

APOLLO POSTRETRIEVAL PROCEDURES FOR NASA RECOVERY TEAM

CONTRACT NAS9-150 EXHIBIT I, PARAGRAPH 10.7

**NASA
SUPPORT
MANUAL**



A0164-6

**MISSION
APOLLO 13
508/109/LM7**

PREPARED UNDER DIRECTION OF
**NASA-MSC LANDING AND RECOVERY DIVISION
RECOVERY SYSTEMS BRANCH**

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Space Division
North American Rockwell

**INTERIM
CHANGE BULLETIN**

SM2A-08-SC109

APOLLO 13

AS508/109/LM7

APOLLO POSTRETRIEVAL PROCEDURES

COMMAND MODULE

Contract NAS9-150
Exhibit 1; Paragraph 10.7

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NASA
APOLLO SUPPORT MANUAL
INTERIM CHANGE BULLETIN

This ICB is issued to expedite release of information required to supplement existing Apollo Support Manuals. Information delineated by this ICB will be incorporated with- in the next scheduled change or revision of the applicable manual.

Manual No. SM2A-08-SC109 Date 15 Dec 1969 SID No. 69-646 Sheet of
ICB No. 1 Sequence No.

Replace the following pages with printed pink pages:

ICB Title	41	153	189
List of Effective Pages	42	154	190
Title/Signature	43	155	197
A	44	156	198
1	45	157	199
2	46	158	200
3	53	159	203
4	54	160	204
5	59	161	207
6	60	162	208
7	117	163	209
8	118	164	210
9	119	165	211
10	120	166	212
11	121	167	213
12	122	168	214
15	127	171	221
16	128	172	222
23	131	175	305
24	132	176	306
25	133	177	309
26	134	178	310
33	135	179	311
34	136	180	312
37	137	181	323
38	138	182	324
39	151	183	333
40	152	184	334

CONTENTS

	Page
SPACECRAFT POSTRETRIEVAL PROCEDURES	1
General	1
Safety	1
Command Module Positioning/Inspection	2
Couch Removal	5
Photographic Requirements	5
Tools and Equipment	5
Postretrieval Procedures	8
 Procedure	
1 Photographic Requirements - Lunar Landing Mission	12
1A Photographic Procedures - Nonlunar Landing Mission	19
2 Engine Vent Plug Installation	33
3 Opening Unified Hatch	38
4 Forward Hatch Removal	43
5 Panel Readings and Switch Positions	47
6 Systems Shutdown	117
7 Command Module Interior Inspection	125
8 Impact Attenuation Strut Insp/Ctr Couch Removal	143
9 Potable Water Samples	151
10 Waste Water Samples	175
11 Deleted	
12 Data Storage Equipment (DSE) Tape Removal	186
13 Deleted	
14 Command Module Exterior Inspection	195
15 Uprighting System Inspection and Removal	209
16 VHF Antenna (No. 1) Inspection and Stowage	213
17 VHF Antenna (No. 2) Inspection and Stowage	219
18 Flashing Light Inspection and Stowage	223
19 RCS Access Panel Sea Water Removal	226
20 Parachute and Fwd Heat Shield Inspection	229
21 Crew Equipment Removal	231
22 Securing Unified Hatch	304
23 Engine Vent Plug Removal	307
24 Microbial Sampling Procedures	309
25 Urine Dump and Steam Duct Filter Installation	311
26 Radiation Survey/Safing	315
27 Personal Radiation Dosimeter Readings	321
A Reaction Control System (RCS) Anomaly	323
B Ordnance Anomaly	328
C Emergency First Aid for Propellant Injury	331
D Potable/Waste Water System Pressurization	332

INTRODUCTION

PURPOSE

The purpose of the Apollo Postretrieval Procedures manual is to identify and define specific postretrieval procedures to be accomplished by the NASA Recovery Team. The manual is designed for recording the condition of the CM structure, internal and external equipment, control/switch and circuit breaker positions, and instrument readings at the time of retrieval.

NOTE

Refer to the following page for a listing of regulations which must be adhered to by all personnel associated with CM postretrieval operations.

SCOPE

This manual specifically defines and provides:

- a. The suggested sequence for accomplishing individual postretrieval procedures on board the recovery ship or at an interim port. (Refer to flow charts located on pages 9, 10, and 11.)
- b. Suggested safety precautions, required tools and equipment, photographic requirements, instructions for accomplishing the specific task, and packaging instructions for components removed during postflight operations.
- c. Anomaly procedures. (Refer to procedures (A), (B), (C), and (D) located in the back of this manual.)

IMPORTANT**GENERAL**

Following recovery and positioning of the CM, certain precautions must be taken to prevent associated personnel and spectators from exposure to known and unknown hazards. Accordingly, the following statements must be strictly adhered to:

1. Following recovery and positioning of the CM, the area shall be immediately policed for any loose items, i.e., pieces of ablator, thermal protective coating, etc. Any items found during this policing operation shall be identified and packaged for return shipment to MSC.

NOTE

Under no circumstances shall CM particles/debris be allowed to remain in the general area. All recovered components shall be transported to the confines of the postretrieval area for identification, packaging, and stowage, within the area and/or another authorized area selected by the NASA Team Leader.

2. Following positioning of the CM on the hangar deck (or appropriate postretrieval operation site) the immediate area shall be roped off (sized as necessary/space permits). In addition, guards shall be positioned at strategic locations to prevent access by unauthorized persons.
3. Upon initiation of CM postretrieval operations, items removed from the CM shall not be removed from the enclosed (guarded) area until appropriately packaged and labeled. Items that are removed from the CM, and not removed from the immediate area, shall remain within the confines of the restricted area.

NOTE

- Under no circumstance shall CM components/equipment be allowed to remain in the general area without being properly identified, packaged, and/or stowed in an authorized area.
- The NASA Team Leader shall be responsible for the establishment and adherence of regulations related to shipboard operations.

SPACECRAFT POSTRETRIEVAL PROCEDURES

GENERAL

This document details the Apollo Command Module (CM) postretrieval procedures to be performed on board the recovery ship. The on-board NASA-MSC representative shall select and accomplish those tasks which require immediate attention.

NOTE

- NO PROCEDURE (CONTAINED IN THIS MANUAL) SHALL TAKE PRECEDENCE OVER CREW EGRESS OR AID.
- All inspection records and photographic data shall be forwarded to the MSC Mission Evaluation team.
- One copy of the marked-up manual shall be returned to NR-Downey via RASPO/ASPO.
- IF THE REMARKS COLUMN IS BLANK, PROCEDURE WAS PERFORMED AS OUTLINED (NO PROBLEMS ENCOUNTERED).

SAFETY

The NASA Team Leader shall be responsible for ensuring that all personnel are aware of the potential dangers associated with CM recovery and postretrieval operations. Hazards which may be encountered during postretrieval operations are:

- Toxic fumes from hypergolic propellants
- Raw propellants
- Flash fires
- Unexpended pyrotechnic devices
- Radiation contamination.

The probability of raw propellant contamination and flash fires is increased once the CM is hoisted from the water. Accordingly, protective clothing and equipment are provided to minimize this danger to personnel.

For specific information relative to anomalies, refer to the procedures identified as (A), (B), and (C), located in the back of this manual. Procedure A, RCS ANOMALY, provides information pertaining to the containment of RCS fires and propellant leaks, Procedure (B), ORDNANCE

ANOMALY identifies the various explosive devices and related safety precautions. Procedure (C), EMERGENCY FIRST AID FOR PROPELLANT INJURY, provides basic first-aid instructions which must be accomplished if an individual comes in contact with raw propellants or vapors. Procedure (D) provides instructions for pressurizing the CM water systems, as required, to accomplish certain procedures within this manual.

ELECTRICAL GROUNDING. After CM positioning and prior to commencing any postretrieval operations, Recovery Team personnel shall establish an electrical ground. Utilize the grounding cable provided as part of the on-board equipment. Attach one end of the cable to the CM; any point of the forward compartment inner structure (preferably a gusset) may be used as a ground point. Attach the free end of the cable to a deck "pad-eye." (Refer to procedure (2), sheet 3 of 4.)

COMMAND MODULE POSITIONING/INSPECTION

Following retrieval, the CM shall be positioned on the Apollo spacecraft transportation dolly, spacecraft cradle, or sandbags - exercise care in placing CM on dolly (cradle) to prevent damage to sensors and ablator.

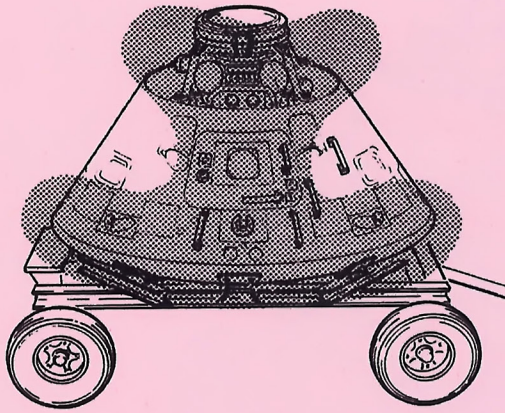
NOTE

If possible, photographs of the aft heat shield should be obtained prior to positioning the CM. Refer to PHOTOGRAPHIC REQUIREMENTS, procedure (1) or (1A) sheet 3 of 6.

The CM shall then be checked for propellant leaks and/or an accumulation of propellant vapors. Should propellant leaks be detected, it shall be the responsibility of the NASA Team Leader to determine the course of action to be taken. An accumulation of propellant vapors or leaks will normally necessitate "CM washdown" to eliminate hazardous conditions. (See illustrations titled "CM Danger Areas" and "CM Washdown/Fire Fighting.")

NOTE

- CM washdown (other than the CM RCS washdown) shall be performed following retrieval - use low pressure fog nozzle.
- Prior to CM washdown, obtain photographs of CM window and aft heatshield. (Refer to procedure (1) or (1A) for requirements.)

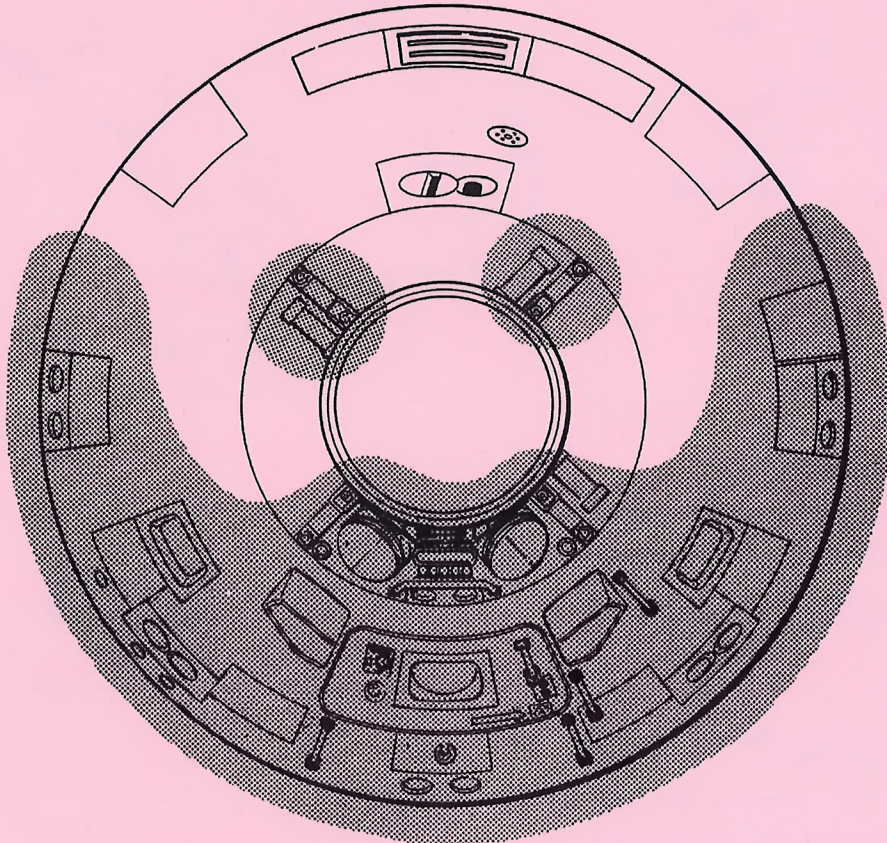


NOTE

- Should propellant leaks or vapors be detected, attempt to establish a safe condition by dousing the contaminated area with large amounts of water.
- Utilize low-pressure water spray to avoid damage to charred areas.
- Surrounding areas should be washed down.

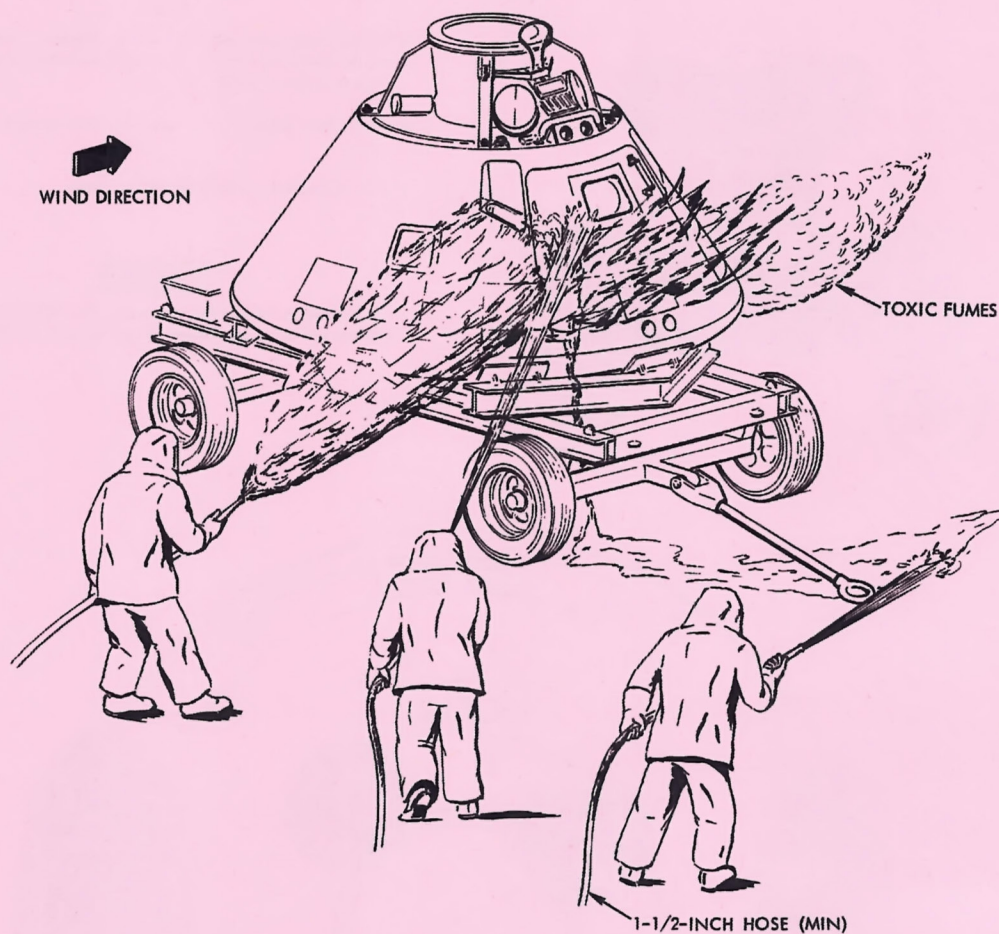
Warning

Limit working time in danger areas. The RCS and Ordnance devices are to be considered dangerous until verified otherwise.



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CM Danger Areas



- 1 Direct water at base of flame.
- 2 Wash propellants away as soon as possible.
- 3 Wash down all equipment exposed to propellants.
- 4 Monitor CM to determine if RCS fumes are present after fire is extinguished.

NOTE

- Use high-capacity fog nozzle (low pressure) to disperse and absorb vapors.
- Fresh or salt water may be used to combat hypergolic fires.
- Remain upwind or crosswind when flushing CM with water.

Warning

- Do not stand in RCS thruster areas (approximately 20 feet from any nozzle).

SM-2A-837F

CM Washdown/Fire Fighting

COUCH REMOVAL

To ease movement within the CM, the center couch may be removed following couch/strut inspection. Refer to procedure (8) for removal instructions.

PHOTOGRAPHIC REQUIREMENTS

Specific photographic requirements applicable to individual postretrieval procedures are included in each procedure. In addition, overall photographic requirements are defined within procedure (1), PHOTOGRAPHIC REQUIREMENTS - LUNAR LANDING MISSION or (1A), PHOTO REQUIREMENTS - NONLUNAR LANDING MISSION.

TOOLS AND EQUIPMENT

The following special tools and equipment are provided for use during postretrieval operations.

Quantity	Nomenclature	Procedure No. (Ref)
SPECIAL TOOLS/EQUIPMENT		
1	Access panel removal kit, primary recovery ship (PRS)	(19)
1	Face shield, model 7-11	(2)
2	Geiger-Mueller survey meter	(26)
1	Ground cable*	
1	Hatch tool kit	(3), (4), (22)
2	Legstat (grounding device)	(B)
1	Microbial sampling kit	(24)
1	NASA safety pin	(3)
50	Polyethylene bags (assorted sizes)	As necessary
1	Potable water sample kit	(9)

*Refer to introductory text; paragraph titled "ELECTRICAL GROUNDING"

Quantity	Nomenclature	Procedure No. (Ref)
1	Spring scale (0-40 oz)	(16)
2	Vent plug set (PRS)	(2)
1	Vent plug set, secondary recovery ship (SRS)	(2)
1	Waste water sample kit	(10)
1	Window cover set, P/N MK394-10061-101	(14)
MISCELLANEOUS TOOLS/EQUIP		
2	Adjustable wrench, 6-inch	As required
1	Adjustable wrench, 10-inch	As required
	Allen wrenches/adapters (assorted)	As required
1	Combination wrench set, 1/4-inch through 1-1/2 inch	
50	Containment stickers	(26)
1 ea	Crows foot, 3/8-inch through 3/4-inch	As required
3	Coveralls	All
	Dosimeter, pocket	(26)
1 roll	Electrical tape, 1/2-inch	As required
	Film badge, radiation	(26)
2	Flashlight	As required
1	Knife, short blade	(3)

SM2A-08-SC109

Quantity	Nomenclature	Procedure No. (Ref)
1 pr	Leather gloves	②, ④
1	Metal snips	As required
1	Mirror	As required
40 ft	Nylon line, 1/4-inch	
50	Part removal tags	As required
1	Pliers, diagonal	As required
1	Pliers, duckbill	As required
1	Pliers, needle nose	As required
1	Pliers, vise grip	As required
1	Pliers, water pump (10-inch)	As required
6 pr	Rubber gloves, long cuff	②, ②③, ②⑥
1	Scale, 6-inch	As required
1	Scissors (X-acto knife - alternate)	
1 ea	Screwdriver, slot (assorted)	As required
1 ea	Screwdriver, torq-set (#1, #2, #3, #4, #6, #8, #10, #12, #14, 1/4-inch)	As required
1	Screwdriver, phillips (assorted)	As required
1 ea	Shim stops (or feeler gage)	⑧
1	Steel rule, 6-foot	As required
1	Socket set (deep), 1/4-inch drive	As required
1	Socket set, 3/8-inch drive	As required

Quantity	Nomenclature	Procedure No. (Ref)
1	Stopwatch	As required
2 pr	Surgeons gloves	(24)
100	Test stickers (tape)	(26)
2 ft	Wire (sized as required)	(17)

POSTRETRIEVAL PROCEDURES

The remainder of this document is devoted to individual procedures normally accomplished by the NASA Recovery Team. Procedures shall be accomplished under the direction of the designated NASA Team Leader. Procedural sequence shall be as specified by the applicable flow chart.

Primary Recovery Ship (PRS). If the CM is recovered by the Primary Recovery Ship, accomplish applicable procedure as defined in the Primary Recovery Ship - Postretrieval Procedures - Flow Chart.

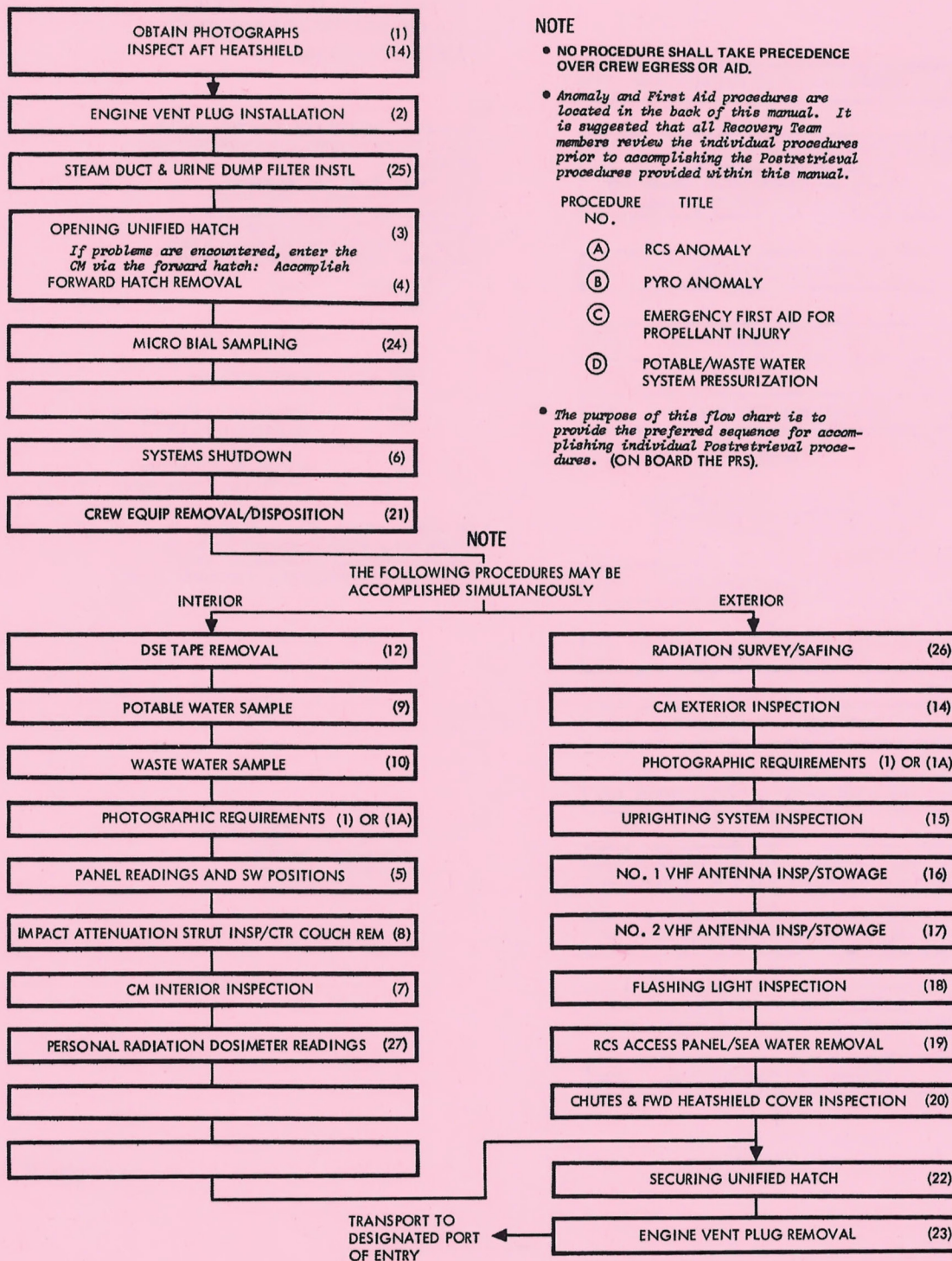
Secondary Recovery Ship (SRS). Should the CM be recovered by other than the Primary Recovery Ship, only specified procedures shall be accomplished on board the recovery ship, the remainder of the procedures shall be accomplished at an interim port. Refer to the Secondary Recovery Ships - Postretrieval Procedures - Flow Chart for specific procedural requirements and sequencing.

Pad Abort. The Pad Abort (Water or Land Impact) - Postretrieval Procedures - Flow Chart provides required procedures/sequence and applicable cautions/notes to be employed following a pad abort. Should a pad abort occur, real-time decisions will establish procedural sequence following CM recovery and crew egress.

NOTE

It is required that all procedures in which deviations or abnormalities were noted be completed by writing appropriate comments in the applicable "Remarks" column. Such comments would include:

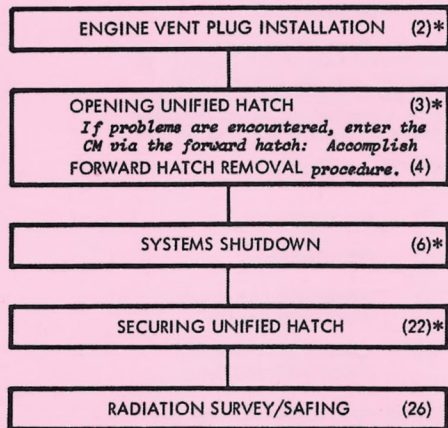
- a. Completion of procedures with any deviations from the written instructions.
- b. Reason(s) for not completing procedure(s).
- c. If no deviations or abnormalities were noted, Remarks columns may be left blank.



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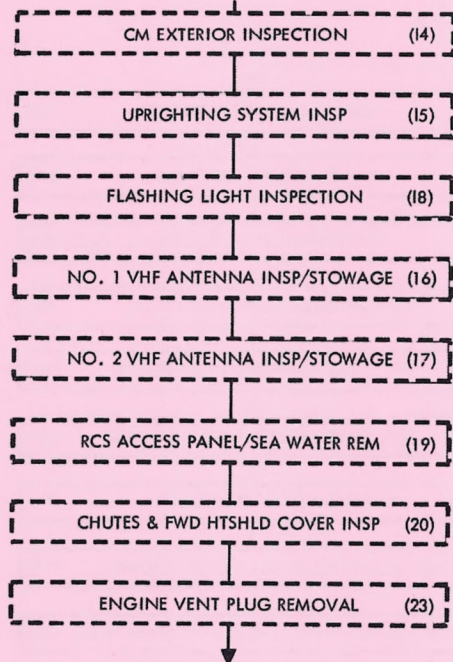
Primary Recovery Ship - Postretrieval Procedures - Flow Chart

THIS FLOW CHART APPLIES
TO NON LUNAR LANDING
MISSIONS ONLY



NOTE

Should recovery be accomplished other than by PRS accomplish the following procedures at an interim port.



TRANSPORT TO DESIGNATED
PORT OF ENTRY

NOTE

• NO PROCEDURE (CONTAINED IN THIS MANUAL) SHALL TAKE PRECEDENCE OVER CREW EGRESS OR AID.

• Anomaly and First Aid procedures are located in the back of this manual. It is suggested that all Recovery Team members review the individual procedures prior to accomplishing the Postretrieval procedures provided within this manual.

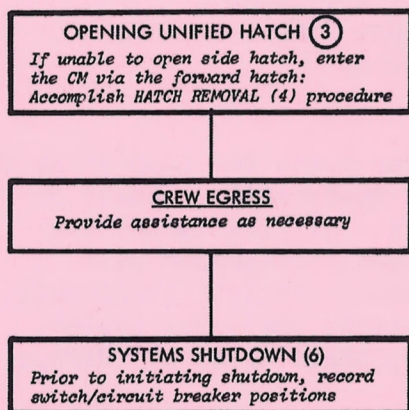
PROCEDURE NO.	TITLE
(A)	RCS ANOMALY
(B)	PYRO ANOMALY
(C)	EMERGENCY FIRST AID FOR PROPELLANT INJURY
(D)	POTABLE/WASTE WATER SYSTEM PRESSURIZATION

• The purpose of this flow chart is to provide the preferred sequence for accomplishing individual Postretrieval procedures. (ON BOARD SECONDARY RECOVERY SHIPS)

* Utilize procedure (1A) to obtain photographs as directed by the NASA Team Leader

SM-2A-2130C ■

Secondary Recovery Ship - Postretrieval Procedures - Flow Chart

**NOTE**

- Pyro anomaly and First Aid procedures for propellant injury are located in the back of this manual. It is suggested that all Recovery Team members review the individual procedures prior to accomplishing the Postretrieval procedures provided within this manual.

PROCEDURE NO.**TITLE**

(B)

ORDNANCE ANOMALY

(C)

EMERGENCY FIRST AID FOR PROPELLANT INJURY

- The purpose of this flow chart is to provide the preferred sequence for accomplishing individual Postretrieval procedures (FOLLOWING A PAD ABORT-WATER OR LAND IMPACT).

Warning

HAZARDS WHICH MAY BE ENCOUNTERED FOLLOWING A PAD ABORT ARE:

- UNEXPENDED ORDNANCE DEVICES
- FLASH FIRES
- RAW PROPELLANTS
- TOXIC FUMES (FROM PROPELLANTS)
- FLYING DEBRIS
- RADIATION CONTAMINATION

NOTE

1. PROCEDURES CONTAINED IN THIS MANUAL SHALL NOT TAKE PRECEDENCE OVER CREW EGRESS OR AID.

2. Should propellant leaks or vapors be detected, attempt to establish a safe working condition by dousing the contaminated area with large amounts of water.

3. Recovery/rescue personnel shall wear appropriate protective clothing.

4. All recovery/rescue operations shall be under the direction of the Launch Site Recovery Commander

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Pad Abort (Water or Land Impact) - Postretrieval Procedures - Flow Chart

PHOTOGRAPHIC REQUIREMENTS - LUNAR LANDING MISSION

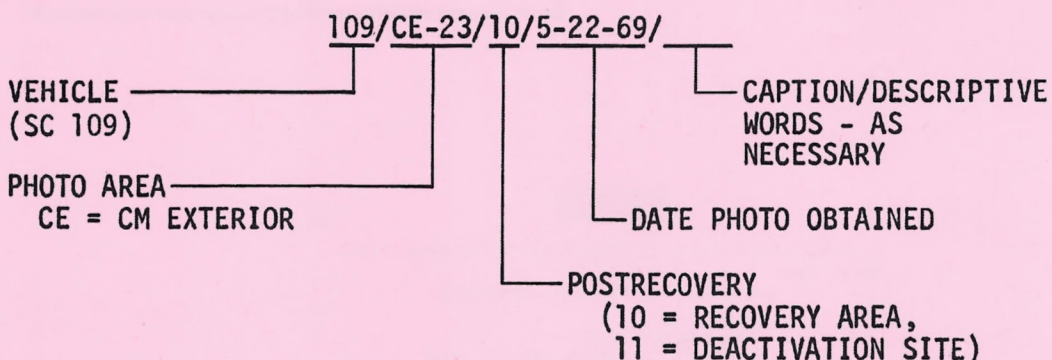
Sheet 1 of 6

NOTE

This procedure should be followed if a mission is a lunar landing mission. Procedure 1A should be followed for nonlunar landing missions.

The purpose of this procedure is to provide the means for completing the photographic cycle (coverage) of a particular spacecraft. Sheets 3 through 5 identify exterior photographic areas. Utilization of the index system to identify all exterior postflight photographs will facilitate photographic comparison of individual vehicles (components, bays, etc.) before and after flight. In addition, the index system will enable recovery personnel to identify (by photo area) all damage, anomalies, etc.

The numbering (index) system utilized to identify individual photographs is defined as follows:

**NOTE**

If additional photographs (over and above those identified on sheets 3 through 5) are required, the photographer or recovery engineer shall identify the subject component, damage, etc., with an alpha suffix. For example, photo area CE-23 contains the positive pitch engines, an engine access panel and the sea anchor attach fitting. Accordingly, if the responsible recovery engineer desired a photograph of the sea anchor attach fitting, it would be identified as follows:

109/CE-23A/10/3-22-69/Sea Anchor Attach Fitting

PHOTOGRAPHIC REQUIREMENTS - LUNAR LANDING MISSION

Sheet 2 of 6

SAFETY

1. If a drogue or pilot parachute has failed to deploy, exercise extreme caution when photographing the upper deck (ablative hatch, tunnel, forward bulkhead, etc.).
2. If one or both of the VHF antennas, or the flashing light has failed to deploy, use caution when working on the upper deck.
3. Observe standard safety precautions when working within the CM. Avoid actuating any switches, controls, etc. Actuation of certain controls could cause injury to personnel outside the CM.
4. Observe standard safety precautions when working around the RCS engines and pyrotechnic devices. Procedures (A) and (B) illustrate the various RCS engines and pyrotechnic devices. Procedure (C), EMERGENCY FIRST AID FOR PROPELLANT INJURY, provides recommended first-aid treatment for personnel contaminated with RCS propellants.

INSTRUCTIONS**NOTE**

- The PHOTO AREAs and corresponding PHOTO IDENT NO. (provided on sheets 3 through 5) encompass all the items/areas called out within procedures (2) through (27). If additional photographs of individual components or test setup are desired, the recovery engineer shall identify the area or test setup with a related number and include the number/caption on sheets 3 through 5 as applicable.
- Interior photography will not utilize the photo identification system.

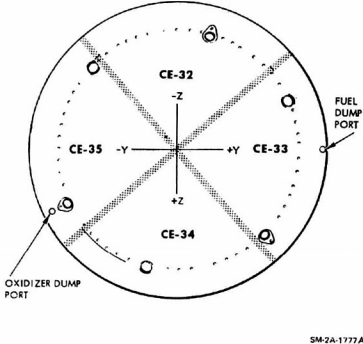
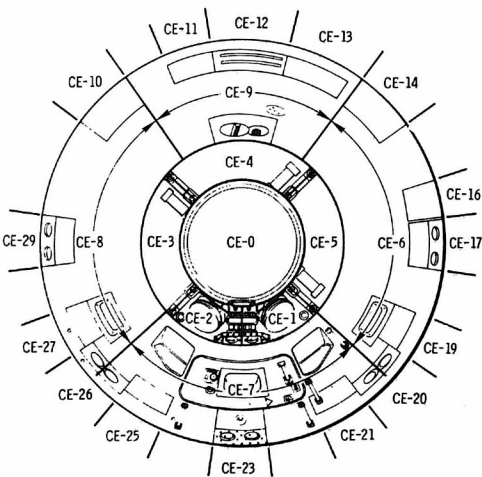
PHOTOGRAPHIC REQUIREMENTS - LUNAR LANDING MISSION

Sheet 3 of 6

EXTERIOR PHOTOGRAPHIC REQUIREMENTS

NOTE

Obtain closeups of any damage, irregularities, etc.

Photo Area	Ref*	Photo Ident Number/Date	Remarks/ Suggested Caption
1. Aft heat shield 	⑭	109/CE-32/10/_____ 109/CE-33/10/_____ 109/CE-34/10/_____ 109/CE-35/10/_____ 109/CE-36/10/_____	Head on view of aft heat shield highlighting any streaking on the ablator.
2. Engine vent plug installation 	②	109/CE-2A-10/_____ 109/CE-23A/10/_____	Negative pitch engines* Positive pitch engines *Prior to inserting vent plugs

*Related procedure

Date _____ Time _____ Signature _____

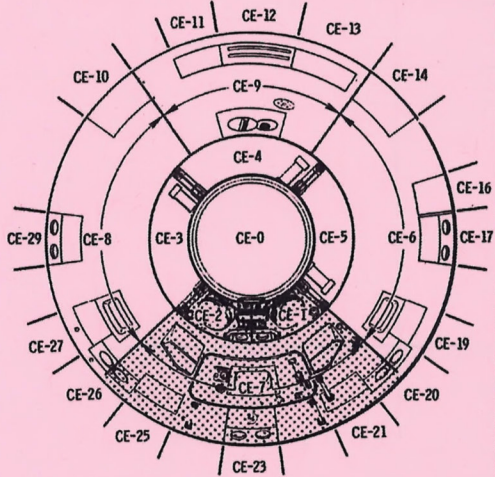
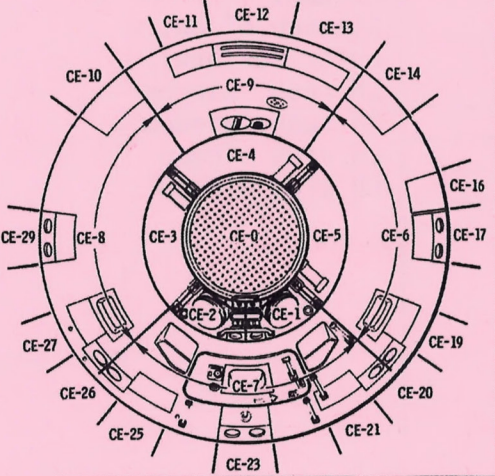
PHOTOGRAPHIC REQUIREMENTS - LUNAR LANDING MISSION

Sheet 4 of 6

EXTERIOR PHOTOGRAPHIC REQUIREMENTS

NOTE

Obtain closeups of any damage, irregularities, etc.

Photo Area	Ref*	Photo Ident Number/Date	Remarks/Suggested Caption
3. Opening unified hatch 	③	109/CE-7B/10/ _____	Overall hatch, including a portion of the CM. (Before and after opening.)
4. Forward hatch 	④	109/CE-0/10/ _____	Fwd hatch (exterior)

*Related procedure

Date _____ Time _____ Signature _____

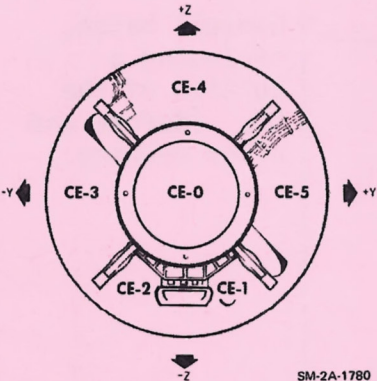
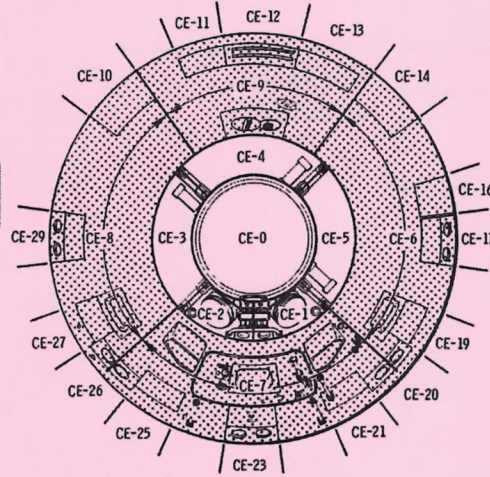
PHOTOGRAPHIC REQUIREMENTS - LUNAR LANDING MISSION

Sheet 5 of 6

EXTERIOR PHOTOGRAPHIC REQUIREMENTS (FOLLOWING CREW EGRESS)

NOTE

Obtain closeups of any damage, irregularities, etc.

Photo Area	Ref*	Photo Ident Number/Date	Remarks/ Suggested Caption
1. Forward compartment 	(14) (15) (16) (17) (18) (20)	109/CE-0/10/ 109/CE-1/10/ 109/CE-2/10/ 109/CE-3/10/ 109/CE-4/10/ 109/CE-5/10/	
2. Crew compartment heat shield 	(14) (22)	109/CE-8/10/ 109/CE-5/10/ 109/CE-6/10/ 109/CE-9/10/ 109/CE-7C/10/ 109/CE-7D/10/ 109/CE-7E/10/ 109/CE-7F/10/ 109/CE-6A/10/ 109/CE-8A/10/	Closeup of hatch window. Closeup of hatch outer surface. LH rend. window RH rend. window LH side window RH side window

*Related procedure

Date _____ Time _____ Signature _____

PHOTOGRAPHIC REQUIREMENTS - LUNAR LANDING MISSION

Sheet 6 of 6

INTERIOR PHOTOGRAPHIC REQUIREMENTS

Take a complete set of interior photographs as required.

PACKAGING REQUIREMENTS

1. Exposed film shall be forwarded to MSC for processing.

Remarks: _____

Date _____ Time _____ Signature _____

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PHOTOGRAPHIC REQUIREMENTS - NONLUNAR LANDING MISSIONS

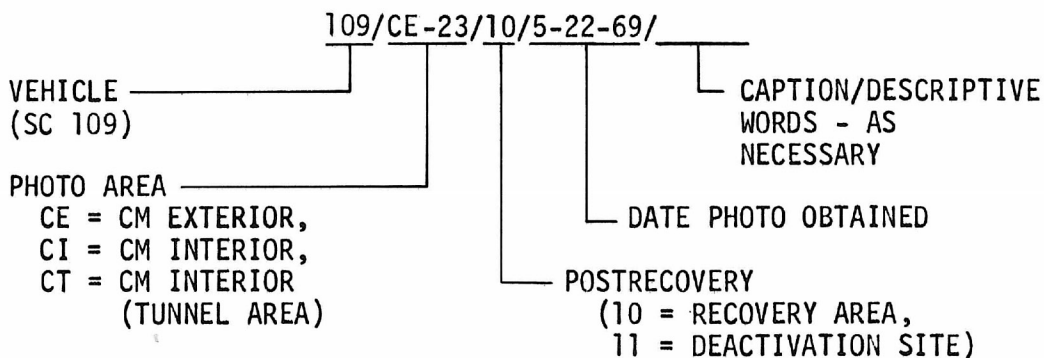
Sheet 1 of 14

NOTE

This procedure is to be followed on all non-lunar landing missions.

The purpose of this procedure is to provide the means for completing the photographic cycle (coverage) of a particular spacecraft. Sheets 3 through 5 identify exterior photographic areas. Sheets 6 through 14 identify interior photographic areas. Utilization of the index system to identify all postflight photographs will facilitate photographic comparison of individual vehicles (components, bays, etc.) before and after flight. In addition, the index system will enable recovery personnel to identify (by photo area) all damage, anomalies, etc.

The numbering (index) system utilized to identify individual photographs is defined as follows:

**NOTE**

If additional photographs (over and above those identified on sheets 3 through 14) are required, the photographer or recovery engineer shall identify the subject component, damage, etc., with an alpha suffix. For example, photo area CE-23 contains the positive pitch engines, an engine access panel and the sea anchor attach fitting. Accordingly, if the responsible recovery engineer desired a photograph of the sea anchor attach fitting, it would be identified as follows:

109/CE-23A/10/3-22-69/Sea Anchor Attach Fitting

PHOTOGRAPHIC REQUIREMENTS - NONLUNAR LANDING MISSIONS

Sheet 2 of 14

SAFETY

1. If a drogue or pilot parachute has failed to deploy, exercise extreme caution when photographing the upper deck (ablative hatch, tunnel, forward bulkhead, etc.).
2. If one or both of the VHF antennas, or the flashing light has failed to deploy, use caution when working on the upper deck.
3. Observe standard safety precautions when working within the CM. Avoid actuating any switches, controls, etc. Actuation of certain controls could cause injury to personnel outside the CM.
4. Observe standard safety precautions when working around the RCS engines and pyrotechnic devices. Procedures (A) and (B) illustrate the various RCS engines and pyrotechnic devices. Procedure (C), EMERGENCY FIRST AID FOR PROPELLANT INJURY, provides recommended first-aid treatment for personnel contaminated with RCS propellants.

INSTRUCTIONS**NOTE**

The PHOTO AREAs and corresponding PHOTO IDENT NO. (provided on sheets 3 through 14) encompass all the items/areas called out within procedures (2) through (27). If additional photographs of individual components or test setup are desired, the recovery engineer shall identify the area or test setup with a related number and include the number/caption on sheets 3 through 14 as applicable. For example, if photographs of the WASTE WATER setup are desired, they should be keyed to the basic "CI" number; for instance, the WATER CONTROL PANEL (No. 352) located in photo area CI-44 (reference sheet 10). Photo area CI-44 includes panels 351, 352 and the CO₂ and odor absorber assembly; therefore, an individual photograph of panel 352 would be identified as CI-44A. A photograph depicting panel 352, the sample tubing and sample container, would be identified as CI-44C.

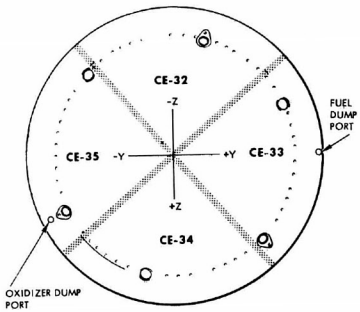
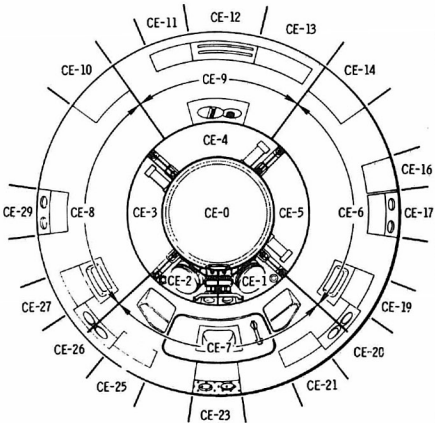
PHOTOGRAPHIC REQUIREMENTS - NONLUNAR LANDING MISSIONS

Sheet 3 of 14

EXTERIOR PHOTOGRAPHIC REQUIREMENTS (PRIOR TO AND INCLUDING CREW EGRESS)

NOTE

Obtain closeups of any damage, irregularities, etc.

Photo Area	Ref*	Photo Ident Number/Date	Remarks/ Suggested Caption
1. Aft heat shield  SM-2A-1777A	⑭	109/CE-32/10/ _____ 109/CE-33/10/ _____ 109/CE-34/10/ _____ 109/CE-35/10/ _____ 109/CE-36/10/ _____	Head on view of aft heat shield highlighting any streaking on the ablator.
2. Engine vent plug installation  SM-2A-1777A	②	109/CE-2A-10/ _____ 109/CE-23A/10/ _____	Negative pitch engines* Positive pitch engines *Prior to inserting vent plugs

*Related procedure

Date _____ Time _____ Signature _____

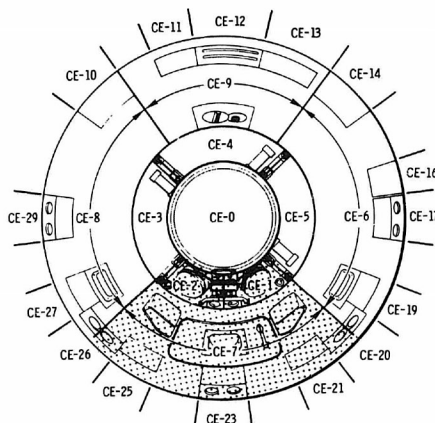
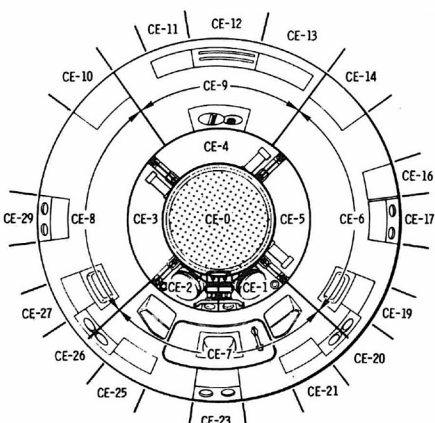
PHOTOGRAPHIC REQUIREMENTS - NONLUNAR LANDING MISSIONS

Sheet 4 of 14

EXTERIOR PHOTOGRAPHIC REQUIREMENTS

NOTE

Obtain closeups of any damage, irregularities, etc.

Photo Area	Ref*	Photo Ident Number/Date	Remarks/Suggested Caption
3. Opening unified hatch 	③	109/CE-7B/10/ _____	Overall hatch, including a portion of the CM. (Before and after opening.)
4. Forward hatch 	④	109/CE-0/10/ _____	Fwd hatch (exterior)

*Related procedure

Date _____ Time _____ Signature _____

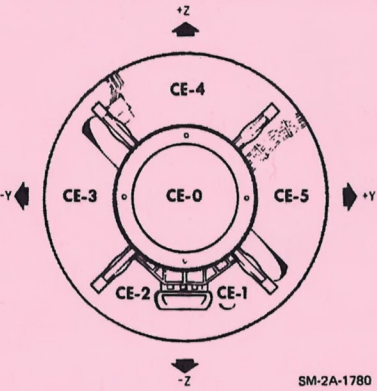
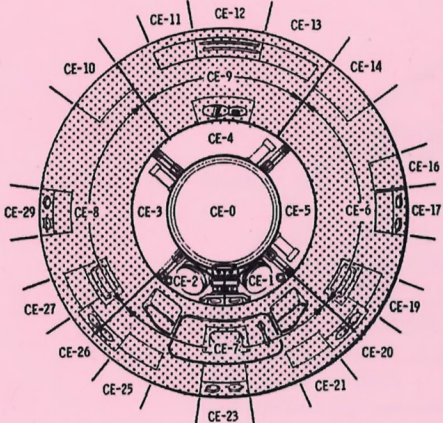
PHOTOGRAPHIC REQUIREMENTS - NONLUNAR LANDING MISSIONS

Sheet 5 of 14

EXTERIOR PHOTOGRAPHIC REQUIREMENTS (FOLLOWING CREW EGRESS)

NOTE

Obtain closeups of any damage, irregularities, etc.

Photo Area	Ref*	Photo Ident Number/Date	Remarks/Suggested Caption
1. Forward compartment 	⑭ ⑮ ⑯ ⑰ ⑱ ⑳	109/CE-0/10/ _____ 109/CE-1/10/ _____ 109/CE-2/10/ _____ 109/CE-3/10/ _____ 109/CE-4/10/ _____ 109/CE-5/10/ _____	
2. Crew compartment heat shield 	⑭ ⑳	109/CE-8/10/ _____ 109/CE-5/10/ _____ 109/CE-6/10/ _____ 109/CE-9/10/ _____ 109/CE-7C/10/ _____ 109/CE-7D/10/ _____ 109/CE-7E/10/ _____ 109/CE-7F/10/ _____ 109/CE-6A/10/ _____ 109/CE-8A/10/ _____	Closeup of hatch window. Closeup of hatch outer surface. LH rend. window RH rend. window LH side window RH side window

*Related procedure

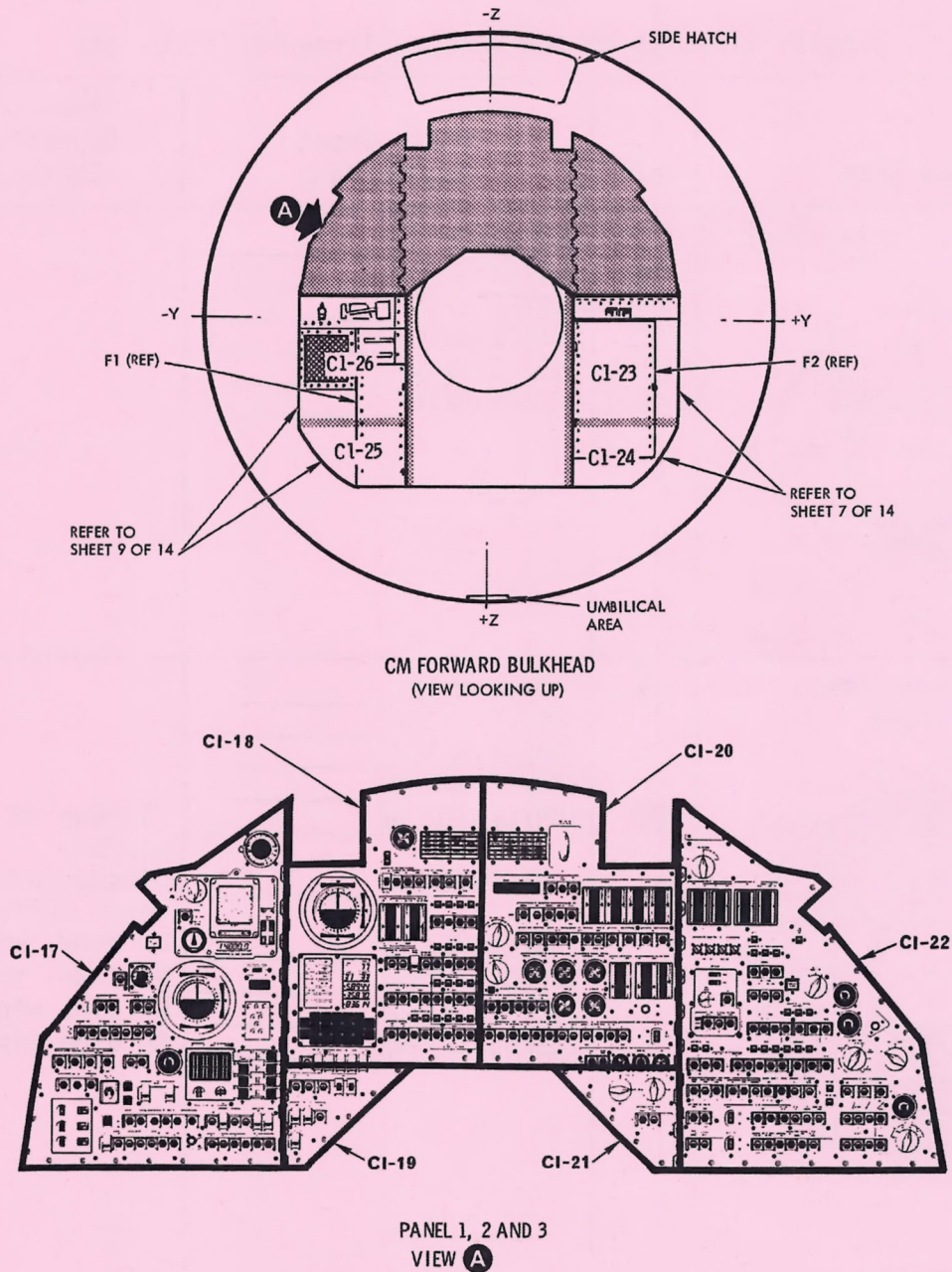
Date _____ Time _____ Signature _____

PHOTOGRAPHIC REQUIREMENTS - NONLUNAR LANDING MISSIONS

Sheet 6 of 14

INTERIOR PHOTOGRAPHIC REQUIREMENTS

To facilitate identification of individual photographic areas, photo identification areas, CI-1, -2, etc., have been superimposed on CM interior drawings located on sheets 6, 7, 8, 9, and 10.



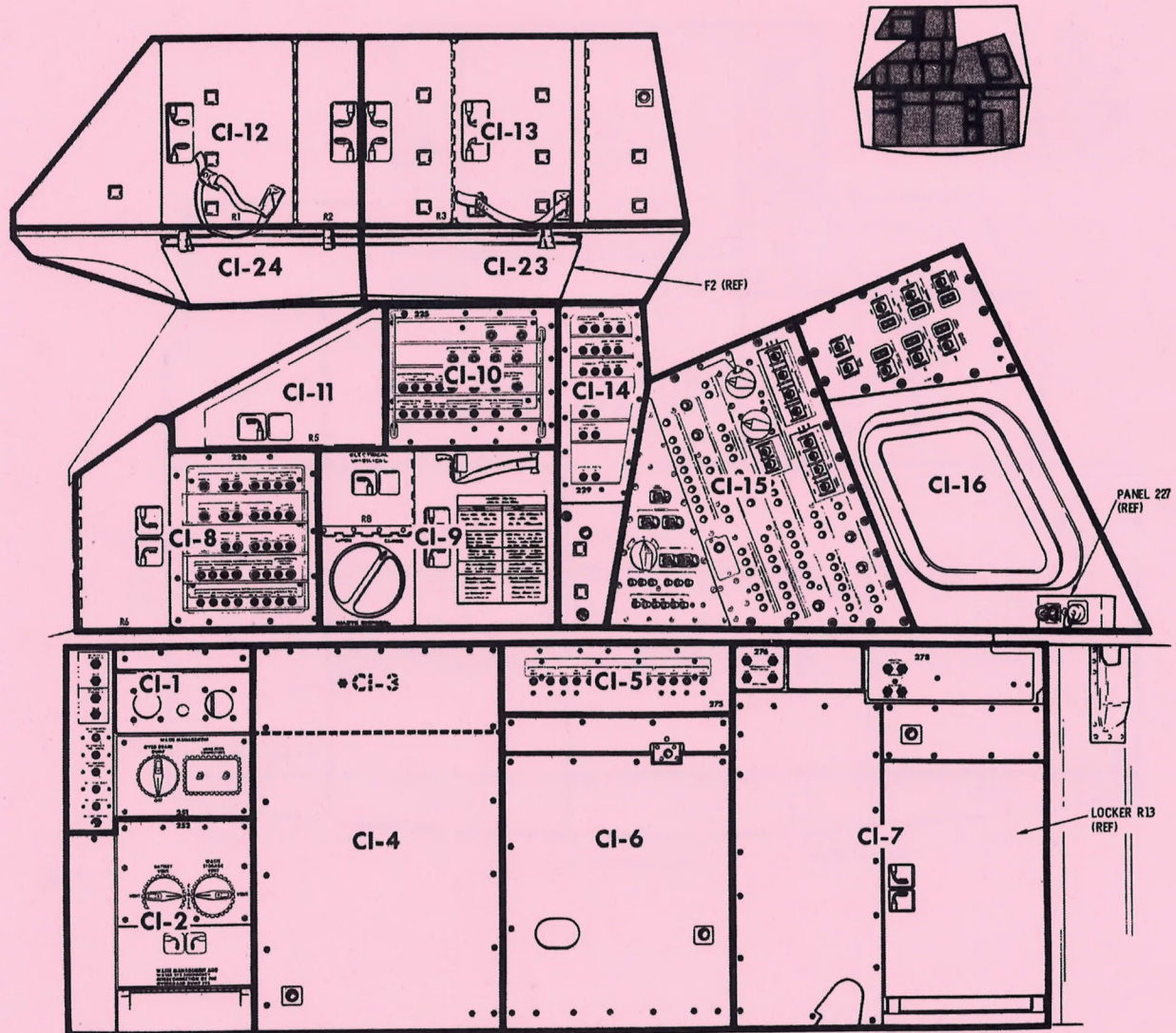
SM-2A-2045

CM Forward Bulkhead/MDC

Date _____ Time _____ Signature _____

PHOTOGRAPHIC REQUIREMENTS - NONLUNAR LANDING MISSIONS

Sheet 7 of 14



*CI-3 NOT ACCESSIBLE FROM EXTERIOR UTILIZE CODE CI-4 FOR ENTIRE PANEL

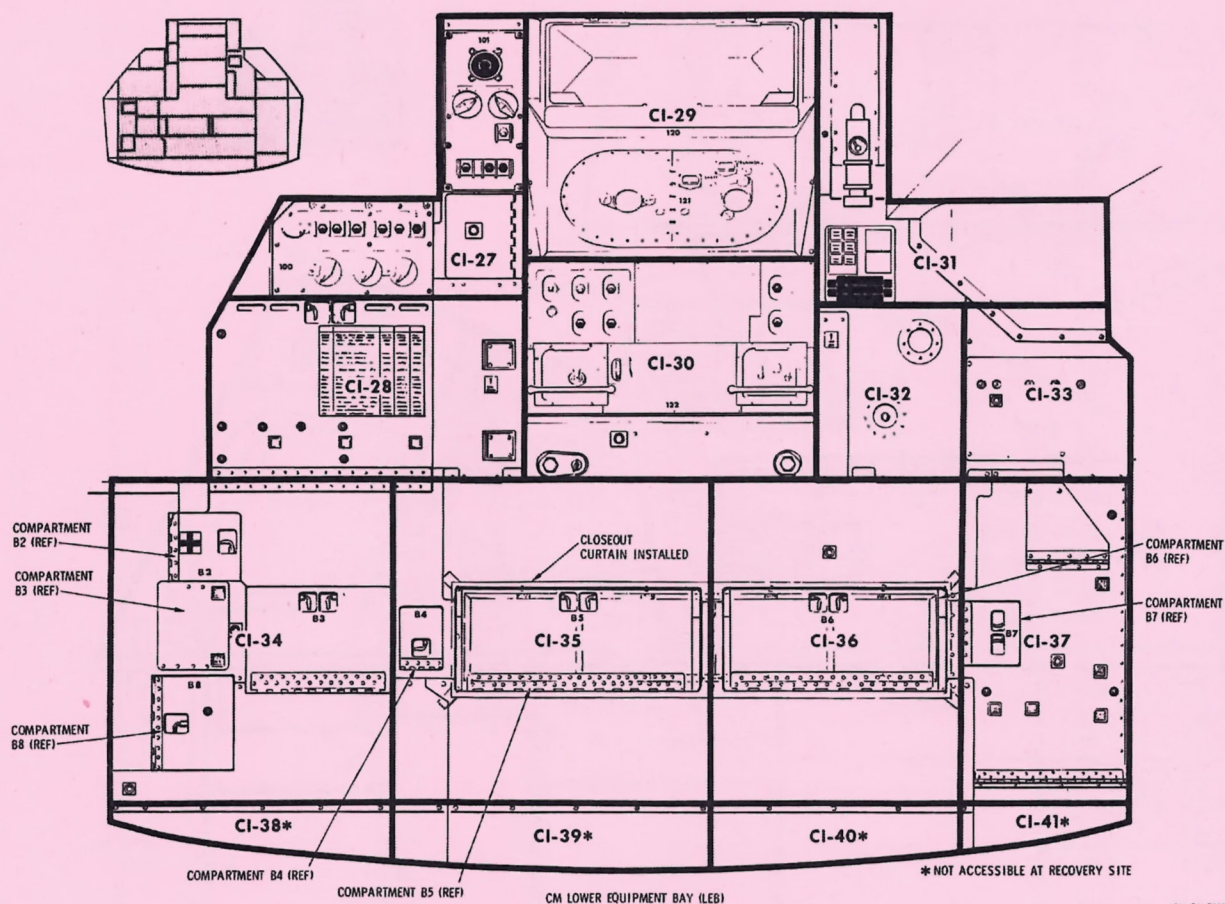
CM RIGHT-HAND EQUIPMENT BAY (RHEB)

SM-2A-2008A

CM RIGHT-HAND EQUIPMENT BAY (RHEB)

PHOTOGRAPHIC REQUIREMENTS - NONLUNAR LANDING MISSIONS

Sheet 8 of 14

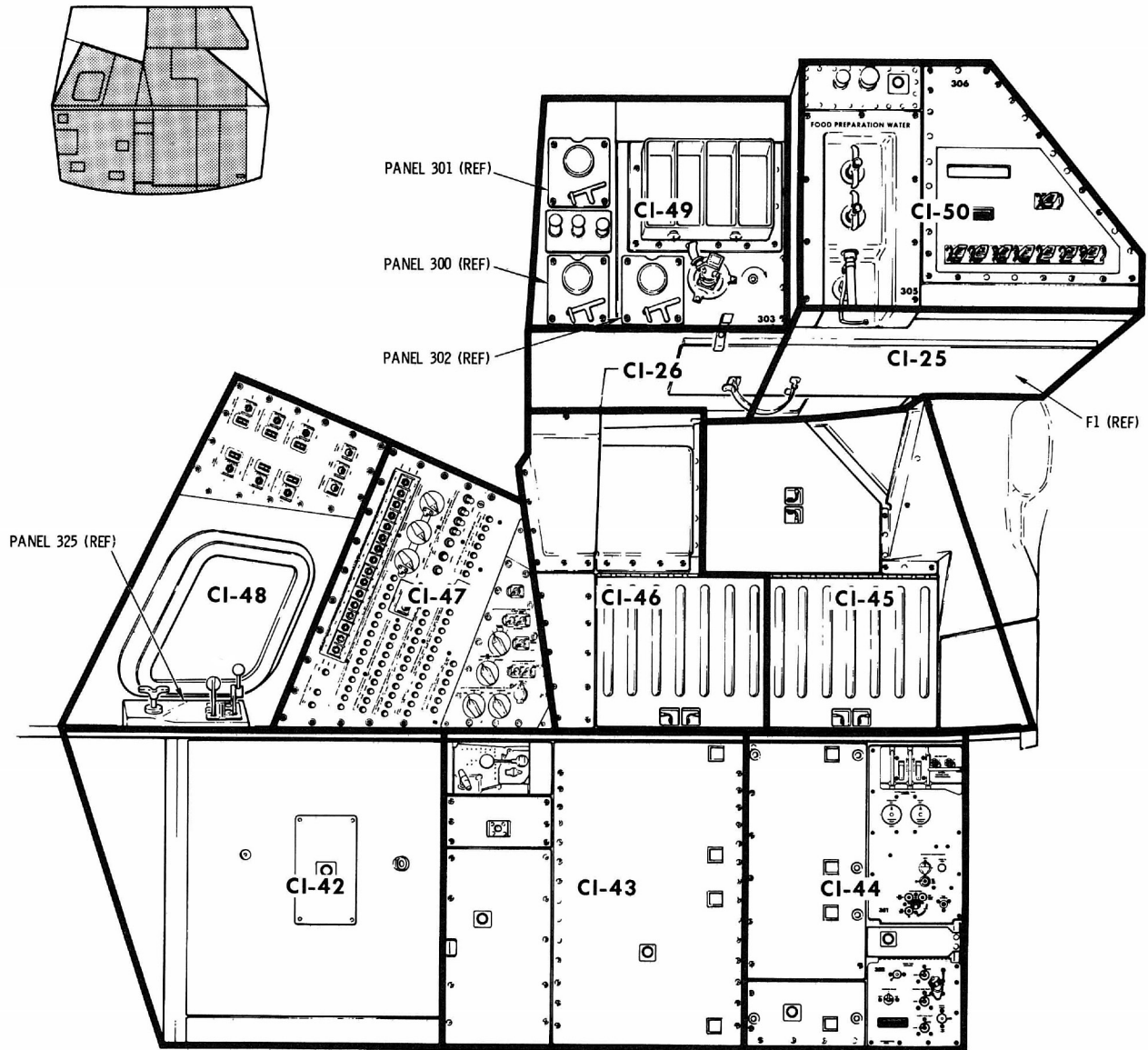


SM-2A-2009C

CM LOWER EQUIPMENT BAY (LEB)

PHOTOGRAPHIC REQUIREMENTS - NONLUNAR LANDING MISSIONS

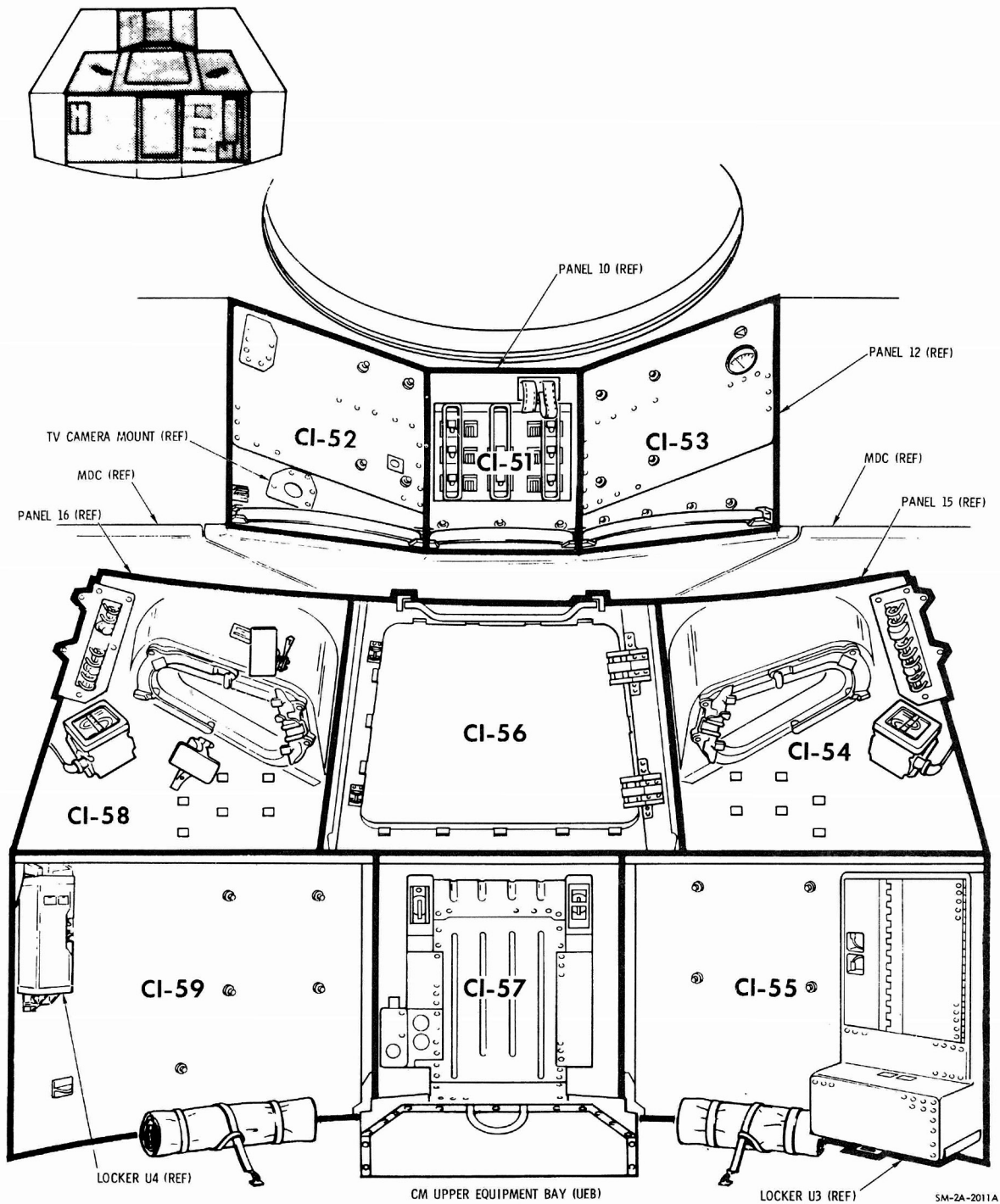
Sheet 9 of 14



CM LEFT-HAND EQUIPMENT BAY (LHEB)

SM-2A-2010

CM LEFT-HAND EQUIPMENT BAY (LHEB)



CM UPPER EQUIPMENT BAY (UEB)

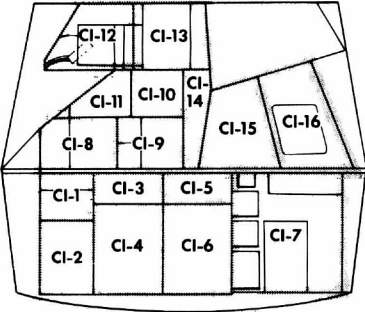
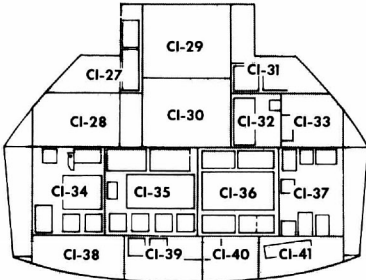
PHOTOGRAPHIC REQUIREMENTS - NONLUNAR LANDING MISSIONS

Sheet 11 of 14

INTERIOR PHOTOGRAPHIC REQUIREMENTS

NOTE

Obtain closeups of any damage, irregularities, etc.

Photo Area	Ref*	Photo Ident Number/Date	Remarks/ Suggested Caption
1. Right-hand equipment bay (RHEB)  SM-2A-1783	(5) (6) (7)	109/CI-1/10/_____ 109/CI-2/10/_____ 109/CI-3/10/_____ 109/CI-4/10/_____ 109/CI-5/10/_____ 109/CI-6/10/_____ 109/CI-7/10/_____ 109/CI-8/10/_____ 109/CI-9/10/_____ 109/CI-10/10/_____ 109/CI-11/10/_____ 109/CI-12/10/_____ 109/CI-13/10/_____ 109/CI-14/10/_____ 109/CI-15/10/_____ 109/CI-16/10/_____ 	
2. Lower equipment bay (LEB)  SM-2A-1778	(5) (7) (11)	109/CI-27/10/_____ 109/CI-28/10/_____ 109/CI-29/10/_____ 109/CI-30/10/_____ 109/CI-31/10/_____ 109/CI-32/10/_____ 109/CI-33/10/_____ 109/CI-34/10/_____ 109/CI-35/10/_____ 109/CI-36/10/_____ 109/CI-37/10/_____ 109/CI-38/10/_____ 109/CI-39/10/_____ 109/CI-40/10/_____ 109/CI-41/10/_____ 	

*Related procedure

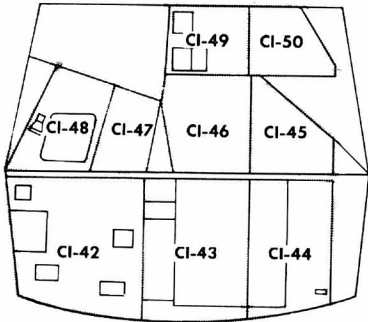
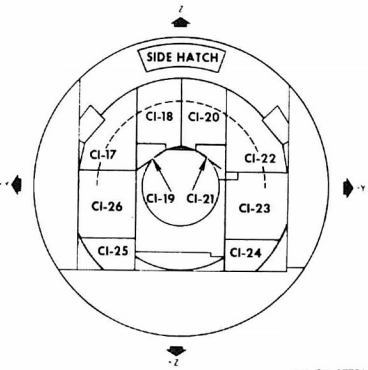
PHOTOGRAPHIC REQUIREMENTS - NONLUNAR LANDING MISSIONS

Sheet 12 of 14

INTERIOR PHOTOGRAPHIC REQUIREMENTS

NOTE

Obtain closeups of any damage, irregularities, etc.

Photo Area	Ref*	Photo Ident Number/Date	Remarks/ Suggested Caption
3. Left-hand equipment bay (LHEB)  SM-2A-1781	(5) (6) (7) (9) (10) (13)	109/CI-42/10/_____ 109/CI-43/10/_____ 109/CI-44/10/_____ 109/CI-45/10/_____ 109/CI-46/10/_____ 109/CI-47/10/_____ 109/CI-48/10/_____ 109/CI-49/10/_____ 109/CI-50/10/_____	
4. Forward bulkhead  SM-2A-1779A	(5) (6) (7) (9)	109/CI-17/10/_____ 109/CI-18/10/_____ 109/CI-19/10/_____ 109/CI-20/10/_____ 109/CI-21/10/_____ 109/CI-22/10/_____ 109/CI-23/10/_____ 109/CI-24/10/_____ 109/CI-25/10/_____ 109/CI-26/10/_____	MDC, Panel 1 MDC, Panel 2 (LH side) MDC, Panel 2 (LH corner) MDC, Panel 2 (RH side) MDC, Panel 2 (RH corner) MDC, Panel 3 † † † †

*Related procedure

†See sheet 7 of 14

f See sheet 9 of 14

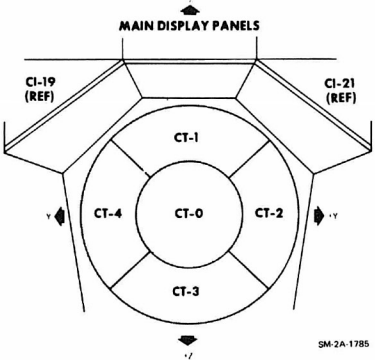
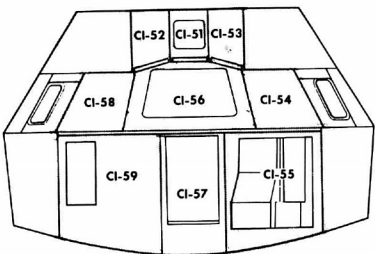
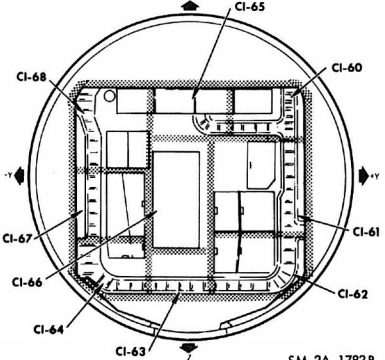
PHOTOGRAPHIC REQUIREMENTS - NONLUNAR LANDING MISSIONS

Sheet 13 of 14

INTERIOR PHOTOGRAPHIC REQUIREMENTS

NOTE

Obtain closeups of any damage, irregularities, etc.

Photo Area	Ref*	Photo Ident Number/Date	Remarks/Suggested Caption
5. Crew transfer tunnel 	(7)	109/CT-0/10/_____ 109/CT-1/10/_____ 109/CT-2/10/_____ 109/CT-3/10/_____ 109/CT-4/10/_____	Fwd pressure hatch (interior) Tunnel area Tunnel area Tunnel area Tunnel area
6. Upper equipment bay (UEB) 	(5) (7) (14)	109/CI-51/10/_____ 109/CI-52/10/_____ 109/CI-53/10/_____ 109/CI-54/10/_____ 109/CI-55/10/_____ 109/CI-56/10/_____ 109/CI-57/10/_____ 109/CI-58/10/_____ 109/CI-59/10/_____	Volume U3 Inner surface of hatch Repress sys and hatch bottles Volume U4
7. Aft bulkhead 	(5) (7) (12)	109/CI-60/10/_____ 109/CI-61/10/_____ 109/CI-62/10/_____ 109/CI-63/10/_____ 109/CI-64/10/_____ 109/CI-65/10/_____ 109/CI-66/10/_____ 109/CI-67/10/_____ 109/CI-68/10/_____	NOTE Obtain closeups of any water/condensation observed on the aft bulkhead.

*Related procedure

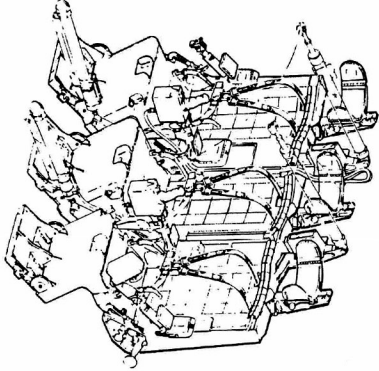
PHOTOGRAPHIC REQUIREMENTS - NONLUNAR LANDING MISSIONS

Sheet 14 of 14

INTERIOR PHOTOGRAPHIC REQUIREMENTS

NOTE

Obtain closeups of any damage, irregularities, etc.

Photo Area	Ref*	Photo Ident Number/Date	Remarks/Suggested Caption
8. Crew couches 	⑦ ⑧	NOTE As directed by the NASA Team Leader.	NOTE If any strut has stroked, obtain photos of the individual struts as well as overall photos of the assembly (couch/struts).
9. Crew Equipment *Related procedure	②①	As directed by the NASA Team Leader.	

PACKAGING REQUIREMENTS

- Exposed film shall be forwarded to MSC for processing.

Remarks: _____

ENGINE VENT PLUG INSTALLATION

Sheet 1 of 4

The purpose of this procedure is to provide instructions for installing the engine vent plugs. Installed vent plugs will afford safe working conditions by diverting transient propellant vapors away from the immediate working area.

NOTE

- Engine vent plugs shall be installed in negative pitch engines only.
- Lower engines (positive pitch) shall be covered with a Viton blanket.

SAFETY

1. Wear appropriate protective clothing (face shield, rubber gloves, etc.).
2. Do not attempt engine vent plug installation if visual vapor leaks are observed.
3. Do not allow unprotected parts of the body to come in contact with the engines or surrounding area.
4. If a drogue parachute has failed to deploy, exercise extreme caution when working in the vicinity of the upper deck.

PHOTOGRAPHIC REQUIREMENTS

Refer to procedure ① or ①A.

TOOLS AND EQUIPMENT

Quantity	Nomenclature
1	Face shield (model 7-11)
2 pr	Rubber gloves
2	Vent plug
20 ft	Nylon line
5 sq ft	Viton blanket

ENGINE VENT PLUG INSTALLATION

Sheet 2 of 4

INSTRUCTIONS

1. Inspect positive pitch engine nozzles and surrounding area; record condition.
2. Install Viton blanket (apron) over the positive pitch engines.
3. Position access stand as necessary to gain access to the side hatch area and the negative pitch engines.
4. To install vent plugs proceed as follows:
 - a. Back off serrated knob until knob hits handle.
 - b. Push vent plugs, seal first, into the engine nozzle.
 - c. Slide rubber positioner down and into the nozzle.

Caution

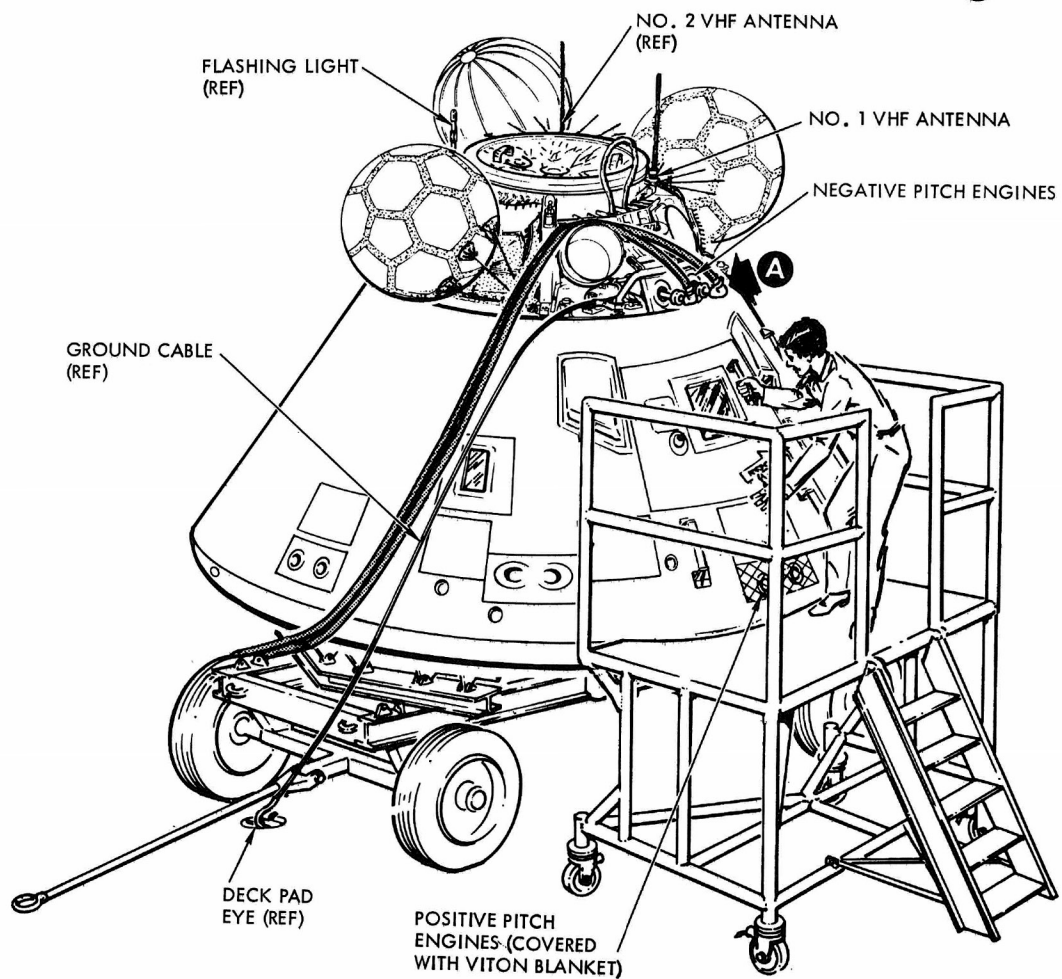
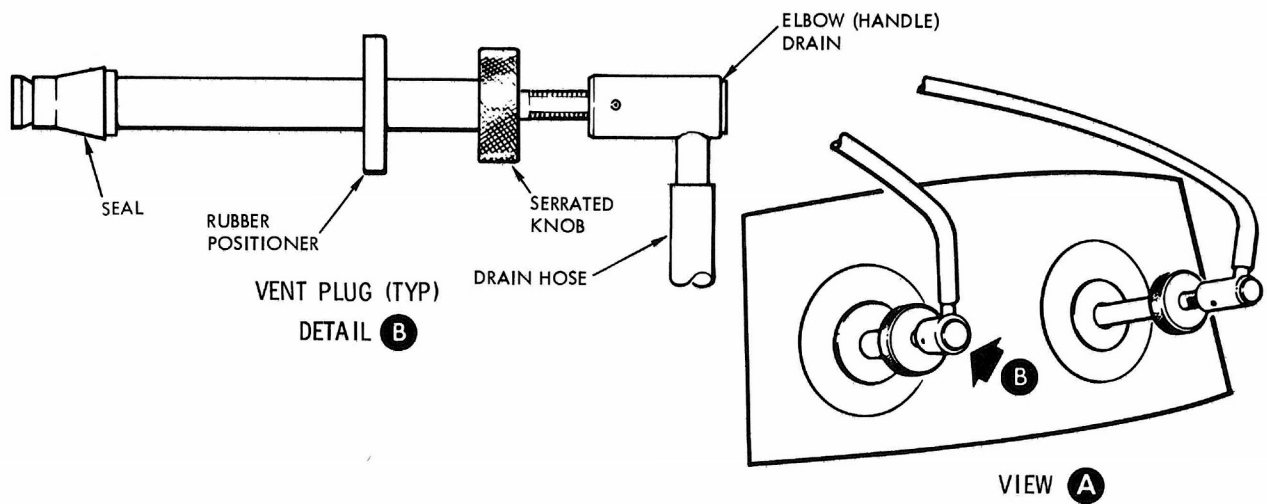
Avoid striking engine throat with edge of vent plug expander.

- d. While holding vent plug handle (elbow drain) secure plug by turning the serrated knob clockwise until the expander firmly seats the seal in the engine throat.
- e. Verify proper seating by attempting to pull the plug free.
- f. Guide drain tubing to the far side (plus Z) of the spacecraft and secure in place.

Date _____ Time _____ Signature _____

ENGINE VENT PLUG INSTALLATION

Sheet 3 of 4



SM-2A-1452F

ENGINE VENT PLUG INSTALLATION

Sheet 4 of 4

PACKAGING REQUIREMENTS

1. Vent plugs shall remain installed until all postretrieval procedures are completed. Refer to procedure 23 for removal procedures.

Remarks: _____

Date _____ Time _____ Signature _____

SM2A-08-SC109

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OPENING UNIFIED HATCH

Sheet 1 of 5

This procedure provides instructions for opening the unified hatch.

NOTE

Should the hatch fail to open, enter the CM through the forward hatch. Refer to procedure ④.

SAFETY

1. Verify vent plugs installed in the negative pitch engine ports. Refer to procedure ②.
2. If a drogue or pilot parachute has failed to deploy, exercise extreme caution when opening the hatch and entering the CM.
3. If the EVA handle appears damaged, and it becomes necessary to pull on the handle, wear leather gloves.

PHOTOGRAPHIC REQUIREMENTS

Refer to procedure ① or ①A.

Caution

PROCEDURES CONTAINED IN THIS MANUAL SHALL NOT TAKE PRECEDENCE OVER CREW EGRESS OR AID.

TOOLS AND EQUIPMENT

Quantity	Nomenclature	Part No.
1	NASA hatch tool	SEZ3410078-101
1	Safety pin	AN416-1
1 pr	Leather gloves	
1	Block of wood (cut to size)	

INSTRUCTIONSOPENING UNIFIED HATCH*Caution*

Follow opening procedures as prescribed, do not deviate.

OPENING UNIFIED HATCH

Sheet 2 of 5

INSTRUCTIONS

1. Inspect hatch and surrounding area for general condition.
2. Insert NASA tool into hatch drive penetration (engage latching mechanism). (See sheet 3 of 5.)
3. Turn tool in a clockwise direction (until it stops).

Warning

If counterbalance is pressurized, the hatch will swing open; stand clear of hatch opening path.

4. Turn tool in a counterclockwise direction (until it stops).

NOTE

Additional force may be required to fully retract latches, after tool hits hard stop.

5. Pull/push hatch to the full open position. (Verify that counterbalance has secured hatch in full open position.)

NOTE

The hatch weighs approximately 250 pounds. If the counterbalance is inoperative, two men will be required to open the hatch.

6. Insert a wooden block between overcenter lock and counterbalance arm. (See sheet 4 of 5.)
7. Crew egress (as applicable).
8. Install safety pin (AN416-1) in the actuator handle selector. (See sheet 4 of 5.)

Caution

Do not move or reposition hatch controls.

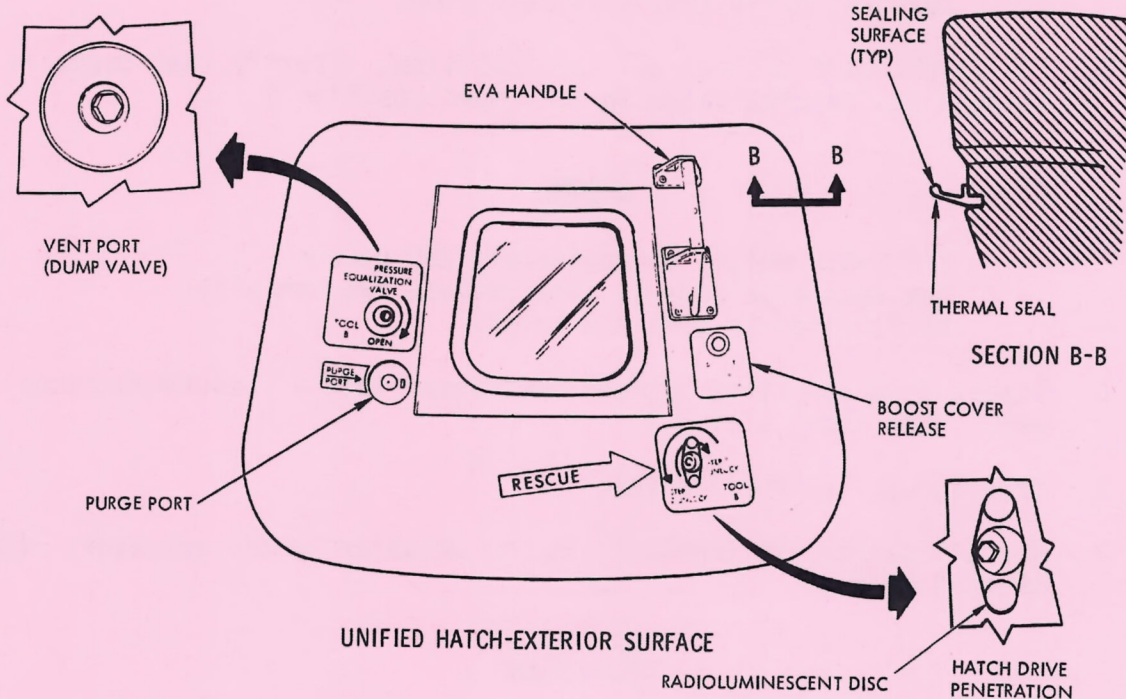
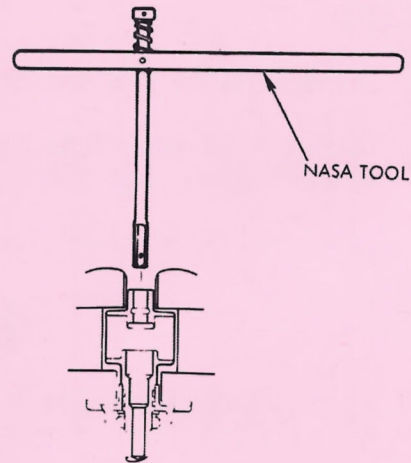
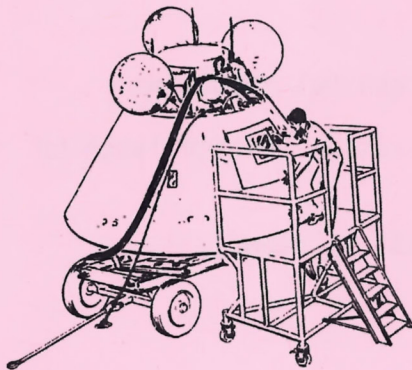
Changed 16 February 1970

Date _____ Time _____ Signature _____

Changed 16 February 1970

OPENING UNIFIED HATCH

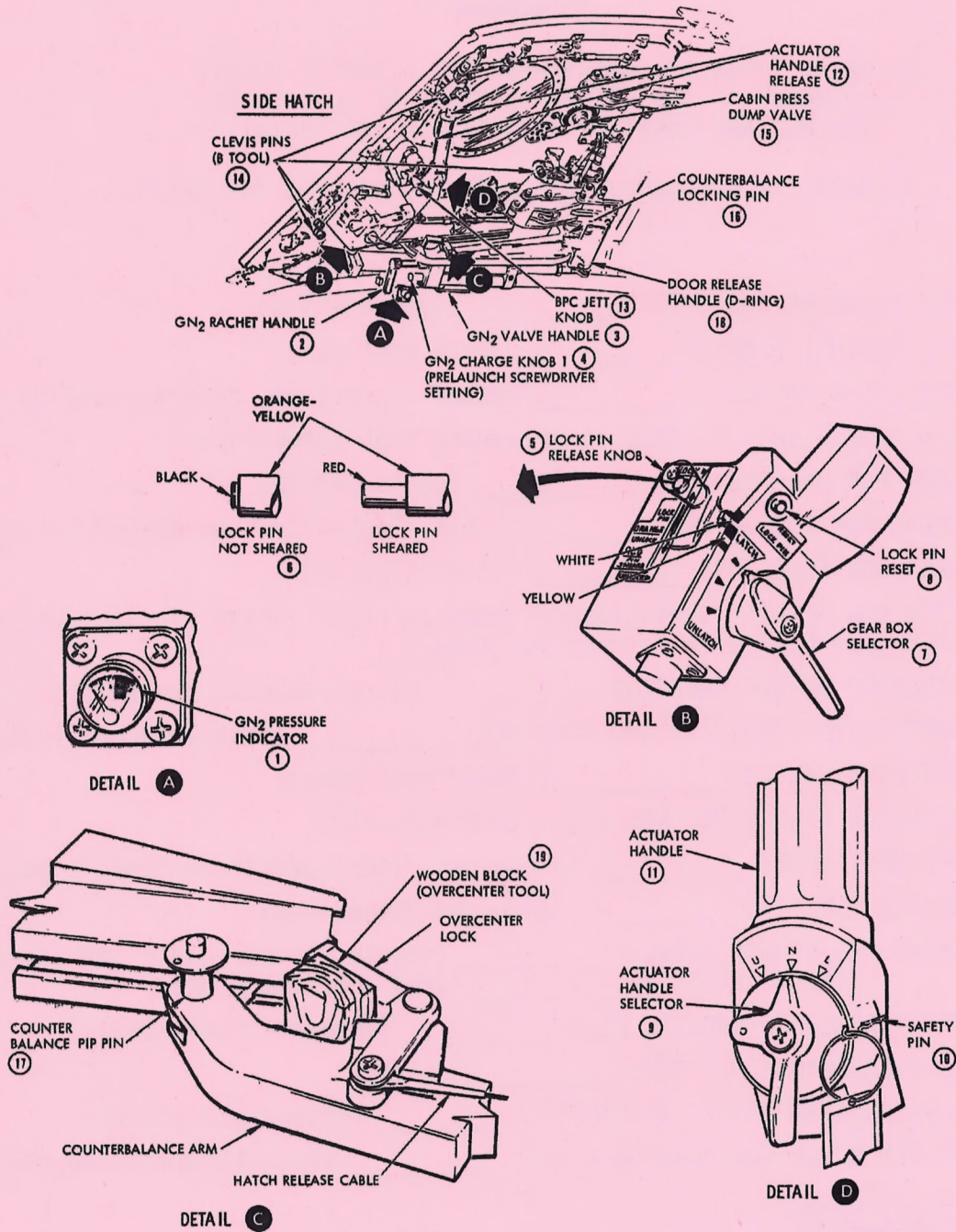
Sheet 3 of 5



Opening Unified Hatch (Sheet 1 of 2)

OPENING UNIFIED HATCH

Sheet 4 of 5



SM-2A-1431K

Opening Unified Hatch (Sheet 2 of 2)

OPENING UNIFIED HATCH

Sheet 5 of 5

INSTRUCTIONS

9. Inspect hatch interior and record "as found" position of all hatch controls (do not reposition).

Caution

- Never close the hatch with the actuator handle selector in the LATCH position; it must be in the NEUTRAL position with safety pin installed.
- Refer to procedure (22) prior to closing the hatch.

Record:

- 1 GN₂ PRESSURE INDICATOR: _____ (green/white)
- 2 GN₂ RATCHET HANDLE: _____ (note position)
- 3 GN₂ VALVE HANDLE: _____ (pushed - pressure, neutral, pulled - vent)
- 4 GN₂ CHARGE KNOB 1: (Set at prelaunch with screwdriver)
- 5 LOCK PIN RELEASE KNOB: _____ (white/yellow)
- 6 SHEAR PIN INDICATOR: _____ (blk; locked/ora; unlocked/red; sheared)
- 7 GEAR BOX SELECTOR: _____ (LATCH/N/UNLATCH)
- 8 LOCK PIN RESET: Springloaded (Push to relock shear pin applicable when gear box is in latched position.)
- 9 ACTUATOR HANDLE SELECTOR: _____ (U; unlatch/N; neutral/L; latch)
- 10 SAFETY PIN (AN416-1) AND STREAMER: _____ (installed/not installed)
- 11 ACTUATOR HANDLE: _____ (Stowed/not stowed)
- 12 ACTUATOR HANDLE RELEASE (2): (Springloaded)
- 13 BPC JETT KNOB: _____ (arrow up; disengaged/arrow down; engaged)
- 14 CLEVIS PINS (4): _____ (engaged/disengaged)
- 15 CABIN PRESS DUMP VALVE: _____ (handle stowed/handle not stowed)
YELLOW PINS IN: _____ (red area/green area)
- 16 COUNTERBALANCE LOCKING PIN: _____ (engaged/disengaged)
- 17 COUNTERBALANCE PIP PIN: _____ (in/out)
- 18 DOOR RELEASE HANDLE (D-RING): _____ (stowed/not stowed)
- 19 WOODEN BLOCK (overcenter tool): _____ (installed/not installed)

PACKAGING REQUIREMENTS

1. Not applicable

Date _____ Time _____ Signature _____

FORWARD HATCH REMOVAL

Sheet 1 of 4

This procedure provides an alternate method for entering the CM should the normal procedure (3) fail to open the unified hatch.

NOTE

This procedure is to be performed only at the request of the RCC, Houston.

SAFETY

1. If a drogue or pilot parachute has failed to deploy, exercise extreme caution when removing the forward hatch and entering the tunnel.
2. If one or both of the VHF antennas, or the flashing light has failed to deploy, use caution when working on the upper deck.
3. The forward hatch weighs approximately 85 pounds; use caution when handling.

Warning

Do not allow hatch to fall into the CM.

TOOLS AND EQUIPMENT

Quantity	Nomenclature
1	NASA hatch tool
1	Line (20' or greater length)

PHOTOGRAPHIC REQUIREMENTS

Refer to procedure (1) or (1A).

FORWARD HATCH REMOVAL

Sheet 2 of 4

INSTRUCTIONS

- 1. Insert NASA hatch tool (7/16-inch hex) into the hatch unlocking mechanism.
- 2. Secure line to hatch tool and then pass the line over a pulley, beam, etc., located above the hatch. (If no overhead pivot point is available, secure the line in a manner to prevent the hatch from falling.)
- 3. Verify line knots and fastenings are secure.
- 4. Remove all slack from the line and apply tension.

Warning

The forward hatch weighs approximately 85 pounds, do not drop.

NOTE

If possible, inform the crew or personnel within the CM that the hatch is about to be lowered.

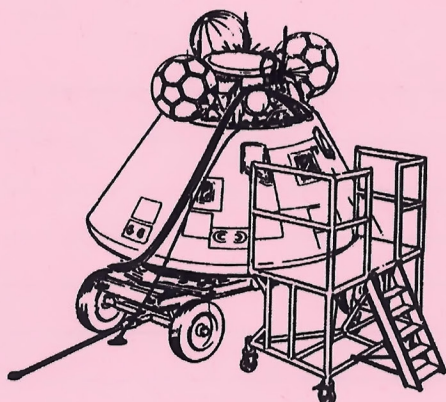
- 5. Turn the hatch tool counterclockwise (approximately 167 degrees).
- 6. Lower hatch into CM. Stow on a padded surface to prevent damage.

Remarks: _____

Date _____ Time _____ Signature _____

FORWARD HATCH REMOVAL

Sheet 3 of 4

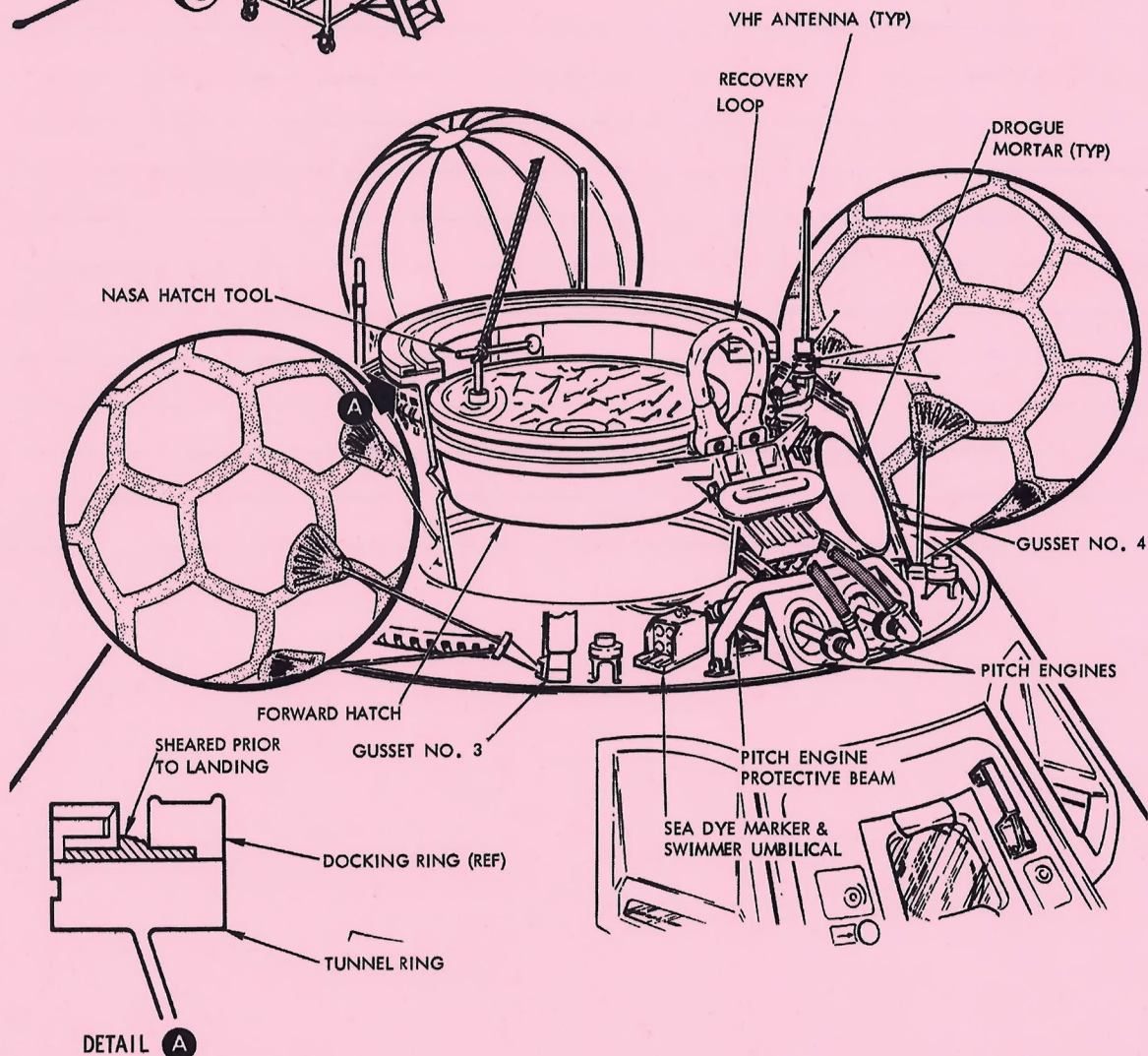


NOTE

NASA hatch tool may be utilized as a handle (by recovery personnel) to lower the hatch into the CM.

Warning

- DO NOT drop hatch.
- If possible, inform crew or personnel within the CM that the hatch is about to be lowered into CM.



SM-2A-1831D

Forward Hatch Removal

Sheet 4 of 4

Not applicable.

[illegible]

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 1 of 70

All control and display [indicators, control handles, pushbuttons, switches, and circuit breakers (C/B)] positions shall be recorded as soon as possible after retrieval.

NOTE

On lunar landing missions this procedure will normally be performed when the CM is in the Lunar Receiving Laboratory (LRL). In the event of a systems malfunction, recording of certain switch positions will be performed at the direction of the RCC, Houston.

SAFETY

1. Observe standard safety precautions when working in the CM.
2. Do not reposition any switch, C/B, or control to gather additional information on a spacecraft system. Repositioning of a switch, C/B, or control could cause injury to personnel outside the CM, or cause damage to an on-board system. In addition, the repositioning of switches other than those specified (within this document) may jeopardize postflight testing at the contractor's facility.

PHOTOGRAPHIC REQUIREMENTS

1. Refer to procedures ① and ①A.

TOOLS AND EQUIPMENT

Not applicable.

INSTRUCTIONS

1. Mark figures S-3 through S-43 so that each figure represents the "as recovered" position of the controls and displays on the corresponding spacecraft panel. Figures S-1 and S-2 illustrate the proper method for recording the position of these controls and displays.
2. Use a red pencil or pen for marking all recordings.
3. Sketch or circle, as applicable, all switches and indicator positions on the panel drawings to ensure positive identification of the actual indicator or switch position.
4. Note/record any damage to instrument covers (glass), controls, etc.

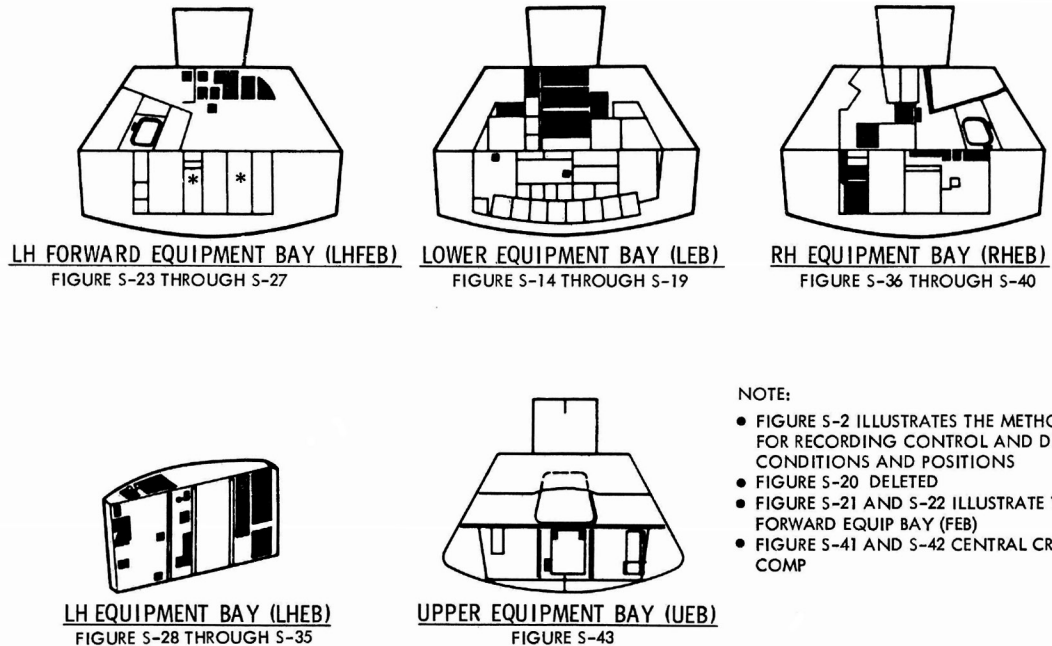
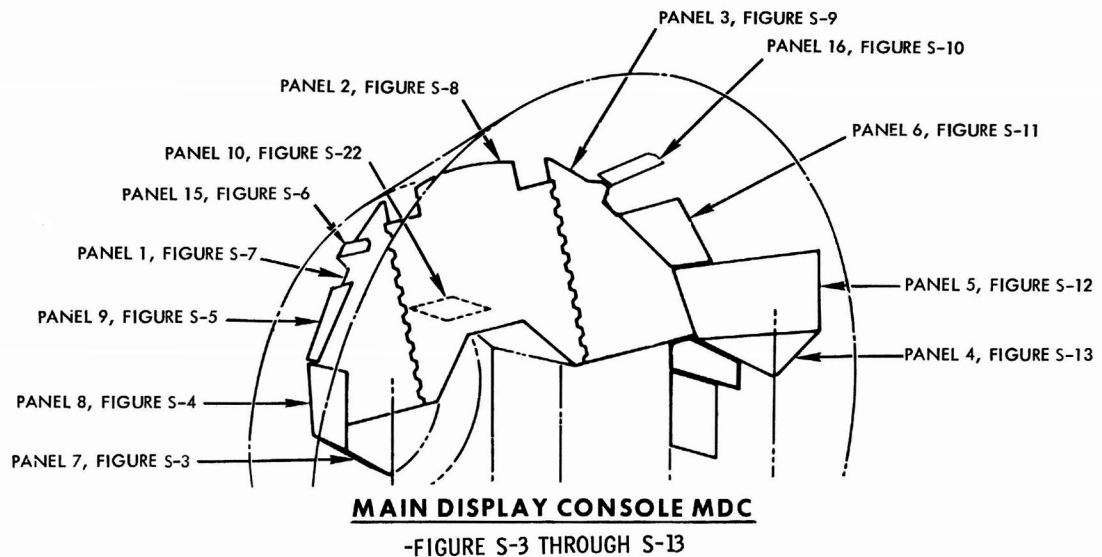
Remarks: _____

PACKAGING REQUIREMENTS

Not applicable.

PANEL READINGS AND SWITCH POSITIONS

Sheet 2 of 70

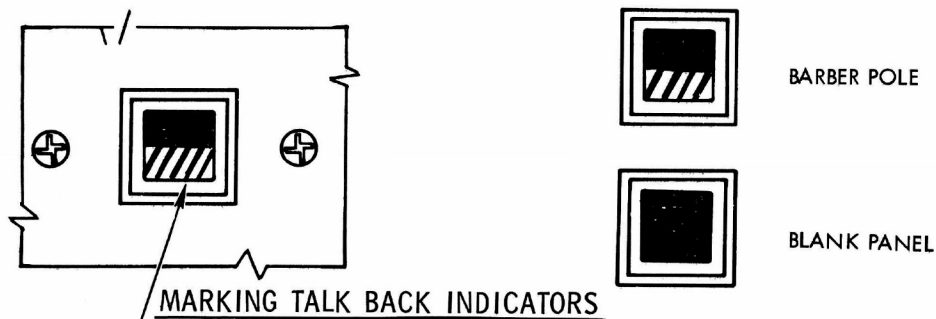
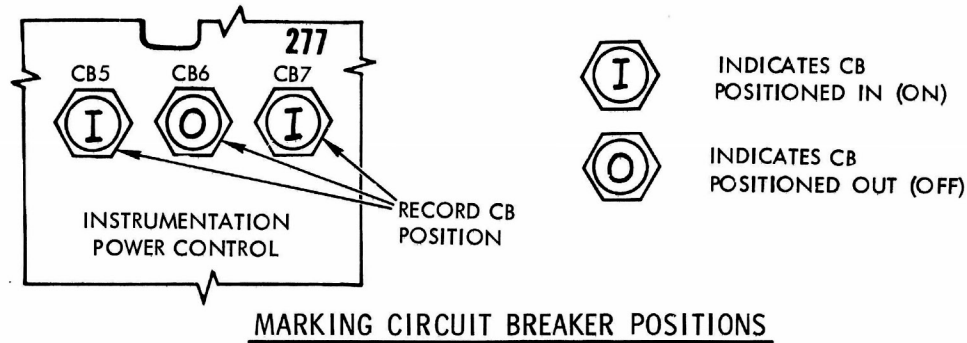


SM-2A-1889A

Figure S-1. Postretrieval Check Data Sheet Index

PANEL READINGS AND SWITCH POSITIONS

Sheet 3 of 70



RECORD ACTUAL DISPLAY

NOTE

1. THIS ILLUSTRATION, TOGETHER WITH SHEET 2 AND 3 ILLUSTRATE THE METHODS FOR RECORDING INDICATOR, SWITCH, AND CONTROL POSITIONS.
2. USE RED PENCIL OR PEN FOR ALL RECORDINGS.
3. SKETCH INDICATOR HANDS AND SWITCHES AS NECESSARY TO ASSURE POSITIVE IDENTIFICATION OF ACTUAL INDICATION.

Warning

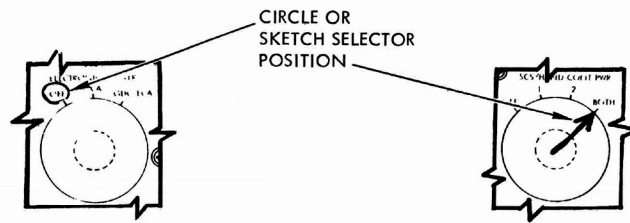
CONTROLS AND SWITCHES SHALL NOT BE REPOSITIONED TO GATHER ADDITIONAL INFORMATION.

SM-2A-1890A

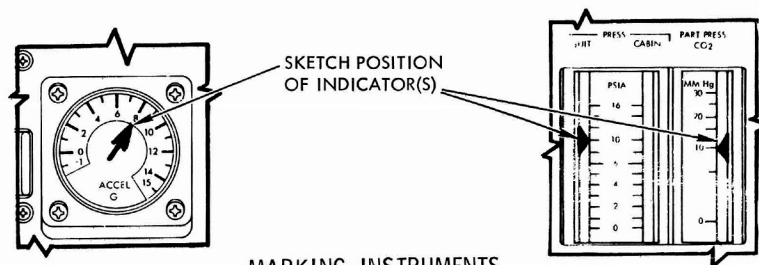
Figure S-2. Methods for Recording Control and Display Indicators
(Sheet 1 of 3)

PANEL READINGS AND SWITCH POSITIONS

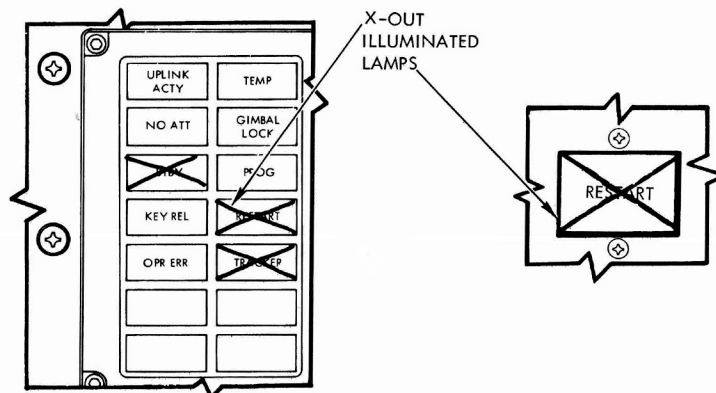
Sheet 4 of 70



MARKING ROTARY SWITCHES



MARKING INSTRUMENTS



MARKING ILLUMINATED LIGHTS

NOTE

USE RED PENCIL OR PEN TO RECORD INDICATOR, SWITCH CONTROL POSITIONS.

Warning

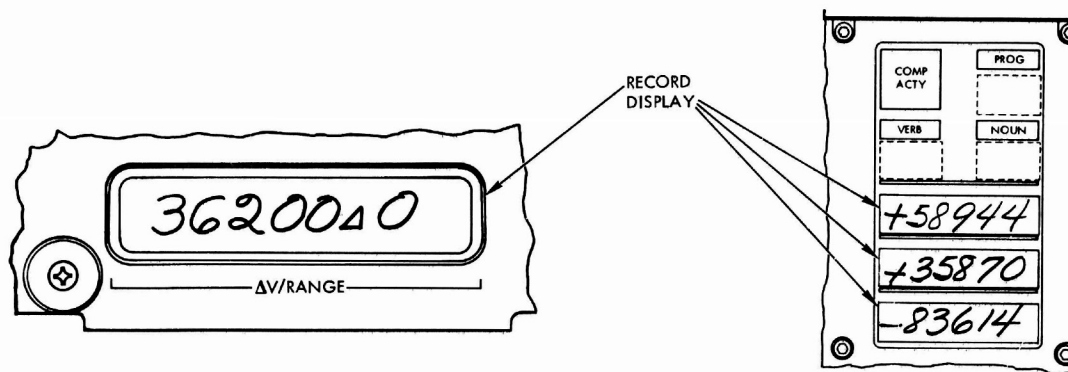
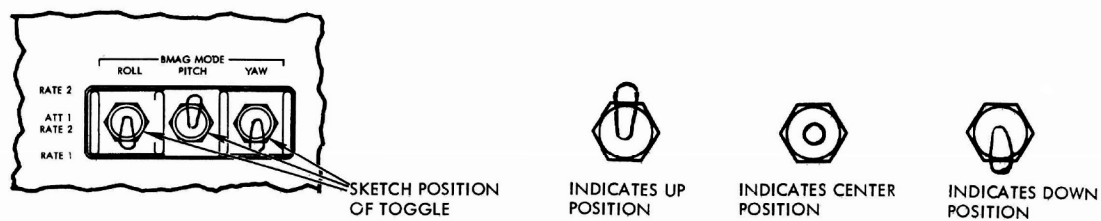
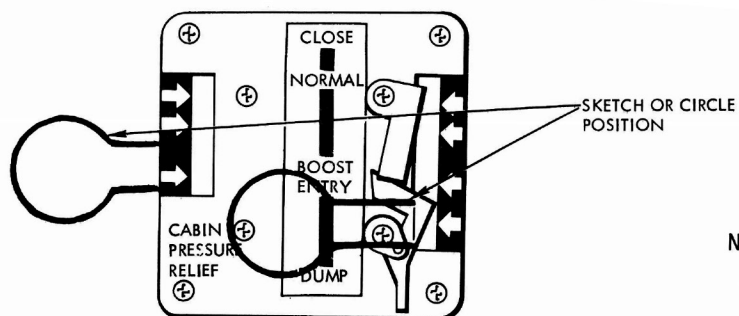
CONTROLS AND SWITCHES SHALL NOT BE REPOSITIONED TO GATHER ADDITIONAL INFORMATION.

SM-2A-1891

Figure S-2. Methods for Recording Control and Display Indicators (Sheet 2 of 3)

PANEL READINGS AND SWITCH POSITIONS

Sheet 5 of 70

MARKING INSTRUMENT WINDOWSMARKING TOGGLE SWITCH POSITIONS

NOTE

USE RED PENCIL OR PEN TO RECORD ALL INDICATOR, SWITCH, AND CONTROL POSITIONS

Warning

CONTROLS AND SWITCHES SHALL NOT BE REPOSITIONED TO GATHER ADDITIONAL INFORMATION.

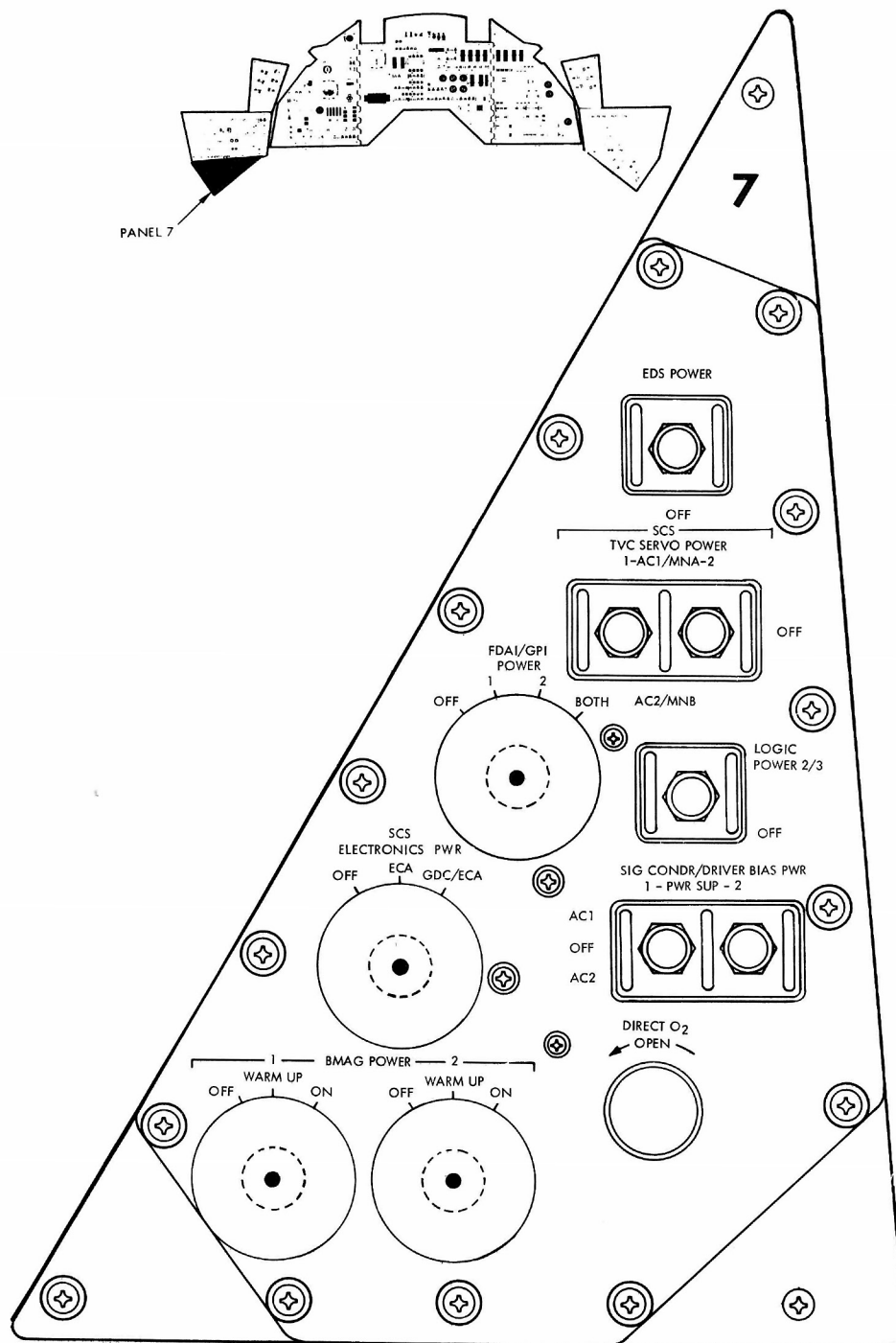
MARKING CONTROL HAND LEVER POSITIONS

SM-2A-1892B

Figure S-2. Methods for Recording Control and Display Indicators (Sheet 3 of 3)

PANEL READINGS AND SWITCH POSITIONS

Sheet 6 of 70



SM-2A-1851B

Figure S-3. MDC Check Data Sheet, Panel 7

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 7 of 70

SM-2A-18718

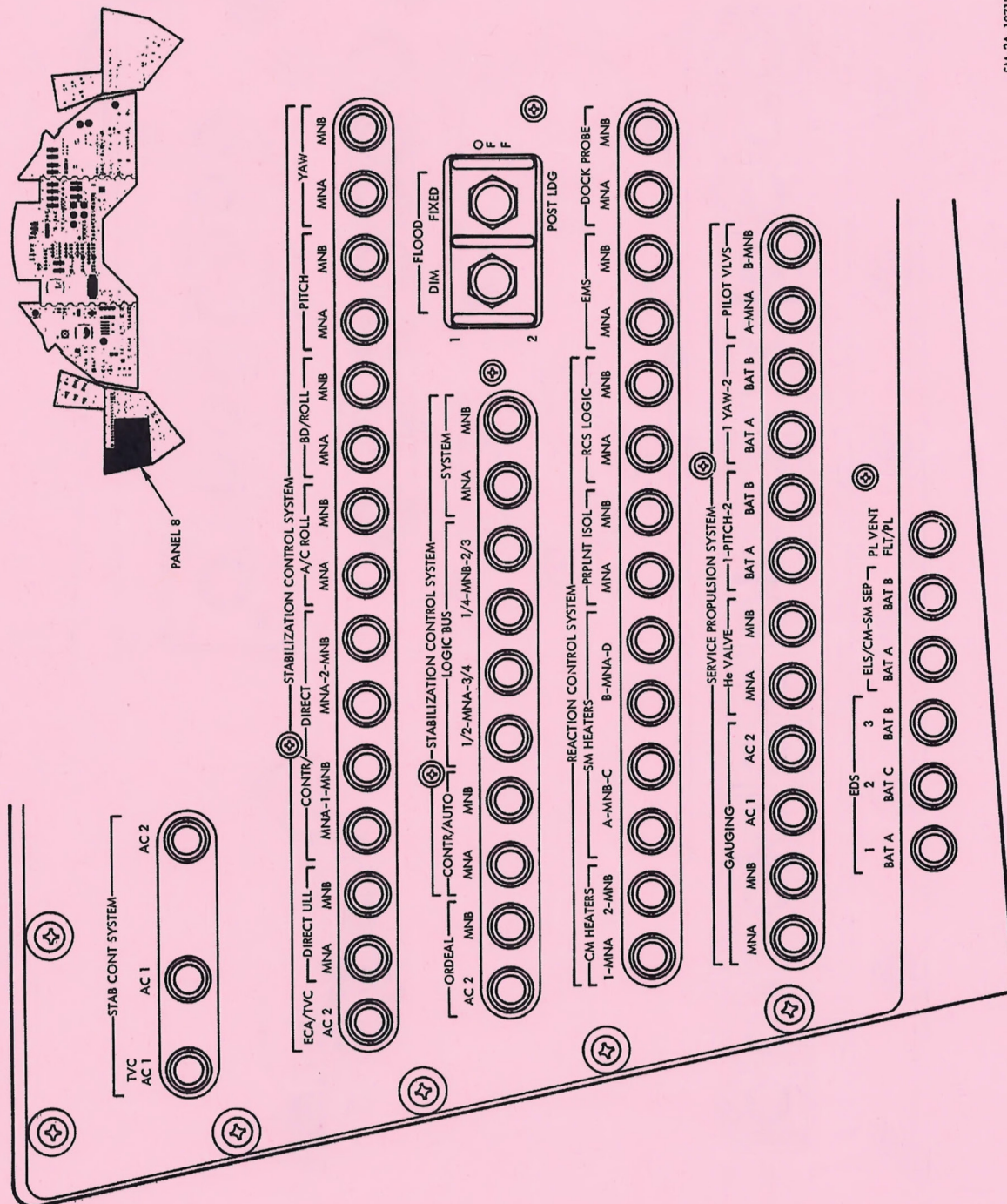


Figure S-4. MDC Check Data Sheet, Panel 8 (Sheet 1 of 2)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 8 of 70

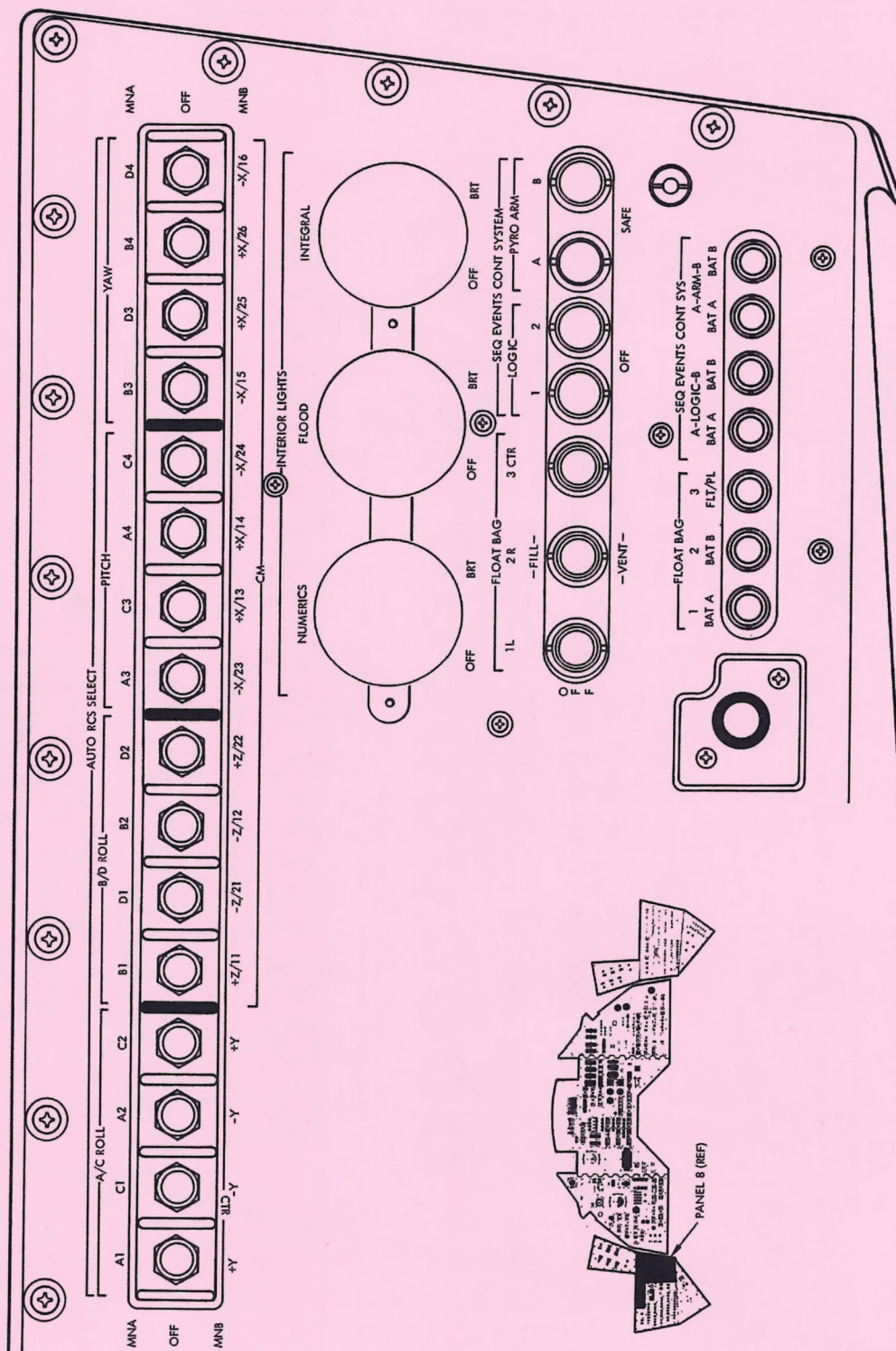
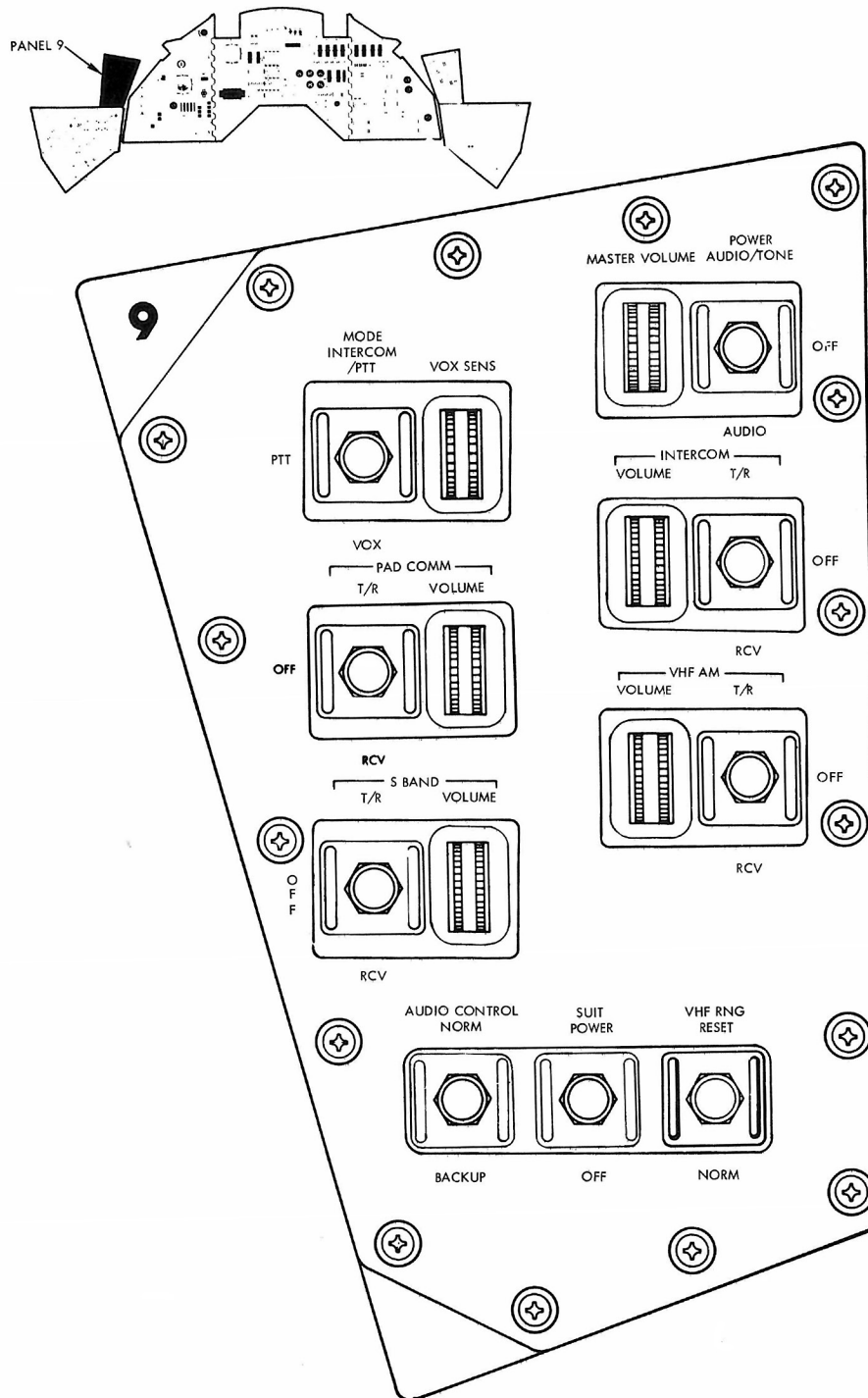


Figure S-4. MDC Check Data Sheet, Panel 8 (Sheet 2 of 2)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 9 of 70



SM-2A-1849B

Figure S-5. MDC Check Data Sheet, Panel 9

Date _____ Time _____ Signature _____

SM-2A-1844A

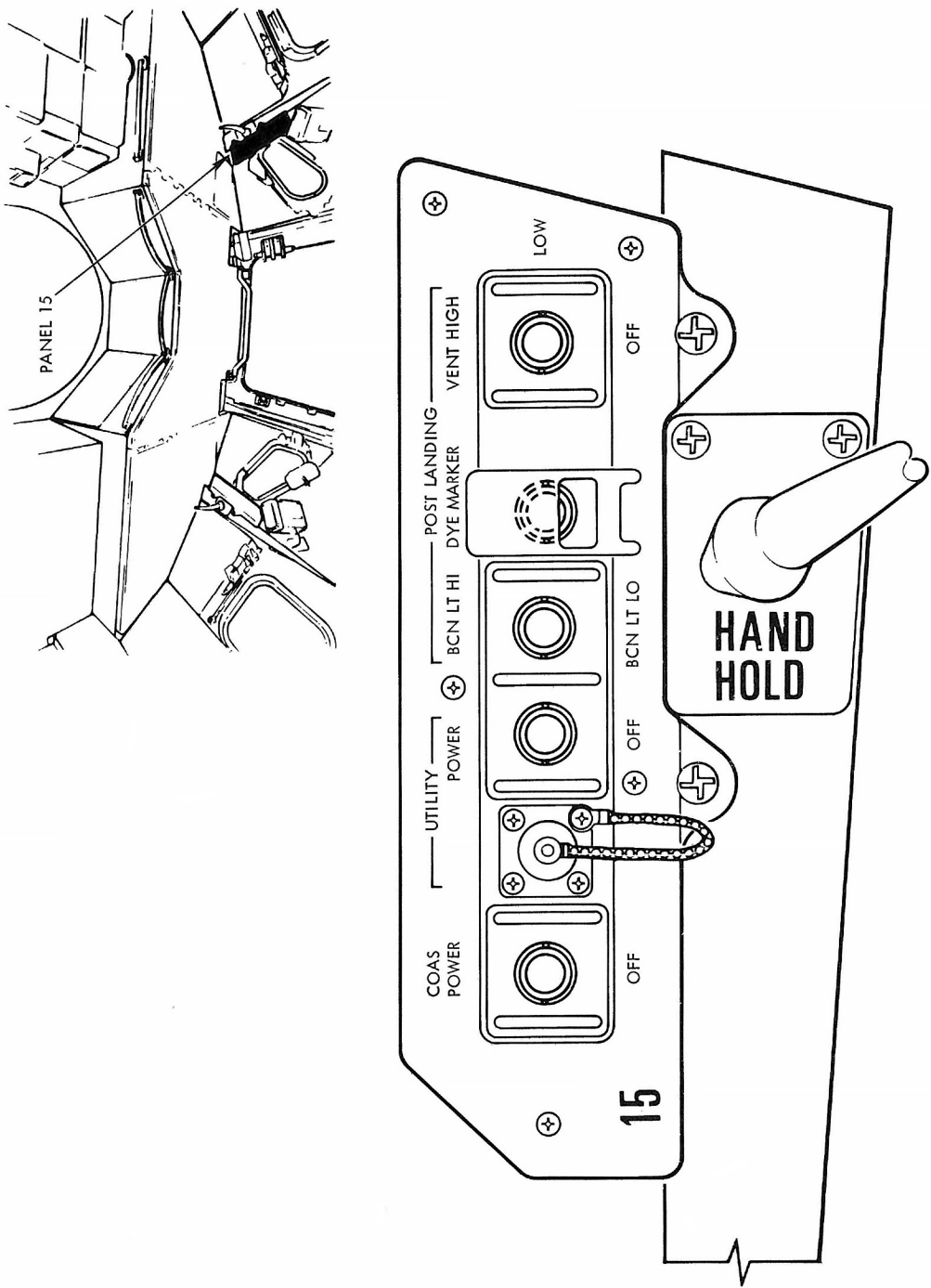
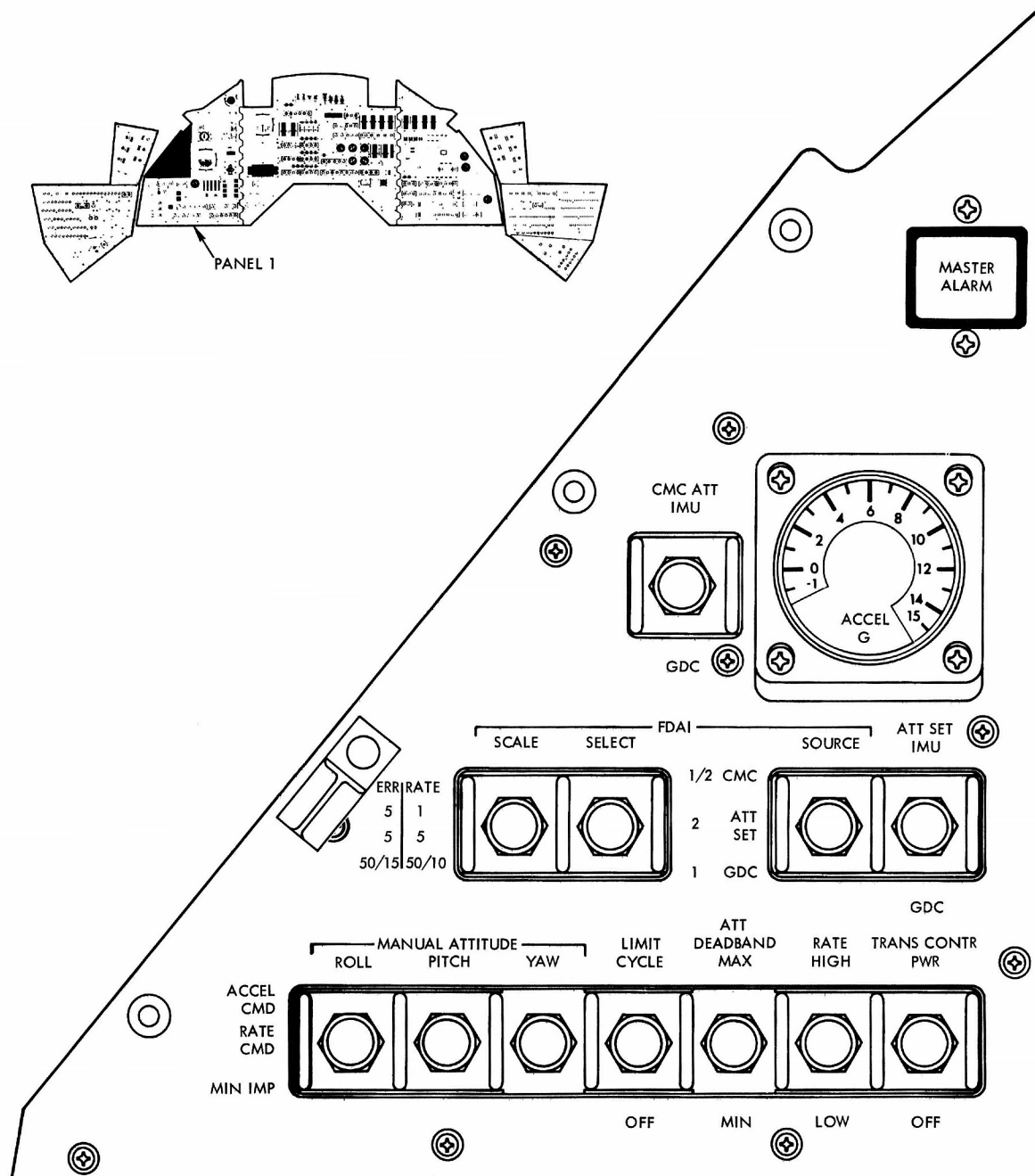


Figure S-6. MDC Check Data Sheet, Panel 15

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 11 of 70



SM-2A-1872A

Figure S-7. MDC Check Data Sheet, Panel 1 (Sheet 1 of 5)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 12 of 70

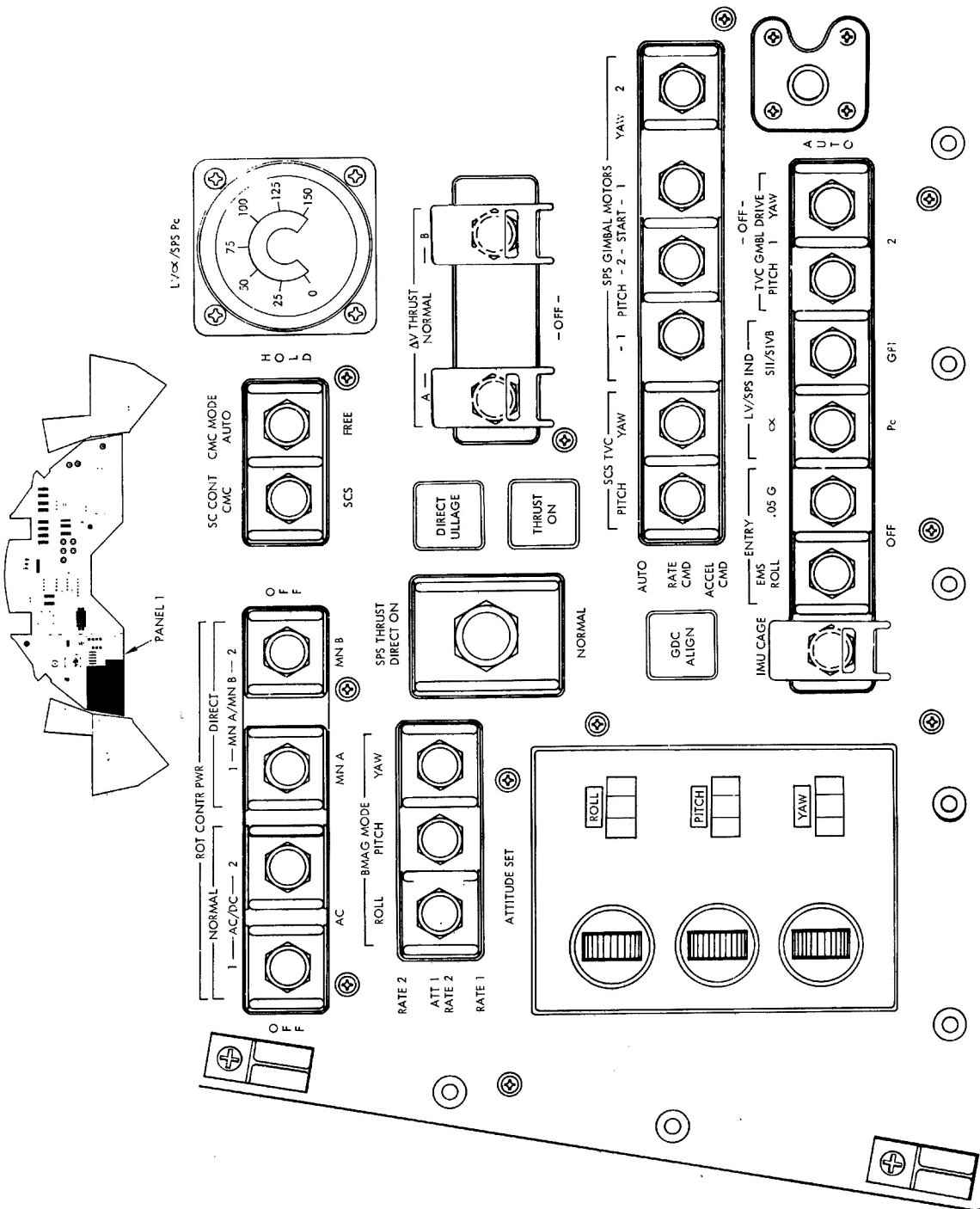
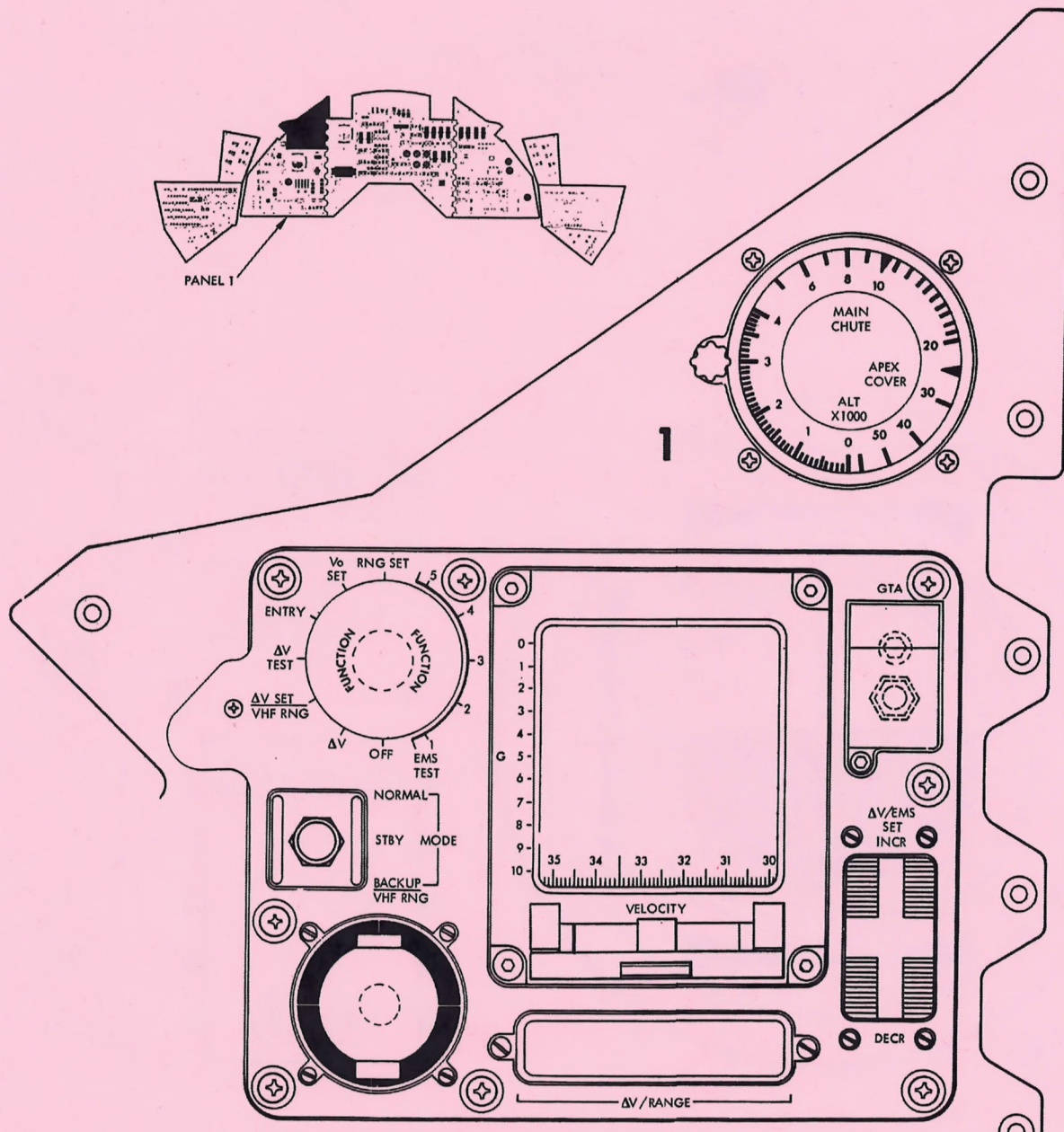


Figure S-7. MDC Check Data Sheet, Panel 1 (Sheet 2 of 5)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 13 of 70



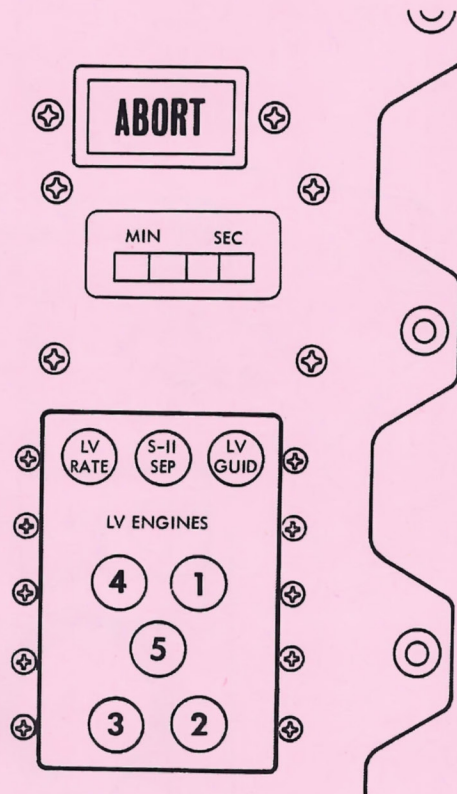
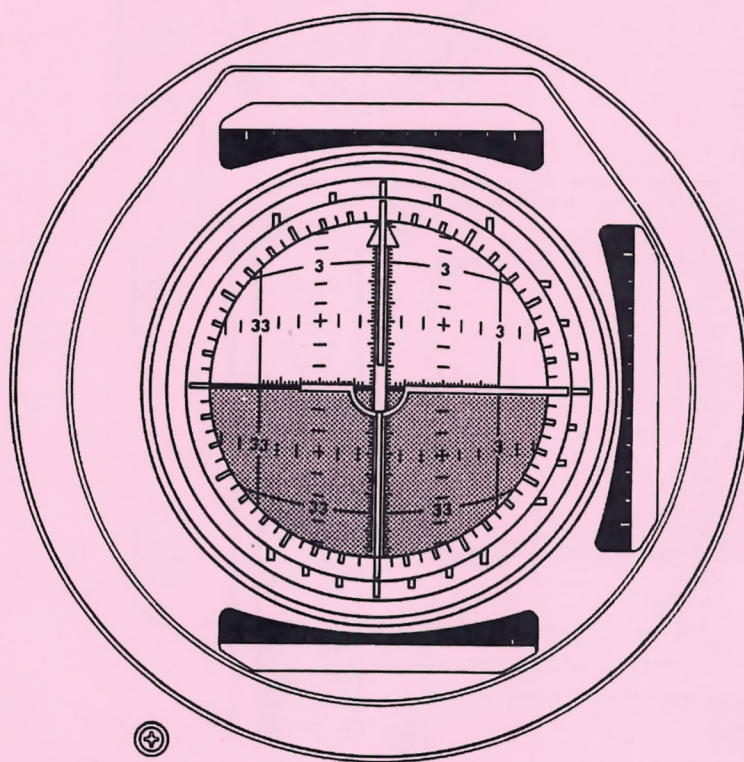
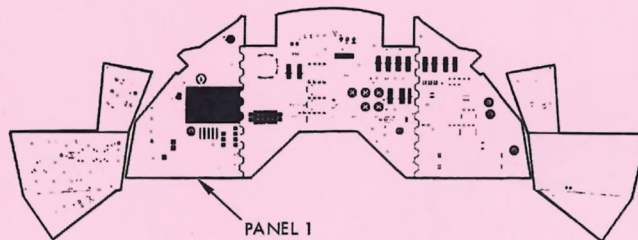
SM-2A-18748

Figure S-7. MDC Check Data Sheet, Panel 1 (Sheet 3 of 5)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 14 of 70



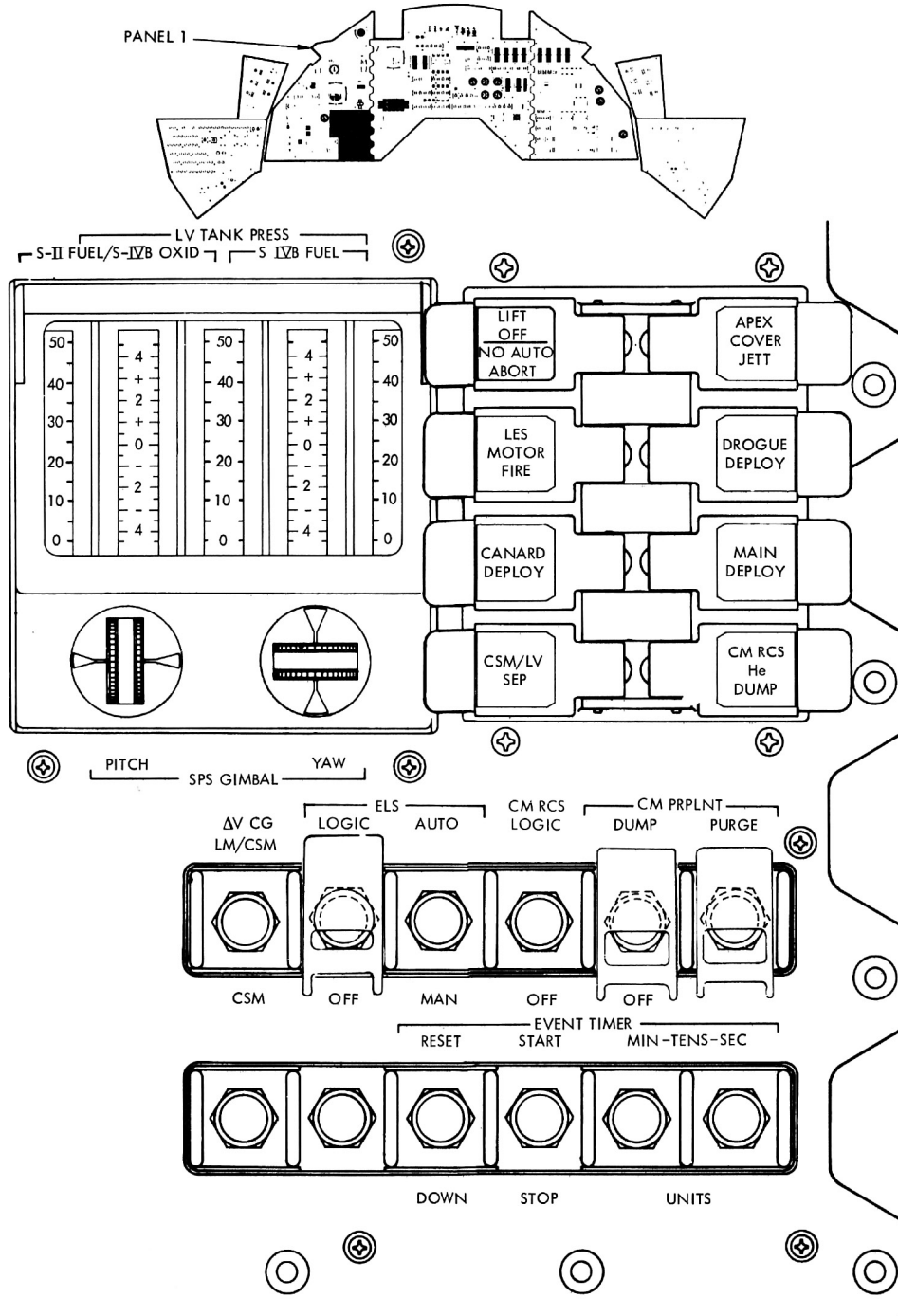
SM-2A-1875

Figure S-7. MDC Check Data Sheet, Panel 1 (Sheet 4 of 5)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

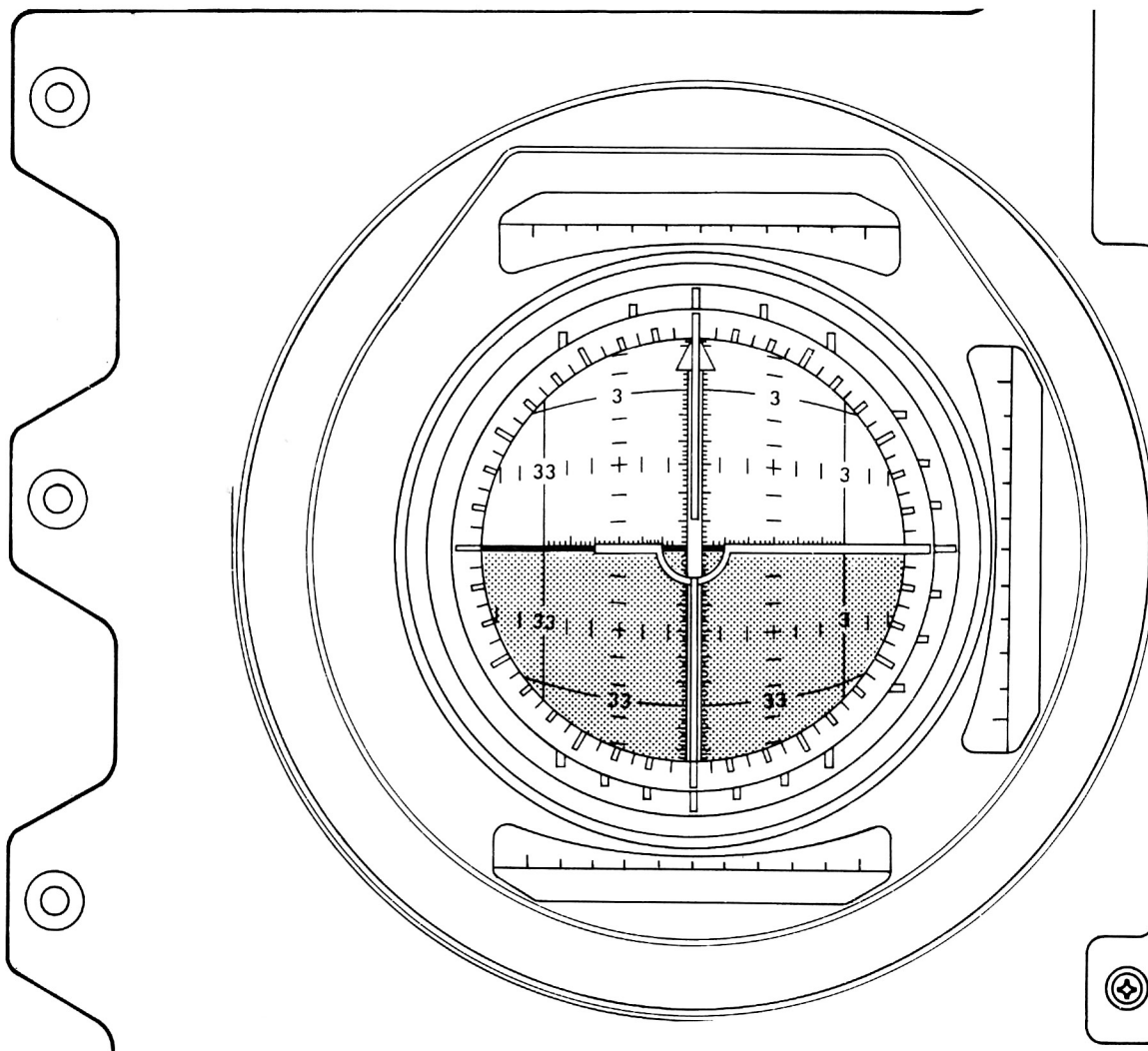
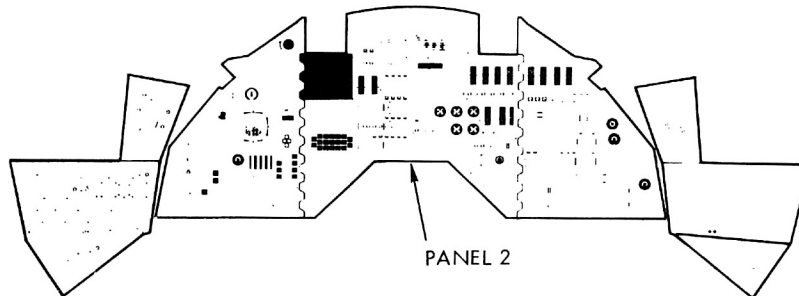
Sheet 15 of 70



SM-2A-1876B

Figure S-7. MDC Check Data Sheet, Panel 1 (Sheet 5 of 5)

Date _____ Time _____ Signature _____



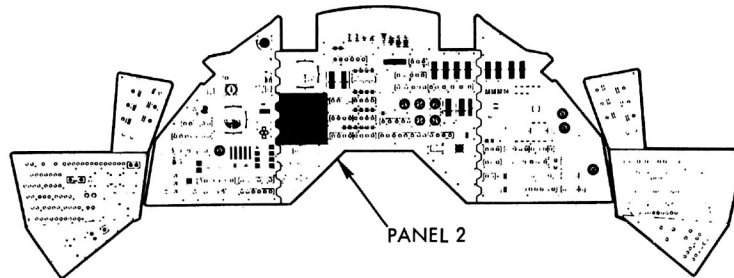
SM-2A-1877

Figure S-8. MDC Check Data Sheet, Panel 2 (Sheet 1 of 12)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 17 of 70



UPLINK ACTY	TEMP	COMP ACTY	PROG			
NO ATT	GIMBAL LOCK	VERB	NOUN			
STBY	PROG					
KEY REL	RESTART					
OPR ERR	TRACKER					
VERB	+	7	8	9	CLR	ENTR
NOUN	-	4	5	6	PRO	RSET
	0	1	2	3	KEY REL	

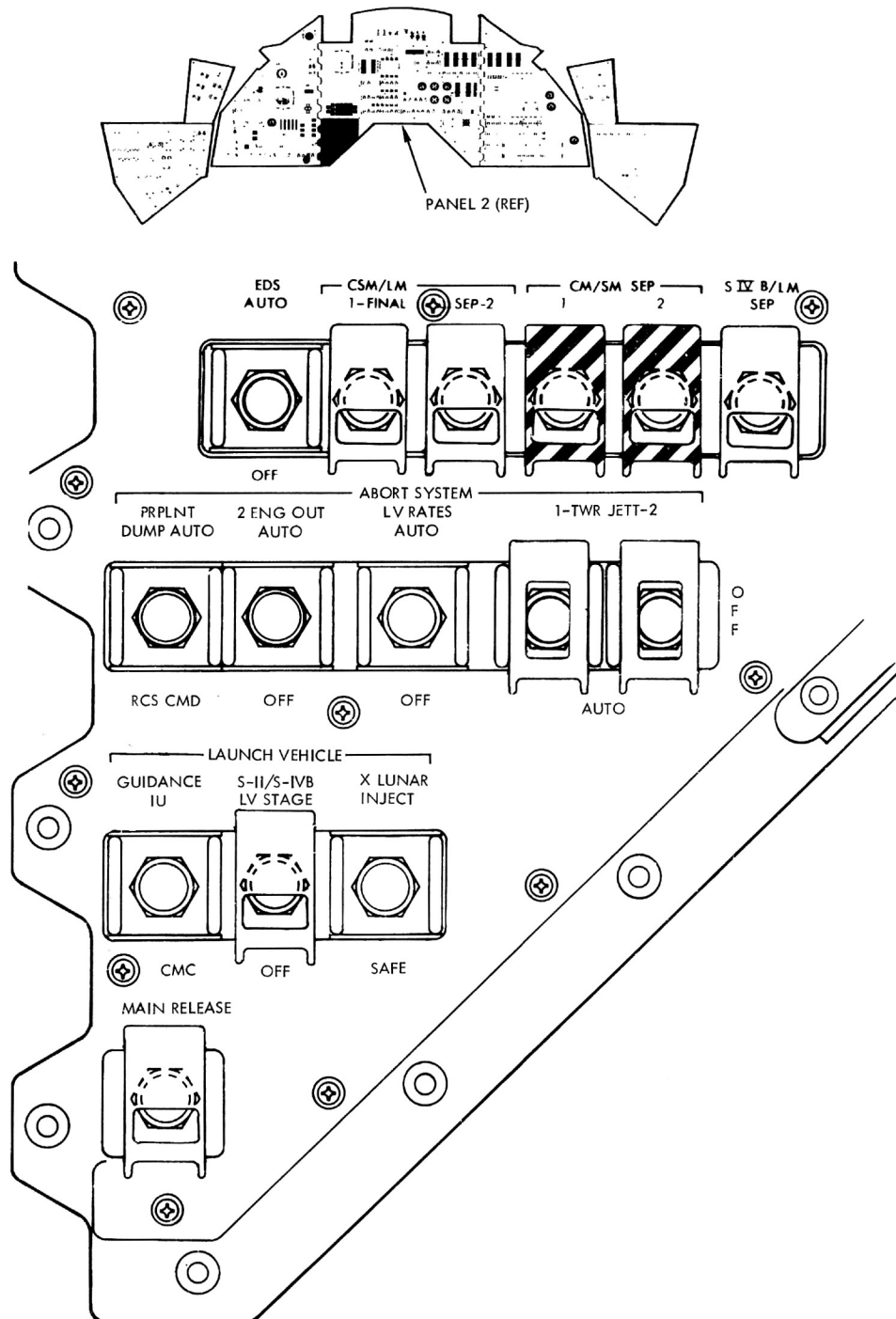
SM-2A-1878 B

Figure S-8. MDC Check Data Sheet, Panel 2 (Sheet 2 of 12)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 18 of 70



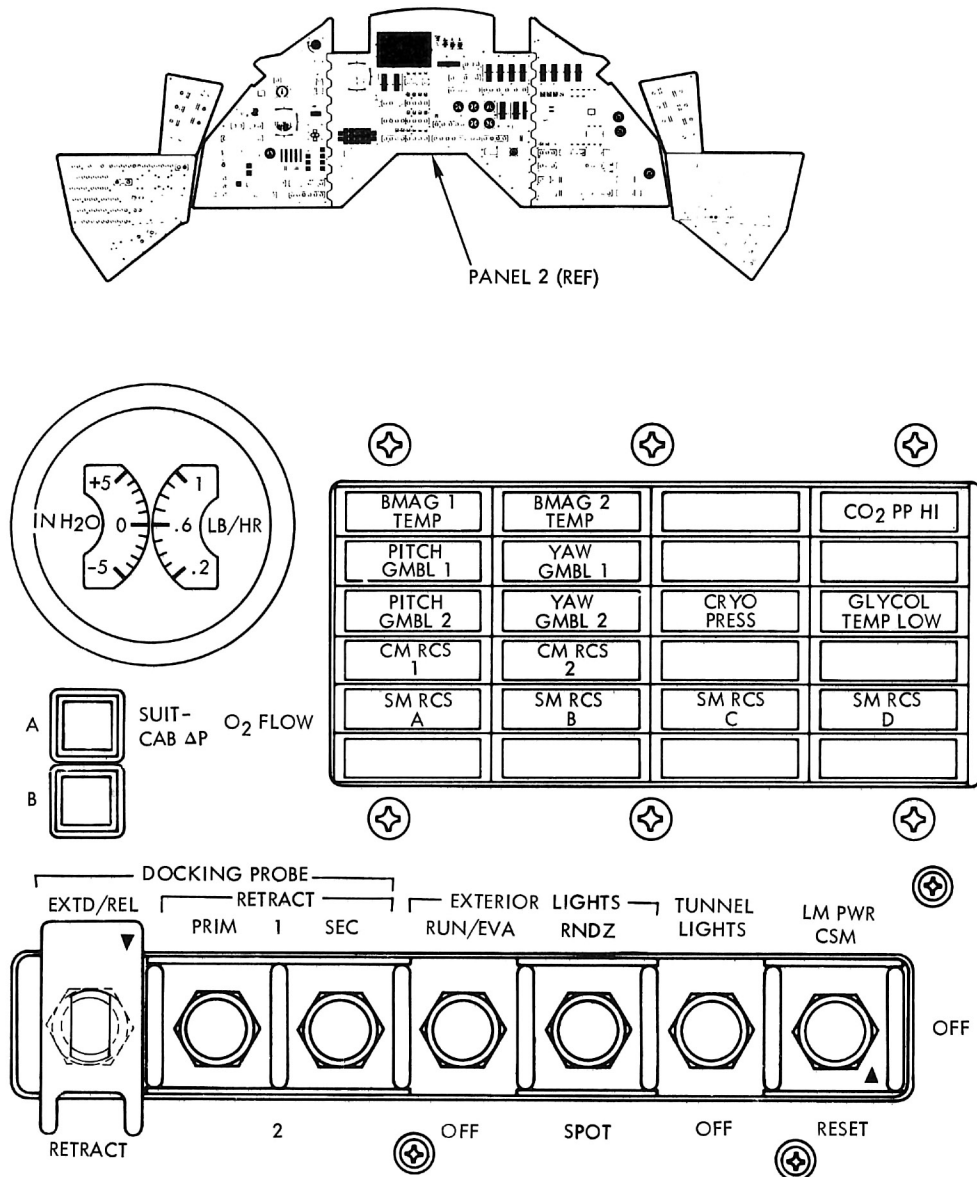
SM-2A-1879D ■

Figure S-8. MDC Check Data Sheet, Panel 2 (Sheet 3 of 12)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 19 of 70



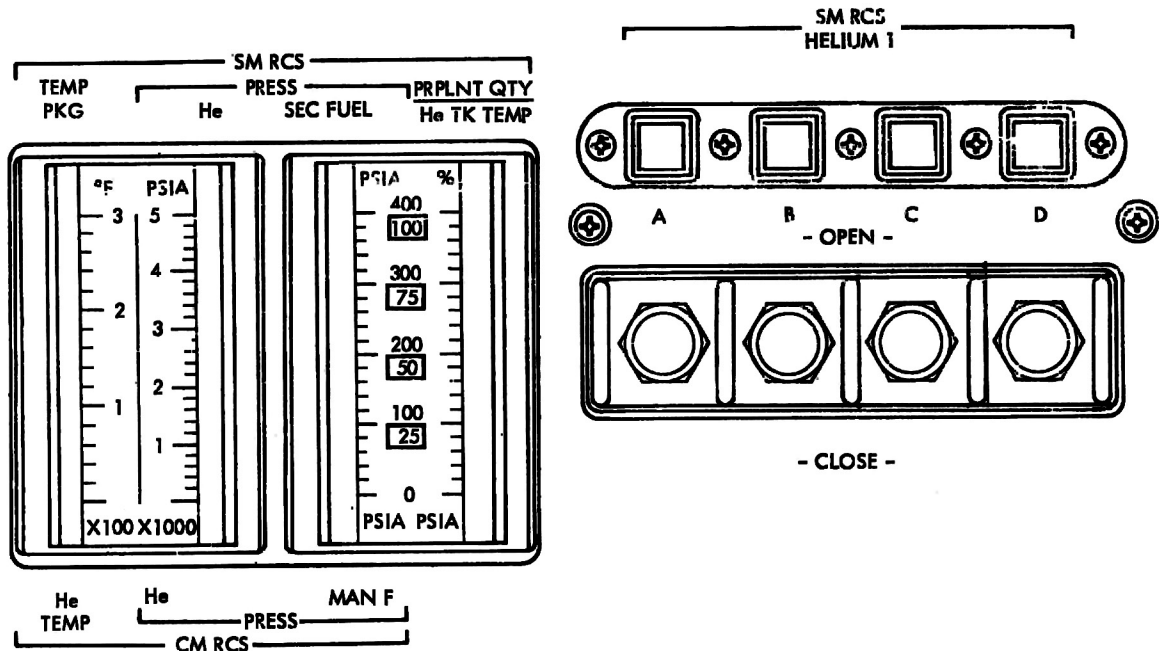
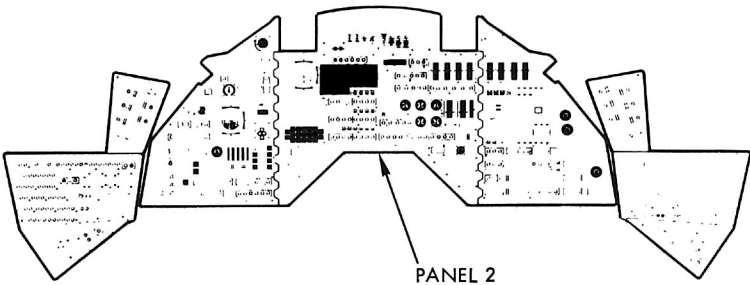
SM-2A-1880D

Figure S-8. MDC Check Data Sheet, Panel 2 (Sheet 4 of 12)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 20 of 70



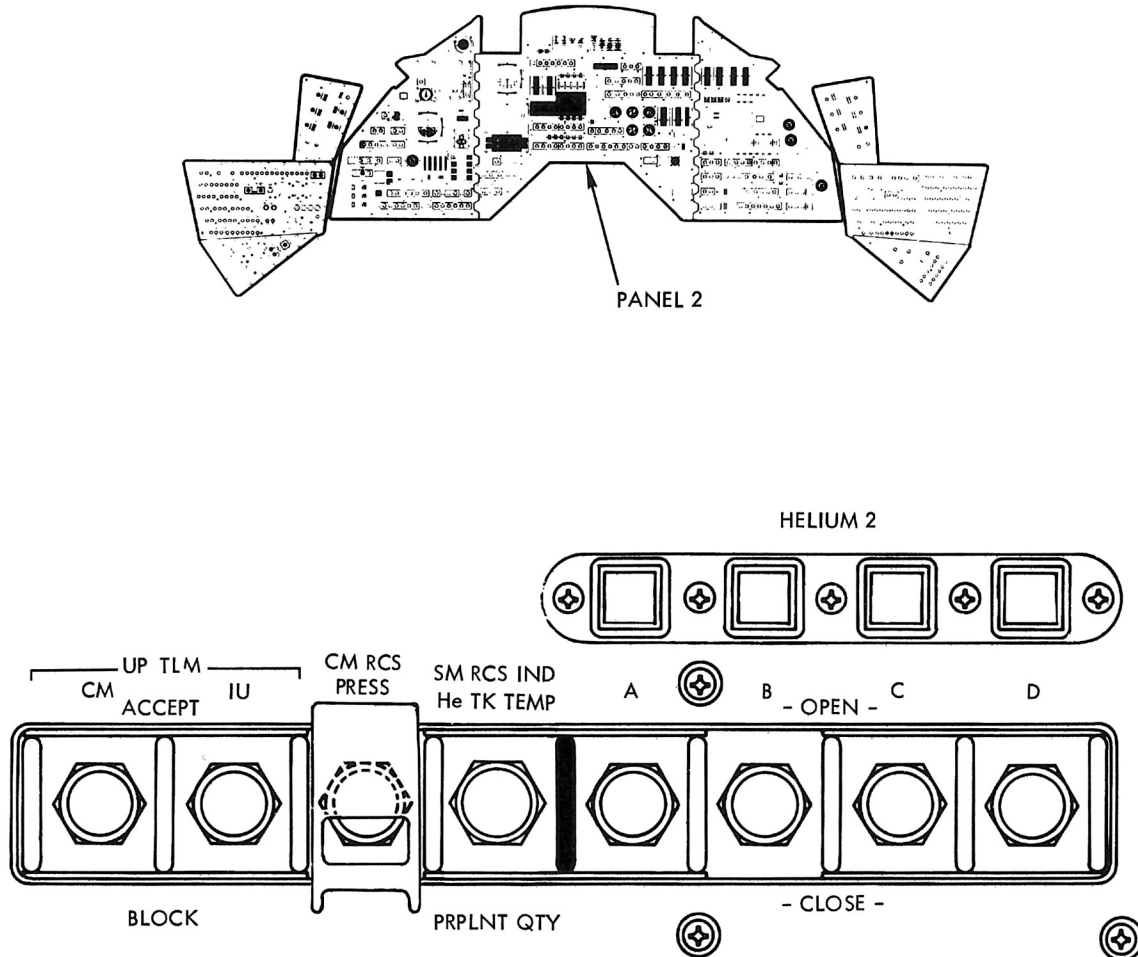
SM-2A-1881C

Figure S-8. MDC Check Data Sheet, Panel 2 (Sheet 5 of 12)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 21 of 70



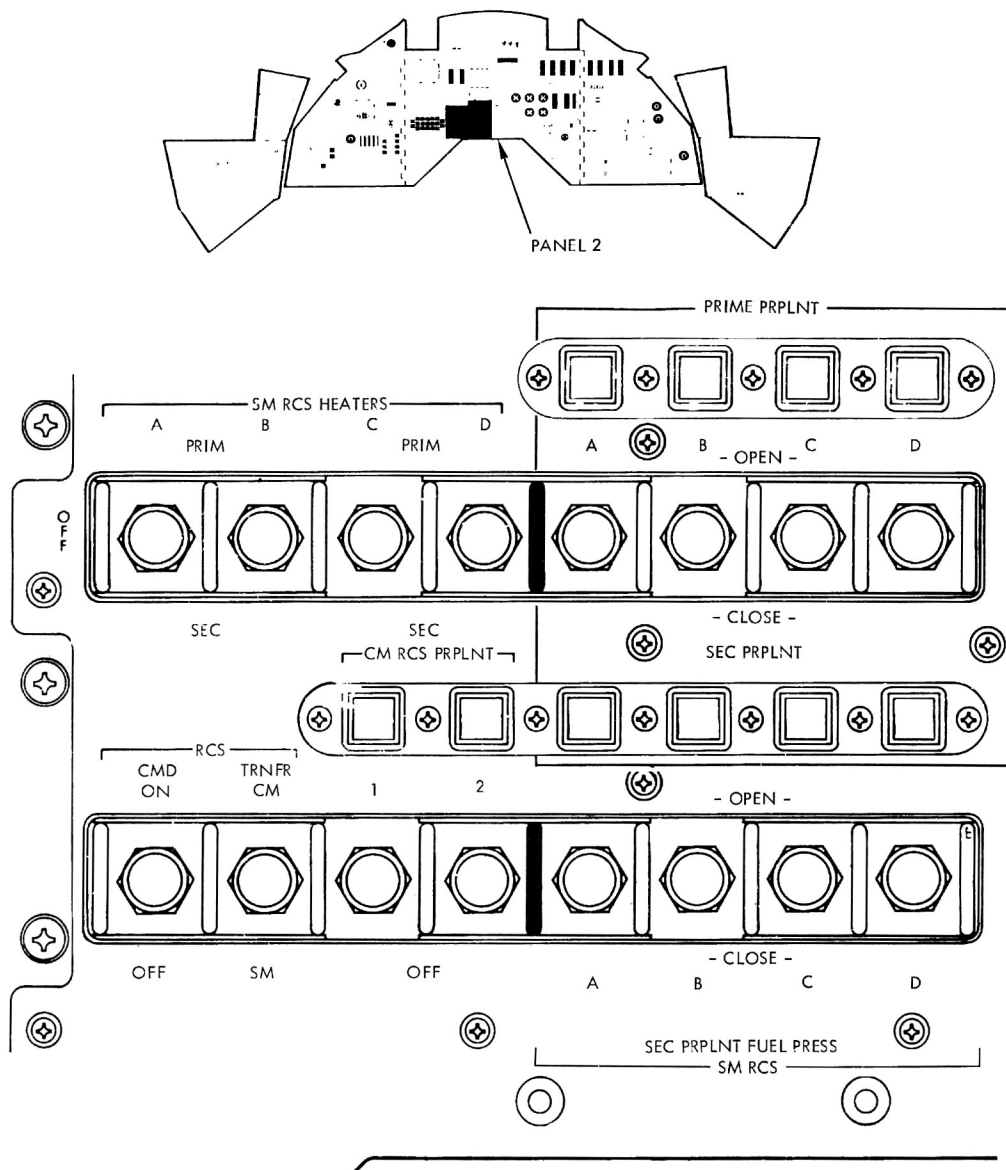
SM-2A-1882D

Figure S-8. MDC Check Data Sheet, Panel 2 (Sheet 6 of 12)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 22 of 70



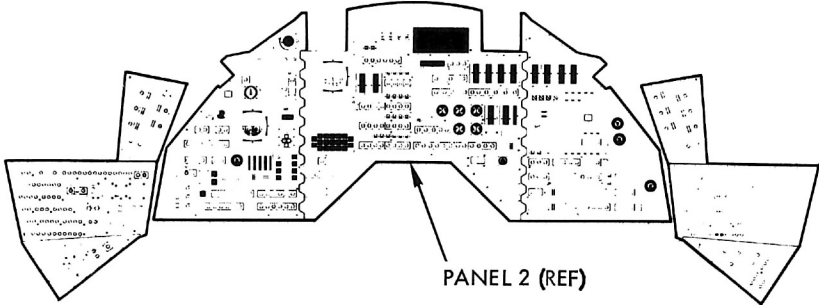
SM-2A-1883C

Figure S-8. MDC Check Data Sheet, Panel 2 (Sheet 7 of 12)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 23 of 70



2

	FC 1	FC 2	FC 3
	INV 1 TEMP HI	INV 2 TEMP HI	INV 3 TEMP HI
SPS PRESS		AC BUS 1	AC BUS 2
	FC BUS DISCONNECT	AC BUS 1 OVERLOAD	AC BUS 2 OVERLOAD
CMC	CREW ALERT	MN BUS A UNDERVOLT	MN BUS B UNDERVOLT
ISS	C/W	O ₂ FLOW HI	SUIT COMPRESSOR

POST LDG VENT
VALVES UNLOCK

PULL

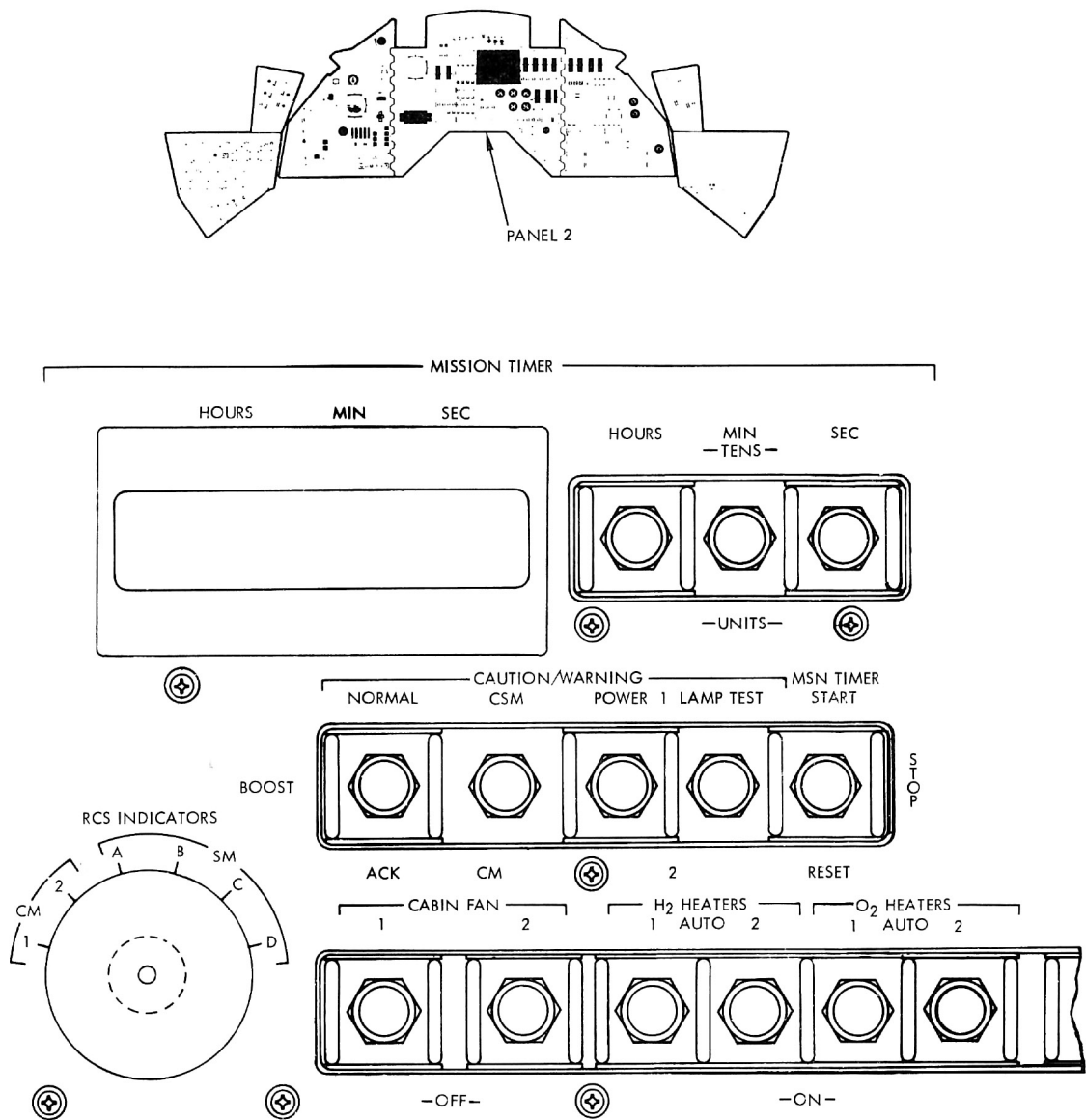
* NOTE: RECORD POSITION OF HANDLE IN _____, OR OUT _____

SM-2A-1884E

Figure S-8. MDC Check Data Sheet, Panel 2 (Sheet 8 of 12)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS



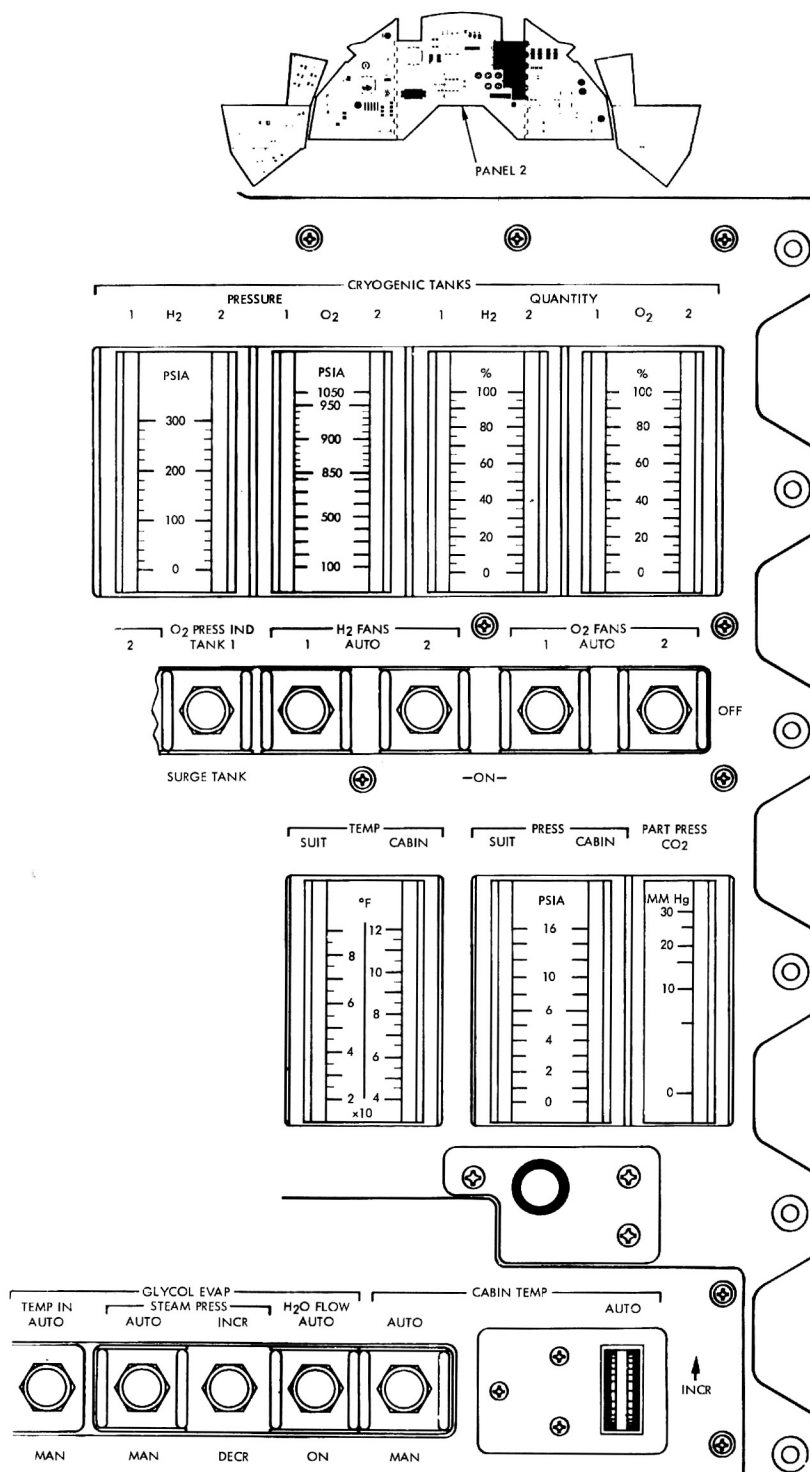
SM-2A-1885

Figure S-8. MDC Check Data Sheet, Panel 2 (Sheet 9 of 12)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 26 of 70



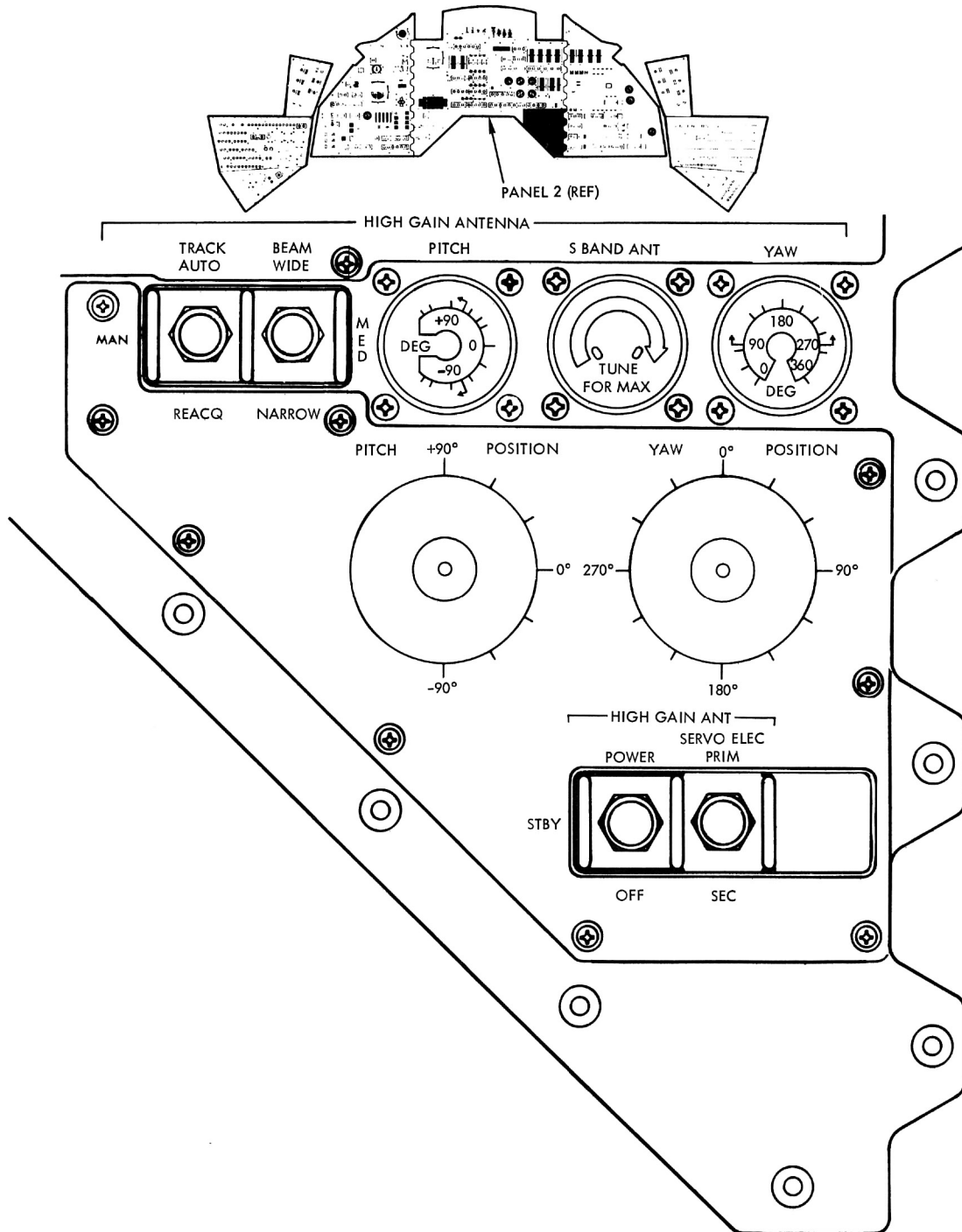
SM-2A-1887

Figure S-8. MDC Check Data Sheet, Panel 2 (Sheet 11 of 12)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 27 of 70



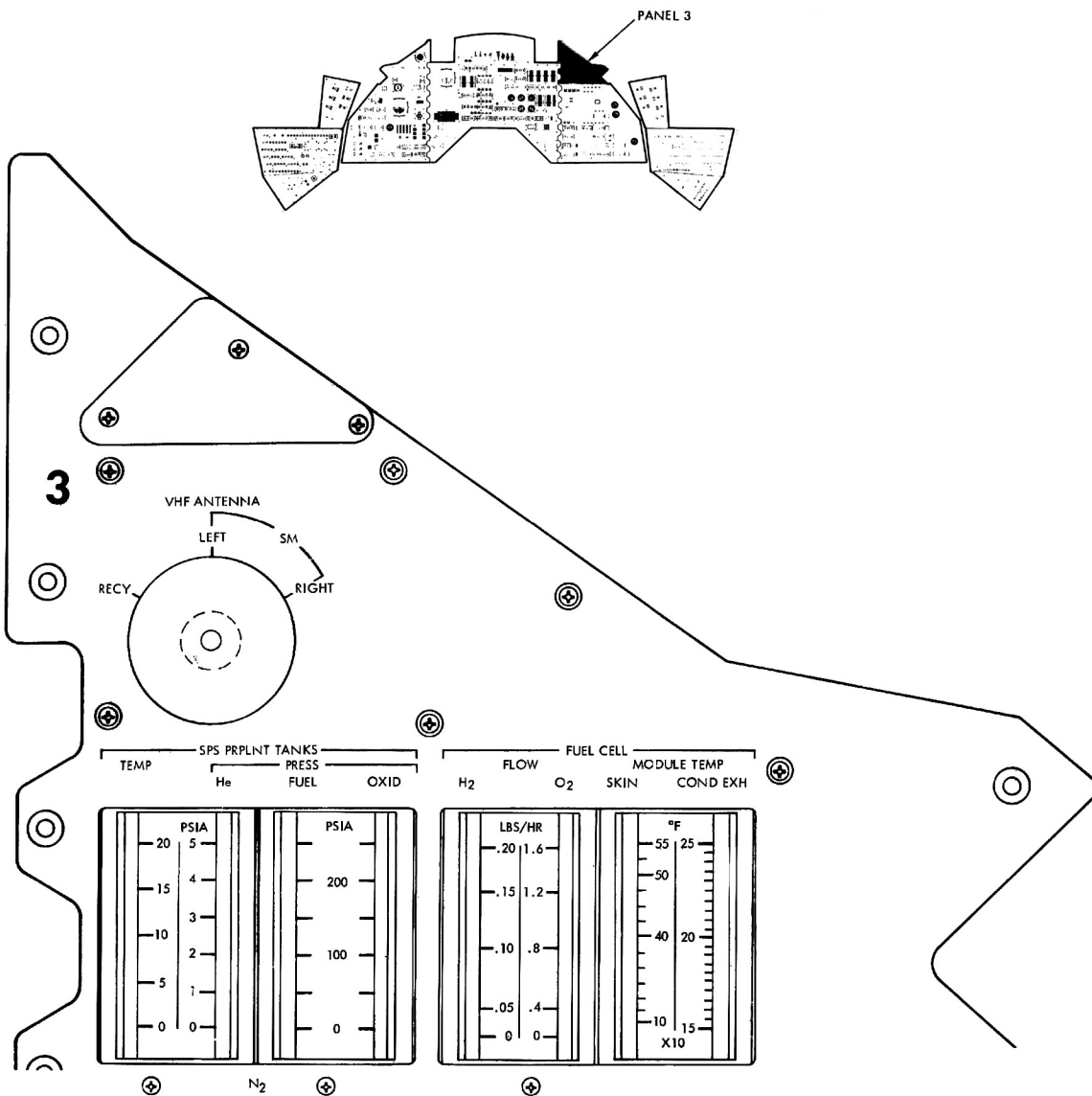
SM-2A-1888C

Figure S-8. MDC Check Data Sheet, Panel 2 (Sheet 12 of 12)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 28 of 70



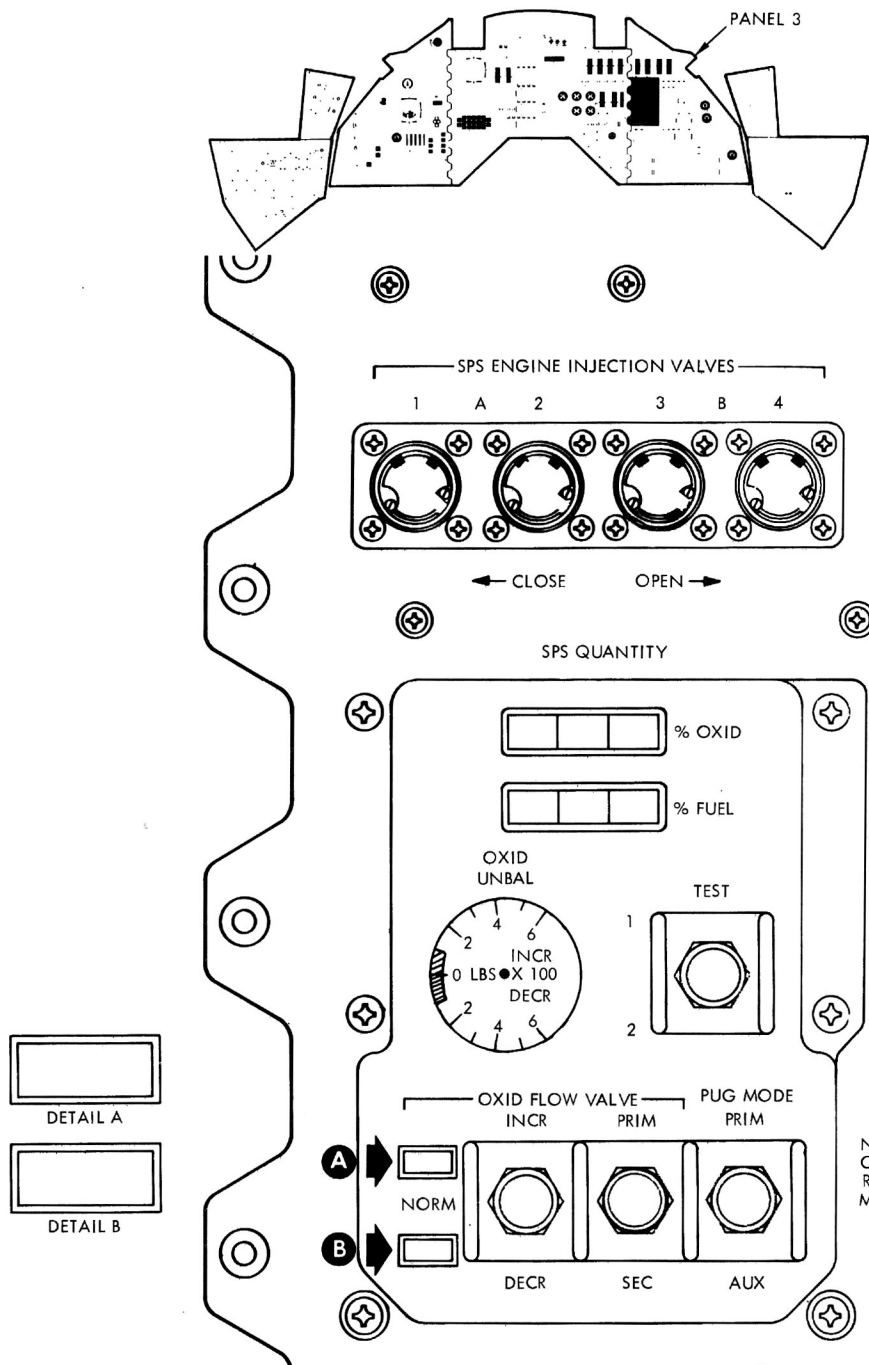
SM-2A-1863

Figure S-9. MDC Check Data Sheet, Panel 3 (Sheet 1 of 7)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

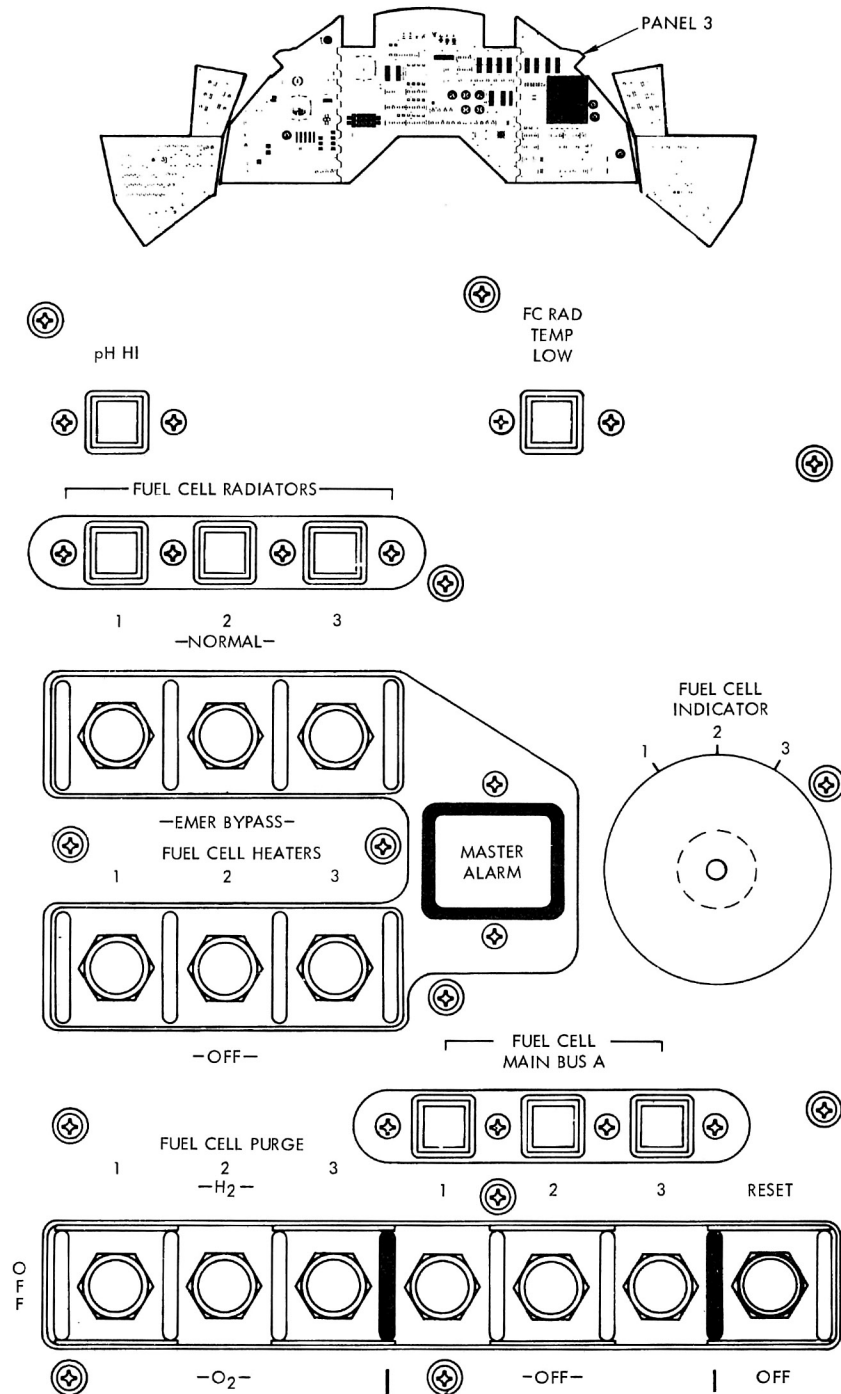
Sheet 29 of 70



SM-2A-1864

Figure S-9. MDC Check Data Sheet, Panel 3 (Sheet 2 of 7)

Date _____ Time _____ Signature _____



SM-2A-1865A

Figure S-9. MDC Check Data Sheet, Panel 3 (Sheet 3 of 7)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 31 of 70

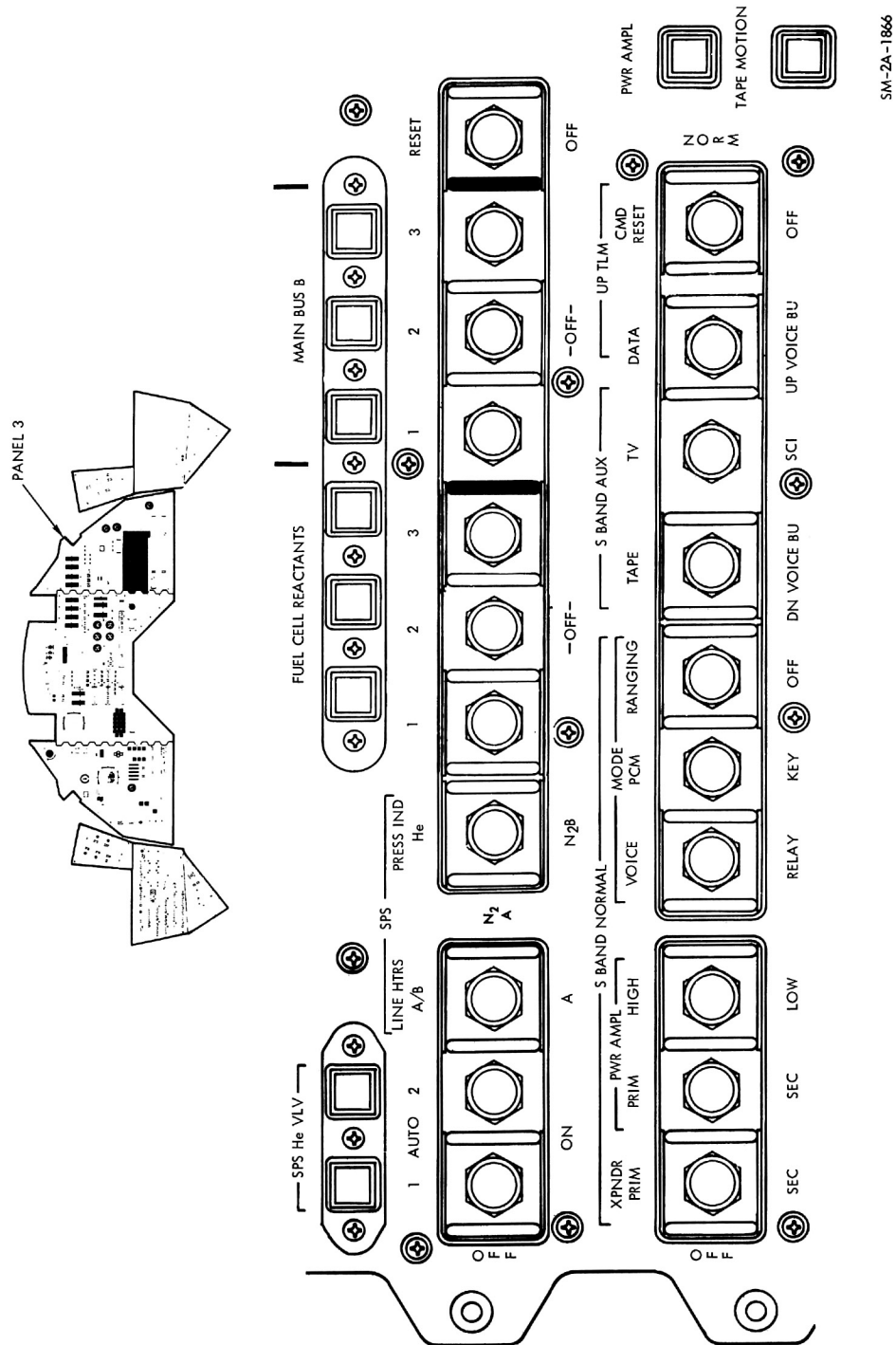
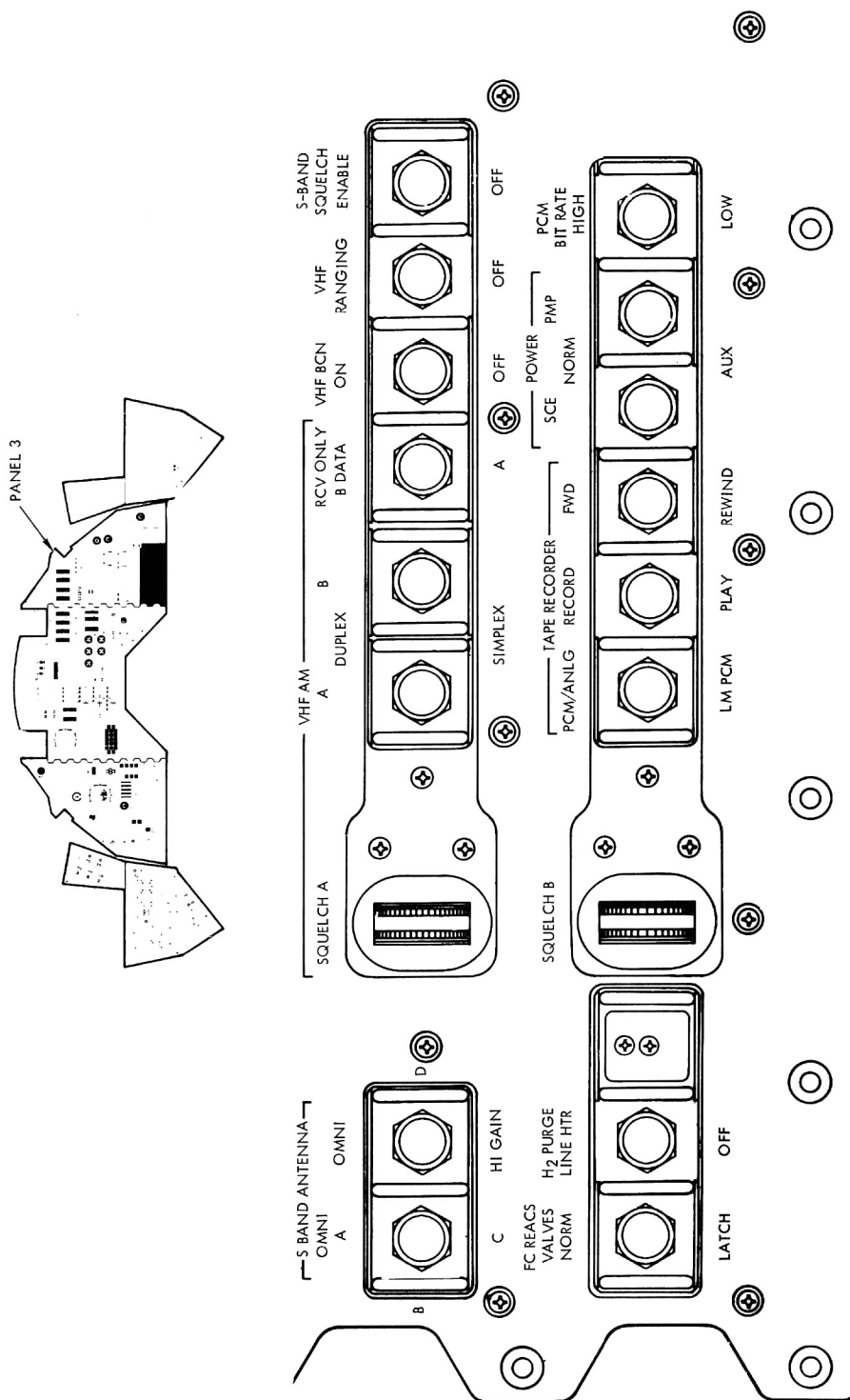


Figure S-9. MDC Check Data Sheet, Panel 3 (Sheet 4 of 7)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 32 of 70



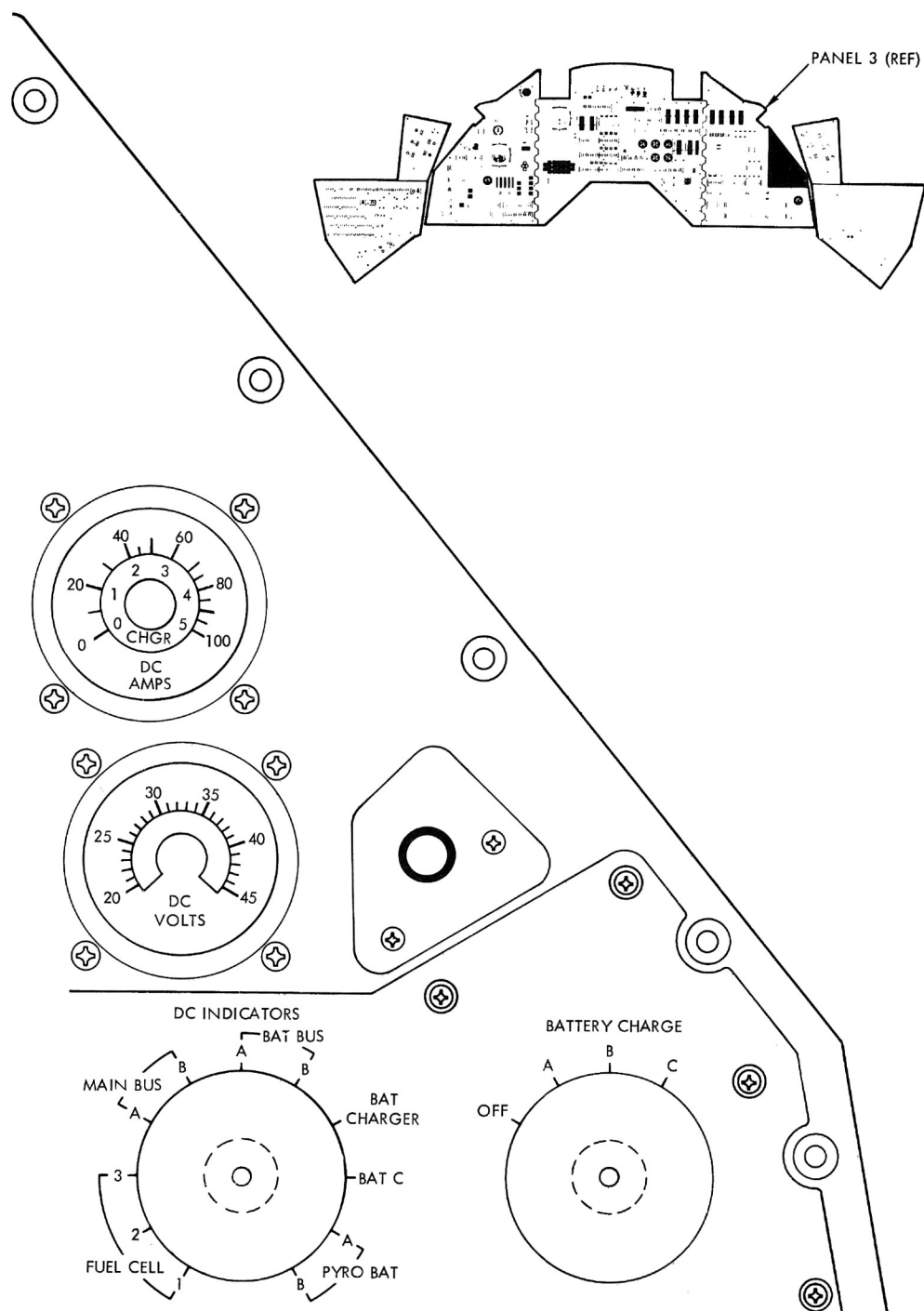
SM-2A-1867C

Figure S-9. MDC Check Data Sheet, Panel 3 (Sheet 5 of 7)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

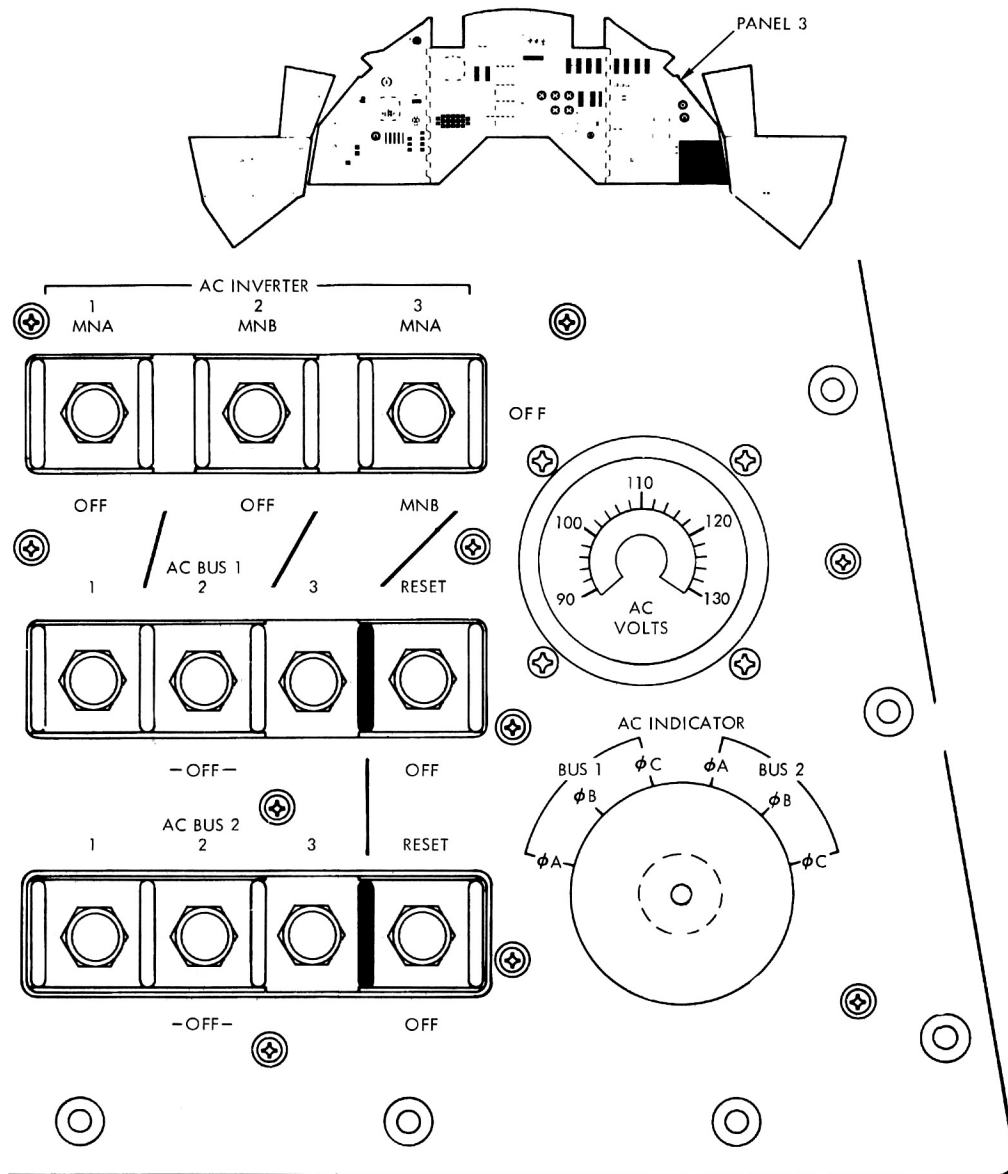
Sheet 33 of 70



SM-2A-1868D

Figure S-9. MDC Check Data Sheet, Panel 3 (Sheet 6 of 7)

Date _____ Time _____ Signature _____



SM-2A-1869

Figure S-9. MDC Check Data Sheet, Panel 3 (Sheet 7 of 7)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 35 of 70

SM-2A-18938

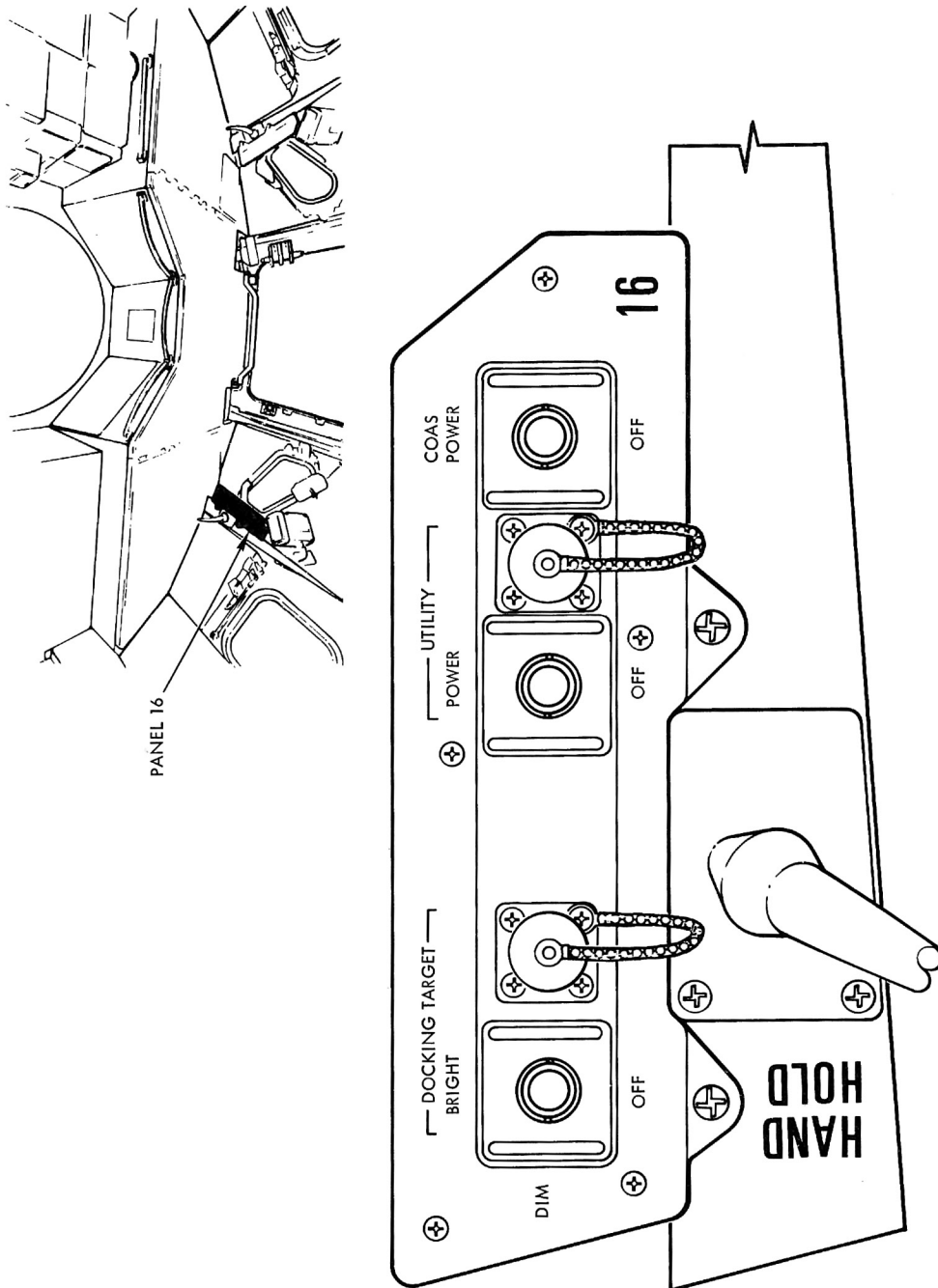
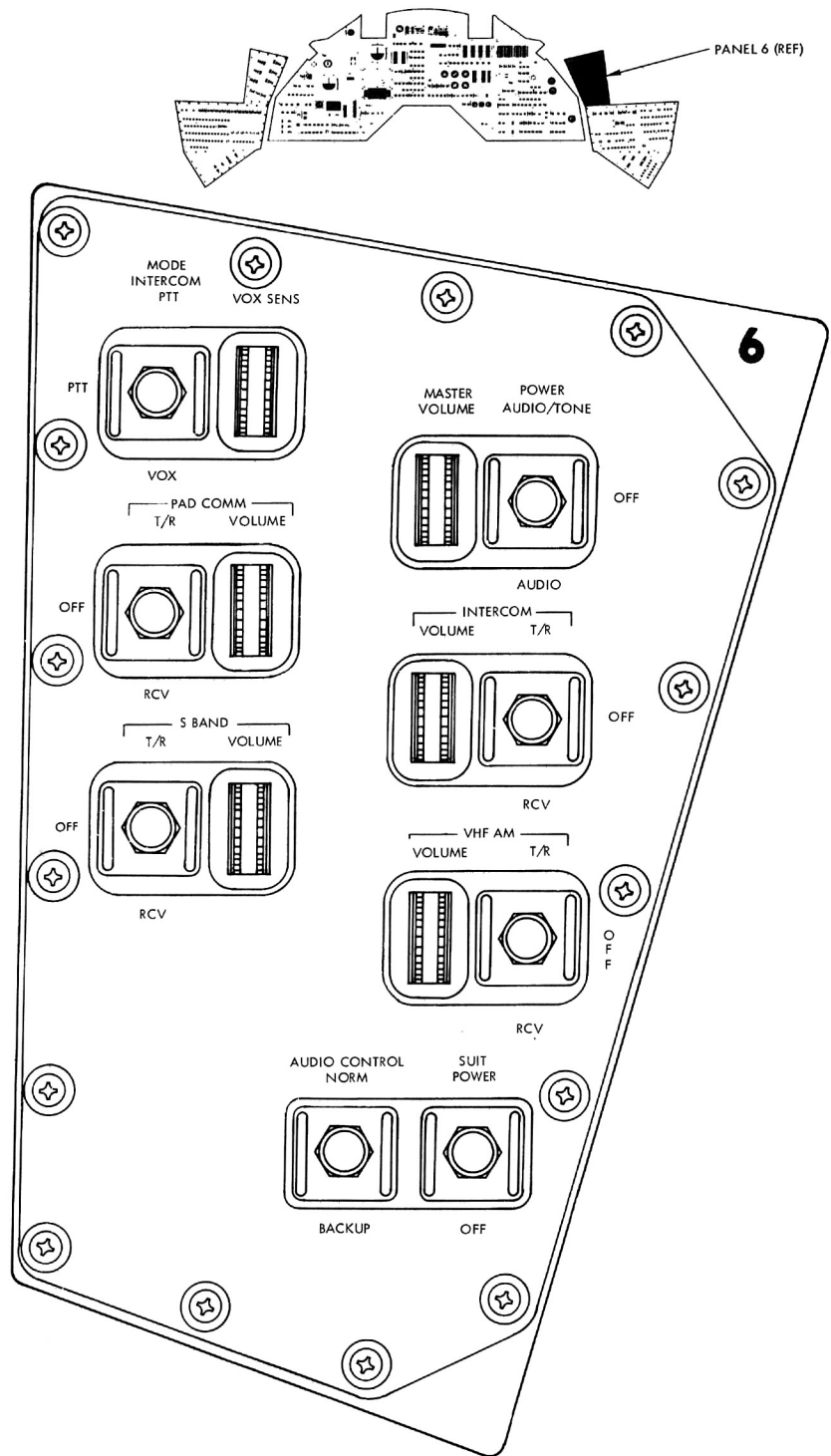


Figure S-10. MDC Check Data Sheet, Panel 16

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS



SM-2A-18488

Figure S-11. MDC Check Data Sheet, Panel 6

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 37 of 70

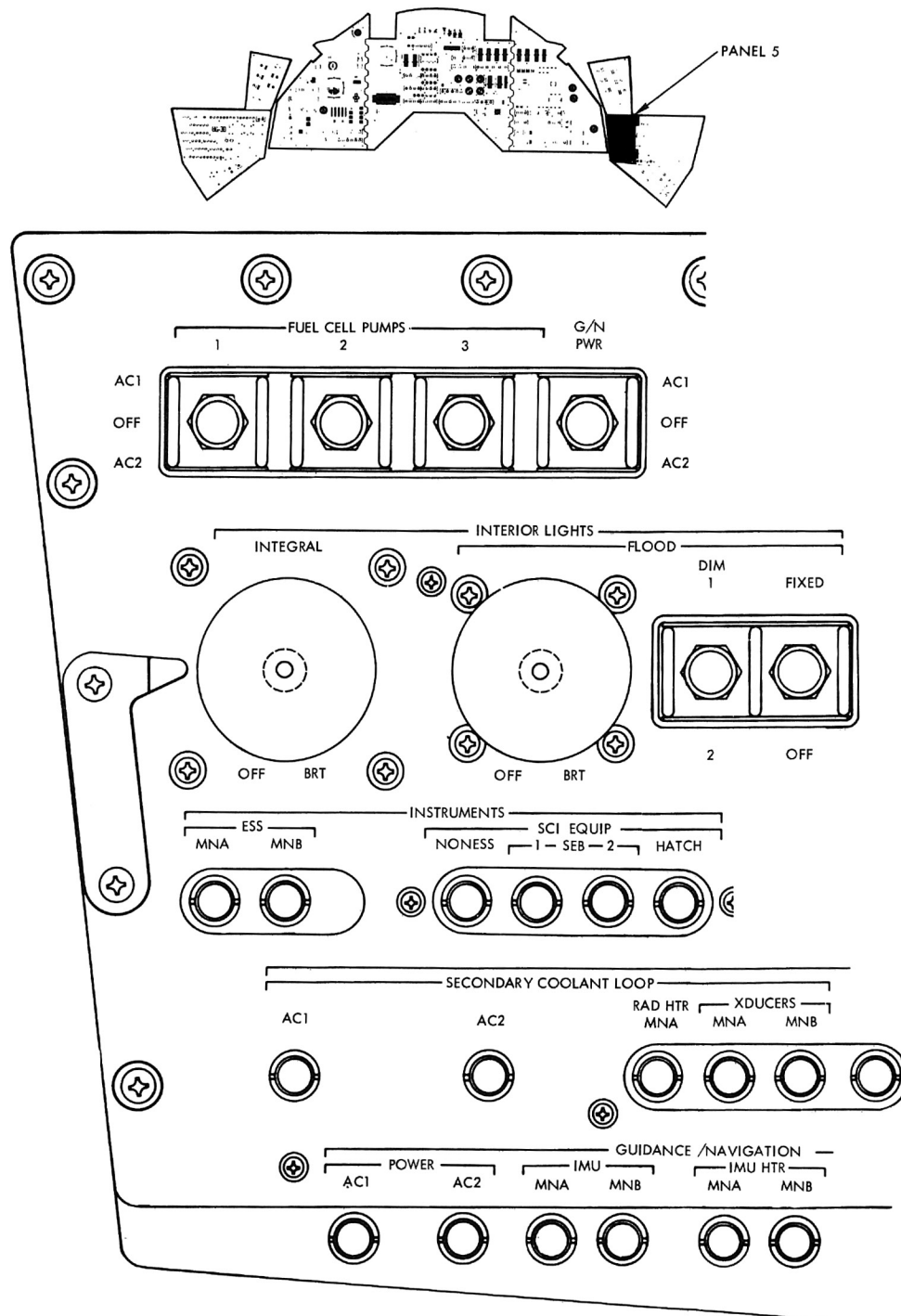


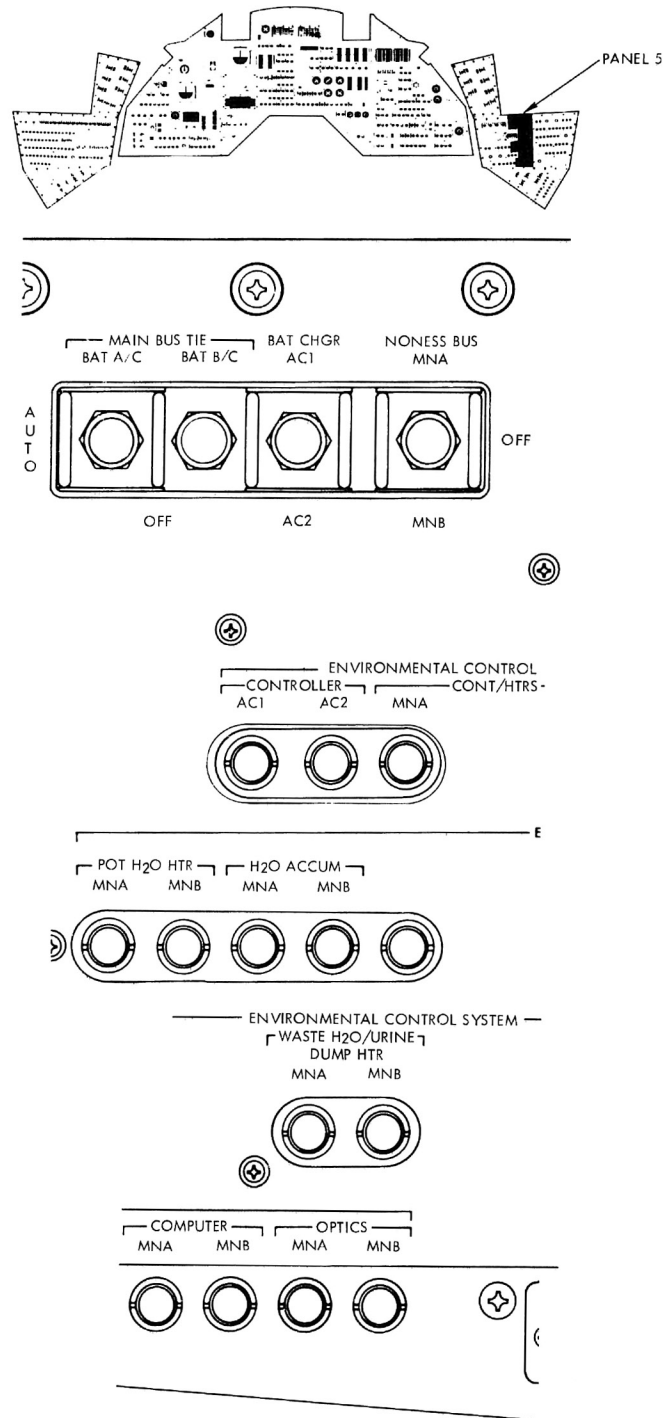
Figure S-12. MDC Check Data Sheet, Panel 5 (Sheet 1 of 3)

SM-2A-1870A

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 38 of 70



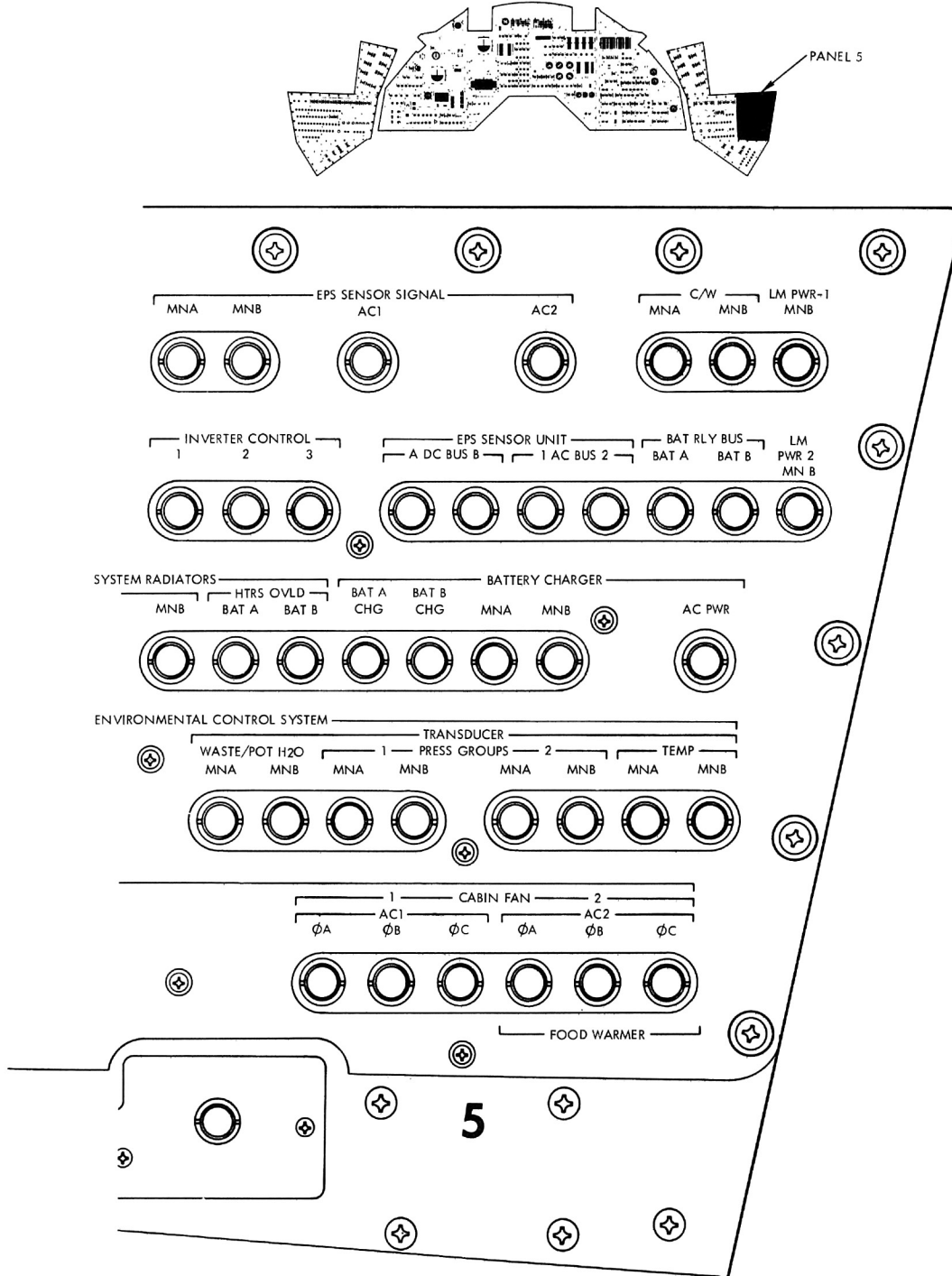
SM-2A-1897A

Figure S-12. MDC Check Data Sheet, Panel 5 (Sheet 2 of 3)

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 39 of 70



SM-2A-1898C

Figure S-12. MDC Check Data Sheet, Panel 5 (Sheet 3 of 3)

Date _____ Time _____ Signature _____

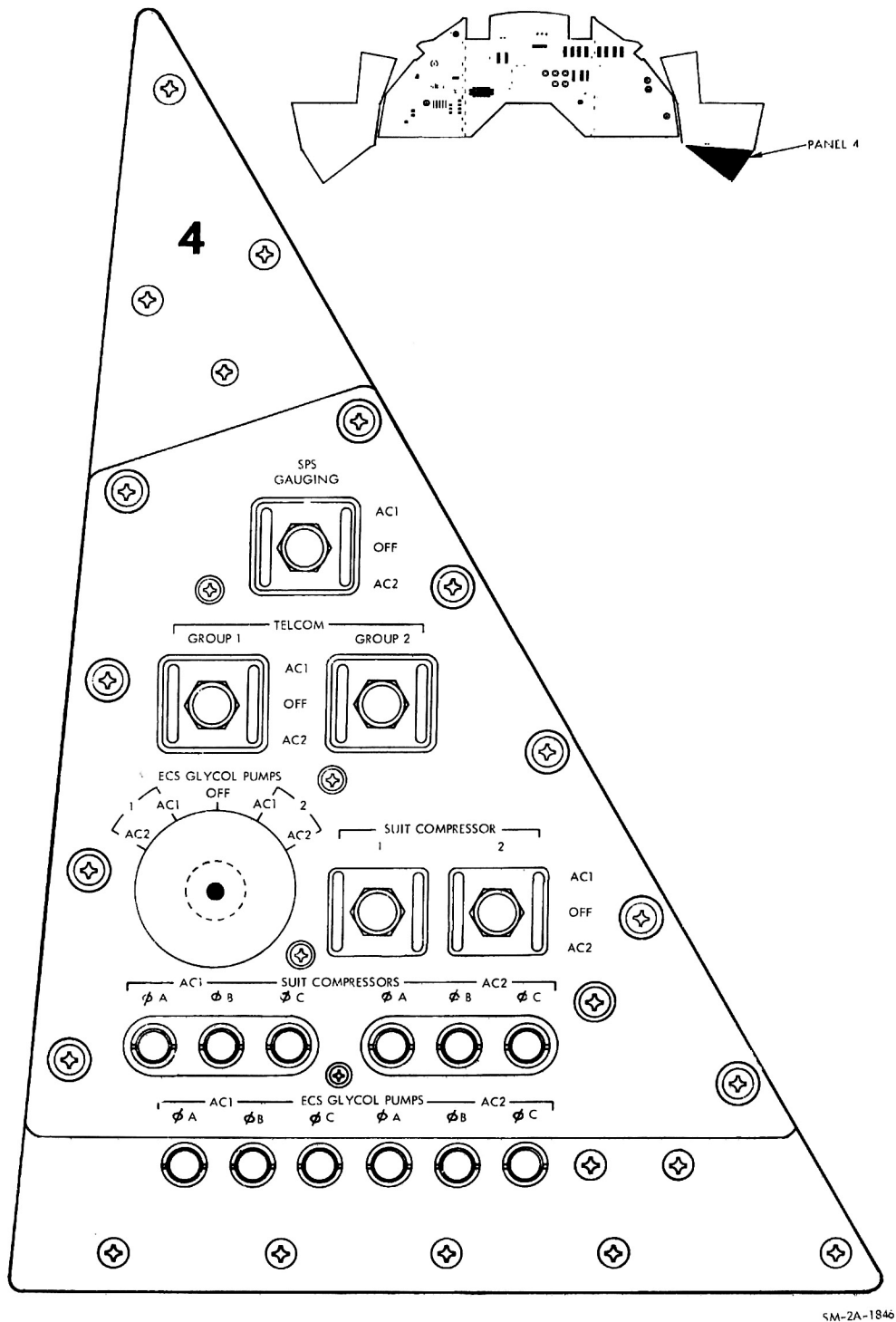
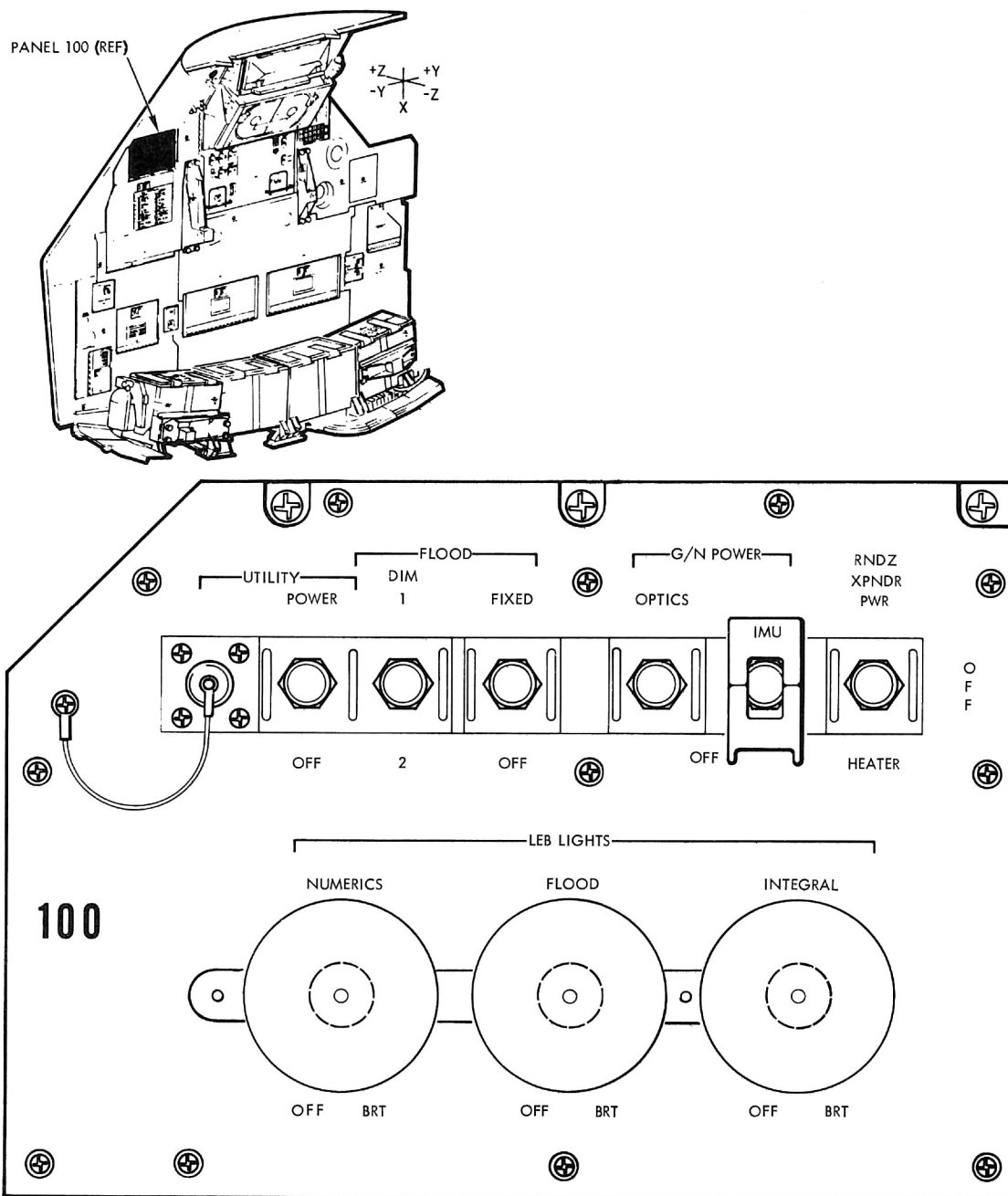


Figure S-13. MDC Check Data Sheet, Panel 4

Date _____ Time _____ Signature _____



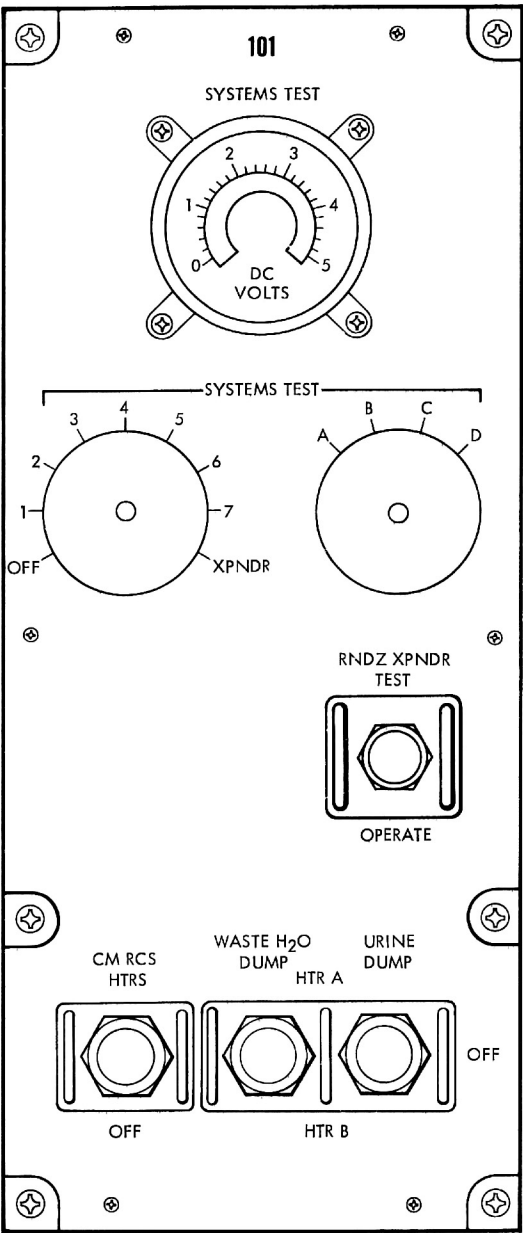
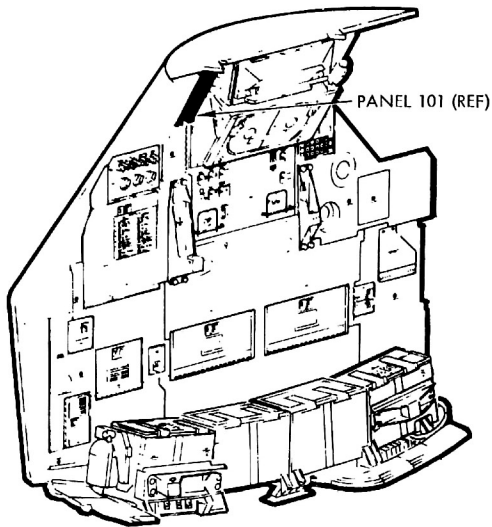
SM-2A-1847E [REDACTED]

Figure S-14. LEB Check Data Sheet, Panel 100

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 42 of 70



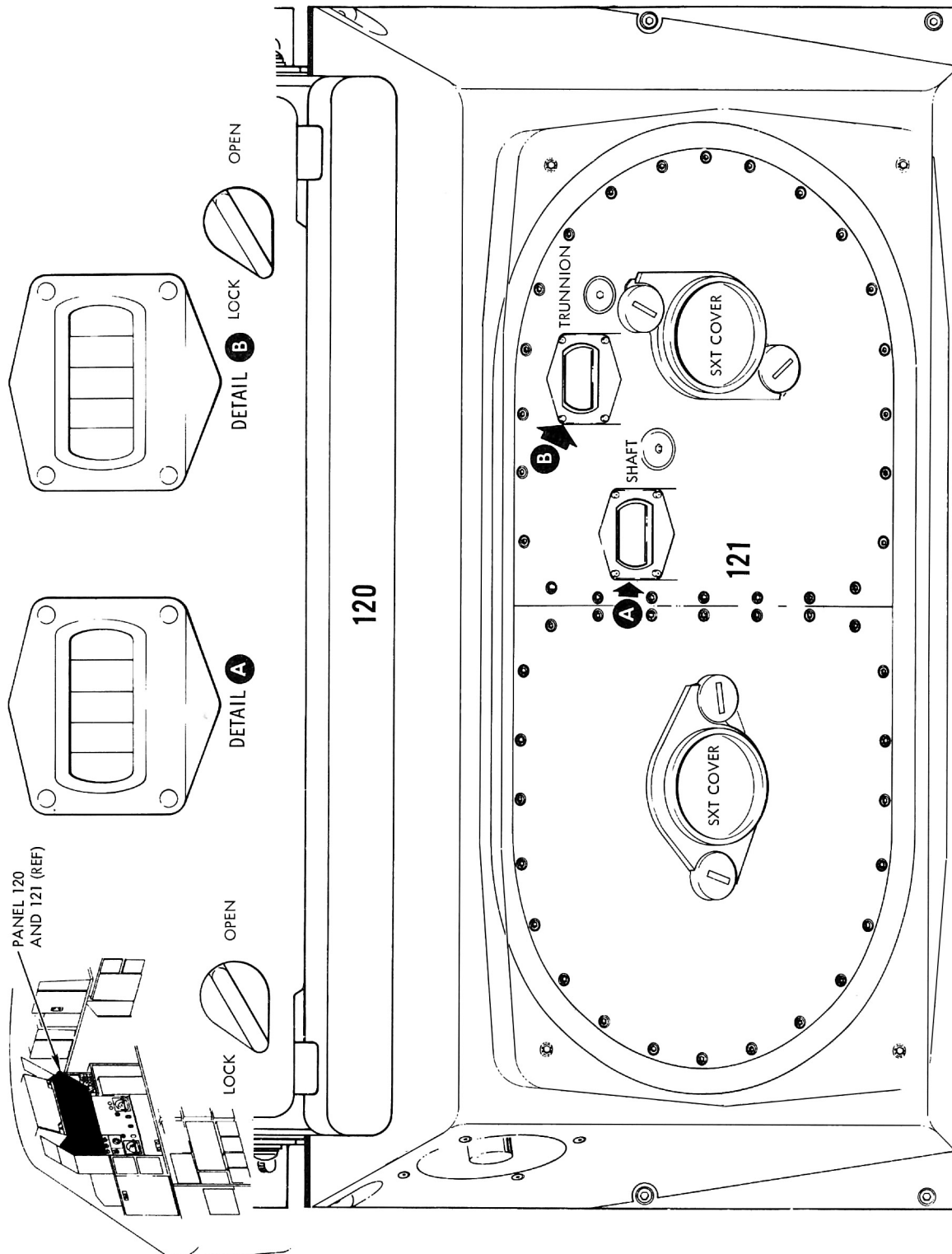
SM-2A-1843B

Figure S-15. LEB Check Data Sheet, Panel 101

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

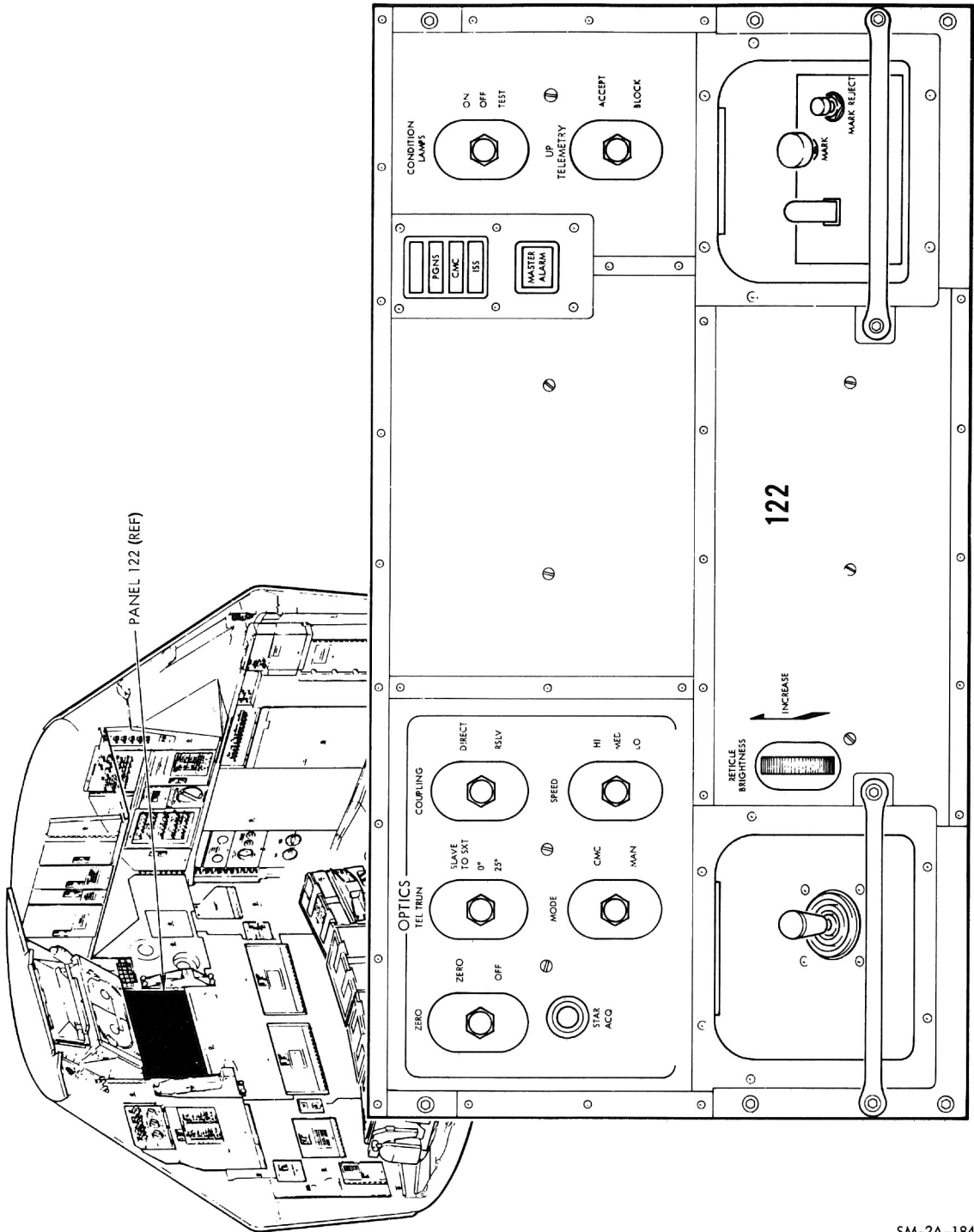
Sheet 43 of 70



SM-2A-1842A

Figure S-16. LEB Check Data Sheet, Panel 120 and 121

Date _____ Time _____ Signature _____

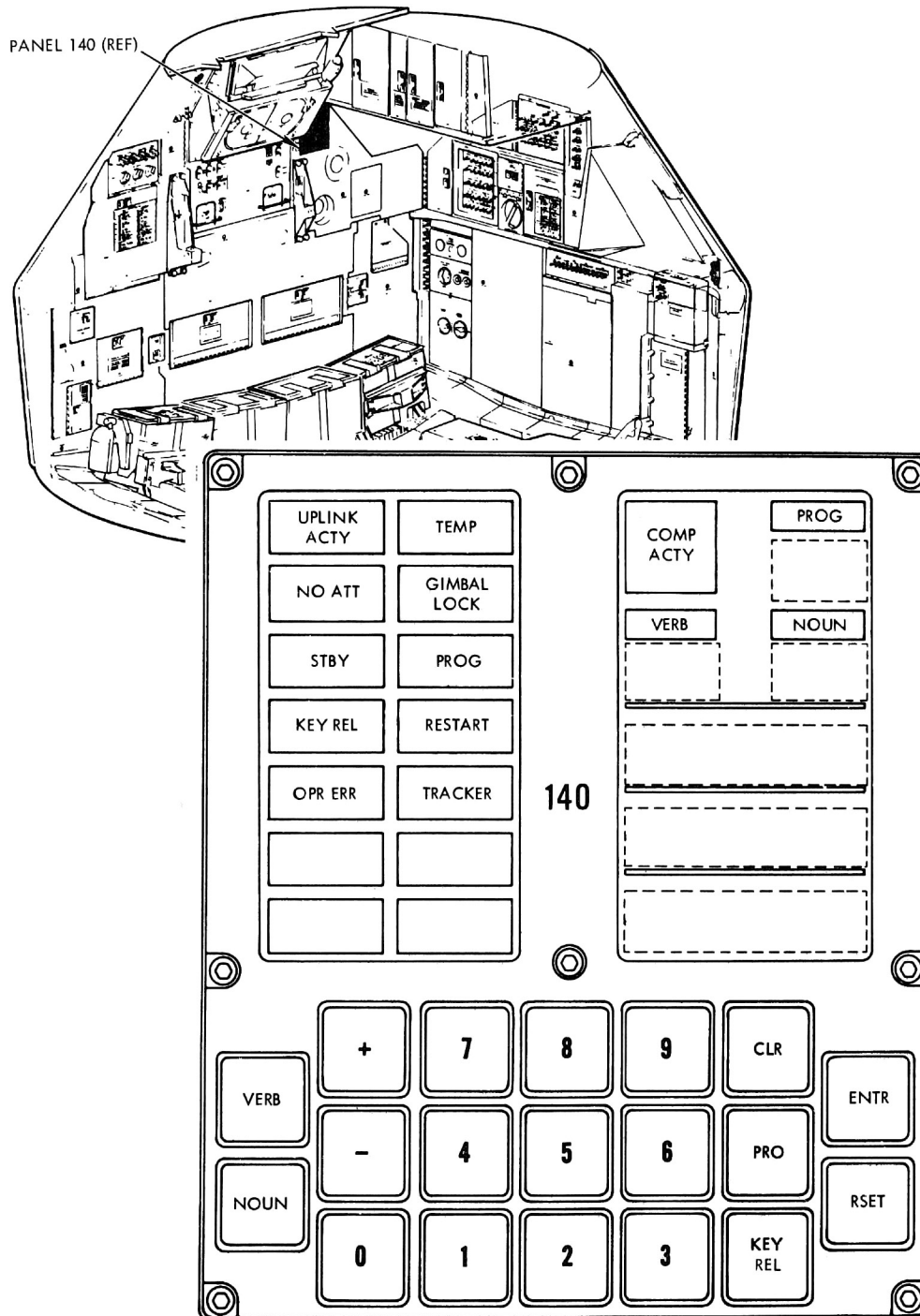


SM-2A-1841B

Figure S-17. LEB Check Data Sheet, Panel 122

PANEL READINGS AND SWITCH POSITIONS

Sheet 45 of 70



SM-2A-1676E

Figure S-18. LEB Check Data Sheet, Panel 140

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 46 of 70

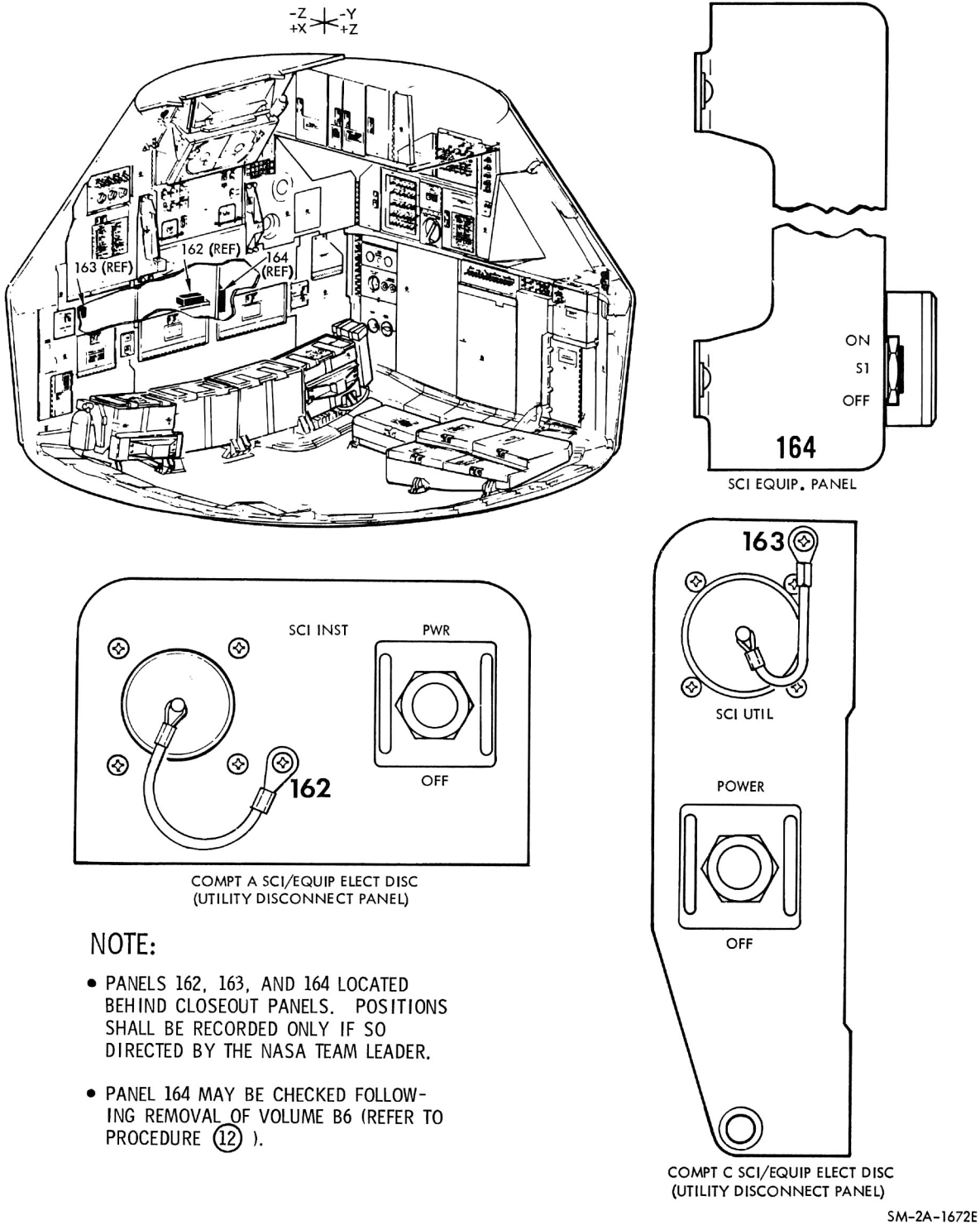


Figure S-19. LEB Check Data Sheet, Panel 162, 163 and 164

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 47 of 70

Figure S-20 (Deleted)

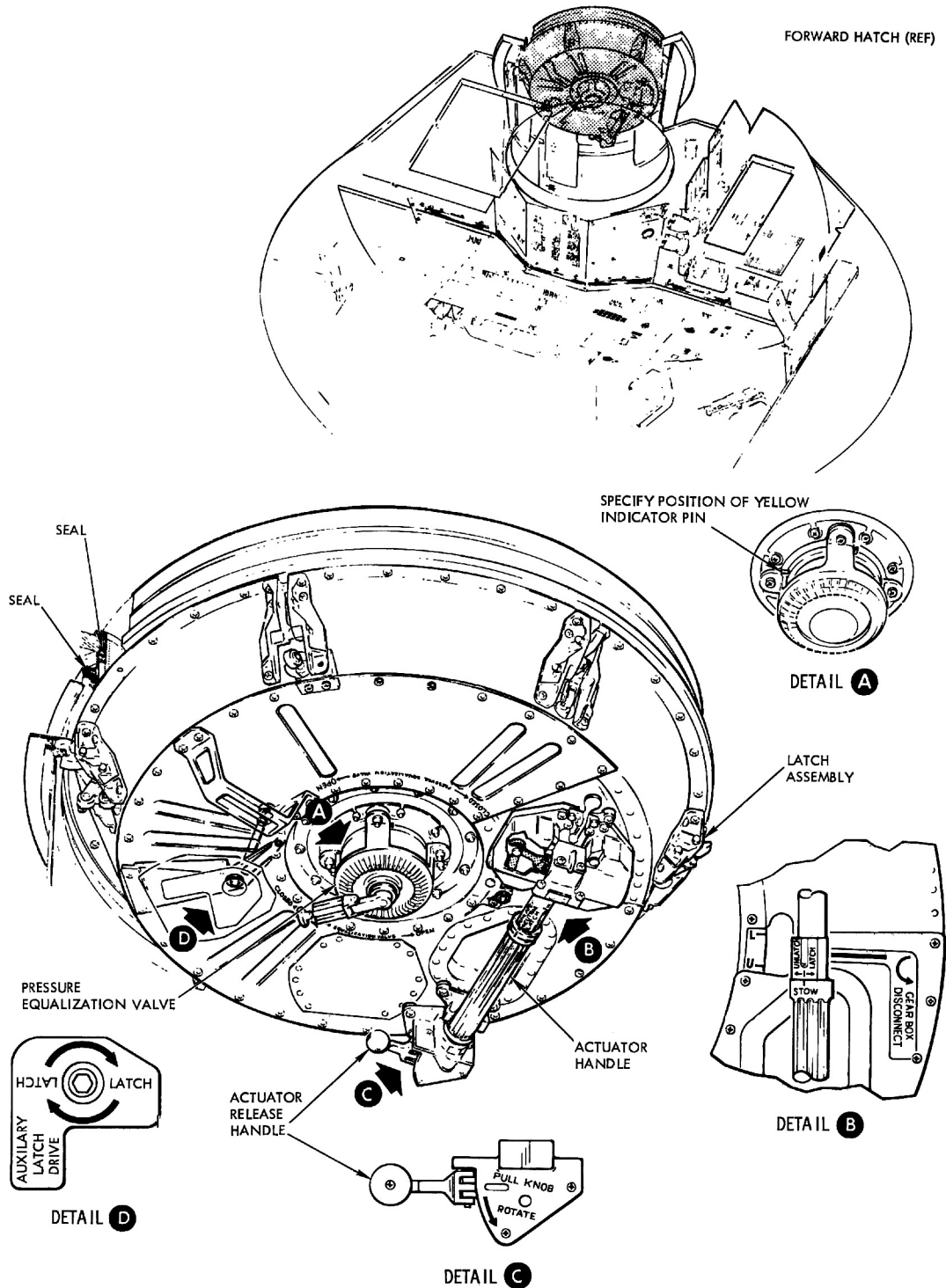
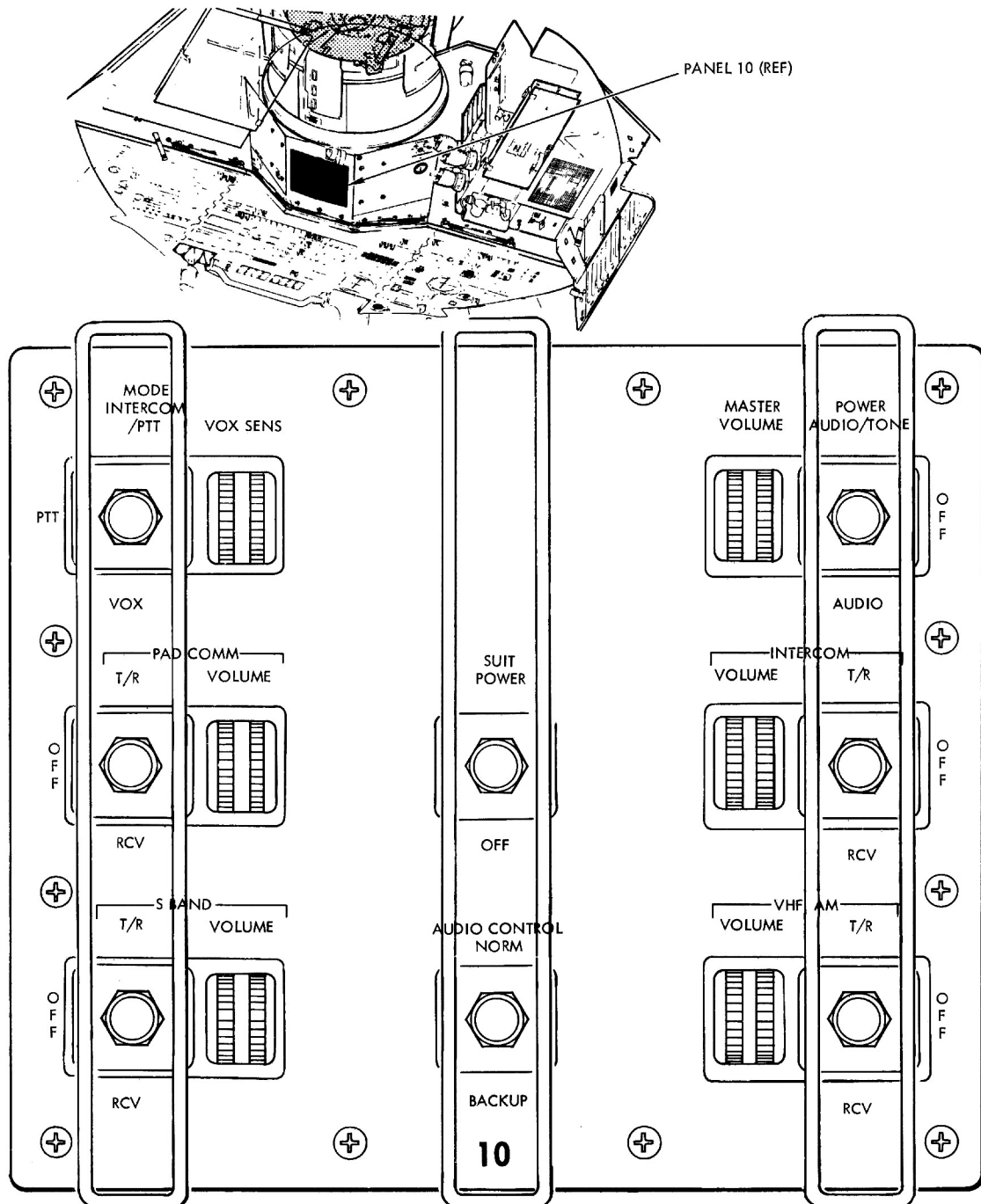


Figure S-21. FEB Check Data Sheet, Forward Hatch

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 49 of 70



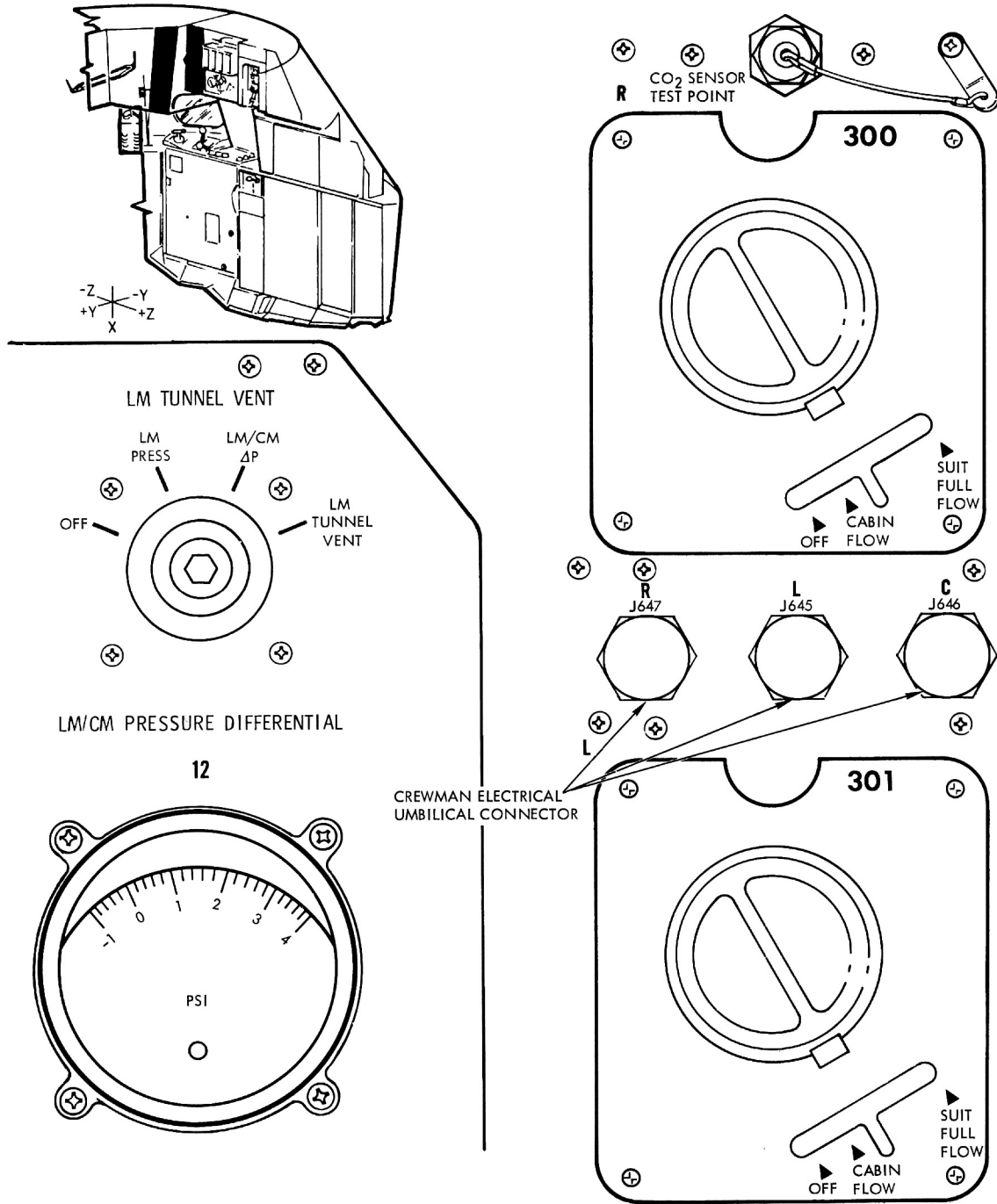
SM-2A-1840B

Figure S-22. FEB Check Data Sheet, Panel 10

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 50 of 70



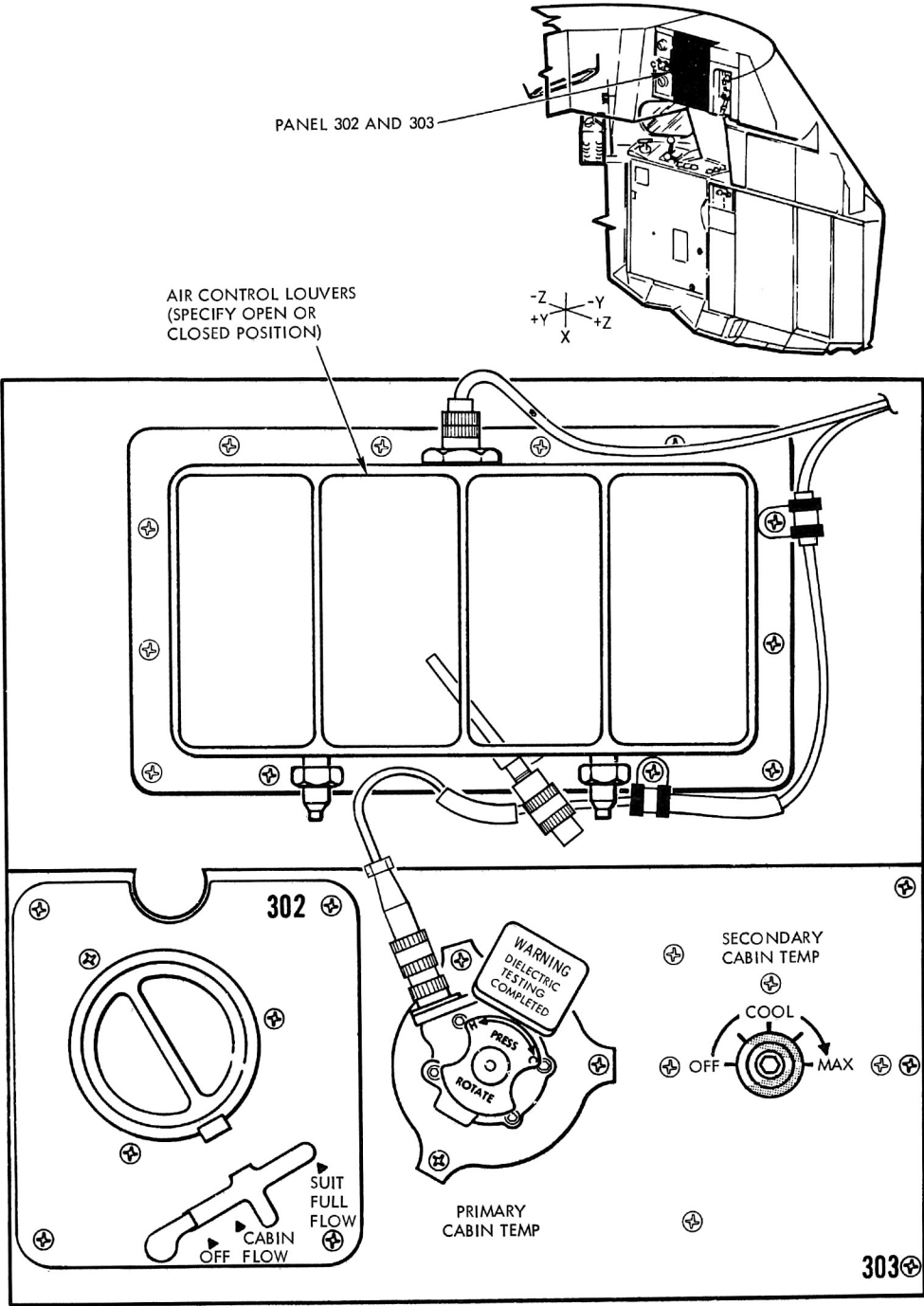
SM-2A-1839 A

Figure S-23. LHFEB Check Data Sheet, Panel 300, 301, and 12

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 51 of 70



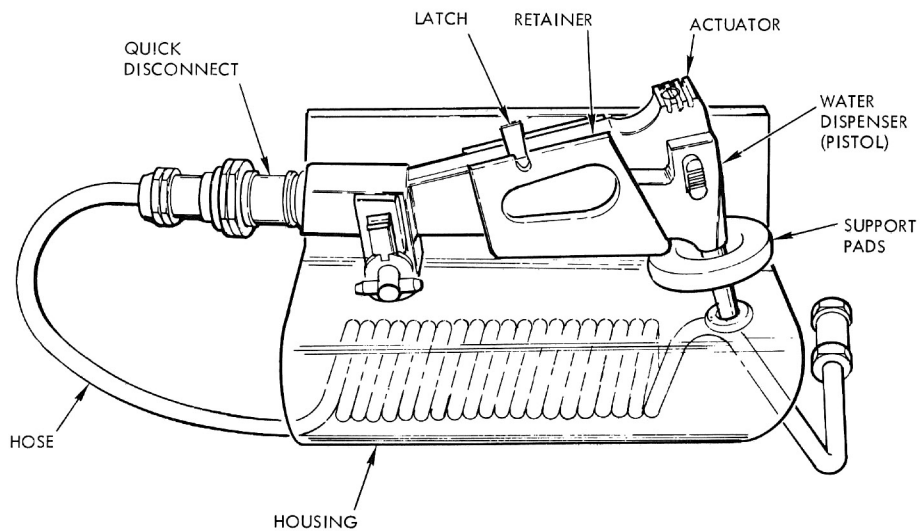
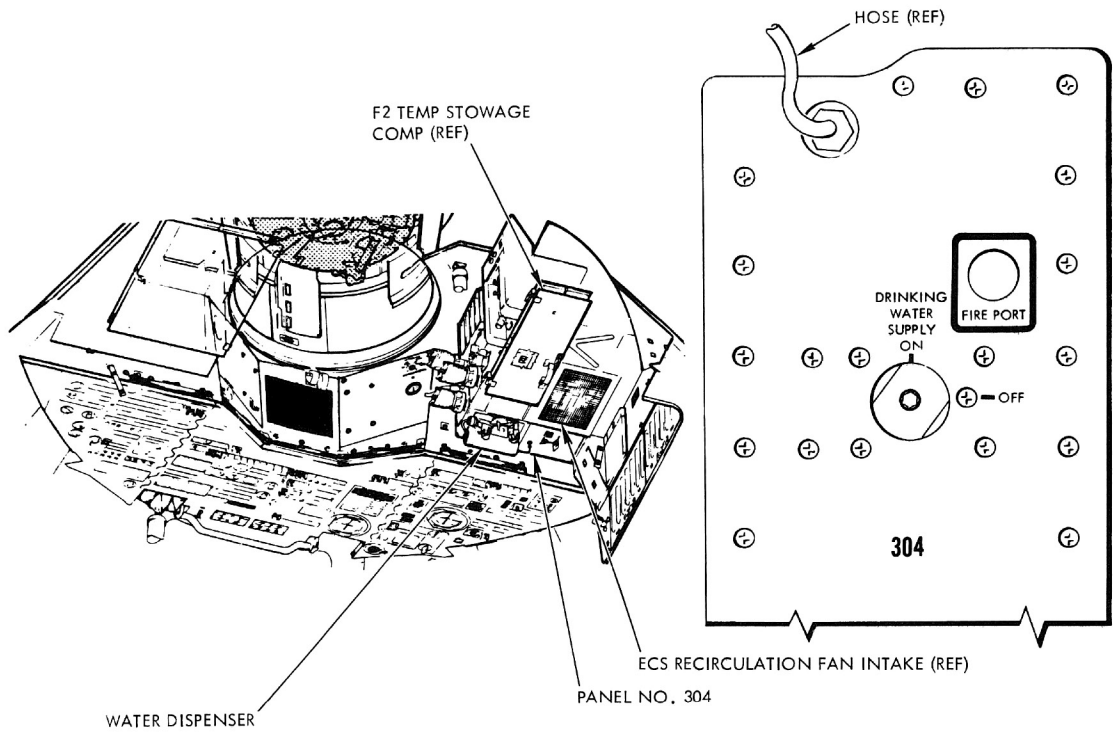
SM-2A-1838 A

Figure S-24. LHFEB Check Data Sheet, Panel 302 and 303

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

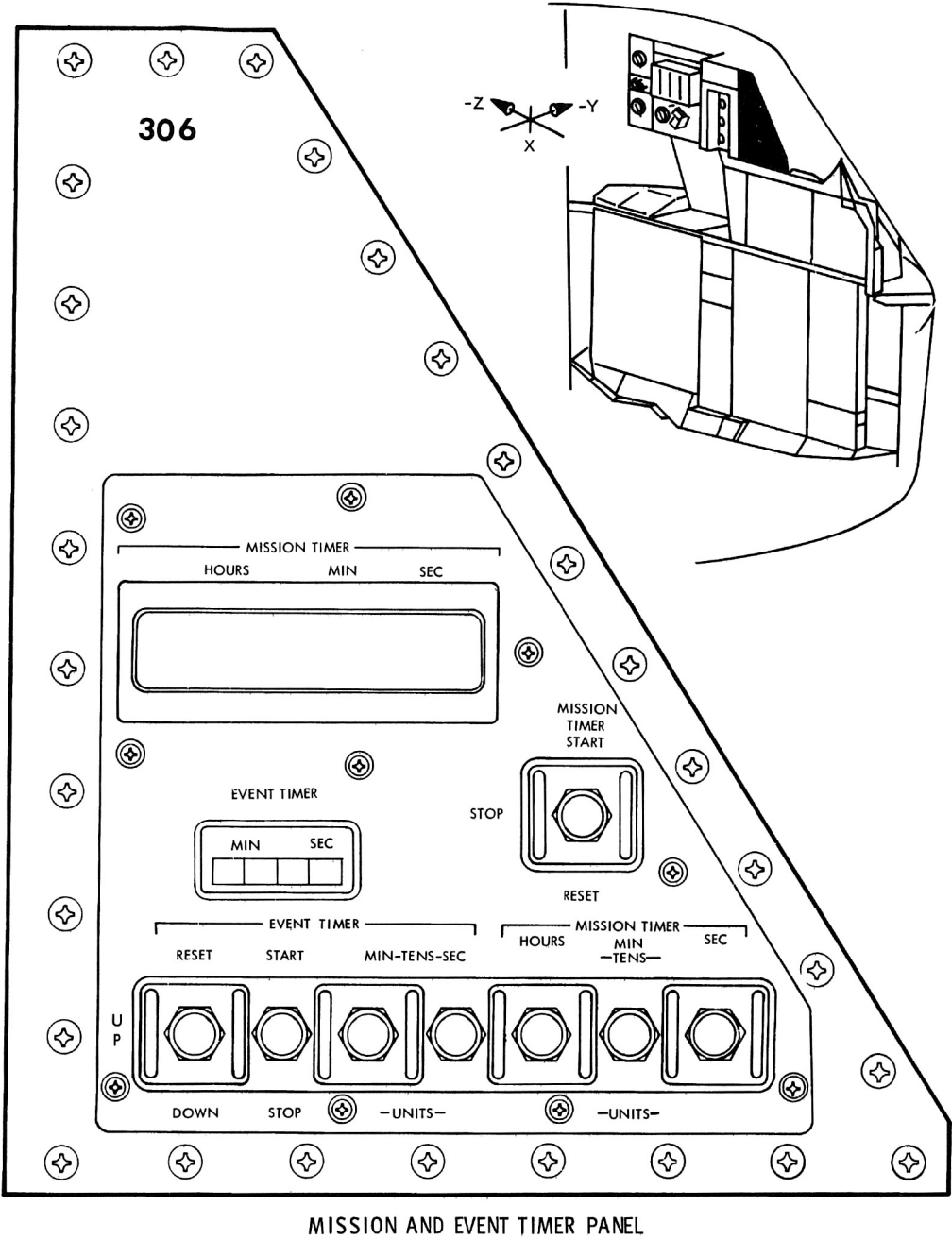
Sheet 52 of 70



SM-2A-1837B

Figure S-25. LHFEB Check Data Sheet, Panel 304 and Water Dispenser Counter

Date _____ Time _____ Signature _____

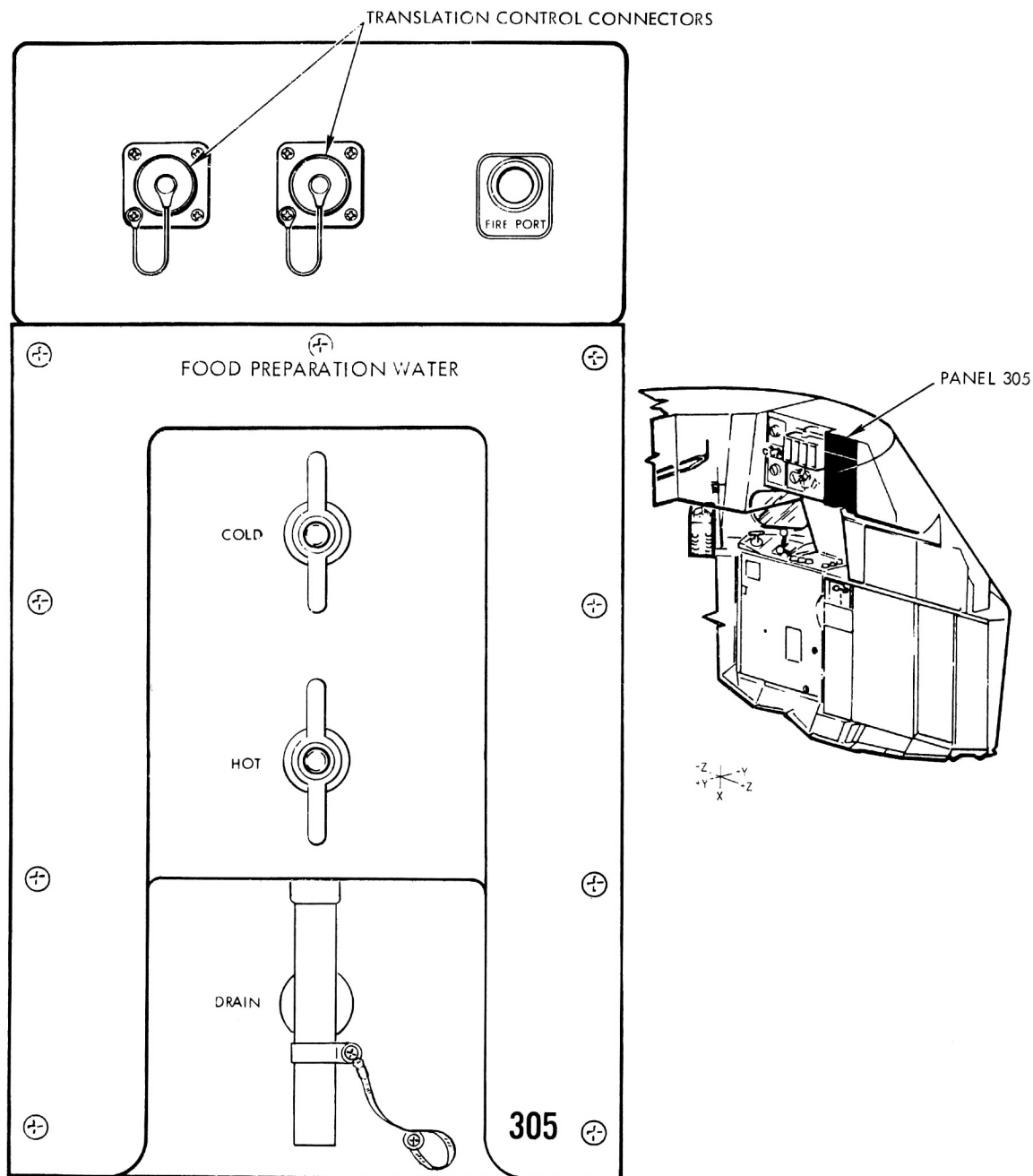


SM-2A-1853A

Figure S-26. LHFEBC Check Data Sheet, Panel 306

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS



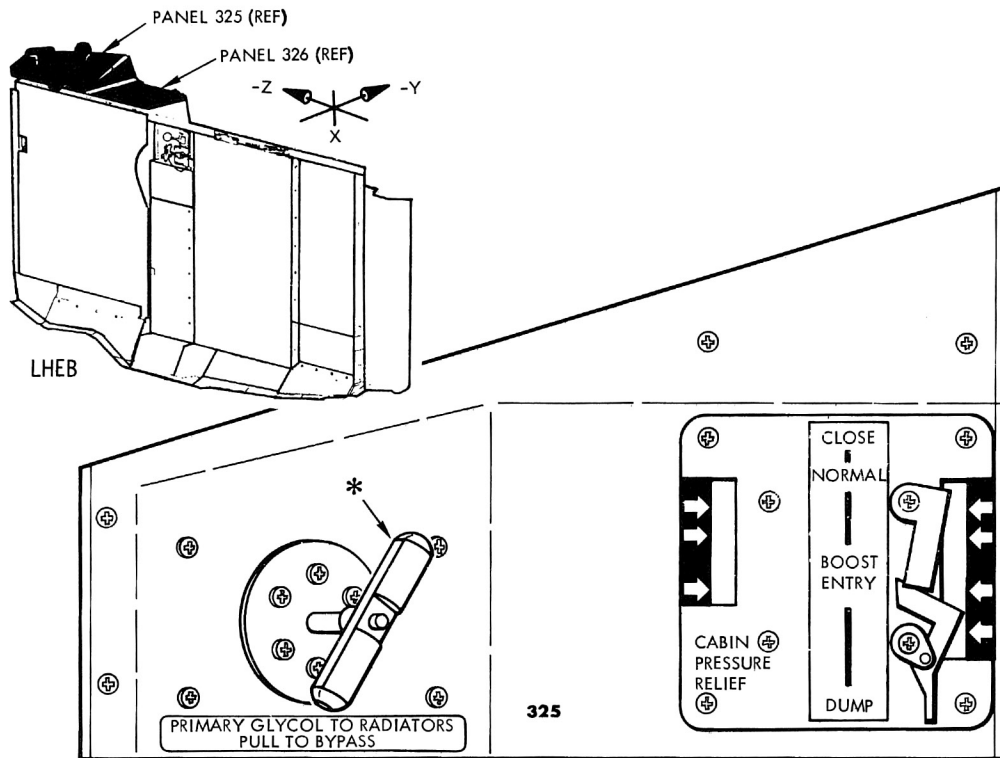
SM-2A-1854

Figure S-27. LHFEB Check Data Sheet, Panel 305

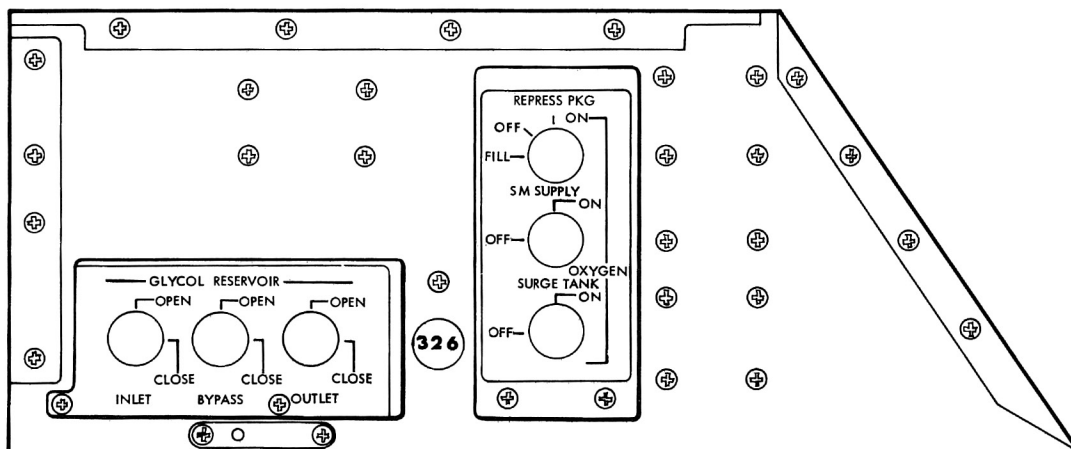
Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 55 of 70



* RECORD POSITION OF PRIMARY GLYCOL TO
RADIATORS HANDLE: _____,



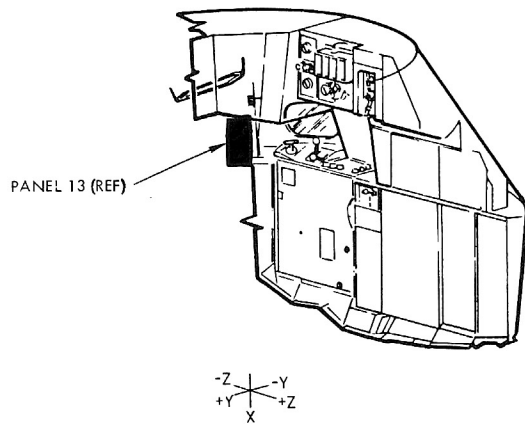
SM-2A-1852F ■

Figure S-28. LHEB Check Data Sheet, Panel 325 and 326

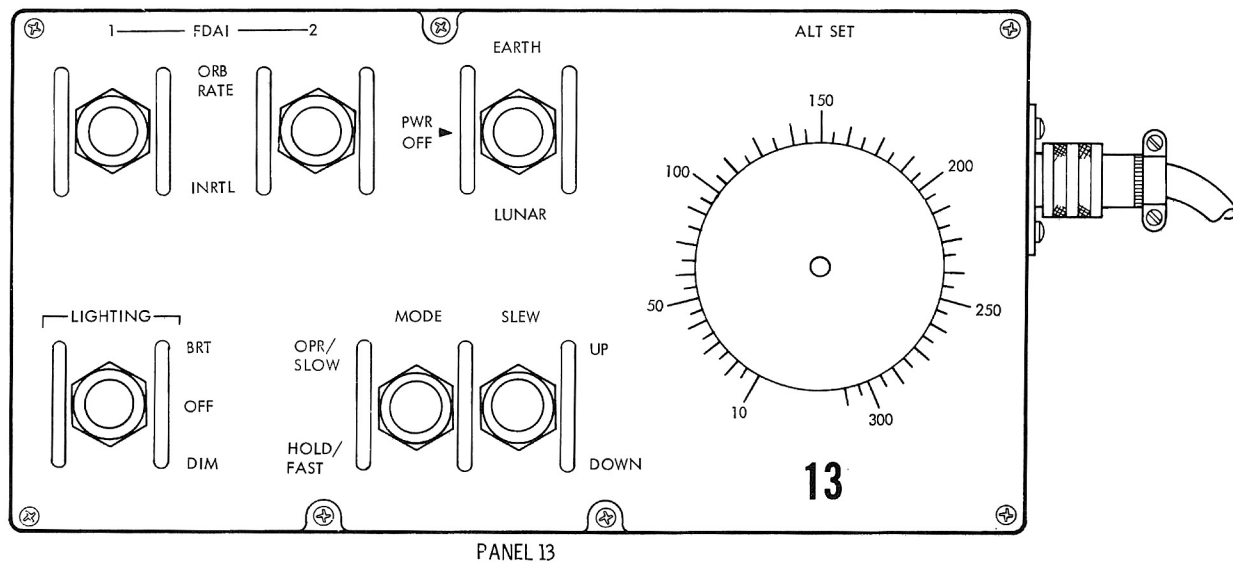
Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 56 of 70



NOTE:
PANEL NO. 13 SHOWN IN
USE POSITION - STOWED
IN VOL U3 DURING
REENTRY AND LANDING



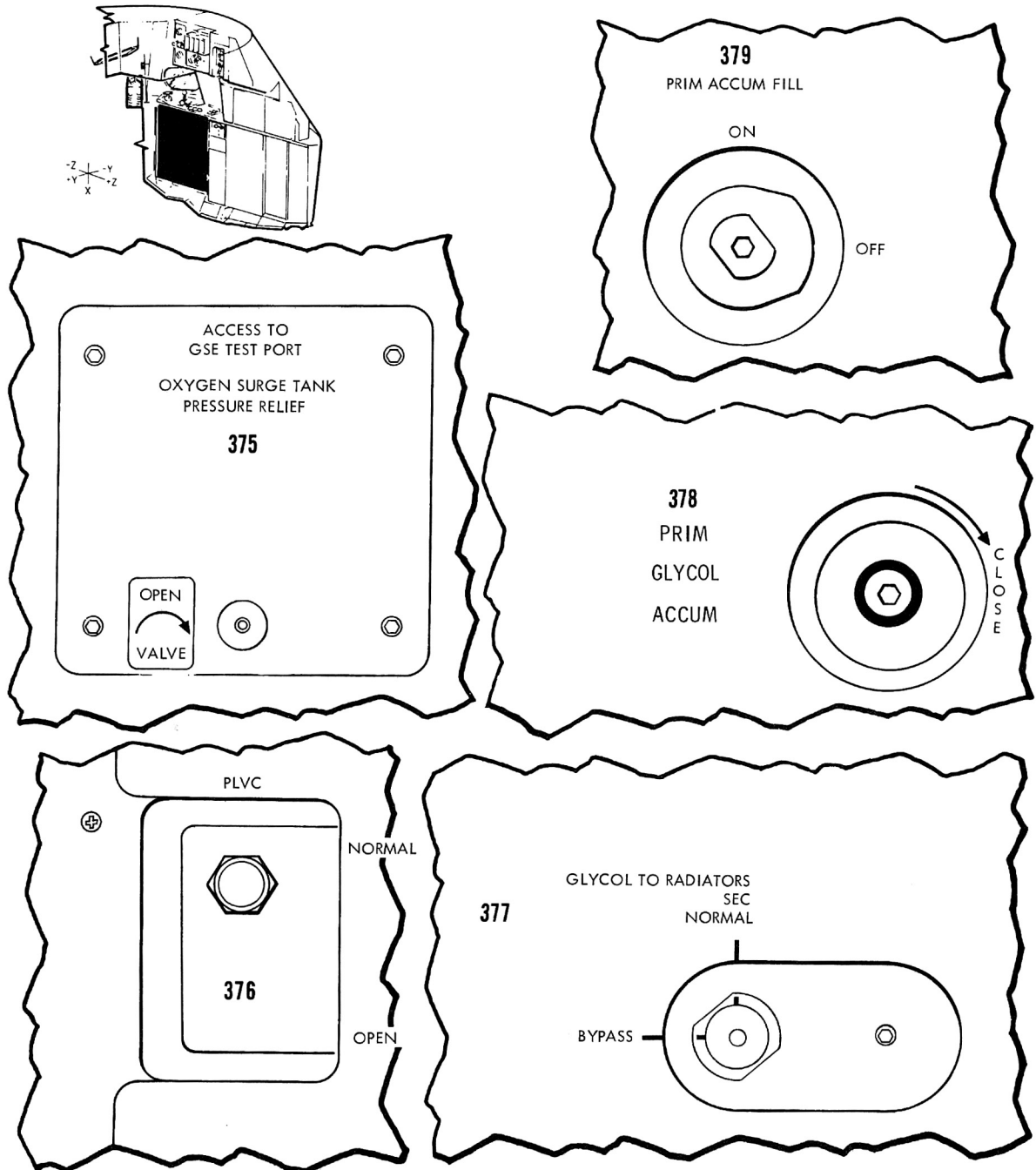
SM-2A-1855D

Figure S-29. LHEB Check Data Sheet, Panel 13

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 57 of 70



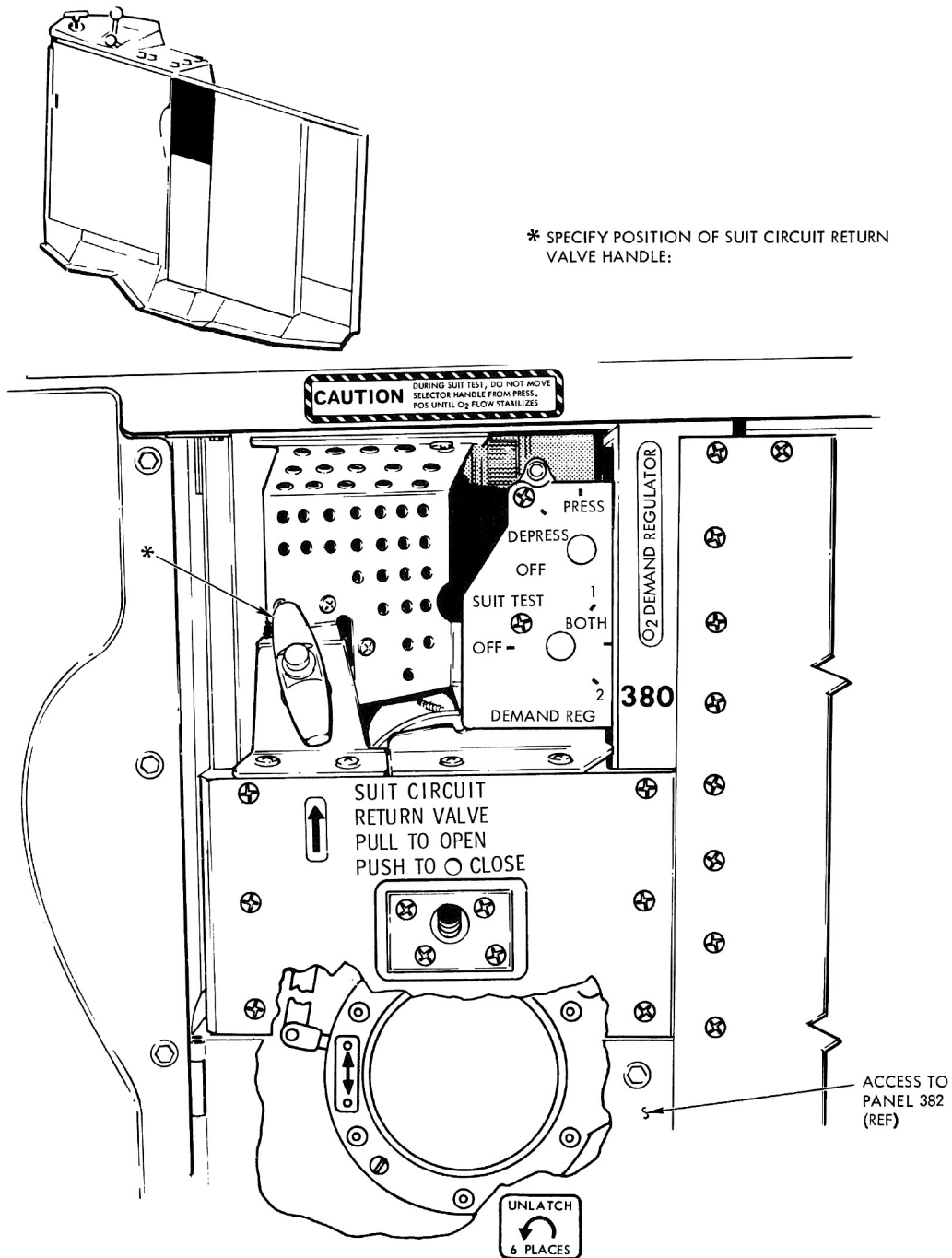
SM-2A-1856

Figure S-30. LHEB Check Data Sheet, Panel 375, 376, 377, 378, and 379

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 58 of 70



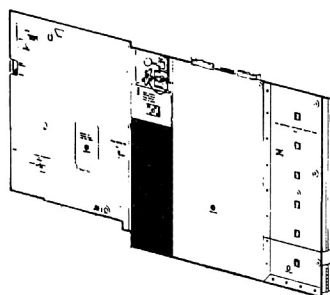
SM-2A-1858B

Figure S-31. LHEB Check Data Sheet, Panel 380

Date _____ Time _____ Signature _____

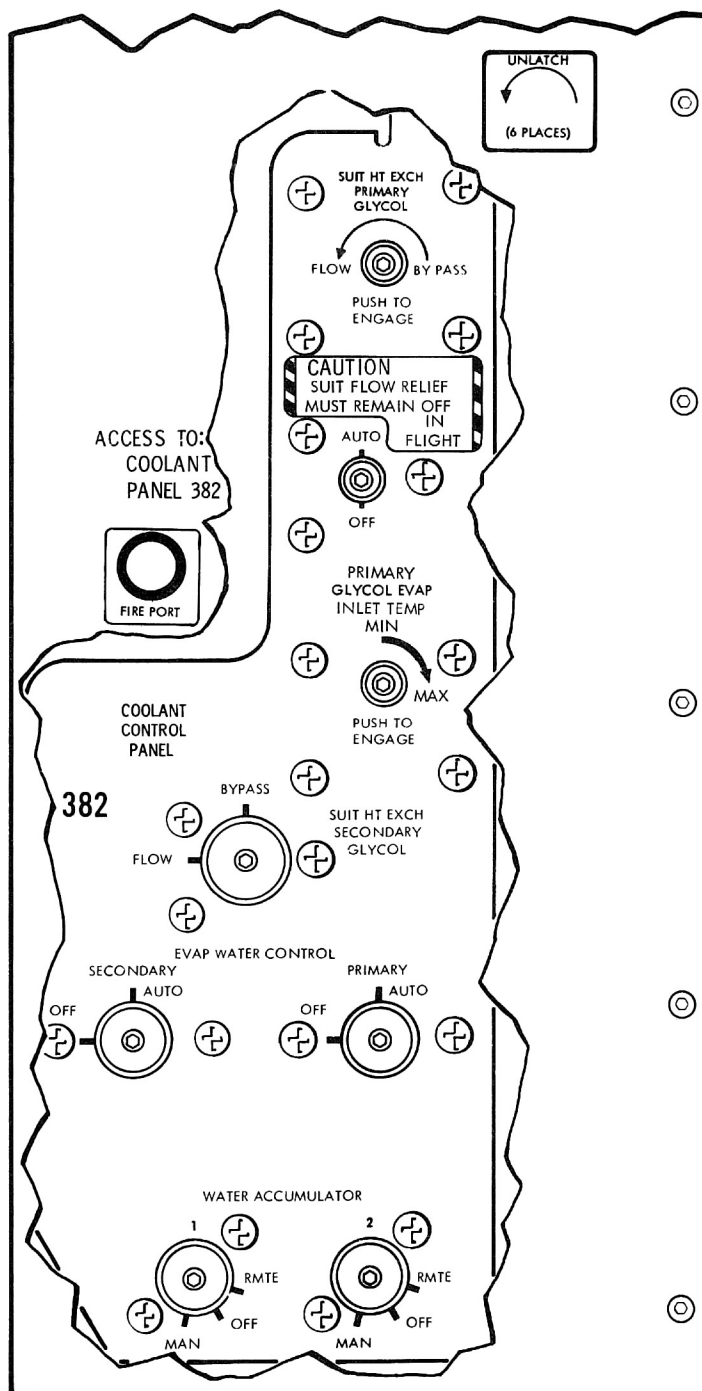
PANEL READINGS AND SWITCH POSITIONS

Sheet 59 of 70



NOTE

- DO NOT UNLOCK Y-Y STRUT TO GAIN ACCESS TO PANEL 382-UNLESS SO DIRECTED BY HOUSTON-RCC
- PANEL NO. 382 LOCATED BEHIND A HINGED PANEL; TO OPEN, RELEASE THE SIX 5/32 INCH FASTENERS USING AN ALLEN HEAD ADAPTER OR THE "E" TOOL (ADAPTER HANDLE)



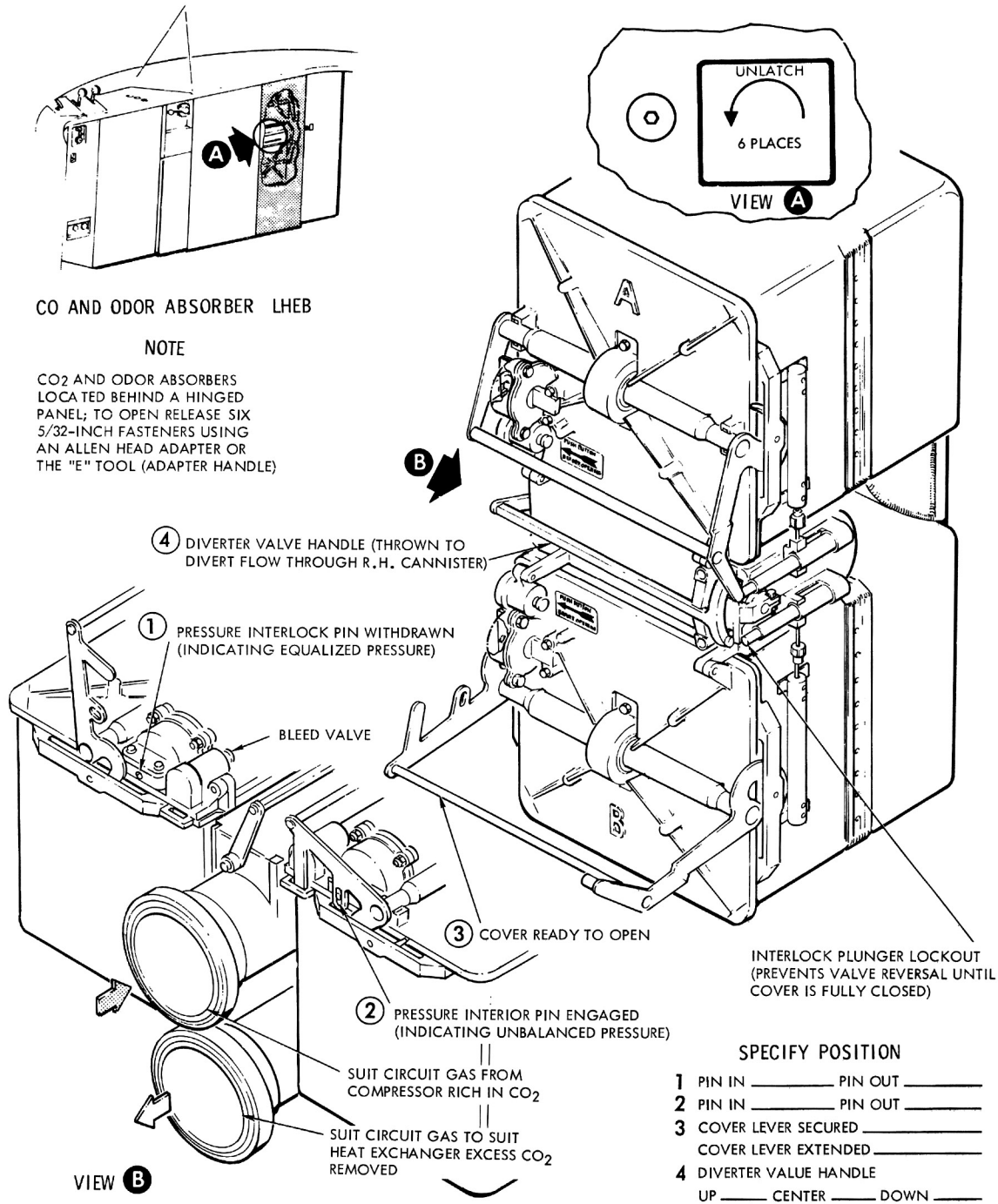
SM-2A-1835E

Figure S-32. LHEB Check Data Sheet, Panel 382

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 60 of 70



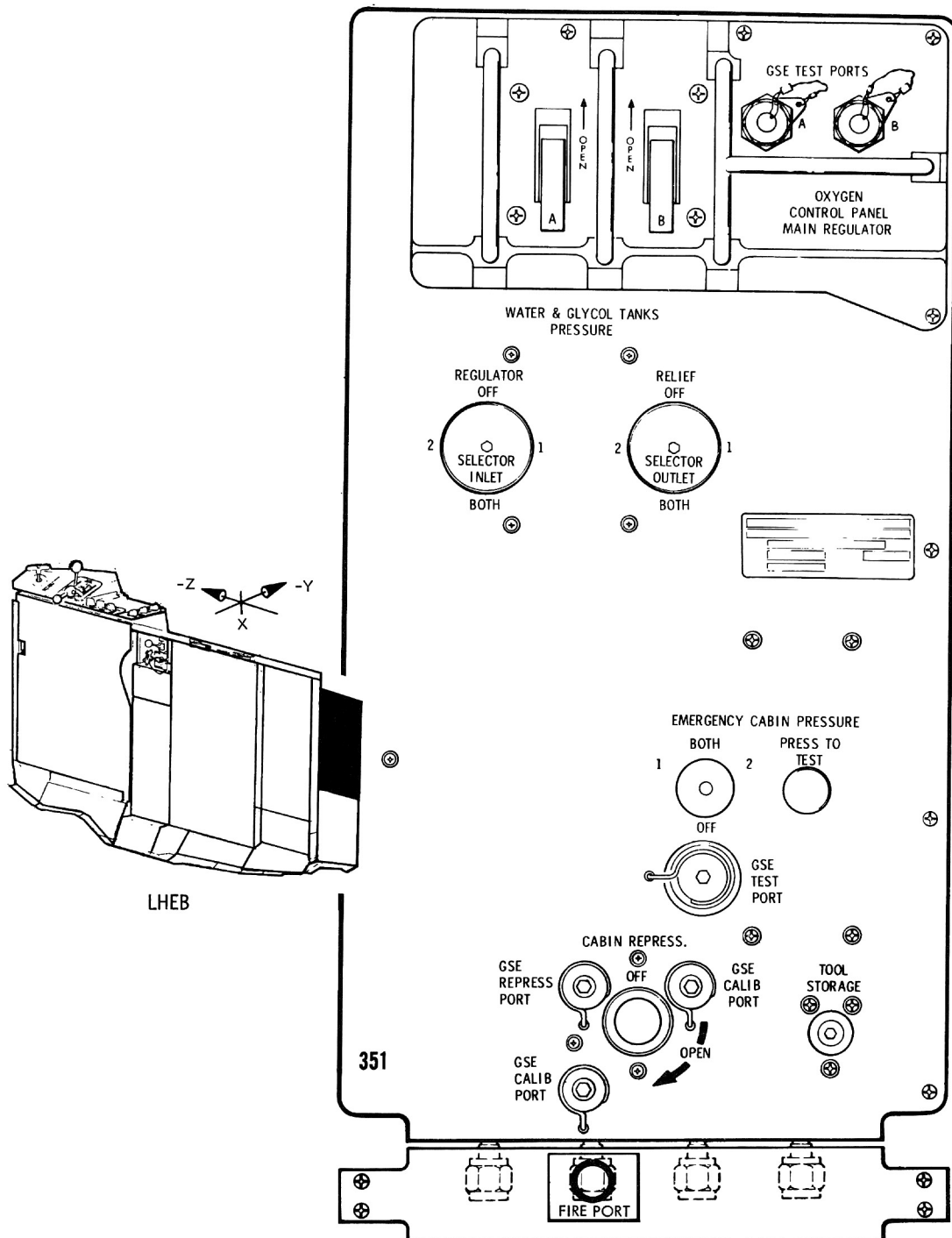
SM-2A-1836A

Figure S-33. LHEB Check Data Sheet, Panel 350

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 61 of 70



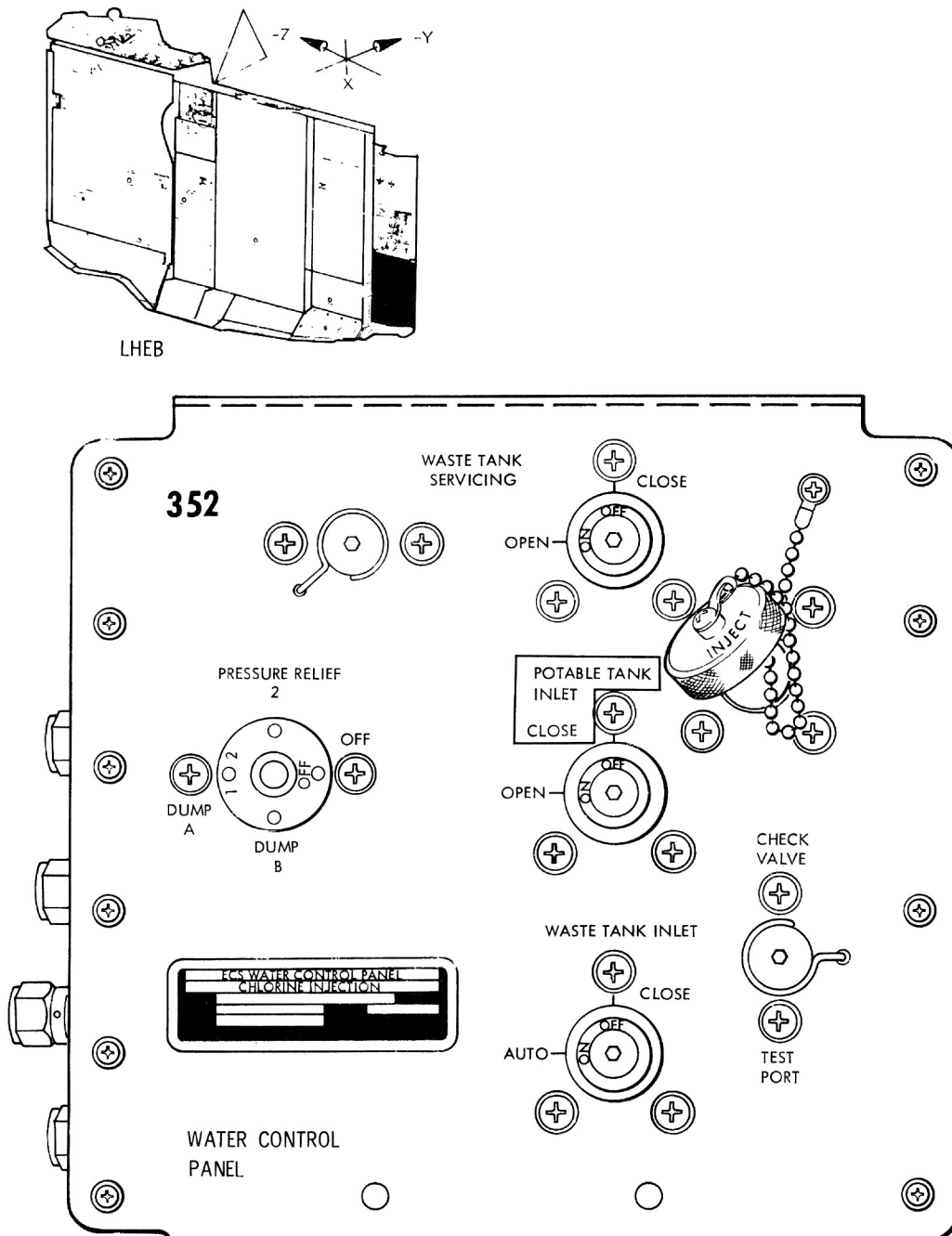
SM-2A-1833C

Figure S-34. LHEB Check Data Sheet, Panel 351

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 62 of 70



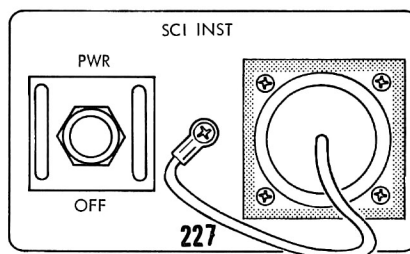
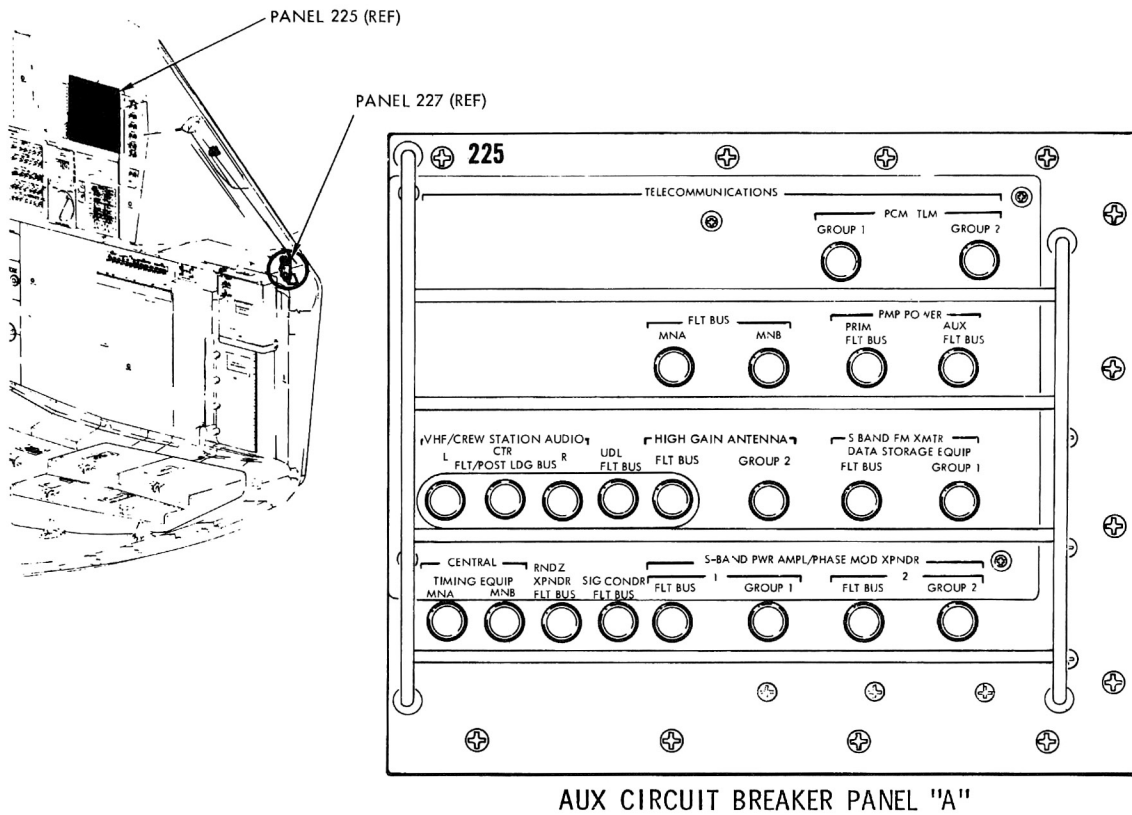
SM-2A-18348

Figure S-35. LHEB Check Data Sheet, Panel 352

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 63 of 70

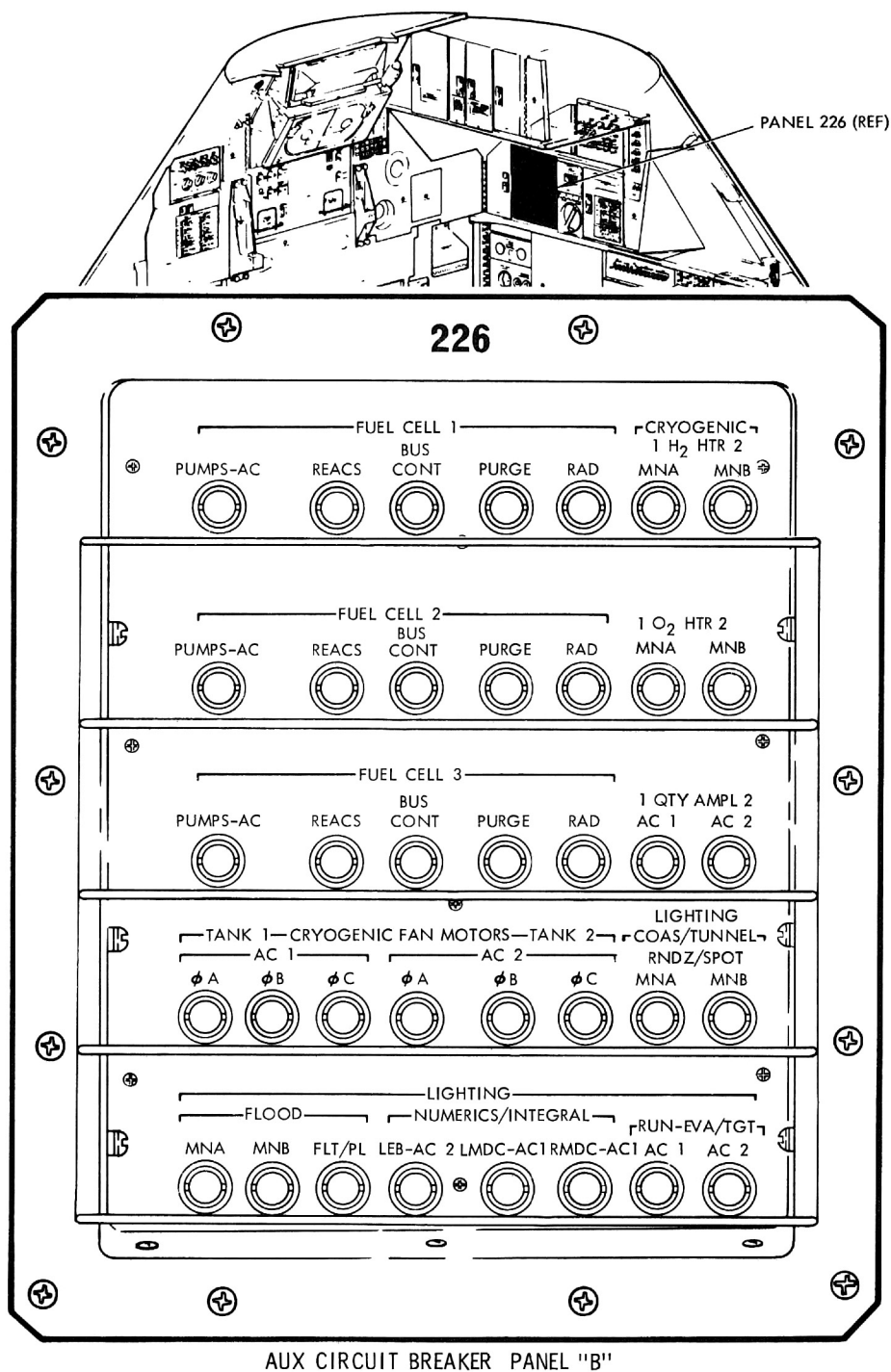


SCIENTIFIC EQUIP ELECT DISCONNECT

SM-2A-1860D

Figure S-36. RHEB Check Data Sheet, Panel 225 and 227

Date _____ Time _____ Signature _____



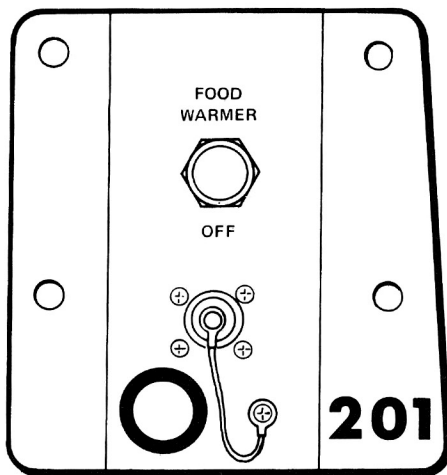
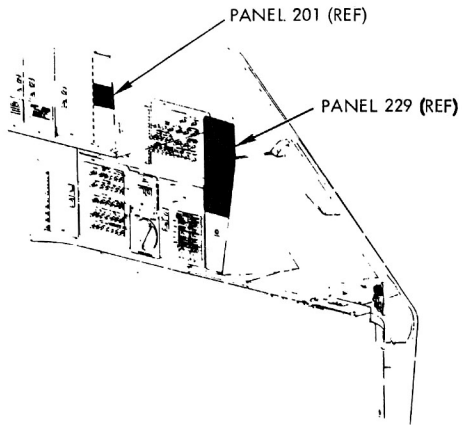
SM-2A-1862B

Figure S-37. RHEB Check Data Sheet, Panel 226

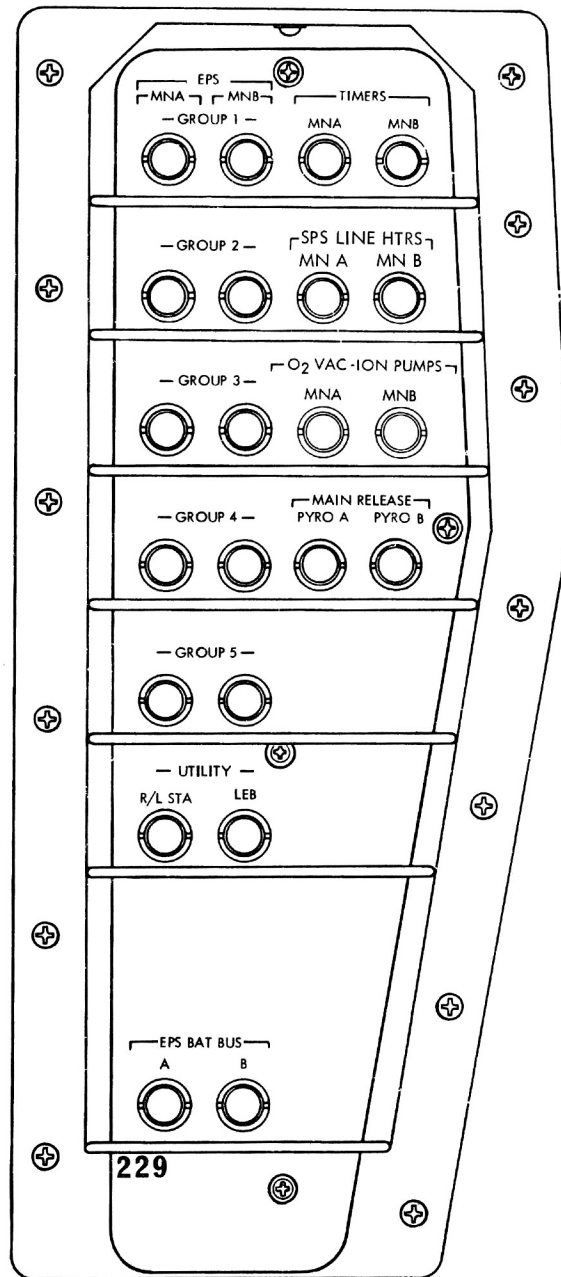
Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 65 of 70



FOOD WARMER PANEL



EPS PANEL

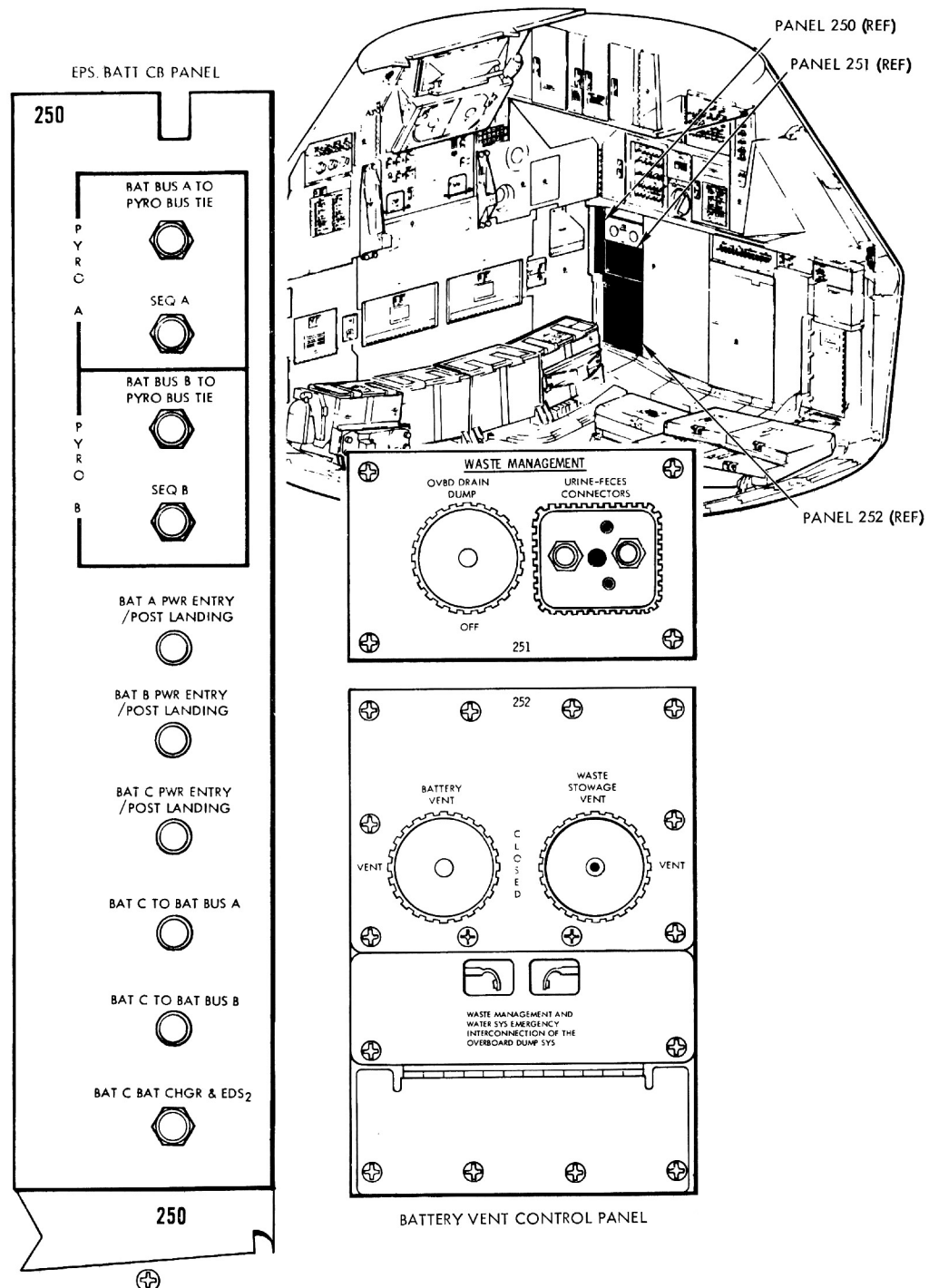
SM-2A-1857E ■

Figure S-38. RHEB Check Data Sheet, Panel 201 and Panel 229

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 66 of 70



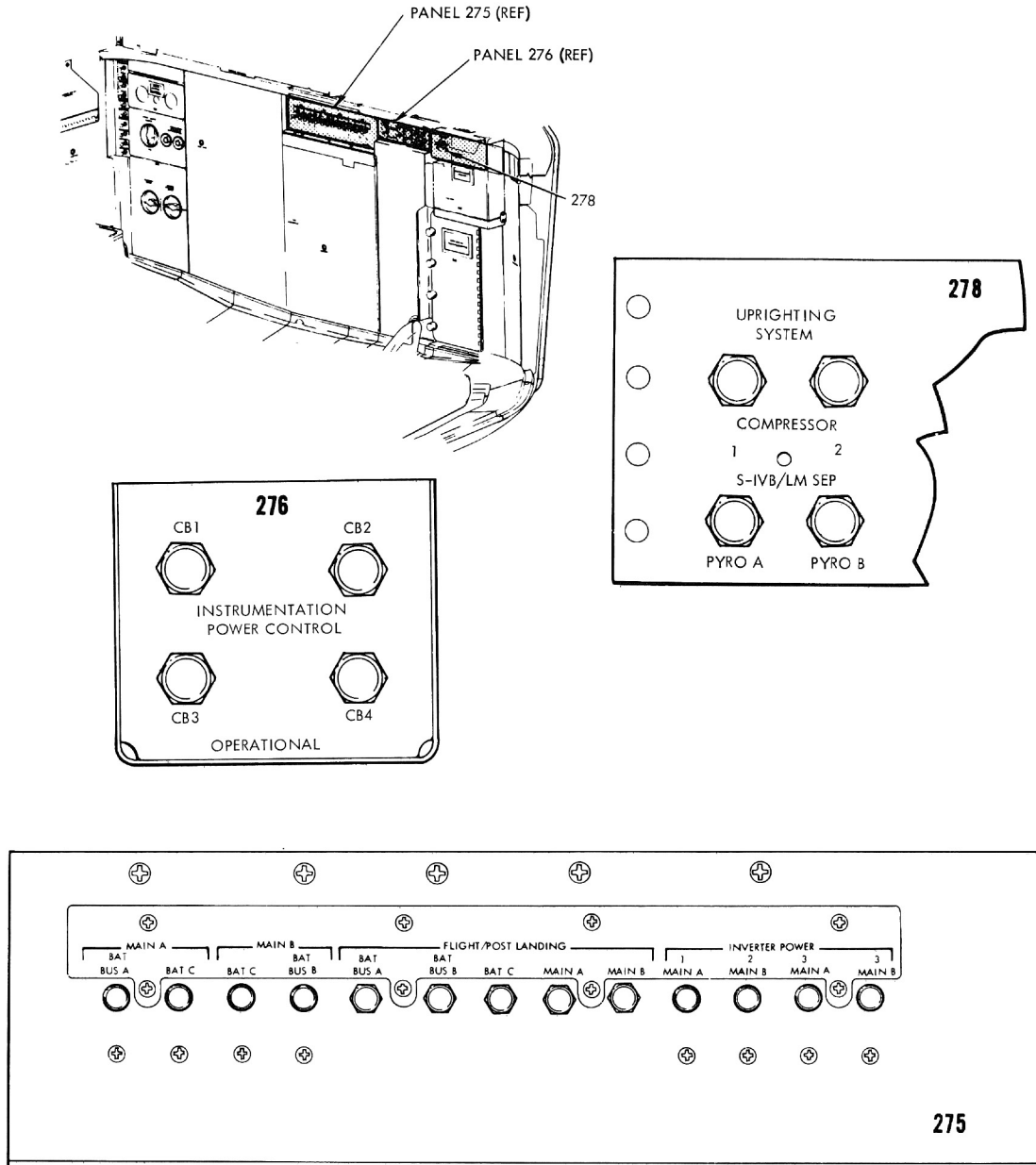
SM-2A-1861C

Figure S-39. RHEB Check Data Sheet, Panel 250, 251, and 252

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 67 of 70



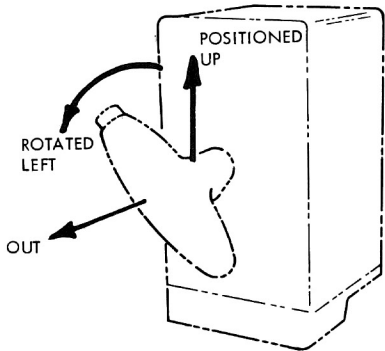
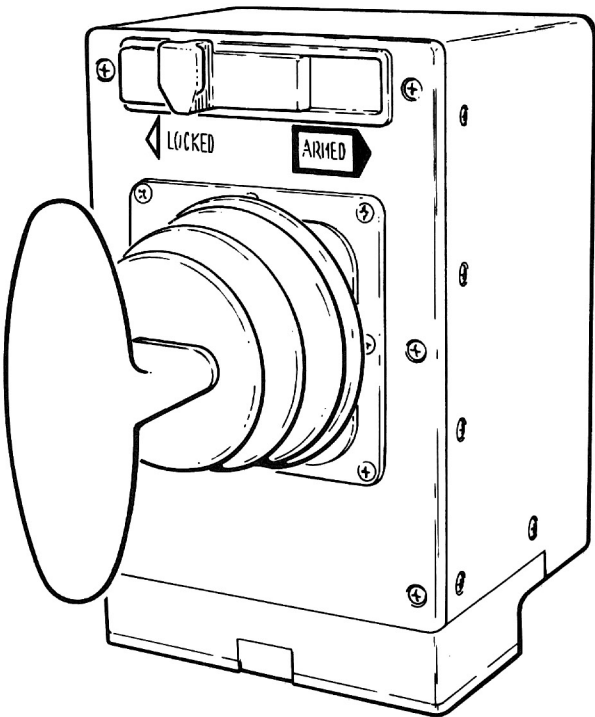
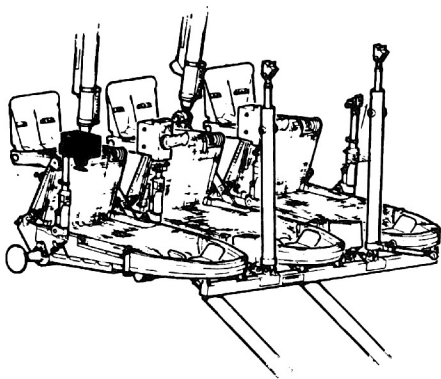
SM-2A-1845 C

Figure S-40. RHEB Check Data Sheet, Panel 275, 276, and 278

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 68 of 70



NOTE
IN ADDITION TO SWITCH POSITION,
INDICATE HANDLE POSITION UTILIZING
SKETCHED ARROWS. THE TRANSLATION
CONTROL IS NORMALLY CENTERED,
SHOULD CONTROL BE OFF-CENTER,
SO INDICATE)

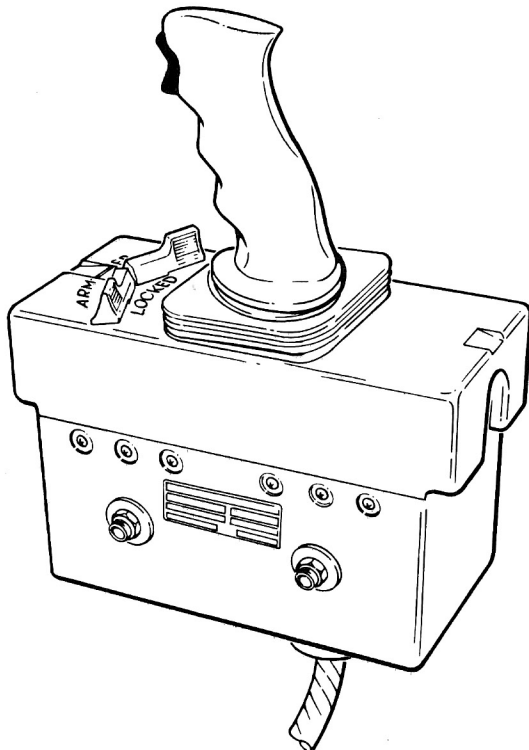
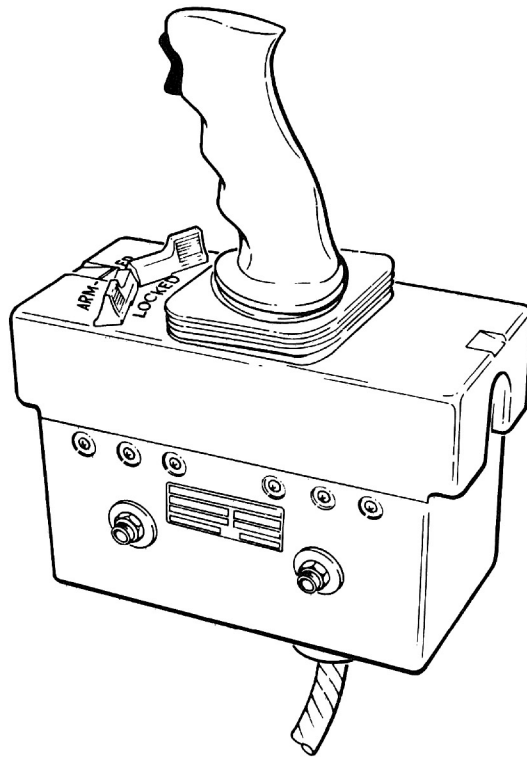
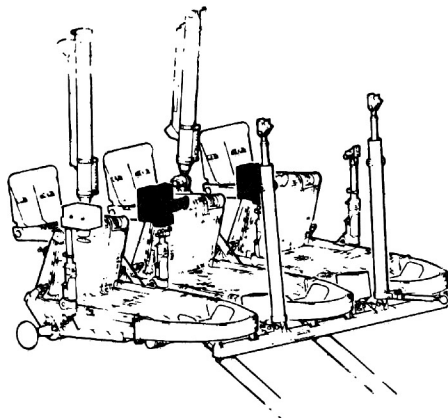
SM-2A-1900A

Figure S-41. Central Crew Compartment Check Data Sheet,
Translation Control

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 69 of 70



NOTE

1. ROTATION CONTROLS ARE NORMALLY CENTERED (NEUTRAL), SHOULD CONTROL BE OFF CENTER SO INDICATE.

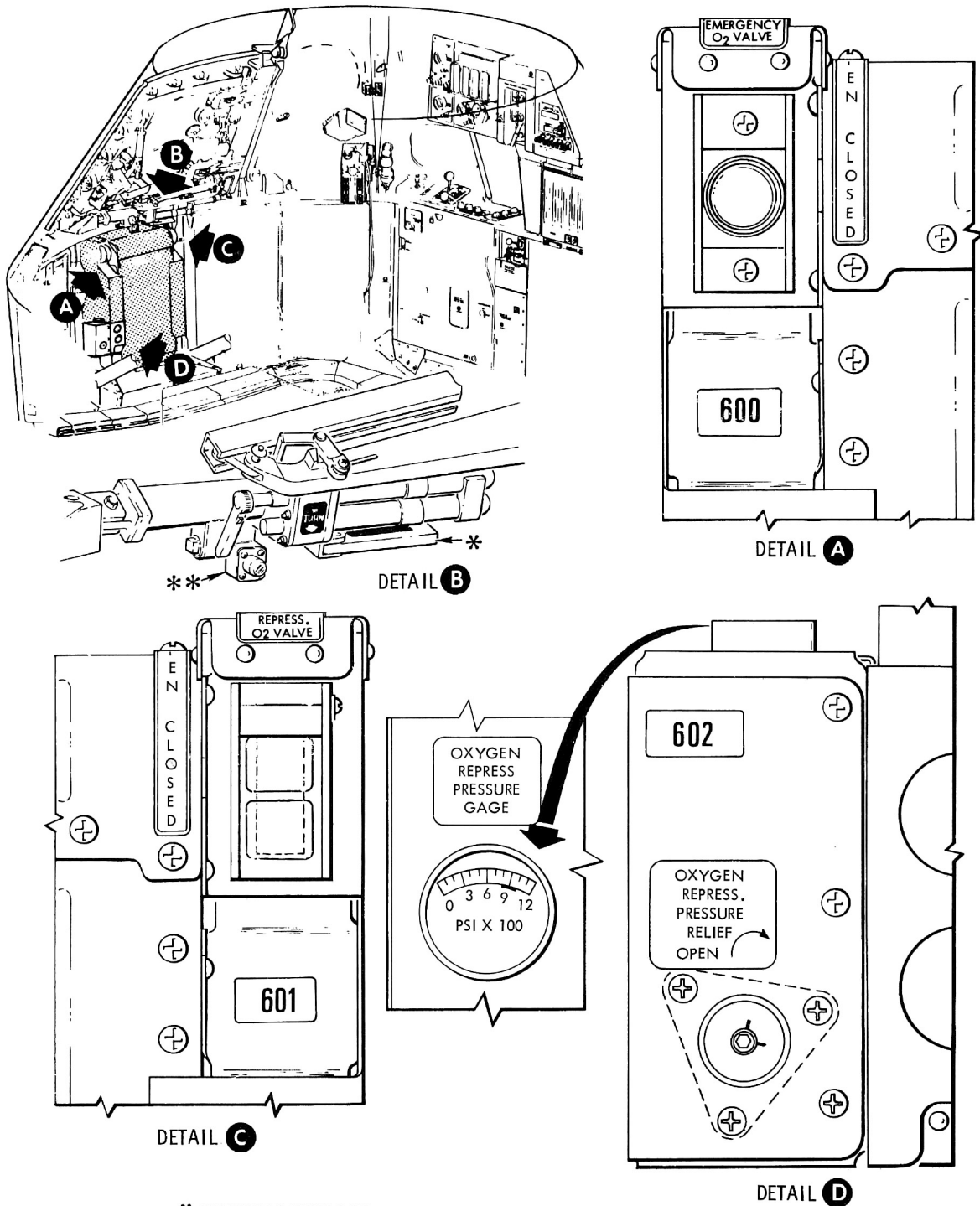
SM-2A-1901

Figure S-42. Central Crew Compartment Check Data Sheet,
Rotation Controls

Date _____ Time _____ Signature _____

PANEL READINGS AND SWITCH POSITIONS

Sheet 70 of 70



* SPECIFY POSITION OF
 ↙ VENT/PRESS ↗ HANDLE _____
 ** RECORD GN₂ PRESSURE: GREEN _____, WHITE _____.

SM-2A-1859D

Figure S-43. UEB Check Data Sheet, Panel 600, 601, and 602

Date _____ Time _____ Signature _____

SYSTEMS SHUTDOWN

Sheet 1 of 7

This procedure identifies and locates the various switches and circuit breakers that must be repositioned to power down the spacecraft.

NOTE

- Power down shall be accomplished following completion of procedure ⑤, Panel Readings and Switch Positions.
- The positioning of switches and circuit breakers other than those specified may jeopardize post-flight testing; accordingly, power down shall be accomplished in the manner prescribed.

SAFETY

1. Observe standard safety precautions when working within the CM.
2. Actuate only specified switches. Actuation of switch/controls could cause injury to personnel outside the CM.

PHOTOGRAPHIC REQUIREMENTS

1. Obtain a complete set of photographs depicting each panel prior to pulling any circuit breaker. Refer to Procedure ① or ①A. ■

TOOLS AND EQUIPMENT (Not applicable)

Date _____ Time _____ Signature _____

SYSTEMS SHUTDOWN

Sheet 2 of 7

INSTRUCTIONS

PANEL NO. 278 (See adjacent illustration.)

1. Verify/pull the following UPRIGHTING SYSTEM circuit breakers:

	Verified	Pulled
UPRIGHTING SYSTEM - COMPRESSOR 1	_____	_____
UPRIGHTING SYSTEM - COMPRESSOR 2	_____	_____

PANEL NO. 275 (See adjacent illustration.)

1. Verify/pull the following MAIN A and MAIN B circuit breakers:

MAIN A - BAT BUS A	_____	_____
MAIN A - BAT C	_____	_____
MAIN B - BAT C	_____	_____
MAIN B - BAT BUS B	_____	_____

2. Verify/pull the following FLIGHT/POST LANDING circuit breakers:

FLIGHT/POST LANDING - BAT BUS A	_____	_____
FLIGHT/POST LANDING - BAT BUS B	_____	_____
FLIGHT/POST LANDING - BAT C	_____	_____
FLIGHT/POST LANDING - MAIN A	_____	_____
FLIGHT/POST LANDING - MAIN B	_____	_____

PANEL NO. 250 (See adjacent illustration.)

1. Verify/pull the following pyro battery circuit breakers:

BAT BUS B TO PYRO BUS TIE	_____	_____
SEQ A	_____	_____
BAT BUS A TO PYRO BUS TIE	_____	_____
SEQ B	_____	_____

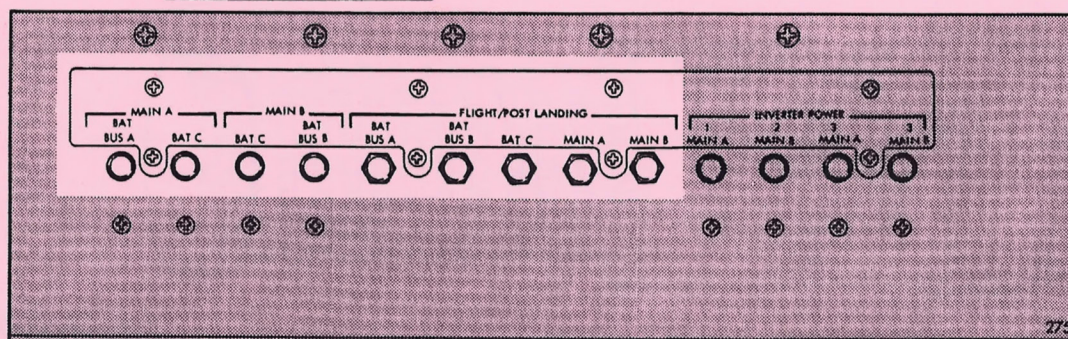
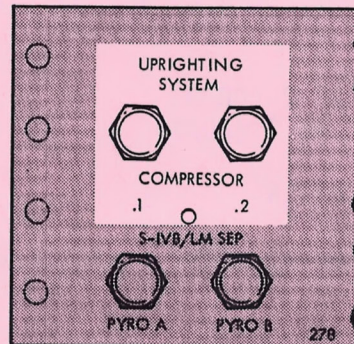
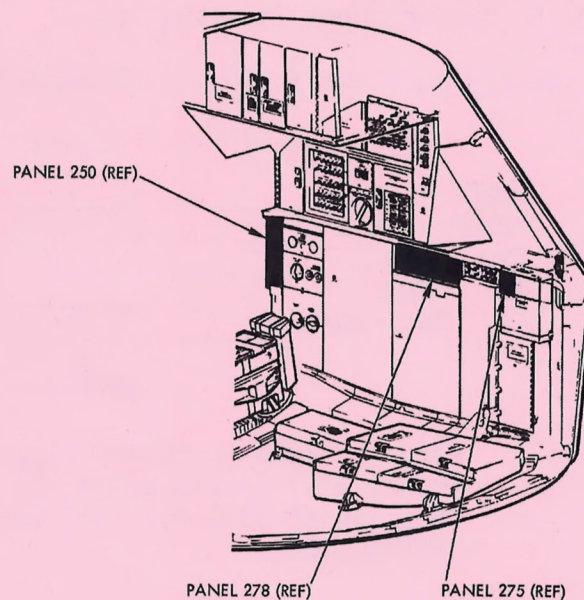
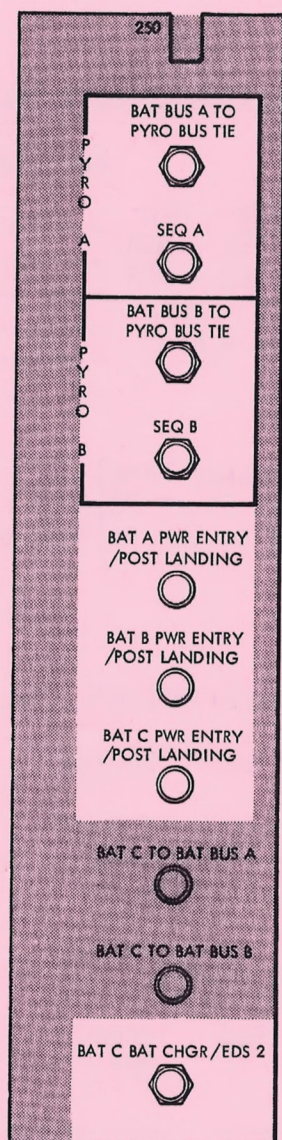
2. Verify/pull the following entry battery circuit breakers:

BAT A PWR ENTRY/POST LANDING	_____	_____
BAT B PWR ENTRY/POST LANDING	_____	_____
BAT C PWR ENTRY/POST LANDING	_____	_____
BAT C BAT CHGR/EDS 2	_____	_____

Date _____ Time _____ Signature _____

SYSTEMS SHUTDOWN

Sheet 3 of 7



SM-2A-1686G

System Shutdown, Panels 278, 275 and 250

SYSTEMS SHUTDOWN

Sheet 4 of 7

INSTRUCTIONS

PANEL NO. 5 (See adjacent illustration.)

1. Verify/pull the following GUIDANCE/NAVIGATION circuit breakers:

	Verified	Pulled		Verified	Pulled
POWER - AC 1	_____	_____	IMU HTR - MNB	_____	_____
POWER - AC 2	_____	_____	COMPUTER - MNA	_____	_____
IMU - MNA	_____	_____	COMPUTER - MNB	_____	_____
IMU - MNB	_____	_____	OPTICS - MNA	_____	_____
IMU HTR - MNA	_____	_____	OPTICS - MNB	_____	_____

NOTE

Refer to RHEB Auxiliary Circuit Breaker Panel "B" (Panel 226) in Procedure 5 (Sheet 64 of 70) for location of CB33 and CB37 required in the following INSTRUCTIONS.

PANEL NO. 226

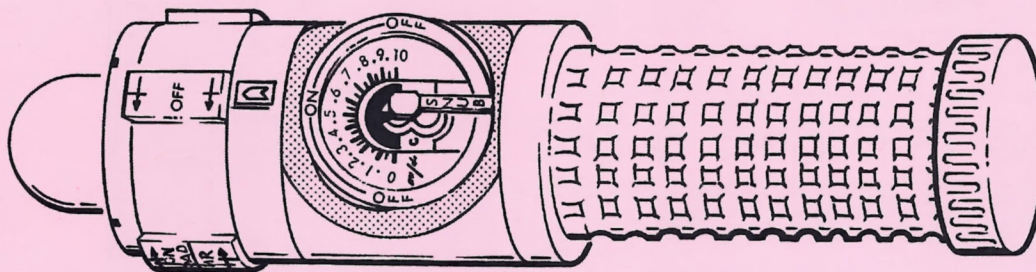
1. Verify/pull the following LIGHTING-NUMERICS/INTEGRAL circuit breakers:

	Verified	Pulled
LEB - AC 2 (CB33)	_____	_____
LMDC - AC 1 (CB37)	_____	_____

RADIATION SURVEY METER

1. Verify survey meter positioned to OFF as shown.

Verified	Turned
OFF	OFF
_____	_____



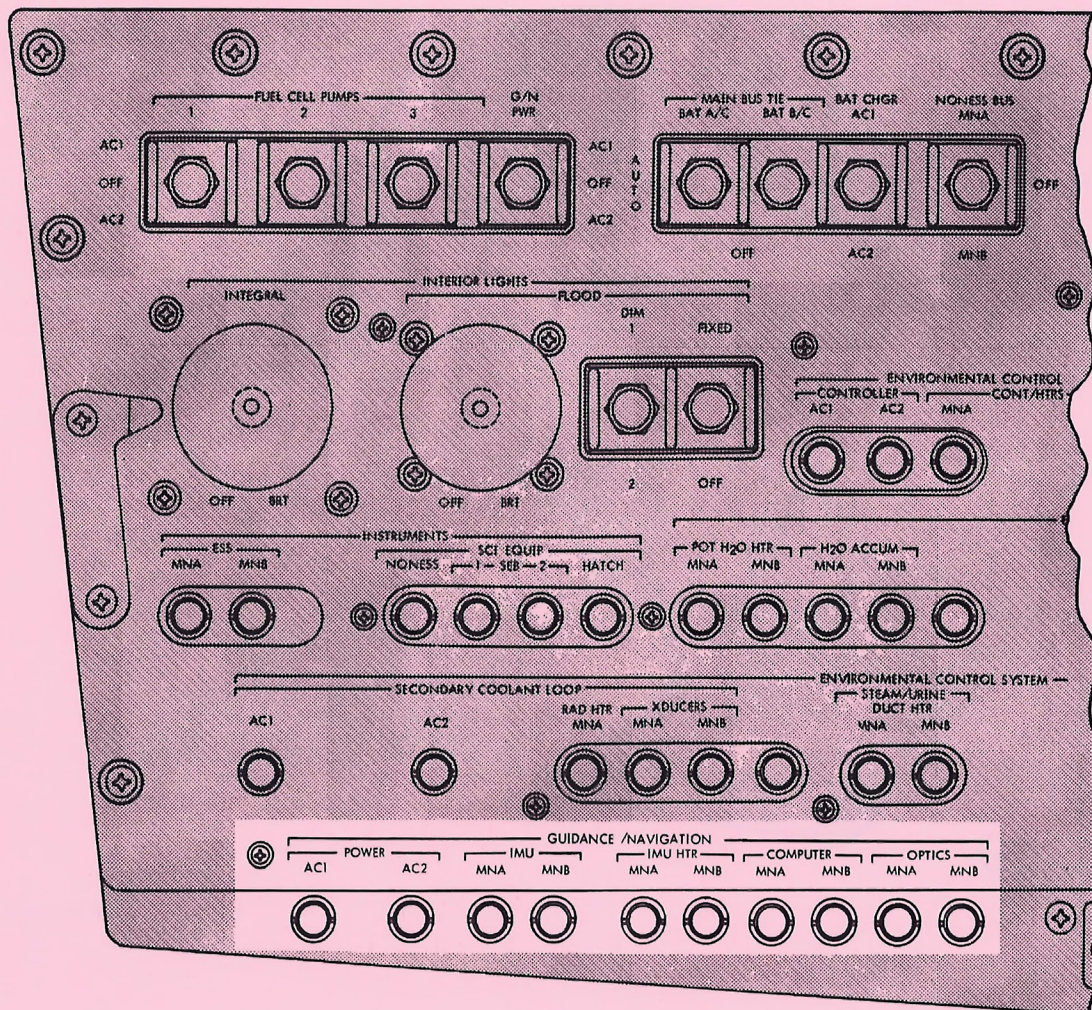
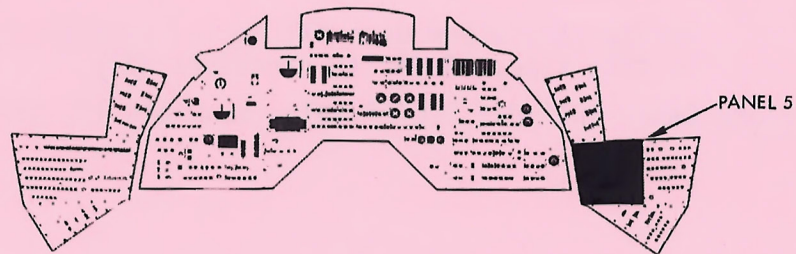
SM-2A-2150

Radiation Survey Meter

Date _____ Time _____ Signature _____

SYSTEMS SHUTDOWN

Sheet 5 of 7



SM-2A-1687B

System Shutdown, Panel 5

SYSTEMS SHUTDOWN

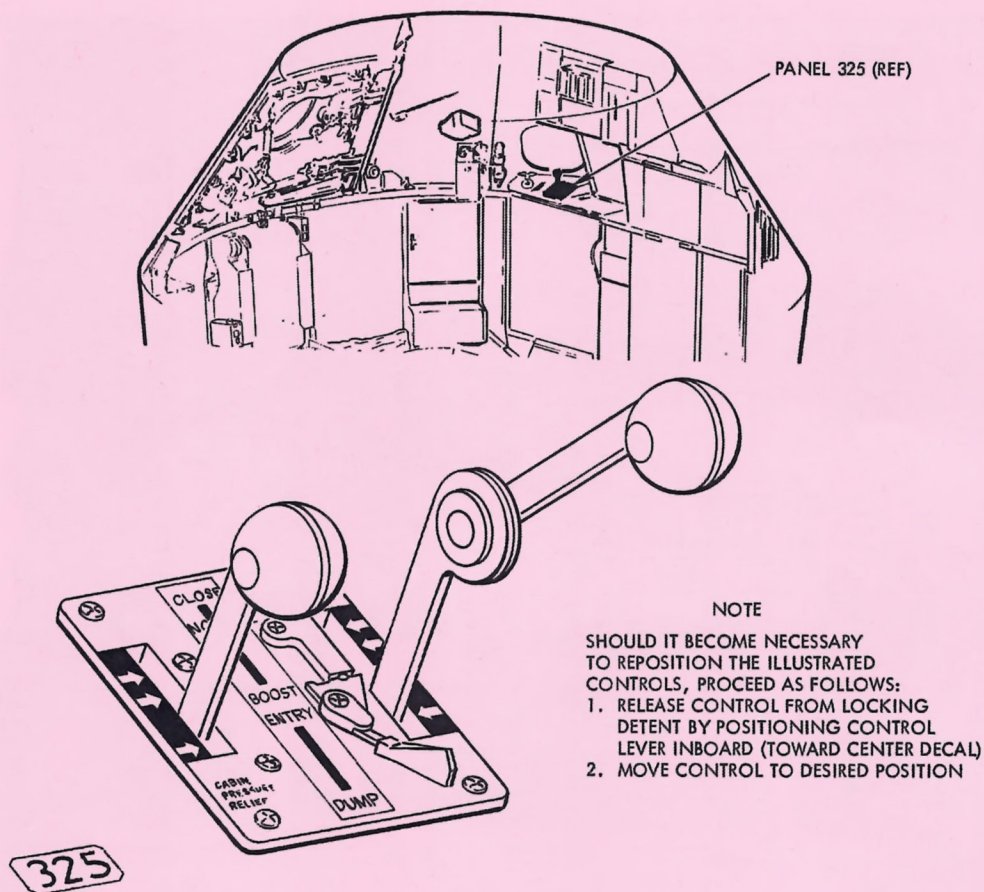
Sheet 6 of 7

PANEL NO. 325

NOTE

Verify that steam duct filter is installed prior to this step. Refer to procedure (25).

1. Place CABIN PRESSURE RELIEF valve controls (2) to BOOST ENTRY.



SM-2A-1688D

Systems Shutdown, Panel 325

SYSTEMS SHUT DOWN

Sheet 7 of 7

PACKAGING REQUIREMENTS

Not applicable.

Remarks :

123

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COMMAND MODULE INTERIOR INSPECTION

Sheet 1 of 18

Following system shutdown, or shortly thereafter, recovery personnel shall visually inspect the CM interior for apparent damage/irregularities, etc. Sheets 3, 5, 7, 9, 11, 13, 15 and 17 should be used as a guide for identifying the various components/areas.

NOTE

The inspection shall be confined to visual observations unless otherwise directed by the NASA Team Leader.

SAFETY

1. Observe standard safety precautions when working within the CM.
2. Avoid actuating any switches, controls, etc.; actuation of certain controls could cause injury to personnel outside the CM.

PHOTOGRAPHIC REQUIREMENTS

1. Refer to procedure ① or ①A.

TOOLS AND EQUIPMENT

Quantity	Nomenclature
	Polyethylene bags

INSTRUCTIONS**NOTE**

Refer to sheets 2 through 14.

COMMAND MODULE INTERIOR INSPECTION

Sheet 2 of 18

1. Inspect CM floor for presence of water or other fluids; measure (estimate) the quantity of fluid present. Record findings.

NOTE

Should fluid be present within the CM, forward a sample to MSC as expeditiously as practical.

2. Inspect for (and record) any damage or irregularities to components/ areas identified in the adjacent illustration.

NOTE

The inspection shall be confined to visual observations unless otherwise directed by the NASA Team Leader.

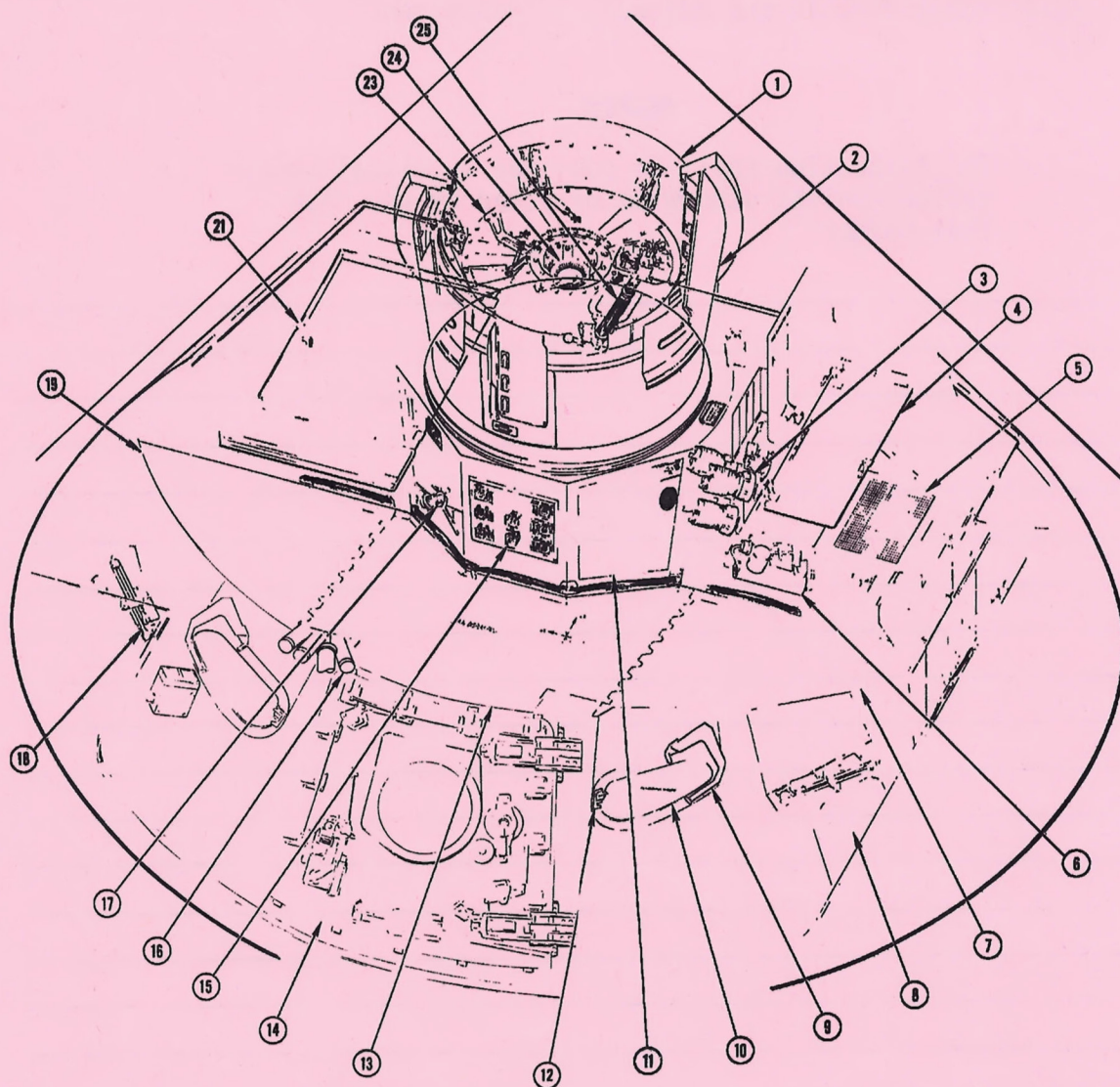
Remarks: _____

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Date _____ Time _____ Signature _____

COMMAND MODULE INTERIOR INSPECTION

Sheet 3 of 18



FORWARD PRESSURE HATCH, MDC AND LEFT-HAND FORWARD EQUIPMENT BAY

- | | |
|--|--------------------------------------|
| 1. FORWARD HATCH | 14. UNIFIED HATCH |
| 2. TUNNEL | 15. AUDIO CONTROL PANEL (NO. 10) |
| 3. SUIT HOSE CONNECTOR (PANEL 300, 301, 302) | 16. PLV DUCT |
| 4. F1 TEMPORARY STOWAGE COMPARTMENT | 17. TV CAMERA MOUNT |
| 5. ECS RECIRCULATION FAN INTAKE | 18. INTERNAL VIEWING MIRROR (TYP) |
| 6. WATER METERING DEVICE | 19. MDC PANEL (NO. 3) |
| 7. MDC PANEL (NO. 1) | 20. DELETED |
| 8. LEFT-HAND FORWARD VIEWING WINDOW | 21. F2 TEMPORARY STOWAGE COMPARTMENT |
| 9. CAMERA MOUNT | 22. DELETED |
| 10. LEFT-HAND RENDEZVOUS WINDOW | 23. HANDHOLD |
| 11. TUNNEL/LM PRESSURIZATION PANEL (NO. 12) | 24. PRESSURE EQUALIZATION VALVE |
| 12. COAS MOUNT | 25. PUMP HANDLE, FWD HATCH RELEASE |
| 13. MDC PANEL (NO. 2) | |

SM-2A-1830C

Forward Hatch, MDC and Left-Hand Forward Equipment Bay

Sheet 4 of 18

3. Inspect for (and record) any damage or irregularities to components/ areas identified in the adjacent illustration.

NOTE

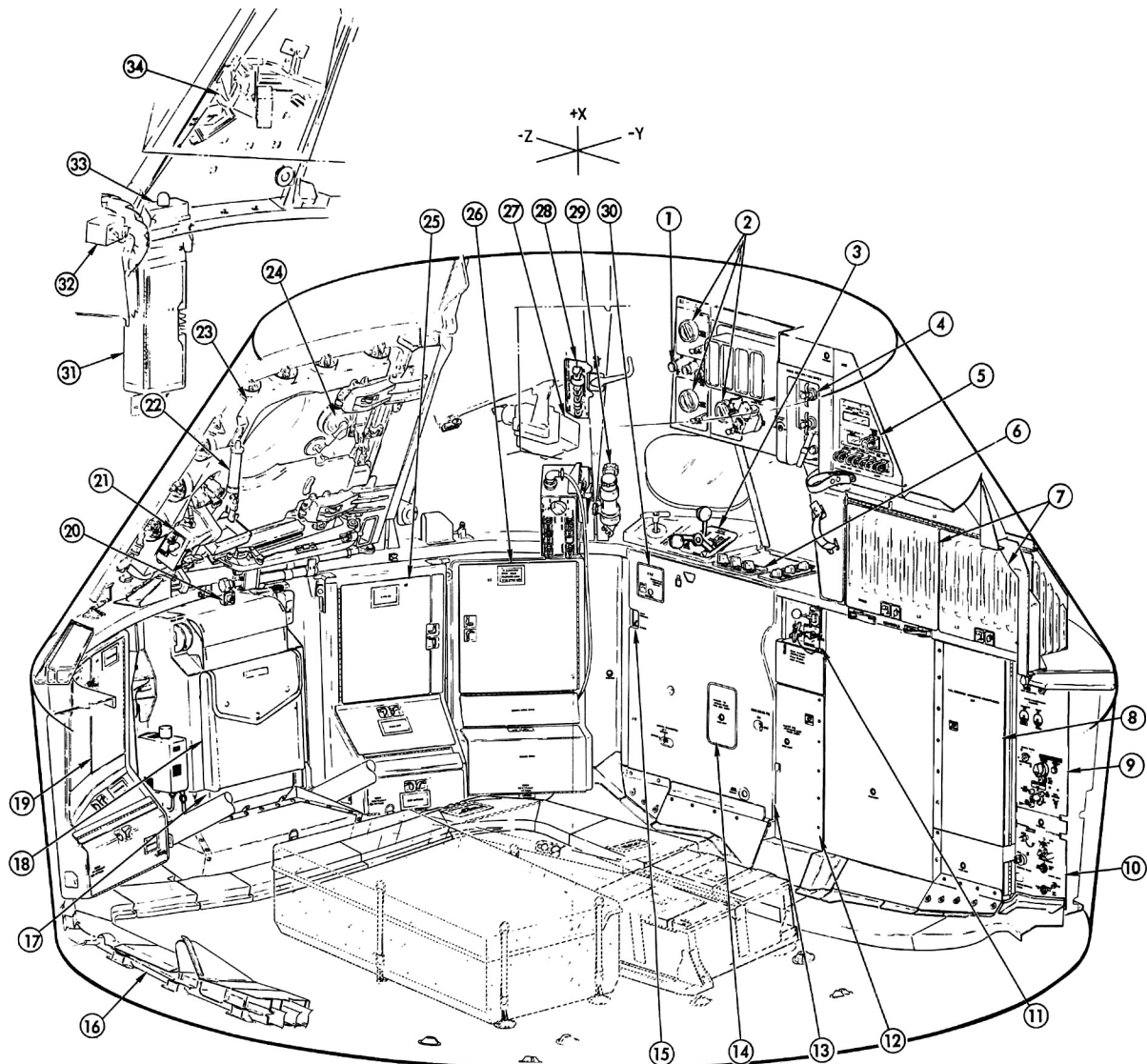
The inspection shall be confined to visual observations unless otherwise directed by the NASA Team Leader.

Remarks: _____

Date _____ Time _____ Signature _____

COMMAND MODULE INTERIOR INSPECTION

Sheet 5 of 18



AFT BULKHEAD, UPPER AND LEFT-HAND EQUIPMENT BAYS (CLOSEOUT PANELS INSTALLED)

- | | |
|---|---|
| 1. Communication cable connectors | 18. Window shade container |
| 2. ECS O ₂ hose connectors | 19. Deleted |
| 3. Cabin pressure relief control panel (No. 325) | 20. GN ₂ gauge |
| 4. Food preparation water unit | 21. Unified hatch gear box |
| 5. Timer panel (No. 306) | 22. Unified hatch pump handle |
| 6. ECS O ₂ and glycol control panel (No. 326) | 23. Unified hatch |
| 7. L3 stowage compartments | 24. Vent Valve |
| 8. ECS filter access panel (No. 350) | 25. Deleted |
| 9. Oxygen control panel (No. 351) | 26. U3 stowage locker |
| 10. Water Control panel (No. 352) | 27. Floodlight |
| 11. O ₂ demand regulator valve panel (No. 380) | 28. Panel 15 |
| 12. Coolant control panel (No. 382) | 29. Crew optical alignment sight |
| 13. W/G accumulator fill control panel (No. 379) | 30. O ₂ surge tank pressure relief |
| 14. Seawater plug access panel | 31. U4 Stowage locker |
| 15. PLVC control panel (No. 376) | 32. Scientific/electrical disconnect panel (No. 227) |
| 16. Electrical cableway (typical) | 33. Van Allen Belt Dosimeter |
| 17. Emergency O ₂ and repressurization system | 34. Crew optical alignment sight power switch (No. 228) |

SM-2A-1433E

Aft Bulkhead, Upper and Left-Hand Equipment
Bays - Closeout Panels Installed

Sheet 6 of 18

4. Inspect for (and record) any damage or irregularities to components/ areas identified in the adjacent illustration.

NOTE

- The inspection shall be confined to visual observations unless otherwise directed by the NASA Team Leader.
- Closeout panels shall not be removed for inspection purposes. Remove panels only per instructions received from the NASA Team Leader.

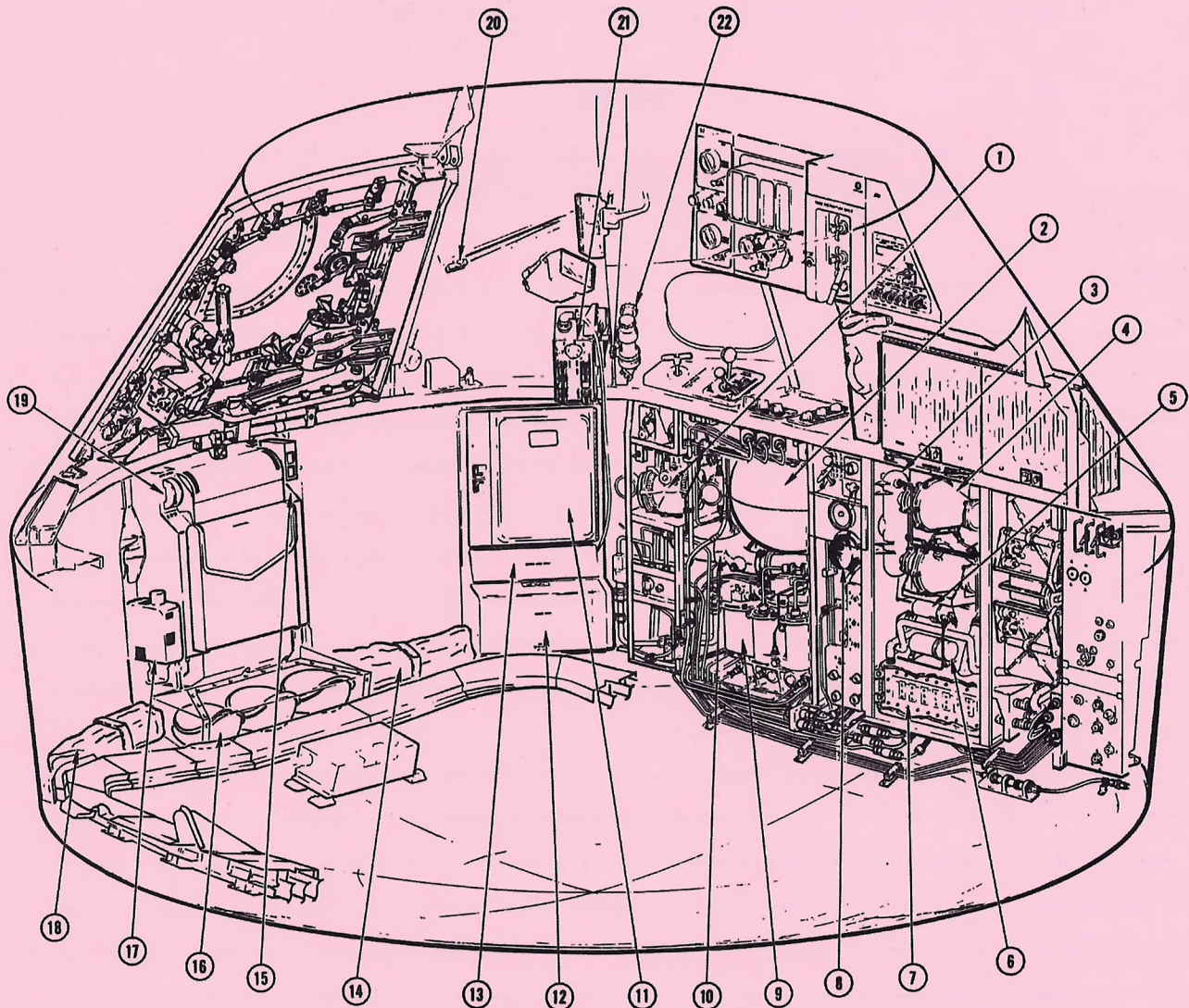
Remarks :

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Date _____ Time _____ Signature _____

COMMAND MODULE INTERIOR INSPECTION

Sheet 7 of 18



AFT BULKHEAD, UPPER AND LEFT-HAND EQUIPMENT BAYS (CLOSEOUT PANELS REMOVED)

- | | |
|-------------------------------------|-----------------------------------|
| 1. Cabin pressure relief valve | 12. Ordeal box stowage |
| 2. Surge tank | 13. Ordeal cable stowage |
| 3. Compressor inlet manifold | 14. Sleeping bag (stowed) |
| 4. Suit compressor (typ) | 15. Panel 601 |
| 5. H ₂ O filter | 16. O ₂ masks (stowed) |
| 6. H ₂ O accumulator | 17. Panel 602 |
| 7. Heat exchanger | 18. Sleeping bag (stowed) |
| 8. Suit circuit return inlet screen | 19. Panel 600 |
| 9. Water glycol pump assembly | 20. Mount-Optical alignment sight |
| 10. Steam vent | 21. Panel 313 |
| 11. U3 Stowage locker | 22. COAS |

SM-2A-1618E

Aft Bulkhead, Upper and Left-Hand Equipment
Bays - Closeout Panels Removed

7

SM2A-08-SC109

COMMAND MODULE INTERIOR INSPECTION

Sheet 8 of 18

5. Inspect for (and record) any damage or irregularities to components/ areas identified in the adjacent illustration.

NOTE

The inspection shall be confined to visual observations unless otherwise directed by the NASA Team Leader.

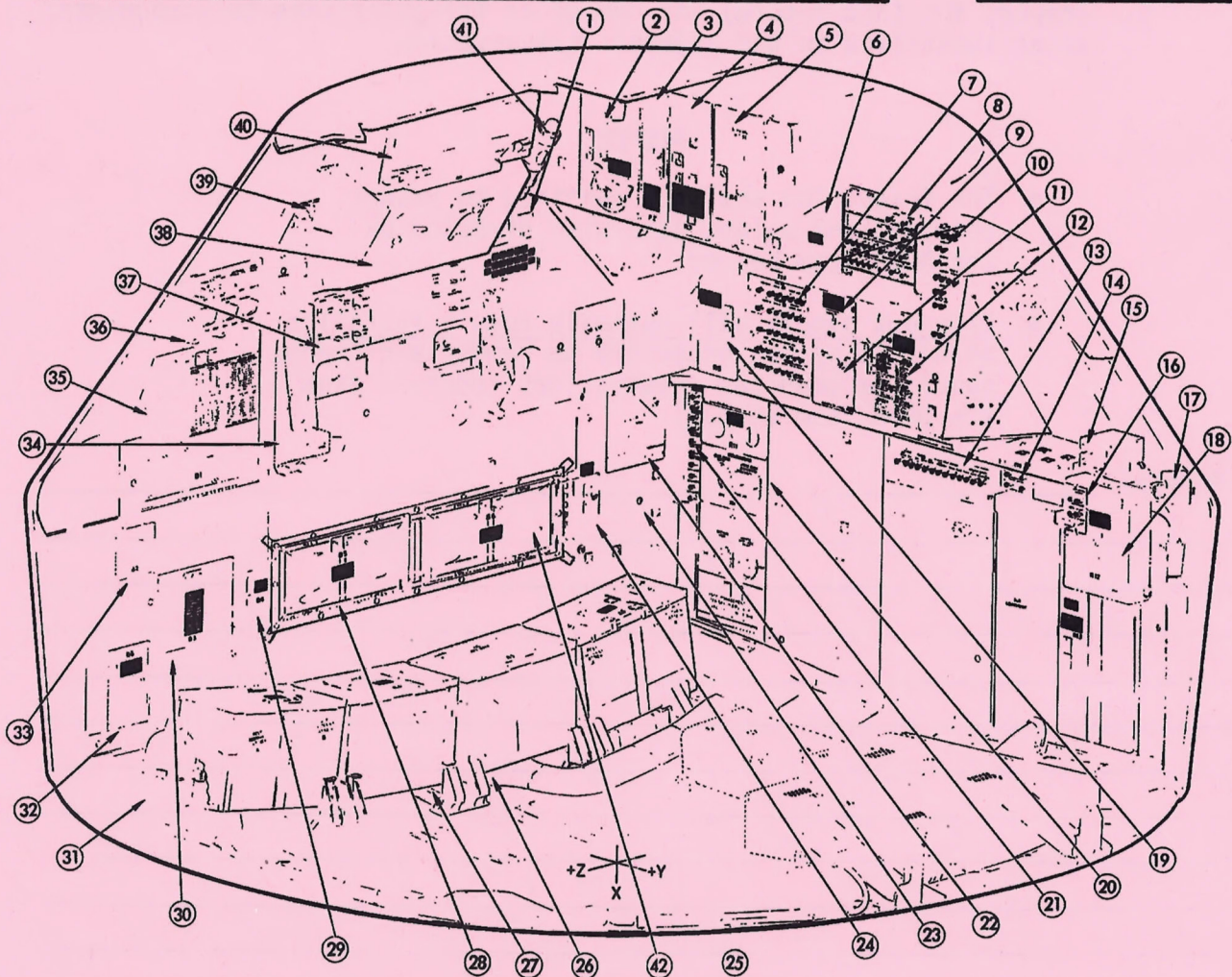
Remarks : _____

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Date _____ Time _____ Signature _____

COMMAND MODULE INTERIOR INSPECTION

Sheet 9 of 18



AFT BULKHEAD, L. E. B. AND RIGHT-HAND EQUIPMENT BAYS (CLOSEOUT PANELS INSTALLED)

- | | |
|--|---|
| 1. LEB display keyboard panel (No. 140) | 22. VHF antenna access (cables) |
| 2. R1 stowage compartment | 23. S-band squelch panel (No. 180) |
| 3. R2 stowage compartment | 24. B7 stowage compartment |
| 4. R3 stowage compartment | 25. B6 stowage compartment (CO2 absorbers) |
| 5. R4 stowage compartment | 26. A4 stowage compartment |
| 6. R5 stowage compartment | 27. A5 stowage compartment |
| 7. Aux circuit breaker panel B (No. 226) | 28. B5 stowage compartment (CO2 absorbers) |
| 8. Aux circuit breaker panel A (No. 225) | 29. B4 stowage compartment |
| 9. R8 stowage compartment | 30. B3 stowage compartment (camera equipment) |
| 10. Circuit breaker panel (No. 229) | 31. Fire extinguisher |
| 11. R9 stowage compartment | 32. B8 stowage compartment (camera equipment) |
| 12. R10 stowage compartment | 33. B2 stowage compartment (medical kit) |
| 13. Power circuit breaker panel (No. 275) | 34. Translation controller mount (use pos) |
| 14. Circuit breaker panel (No. 276) | 35. B1 stowage compartment (food) |
| 15. Cabin analyzer (Deleted) | 36. Lighting control panel (No. 100) |
| 16. Uprighting system panel (No. 278) | 37. G&N control panel (No. 122) |
| 17. Scientific/electrical disconnect panel (No. 227) | 38. Optics panel (No. 121) |
| 18. Data file | 39. Auxiliary test panel (No. 101) |
| 19. R6 stowage compartment | 40. Optics stowage compartment |
| 20. Waste management system panels | 41. Radiation survey meter |
| 21. Battery circuit breaker panel (No. 250) | 42. Closeout curtain (installed) |

SM-2A-1434J

Aft Bulkhead, L. E. B. and Right-Hand Equipment
Bay - Closeout Panels Installed

COMMAND MODULE INTERIOR INSPECTION

Sheet 10 of 18

6. Inspect for (and record) any damage or irregularities to components/ areas identified in the adjacent illustration.

NOTE

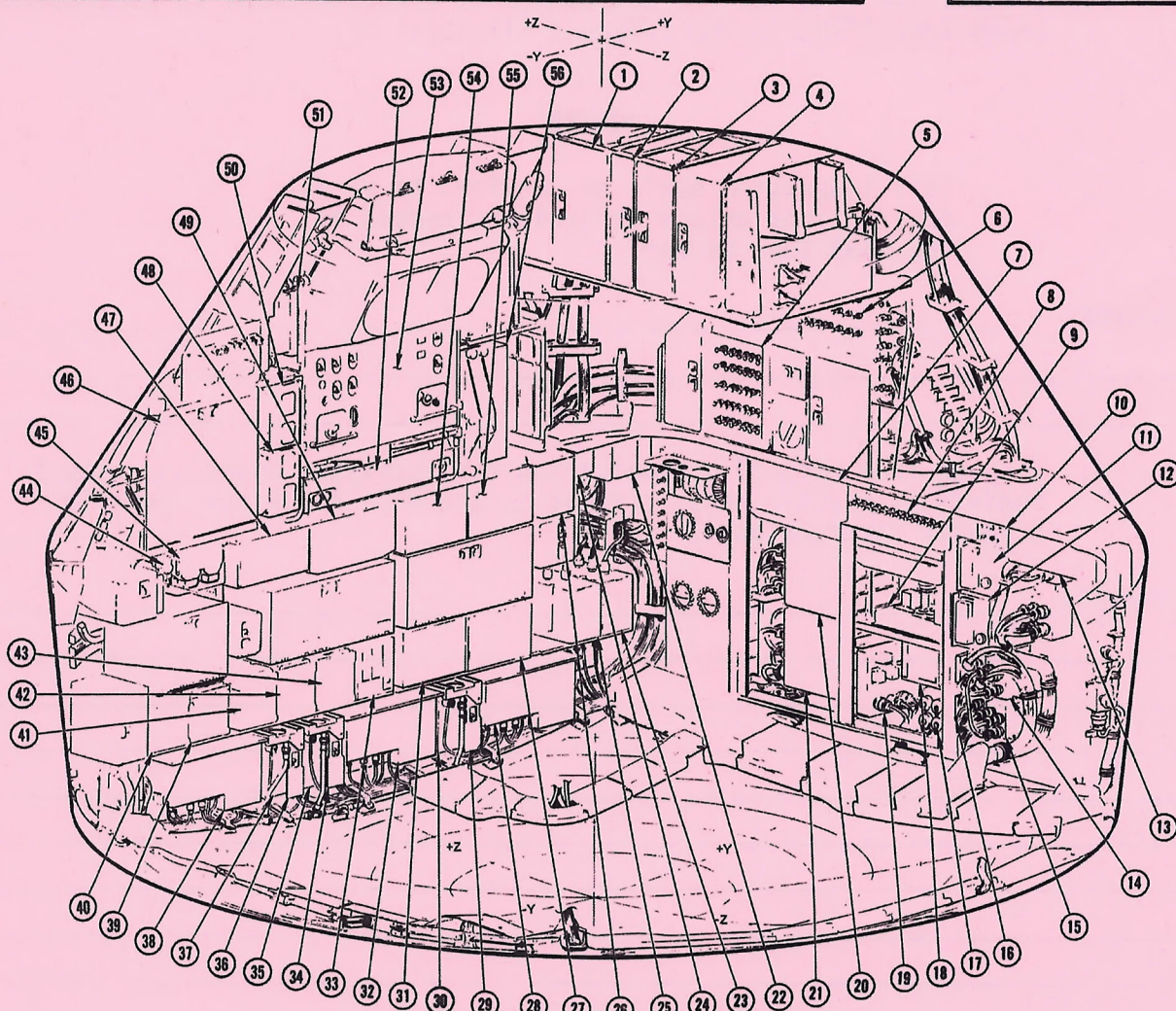
- The inspection shall be confined to visual observations unless otherwise directed by the NASA Team Leader.
- Closeout panels will normally remain installed. Should it become necessary to remove a closeout panel, proceed per instructions received from the NASA Team Leader.

Remarks: _____

Date _____ Time _____ Signature _____

COMMAND MODULE INTERIOR INSPECTION

Sheet 11 of 18



AFT BULKHEAD, L.E.B. AND RIGHT-HAND EQUIPMENT BAY (CLOSEOUT PANELS REMOVED)

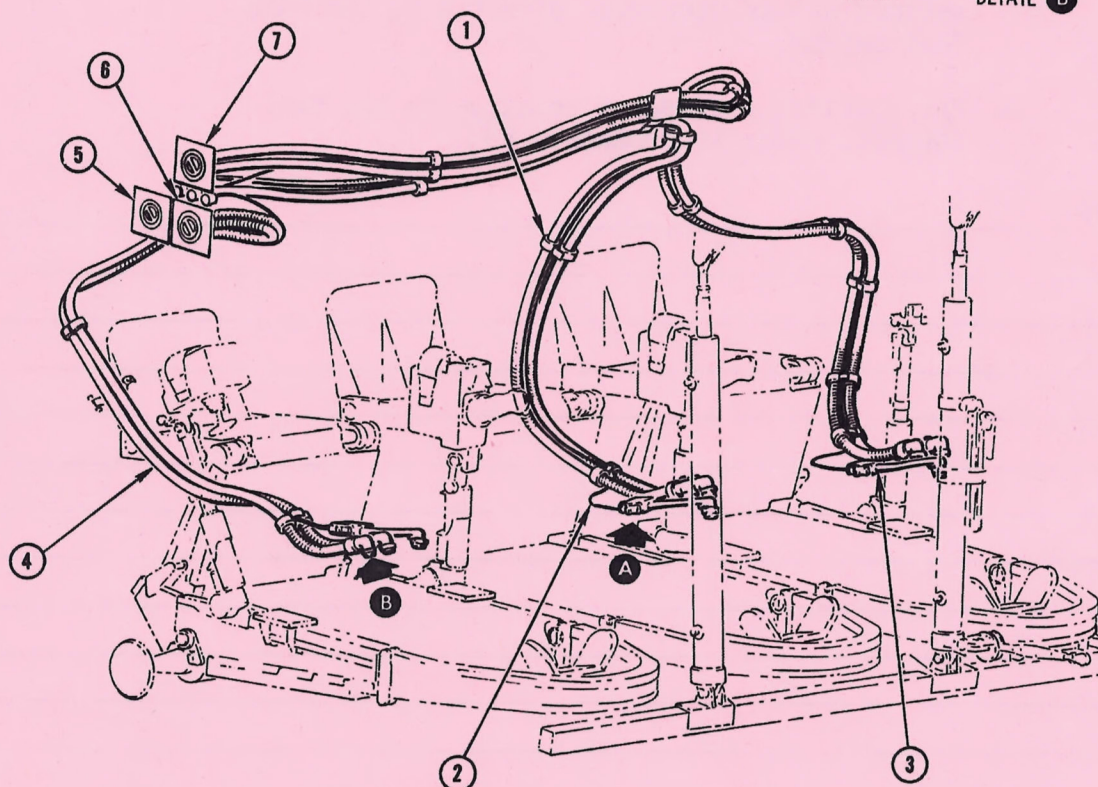
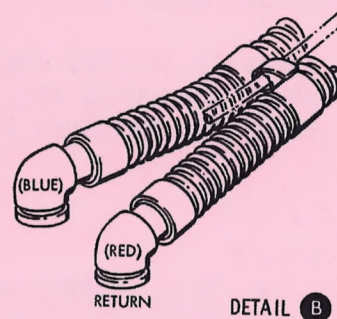
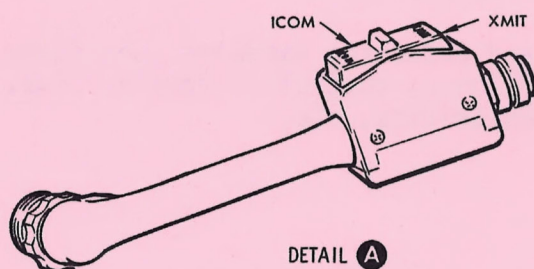
1 R1 STOWAGE COMPARTMENT	19 CIRCUIT UTILIZATION BOX	38 NO. 3 INVERTER
2 R2 STOWAGE COMPARTMENT	20 MASTER EVENTS SEQ CONTROLLER	39 ELECTRONIC CONTROL ASSEMBLY
3 R3 STOWAGE COMPARTMENT	21 MASTER EVENTS SEQ CONTROLLER	40 THRUST VECTOR POSIT SERVO AMP
4 R4 STOWAGE COMPARTMENT	22 VHF BEACON	41 GYRO DISPLAY COUPLER
5 AUX CIRCUIT BREAKER PANEL B (NO. 226)	23 AUDIO CENTER	42 ELECTRONIC DISPLAY ASSEMBLY
6 AUX CIRCUIT BREAKER PANEL A (NO. 225)	24 TRIPLEXER	43 REACTION JET & ENG ON-OFF CONTROL
7 WASTE STOWAGE BLADDER	25 PREMOD PROCESSOR	44 COMPT C SCI/EQUIP ELECT DISCONNECT (NO. 163)
8 PWR CIRCUIT BREAKER PANEL (NO. 275)	26 VHF/AM	45 AC POWER CONTROL
9 DC POWER CONTROL BOX	27 UP-DATA LINK	46 FOOD COMPARTMENT, B1
10 DELETED	28 NO. 1 INVERTER	47 COUPLING DATA UNIT
11 LUNAR DOCKING EVENTS CONTROLLER	29 CIRCUIT BREAKER	48 SCS GYRO ASSEMBLY NO. 2
12 LUNAR DOCKING EVENTS CONTROLLER	30 BATTERY A	49 CM COMPUTER
13 UPRIGHTING SYSTEM PANEL (NO. 278)	31 DATA STOWAGE EQUIPMENT	50 SCS GYRO ASSEMBLY NO. 1
14 EARTH LANDING SEQ CONTS (C20A1)	32 NO. 2 INVERTER	51 PULSED INTEGRATING PENDULOUS ACCEL
15 EARTH LANDING SEQ CONTS (C20A2)	33 S-BAND POWER AMP	52 POWER SERVO ASSEMBLY
16 PYRO CONTROL VERIFICATION BOX (C20A4)	34 CIRCUIT BREAKER	53 OPTICS PANEL (NO. 122)
17 GRD SPT EQUIP TEST PLUGS	35 BATTERY B	54 UNIFIED S-BAND
18 PHASE CORRECTION BOX	36 CIRCUIT BREAKER	55 SIGNAL CONDITIONER
	37 BATTERY C	56 PULSE CODE MODULATION TELEMETRY

SM-2A-1617C

Aft Bulkhead, L.E.B. and Right-Hand Equipment Bay - Closeout Panels Removed

COMMAND MODULE INTERIOR INSPECTION

Sheet 13 of 18



CENTRAL CREW COMPARTMENT CREW COMM CABLES/OXYGEN HOSES

1. Keeper (every 12-inches)
2. Communications Umbilical (typ)
3. Communications control head (typ)
4. Oxygen Umbilical (typ)

5. Panel 302
6. Panel 301
7. Panel 300

SM-2A-1899C

Central Crew Compartment - Crew Comm Cables/Oxygen Hoses

COMMAND MODULE INTERIOR INSPECTION

Sheet 14 of 18

9. Inspect for (and record) any damage or irregularities to components/ areas identified in the adjacent illustration.
10. Visually inspect the crew couches and attaching hardware (seat/back pans, headrests and armrests, floodlights, controls, securing pins, etc.) for evidence of damage, irregularities, etc.

NOTE

- This inspection shall be confined to visual observations unless otherwise directed by the NASA Team Leader.
- For specific procedures relative to the Crew Couches, refer to procedure (8).

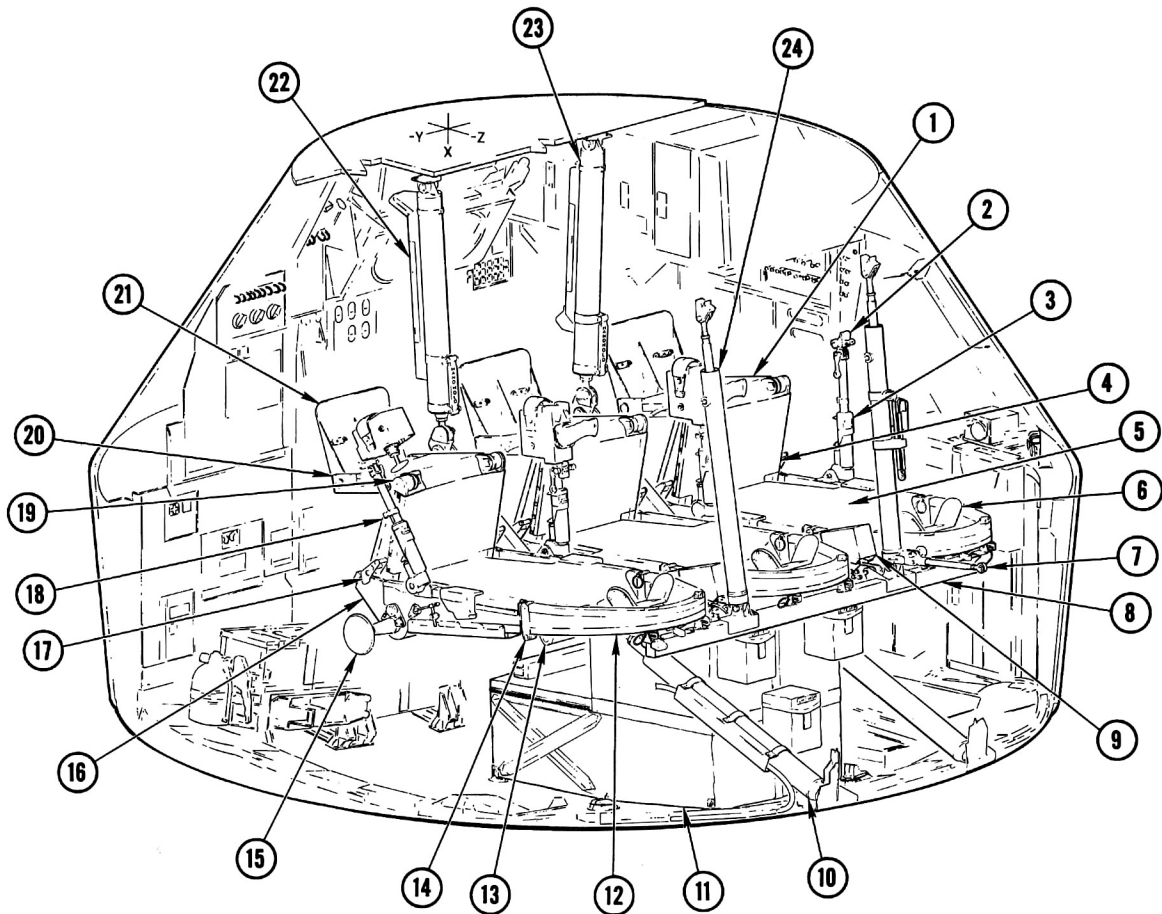
Remarks:

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Date _____ Time _____ Signature _____

COMMAND MODULE INTERIOR INSPECTION

Sheet 15 of 18



CENTRAL CREW COMPARTMENT (CREW COUCHES)

- | | |
|--------------------------------|---|
| 1. LEG PAN | 13. SHOULDER BEAM |
| 2. CONTROL SUPPORT | 14. SHOULDER PIVOT |
| 3. ARMREST | 15. Y-Y STRUT |
| 4. SEATPAN | 16. SEAT PIVOT |
| 5. BACKPAN | 17. SEAT PIVOT CONTROL |
| 6. HEADREST | 18. KNEE PIVOT CONTROL |
| 7. EVA STABILIZER STRUT | 19. KNEE JOINTS |
| 8. HEAD BEAM | 20. HEEL BEAM |
| 9. FLOODLIGHT | 21. FOOT PAN |
| 10. Z-Z ATTENUATOR STRUT (TYP) | 22. LEB FLOODLIGHT |
| 11. PGA CONTAINER | 23. X-X ATTENUATOR STRUT (FOOT) - (TYP) |
| 12. COUCH BODY SUPPORT | 24. X-X ATTENUATOR STRUT (HEAD) - (TYP) |

SM-2A-1832B

Central Crew Compartment - Crew Couches

COMMAND MODULE INTERIOR INSPECTION

Sheet 16 of 18

11. Inspect for (and record) any damage or irregularities to components/ areas identified in the adjacent illustration.

NOTE

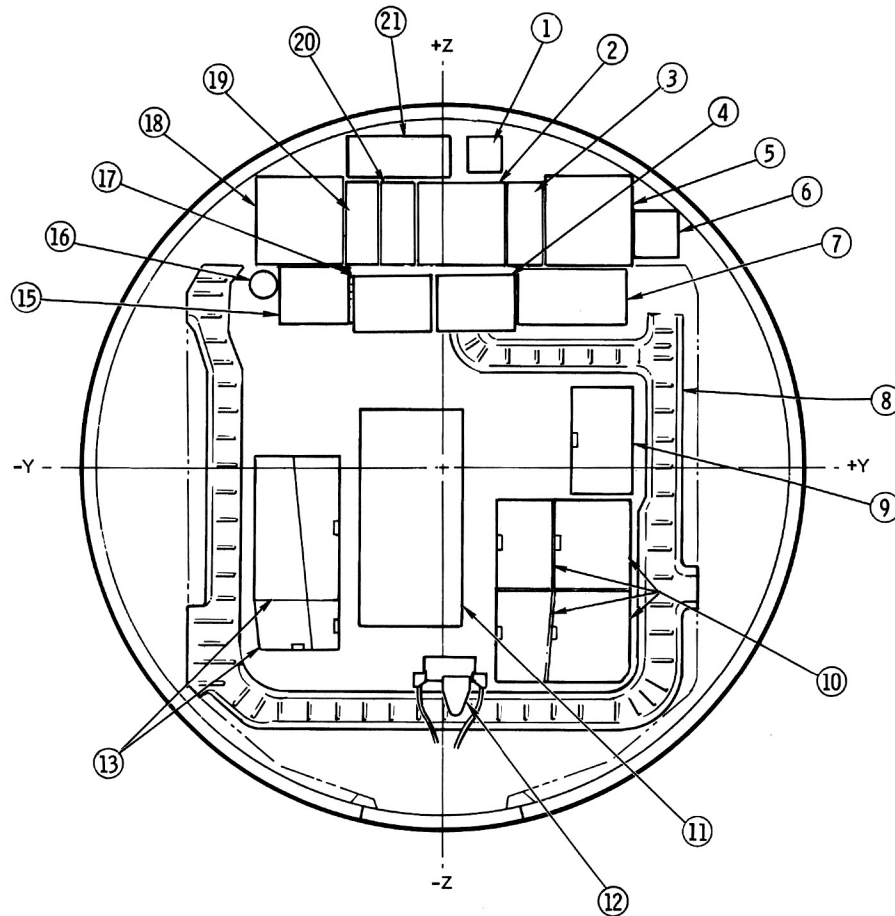
- The inspection shall be confined to visual observations unless otherwise directed by the NASA Team Leader.
- Should water or other fluids be observed, enter appropriate remarks.

Remarks :

Date _____ Time _____ Signature _____

COMMAND MODULE INTERIOR INSPECTION

Sheet 17 of 18



AFT EQUIPMENT STOWAGE BAY (AESB)

1. Battery charger
2. Inverter No. 2
3. Battery A
4. A5 Stowage Locker (Volume)
5. Inverter No. 1
6. Pyro batteries
7. A6 Stowage locker (Volume)
8. Electrical cableway (typ)
9. A7 stowage locker (Volume)
10. B8 stowage locker (Volume)

11. PGA stowage bags
12. Control box
13. A1 stowage locker
14. Deleted
15. A3 stowage locker (Volume)
16. Fire extinguisher
17. A4 Stowage Locker (Volume)
18. Inverter No. 3
19. Battery C
20. Battery B
21. Inverter DC control box

SM-2A-1436F

Aft Equipment Bay - Stowage Compartments and Cableways

COMMAND MODULE INTERIOR INSPECTION

Sheet 18 of 18

PACKAGING REQUIREMENTS

1. Bottle fluid sample(s), as necessary, for return shipment to MSC.

Remarks: _____

Date _____ Time _____ Signature _____

IMPACT ATTENUATION STRUT INSP/CTR COUCH REMOVAL

Sheet 1 of 7

This procedure provides instructions for inspecting and obtaining impact attenuation strut measurements, and instructions for removing the center couch.

SAFETY

1. Observe standard safety precautions when working in the CM.
2. Avoid actuating any switches, controls, etc. Actuation of certain controls could cause injury to personnel outside the CM.

PHOTOGRAPHIC REQUIREMENTS

1. Refer to procedure (1) or (1A) .

TOOLS AND EQUIPMENT

Quantity	Nomenclature
1	Scale (6-inch)
1	Shim stock (or feeler gage)
1	Steel rule (6-ft)

INSTRUCTIONS

1. Visually inspect each strut for evidence of stroking, damage, irregularities, etc. IF VISUAL EVIDENCE OF STROKING/DAMAGE IS NOT EVIDENT - DO NOT PERFORM STEP 2.

Remarks : _____

Date	Time	Signature
------	------	-----------

IMPACT ATTENUATION STRUT INSP/CTR COUCH REMOVAL

Sheet 2 of 7

2. Obtain strut measurements per the following instructions:

- a. Y-Y Struts. Using shim stock or feeler gage, measure distance between CM bearing plate and Y-Y attenuation lock bearing pad (at bearing pad center). Assure the opposite side of the Y-Y strut is positioned firmly against its bearing pad (by pushing or pulling couch assembly in the desired direction) when taking this measurement.

Record measurement: _____ RH, or _____ LH (as applicable).

Remarks: _____

NOTE

Use a steel rule/scale for all measurements.

- b. X-X Struts. Measure distance from the end cap to the locknut along the stroking shaft. (See adjacent illustration.)

Record measurements: _____ RH foot, _____ LH foot,
_____ RH head, _____ LH head.

Remarks: _____

- c. Z-Z Struts. Measure distance from the end cap to the locknut along the stroking shaft. (See adjacent illustration.)

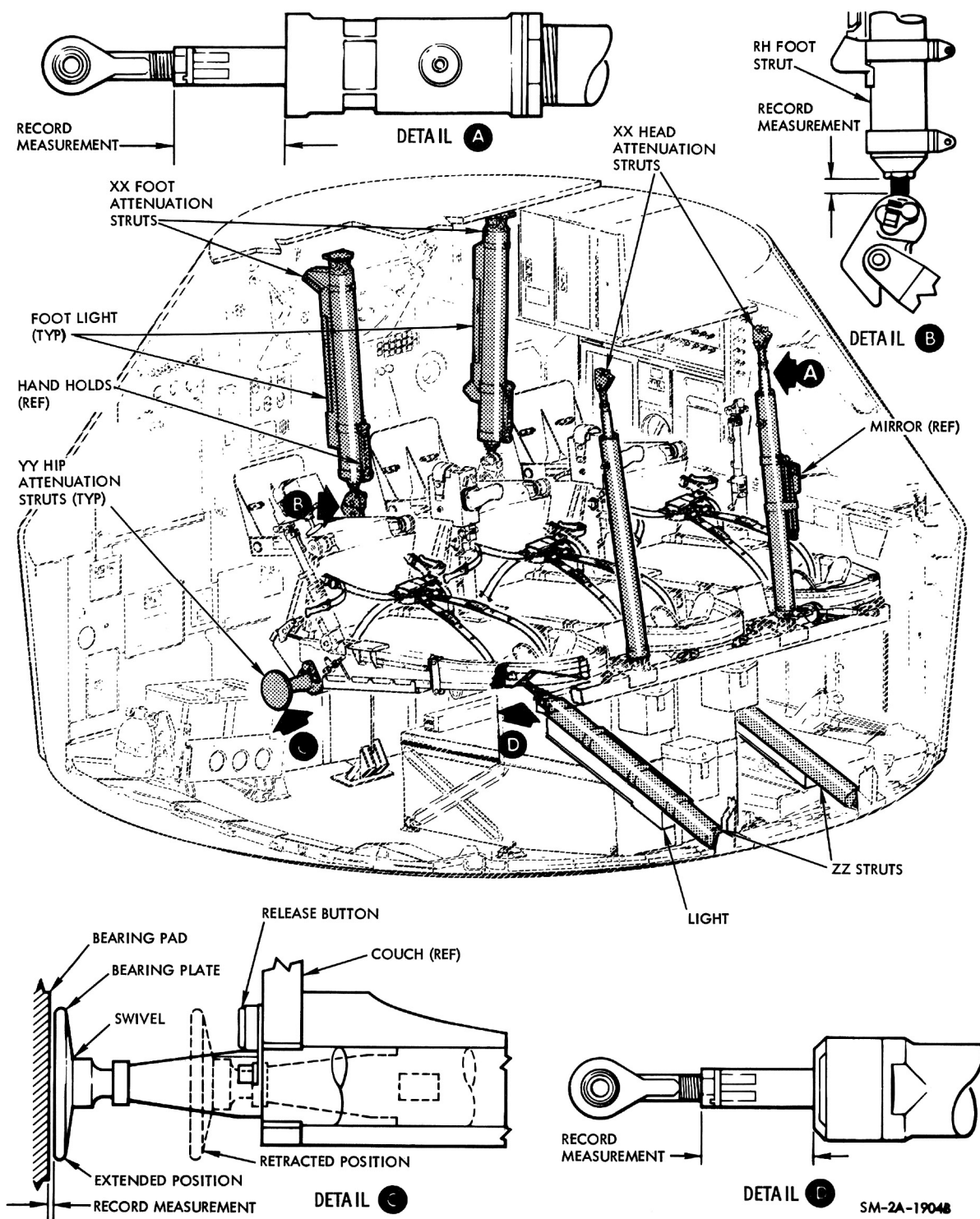
Record measurements: _____ RH, _____ LH

Remarks: _____

Date _____ Time _____ Signature _____

IMPACT ATTENUATION STRUT INSP/CTR COUCH REMOVAL

Sheet 3 of 7

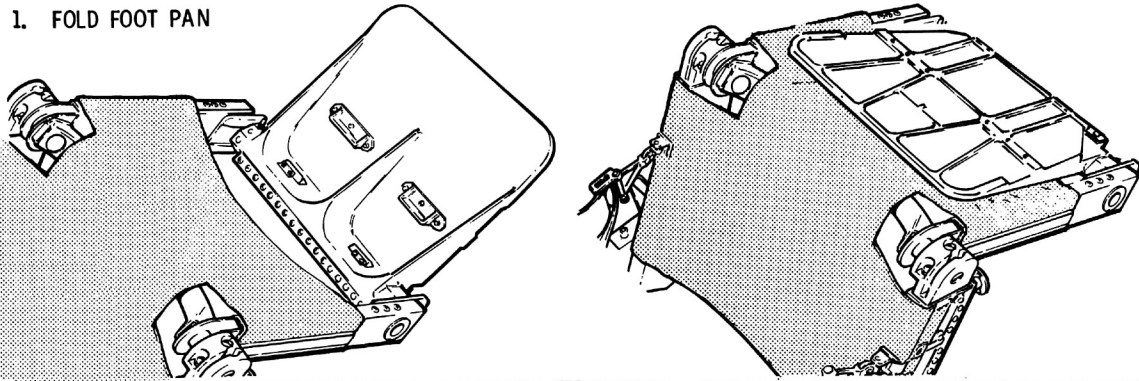


IMPACT ATTENUATION STRUT INSP/CTR COUCH REMOVAL

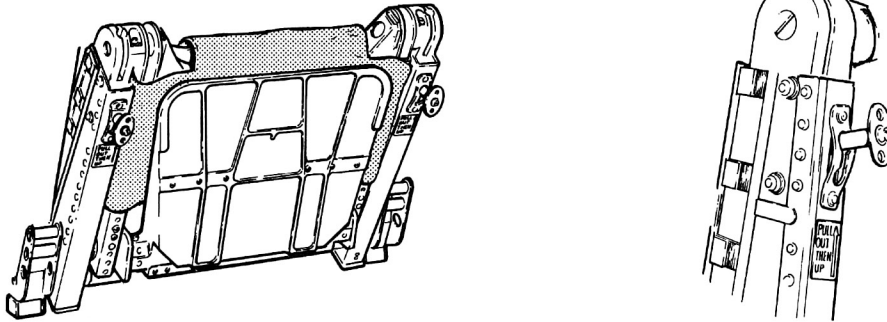
Sheet 4 of 7

FOLDING CENTER COUCH

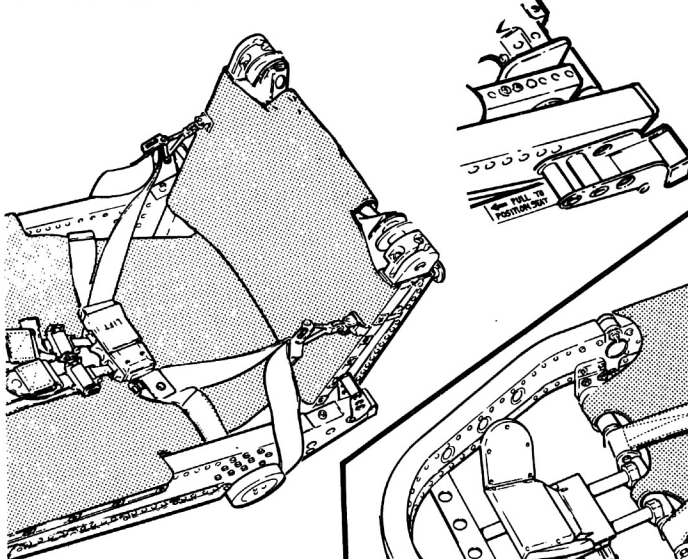
1. FOLD FOOT PAN



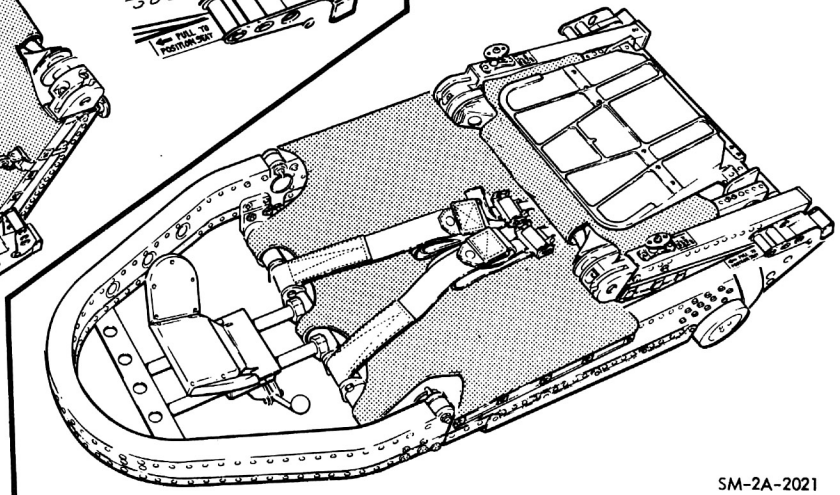
2. FOLD LEG PAN



3. FOLD SEAT PAN



4. CENTER COUCH FOLDED



SM-2A-2021

**IMPACT ATTENUATION STRUT INSP/CTR COUCH REMOVAL**

Sheet 5 of 7

CENTER COUCH REMOVAL

1. To facilitate access to the AEB the center couch may be removed as follows:
 - a. Fold foot pan.
 - b. Fold leg pan.
 - c. Fold seat pan.
 - d. Pull knob of hip beam clamp to engage socket-turning mechanism; then unscrew clamp to open (typical both sides). (See sheet 6 of 7.)

NOTE

If necessary, retract the Y-Y (side) struts to allow the center couch to be lowered. Retract strut by pressing release button and rotating strut so arrow moves away from dot; then push strut to retract.

- e. With hip beam clamps wide open, take a firm grip on hip area of center couch and push down (do not drop).
- f. Remove the two pip pins to the left/right of headrest. (See sheet 6 of 7.)
- g. Manipulate the center couch through the hatch opening.

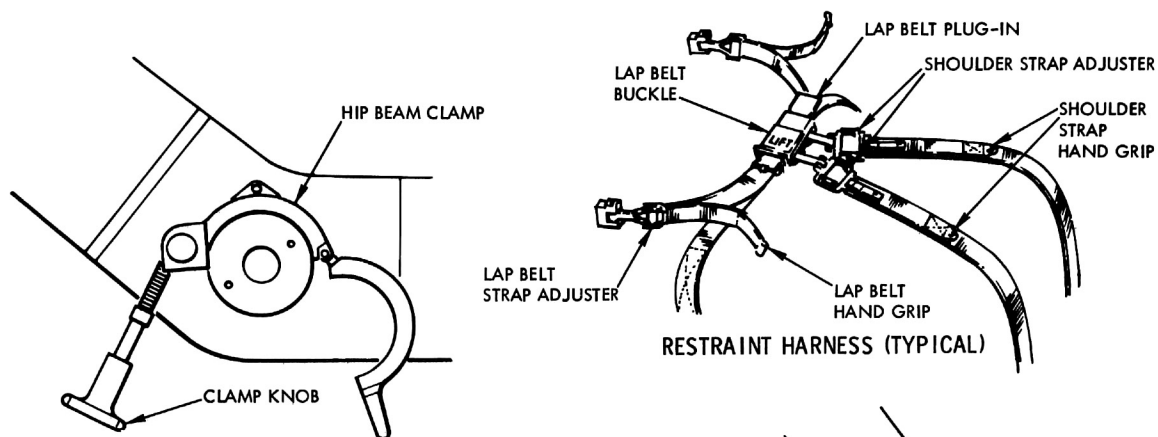
CENTER COUCH INSTALLATION

1. Install center couch as follows:
 - a. Completely fold couch. (See sheet 4 of 7.)
 - b. Manipulate couch so hip beams approach hip beam clamps from underside. (See sheet 6 of 7.)
 - c. Pull knob of hip beam clamp; then close and tighten clamp (typical both sides).
 - d. Reinstall two pip pins to the left/right of headrest. (See sheet 6 of 7.)

Date _____ Time _____ Signature _____

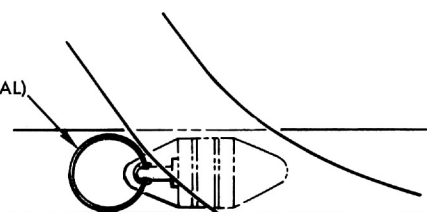
IMPACT ATTENUATION STRUT INSP/CTR COUCH REMOVAL

Sheet 6 of 7

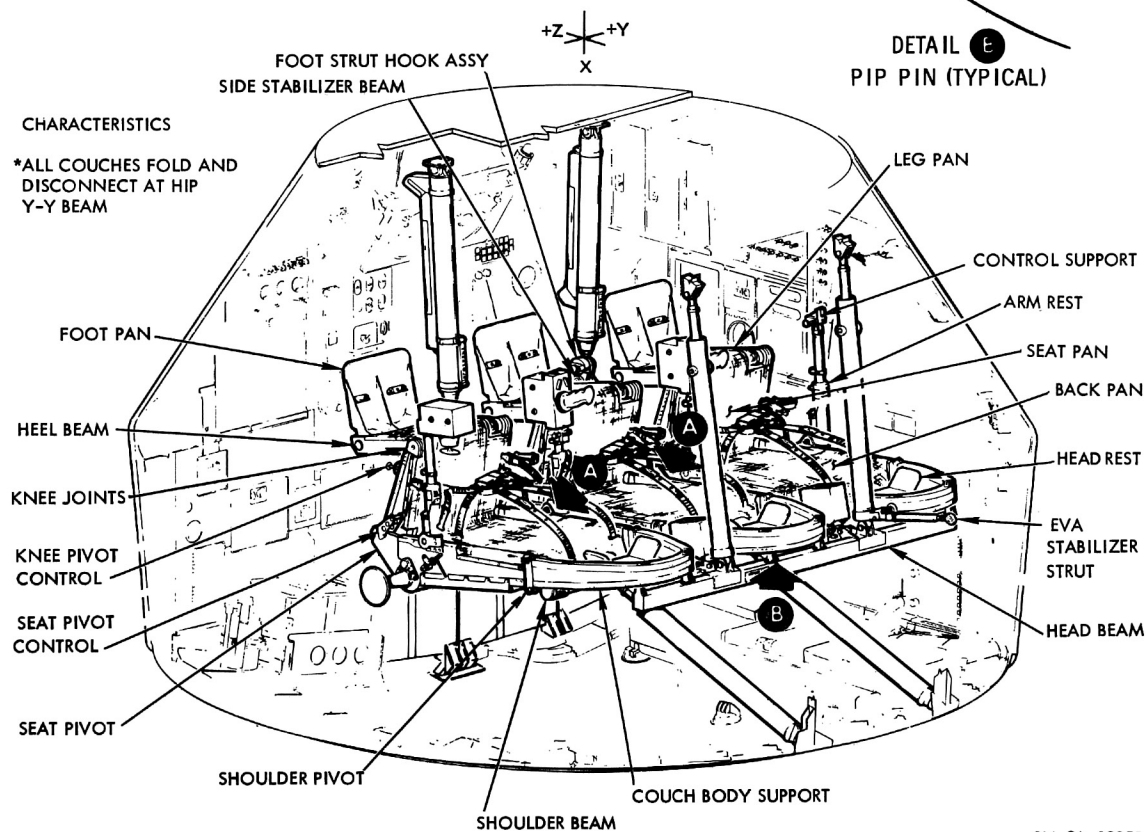


DETAIL A
HIP BEAM CLAMP ASSY (TYPICAL)

PIP PIN (TYPICAL)



DETAIL E
PIP PIN (TYPICAL)



SM-2A-1905B

IMPACT ATTENUATION STRUT INSP/CTR COUCH REMOVAL

Sheet 7 of 7

- e. Unfold seat pan.
- f. Unfold leg pan.
- g. Unfold foot pan.
- h. If Y-Y struts are retracted, extend the struts. Extend by pulling strut out and rotating until arrow aligns with dot (ball engages detent).

PACKAGING REQUIREMENTS

Not applicable.

Remarks :

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Date _____ Time _____ Signature _____

SM2A-08-SC109

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POTABLE WATER SAMPLES

Sheet 1 of 24

This procedure provides instructions for obtaining potable water samples from the HOT water port (FOOD PREPARATION WATER panel, No. 305) and the water gun.

IMPORTANT

It is mandatory that a positive accounting be made of all water taken from the CM. Notify Houston RCC via the PRS coordination circuit regarding the amount of water taken (or lost) from the CM.

NOTE

Should recovery be accomplished by other than the primary recovery ship, potable water samples will be obtained at the port of entry following off-loading of the CM.

SAFETY

1. Observe standard safety precautions when working in the CM.

PHOTOGRAPHIC REQUIREMENTS

1. None

TOOLS AND EQUIPMENT

Quantity	Nomenclature
2	Open end wrench, 1/2-inch
2	Open end wrench, 9/16-inch
2	Adjustable wrench, 6-inch
1	1000 ml sample container (chem) and sampling cap
1	500 ml sample container (chem) and sampling cap
2	500 ml sample container (micro) and sampling cap
1	20 ml sample container (chlorine)
2	10 ml sample container (vacutainer)
1	Waste container (30 ml)
125 ml	70% aqueous ethyl alcohol
1	Screwdriver, blade
1	Screwdriver, torq-set
1	Allen-head adapter, 5/32-inch
1	Socket set, 1/2-inch drive
1	Water sample tool kit

POTABLE WATER SAMPLES

Sheet 2 of 24

INSTRUCTIONS

1. Determine if system pressure is available as follows:
 - a. On panel 7, verify/place DIRECT O₂ valve at CLOSED position.
 - b. On panel 326, verify/place SURGE TANK and REPRESS PKG valves at ON position.
 - c. On panel 351, verify/place OXYGEN CONTROL PANEL MAIN REGULATOR valves (toggles) A and B at OPEN.
 - d. On panel 351, verify/place WATER & GLYCOL TANKS PRESSURE--REGULATOR and--RELIEF valves at BOTH.
 - e. Allow a minimum of 3 minutes for system pressure buildup, then take sample water at "FOOD PREPARATION WATER" panel 305.

NOTE

If no pressure is available to take sample, refer to procedure (D).

Date _____ Time _____ Signature _____

POTABLE WATER SAMPLES

Sheet 3 of 24

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POTABLE WATER SAMPLES

Sheet 4 of 24

INSTRUCTIONS (for obtaining hot water port samples)**NOTE**

Obtain hot water port samples prior to obtaining water gun samples.

2. Record the time sample is obtained on each container label of first sample taken.
3. Clean (swab) water outlet probe with aqueous ethyl alcohol solution before taking the first sample.

Caution

- Do not touch (contaminate) water outlet probe after cleaning.
- Allow all alcohol to evaporate prior to water outlet probe/flex line interface.

500 ML SAMPLE (CHEM)

1. Remove water outlet probe cover (located on panel 305).
2. Unwrap AWSD 500 ml - CHEM (not vacutainer port-wrapped separately) and connect AWSD flex line to the water outlet probe.
3. Verify tygon tubing inserted in outlet of waste container.
4. Open valve B (horizontal position).

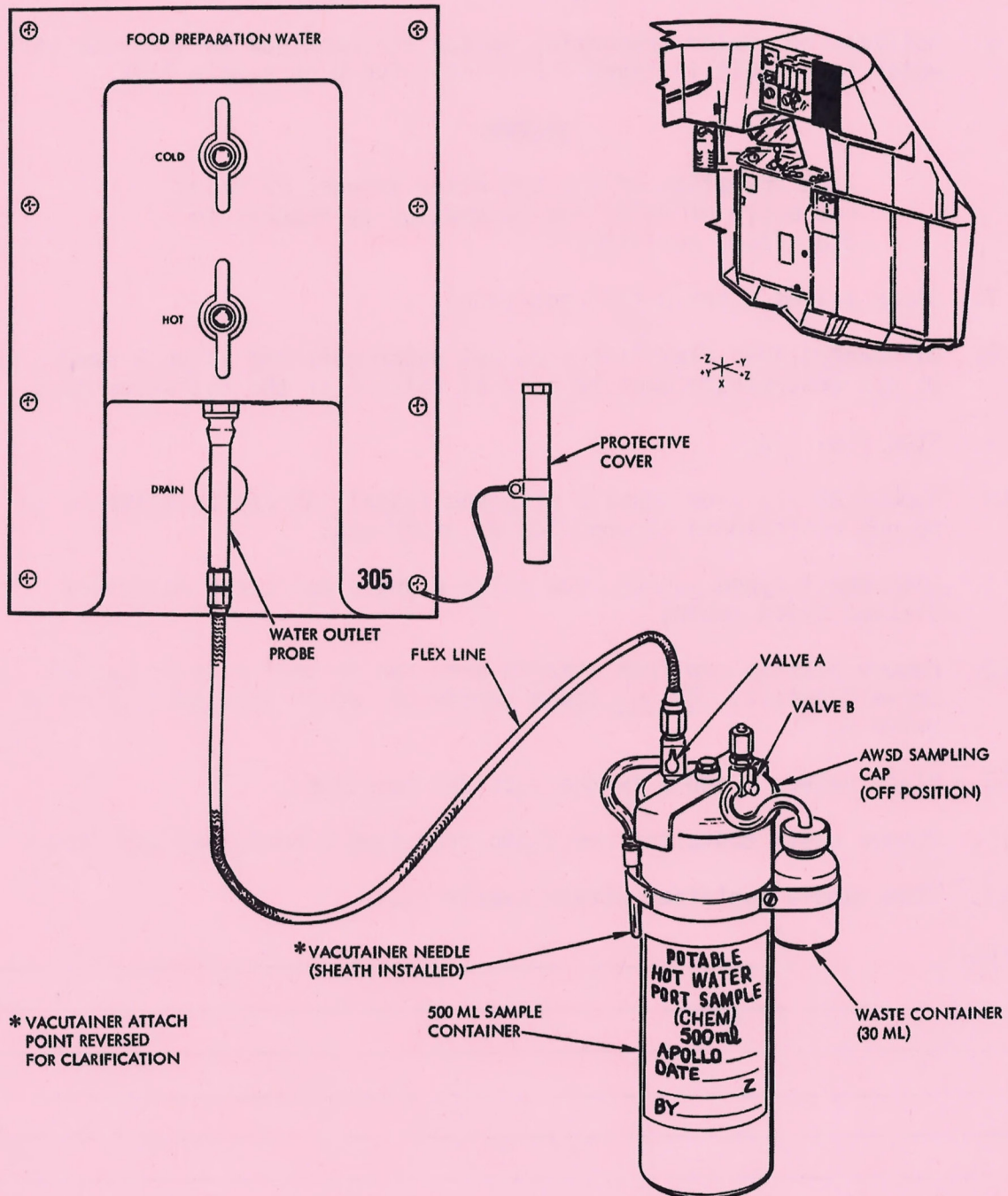
IMPORTANT

- As soon as 500 ML sample is taken, take a 20 ML sample for chlorine analysis.
- As soon as possible on board ship, measure chlorine count and record findings in "Remarks" column under 20 ML SAMPLE (CHLORINE).

Date _____ Time _____ Signature _____

POTABLE WATER SAMPLES

Sheet 5 of 24



SM-2A-2018A

POTABLE WATER SAMPLES

Sheet 6 of 24

INSTRUCTIONS (Cont)

5. Position valve A to the sampling position (vertical position).
6. Activate hot water triggering device and continue to activate until water is visible in tygon tubing at valve B on sample tank.

NOTE

Each actuation of the hot water trigger releases one ounce of water and automatically returns to the closed position.

7. Close valves A and B (45° position).
8. Disconnect AWSD flex line from hot water port and valve A sample port. Do not contaminate exposed port of valve A or the hot water port.
9. Stow flex line.
10. Remove AN cap from sterile wrap and install AN cap on valve A. Do not contaminate (touch) inside of AN cap.
11. Disconnect tygon tubing from valve B and plastic cap on outlet. Discard tygon tubing.
12. Remove plastic cap from sterile wrap and install plastic cap on valve B outlet. Do not touch inside of cap or exposed fitting on valve B.
13. Place valves A and B in the vertical position.
14. Remove waste container and clamp from sample container and stow.
15. Stow sample container within sample rack.

Remarks: _____

Date _____ Time _____ Signature _____

POTABLE WATER SAMPLES

Sheet 7 of 24

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POTABLE WATER SAMPLES

Sheet 8 of 24

INSTRUCTIONS (Cont)

20 ML SAMPLE (CHLORINE)

1. Collect 20 ml of hot water from the water outlet probe (in a suitable container) for chlorine analysis.

Remarks:

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Date _____ Time _____ Signature _____

POTABLE WATER SAMPLES

Sheet 9 of 24

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POTABLE WATER SAMPLES

Sheet 10 of 24

INSTRUCTIONS (Cont)

500 ML SAMPLE (MICRO)

1. Unwrap AWSO, 500 ml MICRO (not vacutainer port-wrapped separately), and connect AWSO flex line to the water outlet probe.
2. Verify tygon tubing inserted in outlet of waste container.
3. Open valve B (horizontal position).
4. Position valve A to the sample position (vertical position).
5. Activate hot water triggering device and continue to activate until water is visible in tygon tubing at valve B on sample tank.

NOTE

Each actuation of the hot water trigger releases one ounce of water and automatically returns to the closed position.

6. Close valves A and B (45° position).
7. Remove tygon tubing from valve B and stow.
8. Remove plastic cap from sterile wrap and install cap on valve B outlet. Do not touch inside of cap or exposed port of valve B.
9. Place valve B in vertical position.
10. Remove waste container and clamp from sample container. Stow clamp.
11. Remove cap from waste container and store the cap.

NOTE

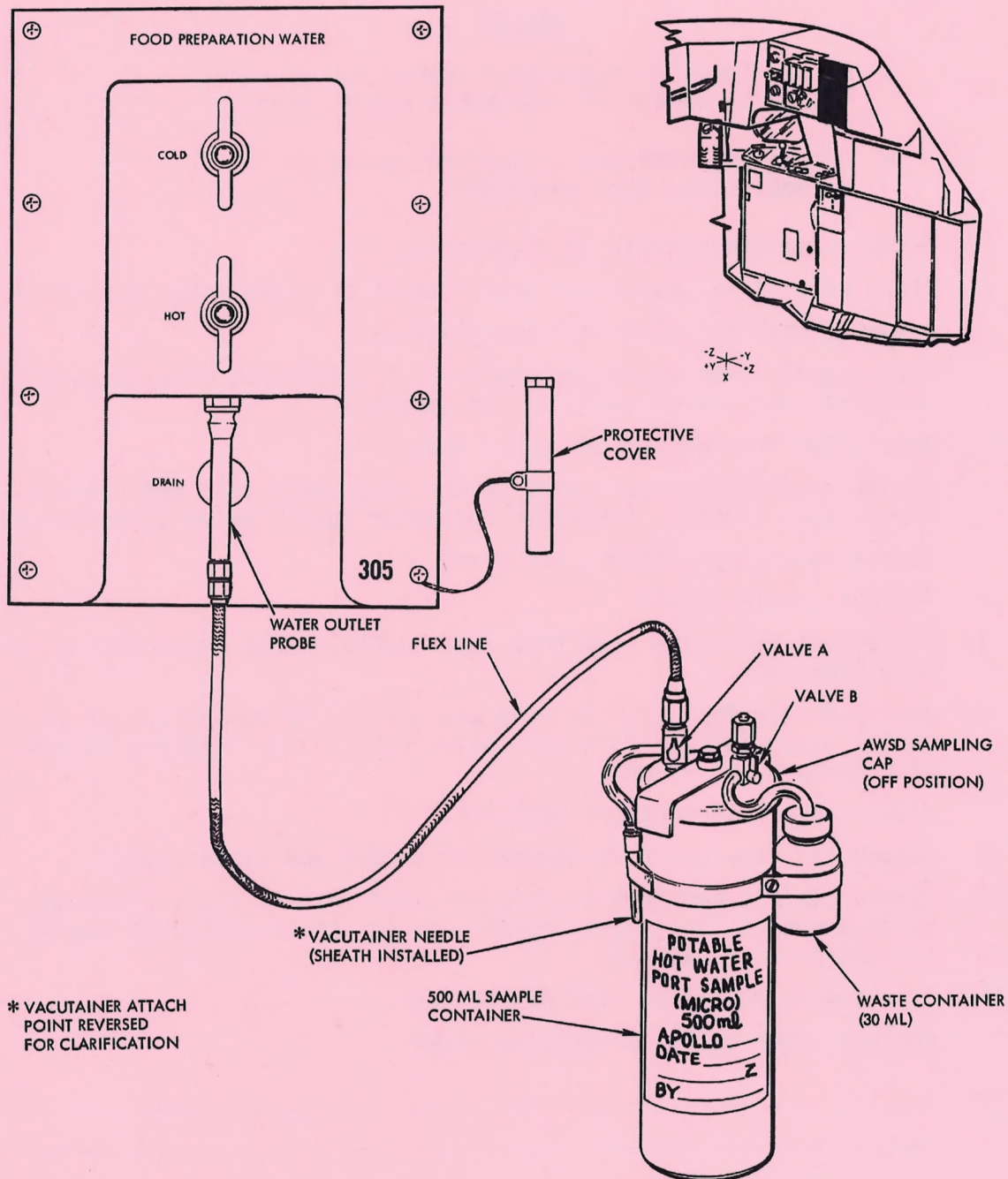
The waste container will be used to collect overflow from the vacutainer needle during the collection of the 10 ml samples.

Remarks: _____

Date _____ Time _____ Signature _____

POTABLE WATER SAMPLES

Sheet 11 of 24



SM-2A-1684D

POTABLE WATER SAMPLES

Sheet 12 of 24

INSTRUCTIONS (Cont)

10 ML SAMPLE

NOTE

- Do not touch (contaminate) rubber top of vacutainer or needle of vacutainer sample port.
- Remove and dump waste container prior to accomplishing this procedure.

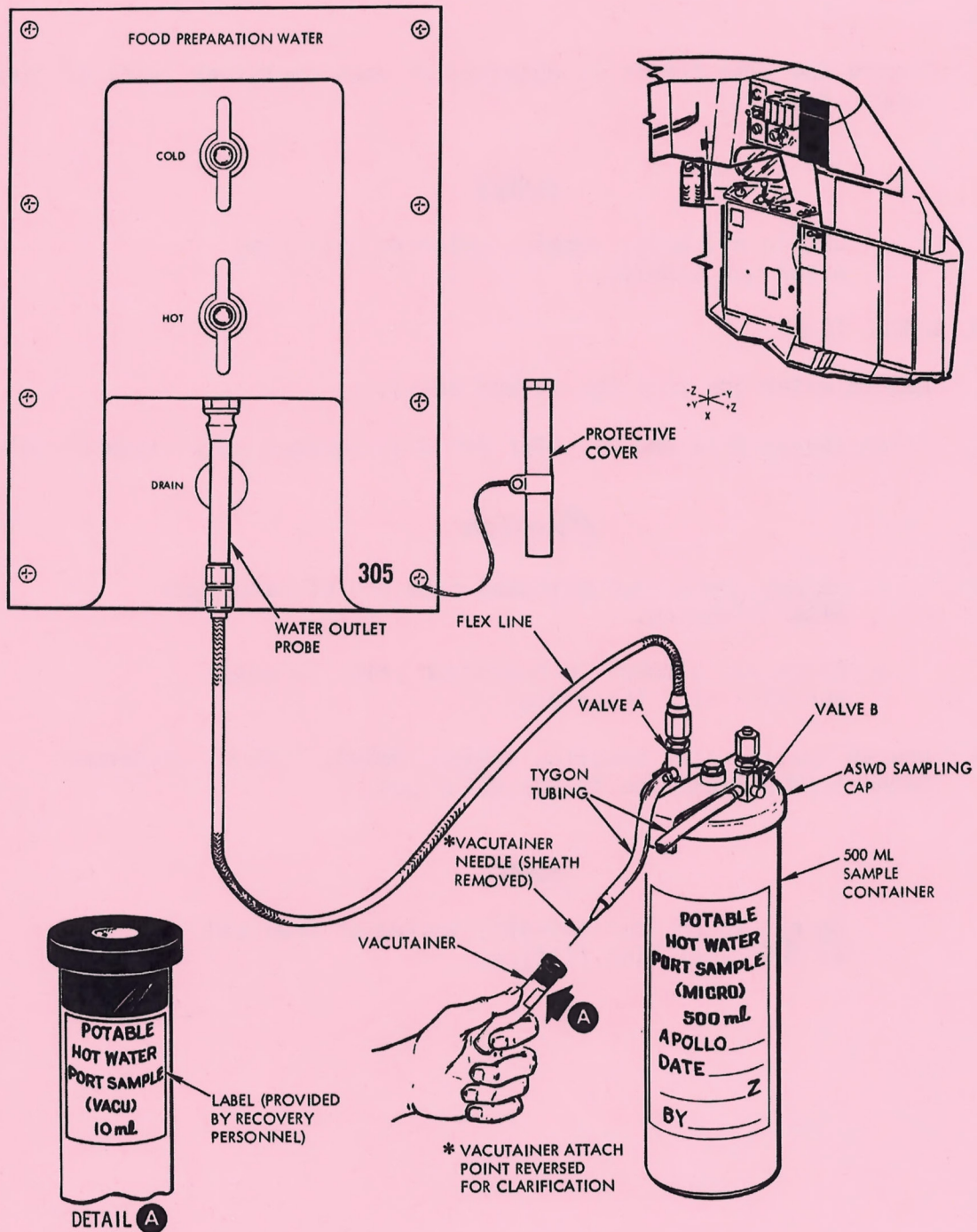
1. Remove vacutainer sample port wrapping.
2. Place valve A to vacutainer sample position (horizontal position).
3. Remove sheath on needle of vacutainer port.
4. Place needle over waste container and activate hot water supply (pull plunger) until water comes out of needle.
5. Remove top from vacutainer outer container.
6. Plunge vacutainer sample port needle into vacutainer and collect 10 ml water sample. (Activate hot water supply valve as necessary.)
7. Remove vacutainer, recap, and store.
8. Replace needle sheath.
9. Disconnect AWSO flex line from water outlet probe and sampling cap. Stow flex line.
10. Remove AN cap from sterile wrap and install AN cap on top of valve A. Do not touch inside of cap or outlet of valve A. Tighten AN cap with an open end wrench.
11. Place valve A to vertical position.
12. Remove and stow sheathed vacutainer needle and tygon tubing.
13. Remove plastic cap from sterile wrap and install plastic cap on valve A outlet (horizontal port). Do not touch inside of cap or exposed port of valve A.
14. Stow sample container with sample rack.
15. Replace water outlet protective cover.

Remarks: _____

Date _____ Time _____ Signature _____

POTABLE WATER SAMPLES

Sheet 13 of 24



SM-2A-1685C

POTABLE WATER SAMPLES

Sheet 14 of 24

INSTRUCTIONS (for obtaining water gun samples)

GENERAL

1. Record the time sample is obtained on each container label of first sample taken.

NOTE

Obtain hot water samples prior to obtaining water gun samples.

1000 ML SAMPLE (CHEM)

1. Remove water gun from its stowed position.
2. Clean (swab) free end of water gun with aqueous ethyl alcohol solution.

Caution

- Do not touch (contaminate) free end of water gun after cleaning.
 - Allow all alcohol to evaporate prior to water gun/flex line interface.
3. Unwrap Apollo water sampling device (AWS D), 1000 ml container. Connect AWS D flex line to the water gun.

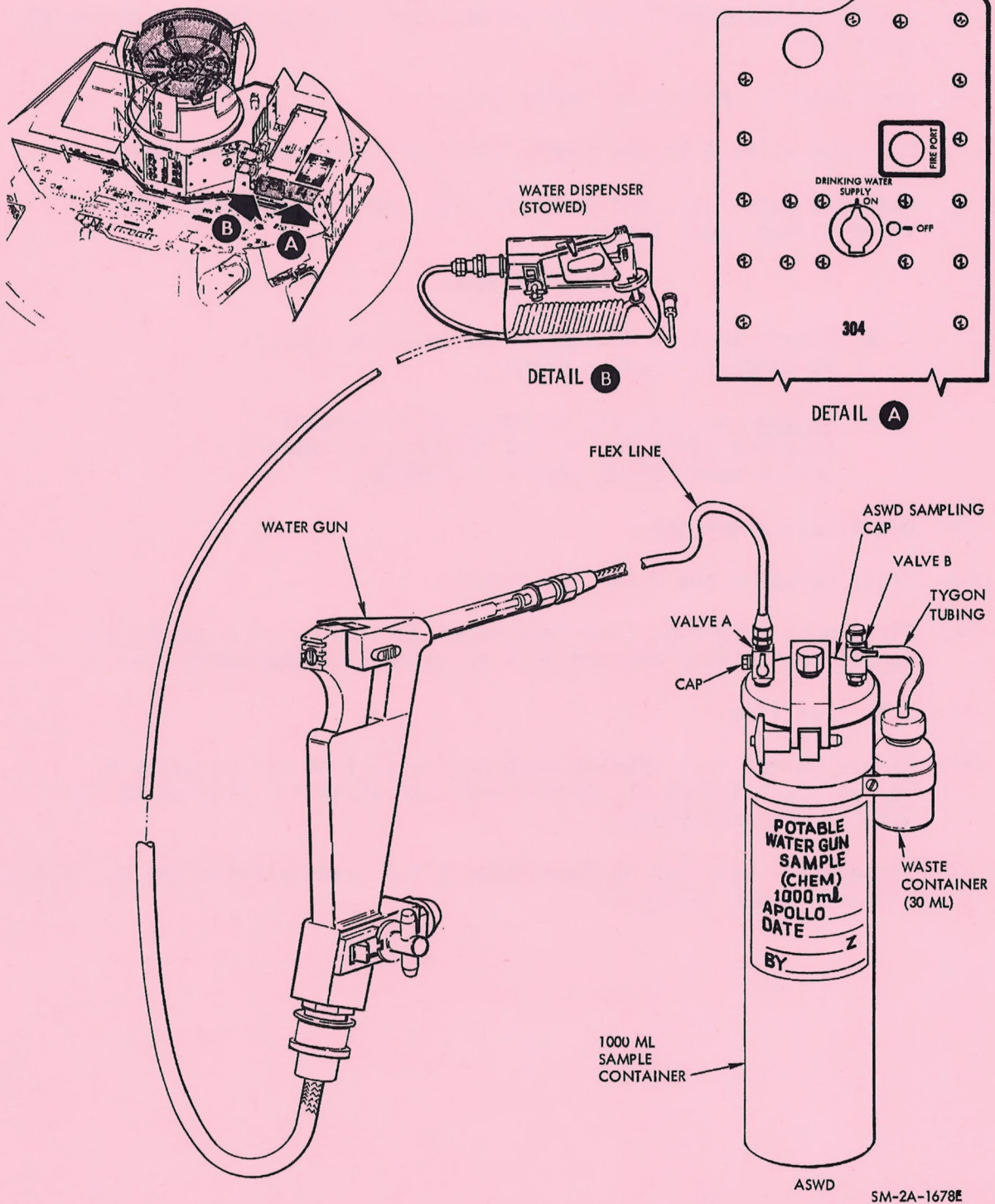
NOTE

Do not touch (contaminate) inside of free end of AWS D flex line fitting.

Date _____ Time _____ Signature _____

POTABLE WATER SAMPLES

Sheet 15 of 24



POTABLE WATER SAMPLES

Sheet 16 of 24

INSTRUCTIONS (Cont)

4. Verify tygon tubing is in waste container.
5. Verify DRINKING WATER SUPPLY valve (panel 304) positioned to the ON position.
6. Open valve B (horizontal position).
7. Position valve A to the sample position (vertical position).
8. Activate water gun, and maintain flow until water exits through valve B into tygon tubing.

IMPORTANT

- Ensure that 20 ML sample for chlorine analysis is taken from water pistol.
 - As soon as possible on board ship, measure chlorine count and record findings in "Remarks" column under 20 ML SAMPLE (CHLORINE).
9. Deactivate water gun.
 10. Close valves A and B (45° position).
 11. Disconnect AWSO flex line from water gun and valve A sample cap. Do not contaminate exposed port of valve A or the water gun.
 12. Stow flex line.
 13. Remove AN cap from sterile wrap and install AN cap on valve A. Do not touch inside of cap or outlet of valve A. Tighten AN cap with an open end wrench.
 14. Disconnect tygon tubing from valve B and place plastic cap on outlet. (Discard tygon tubing.)

Date _____ Time _____ Signature _____

POTABLE WATER SAMPLES

Sheet 17 of 24

INSTRUCTIONS (Cont)

15. Remove plastic cap from sterile wrap and install cap on valve B outlet.
16. Place valves A and B in the vertical position.
17. Remove waste container and clamp from sample container.
18. Stow sample container within sample rack.

Remarks :

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Date _____ Time _____ Signature _____

POTABLE WATER SAMPLES

Sheet 18 of 24

INSTRUCTIONS (Cont)

20 ML SAMPLE (CHLORINE)

1. Collect 20 ml of water from the water gun (in a suitable container) for chlorine analysis.

Remarks : _____

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Date _____ Time _____ Signature _____

POTABLE WATER SAMPLES

Sheet 19 of 24

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POTABLE WATER SAMPLES

Sheet 20 of 24

INSTRUCTIONS (Cont)

500 ML SAMPLE (MICRO)

NOTE

Do not unwrap vacutainer port.

1. Unwrap AWSD, 500 ml MICRO container (not vacutainer port-wrapped separately) and attach free end of flex line to water gun.

NOTE

Do not contaminate inside of free end of flex line fitting.

2. Verify tygon tubing is in waste container.
3. Open valve B (horizontal position).
4. Position valve A to the sample position (vertical position).
5. Activate water gun; maintain flow until water exits through valve B into tygon tubing.
6. Deactivate water gun.
7. Close valves A and B (45° position).
8. Remove tygon tubing from valve B and stow.
9. Remove plastic cap from sterile wrap and install plastic cap on valve B. Do not touch inside of cap, horizontal port of valve B.
10. Place valve B to vertical position.
11. Remove waste container and clamp. Store clamp.
12. Remove cap from waste container and store the cap.

NOTE

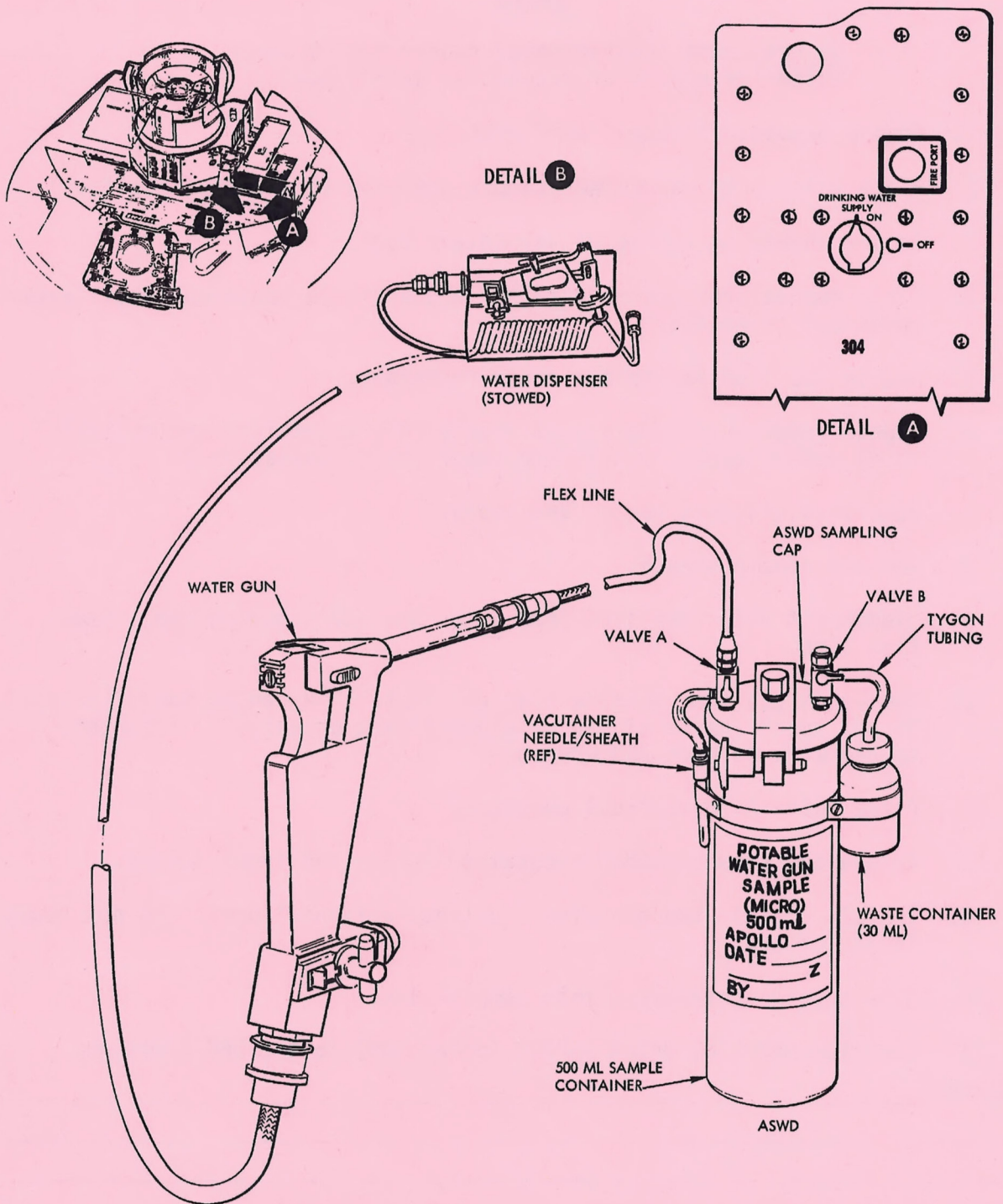
Waste container will be used to collect overflow from the vacutainer needle during the collection of the 10 ml sample.

Remarks: _____

Date _____ Time _____ Signature _____

POTABLE WATER SAMPLES

Sheet 21 of 24



SM-2A-1679F

POTABLE WATER SAMPLES

Sheet 22 of 24

INSTRUCTIONS (Cont)

10 ML SAMPLE (VACU)

NOTE

Do not touch (contaminate) rubber top of vacutainer or needle of vacutainer sample port.

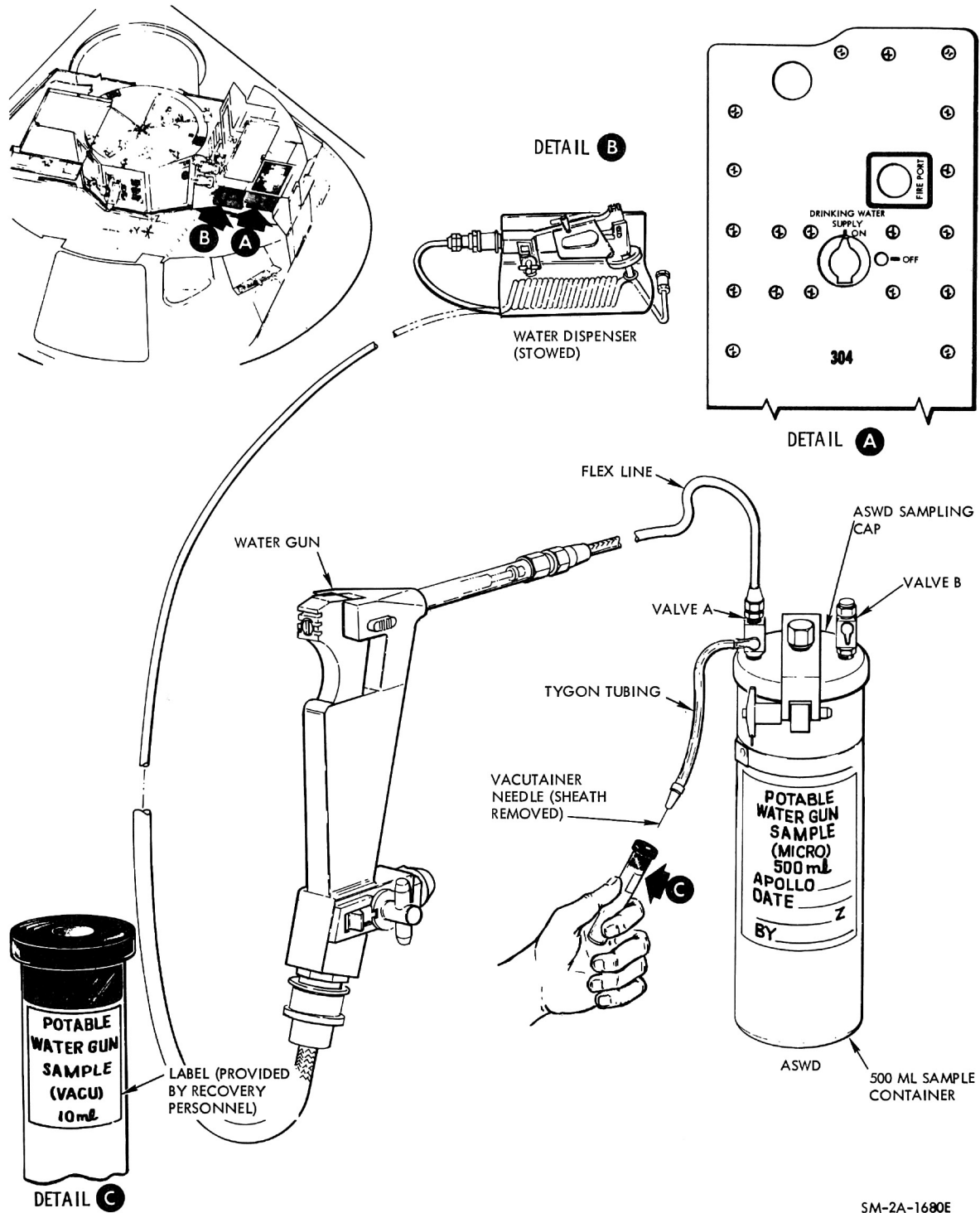
1. Remove vacutainer sample port wrapping.
2. Place valve A to vacutainer sample position (horizontal position).
3. Remove sheath on needle of vacutainer port.
4. Place needle over waste container and activate water gun until water comes out of needle.
5. Remove top from vacutainer outer container.
6. Plunge vacutainer sample port needle into vacutainer and collect 10 ml water sample. (Activate water gun as necessary.)
7. Remove vacutainer; recap, and store.
8. Replace needle sheath.
9. Disconnect AWSO flex line from water gun and sampling cap. Stow flex line.
10. Remove AN cap from sterile wrap and install AN cap on top of valve A. Do not touch inside of cap or exposed port on valve A. Tighten AN cap with an open end wrench.
11. Place valve A to vertical position.
12. Remove and stow sheathed vacutainer needle and tygon tubing.
13. Install plastic cap on valve A outlet horizontal port. Do not touch inside of cap.
14. Stow sample container within sample rack.
15. Position DRINKING WATER SUPPLY (panel 304) to the OFF position.

Remarks: _____

Date _____ Time _____ Signature _____

POTABLE WATER SAMPLES

Sheet 23 of 24



SM-2A-1680E

SM2A-08-SC109

Sheet 24 of 24

PACKAGING REQUIREMENTS

1. Package samples in appropriate container for return shipment to MSC.

Remarks : _____

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Date _____ Time _____ Signature _____

WASTE WATER SAMPLES

Sheet 1 of 10

This procedure provides instructions for obtaining waste water samples from the Water Control Panel (No. 325) WASTE TANK SERVICING port.

IMPORTANT

It is mandatory that a positive accounting be made of all water taken from the CM. Notify Houston RCC via the PRS coordination circuit regarding the amount of water taken (or lost) from the CM.

NOTE

Should recovery be accomplished by other than the primary recovery ship, waste water samples will be obtained at the port of entry following off-loading of the CM.

SAFETY

1. Observe standard safety precautions when working in the CM.

PHOTOGRAPHIC REQUIREMENTS

1. None

TOOLS AND EQUIPMENT

Quantity	Nomenclature
2	Open end wrench, 1/2-inch
2	Open end wrench, 9/16-inch
2	Adjustable wrench, 6-inch
1	1000 ml sample container (chem) and sampling cap
1	500 ml sample container (micro) and sampling cap
1	10 ml sample container (vacutainer)
1	Waste container (30 ml)
125 ml	70% aqueous ethyl alcohol
1	T-handle, 5/32-inch
1	Screwdriver, blade
1	Screwdriver, torq-set
1	Allen-head adapter, 5/32-inch
1	Allen-head adapter, 7/32-inch

Date _____ Time _____ Signature _____

WASTE WATER SAMPLES

Sheet 2 of 10

INSTRUCTIONS

1. Determine if system pressure is available as follows:
 - a. On panel 7, verify/place DIRECT O₂ valve at CLOSED position.
 - b. On panel 326, verify/place SURGE TANK and REPRESS PKG valves at ON position.
 - c. On panel 351, verify/place OXYGEN CONTROL PANEL REGULATOR valves (toggles) A and B at OPEN.
 - d. On panel 351, verify/place WATER & GLYCOL TANKS PRESSURE - REGULATOR and - RELIEF valves at BOTH.
 - e. Allow a minimum of three minutes for system pressure build-up take samples at "WASTE WATER SERVICING" panel 352.

NOTE

If no pressure is available to take sample,
refer to procedure (D).

Date _____ Time _____ Signature _____

WASTE WATER SAMPLES

Sheet 3 of 10

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WASTE WATER SAMPLES

Sheet 4 of 10

INSTRUCTIONSGENERAL

2. Record the time sample is obtained on each container label of first sample taken.

1000 ML SAMPLE (CHEM)

1. Remove protective plug from WASTE TANK SERVICING port.
2. Clean (swab) servicing port with aqueous ethyl alcohol solution.

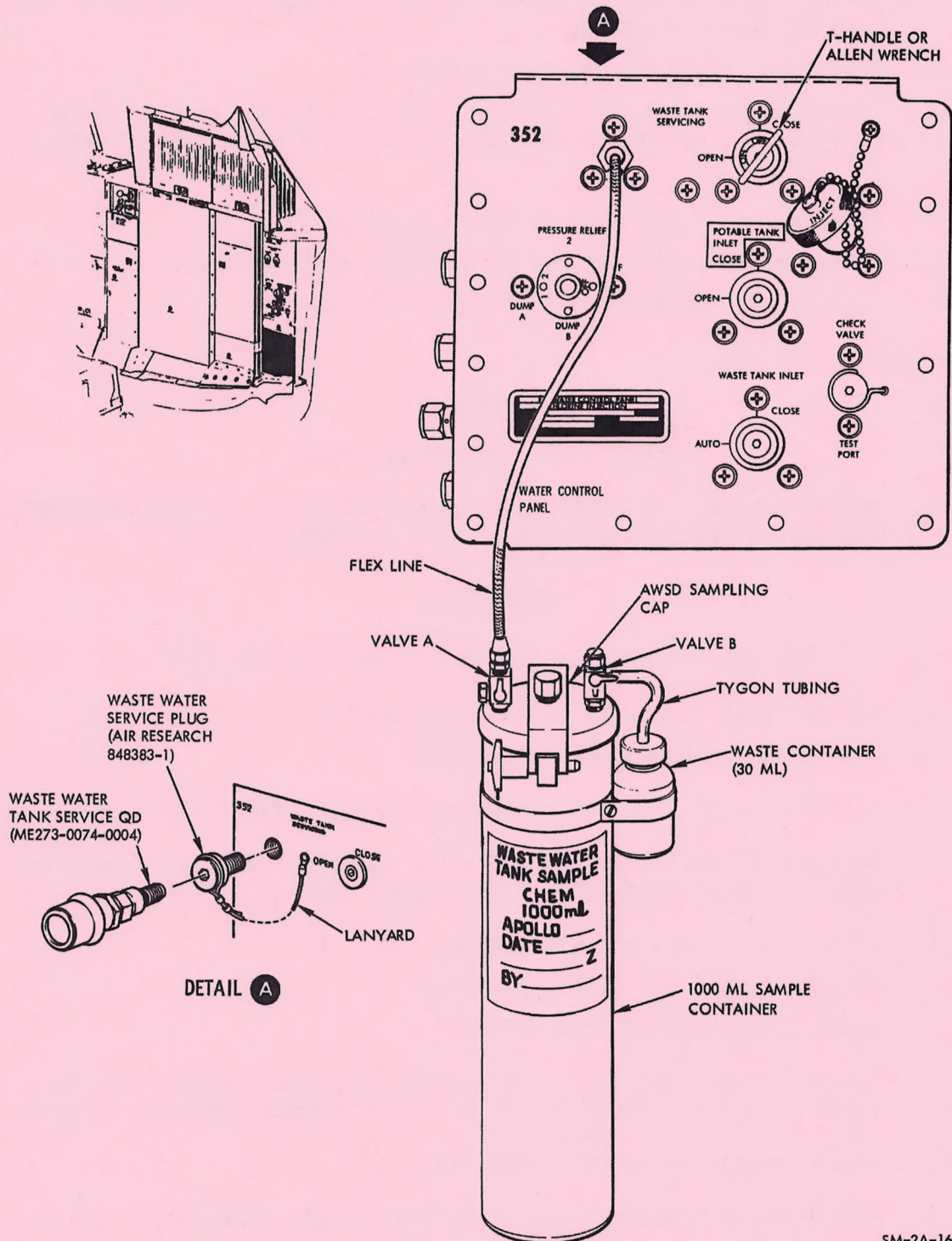
Caution

- Do not touch (contaminate) servicing port after cleaning.
 - Allow all alcohol to evaporate prior to servicing port/flex line interface.
 - Do not contaminate inside of flex line fitting.
3. Unwrap Apollo water sampling device (AWSD), 1000 ml container and connect AWSD flex line (using a 1/4-inch union and O-ring) to servicing port.
 4. Verify tygon tubing is in waste container.
 5. Open valve B (horizontal position).
 6. Position valve A to the sample position (vertical position).
 7. Position WASTE TANK SERVICING valve to OPEN; maintain flow until water exits through valve B into tygon tubing.
 8. Close WASTE TANK SERVICING valve.
 9. Close valves A and B (45° position).
 10. Disconnect AWSD flex line from sample cap and waste tank servicing port. Do not contaminate exposed port of valve A or waste water servicing port.

Date _____ Time _____ Signature _____

WASTE WATER SAMPLES

Sheet 5 of 10



SM-2A-1682F

WASTE WATER SAMPLES

Sheet 6 of 10

INSTRUCTIONS (Cont)

11. Remove AN cap from sterile wrap and install AN cap on valve A. Do not touch inside of cap or outlet of valve A. Tighten AN cap with an open end wrench.
12. Disconnect tygon tubing from sample cap.
13. Remove plastic cap from sterile wrap and install on horizontal port of valve B. Do not contaminate inside of plastic cap or exposed valve B port.
14. Place valves A and B to vertical position.
15. Remove waste container and clamp from sample container.
16. Stow sample container within sample rack.

500 ML SAMPLE (MICRO)

NOTE

Do not unwrap vacutainer port.

1. Unwrap AWSO 500 ml MICRO (not vacutainer port - wrapped separately) and attach free end of flex line to service port.

Caution

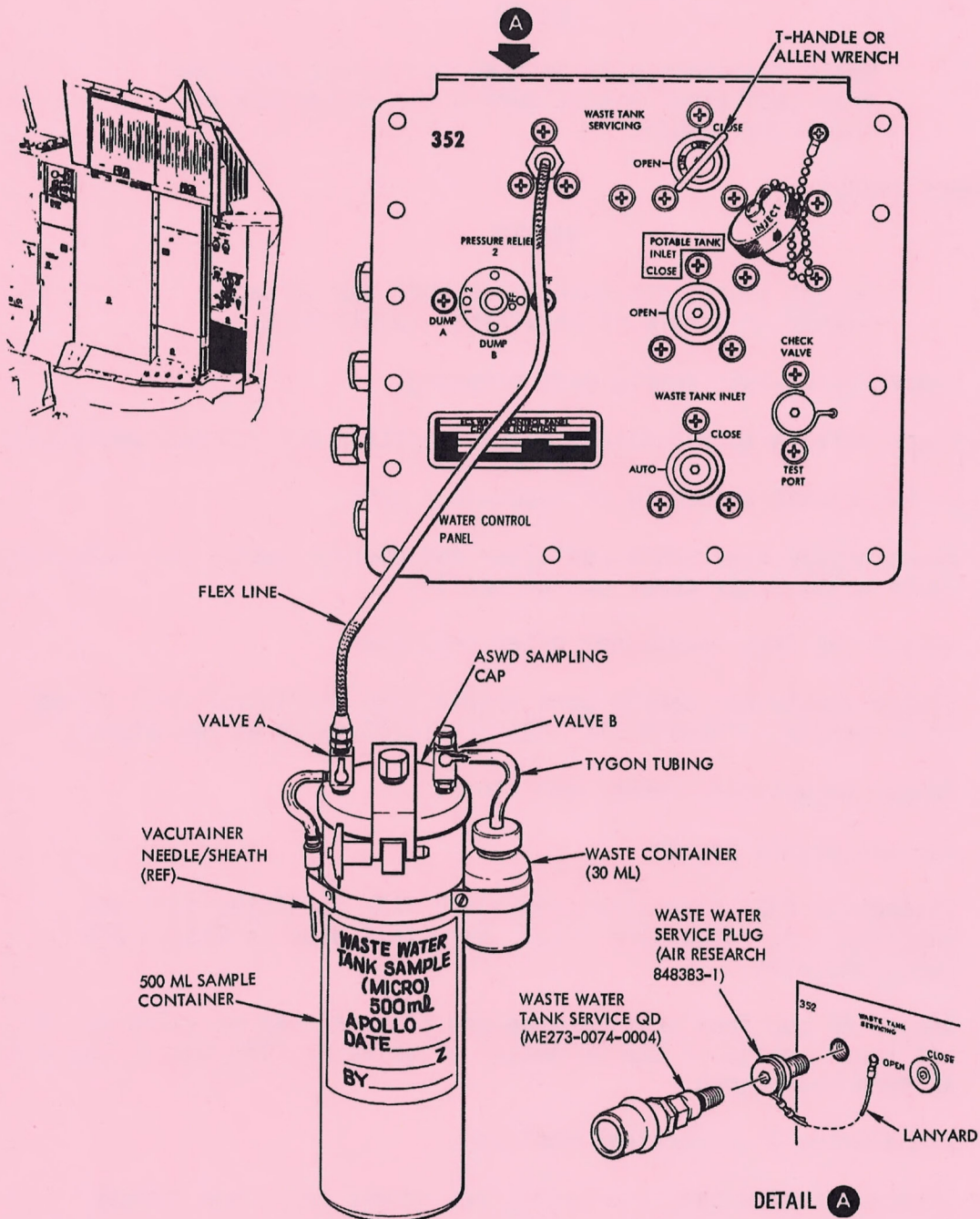
Do not contaminate inside free end of flex line.

2. Verify tygon tubing is in waste container.
3. Open valve B (horizontal position).
4. Position valve A to the sample position (vertical position).
5. Position WASTE TANK SERVICING valve to OPEN; maintain flow until water exits through valve B into tygon tubing.
6. Close WASTE TANK SERVICING valve.
7. Close valves A and B (45° position).
8. Remove tygon tubing from valve B.
9. Remove plastic cap from sterile wrap and place plastic cap on valve B. Do not touch inside of cap or exposed port of valve B.
10. Place valve B in vertical position.
11. Remove waste container and clamp from sample container. (Stow clamp.)

Date _____ Time _____ Signature _____

WASTE WATER SAMPLES

Sheet 7 of 10



SM-2A-1771D

WASTE WATER SAMPLES

Sheet 8 of 10

INSTRUCTIONS (Cont)

12. Remove cap from waste container. (Stow clamp.)

NOTE

Waste container will be used to collect overflow from vacutainer needle during the collection of the 10 ml sample.

10 ML SAMPLE (VACU)

NOTE

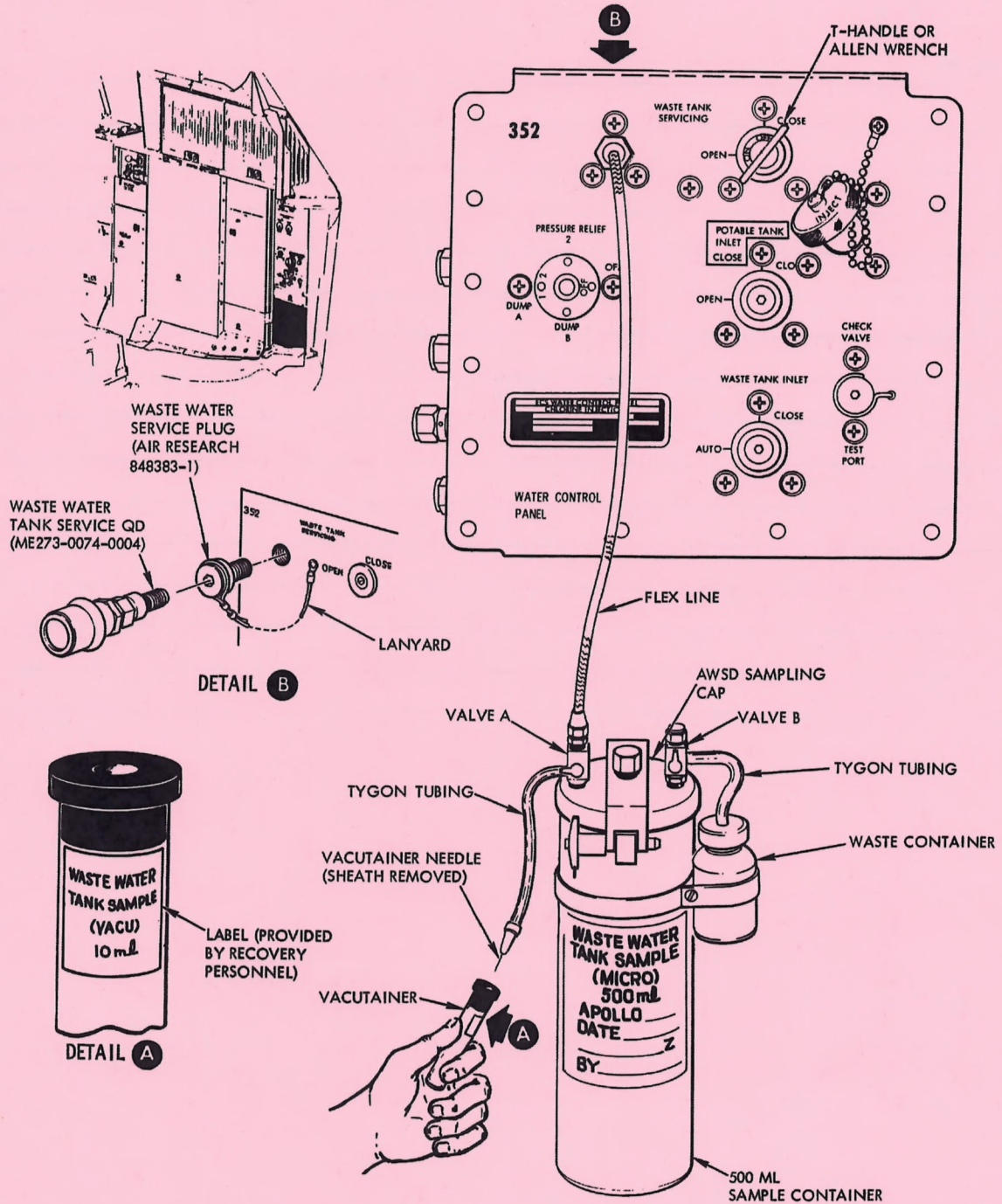
Do not touch (contaminate) rubber top of vacutainer or needle of vacutainer sample port.

1. Remove vacutainer sample port wrapping.
2. Place valve A to vacutainer sample position (horizontal position).
3. Remove sheath on needle of vacutainer port.
4. Place needle over waste container and operate waste tank servicing valve until water comes out of needle.
5. Remove top from vacutainer outer container.
6. Plunge vacutainer sample port needle into vacutainer and collect 10 ml sample. (Open WASTE TANK SERVICING valve as necessary.)
7. Remove vacutainer, recap, and store.
8. Replace needle sheath.
9. Disconnect AWSO flex line from WASTE TANK SERVICING port and sampling cap. Stow flex line. Reinstall plug in WASTE TANK SERVICING port.
10. Remove AN cap from sterile wrap and place AN cap on valve A. Do not touch inside of cap or outlet of valve A. Tighten AN cap with an open end wrench.
11. Place valve A to vertical position.
12. Remove and stow sheathed vacutainer needle and tygon tubing.
13. Remove plastic cap from sterile wrap and place plastic cap on valve A outlet. Do not touch inside of cap or outlet of valve A.
14. Stow sample container within sample rack.

Date _____ Time _____ Signature _____

WASTE WATER SAMPLES

Sheet 9 of 10



SM-2A-1683F

WASTE WATER SAMPLES

Sheet 10 of 10

PACKAGING REQUIREMENTS

1. Package samples in appropriate container for return shipment to MSC.

Remarks: _____

Date _____ Time _____ Signature _____

Procedure 11 deleted.

■

DATA STORAGE EQUIPMENT (DSE) TAPE REMOVAL

Sheet 1 of 7

This procedure provides instructions for removing the Data Storage Equipment (DSE) tape from the DSE.

SAFETY

1. Observe standard safety precautions when working in the CM.
2. Avoid actuating any switches, controls, etc.

PHOTOGRAPHIC REQUIREMENTS

None.

TOOLS AND EQUIPMENT

Quantity	Nomenclature
1	Allen-head adapter, 3/16-inch
1	Allen-head adapter, 5/32-inch
1	Ratchet set, 1/4-inch drive
1 ea	Screwdriver (torq-set), #3 and #4
1 ea	Screwdriver (torq-set), #12 and #14

INSTRUCTIONS

1. Remove closeout panel (V36-334103) as follows:

NOTE

- The panel rests on spacers held by 5 torq-set screws which do not have to be removed.
 - It is not necessary to remove the row of AN screws securing panel halves.
- a. Disengage 10 Calfax fasteners (P/N CA1824) securing closeout panel to LEB structure (4 at top and 6 in second row).
 - b. Pull back on upper portion of panel and lift panel free.
2. Remove and stow closeout panel.

NOTE

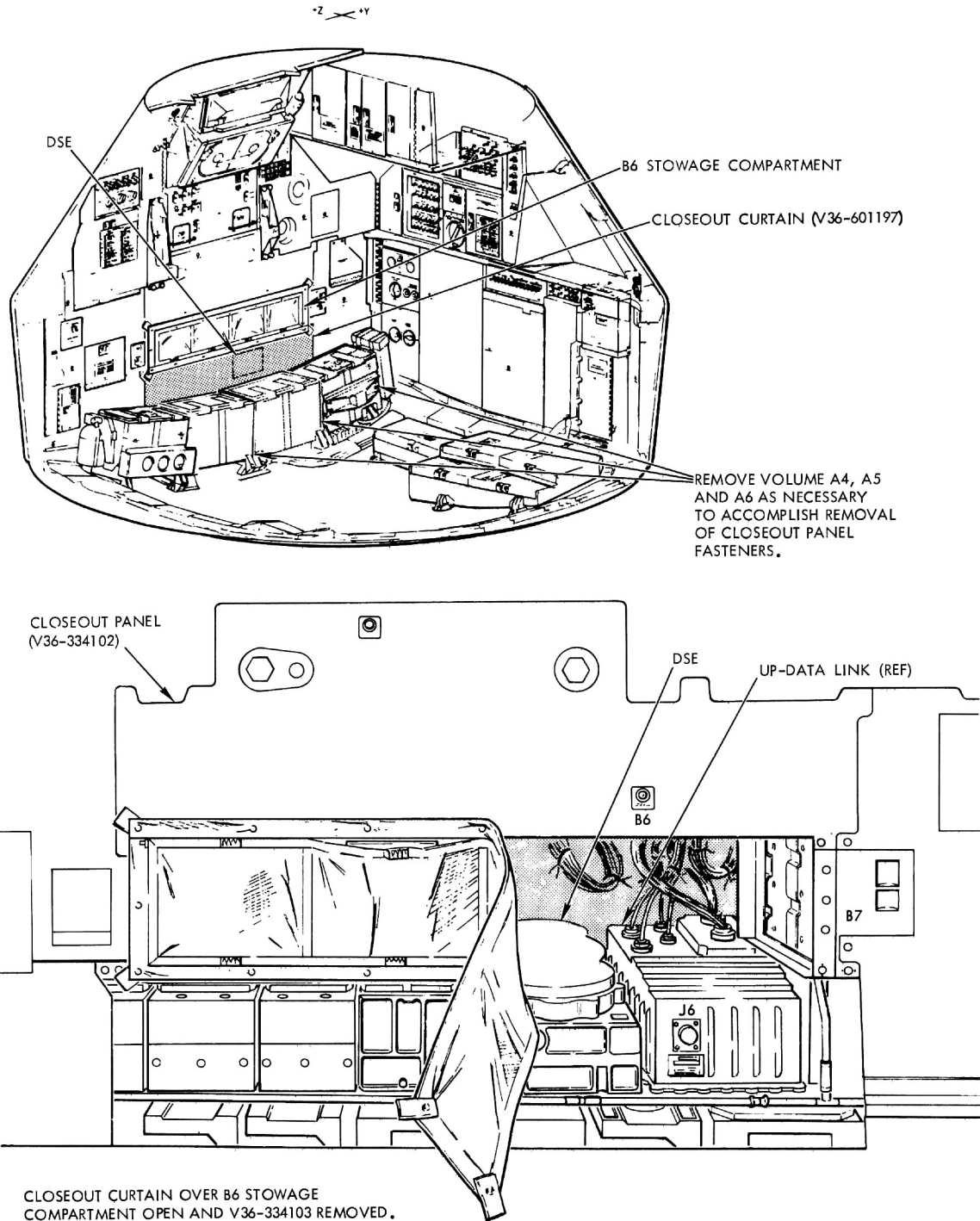
Steps 3 through 6 are required for nonlunar landing missions only.

3. Open B6 stowage compartment cover.

Date _____ Time _____ Signature _____

DATA STORAGE EQUIPMENT (DSE) TAPE REMOVAL

Sheet 2 of 7



SM-2A-1704D

Data Storage Equipment (DSE)

DATA STORAGE EQUIPMENT (DSE) TAPE REMOVAL

Sheet 3 of 7

INSTRUCTIONS (Cont)

4. Remove CO₂ absorbers. (Place in plastic bags and set aside.)
5. Release the two knurled hand screws securing volume B6 to LEB structure.
6. Slide B6 container (pull out) free from LEB.
7. Remove fitting assembly (V36-334030) as follows:
 - a. Using a 5/32-inch allen-head adapter and socket set, disengage one Calfax fastener securing closeout panel V36-334102 to upper end of V36-334030 fitting assembly. (See sheet 2 of 7.)
 - b. Using a #12 torq-set screwdriver, remove four NAS1133C3 screws (front).
 - c. Using a #14 torq-set screwdriver, remove four NAS1154C12 screws and four shims (MD115-2002-0004) near inner front of bracket.
 - d. Using a #14 torq-set screwdriver, remove two NAS1134C12 screws (rear).
 - e. Bag hardware and attach to bracket.
8. Remove mounting hardware from J-box (V36-759560) as follows:

Caution

Do not disconnect electrical connectors.

- a. Remove four screws (66449-3-1) and four washers (LD143-0002-2203).
- b. Bag hardware and attach bag to J-box.

Caution

Exercise care to avoid excessively straining J-box cabling.

9. Move J-box (as necessary) to gain access to DSE mounting fasteners.
10. DSE top cover removal.

Caution

Use extreme care when removing and replacing the tape cover as the magnetic heads may be damaged if hit by the edge of the top cover.

Date _____ Time _____ Signature _____

DATA STORAGE EQUIPMENT (DSE) TAPE REMOVAL

Sheet 4 of 7

INSTRUCTIONS (Cont)

- a. Loosen 12 cover bolts with a 5/32-inch allen wrench.
- b. Place cover bolts in a plastic bag and set aside.
- c. Attempt to lift cover with fingers. If cover cannot be raised with fingers, loosen the PRESSURE RELIEF screw; then torque the screw to 10 inch-pounds.

Caution

Do not attempt to pry cover off. Damage to the seal will result.

11. DSE tape removal

- a. Wind remainder of tape on take-up reel by turning both reels by hand.
- b. While holding take-up reel, turn reel locking device counter-clockwise to align the cam ring guide pin with the slots in the reel.

Caution

Do not use force to unlock the reel. Twisting the locking device too far will cause damage to guide pins on the cam ring.

- c. Lift reel off hub assembly with both hands.

12. DSE top cover replacement

- a. Lower cover onto unit carefully. Check that heat shield is located over magnetic heads.
- b. Tighten top cover bolts evenly; then torque to 32 inch-pounds.

Date _____ Time _____ Signature _____

DATA STORAGE EQUIPMENT (DSE) TAPE REMOVAL

Sheet 5 of 7

13. Reinstall J-box and fitting assembly (V36-334030).
14. Reinstall and secure closeout panel (V37-334103).
15. Reinstall volume B6 container and CO₂ absorbers; then close and secure access panel. (Nonlunar landing missions only)

NOTE

If DSE removal is required, perform steps 16 through 22.

16. Disconnect the three DSE electrical connectors. Bag and stow free ends to prevent damage.

NOTE

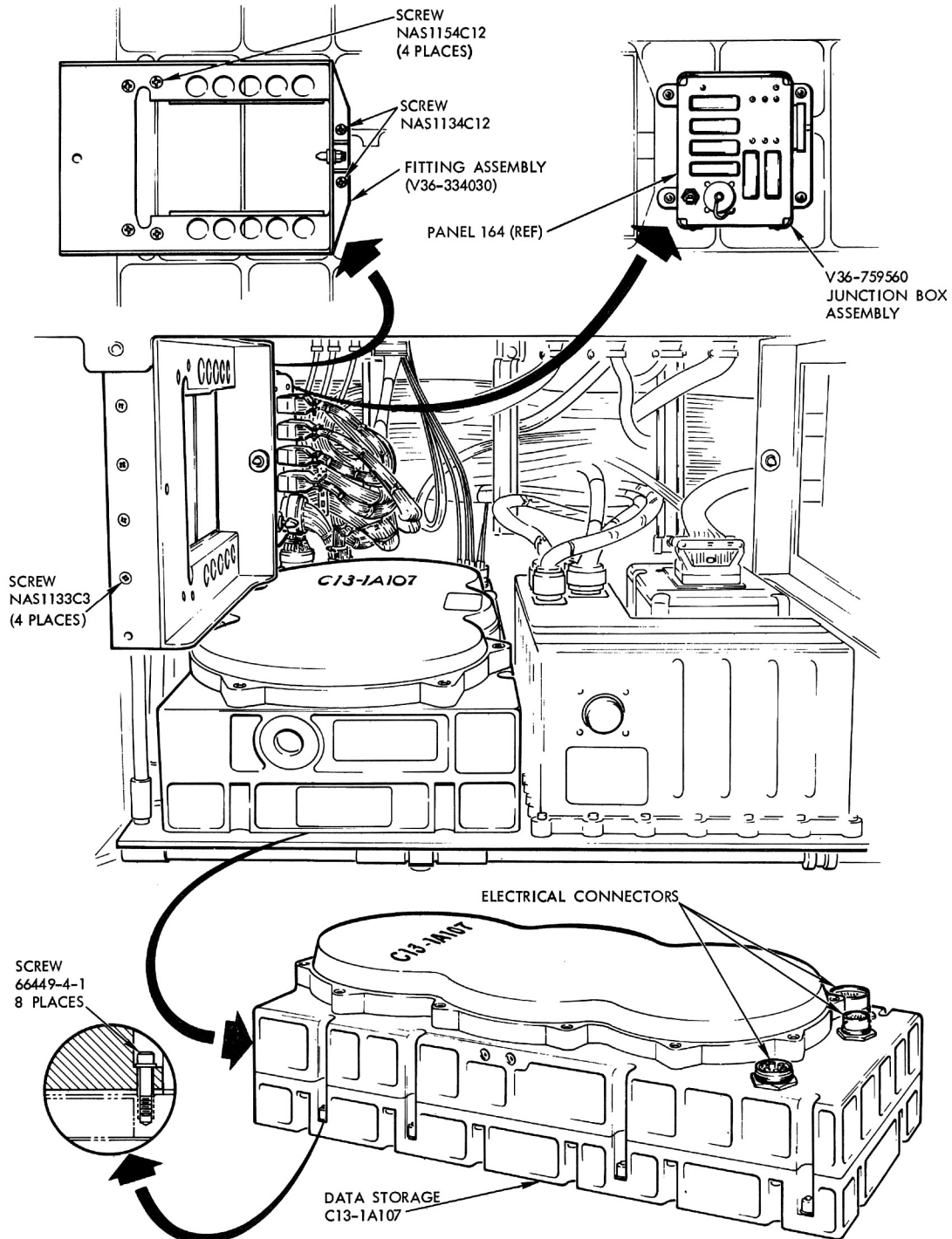
The left-hand connectors on the DSE are twist-off connectors, the right-hand connectors are a snap-off type connector.

17. Using a 3/16-inch allen-head adapter, 6-inch extension, and ratchet wrench, remove the eight mounting screws.
18. Slide DSE free from LEB cap connectors.
19. DSE Installation
 - a. Using a 3/16-inch allen-head adapter, 6-inch extension, and ratchet wrench, install the 8 mounting screws (66449-1) and 8 mounting washers (LD153-0002-2404), torque screws to 65+5 inch-pounds.
20. Reinstall J-box and fitting assembly (V36-334030).
21. Reinstall and secure closeout panel (V37-334103).
22. Reinstall volume B6 container and CO₂ absorbers; then close and secure access panel. (Nonlunar landing missions only)

Date _____ Time _____ Signature _____

DATA STORAGE EQUIPMENT (DSE) TAPE REMOVAL

Sheet 6 of 7



SM-2A-1748B

12

SM2A-08-SC109

DATA STORAGE EQUIPMENT (DSE) TAPE REMOVAL

Sheet 7 of 7

PACKAGING REQUIREMENTS

1. Package DSE tape in a suitable container for shipment to MSC.

Remarks: _____

[illegible]

Date _____ Time _____ Signature _____

Procedure 13 deleted.

■

SM2A-08-SC109

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COMMAND MODULE EXTERIOR INSPECTION

Sheet 1 of 14

This procedure provides instructions for conducting a thorough walk-around inspection of the CM exterior surface areas following flight/recovery.

Warning

Verify that procedure (26) has been completed prior to accomplishing this procedure.

Caution

- Take precautions as necessary to protect the ablator surface and eliminate degradation of the ablator and char.
- At no time shall any person stand on or place tools or equipment on any portion of the CM without first applying an adequate protective cover. In particular, tools, equipment, or hard objects of any kind shall never be placed in a precarious manner, which could result in their falling and striking the CM.

SAFETY

1. Observe standard safety precautions when working around RCS engines and ordnance devices. Sheet 8 illustrates/identifies the various RCS engines. Procedures (A) and (B) provide anomaly procedures which may be associated with the RCS and ordnance devices.

PHOTOGRAPHIC REQUIREMENTS

Refer to procedure (1) or (1A) .

TOOLS AND EQUIPMENT

Not applicable.

COMMAND MODULE EXTERIOR INSPECTION

Sheet 2 of 14

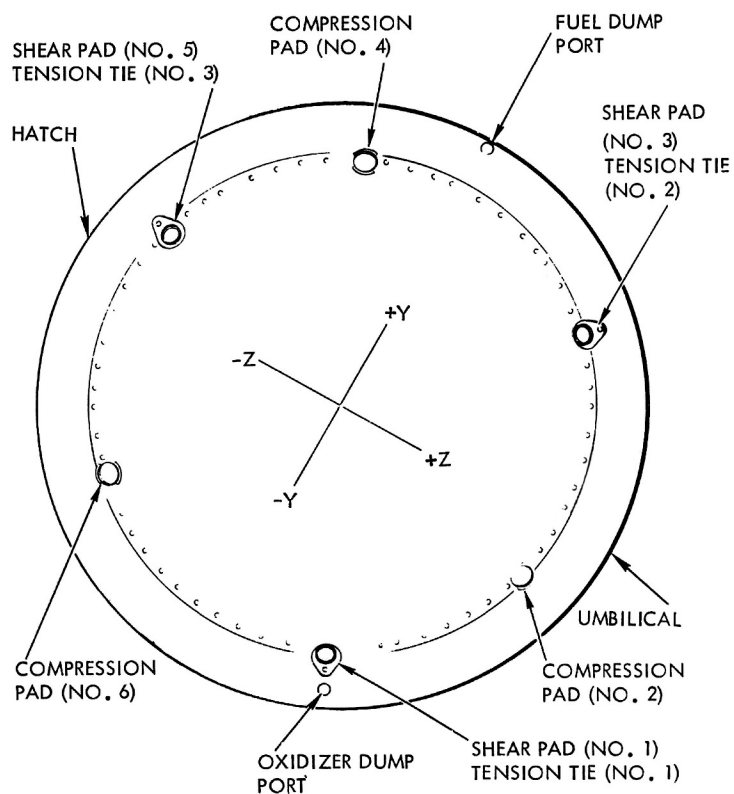
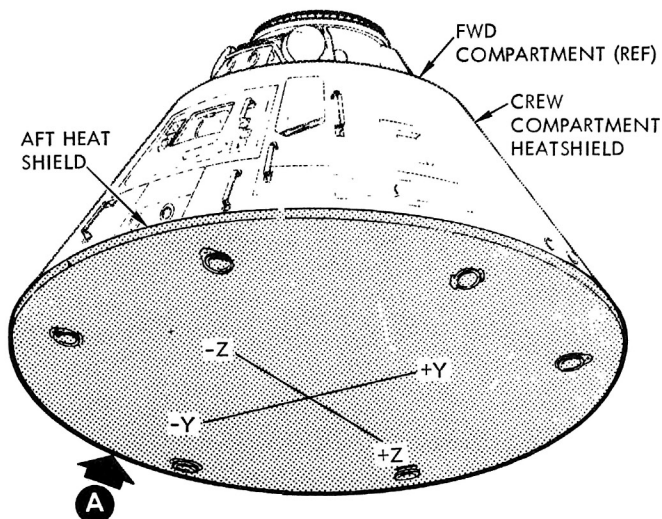
INSTRUCTIONS (AFT HEAT SHIELD)

1. Inspect heat shield for general appearance. Record findings.

PACKAGING REQUIREMENTS

Not required; however, take precautions as necessary to protect the aft heat shield from damage during postretrieval inspection and transit operations.

Remarks: _____



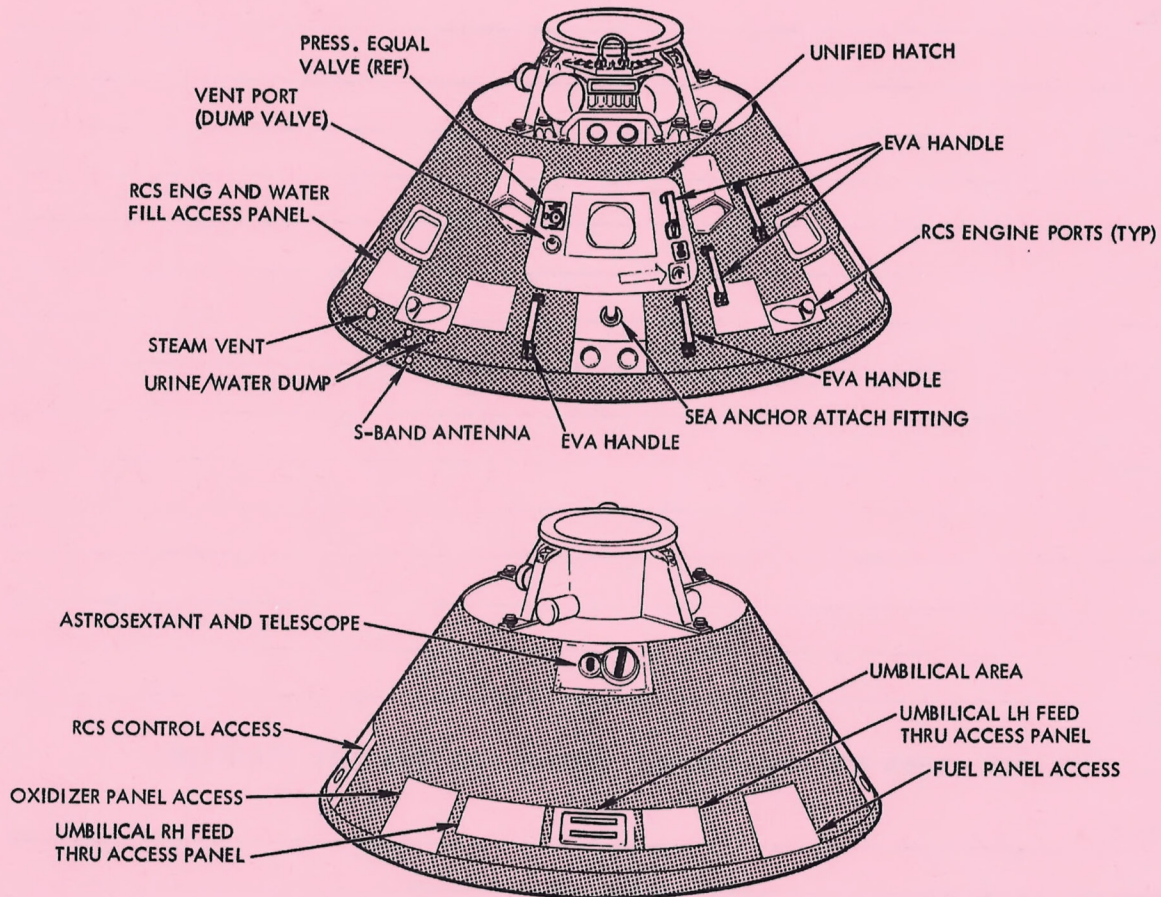
DETAIL A

SM-2A-1066J

CM Aft Heat Shield

COMMAND MODULE EXTERIOR INSPECTION

Sheet 3 of 14

INSTRUCTIONS (CREW COMPARTMENT HEAT SHIELD)

SM-2A-10655

1. Inspect urine/water dump nozzles; record any abnormal findings.

Remarks: _____

Date _____ Time _____ Signature _____

COMMAND MODULE EXTERIOR INSPECTION

Sheet 4 of 14

INSTRUCTIONS (CREW COMPARTMENT HEAT SHIELD)

2. Inspect umbilical area for general conditions. Record findings, as well as any damage incurred during recovery operations.

Remarks :

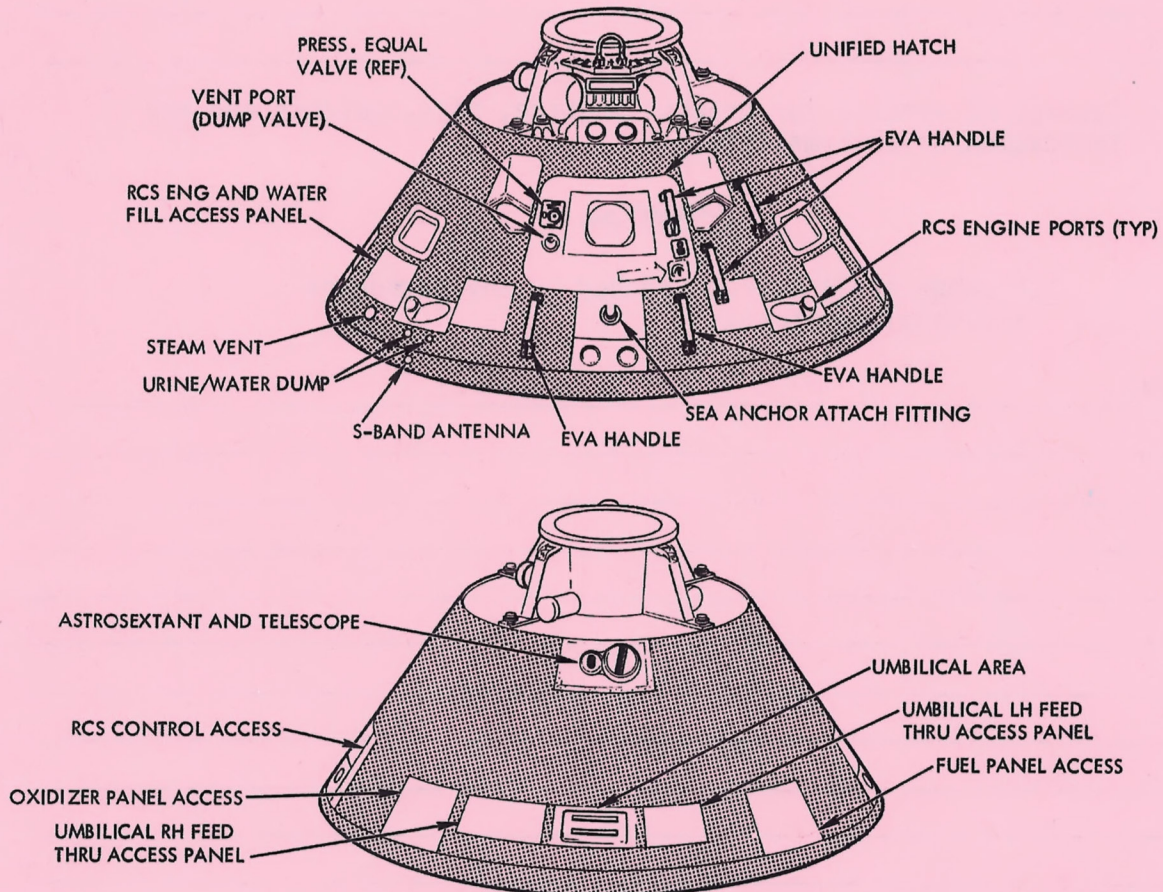
- 3. Inspect steam and vent ports; record any abnormal findings.**

Remarks :

Date _____ Time _____ Signature _____

COMMAND MODULE EXTERIOR INSPECTION

Sheet 5 of 14

INSTRUCTIONS (CREW COMPARTMENT HEAT SHIELD)

SM-2A-10655 ■

4. Inspect astrosextant and telescope area; record any abnormal findings.

Remarks: _____

NOTE

If snagging line/hook assembly has been utilized, place in a plastic bag and tape to the hatch exterior. Refer to packaging requirements.

Date _____ Time _____ Signature _____

COMMAND MODULE EXTERIOR INSPECTION

Sheet 6 of 14

INSTRUCTIONS (CREW COMPARTMENT HEAT SHIELD)

5. Inspect sea anchor attach fitting; record any abnormal findings.

Remarks : _____

6. Inspect CM windows for cracks, sooting, pits, notches and any indication of abnormalities.

Caution

Windows shall not be touched by any person or retrieval equipment.

Remarks: _____

PACKAGING REQUIREMENTS

1. Install window covers. In the absence of window covers, use waterproof paper (or similar material) to cover windows.
2. Cover umbilical area with waterproof paper (or similar material), tape down all edges.
3. Take precautions, as necessary, to protect crew compartment heat shield (ablator surface) from damage during postretrieval inspection and transit operations.
4. Cover astrosextant and telescope with waterproof paper (or similar material), tape down all edges.

Date _____ Time _____ Signature _____

COMMAND MODULE EXTERIOR INSPECTION

Sheet 7 of 14

INSTRUCTIONS (UNIFIED HATCH)

PACKAGING REQUIREMENTS (Cont)

5. Secure and stow grapple hook as follows:
 - a. Retract and tape individual hooks in stowed position.
 - b. Coil and tape attaching line.
 - c. Bag grapple hook and attaching line.
 - d. Tape (stow) bagged assembly to CM exterior.
6. Install urine dump and steam duct filters per procedure (25).

Remarks: _____

Date _____ Time _____ Signature _____

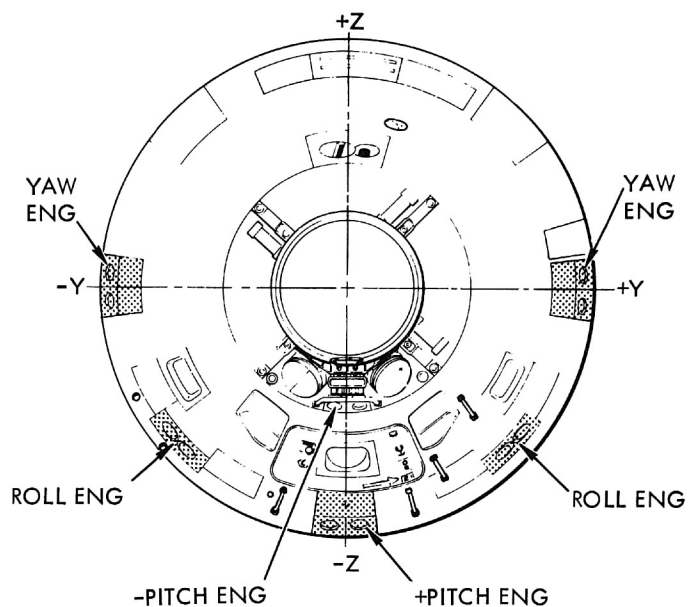
COMMAND MODULE EXTERIOR INSPECTION

Sheet 8 of 14

Warning

Because of potential hazards associated with the RCS, any visual inspection of the thrusters (engine ports) must be conducted from a safe distance.

1. Visually inspect the exterior areas of the RCS (exhaust cones, throats, liners, adjacent skin, and mounting plate bolts). Note all abnormalities as well as general condition.



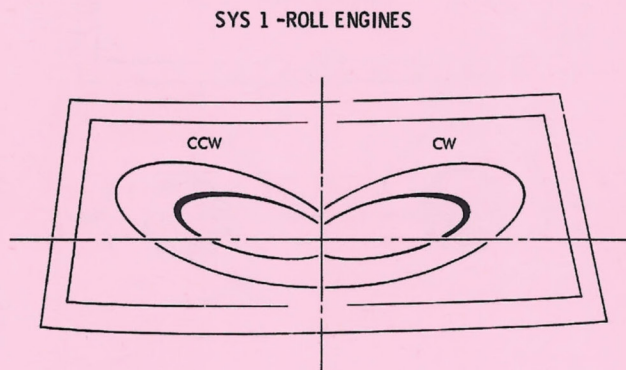
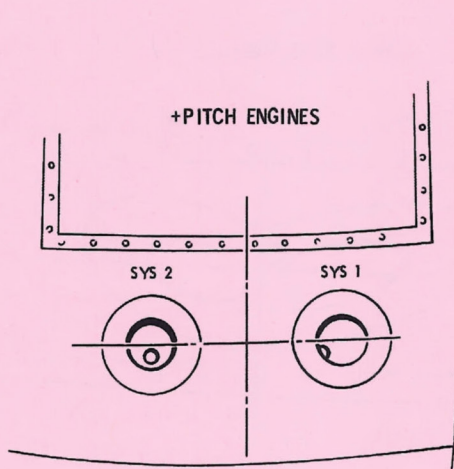
SM-2A-1061F

NOTE

Record findings on sheets 9, 10 and 11.

COMMAND MODULE EXTERIOR INSPECTION

Sheet 10 of 14



REMARKS: _____

REMARKS: _____

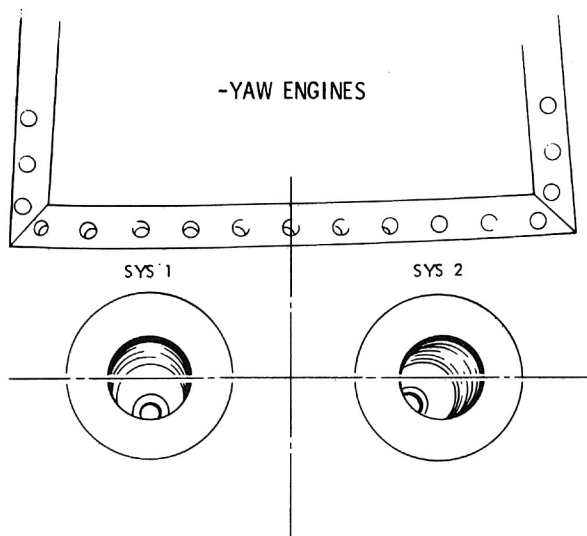
NOTE

- 1 RECORD PERCENTAGE OF CHAR WITHIN EACH QUADRANT (0% = NO CHAR).
- 2 RECORD COMMENTS RELATING CONDITION OF EXHAUST CONES, THROATS AND LINERS (NOTE ALL ABNORMALITIES AS WELL AS GENERAL CONDITION).

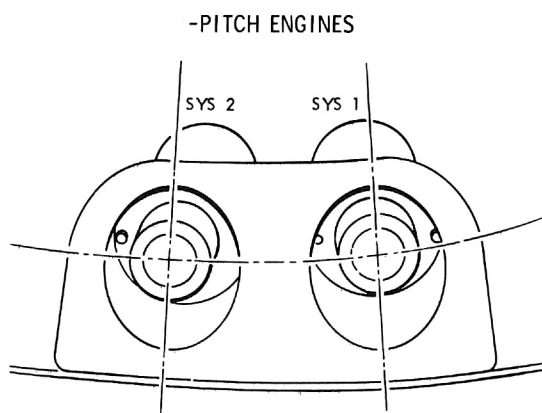
SM-2A-1191A

COMMAND MODULE EXTERIOR INSPECTION

Sheet 11 of 14



REMARKS: _____



REMARKS: _____

NOTE

- 1** RECORD PERCENTAGE OF CHAR WITHIN EACH QUADRANT
(0% = NO CHAR)
- 2** RECORD COMMENTS RELATING CONDITION OF EXHAUST CONES,
THROATS AND LINERS (NOTE ALL ABNORMALITIES AS WELL
AS GENERAL CONDITION).

SM-2A-1192 A

COMMAND MODULE EXTERIOR INSPECTION

Sheet 12 of 14

INSTRUCTIONS (FORWARD COMPARTMENT)

1. Inspect forward compartment structure for evidence of burning, damage, etc.

Caution

Do not disturb or walk on the upper deck before complete photographic coverage has been accomplished.

Warning

If a parachute, antenna, or the flashing beacon has failed to deploy, use caution when working on the upper deck.

Remarks: _____

2. Inspect all visible ordnance cartridges for firing. (Procedure (B) illustrates the various ordnance devices.)

Remarks: _____

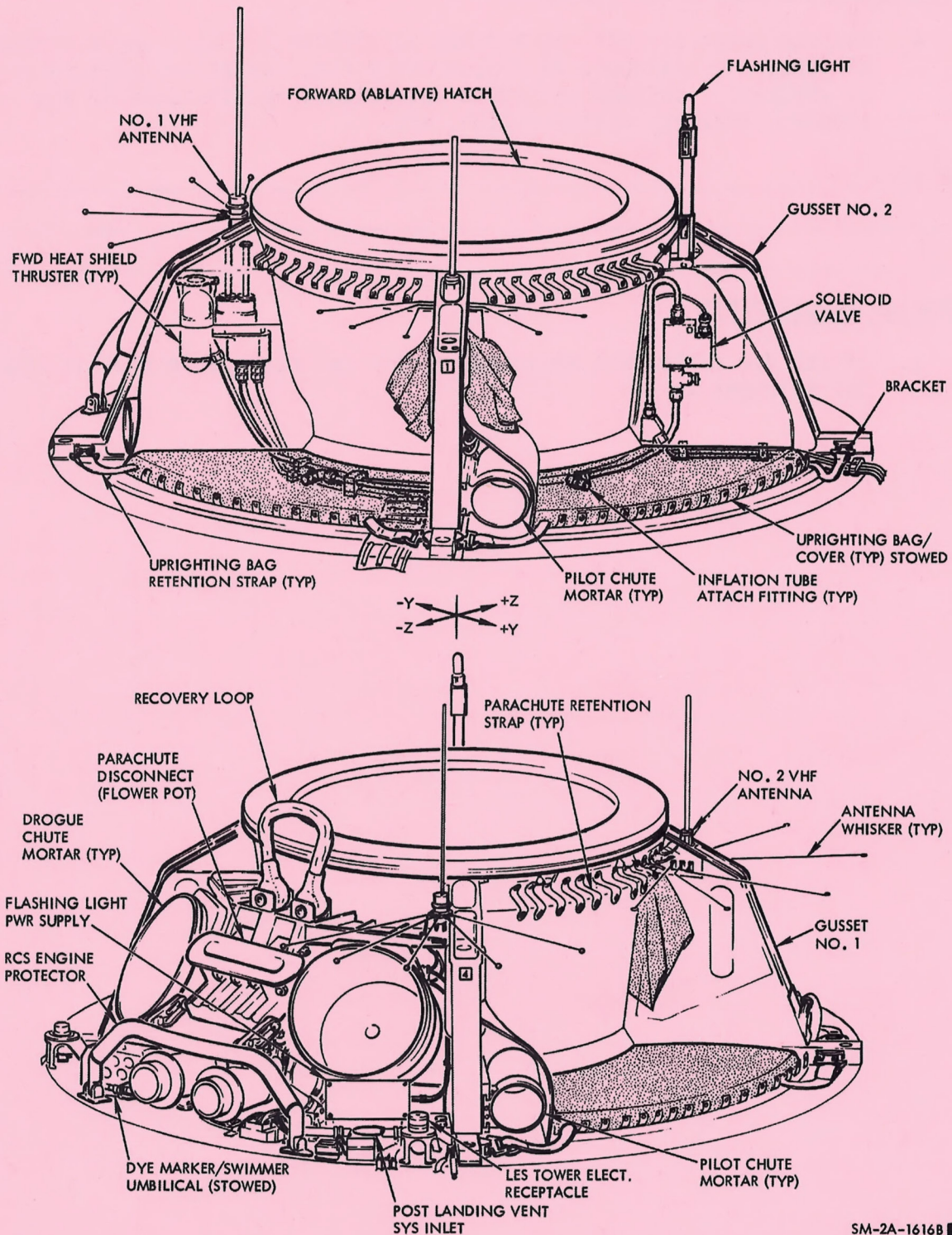
3. Inspect forward compartment components (antennas, swimmer umbilical, sea dye marker, recovery beacon, mortars, chute attach fittings, recovery loop, etc.) for evidence of damage, bending, crushing, etc.

Remarks: _____

Date _____ Time _____ Signature _____

COMMAND MODULE EXTERIOR INSPECTION

Sheet 13 of 14



COMMAND MODULE EXTERIOR INSPECTION

Sheet 14 of 14

INSTRUCTIONS (FORWARD COMPARTMENT) (Cont)

4. Inspect upper airlock lip and top of airlock (-Z bay) above drogue parachute for evidence of drogue cable riser abrasion; note extent of abrasion. Inspect parachute retention flap straps; note any ripping, tearing, discoloration, etc.

Remarks: _____

PACKAGING REQUIREMENTS

1. If sea dye marker was deployed, remove and package in plastic bags for shipment to NR.

Date _____ Time _____ Signature _____

UPRIGHTING SYSTEM INSPECTION AND REMOVAL

Sheet 1 of 4

The uprighting bags (if deployed) shall be removed and packaged on board the recovery ship.

SAFETY

1. If a drogue or pilot parachute has failed to deploy, exercise extreme caution when working on the upper deck.
2. If one or both of the antennas/whiskers, the dye marker or the flashing light has failed to deploy, use caution when working on the upper deck.

PHOTOGRAPHIC REQUIREMENTS

Refer to procedure ①.

TOOLS AND EQUIPMENT

Quantity	Nomenclature
1	Screwdriver, #2 phillips
1	Wrench, 3/8-inch open end
1	Ratchet, 3/8-inch drive
1	Socket, 3/8-inch drive (12 point)
3	Bags (for storage of uprighting bags)
6	Polyethylene bags (for sealing air hoses and fittings)

UPRIGHTING SYSTEM INSPECTION AND REMOVAL

Sheet 2 of 4

INSTRUCTIONS

UPRIGHTING BAG(S) NOT DEPLOYED

1. Uprighting bag(s) which have not deployed shall remain installed (intact) until postflight evaluation. However, cover(s) fabricated from heavy cardboard (or an equivalent substitute) should be placed over the bags to prevent damage during the postflight inspection.

INSPECTION OF DEPLOYED BAGS

1. Record number of bags deployed and degree of inflation; fully inflated, partially inflated, or not inflated.

Remarks: _____

2. Prior to removal of bags from spacecraft, inspect bags, retention straps, hoses and attaching hardware for security, cuts, tears, abrasions and other abnormal conditions.

Remarks: _____

REMOVAL OF DEPLOYED BAGS

1. Remove bolts (2) securing uprighting bag(s) retention straps to attach fitting on structure.

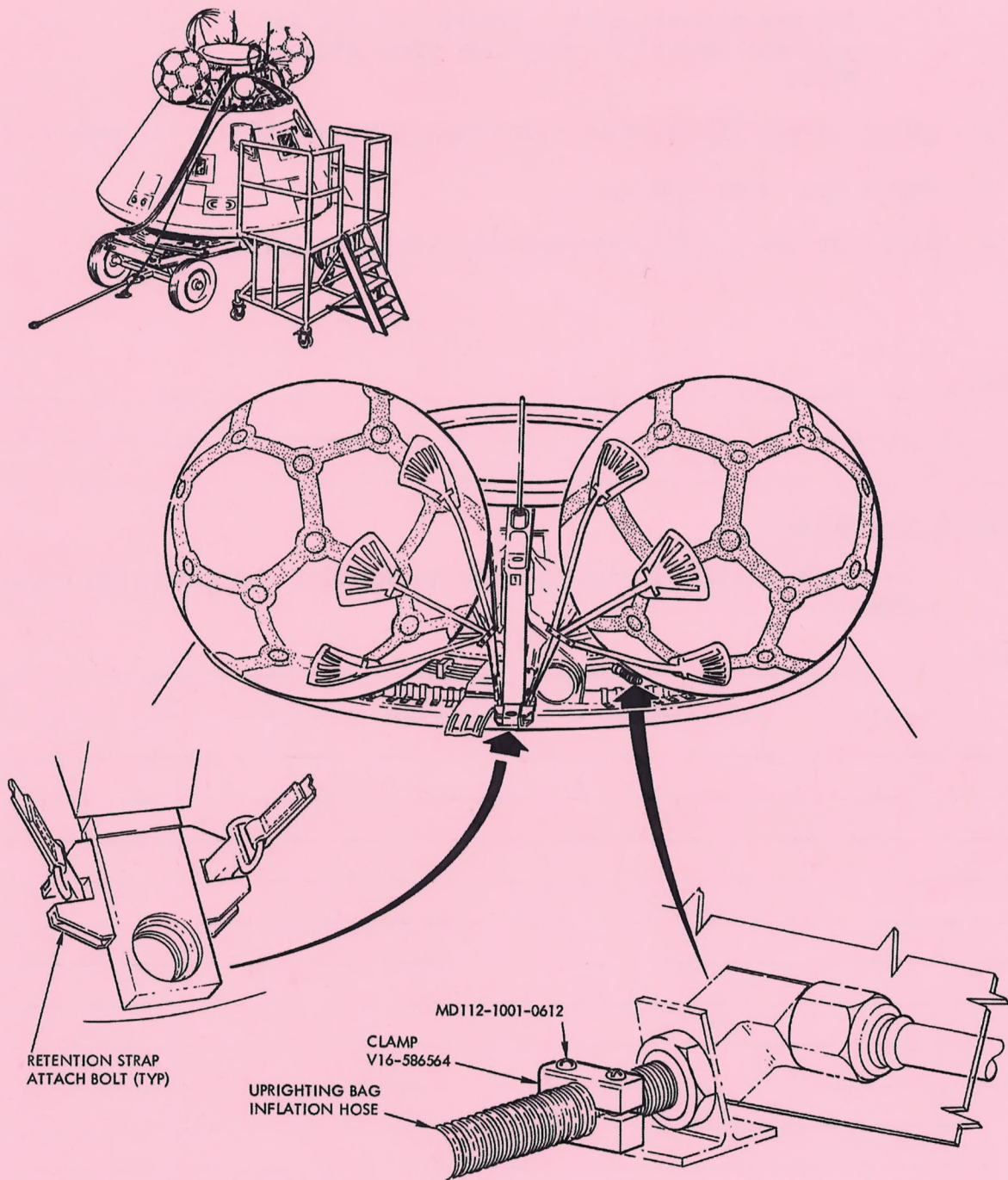
NOTE

If bags are fully inflated, it may be necessary to relieve tension on the retention straps prior to removal of attach bolts. To relieve tension, perform steps 2 and 3.

Date _____ Time _____ Signature _____

UPRIGHTING SYSTEM INSPECTION AND REMOVAL

Sheet 3 of 4



SM-2A-1671B

UPRIGHTING SYSTEM INSPECTION AND REMOVAL

Sheet 4 of 4

Caution

Bag may contain water. Provide support for bag upon removal of retention strap attach bolts.

2. Loosen screws (2) securing hose clamps (V16-586564) to air hose.
3. Remove hose from fitting.
4. Seal hose and air fittings opening with polyethylene bags.

Remarks: _____

PACKAGING REQUIREMENTS

1. If removed, package uprighting bags in suitable containers for return shipment.

Remarks: _____

Date _____ Time _____ Signature _____

VHF ANTENNA (NO. 1) INSPECTION AND STOWAGE

Sheet 1 of 6

Following CM recovery, the No. 1 VHF antenna blade and whisker assembly shall be inspected and then stowed to prevent ground-handling damage.

SAFETY

1. If a drogue or pilot parachute has failed to deploy, exercise extreme caution when working on the upper deck.
2. If one or both of the antennas/whiskers, the dye marker or the flashing light has failed to deploy, use caution when working on the upper deck.
3. While working with the No. 1 antenna/whiskers, keep face away from the area immediately above and outboard of the assemblies.

PHOTOGRAPHIC REQUIREMENTS

Refer to procedure ① or ①A .

TOOLS AND EQUIPMENT

Quantity	Nomenclature
1	Safety (clevis) pin
1	Spring scale (40 oz)

INSTRUCTIONS

Inspection - Antenna/Whiskers

1. Inspect blade and whisker assembly for general condition.

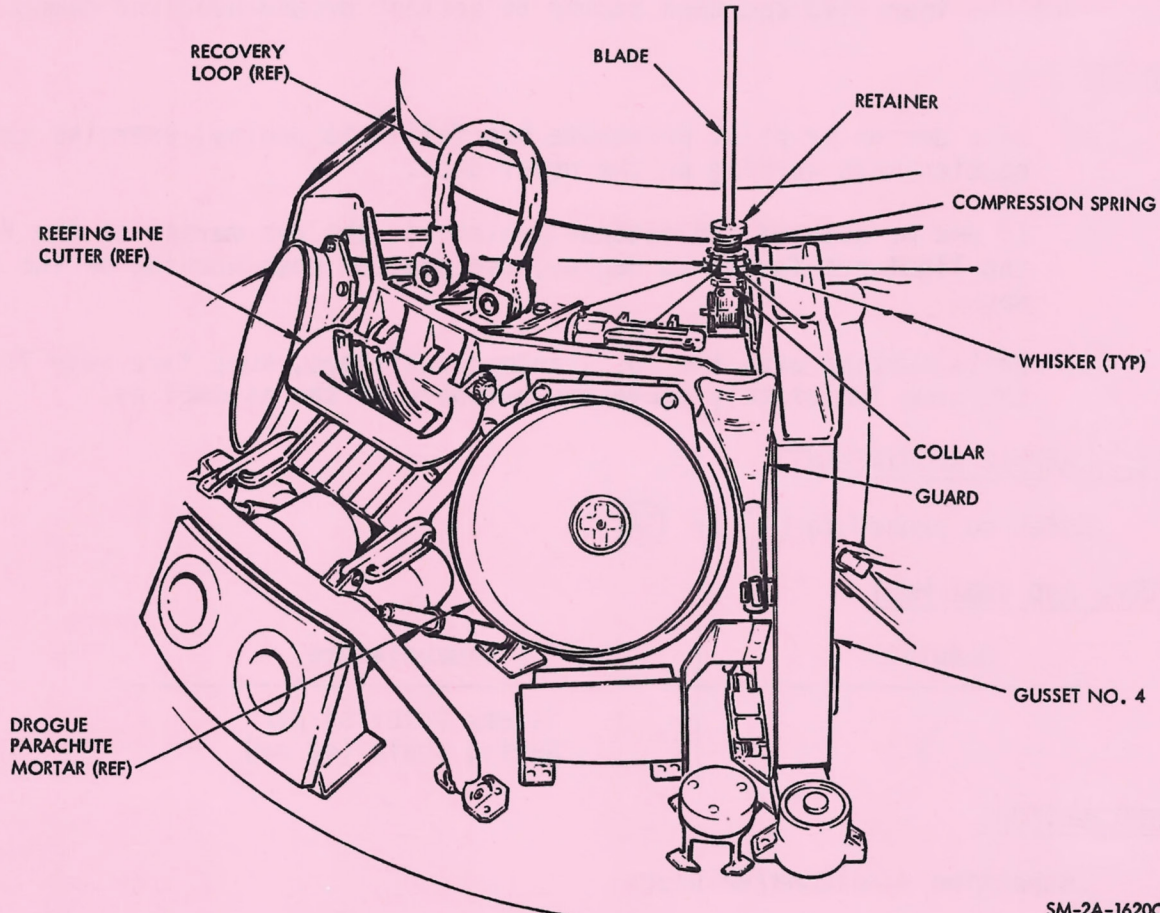
Warning

- Exercise extreme caution when inspecting an antenna/whisker assembly which has failed to deploy.
- Note position/condition of the antenna downlock.

Date _____ Time _____ Signature _____

VHF ANTENNA (NO. 1) INSPECTION AND STOWAGE

Sheet 2 of 6



SM-2A-1620C

2. If the reefing line is still secured to the downlock, apply downward pressure (to prevent inadvertent deployment) and insert the safety (clevis) pin. Refer to sheet 5.

Remarks: _____

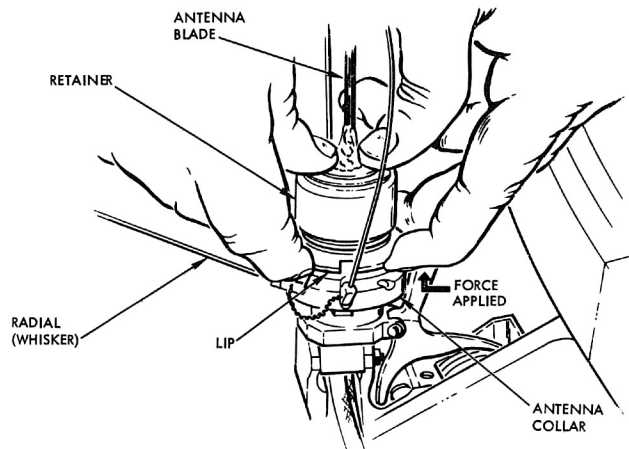
Date _____ Time _____ Signature _____

VHF ANTENNA (NO. 1) INSPECTION AND STOWAGE

Sheet 3 of 6

Stowing Antenna Assembly

1. Using both hands, grasp the antenna lip and retainer (as shown) and apply an upward force to depress the compression spring and raise the whiskers.



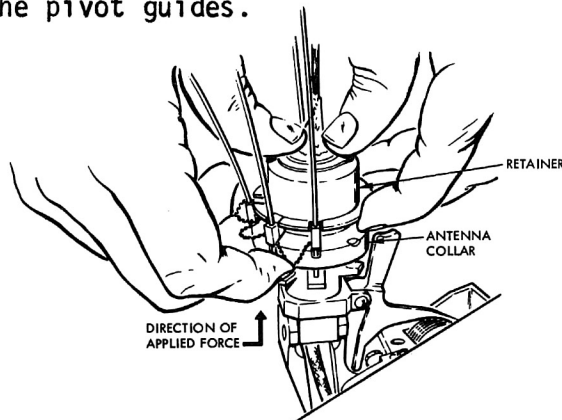
SM-2A-1621

Remarks: _____

2. Reposition the hand in contact with the whiskers and grasp the bottom of the antenna collar. Then apply an upward force to seat the collar against the retainer.

NOTE

Verify the radial pivots are seating properly in the pivot guides.



SM-2A-1622

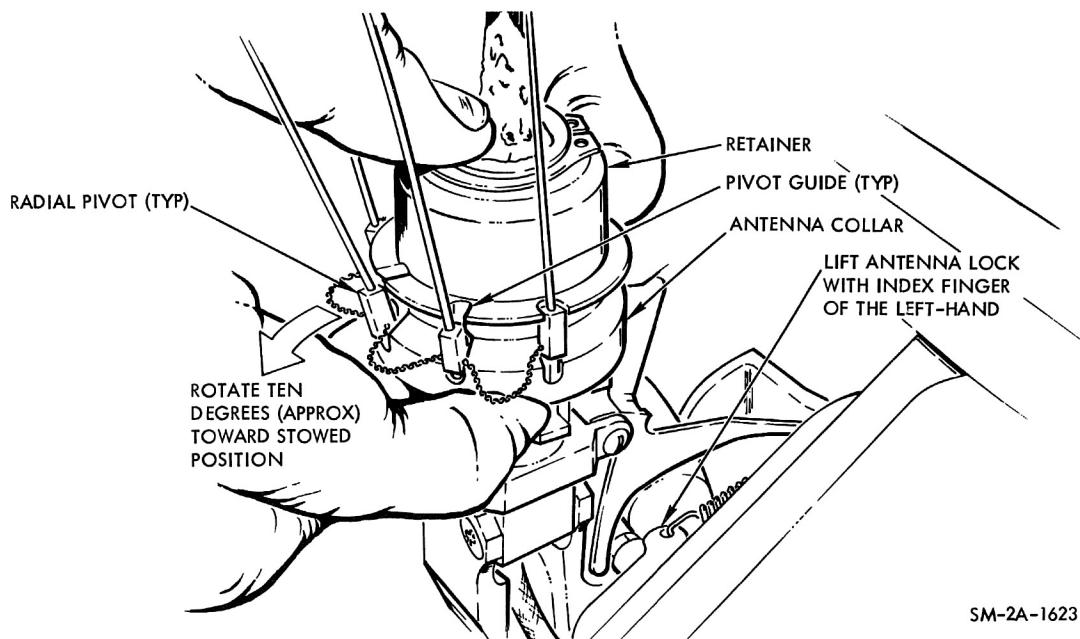
Remarks: _____

Date _____ Time _____ Signature _____

VHF ANTENNA (NO. 1) INSPECTION AND STOWAGE

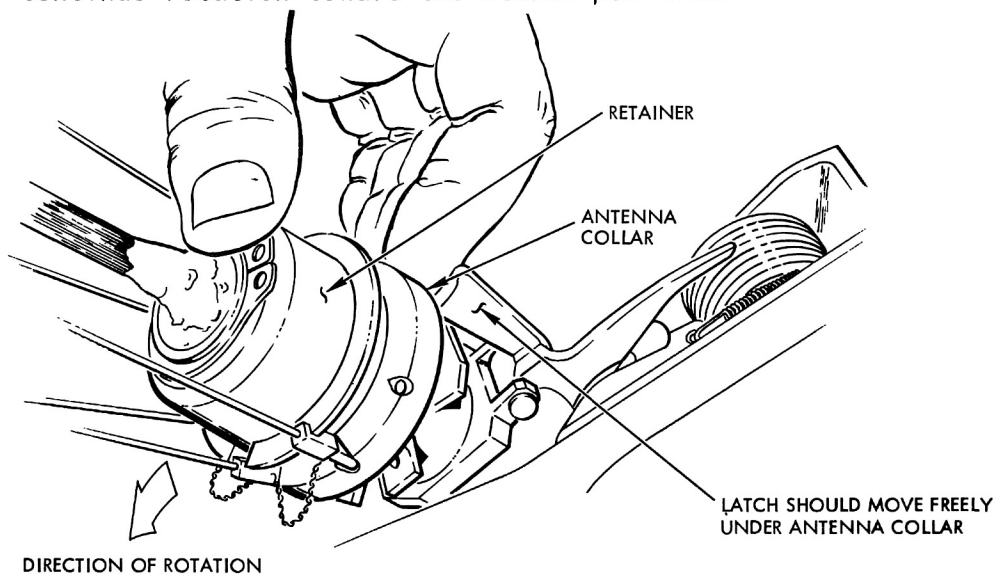
Sheet 4 of 6

3. While holding the collar against the retainer with one hand, release the antenna lock.



Remarks: _____

4. Rotate the antenna approximately 10 degrees (latch should move freely). Continue rotation toward the stowed position.



Remarks: _____

Date _____ Time _____ Signature _____

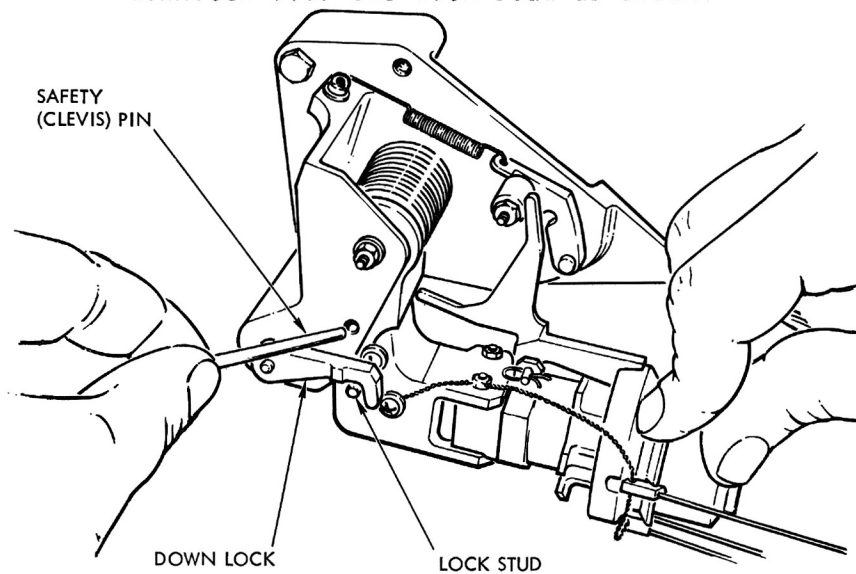
VHF ANTENNA (NO. 1) INSPECTION AND STOWAGE

Sheet 5 of 6

5. When the safety pin holes align, insert the safety (clevis) pin.

NOTE

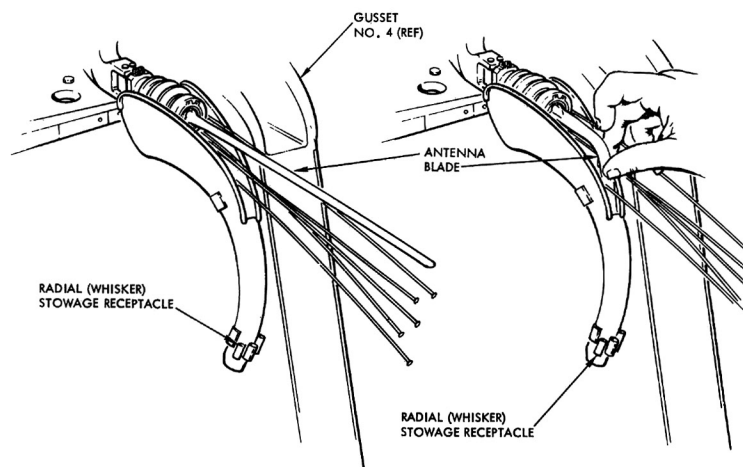
Prior to insertion of the safety pin, position the downlock over the lock stud as shown.



SM-2A-1625

Remarks : _____

6. Stow antenna blade. (Grasp blade between thumb and forefinger, as shown, and apply sufficient pressure to position the blade in radial stowage receptacle.)



SM-2A-1627A

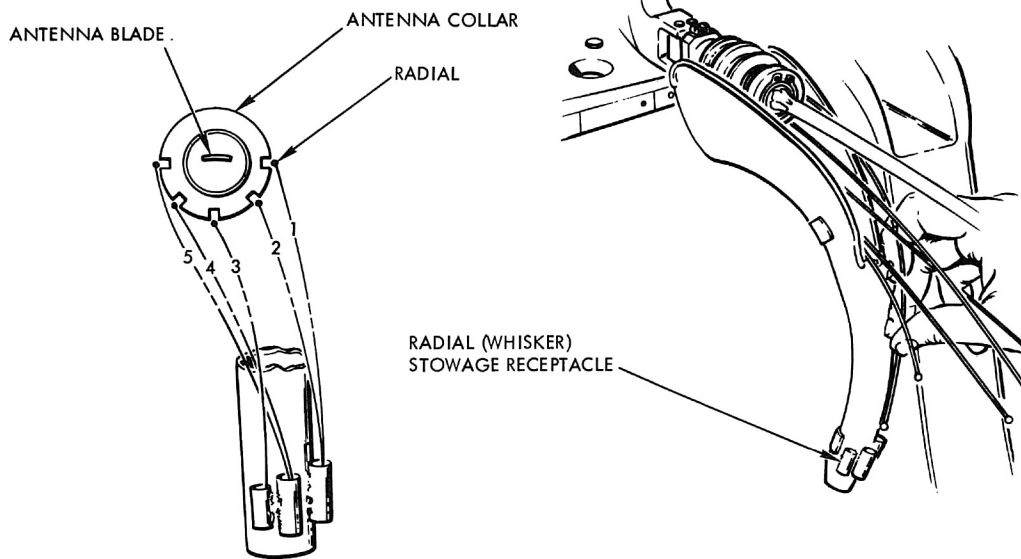
Remarks : _____

Date _____ Time _____ Signature _____

VHF ANTENNA (NO. 1) INSPECTION AND STOWAGE

Sheet 6 of 6

7. Stow whiskers in accordance with the numbering sequence provided in the following illustration. (Stowage shall be accomplished by grasping each whisker, lengthwise, at the middle with the thumb and forefinger, as shown, and applying a slight downward pressure with the thumb.)



SM-2A-1626B

Remarks : _____

Date _____ Time _____ Signature _____

VHF ANTENNA (NO. 2) INSPECTION AND STOWAGE

Sheet 1 of 4

Following CM recovery, the No. 2 VHF antenna blade and whisker assemblies shall be inspected and then stowed to prevent ground-handling damage.

SAFETY

1. If a drogue or pilot parachute has failed to deploy, exercise extreme caution when working on the upper deck.
2. If one or both of the antennas/whiskers, the dye marker, or the flashing light has failed to deploy, use caution when working on the upper deck.
3. While working with the No. 2 antenna/whiskers, keep face away from the area immediately above and outboard of the assemblies.

PHOTOGRAPHIC REQUIREMENTS

Refer to procedure ①.

TOOLS AND EQUIPMENT

Quantity	Nomenclature
1 roll	Electrical tape
2 ft	Wire (sized as necessary)

INSTRUCTIONS

Inspection - Antenna/Whiskers Deployed

1. Inspect blade and whisker assemblies for general condition.

NOTE

If visual inspection reveals partial deployment of either the blade or whiskers, obtain necessary photographs. Stow the whiskers (per instructions provided on sheet 3); then stow the antenna blade. (Refer to sheet 4.)

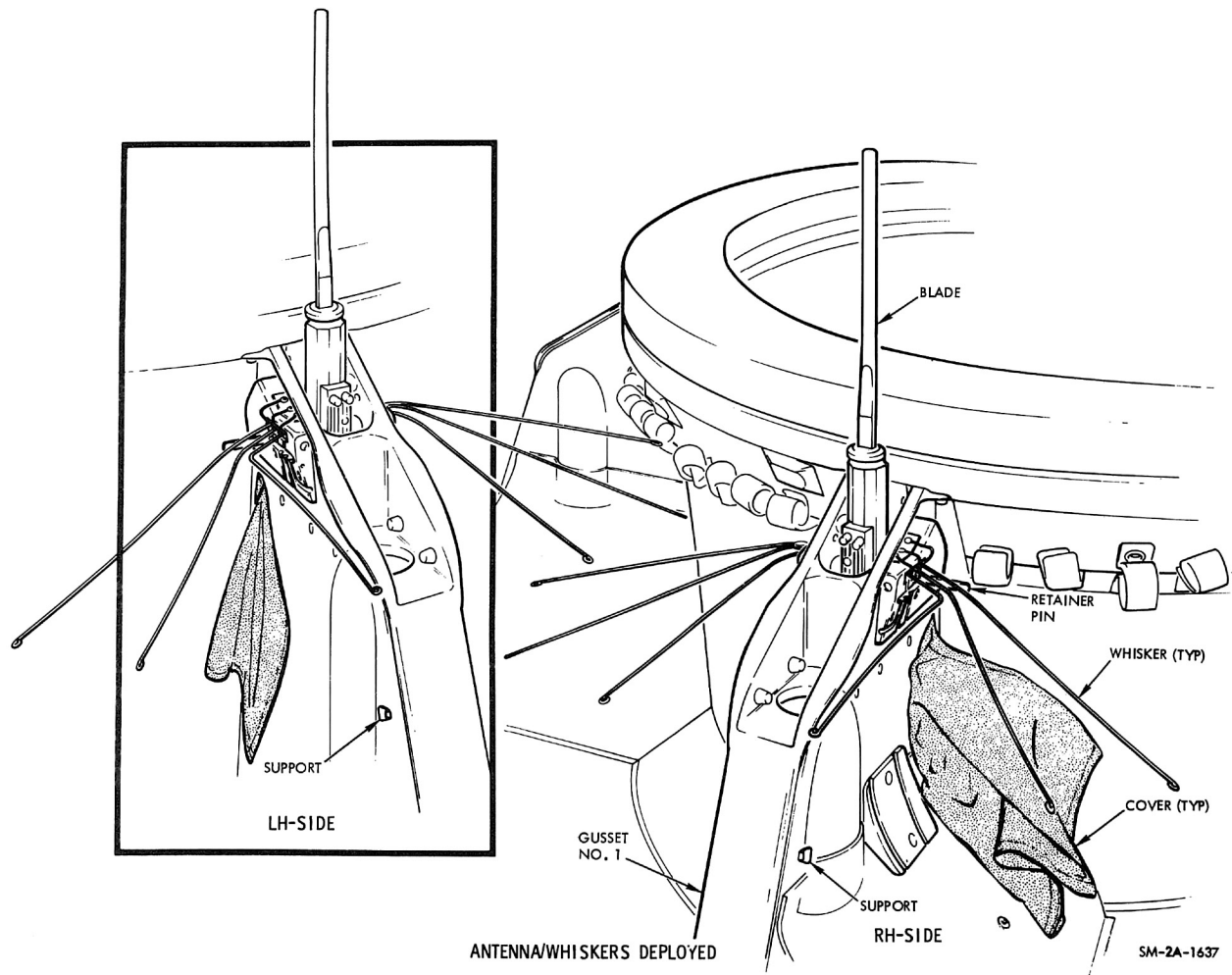
Date _____ Time _____ Signature _____

VHF ANTENNA (NO. 2) INSPECTION AND STOWAGE

Sheet 2 of 4

INSTRUCTIONS**Warning**

Exercise extreme caution when inspecting an antenna/whisker assembly which has failed to deploy.



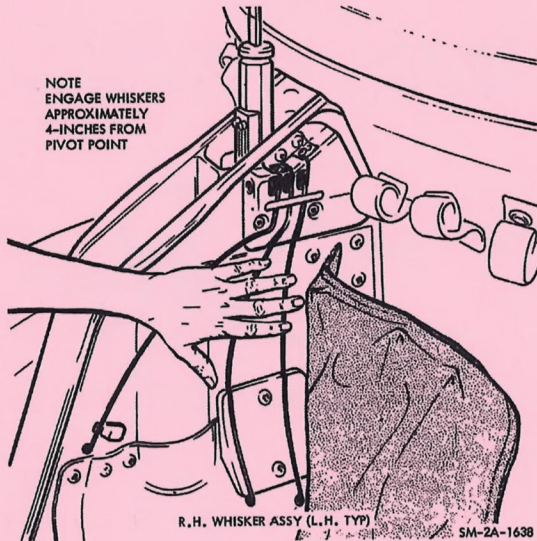
VHF ANTENNA (NO. 2) INSPECTION AND STOWAGE

Sheet 3 of 4

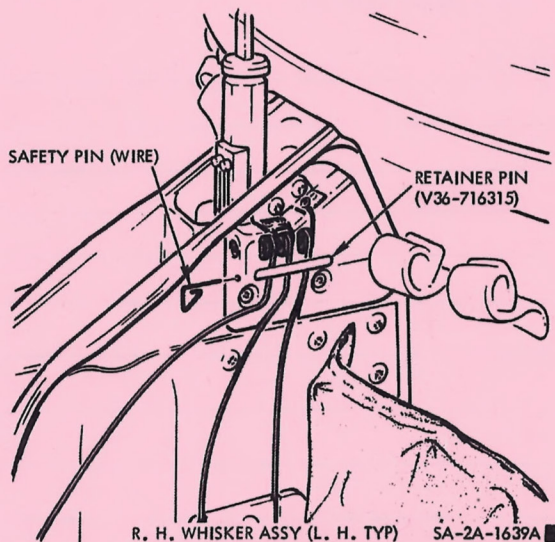
STOWING ANTENNA BLADE/WHISKERS

Stowing Whiskers

1. Place open hand against the whiskers and apply downward pressure.

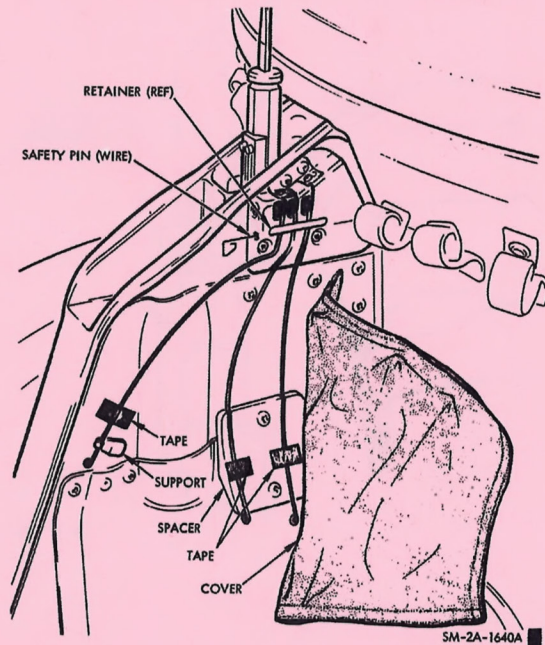


2. Position the V36-716315 retainer to the stowed position and insert the safety pin.

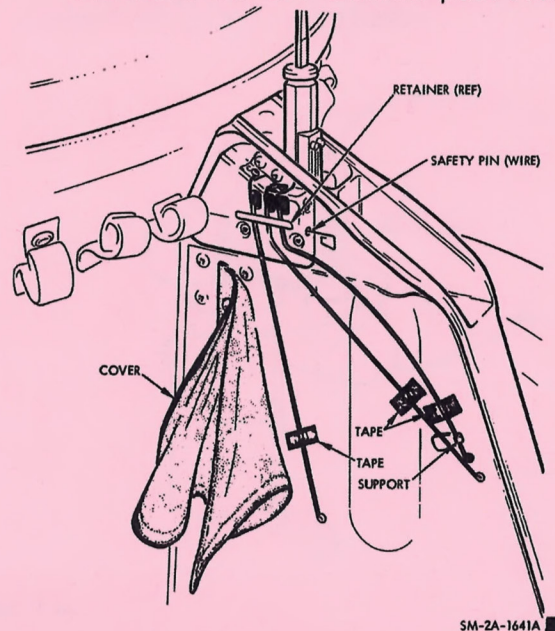


3. After securing the whisker assemblies, stow the individual whiskers as follows:

- a. Right whiskers. Stow and tape whiskers in the stowed position.



- b. Left whiskers. Stow and tape whiskers in the stowed position.



Date _____ Time _____ Signature _____

VHF ANTENNA (NO. 2) INSPECTION AND STOWAGE

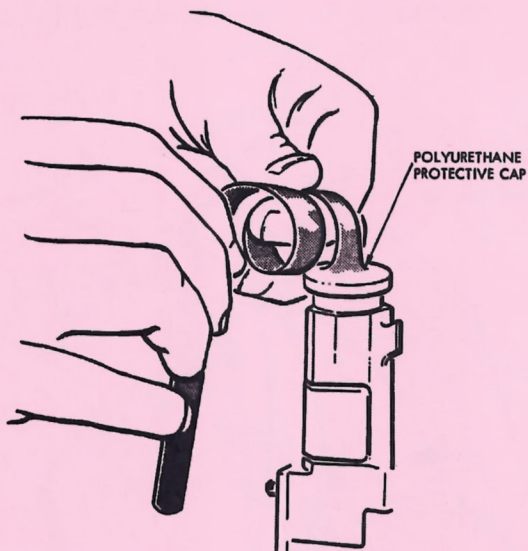
Sheet 4 of 4

STOWING/TAPING ANTENNA BLADE

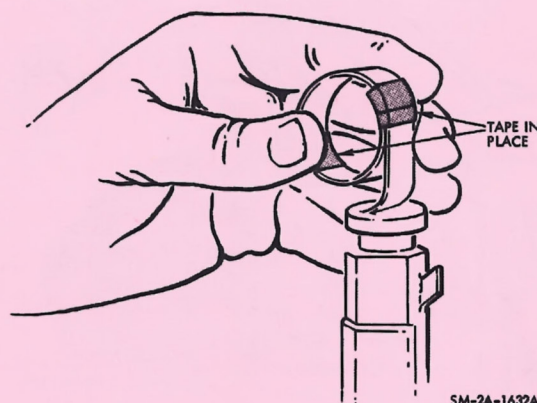
1. Grasp antenna blade between the thumb and index finger and coil the antenna.
3. Apply thumb pressure to retain coiled blade in the coiled position.

NOTE

When properly coiled, tape the blade in the coiled position.

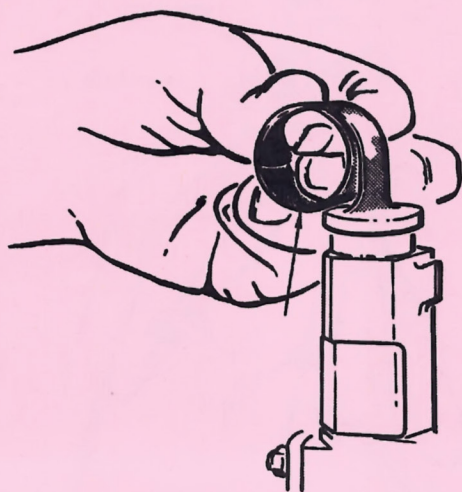


SM-2A-1629



SM-2A-1632A

2. Continue coiling until a complete circle is formed.



SM-2A-1630

PACKAGING REQUIREMENTS

Not applicable.

Remarks: _____

Date _____ Time _____ Signature _____

FLASHING LIGHT INSPECTION AND STOWAGE

Sheet 1 of 2

Following CM recovery, the flashing light shall be inspected and then stowed to prevent ground-handling damage.

SAFETY

1. If a drogue or pilot parachute has failed to deploy, exercise extreme caution when working on the upper deck.
2. If an antenna or the flashing light has failed to deploy, use caution when working on the upper deck.

TOOLS AND EQUIPMENT

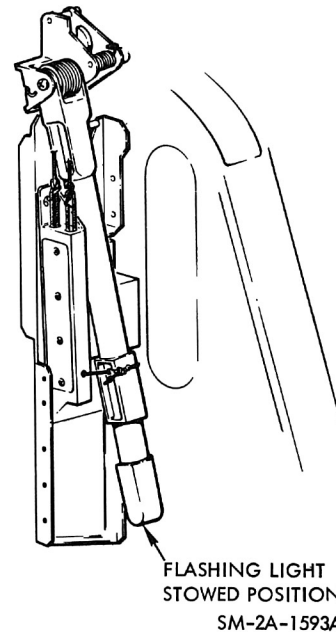
Quantity	Nomenclature
3 feet	Nylon cord

PHOTOGRAPHIC REQUIREMENTS

Refer to procedure ①.

INSTRUCTIONS***Warning***

- If the flashing light has not deployed, do not disturb.
- If the flashing light has malfunctioned in any way (partially deployed, hung-up, bent, etc.), do not disturb.



FLASHING LIGHT INSPECTION AND STOWAGE

Sheet 2 of 2

1. Inspect flashing light for general condition.
2. When inspection is complete, manually place the flashing light in the stowed position. Utilize nylon cord to secure light in the stowed position. (Refer to sheet 1.)

PACKAGING REQUIREMENTS

Not applicable.

Remarks : _____

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Date _____ Time _____ Signature _____

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RCS ACCESS PANEL/SEA WATER REMOVAL

Sheet 1 of 3

This procedure provides instructions for removing the access panels illustrated on sheet 2.

SAFETY

1. Observe standard safety precautions when entering RCS access areas. If a leak is noted, refer to procedure (A) RCS ANOMALY.
2. Explosive-operated valves are located behind the fuel, oxidizer, helium and umbilical access panels. Whether or not they have fired cannot be determined by visual inspection; therefore, it must be assumed that they are "live." Their firing would not cause injury or damage, per se; however, it could release propellant trapped in the lines.

PHOTOGRAPHIC REQUIREMENTS

Refer to procedure (1).

TOOLS AND EQUIPMENT

Quantity	Nomenclature
1	Access panel removal kit

INSTRUCTIONS

NOTE

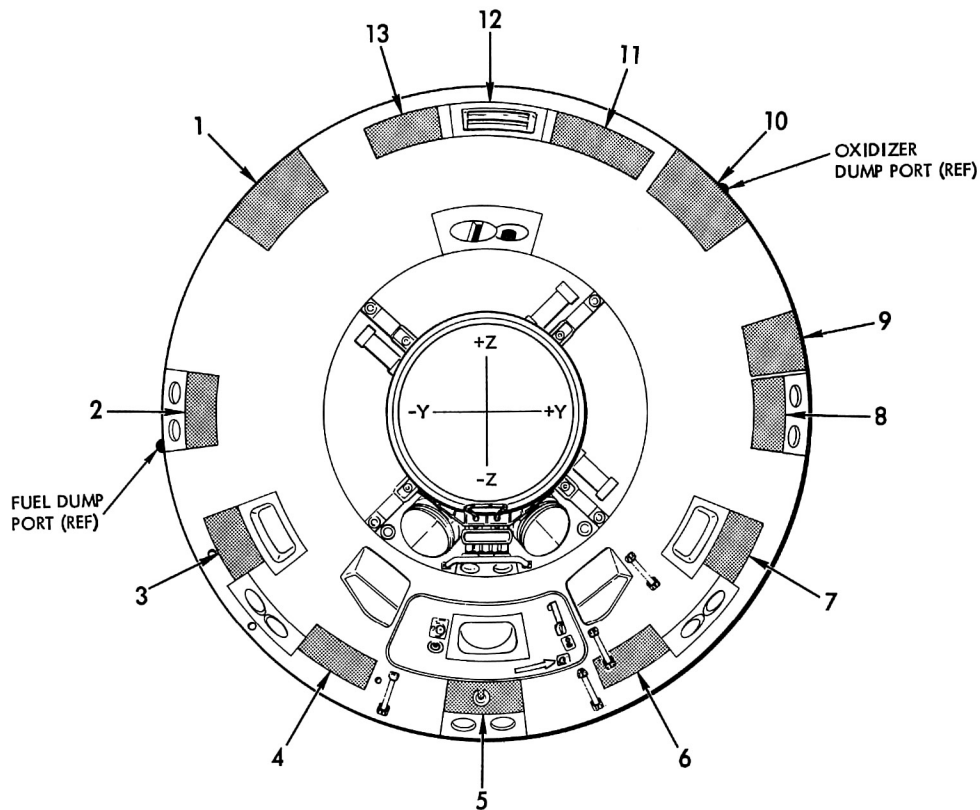
Prior to commencing ablator plug removal (drilling), verify all engine nozzles covered with tape to prevent an accumulation of chips/shavings.

1. Using a wire brush or screwdriver, scrape any charred area to locate ablator plugs.
2. Using a #32 drill, remove RTV compound from plug installation holes in each corner of panel.
3. Using pronged tool, remove as many plugs as possible.

Date _____ Time _____ Signature _____

RCS ACCESS PANEL/SEA WATER REMOVAL

Sheet 2 of 3



INDEX	PANEL	BASIC PHOTO DES
1	FUEL SERVICING PANEL	CE-10
2	SYS 2 He SERVICING PANEL & -YAW ENGINES	CE-29
3	CCW ROLL ENG & POTABLE WATER FILL VALVE	CE-27
4	CW ROLL ENGINES	CE-25
5	+PITCH ENGINES	CE-23
6	CCW ROLL ENGINES	CE-21
7	CW ROLL ENGINES	CE-19
8	SYS 1 He SERVICING PANEL & +YAW ENGINES	CE-17
9	CM RCS CONTROL BOX (C19A1)	CE-16
10	OXIDIZER SERVICING PANEL	CE-14
11	UMBILICAL RH FEED THRU	CE-13
12	UMBILICAL AREA	CE-12
13	UMBILICAL LH FEED THRU	CE-11

SM-2A-1114J

Do not remove the following panels: Index 3, 4, 5, 6, 7, and 12.

RCS ACCESS PANEL/SEA WATER REMOVAL

Sheet 3 of 3

4. Remove remaining plugs with a pneumatic drill and 1/2-inch bit.

Caution

Care should be taken when drilling to prevent damage to panel attachment bolts under each plug.

5. Using torq-set screwdriver, remove all screws.
6. Insert 5-inch bolts into each corner hole (to facilitate loosening and handling) and remove panel.
7. Following removal of RCS access panels, sea water in the toroidal area shall be drained (e.g., siphoned) and the area refilled with fresh water and again drained. If time permits, the cycle should be repeated.

PACKAGING REQUIREMENTS

1. Place ablator plugs and screws in plastic bags; identify bags, and secure to plumbing within the applicable access area.

Remarks: _____

Date	Time	Signature
------	------	-----------

PARACHUTE AND FWD HEAT SHIELD INSPECTION

Sheet 1 of 2

This procedure provides instructions for inspecting and packaging the forward heat shield and its parachute, the drogue parachutes, pilot parachutes, and the main parachutes, in the event any of these items are recovered.

SAFETY

1. If a drogue or pilot parachute has failed to deploy, remain out of line of fire of the parachute mortar and exercise extreme caution when working in the vicinity of the upper deck.
2. If one or both of the VHF antennas, the dye marker, or the flashing light has failed to deploy, use caution when working on the upper deck.
3. If the parachute on a recovered heat shield has failed to deploy, do not attempt to deploy or unpack the parachute on board the recovery vessel.
4. All unfired ordnance devices shall be conspicuously identified (red flags).

PHOTOGRAPHIC REQUIREMENTS

1. General photographic coverage as directed by NASA Team Leader.

TOOLS AND EQUIPMENT

Quantity	Nomenclature
3	Parachute bag

INSTRUCTIONS*Caution*

Verify that procedure (26) has been completed prior to accomplishing this procedure.

1. Inspect the forward heat shield for damage and evidence of recontact with the CM.

Remarks: _____

2. Inspect EVA handle and record any abnormal findings. Note degree of heat damage, sharpness of edges, and local effects to the ablator.

Remarks: _____

Date _____ Time _____ Signature _____

PARACHUTE AND FWD HEAT SHIELD INSPECTION

Sheet 2 of 2

PACKAGING REQUIREMENTS

FORWARD HEAT SHIELD

NOTE

Attach appropriate RADIATION WARNING
decals/stickers to shipping crate. (Refer
to procedure (26).)

1. If intact, have ship's carpenter fabricate a crate suitable for shipping cover back to NR.
2. Should damage be extensive, package individual components in bags, or wrap with paper, and package in a cardboard or wooden box.

PARACHUTES

1. Package parachutes and attaching hardware within individual parachute recovery bags for return shipment.

NOTE

- Parachutes should be protected from direct sunlight.
- Do not wash or dry parachutes.

Remarks :

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Date _____ Time _____ Signature _____

CREW EQUIPMENT REMOVAL

Sheet 1 of 72

Pages 231 through 302 will be provided at a later date.

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SECURING UNIFIED HATCH

Sheet 1 of 3

Following systems shutdown, interior inspection, equipment removal, etc., the unified hatch shall be closed and secured.

SAFETY

1. If a drogue or pilot parachute has failed to deploy, exercise extreme caution when entering/securing the CM.
2. Observe standard safety precautions when working in the CM.

PHOTOGRAPHIC REQUIREMENTS

Refer to procedure ①.

TOOLS AND EQUIPMENT

Quantity	Nomenclature	Part No.
1	NASA hatch tool	SEZ34100078-101

INSTRUCTIONS

1. Verify all tools and equipment utilized to accomplish postretrieval procedures have been removed from the CM.
2. Verify all interior components/access panels, etc., are secured.
3. Verify lockpin has not sheared. (If sheared, red portion of lockpin will extend approximately 1/2-inch beyond orange portion of pin.)
4. Verify both control handles (actuator handle selector and gear box selector) are in the "N" (neutral) position.
5. Verify NASA safety pin installed.
6. Record pressure gage indication: _____(green/white).

NOTE

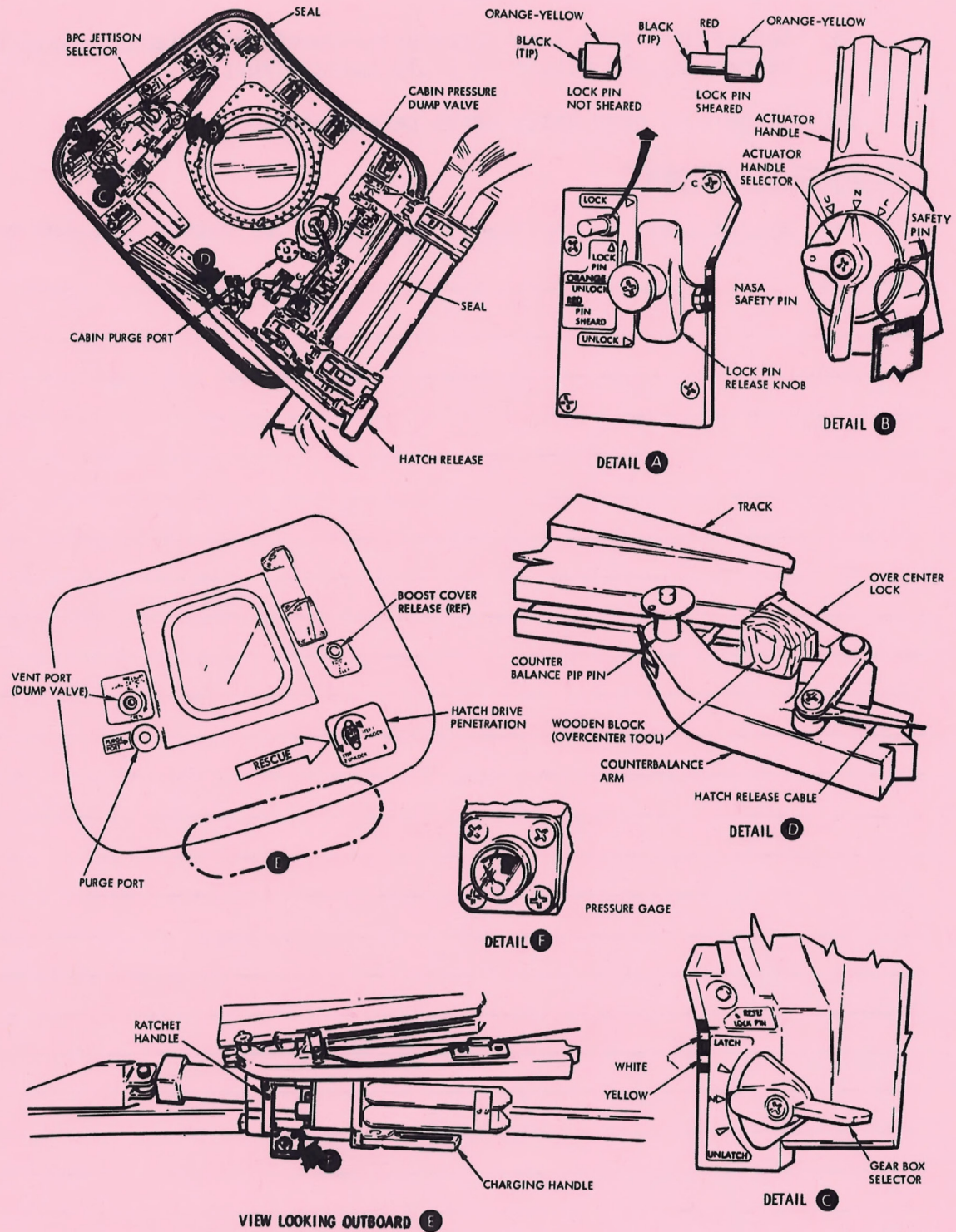
Prior to closing the hatch, open the dump valve by rotating the control handle located on the inside of the hatch (leave open).

7. Remove wooden block (overcenter tool).
8. While holding the hatch (pulling back), release the overcenter lock.

Date _____ Time _____ Signature _____

SECURING UNIFIED HATCH

Sheet 2 of 3



SM-2A-1467L

SECURING UNIFIED HATCH

Sheet 3 of 3

9. Push and hold hatch closed.
10. Insert NASA tool into hatch drive penetration (engage latching mechanism) and rotate in a clockwise direction.
11. Place seal over hatch drive penetration.

PACKAGING REQUIREMENTS

- 1. Return tools to applicable containers for return shipment to MSC.**

Remarks: _____

Date _____ Time _____ Signature _____

ENGINE VENT PLUG REMOVAL

Sheet 1 of 2

This procedure provides instructions for removing the pitch engine vent plugs prior to off-loading of the CM.

NOTE

Vent plugs will normally remain installed until all postretrieval procedures are completed. (If the vent plugs are not removed on board the recovery ship, removal shall be accomplished under the direction of the LST Director.)

SAFETY

1. Wear appropriate, protective clothing (face shield, rubber gloves, etc.).
2. Stand to one side of the engine ports when removing vent plugs.
3. Avoid body contact with the vent plugs following removal.

NOTE

For information relative to first aid, refer to procedure ③, EMERGENCY FIRST AID FOR PROPELLANT INJURY.

PHOTOGRAPHIC REQUIREMENTS

Refer to procedure ①.

TOOLS AND EQUIPMENT

Quantity	Nomenclature
1	Face masks
1 pr	Rubber gloves

INSTRUCTIONS

1. Remove securing lines from drain tubing.
2. Loosen vent plug by turning serrated knob counterclockwise until knob hits handle.

Date _____ Time _____ Signature _____

ENGINE VENT PLUG REMOVAL

Sheet 2 of 2

3. Remove vent plug. If difficulty is encountered, gently move the plug from side to side (while pulling outboard) to loosen the rubber positioner.
4. Record condition of engine nozzles and vent plug seals.

Remarks: _____

5. Wash vent plug and hose interior with fresh water.

PACKAGING REQUIREMENTS

1. Package vent plugs and tubing for return shipment to MSC.

Remarks : _____

Date _____ Time _____ Signature _____

MICROBIAL SAMPLING PROCEDURES

Sheet 1 of 2

This procedure provides instructions for obtaining microbial samples.

IMPORTANT

THIS PROCEDURE SHALL BE PERFORMED BY THE FIRST PERSON ENTERING THE CM AND BEFORE ANY OTHER PROCEDURES ARE PERFORMED.

SAFETY

1. Observe standard safety precautions when working within the CM.
2. Do not reposition any switch, CB, or control. Repositioning of a switch, CB, or control could cause injury to personnel outside the CM, or cause damage to an on-board system.

PHOTOGRAPHIC REQUIREMENTS

Not applicable.

TOOLS AND EQUIPMENT

Quantity	Nomenclature
12	Sterile swabs immersed in saline
6	Test tubes containing trypticose soy broth
6	Test tubes containing veal infusion broth
2 pr	Surgeons gloves

INSTRUCTIONS***Caution***

- Surgeons gloves MUST BE WORN during sampling procedures.
 - Do not touch surfaces to be swabbed prior to sampling.
1. Remove two sterile swabs from saline solution (press lightly against side of test tube to remove excess saline).
 2. Holding the two swabs in one hand, pass the swabs over the designated hardware (rotating the swab and applying light pressure).

Date _____ Time _____ Signature _____

MICROBIAL SAMPLING PROCEDURE

Sheet 2 of 2

NOTE

If possible, 4 square inches of surface will be sampled.

3. Sample the following areas:
 - a. CDR rotational hand-controller pistol grip (both sides).
 - b. Tip of drinking water gun.
 - c. Top of X-X head struts (using same swab).
 - d. Aft bulkhead in front of Volume A5.
 - e. Soles of boots and palms of gloves (if PGA is in CM).

Caution

Do not touch swab, inside of test tube, cap, or solution with hands.

4. Take one swab, place one-third (including cotton) in trypticose soy broth solution, break off and discard remainder of stick. Cap test tube and verify swab is in the solution.
5. Place the other swab in the veal infusion broth as per step 4.
6. Repeat steps 4 and 5 for each location sampled.

PACKAGING REQUIREMENTS

1. Label each test tube containing swab with:
 - a. Flight mission number
 - b. Location sampled
 - c. Time of sampling
 - d. Date of sampling
 - e. Name of person taking sample.
2. Forward test tubes to Recovery Team Leader for packaging.

Remarks: _____

Date _____ Time _____ Signature _____

URINE DUMP AND STEAM DUCT FILTER INSTALLATION

Sheet 1 of 3

This procedure provides instructions for installing filters to the urine dump and steam duct ports.

SAFETY

1. Do not touch urine dump nozzle or inside of steam duct during filter installation.
2. Do not remove filters once installed.

PHOTOGRAPHIC REQUIREMENTS

None

TOOLS & EQUIPMENT

Quantity	Nomenclature
1	Philips head screwdriver
1	RCS access panel removal kit
1	Socket set, 1/4-inch drive
1	Flashlight
1	Handle, adapter, 1/2-inch square drive (breakover bar)
1	Crows foot, 1-7/8-inch, 1/2 square drive

INSTRUCTIONS

Steam Duct Filter Installation

1. Back off hex nuts #1 and #2. (See illustration.)
2. Insert filter stop assembly into steam duct with filter assembly pointing upward.
3. Tighten hex nut #1.
4. Tighten hex nut #2.
5. Verify proper installation by attempting to pull filter free of CM.

Urine Dump Filter Installations

NOTE

Installation instructions are the same for both filters.

Date _____ Time _____ Signature _____

URINE DUMP AND STEAM DUCT FILTER INSTALLATION

Sheet 2 of 3

1. Loosen four philips head screws holding filter plate to adjustable angle support. (See illustration.)
2. Place filter plate over urine dump nozzle so that filter port aligns with nozzle; then mark which plugs and screws on access panel must be removed.
3. Remove access panel plugs and screws using Access Panel Removal Kit.
4. Place urine dump nozzle adapter assembly over access panel and install angle support to access panel using four removed screws.
5. Remove cap from port on adjustable filter plate.
6. Using a flashlight, align hole in adjustable filter plate with small hole in urine dump nozzle; then tighten philips head screws. Recheck alignment.
7. Verify proper attachment of adapter by trying to pull unit away from CM.
8. Install filter on filter port.

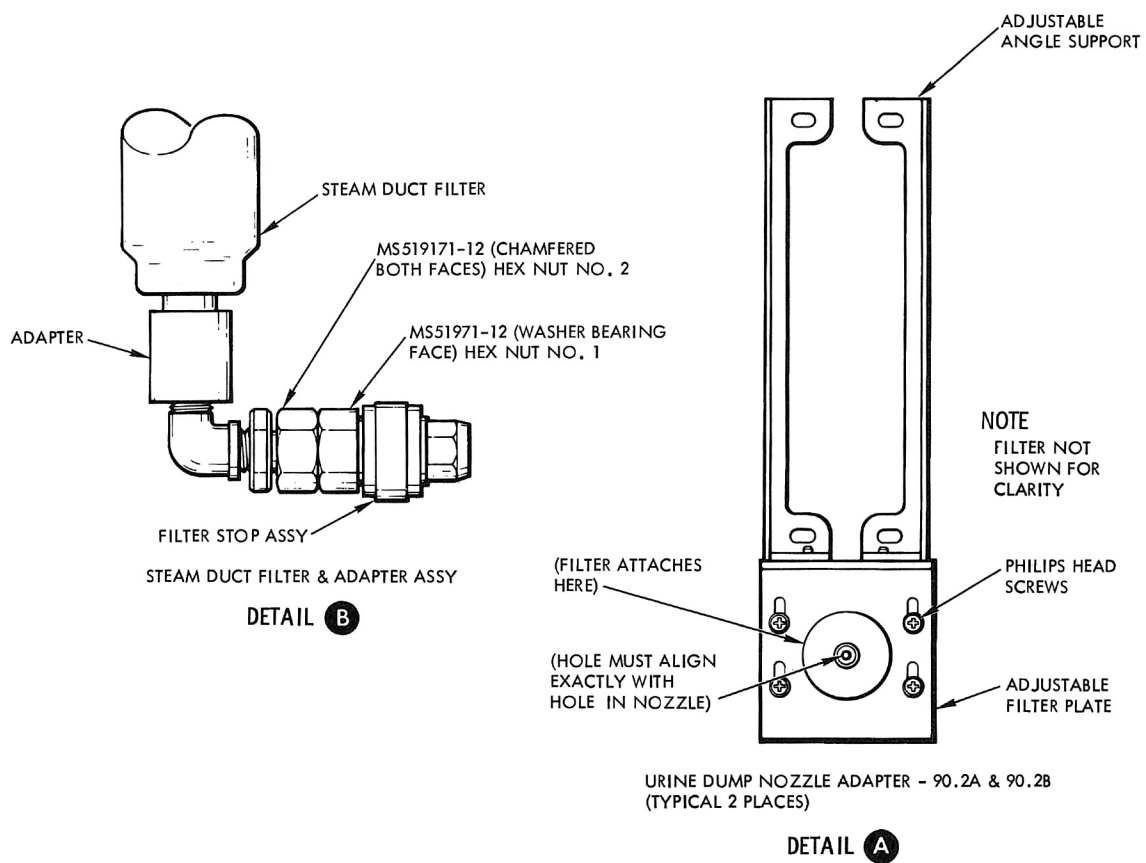
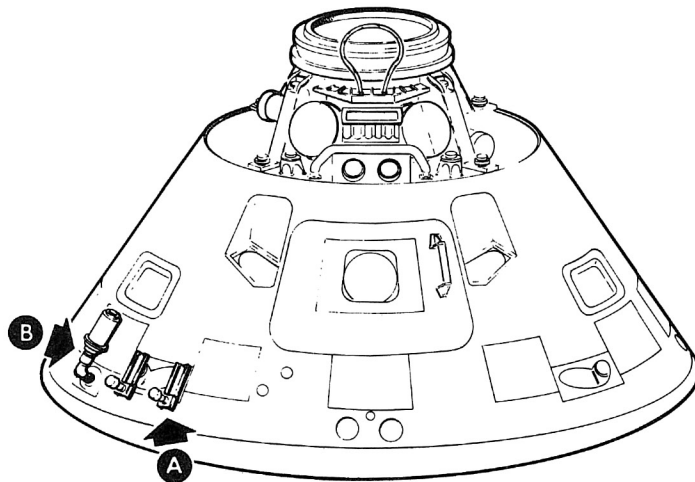
PACKAGING REQUIREMENTS

None

Date _____ Time _____ Signature _____

URINE DUMP AND STEAM DUCT FILTER INSTALLATION

Sheet 3 of 3



SM-2A-2179

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RADIATION SURVEY/SAFING

Sheet 1 of 6

Certain CM components contain radioactive material. (See sheet 3.) Accordingly, the purpose of this procedure is to identify and verify that these components have not been damaged. However, it should be noted that regardless of their condition, personnel responsible for postflight operations are subject to radiation exposure.

NOTE

If the radioluminescent discs are not damaged, external radiation exposure above allowable limits could only occur by prolonged, direct contact with one or more of the discs.

Warning

- If one or more of the discs are damaged, external contamination can occur by touching contaminated discs or adjacent surfaces. (External contamination of personnel can be removed by thoroughly washing the contaminated area.)
- Damaged discs increase the probability of internal contamination via ingestion, and less likely, inhalation. Therefore, external contamination should be removed before permitting any eating or drinking.

SAFETY

1. If propellant leaks (vapors) are evident, do not attempt to accomplish this procedure until the leakage has been stopped. (Refer to procedure (A).)
2. If a drogue or pilot parachute has failed to deploy, exercise extreme caution when working in the vicinity of the upper deck. (Refer to procedure (B).)
3. Do not allow unprotected parts of the body to come in contact with the radioluminescent discs/adjacent areas. Wear appropriate protective clothing (rubber gloves, etc.).
4. All radioluminescent discs shall be considered to be leaking radioactive contamination until confirmed otherwise.
5. Contaminated surfaces and areas should be marked with appropriate warning signs/decals.
6. All personnel responsible for accomplishing this procedure shall wear a film badge and a pocket dosimeter.

RADIATION SURVEY/SAFING

Sheet 2 of 6

PHOTOGRAPHIC REQUIREMENTS

1. Refer to procedure ①.

TOOLS AND EQUIPMENT

Quantity	Nomenclature
2	Geiger-Mueller survey meter (with thin-end window probe)
100	Test stickers (tape)
50	Containment stickers (tape)
4 pr	Rubber gloves
	Film badges
	Pocket dosimeters

INSTRUCTIONS**Warning**

- Avoid body contact with discs and adjacent surfaces.
- If body contact is made and radiation contamination is confirmed (with the Geiger-Mueller instrument), immediately remove any contaminated clothing and wash with soap and water.

1. Visually inspect all radioluminescent discs for damage.

NOTE

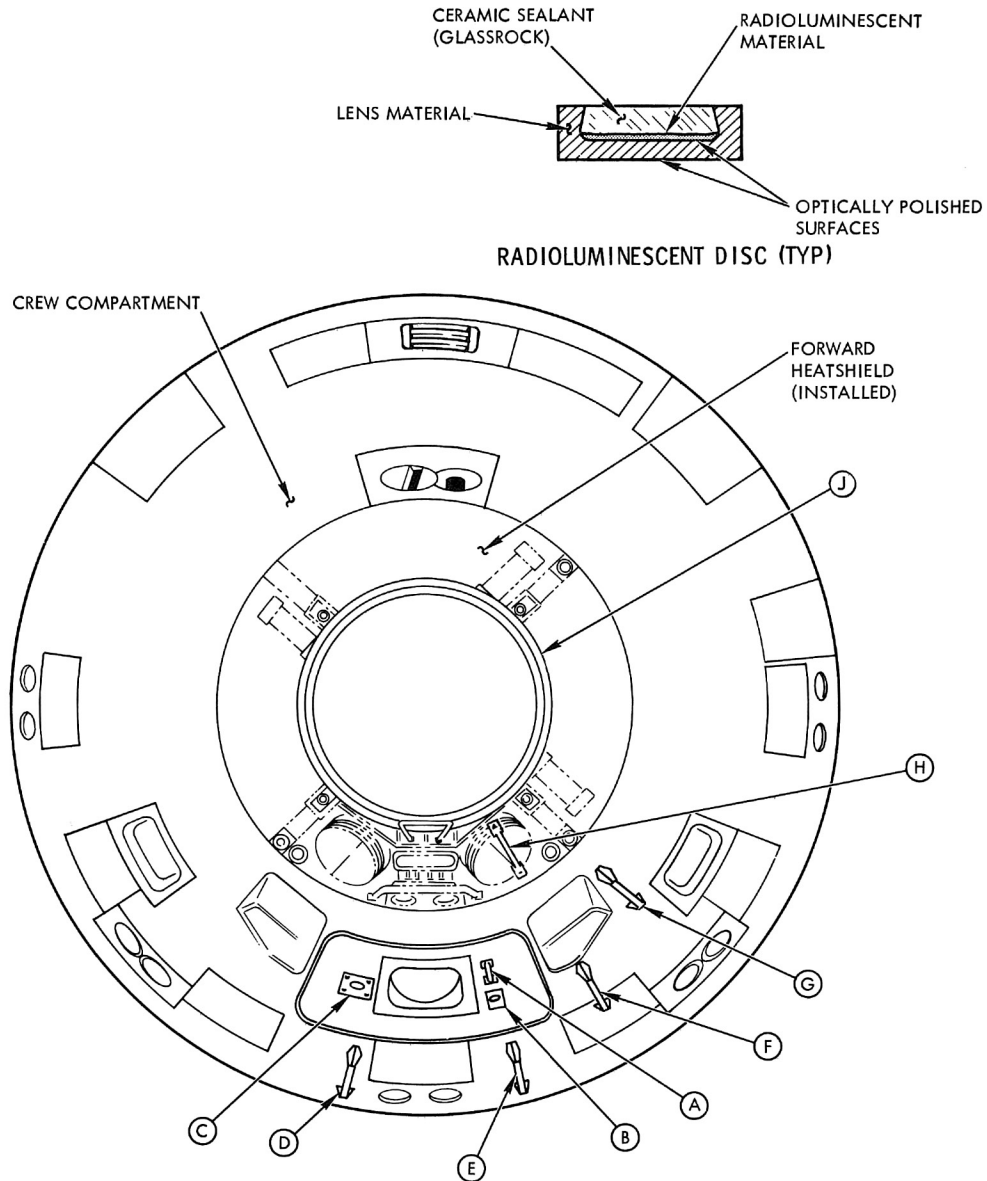
- If damage is evident, ascertain the leakage rate (per instructions in steps 2, 3, 4, and 6), and immediately cover source with containment stickers.
- If any of the discs are missing or damaged, notify the Houston Recovery Control Center (RCC) via the PRS coordination circuit.

2. Apply test sticker to each disc.

Date _____ Time _____ Signature _____

RADIATION SURVEY/SAFING

Sheet 3 of 6



INDEX	NOMENCLATURE
A	HATCH HANDLE (3 DISCS)
B	HATCH RELEASE MECHANISM (2 DISCS)
C	HATCH PRESS EQUAL VLV (4 DISCS)
D	EVA HANDLE (4 DISCS)
E	EVA HANDLE (4 DISCS)
F	EVA HANDLE (4 DISCS)
G	EVA HANDLE (4 DISCS)
H	DEPLOYABLE EVA HANDLE (4 DISCS)
J	EVA CIRCULAR HANDRAIL (8 DISCS)

SM-2A-1817A

RADIATION SURVEY/SAFING

Sheet 4 of 6

INSTRUCTIONS (Cont)

3. Remove test stickers.

NOTE

- Verify that the instrument has been properly calibrated.
 - Individual test stickers shall be monitored in an area removed from the CM.
4. Utilizing the Geiger-Mueller instrument, monitor each test sticker.

Record findings:

CM EXTERIOR (CREW COMPARTMENT)

Hatch handle
(INDEX A)

EVA handles
(INDEX D)

Hatch release
mechanism
(INDEX B)

(INDEX E)

Hatch pressure
equalization valve
(INDEX C)

(INDEX F)

CM EXTERIOR
(FWD HEAT SHIELD)

(INDEX G)

Deployable EVA
handle (INDEX H)

EVA circular
handrail
(INDEX J)

Date _____ Time _____ Signature _____

RADIATION SURVEY/SAFING

Sheet 5 of 6

INSTRUCTIONS (Cont)

5. Identify and package test stickers within individual packages for return shipment to MSC.
6. After monitoring the individual discs, apply containment stickers to all discs (regardless of condition).
7. After applying containment stickers (to all discs), utilize the Geiger-Mueller instrument to monitor the CM exterior surface areas for contamination. If a positive indication is obtained, proceed as follows:
 - a. Attempt to remove the radiation source (contamination) by washing the contaminated area with a solution of detergent and water. (As directed by the NASA team leader.)
 - b. Contain the radiation source by applying containment stickers to all areas.
 - c. Display appropriate RADIATION WARNING decals/stickers.
8. Monitor each individual involved.

Caution

- If clothing is contaminated, remove and stow in a plastic bag.
- Wash and stow rubber gloves (regardless of condition) within plastic bags.

PACKAGING REQUIREMENTS

1. Attach appropriate RADIATION WARNING decals/stickers to CM and plastic bags containing contaminated clothing/gloves.
2. Package test stickers for return shipment to MSC.
3. Package monitoring device for return shipment to MSC.

Date _____ Time _____ Signature _____

RADIATION SURVEY/SAFING

Sheet 6 of 6

Remarks: _____

PERSONAL RADIATION DOSIMETER READING

Sheet 1 of 1

This procedure provides space to record the CDR, CMP, and LMP personal radiation dosimeter readings.

SAFETY

1. Observe standard safety precautions when working in CM.

PHOTOGRAPHIC REQUIREMENTS

None

TOOLS AND EQUIPMENT

None

INSTRUCTIONS

Record the CDR, CMP, and LMP personal radiation dosimeter (PRD) readings, serial number, and time readings were taken. Refer to procedure (21) sheet 13 of 59 (page 235) for PDR locations.

	S/N	READINGS IN RADS	Time/Date Reading Taken
CDR	_____	_____	_____
CMP	_____	_____	_____
LMP	_____	_____	_____

PACKAGING REQUIREMENTS

None

Date _____ Time _____ Signature _____

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REACTION CONTROL SYSTEM (RCS) ANOMALY

Sheet 1 of 4

This procedure provides information for controlling RCS propellant leaks or fires.

SAFETY

1. Should fuel or oxidizer leaks be evident, all personnel shall be evacuated from the immediate area. Work in the RCS thruster areas should be minimized. (See adjacent illustration.)

PHOTOGRAPHIC REQUIREMENTS

1. If possible, obtain photographic coverage of any propellant leaks, fires, etc.

Warning

Photographers shall not expose themselves to unnecessary dangers. Photographic coverage will not take precedence over crew egress or assisting injured personnel.

INSTRUCTIONS

LEAKS

1. Thoroughly wash down any areas contaminated with propellant liquid or fumes, if so directed by the NASA Team Leader.

Warning

Individual(s) attempting to carry out this action must be wearing protective clothing and a self-contained breathing supply.

FIRES

1. Fires shall be doused with large amounts of water, using low-pressure nozzles.
2. Because of the wide flammability limits and reignition hazard, foams, powders, water fog, and vaporizing liquids are not as effective as water dilution. Both propellants are soluble in water; either salt or fresh water may be used to extinguish the flame.

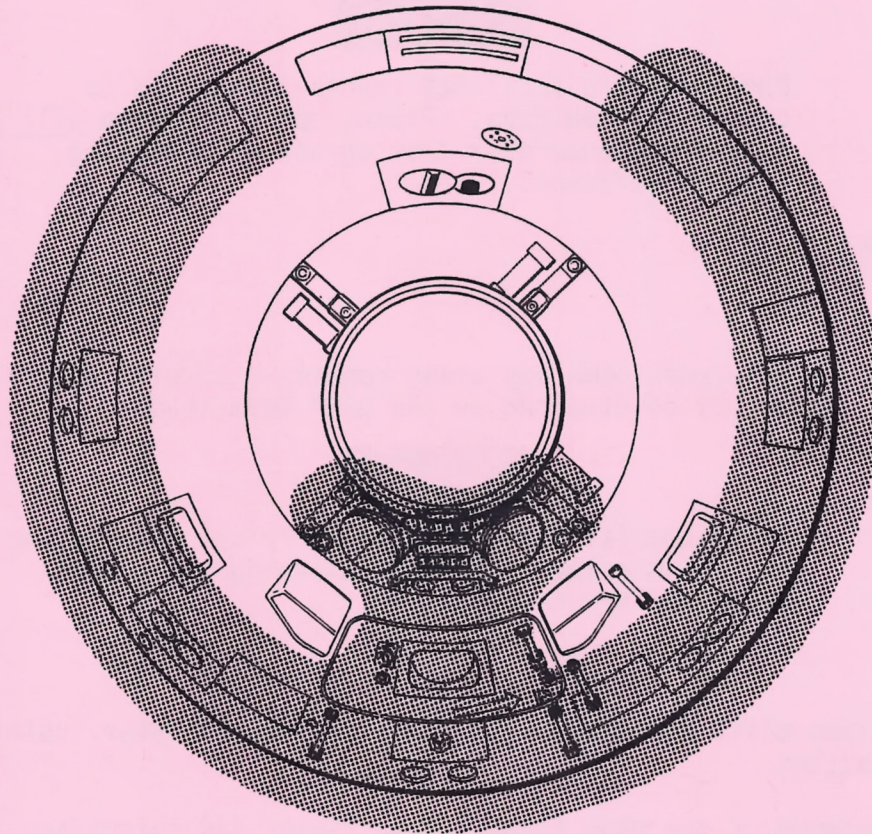
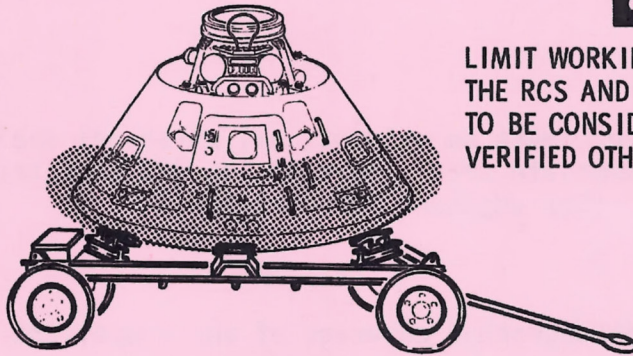
Date _____ Time _____ Signature _____

REACTION CONTROL SYSTEM (RCS) ANOMALY

Sheet 2 of 4

Warning

LIMIT WORKING TIME IN DANGER AREAS.
THE RCS AND ORDNANCE DEVICES ARE
TO BE CONSIDERED DANGEROUS UNTIL
VERIFIED OTHERWISE.



SM-2A-1133F

REACTION CONTROL SYSTEM (RCS) ANOMALY

Sheet 3 of 4

Because the fumes from a propellant fire are highly toxic, personnel must have a self-contained air supply and should fight the fire from an upwind position. After extinguishing the flame, continue to flush the spacecraft and surrounding equipment to ensure all traces of propellant have been diluted.

NOTE

- For information relative to first aid, refer to procedure ③, EMERGENCY FIRST AID FOR PROPELLANT INJURY.
- Should a fuel and/or oxidizer leak occur, note duration, leak source, corrective action, etc.

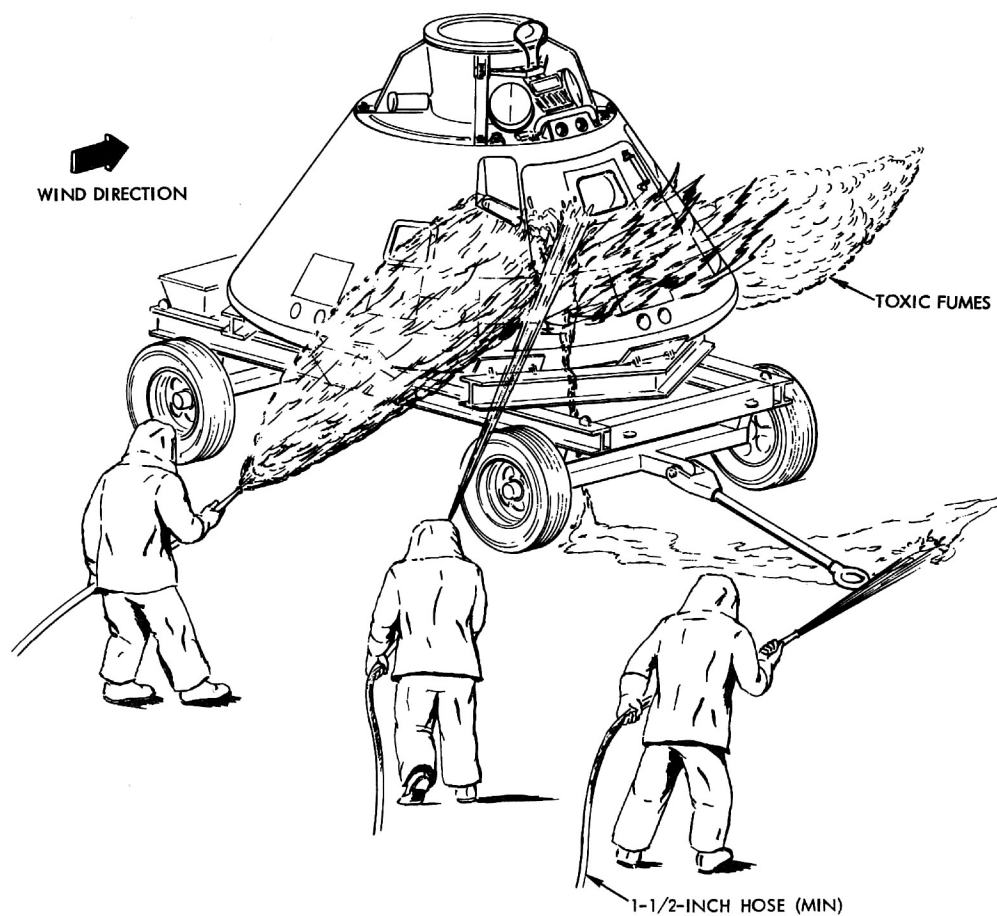
Remarks: _____

PACKAGING REQUIREMENTS

Not applicable.

REACTION CONTROL SYSTEM (RCS) ANOMALY

Sheet 4 of 4



- 1 Direct water at base of flame.
- 2 Wash propellants away as soon as possible.
- 3 Wash down all equipment exposed to propellants.
- 4 Monitor CM to determine if RCS fumes are present after fire is extinguished.

NOTE

- Use high-capacity fog nozzle (low pressure) to disperse and absorb vapors.
- Fresh or salt water may be used to combat hypergolic fires.
- Remain upwind or crosswind when flushing CM with water.

Warning

- Do not stand in RCS thruster areas (approximately 20 feet from any nozzle).

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ORDNANCE ANOMALY

Sheet 1 of 3

Recovery team personnel shall visually inspect all external ordnance devices to determine their condition (expended/not fired).

SAFETY

1. All ordnance devices shall be considered unsafe until verified safe by using an igniter circuit tester. Stay clear of all ordnance devices until they have been confirmed safe. Safing will be accomplished at the port of entry.
2. Personnel responsible for determining the status/working with ordnance devices shall wear garter grounding devices (Legstat).
3. If a parachute has failed to deploy, do not attempt to deploy or unpack the parachute. Erect a barrier around the CM to prevent personnel from entering the mortar line-of-fire.
4. The apex cover contains an ordnance-deployed parachute. If the chute has failed to deploy, use extreme caution when handling. Do not attempt to deploy or unpack the parachute.
5. If one or both of the VHF antennas or the flashing light has not deployed, use caution when working on the upper deck.
6. If docking ring has failed to deploy, do not attempt to deploy docking ring. Use extreme caution in area of docking ring.

PHOTOGRAPHIC REQUIREMENTS

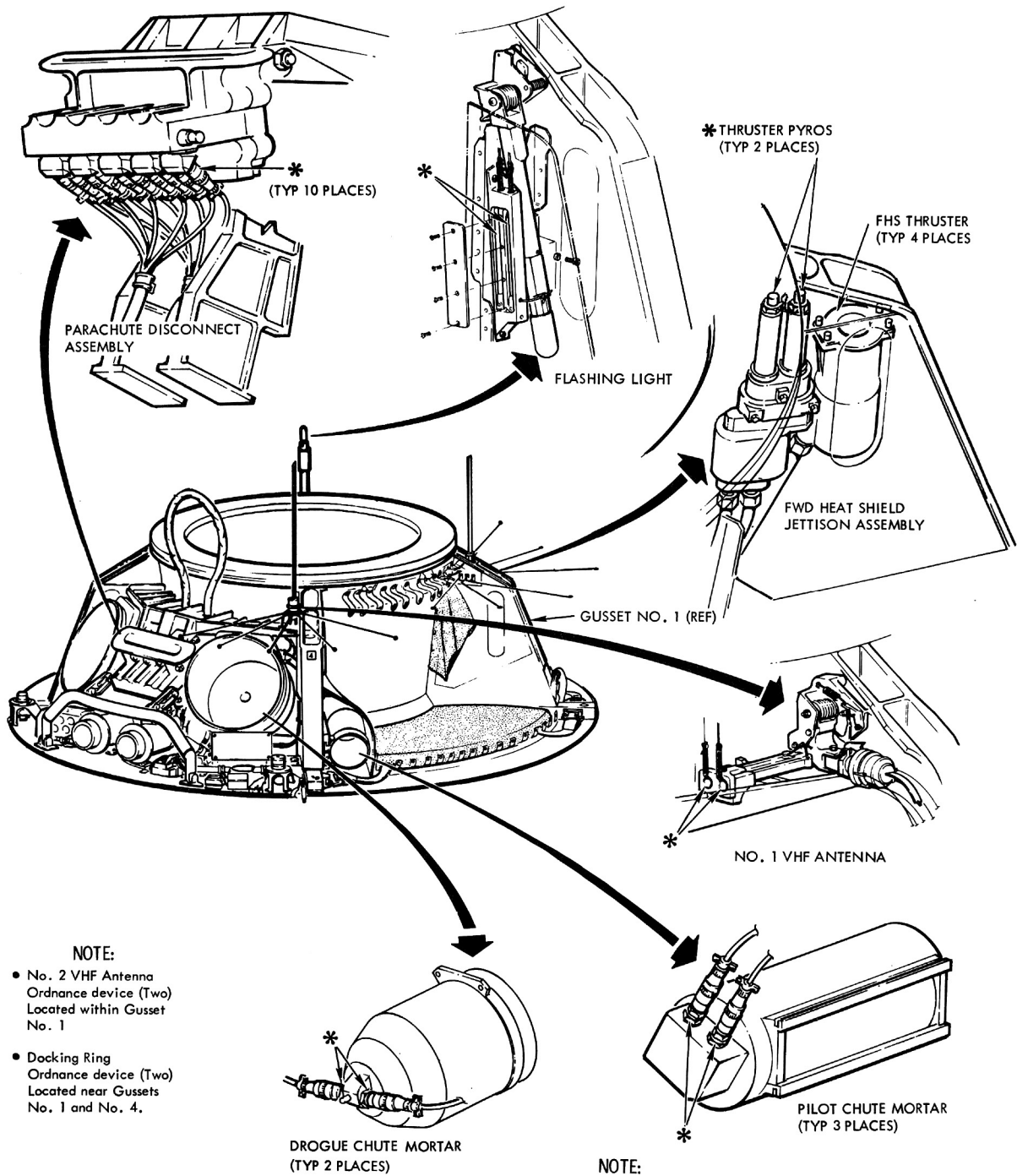
1. Closeups of any unexpended ordnance devices (if obtainable without undue risk to the photographer).
2. Closeups of any ordnance devices which have fired, but appear unused or abnormal in any way.

TOOLS AND EQUIPMENT

Quantity	Nomenclature
2	Legstat (grounding device)
	Assorted handtools (nonconductive)

ORDNANCE ANOMALY

Sheet 2 of 2



NOTE:
* = Ordnance Device

SM-2A-1692D



ORDNANCE ANOMALY

Sheet 3 of 3

INSTRUCTIONS

1. If any of the ordnance devices appearing on the adjacent illustration have not fired, inform the Houston-Recovery Control Center (RCC) and the Landing-Safing team upon arrival at the port of entry.
2. Red flag any unexpended ordnance devices.

Remarks: _____

PACKAGING REQUIREMENTS

Not applicable.

EMERGENCY FIRST AID FOR PROPELLANT INJURY

Sheet 1 of 2

This procedure provides recommended "first aid treatment" for personnel contaminated with RCS propellants; in addition, it also describes the various symptoms associated with propellant exposure.

SAFETY**NOTE**

Speed is of prime importance when treating personnel exposed to raw propellants.

1. All personnel associated with postretrieval operations shall be thoroughly familiar with recommended first aid procedures as outlined in the following chart.

Type of Exposure	Symptoms	Action
FUEL (MMH)		
Local Contact (Eyes and Skin)	Itching, tearing, swelling, stinging pain, temporary blindness	Removal of clothing and immediate deluging of affected area with water. Obtain qualified medical advice as soon as possible.
Vapor Inhalation	Coughing, choking, difficulty in breathing	Apply artificial respiration or supplemental oxygen and obtain qualified medical advice as soon as possible.
Ingestion	Lethargy, nausea, convulsions	Obtain qualified medical advice as soon as possible.
OXIDIZER (N ₂ O ₄)		
Local Contact (Eyes and Skin)	Stinging, burning sensation, itching, possible blindness	Immediate deluging of affected area with water. Obtain qualified medical advice as soon as possible.
Vapor Inhalation	Irritation of respiratory system	Obtain qualified medical advice as soon as possible.
Ingestion	Nausea, unconsciousness	Obtain qualified medical advice as soon as possible.

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EMERGENCY FIRST AID FOR PROPELLANT INJURY

Sheet 2 of 2

Remarks:

This image shows a single page of white paper with horizontal black ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

POTABLE/WASTE WATER SYSTEM PRESSURIZATION

Sheet 1 of 3

This procedure provides instructions for pressurizing the potable and waste water systems if there is no on-board pressure in the systems.

SAFETY

1. Observe standard safety precautions when working in the CM.
2. Follow instructions as listed -- DO NOT DEVIATE.

PHOTOGRAPHIC REQUIREMENTS

None

TOOLS AND EQUIPMENT

Quantity	Nomenclature
1	Allen-head adapter, 5/32 inch
1	Socket set, 1/4-inch drive
1	Crows foot, 9/16-inch

INSTRUCTIONS

1. Determine if system pressure is available as follows:
 - a. On panel 7, verify/place DIRECT O₂ valve to CLOSED.
 - b. On panel 326, verify/place SURGE TANK and REPRESS PKG valves to ON position.
 - c. On panel 351, verify/place OXYGEN CONTROL PANEL REGULATOR valves (toggles) A and B to OPEN.
 - d. On panel 351, verify/place WATER & GLYCOL TANKS PRESSURE - REGULATOR and - RELIEF valves to BOTH.
 - e. Allow a minimum of 3 minutes for system pressure build-up, then attempt to take samples.
2. If pressure is still not available, place all valves of steps 1a through 1d to OFF or closed position; except, leave WATER & GLYCOL TANKS PRESSURE - RELIEF valve at BOTH position.
3. Using a 5/32-inch Allen-head adapter, loosen the fasteners securing the V36-311011-917 cover.
4. Remove V36-311011-917 cover.

Date _____ Time _____ Signature _____

5. Using a 5/32-inch allen-head adapter, loosen the eight fasteners securing the CO₂ ABSORBER CARTRIDGE ACCESS PANEL (V36-333011), then the ACCESS to E.C.U. ELECTRONICS PACKAGE (V36-333041) access cover, located below the CO₂ and odor absorber assembly (panel 350).

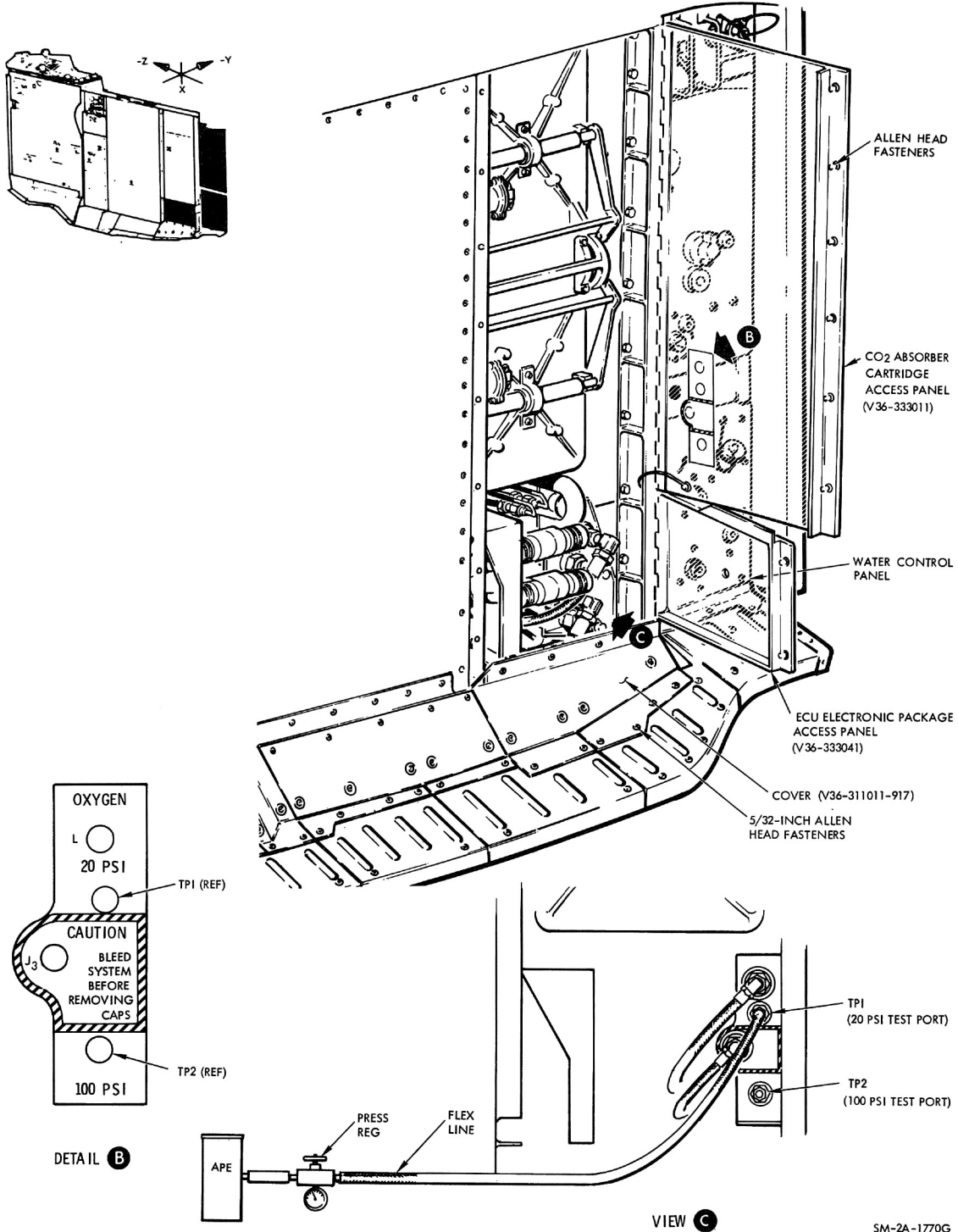
Warning

- Verify positive location of TP1 (20 psi) test port by comparing with identification on inside of V36-333011 hinged cover as shown on adjoining illustration.
 - Use caution when removing cap from TP1 since residual pressure may be present in line.
 - Do not disturb TP2 (100 psi) test port.
6. Open access covers and slowly unscrew cap of TP1 (20 psi) test port to bleed any residual pressure while removing cap.
 7. Attach auxiliary pressurizing equipment (APE) hose to TP1. (See adjoining illustration.)
 8. Open APE regulator, verify pressure gauge reads 20 psi.
 9. Obtain designated potable water samples as instructed in procedures ⑨ and ⑩.
 10. After obtaining desired samples, when APE has been used, proceed as follows:
 - a. Close APE regulator.
 - b. Allow regulator to bleed down line pressure, then slowly disconnect APE from TP1.
 - c. Reinstall TP1 cap.

Date _____ Time _____ Signature _____

POTABLE/WASTE WATER SYSTEM PRESSURIZATION

Sheet 3 of 3



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