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#### MINUTES

Tenth Apollo Lunar Surface Program

Interface Meeting

September 7, 1967

The tenth of a series of Apollo Lunar Surface Program Interface meetings was held at The Bendix Aerospace System Division, Ann Arbor, Michigan, September 7, 1967.

Mr. Joe Clayton, Bendix ALSEP Program Director, opened the meeting and welcomed all to Bendix. Mr. Small, Manager, Lunar Surface Project Office then introduced Dr. C. O. Alley of the University of Maryland as the PI for the Lunar Laser Ranging Retro-Reflector experiment.

Each organization (PI's, contractors, etc.) gave a status report which included the following:

- a. Overall schedule status
- b. Accomplishments to date
- c. Forecasted accomplishments
- d. Problems

The enclosed agenda shows the organizational elements and subject material presented. Presentation material used is attached. Pertinent points discussed are briefly summarized below:

a. The schedule presented by Dr. Snyder on the SWS shows that the Qual Model will marginally support the required delivery. However, due to conflicts with OGO calibration, it probably will be shipped uncalibrated. Dr. Snyder introduced Mr. Bob White who is replacing Mr. Gary Walker as project engineer at Jet Propulsion Laboratories.

- b. Mr. Herb Cross, speaking for Dr. Sonett, stated that the LSM design is now frozen. The Proto type unit has been delivered. The Qual unit does not support the System Qual at Bendix.
- c. The PSE schedule was presented as supporting the System Qual. However, a recently discovered problem could cause some delay. Dr. Latham requested and was given Mr. Phil Claskey, at Teledyne, as a point of contact for Test Program Status. LGO plans to have continuous coverage during all testing at Teledyne and Bendix.
- d. The SIDE schedule was reported as approximately 3 weeks late to support the System Qual at Bendix. This is due basically to long calibration time.
- e. The CCGE gauge is currently undergoing mount revision. However can still support system testing.
- f. Dr. C. Alley gave a brief description of the Lunar Laser Ranging Experiment including the scientific objectives. It was pointed out by Mr. Small that this experiment has not been assigned to a flight but development and fabrication is geared to the first Lunar landing mission.
- g. Mr. Al Schorken presented the ALSEP Test Program Status and briefly described the planned tour of Plant #2.
- h. After the tour Mr. John Driscoll described the LM/ALSEP Interface Design Summary and Mr. J. Burns presented the ALSEP Status.
  - i. An integrated lunar surface program schedule is enclosed.

The following action items resulted from the meeting:

B70907-01M - MSC will provide clarification of ALSEP hardware nomenclature by October 1, 1967.

Mr. Moke to each PI.

B70907-02S - ARC to provide impact to add survival heater to LSM by October 1, 1967.

Mr. Cross to Mr. Moke.

B70907-03B - Bendix to provide plan for calibration of GFE/GSE by September 21, 1967.

Mr. Clayton to Mr. Small.

Jøhn W. Small, Manager Lunar Surface Project Office

#### AGENDA

#### APOLLO LUNAR SURFACE EXPERIMENTS PACKAGE

#### Interface Meeting

#### Bendix Aerospace Systems Division

#### Ann Arbor, Michigan

#### September 7, 1967

9:00 a.m.	Welcome	Mr. J. Clayton
9:05	Introduction	Mr. J. Small
9:15 - 1:30 p.m.	Organizational Status Reports:	
	. Overall Schedule Status	
	. Accomplishments To Date	
	. Forecasted Accomplishments	
	. Problems	
9:15	SWS	Dr. C. Snyder
9:30	LSM <sup>.</sup>	Dr. C. Sonett
9:45	PSE	Dr. G. Latham
10:00	SIDE	Dr. J. Freeman
10:15	CCGE	Dr. F. Johnson
10:30	CPLEE	Dr. B. O'Brien
10:45	ASE	Dr. R. Kovach
11:00	HFE	Dr. M. Langseth
11:15	LRR	Dr. C. Alley
11:30	DRILL	Mr. M. Goldman
11:45	RTG	Mr. W. Remini

12:00 Noon	ALSEP Test Program Status	Mr.	Α.	Schorken
12:30 p.m.	Lunch			
1:30	Review of ALSEP Plant #2 Operations (Prototype Testing, Manufacturing Human Factor, etc.)	,		
3:00	ALSEP Status	Mr.	J.	Clayton
3:30	LM/ALSEP Interface Design Summary	Mr.	J.	Driscoll
4:00	Question Period		4.	
4:30	Adjourn			

#### ATENDEES

L. Tiffany Bendix A. Ketler General Electric J. Burns Bendix G. Chang Bellcomm, Inc. J. McDowell Bendix R. Shay Bendix R. Kovach Stanford University G. Latham Columbia University P. Maloney NASA-MSC J. Langford NASA-MSC R. Moke NASA-MSC J. Clayton Bendix J. Small NASA-MSC C. Schorken Bendix J. Kenney NASA-MSC at Bendix J. Sanders NASA-MSC A. Collins Bendix R. Swain Teledyne R. Schmidt Bendix P. Hickson Bellcomm, Inc. J. Zill NASA-MSC W. Sandstrom Marshall Labs. W. Smith Rice University J. Stenning Bendix E. Van Valkenburg Bendix

J. Musslewhite	Rice University
A. Robinson	Bendix
J. Dye	Bendix
G. Walker	Jet Propulsion Laboratory
W. Collier	Jet Propulsion Laboratory
B. White	Jet Propulsion Laboratory
J. Redd	NASA-MSC
D. Sherwood	NASA-MSC
J. Harris	NASA-MSC
M. Yates	Bellcomm, Inc.
H. Rudolph, Jr.	NASA-KSC
W. Johnson	Bendix
C. Ahlstrom	Bendix
J. Grayson	NASA-MSC
L. Fekete	Grumman Aircraft Engineering Corp.
T. Newman	Grumman Aircraft Engineering Corp.
L. Lewis	Bendix
C. McClenny	NASA-MSC
K. McDermott	Columbia University
H. Miller	Bendix
H. Greider	NASA-MSC
L. Paine	Bendix
A. Stephenson	NASA-MSC
J. Sulester	NASA-MSC
R. Longmire	NASA-MSC
R. Irwin	NASA-MSC

	3
W. Dunaway	NASA-MSC
C. Vaughn	NASA-MSC
W. Durrett	NASA-KSC
J. Driscoll	Grumman Aircraft Engineering Corp.
G. Young	Teledyne
E. Davin	NASA Headquarters
H. Culver	Goddard Space Flight Center
K. Schaver	Bendix/GSFC
F. Pallon	Bendix/GSFC
J. Lewko	Bendix
W. Collier	Jet Propulsion Laboratory
M. Goldman	Martin-Marietta Corporation
W. Remini	NASA-MSC
J. Carroll	Graduate Research Center of the Southwest
Dr. J. Freeman	Rice University
Dr. C. Alley	University of Maryland

Rice University

Ames Research Center

Jet Propulsion Laboratory

Dr. B. O'Brien

Dr. C. Snyder

H. Cross

# SOLAR WIND SPECTROMETER

#### SCHEDULE AND STATUS

UNIT	STATUS	SCHEDULED DELIVERY . TO DASD
SN 5 QUAL 1	95% COMPLETE	SUBSEQUENT TO 19 STITEMEER TO US MEGOTIMED
SN 6 QUAL SPARE	75% COMPLETE STALLED FOR TRANSFORMER	6 NOVEMEER
SN 7 PLICHT 1	60% COMPLETE	27 MOVSMOBR
SN 8 PLIGHT 1 STARE	4075 COMPLETE	

## SWS PROBLEMS

- 1. CHOICE OF HIGH-VOLTAGE RESISTOR
- 2. SENSOR MOUNTING
- 3. STRENGTH OF HIGH-VOLTAGE STANDOFFS
- 4. BREAKAGE OF FILAMENTS FOR DUST COVER REMOVAL
- 5. REJECTION OF POWER TRANSFORMERS FOR FLIGHT UNITS

#### SWS FORECAST

- 1. COMPLETE QUALIFICATION OF SENSOR
- 2. INSTITUTE FAILURE REPORTING TO MSC
- 3. APPROVE CALIBRATION PROCEDURE
- 4. EVALUATE RESULTS OF PROTO-G TEST AND TAKE APPROPRIATE ACTION
- 5. IMPLEMENT SOLUTIONS TO HIGH-VOLTAGE ARCING PROBLEM
- 6. SELECT HIGH-VOLTAGE RESISTOR

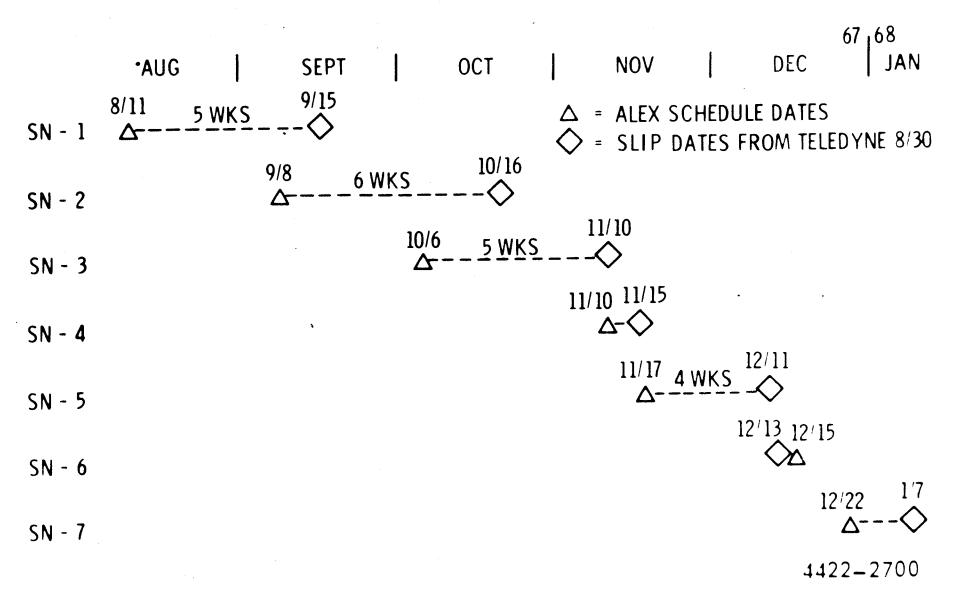
#### SWS ACCOMPLISHINENTS

- 1. CALIBRATION PROCEDURE GENERATED
- 2. MECHANICAL STRUCTURE DESIGN AND INTERFACE FINALIZED
- 3. INSTRUMENT QUAL TESTING SUCCESSFULLY COMPLETED, EXCEPT FOR SENSOR
- 4. FAILURE REPORTING SYSTEM WITHIN EOS AND JPL INSTITUTED
- 5. SENSOR STIMULATOR TESTED AND APPROVED
- 6. THERMAL-MECHANICAL SIMULATION UNIT CONSTRUCTED AND DELIVERED
- 7. SWS NO. 4 DELIVERED TO JPL
- 8. FIRST ARTICLE CONFIGURATION INSPECTION COMPLETED, INCLUDING
  - A. FREEZE OF DELIVERABLE DOCUMENTS
  - B. FREEZE OF HARDWARE DESIGN, INSPECTION TECHNIQUES, AND FABRICATION DETAILS
  - C. DRAWING FREEZE
  - D. IMPLEMENTATION OF CONFIGURATION CONTROL
  - E. APPROVAL OF INSTRUMENT PERFORMANCE

COPIES OF MR. H. CROSS'S SLIDES

WERE NOT AVAILABLE AT PRESS TIME

# PSE PRODUCTION SCHEDULE



## PSE ACCOMPLISHMENTS - I

- LGO TESTS (MODEL EM-2)
  - OPERATION THROUGH 26 JULY
  - LIGHTNING DAMAGE 26 JULY
  - RETURNED TO TELEDYNE
    - RETAIN AS REFERENCE MODEL
  - DVT UNIT TO LGO AFTER TESTS
    - LONG TERM FUNCTIONAL TESTS

#### PSE ACCOMPLISHMENTS - III

- DVT
  - SCHEDULED TO RESUME WEEK OF 4 SEPT
  - DELAY CAUSED BY
    - PERIOD ADJUSTMENT
      - FLEXURE SPRING RATE
    - DRIVE SCREW PASSIVIZATION
      - RECOATED
    - CAGING MECHANISM
      - REVISIONS MADE, PASSES LEAK TEST
    - NOISE EVALUATION
      - UNIT USED IN TEST
    - LPZ CLAMSHELL INSTALLATION
      - LATEST DESIGN

# PSE ACCOMPLISHMENTS - II

- PROTO
  - RETURNED TO BxA 1 AUG
    - NEW BELLOWS
    - NEW LPZ CLAMSHELL
    - NOISE SURPRESSION MODS
  - PRE-INTEGRATION TESTS 2-3 AUG.
  - INTEGRATION TESTS 4 AUG.

- SENSOR EXCITER MODIFIED TO
- ELIMINATE CAL SIGNAL LOADING
- INTEGRATION TESTS REPEATED 31 AUG

# CPLEE QUALIFICATION AND FLIGHT MODEL SCHEDULE

	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
QUAL MODEL QUAL MODEL SPARE ALSEP ARRAY B QUAL TEST				<b>A</b>							
FLIGHT MODEL #1 FLIGHT MODEL #2 (SPARE) FLIGHT MODEL #3 FLIGHT MODEL #4						4					

# CPLEE PROTOTYPE SCHEDULE

		10	)67		1968				
	SEPT	OCT	NOV	DEC	JAN	FEB	MAR		
ASSEMBLY AND FUNCTIONAL TEST ACCEPTANCE TEST AT BRL CALIBRATION FUNCTIONAL TEST WITH ARRAY C PROTOTYPE ARRAY B SYSTEM TESTS EXPERIMENT INTEGRATION PROTOTYPE DVT			•						

# CPLEE DESIGN VERIFICATION TEST MODEL

	AUG	SEPT	OCT	NOV
DVT MODEL DELIVERED BY BRL	8-15			
CALIBRATION LAB CHECKOUT AT RICE	8-19			
RETEST AT BRL	<b>8</b> -2	24		
PERFORMANCE TEST AT BXA		8-31		
EMI TEST				
MAGNETIC PROPERTIES TEST				
CALIBRATION AT RICE				·
PIA AT BXA				
ACCELERATION				
SHOCK				
VIBRATION				
THERMAL-VACUUM				

## MAJOR ACCOMPLISHMENTS CPLEE

- DESIGN VERIFICATION TEST MODEL DELIVERED
   BY BRL
- FUNCTIONAL TEST PERFORMED AT RICE CALIBRATION LAB.
- DVT TESTS STARTED AT BXA
- ALL SUBASSEMBLIES FABRICATED FOR CPLEE PROTOTYPE MODEL
- 70 % OF QUAL MODEL SUBASSEMBLIES FABRICATED.

#### CPLEE PROBLEMS

- RADIAL CRACKS IN SWAGED TERMINALS
- BLACK COATINGS ON PHYSICAL ANALYZER
   BAFFLES AND APERTURES
- VACUUM TEST FACILITIES AT BRL
- COMPLETION OF IN-PROCESS AND SUB-ASSEMBLY TEST SPECIFICATIONS

#### SCHEDULE STATUS

- OVERALL SCHEDULE-NO CHANGE
- SUB-CONTRACTOR SLIP (TRANSMITTER PROBLEM)

## **ACCOMPLISHMENTS**

- SUCCESSFUL RECEIVER QUAL TEST
- GRENADE BALLAST REMOVAL CHANGE 3 GRENADES, TOTAL 0. 6 LBS
- GLA/GLA T/S REWORK COMPLETED
  - -MODIFIED GLA
  - MODIFIED TEST SET
  - NEW CABLES

- NEW PROCEDURES

VERIFIED BY INERT **GLA TEST** 

SOS RESUMED GRENADE TESTING

4422 - 2716

## ACCOMPLISHMENTS (CONTINUED)

- BENDIX BOARD OF INQUIRY COMPLETED
  - ASE INVESTIGATION CONCURRENCE
  - ASE CORRECTIVE STEPS
- WSTF PROGRAM
  - INITIAL SUBSYSTEM TESTS COMPLETED
  - SYSTEM NOISE CHECK AT WSTF
- ◆ △ CDR AT GEOTECH
  - S/N LEVEL CHANGE IMPLEMENTED
  - QUAL UNIT COMPLETED ACCEPTANCE TESTS
- DVT PLAN COMPLETED

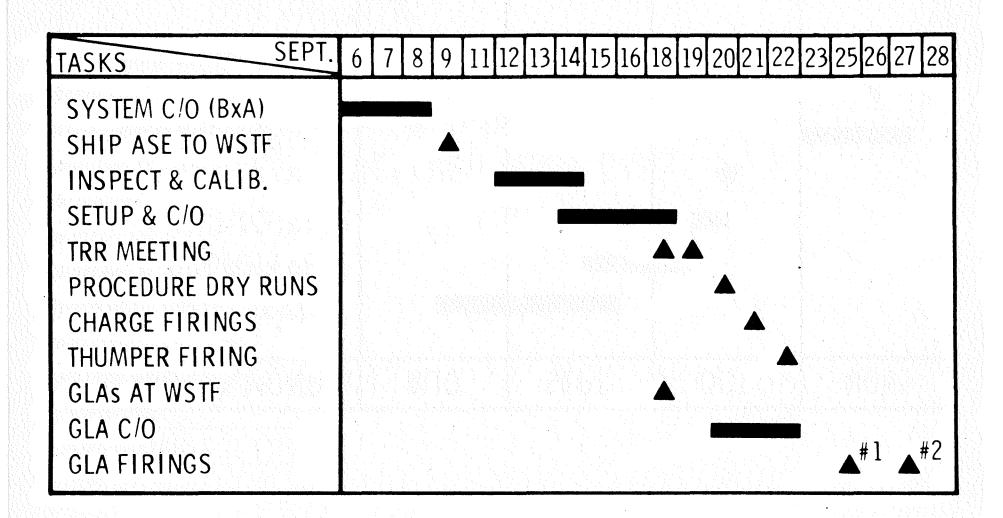
# PROBLEMS TO A SERVICE MANAGEMENT

- TRANSMITTER LONG TERM FREQ. DRIFT
  - CDC TEST/EXPERIMENTAL MODEL PROGRAM
  - BERRY RECEIVER STUDY
- INCLINOMETER
  - -NEW ANGLE SENSOR EVALUATION
  - RANGE ACCURACY ANALYSIS
- TEST EQUIPMENT

# ASE TRANSMITTER SCHEDULE

CDC TASKS MONTHS	AUG.	SEPT	OCT.	NOV.
FREQ. DRIFT TESTS BUILD PROTOTYPE RE-QUAL. PROGRAM				

# ASE/WSTF PROGRAM



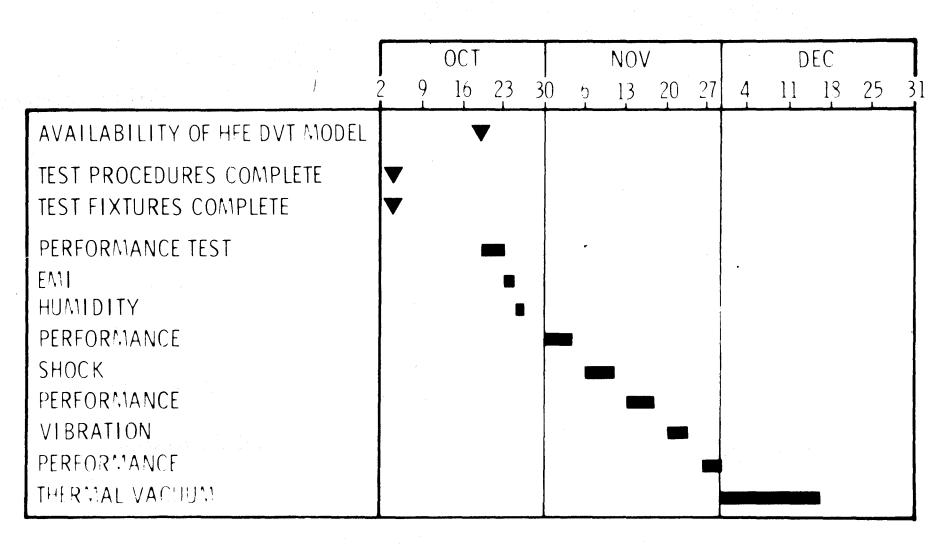
# **FUTURE EFFORTS**

- RESOLVE TRANSMITTER FREQ. DRIFT PROBLEM
  - $-\triangle$  CDR
  - NEW QUAL
- CONDUCT RECEIVER CDR
- COMPLETE & DELIVER WSTF GLAS
- CONDUCT WSTF PROGRAM
  - COMPLETE SYSTEM TEST AT BXA
  - TRR MEETING
  - CONDUCT TESTS AT WSTF

# H.F.E. DELIVERABLE HARDWARE SCHEDULE

		19	67		1968						
	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY
DVT PROTOTYPE QUAL. QUAL. SPARE FLT. FLT. FLT. ALSEP PROTO ''B'' TESTS								● GL	ILTON	TTLE D	

## H.F.E. DESIGN VERIFICATION TEST SCHEDULE



## ACCOMPLISHMENTS TO DATE

- 1. ENGINEERING MODEL 2 ELECTRONICS SHIPPED FROM GULTON TO A. D. LITTLE ON 8/4/67.
- 2. DVT (FORMER PROTO) MODEL ELECTRONICS SHIPPED FROM GULTON TO A. D. LITTLE ON 8/17/67.
- 3. THE QUAL #1 (FORMER QUAL #2) IS UNDERGOING ELECTRICAL CHECKOUT AT GULTON.
- 4. ALL OF THE PROBE AND PROBE PACKAGE DRAWINGS HAVE BEEN APPROVED AT A. D. LITTLE.
- 5. E2 TRAINING SIMULATOR AT A. D. LITTLE IS BEING UPDATED TO LATEST DRAWINGS CONFIGURATION.
- 6. THE CONTENTS OF THE ACCEPTANCE DATA PACKAGE TO BE USED BY A. D. LITTLE HAS BEEN APPROVED.

# ACCOMPLISHMENTS TO DATE (CONT.)

- 7. THE PROBES ARE BEING INTEGRATED WITH THE ENGINEERING MODEL ELECTRONICS.
- 8. THE DVT PROBE (FORMER PROTOTYPE) HAVE BEEN ACCEPTED AT A. D. LITTLE. THEY ARE BEING INTE-GRATED WITH THE ELECTRONIC AT A. D. LITTLE.
- 9. FLIGHT MODEL PROBE BEING ASSEMBLED.
- 10. THERMAL SIMULATOR CDR HAS BEEN HELD DUR-ING JULY. ALL ACTION ITEMS HAVE BEEN COMPLETED.
- 11. TEST PLAN FOR DVT AT BENDIX COMPLETED AND ISSUED
- 12. APOLLO LUNAR SURFACE DRILL INTERFACE CONTROL
  SPECIFICATION HAS BEEN SIGNED OFF BY MARTIN,
  BXA AND MSC.
  4422-271:

#### HFE MAJOR PROBLEMS

- 1. THE DVT MODEL HAD TO BE RETURNED TO GULTON TO REMOVE METAL CHIPS WHICH GOT INTO ELECTRONICS.
- 2. SOME DIFFICULTY IS BEING EXPERIENCED BY A. D. LITTLE IN SATISFYING THE RE-QUIREMENTS OF NPC 200-4 IN SOLDERING THE PROBE LEADS TO THE ELECTRONICS.
- 3. THE THERMAL SIMULATOR SHIPPING DATE HAS SLIPPED TWO WEEKS.

## HFE MAJOR FORECASTED ACCOMPLISHMENTS

- 1. THE DVT MODEL SHOULD BE TESTED AT A.D.

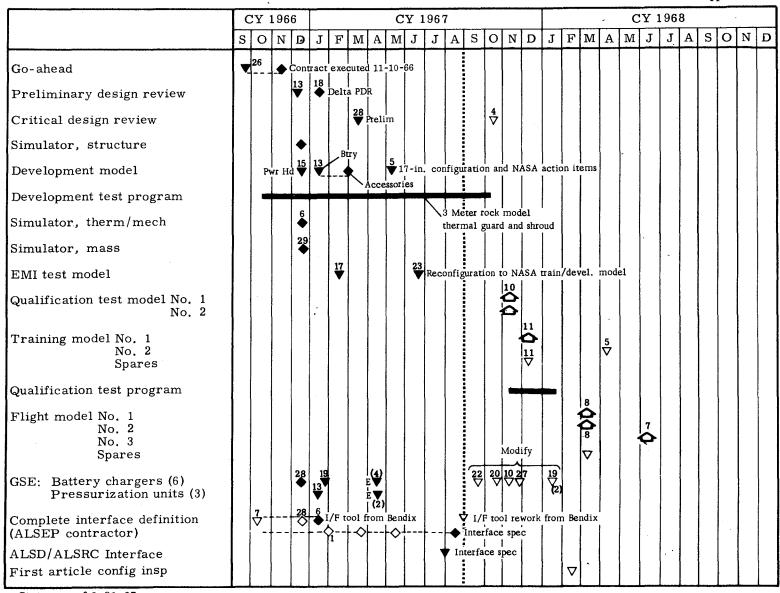
  LITTLE AND INTEGRATED AT BENDIX DURING
  THE MONTH OF OCTOBER.
- 2. THE PROTOTYPE SHOULD BE SHIPPED FROM A. D. LITTLE DURING OCTOBER.
- 3. THE LABORATORY AND THERMAL VACUUM SIMULATORS SHOULD BE IN ACCEPTANCE TESTING DURING SEPTEMBER AND EARLY OCTOBER.
- 4. DESIGN VERIFICATION TESTING SHOULD START
  DURING OCTOBER. 4422-271

COPIES OF DR. C. ALLEY'S SLIDES

WERE NOT AVAILABLE AT PRESS TIME

#### MAJOR MILESTONE SCHEDULE--ALSD

DPR 3-10 Appendix II



#### DELIVERABLE GLFC HARDWARE

#### ENGINEERING UNITS -

· HARDWARE AVAILABILITY

#### M5 - PRIME CASK

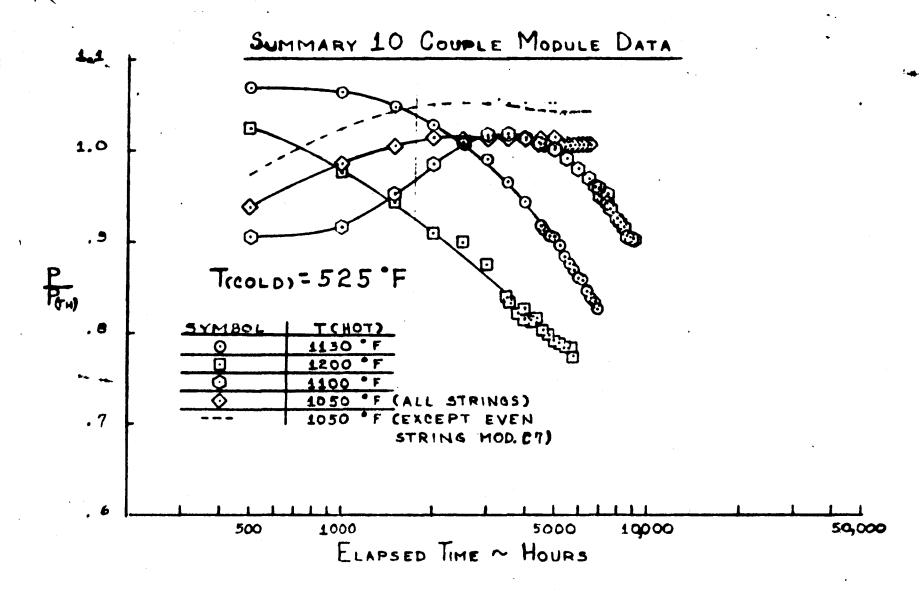
- · QUALIFICATION PER PRIME UNITS
- · SPARE WILL BE SPARE FOR ALL PRIME UNITS
- · COMPLETION THROUGH AEC STAGE INSPECTION BY 4/15/68

#### M6 AND M7 - 1G AND 1/6G TRAINING MOCKUPS

- · NON GRAPHITE MATERIALS WOOD/MAGNESIUM
- · WEIGHT/CG SIMULATION
- SIZE AND SHAPE SIMULATION
- · OPERATING BREECH LOCK AND SPLINE MECHANISMS
- NO THERMAL OR LOAD REQUIREMENTS
- COMPLETION SET FOR 10/1/67

#### PRIME UNITS - 4 FLIGHT PLUS ONE SPARE

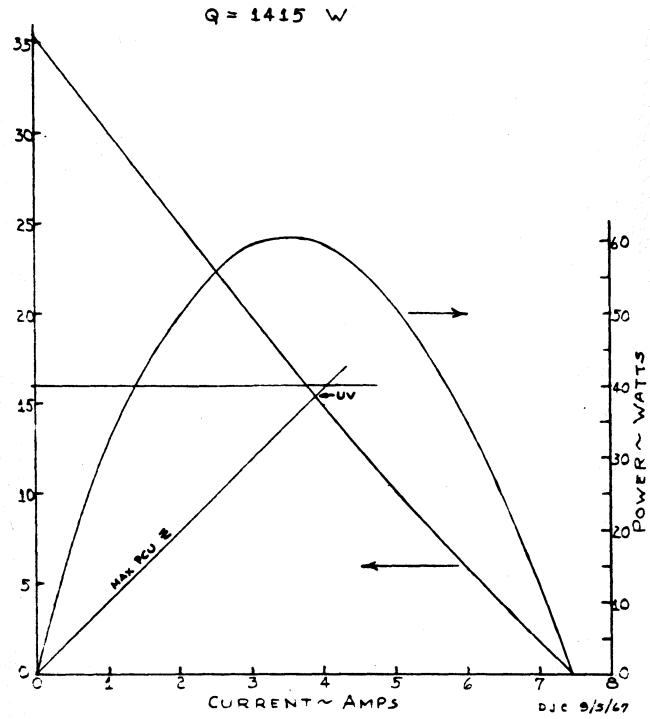
- TWO UNITS THROUGH STAGE INSPECTION BY 4/15/68
- THREE UNITS THROUGH STAGE INSPECTION BY 6/30/68

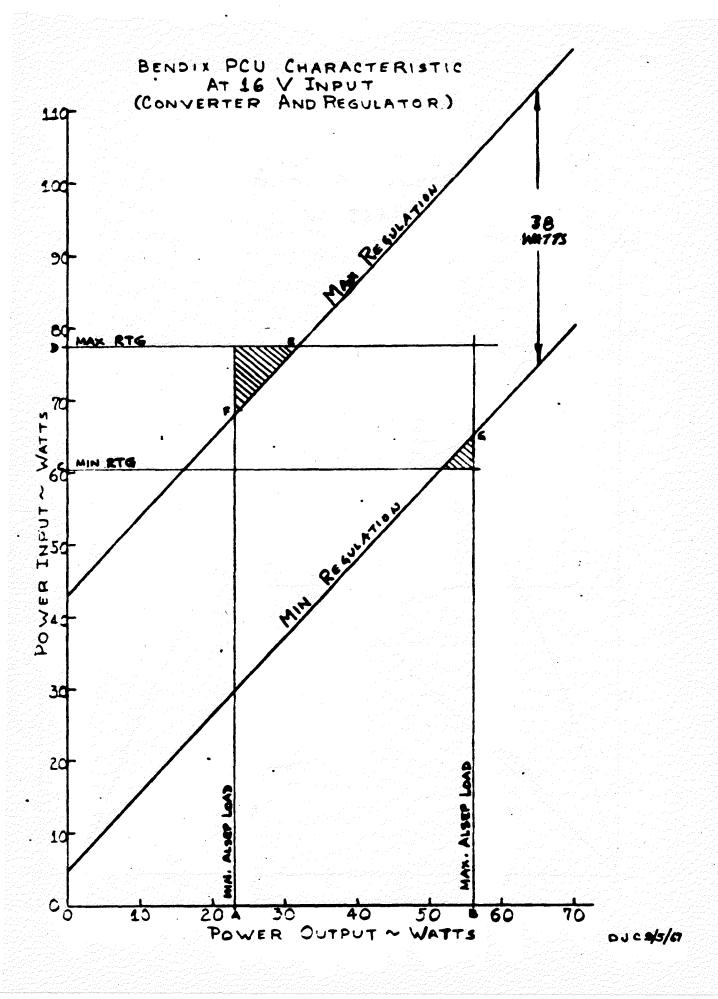


#### PROCEDURE

- 1. INCOMING INSPECTION TEST, PCU TEST CHASSIS
  - A. VISUAL INSPECTION
  - B. ELECTRICAL BENCH TEST WITH SIMULATED PCU
  - C. ELECTRICAL BENCH TEST WITH BENDIX PCU
- 2. ELECTRICAL CHECKOUT, PCU TEST CHASSIS WITH IPU TEST CONSOLE
- 3. RTG-PCU INTEGRATION TEST

### RTG CHARACTERISTIC THEORETICAL MINIMUM





#### RTG - PCII INTEGRATION TEST PROGRAM

#### **PURPOSE**

- 1. CHECK COMPATIBILITY OF PCU AND RTG DESIGNS.
- 2. DETERMINE PERFORMANCE CHARACTERISTICS OF PCU-RTG SYSTEM UNDER SELECTED CONDITIONS

RTD TEST RESULTS - 1100°F UNITS

	NON VENTED			VENTED		
	1	2	3	4	5	
PHASE I - 418 HOURS IN T/V	<u>+</u> .4%	<u>+</u> .4%	<u>+</u> .3%	± .15%	± .15%	
	(3024)	(2896)	(2958)	(2977)	(3007)	
CALIBRATION - CYCLING	<u>+</u> .005%	<u>+</u> .09%	<u>+</u> .05%	<u>+</u> .01%	± .015%	
PHASE II - 200 HOURS IN T/V	± .10% (2992)	± .05% (2987)	± .05% (3041)	<u>+</u> .05% (3012)	± .05% (2972)	

#### RTD STATUS

PROBLEMS: MOISTURE ABSORPTION AND SLOW DRY OUT DUE TO SMALL CRACKS IN

HERMETIC SEAL YIELDING LOW INSULATION RESISTANCE AND DRIFT

SOLUTION: VENTING WITH POROUS PLUGS

RESULTS: TESTING OF TWO VENTED AND THREE NON VENTED UNITS

PHASE 1 - T/V TESTING BEFORE AMBIENT CALIBRATIONS

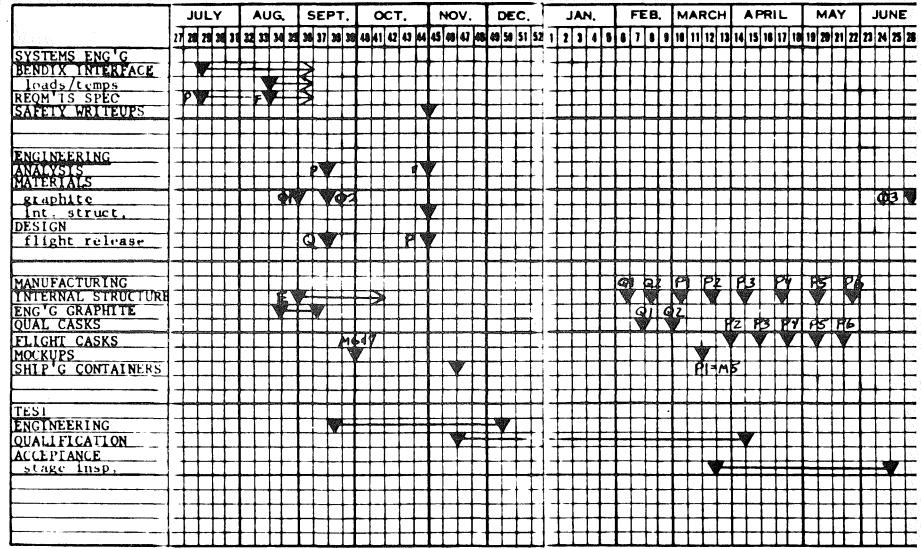
PHASE II - T/V TESTING AFTER AMBIENT CALIBRATIONS

ACCEPTANCE TESTING OF PRIME UNITS

CONCLUSIONS: DRY OUT RATES ARE ACCELERATED AND UNITS ARE NOW CONSISTENTLY STABLE

HERMETIC SEAL IS NOT NECESSARY

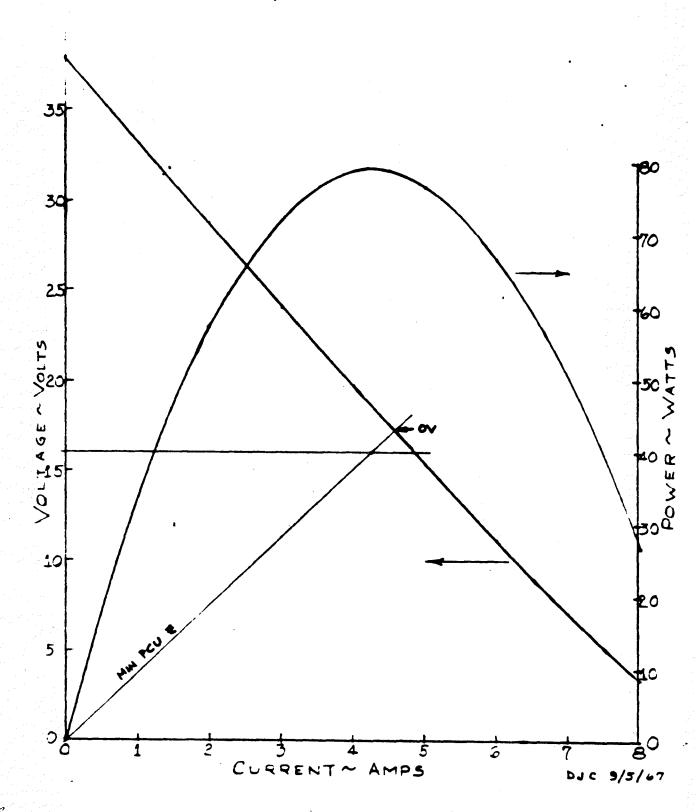
UNITS MUST BE INDIVIDUALLY CALIBRATED TO EACH GENERATOR INSTALLATION

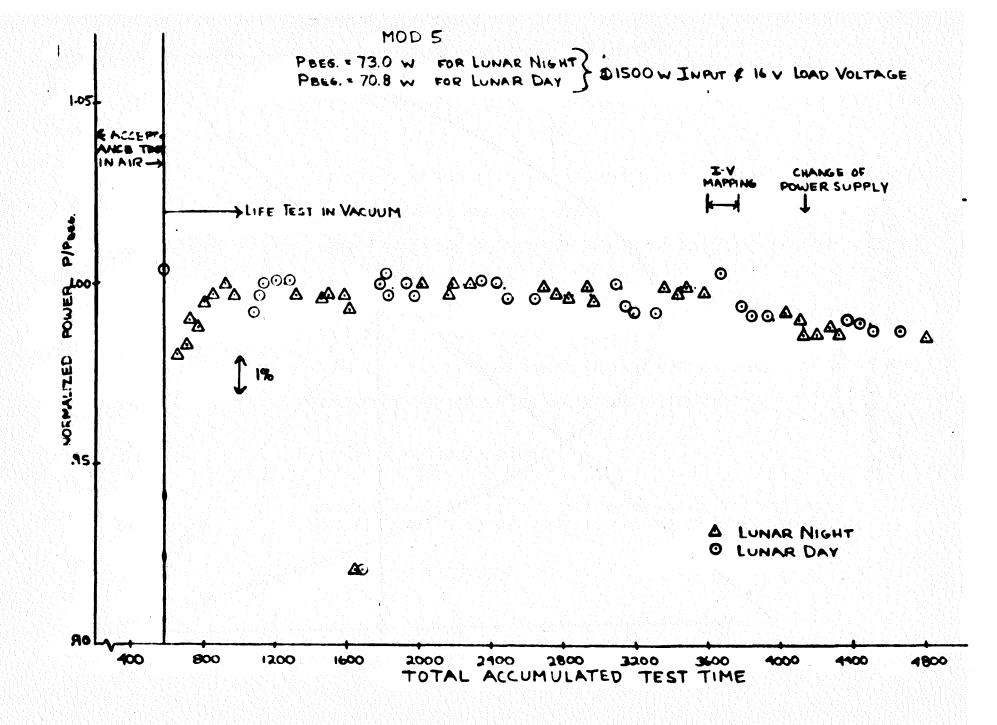


FORM 1134 REV. (12-64)

## RTG CHARACTERISTIC THEORETICAL MAXIMUM

Q = 1505 W





#### RTD STATUS

PROBLEMS: MOISTURE ABSORPTION AND SLOW DRY OUT DUE TO SMALL CRACKS IN

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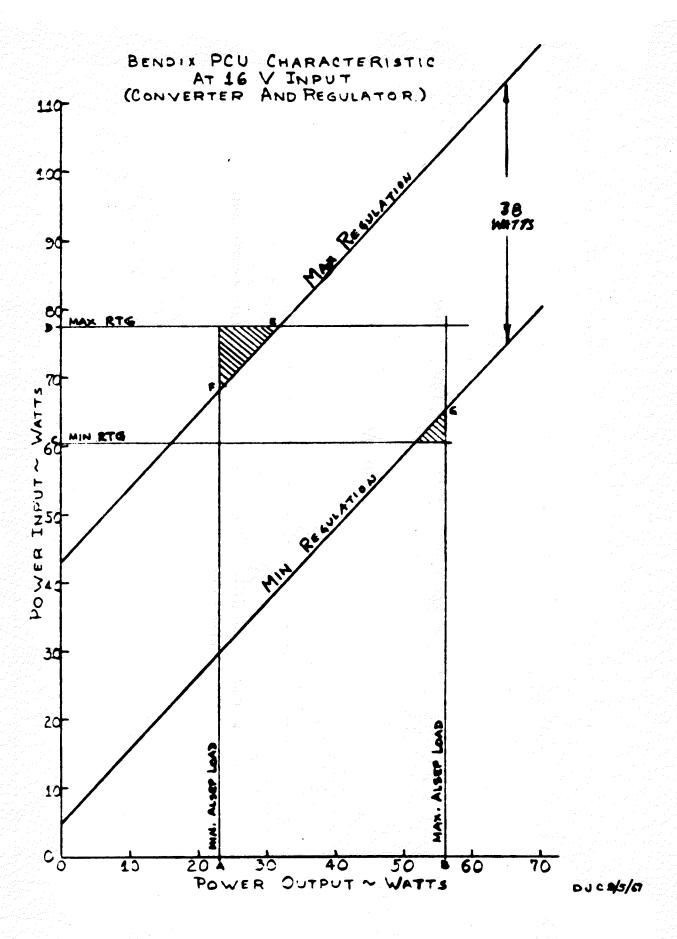
RTD TEST RESULTS - 1100°F UNITS

	NON VENTED			VENTED	
Att Ayrology a	1	2	3	4	5
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	(3024)	(2896)	(2958)	(2977)	(3007)
CALIBRATION - CYCLING	<u>+</u> .005%	<u>+</u> .09%	<u>+</u> .05%	<u>+</u> .01%	<u>+</u> .015%
			·		
PHASE II - 200 HOURS IN T/V	<u>+</u> 10%	± .05%	<u>+</u> .05%	<u>+</u> .05%	<u>+</u> .05%
	(2992)	(2987)	(3041)	(3012)	(2972)

### RTG - PCU INTEGRATION TEST PROGRAM

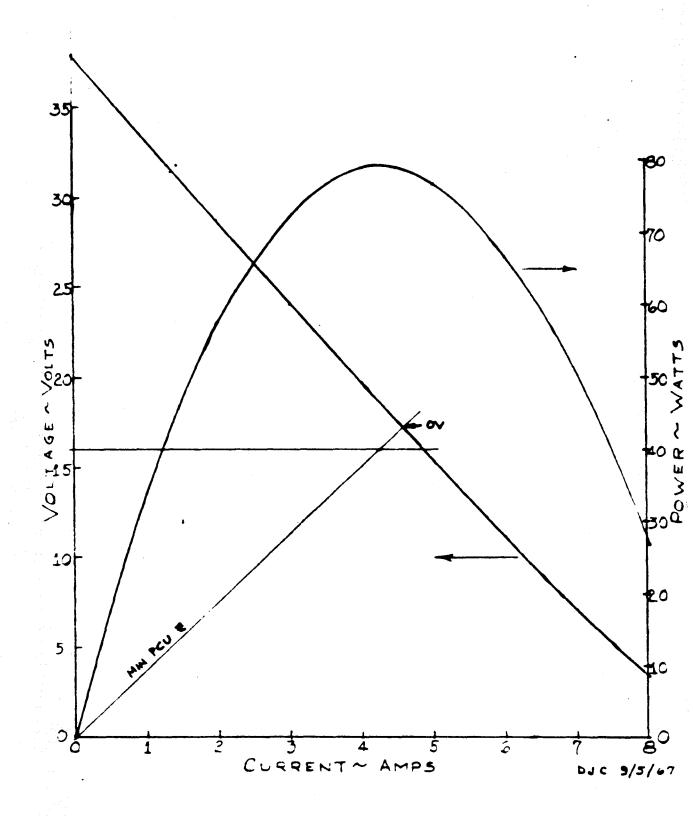
#### PURPOSE

- 1. CHECK COMPATIBILITY OF PCU AND RTG DESIGNS.
- 2. DETERMINE PERFORMANCE CHARACTERISTICS OF PCU-RTG SYSTEM UNDER SELECTED CONDITIONS

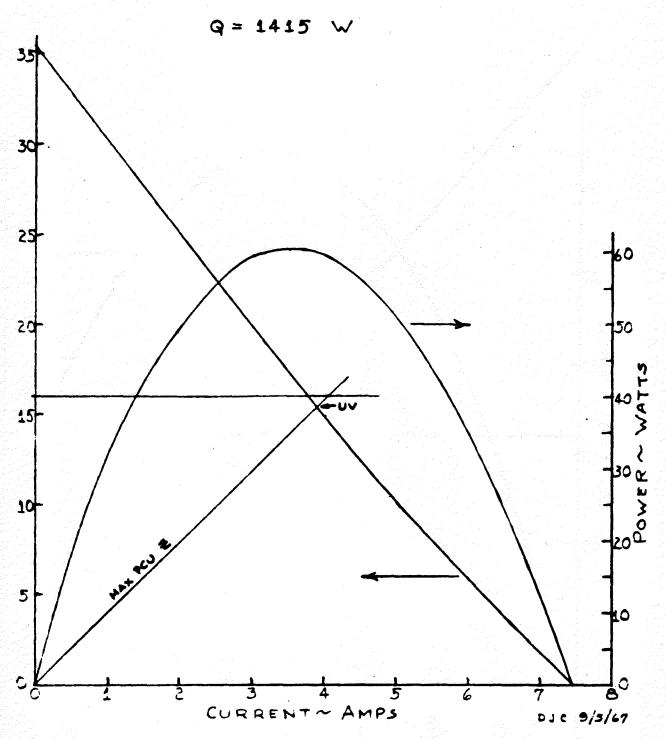


RTG CHARACTERISTIC

Q = 1505 W



RTG CHARACTERISTIC



#### PROCEDURE

- 1. INCOMING INSPECTION TEST, PCU TEST CHASSIS
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#### DELIVERABLE GLFC HARDWARE

#### ENGINEERING UNITS -

· HARDWARE AVAILABILITY

#### M5 - PRIME CASK

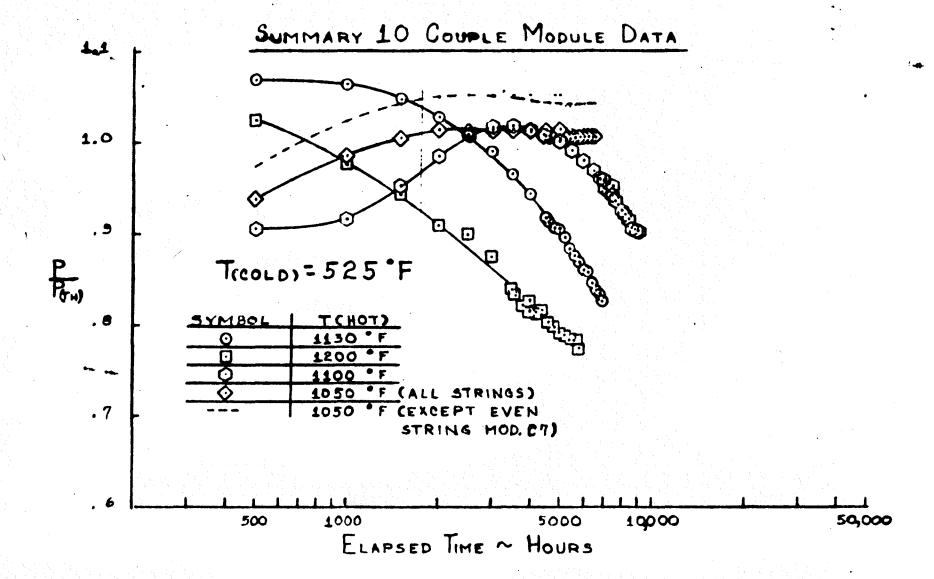
- · QUALIFICATION PER PRIME UNITS
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- · COMPLETION THROUGH AEC STAGE INSPECTION BY 4/15/68

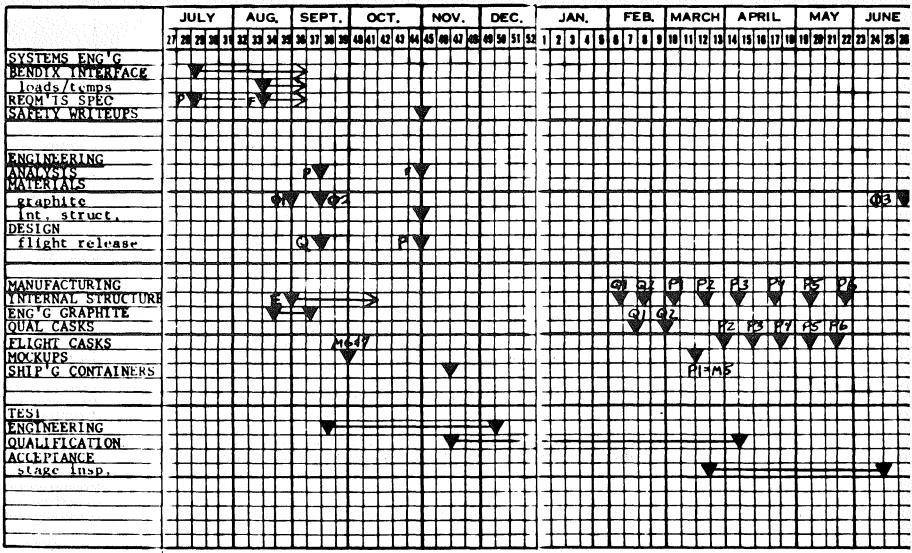
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- · COMPLETION SET FOR 10/1/67

#### PRIME UNITS - 4 FLIGHT PLUS ONE SPARE

- TWO UNITS THROUGH STAGE INSPECTION BY 4/15/68
- THREE UNITS THROUGH STAGE INSPECTION BY 6/30/68

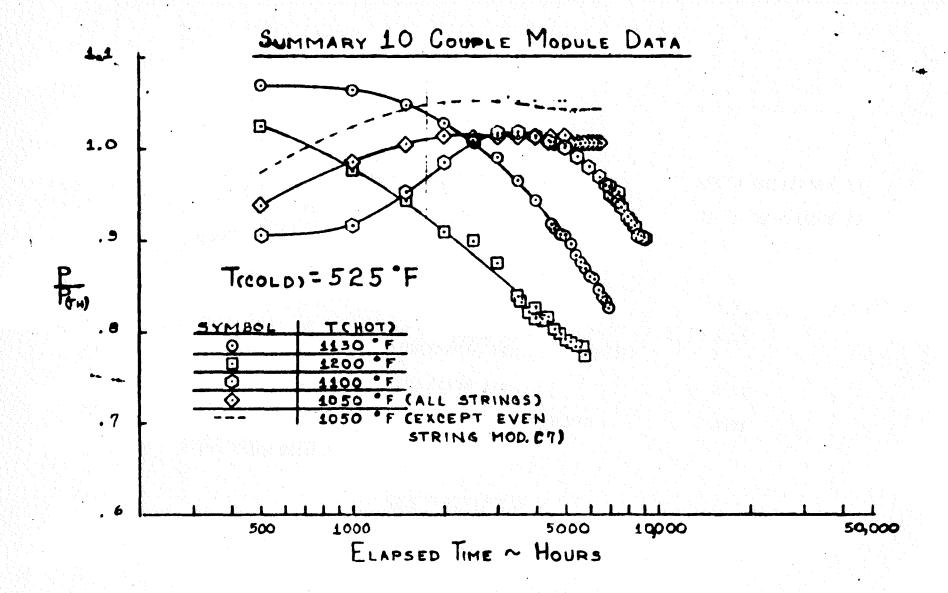




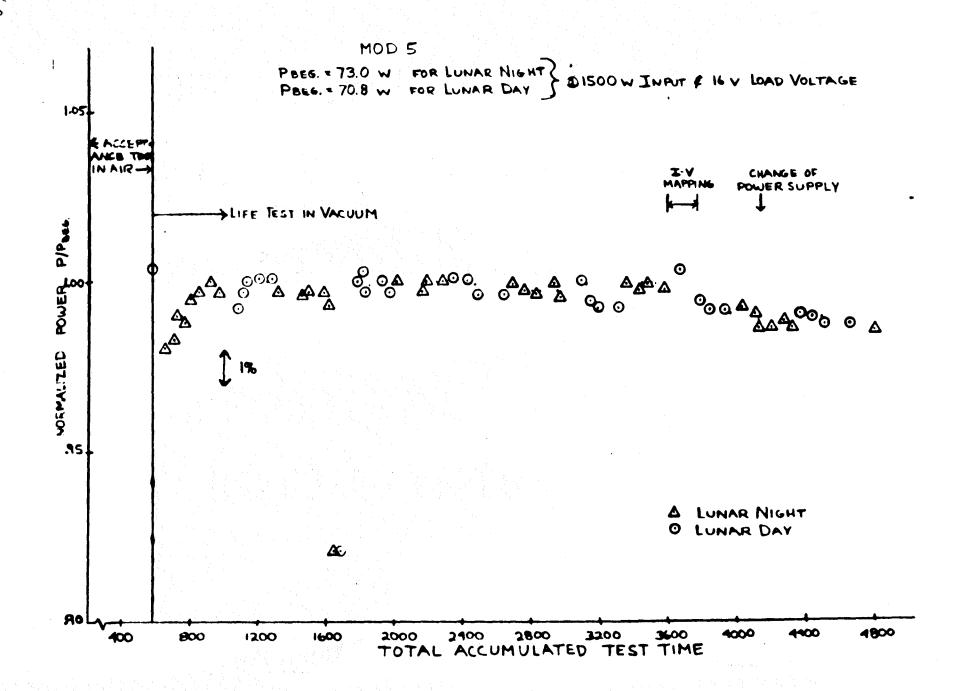
FORM 1134 REV. (12-66)

#### PCU TEST STATUS

Α,	PLANS COMPLE	TED		
	0	RTG/PCU INTEGRATION TEST PROGRAM	8/31	
	o	INCOMING INSPECTION TEST	8/31	
	o	ELECTRICAL CHECKOUT, PCU TEST CHASSIS INSTALLED IN IPU TEST CONSOLE	8/31	
	o	RTG/PCU INTEGRATION TEST	9/8	
В.	SCHEDULE			
	o	ACCEPTANCE AND COMPATIBILITY TESTS	BEGIN SEPTEMBE	R 11
	O	INTEGRATION TEST WITH MOD 8B	BEGIN SEPTEMBE	CR 18







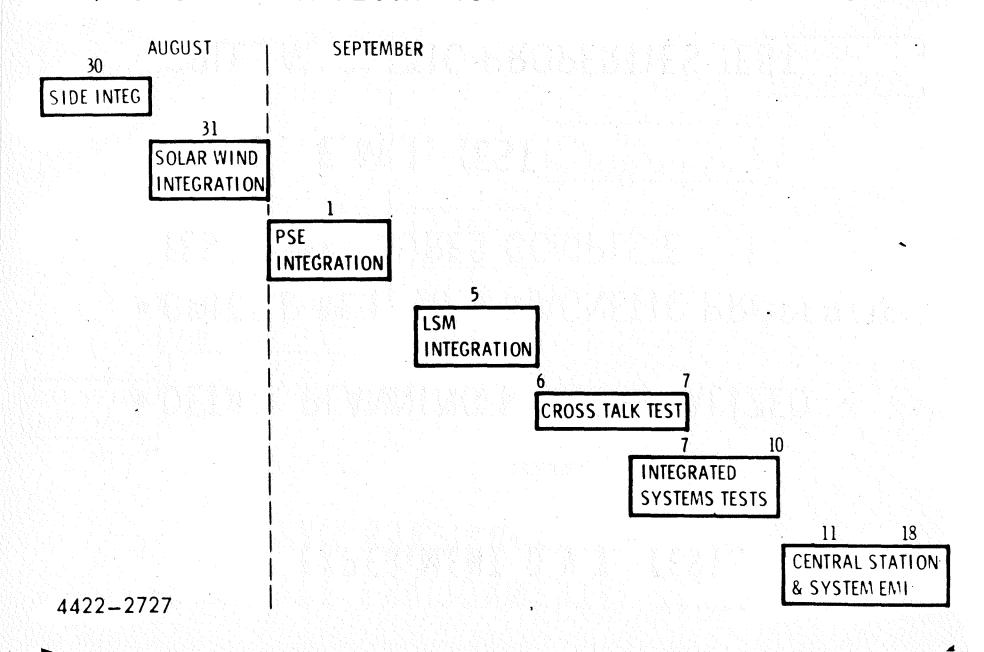
### THERMAL VACUUM TEST

- FULLY DEPLOYED ALSEP
- LUNAR SURFACE SHROUD (-300 F, +278 )
- INFRA-RED SOLAR SIMULATION
- 200 ENVIRONMENT PARAMETERS
- NORMAL ALSEP H/K DATA
- SIMULATOR BACK UP

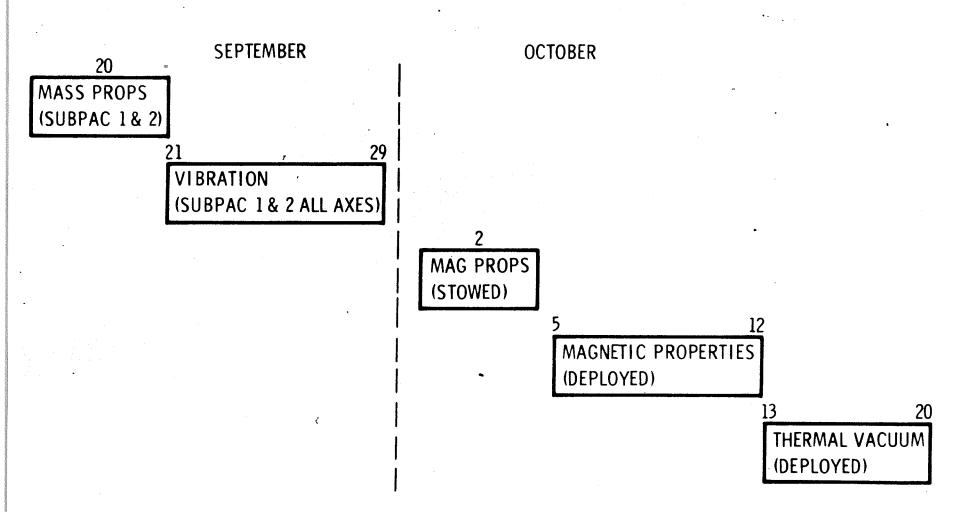
### EXPERIMENT D.V.T. TESTS

- DETAIL PLANNING BEING FINALIZED
- CPLEE E. M. I. AND MAGNETIC PROPERTIES TEST PROCEDURES COMPLETE
- CPLEE E.M.I. TEST
- CPLEE MAGNETIC PROPERTIES TEST

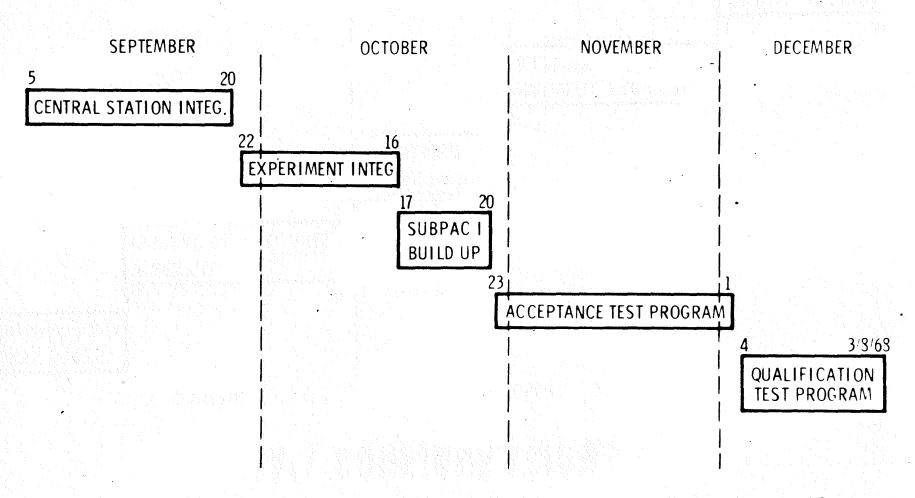
### PROTOTYPE INTEGRATION "A" CONFIGURATION



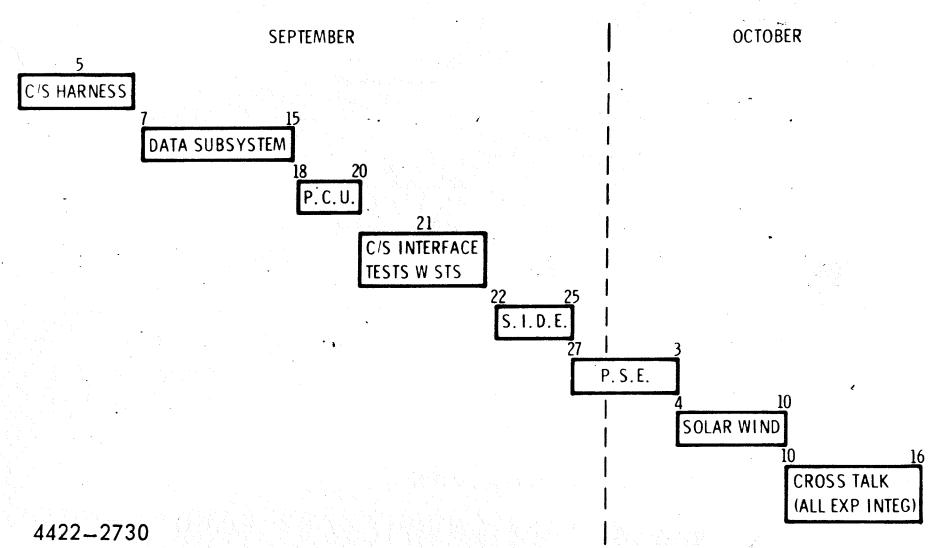
## PROTOTYPE ENVIRONMENTAL TESTING "A" CONFIGURATION



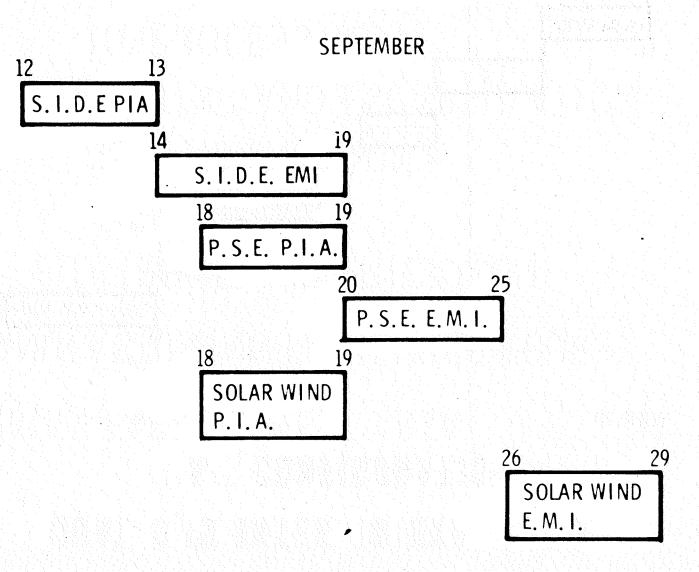
# QUAL TEST PROGRAM SCHEDULE ''A'' CONFIGURATION



# QUAL C/S INTEG. & EXP INTEG. ''A'' CONFIGURATION



# QUAL EXPERIMENT P.I.A & E.M.I ''A'' CONFIGURATION



4422-2728

### PLANT 2 TOUR

- HUMAN FACTORS TEST AREA
- MANUFACTURING FACILITIES TOUR

  ELECTRONICS FABRICATION

  CLEAN ROOM

  GSE FABRICATION

  POTTING AND ENCAPSULATION

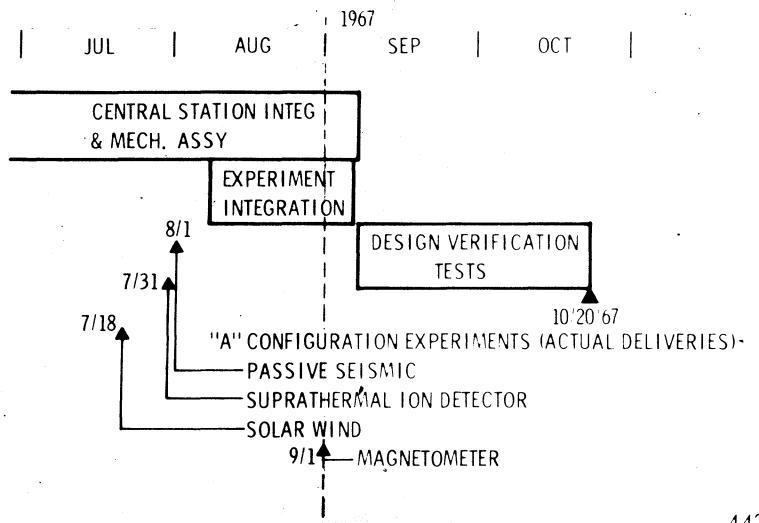
  IN-PROCESS TEST

MECHANICAL FABRICATION AREA

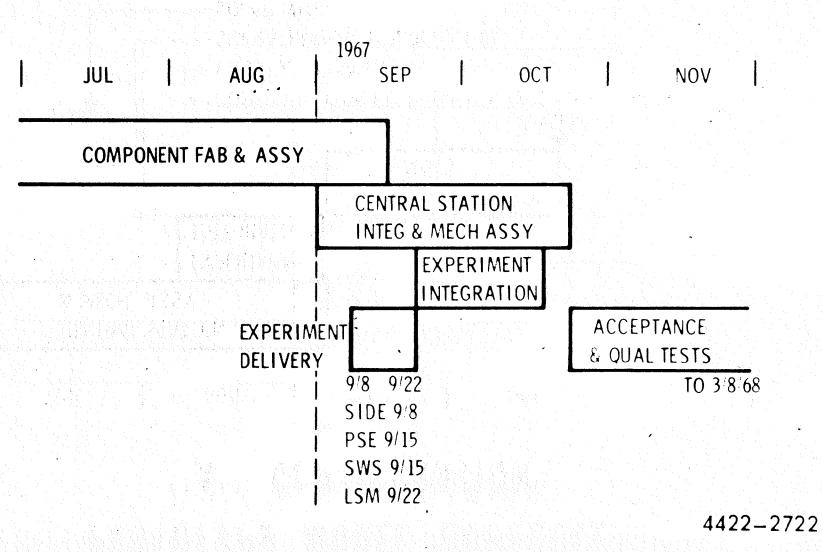
### PLANT 2 TOUR

 TEST PRESENTATION QUAL TEST IN COMPONENTS LAB PROTO SYSTEM TEST IN SYSTEM TEST LAB ASE TEST IN EXPERIMENT TEST LAB CPLEE MAGNETIC PROPERTIES TEST IN SCREEN ROOM TOUR OF T/V AND VIBRATION TEST **AREAS** PRESENTATION OF EQUIPMENT, PLANS AND TEST SET UP FOR PROTO T/V TESTS 4422-2733

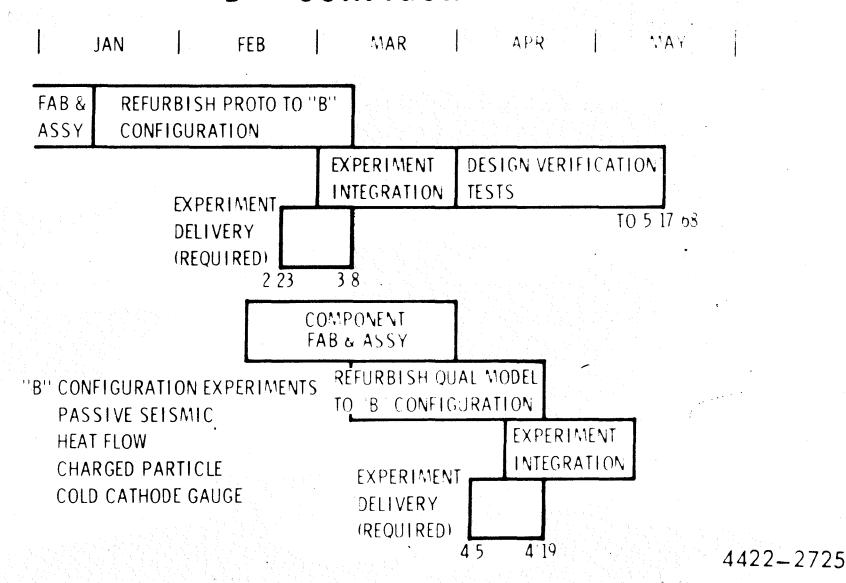
## PROTOTYPE MODEL SCHEDULE ''A'' CONFIGURATION



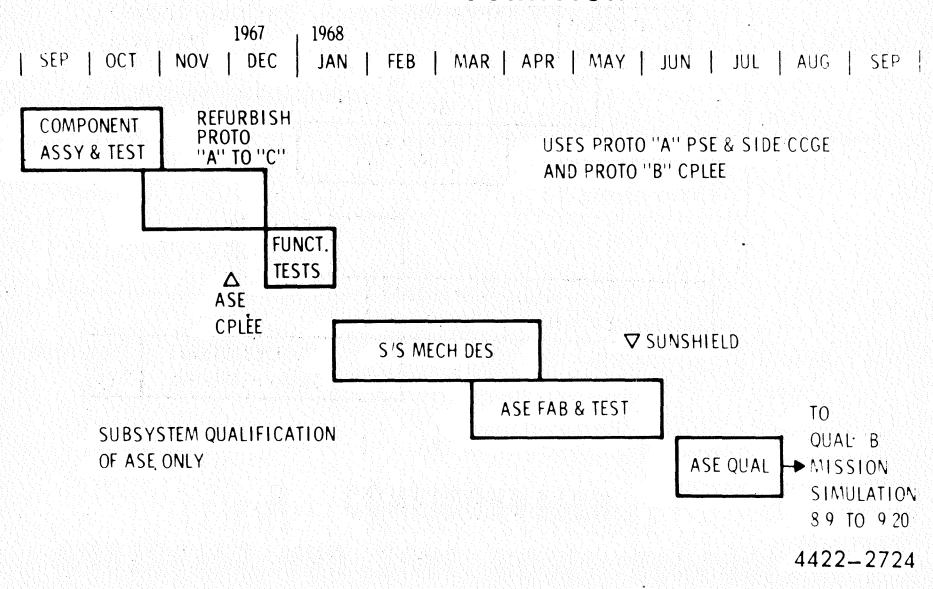
## QUALIFICATION MODEL SCHEDULE ''A'' CONFIGURATION



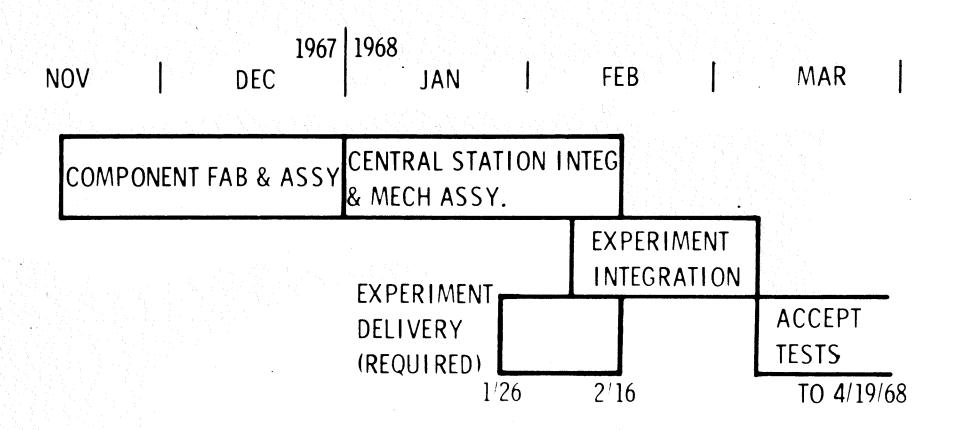
## PROTOTYPE AND QUAL MODEL SCHEDULE ''B'' CONFIGURATION



# PROTOTYPE AND QUAL MODEL SCHEDULE ''C'' CONFIGURATION



### FLIGHT 1 MODEL SCHEDULE



PRESENTATION

TO

SEQ INTERFACE CONFERENCE

SEPTEMBER 7, 1967

GRUMMAN AIRCRAFT ENGINEERING CORPORATION

#### A. LM FUEL CASK

- 1. Struts finalized and manufactured for 60 lb cask. Parts are presently available and two assembled units can be made available for shipment to Bendix when required for DVT.
- 2. Preliminary drawing showing access to cask in SLA with new thermal door (CCA586) is available now. Loading operation will be somewhat more difficult and new installation demonstration at KSC is suggested.
- 3. One temperature measurement (MCR 550C) has been added to the LM Fuel Cask System.

  This will be routed through the LM telemetry and will be able to record a Bendix selected temperature from time of fuel element insertion to seconds prior to launch; and would then give system temperatures whenever LM telemetry is on.
- 4. GAEC to redesign parts of LM thermal shield (secondary door) to withstand direct view of cask.
- 5. 18 accelerometers on LM Fuel Cask recorded data during LTA 3 DR (LM6). Data will be available (approx.) end of October.

#### B. SEQ SUBPACKAGES NOS. I & II (ALSEP) (CCA 586)

- 1. GAEC/Bendix Hard Point interface drawing signed off on 7/26/67.
- 2. Mock-up proved over-all boom concept is OK but many corrections were required.
- 3. Retro-fit to LM 4, 5 and 6.
- 4. + 15 25 lbs.
- 5. Installation check fixtures and master tooling to be sent to Bendix on
- 6. ALSEP/IM Withdrawal System Test Philosophy.

#### A. COMPONENT TESTING

Qualify each member of ALSEP withdrawal mechanism for: Salt Fog, Vibration, Static Load, Sand and Dust and Thermal Vacuum environment as required.

#### B. STRUCTURAL TESTING

- (a) Build Quad II Structure and wibrate for required mission levels. (Use ALSEP and RTG Fuel Cask as GFE). These tests are anticipated to terminate 1/1/68.
- (b) Measure deflections of Quad II structure on LTA-3D or LTA-3DR for three (3) leg landing conditions, and other reasonable worst case landing attitudes.

#### C. THERMAL VACUUM TESTING

(a) Update Quad II Structure (same unit as for structural testing) to deliver to:

(a) Chamber A

or (b) Chamber B

or (c) G.E

or (d) Bendix

for functional, thermal verification of integrated mechanisms and possibly the interfaces. Alternate: Use GAEC T/V facilities and remote actuation of mechanisms.

#### D. 1/6 g SIMULATION

GAEC recommends that MSC conduct a simulation of access and deployment in the KC-135 Airplane. (Ref. LTX-180-65 dated 8/15/67).

MOTE: Preliminary Test plan due 10/1/67.

#### C. SAMPLE RETURN CONTAINERS (SRC'S)

1. New NASA requirement will move SRC's to a modularized container in the descent stage out bound and return them in the ascent stage.

Other items in this d/s container will be:

- a) PLSS batteries
- b) TV camera System (Including 100' TV cable)
- c) 10' dish cable

#### D. STILL CAMERA PACKAGE

- 1. GAEC is currently proposing to build this package (ECP #1114)
  - a) Items will be soft stowed by compressing them in foam.
  - b) New Environmental conditions on combents (engine box).
  - c) could serve as utility container.

## SIGN OFF

ICD AND IRU NUMBER AND TITLE	GAEC	S & AD	CURRENT EFFORT OR NEED FOR ACTION
LIS-360-22101 IM SCIENTIFIC EQUIPMENT  MATERIALS COMPATABILITY  REQUIREMENTS .	10/21/65	10/21/65	
LIS-360-22101-1 ADDED LUBECO AND EVER- LUBE TO THE MATERIALS LIST.		4/13/67	
LIS-360-22102 SCIENTIFIC EQUIPMENT MASS PROPERTIES.	10/21/65	10/21/65	GAEC IS CURRENTLY STUDYING THE WEIG  AND BALANCE IMPLICATIONS OF LAUNCH  ANY IM WITHOUT SEQ.
LIS-360-22102-1 COMMINED FILM CONTS	12/21/65	12/21/65	

ICD AND	IRN NUMB	ER AID TITIE	GAEC SIGN O	S & AD	CURRENT EFFORT OR NEED FOR ACTION
LIS-360-	22102				
22102	_ 2.	LAUNCHED F & T CONT., SEQ.	7/1/66	8 <b>/25/66</b> .	
		CAMERA EXTRA FILM CONT. AND			
		STILL CAMERA CONT. IN LEM VS			
		CM.		·	
22102		INCORPORATED CCA 183	6/7/66	DISAPPROVED	
		LAUNCH STILL CAMERA IN LM	7/1/66	DISAPPROVED	
22102		VS CM. INCORPORATE SCN # 276			
			8/9/66	DISAPPROVED	
	5.	REDUCED WT. OF F & T.		·	
	6.	PROVIDE FOR RTG (CCAL83)	1/10/67	2/13/67	
	. 7.	27 lb. SRC	1/19/67	2/10/67	
•	8.	CCA498 (60 1b. CASK)	4/15/67	6/21/67 6/20/67	
	9.	40 1b. SRC	5/2/67 6/1/67	6/21/67	
•	10. A.	EFFECTIVITY GENERAL UPDATE	9/11/67	DISAPPROVED	
	В.	GENERAL UPDATE AND MOD.	9/15/67	10/15/67	
		KIT DEFINITION.			
LIS-360	-22301	ENVIRONMENTAL CONDITIONS IN-	10/21/65	12/21/65	A NEW SECTION FOR CAMERA CONTENTS V
. •	•	DUCED BY THE IM ON THE STILL		·	BE REQUIRED IF GAEC IS TO BUILD COL
		CAMERA PACKAGE.	1,100,166	12/13/66	Intime.
LIS-360	22301 <b>-1</b>	GENERAL UPDATING INCLUDING AN UPDATED CABIN PRESSURE (VS)	4/20/66	12/13/00	
		ELARSED TIME CURVE.			
			<b>a</b>		

C	T	$_{ m GN}$		$\wedge \tau$	ישי			8
W	T,	$\alpha_{M}$	1	Oυ	T.			75

ICD AND IRN NUMB	UR AND TITLE	†GAEC	S & AD	CURRENT EFFORT OR NEED FOR ACTION
LIS-360-22301-2	DEFINES ENVIRONMENTS FOR LAUNCH, BOOST AND TRANS- LUNAR PHASES BECAUSE SCN 276 REQUIRED CAMERA TO BE CARRIED IN LEM (VS) CM	8/1/66	9/1/66	
LIS-360-22301- <b>3</b>	DEFINED VEHICLE EFFECTIVITY AS IM-4-15 (CCA575)	3/18/67	6/21/67	
LIS-360 -22 <b>3</b> 01-A	ADDED THE ENVIRONMENTAL  CRITERIA FOR THE LUNAR  ASCENT PHASE (CCA468) AND  INCORPORATED IRN'S NO 1, 2, - 3.	11/15/67(EST)	12/15/67 (EST.)	
LIS-360-22302 REMARKS -	ENVIRONMENTAL CONDITIONS INDUCED BY LM ON THE SCIENTIFIC EQUIP. IN THE DESCENT STAGE.  VEHICLE EFFECTIVITY LM-4 AND SUBSEQUENT	10/21/65	10/21/65	VIBRATION SECTION WILL NEED UPDATI A RESULT OF THE LTA3 DR (LM6) AND (LIVE T/V RACKET FIRING) TESTING: THERMAI SECTION WILL NEED UPDATING RESULT OF CCA586 (MAX DOOR-OPEN TI
	REVISE VIBRATION WORDING TEMPERATURE CONDITIONS	7/1/66 11/2/66	8/25/66 11/09/66	
LIS-360-22302-3	ADDED TEMP. TIME HISTORY CURVE OF THE SEQ BAY TO ICD.			

	SIGN O	FF q	
ICD AND IRN NUMBER AND TITLE	GAEC	S & AD	CURRENT EFFORT OR NEED FOR ACTION
LIS-360-22303 ENVIRONMENTAL CONDITIONS IN- DUCED BY LM ON THE LUNAR SAMPLE RETURN CONTAINERS	12/21/65	12/21/65	NEW ENVIRONMENTAL CONDITIONS WILL BE ADDED FOR NEW D/S SRC LOCATION OUT BOUND.
LIS-360-22303-1 DEFINES TEMPERATURE TIME HISTORY CURVES OF LM WALL AND IM ASCENT ENGINE COVER	+/2o/66	11/9/66	
LIS-360-22303-2 CHANGE SPECIMEN TO SAMPLE TO AGREE WITH LSP-360-11	3/1/66	9/1/66	
LIS-360-22303-3 VEHICLE EFFECTIVITY  IM 4 ANS SUB.	. 5/6/67	6/21/67	
LIS-360-22303-4 CCA 668-SRC's OUTBOUND IN D/S	11/15/67(est)	1/2/68 (Est.)	

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ICD AND IRN NUMBER AND TITLE	GAEC	S & AD	CURRENT EFFORT OR NEED FOR ACTION
LIS-360-22304 ENVIRONMENTAL CONDITIONS INDUCED BY IM ON SEQUENCE CAMERA EXTRA FILM CONTAINER.	12/21/65	12/21/65	DRAFT OF 304-2 COMPLETED BY 10/14/ IRN NOW BEING REVIEWED IN HOUSE BY GAEC. DELAY BETWEEN COMPLETION OF
LIS-360-22304-1 DEFINES A TEMPERATURE TIME HISTORY CURVE OF THE LM CABIN WALLS	4/20/66 1	11/09/66	AND GAEC REVIEW DUE TO NAA FAILURE SIGN OFF IRN 6043.
LIS-360-22304-2 DEFINES ENVIRONMENTS FOR LAUNCH AND BOOST AND TRANS- LUNAR (SCN 276)	9/11/67	10/11/67	
LIS-360-22304-3 VEHICLE EFFECTIVITY	5/30/67	6/21/67	

SIGN OFF

•	DIGH	V	
ICD AND IRN NUMBER AND TITLE	GAEC	S & AD	CURRENT EFFORT OR NEED FOR ACTION
ICD AND THE MEMBER AND TITLE			
LIS-360-22305 ENVIRONMENTAL CONDITIONS	12/21/65	12/21/65	
INDUCED BY IM ON THE FILM			
AND TAPE CONTAINER.			
LIS-360-22305-1 DEFINES TEMPERATURE	4/20/66	11/9/66	
TIME HISTORY CURVES OF IM	-		
CABIN WALLS AND ASCENT		·	
ENGINE COVER.			
LIS-360-22305-2 DEFINES ENVIRONMENTS FOR	10/1/66	11/21/66	
LAUNCH AND BOOST AND TRANS-			
Lunar (scn27b)			
LIS-360-22305-3 VEHICLE EFFECTIVITY	5/12/67	6/21/67	
IM4 AND SUB.			

				12	
	ICD AND IRN NU	BER AND TITLE	SIGN OFF GAEC	S & AD	CURRENT EFFORT OR NEED FOR ACTION
The second secon	LIS-360-22402	ENVIRONMENTAL CONSTRAINTS	10/20/66	11/16/66	LTA 3 DR (IM6) VIBRATION RESULTS TO
The state of the s	YXXX A SAN	IMPOSED BY IM ON THE LM FUEL			INCORPORATED IN -2 IRN. NEW SURFAC
	LIS-360-22402-	CASK  NEW THERMAL AND VIBRATION  CRITERIA	2/28/67	DISAPPROVED	EMISSITIVITIES DUE TO CCA 586 WILL ADDED LATER. ACTIVE COOLING MAY ELIMINATE 48 HR
	LIS-360-22402-2	2 NEW VIBRATION RESULTS	10/67 (Est).	11/67 (Est).	ASSOCIATION REQUIREMENT.
		LM ELECTRICAL POWER ALLO- CATION AND CONSTRAINTS FOR THE SCIENTIFIC EQUIPMENT (SEQ).  GENERAL UPDATING INCLUDES CHANGE OF LM NOMINAL VOLTAGE PRANCE FROM 24-33VDC TO 26-33	10/21/65 12/21/66	10/21/6 <b>5</b> 12/13/66	A GFE IMPEDANCE SIMULATOR MAY BE REQUIRED (NASA DECISION) FOR IM 4 AND SUB "FEAT" TESTS.
		VCC AND CHAUSE OF FEAK POWER FROM 1,000 WATTS TO 780 WATTS			

₹ 1			•
ICD AND IRN NUBER AND TITLE	SIGN . GAEC	-5 OFF /3 S & AD	CURRENT EFFORT OR NEED FOR ACTION
LID-360-22502 IM WIRING ELECTRICAL	12/21/65	12/21/65	ESI, LTA-1, LTA-8, LM4 and SUBQ.
INTERFACE FOR SCIENTIFIC			EFFECTIVITIES WILL BE ADDED.
equipment			LM-3 CAN BE ADDED IF DESIRED
REMARKS - VEHICLE EFFECTIVITY LTA-1,			ADD LM-3.
LTA-8, LM-4AND SUB. SIGNED			
OFF BY EPO AND GAEC AT			
SEQ MEETING NO. 4. 502-1			9/15/67
ADD EFFECTIVITIES	-		
	·		
LIS-360-22503 ELECTRICAL INTERFACE BE-	9/15/67	10/15/67	DRAFT COPY AVAILABLE TODAY
TWEEN THE RADIOISOTOPE		<u>.</u>	
THERMOELECTRIC GENERATOR		~	
(RTG) CASK SHIELD TEMP-			
ERATURE TRANSDUCER AND THE	•		
IM VEHICLE.			

ICD AND IRN NUMBER AND TITLE	SIGN OFF	14 S & AD	CURRENT EFFORT OR NEED FOR ACTION
LIS-360-22700 DELIVERY, INSTALLATION AND PRE-LAUNCH SERVICING RE- QUIREMENTS FOR LM SCIENTIFIC EQUIPMENT.	3 Mo. SUBQ.  TO REQUIRE-  MENT DEFIN-  ITION.		SEQ REQUIREMENTS NOT YET DEFINED TO GAEC - BEING RESOLVED TODAY.
LID-360-22704 SCIENTIFIC EQUIPMENT BAY	10/1/67(Est.)	11/1/67 (Est.)	BEING UPDATED DUE TO CCA586 AND MAY
PRE-LAUNCH ASSESSIBILITY			REQUIRE REVISION TO PLANS FOR PRE- LAUNCH INSTALLATION OF THE RTG FUEL ELEMENT. COPY IS AVAILABLE TODAY.

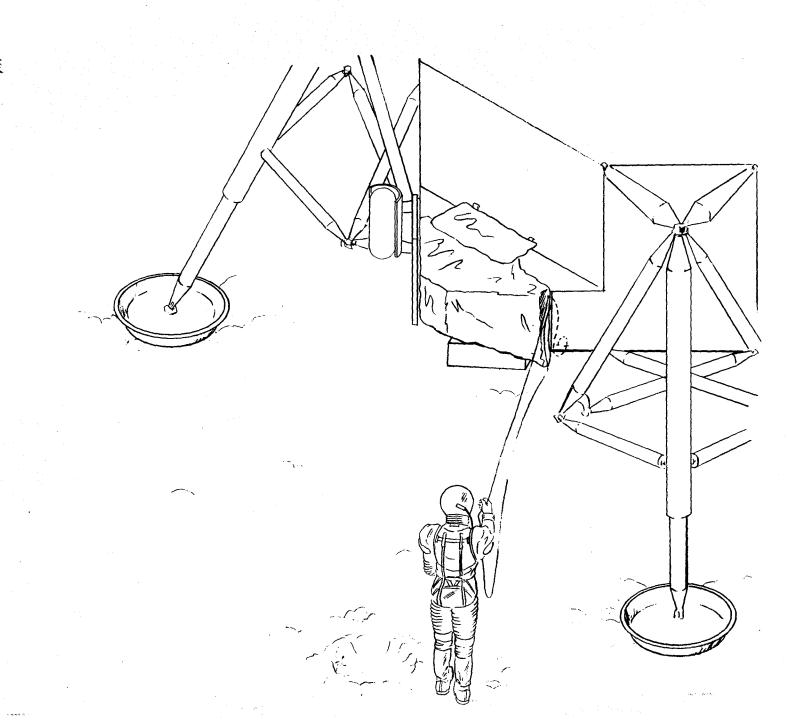
	ICD AND IRN NUM	BER AND TITLE	GAEC SIGN (	OFF /J	CURRENT EFFORT OR NEED FOR ACTION
AN MANAGANI MANAGANAN MANAGAN	LID-360-22802	SPECIMEN RETURN CONTAINERS STOWAGE (LM)	10/21/65	10/21/65	A NEW IRN-3 WILL BE REQUIRED TO EXPY  EXTERNAL ENVELOPE TO INCLUDE NEW  (PIANO TYPE) HINGES. DWG NEEDED FRO
The second secon	LIS-360-22802-1	CHANGE NOVENCLATURE	9/1/65	8/15/66	V .
		REDUCED CORNER RADIUS,	6/7/67		
MANANAMANA AND AND AND AND AND AND AND AND AND		4.00 INCH CRITICAL DIMENSION  TO BE MEASURED FROM CENTER- LINE OF PINS TO BOTTOM OF  CONTAINER, CHANGED TOLERANCE  OF SRC WIDTH AND VERTICAL C.G			
		DIMENSION.			
	LID-360-22803	SEQUENCE CAMERA EXTRA FILM CONTAINER STOWAGE (LM).	12/21/65	12/21/65	THE CONTENTS OF THIS CONTAINER (100' CABLE) WILL BE STOWED IN THE DESCENT STAGE WITH THE TV CAMERA, AND A NEW T CONNECTOR WILL BE ADDED TO THE D/S.
					(CCA 668).
	LID-360-22803-1	CHANGE CORNER RADIUS OF  CONTATIER SO WESTINGHOUSE  DOUSH'T HAVE TO BEAD	)/20/67(EST)	10/20/67(EST.)	e e e e e e e e e e e e e e e e e e e

LID-360-22804	STILL CAMERA PACKAGE	10/21/65	10/21/65	MIGHT NEED NEW ICD FOR INTERFACE
	STOWAGE (LM)			TWEEN CONTAINER AND CONTENTS DU
REMARKS - VEHICL	E EFFECTIVITY LM-4 AND			ECP 1114. (GAEC TO PROVIDE CONTA
North Control of the	SUBSEQUENT. SIGNED OFF BY			
	EPO AND GAEC AT SEQ MEETING			
LID-360-22804-1	NO. 3  DEFINES MAX. ALLOWED TOL.	10/19/66	11/9/66	
	ERANCE IN DISTANCE BETWEEN THE PARALLEL MOUNTING RAILS			
	ON LM ENGINE COVER FOR			
LID-360-22804-A	CAMERA REVISED INTERFACE DIMENSIONS	3/2 <sup>1</sup> 4/67	7/25/67	
	TO IMPROVE INTERCHANCE-			
	ABILITY, INCORPORATED IRN# 1 ADDED NOT PERTAINING TO DRY			
	FILM LUBRICANTS.			
LID-360-22805	FILM AID TAPE CONTAINER	12/21/65	12/21/65	NAA IS REQUESTING THAT CONTAINER
	STOWAGE (LM)			MOVED INBOARD 5/16".
LIS-360-22805-1	DELETES 4 OF THE 6 CALFAX	10/14/66	11/9/66	
	FASTENERS (SWIP PROGRAM)			

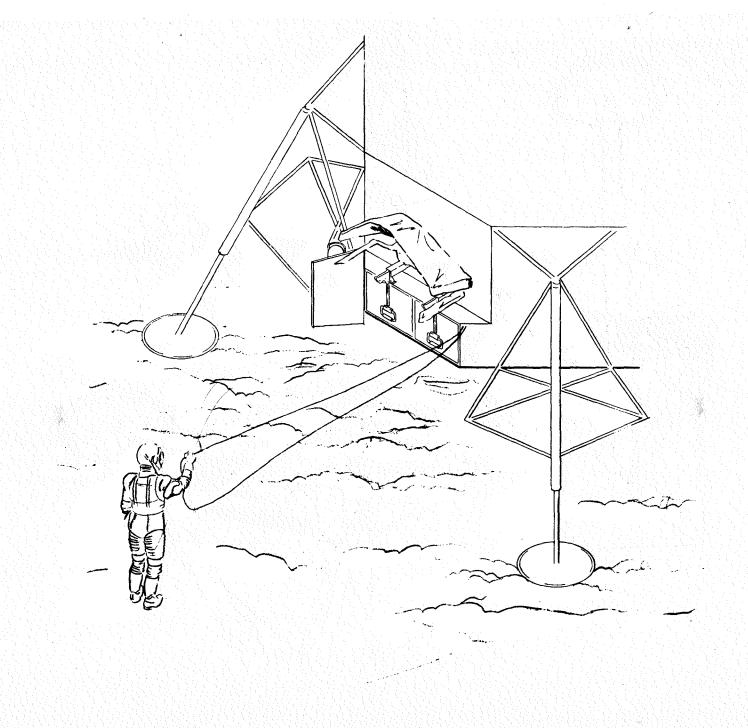
- COLUMN STATEMENT STATEME		<b>1</b>			<b>1</b>
awww.aww.aww	ICD AND IRN NUM	יים אווא פרשיגיים אווא פרשיגיים אווא פרשיגיים אווי	SIGN OFF	7 /7 S & AD	CHOSELES PERODO OD MEET TOD ACOLON
Mention contraction	LID-360-22809	MOUNTING OF 34 16 RTG FUEL			CURRENT EFFORT OR NEED FOR ACTION
CONTROL DE	mp=300=22009		7/15/66	12/10/66	INCORPORATION OF BEHDIX DESIGN AS 8
	4	CASK TO THE IM.			3 OF THE INTERFACE. HARD POINT INI
adionical (coloring)	LID-360-22809A	MOUNTING OF 60 1b RTG CASK	9/15/67(EST) (SHEET 1)	3/16/67 (SHEET 2)	FACE S/O AND PARTS IN STOCK TO LM 7
APPENDICUM CONTRACTORY	000.7	TO THE IM	7/20/67	(102.165	SHEETS 1 & 3 ARE BEING UPDATED TO C
SCHWINGS FROM PARTY.	809-1	CHANGE TOLL.	5/18/67	6/21/67	TO CCA 498 and 586.
STATE OF THE PARTY	809-2	CHANGE DATUM TOLLERANCE	6/2/67	6/27/67	
ANTHORNAND ANTHONY	LID-360-22810	SCIENTIFIC EQUIPMENT	10/21/65	10/21/65	THIS ICD APPLICABLE TO LTA-8 AND IM
SPECIAL CONTROL CONTRO		CONTAINERS STOWAGE AND			ONLY (OLD INTERFACE PRIOR TO CCA 58)
outer a contract of the contra	·	REMOVAL (LM DESCENT STAGE)			
	LID-360-22810A	NEW ALSEP I/F	9/15/66	10/5/66	
arcountaireophia	LID-360-22810 1	DEFINED C.Q.	10/21/65	10/21/65	
PANNOUN TRANSPORTED AND A STATE OF THE STATE	LID-360-22810-2	TOLERANCE CHANGE	6/7/66	10/5/66	
ANNEW MICONAL STREET	LID-360-22810-3	VERTICAL COLUMN CLEARANCE	4/27/66	11/09/66	
<b>WARRING WITH</b>	4	CHANGE DEMS.		8/31/66	
Wichelmenters of the state of t	5	CHAIGE DEMS.		6/21/67	
TANAMIN MARITINA MININA	6.	CHANGES TABS on IM-3		6/24/67	
Martine di Douganament	7	LTA-8 ONLY (DISAPPROVED)		DISAPPROVED	
Oracles Construction and American	. 8	APPLIES 810 TO LM-3 &	7/25/67	7/26/67	
Matroductorosada		LTAS ONLY	17-5701	1/20/01	
SECTION OF THE PROPERTY.		Iday Cald			
Manadamonionistina.		. es	11.		2n g-
Montes	A company of the company				-4

P INTERFACE FOR EMOVAL (CCA 586)	7/20/67	7/26/67	* INTERFACE MUST BE QUALIFIED THROUG JOINTLY BY GAEC/NASA
et stage TC equipment with- system (CCA 586) IAL)	10/1/67(EST)	11/1/67(EST)	WITHDRAWAL SYSTEM CURRENTLY UNDER DEVELOPMENT.
TIFIC EQUIPMENT  CAL INTERFACE  OR LOCATION	1/28/66	2/7/66	
	EMOVAL (CCA 586)  ET STAGE  IC EQUIPMENT WITH- STEEM (CCA 586)  VAL)  FIFIC EQUIPMENT  CAL INTERFACE  OR LOCATION	EMOVAL (CCA 586)  ET STAGE  IO/1/67(EST)  TC EQUIPMENT WITH- STRIPM (CCA 586)  VAL)  FIFTC EQUIPMENT  I/28/66  CAL INTERFACE  OR LOCATION	EMOVAL (CCA 586)  ETT STAGE  10/1/67(EST)  11/1/67(EST)  TIC EQUIPMENT WITH- STRIPM (CCA 586)  VAL)  ETIFIC EQUIPMENT  1/28/66  2/7/66  EAL INTERFACE  OR LOCATION

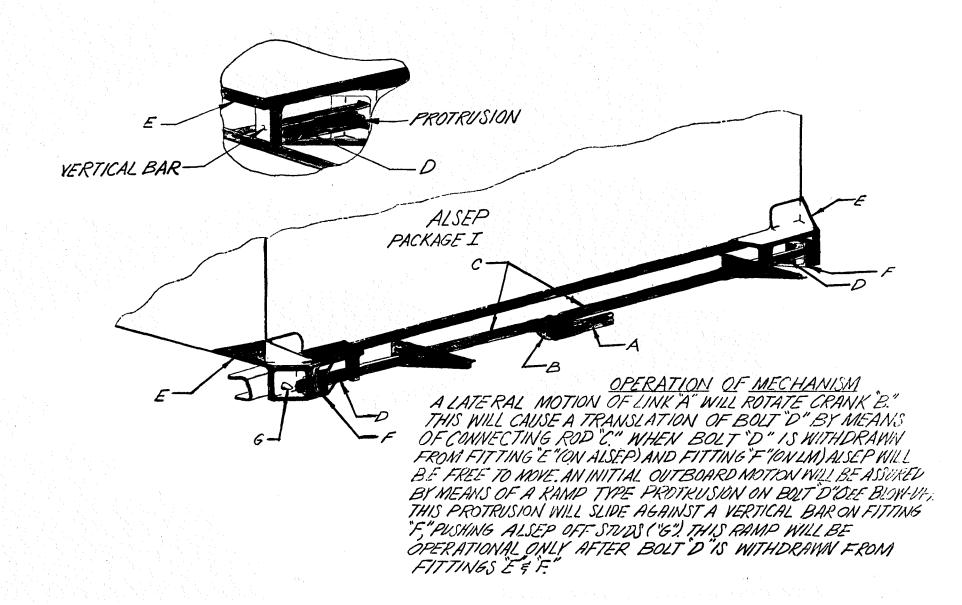
ICD AND IRN NUMBI	ER AND TITLE	SIGN GAEC	S & AD	CURRENT EFFORT OR NEED FOR ACTION
LID-360-22814	LM SCIENTIFIC EQUIP- MENT ELECTRICAL CONNECT- OR THERMAL DOOR (FUNCT-	4/25/67	4/25/67	ATTACHMENT MATERIAL (VELCRO) WAS FLAMABLE AND NEW MATERIAL MUST BE DEVELOPED.
	IONAL)		<b>.</b>	
·	METHOD OF ATTACHING			
	DOOR TBD.			

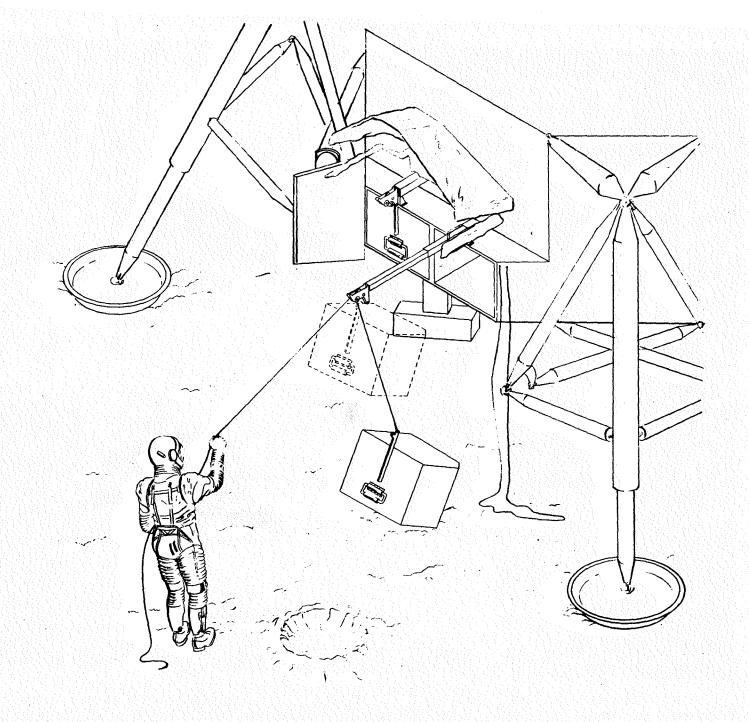


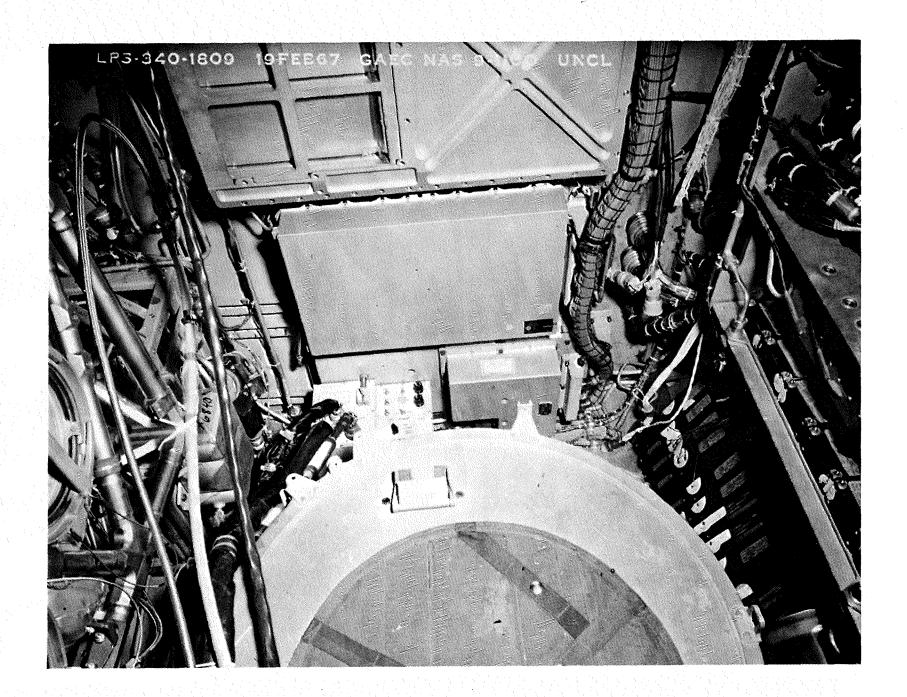
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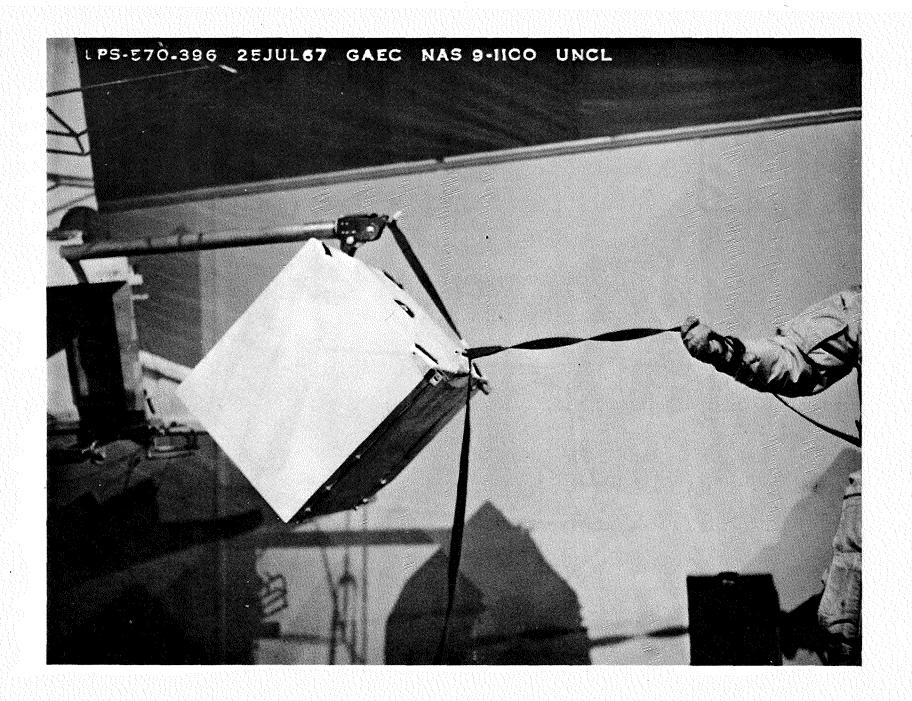


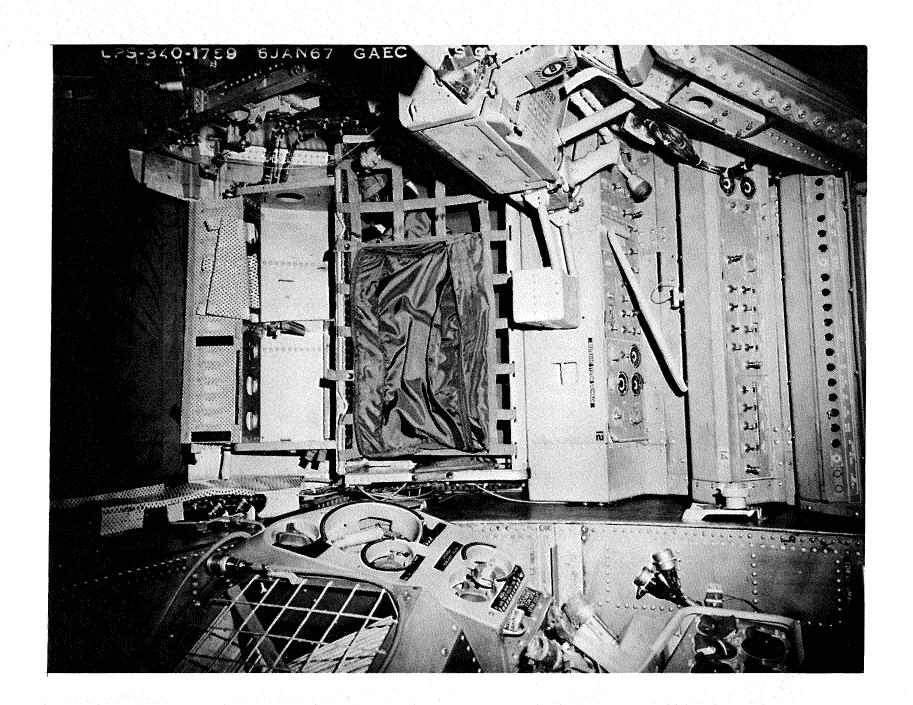
# ALSEP LOCKING MECHANISM PKG II OPP.

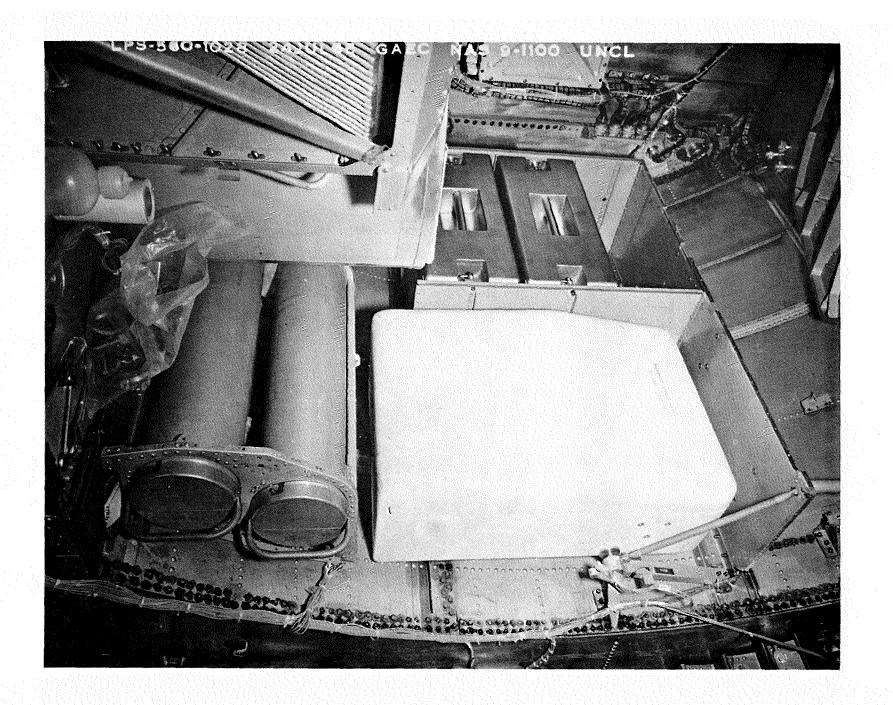


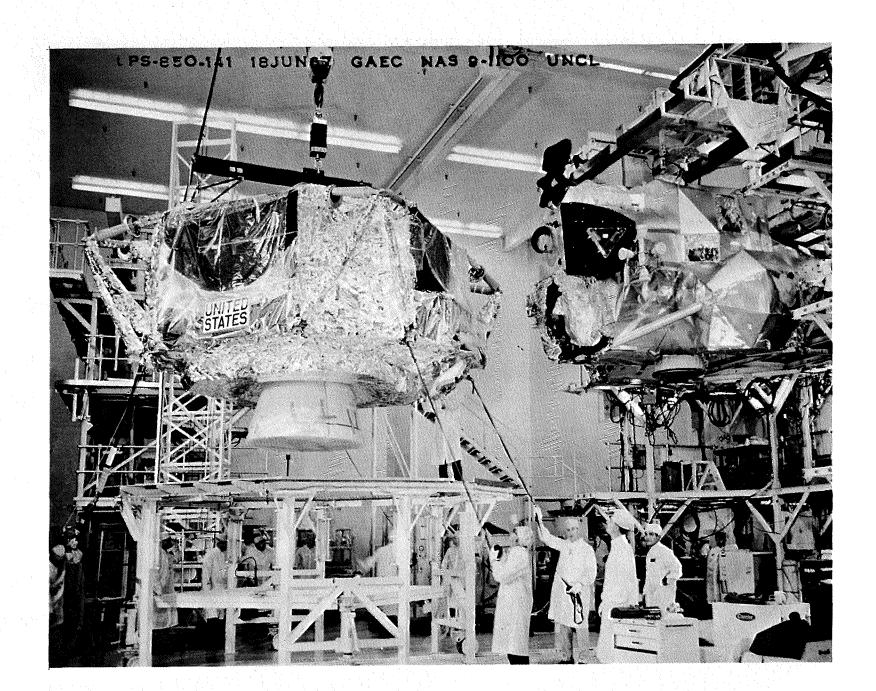


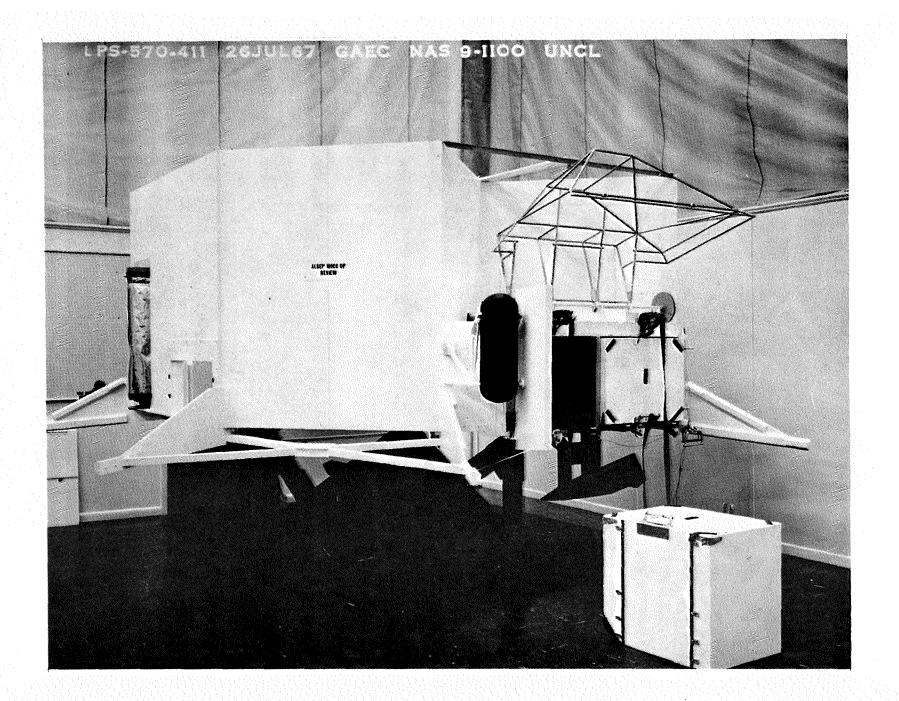


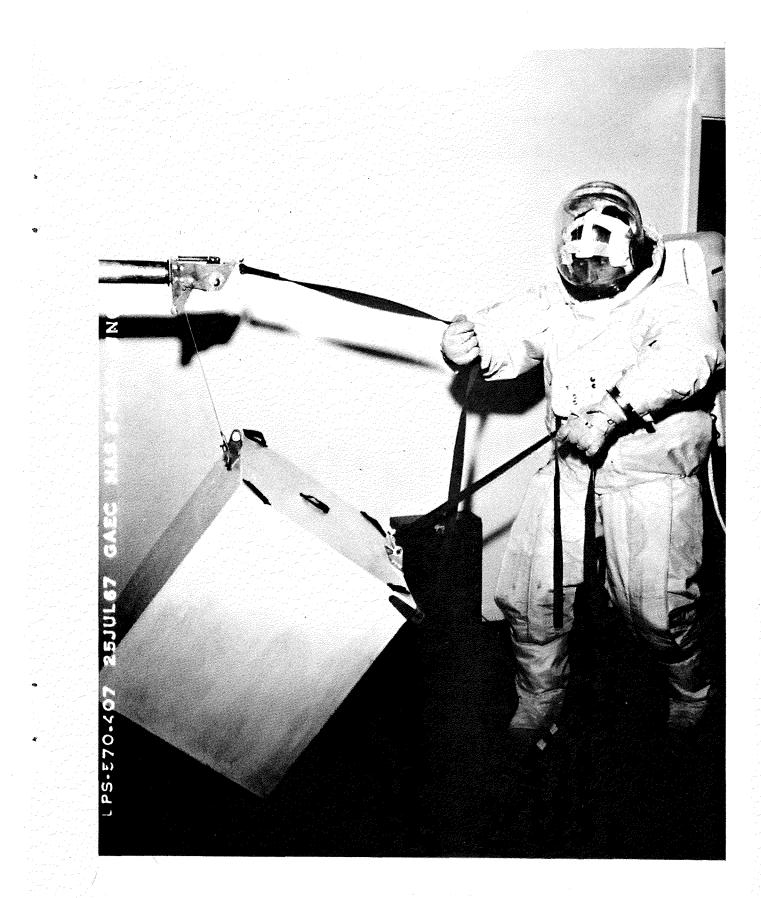












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