

Wata Bank
7/1/4
ALSEP papers

Addressees:

NASA Hqs., L. Reiffel, MA
NASA Hqs., W. O'Bryant, SL
NASA Hqs., E. Davin, SL
NASA Hqs., R. Green, SL
NASA Hqs., A. Schwartzkopf
KSC/W. Durett
AP3/L. Davis
BG721/D. Cherry
 J. Goldstein
 P. Clyatt
 T. Krenek
BN7/J. Harris
 Z. Eubanks
EC5/E. LaFevers
EE2/W. Zrubek
 R. Armstrong
TH4/D. Evans
 T. Foss
 E. Lafferty
 C. Warren
 J. Modisette
 W. Le Croix
 R. Manka
 W. Womack
 ~~J. Dragg~~
EF2/L. York
EP4/E. Weeks
 T. Graves
EP5/J. Grayson
 J. Briley
ES3/R. Harris
TA/R. Piland
 R. Vale
 P. Penrod
 E. Smith
 H. Atwater
TD/J. Langford
 P. Maloney
 J. Redd
TD2/R. Moke
 A. Carraway
 J. Sanders
 C. McClenny
 R. McCombs
TD3/D. Wiseman
 R. Irwin
 G. Kenney
 P. Gerke
 H. Greider
 T. Herrington
 J. Lowery

TF2/W. Stephenson
TF3/O. Smistad
FA/C. Kovitz
FC/J. Hodge
 R. Martin
 C. Beers
 M. Lowe
 R. Rose
 D. Pendley
 B. Sharpe
 J. Saultz
PP/J. McClintock
PS6/S. Jones
PA/W. Lee
PD/E. Hamblett
ZS5/B. Remini
D. J. McDonald, Rm. 428, Bldg. 45
 (Philco)

UNITED STATES GOVERNMENT

Memorandum

TO : See list attached

DATE:

FROM : TD/Manager, Lunar Surface Project Office

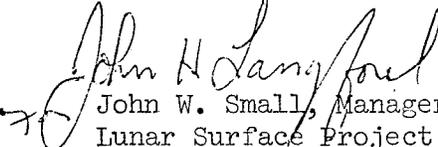
In reply refer to:
TD/M9-67

SUBJECT: Minutes of Sixth Apollo Lunar Surface Experiment Program Interface Meeting

Enclosed are the minutes of the Sixth Apollo Lunar Surface Experiment Program Interface Meeting held at NASA-MSO, January 26, 1967.

The Seventh Apollo Lunar Surface Experiment Interface Meeting is planned for March 2, 1967, at MSC, Houston, Texas. The detailed agenda will be forwarded in the near future.

Sincerely yours,


John W. Small, Manager
Lunar Surface Project Office

Enclosure

TD/JHLangford:dw



ATTENDEES

<u>Name</u>	<u>Organization</u>
G. V. Lathem	Columbia Univ
R. L. Kovach	Stanford Univ
W. P. LeCroix	MSC
W. E. Johnson	Bendix
E. S. Van Valkenburg	Bendix
M. A. Lowe	MSC
R. M. Travis	MSC
P. R. Maloney	MSC
E. B. Hamblett	MSC
W. K. Stephenson	MSC
H. L. Culver	NASA - GSFC
J. S. Watkins	MIT
R. A. Schmidt	Bendix
Jack E. Dye	Bendix
D. Green	NASA Hqs
E. Smith	MSC
J. W. Small	MSC
J. H. Langford	MSC
H. Atwater	MSC
D. B. Pendley	MSC
L. B. Davis	MSC
C. W. Snyder	JPL
W. J. Schnider	JPL
J. M. Redd	MSC
J. F. Clayton	Bendix
M. E. Donnelly	Bendix
C. J. Kovitz	MSC
J. A. Burns	Bendix
W. Remini	AEC

<u>Name</u>	<u>Organization</u>
O. Smistad	MSC
L. B. York	MSC
W. R. Durrett	NASA-KSC
J. M. Sanders	MSC
G. P. Kenney	MSC
T. E. Herrington	MSC
C. O. McClenn	MSC
J. G. McClintock	MSC
G. T. Burton	Bendix
John T. Musslewhite	Rice Univ
L. C. Paine	Bendix - RLD
J. H. Goldstein	MSC
A. D. Robinson	Bendix
J. D. Harris	MSC
Z. K. Eubanks	MSC
R. A. Moke	MSC
D. G. Wiseman	MSC
B. L. Sharpe	MSC
J. E. Saultz	MSC
D. J. McDonald	MSC
H. V. Cross	NASA-ARC
P. Dyal	NASA-ARC
W. D. Womack	MSC
R. F. Martin	MSC
J. M. Sulester	MSC
R. J. Swain	Teledyne
R. A. McComb	MSC
H. J. Lowery	MSC
J. H. Grayson	MSC
D. E. Evans	MSC
F. S. Johnson	SCAS
W. A. Smith	Rice Univ

<u>Name</u>	<u>Organization</u>
P. H. Bailey	Rice Univ
J. Briley	MSC
P. D. Gerke	MSC
J. W. Freeman	Rice Univ
E. L. Weeks	MSC
B. J. O'Brien	Rice Univ
R. Juday	MSC
R. R. Morgan	MSFC
T. F. Krenek	MSC
G. D. Huton	MSC
C. S. Warren	MSC

MINUTES

SIXTH INTERFACE MEETING ON APOLLO LUNAR SURFACE EXPERIMENTS PROGRAM

January 26, 1967

The meeting was opened with the introduction of Mr. Lindy Davis, MSC Public Affairs Office. Mr. Davis described the procedure for contractor release of information, copy of which is attached. It was pointed out that the paragraph entitled "Technical Articles and Papers" on page 3 does not apply to universities unless they are involved in the manufacture of flight hardware.

The remainder of the meeting was devoted to the review of the ALSEP hardware delivery requirements and status. Messrs. Small, Maloney, Wiseman and Moke described in detail the activities required from present until launch including test and manufacture of experiments, test and manufacture of the ALSEP and Factory and KSC operations and checkout. Relative to the target launch date , this information supports the ALSEP delivery requirements. All predicted experiment flight delivery schedules must be improved to support the spacecraft schedule. Copies of charts shown are enclosed.

The current development status of the ALSEP and each experiment was presented by Mr. Clayton, Bendix Aerospace Systems Division, each ALSEP PI, and/or experiment Project Engineer/Program Manager. These presentations included potential schedule improvement work-arounds, reasons for schedule delays and recommended actions where applicable. Copies of charts used are enclosed.

The following action items resulted from the meeting:

M70126-01M MSC to clarify what is meant by Design limit (off-limit) testing as it applies to the ALSEP by 2/10/67.
Provider Richard Moke to each PI.

M70126-02M MSC will request design limits for each GFE PI for his instrument by 2/10/67.
Provider Richard Moke to each GFE PI.

M70126-03B Bendix provide details of prototype testing to AEC by 2/10/67. Provider J. Clayton to AEC.

M70126-04X Dr. Kovach provide calculated value of key parameters and critical items for acceptance (See ASD slide titled "Data Requirements from PI's") calculated values by 2/15/67.
Provider R. Kovach to J. Clayton.

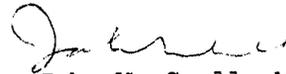
M70126-05P Dr. Latham provide calculated values of key parameters and critical items for acceptance (see ASD slide titled "Data Requirements from PI's") by 2/3/67.
Provider G. Latham to J. Clayton.

M70126-06F Dr. Freeman provide calculated values of key parameters and critical items for acceptance (see ASD slide titled "Data Requirement from PI's") by 2/3/67.
Provider J. Freeman to J. Clayton.

M70126-07J Dr. Snyder provide calculated values of key parameters and critical items for acceptance (see ASD slide titled "Data Requirements from PI's") by 2/13/67.
Provider C. Snyder to J. Clayton.

M70126-08S Dr. Sonett provide calculated values of key parameters and critical items for acceptance (see ASD slide titled "Data Requirements from PI's") by 3/1/67.
Provider C. Sonett to J. Clayton.

- M70126-090 Dr. O'Brien provide calculated values of key parameters and critical items for acceptance (see ASD slide titled "Data Requirements from PI's") by 2/17/67.
Provider B. O'Brien to J. Clayton.
- M70126-10L Dr. Langseth provide calculated values of key parameters and critical items for acceptance (see BSD slide titled "Data Requirements from PI's") by 3/20/67.
Provider M. Langseth to J. Clayton.
- M70126-11M MSC will schedule PDR and CDR for the Active Seismic Experiment Thumper by 2/2/67.
Provider J. Langford to J. Clayton.



John W. Small, Manager
Lunar Surface Project Office

AGENDA

Lunar Surface Program Interface Meeting

January 26, 1967

9:00 AM	Introduction	J. Small
	Lunar Surface Schedule Status and Planning	
9:15 AM	General Program	J. Small
9:30 AM	Operations	P. Maloney
10:00 AM	Development Manufacture, Test	D. Wiseman
11:00 AM	Experiments	R. Moke
12:30	Lunch	
	Program Hardware Schedule Assessment/Plans	
1:30 PM	Introduction	J. Small
1:45 PM	ALSEP	J. Clayton
2:00 PM	Active Seismic Experiment	R. Kovach R. Schmidt
2:15 PM	Passive Seismic Experiment	G. Latham R. Schmidt
2:30 PM	Charged Particle Lunar Environment Experiment	B. O'Brien A. Robinson
2:45 PM	Lunar Surface Magnetometer	C. Sonett
3:00 PM	Solar Wind Spectrometer	C. Snyder
3:15 PM	Cold Cathode Gauge Experiment	F. Johnson
3:30 PM	Suprathermal Ion Detector Experiment	J. Freeman
3:45 PM	Heat Flow Experiment	M. Langseth W. Johnson
4:00 PM	Radioisotope Thermoelectric Generator	W. Remini
4:15 PM	Summary and Conclusions	J. Small
4:30 PM	Adjourn	



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS 77058

IN REPLY REFER TO:

CONTRACTOR INFORMATION RELEASE REVIEW PROCEDURES (MSC/SOP)

I. PURPOSE

This document establishes policies and procedures pertaining to review and approval of requests from contractors, suppliers and vendors for public release of information concerning the Manned Spacecraft Center.

II. SCOPE

This document applies to Manned Spacecraft Center activities receiving and reviewing requests from contractors, suppliers and vendors for proposed public dissemination of information concerning MSC and/or MSC contracts.

III. POLICY

- A. It is the policy of MSC to assist its contractors, vendors and suppliers in identification of their product or services with manned space flight programs. However, it is necessary to assure that such identification, through information release and/or commercial advertising, adheres to technical accuracy and MSC policy, and is in the best interest of the United States government, the National Aeronautics and Space Administration and the firm concerned. It is the intention of the Manned Spacecraft Center to prevent crass or irresponsible commercialism in information release and/or advertising activities.
- B. Requests concerning proposed information releases received from contractors, suppliers and vendors will be reviewed by appropriate MSC offices; and a reply indicating approval or disapproval will be forwarded as expeditiously as possible.

- C. All information releases must be received by the Public Information Branch (AP3) at least 10 days prior to desired release time. Material contained within the information release should pertain only to the contractor's product or service and the use thereof and should contain only a broad reference to portions of the mission not involving the product or service.
- D. Information releases which apply to a specific mission must be submitted 30 days prior to that mission and will not be considered for priority review later than 14 days prior to a specific mission.
- E. Information releases will not be reviewed for editorial content except in such cases where editorial content might reflect unfavorably on the Manned Spacecraft Center.
- F. Any change in content after MSC review and approval to publish will require that such information release be resubmitted.

Advertising

- A. All advertising must be received by MSC at least 15 days prior to earliest closing date applicable.
- B. All artwork, layout and copy for advertising must be included when submitting for review.
- C. Any change in content of layout, artwork, photos or copy will require resubmission.
- D. Advertising content will be limited to an explanation of the advertiser's product or service and how it applies to a specific program or mission.
- E. Consideration will not be given advertising of a product or service in a context which does not normally involve that product or service.

Still Photos

- A. Still photos provided by NASA must receive prior written approval for commercial use and must be submitted for review within the context in which they will be used.
- B. Approval for commercial use of NASA photos will not be granted when recognizable individuals are present in such photos.

Motion Pictures/Film

Contractors may wish to purchase motion picture film related to MSC programs. In such cases, MSC desires to assist in every way possible consistent with existing policy.

- A. All such requests should be made to the Public Information Branch (AP3) and should contain a brief description of the film desired and the intended usage. Footage will be supplied by the Audio-Visual Branch directly to the contractor after PIO approval.
- B. When film is purchased for commercial use, prior written approval is required. Contractor, supplier or vendor is required to submit for approval storyboard, script and film.

Technical Articles and Papers

All technical articles and papers prepared by contractor, supplier or vendor under NASA contract or about goods or services provided to NASA under contract will be submitted for review prior to presentation or publication.

- A. Technical articles and papers must be submitted for review in three copies at least 30 days prior to presentation or publication.
- B. Where there is joint MSC-Contractor authorship, one copy of the paper should be sent through standard MSC channels by the MSC author. A second copy should be submitted through routine public information channels by the contractor author.

IV. REFERENCES

- A. NASA Classification Guides
- B. Department of Defense Industrial Security Manual for safeguarding classified information.

V. DEFINITIONS

For purpose of this document, the following definitions will apply:

- A. Information is any form of communication through which data or ideas are transferred, such as correspondence, reports, magazine articles, news releases, stories, speeches, films, slides, exhibits, displays, etc.
- B. Major Information is information which involves discussion of detailed technical aspects of NASA advanced studies or policy matters.

VI. PROCEDURE

- A. All proposed information releases received from a contractor, supplier or vendor will be submitted to the Public Information Branch (AP3) which will initiate proper review procedure to insure appropriate result as expeditiously as possible. The Public Information Branch will determine which of the reviewing offices have an interest in the proposed release and establish a routing sequence. Such reviewing offices may consist of, but not be limited to, one or more of the following:
 - 1. The technical reviewer is responsible for:
Determining that the contents of the proposed information release are technically correct and that it contains no controversial material.
 - 2. The contracting officer is responsible for:
Determining, if appropriate, that the contents of the proposed information releases referred to him are contractually correct.

3. The security division is responsible for:
Determining that the proposed information releases referred to him do not contain classified or sensitive material.
- B. Subcontractors, suppliers and vendors working for prime contractors will route information materials through their respective contractors. Prime contractors will review the material and forward it and their comments to the Public Information Branch (AP3). The Public Information Branch will return the material directly to the originator, with a copy going to the prime contractor.
1. The Public Information Branch (AP3) requires three copies of written material and three prints of each still photo or piece of artwork submitted for review.
 2. The original and one copy of the submittal cover letter is required and should contain the following information:
 - a. Contract number
 - b. Technical monitor at MSC
 - c. Prime contractors submitting material for subcontractors should include the name and address of the person to whom the material is to be returned.
- C. Contractors, suppliers and vendors performing work in support of MSC projects may respond to query, utilizing material which is currently accurate and previously cleared for release.

UNCLASSIFIED

3 YEAR

TITLE: <i>Lee</i> STATUS: <i>Lee</i> O. G. MORRIS		MANNED SPACE FLIGHT SCHEDULE SPECIAL SUMMARY APOLLO MFG AND DELIVERY SCHEDULE LTA/LM (NOTE 1)		PROJECT: APOLLO SCHL. NO:		OFFICIAL SCHEDULE APPROVAL: FEB 8, 1963 LAST SCHEDULE CHANGE: JUL 65 (DATE) (BY) (PLS) STATUS AS OF DEC 31, 1966 (DATE) (BY) (PLS)																										
		CONTRACTOR: GAEC (NAS 9-1100)		(3) LEVEL																												
MILESTONES		CY 1964		CY 1965		CY 1966		CY 1967		CY 1968																						
		J	F	A	M	J	J	A	S	O	N	J	F	A	M	J	J	A	S	O	N	J	F	A	M	J	J	A	S	O	N	
1	LEM HARDWARE INSPECTION & REVIEW (LEM-3)																															
2	LTA-2 DYNAMIC TEST MSFC																															
3	LTA-10 LEM/SLA STRUCT TEST NAA																															
4	LM-2 THERMAL VACUUM TEST GAEC(ASC)																															
5	LTA-3 STRUCTURAL TEST GAEC(ASC)																															
6	DUMMY LTA TO MSFC FOR SAT V DYN TEST																															
7	LTA-1 HOUSE SPACECRAFT #1 GAEC																															
8	LTA-5D PROP(DSC) TEST WSTF																															
9	PA-1 ASCENT PROPULSION RIG WSTF																															
10	PD-2 DESCENT PROPULSION RIG WSTF																															
11	LTA-8 THERMAL VACUUM MSC (NOTE 1)																															
12	LM-1 UNMANNED KSC (NOTE 1)																															
13																																
14	LM-2 UNMANNED OR MANNED KSC																															
15	LM-3 MANNED KSC																															
16	LM-4 MANNED																															
17	LM-5 MANNED																															
18	LM-6 MANNED																															
19	LM-7 MANNED																															
20	LM-8 MANNED																															

ASSY - STRUCTURAL ASSEMBLY
 SI - SUBSYSTEMS INSTALLATION
 CO - FACTORY CHECKOUT

1. THIS DATE REFLECTS REVISED CONTRACTOR WORK PLANS BASED ON CURRENT STATUS. CONTRACT DELIVERY DATE HAS NOT CHANGED.

UNCLASSIFIED

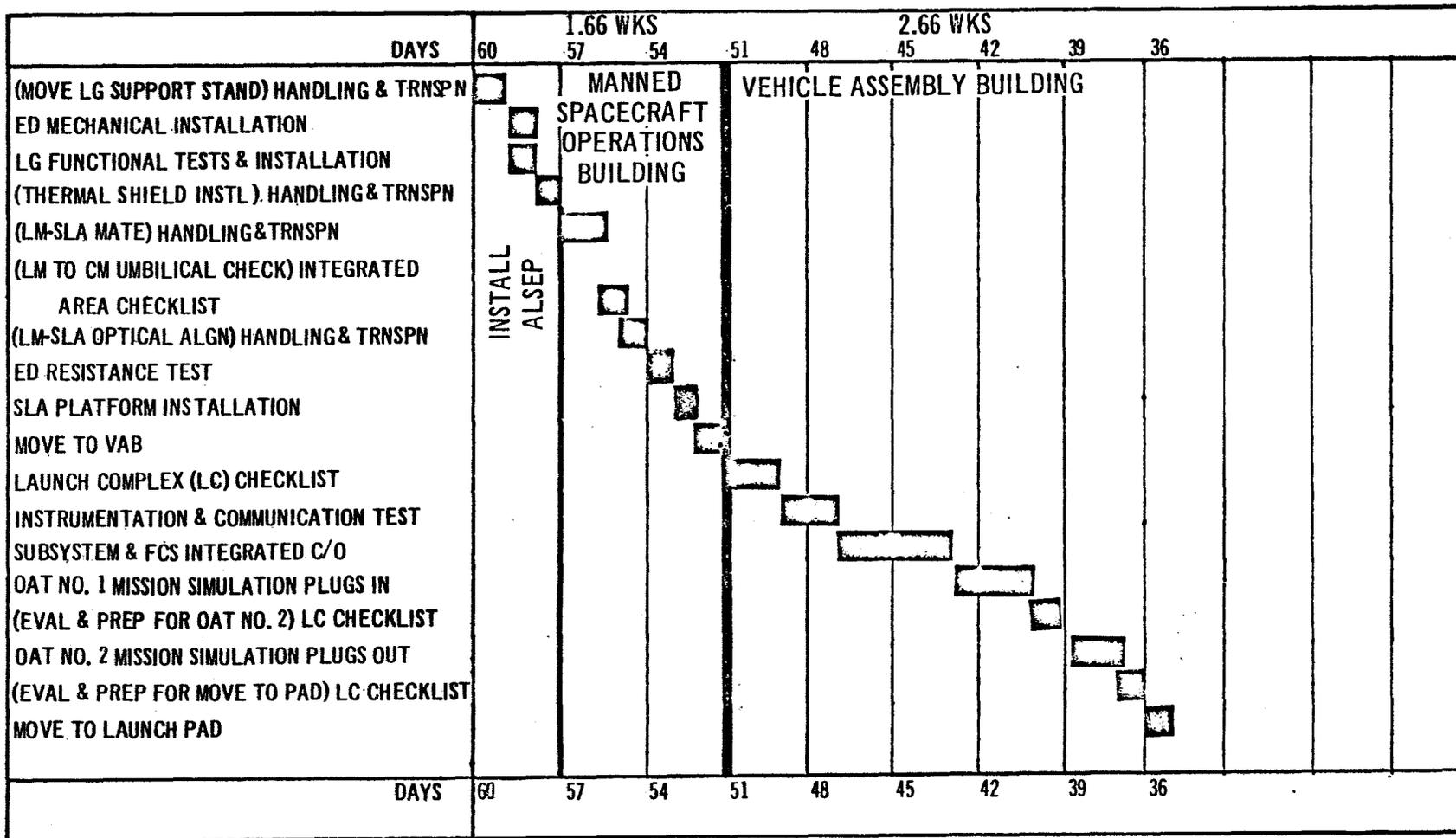
3 YEAR

SCHEDULE RESPONSIBILITY: <u>W. A. LEE</u> STATUS RESPONSIBILITY: <u>O. G. MORRIS</u>		MANNED SPACE FLIGHT SCHEDULE APOLLO MANUFACTURING & DELIVERY SCHEDULE LTA/LM PROJECT APOLLO SCHD. NO. 3-1413-2		3 LEVEL		ORIGINAL SCHEDULE APPROVAL: <u>FEB 8, 1963</u> (DATE) LAST SCHEDULE CHANGE: <u>MAY 66</u> (DATE) (BY) (INITIALS) STATUS AS OF: <u>DEC 31, 1966</u> (DATE) (INITIALS)																															
MILESTONES		CY 1966				CY 1967				CY 1968																											
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
1																																					
2	<u>LH-4 MANNED MISSION-KSC</u>																																				
3	STRUCTURAL FINAL ASSY																																				
4	SYS INSTL & CHECKOUT																																				
5	INTEGRATED TEST & SHIP																																				
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7	<u>LH-5 MANNED MISSION-KSC (NOTE 1)</u>																																				
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12	<u>LH-6 MANNED MISSION-KSC (NOTE 1)</u>																																				
13	STRUCTURAL FINAL ASSY																																				
14	SYS INSTL & CHECKOUT																																				
15	INTEGRATED TEST & SHIP																																				
16																																					
17	<u>LH-7 MANNED MISSION-KSC (NOTE 1)</u>																																				
18	STRUCTURAL FINAL ASSY																																				
19	SYS INSTL & CHECKOUT																																				
20	INTEGRATED TEST & SHIP																																				
NOTES 1, PERT EXPECTED DATES WILL BE ADDED AS THESE VEHICLES ARE INCLUDED IN PERT.																																					

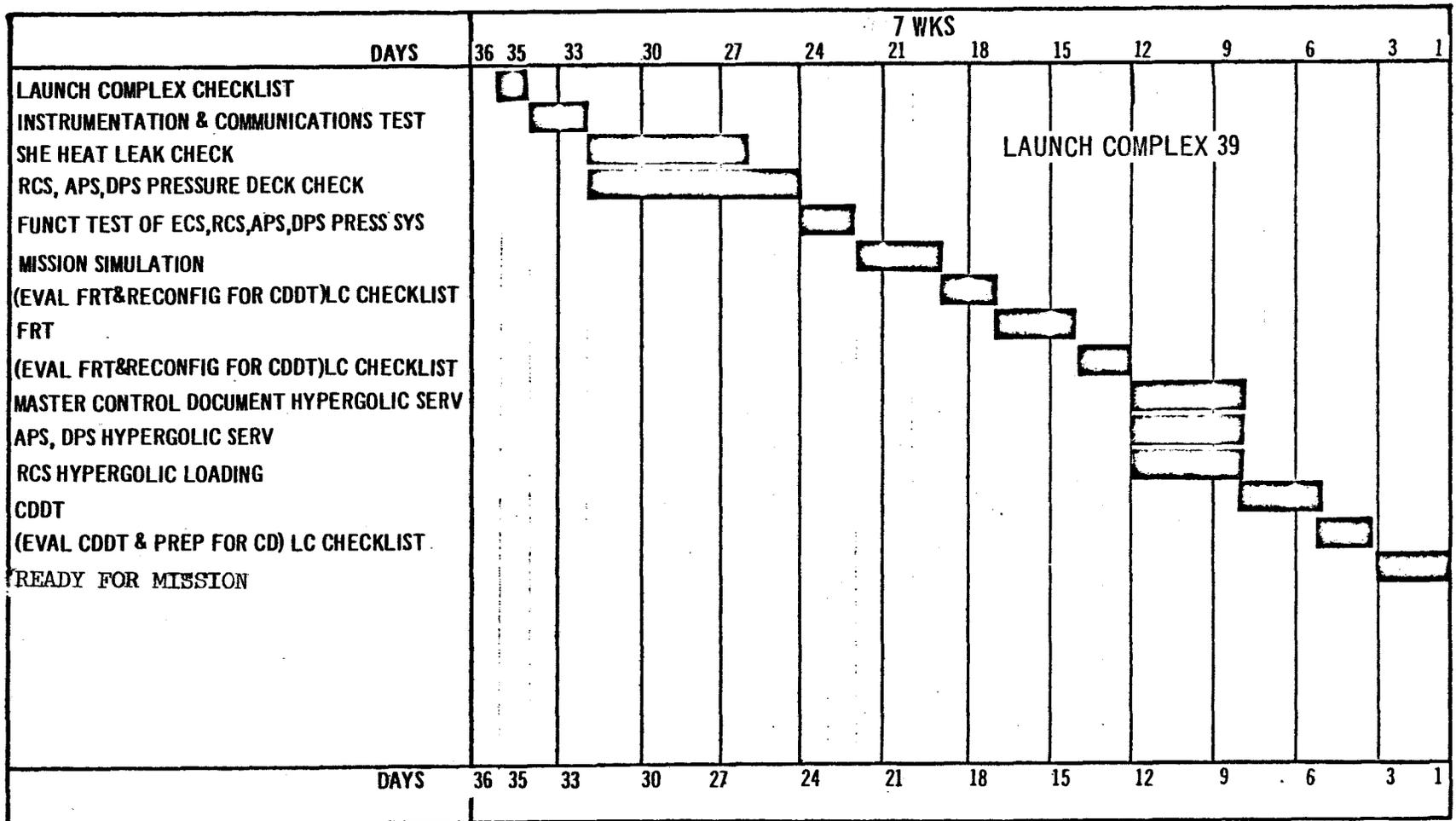
KSC
 ALSEP/SPACEVEHICLE
 PROGRAM.

9 WKS	1.66 WKS	2.66 WKS	10 WKS
<p style="text-align: center;"><u>ALSEP PREPARATION & CHECKOUT</u></p> <p>INSERTION OF ALSEP IN SEQ BAY OF LM DESCENT STAGE →</p>	<p style="text-align: center;"><u>MANNED SPACECRAFT OPERATIONS BUILDING</u></p> <p>COMPLETION OF S/C INTEGRATION IN MANNED SPACECRAFT OPERATIONS BUILDING</p>	<p style="text-align: center;"><u>VEHICLE ASSEMBLY BUILDING</u></p> <p>SPACEVEHICLE INTEGRATION, SPACECRAFT & LAUNCH VEHICLE INTERFACE CHECKS, LAUNCH UMBILICAL TOWER CONNECTIONS, MISSION SIMULATIONS.</p>	<p style="text-align: center;"><u>LAUNCH COMPLEX 39</u></p> <p>SUBSYSTEM TESTS, COMPLEX & RANGE COMPATIBILITY TESTS, MISSION SIMULATION, SERVICING, READY FOR MISSION</p>

KSC SPACECRAFT / LAUNCH VEHICLE PROGRAM

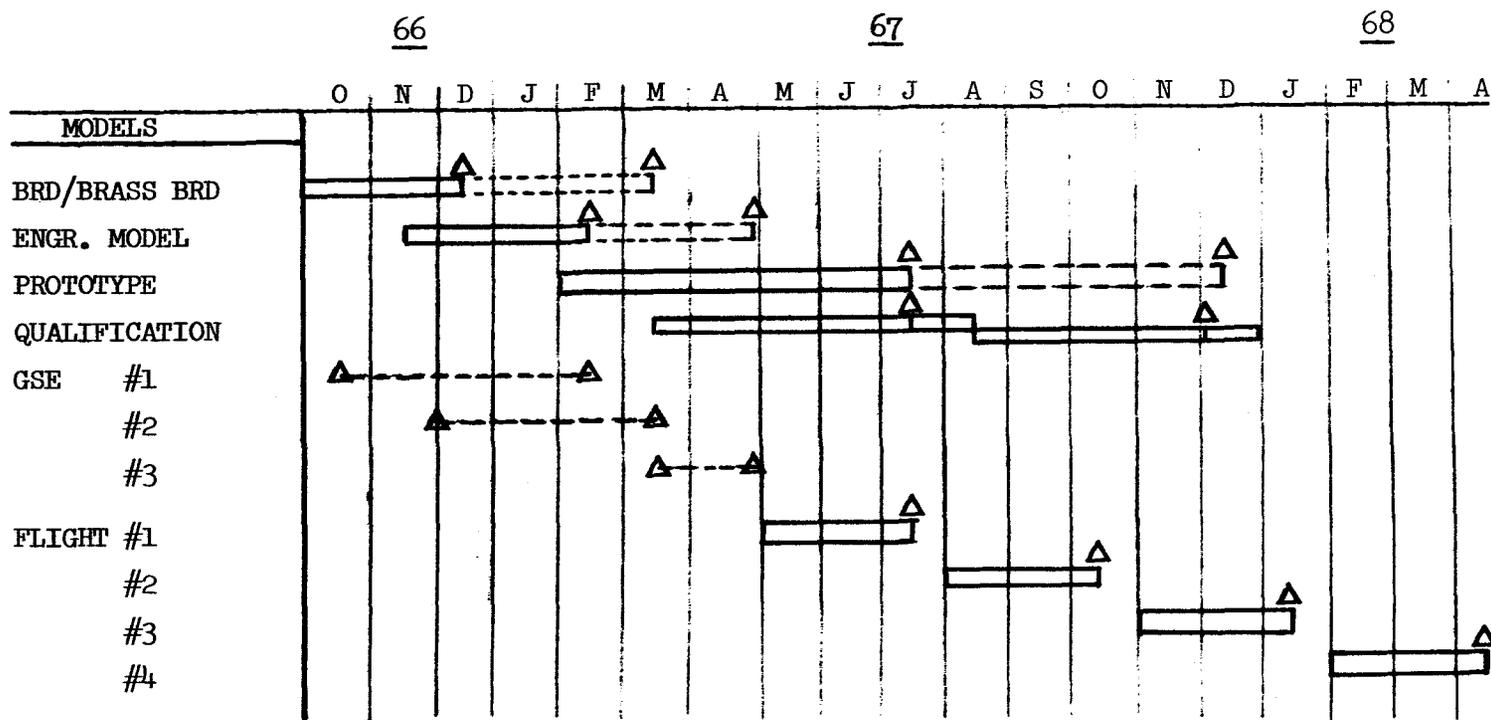


KSC SPACEVEHICLE PROGRAM



A L S E P
D E V E L O P M E N T
P R O G R A M

ALSEP DEVELOPMENT AND TEST PROGRAM



EQUIPMENT DEFINITIONS

BREADBOARD-BRASSBOARD

ENGINEERING TOOL TO ALLOW PROPER EQUIPMENT DESIGN. IT MAY OR MAY NOT CONFIGURE FINAL ALSEP PRODUCTION EQUIPMENT.

ENGINEERING MODEL

AN ALSEP SYSTEM NEARLY LIKE THE FINAL PRODUCTION MODEL ELECTRICALLY AND MECHANICALLY. PRODUCTION LIKENESS MUST BE MAINTAINED TO THE DEGREE THAT USEFUL ELECTRICAL INTEGRATION AND ELECTRO-MAGNETIC INTERFERENCE TESTS CAN BE ACCOMPLISHED.

PROTOTYPE

AN ALSEP SYSTEM PHYSICALLY AND ELECTRICALLY LIKE THE FINAL PRODUCTION MODEL. DETAILS OF PARTS USED MAY NOT BE AS THE FINAL PRODUCTION PARTS (e.g., HI-REL RESISTORS)

QUAL MODEL

A COMPLETE FINAL PRODUCTION MODEL ALSEP SYSTEM NOT YET TYPE-QUALIFIED.

TEST CATEGORIES

(DEVELOPMENT)

BREADBOARD/BRASSBOARD

- . TEST OF COMPONENTS AND SUBSYSTEMS
- . DESIGN FEASIBILITY (FUNCTIONAL)

ENGINEERING MODEL

- . TESTS OF COMPONENTS, SUBSYSTEM, SYSTEM
- . DESIGN VERIFICATION (FUNCTION, FORM, COMPATIBILITY)

PROTOTYPE

- . TESTS OF SUBSYSTEM, SYSTEM
- . DESIGN VERIFICATION (INTEGRATION, FUNCTION, COMPATIBILITY, ENVIRONMENTAL)
- . PRE-QUALIFICATION (FUNCTION AND ENVIRONMENT)
- . DESIGN MARGINS (FUNCTIONS AND ENVIRONMENT OFF-LIMITS)

TEST CATEGORIES

(PRODUCTION)

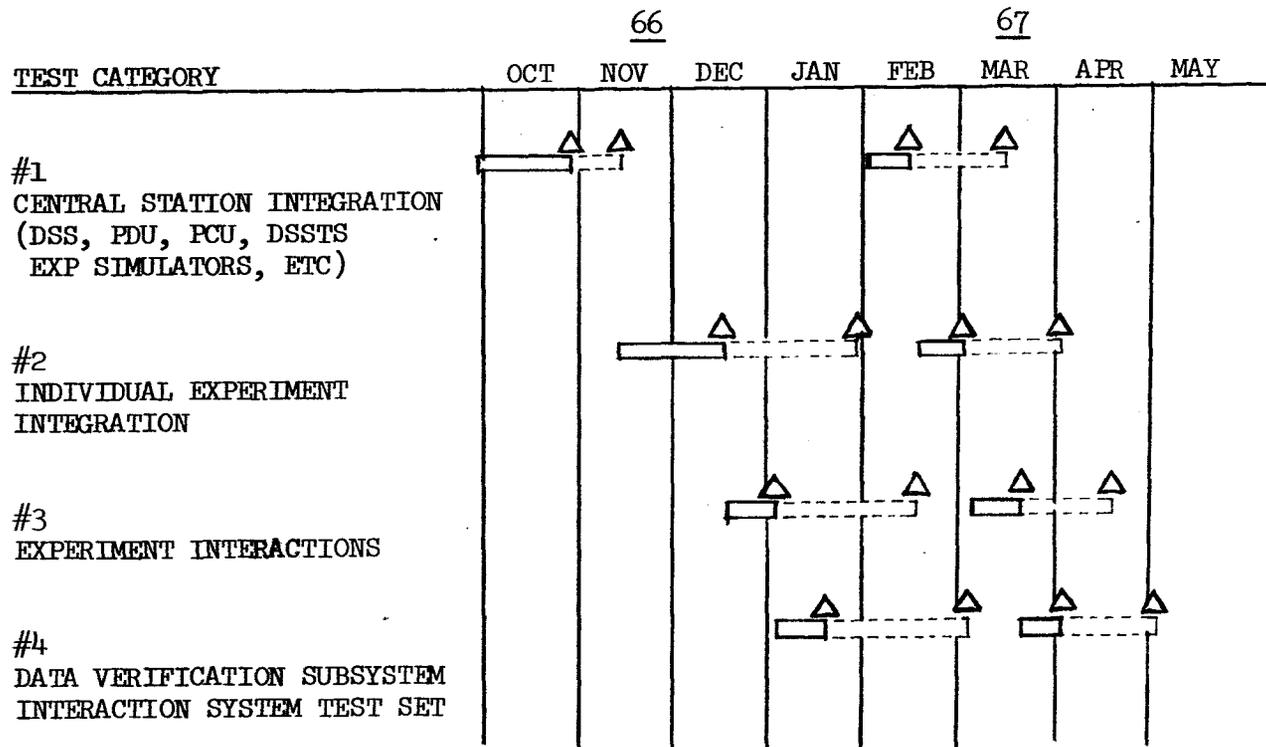
QUALIFICATION

- . TEST OF SYSTEM
- . DESIGN PROOF (FUNCTION, COMPATIBILITY, ENVIRONMENT)

ACCEPTANCE

- . TEST OF SYSTEM
- . SYSTEM SIMILARITY WITH QUAL MODEL (FUNCTION, ENVIRONMENT, COMPATIBILITY)

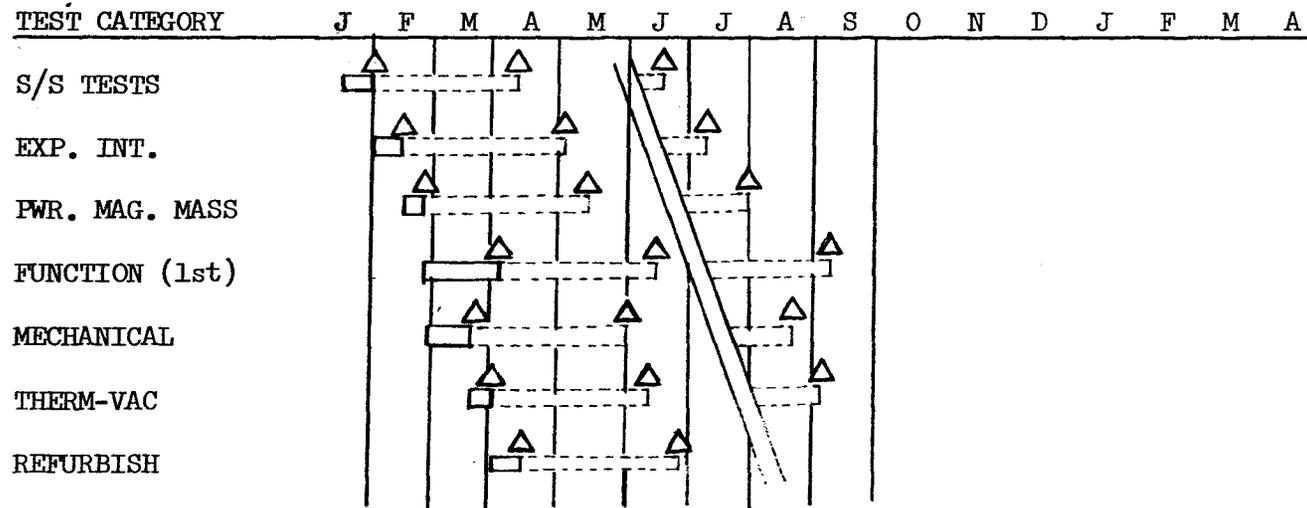
ALSEP ENGINEERING MODEL TEST



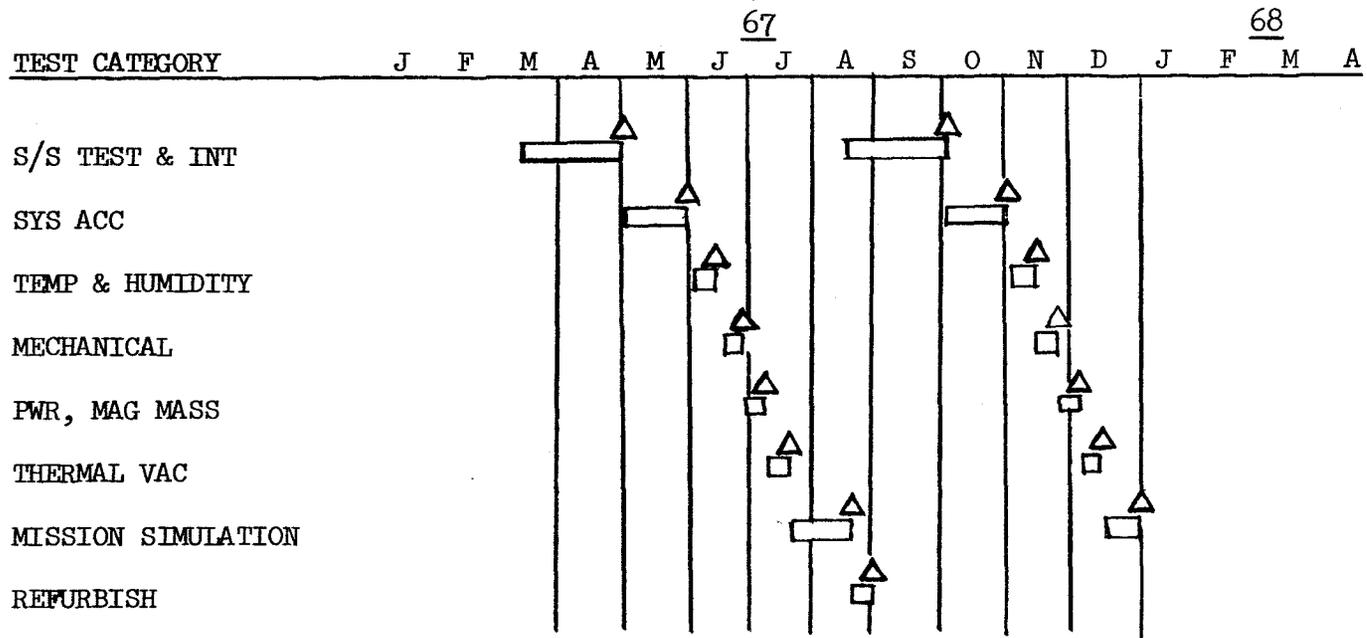
ALSEP PROTOTYPE MODEL TESTS

67

68

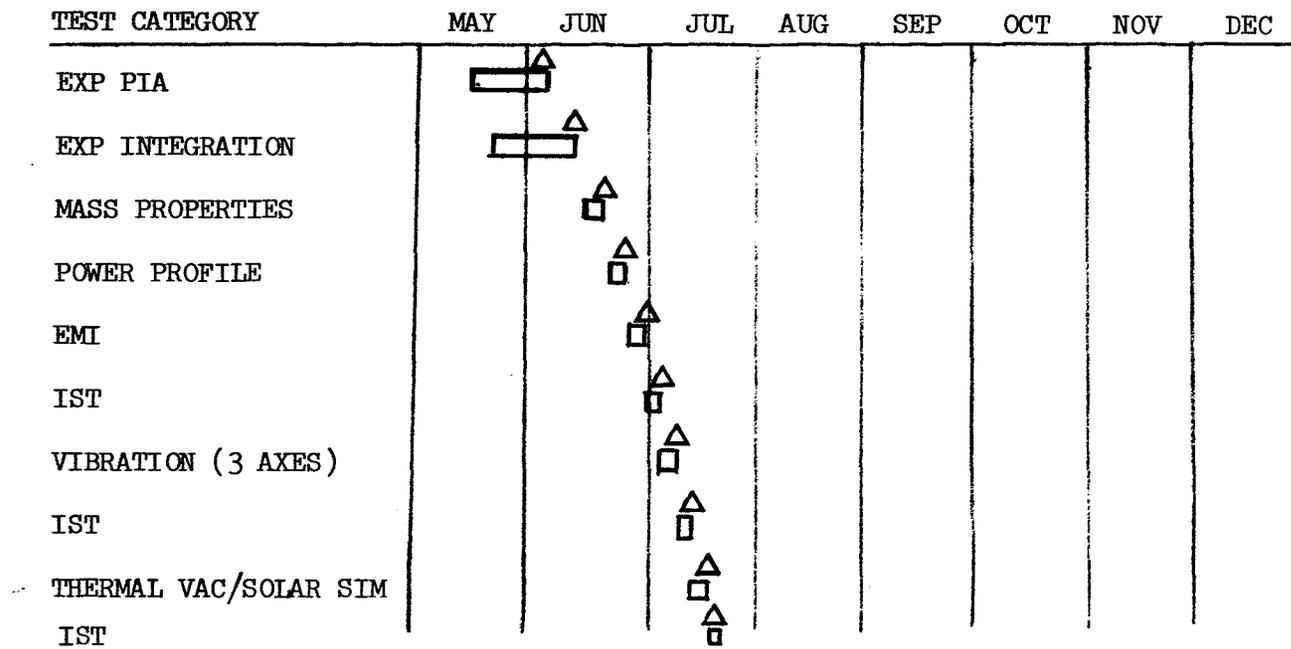


ALSEP QUALIFICATION MODEL TESTS



ALSEP FLIGHT MODEL TEST (ACCEPTANCE A1)

67



ENGINEERING MODEL TESTING

EXPERIMENT	ETS	ENGINEERING MODEL	REMARKS
PSE	Available	Available	
SWS	Available	Available	
SIDE/CCGE	Jan 30	Feb 15	B/B and ETS Previously Tested B/B and ETS Due for Return to BxA Jan 30
LSM	Shipped	Feb 7	B/B and ETS Previously Tested
CPLEE	Available	Available	
COMPLETION - 3/5/67		PLANNED COMPLETION - 1/20/67	

HARDWARE SCHEDULES

EXPERIMENT	PROTO		QUAL		FLIGHT	
	NEED	FORECAST	NEED	FORECAST	NEED	FORECAST
PSE	3/10	3/15	3/24	4/7	5/15	5/15
SWS	4/1	4/3	3/31	4/17	6/1	6/5
SIDE/CCGE	3/17	3/15	4/7	4/21	5/29	6/1
LSM	3/24	4/2	4/14	5/1	5/24	6/1
COMPLETE	6/15	6/20	7/15	8/1	7/15	8/1
CPLLE	4/1	3/31	4/14	5/1	6/1	6/1
TOOLS	4/1	2/15	5/1	3/15	6/1	6/1

BENDIX STATUS

- DELIVERY OF QUALIFIED FLIGHT ALSEP CAN BE MADE ON 14 JULY 1967
- NO SIGNIFICANT DESIGN, MANUFACTURING OR TEST PROBLEMS NOW KNOWN

ACCEPTANCE CRITERIA SCHEDULE

EXP.	CALCULATED VALUES (FILL IN ATM- 594)	FREEZE ON MEASUREMENTS LIST	FINAL TOLERANCES
SIDE	3 FEB	28 FEB	COINCIDENT WITH QUAL MODEL DELIV ↓
PSE	3 FEB	15 MAR	
SWS	13 FEB	27 MAR	
LSM	1 MAR	1 APRIL	
ASE	15 FEB	15 MAR	
CPLE	17 FEB	20 MAR	
HFE	20 MARCH	15 APRIL	

PROTOTYPE SCHEDULE - ARRAY A

JAN FEB MAR APR MAY
13 20 27 3 10 17 24 3 10 17 24 31 7 14 21 28 5 12 19

CENT. STA. COMPONENTS

CENTRAL STA.
INTEG.

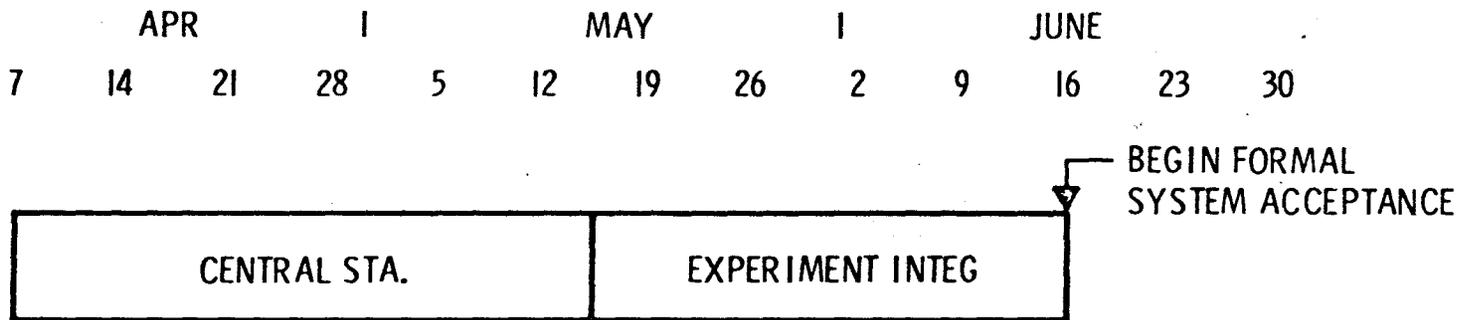
EXPERIMENT INTEG SYSTEM LEVEL
DES. VERIF.

STS READY FOR
PROTOTYPE

STS CHECKOUT STS WITH ENG MODEL

3/10

CURRENT FORECAST OF FLIGHT I ARRAY DELIVERIES- MAJOR PROBLEM



▲ 5/1

PSE

▲ LSM
6/1

▲ SW
6/5

▤ LATEST DATE FOR ANY EXP

▲ SIDE
6/15

BACKUPS:

▲ ASE
5/1

CPLLE ▲
6/1

4422-2152

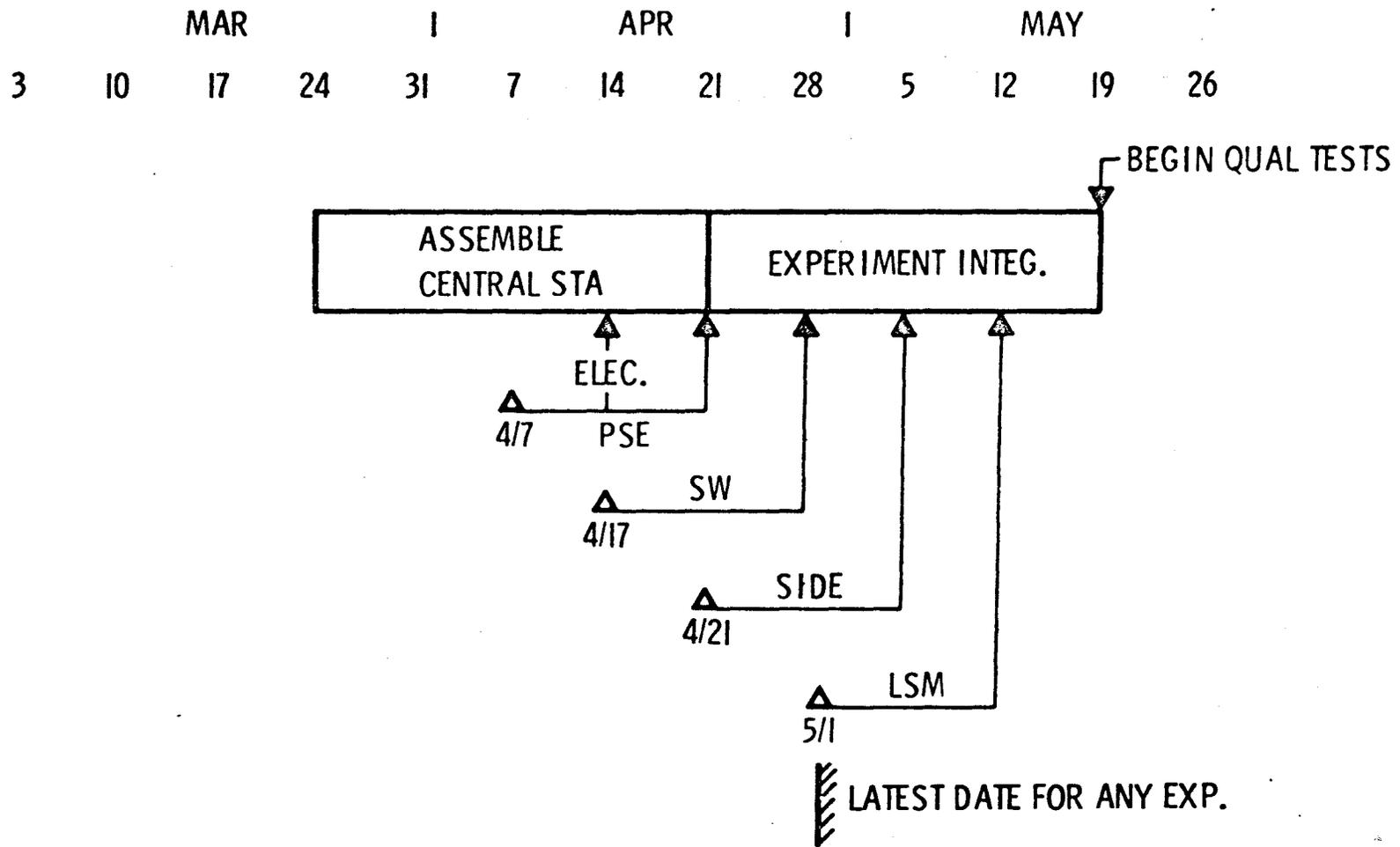
PLANNED USE OF P. I. DATA

	PROTOTYPE	QUAL	ACCEPTANCE	LUNAR	
				DEPLOY	OPERATE
ACCEPTANCE CRITERIA INCLUDING TOLERANCE LIMITS	YES	YES	YES	NO	NO
CALIBRATION & CONVERSION DATA	ENG ONLY	ENG & SCIEN- TIFIC	NO	ENG ONLY	ENG & SCIEN- TIFIC

DATA REQUIREMENTS FROM PRINCIPAL INVESTIGATORS

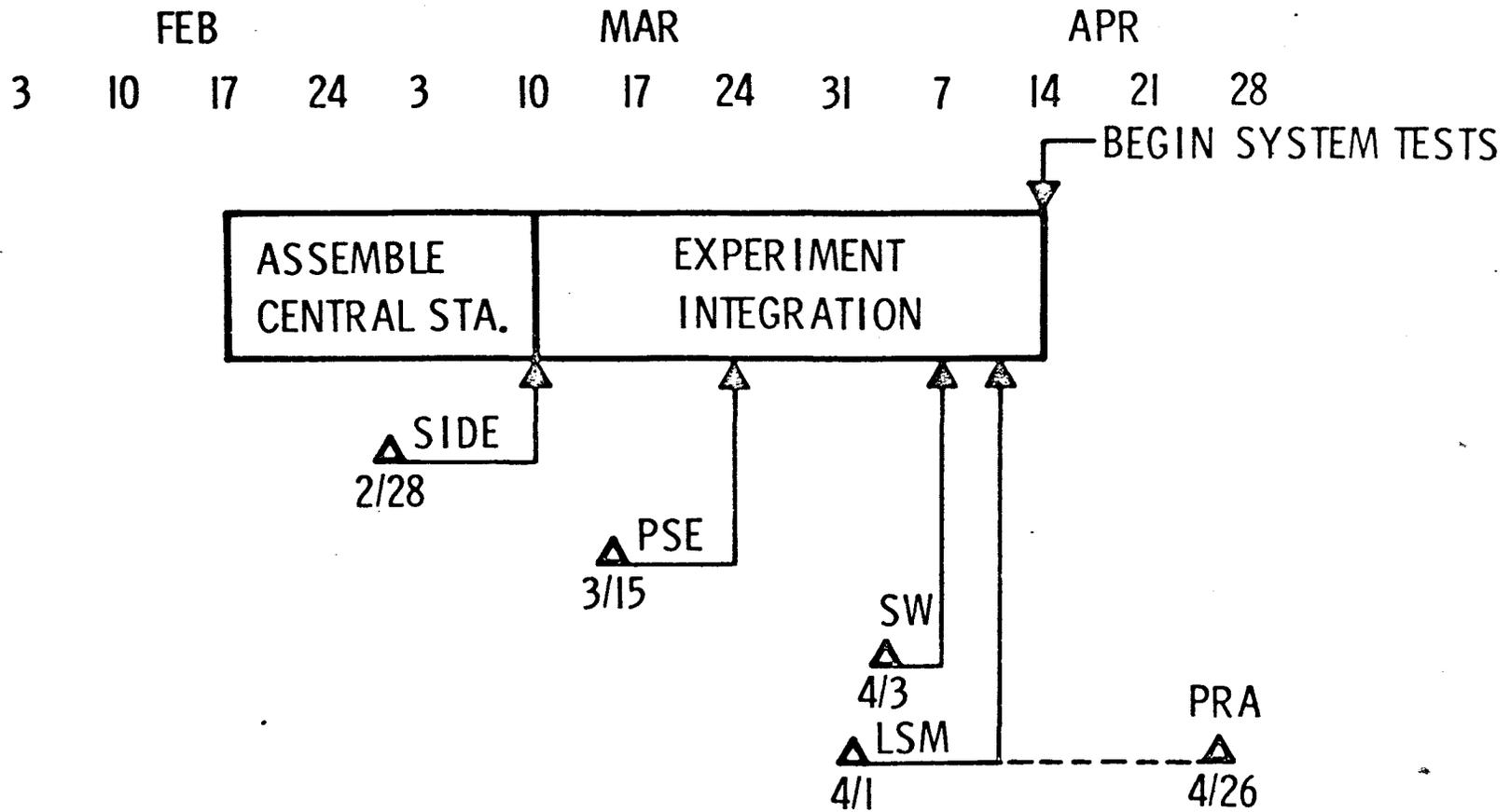
- COMPLETE THE MEASUREMENTS REQUIREMENTS DOCUMENT
- APPROVAL OF EXPERIMENT ACCEPTANCE CRITERIA (ATM-594)
- TOLERANCE LIMITS ON ACCEPTANCE MEASUREMENTS
- CALIBRATION & CONVERSION DATA
 - ENGINEERING
 - SCIENTIFIC

PLAN FOR INTEGRATION OF EXPERIMENTS IN ARRAY A QUALIFICATION



BACKUPS: ASE ▲ ▲ CPLEE

PLAN FOR INTEGRATION OF EXPERIMENTS IN ARRAY A PROTOTYPE



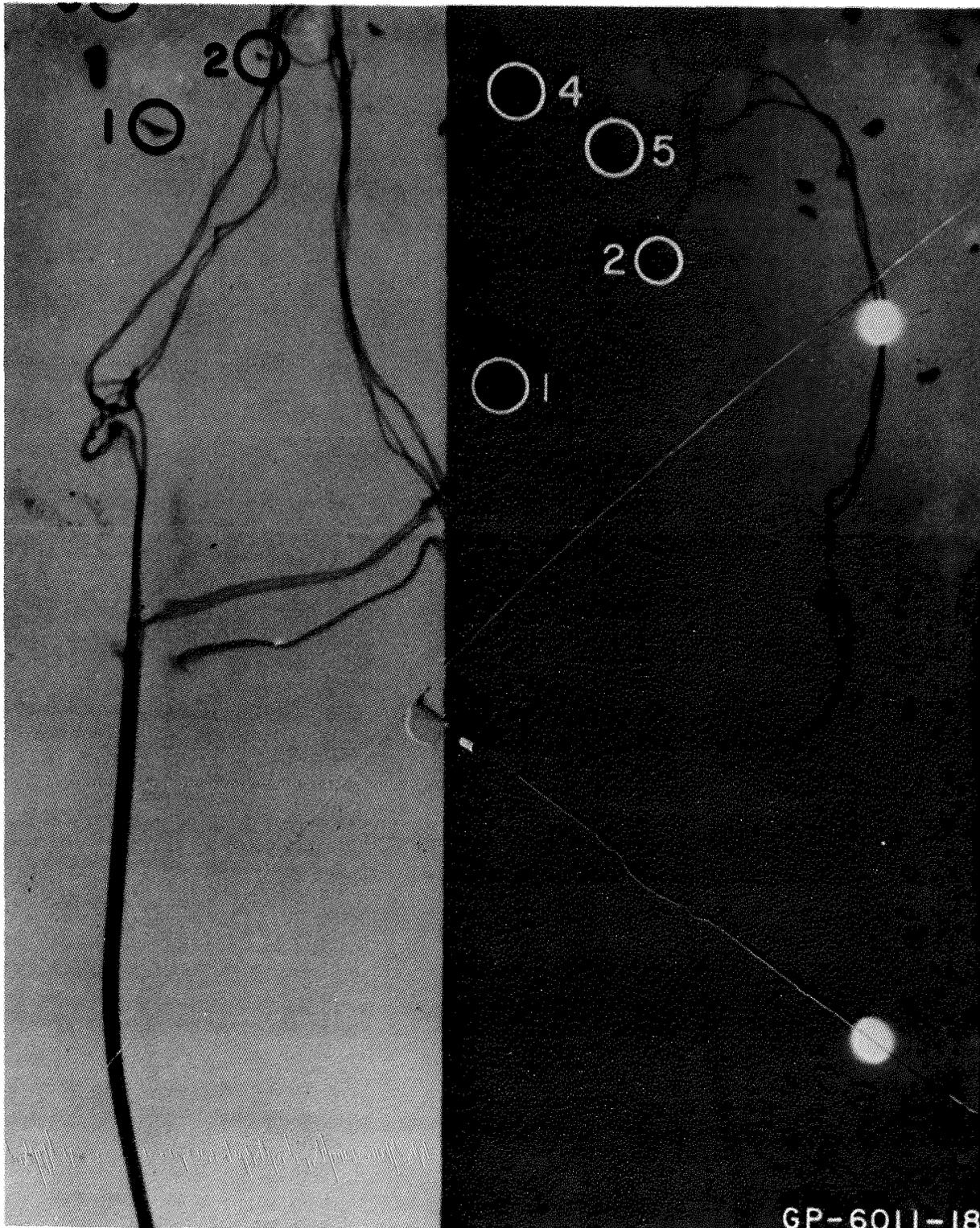
BACKUPS

▲ ASE
MORTAR

▲ RICE CALIB 3/20
▲ CPLEE

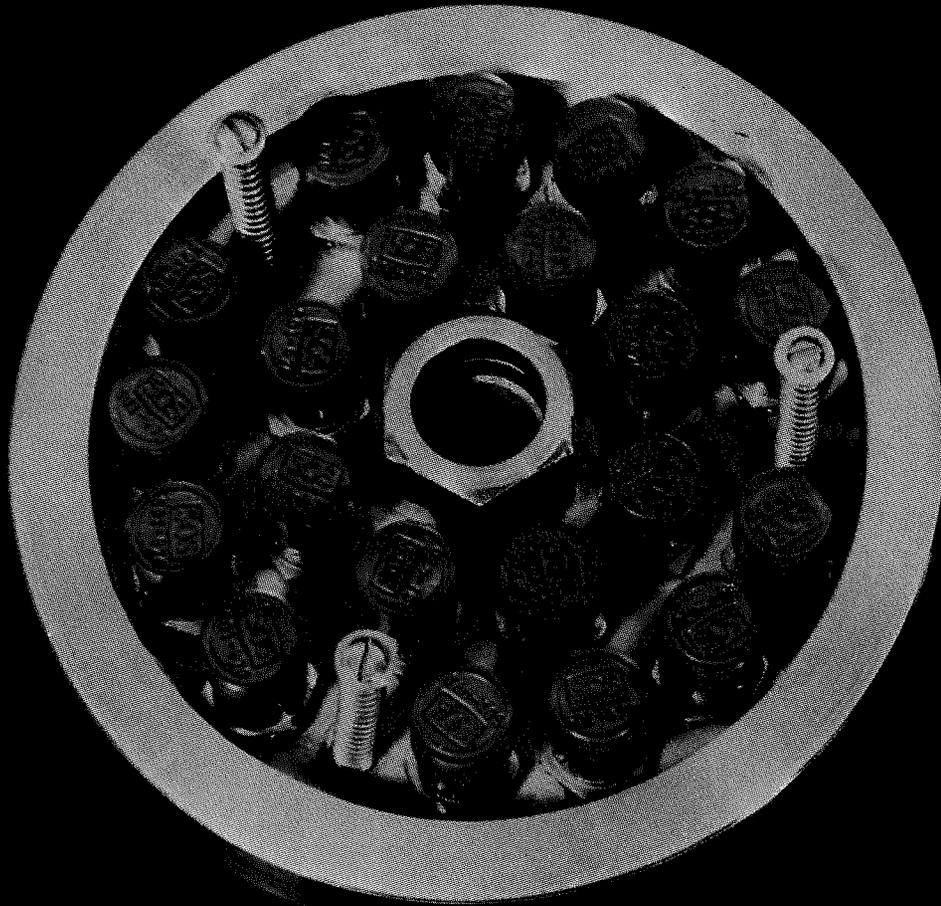
PROBLEM AREAS

1. S.O.S. TESTING
2. COMMUNICATIONS WITH BENDIX
3. GEOPHONE CONFIGURATION AND TEST INADEQUACIES
4. GEOTECH'S LOG COMPRESSION AND QUANTIZATION LEVELS
5. PARTICLE BLOW-OUT FROM THUMPER
6. SUBSYSTEM AND SYSTEM TEST INADEQUACIES



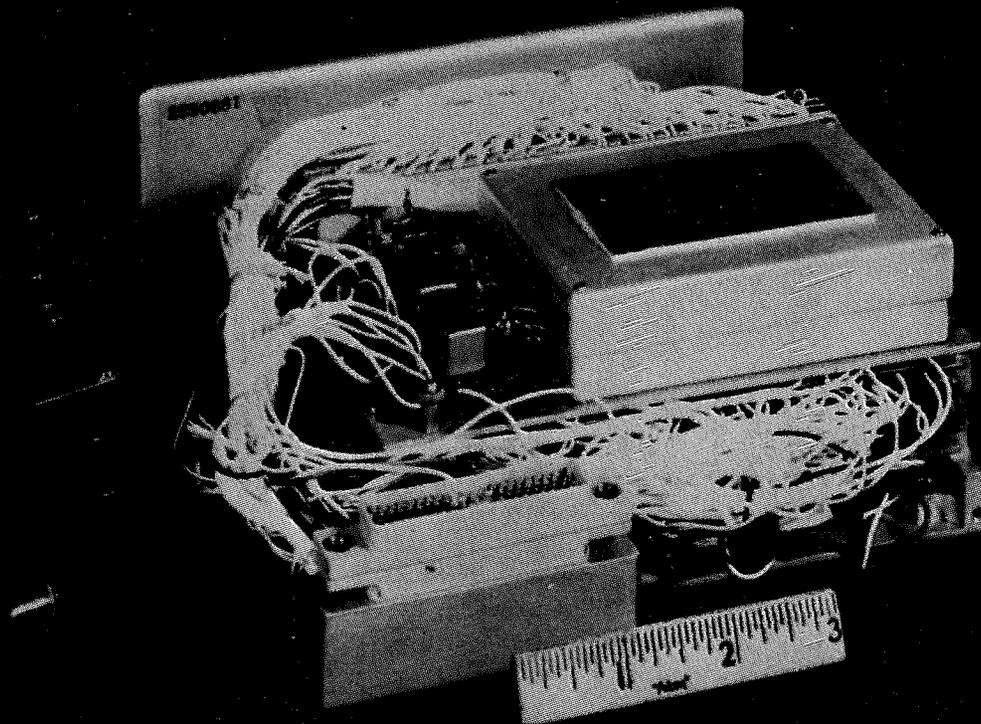
GP-6011-18

ASE THUMPER



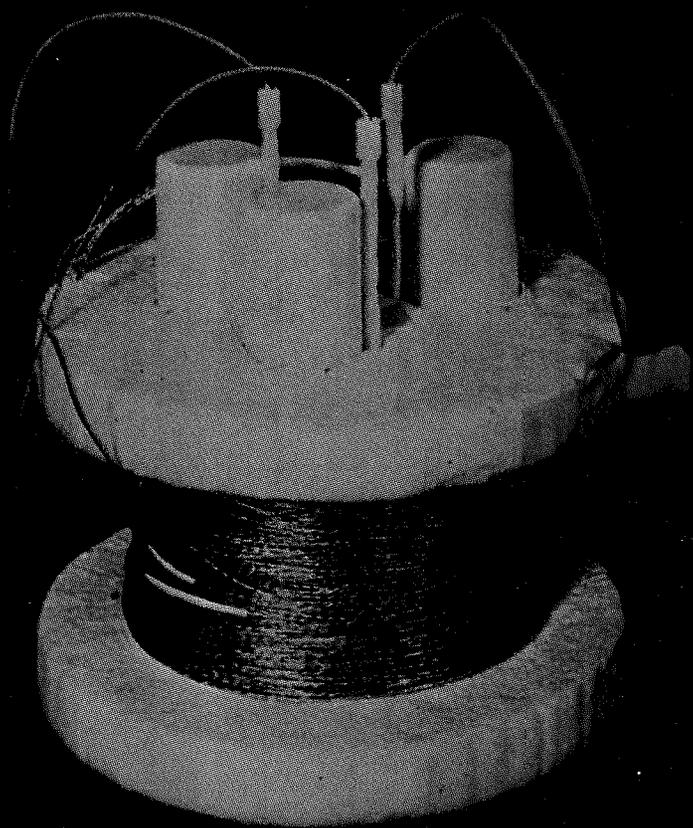
4422-2254

ASE CENTRAL ELECTRONICS PACKAGE



4422-2251

ASE GEOPHONE



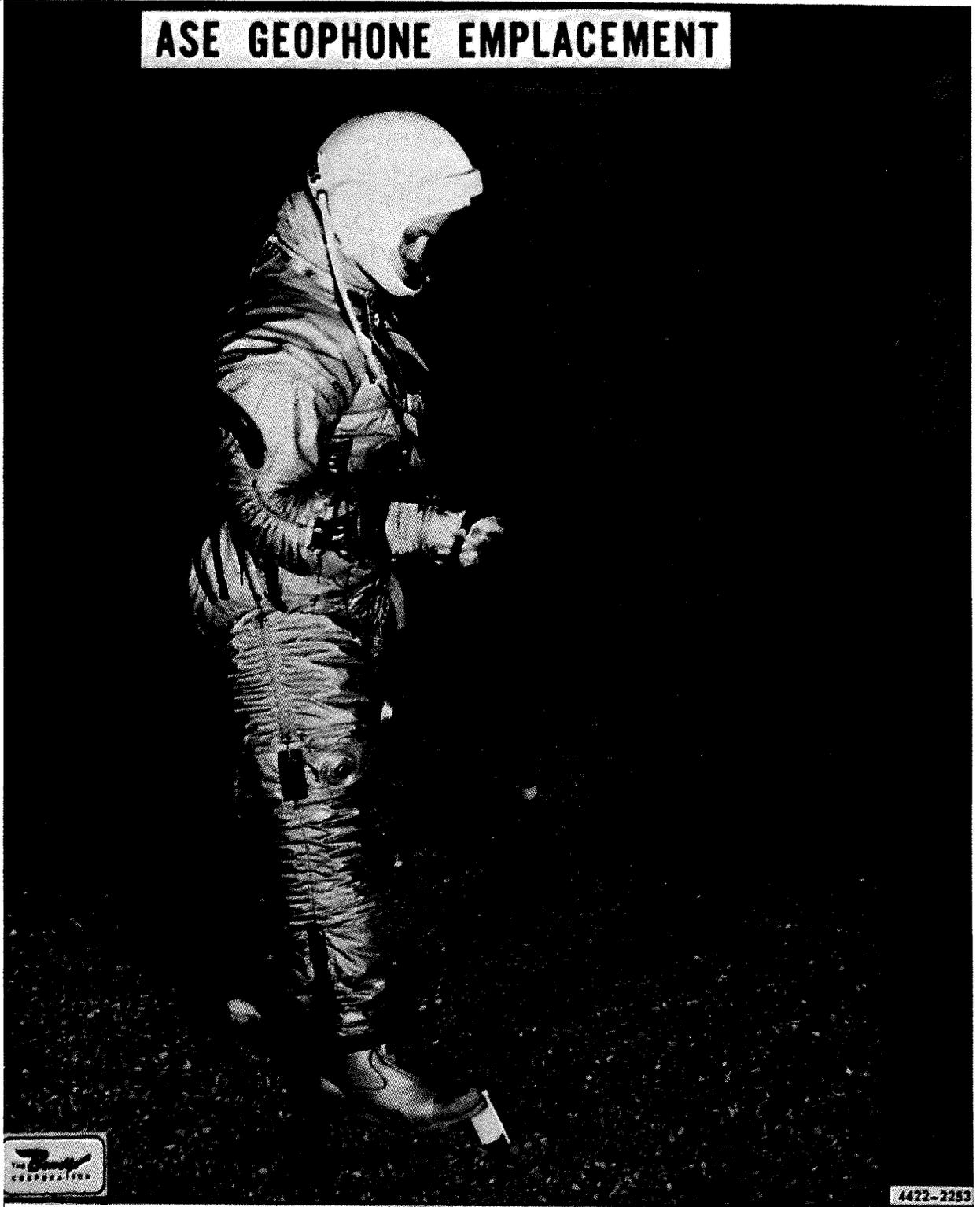
4422-0050

ASE MORTAR PACKAGE (ENGINEERING MODEL)



4422-2250

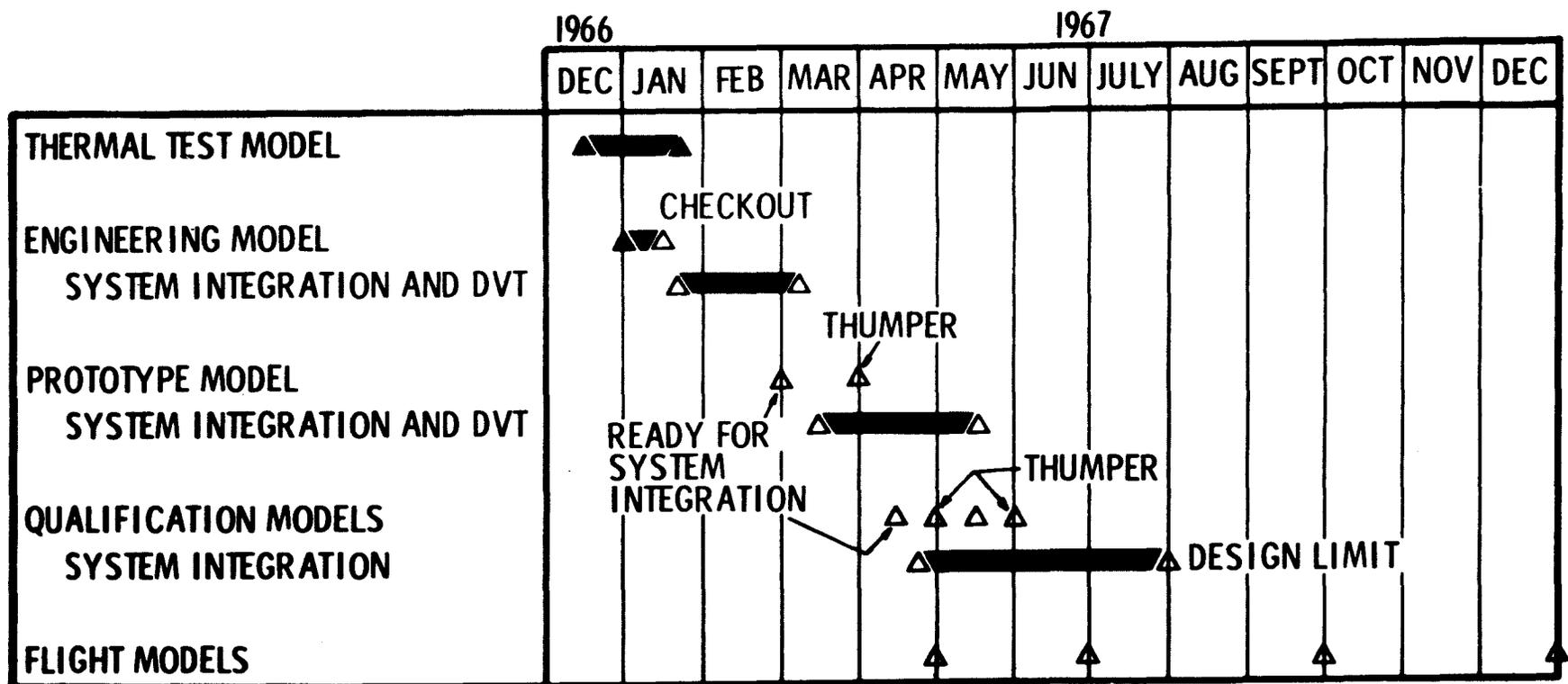
ASE GEOPHONE EMPLACEMENT



The *Dewey*
CORPORATION

4422-2253

ASE SCHEDULE

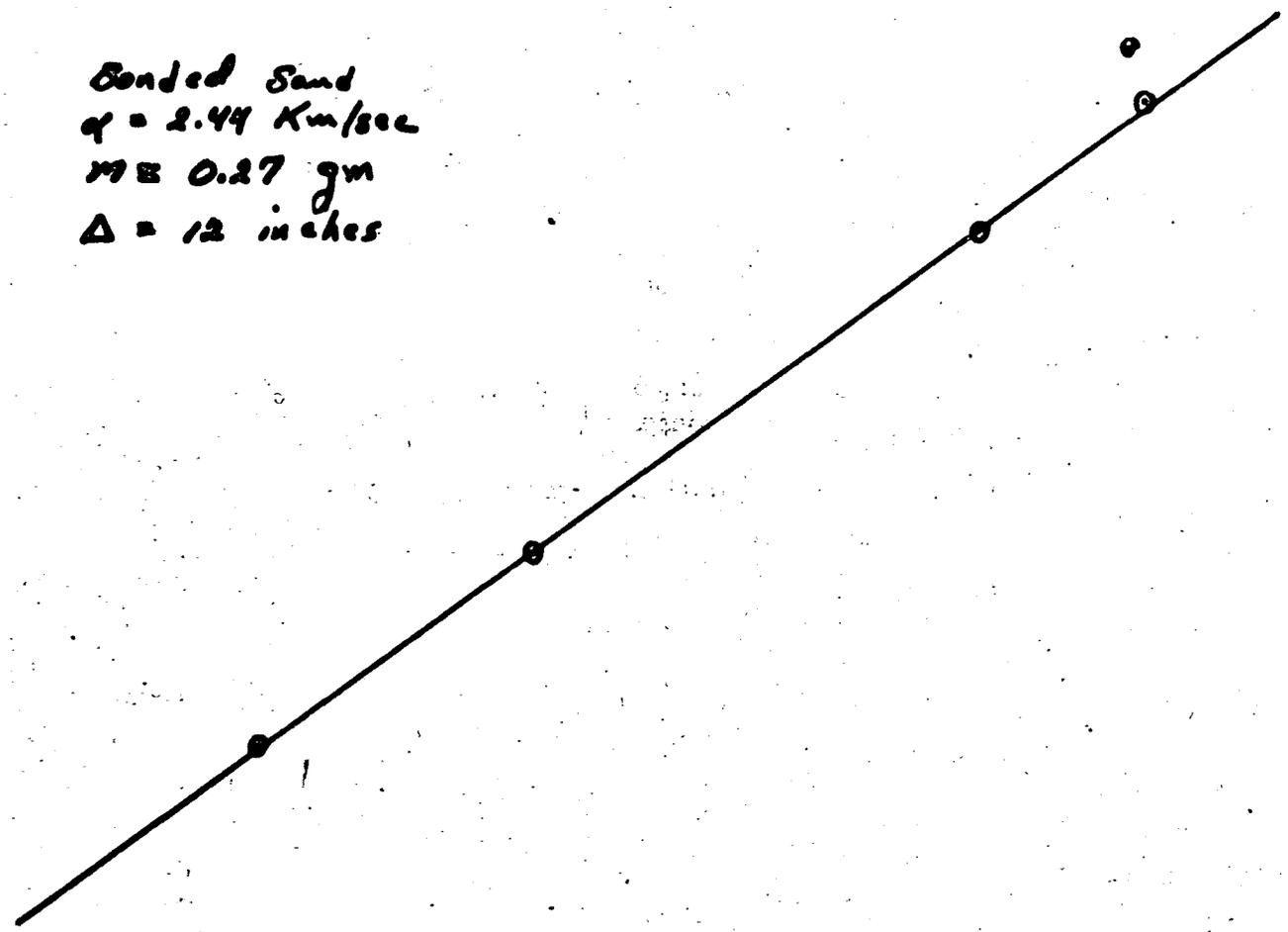


10¹¹

Bonded Sand
 $\alpha = 2.44 \text{ Km/sec}$
 $M = 0.27 \text{ gm}$
 $\Delta = 12 \text{ inches}$

10¹⁰

PROJECTILE K.E. (ERGS)



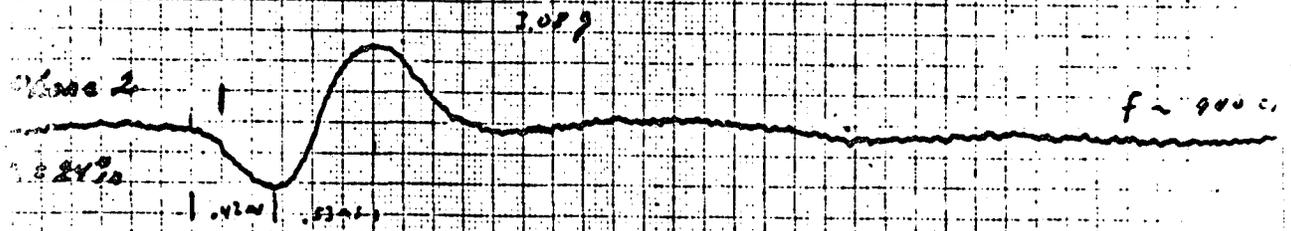
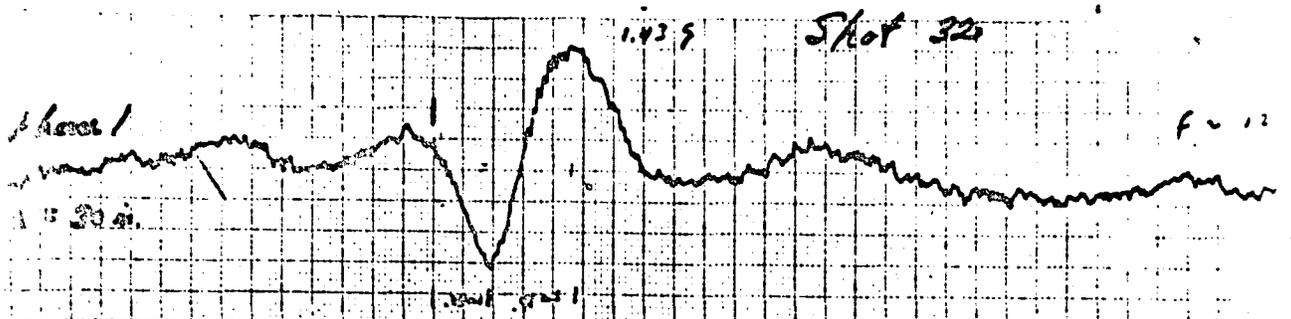
10⁹

10

100

1000

Amplitude (p-p) of first cycle (g's)



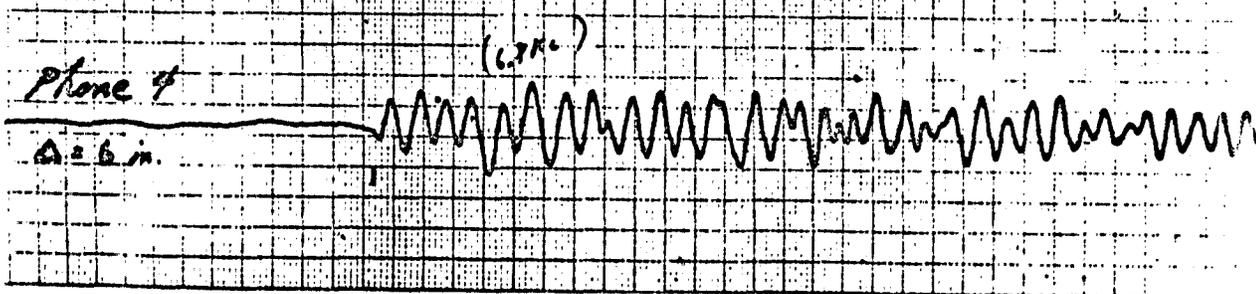
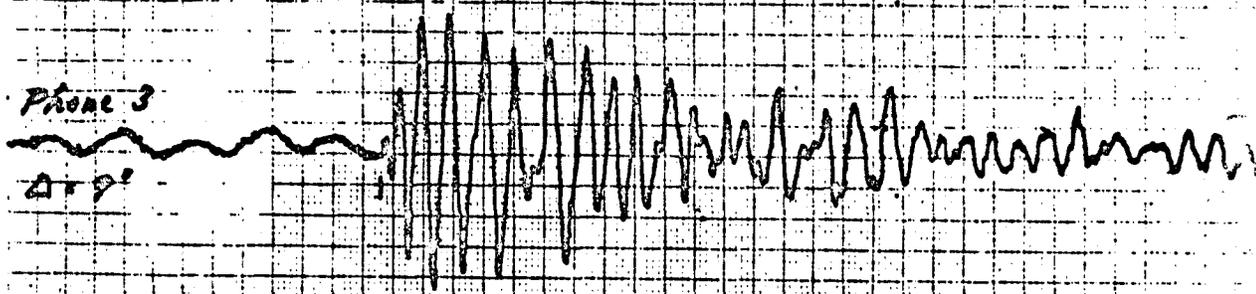
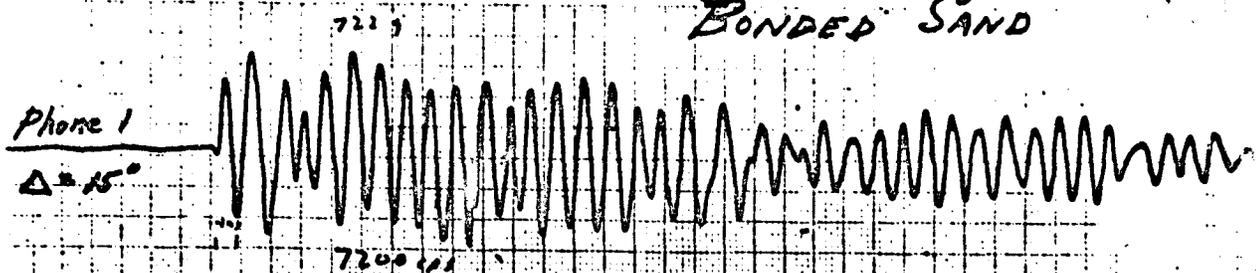
$v = 19,700 \text{ ft/sec}$

$m = 0.22 \text{ gms}$

Shot 32

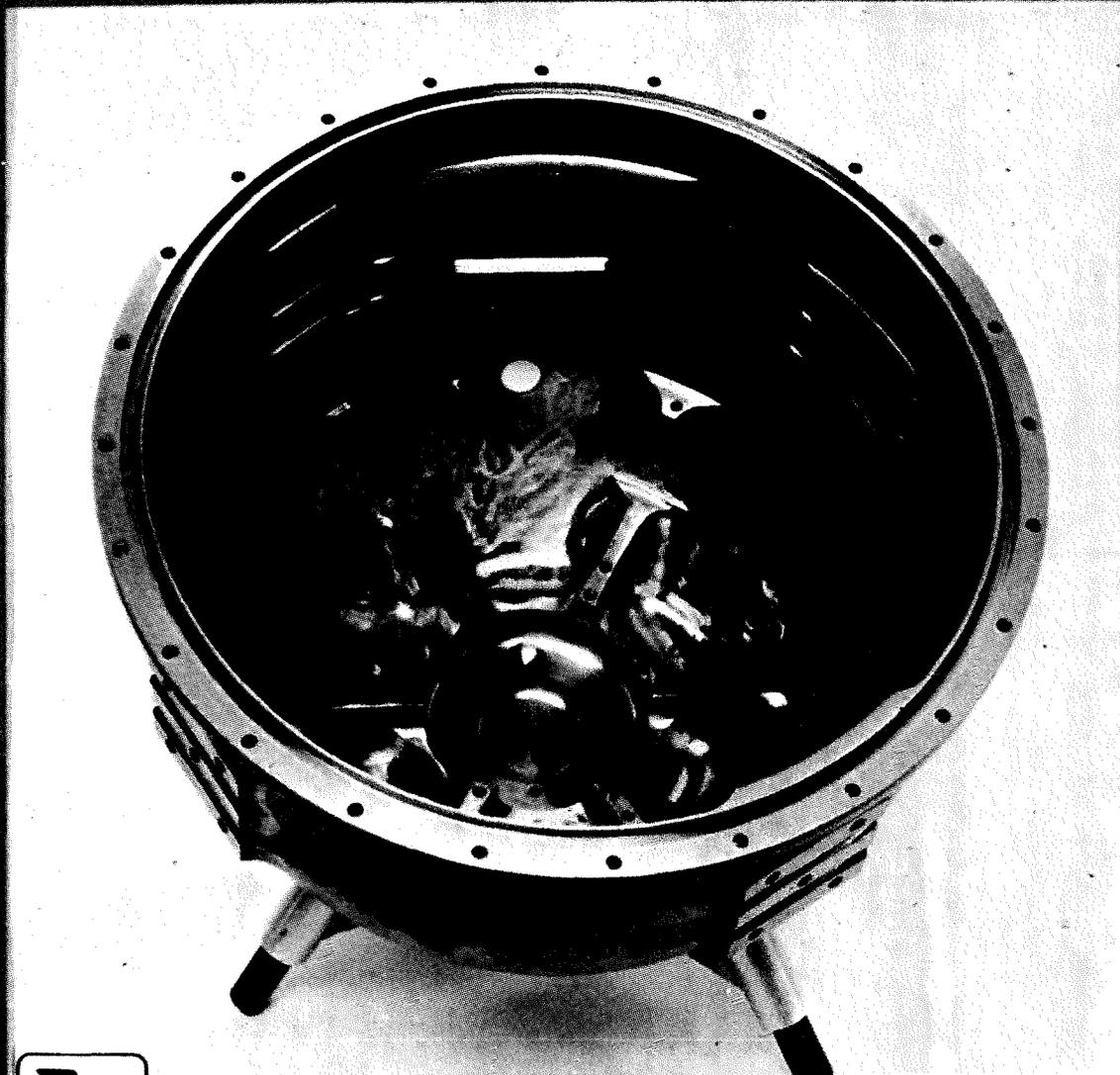
19,700 ft/sec

BONDED SAND

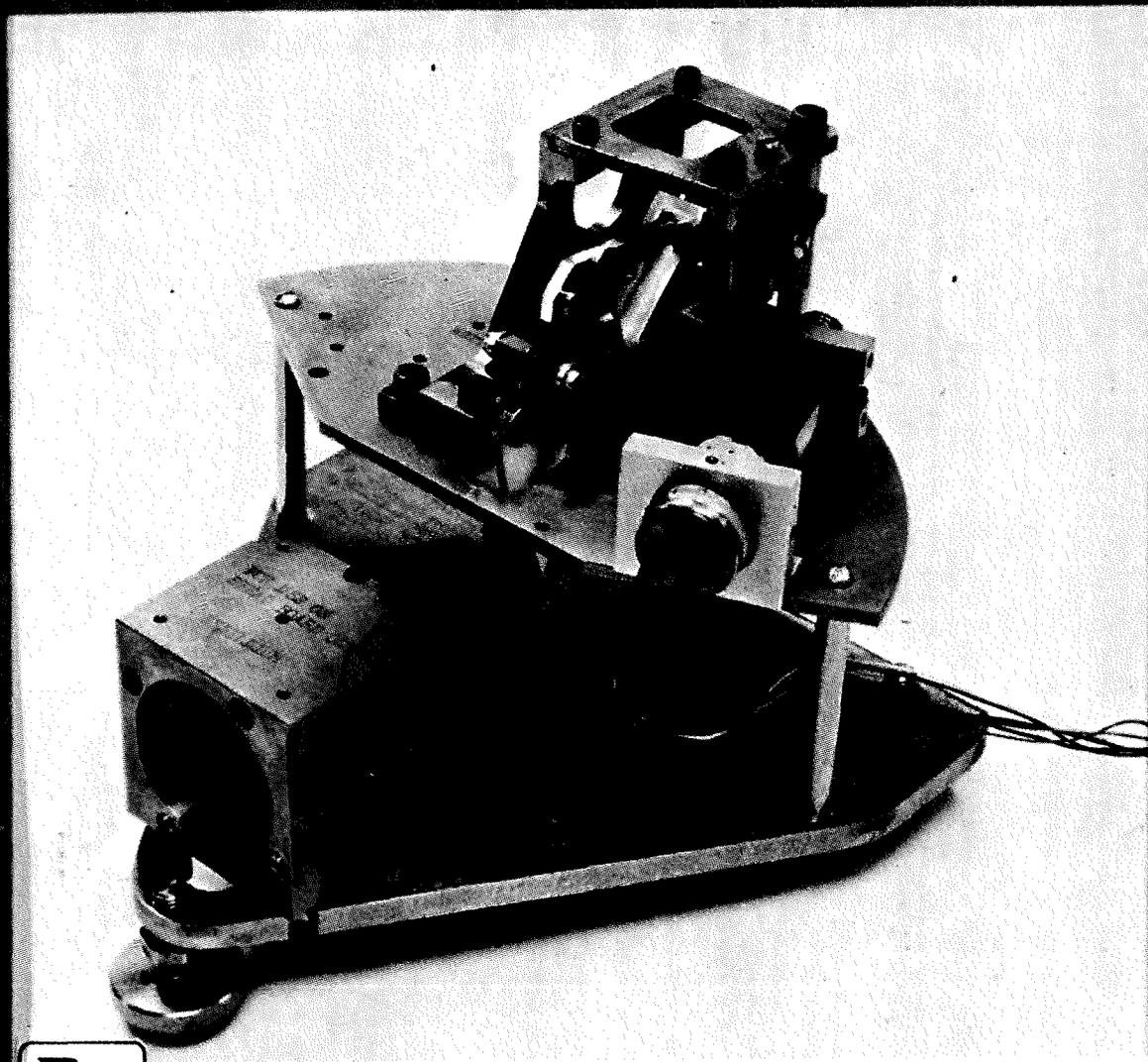


MS 0.27 cmc

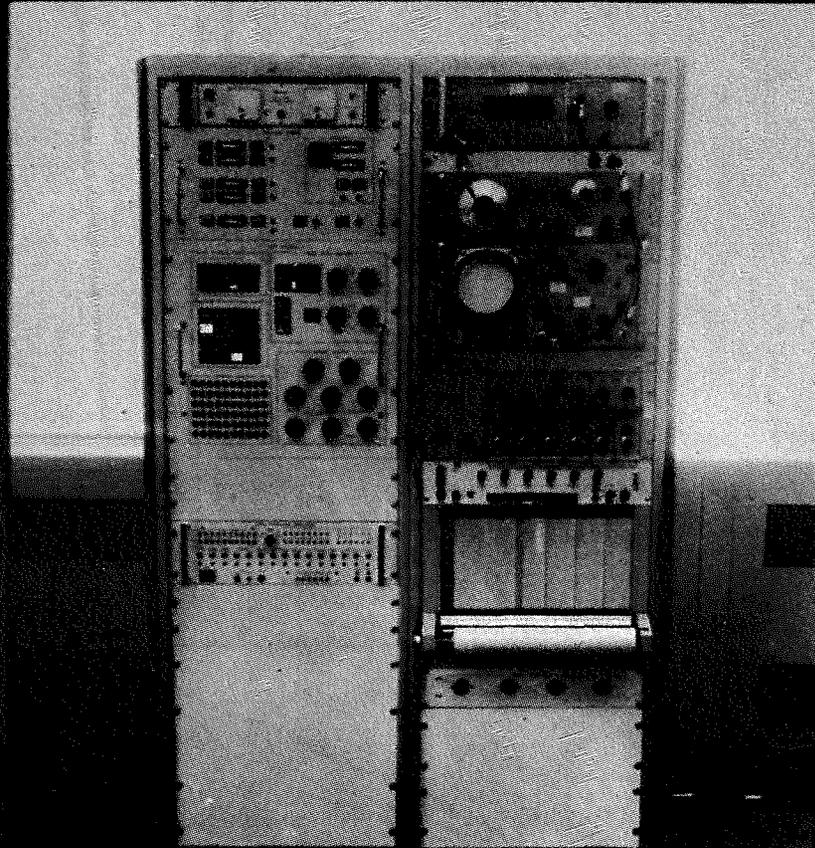
PSE SENSOR BERYLLIUM BASE



PSE LONG PERIOD VERTICAL SEISMOMETER ASSEMBLY



PSE TEST SET

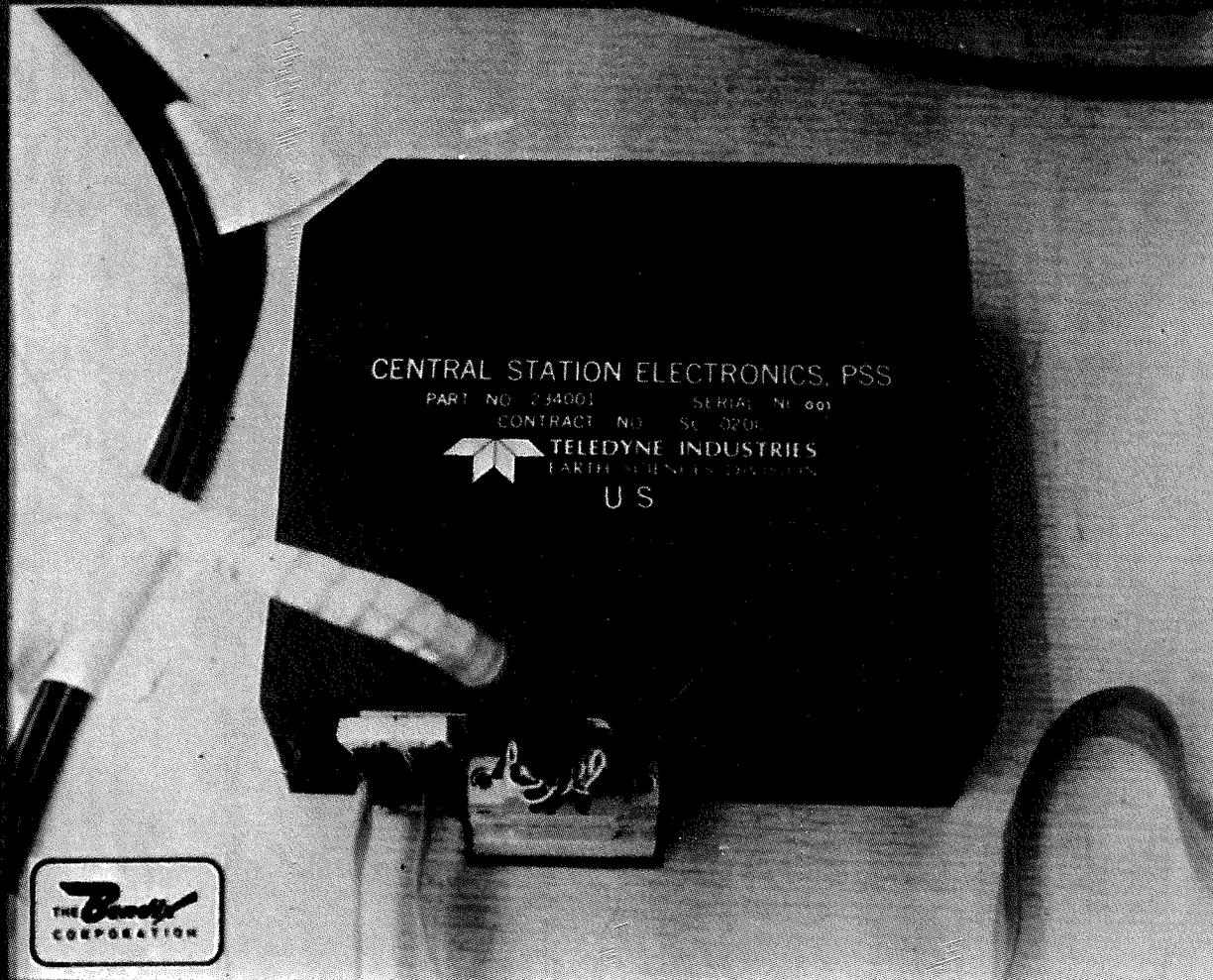


4422-2006

PSE DEPLOYMENT



PSE CENTRAL STATION ELECTRONICS



CENTRAL STATION ELECTRONICS, PSS

PART NO. 234001

SERIAL NO. 001

CONTRACT NO. SC 0201



TELEDYNE INDUSTRIES
EARTH SCIENCES DIVISION

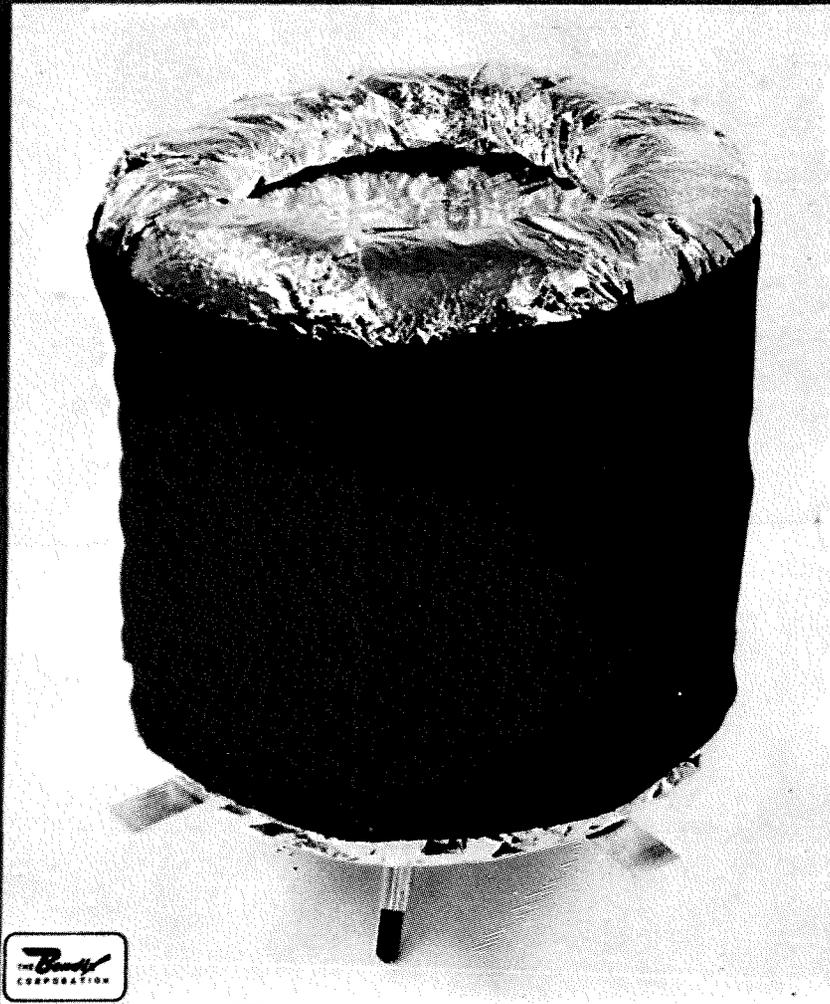
U S



4422-2000

PSE THERMAL SHROUD

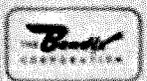
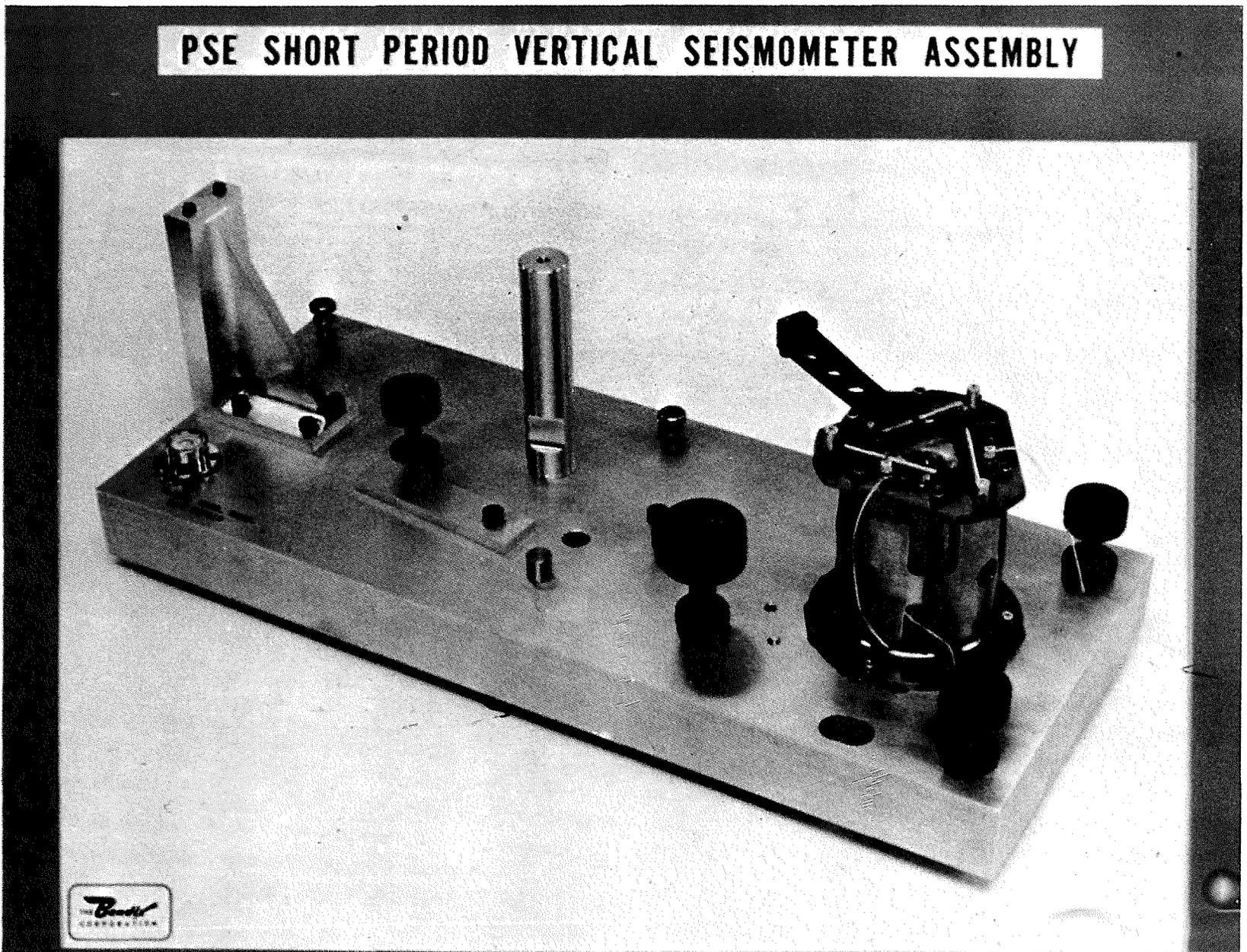
(STOWED WITH PREFLIGHT RETAINING NET)



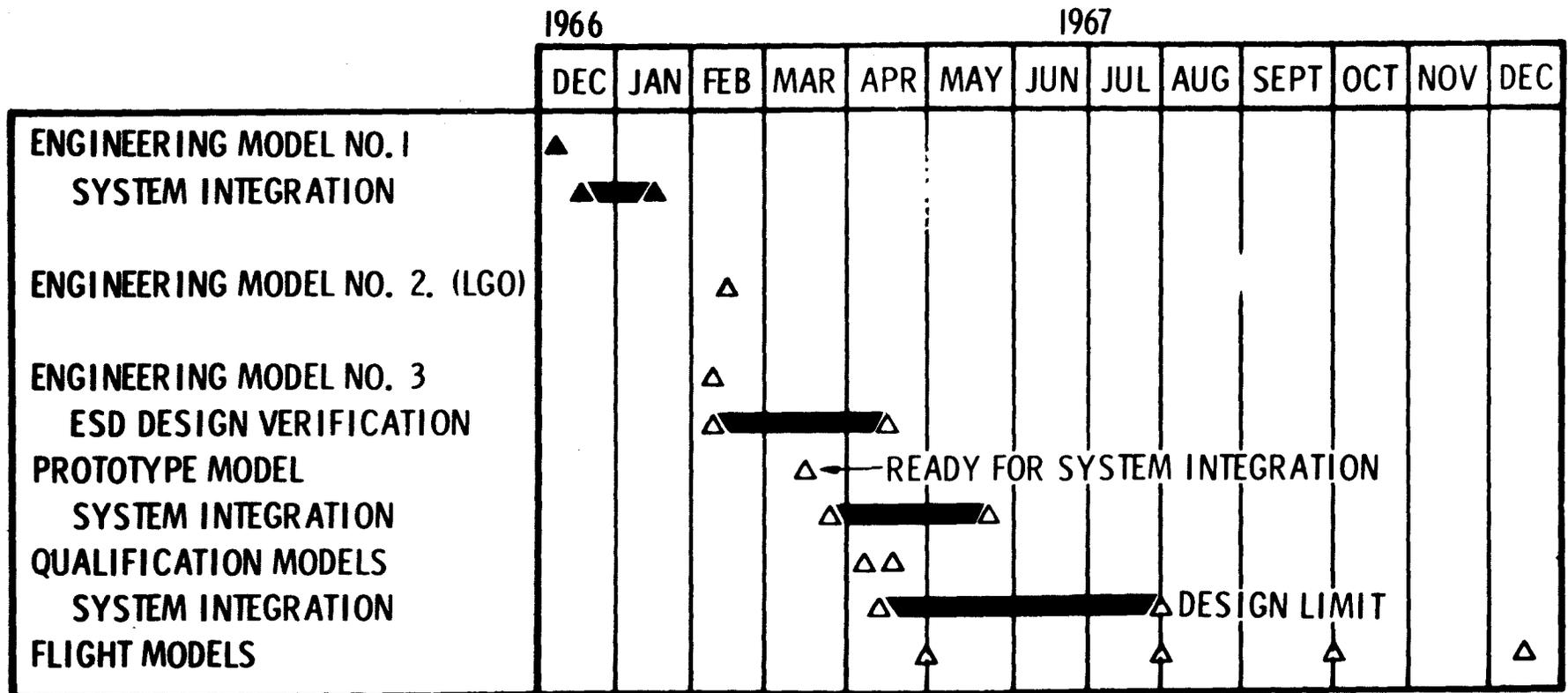
The Boeing
CORPORATION

4422-2004

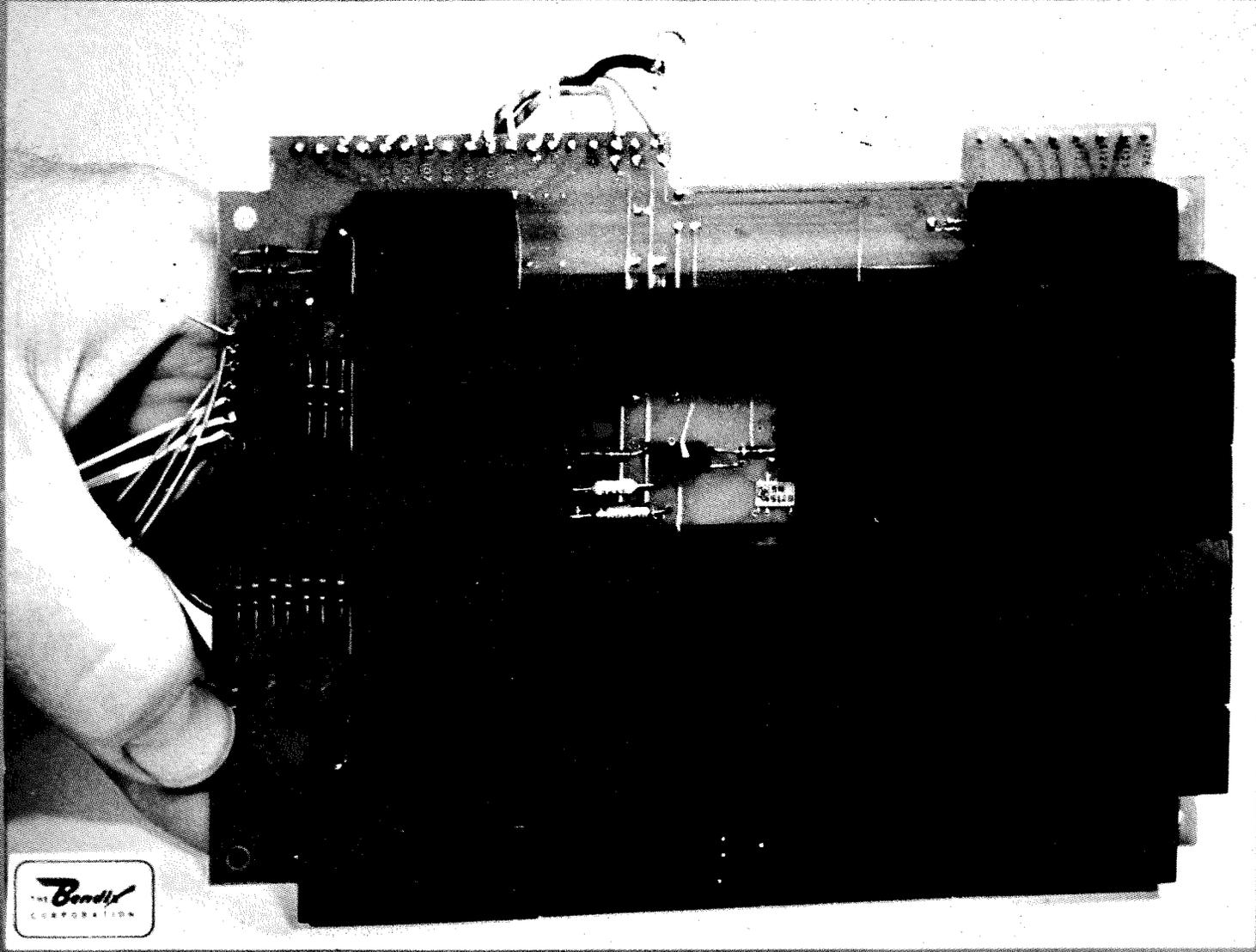
PSE SHORT PERIOD VERTICAL SEISMOMETER ASSEMBLY



PSE SCHEDULE

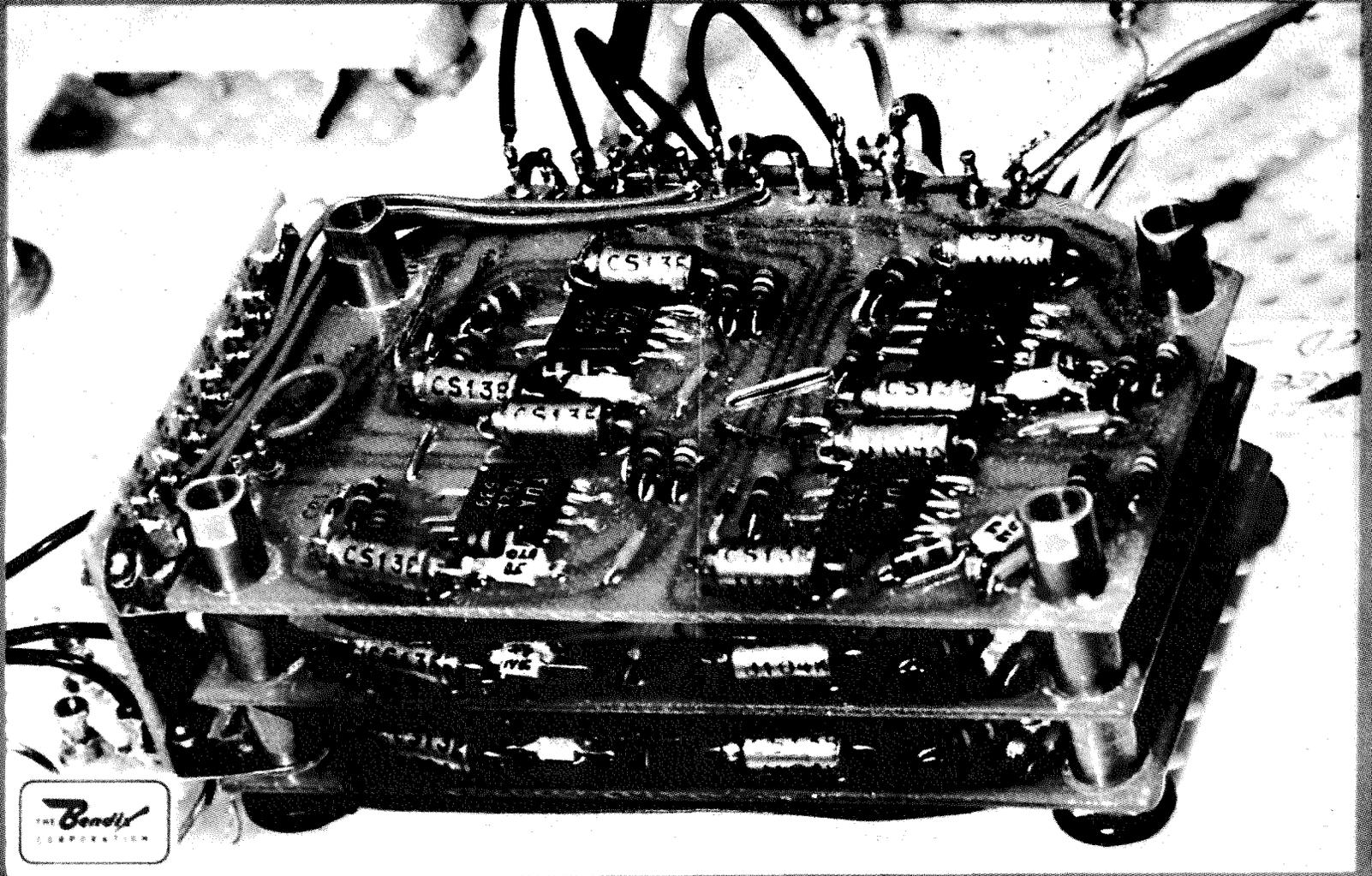


CPLLEE LOGIC SUBASSEMBLY



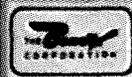
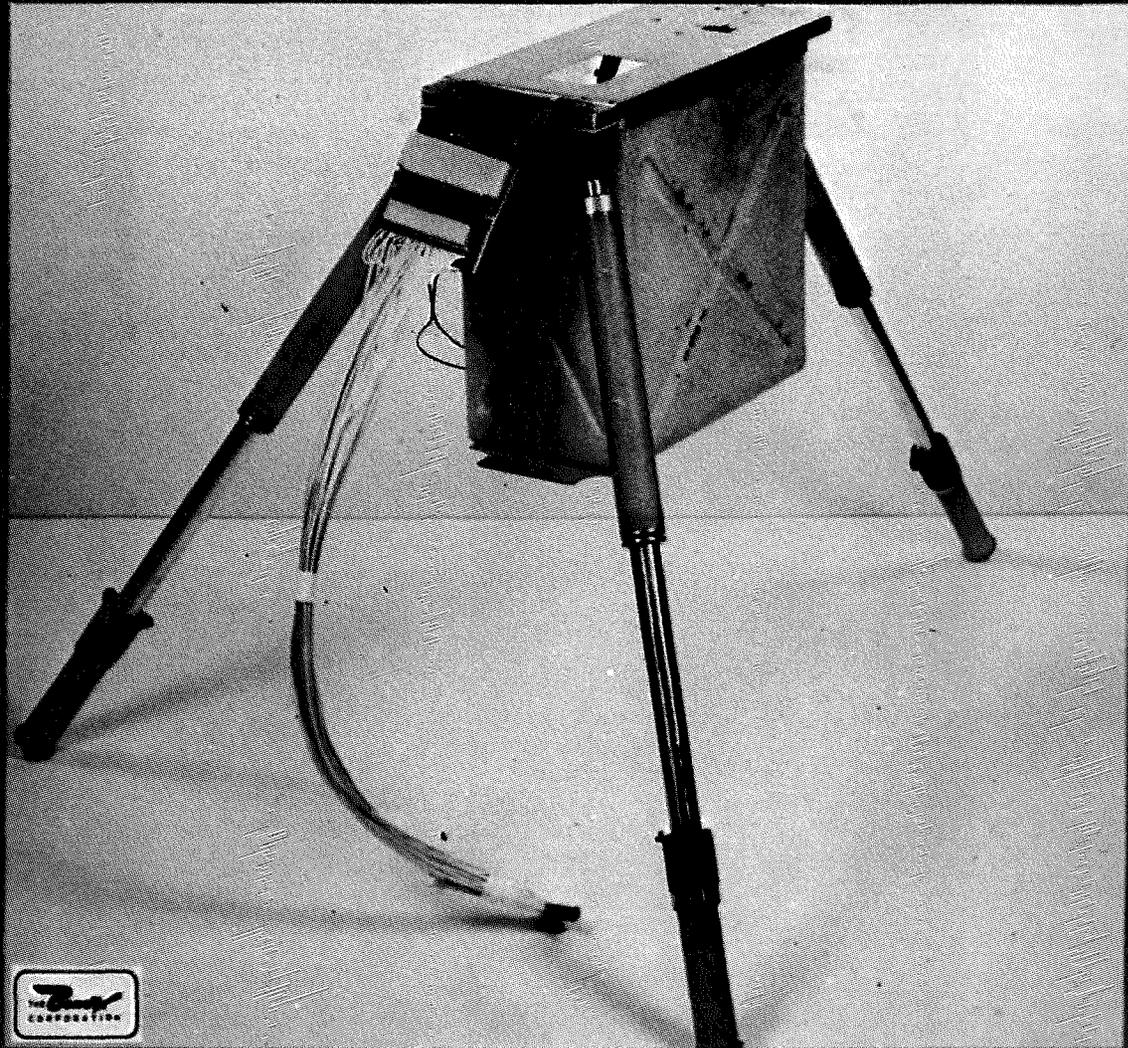
THE *Bendix*
CORPORATION

CPLER AMPLIFIERS

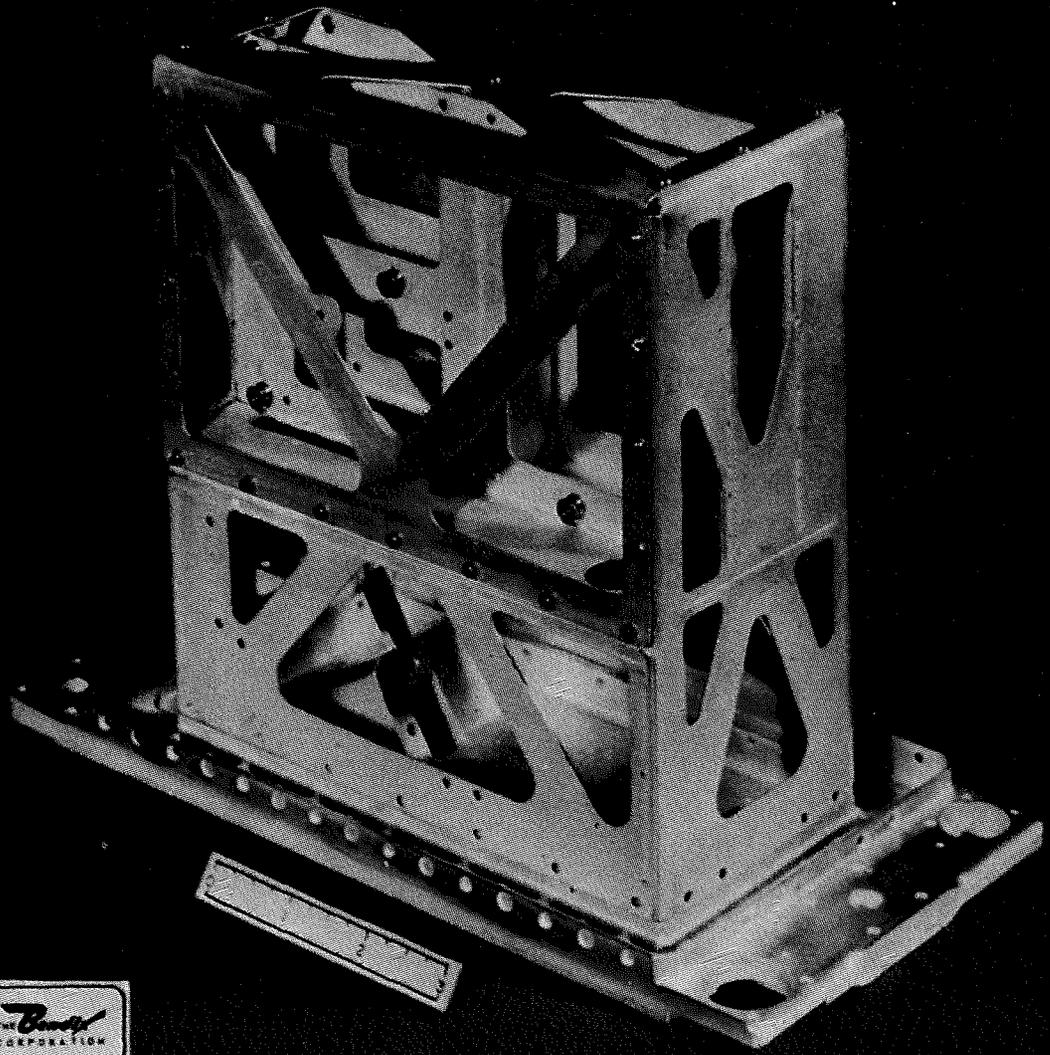


4422-2054

**CPLLE ENGINEERING MODEL
(DEPLOYED CONFIGURATION)**



CPLER STRUCTURAL/THERMAL ASSY



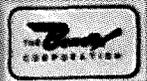
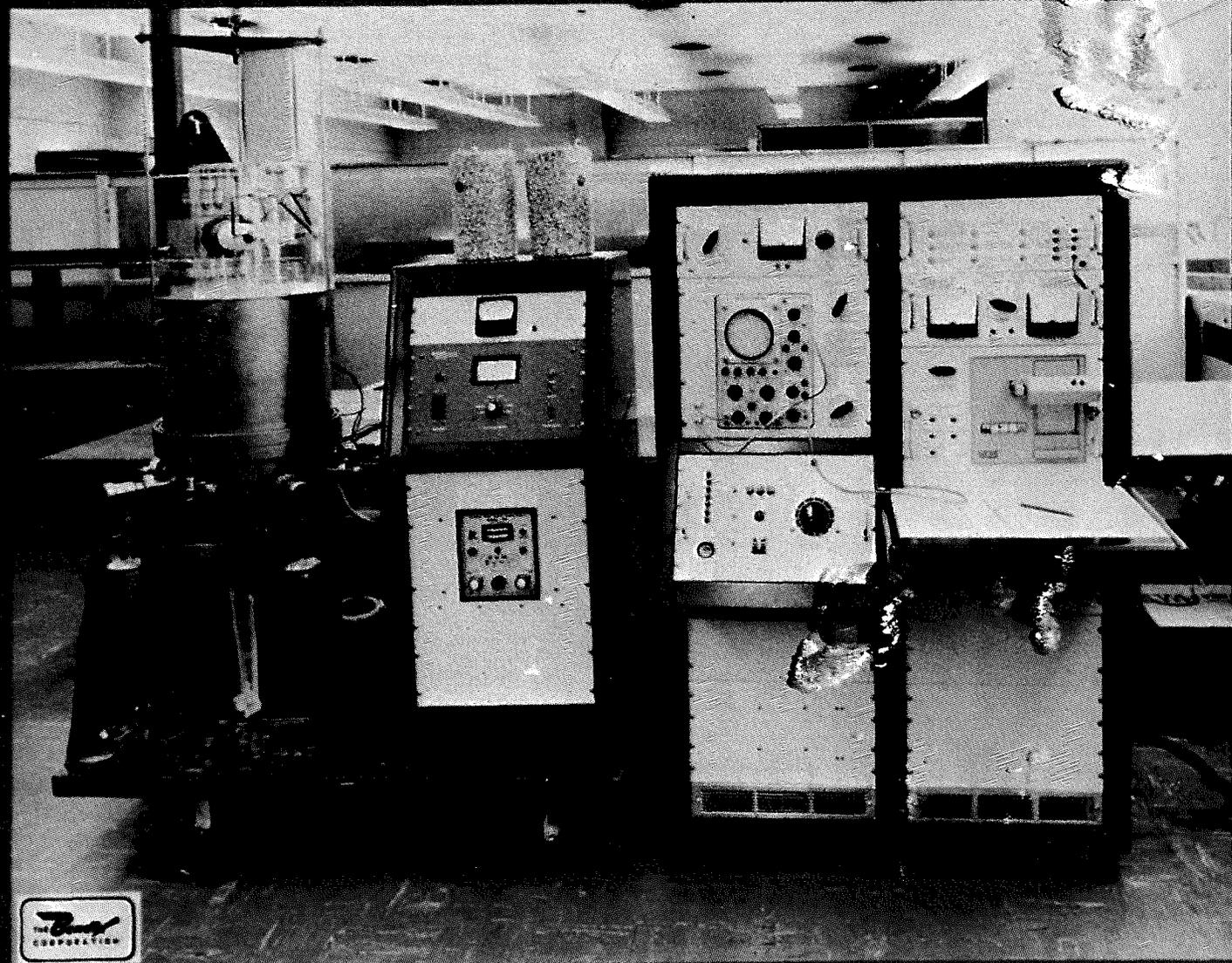
4422-2055

CPLLEE EMPLACEMENT

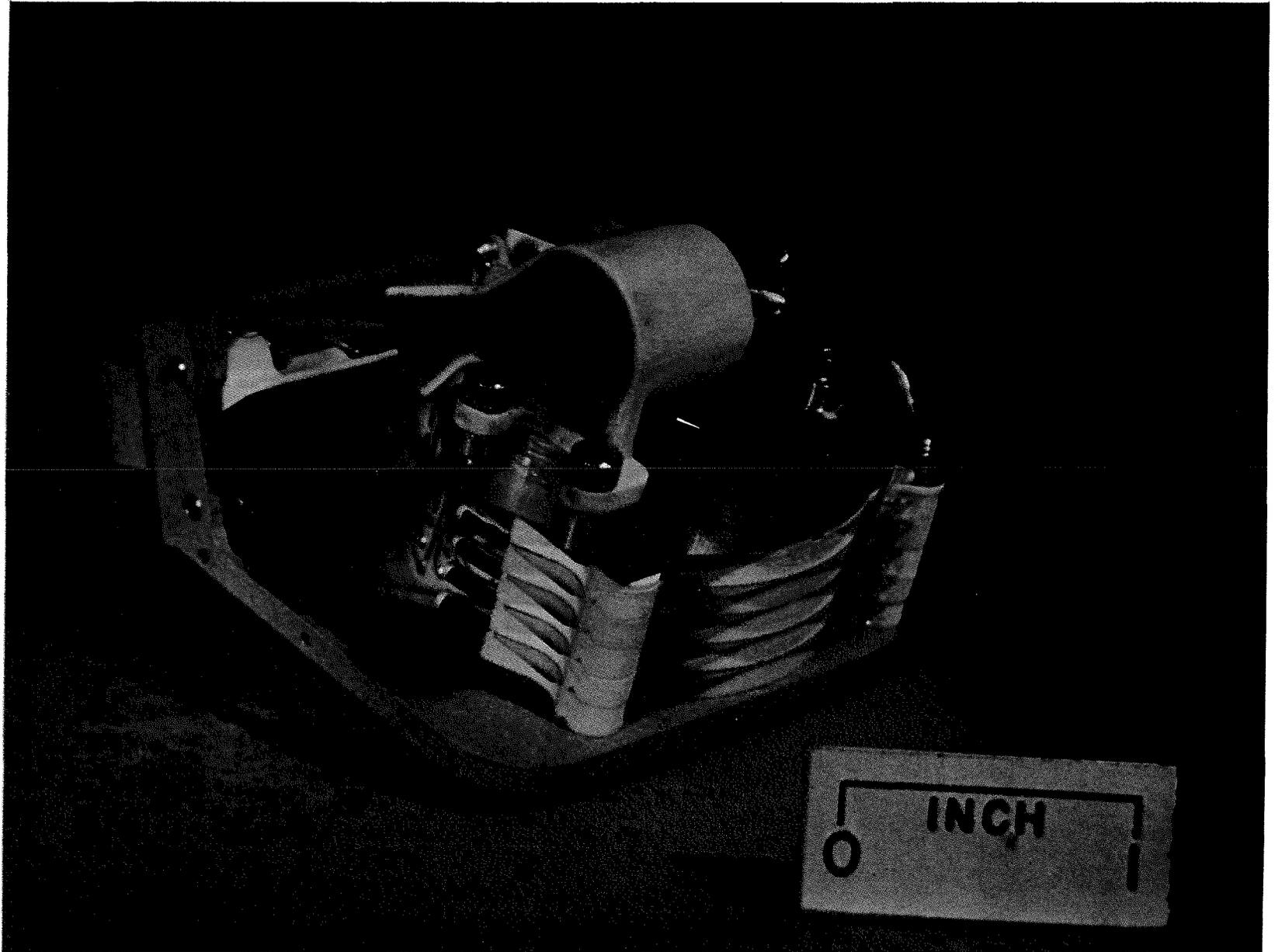


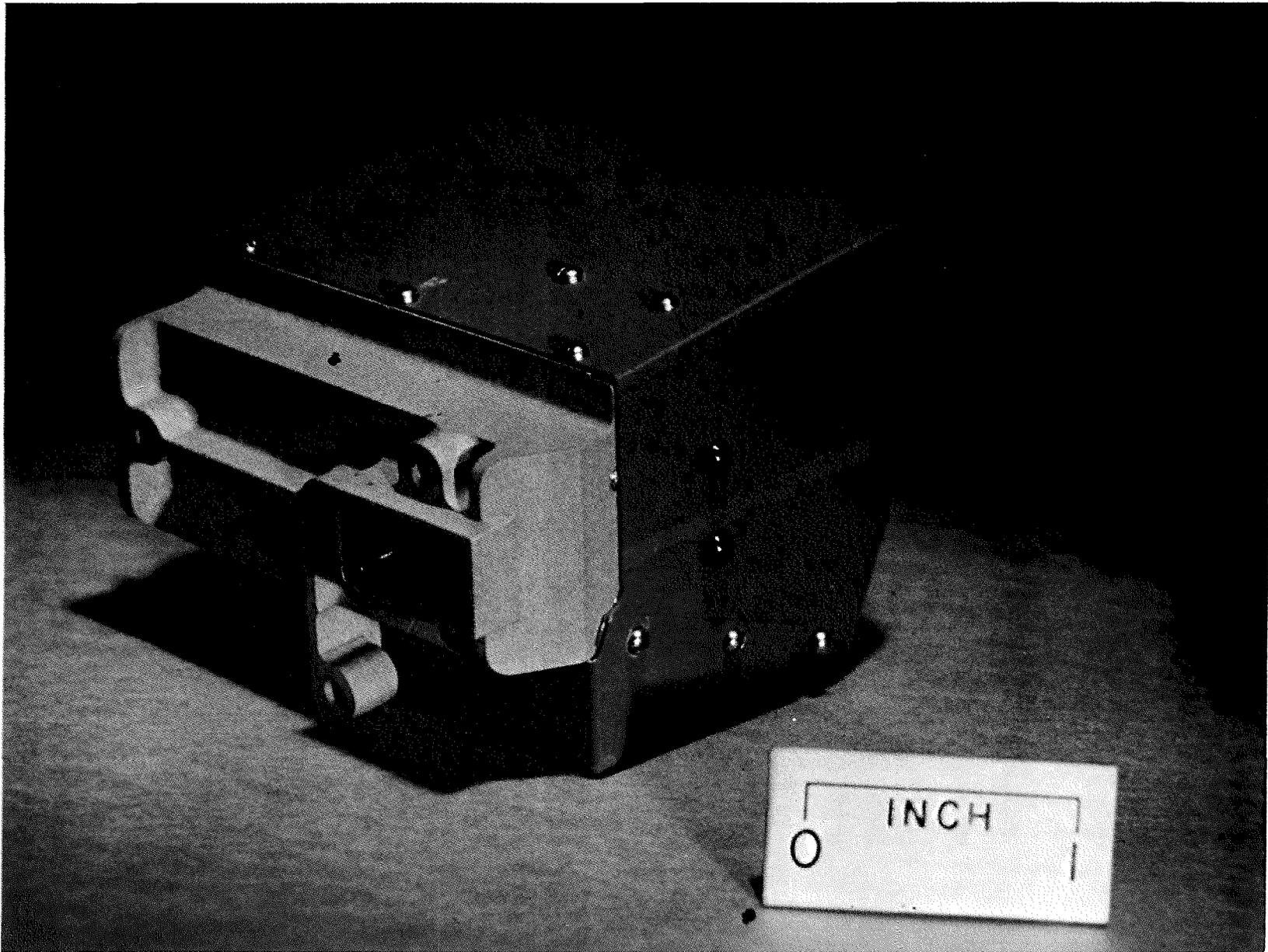
4422-2056

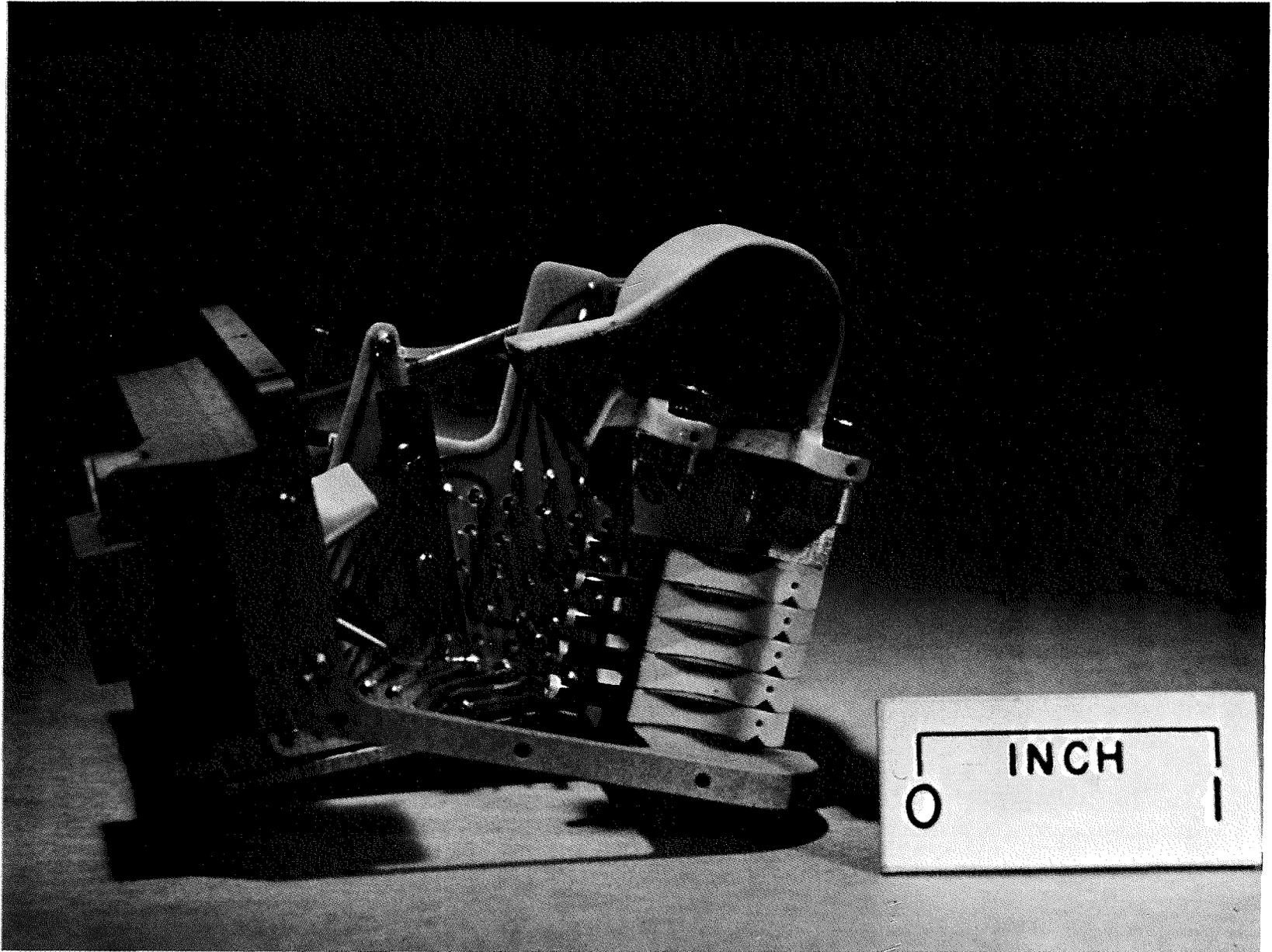
CPLLEE TEST SET



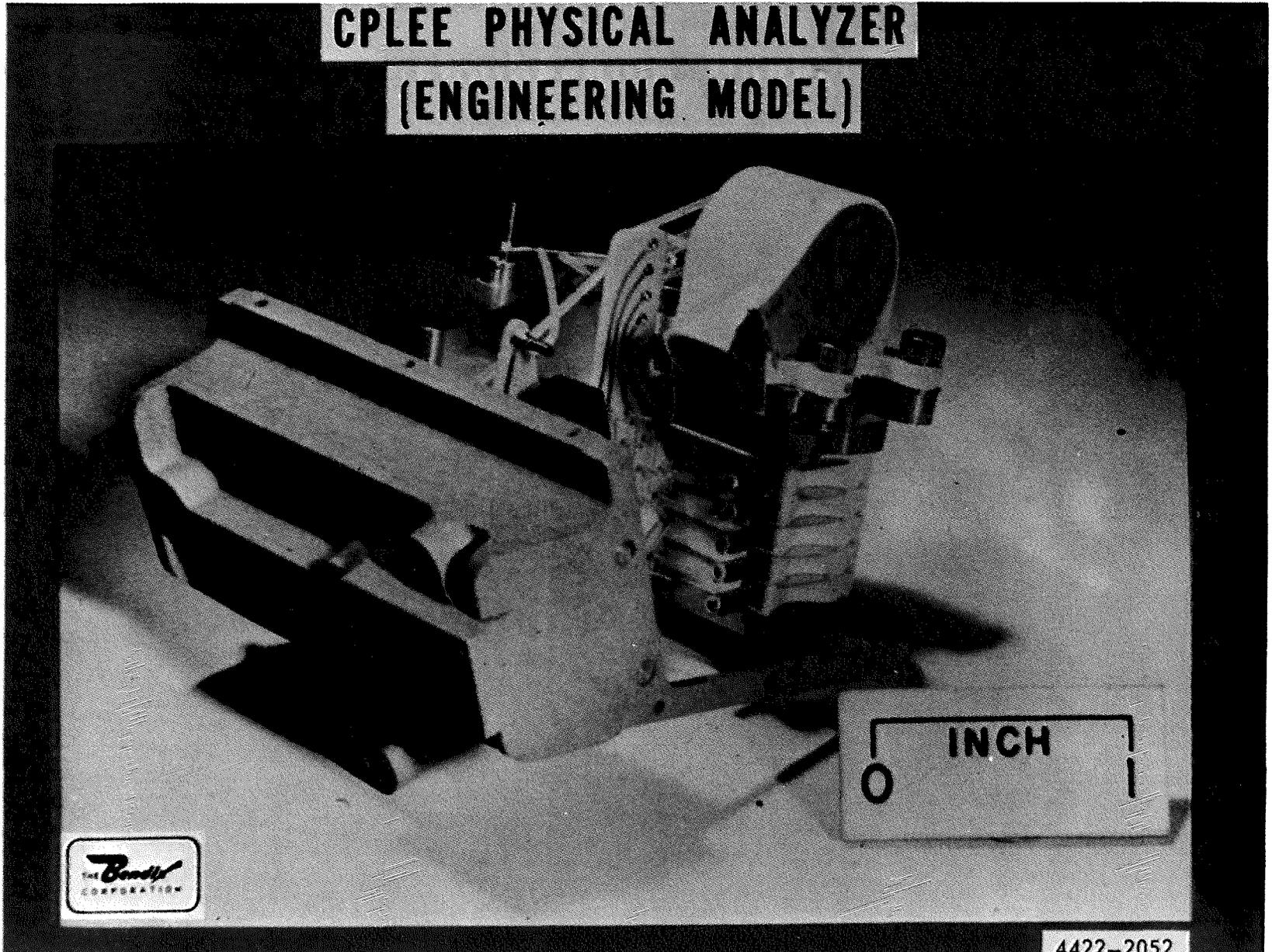
4422-2851







**CPLER PHYSICAL ANALYZER
(ENGINEERING MODEL)**



4422-2052

MAJOR CPLEE ACHIEVEMENTS

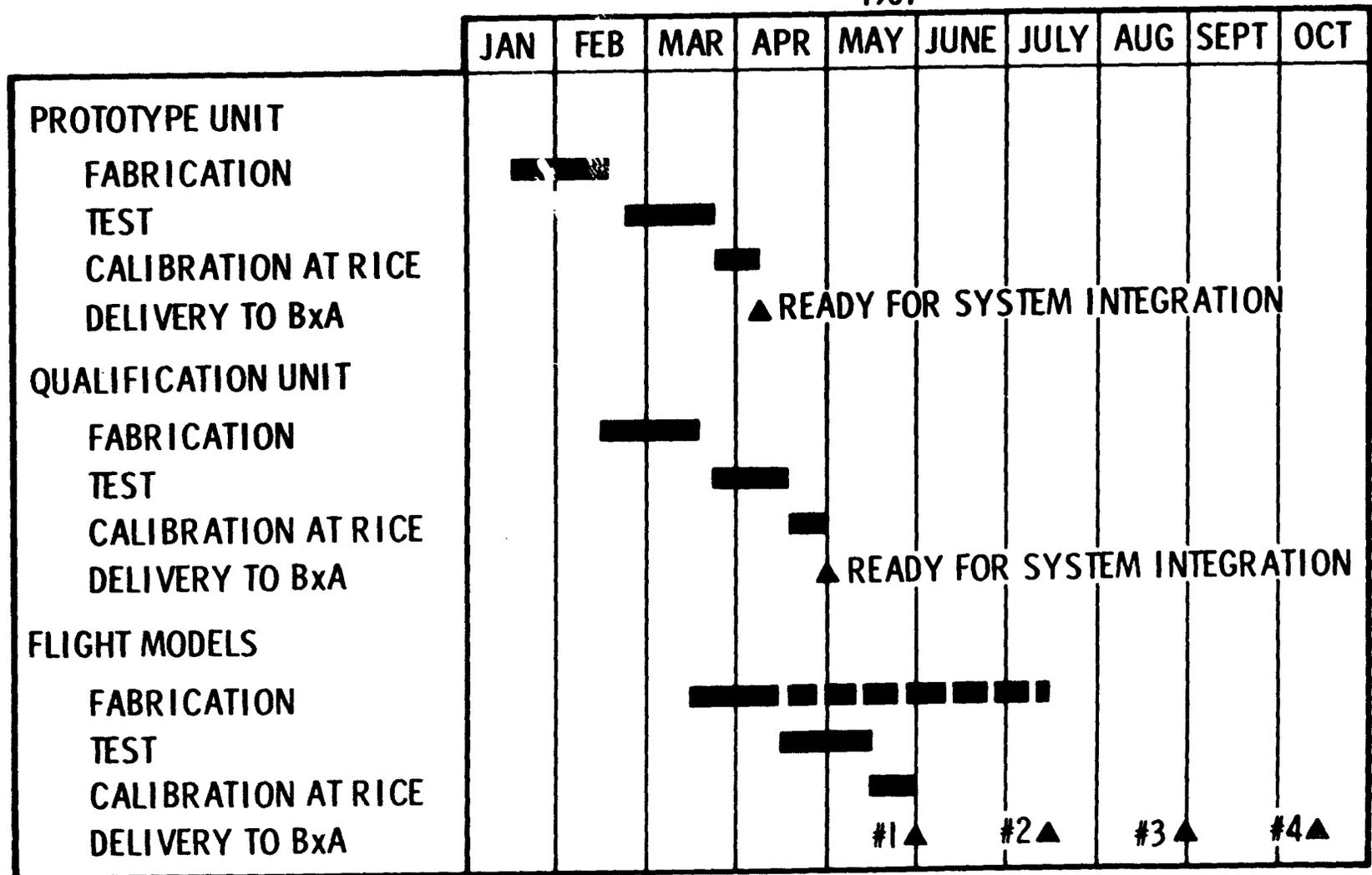
- ENGINEERING MODEL COMPLETED
- THERMAL MODEL COMPLETED AND TESTED
- THREE SERIES OF DEPLOYMENT TESTS COMPLETED
- INTERFACE CONTROL AND DESIGN SPECIFICATIONS COMPLETED
- SYSTEM INTEGRATION TESTS WITH CPLEE ENGINEERING MODEL AND ALSEP DATA SUBSYSTEM IN PROCESS
- EXPERIMENT TEST SET COMPLETED

CPLEE DESIGN COMPARISON

<u>SUBASSEMBLY</u>	<u>THERMAL</u>	<u>MODEL</u> <u>ENGINEERING MODEL</u>	<u>PROTOTYPE</u>
<u>STRUCTURAL</u>			
Thermal Plate	X	X	X
Electronic Frame		X	X
Thermal Bag	X	None	X
Thermal Coatings	X	None	X
Dust Cover & B-source		None	X
<u>PHYSICAL ANALYZER</u>		X	X
<u>ELECTRONICS</u>			
Amplifiers		X	New
Logic		X	X
Switchable Power Supply		X	X
Channeltron Power Supply		X	X
Low Voltage P.S.		X	X
Survival Heater	Simulated	None	X

CPLLE PROGRAM SCHEDULE

1967

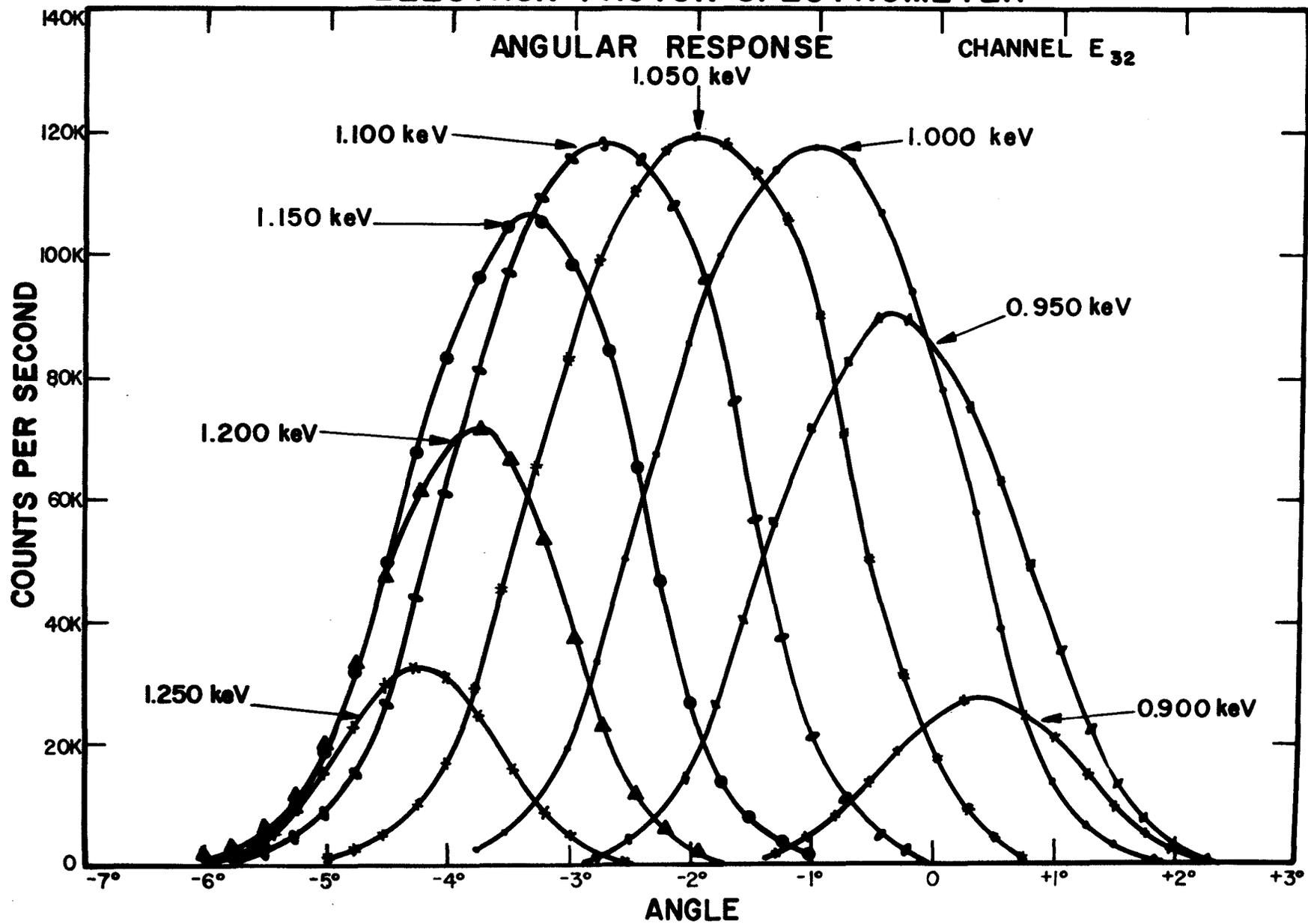


CPLEE DESIGN COMPARISON (ENGINEERING MODEL AND PROTOTYPE)

<u>SUBASSEMBLY</u>	<u>ENGINEERING MODEL</u>	<u>PROTOTYPE</u>
STRUCTURAL/THERMAL		
THERMAL PLATE	X	X
ELECTRONIC FRAME	X	X
THERMAL BAG	NONE	X
THERMAL COATINGS	NONE	X
DUST COVER & B-SOURCE	NONE	X
PHYSICAL ANALYZER	X	X
ELECTRONICS		
AMPLIFIERS	X	NEW
LOGIC	X	X
SWITCHABLE POWER SUPPLY	X	X
CHANNELTRON POWER SUPPLY	X	X
LOW VOLTAGE P. S.	X	X
SURVIVAL HEATER	NONE	X

4422-2058

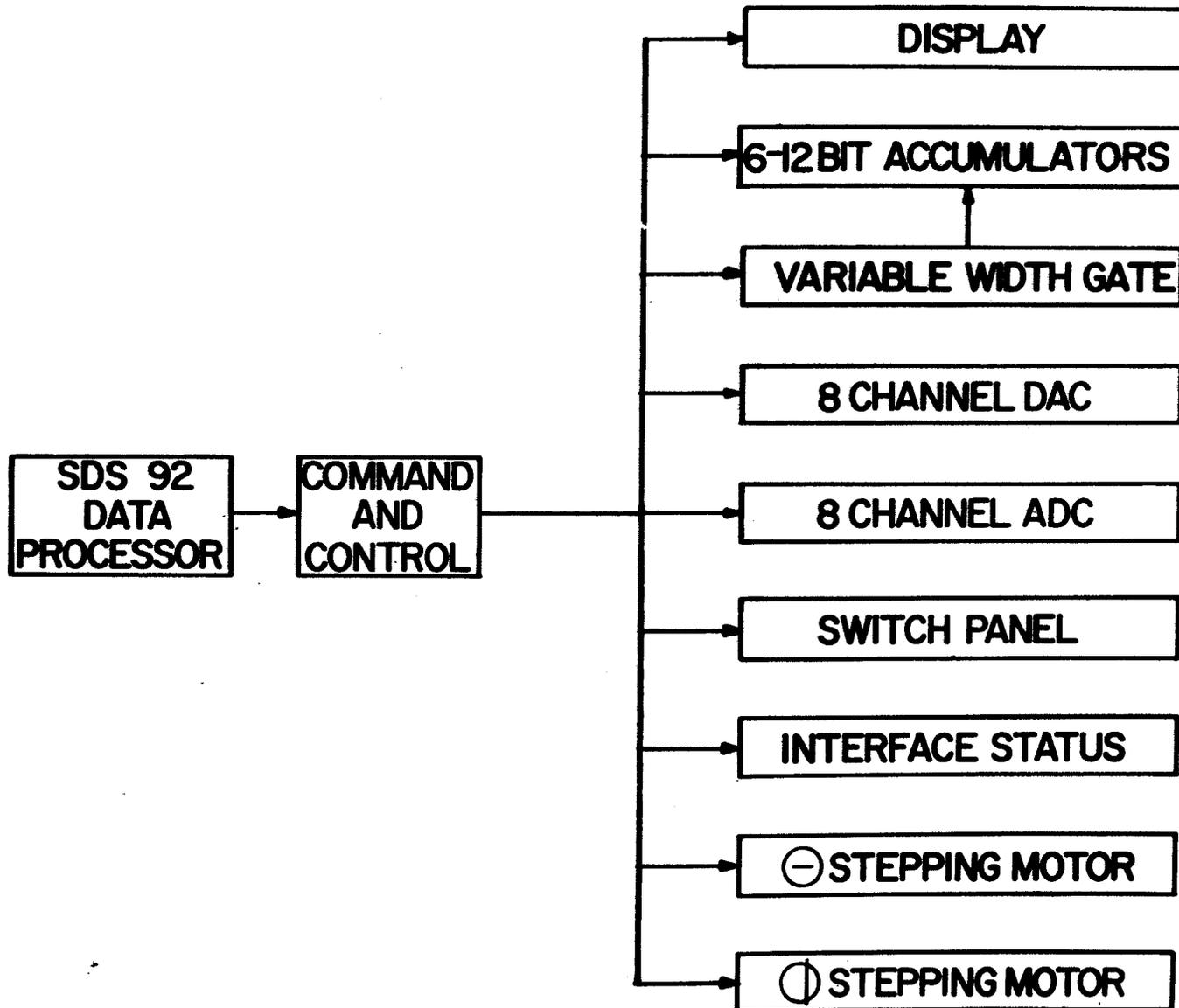
ELECTRON-PROTON SPECTROMETER

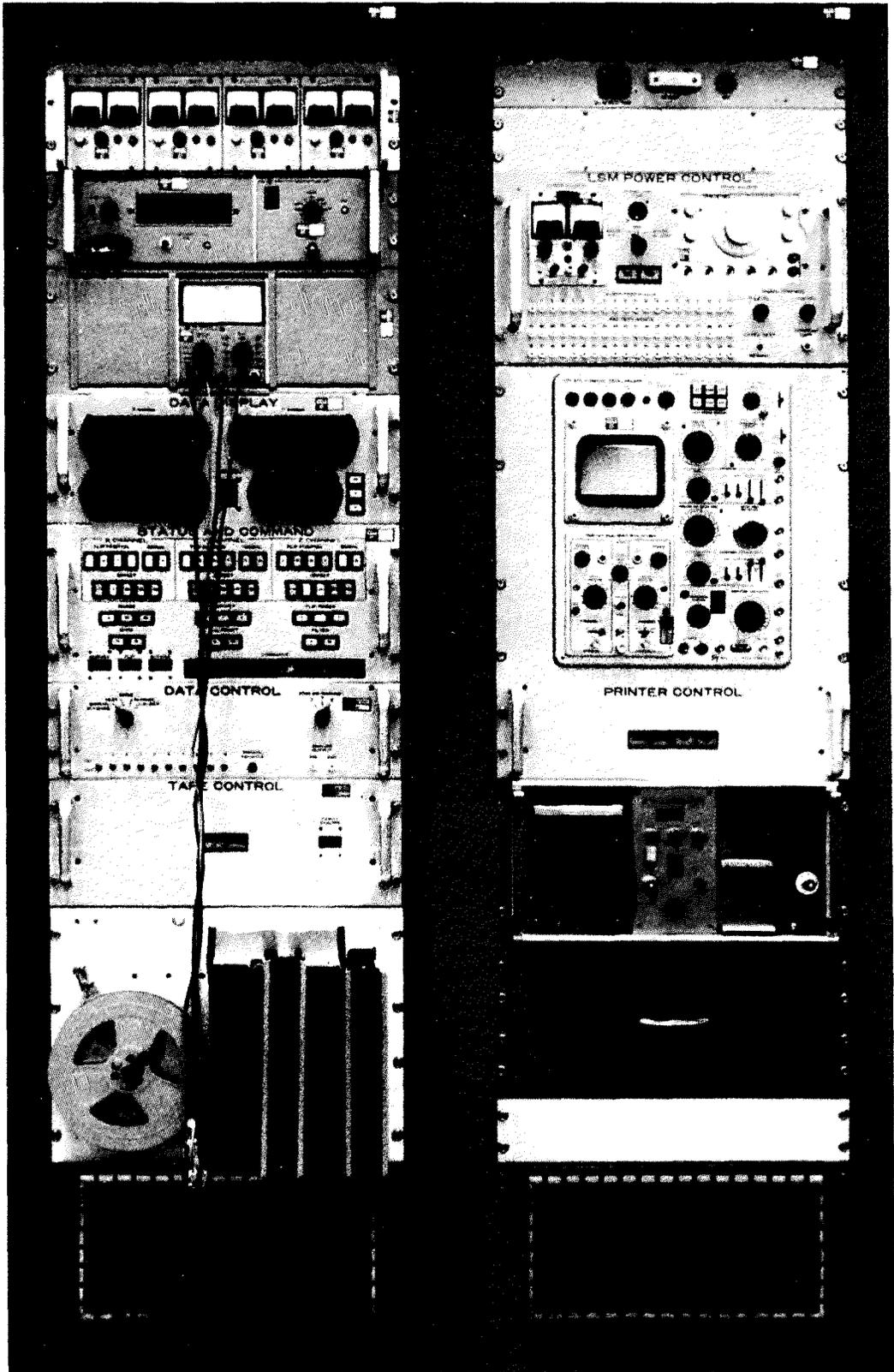


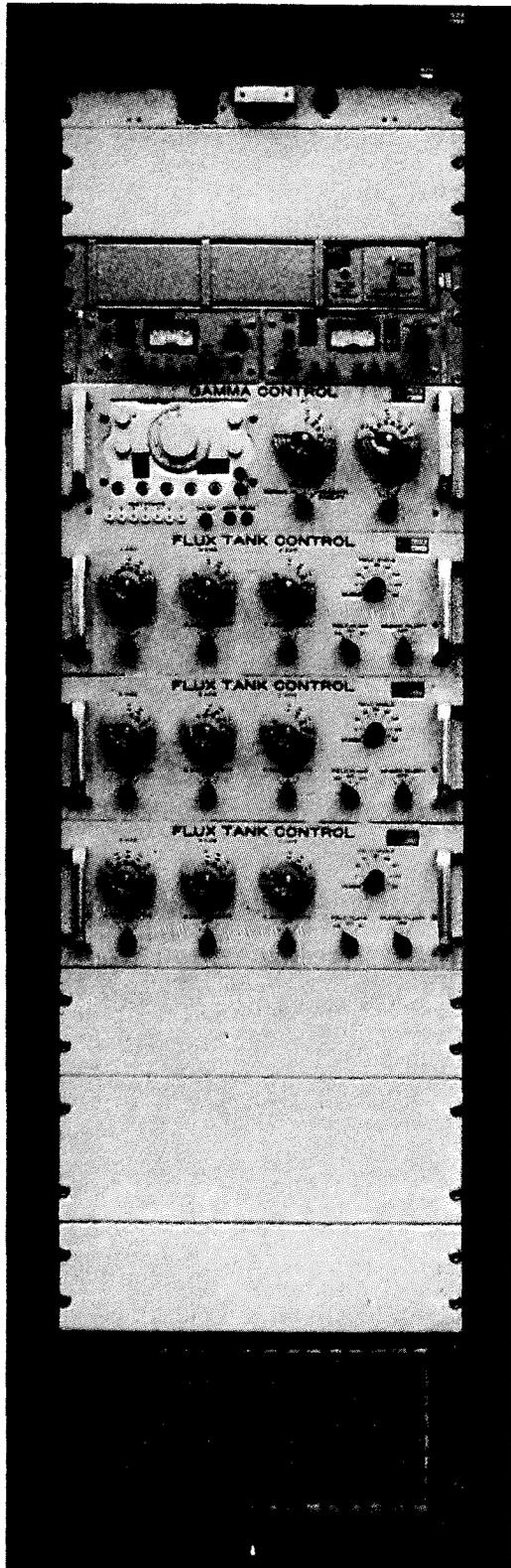
MASTER SCHEDULE FOR CPLEE CALIBRATION

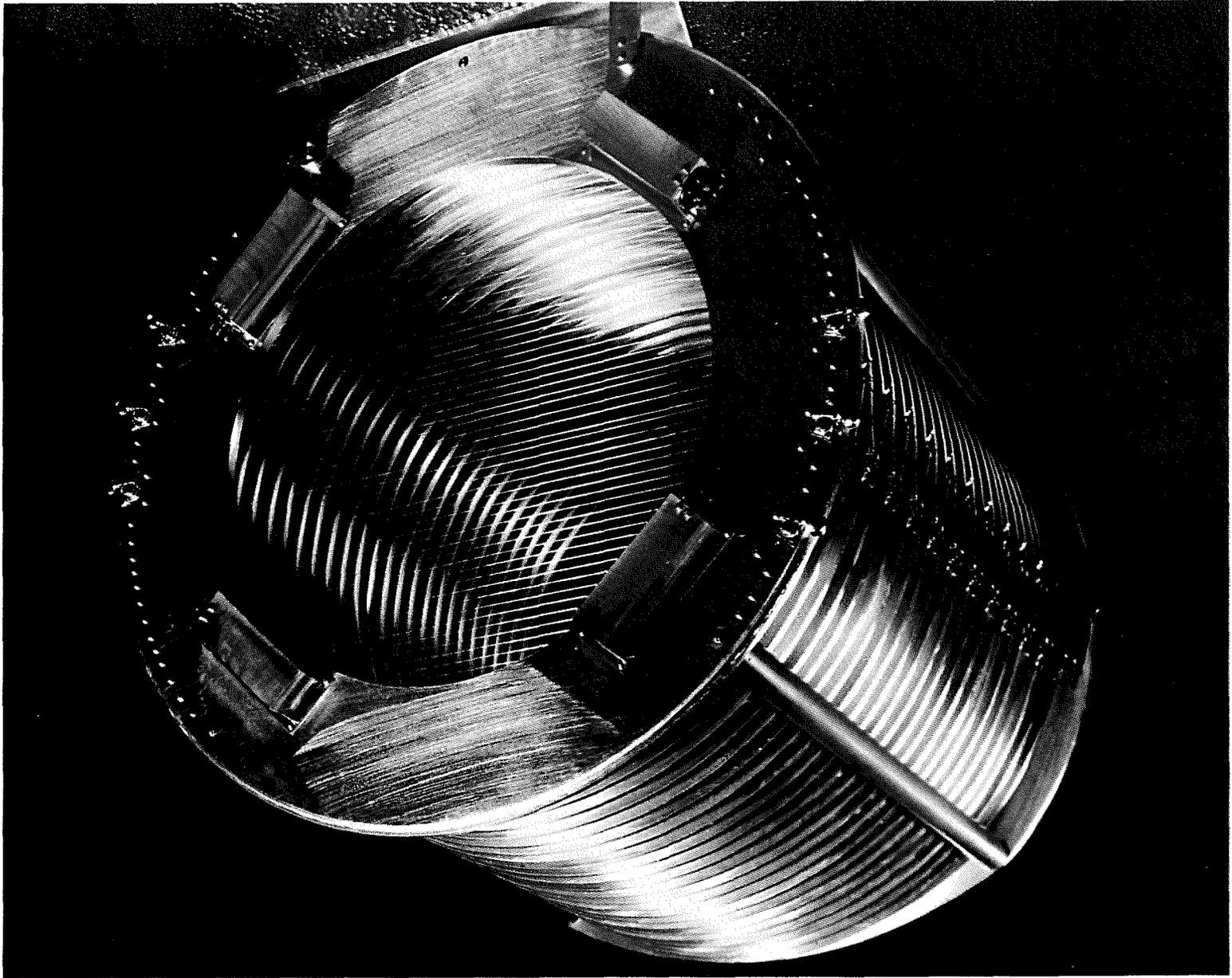
ACTIVITY	1967												
	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
COMPLETE FACILITY		▲											
VACUUM SYSTEM DELIVERED	▲												
VACUUM SYSTEM CHECKED OUT		▲▲											
UV SOURCE DELIVERED	▲												
UV SOURCE CALIBRATION		▲	▲										
ELECTRON SOURCE FAB. COMP.	▲												
ELECTRON SOURCE CLEANED		▲▲											
COMMAND & CONTROL UNIT COMP.	▲												
CHECK OUT OF COM. & CON. UNIT	▲	▲											
CHECK OUT OF CALIB. SYSTEM		▲	▲										
COMP. CALIB. PROCEDURE				▲									
DELIVERY OF ATCS				▲									
PROTOTYPE UNIT CALIB.				▲	▲								
QUAL. UNIT CALIB.					▲	▲							
1ST FU CALIB.						▲	▲						
2ND FU CALIB.								▲	▲				
3RD FU CALIB.									▲	▲			
4TH FU CALIB.											▲	▲	

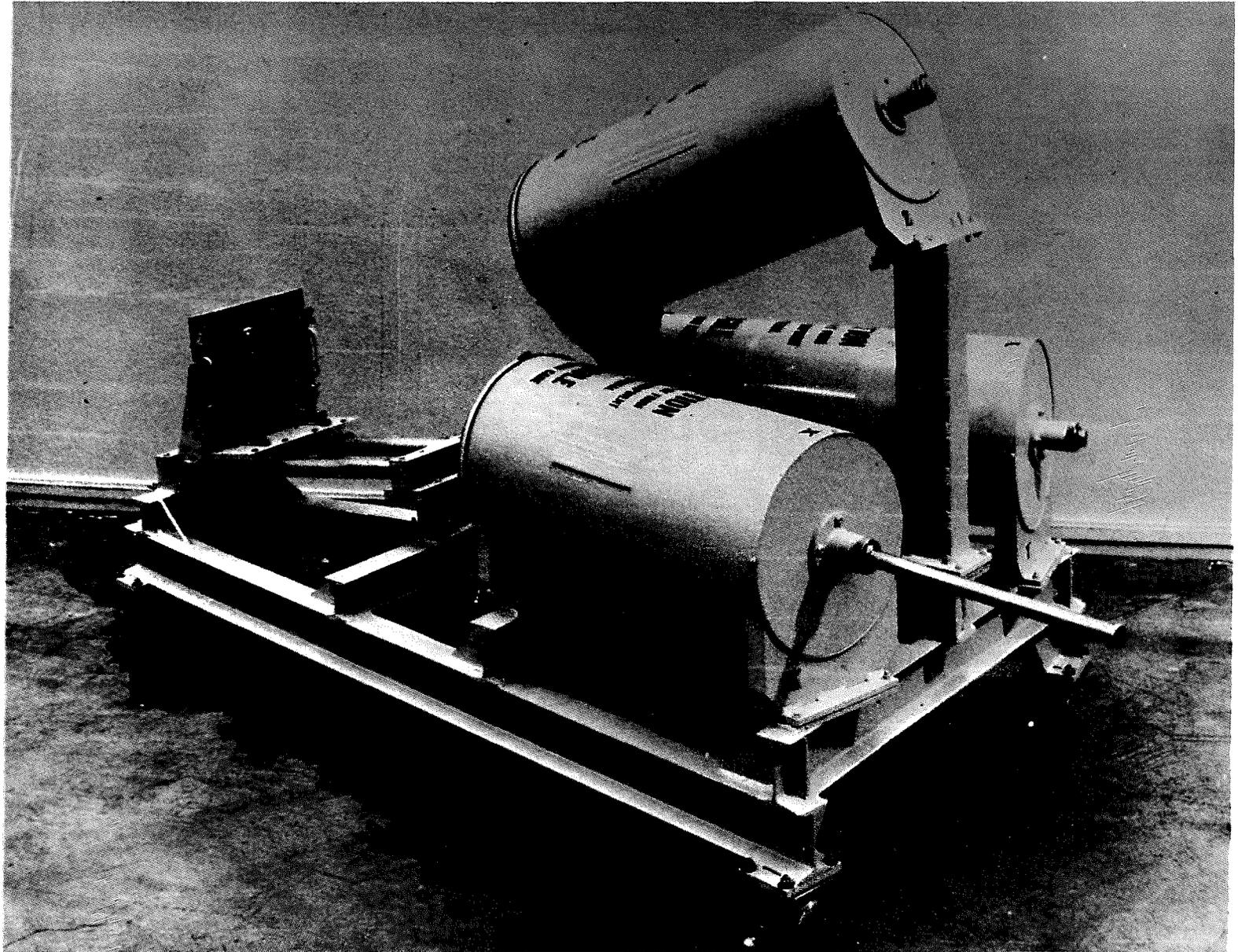
CPLEE CALIBRATION SYSTEM











TASK: EXPERIMENT TEST SET NO.1

ML MODEL 324, S/N 1

GOOD SHAPE

MINOR PROBLEM X

MAJOR PROBLEM

CRITICAL

COMMENTS

THE MINOR PROBLEM EXPERIENCED WAS PARTS PROCUREMENT. THIS SYSTEM WAS USED AT BENDIX FOR
ALSEP/SIDE INTEGRATION TESTS PRIOR TO MATING WITH A COMBINED SIDE/CCGE BREADBOARD SYSTEM.

MILESTONES	1966												1967											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
ENGINEERING DRAWING RELEASE						△		▲																
PARTS PROCUREMENT																								
ELECTRICAL							△		▲															
MECHANICAL							△		▲															
FABRICATION & ASSEMBLY							△		▲															
ACCEPTANCE DATA PACKAGE							△				▲													
SUBSYSTEM TEST								△		▲														
SYSTEM CHECKOUT								△		▲														
ALSEP INTEGRATION TESTS (BSD)											▲													
SIDE/CCGE INTEGRATION TEST																								
ACCEPTANCE TESTS									△															
ACCEPTANCE TEST DATA SHEETS									△															
FINAL INSPECTION									△															
DELIVERY									△															
CATEGORY 3 & 4 TESTS (BSD)																								

△ SCHEDULED

▲ CURRENT ESTIMATE

▲ ACTUAL

TASK: DELIVERABLE BREADBOARD MODEL

ML MODEL 320, S/N 1

GOOD SHAPE X

MINOR PROBLEM

MAJOR PROBLEM

CRITICAL

COMMENTS

MILESTONES	1966												1967											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
PRELIMINARY DESIGN										▲														
PARTS PROCUREMENT										▲														
FABRICATION										▲														
ASSEMBLY										▲														
TEST & CHECKOUT										▲														
INTEGRATION TESTS (BSD)											▲													
CCGE INTEGRATION												▲												
ETS MATING												▲												
ACCEPTANCE DATA PACKAGE												▲												
ACCEPTANCE TESTS													▲											
ACCEPTANCE TEST DATA SHEETS													▲											
FINAL INSPECTION													▲											
DELIVERY													▲											
CATEGORY 3 TESTS (BSD)																								

△ SCHEDULED

▲ CURRENT ESTIMATE

▲ ACTUAL

TASK: FLIGHT UNIT NO.1

ML MODEL 323, S/N 2

GOOD SHAPE

MINOR PROBLEM X

MAJOR PROBLEM

CRITICAL

COMMENTS

THE MINOR PROBLEM BEING EXPERIENCED IS PARTS PROCUREMENT. NO SUBSTITUTION OF ELECTRONIC PARTS ARE PLANNED FOR THIS SYSTEM.

MILESTONES	1966												1967											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
	PARTS PROCUREMENT																							
ELECTRICAL										▲														
MECHANICAL										▲														
PARTS SCREENING											▲													
ACCEPTANCE DATA PACKAGE												▲												
FABRICATION																								
MODULES												▲												
BLIVETS (SUBSYSTEM)												▲												
SUBSYSTEM TEST												▲												
SYSTEM ASSEMBLY												▲												
SYSTEM CHECKOUT												▲												
ACCEPTANCE TESTS												▲												
ACCEPTANCE TEST DATA SHEETS												▲												
FINAL INSPECTION												▲												
DELIVERY												▲												
RICE CALIBRATION												▲												
DELIVERY TO MSC												▲												

▲ SCHEDULED

▲ CURRENT ESTIMATE

▲ ACTUAL

TASK: QUALIFICATION MODEL NO.1

ML MODEL 323, S/N 1

GOOD SHAPE

MINOR PROBLEM X

MAJOR PROBLEM

CRITICAL

COMMENTS

THE MINOR PROBLEM BEING EXPERIENCED IS PARTS PROCUREMENT. ELECTRONIC PARTS USED IN THIS SIDE/CCGE SYSTEM WILL BE SCREENED TO ML SPECIFICATIONS IF THE SCHEDULE AND PARTS DELIVERY PERMITS. NO SUBSTITUTION OF ELECTRONIC PARTS ARE PLANNED FOR THIS SYSTEM.

MILESTONES	1966												1967											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
PARTS PROCUREMENT																								
ELECTRICAL									▲				▲											
MECHANICAL									▲				▲											
PARTS SCREENING									▲				▲											
ACCEPTANCE DATA PACKAGE										▲			▲											
FABRICATION																								
MODULES										▲			▲											
BLIVETS (SUBSYSTEM)										▲			▲											
SUBSYSTEM TEST										▲			▲											
SYSTEM ASSEMBLY										▲			▲											
SYSTEM CHECKOUT										▲			▲											
ACCEPTANCE TESTS										▲			▲											
ACCEPTANCE TEST DATA SHEETS										▲			▲											
FINAL INSPECTION										▲			▲											
DELIVERY										▲			▲											

▲ SCHEDULED

▲ CURRENT ESTIMATE

▲ ACTUAL

TASK: PROTOTYPE MODEL

ML MODEL 322, S/N 2

GOOD SHAPE

MINOR PROBLEM

MAJOR PROBLEM X

CRITICAL

COMMENTS

THE CURRENT ESTIMATED SCHEDULE BELOW IS BASED ON DELIVERY OF A COMBINED SIDE/CCGE SYSTEM.
 THE MAJOR PROBLEM BEING EXPERIENCED IS PARTS PROCUREMENT. VARIOUS ELECTRONIC PARTS WILL BE
 SUBSTITUTED IN THIS SYSTEM.

MILESTONES	1966												1967											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
	ENGINEERING DRAWING RELEASE							▲					▲											
PARTS PROCUREMENT																								
ELECTRICAL								▲					▲											
MECHANICAL									▲				▲											
ACCEPTANCE DATA PACKAGE									▲				▲											
FABRICATION																								
MODULES										▲			▲											
BLIVETS (SUBSYSTEM)											▲		▲											
SUBSYSTEM TEST											▲		▲											
SYSTEM ASSEMBLY												▲		▲										
SYSTEM CHECKOUT														▲										
ACCEPTANCE TESTS															▲									
ACCEPTANCE TEST DATA SHEETS																▲								
FINAL INSPECTION																	▲							
DELIVERY																		▲						

▲ SCHEDULED

▲ CURRENT ESTIMATE

▲ ACTUAL

TASK: EXPERIMENT TEST SET NO.2

ML MODEL 324, S/N 2

GOOD SHAPE

MINOR PROBLEM X

MAJOR PROBLEM

CRITICAL

COMMENTS

DELIVERY OF ETS NO.2 IS SCHEDULED FOR CONCURRENT DELIVERY OF ENGINEERING MODEL NO.1

MILESTONES	1966												1967											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
ENGINEERING DRAWING RELEASE						▲		▲																
PARTS PROCUREMENT																								
ELECTRICAL								▲			▲													
MECHANICAL								▲			▲													
FABRICATION & ASSEMBLY									▲			▲												
ACCEPTANCE DATA PACKAGE									▲			▲												
SUBSYSTEM TEST									▲			▲												
SYSTEM CHECKOUT										▲			▲											
ACCEPTANCE TESTS										▲			▲											
ACCEPTANCE TEST DATA SHEETS										▲			▲											
FINAL INSPECTION										▲			▲											
DELIVERY										▲			▲											

▲ SCHEDULED

▲ CURRENT ESTIMATE

▲ ACTUAL

TASK: ENGINEERING MODEL NO.1

ML MODEL 322, S/N 1

GOOD SHAPE

MINOR PROBLEM

MAJOR PROBLEM X

CRITICAL

COMMENTS

THE CURRENT ESTIMATED SCHEDULE BELOW IS BASED ON DELIVERY OF A SIDE/CCGE SYSTEM.
 THE MAJOR PROBLEM BEING EXPERIENCED IS PARTS PROCUREMENT. VARIOUS ELECTRONIC PARTS ARE BEING SUBSTITUTED FOR THIS SYSTEM.

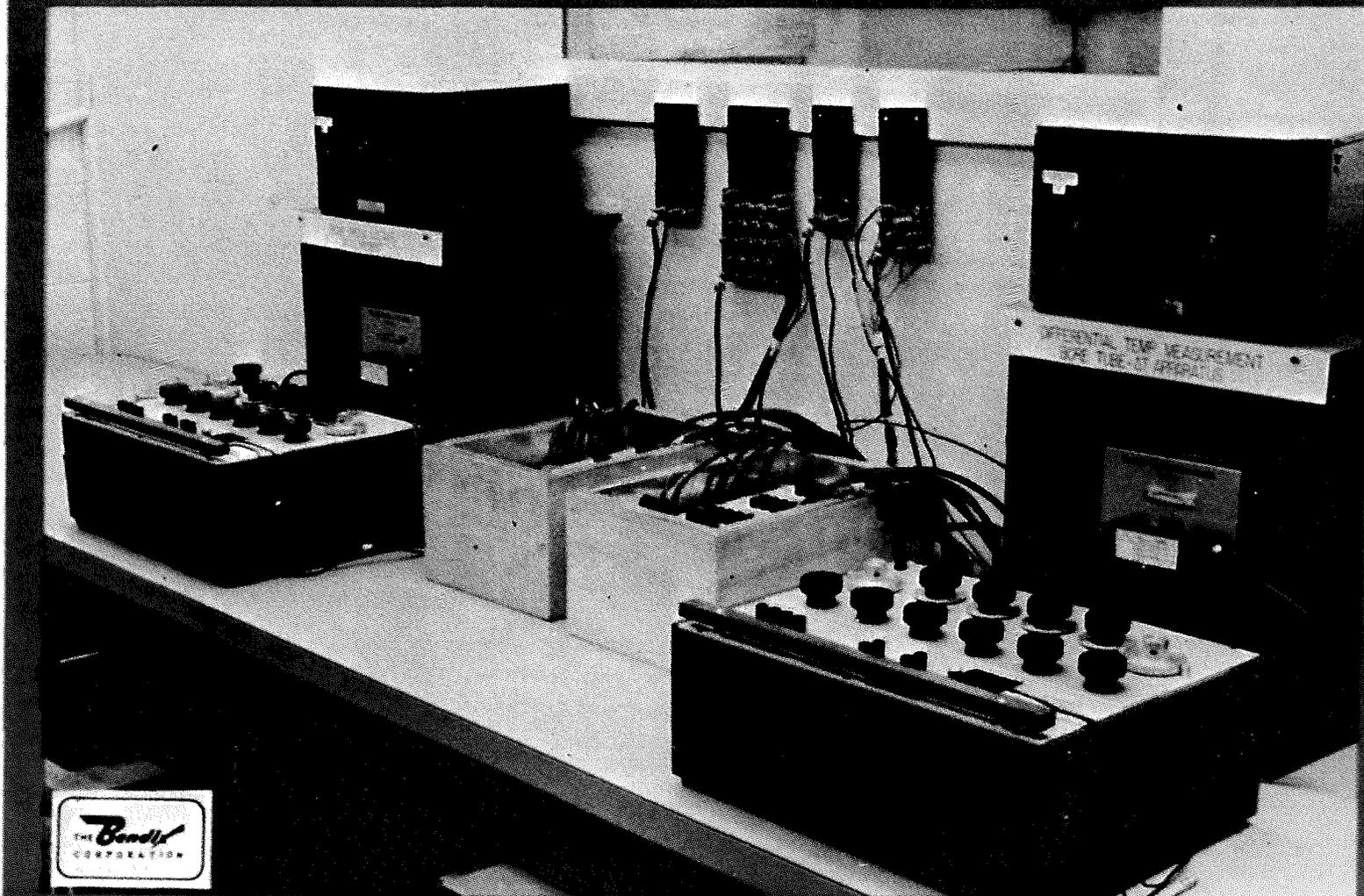
MILESTONES	1966												1967											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
ENGINEERING DRAWING RELEASE								▲				▲												
PARTS PROCUREMENT																								
ELECTRICAL								▲																
MECHANICAL								▲																
ACCEPTANCE DATA PACKAGE								▲																
FABRICATION																								
MODULES								▲																
BLIVETS (SUBSYSTEM)								▲																
SUBSYSTEM TEST								▲																
SYSTEM ASSEMBLY								▲																
SYSTEM CHECKOUT									▲															
ACCEPTANCE TESTS									▲															
ACCEPTANCE TEST DATA SHEETS									▲															
FINAL INSPECTION									▲															
DELIVERY									▲															
CATEGORY 4 TESTS (BSD)																								

▲ SCHEDULED

▲ CURRENT ESTIMATE

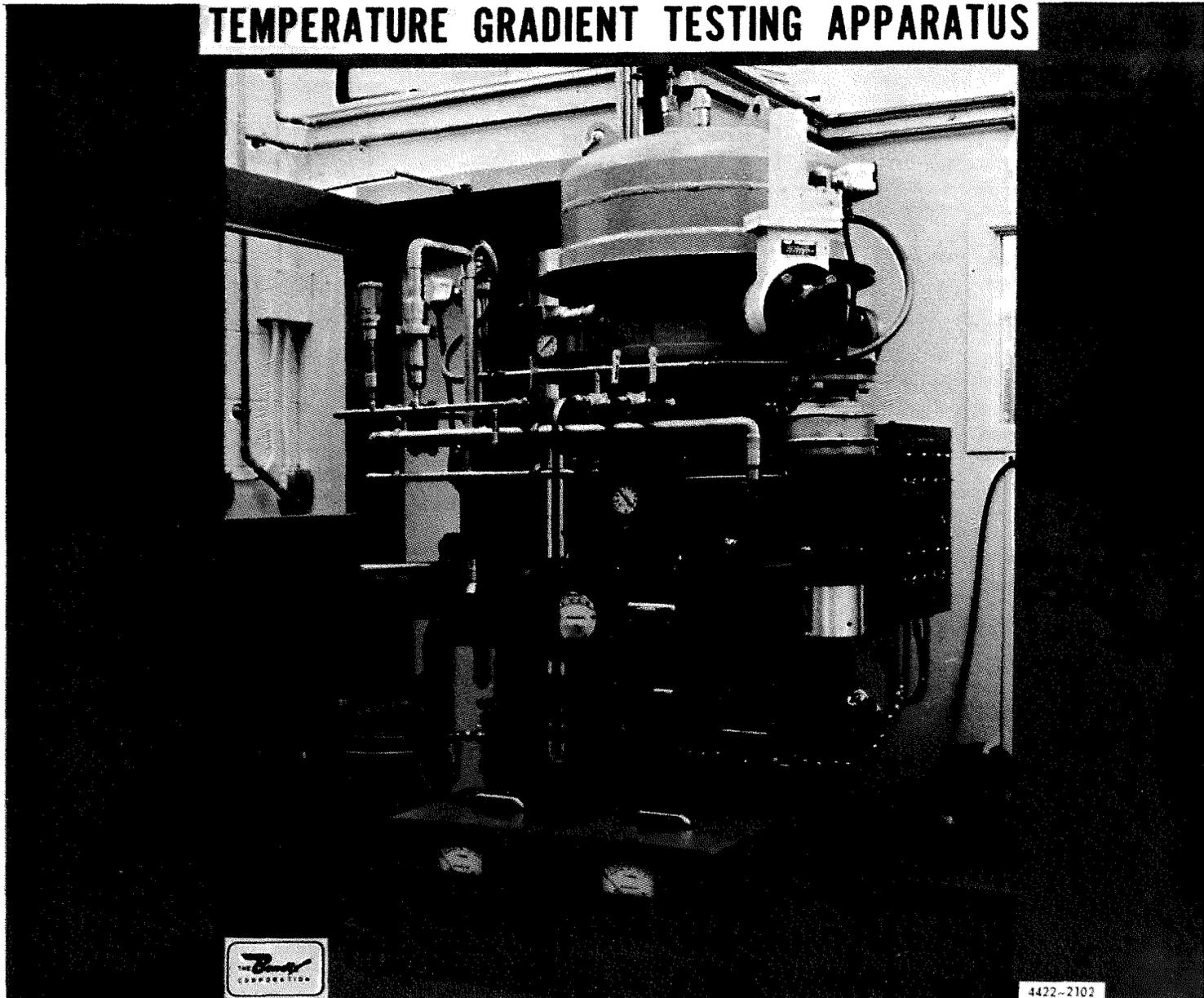
▲ ACTUAL

POTENTIOMETER USED WITH TEMP GRADIENT APPARATUS



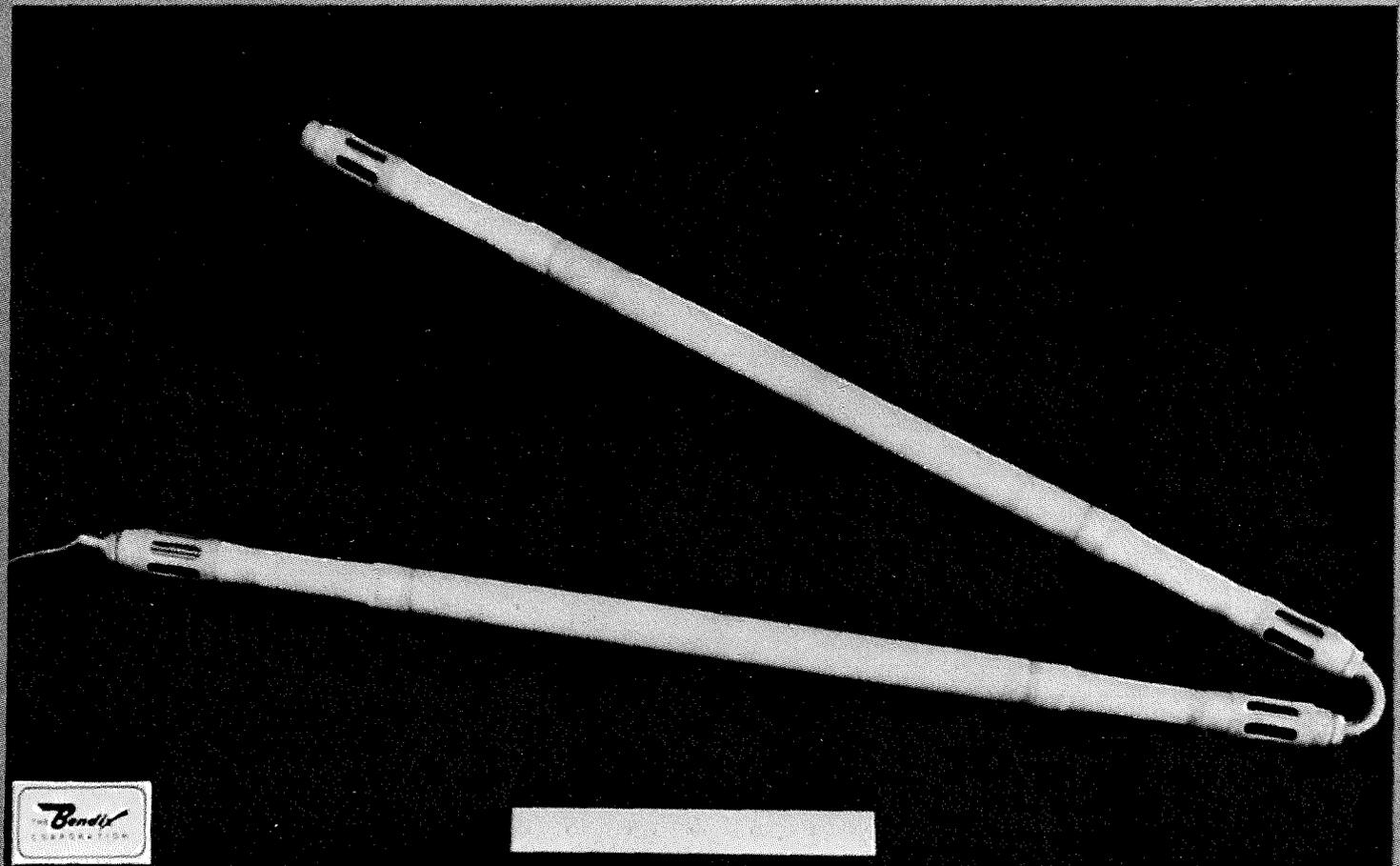
4422-2103

TEMPERATURE GRADIENT TESTING APPARATUS



4422-2102

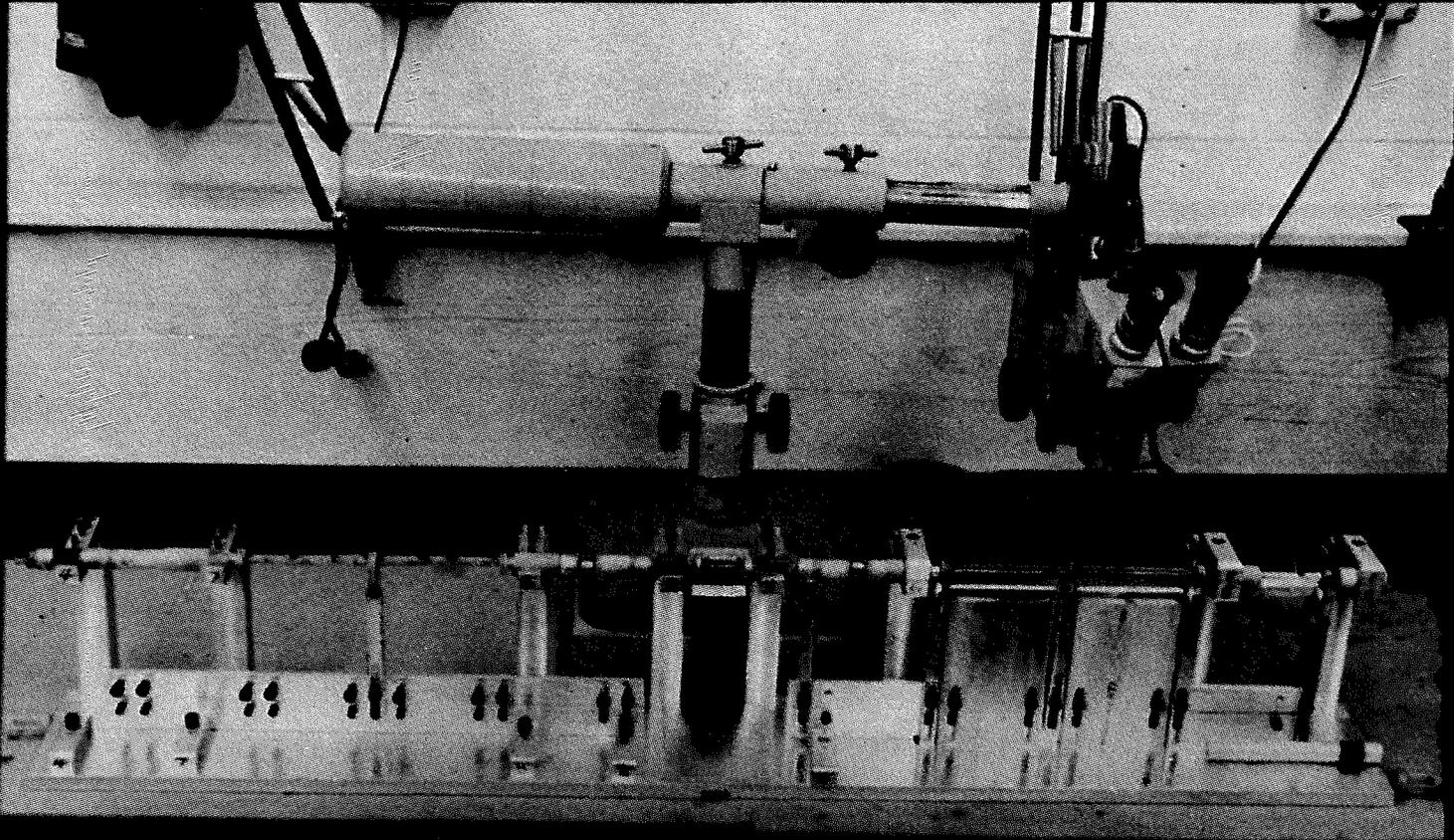
ASSEMBLED HEAT FLOW PROBE



The Bendix
CORPORATION

4422-2101

HEAT FLOW FUNCTIONAL PROBE ASSY



4422-2100

HFE DEVELOPMENT SCHEDULE

	JAN	FEB	MAR	APR	MAY	JUNE
H.F. THERMAL MODEL-FAB/ASSY TEST(BxA)	██████████	██████████				
H.F. STRUCTURAL MODEL-FAB/ASSY - TEST (BxA)	██████████	██████████				
H.F. ENG. MODEL #1 - ELEC DEL ASSY - TEST (ADL) H.F. SYSTEM TEST (BxA)		△ ██████████	READY FOR SYSTEM △INTEGRATION ██████████			
H.F. ENG MODEL #2 - ELEC DEL ASSY-ENG CALIB. TEST (ADL)		△	████████████████████			

HFE DELIVERABLE HARDWARE SCHEDULE

