight crab corrections to be used. The resolution requirements of this specification are only applicable when the camera has achieved the commanded image motion compensation speed. Crab movement shall not take place during camera operation.

A movement of one step in crab shall take less than 1 second. A movement in crab from one extreme to the opposite extreme position shall take less than 8 seconds.

3.7.5.6 Obliquity Aiming - Obliquity aiming shall be accomplished by a rotation of the entire S/V. This maneuver shall be accomplished by an OCV subsystem and is the responsibility of an associate contractor. The command for obliquity position shall be received in sufficient time to allow completion of the motion prior to camera operation. The minimum range of roll positions shall be ± 44 degrees in steps of 0.7 ± 0.02 degrees. The roll maneuver shall not prohibit completion of any required mode of operation.

3.7.5.7 Instrumentation and Recorders - Instrumentation and recorders shall normally be turned on when the flight payload view port door is open. The recorder may be commanded to remain off. The instrumentation and recorder requirements shall be in accordance with Eastman Kodak Company Specification 502-146.

3.7.5.8 Preparation for De-orbit - The preparations for the recovery of the exposed record shall provide the maximum protection for the photographic latent image and the maximum reliability for the de-boost sequence. Under normal operations, sufficient camera operation will be programmed to empty the film supply cassette and achieve a telemetry indication that all film has been transported to the forward record storage assembly. Upon use of the complete film supply, or cutting of the film, film tension will drop and the take-up motor will run continuously until C/P power is off.

Devices provided by an associate contractor will cut the film, (if exhausted has not been completed) seal the SRV and separate the film chute. To fulfill the requirements above, the following sequence should be followed:

(a) Transport all the film into the T/U cassette

(b) Activate the SRV cutter sealer

(c) After SRV sealing, turn off C/P power

(d) Separate the film chute

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3.7.5.9 Vehicle Programming - The photographic subsystem programs are not the responsibility of this subsystem contractor, however, it shall be required that such programming comply with the P/L restrictions necessary for the successful operation of the photographic subsystem.

3.7.6 Focus Control by Subsystem - The photographic subsystem shall provide a focus control system as part of the flight hardware. This system shall have the ability to sense relative camera focus, while in orbit, when the vehicle is in a predetermined stable attitude to attain a standard in-track image speed for the focus sequence as specified in Eastman Kodak Company Specification 802-153.

The flight payload focus position shall be adjustable in any of three modes of operation as follows:

(a) The open loop mode in which real time focus system output signals are transmitted to certain ground stations where this information is used by operators to determine the necessary real time commands to be transmitted through the programmer and control system.

(b) The remote-record mode in which focus system output signals are recorded over any land mass during daylight, read-out at a subsequent contact station and returned to focus operators who determine the necessary real time commands to be transmitted through the programmer and control system.

(c) The closed loop mode in which a servo system automatically adjusts for the optimum focus signal output.

3.7.7 Handling of Recovered Record - After landing of the recovery vehicle the handling of the film record shall be in accordance with Eastman Kodak Company Specification 702-176.

3.7.8 Operational Film Processing - The flight payload subsystem shall meet the requirements of this specification in so far as the film is processed to meet the requirements of Eastman Kodak Company Specification 702-184.

3.8 Deliverable Hardware and AGE

3.8.1 Airborne

3.8.1.1 Structural Mock-up - The Structural mock-up shall be nonoperating model of the complete flight payload. It shall simulate size, but not weight or any other characteristics. It shall be dimensionally accurate at the exterior envelope and at the mating interfaces, including electrical and mechanical connections. Requirements for the structural mock-up shall be in accordance with Eastman Kodak Company Specification 802-103.

3.8.1.2 Forward Record Storage Drop Test Assembly (Dummy Forward Record Storage Assembly). - The dummy forward record storage assemblies are intended for a program of laboratory and aerial drop tests to be conducted by an associate contractor. Impact recording equipment may be installed. The assembly shall duplicate the size, weight, and mass distribution of flight hardware. The requirements for the dummy forward record storage assembly shall be in accordance with Eastman Kodak Company Specification 802-124.

3.8.1.3 Thermal Model Payload - The thermal model payload shall contain simulated electrical loads and instrumentation to permit the accurate determination of temperature distribution under simulated flight environments. The thermal model payload shall faithfully represent the thermal characteristics, which will exist in the flight payloads. Requirements for the thermal model payload shall be in accordance with Eastman Kodak Company Specification 802-123.

3.8.1.4 Engineering Model - This model shall be representative of the first flight model payload design, but shall be modified as required or indicated by the results of engineering review or testing. The unit shall be designed to meet applicable specifications for flight payloads, but will not be required to pass environmental testing as prescribed in these specifications. Requirements of the engineering model shall be in accordance with Eastman Kodak Company Specification 802-150.

3.8.1.5 Flight Model Payload - The flight payload models shall be composed of the assemblies specified in 3.1.1, Table I. The flight model payload shall be responsible for exposing film in orbit upon receipt of command from an associated subsystem; storing the unexposed film from launch until time of exposure and winding the exposed film into the forward record storage assembly for the recovery phase of flight. The flight payload shall include the structures and mechanism required for the orbital operation of the equipment except those which are the responsibility of other subsystems, as defined in Eastman Kodak Company Interface Specification 502-146.

The complete requirements of the flight payload shall be given in Eastman Kodak Company Specification 802-153.

3.8.1.5.1 S/V Compatibility Model - The S/V compatibility model shall establish the compatibility of the Flight Payload with the associate contractor's OCV + SRV. This model shall meet the performance requirements of a flight payload model except in areas where performance does not affect compatibility. An example of such an area is optical requirements. The

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performance requirements for the S/V compatibility model shall be in accordance with Eastman Kodak Company Specification 802-153.

3.8.1.5.2 Reliability Test Model - The reliability test model shall be fabricated and assembled to be identical with the Flight Model Payload, Eastman Kodak Company Specification 802-153, and shall be updated in a similar fashion except where engineering judgment indicates that the design change has no significant effect on the qualification of the affected component. This model which includes additional components and subassemblies as defined in Work Statement Exhibit "A" to AF33(616)7704 shall be subjected to reliability testing to establish modes of failure under environmental extremes and to accumulate the maximum possible operating time and shall be tested in accordance with Eastman Kodak Company "Flight Payload Qualification Test Plan" 802-148.

3.8.1.6 Dynamic Simulator - Dynamic simulator shall be provided to simulate the static, dynamic, spatial, inertial and stiffness characteristics of the C/P during powered flight in accordance with Eastman Kodak Company drawing 805-101. The dynamic simulator shall comply with the requirements of Eastman Kodak Company Specification 802-207.

3.8.1.7 Electric Simulator - An electric simulator shall be provided to produce a high degree of assurance that the C/P, OCV and SRV can be mated electrically without damage to any of the three subsystems. The electrical simulator shall be capable of acting as a substitute for the C/P during electrical interface compatibility checkout at the MAB and on the Pad. The electric simulator shall conform to the requirements of Eastman Kodak Company Specification 502-208.

3.8.2 Aerospace Ground Equipment - The aerospace ground equipment shall be in accordance with Eastman Kodak Company Specification 802-179. Data below gives the five major categories of this equipment and lists those items that belong to each. The Aerospace Ground Equipment list, format "A", of Work Statement - Exhibit "A" to AF33(616)7704 forms a more extensive reference for these items. The individual specifications as listed in Table IV give the complete requirements of each item. Table IV also lists the location where the equipment is recommended for use.

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TABLE III

Aerospace Ground Equipment

Title	Specification	Recommended For Use At EK	GE	VAFB
Payload Test Equipment				
Test Console	802-107	x		x
Portable Test Set	802-108	x	x	x
Collimator Assembly	802-149	x		x
Record Storage Test Set	702-173	x	x	x
Line of Sight Test Set	802-156	x		x
Leak Rate Test Set	602-157	x	x	x
Cable Test Point Board (Set)	502-158	x	x	x
Record Storage Bracket	702-127	x	x	x
Command Monitor	602-217		x	x
Breakout Bos	502-161		x	x
Secondary Standard	502-162	x		x
Payload Support Equipment				
Record Loading and Unloading Kit	702-141	x	x	x
Record Dolly	802-163	x	x	x
Air Supply and Record Storage Alignment Measuring Equipment (Film Supply Cassette and Record Storage Alignment Measuring Equipment)	702-214	x	x	x
Integration Accessory Kit	702-143	x	x	x

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TABLE III (CONT'D)

Aerospace Ground Equipment

Title	Specification	Recommended For Use At EK	GE	VAFB
Payload Support Equipment(Cont'd)				
Purging Equipment	602-168	x	x	x
Record Advance Control	702-213		x	x
Record Travel Viewer	702-226	x	x	x
Forward Storage Table and Lifting Yoke	702-221	x	x	x
Payload Handling Equipment				
General Purpose Mobile Hoist	602-171	x		x
Truck	802-114	x	x	x
Space Chamber Lifting Yoke (Camera Payload Assembly Lifting Yoke)	802-137	x	x	x
Handling Accessory Kit	702-147	x	x	x
Erector	602-132	x	x	x
Package Shipping Container (Payload Shipping Container)	602-144	x		
Accessory Shipping Container	702-183	x		
Space Chamber Integration Lifting Yoke (Camera Payload Integration Lifting Yoke)	602-174	x	x	x
Cradle	602-126	x		
Photo Support Equipment				
Record Viewer	702-110	x		x
Record Splicer	702-175	x	x	x
Test Record Support Equipment	802-177	x	x	x
Test Record Transfer	802-238	x		x

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TABLE III (CONT'D)

Aerospace Ground Equipment

Title	Specification	Recommended For Use At EK	GE	VAFB
Operating Equipment				
Operating Equipment (Ground Equipment Functional Specification)	502-181	x	x	x

3.8.2.1 Payload Test Equipment - The payload test equipment shall supply the required testing capability for checking out the payload. Required equipment is listed in Table III of 3.8.2, and the individual specification for each piece of equipment is listed in this table. (F)

3.8.2.1.1 Test Console - The test console consists of all components and equipment which are essential to supply the power for operating the C/P and associated test collimator equipment. In conjuction with the collimator, the console provides the stimuli required to induce proper flight payload operations and a display of the output of all desired flight payload circuit voltages.

3.8.2.1.2 Portable Test Set - The portable test set is a portable, less versatile, version of the test console. It provides the flight payload with signals and power inputs for limited operation away from the collimator and test points for the outputs of all transducers in the flight payload. The portable test set provides the only means of operating the flight payload at the associate contractor's facility and a means of operating the flight payload when it is not on the collimator at Vandenberg Air Force Base.

(C) (F)

(D) 3.8.2.1.3 Collimator Assembly - The collimator shall provide an optical reference, a target simulating the scale seen from nominal orbital altitude of 72 nautical miles, essential in ascertaining the performance qualities of the payload assembly and of the complete flight payload assembly.

A stationary target shall be provided for the measurement of resolution and other optical characteristics. A moving target shall be provided to simulate apparent motion of the scene that the camera views while in orbit, and a target shall also be supplied to test the focus system.

3.8.2.1.4 Record Storage Test Set - The film record storage assembly test set shall have the capability to provide the forward record storage with a sufficiently exact simulation of operating inputs and outputs to enable testing the performance requirements of the forward record storage assembly.

3.8.2.1.5 Line of Sight Test Set - The line of sight test set shall provide a means of determining position accuracy of the Stereo and Crab servo drives. The test set shall also provide a means for line of sight alignment of the complete flight payload optical assembly with respect to a flight payload reference surface and for checking such alignment subsequent to certain severe environmental testing and handling. The line of sight test set shall be in accordance with Eastman Kodak Company specification 802-156.

3.8.2.1.6 Leak Rate Test Set - Certain sections of the flight payload shall be required to maintain an internal air pressure in accordance with Eastman Kodak Company specification 502-118. The leak rate test set shall provide the means of determining the rate at which this internal pressure

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changes when the flight payload pressure differentials are equivalent to those existing in the operating environment. As a part of this equipment a leak detector shall be required for locating the source of leaks.

3.8.2.1.7 Cable Test Point Board (Set) - The cable test point board shall be a rack and test jack panel arrangement including insertion cables which may be introduced between various C/P subassemblies when mounted on the C/P, for use in trouble shooting and camera payload check out.

3.8.2.1.8 Record Storage Assembly Bracket - The record storage assembly bracket shall be attached to the cradle and used to support the assembly in the proper relation to the remainder of the flight payload. The bracket shall be used in production and assembly tests in the absence of the support supplied by the re-entry vehicle. The bracket shall contain an adjustment feature to permit alignment of the forward record storage assembly with the remainder of the flight payload.

3.8.2.1.9 Command Monitor - The command monitor provides a means of observing certain selected command inputs to the C/P and telemetry outputs from the C/P at the electrical interface between the C/P and the remainder of the S/V. This device will allow diagnostic evaluation of test results in the MAB and on the Pad, and will also act as a safety monitor to measure the integrity of the C/P during all test sequences prior to launch.

3.8.2.1.10 Breakout Box - The breakout box shall be used at the S/V - flight payload interface as an insertion box to provide switching and break-out capability during functional and integration tests as well as trouble shooting operations.

3.8.2.1.11 Secondary Standard - The secondary standard shall provide a means of calibrating meters, measuring equipment and recorders in the electrical test equipment against standards capable of being calibrated against laboratory or primary standards.

3.8.2.2 Payload Support Equipment - The payload support equipment shall consist of the support equipment listed in Table III of 3.8.2. Table III of 3.8.2 lists the individual specification numbers for each of the payload support equipment items. A description of individual items is given in 3.8.2.2.1 through 3.8.2.2.8.

3.8.2.2.1 Record Loading and Unloading Kit - The record loading and unloading kit shall consist of those items, essential for loading and threading the film into the payload either before or after mating of the flight payload with the OCV plus SRV. It shall provide items necessary for removing used film from the record storage after test.

3.8.2.2.2 Record Dolly - The record dolly shall provide a means of supporting, protecting, transporting and handling of the film rolls between the storage area (cooler) and loading station or vice versa. It shall perform the same function in removal of film at flight payload test stations and in transporting the film to the test record processing station.

3.8.2.2.3 Air Supply and Record Storage Alignment Measuring Equipment (Film Supply Cassette and Record Assembly Measuring Equipment) - The film supply cassette and record storage assembly alignment measuring equipment shall enable the proper linear and angular alignment between the following elements of the film handling system: camera, film supply cassette, and forward record storage assembly.

3.8.2.2.4 Integration Accessory Kit - The integration accessory kit shall include all the additional items necessary to remove the cradle from the flight payload. It shall supplement the C/P lifting yoke, the erector, the C/P integration lifting yoke and the overhead hoist.

3.8.2.2.5 Purging Equipment - The purging equipment shall supply the necessary dry gas and appropriate fittings required to provide the conditions within the shipping container necessary for the establishment of a dry air environment.

3.8.2.2.6 Record Advance Control - The record advance control provides an auxiliary method of advancing the film within the C/P, after the payload has been mated with the OCV. When commanded the unit will supply the necessary signals via auxiliary cables to the motor speed drive, forward record storage assembly motor, and supply cassette torque motor, to advance the film for test and threading operations. The unit shall be used in the MAB and the VSB and VAFB.

3.8.2.2.7 Record Travel Viewer - The record travel viewer provides a means of visually inspecting and tracking of the film onto the forward storage assembly take-up roller of a completely assembled satellite vehicle.

3.8.2.2.8 Forward Storage Table and Lifting Yoke - The forward storage table and lifting yoke provides a method of holding the record storage assembly in the proper position so that record spool may be inserted into or removed from the record storage assembly. It also provides a means of transporting the forward record storage assembly within a building and provides stowage for the yoke. The yoke provides a means of lifting the forward storage assembly.

3.8.2.3 Payload Handling Equipment - The payload handling equipment shall provide the capability of handling the payload according to the list, Table III of 3.8.2. Table III of 3.8.2 also lists the individual specification number for each of the payload handling equipment items. A description of individual items is as follows:

3.8.2.3.1 General Purpose Mobile Hoist - The general purpose mobile hoist shall be used for general handling (e.g. replacement of parts and assemblies on the collimator and on payloads) at Vandenberg Air Force Base, Missile Assembly Building.

3.8.2.3.2 Truck - The truck is a mobile platform for supporting the cradle and its contents during assembly and for transporting the cradle and its contents horizontally between assembly and test stations.

3.8.2.3.3 Space Chamber Lifting Yoke (Camera Payload Assembly Lifting Yoke) - The C/P assembly lifting yoke is a structure that shall permit the stable attachment of a hoist to the cradle containing the C/P assembly.

3.8.2.3.4 Handling Accessory Kit - The handling accessory kit shall include all the special wrenches, lifting adapters, slings and other tools, except the camera payload lifting yoke, to perform the necessary tasks described as format "A", of the Aerospace Ground Equipment list of Work Statement - Exhibit "A" to AF33(616)7704 and the tasks required in the specification for this item. (See Table III of 3.8.2).

3.8.2.3.5 Erector - The erector shall provide a means for rotating the cradle and contents from a horizontal to vertical position and back again without causing vibration or shock damage or distortion to the cradle contents. The erector shall be a required piece of equipment wherever the payload is removed from its cradle.

3.8.2.3.6 Package Shipping Container (C/P Shipping Container) - The C/P shipping container receives the C/P (less forward record storage assembly) and its cradle. The shipping container shall minimize injurious effects of transportation and incident handling upon the contents. It shall provide and maintain a clean inert interior atmosphere.

3.8.2.3.7 Accessory Shipping Container - The accessory shipping container shall provide a protective enclosure that provides a proper environment during shipping and handling between manufacture and receiving point for the forward record storage assembly.

3.8.2.3.8 Space Chamber Integration Lifting Yoke (C/P Integration Lifting Yoke) - The C/P integration lifting yoke is a structure that shall in conjunction with a hoist provide support for the C/P during and after removal from the cradle when in a vertical position. It is also used to lower the flight payload into the OCV during mating.

3.8.2.3.9 Cradle - The cradle shall be a very rigid handling device that holds, protects and provides support for the C/P. It shall be designed to support the assembly in a manner identical to that provided in the OCV. The cradle shall be made to accept the forward record storage assembly. (see 3.8.2.1.8) in operation when required.

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(F) 3.8.2.4 Photo Support Equipment - Table III of 3.8.2 lists the specifications for the individual items of photo support equipment. A description of the individual items is given in 3.8.2.4.1 through 3.8.2.4.3.

3.8.2.4.1 Record Viewer - The record viewer shall provide a suitable means of viewing the film output of the C/P for visual and microscopic inspection on an illuminated viewing table. Suitable film handling and measuring equipment shall also be provided in the design of the record viewer.

3.8.2.4.2 Record Splicer - The record splicer shall provide the capability of making thin, uniform reliable splices on 9.5 inch record which shall pass through the camera and film transport system.

3.8.2.4.3 Test Record Support Equipment - The test record support equipment shall consist of specialized items such as re-wind and support tables which shall be as specified in the individual specifications for this equipment.

3.8.2.4.4 Test Record Transfer - The test record transfer shall consist of an item to aid in removing quantities of test film from the forward record storage assembly. Mounted on the supply cassette assembly after removal of the supply cassette cover, it may be used to re-wind film from the take-up spool without the necessity of disassembling the forward record storage assembly to remove the take-up spool.

3.8.2.5 Operating Equipment - The operating equipment shall fulfill the function of the ground based portion of the focus control system, and is located in the operating console, the test console, and the portable test set. As such it shall contain networks for real time control of various focus control function modes. The operating equipment shall provide metering and display information indicating and metering various focus control functions.

3.8.2.6 Spare Parts - All spare parts shall be considered part of the Aerospace Ground Equipment and shall be as follows:

3.8.2.6.1 Airborne Spares - Airborne spare parts shall be supplied in accordance with 2.2 of Annex II Exhibit "A" of the Work Statement - Exhibit "A" to AF33(616)7704.

3.8.2.6.2 Aerospace Ground Equipment Spare Parts - All aerospace ground equipment spare parts shall be supplied in accordance with 2.2 of Annex II of Exhibit "A" of Work Statement - Exhibit "A" to AF33(616)7704.

3.9 General Requirements

3.9.1 Manufacturing Standards - The photographic subsystem components shall conform to the manufacturing standards of Eastman Kodak Company standard 401-104-2.

3.9.2 Interchangeability - Components of all equipment, of the same model, regardless of series designation, exclusive of experimental and prototype systems, shall be interchangeable or replaceable.

3.9.3 Ease of Assembly and Maintenance of Equipment - Mechanical and electrical components shall be designed and constructed to require a minimum of skill, experience and time necessary to assembly and maintain them. The design shall eliminate in so far as possible any misassembly of parts or mismating of electrical connections. The components design and construction shall minimize the need for holding or supporting these components during final positioning and fastening.

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3.9.4 Service Life - Service life is defined as operational or "wear time" from final payload assembly through the flight operational phase. This includes all performance at Eastman Kodak Company and Vandenberg Air Force Base as well as flight operation.

The complete flight payload shall be able to survive a service life of 2,400 stereo pairs utilizing 12,000 feet of film, or its equivalent. This equivalent shall be considered operation of the flight payload which does not cause any part of the flight payload to be operated for an accumulated time or under a stress greater than would be employed in taking the above defined stereo pairs.

Though the duty cycles of individual components vary, the life of these individual components shall be adequate to allow the completion of the subsystem service life. The individual component service life shall be given in the applicable component specification.

3.9.5 Reliability - A primary objective of the design and manufacture of the photographic subsystem is to achieve high reliability in accordance with Eastman Kodak Company Specification 401-106. The reliability requirement shall be to achieve a 95 percent probability of obtaining 60 percent information return for the performance requirements listed below:

(a) Capable of being launched into orbit and performing its functions in that environment.

(b) Resolving power shall be as specified in section 3.7.4

(c) Area Coverage - On command, and in a maximum of five days, be capable of exposing the entire film supply in modes of operation specified in this document.

(d) Capable of protecting the film during launch, and on obit, prior to exposure and of performing the necessary film handling tasks specified in this specification. If the tasks listed in the reliability portion of the Work Specification are carried out, it will be considered that the above engineering confidence level has been achieved.

3.9.6 Disposition of Variances - Variances from the requirements of this specification shall require Eastman Kodak Company approval.

3.9.7 Contract Conformance - It is understood that the contract is conformed to if the photographic subsystem conforms to the requirements of this specification.

3.9.8 Human Engineering - Where feasible, the provisions of Eastman Kodak Company standard 401-108 "Design Standards for Human Factors, Engineering" shall apply.

3.9.9 Safety of Personnel

3.9.9.1 Mechanical - The design of the equipment shall provide maximum convenience and safety to personnel when installing, operating, and maintaining or replacing the equipment. Sharp projections on edges of cabinets, doors and similar parts shall be avoided.

3.9.9.2 Electrical - Provisions shall be made to prevent personnel from accidently coming in contact with voltages in excess of 40 volts, including potentials on charged capacitors when the subsystem is in its normal operating condition.

3.9.9.2.1 Ground Potential - The design and construction of the equipment shall be such that all external parts shall be at ground potential at all times.

3.10 Documentary Requirements - Procedures shall be prepared and documented by the contractor defining a quality control system that shall fulfill the requirements of this specification. The documentation requirements shall include, but not be limited to, the following:

3.10.1 Drawings - All engineering drawings and associated lists prepared by the contractor for the purpose of defining requirements of design, inspection and tests for deliverable equipment shall be prepared in accordance with Eastman Kodak Company specifications 401-101 and 401-102.

3.10.2 Specifications - The contractor shall generate material to complete performance requirements and description of the equipment contained in this specification.

3.10.3 Manuals - An integrated series of equipment - oriented class III (Utility) technical manuals shall be provided by Eastman Kodak Company. These manuals pertaining to the C/P and associated ground equipment shall be prepared in accordance with WDT Exhibit 56-5C. These manuals shall be available when delivery of equipment is made.

3.10.4 Inspection Reports - Inspection reports shall be generated and maintained by the contractor. These reports, as well as in-process inspection, shall be made available, upon request, by Eastman Kodak Company. Continuity of records and identity of parts assembled, shall likewise be maintained and made available by Eastman Kodak Company.

3.10.5 Alignment and Calibration - Records shall be generated and made available of the alignment and calibration of all measuring and test equipment for the subsystem.

3.10.6 Test Procedures - Qualification and acceptance test procedures for the subsystem that demonstrate conformance with the requirements of this specification shall be prepared by the contractor.

3.10.7 Performance Record - All data including operating time and malfunction reports, generated through tests, shall be recorded by serial number and preserved as a performance record in the log book defined by Eastman Kodak Company drawing 804-104.

4. QUALITY ASSURANCE PROVISIONS

The quality control system requirements of MIL-Q-9858 shall apply.

4.1 Classification of Tests - The inspection and testing of the subsystem hardware shall be classified as follows:

(a) Qualification Tests

(b) Acceptance Tests

(c) Reliability Tests

4.2 Qualification Tests - Qualification tests to verify the capability of the flight payload to meet its functional and environmental requirements shall be performed on individual components and on a payload assembly, in accordance with Eastman Kodak Company specification 802-148.

The reliability test model as defined in 3.8.1.5.2 shall be used in this test program. Qualification testing shall include but not be limited to the following:

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4.2.1 Visual Inspection - All parts, subassemblies and assemblies to be qualification tested shall be inspected for conformance to the manufacturing standards, Eastman Kodak Company standard 401-119.

4.2.2 Drawing Conformance - All parts, subassemblies and assemblies to be qualification tested shall be inspected for conformance with their respective drawings.

4.2.3 Performance Tests - The equipment to be qualification tested shall be tested for its ability to comply with the performance requirements of section 3.

4.2.4 Environmental Qualification Tests

4.2.4.1 Payload Assembly - A single payload (the reliability test model) shall be subjected to the environmental tests of section 4.4 of Eastman Kodak Company specification, 802-148 (Flight Payload Qualification Test Plan), which is based upon qualification test requirements of Eastman Kodak Company specification 502-118 (Environmental Design Criteria). Following completion of these tests the payload shall be inspected for damage and the performance test of 4.2.3 shall be repeated. In addition, individual components (representative of flight payload design, but not necessarily components of the reliability test model only) shall be subjected to the environmental tests of sections 4.1 thru 4.3 of Eastman Kodak Company specification 802-148.

4.2.4.1.1 Diagnosis Report - Following the environmental qualification tests, diagnosis shall be made of any impairment of performance of the subsystem assembly components, and a full report shall be written.

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4.2.4.2 Aerospace Ground Equipment - Environmental qualification tests shall be required for the shipping containers used for the payload, and the forward record storage assembly as specified in applicable individual specifications.

4.2.5 Life Tests

4.2.5.1 Payload Assembly - The service life capability of the payload assembly shall be tested for compliance with requirements of Eastman Kodak Company specification 802-153 and this specification.

4.2.5.2 Aerospace Ground Equipment - All items of ground equipment shall be designed for compliance with service life requirements of Eastman Kodak Company specification 802-179. Life tests shall not be performed.

4.3 Acceptance Tests - The Flight Model Payloads and Aerospace Ground Equipment shall be acceptance tested as follows:

4.3.1 Flight Model Payloads - Acceptance tests shall be performed on each Flight Model Payload. The test procedures shall comply with 3.10.6 and shall be in accordance with Eastman Kodak Company drawing 804-104 and specification 802-153 and shall include, but not be limited to the following:

4.3.1.1 Visual Inspection - All parts, subassemblies and assemblies of the payloads shall be inspected for conformance to the manufacturing standards, Eastman Kodak Company standard 401-119.

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4.3.1.2 Drawing Conformance - All parts, subassemblies and assemblies of the payloads shall be inspected for conformance to their respective drawings.

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4.3.1.3 Performance Tests - The Flight Payload Models shall be tested for their ability to comply with the requirements of Eastman Kodak Company specification 802-153.

4.3.2 Aerospace Ground Equipment - Acceptance tests shall be performed on all Aerospace Ground Equipment. The acceptance test procedure shall comply with 3.10.6 and shall be in accordance with Eastman Kodak Company drawing procedure 804-105, and shall include but not be limited to the following:

4.3.2.1 Visual Inspection - All parts, subassemblies and assemblies of the ground equipment shall be inspected for conformance to the manufacturing standards, Eastman Kodak Company standard 401-119.

4.3.2.2 Drawing Conformance - All parts, subassemblies and assemblies of ground equipment shall be inspected for conformance with their respective drawings.

4.3.2.3 Performance Tests - All Aerospace Ground Equipment shall be tested for its ability to comply with requirements of Eastman Kodak Company specification 802-179 and shall meet the requirements of the individual specifications of Table III of 3.8.2.

4.3.3 Other Equipment - Other deliverable airborne equipment and mock-ups shall be subjected to performance tests in accordance with applicable specifications for each item.

4.3.4 Environmental Acceptance Tests

4.3.4.1 Flight Payloads - Each payload shall be subjected to the acceptance vibration test levels specified in Eastman Kodak Company specification 502-118.

4.3.4.2 Aerospace Ground Equipment - Environmental acceptance tests of Aerospace Ground Equipment shall not be required.

4.4 Reliability Testing - A series of tests shall be conducted utilizing the Reliability Test Model to determine safety margins and investigate modes of failure, due to extremes of environmental or operating conditions or due to extended operation (life testing). Results of these tests, together with results of qualification testing and applicable testing of other airborne models listed in Table II of section 3.2.3.1, shall constitute fulfillment of the laboratory test program requirements of section 3.1.4.4 of Work Statement, Exhibit "A", to AF33(616)7704.

4.5 Test Conditions

4.5.1 Alignment and Calibration - The alignment and calibration of all measuring and test equipment for the subsystem and the recorded data shall be in accordance with the requirements of 3.10.5.

4.5.2 Atmospheric Conditions

4.5.2.1 Payload Assembly - The atmospheric conditions for all subsystem tests, shall be in accordance with the temperature, barometric pressure and relative humidity requirements of Eastman Kodak Company specifications 502-118 and 502-146.

4.5.2.2 Aerospace Ground Equipment - The atmospheric conditions for all items of aerospace ground equipment tested shall be in accordance with operating and nonoperating conditions of Eastman Kodak Company specification 802-179.

4.5.3 Electrical Conditions - The electrical inputs and outputs of the subsystem components under test shall be in compliance with section 3.

4.6 Documentation - The documentation of the payload components and ground equipment shall be in compliance with the requirements of section 3.10.

5. PREPARATION FOR DELIVERY

5.1 Camera Payload - The camera payload, less the camera payload retrieval components shall be packed and packaged in the camera payload shipping container, Eastman Kodak Company specification 602-144.

5.2 Forward Record Storage Assembly - The forward record storage assembly shall be packed and packaged in the accessory shipping container Eastman Kodak Company specification 702-183 in accordance with the loading procedure, Eastman Kodak Company Utility Manual, 554-121.

5.3 Dust Shield "B" Assembly - The external interface dust shield "B" assembly, Eastman Kodak Company drawing, 813-227, shall be packed and packaged in a separate container for shipment.

5.4 Aerospace Ground Equipment - All items of aerospace ground equipment shall be suitably packed, packaged and marked for shipment by common carrier. The packing shall provide protection for the equipment to withstand the general environmental conditions incident to handling, transportation and storage commensurate with the method of shipment.

Where practical, each component shall be packed separately to minimize size and weight. Shipping and handling of the equipment shall be supervised at every stage by responsible personnel. All items shall be caution placarded in prominent locations in order to minimize the possibility of handling mishaps.

5.4.1 Packaging (Separate Components or Items) - All subassemblies and assemblies for shipment as separate items and not for assembly to a camera payload, shall be cleaned, labeled, and sealed, with their identification, in transparent plastic bags.

5.4.1.1 Major Assemblies - The major assemblies after cleaning and sealing in plastic bags as above, shall be packaged in fitted and padded boxes. The boxes shall be reusable and shall be equipped with hinges and latch. Each box shall bear proper identification.

5.4.1.2 Small Parts - Small parts, such as screws, nuts, retaining rings, etc., shall be cleaned and sealed in plastic bags as above. There shall be several parts, but only one part number per bag.

5.5 <u>Packing</u> - All parts, subassemblies and assemblies, as packaged, shall be crated for shipment as follows:

(a) Major assemblies in fitted boxex shall be crated individually.

(b) Other assemblies and subassemblies shall be crated individually.

(c) Small parts in plastic bags, shall be grouped and each group crated individually.

5.6 <u>Packing List</u> - A list of all parts included in a crate shall be placed immediately beneath the cover of the crate.

5.7 <u>Warning Notice</u> - A warning notice which indicates that the plastic bags shall not be opened prior to assembly due to cleanliness requirements, shall be prominently displayed on each list and on each plastic bag.

6. NOTES

6.1 Smear Allocation and Subsystem Performance Tolerances - If the location, attitude, and orbital parameters of the satellite are known, it is theoretically possible to determine a film speed that would exactly compensate for image motion along the center line of the photograph. Errors in knowledge of satellite location and attitude, the small changes in attitude during exposure, vibrations in the film drive mechanism and the discreteness of the film velocity steps can cause slight errors in image motion compensation that will produce smear.

The following paragraphs and tables discuss the various contributors to smear and the tolerance for each. Table IV gives the formulas for the X and Y components of object smear (in the ground plane) at the center of the field.

6.1.1 Smear Budget Theory - Each on-axis contributor may be assigned to one of two categories. Category A consists of those contributors whose smears vary independently within a single mission. The smears produced by individual members of this category may be root-sum-squared.

Category B is characterized by the property that the smear which its members cause is different from mission to mission. Because these smears are not variable within a mission, they cannot be root-sum-squared with the members of Category A. Since they are independent, however, they may be root-sum-squared within themselves.

The smear contributed by Categories A and B must be combined to produce an over-all allowable smear that will not be exceeded in 95 percent of the frames taken during any one mission at a 95 percent confidence level. The total smear is computed by the following formula:

Total smear, S_x or S_y = $Q\,S_A + S_B$

$$= Q \sqrt{\sum_{i=1}^{12} S_i^{\,2}} + \sqrt{\sum_{i=13}^{20} S_i^{\,2}} \qquad (1)$$

Where: S_i the smear due to the ith contributor listed in Table 6.

S_A = Smear due to the combined Category A (within mission) contributors.

S_B = Smear due to the combined Category B (between mission) contributors.

Note that the smear for each contributor corresponds to its two-sigma variability as given in Table V, so that $S_i = 2\sigma_i$. The 95 percent confidence level is established by assuming that during any single mission the B category smears combine to give a smear approximately equal to the two-sigma variability of their sum. This value (S_B) is then treated as a constant for the mission and for the analysis which follows. Note that a confidence level of 95 percent is quite conservative. The A contributor distribution is then considered to be shifted, with its mean at S_B during a mission (See Figure 6-1). The 95 percent probability of having an actual smear less than or equal to the total allowable smear is established by choosing the factor Q correctly. If Q is chosen too small, the smear computed by equation (1) bounds less than 95 percent of the cases. If Q is chosen too large, the smear bounds more than 95 percent of the cases. There is one Q such that the total smear either side of zero, as computed by equation (1) bounds 95 percent of the area under the (shifted) A-distribution. This is the one that is used. For S_B large compared with S_A, Q = 0.83.

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Two extreme cases of this situation are depicted in Figure 6-1. In the top figure, S_B is essentially zero, so that the A-distribution is not shifted. The number of standard deviations (sigma units) which include 95 percent of the A-distribution is by definition, 1.96 σ_A, or 0.98 S_A, since S_A is a two-sigma smear. In the lower figure of Figure 6-1, S_B is large. In this case $Q = 0.83$ as stated earlier.

For the G-System, on axis, Q is approximately 0.92, since the "B" contributors are small, but not zero. In actual computation, the factor Q is determined iteratively by computer to establish the 95 percent probability for any given smear budget.

6.1.2 Assignment of Contributors to Sources - A different breakdown of smear contributors is required to separate the contributors according to their source. All of those contributors which are attributable to the camera payload section are placed in one group, while those due to the OC7 are placed in another. Tracking contributions belong to a third group.

The total smear (in the ground plane) attributable to the camera payload is computed as follows: The value of the individual smear contributors (X_i, Y_i) are taken from Table V. These calculations are based on an 0.0085 inch slit width (short dimension), at a 70 n.mi. altitude, and vertical photography.

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$$S_{X(C/P)} = Q \sqrt{\sum_{i=8}^{12} X_i^2} + \sqrt{\sum_{i=18}^{20} X_i^2} = 5.9 \text{ in.} = .49 \text{ ft.} \quad (Q = .92)$$

$$S_{Y(C/P)} = Q \sqrt{\sum_{i=8}^{12} Y_i^2} + \sqrt{\sum_{i=18}^{20} Y_i^2} = 3.1 \text{ in.} = .26 \text{ ft.} \quad (Q = .92)$$

Similarly, the OCV contributors total as follows:

$$S_{X(OCV)} = Q \sqrt{\sum_{i=2}^{7} X_i^2} + \sqrt{\sum_{i=15}^{17} X_i^2} = 2.0 \text{ in.} = .17 \text{ ft.} \quad (Q = .92)$$

$$S_{Y(OCV)} = Q \sqrt{\sum_{i=2}^{7} Y_i^2} + \sqrt{\sum_{i=15}^{17} Y_i^2} = 4.4 \text{ in.} = .37 \text{ ft.} \quad (Q = .92)$$

The only tracking contributor (X_1, Y_1), (knowledge of altitude) yields smear of:

$$S_{X(T)} = 2.5 \text{ in.} = .21 \text{ ft.} \quad (Q = .92)$$

$$S_{Y(T)} = 0 \text{ in.} = 0 \text{ ft.}$$

For the 15° stereo, 30° obliquity, -2.0° crab case at 70 n.mi., the results of solving the above equations are:

$$S_{X(C/P)} = 9.2 \text{ in.} = 0.77 \text{ ft.}$$

$$S_{Y(C/P)} = 4.3 \text{ in.} = 0.36 \text{ ft.}$$

$$S_{X(OCV)} = 6.2 \text{ in.} = 0.52 \text{ ft.}$$

$$S_{Y(OCV)} = 7.4 \text{ in.} = 0.62 \text{ ft.}$$

$$S_{X(T)} = 3.1 \text{ in.} = 0.26 \text{ ft.}$$

$$S_{Y(T)} = 0 \text{ in.} = 0 \text{ ft.}$$

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TABLE IV

SMEAR EQUATIONS

	On Ground	In Image Plane
Knowledge of Altitude	$X_1 = \frac{Wh}{F} \frac{\Delta h}{h} \sec^2 \Sigma \sec \Omega$	$x_1 = W \frac{\Delta h}{h}$
	$Y_1 = 0.$	$y_1 = 0.$
Roll	$X_2 = \frac{Wh}{F} A_x \sec^2 \Sigma \tan \Omega \sec \Omega$	$x_2 = W A_x \tan \Omega$
	$Y_2 = 0.$	$y_2 = 0.$
Pitch	$X_3 = \frac{Wh}{F} A_y (1 + \sec^2 \Omega) \tan \Sigma \sec^2 \Sigma$	$x_3 = W A_y (\cos \Omega - \sec \Omega) \tan \Sigma$
	$Y_3 = \frac{Wh}{F} A_y \sec^2 \Sigma \tan \Omega \sec \Omega$	$y_3 = W A_y \sec\Sigma \sin \Omega$
Yaw	$X_4 = \frac{Wh}{F} A_z \tan \Omega \tan \Sigma \sec^2 \Sigma$	$x_4 = W A_z \sin \Omega \tan \Sigma$
	$Y_4 = \frac{Wh}{F} A_z \sec^2 \Sigma \sec \Omega$	$y_4 = W A_z \cos \Omega \sec \Sigma$
Roll Rate	$X_5 = 0.$	$X_5 = 0.$
	$Y_5 = \frac{Wh^2}{FV_x} \dot{A}_x \sec^2 \Sigma \sec^3 \Omega$	$y_5 = \frac{Wh}{V_x} \dot{A}_x \sec \Sigma \sec \Omega$
Pitch Rate	$X_6 = \frac{Wh^2}{FV_x} \dot{A}_y \sec^4 \Sigma \sec \Omega$	$x_6 = \frac{Wh}{V_x} \dot{A}_y \sec^2 \Sigma$
	$Y_6 = \frac{Wh^2}{FV_x} \dot{A}_y \tan \Sigma \sec^2 \Sigma \tan \Omega \sec^2 \Omega$	$y_6 = \frac{Wh}{V_x} \dot{A}_y \tan \Sigma \sec \Sigma \tan \Omega$

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TABLE IV (Continued)

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	On Ground	In Image Plane
Yaw Rate	$X_7 = \frac{Wh^2}{FV_x} \dot{A}_z \sec^4 \Sigma \tan \Omega \sec \Omega$	$x_7 = \frac{Wh}{V_x} \dot{A}_z \tan \Omega \sec^2 \Sigma$
	$Y_7 = \frac{Wh^2}{FV_x} \dot{A}_z \tan \Sigma \sec^2 \Sigma \sec^2 \Omega$	$y_7 = \frac{Wh}{V_x} \dot{A}_z \tan \Sigma \sec \Sigma$
Crab Servo Steps and Error	$X_8 = \frac{Wh}{F} \Delta\chi \sec^2 \Sigma \tan \Omega \sec \Omega$	$x_8 = W \Delta\chi \tan \Omega$
	$Y_8 = \frac{Wh}{F} \Delta\chi \sec \Sigma \sec^2 \Omega$	$y_8 = W \Delta\chi$
Film Drive Oscillation Amplitude	$X_9 = \frac{Wh^2}{FV_x} (Vib) \sec^4 \Sigma \sec^2 \Omega$	$x_9 = \frac{Wh}{V_x F} (Vib) \sec^2 \Sigma \sec \Omega$
	$Y_9 = 0.$	$y_9 = 0.$
Stereo Servo	$X_{10} = 4 \frac{Wh}{F} \Delta\Sigma_m \tan \Sigma \sec^2 \Sigma \sec \Omega \cos \chi$	$x_{10} = 4 W \Delta\Sigma_m \tan \Sigma \cos \chi$
	$Y_{10} = 4 \frac{Wh}{F} \Delta\Sigma_m \tan \Sigma \sec \Sigma \sec^2 \Omega \sin \chi$	$y_{10} = 4 W \Delta\Sigma_m \tan \Sigma \sin \chi$
Film Velocity Steps	$X_{11} = \frac{Wh}{F} \left(\frac{\Delta V_F}{V_F}\right) \sec^2 \Sigma \sec \Omega$	$x_{11} = W \left(\frac{\Delta V_F}{V_F}\right)$
	$Y_{11} = 0.$	$y_{11} = 0.$
Film Velocity Drift	$X_{12} = \frac{Wh}{F} \left(\frac{\Delta \dot{V}_F}{V_F}\right) \sec^2 \Sigma \sec \Omega$	$x_{12} = W \left(\frac{\Delta \dot{V}_F}{V_F}\right)$
	$Y_{12} = 0.$	$y_{12} = 0.$

TABLE IV (Continued)

	On Ground	In Image Plane
Roll Alignment	$X_{15} = \frac{Wh}{F} B_x \sec^2 \Sigma \tan \Omega \sec \Omega$	$x_{15} = W B_x \tan \Omega$
	$Y_{15} = 0.$	$y_{15} = 0.$
Pitch Alignment	$X_{16} = \frac{Wh}{F} B_y (1 + \sec^2 \Omega) \tan \Sigma \sec^2 \Sigma$	$x_{16} = W B_y (\cos \Omega + \sec \Omega) \tan \Sigma$
	$Y_{16} = \frac{Wh}{F} B_y \sec^2 \Sigma \tan \Omega \sec \Omega$	$y_{16} = W B_y \sec \Sigma \sin \Omega$
Yaw Alignment	$X_{17} = \frac{Wh}{F} B_z \tan \Omega \tan \Sigma \sec^2 \Sigma$	$x_{17} = W B_z \sin \Omega \tan \Sigma$
	$Y_{17} = \frac{Wh}{F} B_z \sec^2 \Sigma \sec \Omega$	$y_{17} = W B_z \cos \Omega \sec \Sigma$
Crab Mirror Mounting Error	$X_{18} = \frac{Wh}{F} M_c \sec^2 \Sigma \tan \Omega \sec \Omega$	$x_{18} = W M_c \tan \Omega$
	$Y_{18} = \frac{Wh}{F} M_c \sec \Sigma \sec^2 \Omega$	$y_{18} = W M_c$
Stereo Mirror Mounting Error	$X_{19} = 4 \frac{Wh}{F} M_s \tan \Sigma \sec^2 \Sigma \sec \Omega \cos \chi$	$x_{19} = 4 W M_s \tan \Sigma \cos \chi$
	$Y_{19} = 4 \frac{Wh}{F} M_s \tan \Sigma \sec \Sigma \sec^2 \Omega \sin \chi$	$y_{19} = 4 W M_s \tan \Sigma \sin \chi$
Knowledge of Focal Length	$X_{20} = \frac{Wh}{F} \left(\frac{\Delta F}{F}\right) \sec^2 \Sigma \sec \Omega$	$x_{20} = W \left(\frac{\Delta F}{F}\right)$
	$Y_{20} = 0.$	$y_{20} = 0.$

(F)

TABLE IV (Continued)

NOMENCLATURE

A_x = Roll error angle (includes error in obliquity maneuver)

A_y = Pitch error angle

A_z = Yaw error angle

$\dot{A}_x$ = Roll rate error

$\dot{A}_y$ = Pitch rate error

$\dot{A}_z$ = Yaw rate error

B_x = Vehicle alignment error about roll axis

B_y = Vehicle alignment error about pitch axis

B_z = Vehicle alignment error about yaw axis

Δx = Error in crab compensation (steps and servo error)

Vib = Amplitude of the linear velocity error of the platen due to vibration (oscillation)

ΔV_P = Amplitude of the linear velocity error of the platen due to discreteness and drift of the drive mechanism and/or electronics

M_c = Angular error in stereo mirror crab alignment (radians)

M_s = Angular error in stereo mirror stereo alignment (radians)

X_i = Component of smear on ground parallel to the ground track for the ith contributor

x_i = Component of smear in the image plane perpendicular to the slit for the ith contributor

Y_i = Component of smear on ground perpendicular to the ground track for the ith contributor

y_i = Component of smear in the image plane parallel to the slit for the ith contributor

(F)

TABLE IV (Continued)

NOMENCLATURE

w = Slit width

h = True altitude of the camera above ground

F = Focal length

Δh = Uncertainty in knowledge of altitude

Σ = Stereo angle of line of sight

Σ_m = Stereo mirror angle = $\Sigma/2$

$\Delta\Sigma_m$ = Uncertainty in stereo mirror angle due to errors in the positioning mechanism

Ω = Obliquity angle of the line of sight

χ = Crab angle of the mirror

F

TABLE V

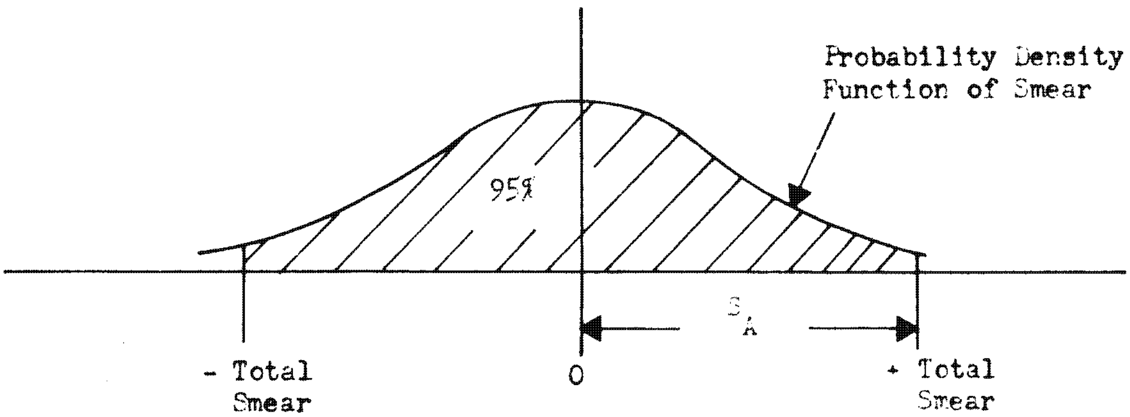
Intrack (Sx) and Crosstrack (Sy) Smear Contributors

SMEAR (95% Level) (at 70.0 n.m. altitude, with 0.0085 in. slit width)

Smear Contributor	Suggested Tolerance	Distribution	Estimated STD Deviation	Vertical Photography x(in.)	Vertical Photography y(in.)	30° Obliquity 15° Stereo x(in.)	30° Obliquity 15° Stereo y(in.)	Allocation	Smear Component
Knowledge of Altitude (n.m.)	±0.5	Normal	0.167	2.68	0	3.34	0	Ephemeris	X_1
Roll Attitude (deg)	±0.7	Normal	0.233	0	0	3.30	0	OCV	X_2
Pitch Attitude (deg)	±1.0	Normal	0.333	0	0	4.42	4.74	OCV	X_3, Y_3
Yaw Attitude (deg)	±0.6	Normal	0.200	0	3.93	0.66	4.92	OCV	X_4, Y_4
Roll Rate (deg/sec)	±0.01	Normal	0.003	0	1.11	0	1.86	OCV	Y_5
Pitch Rate (deg/sec)	±0.02	Normal	0.007	2.21	0	2.97	0.50	OCV	X_6, Y_6
Yaw Rate (deg/sec)	±0.015	Normal	0.005	0	0	1.29	0.65	OCV	X_7, Y_7
Crab Steps (deg) Crab Error (deg) (RSS)	±0.25 ±0.15	Uniform Normal	0.145) 0.050) RSS	0	3.00	2.16	4.19	C/P	X_8, Y_8
Film Dr. Oscillation Amplitude (microns/sec)	1554.0	Normal	518.0	5.04	0	7.81	0	C/P	X_9
Stereo Servo (not LOS) (deg)	±0.22	Normal	0.073	0	0	1.92	0.08	C/P	X_{10}, Y_{10}
Film Velocity Steps (%)	±0.50	Uniform	0.289	3.25	0	4.05	0	C/P	X_{11}
Film Velocity Error (%)	±0.20	Normal	0.067	0.75	0	0.94	0	C/P	X_{12}
Roll Alignment (deg)	±0.04	Normal	0.013	0	0	0.19	0	OCV	X_{15}
Pitch Alignment (deg)	±0.04	Normal	0.013	0	0	0.18	0.19	OCV	X_{16}, Y_{16}
Yaw Alignment (deg)	±0.1	Normal	0.033	0	0.66	0.11	0.82	OCV	X_{17}, Y_{17}
Crab Mirror Mounting (deg)	±0.05	Normal	0.017	0	0.33	0.24	0.46	C/P	X_{18}, Y_{18}
Stereo Mirror Mounting (deg)	±0.05	Normal	0.017	0	0	0.44	0.02	C/P	X_{19}, Y_{19}
Knowledge of Focal Length (in.)	±.062	Normal	0.021	0.30	0	0.38	0	C/P	X_{20}
			Total Smear (in.)	6.88	5.18	11.67	8.35	S/V	

(Will be exceeded in less than 5% of the frames from a single mission with a 95% confidence level.)

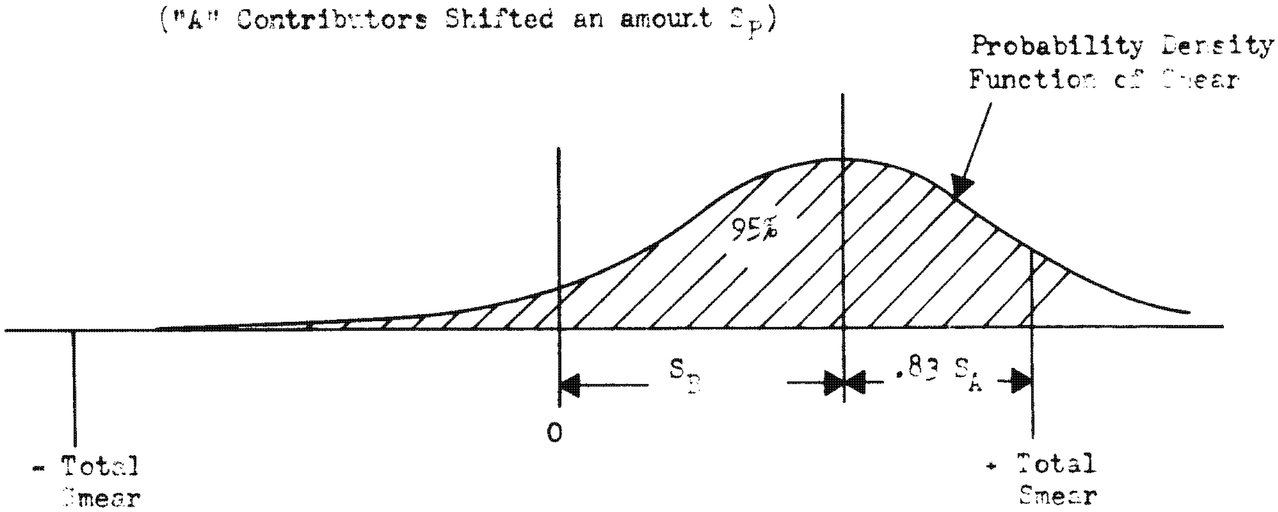
"A" Contributors Only



$Q = 0.98$

Large "B" Contributors

("A" Contributors Shifted an amount S_B)



$Q = 0.83$

Figure 6-1
Smear Probability Density

F

APPENDIX 7

SYSTEMS TEST PROCEDURE

R-300488-KH

Sheets: 144

VTP-302

SYSTEMS TEST PROCEDURE

EASTMAN KODAK COMPANY

VAFB

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	General rewrite to update existing operations.	4-15-66	[illegible]

PREPARED BY: [signature] DATE: 4-6-66

QUALITY CONTROL: R H [signature] DATE: 4-6-66

PROJECT SUPERVISOR: [signature] DATE: 4-6-66

BASE MANAGER: [signature] DATE: 4-11-66

TABLE OF CONTENTS

1.0 PURPOSE

The purpose of this procedure is to:

Verify the capability of the OCV to provide the proper voltages, commands, and connections to the OCV/CP interface.

Provide instruction and criteria for the mating operations.

Demonstrate that the C/P, after mating and on through all the ground testing, is capable of performing the electrical and/or mechanical operations necessary for the flight mission.

2.0 REFERENCE DOCUMENTS

VTP-301	Subsystem Test Procedure
VOI-400	Operating Instructions
801-116	Payload Interface
502-146	Interface Specification

3.0 DOCUMENTATION

3.1 Test Data

All test data shall be recorded on the data sheets for this procedure.

3.2 Payload Log

The payload log shall be maintained as a historical record of the testing progress.

3.3 Chart Records

The TME chart recorders shall be operated whenever the five (5) volt instrumentation voltage is applied. The GEL J, K and L recorders shall be operated whenever the TM is available. All the recorders shall be operated at a speed of one (1) mm/sec. during the non-event periods, and at five (5) mm/sec. during the event periods.

(Exception: The GEL J, K and L recorders shall be operated at ten (10) mm/sec. during the airborne recorder play-back periods.)

3.3 At the time when a chart is removed from a recorder, it shall be identified with the following information:

CP/OCV Serial Number
Test Procedure Number
Items/Tasks Numbers
Date
Time
Recorder Designation

3.4 Disposition of Data

All charts, real time data sheets, and C/P log sheets shall be delivered to the data room immediately after the completion of an operation and/or test procedure (unless otherwise noted).

4.0 FACILITIES

4.1 Equipment

544-294	Breakout Box Assembly
550-100	Portable Test Set
552-125	Electric Simulator
644-700	Erector
648-100	Space Chamber Cradle Assembly
737-383	Record Storage Test Set
744-409	Plug Gage
745-529	Record Travel Viewer and Carrying Case Assembly
748-497	Record Supply and Record Storage Alignment Fixture
749-100	Record Splicer
844-150	Integration Lifting Yoke Assembly
	16 Channel Recorder (incl. Selector Switch Panel and Digital Voltmeter)
	Alignment Target
	Plano Mirror
	Theodolite and Stand
	Record Clamps (2)
	Digital Electronic Counter
	Compensator Locking Plug
	Compensator Protective Cover Assembly
	Bellows Support Pad
	Plastic Roller Covers (3)
	Rollaway (includes tools listed on the Tool Check List)
5534	Hygrometer
	Overhead Hoist

4.2 Power

115 ± 5 volt AC, 60 cycles ± 1%, single phase, 60 amperes

4.3 Area

Clean room standards maintained as per Interface Specification, 502-146.

5.0 OPERATING CONDITIONS

5.1 Environmental

Temperature - 60°F to 90°F (unless otherwise noted)
Humidity - 45 ± 5% RH (until that time when all the record path is sealed after integration; beyond that time, the associate is responsible for preventing condensation of moisture on any surface of the C/P).
Pressure - 30.86 to 29.3 In. HG. ABS.

5.2 Payload Status

The status of the payload shall be defined in each operation.

5.3 Calibration

All test instruments used for conducting these tests shall be within their calibration periods.

OPERATION 1 FRSA READINESS

ITEM

1.0 PLUG GAGE CHECK

1.1 Upon notification by the associates, provide the Plug Gage (744-409) and assist with its installation into the RV.

1.2 Verify that when all the components are installed in the capsule, there is clearance about the Plug Gage and the capsule cover can be seated.

1.3 Remove the Plug Gage.

2.0 FRSA INSTALLATION

NOTE: Conditions necessary to start this item:

VTP-301, Task 11 complete.

2.1 Disconnect P668/J668, remove the FRSA reel and replace the two (2) reel mounting U-clamps.

2.2 Remove the protective covering from the mirrors, inspect and clean the FRSA as required.

2.3 Install the three (3) plastic roller covers on the FRSA rollers.

2.4 Install the compensator protective cover.

2.5 Remove the FRSA from the handling frame and vacuum out the mounting holes in the FRSA.

2.6 Deliver the FRSA to the RV build-up area and assist with the installation as required.

2.7 Prior to the FRSA/Capsule Alignment, remove the compensator protective cover and install the compensator locking plug.

2.8 After the FRSA/Capsule Alignment, remove the compensator locking plug and install the compensator protective cover.

3.0 CUTTER CHECKS

3.1 Provide the associates with the record to conduct their cutter and sealer checks.

ITEM

3.2 Verify that the associates return the record that was given to them for their cutter and sealer checks and discard this record into a "used record" container.

4.0 WEIGHT AND BALANCE OF THE RV

4.1 Upon notification by the associates that they are ready to have the reel installed in the FRSA for weight and balance, remove the compensator protective cover.

4.2 Remove the two (2) reel mounting U-clamps and install the reel. Secure the reel with the U-clamps utilizing the screws previously removed and connect P668/J668.

4.3 Install the compensator locking plug and secure with tape.

4.4 Monitor the build-up of the RV.

4.5 When the weight and balance task has been accomplished, disconnect P668/J668, remove the reel, reinstall the U-clamps, remove the compensator locking plug and tape, and reinstall the compensator protective cover.

5.0 FRSA REEL INSTALLATION

5.1 When the build-up of the RV has been completed to the point of installing the FRSA reel, move the RV into the EK/V subsystem area.

5.2 Remove the compensator protective cover and the three (3) plastic roller covers.

5.3 Inspect the RV/FRSA and clean as required.

5.4 Install the FRSA reel. Use four (4) new U-clamp screws (400-164-141) and torque to 25 ± 2 inch-pounds.

5.5 Connect the FRSA frame plug, P668 to the FRSA reel jack, J668.

5.6 Disconnect P1461 from the FRSA frame jack, J661, and then connect the Record Storage Test Set plug, P661, to J661.

5.7 Connect a ground lead between the FRSA frame and the Record Storage Test Set chassis.

ITEM

5.8 Thread a twenty-five (25) foot length of leader (clean record) through the FRSA compensator and rollers and secure three-quarters (3/4) of one wrap around the reel per VOI-402. Record the measured length of the leader installed.

5.9 Station one person in line with the FRSA entrance rollers to hold the record clear of interference and to maintain adequate tension on the record during the take-up operation.

5.10 Turn on the Record Storage Test Set power and command the FRSA reel on, in the forward direction, for a three (3) second interval.

5.11 Verify that the FRSA operates properly and that the reel pawls are engaged.

5.12 Continue to operate the FRSA reel in the forward direction as required to take up all but ten (10) feet of the leader (as measured outside the FRSA from the compensator roller to the end of the leader).

5.13 Turn the test selector switch on the Record Storage Test Set to the instrumentation position - CPL 15.

5.14 Rotate the gear on the shaft of roller thirty-one (31) in such a manner as to obtain the maximum and minimum values of CPL 15 as indicated by the meter on the Record Storage Test Set. Record both voltage levels on the data sheet.

5.15 Rotate the gear to a position such that CPL 15 output is left at its maximum value.

5.16 Slide the record protection envelope over the ten (10) feet of excess leader (the end of the envelope must be no closer than two (2) inches from the compensator roller).

5.17 Roll up the excess leader and envelope and secure the roll to the compensator roller frame.

5.18 Disconnect P661 and connect P1461 to J661 and remove the FRSA frame ground lead.

5.19 Reinspect the RV/FRSA (in particular for cleanliness, interference, and also proper installation of the EMI strap).

ITEM

5.20 Cover the exposed area of the RV with a piece of plastic sheeting, move the assembly back to the RV work area, and release the assembly to the associates.

6.0 SRV BUILD-UP

6.1 Monitor and assist as needed to handle the record during the build-up of the SRV.

CAUTION: If it becomes necessary to clean the record, a clean, lint-free, dry cloth should be the only material used. Handle the record with clean, white gloves.

6.2 After the leader/record protection envelope has been threaded through the section of chute with the chute access port opening and this section has been mated and fastened, remove the record protection envelope. Roll up the excess leader and tape it securely in the chute access port opening in such a manner as to block off or seal the chute.

PROCEDURE PARAGRAPH REFERENCE	FUNCTION					NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
	DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED		
1.0	Plug Gage Check						
1.1	Plug Gage Installed	Init/Date			________		
1.2	Verify Plug Gage/Capsule Fit	"			________		
1.3	Plug Gage Removed	"			________		
2.0	FRSA Installation						
2.1	P668/J668 Disconnected, FRSA reel Removed	Ck			________		
2.2	Mirrors Uncovered and FRSA Inspected and Cleaned	Ck			________		
2.3	Three (3) Plastic Roller Covers Installed	Ck			________		
2.4	Compensator Protective Cover Installed	Ck			________		
2.5	FRSA Mounting Holes Vacuumed	Ck			________		
2.6	FRSA Installed	Init/Date			________		
2.7	Compensator Protective Cover Removed, Compensator Locking Plug Installed	"					

PROCEDURE PARAGRAPH REFERENCE	FUNCTION DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CONFORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
2.8	FRSA/Capsule Alignment Completed, Compensator Locking Plug Removed, and Compensator Protective Cover Reinstalled	Init/Date			________		
3.0	<u>Cutter Checks</u>						
3.1	Record Provided	Ck			________		
3.2	Record Returned and Properly Discarded	Init/Date			________		
4.0	<u>Weight and Balance of the RV</u>						
4.1	Compensator Protective Cover Removed	Ck			________		
4.2	FRSA Reel Installed and P668/J668 Connected	Ck			________		
4.3	Compensator Locking Plug Installed and Secured	Init/Date			________		
4.4	RV Build-up Monitored	Ck			________		
4.5	Weight and Balance Task Completed, P668/J668 Disconnected, Reel Removed, Compensator Locking Plug Removed and Compensator Protective Cover Reinstalled	Init/Date			________		

PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CONFORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
5.0	FRSA Reel Installation						
5.2	Compensator Protective Cover and Three (3) Plastic Roller Covers Removed	Ck			____		
5.3	FRSA/RV Inspected and Cleaned	Ck			____		
5.4	FRSA Reel Installed w/Four (4) New Screws (torqued to 25 ± 2 inch-pounds)	Ck			____		
5.5	P668/J668 Connected	Ck			____		
5.6	Record Storage Test Set Plug, P661, Connected to FRSA Frame Connector, J661	Ck			____		
5.7	FRSA Frame Ground Lead to the Record Storage Test Set Chassis	Ck			____		
5.8	Twenty-five foot Length of Leader Threaded onto FRSA	Ck			____		
5.11	FRSA Operates Properly, Pawls Engaged	Ck			____		
5.12	Fifteen (15) feet of Leader in FRSA, Ten (10) feet of Leader Outside FRSA	Ck			____		
5.14	CPL 15 Maximum Value	Volt	As Read		____		
	CPL 15 Minimum Value	Volt	As Read		____		

OPERATION 1 FRSA READINESS F ______ RTDS VTP-302-1

PROCEDURE PARAGRAPH REFERENCE	FUNCTION DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CONFORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
5.15	CPL 15 Maximum Value	Volt	As Set		______		
5.16	Record Protection Envelope On	Ck			______		
5.17	Record Protection Envelope/Leader Rolled and Secured to Compensator Roller Frame	Ck			______		
5.18	Disconnect P661, Connect P1461 to J661 and Remove Ground Lead	Ck			______		
5.19	RV/FRSA Reinspected	Ck			______		
5.20	RV Assembly Covered, Moved to RV Work Area and Released	Init/Date			______		
6.0	SRV Build-up						
6.1	SRV Build-up Monitored	Ck			______		
6.2	Record Protection Envelope Removed, Leader Rolled and Secured in Chute	Init/Date			______		

OPERATION 2 SV ELECTRICALLY MATED SUBSYSTEM VERIFICATION

ITEM

1.0 TEST PROCEDURE - 50

1.1 Verify that the equipment and interconnections comply with VOI-409/TP-50.

1.2 Verify that the TME is properly configured and is operating.

1.3 Monitor the TME for the computer events and the HMC verifications as per TP-50.

1.4 Operate the GEL recorders J, K and L (at a speed of 10 mm/sec) at one time during the test when both the operating power and the TM are on.

1.5 Read and record the DVM values of all the available VTP/VP points, via the selector switch, at the first opportune time, when both the TM and the operating power are on.

1.6 Verify the presence of the twenty (20) CPS and the five hundred (500) CPS timing signals.

1.7 Obtain the charts from recorders J, K and L in the GEL along with the TME charts and deliver to the data room.

1.8 Reduce the data from the charts and record as required on the data sheets.

1.9 Verify that all the data has been analyzed and that all the non-conformances and/or procedure deviations have been described on the Non-Conformance/Procedure Deviation sheet, and that the data package has been completed.

PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
1.0	<u>TP-50</u>						
1.1	Verify equipment and set-up complies with VOI-409/TP-50	Ck					
1.3	TME recorders monitored, all computer events verified per TP-50	Ck					
1.4	GEL recorders operated	Ck					
1.5	Ambients read and recorded on ambient sheet	Ck					
1.6	Timing signals present 20 CPS	Ck					
	500 CPS	Ck					
1.9	Verify data package completed	Init/ Date					

FM ______

AMBIENTS
(SIMULATOR)

T.P. No.________ Date________

Run No.________ Time________ DRS-VTP-302- 2

Task Time	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC
	VP 46	+28 V	27-32.5 V			21	12-3	2.20-2.40		
	1	10-7	0-0.15			22	12-8	2.60-2.90		
	2	10-29	0.40-0.50			23	12-12	3.00-3.30		
	3	14-14	0.80-0.90			24	10-5	3.15-4.00		
	4	10-51	1.20-1.30			25	14-10	3.70-4.10		
	5	10-57	1.50-1.70			26	10-72	3.25-4.10		
	6	10-52	1.90-2.10			27	14-20	4.50-4.70		
	7	10-53	2.30-2.50			28	15-4	5.00-5.40		
	8	10-54	2.65-2.85			29	12-2	0-0.15		
	9	10-55	3.00-3.25			30	12-4	0.40-0.65		
	10	10-56	3.40-3.60			31	12-9	0.75-1.10		
	11	12-6	3.85-4.15			32	10-6	1.00-1.50		
	12	14-16	4.00-4.20			33	12-13	1.40-2.00		
	13	14-1	4.50-4.60			34	12-17	1.80-2.45		
	14	14-2	4.90-5.00			35	12-24	2.10-2.70		
	15	12-10	0-0.15			+22	15-3	4.00-4.50		
	16	14-18	0.40-0.50			-22	D.V.M.	21.78-22.22		
	17	14-17	0.80-0.90			+5	D.V.M.	4.95-5.05		
	18	12-11	1.15-1.30							
	19	14-3	1.50-1.70							
	20	14-19	1.90-2.00							

REMARKS

FM________

Bit sequence for Simulator Operation in Task 5 of TP-50

DRS-VTP-302-2

Code	Item	MSD 1	2	3	4	5	6	7	Time	Elev. 8	9	10	Az. 11	12	Slit 20	21	Sim. Pwr. 25	Timer 15	16	17	18	24	Check items	Remarks
Pwr.On	33								1								1							
000	34	0	0	0	0	0	0	1	2															
000	35							0	7	0	0	0	0	0										
100	36	0	0	0	0	0	1	1	10															
111	37							0	15	0	1	0	0	1										
211	38	0	0	0	0	1	0	1	20															
222	39							0	25	1	0	0	1	0										
322	40	0	0	0	0	1	1	1	30															
333	41							0	35	1	1	0	1	1										
433	42	0	0	0	1	0	0	1	40															
404	43							0	45	0	0	1	0	0										
504	44	0	0	0	1	0	1	1	50															
515	45							0	55	0	1	1	0	1										
615	46	0	0	0	1	1	0	1	60															
626	47							0	65	1	0	1	1	0										
726	48	0	0	0	1	1	1	1	70															
737	49							0	75	1	1	1	1	1										
837	50	0	0	1	0	0	0	1	80															
800	51							0	85	0	0	0	0	0										

Approved for Release: 2024/01/30 C05098942

FM_______

Bit sequence for Simulator Operation in Task 5 of TP 50

Code	Item	MSD 1	2	3	4	5	6	7	Time	Elev. 8	9	10	Az. 11	12	Slit 20	21	Sim. Pwr. 25	Timer 15	16	17	18	24	Check items	Remarks
900	52	0	0	1	0	0	1	1	90															
911	53							0	95	0	1	0	0	1										
1011	54	0	0	1	0	1	0	1	100															
1022	55							0	105	1	0	0	1	0										
1122	56	0	0	1	0	1	1	1	110															
1133	57							0	115	1	1	0	1	1										
1233	58	0	0	1	1	0	0	1	120															
1204	59							0	125	0	0	1	0	0										
1304	60	0	0	1	1	0	1	1	130															
1404	61	0	0	1	1	1	0	0	139.5	0	0	1	0	0										
1404	62	0	0	1	1	1	0	1	142.5															
1415	63							0	152.0	0	1	1	0	1										
1515	64	0	0	1	1	1	1	1	161.2															
1605	65	0	1	0	0	0	0	0	170.3	0	0	1	0	1										
1605	66							1	173.3															
1626	67							0	182.4	1	0	1	1	0										
1726	68	0	1	0	0	0	1	1	191															
1806	69	0	1	0	0	1	0	0	199.7	0	0	1	1	0										
1806	70							1	203.9															

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Bit sequence for Simulator Operation in Task 5 of TP-50

DRS-VTP-302-2

Code	Item	MSD							Time	Elev.			Az.		Slit		Sim. Pwr.	Timer					Check items	Remarks
		1	2	3	4	5	6	7		8	9	10	11	12	20	21	25	15	16	17	18	24		
1837	71							0	212.6	1	1	1	1	1										
1937	72	0	1	0	0	1	1	1	221.5															
2007	73	0	1	0	1	0	0	0	229.8	0	0	1	1	1										
2007	74							1	234.0															
2000	75							0	242.3	0	0	0	0	0										
2100	76	0	1	0	1	0	1	1	250.6															
2200	77	0	1	0	1	1	0	0	258.5	0	0	0	0	0										
2200	78							1	263.9															
2211	79							0	271.8	0	1	0	0	1										
2311	80	0	1	0	1	1	1	1	280.4															
2401	81	0	1	1	0	0	0	0	287.9	0	0	0	0	1										
2401	82							1	294.5															
2422	83							0	302.0	1	0	0	1	0										
2522	84	0	1	1	0	0	1	1	310.9															
2602	85	0	1	1	0	1	0	0	318.0	0	0	0	1	0										
2602	86							1	325.8															
2633	87							0	332.9	1	1	0	1	1										
2733	88	0	1	1	0	1	1	1	342.1															
2803	89	0	1	1	1	0	0	0	348.8	0	0	0	1	1										

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Bit sequence for Simulator Operation in Task 5 of TP-50

DRS-VTP-302-2

		MSD								Elev.			Az.		Slit		Sim. Pwr.	Timor						
Code	Item	1	2	3	4	5	6	7	Time	8	9	10	11	12	20	21	25	15	16	17	18	24	Check items	Remarks
2803	90							1	356.6															
2804	91							0	363.3	0	0	1	0	0										
2904	92	0	1	1	1	0	1	1	371.9															
3004	93	0	1	1	1	1	0	0	378.2	0	0	1	0	0										
3004	94							1	383.6															
3015	95							0	389.9	0	1	1	0	1										
3115	96	0	1	1	1	1	1	1	396.1															
3205	97	1	0	0	0	0	0	0	402.0	0	0	1	0	1										
3205	98							1	408.6															
3226	99							0	414.5	1	0	1	1	0										
3326	100	1	0	0	0	0	1	1	421.0															
3406	101	1	0	0	0	1	0	0	426.5	0	0	1	1	0										
3406	102							1	434.3															
3437	103							0	439.8	1	1	1	1	1										
3537	104	1	0	0	0	1	1	1	446.6															
3607	105	1	0	0	1	0	0	0	451.7	0	0	1	1	1										
3607	106							1	459.5															
3600	107							0	464.6	0	0	0	0	0										
3700	108	1	0	0	1	0	1	1	470.8															

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Bit sequence for Simulator Operation in Task 5 of TP-50

DRS-VTP-302-2

		MSD								Elev.			Az.		Slit		Sim. Pwr.	Timer						
Code	Item	1	2	3	4	5	6	7	Time	8	9	10	11	12	20	21	25	15	16	17	18	24	Check items	Remarks
3800	109	1	0	0	1	1	0	0	475.5	0	0	0	0	0										
3800	110							1	484.5															
3811	111							0	489.2	0	1	0	0	1										
3911	112	1	0	0	1	1	1	1	495.7															
4001	113	1	0	1	0	0	0	0	500.0	0	0	0	0	1										
4001	114							1	510.2															
4022	115							0	514.5	1	0	0	1	0										
4122	116	1	0	1	0	0	1	1	521.3															
4202	117	1	0	1	0	1	0	0	525.2	0	0	0	1	0										
4202	118							1	535.4															
4233	119							0	539.3	1	1	0	1	1										
4233	120	1	0	1	0	1	1	1	545.5															
4403	121	1	0	1	1	0	0	0	549.0	0	0	0	1	1										
4403	122							1	560.4															
4404	123							0	563.9	0	0	1	0	0										
4504	124	1	0	1	1	0	1	1	571															
4515	125							0	576	0	1	1	0	1										
4615	126	1	0	1	1	1	0	1	580															
4626	127							0	585	1	0	1	1	0										

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Bit sequence for Simulator Operation in Task 5 of TP-50

DRS-VTP-302-2

		MSD								Elev.			Az.		Slit		Sim. Pwr.	Timer						
Code	Item	1	2	3	4	5	6	7	Time	8	9	10	11	12	20	21	25	15	16	17	18	24	Check items	Remarks
4726	128	1	0	1	1	1	1	1	590															
4737	129							0	595	1	1	1	1	1										
4837	130	1	1	0	0	0	0	1	600															
4800	131							0	605	0	0	0	0	0										
4900	132	1	1	0	0	0	1	1	610															
4911	133							0	615	0	1	0	0	1										
5011	134	1	1	0	0	1	0	1	620															
5022	135							0	625	1	0	0	1	0										
5122	136	1	1	0	0	1	1	1	630															
5133	137							0	635	1	1	0	1	1										
5233	138	1	1	0	1	0	0	1	640															
5204	139							0	645	0	0	1	0	0										
5304	140	1	1	0	1	0	1	1	650															
5315	141							0	655	0	1	1	0	1										
5415	142	1	1	0	1	1	0	1	660															
5426	143							0	665	1	0	1	1	0										
5526	144	1	1	0	1	1	1	1	670															
5537	145							0	675	1	1	1	1	1										
5637	146	1	1	1	0	0	0	1	680															
5600	147							0	685	0	0	0	0	0										

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Bit sequence for Simulator Operation in Task 5 of TP-50

		MSD								Elev.			Az.		Slit		Sim. Pwr.	Timer						
Code	Item	1	2	3	4	5	6	7	Time	8	9	10	11	12	20	21	25	15	16	17	18	24	Check items	Remarks
5700	148	1	1	1	0	0	1	1	690															
5711	149							0	695	0	1	0	0	1										
5811	150	1	1	1	0	1	0	1	700															
5822	151							0	705	1	0	0	1	0										
5922	152	1	1	1	0	1	1	1	710															
5933	153							0	715	1	1	0	1	1										
6033	154	1	1	1	1	0	0	1	720															
6004	155							0	725	0	0	1	0	0										
6104	156	1	1	1	1	0	1	1	730															
6115	157							0	735	0	1	1	0	1										
6215	158	1	1	1	1	1	0	1	740															
6226	159							0	745	1	0	1	1	0										
6326	160	1	1	1	1	1	1	1	750															
6337	161							0	847.2	1	1	1	1	1										
HOLD	162								850													1		
RUN	163								855													0		
HOLD	164								860													1		
RUN	165								865													0		
HOLD	166								870													1		

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Bit sequence for Simulator Operation in Task 5 of TP-50

DRS-VTP-302-2

Code	Item	MSD 1	2	3	4	5	6	7	Time	Elev. 8	9	10	Az. 11	12	Slit 20	21	Sim. Pwr. 25	Timer 15	16	17	18	24	Check items	Remarks
TIMER	167								875									1	0	0	0	0		
FWD.	169								960									1	0	1	0			
STEADY	170								965									1	0	0	0			
REV.	172								980									1	0	0	1			
STEADY	173								985									1	0	0	0			
AUTO	174								990									1	1					
ENV.ON	175								1000															
T.C.OFF	175								1000															
ENV.OFF	176								1020									0	0	0	0			
SLIT A	177								1030						0	0								
SLIT B	178								1040						0	1								
SLIT C	179								1050						1	0								
SLIT D	130								1060						1	1								
PWR.OFF	182								1300								0							

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TASK 5 OF TP 50---EVENT RECORDER CHECK

CHANNEL	VP		CHANNEL	VP		CHANNEL	VP		REMARKS
1	6		25	36					Check that 28V appears on all channels.
2	7		26	38					
3	8		27	39					
4	9		28	40					
5	10		31	27					
6	11		32	29					
11	18		33	31					
12	19		34	33					
13	20		35	35					
14	21		36	37					
15	22		37	39					
16	23		38	40					
17	24		41	2					
18	25		42	3					
19	26		43	4					
21	28		44	48					
22	30								
23	32								
24	34								

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OPERATION 3 ELECTRICALLY MATED MISSION PROFILE

NOTE: Conditions necessary to start this operation:

VTP-302, Operation 2 complete. (Test Acceptance Record signed off and/or the SV released for further processing.)

ITEM

1.0 TEST PROCEDURE - 41

1.1 Verify that the equipment and interconnections comply with VOI-409/TP-41.

1.2 Verify that the TME is properly configured and is operating.

1.3 Monitor the TME for the computer events and the HMC verifications as per TP-41.

1.4 Read and record the DVM values of all the available VTP/VP points via the selector switch at the first opportune time when both the TM and the operating power are on.

1.5 Operate the GEL recorders J, K and L (at a speed of 10 mm/sec) at one time during the test when both the operating power and the TM are on.

1.6 Obtain the charts from recorders J, K and L in the GEL along with the TME charts and deliver to the data room.

1.7 Reduce the data from the charts and record as required on the data sheets.

1.8 Verify that all the data has been analyzed, and that all the non-conformances and/or procedure deviations have been described on the Non-Conformance/Procedure Deviation sheet, and that the data package has been completed.

OPERATION 3 ELECTRICALLY MATED MISSION PROFILE F RTDS VTP-302-3

PROCEDURE PARAGRAPH REFERENCE	FUNCTION DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
1.0	TP-41						
1.1	Verify Equipment and Set-up Complies with VOI-409/TP-41	Ck			______		
1.3	TME Recorders Monitored, all Computer Events Verified per TP-41	Ck			______		
1.4	Ambients Read and Recorded on Ambient Sheet	Ck			______		
1.5	GEL Recorders J, K and L Operated	Ck			______		
1.8	Verify Data Package Completed	Init/Date			______		

FM _____

AMBIENTS

(SIMULATOR)

T.P. No. 41   Date _____

Run No. _____   Time _____   DRS-VTP-302- 3

Task Time	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC
	VP 46	+28 V	27-32.5 V			21	12-3	2.20-2.40		
	1	10-7	0-0.15			22	12-8	2.60-2.90		
	2	10-29	0.40-0.50			23	12-12	3.00-3.30		
	3	14-14	0.80-0.90			24	10-5	3.15-4.00		
	4	10-51	1.20-1.30			25	14-10	3.70-4.10		
	5	10-57	1.50-1.70			26	10-72	3.25-4.10		
	6	10-52	1.90-2.10			27	14-20	4.50-4.70		
	7	10-53	2.30-2.50			28	15-4	5.00-5.40		
	8	10-54	2.65-2.85			29	12-2	0-0.15		
	9	10-55	3.00-3.25			30	12-4	0.40-0.65		
	10	10-56	3.40-3.60			31	12-9	0.75-1.10		
	11	12-6	3.85-4.15			32	10-6	1.00-1.50		
	12	14-16	4.00-4.20			33	12-13	1.40-2.00		
	13	14-1	4.50-4.60			34	12-17	1.80-2.45		
	14	14-2	4.90-5.00			35	12-24	2.10-2.70		
	15	12-10	0-0.15			+22	15-3	4.00-4.50		
	16	14-18	0.40-0.50			-22	D.V.M.	21.78-22.22		
	17	14-17	0.80-0.90			+5	D.V.M.	4.95-5.05		
	18	12-11	1.15-1.30							
	19	14-3	1.50-1.70							
	20	14-19	1.90-2.00							

REMARKS

TP No. ____ Date ________ Page ____ of ________

Run No. ____ Chart Ident. ____________ Time of Test ______.

DRS-VTP-302-3

Task & Item No.	Time (Prgm.)	CPL No.	Expected Value	Actual Value		Commands Bits												MSD Time		REMARKS
				TLM	HMC	1	2	3	4	5	6	7	8	9	10	11	12	On	OFF	
						0	0	0	1	0	0	1								#2 ON 4.7 secs.
												0	0	1	0	0	1			#2 OFF 0.3 secs.
						0	1	1	0	1	0	1								#3 ON 15.7 secs.
												0	0	1	0	1	0			#3 OFF
						1	1	1	0	1	1	1								#4 ON 5.0 secs.
												0	1	1	0	1	1			#4 OFF
						0	1	0	1	1	0	1								#15 ON 7.0 secs.
												0	1	1	0	1	1			#15 OFF 40 secs.
						1	0	1	0	0	1	1								#16 ON 5.5 secs.
						1	0	1	0	0	1	0	0	0	0	1	1			#16 OFF 11.6 secs.
												1								#17 ON 5.5 secs.
												0	1	1	1	0	0			#17 OFF
		VP 49	28v																	TIMER ON
		VP 16	28v																	NEG. ON
		VP 16	0																	NEG. OFF
		VP 17	28v																	POS. ON

TP No. ____ Date ________ Page ___ of ____

Run No. ____ Chart Ident. __________ Time of Test ______

DRS-VTP-302-3

Task & Item No.	Time (Prgm.)	CPL No.	Expected Value	Actual Value TLM	Actual Value HMC	Commands Bits 1	2	3	4	5	6	7	8	9	10	11	12	MSD Time On	MSD Time OFF	REMARKS
		VP 17	0																	POS. OFF
						1	0	0	1	0	1	1								#7 ON 4.0 secs.
												0	0	0	1	0	0			#7 OFF 17.0 secs.
						1	0	0	1	0	1	1								#8 ON 4.0 secs.
												0	1	1	1	0	1			#8 OFF
						1	0	1	1	1	0	1								#9 ON 4.8 secs.
						0	1	0	0	0	1	0	0	0	1	0	1			#9 OFF 9.1 secs.
												1								#10 ON 4.8 secs.
												0	0	1	1	1	0			#10 OFF
						1	1	0	1	1	1	1								#11 ON 4.7 secs.
												0	0	1	1	1	1			#11 OFF 0.3 secs.
						0	0	1	0	0	0	1								#12 ON 6.0 secs.
												0	0	1	0	0	0			#12 OFF
		26	0																	ENV. OFF
		26	3.2.4.1																	ENV. ON
		VP 49	0																	[illegible] 03-4

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TP No. / 　　　　Date ______ 　　　　Page ___ of ___

Run No. / 　　　　Chart Ident. ______ 　　　　Time of Test ______

DRS-VTP-302-3

Task & Item No.	Time (Prgm.)	VP	Expected Value	Actual Value TLM	Actual Value HMC	Commands Bits 20	Commands Bits 21	MSD Time On	MSD Time OFF	REMARKS
		2,4	0	----		0	0			Slit A Event 3 off
		4	28	----		0	1			Slit B Event 4 off
		2	28	----		1	0			Slit C Event 15off
		2,4	28	----		1	1			Slit D Event 17 off
		2,4	0	----		0	0			Slit A Event 8 off
		2	28	----		1	0			Slit C Event 10 off
		2,4	28	----		1	1			Slit D Event 12off
		2,4	0	----		0	0			Slit A

OPERATION 4 C/P WEIGHING, INSTALLATION AND OCV/SRV MATING

NOTE: Conditions necessary to start this operation:

VTP-301, Operation 14, complete.
Room temperature is 70 ± 5°F.
Room humidity is 45 ± 5%.

ITEM

1.0 WEIGHING THE C/P

1.1 The C/P will be weighed before mating. At that time, utilizing the overhead hoist with the load cell attached, connect the clevis to the Integration Lifting Yoke.

1.2 Remove the C/P from the cradle following the procedure described in VOI-412, Paragraph 6.8 (Item 6.8.1 thru 6.8.12).

1.3 Raise the C/P until there is approximately one-quarter (1/4) inch clearance between the mating surfaces of the cradle and the C/P.

CAUTION: The C/P must be controlled during this activity so that connector P-601 does not contact the top section of the cradle.

1.4 Proceed with the weighing operation as directed by the associates and record the measured weight.

1.5 When the weighing operation is completed, reinstall the C/P onto the cradle following the procedure described in VOI-412, Paragraph 6.10 (Item 6.10.4 thru 6.10.11).

1.6 Remove the clevis from the Integration Lifting Yoke, move the hoist clear of the C/P, and remove the load cell from the hoist.

2.0 INSTALLATION OF THE C/P INTO THE OCV

2.1 Check off the tool list for the tools retained in room 106.

2.2 Remove the C/P from the cradle following the procedure described in VOI-412, Paragraph 6.8 (Item 6.8.1 thru 6.8.12.

CAUTION: Although the mating of the C/P to the OCV is the associates' responsibility, work as closely as possible

ITEM

2.2 with them so as to prevent any damage from occurring to the C/P. Pay particular attention to the guiding of the torsion pin into its slot in the OCV.

2.3 Remove the three (3) stow pins when the C/P mounting pads are approximately one-half (1/2) inch above the OCV mating surfaces.

2.4 Assist during the final mating and verify that the three (3) thermal bushings are in before the mating bolts are installed.

2.5 Reinstall the three (3) stow pins when the mating bolts are started. (Make certain the stow pins are secured before the mating bolts are tightened.)

2.6 After the mating bolts have been tightened, remove the Integration Lifting Yoke and lower it onto its dolly.

2.7 Remove the three (3) "T" brackets from the C/P.

2.8 Assist and monitor the fastening of the zipper on the dust shields A and B.

2.9 Monitor the installation of the EMI grounding strap to the OCV.

2.10 Remove the dust caps from the interface connectors.

2.11 Verify that the interface connectors P1495, 1496, 1497, 1498, 1499 and 1454 mate properly with the C/P connectors and check for proper cable freedom and routing.

2.12 Install the dust shield and adapter plate assembly to the exit of the air supply at station 84 per drawing 801-116.

CAUTION: The air supply exit will be opened under a reduced light condition and then resealed before returning to a normal light condition.

2.13 Monitor and assist the associates with the installation of the dust shield to the OCV.

ITEM

3.0 OCV/SRV MATING

3.1 When the associates are properly configured for mating the SRV to the OCV, fasten the two (2) record clamps to the forward and aft sides of the VA access hatch opening. (The record clamp with the metal shield attached is mounted on the forward side of the hatch opening.)

3.2 Verify that the inside section of the bellows assembly is clean.

3.3 Unroll the free end of the record at the exit of the air supply and thread it through the bellows and the VA chute, and out the access port.

CAUTION: Do not loosen the air supply exit seal.

3.4 Feed the bellows support pad through the bellows section and on up the chute to the access port until the pad is even with the extended bellows mating surface.

3.5 Under a reduced room light condition, remove the air supply exit seal and transfer the record tension to the access port.

3.6 Monitor the attachment of the bellows section to the air supply exit adapter plate. Return to a normal room light condition after the four (4) corner screws are secured.

3.7 Maintain record tension by pulling the record through the access port in conjunction with the movement of VA toward the OCV.

3.8 When VA/OCV mating surfaces are aligned and partially fastened, remove the bellows support pad and secure the record in the aft record clamp.

3.9 Utilizing a hand mirror and a flashlight, inspect the chute area from the access port to the air supply exit roller for record clearance and verify that the bellows has folded properly.

3.10 Verify that the hatch opening over the chute access port is covered with a piece of plastic material.

ITEM

3.11 Recheck the tool list for the tools retained in room 106.

3.12 Remove the aperture mask cover at the start of the I. P. alignment.

3.13 Verify that all the data has been analyzed, and that all the non-conformances and/or procedure deviations have been described on the Non-Conformance/Procedure Deviation sheet, and that the data package has been completed.

PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CONFORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
1.0	<u>WEIGHING THE C/P</u>						
1.4	C/P Weight (as weighed and not including the Viewport Boot and Dust Shield Ass'y)	Lbs.					
2.0	<u>INSTALLATION OF THE C/P INTO THE OCV</u>						
2.1	Tool List Checked	Ck					
2.3	Three (3) stow pins removed	Ck					
2.4	Three (3) thermal bushings in socket mounting ring	Ck					
2.5	Three (3) stow pins reinstalled	Ck					
2.7	Three (3) "T" brackets removed	Ck					
2.8	Zipper on dust shields A & B fastened	Ck					
2.9	EMI grounding strap installed to OCV	Ck					
2.10	Dust caps removed	Ck					
2.11	Interface connectors mate properly and cables checked	Ck					
2.12	Dust shield and adapter plate installed to C/P	Ck					

PROCEDURE PARAGRAPH REFERENCE	FUNCTION					NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
	DESCRIPTION	UNITS	REQUIRED		MEASURED		
			MIN.	MAX.			
2.13	Dust shield installed to OCV	Ck					
3.0	OCV/SRV MATING						
3.1	Two (2) record clamps installed	Ck					
3.2	Inside section of Bellows Assembly clean	Ck					
3.4	Bellows support pad installed	Ck					
3.8	Bellows support pad removed and record clamped	Ck					
3.9	Record clearance and bellows fold checked	Ck					
3.10	Hatch opening covered	Ck					
3.11	Tool list rechecked	Init/Date					
3.12	Aperture Mask Cover removed	Ck					
3.13	Verify data package completed	Init/Date					

OPERATION 5 MATED ALIGNMENT CHECK

NOTE: Conditions necessary to start this operation:

VTP-302, Operation 4, complete.
S/V moved from assembly area into Room 106.
Room temperature is 70 ± 5°F.
Room humidity is 45 ± 5%.

ITEM

1.0 SV ORIENTATION AND EQUIPMENT SET-UP

1.1 Have the associates roll the SV until the X/Z plane is horizontal and the -Y axis is vertical.

NOTE: Verify that the SV is moved far enough forward on its carriage rails to allow adequate clearance, between the end of the rails and VA access hatch area, for the positioning of the transfer mirror stand.

1.2 Have the associates open the viewport door.

1.3 Verify that the three (3) stow pins are locked in place.

1.4 Have the associates lower the SV vehicle carriage jacks until the wheels are off the floor.

1.5 Install the alignment fixture to the air supply and attach the plano mirror to the clinometer surface of the fixture.

1.6 Place the theodolite in position 1 and level it with the telescope axis at approximately the same height as the work holes in the primary structural ring. See Figure 1.

1.7 Place the load leveling jig against the machined surface of the air heater assembly and have the vehicle carriage jacks adjusted so that the X axis bubble indicates level and the Z axis bubble is level within one (1) graduation.

1.8 Adjust the theodolite in azimuth and elevation until the horizontal reticle intersects the center of the nearest work hole.

1.9 Adjust the theodolite in azimuth only until the other work hole is observed.

ITEM

1.10 Have the associates roll the SV using the roll adjustment screw until the horizontal reticle approaches the center of this work hole.

1.11 Repeat Items 1.8, 1.9 and 1.10 as necessary until the horizontal reticle intersects the centers of both work holes.

1.12 Adjust the height of the theodolite instrument stand so that, with the theodolite leveled and the zenith angle set and locked at 90° ±.5", the horizontal reticle intersects the center of both work holes.

NOTE: All theodolite readings will be direct readings, (i.e. the Roman numeral I on the theodolite frame must be facing the operator when the elevation readings are made).

1.13 Verify that the load leveling jig bubble level, which is parallel to the X axis, indicates level and the theodolite horizontal reticle is in the plane established by the centers of the two work holes, with the theodolite leveled and its zenith scale indicating 90° ± 0.5" before proceeding with the operation.

1.14 Mount a target on a fixed location so that it is approximately in the plane of the theodolite and is visible from both theodolite positions 1 and 2. See Figure 1.

1.15 Rotate the theodolite, in azimuth only, and focus on the target.

1.16 Adjust the target until its center coincides with the theodolite horizontal reticle.

1.17 Remove the tape and unroll the record in the chute access port and secure it in the forward clamp on the access hatch.

1.18 Place the transfer mirror stand in the VA access hatch area so that the transfer mirror is positioned into the center of chute access port. See Figure 1.

1.19 Lower the stand onto its leveling legs and adjust the height to center the transfer mirror in the chute.

1.20 Adjust the two (2) leveling screws on the transfer mirror fixture base until the fixture is level in the X axis direction (perpendicular to the line of sight from the

ITEM

1.20 theodolite in position 2). See Figure 1.

1.21 Place a second theodolite in Position 2. See Figure 1. Position the stand so that the line of sight through the theodolite to the transfer mirror is perpendicular to the transfer mirror cross level.

1.22 Adjust the theodolite to approximately the same height as the target.

1.23 Level the theodolite and set the zenith angle to $90^{\circ} \pm 0.5''$.

1.24 Focus the theodolite on the target.

1.25 Adjust the height of the theodolite instrument stand and re-level the theodolite as required until the horizontal reticle coincides with the center of the target.

NOTE: Before proceeding with the operation, verify that the theodolite is level, the zenith angle is $90^{\circ} \pm 0.5''$, and the horizontal reticle intersects the center of the target.

1.26 Sight from the theodolite in position 2 to the transfer mirror and adjust the mirror and the leveling screw (in line of sight) to achieve autocollimation.

NOTE: The theodolite must still be level with the zenith angle $90^{\circ} \pm 0.5''$ and the horizontal reticle in the X/Z plane as established by the target.

2.0 FRSA TO AIR SUPPLY ALIGNMENT

2.1 Rotate the transfer mirror until the etched cross lines on the FRSA mirror can be seen through the theodolite. This observation requires critical aiming of the instrument stand light down the chute to the transfer mirror.

2.2 Autocollimate from the FRSA mirror. Read and record the elevation (TZ) reading.

2.3 Read and record the elevation (TUE2) and azimuth (TUA2) readings to the intersection of the lines on the FRSA mirror.

ITEM

2.4 Read and record the elevation (TUE1) and azimuth (TUA1) readings to the limit of visibility on the upper extreme end of the vertical line on the FRSA mirror.

2.5 Rotate the theodolite and focus on the extreme outer edge of the horizontal line on the air supply alignment fixture mirror. Read and record the elevation (SCE1) reading. See Figure 1.

2.6 Measure and record the distance between the theodolite pivot axis in position 2 and the transfer mirror.

2.7 Measure and record the distance between the theodolite pivot axis in position 2 and the outer edge of the air supply alignment fixture mirror (U2).

2.8 Move the theodolite from position 1 to position 3. See Figure 1.

2.9 Adjust the height of the theodolite as required to set up for autocollimation from the air supply alignment fixture mirror and level the theodolite.

2.10 Autocollimate from the air supply alignment fixture mirror and read and record the elevation (SZ) reading.

2.11 Move the theodolite from position 3 to position 4. See Figure 1.

2.12 Adjust the height of the theodolite as required to set up for autocollimation from the plano mirror and level the theodolite.

2.13 Autocollimate from the plano mirror and read and record the elevation (SX) reading.

2.14 Calculate the X axis and Z axis tilt and the Y axis translation before disturbing the equipment set-up.

2.15 Verify that all the data has been analyzed, and that all the non-conformances and/or procedure deviations have been described on the Non-Conformance/Procedure Deviation sheet, and that the data package has been completed.

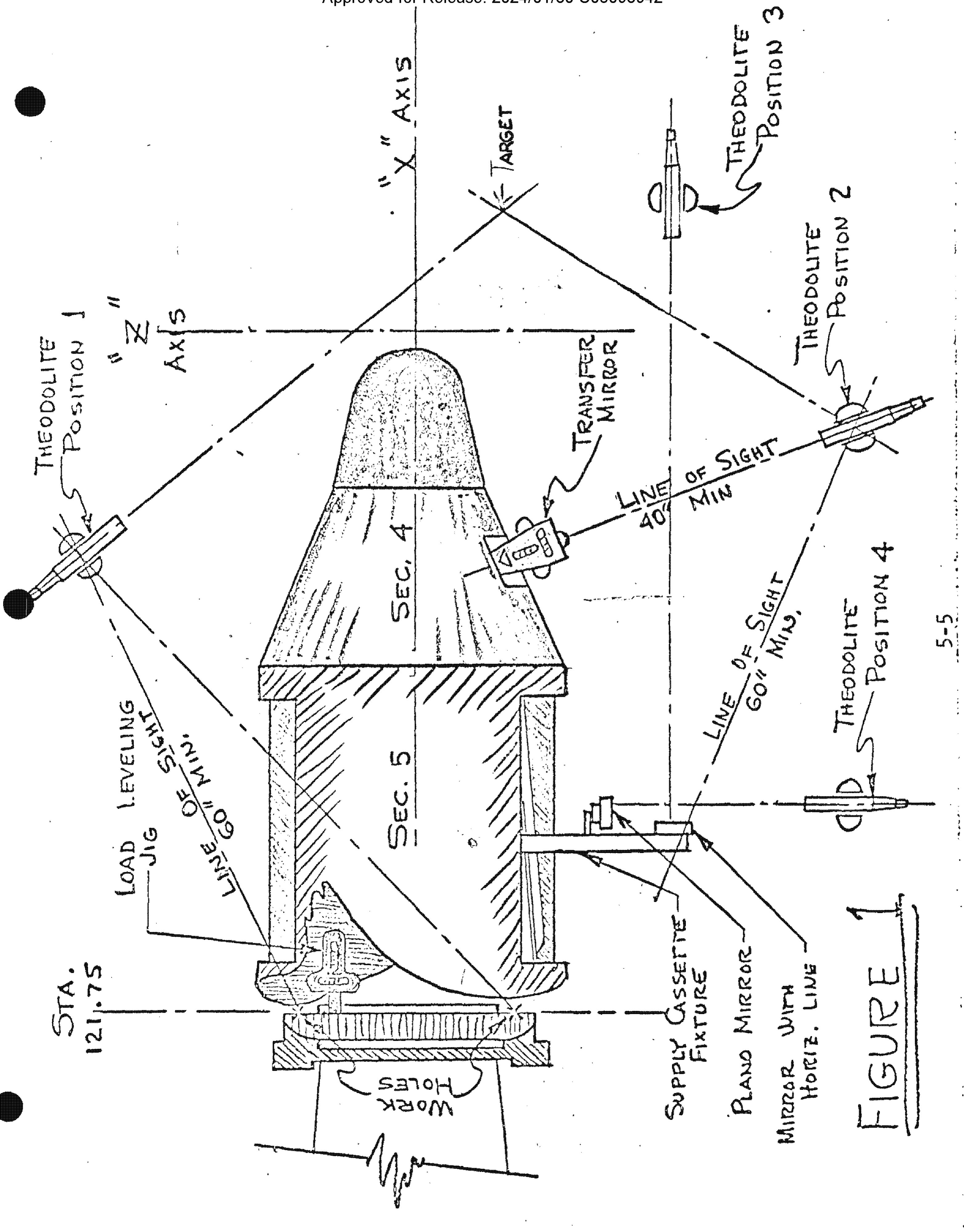
"X" AXIS
TARGET
THEODOLITE POSITION 3
"Z" AXIS
THEODOLITE POSITION 1
TRANSFER MIRROR
THEODOLITE POSITION 2
LINE OF SIGHT 40" MIN
SEC. 4
SEC. 5
THEODOLITE POSITION 4
LINE OF SIGHT 60" MIN.
LOAD LEVELING JIG
LINE OF SIGHT 60" MIN.
STA. 121.75
WORK HOLES
SUPPLY CASSETTE FIXTURE
PLANO MIRROR
MIRROR WITH HORIZ. LINE

FIGURE 1

PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CONFORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
1.0	SV ORIENTATION AND EQUIPMENT SET-UP						
1.3	Three (3) stow pins locked in place	Ck			______		
1.17	Record unrolled and secured in clamp	Ck			______		
1.26	Theodolite in Position 2 is in the X/Z plane and autocollimation to the trans-mirror achieved.	Ck			______		
2.0	FRSA TO AIR SUPPLY ALIGNMENT						
2.2	Elevation reading (TZ)	*			______		
2.3	Elevation reading (TUE2)	*			______		
	Azimuth reading (TUA2)				______		
2.4	Elevation reading (TUE1)	*			______		
	Azimuth reading (TUA1)				______		
2.5.	Elevation reading (SCE1)	*			______		
2.6	D1 = Distance from theodolite Position 2 to transfer mirror +20"	Inch	60"	-	______		

* Degrees, Minutes, Seconds.

PROCEDURE PARAGRAPH REFERENCE	FUNCTION DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CONFORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
2.7	D2 = Distance from theodolite Position 2 to outer edge supply alignment mirror	Inch	60"	-	______		
2.10	Theodolite Position 3 to supply alignment mirror (autocollimated) elevation reading (SZ)	*			______		
2.13	Theodolite Position 4 to plano mirror (autocollimated) elevation reading (SX)	*			______		
2.15	Verify data package completed	Init/Date			______		

* Degrees, Minutes, Seconds.

PROCEDURE PARAGRAPH REFERENCE	FUNCTION					NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
	DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED		
2.14	X Axis Tilt:						
	T.U. X Axis Tilt						
	$(3440') \frac{(TUA2-TUA1)}{(TUE2-TUE1)} =$	±Min			______		
	Supply X Axis Tilt						
	$(SX-90^{o}) =$	±Min			______		
	Total X Axis Tilt						
	(T.U. Tilt)-(Supply Tilt) =	±Min	-30'	+30'	______		

PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CONFORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
2.14	Z Axis Tilt:						
	T/U Z Axis Tilt						
	$(90^\circ - TZ) =$	±Min			______		
	Supply Z Axis Tilt						
	$(SZ - 90^\circ) =$	±Min			______		
	Total Z Axis Tilt						
	(T/U Tilt)-(Supply Tilt) =	±Min	-10'	+10'	______		

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PROCEDURE PARAGRAPH REFERENCE	FUNCTION					NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
	DESCRIPTION	UNITS	REQUIRED		MEASURED		
			MIN.	MAX.			
2.14	Y Axis Translation:						
	Relative Translation, T.U. to X/Z Plane						
	[TAN (TUE2-90°)] [D1] =	±Inch			______		
	Absolute Translation, T.U. to X/Z Plane						
	[Relative Translation] + [6.0 TAN (T/U X Axis Tilt)] =	±Inch			______		
	Relative Translation, Supply to X/Z Plane						
	[TAN (SCE1-90°)] [D2] =	±Inch			______		
	Absolute Translation, Supply to X/Z Plane						
	[Relative Translation] + [23.25 TAN (Supply X Axis Tilt)] =	±Inch			______		

PROCEDURE PARAGRAPH REFERENCE	FUNCTION					NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
	DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED		
2.14	Total Y Axis Translation, Supply to T.U. (Absolute Translation, T.U.)-(Absolute Translation, Supply) =	±Inch	-0.050"	+0.050"	______		

OPERATION 6 C/P SYSTEM TRACKING AND READINESS

NOTE: Conditions necessary to start this operation:

VTP-302, Operation 5, complete.
Room temperature is $70 \pm 5^{\circ}F$.
Room humidity is $45 \pm 5\%$.

ITEM

1.0 RECORD SPLICING

1.1 Unroll the excess record which is rolled and taped to the forward and aft record clamps at the VA access hatch.

1.2 Fit the two (2) sections of the record into the record splicer and allow enough overlap outside the splicer to insure proper alignment of the record.

1.3 Make the record splice and log the length of record cut off the supply and take-up sides respectively.

1.4 Have the associates roll the SV until the X/Y plane is horizontal and the +Z axis is vertical.

1.5 Under dark room conditions, remove the air supply cover.

1.6 With an operator stationed at the access port to guide the record and maintain tension, release the supply reel brake and slowly rewind the supply reel until the slack record loop in the access port area is taken up. The two (2) record clamps must be released while tension is maintained to both the supply and take-up.

1.7 Adjust the record to be centered on the air supply rollers, paying particular attention to roller number twenty-seven (27).

1.8 Log the record splice location in the air supply by indicating the direction and distance of the splice from a particular roller number.

1.9 Install the record travel viewer on VA chute access port opening.

ITEM

1.10 Utilizing the record travel viewer, verify that the record is centered between the flanges on the compensator roller in the forward direction. With a flashlight and a hand mirror observe that the supply exit roller, number twenty-eight (28), is clearly visible with no interference in the chute in the aft direction.

1.11 Install the air supply cover and secure it with the screws previously removed.

1.12 Return the room to a normal light condition.

2.0 TRACKING AND MSD CHECK

2.1 Verify that the equipment and interconnections comply with VOI-409/C/P System Tracking and Readiness.

2.2 Verify that the "GO/NO GO" indicator on the PTS is in the "GO" condition.

2.3 Read and record the times on the PTS running time meters.

2.4 Set the operating power to 28 ± 0.2 volts.

2.5 Execute the MSD and Gain Power "off" before applying operating power to the C/P.

2.6 Station an operator at the VA access hatch opening to observe the movement of the record via the record travel viewer.

2.7 Start the 16 channel recorder running at 5mm/sec. and apply operating power to the C/P. (If the take-up side of the looper is not empty and/or if there is not sufficient record tension, the FRSA drive will operate until these conditions are satisfied.)

2.8 Verify that the record tracking and instrumentation indications are normal.

NOTE: The recorder will be operated at 5mm/sec. during all events and at 1 mm/sec. during non-event periods when operating power is applied.

ITEM

2.9 Read and record the operating current.

2.10 Read and record the values of all the instrumentation points available from DVM, via the selector switch, on the 16 channel recorder cabinet.

Read and record the values of VTP-30, VTP-31, VTP-32, VTP-33, VTP-34, VTP-35 and VP-45 from the DVM on the PTS.

NOTE: During the following MSD operations the MSD must be executed "off" prior to turning "off" operating power.

2.11 Select MSD speed 1 and execute the command "on" for one (1) complete cycle of the looper as indicated by VTP-17. Read and record the period count of BBT-2.

2.12 Verify that the MSD operation and the record tracking are normal.

2.13 Repeat Item 2.11 at speed 28.

2.14 Verify that the MSD operation and the record tracking are normal.

2.15 Repeat Item 2.11 at speed 46.

2.16 Verify that the MSD operation and the record tracking are normal.

2.17 Repeat Item 2.11 at speed 64.

2.18 Verify that the MSD operation and the record tracking are normal.

2.19 Select MSD speed 1 and execute the command "on" for four (4) complete cycles of the looper as indicated by VTP-17. Read and record the period count of BBT-2.

2.20 Verify that the MSD operation and the record tracking are normal.

2.21 Verify that all indications from VTP-15, VTP-16, VTP-17, VTP-18, VTP-19, VTP-28 and VTP-29 are normal for all the MSD operations.

ITEM

2.22 Remove the record travel viewer from the VA chute access port opening.

3.0 SUPPLY REEL TORQUE MOTOR CHECK

3.1 Connect the DVM on the PTS to BBT-5.

3.2 Execute the CB-24 command and read and record the BBT-5 value.

3.3 Turn "off" the operating power and the recorder.

4.0 VIEWPORT BOOT ASSEMBLY INSTALLATION AND SERVO CHECK

4.1 Have the associates roll the SV until the X/Z plane is horizontal and the Y axis vertical.

4.2 Have the associates open the viewport door.

4.3 Remove the reference mirror and verify the mirror bay is clear for mirror movement.

NOTE: One operator will observe mirror movement and verify that clearance exists between the C/P mirror and SV section #5 areas after each command satisfaction. Observations will be made from the viewport and air supply access openings.

4.4 Select and execute the following mirror servo commands and record VTP-13 and VTP-14 after each command has been satisfied:

Elev. Position	Azimuth Position
2	8
3	8
1	8
1	1
3	1
1	1
2	1

4.5 Turn OFF C/P Power.

ITEM

4.6 Install Viewport Boot Assembly (813-407) to C/P aperture mask and make certain that metal strips on viewport boot do not extend beyond the aperture mask when assembly is complete. Have the associates install the viewport door side of the viewport boot assembly per drawing 801-116.

4.7 Verify that the mirror bay is clear for mirror movements.

4.8 Turn ON C/P Power.

NOTE: Insure that the viewport boot does not bind during the mirror movements. If any binding occurs during the following servo commands, determine problem, eliminate binding and repeat mirror commanding sequence.

4.9 Select and execute the following mirror servo commands and record VTP-13 and VTP-14 after each command has been satisfied:

Elev. Position	Azimuth Position
2	8
3	8
1	8
1	1
3	1
1	1
2	1

4.10 Verify that the movement of the mirror assembly with the viewport boot attached was normal.

5.0 HEATER POWER CHECK

5.1 Verify that the port open sensor is not covered or obstructed.

5.2 Turn ON the heater power and adjust for 28 ± 0.2 volts.

5.3 Read and record the heater power current value.

5.4 Read and record the DVM value of VP-50.

ITEM

5.5 Read and record the room temperature.

5.6 Read and record the values of all the instrumentation points available from the DVM, via the selector switch, on the 16 channel recorder cabinet.

Read and record the values of VTP-30, VTP-31, VTP-32, VTP-33, VTP-34, VTP-35 and VP-45 from the DVM on the PTS.

5.7 Turn "off" the heater and operating power.

5.8 Read and record the resistance values of BBT-3 and BBT-4.

5.9 Read and record the times on the PTS running time meters.

6.0 POST READINESS

6.1 Remove the two (2) record clamps from the access hatch.

6.2 Disconnect the test equipment from the C/P interface.

6.3 Reconnect the in-flight cables to J695, J696, J697, J698 and J699.

6.4 Verify that the VA chute access port cover is installed.

6.5 Notify the associates that the SV alignments are completed.

OPERATION 6 C/P SYSTEM TRACKING AND READINESS F ________ RTDS VTP-302-6

PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CONFORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
1.0	RECORD SPLICING						
1.3	Length of record cut off after splicing						
	Supply side	Ft			______		
	Take-up side	Ft			______		
1.8	Record splice location - roller	#±In.			______		
1.10	No interference and record centered on compensator roller	Ck			______		
2.0	TRACKING AND MSD CHECK						
2.1	Equipment and interconnections comply with VOI-409/C/P System Tracking and Readiness	Ck			______		
2.2	"GO/NO GO" indication	GO			______		
2.3	Running Time Meters						
	Operating Power	Hrs			______		
	Heater Power	Hrs			______		
	MSD Running Time	Hrs			______		

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PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
2.3 Cont'd	MSD Operations	Oper			______		
	Gain Control Power	Hr			______		
2.5	MSD and Gain power executed "off"	Ck			______		
2.8	Record Tracking and Instrumentation normal	Ck			______		
2.9	Operating current	amp	0.0	0.5	______		
2.10	Ambient DVM Readings - prior to C/P functions:						
	Sw. Pos. / VTP/VP / Function						
	1 / 1 / CB-12 Monitor	Volt	2.80	3.18	______		
	2 / 2 / Temp.	"	1.70	2.14	______		
	3 / 3 / Temp.	"	0.75	2.70	______		
	4 / 4 / Temp.	"	1.55	3.75	______		
	5 / 5 / Temp.	"	1.55	3.75	______		
	6 / 6 / Temp.	"	1.55	3.80	______		

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PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION Sw. Pos.	VTP/VP	Function	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CONFORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
2.10 Cont'd									
	7	7	Temp.	Volt	1.55	3.75	______		
	8	8	Temp.	"	1.55	3.75	______		
	9	9	Temp.	"	1.55	3.75	______		
	10	10	Ref. Voltage	"	2.33	2.63	______		
	11	11	Temp.	"	1.70	2.2	______		
	12	12	Slit Position	"			______		
	13	13	Stereo Position	"	2.40	2.60	______		
	14	14	Crab Position	"	0.37	0.63	______		
	15	15	T/U Qty. Coarse #1 Reel Rot.	"			______		
	16	16	T/U Qty. Fine	"			______		
	17	17	Looper Position	"	1.9	2.4	______		
	18	18	MSD Output	"	<1.5		______		
	19	19	Data Signals	"			______		

PROCEDURE PARAGRAPH REFERENCE	FUNCTION – DESCRIPTION: Sw. Pos.	VTP/VP	Function	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
2.10 Cont'd									
	20	20	Platen Position Coarse	Volt					
	21	21	Gain Output (VP5)	"					
	22	22	Gain Fwd. (VP1)	"					
	23	23	Gain Rev. (VP12)	"					
	24	24	CB-10 Monitor	"	2.83	3.30			
	25	25	Port Open Tell Tale	"	< 1.10				
	26	26	Envir. Bus (VP50)	"	< 1.5				
	27	27	Platen Position - Fine	"					
	28	28	T/U Qty. Coarse #2	"					
	29	29	T/U Motor Current	"	≈ 0.5				
	30	-	+5v Inst. (VP13)	"	4.8	5.2			
	31	-	-22v (VP44)	"	21.8	22.2			

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PROCEDURE PARAGRAPH REFERENCE	FUNCTION								NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
	DESCRIPTION			UNITS	REQUIRED		MEASURED			
	Sw. Pos.	VTP/VP	Function		MIN.	MAX.				
2.10 Cont'd	32	-	+28v (VP46)	"	27.8	28.2	________			
		-	* +22v (VP45)	"	21.8	22.2	________			
		30	* CB-8 Monitor (VTP-30)	"	2.78	3.08	________			
		31	* CB-9 Monitor (VTP-31)	"	3.92	4.32	________			
		32	* CB-11 Monitor (VTP-32)	"	2.73	3.35	________			
		33	* Pwr. Cont. Mon. Stereo Servo (VTP-33)	"	.30	.68	________			
		34	* Pwr. Cont. Mon. Crab Servo (VTP-34)	"	.28	.68	________			
		35	* Oper. Supply Output (VTP-35)	"	2.93	3.33	________			

* Indicates VTP/VP measurement at PTS

PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CONFORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
2.10 Cont'd							
2.11	BBT-2 for speed 1	Per	34339	34409			
2.12	MSD operation and record tracking normal	Ck					
2.13	BBT-2 for speed 28	Per	26249	26301			
2.14	MSD operation and record tracking normal	Ck					
2.15	BBT-2 for speed 46	Per	21944	21988			
2.16	MSD operation and record tracking normal	Ck					
2.17	BBT-2 for speed 64	Per	18346	18383			

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PROCEDURE PARAGRAPH REFERENCE	FUNCTION DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CONFORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
2.18	MSD operation and record tracking normal	Ck			______		
2.19	BBT-2 for speed 1	Per	34339	34408	______		
2.20	MSD operation and record tracking normal	Ck			______		
2.21	Indications on VTP-15, 16, 17, 28 and 29 normal	Ck			______		
3.0	<u>SUPPLY REEL TORQUE MOTOR CHECK</u>						
3.2	BBT-5	Volt	24	33.4	______		
4.0	<u>VIEWPORT BOOT ASSEMBLY INSTALLATION AND SERVO CHECK</u>						
4.4	Reference mirror removed and mirror bay clear for mirror movement	Ck			______		
4.5	Elevation Position 2 VTP-13	Volt	2.40	2.60	______		
	Azimuth Position 8 VTP-14	"	4.39	4.65	______		
	Transition time (AZ. 1-8)	Sec	-	8.0			

PROCEDURE PARAGRAPH REFERENCE	FUNCTION DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CONFORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
4.5 Cont'd	Elevation Position 3 VTP-13	Volt	4.32	4.58			
	Azimuth Position 8 VTP-14	"	4.39	4.65			
	Transition Time (El. 2-3)	Sec	-	2.0			
	Elevation Position 1 VTP-13	Volt	0.37	0.63			
	Azimuth Position 8 VTP-14	"	4.39	4.65			
	Transition Time (El. 3-1)	Sec	-	4.0			
	Elevation Position 1 VTP-13	Volt	0.37	0.63			
	Azimuth Position 1 VTP-14	"	0.37	0.63			
	Transition Time (AZ. 8-1)	Sec	-	8.0			
	Elevation Position 3 VTP-13	Volt	4.32	4.58			
	Azimuth Position 1 VTP-14	"	0.37	0.63			
	Transition Time (El. 1-3)	Sec	-	4.0			

PROCEDURE PARAGRAPH REFERENCE	FUNCTION DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
4.5 Cont'd	Elevation Position 1 VTP-13	Volt	0.37	0.63	______		
	Azimuth Position 1 VTP-14	"	0.37	0.63	______		
	Transition Time (El. 3-1)	Sec	-	4.0	______		
	Elevation Position 2 VTP-13	Volt	2.40	2.60	______		
	Azimuth Position 1 VTP-14	"	0.37	0.63	______		
	Transition Time (El. 1-2)	Sec	-	2.0	______		
4.7	Viewport Boot installed	Ck			______		
4.8	Mirror Bay clear for mirror movement	Ck			______		
4.9	Elevation Position 2 VTP-13	Volt	2.40	2.60	______		
	Azimuth Position 8 VTP-14	"	4.39	4.65	______		
	Transition Time (AZ. 1-8)	Sec	-	8.0	______		

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PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CONFORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
4.9 Cont'd	Elevation Position 3 VTP-13	Volt	4.32	4.58	______		
	Azimuth Position 8 VTP-14	"	4.39	4.65	______		
	Transition Time (El. 2-3)	Sec	-	2.0	______		
	Elevation Position 1 VTP-13	Volt	0.37	0.63	______		
	Azimuth Position 8 VTP-14	"	4.39	4.65	______		
	Transition Time (El. 3-1)	Sec	-	4.0	______		
	Elevation Position 1 VTP-13	Volt	0.37	0.63	______		
	Azimuth Position 1 VTP-14	"	0.37	0.63	______		
	Transition Time (AZ. 8-1)	Sec	-	8.0	______		
	Elevation Position 3 VTP-13	Volt	4.32	4.58	______		
	Azimuth Position 1 VTP-14	"	0.37	0.63	______		
	Transition Time (El. 1-3)	Sec	-	4.0			

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PROCEDURE PARAGRAPH REFERENCE	FUNCTION DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
4.9 Cont'd	Elevation Position 1 VTP-13	Volt	0.37	0.63	______		
	Azimuth Position 1 VTP-14	"	0.37	0.63	______		
	Transition Time (E1. 3-1)	Sec	-	4.0	______		
	Elevation Position 2 VTP-13	Volt	2.40	2.60	______		
	Azimuth Position 1 VTP-14	"	0.37	0.63	______		
	Transition Time (E1. 1-2)	Sec	-	2.0	______		
4.11	Mirror movement normal	Ck			______		
5.0	HEATER POWER CHECK						
5.1	Port open sensor not obstructed	Ck			______		
5.3	Heater current	Amp	0.0	3.5	______		
5.4	VP-50	Volt	3.0	4.0	______		
5.5	Room temperature	Deg	65	75	______		

PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION			UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
5.6	Ambient DVM Readings - after C/P functions:								
	Sw. Pos.	VTP/VP	Function						
	1	1	CB-12 Monitor	Volt	2.80	3.18	______		
	2	2	Temp.	"	1.70	2.14	______		
	3	3	Temp.	"	0.75	2.70	______		
	4	4	Temp.	"	1.55	3.75	______		
	5	5	Temp.	"	1.55	3.75	______		
	6	6	Temp.	"	1.55	3.80	______		
	7	7	Temp.	"	1.55	3.75	______		
	8	8	Temp.	"	1.55	3.75	______		
	9	9	Temp.	"	1.55	3.75	______		
	10	10	Ref. Voltage	"	2.33	2.63	______		
	11	11	Temp.	"	1.70	2.2	______		
	12	12	Slit Position	"			______		

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PROCEDURE PARAGRAPH REFERENCE	FUNCTION							NON-CONFORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
	DESCRIPTION			UNITS	REQUIRED		MEASURED		
	Sw. Pos.	VTP/VP	Function		MIN.	MAX.			
5.6 Cont'd	13	13	Stereo Position	Volt	2.40	2.60	______		
	14	14	Crab Position	"	0.37	0.63	______		
	15	15	T/U Qty. Coarse #1 Reel Rot.	"			______		
	16	16	T/U Qty. Fine	"			______		
	17	17	Looper Position	"	1.9	2.4	______		
	18	18	MSD Output	"	<1.5		______		
	19	19	Data Signals	"			______		
	20	20	Platen Position Coarse	"			______		
	21	21	Gain Output (VP5)	"			______		
	22	22	Gain Fwd. (VP1)	"			______		
	23	23	Gain Rev. (VP12)	"			______		
	24	24	CB-10 Monitor	"	2.88	3.30	______		

PROCEDURE PARAGRAPH REFERENCE	FUNCTION DESCRIPTION			UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CONFORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
5.6 Cont'd	Sw. Pos.	VTP/VP	Function						
	25	25	Port Open Tell Tale	Volt	<1.10		____		
	26	26	Envir. Bus (VP50)	"	<1.5		____		
	27	27	Platen Position Fine	"			____		
	28	28	T/U Qty. - Coarse #2	"			____		
	29	29	T/U Motor Current	"	$\approx$0.5		____		
	30	-	+5v Inst. (VP13)	"	4.8	5.2	____		
	31	-	-22v (VP44)	"	21.8	22.2	____		
	32	-	+28v (VP46)	"	27.8	28.2	____		
		-	* +22v (VP45)	"	21.8	22.2	____		
		30	* CB-8 Monitor	"	2.78	3.08	____		
		31	* CB-9 Monitor	"	3.92	4.32	____		
		32	* CB-11 Monitor	"	2.73	3.35	____		

* Indicates VTP/VP measurement at PTS

PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
5.6 Cont'd	Sw. Pos. / VTP/VP / Function						
	33 * Pwr. Cont. Mon. Stereo Servo	Volt	.30	.68	______		
	34 * Pwr. Cont. Mon. Crab Servo	"	.28	.68	______		
	35 * Oper. Supply Output	"	2.93	3.33	______		

* Indicates VTP/VP measurement at PTS

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PROCEDURE PARAGRAPH REFERENCE	FUNCTION DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
5.8	Resistance Values						
	BBT-3	Kohm			______		
	BBT-4	"			______		
5.9	Running Time Meters						
	Operating Power	Hrs			______		
	Heater Power	Hrs			______		
	MSD Running Time	Hrs			______		
	MSD Operations	Oper			______		
	Gain Control Power	Hrs			______		
6.0	POST READINESS						
6.1	Two (2) record clamps removed	Ck			______		
6.2	Test Equipment disconnected	Ck			______		
6.3	Interface connectors connected	Ck			______		
6.4	VA Chute Access Port Cover installed	Ck			______		

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PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
6.5	Associates notified SV alignments complete	Init/ Date			________		

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OPERATION 7 SV SYSTEM VALIDATION TEST

ITEM

1.0 TEST PROCEDURE - 16

1.1 Verify that the equipment and interconnections comply with VOI-409/TP-16.

1.2 Verify that the TME is properly configured and is operating.

1.3 Verify that the GEL recorders J, K and L are properly configured and are operating.

1.4 Monitor the TME and GEL recorders for the computer events and the HMC/G-COM verifications as per TP-16.

1.5 Read and record the DVM values of all the available VTP/VP points, via the selector switch on 16 channel recorder cabinet, at the first opportune time when both the TM and the operating power are on (but before any of the computer events take place).

NOTE: The GEL recorder L shall be operated at ten (10) mm/sec. for twenty (20) to forty (40) seconds during periods when the ambient values for the CPL points are taken.

1.6 Repeat Item 1.5 after all of the computer events are completed.

1.7 Read and record the resistance values of UMB-3 and UMB-4, and record the test area temperature and humidity.

1.8 Obtain the charts from the TME and the GEL (J, K, L) recorders and deliver to the data room.

1.9 Reduce the data from the charts and record as required on the data sheets.

1.10 Verify that all the data has been analyzed and that all the non-conformances and/or procedure deviations have been described on the Non-Conformance/Procedure Deviation sheet, and that the data package has been completed.

OPERATION 7 SV SYSTEM VALIDATION TEST F RTDS VTP-302-7

PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
1.0	TEST PROCEDURE -16						
1.1	Equipment and interconnections comply with VOI-409/TP-16	Ck			______		
1.2	TME is properly configured and is operating	Ck			______		
1.3	GEL recorders J, K and L are properly configured and are operating	Ck			______		
1.4	TME and GEL recorders monitored, all computer events verified per TP-16	Ck			______		
1.5 & 1.6	Ambients read and recorded on ambient sheets	Ck			______		
1.7	Test area temperature	Deg.	60	90	______		
	Test area humidity	%RH	45	55	______		
	UMB-3	K⎍	As Read		______		
	UMB-4	K⎍	As Read		______		
1.10	Verify data package completed	Init/Date			______		

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FM ____

AMBIENTS

T.P. No.________ Date________

Run No.________ Time________ DRS-VTP-302-7

Task Time	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC
	VP 46	+28 V	27-32.5 V			21	12-3			
	1	10-7				22	12-8			
	2	10-29				23	12-12			
	3	14-14				24	10-5			
	4	10-51				25	14-10			
	5	10-57				26	10-72			
	6	10-52				27	14-20			
	7	10-53				28	15-4			
	8	10-54				29	12-2			
	9	10-55				30	12-4			
	10	10-56				31	12-9			
	11	12-6				32	10-6			
	12	14-16				33	12-13			
	13	14-1				34	12-17			
	14	14-2				35	12-24			
	15	12-10				+22	15-3			
	16	14-18								
	17	14-17								
	18	12-11								
	19	14-3								
	20	14-19								

REMARKS

TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ______

DRS-VTP-302- 7

F ______

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			CB1A	to CB7A	≈20v	-		0	1	1	0	1	0	1			Preset
			VP46	(+28v)	27 - 32.5v	-											Pwr. ON
			13	2-14-1	48 - 53												
			14	2-12-2	7 - 13												
			17	2-14-17	Inc.												Event 2 ON
			18	2-12-11	>40			0	0	0	1	0	0	1			(4.7 Sec.)
			19	2-14-3													
			13	2-14-1	48 - 53												Event 2 OF
			14	2-14-2	20 - 25												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												(0.3 sec).
			19	2-14-3	0 - 10												
			17	2-14-17	Inc.												Event 3 ON
			18	2-12-11	>30			0	1	1	0	1	0	1			(15.7 sec)

TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ________

F ______ DRS-VTP-302-7

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			13	2-14-1	48 - 53												Event 3 Off
			14	2-14-2	31 - 36												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	8 - 15												SA
			17	2-14-17	Inc.												Event 4 On
			18	2-12-11	> 39			1	1	1	0	1	1	1			(5 Sec)
			13	2-14-1	86 - 92												Event 4 Off
			14	2-14-2	42 - 47												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			25	2-14-10	18 - 22												
			29	2-12-2	<70												For Events 2-4
			12	2-14-16	30 - 37			Trans. Time (3 Sec Max)									SB
			VP46	(+28v)	0	--											Pwr. Off

TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ______

F ______ DRS-VTP-302-7

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2/3-14-17	Inc.												Event 15 On
			18	2/3-12-11	>39			0	1	0	1	1	0	1			(7.0 Sec)
			13	2/3-14-1	86 - 92												Event 15 Off
			14	2/3-14-2	42 - 47												
			17	2/3-14-17	Dec.												
			18	2/3-12-11	0 - 20												(40 Sec)
			12	2/3-14-16	50 - 57			Trans. Time (3 Sec Max)									SC
			17	2/3-14-17	Inc.												Event 16 On
			18	2/3-12-11	>40			1	0	1	0	0	1	1			(5.5 Sec)
			13	2/3-14-1	7 - 13			Trans. Time (4 Sec Max)									Event 16 Off
			14	2/3-14-2	42 - 47												
			17	2/3-14-17	Dec.												
			18	2/3-12-11	0 - 20			1	0	1	0	0	1	0			(11.4 Sec)

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Test Run No. ______ Chart Ident. ______ Time of Test ______

DRS-VTP-302-7

F ______

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2/3-14-17	Inc.												Event 17 On
			18	2/3-12-11	>40												(5.5 Sec)
			13	2/3-14-1	86 - 92			Trans. Time (4 Sec Max) ____									Event 17 Off
			14	2/3-14-2	53 - 58												
			17	2/3-14-17	Dec.												
			18	2/3-12-11	0 - 20												
			12	2/3-14-16	70 - 78			Trans. Time (3 Sec Max) ____									SSD
			26	2-15-9	0												EP-
			VP49	(+28v)	27 - 32.5	---											TC+
			20	2-14-19	Dec.												Gain Rev.
			20	2-14-19	Inc.												Gain Fwd.
			VP49	(+28v)	0	---											TC-
			26	2-15-9	64 - 82												EP+

TP No. 16 Date ______ Page ____ of ____

Test Run No.______ Chart Ident.______ Time of Test ______

F ______ DRS-VTP-302-7

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2-14-17	Inc.												Event 7 On
			18	2-12-11	>35			1	0	0	1	0	1	1			(4.0 Sec)
			13	2-14-1	7 - 13			Trans. Time (4 Sec Max)____									Event 7 Off
			14	2-14-2	53 - 58												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												(17 Sec)
			17	2-14-17	Inc.												Event 8 On
			18	2-12-11	>35			1	0	0	1	0	1	1			(4.0 Sec)
			13	2-14-1	86 - 92			Trans. Time (4 Sec Max)____									Event 8 Off
			14	2-14-2	64 - 70												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	8 - 15			Trans. Time (7 Sec Max)____									SA

TP No. 16 | Date ______ | Page ____ of ____

Test Run No. ______ | Chart Ident. ______ | Time of Test ______

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F ______

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2-14-17	Inc.												Event 9 On
			18	2-12-11	> 40			1	0	1	1	1	0	1			(4.7 Sec)
			13	2-14-1	7 - 13			Trans. Time (4 Sec Max)									Event 9 Off
			14	2-14-2	64 - 70												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20			0	1	0	0	0	1	0			(9.0 Sec)
			17	2-14-17	Inc.												Event 10 On
			18	2-12-11	> 39												(4.7 Sec)
			13	2-14-1	48 - 53												Event 10 Off
			14	2-14-2	76 - 81												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	50 - 57			Trans. Time (5 Sec Max)									SC

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Test Run No. ______   Chart Ident. ______   Time of Test ______

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F ______

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2-14-17	Inc.												Event 11 On
			18	2-12-11	>30			1	1	0	1	1	1	1			(4.7 Sec)
			13	2-14-1	48 - 53												Event 11 Off
			14	2-14-2	87 - 93												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												(0.3 Sec)
			17	2-14-17	Cont. Slope												Event 12 On
			18	2-12-11	>35			0	0	1	0	0	0	1			(6.0 Sec)
			13	2-14-1	48 - 53												Event 12 Off
			14	2-14-2	7 - 13			Trans. Time (8 Sec Max) ___									
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	70 - 78			Trans. Time (3 Sec Max) ___									SD
			12	2-14-16	8 - 15			Trans. Time (7 Sec Max) ___									SA

D7-9

AMBIENTS

FM _____

T.P. No.________ Date________

Run No.________ Time________ DRS-VTP-302-7

Task Time	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC
	VP 46	+28 V	27-32.5 V			21	12-3			
	1	10-7				22	12-8			
	2	10-29				23	12-12			
	3	14-14				24	10-5			
	4	10-51				25	14-10			
	5	10-57				26	10-72			
	6	10-52				27	14-20			
	7	10-53				28	15-4			
	8	10-54				29	12-2			
	9	10-55				30	12-4			
	10	10-56				31	12-9			
	11	12-6				32	10-6			
	12	14-16				33	12-13			
	13	14-1				34	12-17			
	14	14-2				35	12-24			
	15	12-10				+22	15-3			
	16	14-18								
	17	14-17								
	18	12-11								
	19	14-3								
	20	14-19								

REMARKS

T.P. No.______ Date______

Run No.______ Time______ DRS-VTP-302-

Task Time	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC
	VP 46	+28 V	27-32.5 V			21	12-3			
	1	10-7				22	12-8			
	2	10-29				23	12-12			
	3	14-14				24	10-5			
	4	10-51				25	14-10			
	5	10-57				26	10-72			
	6	10-52				27	14-20			
	7	10-53				28	15-4			
	8	10-54				29	12-2			
	9	10-55				30	12-4			
	10	10-56				31	12-9			
	11	12-6				32	10-6			
	12	14-16				33	12-13			
	13	14-1				34	12-17			
	14	14-2				35	12-24			
	15	12-10				+22	15-3			
	16	14-18								
	17	14-17								
	18	12-11								
	19	14-3								
	20	14-19								

REMARKS

T.P. No.________ Date________

Run No.________ Time________ DRS-VTP-302-

Task Time	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC
	VP 46	+28 V	27-32.5 V			21	12-3			
	1	10-7				22	12-8			
	2	10-29				23	12-12			
	3	14-14				24	10-5			
	4	10-51				25	14-10			
	5	10-57				26	10-72			
	6	10-52				27	14-20			
	7	10-53				28	15-4			
	8	10-54				29	12-2			
	9	10-55				30	12-4			
	10	10-56				31	12-9			
	11	12-6				32	10-6			
	12	14-16				33	12-13			
	13	14-1				34	12-17			
	14	14-2				35	12-24			
	15	12-10				+22	15-3			
	16	14-18								
	17	14-17								
	18	12-11								
	19	14-3								
	20	14-19								

REMARKS

FM ____

AMBIENTS

T.P. No.________ Date________ Page 13 of 23

Run No.________ Time________ DRS-VTP-302-

Task Time	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC
	VP 46	+28 V	27-32.5 V			21	12-3			
	1	10-7				22	12-8			
	2	10-29				23	12-12			
	3	14-14				24	10-5			
	4	10-51				25	14-10			
	5	10-57				26	10-72			
	6	10-52				27	14-20			
	7	10-53				28	15-4			
	8	10-54				29	12-2			
	9	10-55				30	12-4			
	10	10-56				31	12-9			
	11	12-6				32	10-6			
	12	14-16				33	12-13			
	13	14-1				34	12-17			
	14	14-2				35	12-24			
	15	12-10				+22	15-3			
	16	14-18								
	17	14-17								
	18	12-11								
	19	14-3								
	20	14-19								

REMARKS

AMBIENTS

FM ____

T.P. No.________ Date________ Page 14 of 23

Run No.________ Time________ DRS-VTP-302-

Task Time	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC
	VP 46	+28 V	27-32.5 V			21	12-3			
	1	10-7				22	12-8			
	2	10-29				23	12-12			
	3	14-14				24	10-5			
	4	10-51				25	14-10			
	5	10-57				26	10-72			
	6	10-52				27	14-20			
	7	10-53				28	15-4			
	8	10-54				29	12-2			
	9	10-55				30	12-4			
	10	10-56				31	12-9			
	11	12-6				32	10-6			
	12	14-16				33	12-13			
	13	14-1				34	12-17			
	14	14-2				35	12-24			
	15	12-10				+22	15-3			
	16	14-18								
	17	14-17								
	18	12-11								
	19	14-3								
	20	14-19								

REMARKS

TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ____

F ________ DRS-VTP-302-7

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			CB1A	to CB7A	≈20v	-		0	1	1	0	1	0	1			Preset
			VP46	(+28v)	27 - 32.5v	-											Pwr. ON
			13	2-14-1	48 - 53												
			14	2-12-2	7 - 13												
			17	2-14-17	Inc.												Event 2 ON
			18	2-12-11	>40			0	0	0	1	0	0	1			(4.7 Sec.)
			19	2-14-3													
			13	2-14-1	48 - 53												Event 2 OFF
			14	2-14-2	20 - 25												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												(0.3 sec).
			19	2-14-3	0 - 10												
			17	2-14-17	Inc.												Event 3 ON
			18	2-12-11	> 30			0	1	1	0	1	0	1			(15.7 sec)

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TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ____

F ________ DRS-VTP-302-7

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			13	2-14-1	48 - 53												Event 3 Off
			14	2-14-2	31 - 36												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	8 - 15												SA
			17	2-14-17	Inc.												Event 4 On
			18	2-12-11	> 39			1	1	1	0	1	1	1			(5 Sec)
			13	2-14-1	86 - 92												Event 4 Off
			14	2-14-2	42 - 47												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			25	2-14-10	18 - 22												
			29	2-12-2	<70												For Events 2-4
			12	2-14-16	30 - 37			Trans. Time (3 Sec Max)									SB
			VP46	(+28v)	0	--											Pwr. Off

TP No.______ Date ______ Page ____ of ____

Test Run No.______ Chart Ident.______ Time of Test ______

F ______ ORS-VTP-302-7

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2/3-14-17	Inc.												Event 15 On
			18	2/3-12-11	>39			0	1	0	1	1	0	1			(7.0 Sec)
			13	2/3-14-1	86 - 92												Event 15 Off
			14	2/3-14-2	42 - 47												
			17	2/3-14-17	Dec.												
			18	2/3-12-11	0 - 20												(40 Sec)
			12	2/3-14-16	50 - 57			Trans. Time (3 Sec Max)									SC
			17	2/3-14-17	Inc.												Event 16 On
			18	2/3-12-11	>40			1	0	1	0	0	1	1			(5.5 Sec)
			13	2/3-14-1	7 - 13			Trans. Time (4 Sec Max)									Event 16 Off
			14	2/3-14-2	42 - 47												
			17	2/3-14-17	Dec.												
			18	2/3-12-11	0 - 20			1	0	1	0	0	1	0			(11.4 Sec)

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TP No. 16 | Date ______ | Page ___ of ___

Test Run No. ______ | Chart Ident. ______ | Time of Test ______

F ______ | DRS-VTP-302-7

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2/3-14-17	Inc.												Event 15 On
			18	2/3-12-11	>39			0	1	0	1	1	0	1			(7.0 Sec)
			13	2/3-14-1	86 - 92												Event 15 Off
			14	2/3-14-2	42 - 47												
			17	2/3-14-17	Dec.												
			18	2/3-12-11	0 - 20			Trans. Time (3 Sec Max)									(40 Sec)
			12	2/3-14-16	50 - 57												SC
			17	2/3-14-17	Inc.												Event 16 On
			18	2/3-12-11	>40			1	0	1	0	0	1	1			(5.5 Sec)
			13	2/3-14-1	7 - 13			Trans. Time (4 Sec Max)									Event 16 Off
			14	2/3-14-2	42 - 47												
			17	2/3-14-17	Dec.												
			18	2/3-12-11	0 - 20			1	0	1	0	0	1	0			(11.4 Sec)

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TP No. 16 Date ______ Page ____ of ____

Test Run No. ______ Chart Ident. ______ Time of Test ______

F ______ DRS-VTP-302-7

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2/3-14-17	Inc.												Event 17 On
			18	2/3-12-11	>40												(5.5 Sec)
			13	2/3-14-1	86 - 92			Trans. Time (4 Sec Max) ___									Event 17 Off
			14	2/3-14-2	53 - 58												
			17	2/3-14-17	Dec.												
			18	2/3-12-11	0 - 20												
			12	2/3-14-16	70 - 78			Trans. Time (3 Sec Max) ___									SSD
			26	2-15-9	0												EP-
			VP49	(+28v)	27 - 32.5	---											TC+
			20	2-14-19	Dec.												Gain Rev.
			20	2-14-19	Inc.												Gain Fwd.
			VP49	(+28v)	0	---											TC-
			26	2-15-9	64 - 82												EP+

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TP No. 16 Date ______ Page ____ of ____

Test Run No. ______ Chart Ident. ______ Time of Test ______

F ______ DRS-VTP-302-7

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2-14-17	Inc.												Event 7 On
			18	2-12-11	>35			1	0	0	1	0	1	1			(4.0 Sec)
			13	2-14-1	7 - 13			Trans. Time (4 Sec Max)____									Event 7 Off
			14	2-14-2	53 - 58												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												(17 Sec)
			17	2-14-17	Inc.												Event 8 On
			18	2-12-11	>35			1	0	0	1	0	1	1			(4.0 Sec)
			13	2-14-1	86 - 92			Trans. Time (4 Sec Max)____									Event 8 Off
			14	2-14-2	64 - 70												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	8 - 15			Trans. Time (7 Sec Max)____									SA

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TP No. - - 16 Date ______ Page ____ of ____

Test Run No. ______ Chart Ident. ______ Time of Test ______

F ______ DRS-VTP-302-7

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2-14-17	Inc.												Event 9 On
			18	2-12-11	> 40			1	0	1	1	1	0	1			(4.7 Sec)
			13	2-14-1	7 - 13			Trans. Time (4 Sec Max)									Event 9 Off
			14	2-14-2	64 - 70												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20			0	1	0	0	0	1	0			(9.0 Sec)
			17	2-14-17	Inc.												Event 10 On
			18	2-12-11	> 39												(4.7 Sec)
			13	2-14-1	48 - 53												Event 10 Off
			14	2-14-2	76 - 81												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	50 - 57			Trans. Time (5 Sec Max)									SC

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TP No. - - 16 Date ______ Page ____ of ____

Test Run No. ______ Chart Ident. ______ Time of Test ______

F ______ DRS-VTP-302-7

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2-14-17	Inc.												Event 11 On
			18	2-12-11	>30			1	1	0	1	1	1	1			(4.7 Sec)
			13	2-14-1	48 - 53												Event 11 Off
			14	2-14-2	87 - 93												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												(0.3 Sec)
			17	2-14-17	Cont. Slope												Event 12 On
			18	2-12-11	>35			0	0	1	0	0	0	1			(6.0 Sec)
			13	2-14-1	48 - 53												Event 12 Off
			14	2-14-2	7 - 13			Trans. Time (8 Sec Max)____									
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	70 - 78			Trans. Time (3 Sec Max)____									SD
			12	2-14-16	8 - 15			Trans. Time (7 Sec Max)____									SA

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FM ____

AMBIENTS

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Run No.________ Time________ DRS-VTP-302-7

Task Time	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC
	VP 46	+28 V	27-32.5 V			21	12-3			
	1	10-7				22	12-8			
	2	10-29				23	12-12			
	3	14-14				24	10-5			
	4	10-51				25	14-10			
	5	10-57				26	10-72			
	6	10-52				27	14-20			
	7	10-53				28	15-4			
	8	10-54				29	12-2			
	9	10-55				30	12-4			
	10	10-56				31	12-9			
	11	12-6				32	10-6			
	12	14-16				33	12-13			
	13	14-1				34	12-17			
	14	14-2				35	12-24			
	15	12-10				+22	15-3			
	16	14-18								
	17	14-17								
	18	12-11								
	19	14-3								
	20	14-19								

REMARKS

OPERATION 8 FINAL MAB CONFIDENCE TEST

NOTE: Conditions necessary to start this operation:

VTP-302, Operation 7, complete. (The Test Acceptance Record signed off and/or the SV released for further processing.)

1.0 C/P PREPARATION

1.1 When the associates have removed the access hatch over the air supply and have opened the viewport door, remove the three (3) stow pins.

1.2 Install thirty-four (34) new screws (400-164-120) in the air supply cover. Torque all cover screws to 15 inch-pounds, tightening diametrically opposite pairs in alternate quadrants and then, using the same sequence, finish torque all screws to 20 inch-pounds.

2.0 TEST PROCEDURE - 23

2.1 Verify that the equipment and interconnections comply with VOI-409/TP-23.

2.2 Verify that the TME is properly configured and is operating.

2.3 Verify that the GEL recorders J, K and L are properly configured and are operating.

2.4 Monitor the TME and GEL recorders for the computer events and the HMC/G-COM verifications as per TP-23.

2.5 Read and record the DVM values of all the available VTP/VP points, via the selector switch on the 16 channel recorder cabinet, at the first opportune time when both the TM and the operating power are on (but before any of the computer events take place).

NOTE: The GEL recorder L shall be operated at ten (10) mm/sec. for twenty (20) to forty (40) seconds during periods when the ambient values for the CPL points are taken.

2.6 Repeat Item 2.5 after all the computer events are completed.

ITEM

2.7 Read and record the resistance values of UMB-3 and UMB-4, and record the test area temperature and humidity.

2.8 Obtain the charts from the TME and GEL (J, K, L) recorders and deliver to the data room.

2.9 Reduce the data from the charts and record as required on the data sheets.

2.10 Verify that all the data has been analyzed and that all the non-conformances and/or procedure deviations have been described on the Non-Conformance/Procedure Deviation sheet, and that the data package has been completed.

OPERATION 8 FINAL MAB CONFIDENCE TEST F ________ RTDS VTP-302-8

PROCEDURE PARAGRAPH REFERENCE	FUNCTION DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
1.0	C/P PREPARATION						
1.1	Three (3) stow pins removed	Ck			______		
1.2	New screws installed in Air Supply Cover and torqued to 20 inch-pounds	Ck			______		
2.0	TEST PROCEDURE - 23						
2.1	Equipment and interconnections comply with VOI-409/TP-23	Ck			______		
2.2	TME is properly configured and operating	Ck			______		
2.3	GEL recorders J, K and L are properly configured and operating	Ck			______		
2.4	TME and GEL recorders monitored, HMC/G-COM verifications per TP-23	Ck			______		
2.5 & 2.6	Ambients read and recorded on ambient sheets	Ck			______		
2.7	Test area temperature	Deg	60	90	______		
	Test area humidity	% RH	45	55	______		

DS-1

PROCEDURE PARAGRAPH REFERENCE	FUNCTION					NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
	DESCRIPTION	UNITS	REQUIRED		MEASURED		
			MIN.	MAX.			
2.7 Cont'd	UMB-3	K	As Read		______		
	UMB-4	K	As Read		______		
2.10	Verify data package completed	Init/ Date			______		

FM ____

AMBIENTS

T.P. No.________ Date________ Page 3 of 11

Run No.________ Time________ DRS-VTP-302-8

Task Time	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC
	VP 46	+28 V	27-32.5 V			21	12-3			
	1	10-7				22	12-8			
	2	10-29				23	12-12			
	3	14-14				24	10-5			
	4	10-51				25	14-10			
	5	10-57				26	10-72			
	6	10-52				27	14-20			
	7	10-53				28	15-4			
	8	10-54				29	12-2			
	9	10-55				30	12-4			
	10	10-56				31	12-9			
	11	12-6				32	10-6			
	12	14-16				33	12-13			
	13	14-1				34	12-17			
	14	14-2				35	12-24			
	15	12-10				+22	15-3			
	16	14-18								
	17	14-17								
	18	12-11								
	19	14-3								
	20	14-19								

REMARKS

TP No.________ Date ______ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test _____

DRS-VTP-302-8

F ______

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			CB1A	to CB7A	≈20v	-		0	1	1	0	1	0	1			Preset
			VP46	(+28v)	27 - 32.5v	-											Pwr. ON
			13	2-14-1	48 - 53												
			14	2-12-2	7 - 13												
			17	2-14-17	Inc.												Event 2 ON
			18	2-12-11	>40			0	0	0	1	0	0	1			(4.7 Sec.)
			19	2-14-3													
			13	2-14-1	48 - 53												Event 2 OFF
			14	2-14-2	20 - 25												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												(0.3 sec).
			19	2-14-3	0 - 10												
			17	2-14-17	Inc.												Event 3 ON
			18	2-12-11	>30			0	1	1	0	1	0	1			(15.7 sec)

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TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ______

F ______ DRS-VTP-302-8

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			13	2-14-1	48 - 53												Event 3 Off
			14	2-14-2	31 - 36												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	8 - 15												SA
			17	2-14-17	Inc.												Event 4 On
			18	2-12-11	> 39			1	1	1	0	1	1	1			(5 Sec)
			13	2-14-1	86 - 92												Event 4 Off
			14	2-14-2	42 - 47												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			25	2-14-10	18 - 22												
			29	2-12-2	< 70												For Events 2-4
			12	2-14-16	30 - 37			Trans. Time (3 Sec Max)									SB
			VP46	(+28v)	0	--											Pwr. Off

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TP No. ______ Date ______ Page ____ of ____

Test Run No. ______ Chart Ident. ______ Time of Test ______

F ______ DRS-VTP-302-8

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2/3-14-17	Inc.												Event 15 On
			18	2/3-12-11	>39			0	1	0	1	1	0	1			(7.0 Sec)
			13	2/3-14-1	86 - 92												Event 15 Off
			14	2/3-14-2	42 - 47												
			17	2/3-14-17	Dec.												
			18	2/3-12-11	0 - 20												(40 Sec)
			12	2/3-14-16	50 - 57			Trans. Time (3 Sec Max)									SC
			17	2/3-14-17	Inc.												Event 16 On
			18	2/3-12-11	>40			1	0	1	0	0	1	1			(5.5 Sec)
			13	2/3-14-1	7 - 13			Trans. Time (4 Sec Max)									Event 16 Off
			14	2/3-14-2	42 - 47												
			17	2/3-14-17	Dec.												
			18	2/3-12-11	0 - 20			1	0	1	0	0	1	0			(11.4 Sec)

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TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ______

F ______ DRS-VTP-302-8

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2/3-14-17	Inc.												Event 17 On
			18	2/3-12-11	>40												(5.5 Sec)
			13	2/3-14-1	86 - 92			Trans. Time (4 Sec Max)___									Event 17 Off
			14	2/3-14-2	53 - 58												
			17	2/3-14-17	Dec.												
			18	2/3-12-11	0 - 20												
			12	2/3-14-16	70 - 78			Trans. Time (3 Sec Max)___									SD
			17	2-14-17	Inc.												Event 7 On
			18	2-12-11	>35			1	0	0	1	0	1	1			(4.0 Sec)
			13	2-14-1	7 - 13			Trans. Time (4 Sec Max)___									Event 7 Off
			14	2-14-2	53 - 58												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												(17 Sec)

D8-7

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TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ______

F ______ DRS-VTP-302-8

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2-14-17	Inc.												Event 8 On
			18	2-12-11	>35			1	0	0	1	0	1	1			(4.0 Sec)
			13	2-14-1	86 - 92			Trans. Time (4 Sec Max)___									Event 8 Of
			14	2-14-2	64 - 70												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	8 - 15			Trans. Time (7 Sec Max)___									SA
			17	2-14-17	Inc												Event 9 On
			18	2-12-11	>40			1	0	1	1	1	0	1			(4.7 Sec)
			13	2-14-1	7 - 13			Trans. Time (4 Sec Max)___									Event 9 Off
			14	2-14-2	64 - 70												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20			0	1	0	0	0	1	0			(9.0 Sec)

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TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ____

F ______ DRS-VTP-302-8

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2-14-17	Inc.												Event 10 On
			18	2-12-11	>39												(4.7 Sec)
			13	2-14-1	48 - 53												Event 10 Of
			14	2-14-2	76 - 81												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	50 - 57			Trans. Time (5 Sec Max)____									SC
			17	2-14-17	Inc.												Event 11 O
			18	2-12-11	>30			1	1	0	1	1	1	1			(4.7 Sec)
			13	2-14-1	48 - 53												Event 11 Off
			14	2-14-2	87 - 93												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												(0.3 Sec)

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TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ______

DRS-VTP-302-8

F ______

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2-14-17	Cont. Slope												Event 12 On
			18	2-12-11	>35			0	0	1	0	0	0	1			(6.0 Sec)
			13	2-14-1	48 - 53												Event 12 Off
			14	2-14-2	7 - 13			Trans. Time (8 Sec Max)____									
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	70 - 78			Trans. Time (3 Sec Max)____									SD
			12	2-14-16	8 - 15			Trans. Time (7 Sec Max)____									SA

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FM ____

T.P. No.________ Date________

Run No.________ Time________ DRS-VTP-302-

Task Time	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	HMC	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	HMC
	VP 46	+28 V	27-32.5 V			21	12-3			
	1	10-7				22	12-8			
	2	10-29				23	12-12			
	3	14-14				24	10-5			
	4	10-51				25	14-10			
	5	10-57				26	10-72			
	6	10-52				27	14-20			
	7	10-53				28	15-4			
	8	10-54				29	12-2			
	9	10-55				30	12-4			
	10	10-56				31	12-9			
	11	12-6				32	10-6			
	12	14-16				33	12-13			
	13	14-1				34	12-17			
	14	14-2				35	12-24			
	15	12-10				+22	15-3			
	16	14-18								
	17	14-17								
	18	12-11								
	19	14-3								
	20	14-19								

REMARKS

OPERATION 9 SV TRANSPORTATION, MATING AND R-DAY CHECKS

NOTE: Conditions necessary to start this operation:

VTP-302 Operation 8 complete. (Test Acceptance Record signed off and/or the SV released for further processing.)

ITEM

1.0 SV TRANSPORTATION AND MATING

1.1 Verify that when the SV is transported out of the test area, the environmental blankets are installed and are operating.

1.2 After the umbilical cables are connected to the SV, obtain and record the UMB-3 and UMB-4 values once every hour.

2.0 TEST PROCEDURE - 26

2.1 Verify that the GEL recorders J, K and L are properly configured and are operating.

2.2 Monitor the GEL recorders for the computer events and the G-COM verifications as per TP-26.

NOTE: The GEL recorder L shall be operated at ten (10) mm/sec. for twenty (20) to forty (40) seconds during periods when the ambient values for the CPL points are taken.

2.3 Obtain the charts from the GEL recorders and deliver to the data room. (The TME charts will be delivered to the data room from the PALC.)

2.4 Reduce the data from the charts and record as required on the data sheets.

2.5 Verify that all the data has been analyzed and that all the non-conformances and/or procedure deviations have been described on the Non-Conformance/Procedure Deviation sheet, and that the data package has been completed.

OPERATION 9 SV TRANSPORTATION, MATING AND R-DAY CHECKS F RTDS VTP-302-9

PROCEDURE PARAGRAPH REFERENCE	FUNCTION					NON-CONFORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
	DESCRIPTION	UNITS	REQUIRED		MEASURED		
			MIN.	MAX.			
1.0	SV TRANSPORTATION AND MATING						
1.1	Environmental blankets on and operating	Ck			______		
1.2	UMB-3 and UMB-4 values recorded hourly	Ck			______		
2.0	TEST PROCEDURE - 26						
2.1	GEL recorders J, K and L properly configured and operating	Ck			______		
2.2	GEL recorders monitored, G-COM verifications per TP-26	Ck			______		
2.5	Verify data package completed	Init/Date			______		

AMBIENTS

FM ____

T.P. No.________ Date________

Run No.________ Time________ DRS-VTP-302-9

Task Time	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC
	VP 46	+28 V	27-32.5 V			21	12-3			
	1	10-7				22	12-8			
	2	10-29				23	12-12			
	3	14-14				24	10-5			
	4	10-51				25	14-10			
	5	10-57				26	10-72			
	6	10-52				27	14-20			
	7	10-53				28	15-4			
	8	10-54				29	12-2			
	9	10-55				30	12-4			
	10	10-56				31	12-9			
	11	12-6				32	10-6			
	12	14-16				33	12-13			
	13	14-1				34	12-17			
	14	14-2				35	12-24			
	15	12-10				+22	15-3			
	16	14-18								
	17	14-17								
	18	12-11								
	19	14-3								
	20	14-19								

REMARKS

TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ____

DRS-VTP-302-9

F ______

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			CB1A	to CB7A	≈20v	-		0	1	1	0	1	0	1			Preset
			VP46	(+28v)	27 - 32.5v	-											Pwr. ON
			13	2-14-1	48 - 53												
			14	2-12-2	7 - 13												
			17	2-14-17	Inc.												Event 2 ON
			18	2-12-11	>40			0	0	0	1	0	0	1			(4.7 Sec.)
			19	2-14-3													
			13	2-14-1	48 - 53												Event 2 OF
			14	2-14-2	20 - 25												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												(0.3 sec).
			19	2-14-3	0 - 10												
			17	2-14-17	Inc.												Event 3 ON
			18	2-12-11	>30			0	1	1	0	1	0	1			(15.7 sec)

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TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ______

DRS-VTP-302-9

F ______

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			13	2-14-1	48 - 53												Event 3 Off
			14	2-14-2	31 - 36												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	8 - 15												SA
			17	2-14-17	Inc.												Event 4 On
			18	2-12-11	> 39			1	1	1	0	1	1	1			(5 Sec)
			13	2-14-1	86 - 92												Event 4 Off
			14	2-14-2	42 - 47												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			25	2-14-10	18 - 22												
			29	2-12-2	<70												For Events 2-4
			12	2-14-16	30 - 37			Trans. Time (3 Sec Max)									SB
			VP46	(+28v)	0	--											Pwr. Off

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TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ______

F ______ DRS-VTP-302-9

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2/3-14-17	Inc.												Event 15 On
			18	2/3-12-1	>39			0	1	0	1	1	0	1			(7.0 Sec)
			13	2/3-14-1	86 - 92												Event 15 Off
			14	2/3-14-2	42 - 47												
			17	2/3-14-17	Dec.												
			18	2/3-12-1	0 - 20												(40 Sec)
			12	2/3-14-16	50 - 57			Trans. Time (3 Sec Max)									SC
			17	2/3-14-17	Inc.												Event 16 On
			18	2/3-12-1	>40			1	0	1	0	0	1	1			(5.5 Sec)
			13	2/3-14-1	7 - 13			Trans. Time (4 Sec Max)									Event 16 Off
			14	2/3-14-2	42 - 47												
			17	2/3-14-17	Dec.												
			18	2/3-12-1	0 - 20			1	0	1	0	0	1	0			(11.4 Sec)

TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ______

F ______ DRS-VTP-302-9

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2/3-14-17	Inc.												Event 17 On
			18	2/3-12-11	>40												(5.5 Sec)
			13	2/3-14-1	86 - 92			Trans. Time (4 Sec Max)___									Event 17 Off
			14	2/3-14-2	53 - 58												
			17	2/3-14-17	Dec.												
			18	2/3-12-11	0 - 20												
			12	2/3-14-16	70 - 78			Trans. Time (3 Sec Max)___									SD
			17	2-14-17	Inc.												Event 7 On
			18	2-12-11	>35			1	0	0	1	0	1	1			(4.0 Sec)
			13	2-14-1	7 - 13			Trans. Time (4 Sec Max)___									Event 7 Off
			14	2-14-2	53 - 58												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												(17 Sec)

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TP No.__________ Date __________ Page ____ of ____

Test Run No.__________ Chart Ident.__________ Time of Test ______

F ______ DRS-VTP-302-9

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2-14-17	Inc.												Event 8 On
			18	2-12-11	>35			1	0	0	1	0	1	1			(4.0 Sec)
			13	2-14-1	86 - 92			Trans. Time (4 Sec Max)____									Event 8 Off
			14	2-14-2	64 - 70												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	8 - 15			Trans. Time (7 Sec Max)____									SA
			17	2-14-17	Inc												Event 9 On
			18	2-12-11	>40			1	0	1	1	1	0	1			(4.7 Sec)
			13	2-14-1	7 - 13			Trans. Time (4 Sec Max)____									Event 9 Off
			14	2-14-2	64 - 70												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20			0	1	0	0	0	1	0			(9.0 Sec)

TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ____

DRS-VTP-302-9

F ______

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2-14-17	Inc.												Event 10 On
			18	2-12-11	>39												(4.7 Sec)
			13	2-14-1	48 - 53												Event 10 Of
			14	2-14-2	76 - 81												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	50 - 57			Trans. Time (5 Sec Max)____									SC
			17	2-14-17	Inc.												Event 11 On
			18	2-12-11	>30			1	1	0	1	1	1	1			(4.7 Sec)
			13	2-14-1	48 - 53												Event 11 Off
			14	2-14-2	87 - 93												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												(0.3 Sec)

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TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ____

F ______ DRS-VTP-302-9

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2-14-17	Cont. Slope												Event 12 On
			18	2-12-11	>35			0	0	1	0	0	0	1			(6.0 Sec)
			13	2-14-1	48 - 53												Event 12 Off
			14	2-14-2	7 - 13			Trans. Time (8 Sec Max)____									
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	70 - 78			Trans. Time (3 Sec Max)____									SD
			12	2-14-16	8 - 15			Trans. Time (7 Sec Max)____									SA

FM ____

T.P. No.________ Date________ Page 10 of 10

Run No.________ Time________ DRS-VTP-302-

Task Time	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC
	VP 46	+28 V	27-32.5 V			21	12-3			
	1	10-7				22	12-8			
	2	10-29				23	12-12			
	3	14-14				24	10-5			
	4	10-51				25	14-10			
	5	10-57				26	10-72			
	6	10-52				27	14-20			
	7	10-53				28	15-4			
	8	10-54				29	12-2			
	9	10-55				30	12-4			
	10	10-56				31	12-9			
	11	12-6				32	10-6			
	12	14-16				33	12-13			
	13	14-1				34	12-17			
	14	14-2				35	12-24			
	15	12-10				+22	15-3			
	16	14-18								
	17	14-17								
	18	12-11								
	19	14-3								
	20	14-19								

REMARKS

OPERATION 10 AMBIENT CHECKS

NOTE: Conditions necessary to start this operation:

VTP-302 Operation 9 complete. (The Test Acceptance Record signed off and/or the SV released for further processing.)

ITEM

1.0 PREPARATION

1.1 Check with the associate test conductor(s) to obtain the times at which the ambient checks will be run. (Usually the periods between runs vary from four (4) to twelve (12) hours.)

1.2 Obtain and record the UMB-3 and UMB-4 values once every hour.

2.0 AMBIENT CHECKS

2.1 Verify that prior to each ambient check, the GEL recorders J, K and L are properly configured and are operating.

2.2 Monitor the GEL recorders for the computer events and the G-COM verifications as per TP-26, Task 7.

NOTE: The GEL recorder L shall be operated at ten (10) mm/sec. for twenty (20) to forty (40) seconds during periods when the ambient values for the CPL points are taken.

2.3 Obtain the charts from the GEL recorders and deliver to the data room.

2.4 Reduce the data from the charts and record as required on the data sheets.

NOTE: During the final twenty-four (24) hours before launch the C/P temperature levels must be established by the flight heater control systems of the C/P.

PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
1.0	<u>PREPARATION</u>						
1.1	Frequency and/or times for the ambient runs obtained	Ck			____		
1.2	UMB-3 and UMB-4 values recorded hourly	Ck			____		
2.0	<u>AMBIENT CHECKS</u>						
2.1	GEL recorders J, K and L properly configured and operating	Ck			____		
2.2	GEL recorders monitored, G-COM verifications per TP-26, Task 7	Ck			____		
2.4	Data recorded as required on the data sheets	Init/ Date			____		

THERMAL CONDITIONS DATA SHEET

RTDS 302-10

SHEET NO. D10-2

FN# ____

DATE	TIME	K ∿ UMB-3	°F UMB-3	K ∿ UMB-4	°F UMB-4		AMBIENT TEMP	R.H.	DEW POINT	REMARKS

F TLM CORRE(:D VALUES DRS VTP 302-10

DATE TIME		CPL 4	CPL 7	CPL 8	CPL 9	CPL 11	AVERAGE	CPL 5	CPL 6	AVERAGE	BBT 3	BBT 4	AVERAGE	CP TEMP	Correc CD (%)
	%														
	T														
	%														
	T														
	%														
	T														
	%														
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OPERATION 11 TERMINAL COUNTDOWN

NOTE: Conditions necessary to start this operation:

VTP-302 Operation 9 complete. (Test Acceptance Record signed off and/or the SV released for further processing.)

All C/P temperature instrumentation has indicated that the C/P temperature levels have been established by the flight heater control systems over a period of twenty-four (24) hours from the scheduled launch time.

ITEM

1.0 TEST PROCEDURE - 24

1.1 Verify that the GEL recorders J, K and L are properly configured and are operating.

1.2 Obtain, record and plot the UMB-3 and UMB-4 values every thirty (30) minutes until T-6 minutes.

1.3 Monitor the GEL recorders for the computer events and the G-COM verifications as per TP-24 through task 5.

NOTE: The GEL recorder L shall be operated at ten (10) mm/sec. for twenty (20) to forty (40) seconds during periods when the ambient values for the CPL points are taken.

1.4 Obtain the charts from the GEL recorders and deliver to the data room. (The TME charts will be delivered to the data room from the PALC.)

1.5 Reduce the data from the charts and record as required on the data sheets.

1.6 Analyze the data and verify that the computer is in a "GO" condition.

1.7 Fill out the VAFB Prelaunch and Launch Data Sheets and report this information to the STC personnel upon request.

1.8 Monitor the GEL recorders for the computer events and the G-COM verifications as required throughout the remaining tasks of TP-24.

ITEM

1.9 After the ambient check following the flight mirror position event in task 19, verify that all the TM values meet the requirements listed in the data sheets.

1.10 Record the final ambient TM values on the ambient data sheet.

1.11 Obtain and record the UMB-1, UMB-2, UMB-5 and UMB-6 values and/or status indications each minute from T-6 minutes to launch on the data sheet provided.

1.12 Monitor the GEL recorders on through launch and as long as the TM is available.

1.13 Obtain the charts from the GEL recorders and deliver to the data room.

1.14 Reduce the data from the charts and record as required on the data sheets.

1.15 Verify that all the data has been analyzed and that all the non-conformances and/or procedure deviations have been described on the Non-Conformance/Procedure Deviation sheet and that the data package has been completed.

PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
1.0	TEST PROCEDURE - 24						
1.1	GEL recorders J, K and L properly configured and operating	Ck			___		
1.2	UMB-3 and UMB-4 values recorded and plotted every thirty (30) minutes until T-6 minutes	Ck			___		
1.3	GEL recorders monitored, G-COM verifications per TP-24 through task 5	Ck			___		
1.6	Data analyzed, computer "GO"	Ck			___		
1.7	VAFB Prelaunch and Launch data sheets filled out	Ck			___		
	Information reported to STC personnel (if requested)	Ck			___		
1.8	GEL recorders monitored, G-COM verifications per remaining tasks of TP-24	Ck			___		
1.9	TM values meet requirements listed in the data sheets	Ck			___		

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PROCEDURE PARAGRAPH REFERENCE	FUNCTION: DESCRIPTION	UNITS	REQUIRED MIN.	REQUIRED MAX.	MEASURED	NON-CON-FORMANCE REFERENCE	PROCEDURE DEVIATION REFERENCE
1.10	Ambient TM values recorded	Ck			______		
1.11	UMB-1, UMB-2, UMB-5 and UMB-6 values and/or status indications recorded each minute from T-6 minutes until launch	Ck			______		
1.12	GEL recorders monitored until TM is unavailable	Ck			______		
1.15	Verify data package completed	Init/Date			______		

FM ____

AMBIENTS

T.P. No.________ Date________

Run No.________ Time________ DRS-VTP-302-

Task Time	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC
	VP 46	+28 V	27-32.5 V			21	12-3			
	1	10-7				22	12-8			
	2	10-29				23	12-12			
	3	14-14				24	10-5			
	4	10-51				25	14-10			
	5	10-57				26	10-72			
	6	10-52				27	14-20			
	7	10-53				28	15-4			
	8	10-54				29	12-2			
	9.	10-55				30	12-4			
	10	10-56				31	12-9			
	11	12-6				32	10-6			
	12	14-16				33	12-13			
	13	14-1				34	12-17			
	14	14-2				35	12-24			
	15	12-10				+22	15-3			
	16	14-18								
	17	14-17								
	18	12-11								
	19	14-3								
	20	14-19								

REMARKS

TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ____

DRS-VTP-302-11

F ________

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			CB1A	to CB7A	≈20v	-		0	1	1	0	1	0	1			Preset
			VP46	(+28v)	27 - 32.5v	-											Pwr. ON
			13	2-14-1	48 - 53												
			14	2-12-2	7 - 13												
			17	2-14-17	Inc.												Event 2 ON
			18	2-12-11	>40			0	0	0	1	0	0	1			(4.7 Sec.)
			19	2-14-3													
			13	2-14-1	48 - 53												Event 2 OFF
			14	2-14-2	20 - 25												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												(0.3 sec).
			19	2-14-3	0 - 10												
			17	2-14-17	Inc.												Event 3 ON
			18	2-12-11	>30			0	1	1	0	1	0	1			(15.7 sec)

TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ______

DRS-VTP-302-11

F ______

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			13	2-14-1	48 - 53												Event 3 Off
			14	2-14-2	31 - 36												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	8 - 15												SA
			17	2-14-17	Inc.												Event 4 On
			18	2-12-11	> 39			1	1	1	0	1	1	1			(5 Sec)
			13	2-14-1	86 - 92												Event 4 Off
			14	2-14-2	42 - 47												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			25	2-14-10	18 - 22												
			29	2-12-2	< 70												For Events 2-4
			12	2-14-16	30 - 37			Trans. Time (3 Sec Max)									SB
			VP46	(+28v)	0	--											Pwr. Off

TP No.__________ Date ______ Page ___ of ___

Test Run No.______ Chart Ident.______ Time of Test _____

DRS-VTP-302- 11

F _____

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2/3-14-17	Inc.												Event 15 On
			18	2/3-12-11	>39			0	1	0	1	1	0	1			(7.0 Sec)
			13	2/3-14-1	86 - 92												Event 15 Off
			14	2/3-14-2	42 - 47												
			17	2/3-14-17	Dec.												
			18	2/3-12-11	0 - 20												(40 Sec)
			12	2/3-14-16	50 - 57			Trans. Time (3 Sec Max)									SC
			17	2/3-14-17	Inc.												Event 16 On
			18	2/3-12-11	>40			1	0	1	0	0	1	1			(5.5 Sec)
			13	2/3-14-1	7 - 13			Trans. Time (4 Sec Max)									Event 16 Off
			14	2/3-14-2	42 - 47												
			17	2/3-14-17	Dec.												
			18	2/3-12-11	0 - 20			1	0	1	0	0	1	0			(11.4 Sec)

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Approved for Release: 2024/01/30 C05098942

TP No. ____________ Date ____________ Page ____ of ____

Test Run No. ____________ Chart Ident. ____________ Time of Test ____

DRS-VTP-302- 11

F ______

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2/3-14-17	Inc.												Event 17 On
			18	2/3-12-11	>40												(5.5 Sec)
			13	2/3-14-1	86 - 92			Trans. Time (4 Sec Max)___									Event 17 Off
			14	2/3-14-2	53 - 58												
			17	2/3-14-17	Dec.												
			18	2/3-12-11	0 - 20												
			12	2/3-14-16	70 - 78			Trans. Time (3 Sec Max)___									SD
			17	2-14-17	Inc.												Event 7 On
			18	2-12-11	>35			1	0	0	1	0	1	1			(4.0 Sec)
			13	2-14-1	7 - 13			Trans. Time (4 Sec Max)___									Event 7 Off
			14	2-14-2	53 - 58												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												(17 Sec)

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TP No.________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ____

F ____ DRS-VTP-302-11

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2-14-17	Inc.												Event 8 On
			18	2-12-11	>35			1	0	0	1	0	1	1			(4.0 Sec)
			13	2-14-1	86 - 92			Trans. Time (4 Sec Max)____									Event 8 Off
			14	2-14-2	64 - 70												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	8 - 15			Trans. Time (7 Sec Max)____									SA
			17	2-14-17	Inc												Event 9 On
			18	2-12-11	>40			1	0	1	1	1	0	1			(4.7 Sec)
			13	2-14-1	7 - 13			Trans. Time (4 Sec Max)____									Event 9 Off
			14	2-14-2	64 - 70												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20			0	1	0	0	0	1	0			(9.0 Sec)

TP No.__________ Date ________ Page ____ of ____

Test Run No.________ Chart Ident.________ Time of Test ______

F ______ DRS-VTP-302-11

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2-14-17	Inc.												Event 10 On
			18	2-12-11	>39												(4.7 Sec)
			13	2-14-1	48 - 53												Event 10 Off
			14	2-14-2	76 - 81												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	50 - 57			Trans. Time (5 Sec Max)___									SC
			17	2-14-17	Inc.												Event 11 On
			18	2-12-11	>30			1	1	0	1	1	1	1			(4.7 Sec)
			13	2-14-1	48 - 53												Event 11 Off
			14	2-14-2	87 - 93												
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												(0.3 Sec)

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TP No.______ Date ______ Page ___ of ___

Test Run No.______ Chart Ident.______ Time of Test ______

F ______ DRS-VTP-302-11

Task & Item No.	Time Prgm.	Time Actual	CPL No.	Link Channel Pin	Expected Value ± 5%	Actual Value TLM	Actual Value HMC	Command Bits 1	2	3	4	5	6	7	MSD TIME ON	MSD TIME OFF	Remarks
			17	2-14-17	Cont. Slope												Event 12 On
			18	2-12-11	>35			0	0	1	0	0	0	1			(6.0 Sec)
			13	2-14-1	48 - 53												Event 12 Off
			14	2-14-2	7 - 13			Trans. Time (8 Sec Max)___									
			17	2-14-17	Dec.												
			18	2-12-11	0 - 20												
			12	2-14-16	70 - 78			Trans. Time (3 Sec Max)___									SD
			12	2-14-16	8 - 15			Trans. Time (7 Sec Max)___									SA

FM ____

T.P. No.________ Date________

Run No.________ Time________ DRS-VTP-302-11

Task Time	CPL No.	Channel and Pin	Expected Value ± 5%	Actual TLM	Value HMC	CPL No.	Channel and Pin	Expected Value ± 5%	Actual TLM	Value HMC
	VP 46	+28 V	27-32.5 V			21	12-3			
	1	10-7				22	12-8			
	2	10-29				23	12-12			
	3	14-14				24	10-5			
	4	10-51				25	14-10			
	5	10-57				26	10-72			
	6	10-52				27	14-20			
	7	10-53				28	15-4			
	8	10-54				29	12-2			
	9	10-55				30	12-4			
	10	10-56				31	12-9			
	11	12-6				32	10-6			
	12	14-16				33	12-13			
	13	14-1				34	12-17			
	14	14-2				35	12-24			
	15	12-10				+22	15-3			
	16	14-18								
	17	14-17								
	18	12-11								
	19	14-3								
	20	14-19								

REMARKS

FM ____

T.P. No.______ Date______ Page 12 of 18

Run No.______ Time______ DRS-VTP-302-11

Task Time	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	HMC	CPL No.	Channel and Pin	Expected Value ± 5%	Actual Value TLM	HMC
	VP 46	+28 V	27-32.5 V			21	12-3			
	1	10-7				22	12-8			
	2	10-29				23	12-12			
	3	14-14				24	10-5			
	4	10-51				25	14-10			
	5	10-57				26	10-72			
	6	10-52				27	14-20			
	7	10-53				28	15-4			
	8	10-54				29	12-2			
	9	10-55				30	12-4			
	10	10-56				31	12-9			
	11	12-6				32	10-6			
	12	14-16				33	12-13			
	13	14-1				34	12-17			
	14	14-2				35	12-24			
	15	12-10				+22	15-3			
	16	14-18								
	17	14-17								
	18	12-11								
	19	14-3								
	20	14-19								

REMARKS

F ______

DRS VTP-302-11

VAFB PRELAUNCH AND LAUNCH DATA

I. Telephone Numbers

805-866-1611 . VAFB Operator
866-8675 Office Area
866-8675 Data Reduction Area
866-9605 If no answer from above number
[redacted] (home)

II. Launch Minus 3.0 Hours

A. Call VAFB and obtain answers to the following questions and record in the space provided:

1. Are there any known differences between the vehicle calibration and its associated published calibration book? ______________
____
____

2. Are there any known problems or potential problem areas? ______
____
____

3. Anticipated status at launch:

a) Take-up Quantity ______________
b) Supply Quantity ______________
c) MSD Speed (not "Pad load") ______________
d) Take-up Weight ______________
e) Supply Weight ______________
f) Crab Position ______________
g) Stereo Position ______________
h) Slit Position ______________

4. To determine the telemetry bias on absolute temperature points use the following table:

Period Prior to Launch	(1) Kilohms	BBT 3 °F	(2) %	CPL 4 °F	(3) Kilohms	BBT 4 °F	(4) %	CPL 11 °F
2200								
2300								
2400								
0100								
0200								
0300								
0400								
0500								
0600								
0700								
0800								
0900								
1000								
1100								
1200								
1300								

Offset No. 1 (Avg (1) - Avg (2) =

Offset No. 2 (Avg (3) - Avg (4) =

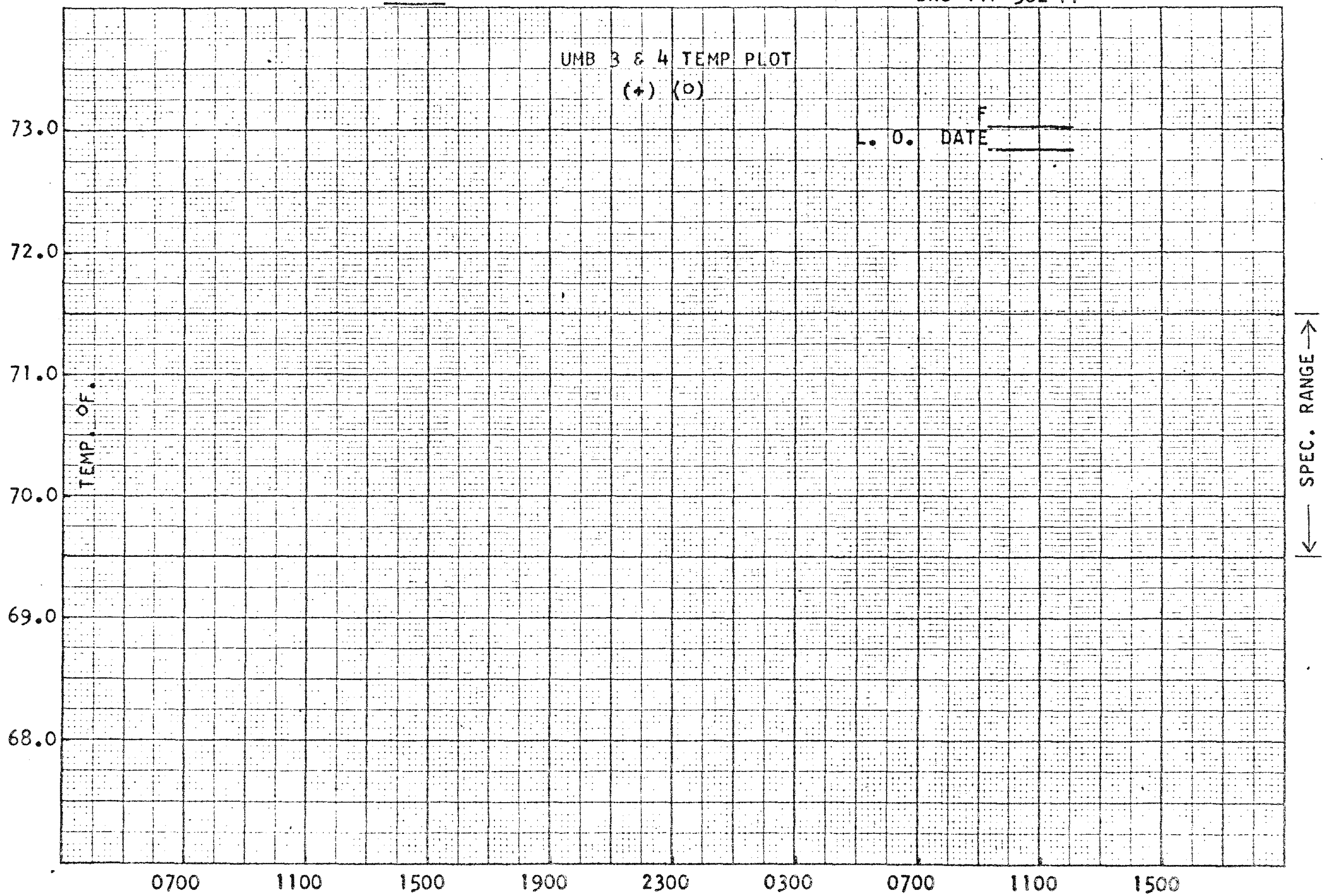
NOTE: Add offset No. 1 to telemetered values of CPL's 4, 6, 7, 8, 9 and 10.

Add offset No. 2 to telemetered values of CPL's 2 and 11.

PL	CHAN-PIN	ITEM	Task 5 % FULL SCALE * (Corrected)	*	Task 19 % FULL SCALE * (Corrected)	*
1	10-7	CB 12 Monitor				
2	10-29	Forward Record Storage Temp.				
	15-17					
3	14-14	Stereo Mirror				
4	10-51	Stereo Mirror Temp.				
5	10-57	Lens Barrel				
6	10-52	45° Temp.				
7	10-53	CST, -Y Sta. 149 Temp.				
8	10-54	CST, -Y Sta. 179 Temp.				
9	10-55	CST, -Y. Sta. 198 Temp.				
10	10-56	Temperature Instrumentation Reference Voltage				
11	12-6	CST, -Z Sta. 179 Temp.				
12	14-16	Slit Position				
13	14-1	Stereo Position				
14	14-2	Crab Position				
15	12-10	Film Qty., Coarse/Reel Rotation				
16	14-18	Film Qty., Fine				
17	14-17	Looper Position				
18	12-11	MSD Electronics				
19	14-3	Amplified Data Signals				
20	14-19	Platen Pos. Coarse				
21	12-3	Focus Output				
	12-18					
22	12-8	Focus Forward				

CPL	CHAN-PIN	ITEM	Task 5 % FULL SCALE * (Corrected)	*	Task 19 % FULL SCALE *(Corrected)	*
23	12-12	Focus Reverse				
24	10-5	CB 10 Monitor				
25	14-10	Port Stoolie				
26	10-72	Environmental Power Supply				
	15-9					
27	14-20	Platen Pos. Fine				
28	15-4	Film Qty., Medium				
29	12-2	Take-up Motor Current				
30	12-4	CB 8 Monitor				
31	12-9	CB 9 Monitor				
32	10-6	CB 11 Monitor				
33	12-13	Elevation Servo				
34	12-17	Azimuth Servo				
35	12-24	28 Volt Supply				
	15-3	22 Volt Supply				
	10-19					

F ____   DRS VTP-302-11



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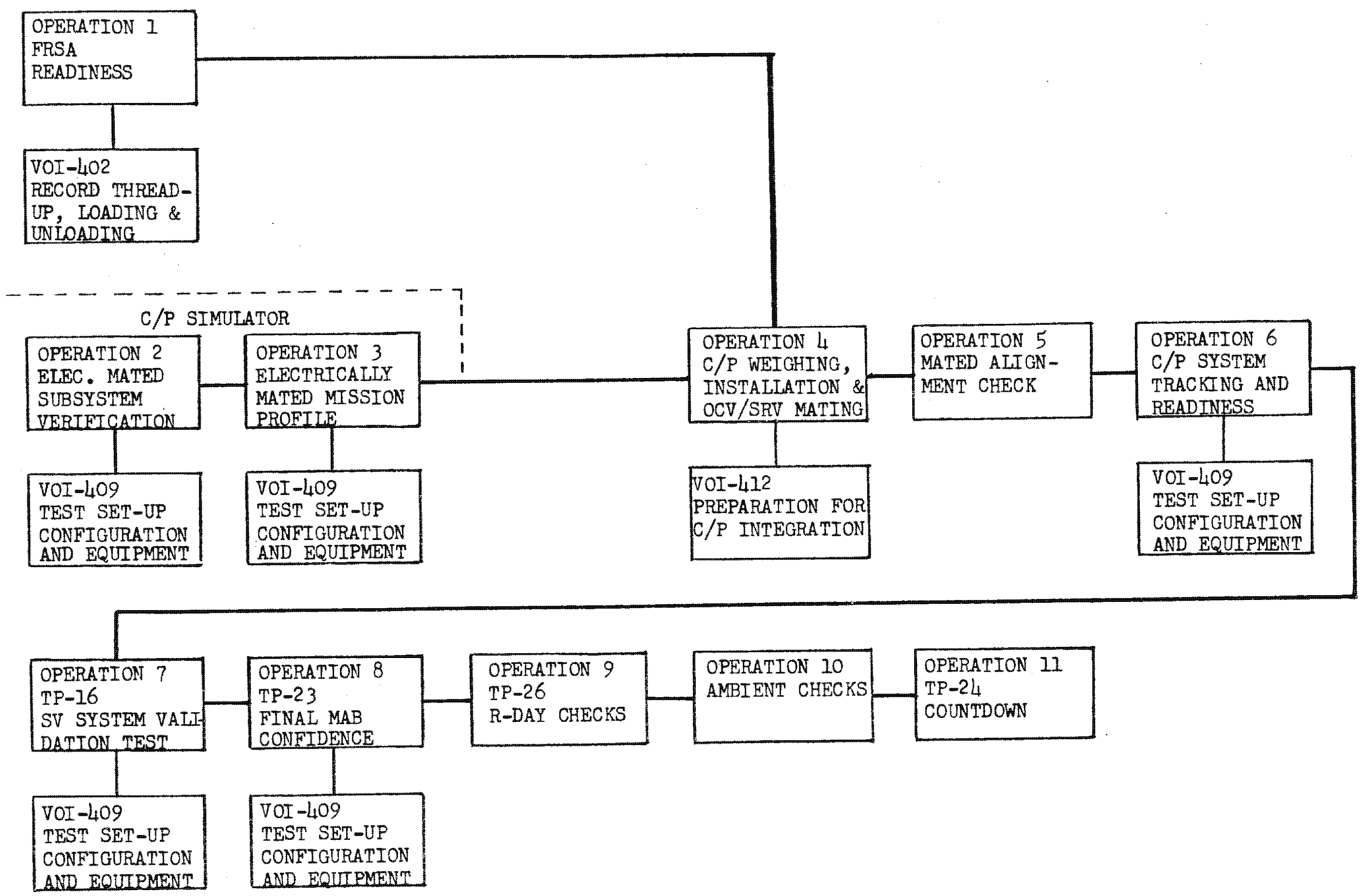
VTP-302-11

D11-18

	UMB-1 ≈2.0v	UMB-2	UMB-5 26-33.4	UMB-6 "Go"	
6 MIN.					
5 MIN.					
4 MIN.					
3 MIN.					
2 MIN.					
1 MIN.					

FM- ______

SYSTEMS FLOW PLAN



APPENDIX 8

PAYLOAD VALIDATION LOG

V. Vinkey

R-300778-KH-009

VALIDATION LOG

FM- 239/988

Tests and Data Evaluation

by

Field Engineering

EASTMAN KODAK COMPANY

Vandenberg Air Force Base

California

Prepared by: S. F. Casper

Reviewed by: R Bishitbrider

Reviewed by: R Jeeman

Approved by: G. R. Poore

RBR

TABLE OF CONTENTS

C/P Validation Log

FM- 239/988

The C/P, FM-239, has been tested in accordance with the following procedures:

VTP-301 Subsystem Test Procedure, Revision F:

Task 1 Continuity and Wiring Verification
Task 2 Alignment of FRSA to Supply Cassette
Task 3 Line of Sight
Task 4 Test Record Installation and Tracking and Slit Evaluation
Task 5 Focus Series
Task 6 MSD Frequency and Port Open Telltale
Task 7 Focus Control Checkout
Task 8 Heater Operation
Task 9 Photo Validation
Task 10 Slit Evaluation
Task 11 FRSA Checkout
Task 12 Flight Record Loading and Hardware Installation
Task 13 Flight Record Photographic Validation and Slit Evaluation
Task 14 Final C/P Preparations for Mating

SET 46 Elevation and Azimuth Servo Replacement
SET 53 Record Transport Control Module Replacement
ETR 71 5 volt Instrumentation Checkout
ETR 72 Distribution Box Checkout (Fuse Assembly Replacement)
ETR 73 Roller and Base Assembly Replacement
ETR 75 Record Transport Looper System Checkout

VTP-302 System Test Procedure

Operation 4 Systems Preparation
Operation 5 Alignment Check
Operation 6 System Tracking and Readiness

TP-16, Rev. **AD**	Issued	**6 Mar 67**	SV Systems Validation
TP-23, Rev. **AC**	Issued	**23 Feb 67**	SV Confidence
TP-26, Rev. **G**	Issued	**7 Apr 67**	R-2 Day Check
TP-24, Rev. **1**	Issued	**2 Jun 67**	Countdown

FM-239 Subsystem Summary

The Camera Payload arrived at VAFB on 11 February 1967.

Fight modifications were made to up-date the payload for Flight. KVM 238, 242, and 249 were Elevation and Azimuth Servo replacements. A special engineering test (SET 46) was performed to validate each up-dated servo. KVM-248 was performed to epoxy the screwheads of the encoder nameplate located in both the Elevation and Azimuth servos. Engineering test requests (ETR-71 and 72) were run to evaluate a loss in 5 volt instrumentation voltage. KVM 236 was performed to replace the 5 volt instrumentation fuse (F-5) which had blown. KVM-237 was performed to replace the Roller and Base Assembly. ETR-73 validated the replacement. KVM-250 was performed to replace the left hand Connector Rod Assembly. KVM-251 was performed to replace the Record Transport Control Module. SET-53 validated the RTCM replacement.

Waivers generated as a result of subsystem testing were as follows:

1. Fuse F-5 (5 volt instrumentation voltage) blown. (KV-182)

2. MSD period count below specification for speeds 55 and 64. (KV-183)

3. Reference mirror readings out of specification. (KV-191)

All tasks, 1-14, inclusive, of VTP-301, Rev. F, Subsystem Test Procedure were performed and verified that the payload was acceptable for mating with the GE vehicle.

Best Photographic Focus, biased for flight, was established at 2.250 VDC for CPL-20.

The following readings are Geometric Mean Resolution values (1/mm) obtained during the C/P Photo Validation Test, VTP-301, Task 9 at:

Speed	31
Slit	B
Temperature	70.27°F
CPL-20	2.125 VDC

On Axis	+.5°	-.5°
151	131	124

The following readings are Geometric Mean Resolution values (1/mm obtained during Flight Record Photo Validation Test, VTP-301, Task 13 at:

Temperature	70.07°F
CPL-20	2.125 VDC
Can #16	

Slit Position	G. M.
B	136
C	139
D	116

The C/P was prepared for mating with GE (SV988) on 24 May 1967.

FM-239 Systems Summary

Flight Record, Can #16, was loaded into the C/P on 22 May 1967.

The Payload, FM-239, and the vehicle #988 were mated on 24 May 1967. One waiver (KV-190) was written to reorient the OCV Dust Shield "B" Zipper Assembly. This was done so that it would be compatible with the C/P Dust Shield "A" Zipper Assembly which was received with the Dust Shield Fastener incorrectly oriented to the Aluminized Glass Fabric of the Zipper Assembly.

Operation 5 (System Alignment) was successfully completed on 25 May 1967.

Operation 6 (Tracking and Readiness) was started on 26 May 1967. ETR 75 was initiated in order to evaluate an anomaly on the Record Transport Looper System. In particular, the looper carriage would actuate the looper empty switch and then drift back allowing the take-up motor to restart. The anomaly occurred only with the Y Axis horizontal. It was theorized that the anomaly was due to the effects of gravity and inertia on the looper carriage assembly. A waiver (KV-192) was written to accept.

SV System Validation Test, TP-16, was completed on 27 May 1967.

MAB Confidence Test, TP-23, was completed on 1 June 1967. ER-19 was run to check an Associates anomaly.

B-Day check, TP-26, was completed on 2 June 1967. ER-20 was run to check an Associates anomaly.

Countdown Procedure, TP-24, was started at 0245 P.D.T., 4 June 1967. The procedure was completed and liftoff occurred at 1104 P.D.T.

SUMMARY OF [illegible]

C/F FM 39 Sheet No. 1

	Date	Test or Function Performed No.	Title or Description	Discrepancy, Failure or Variation No.	Description	Record Used Feet/Accum.	[illegible]
	12-8-66		RCVD FROM [illegible]				
	12-13	301-1	FRSA C/O.				
	2-11-67		RCVD C/P SHIPMENT				
-1500	2-28-67	301-1	[illegible] C/O				
-2030		301-2	[illegible]		CAM # 229	220.5	1200 + 1000
-1015	3-2-67	[illegible]	[illegible]				
-1430		301-4-1	[illegible]				
	3-4-67	301-5-1	PHOTO		5 VOLT [illegible] DIST BOX [illegible]	175 [illegible]	N/G TOO DARK.
-0030	3-7-67	ETR 91R	SP CK 5V INST CIRCUIT			612	
	3-9-67	ETR-72	DIST BOX C/O	KVM 239	REPLACED FUSE		(301-8 [illegible])
	3-13		REPLACED SERVOS	KVM 238	SERVOS INSTALLED		
	3-13		REPLACED ROLLER ASSY	KVM 237	EKU [illegible] (Roller & BASE Assy)		
-1300	3-15	Set 46-1	COMPLETE [illegible] R/O			65.[illegible]	
-2300	3-15	302-3	TE 41				
0800	3-17	ETR-73	[illegible] CAL [illegible] 16-28			1046'	
	3-20	301-4-2	LOAD [illegible]		CAM # 170	15.4	[illegible] TOTAL [illegible]
-1515	3-23	301-5-1-2	FOCUS 0 ± 1 [illegible] 70.5			400.2	
-0800	3-24	301-5-3	FOCUS (+1½ [illegible]) 72.5			163.3'	
-1515	3-28	301-5-4	FOCUS (-1½ [illegible]) 68.5				
	4-5						
-1000	4-7		Replace Elev Servo	KVM 242	Servo Replacement		
-1000	4-18		Replace Az Servo	"	" "		
-1420	4-21	SET 46-2	Servo C/O				
-1500	4-24	301/5-5	FOCUS CK (post servo [illegible])			134.8'	
-2000	4-26	301-7	GAIN			28.6'	
-0930	4-27		EXPOSURE SERIES			123.0'	

SUMMARY OF [illegible]

C/P FM 39 Sheet No. 2

	Date	Test or Function Performed No.	Title or Description	Discrepancy, Failure or Variation No.	Description	Record Used Test/Accum.	Remarks (Days in Area)
-1645	4/27	301-9	[illegible]			30.5'	
	4/27		C/P off Collimator				
-1035	4-28	301-6	MCD			60.2	
	5-18	302-3-3	TP-[illegible]-3				
-2200		Set 46-3	Servo C/O	KV191	Reference Mirror out of Spec	[illegible]	
	5-20	301-8	[illegible] CK				
-0800		[illegible]-53	[illegible] C/O				
-1430		301-12	[illegible]			[illegible]	[illegible]
-1100	5/23	301-13	Flight [illegible]			66.0'	
-0230		301-7-2				40.3'	
-1130		[illegible]-14	Prep [illegible] Mate				
-1430	5/24	302-4	MATE CP-OCV				
				KV190	Dust Shield Assy "A"		
2200			MATE Sec V&VI				
-1730	5/25		MATE Sec IV&V				
	5/25	302-[illegible]	[illegible]				
		302-[illegible]	[illegible]				
-1830	5/26	302-6	[illegible]			179.5	Looper Bounces.
-1900	5/27	302-7	TP-16-1 E2			39.6	
-1200	6-1-67	302-8	TP-23			19.2	
-1[illegible]	6-2-67	302-9-1	TP-[illegible]		[illegible]	18.6	
-2300	6-2-67	302-9-2	TP-2[illegible] [illegible]			17.2	
-1015	[illegible]	302-9-3	TP-26 [illegible]		I/O Pulled [illegible] (EA-20)	13.1	Assoc. Prism
-2400	6-3	302-10	[illegible]				
0440	6-4	302-11	TP 24		CPL-20 - 49% CPL-15 44% CPL-16 88%	13.1	
-1107	6-4	EP-24	LIFT OFF		CPL-27 25% CPL-28 30%		

Date: 3-2-67

C/P No. 239

VTP-301 Subsystem Test Procedure

Task 1 Continuity and Wiring Verification

This task was performed according to procedure.

The following non-conformances and/or deviations were encountered:

None.

The test sequence was continued.

Date: 3-2-67

C/P No. FM-239

VTP-301 Subsystem Test Procedure

Task 2 Alignment of Test FRSA to Supply Cassette

This task was performed according to procedure.

The C/P was leveled by using the Supply Alignment Jig levels.

The theodolite was set up by using the mirrors of the Supply Alignment Jig. The Test FRSA was adjusted by autocollimating, using the preset theodolite.

The following non-conformances and/or deviations were encountered:

None.

The test sequence was continued.

Date: 3-3-67
5-19-67

C/P No. 239

VTP-301 Subsystem Test Procedure

Task 3 Line of Sight

This task was performed according to procedure.

The position data is plotted on the accompanying sheets. The transition time data is in the table below:

Elevation Servo

Position	Time (Sec.)	SET 46 Time (Sec.)
1-3		3.35
3-1		3.30

Azimuth Servo

Position	Time (Sec.)	
1-8	6.7	5.6
8-1	6.3	5.6

Slide Servo

Position	Time (Sec.)
1-2	2.00
2-3	2.15
3-4	2.05
1-3	4.05
1-4	6.00
2-4	4.00

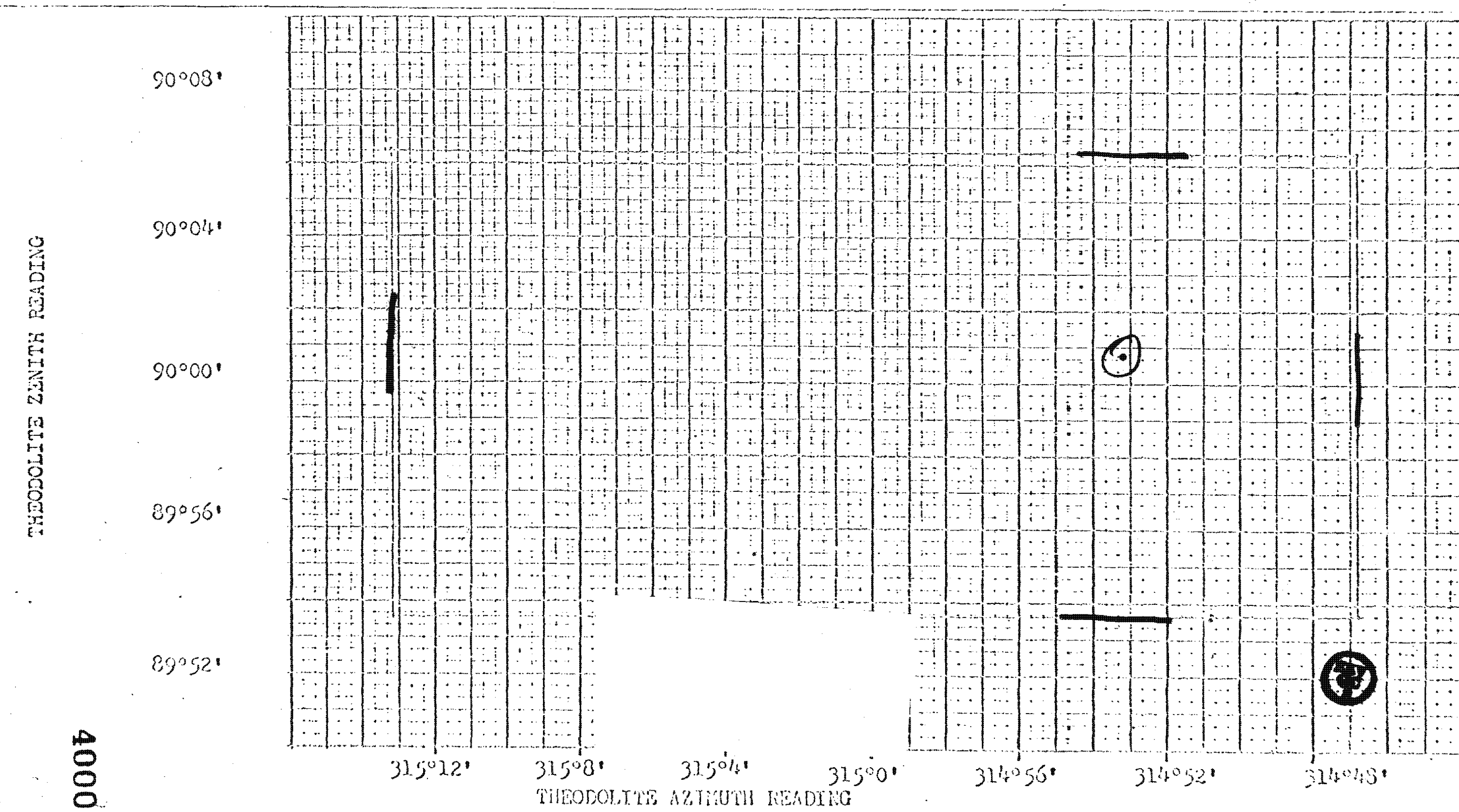
The following non-conformances and/or deviations were encountered: **Reference Mirror was determined to be out of spec and unadjustable. Refer to waiver 191.**

The test sequence was continued.

DATA SHEET
FOR
ACCEPTANCE TEST PROCEDURE: 804-104
LINE OF SIGHT POSITIONS

Assy Dwg. No. 805-101
Assy Ser.No.
Date

Elevation Servo at 0 ° Azimuth Servo at +0 °



4000

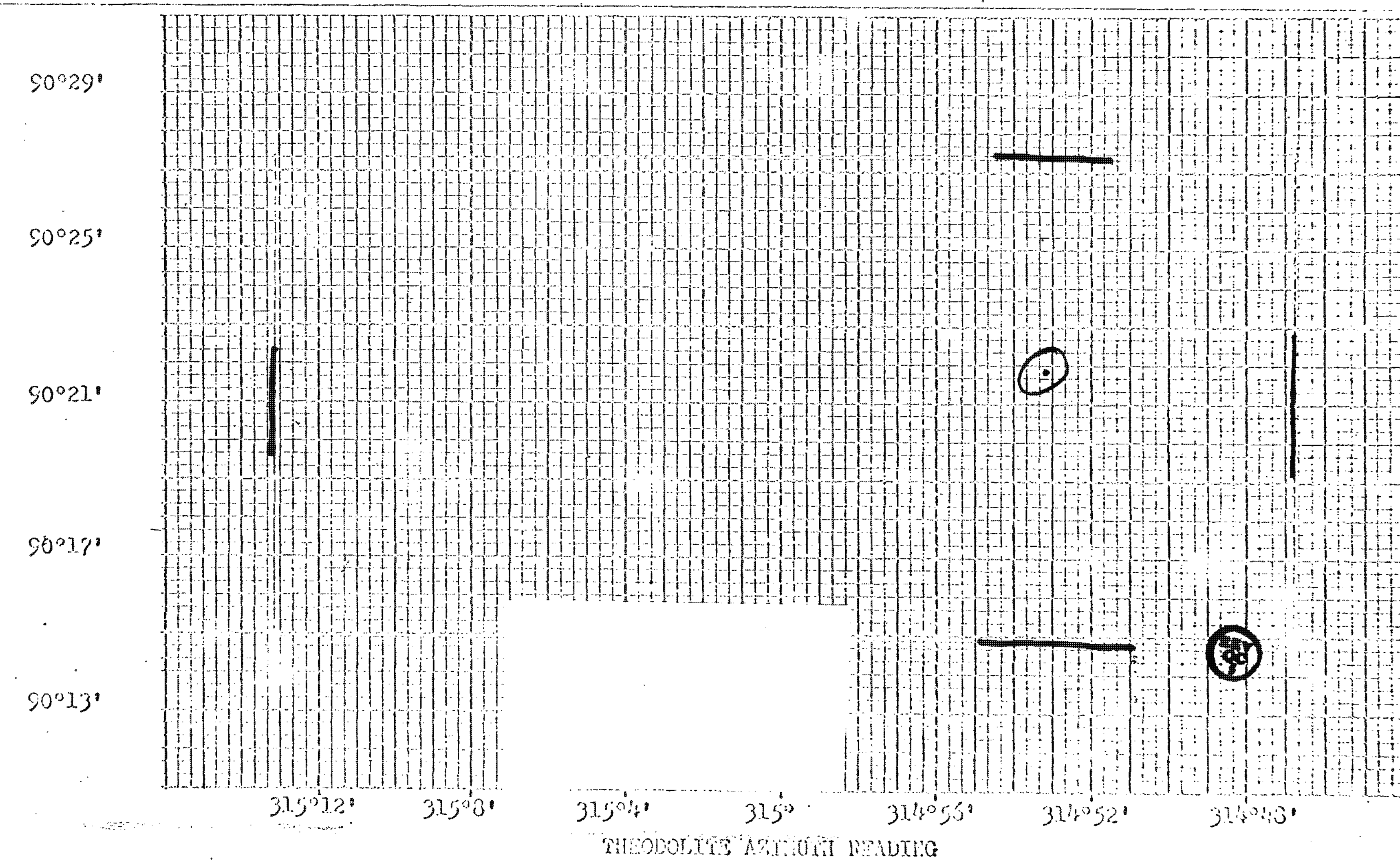
X PRE-VIBRATION O POST-VIBRATION

Approved for Release: 2024/01/30 C05098942

DATA SHEET
FOR
ACCEPTANCE TEST PROCEDURE: 804-104
LINE OF SIGHT POSITIONS

Assy Dwg. No. 805-101
Assy. Ser. No. ____________
Date ____________

Elevation Servo at 0 °   Azimuth Servo at ½ °



X PRE-VIBRATION   0 POST-VIBRATION

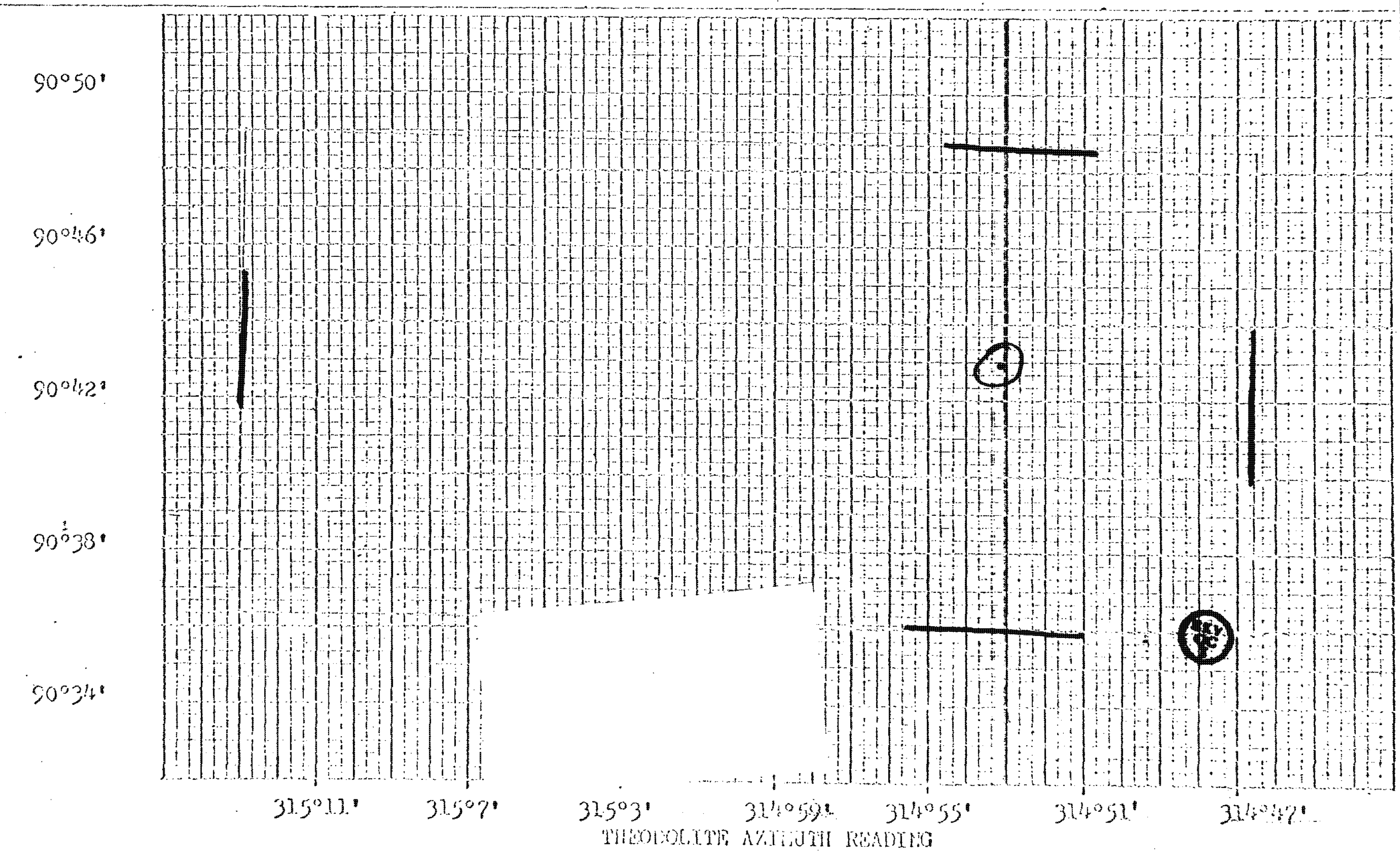
40005

27

DATA SHEET
FOR
ACCEPTANCE TEST PROCEDURE: 804-104
LINE OF SIGHT POSITIONS

Assy Dwg. No. 805-101
Assy Ser. No. ______
Date ______

Elevation Servo at 0 °   Azimuth Servo at 1 °



X PRE-VIBRATION   0 POST-VIBRATION

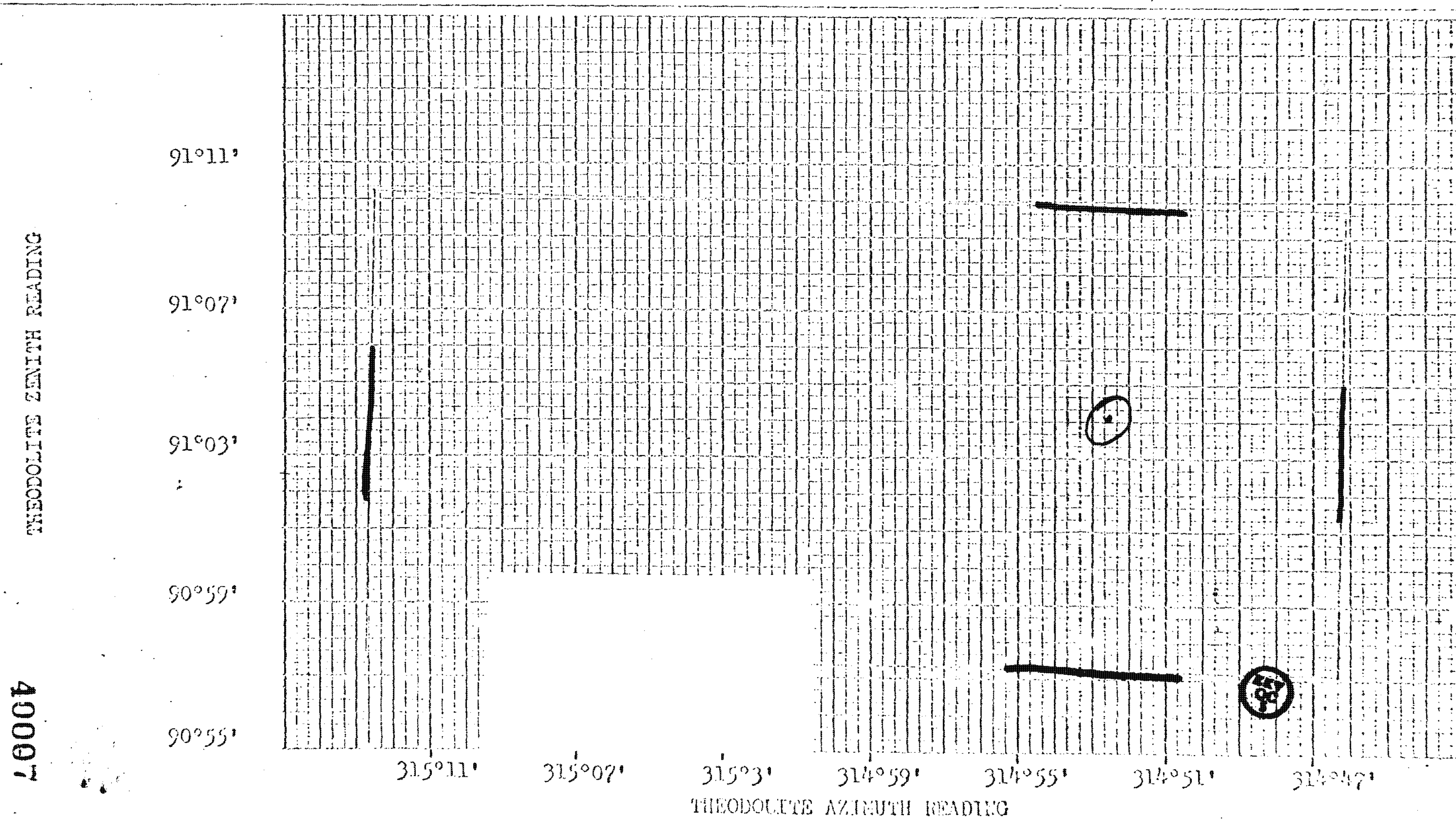
40006

Approved for Release: 2024/01/30 C05098942

DATA SHEET
FOR
ACCEPTANCE TEST PROCEDURE: 804-104
LINE OF SIGHT POSITIONS

Assy Dwg. No. 805-101
Assy Ser. No. ________
Date ________

Elevation Servo at 0 ° Azimuth Servo at $1\frac{1}{2}$°



40007

X PRE-VIBRATION 0 POST-VIBRATION

DATA SHEET
FOR
ACCEPTANCE TEST PROCEDURE: 804-104
LINE OF SIGHT POSITIONS

Assy Dwg. No. 805-101
Assy Ser. No.________
Date________

Elevation Servo at 0°   Azimuth Servo at 2 °

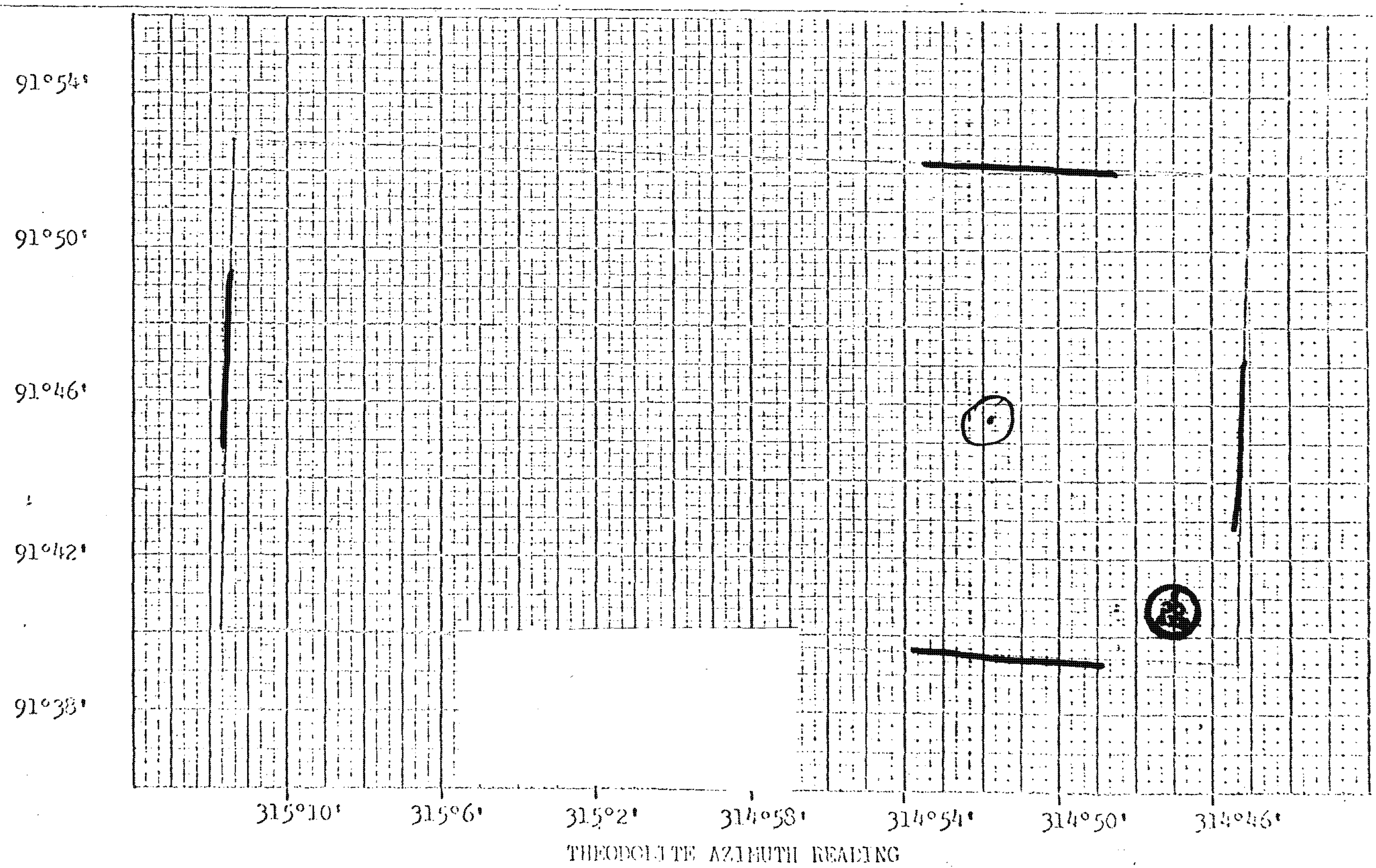
40008

X P[illegible]   0 POST-VIBRATION

DATA SHEET
FOR
ACCEPTANCE TEST PROCEDURE: 804-104
LINE OF SIGHT POSITIONS

Assy Dwg. No. 805-101
Assy Ser. No. ________
Date ________

Elevation Servo at 0°   Azimuth Servo at $2\frac{1}{2}$°

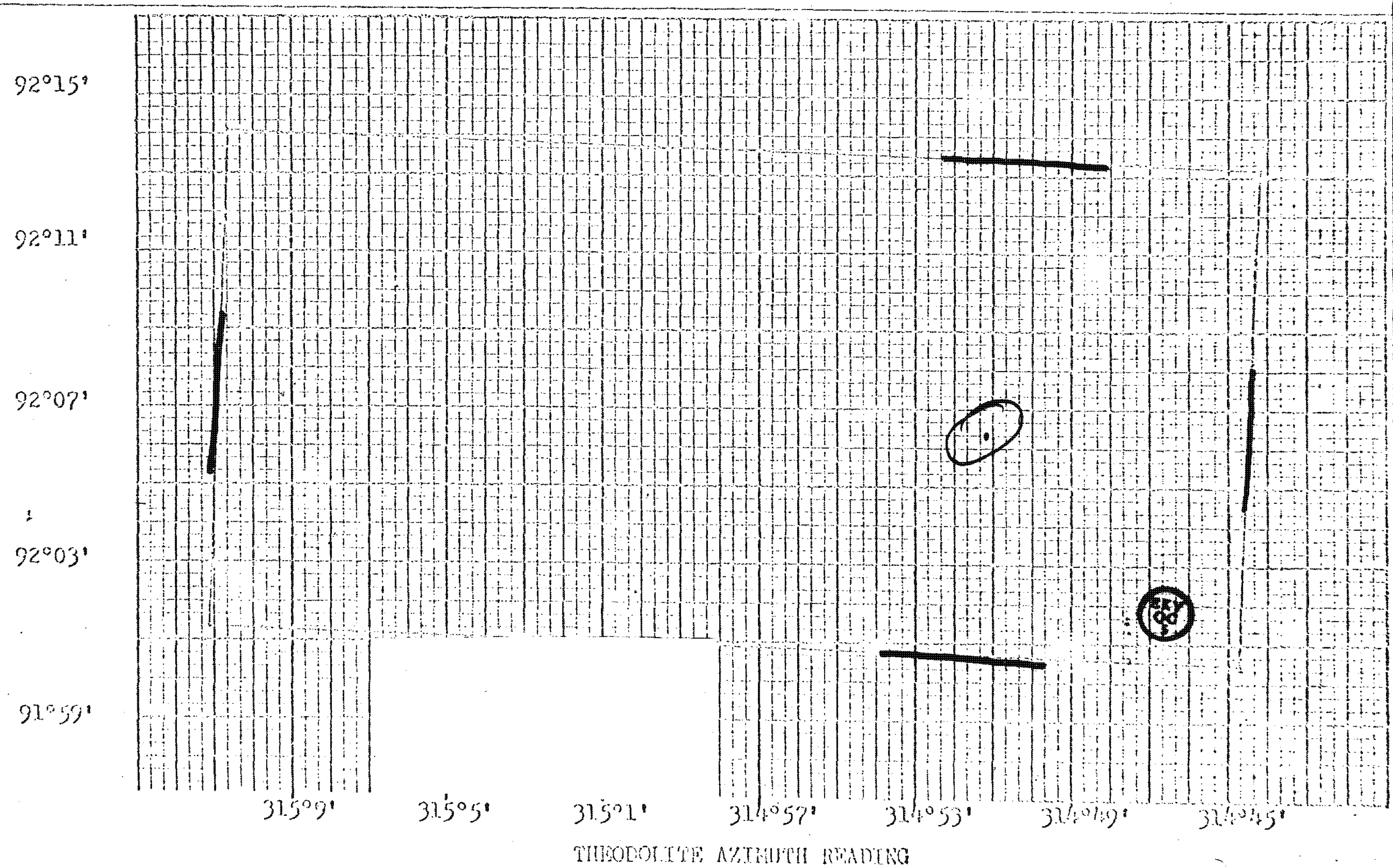


40009

DATA SHEET
FOR
ACCEPTANCE TEST PROCEDURE: 804-104
LINE OF SIGHT POSITIONS

Assy Dwg. No. 805-101
Assy Ser. No._______
Date__________

Elevation Servo at __0°__ Azimuth Servo at __3°__



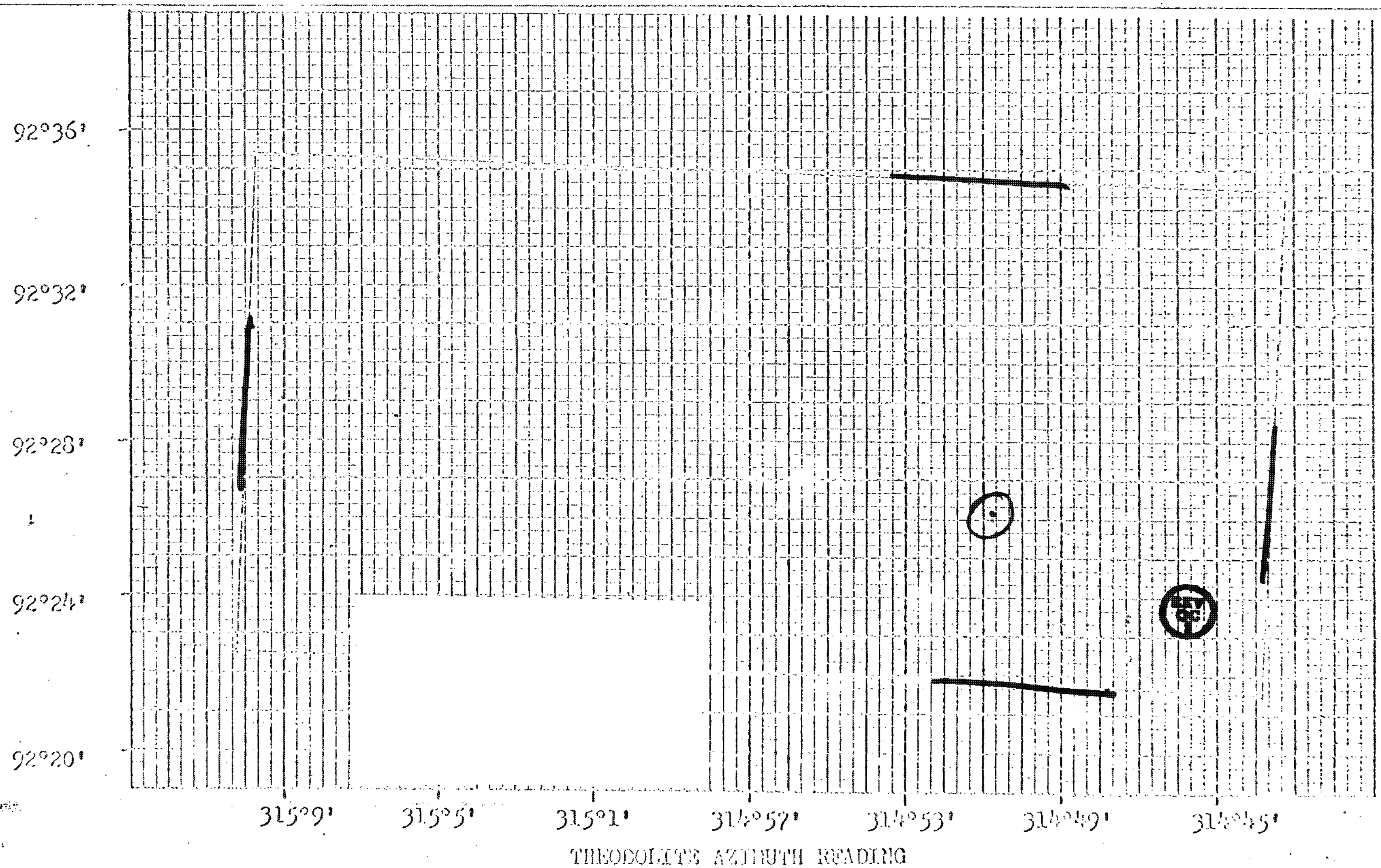
40010

Approved for Release: 2024/01/30 C05098942

DATA SHEET
FOR
ACCEPTANCE TEST PROCEDURE: 804-104
LINE OF SIGHT POSITIONS

Assy Dwg. No. 805-101
Assy Ser. No.
Date

Elevation Servo at 0°   Azimuth Servo at 3½°



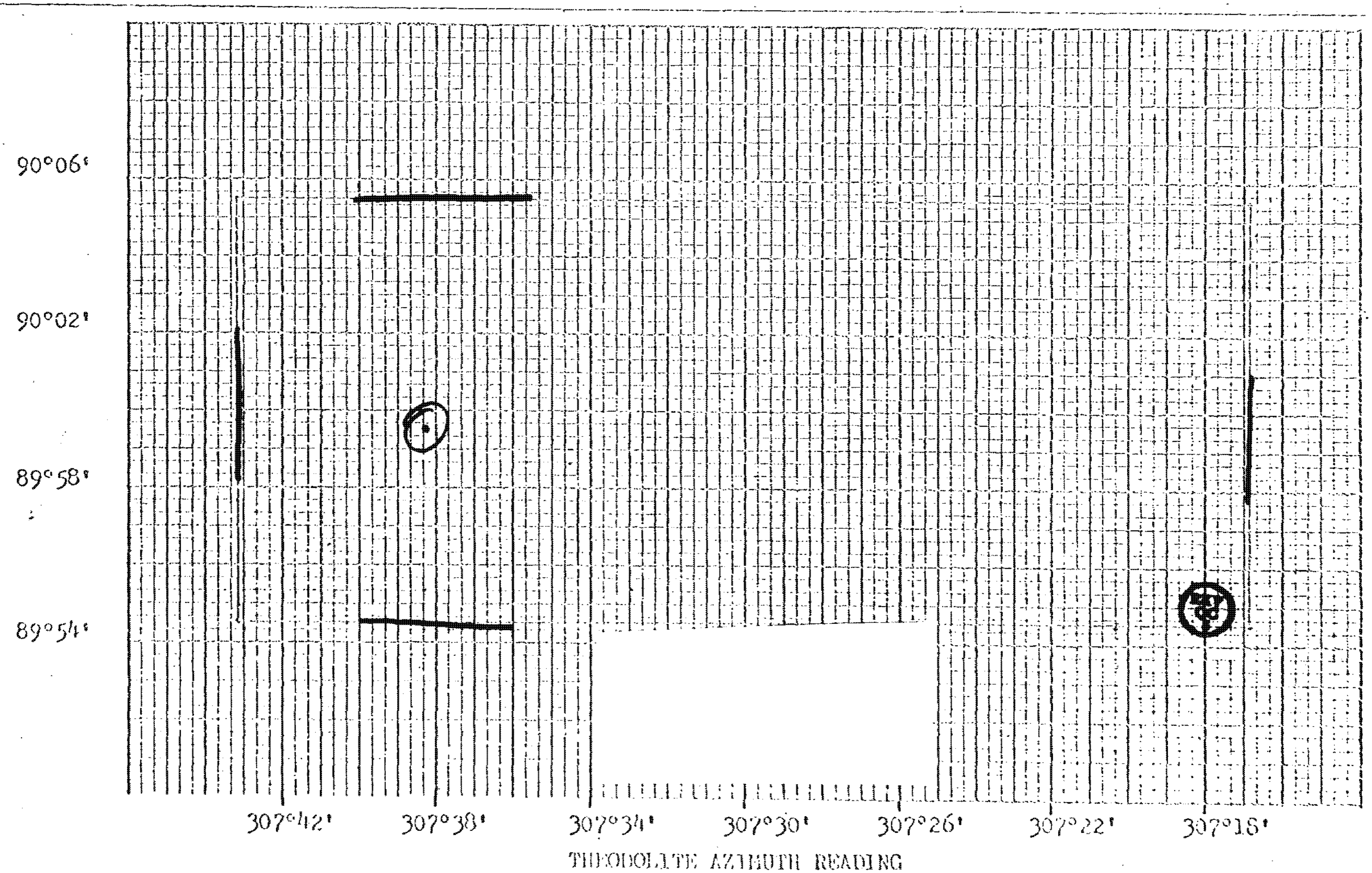
X PRE-VIBRATION   O POST-VIBRATION

40011

DATA SHEET
FOR
ACCEPTANCE TEST PROCEDURE: 804-104
LINE OF SIGHT POSITIONS

Assy Dwg. No. 805-101
Assy Ser. No._______
Date____________

Elevation Servo at $-7\frac{1}{2}°$ Azimuth Servo at +0°



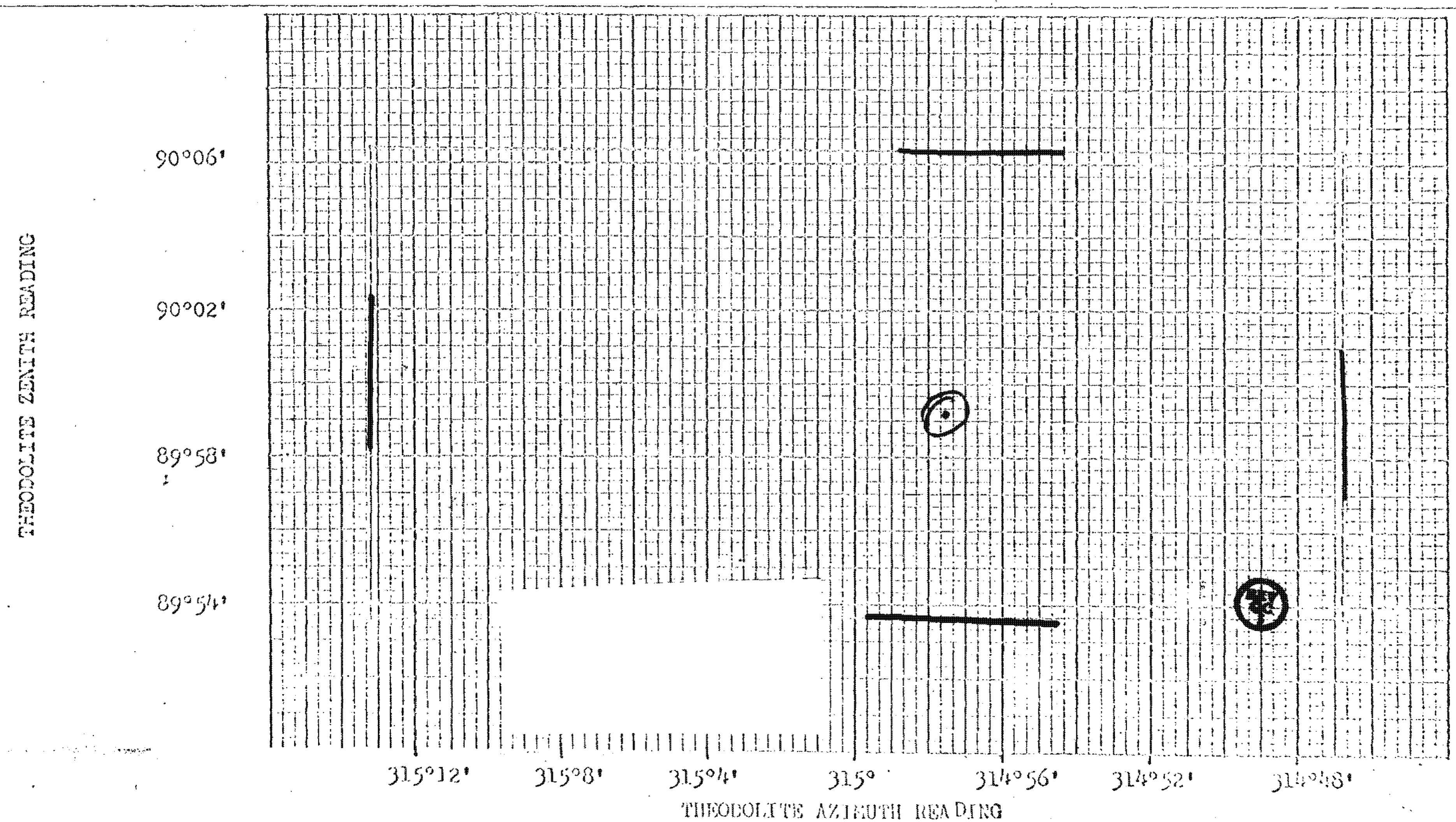
X PRE VIBRATION   O POST VIBRATION

40012

DATA SHEET
FOR
ACCEPTANCE TEST PROCEDURE: 804-104
LINE OF SIGHT POSITIONS

Assy Dwg. No. 805-101
Assy Ser. No.________
Date______________

Elevation Servo at 0°　　　　Azimuth Servo at -0°



0 POST VIBRATION

40013

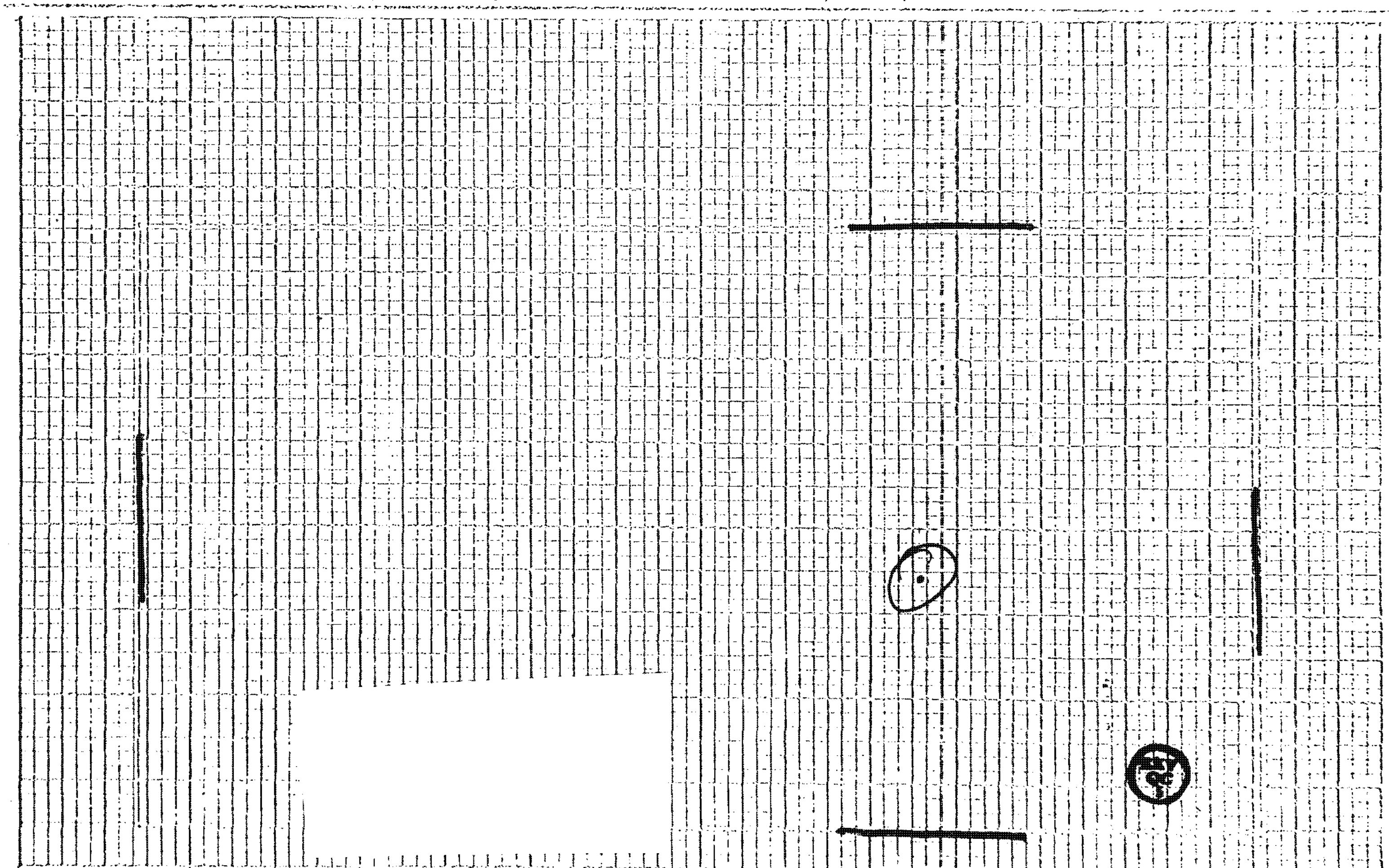
DATA SHEET
FOR
ACCEPTANCE TEST PROCEDURE: 804-104
LINE OF SIGHT POSITIONS

Assy Dwg. No. 805 103
Assy Ser. No. ______
Date ______

Elevation Servo at 47½°   Azimuth Servo at -0°

THEODOLITE ZENITH READING

90°08'
90°04'
90°00'
89°56'
89°52'



322°42' 322°38' 322°34' 322°30' 322°26' 322°22' 322°18'

THEODOLITE AZIMUTH READING

X PRE VIBRATION   0 POST VIBRATION

40014

Date: 3-3-67
3-20-67

C/P No. FM 239

VTP-301 Subsystem Test Procedure

Task 4 Test Record Installation and Tracking and Slit Evaluation

This task was performed according to procedure.

The following non-conformances and/or deviations were encountered:
CPL-28 does not indicate output-upon replaeement of blown fuse (F-5) that occurred during Task 5 satisfactory CPL-28 data was obtained. Also Roller and base assembly replaced at a later date.

The test sequence was continued.

Date: 3-23-67
3-24-67
3-28-67

C/P No. 239

VTP-301 Subsystem Test Procedure

Task 5 Focus Series

This task was performed according to procedure.

The "Best Focus Position" was established at CPL-20 = 2.125 volts at an average C/P temperature of 70.17 °F.

The GM for this platen position was:

On Axis	153	lines/mm
Off Axis +2½°	105	lines/mm
Off Axis -2½°	104	lines/mm

Temperature runs:
On Axis

+1½°F	157	lines/mm at CPL-20 = 2.050
-1½°F	158	lines/mm at CPL-20 = 2.200

Supporting data is included in the accompanying sheets.

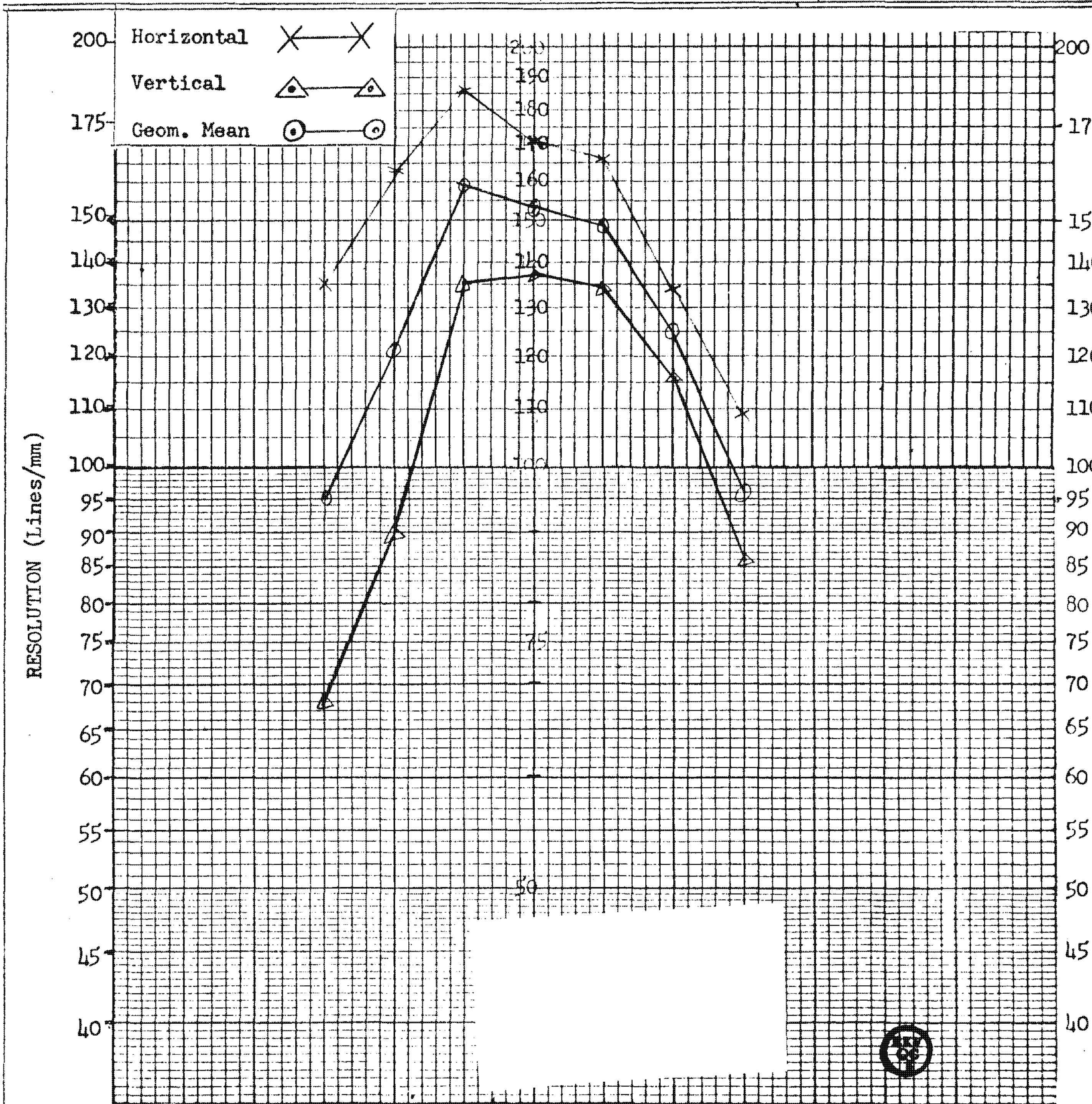
The following non-conformances and/or deviations were encountered: **During testing 5 volt instrumentation dropped to zero volts. It was determined that Fuse F-5 wasblown. Upon replacement satisfactory data was obtained.**

The test sequence was continued.

GRAPHICAL ANALYSIS

C/P No. 37	Room Temp. 70.5°	Speed	ask/Run
Date 3-23-67	Avg. C/P Temp. 70.17	CPL-20	lit
Photo Test 3	Shim/Focus .1041	CPL-27	ld Angle
Sample Size 20	Illumination	Drum Freq	
Time	56%		

BPF	GM
CPL-20	H
CPL-27	V



CP	1.750	1.875	2.0	2.125	2.250	2.375	2.5
Run #	21/22	23/24	25/26	27/28	29/30	31/32	33/34

40017

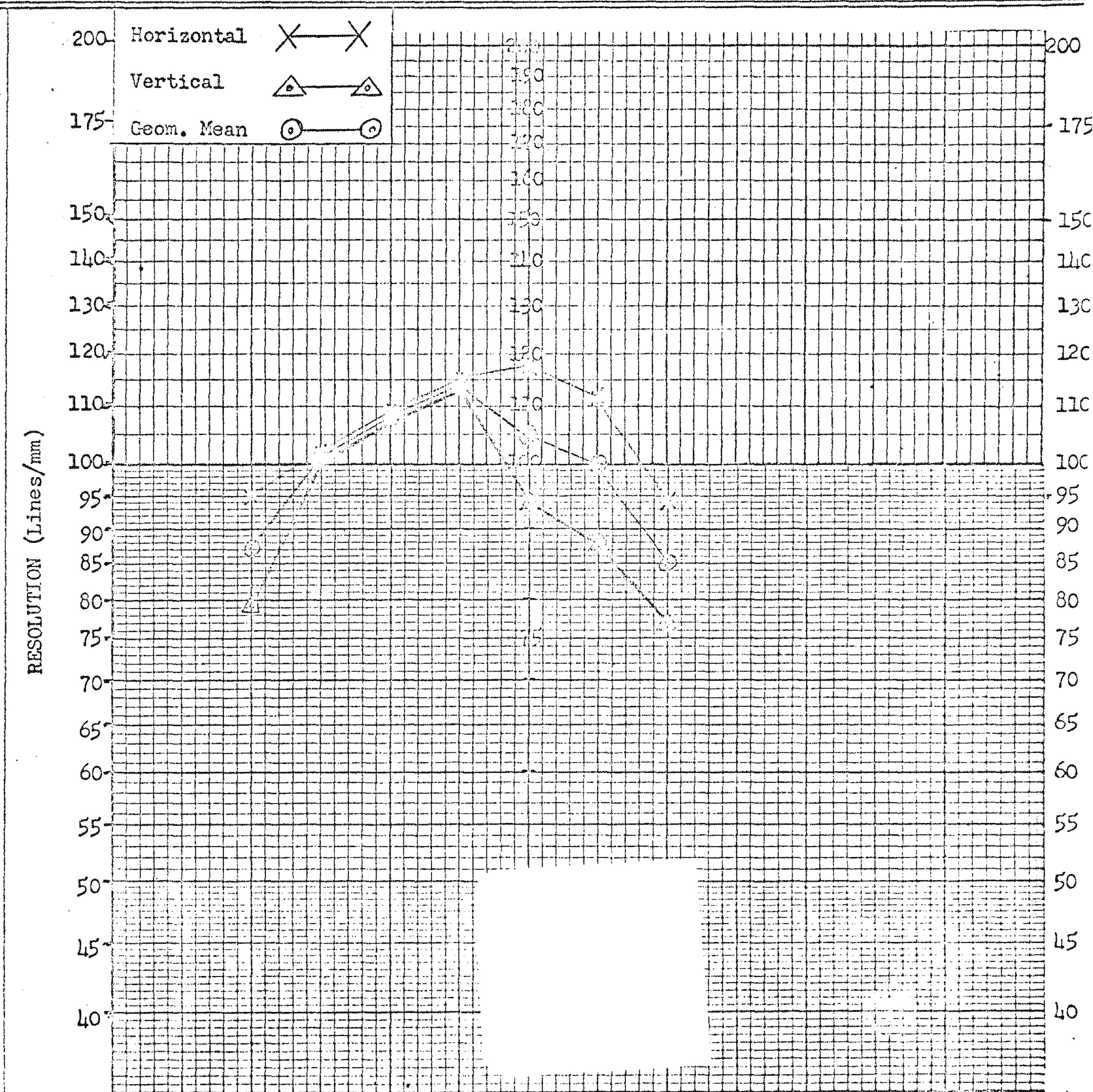
FOCUS VOLTAGE/SPEED/FLD. ANGLE

M/6-11-64

GRAPHICAL ANALYSIS

C/P No. 39	Room Temp. 70.5°	Speed	Task/Run 5
Date 3-23-67	Avg. C/P Temp. 70.01	CPL-20	23
Photo Test 3	Shim/Focus .041	CPL-27	+2.50
Sample Size 10	Illumination [illegible]	Drum Fre.	
Time 1830	RH 58		

BPF	GM
CPL-20	H
CPL-27	V



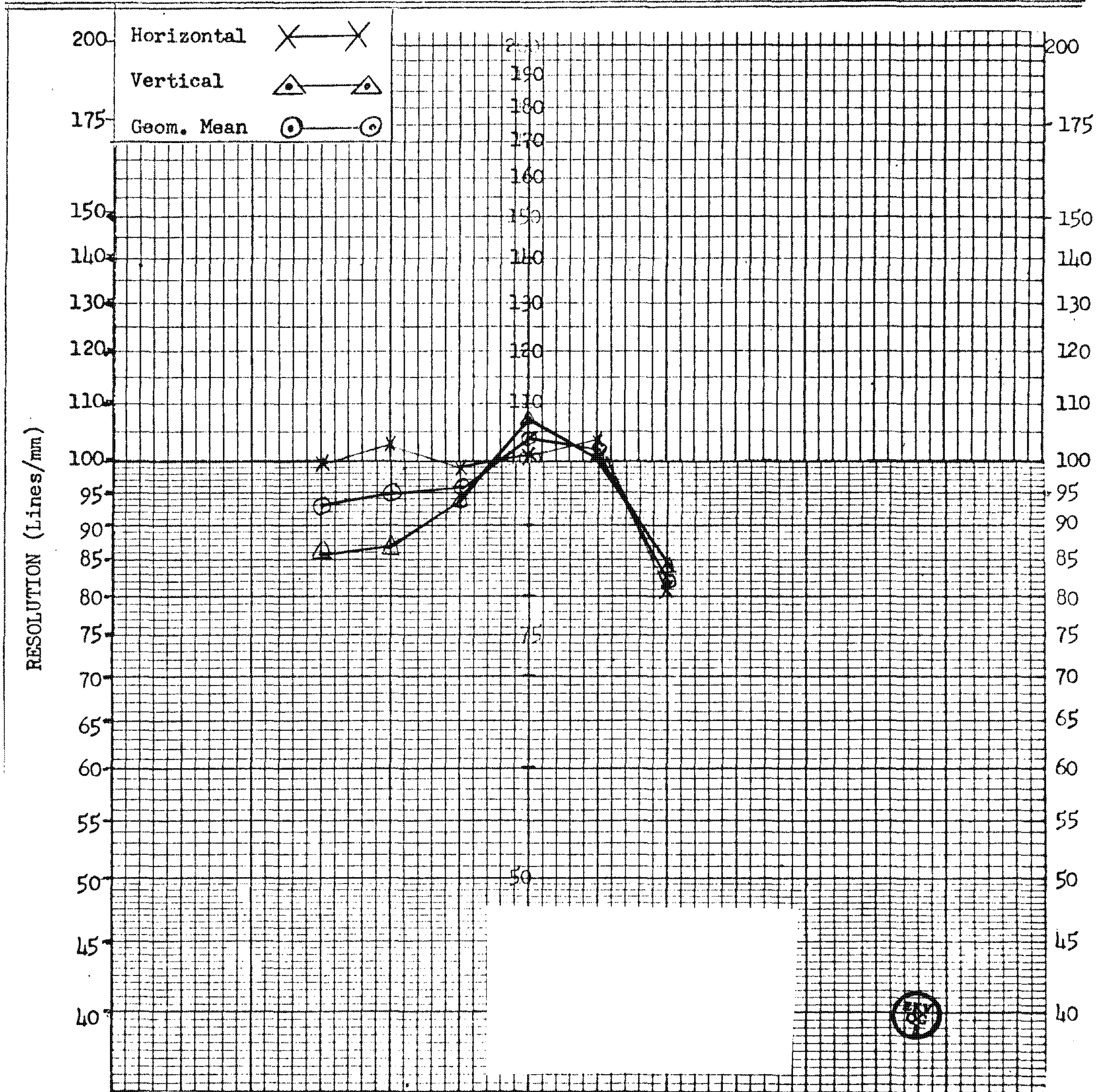
1.625

40018

C/P No.	39	Room Temp.	70.5°	Speed		sk/Run	5
Date	[illegible]3-67	Avg. C/P Temp.	70.21	CPL-20		t	R
Photo Test	3	Shim/Focus	.041	CPL-27		Angle	[illegible]
Sample Size	10	Illumination	[illegible]	Drum Freq			
Time	1400	R/H	56%				

BPF
CPL-20 ____
CPL-27 ____

GM ____
H ____
V ____



CPL-20	1.750	1.875	2.000	2.125	2.250	2.375
Run #	11	12	13	14	15	16

40019

FOCUS VOLTAGE/SPEED/FLD. ANGLE

M/6-11-64

C/P No. 39	Room Temp. 72°	Speed	Task/Run 5-3
Date 3-24-67	Avg. C/P Temp. 71.73°	CPL-20	lit B
Photo Test 4	Shim/Focus .040	CPL-27	d Angle 0°
Sample Size 20	Illumination 3.00	Drum Fre	
Time			

BPF

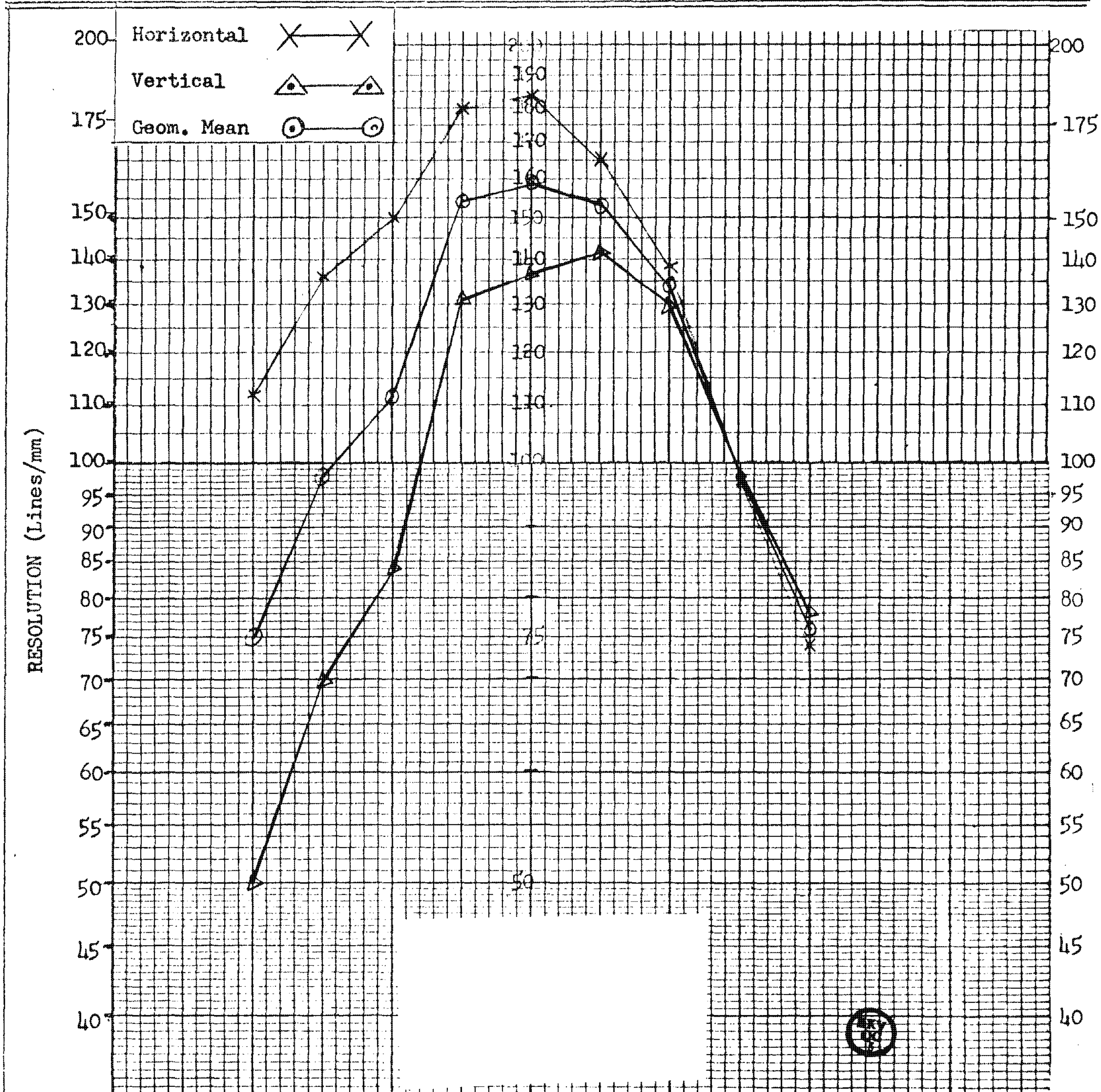
CPL-20

CPL-27

GM

H

V



CPL-20	1.500	1.625	1.750	1.875	2.0	2.125	2.25	2.375	2.5
RUN NO.	9/10	11/12	13/14	15/16	17/18	19/20	21/22	23/24	25/26

400

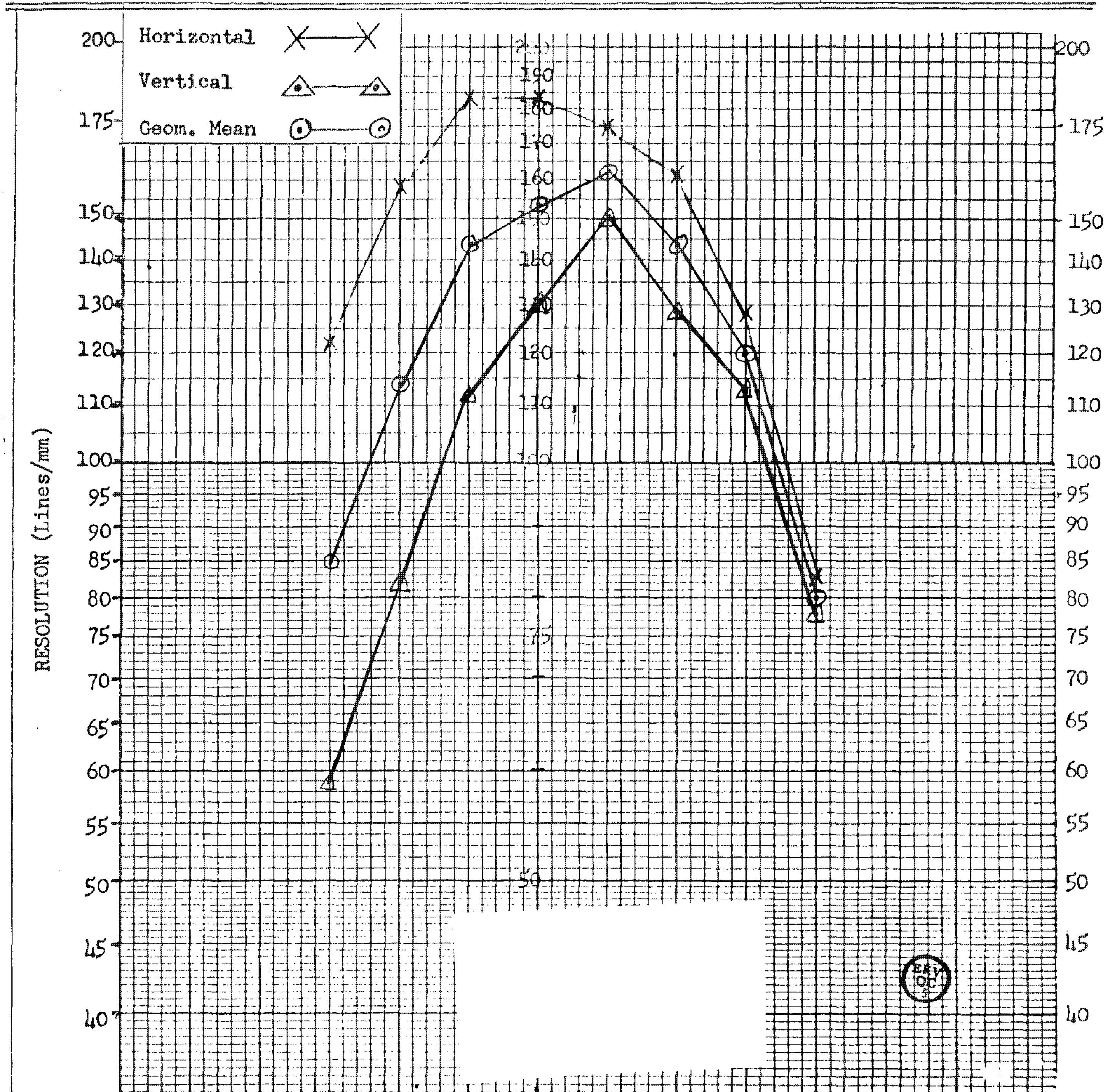
FOCUS VOLTAGE/SPEED/FLD. ANGLE

M/6-11-64

GRAPHICAL ANALYSIS

C/P No.	39	Room Temp.	68.5°	Speed	31	Task/Run	5-4
Date	3-28-67	Avg. C/P Temp.	68.92°	CPL-20		Slit	B
Photo Test	5	Shim/Focus	.041	CPL-27		ld Angle	0°
Sample Size	20	Illumination	3,00	Drum Fre			
Time							

BPF		GM	
CPL-20		H	
CPL-27		V	



CPL, ..	1,750 1,875 2,000 2,125 2,250 2,375 2,500 [illegible]
Run No.	13-14 15-16 17-18 19-20 21-22 23-24 25-26 27-28

40021

FOCUS VOLTAGE/SPEED/FLD. ANGLE

M/6-11-64

Date: 4-28-67

C/P No. 239

VTP-301 Subsystem Test Procedure

Task 6 MSD Frequency and Port Open Telltale

This task was performed according to procedure.

The following non-conformances and/or deviations were encountered: MSD period count at speeds 55 and 64 were below minimum specification. Waiver written to accept (KV-183).

The test sequence was continued.

40022

Date: 4-26-67

C/P No. 239

VTP-301 Subsystem Test Procedure

Task 7 Focus Control Checkout

This task was performed according to procedure.

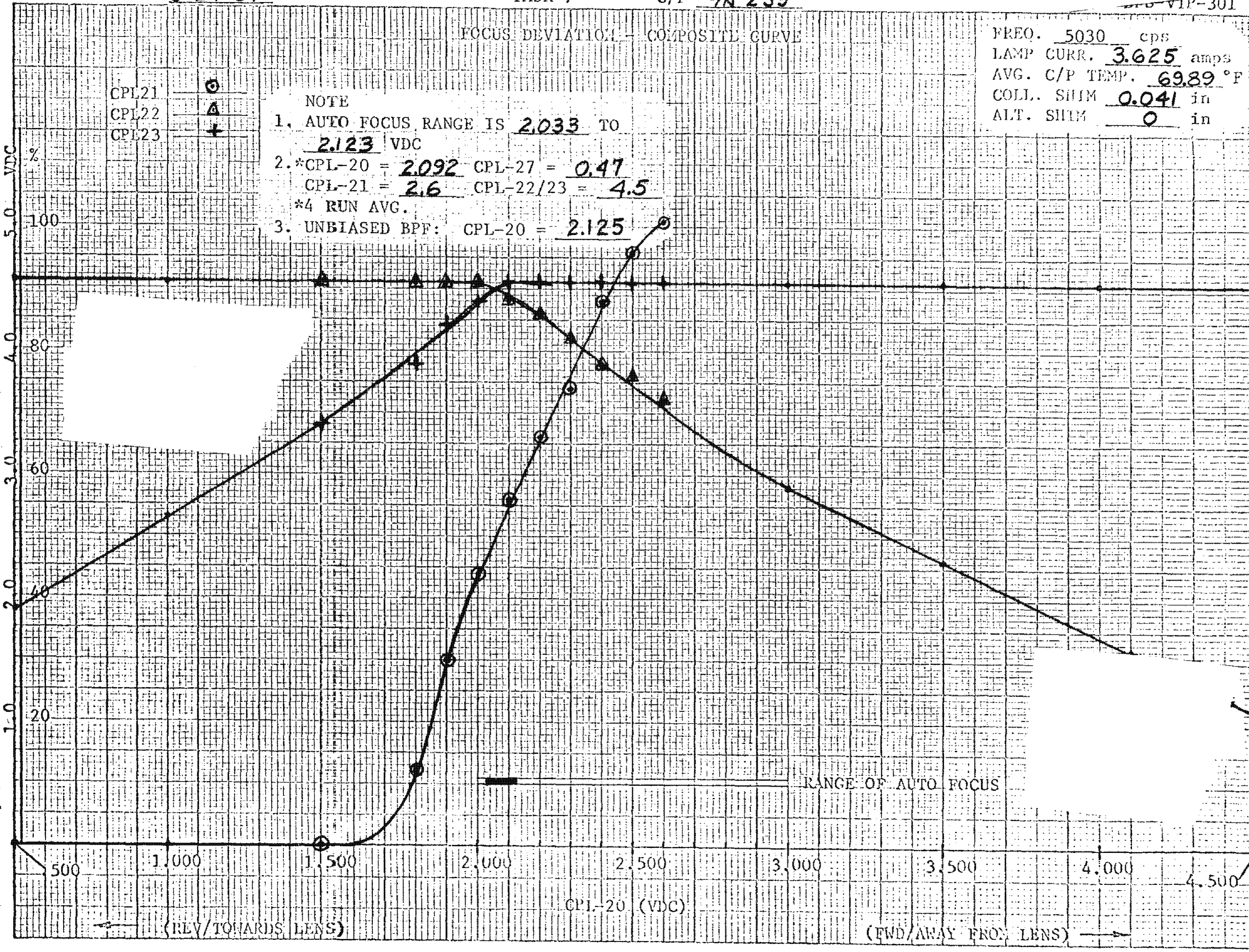
Plots of the data for the 3 frequencies are included in the accompanying sheets.

The following non-conformances and/or deviations were encountered: **Average C/P temperature for the 3280 cps run was +.22°F above specification. Average C/P temperature for the 4100 cps run was .11°F above specification.**

The test sequence was continued.

K+E 10 X 10 TO 1/2 INCH 46 1470
7 1/2 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

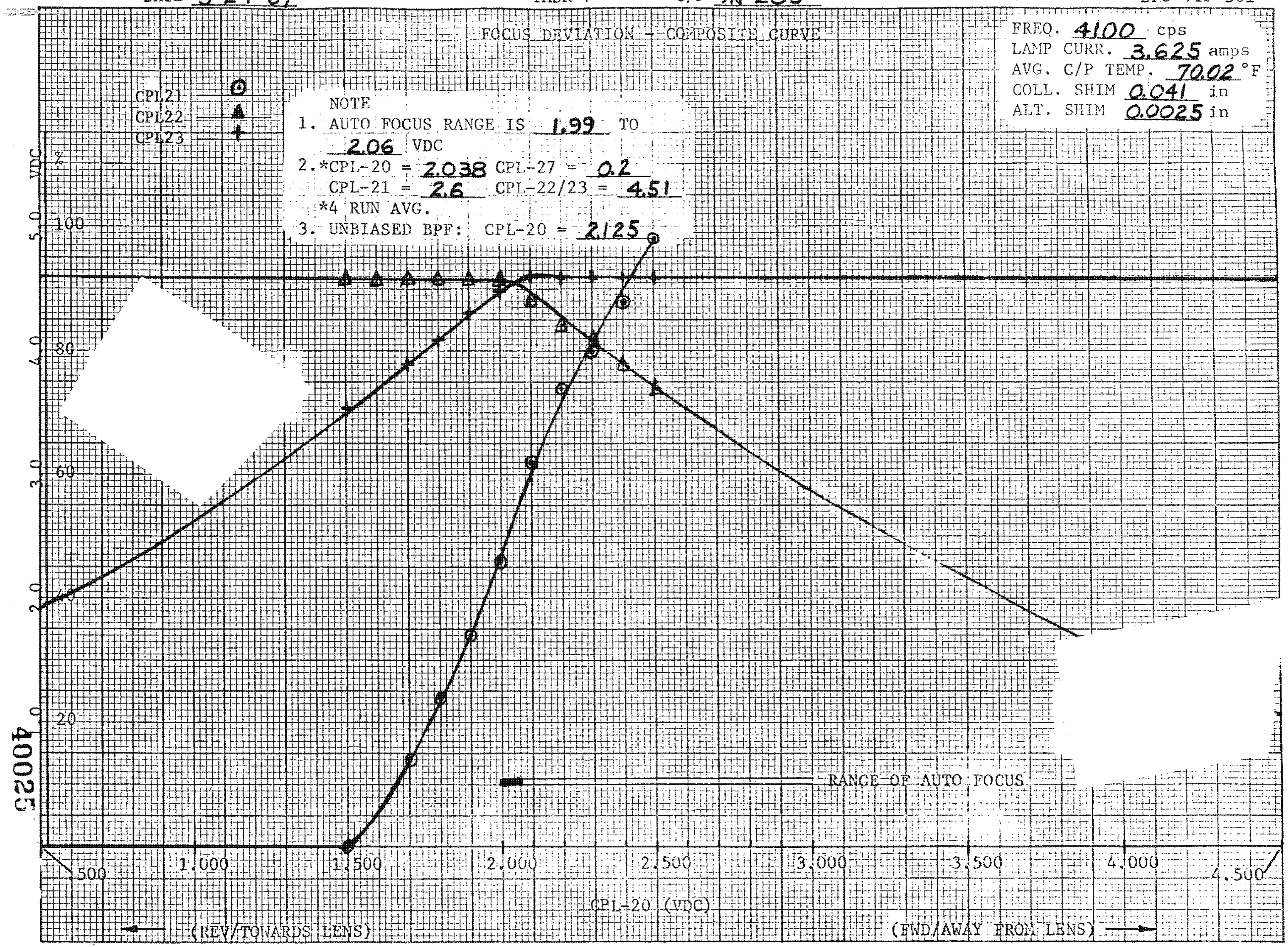
DATE 5-24-67 TASK 7 C/P S/N 239 DTS-VIP-301



40024

DS7- 32

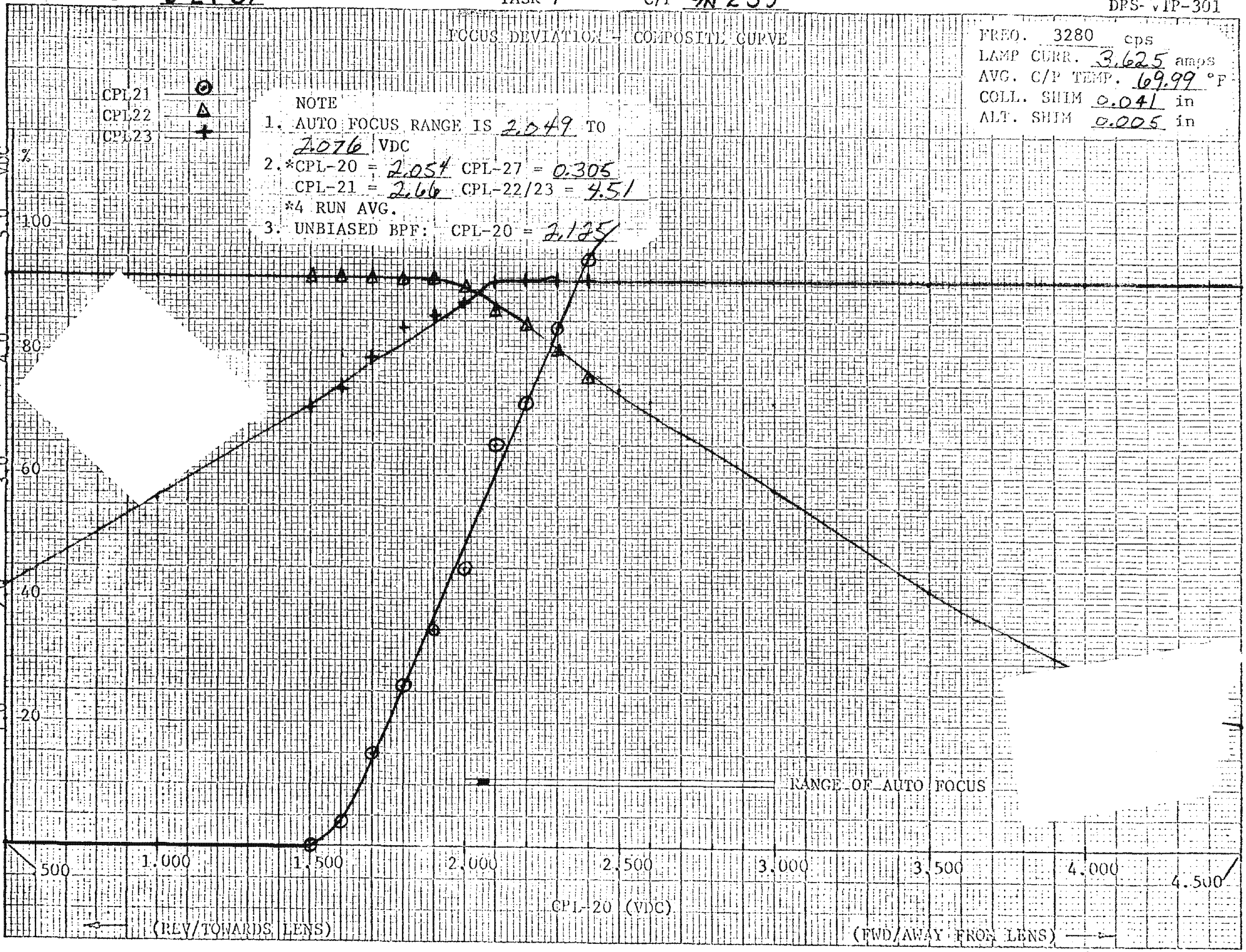
DATE 5-24-67 TASK 7 C/P S/N 239 DRS-vTP-301



DS7-

K+E 10 X 10 TO ½ INCH 7½ X 10 INCHES KEUFFEL & ESSER CO. 46 1470 MADE IN U.S.A.

DATE 5-24-67 TASK 7 C/P S/N 239 DPS-VIP-301



DS7- 34

Approved for Release: 2024/01/30 C05098942

4002C

Date: 5-22-67

C/P No. FM- 239

VTP-301 Subsystem Test Procedure

Task 8 Heater Operation

This task was performed according to procedure.

The following non-conformances and/or deviations were encountered:

NONE

The test sequence was continued.

Date: 4-27-67

C/P No. 239

VTP-301 Subsystem Test Procedure

Task 9 Photo Validation

This task was performed according to procedure.

The optimum settings for "BPF" at an average C/P temperature of 70.27 °F were determined to be:

CPL-20 2.125 volts
CPL-27 0.708 volts

The resulting resolution for the above conditions for speed 31 are tabulated below:

Slit B

GM On Axis	151	lines/mm
Off Axis +0.5°	131	lines/mm
Off Axis -0.5°	124	lines/mm
Average	135	lines/mm

Slit C

GM on Axis	148	lines/mm

Slit D

GM On Axis	124	lines/mm

Supporting date is included in the accompanying sheet.

The following non-conformances and/or deviations were encountered:

None.

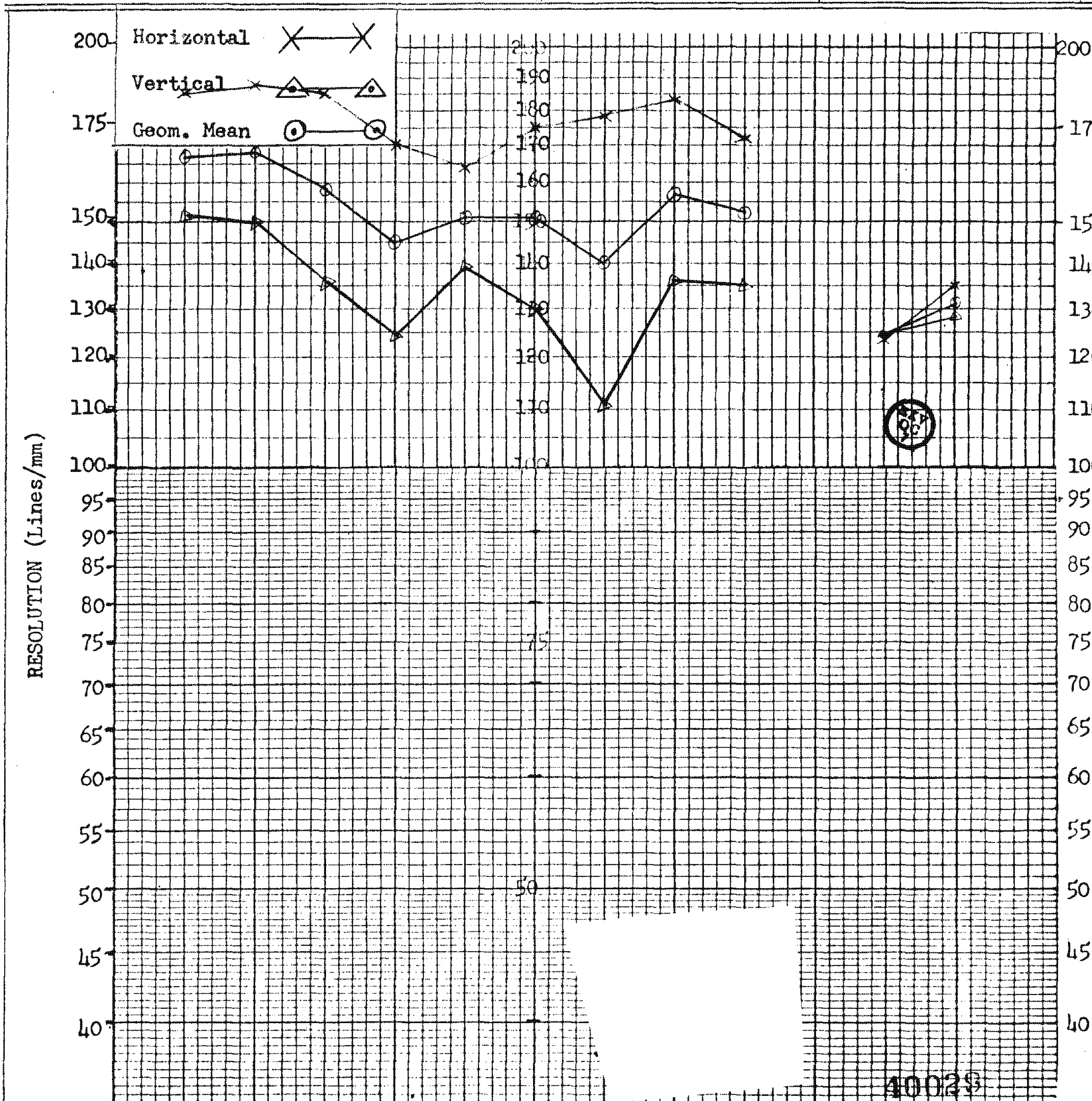
The test sequence was continued.

40028

GRAPHICAL ANALYSIS

C/P No. 39	Room Temp. [illegible]	Speed VARIES	Task/Run 9-1
Date [illegible]	Avg. C/P Temp.	CPL-20	t F
Photo Test 8	Shim/Focus .041	CPL-27	Angle 0°4 ±.5°
Sample Size 60	Illumination [illegible]	Drum Fre	
Time			

BPF	GM
CPL-20 2.125	H
CPL-27	V



SPEED	1	10	19	28	31	37	46	55	64	31	31
AXIS	0°	0°	0°	0°	0°	0°	0°	0°	0°	-.5°	+.5°

FOCUS VOLTAGE/SPEED/FLD. ANGLE

M/6-11-64

Emulsion 3404 241-16 PRODUCT TEST 8 FM-39 CAN #192 Reference TASK-9 Date 4-27-67

EASTMAN KODAK COMPANY

Experimenter Date Witness Date

EXPOSURE

Sensitometer EG&G
Illuminant Quality 6100°K
Tablet No.
Exposure Time 1/100

DEVELOPMENT

Developer P-695
Dev. Time 3'2"
Temp. 90°F

Speed	Gamma	Density Fog + Base
T.18	2.37	.17

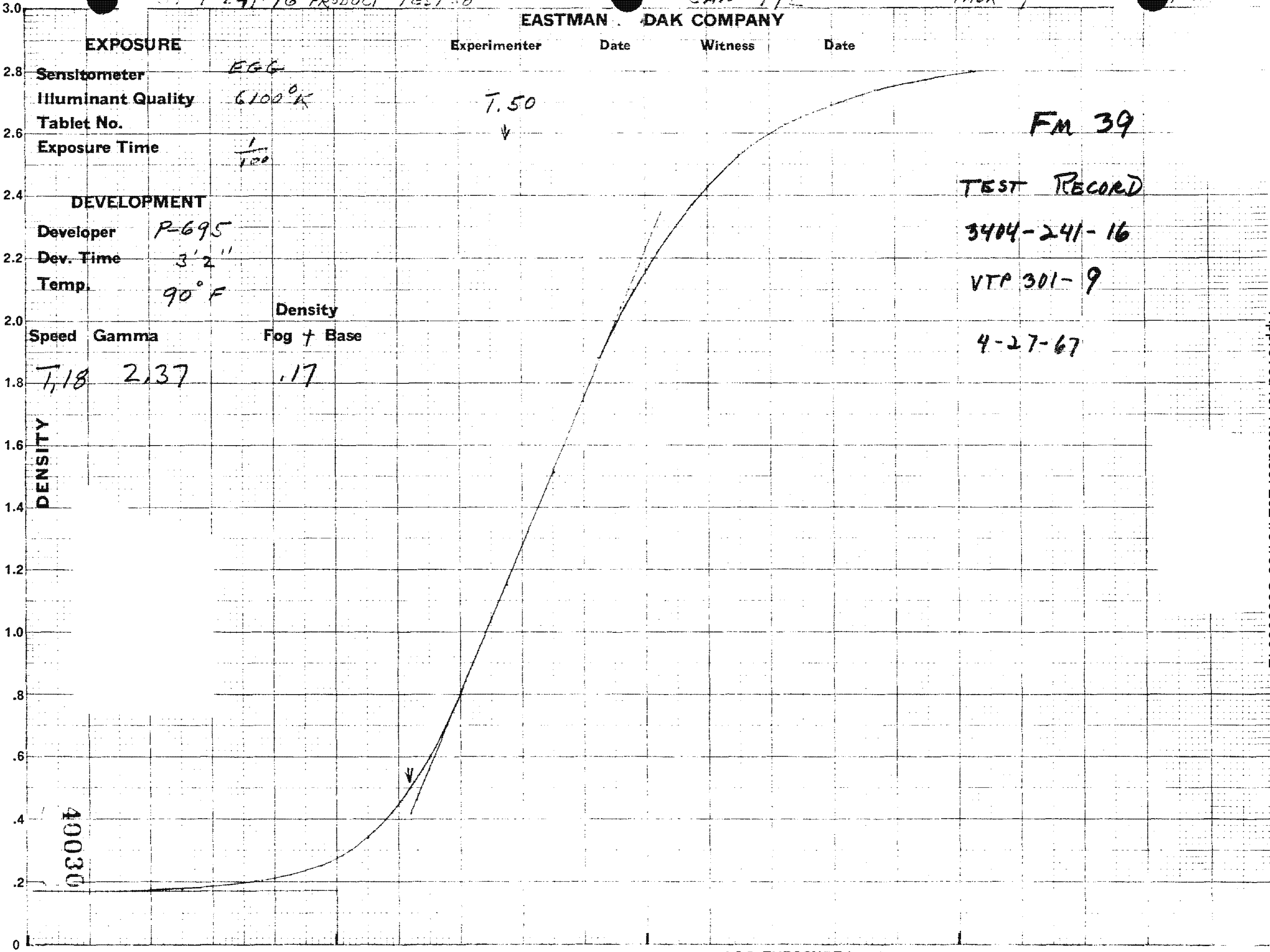
FM 39

TEST RECORD

3404-241-16

VTP 301-9

4-27-67



40030

KP 496178

Date: 5-23-67

C/P No. 239

VTP-301 Subsystem Test Procedure

Task 10 Slit Evaluation

This task was performed according to procedure.

A visual check of the test samples was made at EKV. There were no indications of any non-conformances.

The samples were sent to Rochester for complete evaluation.

Date: 12-13-66

C/P No. FM 239

VTP-301 Subsystem Test Procedure

Task 11 FRSA Checkout

This task was performed according to procedure.

The FRSA was S/N N-648

The following non-conformances and/or deviations were encountered:

None.

The test sequence was continued.

Date: 5-22-67

C/P No. 239

VTP-301 Subsystem Test Procedure

Task 12 Flight Record Loading and Hardware Installation

This operation was performed according to procedure.

The following record makes up the Flight load received in Can #16:

Emulsion	Footage
3404-259	2400'
SO-380-32	1000'
SO-362-3-10-6	100'

Sensitometric data is plotted and included. 25 feet of fogged record were installed in the FRSA. 3339.8 feet of the original record were available at mating.

The following non-conformances and/or deviations were encountered:

None.

The test sequence was continued.

Emulsion 3404-259 FLIGHT RECORD QUALITY CHECK FM-39 TEST 9 **Reference** CAN #16 **Date** 5-17-...

EASTMAN KODAK COMPANY

Experimenter Date Witness Date

EXPOSURE

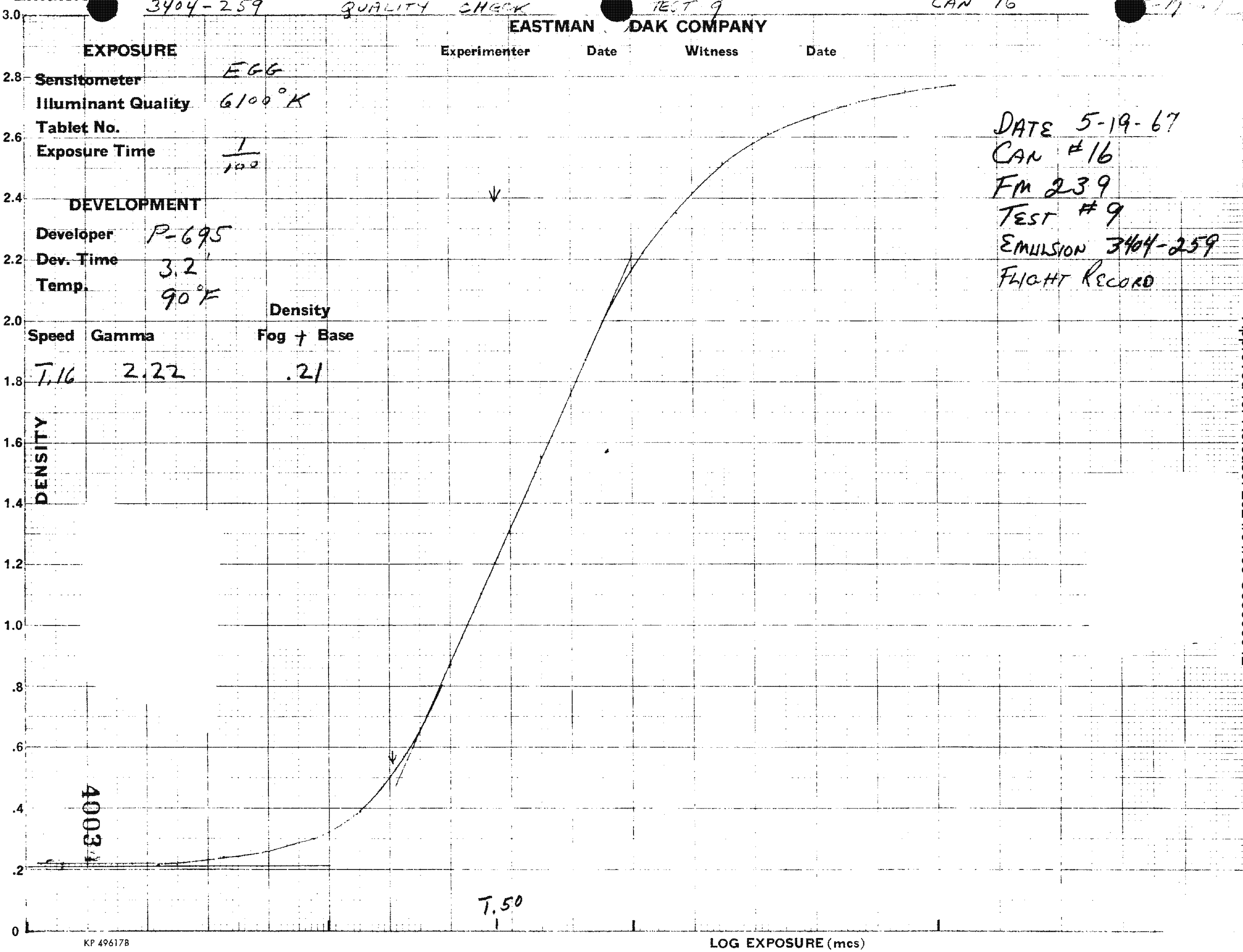
Sensitometer EGG
Illuminant Quality 6100°K
Tablet No.
Exposure Time 1/100

DEVELOPMENT

Developer P-695
Dev. Time 3.2'
Temp. 90°F

Speed	Gamma	Density Fog + Base
T.16	2.22	.21

DATE 5-19-67
CAN #16
FM 239
TEST #9
EMULSION 3404-259
FLIGHT RECORD



4003

KP 49617B

Date: 5-23-67

C/P No. 239

VTP-301 Subsystem Test Procedure

Task 13 Flight Record Photographic Validation and Slit Evaluation

This operation was performed according to procedure.

Geometric Mean for the runs were as follows:

Slit Position

B	136	lines/mm
C	139	lines/mm
D	116	lines/mm

The following non-conformances and/or deviations were encountered:

None.

The test sequence was continued.

40035

Date: 5-24-67

C/P No. FM- 239

VTP-301 Subsystem Test Procedure

Task 14 Final C/P Preparation for Mating

This task was performed according to procedure.

The following non-conformances and/or deviations were encountered:

None

40036

S

Date: 5-24-67

C/P No. FM 239

VTP-302 Systems Test Procedure

Operation 4 Systems Preparation

This operation was completed in two steps.

1. Loading Flight Record - Task 12, VTP-301

2. Weighing C/P - Operation 4, VTP-302

The C/P weight was 1164.87 lbs.

The following non-conformances and/or deviations were encountered: The Dust Shield Fastener was attached to the Aluminized Glass Fabric of Dust Shield "A" Assembly in the wrong orientation. Mating surface was outboard rather than inboard in order to be compatible with OCV Dust Shield "B" Assembly. Assembly "B" was repositioned to be compatible with Assembly "A" for expendiency. Refer to Waiver KV-190.

Date: 5-25-67

C/P No. FM-239

VTP-302 Systems Test Procedure

Operation 5 Alignment Check

This operation was performed according to procedure.

Final results were as follows:

X Axis tilt	+11	min.	30	sec.
Y Axis translation	+0.012	inches		
Z Axis tilt	+1	min.	30	sec.

The following non-conformances and/or deviations were encountered:

None.

Date: 5-26-67

C/P No. FM-239

VTP-302 Systems Test Procedure

Operation 6 C/P System Tracking and Readiness

This operation was performed according to procedure. Final results were as follows:

The flight record configuration at the end of this operation:

Slit through Supply 3145.1 feet
Slit through FRSA 213.6 feet

Transition time of Servos:

Azimuth

Position 1-8 Time: 5.7 sec.
8-1 5.6 sec.

Elevation

Position 1-3 Time: 3.3 sec.
3-1 3.3 sec.

"BFP" Setting (attained with a PTS):

CPL-20 2.233 volts
CPL-27 1.299 volts

The following non-conformances and/or deviations were encountered: **The Record Transport Looper system did not operate normally during the tracking check with the Y Axis horizontal. The Looper Carriage would actuate the looper empty switch and then drift back allowing the take-up motor to restart. Refer to waiver KV-192.**

50003

Sheets 2
Date 6/5/67

To: R. Moler

Subject: Launch Status of FM39 Payload

All TLM data generated as a result of the Countdown (TP-24) has been evaluated. Temperature conditions as determined by UMB-3 and UMB-4 were within the specification limits of 69.5° and 71.5°F for the pre-launch period.

The final status of the C/P at launch was as follows:

CPL	% Full Scale	Condition
1	--	Deleted
2	37	68.79°F.
3	28	-0.19 T°F
4	60	71.16°F
5	60	71.16°F
6	60	71.37°F
7	61	71.30°F
8	60	71.30°F
9	58	70.53°F
10	50	+22 V Ref. Voltage
11	38	69.17°F
12	32	Pos. B Slit
13	47	Pos. 2 Elev. Mirror
14	52	Pos. 5 Az. Mirror
15	44	3013.9 Ft. In Supply

CPL	% Full Scale		Condition
16	88		344.8 Ft. In T.U.
17	39		Normal Tension
18	0		MSD Off
19	41		Brake On
20	44		BPF
21-23	0		Timer Off
24	--		Deleted
25	19		Step 1
26	78		Env. On
27	25		BPF
28	50		Same as 15 & 16
29	2		Data Lamps OFF
30	--		Deleted
31	--		Deleted
32	--		Deleted
33	8		Power Monitor, Elev.
34	10		Power Monitor, Az.
35	81		Operational Supply
+22v	88		+22v
UMB-3	58.70	K	70.60^{O}F
UMB-4	58.41	K	70.67^{O}F

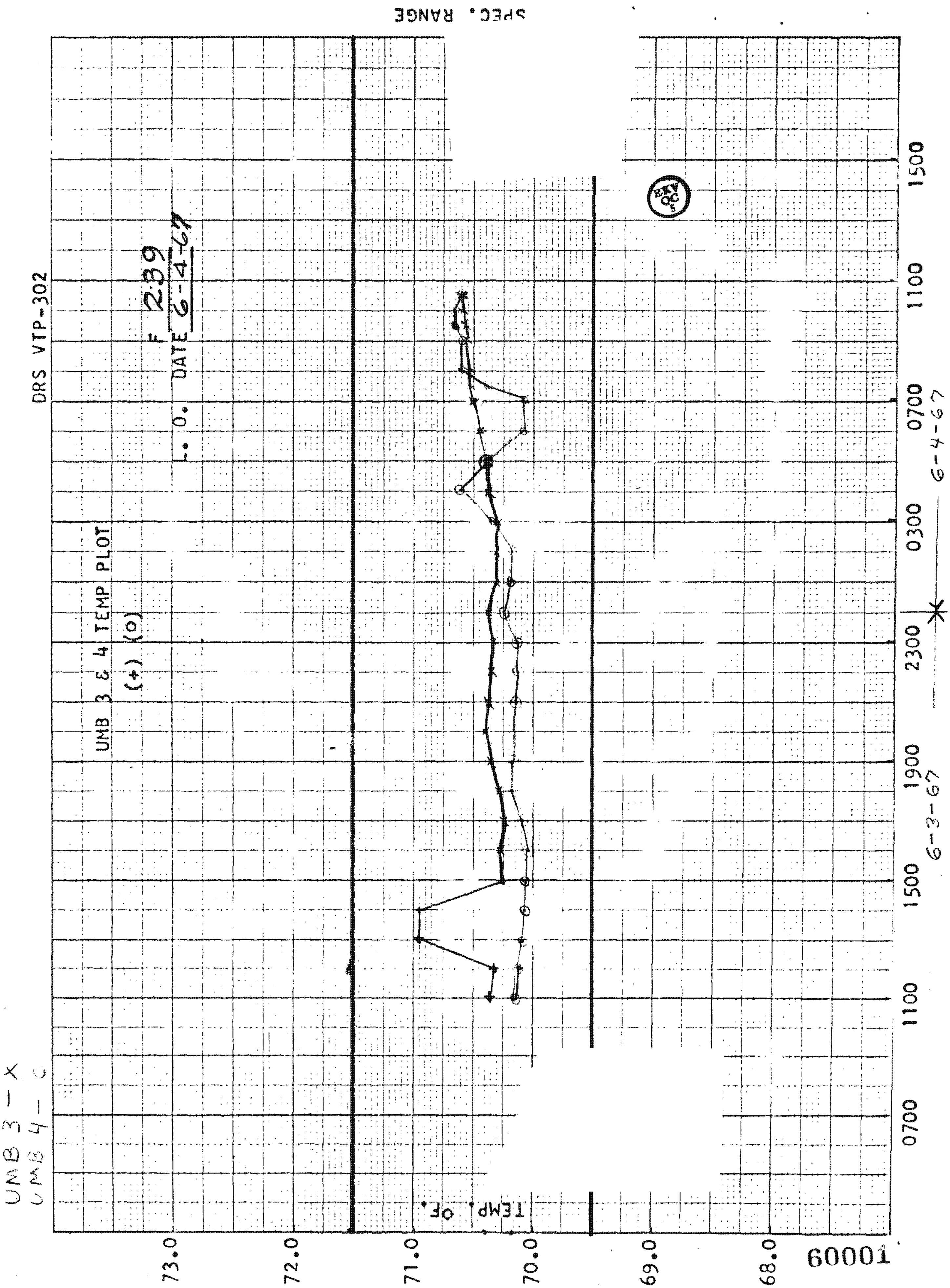
No potential problems were evident upon completion of the data analysis.

S.Langer/kb

S Langer
S. Langer

Approval: G R Poore
G. R. Poore

Copy 001: R. Moler


SPEC. RANGE
DRS VTP-302
F 239
L. O. DATE 6-4-67
UMB 3 & 4 TEMP PLOT
(+) (o)
TEMP. °F.
73.0
72.0
71.0
70.0
69.0
68.0
1500
1100
0700
0300
2300
1900
1500
1100
0700
6-4-67
6-3-67
UMB 3 — X
UMB 4 — O
60001
EKV QC 5

[illegible] - 39   Sheet ___ of ___

F   TLM CORRE[illegible]D VALUES   DRS VTP 3.02-10   10-11

DATE TIME		CPL 4 10-5	CPL 7 10-8	CPL 8 10-9	CPL 9 10-10	CPL 11	AVERAGE	CPL 5 10-6	CPL 6 10-7	AVERAGE	BBT 3	BBT 4	AVERAGE	CP TEMP	Correction (%)
6-2	%														
1100	T	[illegible]													
Run 2	%	62	60	61	62	38		62	60						
1930	T	71.62	71.08	71.51	71.42	69.17	70.98	71.60	71.37	71.49	71.20	70.95	71.08		
Run 3	%	56	57	55	54	37		55	56						
1015	T	70.26	70.41	70.21	69.65	67.79	69.72	70.06	[illegible]	70.27					0
Run 4	%	57	58	[illegible]	[illegible]	38		56	[illegible]						
1530	T	70.48	70.64	[illegible]	[illegible]	69.17	69.94	70.28	70.71	70.49					0
Run 5	%	57	57	55	53	[illegible]		56	56						
2000	T	70.48	70.41	70.21	69.43	69.17	69.94	70.28	70.49	70.38					0
Run 6	%	57	57	55	53	38		56	56						
2400	T	70.48	70.41	70.21	69.43	69.17	69.94	70.28	70.49	70.38					0
	%														
	T														
	%														
	T														
	%														
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0009	%														
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D10-3

SUMMARY

[✓] Failures/Waivers   [ ] ~~Mods/Variations~~

Rpt No.	AGE or Veh	Major Ass'y	Component/Ass'y	Description	Remark/Reason	Completed Date	By	QC
182	C/P	39	617-114 DISTRIBUTION BOX	Fuse F-5 Blown	(F) Replaced Fuse Board Ass'y	3/4/67	[illegible]	EKY QC
183	C/P	39	MSD	Speed 55 & 64 Period Below Spec	Waiver	4/29	[illegible]	EKY QC
190	C/P	39	[illegible] "A" [illegible]	[illegible] attached	Waiver	5/24	PA	EKY QC
191	C/P	39	Performance [illegible]	Out of Spec	[illegible]	5/27	[illegible]	EKY QC
192	C/P	39	Transport System	Erratic [illegible] Markers	Waiver	5/26	[illegible]	EKY QC
			DISCREPANCY	LIST Items 1-17				

70001

EASTMAN KODAK COMPANY – APPARATUS & OPTICAL

FAILURE ANALYSIS

AO 1281-(REV.11-61)

1. FAILURE LOCATION: (Name)
A. Major Component or Assembly
C/P
B. Chassis or Sub-Assembly
Distribution Box
C. Failed Part
Fuse Board Assy - A-5

2. HAS THIS PART FAILED BEFORE ☐ Yes ☐ No
If yes, See Report No. ______

Failure Report No. KV 182

3. FAILURE CATEGORY: ☐ Early Failure ☐ Human Initiated Failure ☐ Wear Out Failure (Time to Failure ______ Hrs.)

4. MODE OF FAILURE (Manner or way part failed)

Apparent overload in 5 volt Instrumentation Ckt caused blown fuse, F-5 (1/20 amp.)

5. CAUSE OF FAILURE: (Attach Photos or Sketches as required)

Undetermined at this time (3/7/67):

Investigation into 5 volt instrumentation circuit in the C/P showed no shorts or low resistance that would cause overload

Investigation into AGE showed no condition that would create overload this included check from Interface end of cables thru Test Console to recorder.

NOTE: The test set up had been changed before trouble shooting began.

6. FAILURE CLASSIFICATION: ☐ Nonconformance to Design ☐ Design

ANALYST C. Krausse | Date of Analysis 3 / 7 / 67

7A. RECOMMENDED CHANGE: ☐ Fabrication Methods ☐ Inspection Procedure ☐ Specifications ☐ Design ☐ Other ______

B. DESCRIPTION OF CHANGE: ______

Reliability Approval ______

8. DESCRIPTION OF ACTION TAKEN: The Roller/Base Assy was removed and sent to Rochester for a different retrofit. EKC/Rochester QC followed up investigation in CPL 28 area when the Assy was in Rochester.

EKV QC 5

9. ACTION TAKEN BY ______ NAME ______ GROUP | DCO NO. ______ OR EFFECTIVE DATE / /

COPIES:

70002

FAILURE REPORT

1. FAILURE LOCATION (Dwg. Title)	2. DWG. NO.	3. SER. NO.	4. MANUFACTURER	5. REPORT NO. KV182
A. Major Component or Assembly C/P	A. 805-101	A. 239	A.	6. PROJECT Equipment Type:
B. Chassis or Sub-Assembly Distribution Box	B. 617-114	B. 611N832	B.	A. Primary [X]
C. Failed Part Fuse Board Ass'y A-5	C. 617-118	C. N453	C.	B. Support [ ]

7. EFFECT ON MAJOR COMPONENT: * [ ] Critical * [ ] Major [ ] Minor
* Failure Analysis Required

8. DESCRIPTION OF TEST: (Bench, Installation, Inspection, Operational, Environmental, Etc.) (Include Test Numbers if Available)

During an on Axis Focus test (VTP 301-task 5)

9. DESCRIPTION OF FAILURE: (Give symptoms observed: Environmental & Operational Conditions Part was subjected to prior and during failure)

Blew Fuse F-5 (5 volt Instrumentation Voltage) on Fuse Board Assy A-5 in Distribution Box

10. PRESENT STATUS OF:

A. MAJOR COMPONENT
[ ] Returned to Service
[ ] Awaiting Parts

B. FAILED PART:
[ ] To Failure Analysis at (Field) (Plant)
[ ] Replaced By ______ NAME
[ ] Repaired By
[ ] Returned to
[ ] Scrapped

BKV QC 5

C. AUTHORIZATION TO PROCEED WITH TEST:

______

______

11. Originated By: R. H. Zieman	12. Date of Failure 3 / 4 / 67	Time

COPIES:

70003

WAIVER FOR
APPROVAL OF NON-CONFOR

Research and Engineering

[ ] Variation
[ ] Deviation

Report No. KV 183
Serial No. FM 239
Date 5-19-67

Item Name Space Chamber Sssembly   Dwg. No. & Rev. 805-101
Serial No. FM-239   Originator Bishetsrieder

Description of Non-Conformance

MSD Period Specification Value (inc. ± .10% Tol.)

SPEED	MAX	MIN	ACTUAL READING	% ERROR FROM NOMINAL
55	20105	20065	20062	.114
64	18383	18346	18340	.133

No. of Previous Occurrences 10   Disposition X Accept ___ Reject

Disposition and/or
Corrective Action Instructions

The measured values represent an out of tolerance condition as indicated above. This condition will not affect flight conditions for this unit.

Disposition:	Accept	Reject	Rework	
Q.C. Engr.	R Freeman 5/31/67			
Program Mgr.	R Bishetsrieder 5/31/67			
Base Mgr.				70004
AF Rep.	David M. Wilde 31 May 67			

WAIVER FOR
APPROVAL OF NON-CONFORMA
Research and Engineeri

[ ] Variation
[ ] Deviation

Report No. KV 190
Serial No. FM-239
Date 5-26-67

Item Name Space Chamber Assembly
Dwg. No. & Rev. 805-101
Serial No. FM-239
Originator Bishetsrieder

Description of Non-Conformance

The Dust Shield Fastener (813-267-1) were attached to the Aluminized Glass Fabric (400-1237-101) of Dust Shield "A" Assy (813-225) in wrong orientation i.e. the mating surface was facing outboard and should have been inboard to be compatible with mating surface of Dust Shield "B" Zipper Assy (813-241) attached to [redacted] OCV per drawing.

No. of Previous Occurrences 0 Disposition ____ Accept ____ Reject

Disposition and/or
Corrective Action Instructions

Remove Dust Shield "B" Zipper Assy (813-241) from Dust Shield Flange (813-242) attached to OCV. Reposition the above assy with the mating surface facing inboard (to be compatible with the "A" assembly) and cement to the Flange with RTV-102 (400-1760-102).

Disposition:	Accept	Reject	Rework	
Q.C. Mgr.	R Geiman 5/31/67			
Program Mgr.	P Bishetsrieder 5/31/67			
Base Mgr.				
AF Rep.	[redacted]	5/31/67	KV QC 5	70005

WAIVER FOR
APPROVAL OF NON-CONFORMAN
Research and Engineeri

[ ] Variation
[ ] Deviation

port No. KV 191
erial No. FM-239
ate 5-26-67

Item Name: Space Chamber Assembly
Dwg. No. & Rev. 805-101
Serial No. 239
Originator: Bishetsrieder

Description of Non-Conformance

The Reference Mirror readings in SET #46, "Elevation and Azimuth Servo Replacement", were : El 90° 00' 49" Az 44' 55' 12"
The Reference Mirror is normally set at El 90° 00' 00" Az 45° 00'00"
The Reference Mirror could not be adjusted.
The Reference Mirror tolerance for Elevation and Azimuth are ± 30".

o. of Previous Occurrences ____ Disposition X Accept ____ Reject

Disposition and/or
Corrective Action Instructions

The customer was given the Reference Mirror readings of El 90° 00' 49" Az 44° 55' 12" and the Stereo Mirror reading for position 2, 1 of El 89° 59' 10" Az 314° 57' 30" and accepted this out of tolerance condition.

Disposition:	Accept	Reject	Rework	
Q.C. Engr.	RFreeman 5/31/67			
Program Mgr.	RBishetsrieder 5/31/67			
Base Mgr.				
AF Rep.		31 May 67		70006

WAIVER FOR
APPROVAL OF NON-CONF

Research and Engineer

____ Variation
____ Deviation

ort No. KV 192
ial No. 239
Date 5-26-67

Item Name Space Chamber Assembly Dwg. No. & Rev. 805-101

Serial No. 239 Originator

Description of Non-Conformance	WAIVE Yes	WAIVE No
The Record Transport Looper system did not operate normally during the tracking check of C/P readiness testing operating 6 VTP-302. The looper carriage would actuate the looper empty switch (S-1004) then drift back allowing the take-up motor to restart. During normal operation the looper carriage holds the micro switch closed at the end of the emptying cycle.	✓	

Disposition XXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

The system was run at three different payload voltages (26.0, 28 and 32.5 volts) and with the Y axis vertical and horizontal. The anomaly occurred only when the Y axis was horizontal. It was theorized that the anomaly was probably due to the effects of gravity and inertia on a looper carriage assembly having considerably less friction in its moving parts than previous units. The decision was made to accept the assembly as is and continue the test cycle.

Approval		Date	
Q.C. Engr.	R. Leeman 5/27/67		
Program Mgr.	Bisheteneller 5/27/67		
AF Rep	6/7/67		70007
AF Rep.			

DISCREPANCY & DISPOSITION LOG

Condition Originated	Action Required	
"P" Plant "V" VAFB	"F" Failure "O" On Site Repair "W" Waiver "R" Replace	Vehicle No. FM239 Sheet No. 1

No.	Date	Description	Origin	Corrective Action	Action Taken Type	Action Taken By	Action Taken Date
1	2/11/67	FRSA Container Extremely dirty [illegible]	P	CLEANED before [illegible]		EKV QC	
2	2/11/67	C/P Container Handling Ring Pulled Partially Treads [illegible] Ret.	P	Done / [illegible]		3 EKV QC	
3	3/2/67	Dust Shield 711-299 SN 2693 Assemble Incorrectly	P	Reassembled properly		EKV QC	-67
4	3/	[illegible] 1I STRAP TOO SHORT T To Spec	P	Longer strap obtained [illegible]		3 EKV QC	5/23/67
5	3/2	[illegible] Paint on [illegible] Lens Barrel	P	Cleaned [illegible]		3 EKV QC	5/2/67
6	3/2/67	Mirror [illegible] 838-100 SN A710	P	NGE [illegible]		8 EKV QC	
7	3/2/67	PLATEN HAS CIRCUMFERENTIAL MARK OPPOSITE X SIDE OF UNIT	P	Record [illegible]		3 EKV QC	5/2/67
8	3/12/67	[illegible] on [illegible] Unit [illegible]	P	[illegible]		8 EKV QC	5/2

DISCREPANCY & DISPOSITION LOG

Condition Originated	Action Required	
"P" Plant "V" VAFB	"F" Failure "O" On Site Repair "W" Waiver "R" Replace	Vehicle No. FM 239 Sheet No. 2

No.	Date	Description	Origin	Corrective Action	Action Taken: Type	By	Date
9	3/2/67	Multiple scratches aft +X lens barrel	P	Beauty Defect		B BKV QC 7	
10	3/2/67	Stereo mirror blemish (scratches)	P	Beauty Defect		B BKV QC 7	
11	3/2/67	Lens has a scratch about 1½" +Y+Z going approx ⅓ way around	P	Beauty Defect		B BKV QC 7	
		Rollers 11, 13 & 15 in the camera has circumferential scratches	P	Not detrimental ([illegible])		B BKV QC 7	
[illegible]		Tape left [illegible] camera	P	Removed		B BKV QC 7	
14	[illegible]/67	[illegible] 6, 8, 19, 24 & 21 have scratches on them	P			B BKV QC 7	
15	3/2/67	Burr on roller #10 raised can be felt	P	Burr turned out to be a piece of tape stuck to roller. OK		B BKV QC 7	
16	3/2/67	Test box, scratches, finger prints	P	Cleaned [illegible]		B BKV QC 7	5/23/67

000004

DISCREPANCY & DISPOSITION LOG

Condition Originated	Action Required	
"P" Plant "V" VAFB	"F" Failure "O" On Site Repair "W" Waiver "R" Replace	Vehicle No. 23[illegible] Sheet No. 3

No.	Date	Description	Origin	Corrective Action	Action Taken: Type	By	Date
17	5/24/67	Interface "A" Dust Shield fastener is [illegible] Dust Shield Fabric.	P	Removed associated [illegible] "B" Assy. Reversed [illegible]	O	[illegible]	5/24/67
		[illegible] zipper is outboard (male). [illegible] zipper is outboard also (male).	P	[illegible] 1102	O	[illegible]	5/24/67

70010

Fm 39

SUMMARY

[ ] ~~Failures/Waivers~~ [✓] Mods/Variations

Rpt No. RVM	AGE or Veh	Major Ass'y	Component/Ass'y	Description	Remark/Reason	Completed Date	By	QC
236	C/P	39	DISTRIBUTION BOX	REPLACE FILTER BD ASSY A-5		3/14	RN	EKV QC
237	C/P	39	AIR SUPPLY	REPLACE ROLLER ASSY		3/13	RAP	EKV QC
238		39	STERO MIRROR	REPLACE SERVOS		3/14	RAP	EKV QC
242	C/O	39	STERO MIRROR	REPLACE E&A SERVOS		4/21/67	RAP	EKV QC
248	C/P	39	AZ & EL SERVOS	EPOXY TWO SCREWS ON NAMEPLATE OF POLY SCIENTIFIC ENCODERS		5/11/67		EKV QC
249	C/P	39	STEREO MIRROR	REPLACE SERVOS.		5/11/67		EKV QC
250	C/P	39	STEREO MIRROR	REPLACE CONNECTING ROD		5/15/67		EKV QC
257	C/P	39	DISTRIBUTION BOX	REPLACE RECORD TRANSPORT CONTROL MODULE & C/O.		5/22/67		EKV QC

PARTS LIST

80001

Report No. KUM-236

AUTHORIZATION FOR FIELD MODIFICATION

Date 3-8-67

Item Name Distribution Box Assembly

Drawing Number 617-114

Item Serial No. 611 N 832 Veh. Serial No. FM-239

Design Authorization Reference: Phone conversation J.C. Heit (EKR) and R. Bish (EKV)

Description of Modification: Replaced Fuse Board A-5 (Dwg #617-118) Set 20 performed to check modification.

Old fuse board S/N N-453

New fuse board S/N P-297

APPROVALS		COMPLETION
[illegible] Prime Contractor Rep.	3/13/67 Date	Date 3-14-67
		By [illegible]
Air Force Rep.	13 Mar 67 Date	QC [illegible]

ING

80002

rt No. KUM-237

AUTHORIZATION FOR FIELD M

Date 3-9-67

Item Name Roller & Base Assembly, Air Supply

Drawing Number 711-297

Item Serial No. N-341 Veh. Serial No. FM-239

Design Authorization Reference: TWX # R-008358-XH Program office to EKR

Description of Modification: Remove and Replace Roller & Base Assembly Ser # N-341 after modification at EKR.

Procede with normal S/S test UTP-301 as check out following installation.

APPROVALS		COMPLETION
[illegible]	3/13/67	Date 3-13-67
Prime Contractor Rep.	Date	By R. A. Perry
		QC [illegible]
Air Force Rep.	Date	EKR QC
		80003

Report No. KUM-238

AUTHORIZATION FOR FIELD MODIFICATION

Date

Item Name Space Chamber

Drawing Number 805-101

Item Serial No. FM-239 Veh. Serial No. FM-239

Design Authorization Reference:

TWX #R- 008357 XH Program

office to EKR

Description of Modification: Replacing Elev. Serv S/N 605053

Dwg #614-100 and Azim Ser S/N 612061 Dwg. #614-101

New Elev Servo Ser #701062 A

Azim Servo Ser #611 060 A

Perform Set 46 following installation

APPROVALS		COMPLETION
Prime Contractor Rep.	Date 3/13/67	Date 3-14-67
Air Force Rep.	Date 13 Mar 67	By R. A. Perry
		QC

EKV QC

80004

Report No. KVM 242

AUTHORIZATION FOR FIELD MODIFICATION

Date 4-7-67

Item Name Elevation & Azimuth Servo Assemblies

Drawing Number 614-100/614-101

Item Serial No. 612102A/409027MA-2 Veh. Serial No. 239

Design Authorization Reference: Ref. TWXR008415-TH

Description of Modification:

(1) Replace Elevation Servo, 614-100, S/N 701062A with Elevation Servo S/N 612102A.

(2) Replace Azimuth Servo, 614-101, S/N 611060A with Azimuth Servo S/N 409027 MA-2

Perform items (1) and (2) Servo validation as per SET #46

APPROVALS		COMPLETION
Stephen F Hauser — Prime Contractor Rep.	4-7-67 — Date	Date 4-21-67
[redacted] Air Force Rep.	7 Apr 67 — Date	By R. A. Perry
		QC
		80005

Report No. KVM 248

Date 5-17-67

AUTHORIZATION FOR FIELD MODIFICATION

Item Name Elevation and Azimuth Servos

Drawing Number 614-100 & 614-101

Item Serial No. Elev. 701063 Azim. 612061

Veh. Serial No. 239

Design Authorization Reference: Telecon: P. Murfin (EKR) and D. Mirth (SSD)

Description of Modification: Cut lock wires and remove (8) screws holding cover to servo. Cover screw heads (2), holding Poly Scientific Nameplate, with Epoxy. Cure over night. Re-assemble servos. Purge with Dry N_2 - leak rate - and continue SET-46.

SET 46 is checkout procedure to be performed following servo replacement.

APPROVALS

[signature] 5/31/67

Prime Contractor Rep. Date

31 May 67

Air Force Rep. Date

COMPLETION

Date [signature]

By 5/17/67

[signature]

80006

AUTHORIZATION FOR FIELD MODIFICATION

Report No. KVM 249
Date 5-17-67

Item Name Elevation and Azimuth Servos
Drawing Number 614-100 and 614-101
Item Serial No. See Below Veh. Serial No. 239

Design Authorization Reference: Per phone from Rochester, Poore-Heit per Program Office Directive.

Description of Modification: Replace both Elevation and Azimuth Servos and perform SET-46 (Servo checkout procedure) following replacement.

OLD SERVO S/N	NEW SERVO S/N
Elev. 612102- A-1	Elev. 701063-A-1
Azim. 409027- MA-2	Azim. 612061-1-A

APPROVALS

P Bishetsnider 5/31/67
Prime Contractor Rep. Date

[redacted] 31 May 67
Air Force Rep. Date

COMPLETION

Date 5/18/67
By C Krause RB
QC R W Bosley KY QC

80007

Report No. KVM 250

AUTHORIZATION FOR FIELD MODIFICATION

Date 5-17-67

Item Name Connecting Rod L.H

Drawing Number 807-252

Item Serial No. See Below

Veh. Serial No. 239

Design Authorization Reference: Telecon: M. Culhane (EKR)

R. Bishetsrieder (EKV)

Description of Modification: Replace Connecting Rod L.H (S/N N 165)

with Rod L.H (S/N L 560)

Original rod diverted for use on FM-238.

APPROVALS		COMPLETION
R Bishetsrieder	5/31/67	Date 5/15/67
Prime Contractor Rep.	Date	By D. Wood RB
	31 May 67	QC [signature] EKV QC
Air Force Rep.	Date	80008

AUTHORIZATION FOR FIELD

Report No. XVM 251
Date 5-19-67

Item Name Distribution Box
Drawing Number 617-114
Item Serial No. N-279 Veh. Serial No. 239

Design Authorization Reference: Per phone from Rochester - Poore-Heit per Program Office Directive

Description of Modification: Replace Record Transport Command Module (RTCM) (617-114) S/N 279 with new module S/N K-314. Leak rate test and functionally check the re-assembled P/L per SET-53.

APPROVALS		COMPLETION
R Bishetsnider Prime Contractor Rep.	5/31/67 Date	Date 5/22/67 By C. Krause RB
[redacted] Air Force Rep.	31 May 67 Date	QC [illegible] BKV QC 1

80009

Veh. No. 239

PARTS CHANGE LOG

Sheet No. 1

Item	Major Ass'y Part No/SN	Part Name / Part Number		Serial No.	Removed By	Date	Replaced By	Date	QC	Remarks
1	[illegible]	[illegible]	Old	N-341	J[illegible]	3/7/[illegible]	[illegible]	3/[illegible]	EKV QC	
		711-277	New	U-341						
2	C/P	[illegible] Button Box	Old	611N832	[illegible]	[illegible]	JM	3/14/67	EKV QC	
		617-114	New	611N932		67	LN			
3	C/P	[illegible]	Old	605053	JK	3/8/67	RAP	3/1[illegible]	EKV QC	
		614-100	New	701062A	[illegible]		JK	67		
4	C/P	Azimuth Servo	Old	612061	JK	3/8/67	RAP	3/[illegible]/67	EKV QC	
		614-101	New	611060A	[illegible]		JK			
[illegible]	C/P	El[illegible] F[illegible]	Old	[illegible]	JK	[illegible]	RAP	3/1[illegible]/67	EKV QC	
		614-551	New	[illegible]3	[illegible]		JK			
6	DIST	Fuse Board Assy A-5	Old	U-453	R[illegible]	3/13/67	SM	[illegible]/67	EKV QC	
		617-118	New	P-297						
7	C/P	Elevation Servo	Old	701063A	JT	3/7/67	RAP	3/7/67	EKV QC	
	3[illegible]	614-100	New	612102A1						
8	C/P	Azimuth Servo	Old	611060A	RAP	4/19/67	RAP	4/20/67	EKV QC	
	805-101	614-101	New	409027 MA-2	DF-200		DF/200			
9	C/P	[illegible]	Old				JK	5/15/67	EKV QC	Supplied [illegible] to [illegible]
		516-202	New	70						
10	Stereo Mirror [illegible]	LH Connect. Rod Assy	Old	N-160	DW	5/10/67	JK	5/15	EKV QC	Cannibalized fr Frame 238
	33	301-252	New	L-56C	DF (IB)					
11	C/P	Elevation Servo	Old	612102A1	JK	5/18/67	JK	5/18/67	EKV QC	
	805-101	614-100	New	701063A1						
12	C/P	Azimuth Servo	Old	409027 MA-2	RAP	[illegible]/67	RAP	[illegible]	EKV QC	
	805-101	614-101	New	612061-1A						

M

Veh. No. 23

PARTS CHANGE LOG

Sheet No. 2

Item	Major Ass'y Part No/SN	Part Name Part Number		Serial No.	Removed By	Date	Replaced By	Date	QC	Remarks
13	DISTRIBUTION Box 617-114	RECORD TRANS CARD ASSY 617-223	Old	N-279	JK	5/19/67	LK	5/19/67		
			New	K-314			JK			
14	Stereo Viewer	View Port Boot 312-4[illegible]	Old				RAP	5/26/67		Initial Installation
			New	N-811						
15	Stereo Prisms (3ea)	Stereo Prisms 749-42	Old	#L659, #3, #17	DWood	5/29/67				Final Removal for Flt
			New							
16	Air Supply	Screens [illegible] Air Supply	Old		DWood	5/29/67				New Screens — Final Flt Install
			New							
17	Ref Mirror	Reference Mirror	Old		RAP	5/26/67				Final Removal
			New							
			Old							
			New							
			Old							
			New							
			Old							
			New							
			Old							
			New							
			Old							
			New							
	1003		Old							
			New							
			Old							
			New							

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1a

OPERATING TIME LOG

DATE	TEST Title & No.	TIME	OPERATING POWER TC-Mtr/ VP 46 start / stop	test / accum	HEATER POWER TC-Mtr/VP-50/VTP26 start / stop	test / accum	GAIN CONTROL TC-Mtr/ VP49 start / stop	test / accum	MSD TIME TC/VP39&40/CPL 18 start / stop	test / accum		
	ROCH		~~66.54~~		—	3.09	—	14.80	—	~~8.94~~	—	
3/3/67	301-3 LOS		847.00 / 847.51	.51 / .51	87.22	0	372.26	0	140.11	0	—	
	301-4-1		847.90	.39 / .90	—	0	—	0	140.15	.04 / .04	—	
3/4/67	301-5-1		848.73	.83 / 1.73	—	0	—	0	140.30	.15 / .19	—	
3/7/67	ETR		849.64 / 850.31	.67 / 2.40	—	0	—	0	140.71	.31 / .50	—	
3/16/67	SET 46		851.10	2.07 / 4.47	—	0	—	0	—	0	—	
	SET 72		853.17	2.59 / 7.06	87.22	.55 / .55	372.26 / 372.27	.01 / .01	140.80	.33 / .83	—	
3/20	301-4-2		[illegible]	1.04 / 8.10	87.77	0	372.27	0	141.13 / 141.15	.02 / [illegible]	—	
[illegible]	301-5-1		856.80 / 858.22	1.42 / 9.52	—	0	—	0	141.50	.35 / 1.20	—	
3/24	301-5-3		859.09	.71 / 10.23	—	0	—	0	141.65	.15 / 1.35	—	
3/28	301-5-4		859.77	.68 / 10.91	—	0	—	0	141.78	.13 / 1.48	—	
4/20	SET 46-2		860.20 / 862.50	2.73 / 13.64	87.92	.15 / .70	372.27	0	141.80	.02 / 1.50	—	
4/24	301-5-5		863.07	.57 / 14.21	—	0	—	0	141.91	.11 / 1.61	—	
4/2[illegible]	301-7		867.56	4.49 / 18.70	—	0	376.36	4.07 / 4.08	141.93	.02 / 1.63	—	
4/27	[illegible]		868.35	.79 / 19.49	—	0	—	0	142.04	.11 / 1.74	—	
	301-7		[illegible]	[illegible] / 19.96	87.92	0 / .70	[illegible]36	0 / 4.08	142.09	.05 / 1.79	—	
			—		—		—		—		—	

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OPERATIONS LOG

1b

DATE	TEST (Title & No.) Remarks	SERVOS Elev Cpl 13 test	SERVOS Elev Cpl 13 accum	SERVOS Azi Cpl 14 test	SERVOS Azi Cpl 14 accum	LOOPER Sws. CPL 17 Empty Sw test	LOOPER Sws. CPL 17 Empty Sw accum	LOOPER Sws. CPL 17 Full Sw test	LOOPER Sws. CPL 17 Full Sw accum	MSD TC-Mtr/Cpl 18 start	MSD TC-Mtr/Cpl 18 stop	MSD TC-Mtr/Cpl 18 test	MSD TC-Mtr/Cpl 18 accum	SLIT test	SLIT accum
	ROCH		76		132				3847				2076		
3/3/67	301-3-LOS	8	8	20	20	0		0		5733		0		21	21
	301-4-1	3	11	2	22	15	15	9	9		5772	0		4	25
3/4	301-5-1	0		0		77	92	10	19		5861	67	78	1	26
3/7/67	ETR 31-R-1	0		0		160	252	154	173		5886	19	97	1	27
3/16/67	SET 46-1	35	46	43	65	1	253	1	174	5913	5914	1	97	5	32
	SET 12			0		119	372	108	192	5914		24	121		
3/20	301-4-2			0		7	260	7	181	5938	[illegible]	4	125	0	
3/23	301-5-1-2			0		157	417	25	206		6077	36	161	2	34
3/24	301-5-3			0		67	474	12	218		6133	56	217	2	36
3/28	301-5-4			0		35	539	15	233		6174	41	258	2	38
4/20	SET 46-2	13	89	37	102	0		0			6176	2	260	2	40
4/24	301-5-5	0		0		49	588	12	245		6217	41	301	4	44
4/26	301-7	0		0		8	596	7	252		6218	1	302	0	
4/27	Exp Series	0		0		53	649	12	264		6261	43	345	4	48
	301-9	0	89	0	102	94	673	7	271		6280	19	354	9	57

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2a

OPERATING TIME LOG

DATE	TEST Title & No.	TIME	OPERATING POWER TC-Mtr/ VP 46 start / stop	test / accum	HEATER POWER TC-Mtr/VP-50/VTP26 start / stop	test / accum	GAIN CONTROL TC-Mtr/ VP49 start / stop	test / accum	MSD TIME TC/VP39&40/CPL 18 start / stop	test / accum		
4/28	301-6		869.43 / 869.62	.19 / 20.15	87.92 / 87.92	0	376.36 / 376.36	0	142.19 / 142.25	.06 / 1.86	—	
5/18	Set 46-3		874.95 / 876.76	1.59 / 21.74	88.42 / 88.42	0	376.36 / 376.36	0	142.37 / 142.37	0	—	
5/22	Set [illegible] 301-8		877.86	1.10 / 22.84	88.77	.35 / 1.05	376.36	0	142.39	.02 / 1.87	—	
	301-12		878.[illegible]	.19 / 23.03	—	0	—	0	142.40	.01 / 1.88	—	
	301-13		878.[illegible]	.48 / 23.51	—	0	—	0	142.46	.06 / 1.94	—	
5/24	301-9-2		883.39	4.86 / 28.37	—	0	380.76	4.50 / 3.58	142.48	.02 / 1.96	—	
			—		—		—		—		—	
5/24	MATE		—		—		—		—		—	
5/25	Readiness	[illegible]	0 / 2.19	2.19 / 30.56	0 / 2.15	[illegible] / 1.20	22.10 / 22.10	0	26.36 / 26.47	.11 / 2.07	—	
5/27	302-7 (T[illegible])		—	1.98 / 32.54	—	4.40 / 5.60	—	.80 / 4.30	—	.04 / 2.11	—	
6/1	302 8 [illegible]		—	0.15 / 32.69	—	0.88 / 6.48	—	0	—	.02 / 2.13	—	
6/2	302-9.1 TP-26		—	.57 / 33.26	—	1.35 / 7.83	—	0	—	.02 / 2.15	—	
6/2	302-9-2 TP-26		—	.57 / 33.83	—	1.25 / 8.08	—	0	—	.02 / 2.17	—	
6/3	302-9-3 -TP-[illegible]		—	.57 / 34.40	—	1.30 / 9.38	—	0	—	.02 / 2.19	—	
6/3	[illegible]-10		—	.30 / 34.70	—	41.7 / 51.08	—	0	—	0	—	
6/4	302-[illegible]		—	.57 / 35.27	—	9.4 / 60.48	—	0	—	.02 / 2.21	—	
	[illegible]		—		—		—		—		—	

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OPERATIONS LOG

DATE	TEST (Title & No.) Remarks	SERVOS Elev Cpl 13 test	accum	SERVOS Azi Cpl 14 test	accum	LOOPER Sws. CPL 17 Empty Sw test	accum	LOOPER Sws. CPL 17 Full Sw test	accum	MSD TC-Mtr/Cpl 18 start	stop	MSD test	accum	SLIT test	accum			
4/28	301-6	0	89	0	102	26	699	15	236	6310	6323	13	267	0	57			
5/18	Set 46-3	24	113	44	146	0		0		6365	6366	0		6	63			
5/22	SET 53 301-8	0		0		2	701	0			6368	2	369	0				
	301-12	0		0		2	703	2	288		6370	2	371	1	64			
5/23	301-13	3	116	2	148	25	728	11	299		6389	19	390	13	77			
5/24	301-7-2	0		0		7	735	7	306		6391	2	392	0				
5/24	MATE																	
5/25	Readiness (PR)	15	131	6	154	110	845	33	339	Bad ctr		66	458	0			PTS # 005	
5/27	302-7 TP16	14	145	16	170	26	871	2	341			24	484	14	91			
6/1	302-8 TP-23	7	152	8	178	13	884	1	342			12	496	7	98			
6/2	302-9-1 TP-06	7	159	8	186	13	897	1	343			12	508	8	106			
6/2	302-9-2 TP-06	7	166	8	194	13	910	1	344			12	520	8	114			
6/3	302-9-3 FR-20 TP-06	7	173	8	202	13	923	1	345			12	532	8	122			
6/3	302-10 Comb	0		0		0		0				0		0				
6/4	[illegible]	7	180	9	211	13	936	1	346			12	544	8	130			
	LIFT OFF																	