



**Aerospace
Systems Division**

APOLLO 15 LRRR QUALIFICATION
STATUS LIST

NO.	REV. NO.
ATM-925	A
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DATE 13 May 197	

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1.0 INTRODUCTION

This technical memo is in response to CCP 269, Exhibit F-1, Item 27 and supports the QTRR activity of the Laser Ranging Retro Reflector. It is the intent of this final report to reflect the qualification rationale and summarize the qualification test plan results for the LRRR Qual model. This report has been finalized to support Flight Model delivery and will be part of the Acceptance Data Package for SN 04.

2.0 DISCUSSION

2.1 Qualification Rationale

The assembly level test program for the Apollo 15 LRRR is shown in Figure 1 and is described in detail in the 300 Array LRRR Integrated Test Plan, TM 646. The retroreflector and mounting hardware are identical to the Apollo 11 and 14 LRRR's and have been previously qualified. The array structural assemblies are an upgraded light weight design. Because of the design experience gained on the previous LRRR Systems (Apollo 11 and 14), the LRRR (300) program was directed on 18 February 1971 to delete the ETM Test Program and proceed directly into the qualification program.

The retroreflectors in the qualification panel assemblies are identical to the flight retroreflectors in all dimensional and mass characteristics.

2.2 Qualification Acceptance Criteria

The acceptance criteria for the Apollo 15 LRRR during system qualification was specified in Appendix XII, Statement of Work for the Laser Ranging Retro-Reflector Experiment (S078) 300 Cube Corner Array, 22 July 1970, Revision A, and provides adequate confidence of successful system performance as based on:

1. The system meeting mass property requirements.
2. The system surviving simulated mission environments in vibration and shock.
3. Successful deployment of the array such that proper leveling and alignment may be accomplished.



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3.0 COMPARISON OF FLIGHT AND QUAL CONFIGURATIONS

- 3.1 Enclosure 1 describes Flight and Qual model design configuration differences.
- 3.2 Configuration status for the Qual model, SN 03, is presented in Enclosure 2.
- 3.3 Configuration status for the Flight Model, SN 04, is presented in Enclosure 3.
- 3.4 Drawing trees are provided herein for comparison and reference use for the Qual, Flight, and Training models (reference Enclosures 4, 5, and 6 respectively).

4.0 QUALIFICATION TEST RESULTS

- 4.1 Qualification test results are tabulated herein, reference Figure 2, for SN 03.
- 4.2 Enclosure 7 herein is an Arthur D. Little tabulation of included and excluded tests for the LRRR 300 corner array, Qual unit, wherein optical alignment tests were performed before and after flight vibration.

5.0 COMMENTS

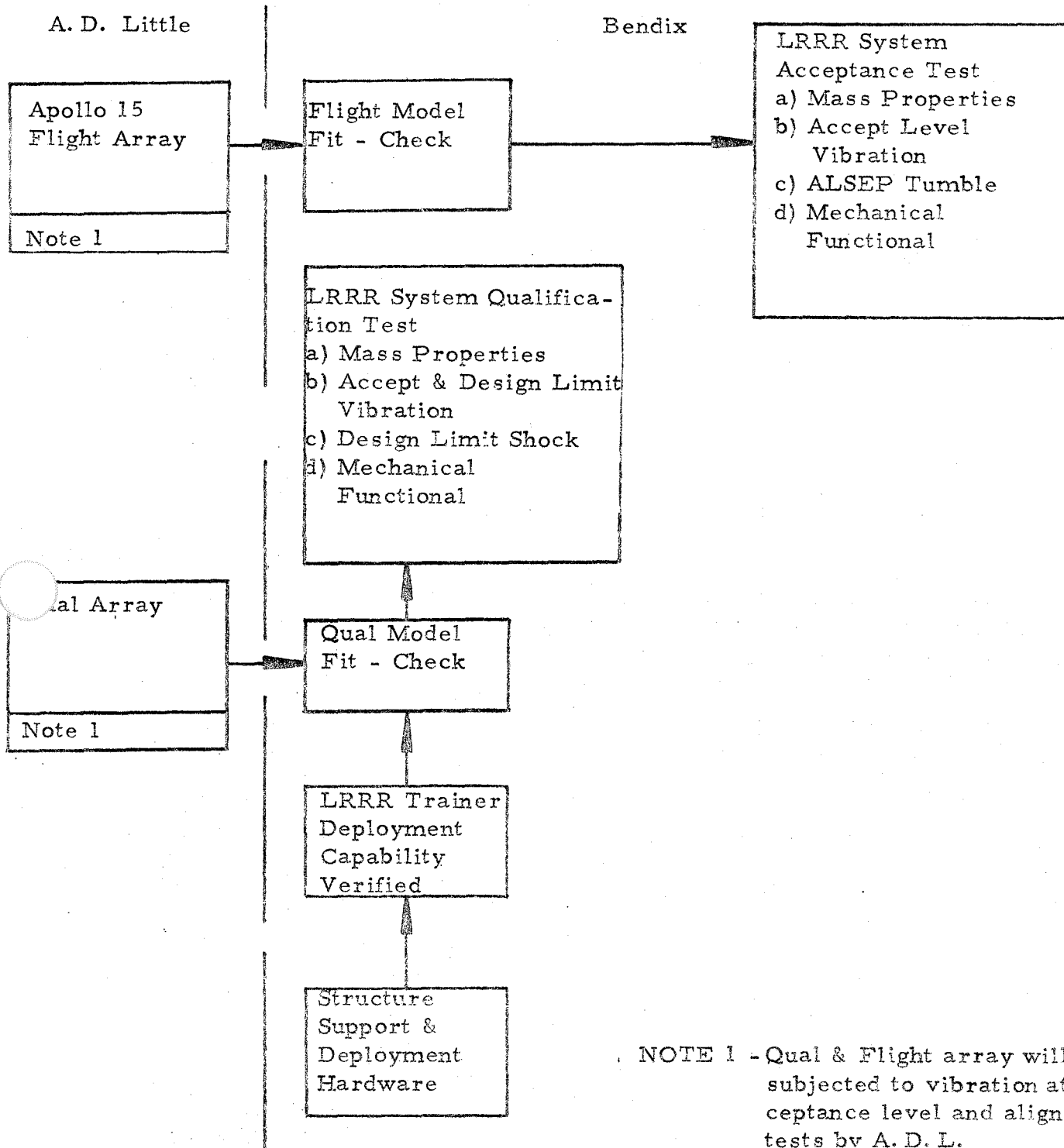
- 5.1 For historical reference and comparison prior LRRR Qualification Status Lists are as follows:
 - (1) EASEP, Apollo 11, EATM-57A, 15 April 1969.
 - (2) ALSEP, Apollo 14, ATM 868A, 20 August 1970.
 - (3) ALSEP, Apollo 15, ATM 925, 24 November 1970.
- 5.2 Enclosures 8 and 9 are photographs of the LRRR 300 Cube Corner Array; the former is before deployment and the latter is after deployment.
- 5.3 Enclosure 10 herein is a summary list for the test procedures which are to be used for the Flight model, LRRR 300 Cube Corner Array, SN 04.



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NOTE 1 - Qual & Flight array will be subjected to vibration at acceptance level and alignment tests by A. D. L.

Figure 1

LRRR QUALIFICATION AND FLIGHT ACCEPTANCE RATIONALE
FOR APOLLO 15

FIGURE 2 - QULIFICATION TEST RESULTS

Test Sequence No.	Bendix Document	Document Date	Test Comp. Date	Title	Delivery Reqmt.	Contract
1	ATR-268/BSR-3102	28 April 1971	12 March 1971	Final Test Report-300 Array Qualification Model Mass Properties Determin- ation Test	CCP 269 Exhibit F1, Item 19	NAS 9-5829
2	ATR-269/BSR-3103	28 April 1971	15 March 1971	Final Test Report-300 Array Qualification Model Visual Inspection Test and Acceptance Level Vibration Test	CCP 269 Exhibit F1, Item 19	NAS 9-5829
3	ATR-270/BSR-3104	28 April 1971	25 March 1971	Final Test Report-300 Array Qualification Model Visual Inspection and Design Limit Vibration Test	CCP 269 Exhibit F1, Item 19	NAS 9-5829
4	ATR-271/BSR-3105	28 April 1971	30 March 1971	Final Test Report-300 Array LRRR Qualification Model Mechanical Func- tional Deployment	CCP 269 Exhibit F1, Item 19	NAS 9-5829

SUMMARY OF FLIGHT AND QUAI MODEL DESIGN CONFIGURATION DIFFERENCES

<u>HARDWARE ITEM</u>	<u>FLIGHT MODEL</u>		<u>QUAL MODEL</u>	
	<u>PART NO.</u>	<u>REMARKS</u>	<u>PART NO.</u>	<u>REMARKS</u>
RETRO-REFLECTORS	100-2664 (FLIGHT)	MEETS ALL LRRR SPEC. REQUIRE- MENTS INCL. OPTICAL	100-2664 (DUMMY)	MEETS ONLY INTERFACE MECHANICAL AND MATERIAL PROPERTY REQTS - MATERIAL - LOWER HOMOGENEITY FUSED QUARTZ
ARRAY STRUCTURE ASSYS (THERMAL PAINT)	2347212 2347213	Z-93 THERMAL PAINT	2347207 2347208	THERMAL PAINT SIMULATED BY 3M VELVET COAT
NAME PLATE	2347363-1	FLIGHT MODEL DESIGNATION	2347363-2	QUAL MODEL DESIGNATION
SIZE CHANGE ADJUSTMENT	2347200-501 REV C	SUN COMPASS SETTING 181.77°	2347200-502 REV B	SUN COMPASS SETTING 179.57°

CONFIGURATION STATUS				LRRR	QUAL	S/N	3	MARCH 5 1971	PAGE 1				
LINE	PART NUMBER	TIER	REV	PART NAME	QTY	MES	SCH	ENG	DATE	CRD	APPVD	DATE	STAT
1	2347200-502	1	-	LRRR 300 ASSY	1				01251				X
2		2	-	TIE DOWN PINS					N/R				
3	2347200-502	2	A	LRRR 300 ASSY						62096	0202		X
4	2347200-502	2	B	LRRR 300 ASSY						62109	0205		
5	ICD2347210	2	-	R-R 204 CUR	REF				12170				R
6	ICD2347211	2	-	R-R 96 CUR	REF				12170				R
7	2347214-502	2	-	ARRAY 204 CUR	1				12290				Q
8	2347214-502	2	A	ARRAY 204 CUR						F62090	0121		Q
9	2347214-502	2	B	ARRAY 204 CUR						62098	0202		Q
10	2347214-502	2	C	ARRAY 204 CUR						F62103	0212		Q
11	2347214-502	2	D	ARRAY 204 CUR						F62106	0219		Q
12	2347214-502	2	E	ARRAY 204 CUR						F62108	0222		Q
13	4001-502	3	B	ARRAY A ASSY	1				01231	0201			R
14	100-2664-002	4	-	CORNER CUBE					N/R	10230			
15	5001-001	4	A	RTNG KING LR3	204				01161				R
16	7028-01-005	4	A	ALIGNMENT PIN	204				01161				R
17	0-7028-001	4	B	UPR MTG KING					N/R	10230			
18	C-7028-002	4	B	LWR MTG KING					N/R	10230			
19	2347207	4	-	ARRAY A STRUT	1				11190				Q
20	2347207	4	RC1	ARRAY A STRUT						F62059	1203		R
21	2347207	4	A	ARRAY A STRUT						62063	1222		Q
22	2347207	4	B	ARRAY A STRUT						62064	0105		X
23	2347207	4	C	ARRAY A STRUT						F62068	0106		X
24	2347207	4	D	ARRAY A STRUT						F62075	0106		X
25	2347207	4	E	ARRAY A STRUT						F62094	0121		X
26	2347205	5	-	RETRU REFL	1				10090				X
27	2347205	5	A	RETRU REFL						62056	1113		Q
28	2347230	5	-	BRKT IF L FWD	1				11050				Q
29	2347231	5	-	BRKT IF R FWD	1				11060				Q
30	2347232	5	-	BRKT L REAR	1				11060				Q
31	2347232	5	A	BRKT L REAR						F62058	1203		Q
32	2347233	5	-	BRKT R REAR	1				11060				Q
33	2347234	5	-	BOLT MACH MOD	8				12280				Q
34	2347236	5	-	BRKT TIE DOWN	1				11050				Q
35	2347239	5	-	HANDLE ASSY	1				10230				Q
36	2347239	5	A	HANDLE ASSY						62053	1105		Q
37	2347239-1	6	-	HANDLE	1				10230				Q
38	2347240	6	-	BRKT HOL LH	1				10230				Q
39	2347241	6	-	BRKT HOL RH	1				10230				Q
40	2347241	6	A	BRKT HOL RH						62054	1103		Q
41	2347263	5	-	BLOCK STRIKER	1				10290				Q
42	2347263	5	A	BLOCK STRIKER						62051	1104		Q
43	2347267	5	-	HNG LH SCMPS	1				10290				Q
44	2347268	5	-	HNG RH SCMPS	1				10290				Q

CONFIGURATION STATUS CODE:

(1) An "X" denotes applicability.

(2) An "R" denotes reference items including record changes.

(3) A "Q" denotes fabrication and/or incorporation of all changes into the hardware.

CONFIGURATION STATUS				LRRR QUAL S/N 3		MARCH 5 1971		PAGE 2				
LINE	PART NUMBER	TIER	REV	PART NAME	QTY	UNT MES	ENG SCH	DATE EXP	ACT	CRD NO	APPVD DATE	STAT
1	2347220-1	3	-	PIN QIK RLSE	1				12200			Q
2	2347220-1	3	RC1	PIN QIK RLSE						62070	0105	R
3	2347220-1	3	A	PIN QIK RLSE						62084	0114	Q
4	2347242	3	-	TOOL SKT ADJ	1				10200			Q
5	2347242	3	A	TOOL SKT ADJ						F62104	0216	Q
6	2345744	4	B	DOWEL PIN	1				11110			Q
7	2345744	4	C	DOWEL PIN						F62104	0216	X
8	2347242-1	4	-	TOOL SOCKET					N/R- 10200			
9	2347246	3	-	DUST COVER	1				11300			Q
10	2347246	3	A	DUST COVER						F62088	0121	Q
11	2347246-1	4	-	COVER MYLAR	1				11300			Q
12	2347246-2	4	-	STIFFENER RH	1				11300			Q
13	2347246-3	4	-	STIFFENER LH	1				11300			Q
14	2347270-1	4	-	LANYARD ASSY	1				11180			Q
15	2347245	5	-	RING LANYARD	1				11030			Q
16	2347248-1	5	-	GDE LNYD FWD	1				11030			Q
17	2347248-1	5	RC1	GDE LNYD FWD						62082	0113	R
18	2347248-3	6	-	GUIDE L FWD	1				01211			Q
19	2347248-4	6	-	GUIDE R FWD	1				01211			Q
20	2347248-5	6	-	SEP TUBE	1				01211			Q
21	2347249	5	-	GDE COV LNYD	2				11030			Q
22	2347270-3	5	-	PAD HOOK	4				11180			Q
23	2347270-4	5	-	PAD HOOK	1				11180			Q
24	2347270-5	5	-	PIN	4				11180			Q
25	2347250	3	-	SUNCOMPASS AY	1				10290	62050	0204	Q
26	2347251	4	-	SURF PL ASSY	1				10290			Q
27	2335682	5	A	BUBBLE LEVEL	1				12030			Q
28	2347253	5	-	PLATE SURFACE	1				10290			Q
29	2347253-1	6	-	PLATE SURFACE	1				10290			Q
30	2347259	5	-	GNOMON	1				10290			Q
31	2347259-1	6	-	GNOMON	1				10290			Q
32	2347260	5	-	PLATE GNOMON	2				10290			Q
33	2347262	5	-	REFL LIGHT	1				10280			Q
34	2347252	4	-	BASE SCMPs	1				11060			Q
35	2347254	4	-	BRKT STRIKER	1				10290			Q
36	2347255	4	-	BRACKET ADJ	1				10290			Q
37	2347256	4	-	PIN ADJ	1				10290			Q
38	2347257	4	-	PIN STRIKER	1				10290			Q
39	2347257	4	RC1	PIN STRIKER						62050	1102	R
40	2347258	4	-	PIN CENTER	1				10280			Q
41	2347261	3	-	PIN PIVOT	1				10290			Q
42	2347261	3	A	PIN PIVOT						F62091	0121	Q
43	2347269-1	3	-	SPR SUN CMPS	1				10290			X
44	2347269-1	3	A	SPR SUN CMPS						62055	1105	X
45	2347269-1	3	B	SPR SUN CMPS						62093	0126	X

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CONFIGURATION STATUS				LRRR		QUAL S/N 3		MARCH 5 1971		PAGE 3		
LINE	PART NUMBER	TIER	REV	PART NAME	QTY	MES	SCH	EXP	ACT	CRD NO	APPVD DATE	STAT
1	2347269-2	3	-	SPR SUN CMPS	1				10290			X
2	2347269-2	3	A	SPR SUN CMPS						62055	1105	X
3	2347269-2	3	B	SPR SUN CMPS						62093	0126	X
4	2347298	3	-	CLEVIS STRUCT	1				12090			Q
5	2347299	3	-	PIN REAR	2				11300			Q
6	2347300	3	-	PIN	1				12090			Q
7	2347343	3	-	CLEVIS REAR	2				11300			Q
8	2347349	3	-	CLEVIS FRONT	1				12090			Q
9	2347350	3	-	LEG ASSY	1				12290			Q
10	2347350	3	A	LEG ASSY						F62105	0216	Q
11	2347298	4	-	WASHER NYLON	1				12280			Q
12	2347298	4	RC1	WASHER NYLON						62074	0106	R
13	2347297	4	-	BOLT MODIFIED	1				12070			Q
14	2347301	4	-	SPRT BRKT ASY	1				12280			Q
15	2347302	5	-	PT SPRT BRKT	1				12160			Q
16	2347348	5	-	SPT BRKT REAR	1				12160			Q
17	2347348	5	A	SPT BRKT REAR						F62083	0113	Q
18	2347303	4	-	KEEPER ASSY	1				12140			Q
19	2347303-1	5	-	KEEPER	1				12140			Q
20	2347335	5	-	PIN SPRING	1				12090			Q
21	2347304	4	-	PIN QIK RLSE	1				12140			Q
22	2347304	4	A	PIN QIK RLSE						62086	0114	Q
23	2347304-1	5	-	RING	1				12140			Q
24	2347337	4	-	PAWL	1				12090			Q
25	2347341	4	-	SLIDE	1				12070			Q
26	2347344	4	-	BRACE FRONT	1				12140			Q
27	2347345	4	-	DIAG SPRT ASY	1				12090			Q
28	2347345	4	A	DIAG SPRT AY						F62089	0121	X
29	2347356	5	-	BRKT DIAG SPT	1				12090			Q
30	2347345-1	5	-	TUBE	1				12090			Q
31	2347346	4	-	LEG & FOOT AY	1				12090			Q
32	2347346	4	RC1	LEG & FOOT AY						62061	1217	R
33	2347346	4	A	LEG & FOOT AY						F62107	0222	X
34	2347339	5	-	FOOT ASSY	1				11300			Q
35	2347338	6	-	BRKT FOOT	1				11300			Q
36	2347340	6	-	FOOT	1				11300			Q
37	2347342	5	-	LEG ASSY	1				12140			Q
38	2347347	4	-	BRACE REAR	1				12140			Q
39	2347347	4	A	BRACE REAR						F62066	0105	Q
40	2347215-502	2	-	ARRAY 90 COR	1				01141			Q
41	4002-502	3	A	ARRAY B ASSY	1				01231			R
42	100-2664-002	4	-	CORNER CUBE					N/R 12230			
43	4001-001	4	A	RING RING LR3	96				01161			R
44	7028-01-005	4	A	ALIGNMENT PIN	96				01161			R
45	8-7028-001	4	B	UPR MTG RING					N/R 12280			

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CONFIGURATION STATUS					LRRR QUAL S/N 3		MARCH 5 1971		PAGE 4			
LINE	PART NUMBER	TIER	REV	PART NAME	QTY	MES	SCH	EXP	ACT	CND NO	APPVD DATE	STAT
1	C-7028-002	4	B	LWR MTG RING						N/R 12020		
2	2347208	4	-	ARRAY B STRUT	1					11170		Q
3	2347208	4	A	ARRAY B STRUT						F62065	0105	Q
4	2347208	4	B	ARRAY B STRUT						F60277	0108	Q
5	2347208	4	C	ARRAY B STRUT						F60279	0108	Q
6	2347208	4	D	ARRAY B STRUT						F60280	0108	Q
7	2347206	5	-	REFL STRUCT	1					10120		Q
8	2347206	5	A	REFL STRUCT						62057	113	Q
9	2347234	5	-	BOLT MACH MOD	8					N/R-12280		Q
10	2347237	5	-	BRKT TIE DOWN	1					10280		Q
11	2347237	5	A	BRKT TIE DOWN						62052	1105	Q
12	2347237-1	6	-	BRACKET	1					10280		Q
13	2347237-2	6	-	HANDLE	1					10280		Q
14	2347238	5	-	BRKT TIE DOWN	1					11090		Q
15	2347243	5	-	SHIM FR TAB	1					10200		Q
16	2347244	5	-	SHIM REAR TAB	1					11090		Q
17	2347265	5	-	HINGE TOP	2					10200		Q
18	2347266	5	-	HINGE BOTTOM	2					10200		Q
19	2347266	5	RC1	HINGE BOTTOM						62092	0121	R
20	2347247	3	-	DUST COVER	1					11180		Q
21	2347247	3	A	DUST COVER						F62060	1209	Q
22	2347247-1	4	-	COVER MYLAR	1					11180		Q
23	2347247-2	4	-	STIF RH MYLAR	1					11180		Q
24	2347247-3	4	-	STIF LH MYLAR	1					11180		Q
25	2347270-2	4	-	LANDYARD ASSY	1					11180		Q
26	2347248-2	5	-	GUIDE FWD	1					11030		Q
27	2347248-2	5	RC1	GUIDE FWD						62082	0113	R
28	2347248-3	6	-	GUIDE L FWD	1					01211		Q
29	2347248-4	6	-	GUIDE R FWD	1					01211		Q
30	2347248-6	6	-	SEP TUBE	1					01211		Q
31	2347249	5	-	GUIDE COVER	2					11030		X
32	2347270-3	5	-	PAD HOOK	4					11180		Q
33	2347270-5	5	-	PIN	4					11180		Q
34	2347217	2	-	PAWL LATCH	2					11240		Q
35	2347218	2	-	HOUSING LATCH	2					11240		Q
36	2347219	2	-	SHIM LATCH	2					11240		Q
37	2347228	2	-	BSHG SUN CMPS	1					02051		Q
38	2347235	2	-	SPRT ROD REAR	1					11050		Q
39	2347264	2	-	PIN ARRAY	2					10200		X
40	2347277-1	2	-	PIN QIK RLSE	1					12280		Q
41	2347277-1	2	RC1	PIN QIK RLSE						62071	0105	R
42	2347277-1	2	A	PIN QIK RLSE						62085	0114	Q
43	2347278-1	2	-	PIN QIK RLSE	1					12280		Q
44	2347278-1	2	RC1	PIN QIK RLSE						62072	0106	R
45	2347279	2	RC1	PAD NYL FSTNR						60273	0106	R

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CONFIGURATION STATUS					LRRR	QUAL	S/N	3	MARCH 5 1971			PAGE	5
LINE	PART NUMBER	TIER	REV	PART NAME	QTY	UNT	ENG	DATE	CRO	APPVD	STAT		
						MES	SCH	EXP		ACT		NO	DATE
1	2347279-1	2	-	PAD NYL FSTNR	8					12280	Q		
2	2347279-2	2	-	PAD NYL FSTNR	8					12280	Q		
3	2347279-3	2	-	PAD NYL FSTNR	3					12280	Q		
4	2347279-4	2	-	PAD NYL FSTNR	2					12280	Q		
5	2347363-2	2	-	PLATE IDENT	1					12290	Q		

CONFIGURATION STATUS

LR

LIGHT S/N 4

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LINE	PART NUMBER	TIER	REV	PART NAME	QTY	UNT	ENG	DATE	CRD	APPVD	STAT
						NES	SCH	EXP	ACT	NO	DATE
1	2347200-501	1	-	LRRR 300 ASSY	1				01251		X
2		2		TIE DOWN PINS					N/R		
3	2347200-501	2	A	LRRR 300 ASSY						62096 0202	X
4	2347200-501	2	B	LRRR 300 ASSY						62109 0305	X
5	2347200-501	2	C	LRRR 300 ASSY						F62127 0430	X
6	IC02347210	2	-	R-R 204 COR	REF				12170		R
7	IC02347211	2	-	R-R 96 COR	REF				12170		R
8	2347214-501	2	-	ARRAY 204 COR	1				12290		Q
9	2347214-501	2	A	ARRAY 204 COR						F62090 0121	Q
10	2347214-501	2	B	ARRAY 204 COR						62098 0202	Q
11	2347214-501	2	C	ARRAY 204 COR						F62103 0212	Q
12	2347214-501	2	D	ARRAY 204 COR						F62106 0219	Q
13	2347214-501	2	E	ARRAY 204 COR						F62108 0222	Q
14	2347214-501	2	F	ARRAY 204 COR						F62117 0324	Q
15	4001-501	3	A	ARRAY A ASSY	1				01231		R
16	4001-501	3	B	ARRAY A ASSY					02031		R
17	100-2644-001	4		CORNER CUBE					N/R		
18	4001-001	4	A	RTNG RING LR3	204				01161		R
19	7028-01-005	4	A	ALIGNMENT PIN	204				01161		R
20	8-7028-001	4		UPR MTC RING					N/R		
21	C-7028-002	4		LWR MTC RING					N/R		
22	2347212	4	-	STRUCT ASSY	1				12010		Q
23	2347212	4	A	STRUCT ASSY						62062 1222	Q
24	2347212	4	B	STRUCT ASSY						F62067 0105	Q
25	2347212	4	C	STRUCT ASSY						F62069 0106	Q
26	2347212	4	D	STRUCT ASSY						F62087 0121	Q
27	2347212	4	E	STRUCT ASSY						62095 0126	Q
28	2347212	4	F	STRUCT ASSY						62099 0202	Q
29	2347212	4	G	STRUCT ASSY						62101 0210	Q
30	2347212	4	H	STRUCT ASSY						62102 0212	Q
31	2347205	5	-	RETRO REFL	1				10090		X
32	2347205	5	A	RETRO REFL						62056 1113	X
33	2347224	5	-	C & C INSTL					02191		R
34	2347225-1	5	-	TEMP COVER	1				02031		R
35	2347230	5	-	BRKT IF L FWD	1				11050		Q
36	2347231	5	-	BRKT IF R FWD	1				11060		Q
37	2347232	5	-	BRKT L REAR	1				11060		Q
38	2347232	5	A	BRKT L REAR						F62058 1203	Q
39	2347233	5	-	BRKT R REAR	1				11060		Q
40	2347234	5	-	BOLT MACH MOD	8				12280		Q
41	2347236	5	-	BRKT TIE DOWN	1				11050		X
42	2347239	5	-	HANDLE ASSY	1				10230		Q
43	2347239	5	A	HANDLE ASSY						62053 1103	Q
44	2347239-1	6	-	HANDLE	1				10230		Q

CONFIGURATION STATUS CODE:

(1) An "X" denotes applicability.

(2) An "R" denotes reference items including record changes.

(3) A "Q" denotes fabrication and/or incorporation of all changes into the hardware.

CONFIGURATION STATUS

LIGHT S/N 4 MAY 17 1971

PAGE 2

LINE	PART NUMBER	TIER	REV	PART NAME	QTY	MES	SCH	EXP	ACT	CRD	NO	APPVD	DATE	STAT
1	2347240	6	-	BRKT HDL LH	1				10230					Q
2	2347241	6	-	BRKT HDL RH	1				10230					Q
3	2347241	6	A	BRKT HDL RH						62054	1105			Q
4	2347263	5	-	BLOCK STRIKER	1				10290					Q
5	2347263	5	A	BLOCK STRIKER						62051	1104			Q
6	2347267	5	-	HNG LH SCMP	1				10290					Q
7	2347267	5	A	HNG LH SCMP						F62113	0322			Q
8	2347268	5	-	HNG RH SCMP	1				10290					Q
9	2347268	5	A	HNG RH SCMP						F62114	0322			Q
10	2347343	5	-	CLEVIS REAR	2				11300					Q
11	2347220-1	3	-	PIN QIK RLSE	1				12280					Q
12	2347220-1	3	RC1	PIN QIK RLSE						62070	0105			R
13	2347220-1	3	A	PIN QIK RLSE						62084	0114			Q
14	2347242	3	-	TOOL SKT ADJ	1				10200					Q
15	2347242	3	A	TOOL SKT ADJ						F62104	0216			Q
16	2345744	4	B	DOWEL PIN	1				11110					Q
17	2345744	4	C	DOWEL PIN						F62104	0216			X
18	2347242-1	4	-	TOOL SOCKET					N/R					
19	2347246	3	-	DUST COVER	1				11300					Q
20	2347246	3	A	DUST COVER						F62089	0121			Q
21	2347246-1	4	-	COVER MYLAR	1				11300					Q
22	2347246-2	4	-	STIFFENER RH	1				11300					Q
23	2347246-3	4	-	STIFFENER LH	1				11300					Q
24	2347270-1	4	-	LANYARD ASSY	1				11180					Q
25	2347245	5	-	RING LANYARD	1				11030					Q
26	2347248-1	5	-	GDE LNYD FWD	1				11030					Q
27	2347248-1	5	RC1	GDE LNYD FWD						62082	0113			R
28	2347248-3	6	-	GUIDE L FWD	1				01211					Q
29	2347248-4	6	-	GUIDE R FWD	1				01211					Q
30	2347248-5	6	-	SEP TUBE	1				01211					Q
31	2347249	5	-	GDE CLV LNYD	2				11030					Q
32	2347270-3	5	-	PAD HOOK	4				11180					Q
33	2347270-4	5	-	PAD HOOK	1				11180					Q
34	2347270-5	5	-	PIN	4				11180					Q
35	2347250	3	-	SUNCOMPASS AY	1				10290					Q
36	2347250	3	A	SUNCOMPASS AY						62100	0202			Q
37	2347251	4	-	SURF PL ASSY	1				10290					Q
38	2347251	4	A	SURF PL ASSY						F62115	0322			Q
39	2335682	5	A	BUBLE LEVEL	1				12030					Q
40	2347253	5	-	PLATE SURFACE	1				10290					Q
41	2347253-1	6	-	PLATE SURFACE	1				10290					Q
42	2347259	5	-	GNOMON	1				10290					Q
43	2347259-1	6	-	GNOMON	1				10290					Q
44	2347260	5	-	PLATE GNOMON	2				10290					Q
45	2347260	5	A	PLATE GNOMON						F62116	0322			Q

CONFIGURATION STATUS

LR LIGHT S/N 4 MAY 17 1971

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LINE	PART NUMBER	TIER	REV	PART NAME	QTY	MES	SCH	EXP	ACT	CRD NO	APPVD DATE	STAT
1	2347262	5	-	REFL LIGHT	1				10280			Q
2	2347252	4	-	BASE SCMP5	1				11060			Q
3	2347252	4	A	BASE SCMP5						F62111	0322	X
4	2347254	4	-	BRKT STRIKER	1				10290			Q
5	2347255	4	-	BRACKET ADJ	1				10290			Q
6	2347256	4	-	PIN ADJ	1				10290			Q
7	2347257	4	-	PIN STRIKER	1				10290			Q
8	2347257	4	KC1	PIN STRIKER						62050	1102	R
9	2347258	4	-	PIN CENTER	1				10280			Q
10	2347261	3	-	PIN PIVOT	1				10290			Q
11	2347261	3	A	PIN PIVOT						F62091	0121	Q
12	2347261	3	B	PIN PIVOT						F62112	0322	Q
13	2347269-1	3	-	SPR SUN CMPS	1				10290			X
14	2347269-1	3	A	SPR SUN CMPS						62055	1105	X
15	2347269-1	3	B	SPR SUN CMPS						62093	0126	X
16	2347269-2	3	-	SPR SUN CMPS	1				10290			X
17	2347269-2	3	A	SPR SUN CMPS						62055	1105	X
18	2347269-2	3	B	SPR SUN CMPS						62093	0126	X
19	2347298	3	-	CLEVIS STRUCT	1				12090			Q
20	2347299	3	-	PIN REAR	2				11300			Q
21	2347300	3	-	PIN	1				12090			Q
22	2347349	3	-	CLEVIS FRONT	1				12090			Q
23	2347350	3	-	LEG ASSY	1				12290			Q
24	2347350	3	A	LEG ASSY						F62105	0216	Q
25	2347296	4	-	WASHER NYLON	1				12280			Q
26	2347296	4	KC1	WASHER NYLON						62074	0106	R
27	2347297	4	-	BOLT MODIFIED	1				12070			Q
28	2347301	4	-	SPRT BRKT ASY	1				12280			Q
29	2347302	5	-	PT SPRT BRKT	1				12160			Q
30	2347348	5	-	SPT BRKT REAR	1				12160			Q
31	2347348	5	A	SPT BRKT REAR						F62083	0113	Q
32	2347303	4	-	KEEPER ASSY	1				12140			Q
33	2347303-1	5	-	KEEPER	1				12140			Q
34	2347335	5	-	PIN SPRING	1				12090			Q
35	2347304	4	-	PIN QIK RLSE	1				12140			Q
36	2347304	4	A	PIN QIK RLSE						62086	0114	Q
37	2347304	4	B	PIN QIK RLSE						F62120	0324	Q
38	2347304-1	5	-	RING	1				12140			Q
39	2347337	4	-	PAWL	1				12090			Q
40	2347341	4	-	SLIDE	1				12070			Q
41	2347344	4	-	BRACE FRONT	1				12140			Q
42	2347345	4	-	DIAG SPRT ASY	1				12090			X
43	2347345	4	A	DIAG SPRT AY						F62089	0121	X
44	2347336	5	-	BRKT DIAG SPT	1				12090			Q
45	2347345-1	5	-	TUBE	1				12090			X

CONFIGURATION STATUS

LRRR FLIGHT S/N 4 MAY 17 1971

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LINE	PART NUMBER	TIER	REV	PART NAME	QTY	MES	SCH	EXP	ACT	CRD NO	APPVD DATE	STAT
1	2347346	4	-	LEG & FOOT AY	1				12090			X
2	2347346	4	RC1	LEG & FOOT AY						62061	1217	R
3	2347346	4	A	LEG & FOOT AY						F62107	0222	X
4	2347339	5	-	FOOT ASSY	1				11300			Q
5	2347338	6	-	BRKT FOOT	1				11300			Q
6	2347340	6	-	FOOT	1				11300			Q
7	2347342	5	-	LEG ASSY	1				12140			Q
8	2347342	5	A	LEG ASSY						F62110	0304	Q
9	2347347	4	-	BRACE REAR	1				12140			Q
10	2347347	4	A	BRACE REAR						F62066	0105	Q
11	2347215-501	2	-	ARRAY 90 COR	1				01141			Q
12	2347215-501	2	RC1	ARRAY 90 COR						F62128	0429	R
13	4002-501	3	A	ARRAY B ASSY	1				01231			R
14	4002-501	3	B	ARRAY B ASSY					02031			R
15	4002-501	3	C	ARRAY B ASSY					04361			R
16	100-2664-001	4	-	CORNER CUBE					N/R			
17	4001-001	4	A	RTNG KING LR3	96				01161			R
18	7028-01-005	4	A	ALIGNMENT PIN	96				01161			R
19	8-7028-001	4	-	UPR MTG KING					N/R			
20	C-7028-002	4	-	LWR MTG KING					N/R			
21	2347213	4	-	STRUCT ASSY	1				01231			Q
22	2347213	4	A	STRUCT ASSY						62097	0202	Q
23	2347206	5	-	REFL STRUCT	1				10120			X
24	2347206	5	A	REFL STRUCT						62057	1113	X
25	2347224	5	-	C & C INSTL					02191			R
26	2347229-2	5	-	TEMP COVER	1				02031			R
27	2347234	5	-	BOLT MACH MOD	8				N/R			Q
28	2347237	5	-	BRKT TIE DOWN	1				10280			Q
29	2347237	5	A	BRKT TIE DOWN						62052	1105	Q
30	2347237-1	6	-	BRACKET	1				10280			Q
31	2347237-2	6	-	HANDLE	1				10280			Q
32	2347238	5	-	BRKT TIE DOWN	1				11090			Q
33	2347243	5	-	SHIM FR TAB	1				10200			Q
34	2347244	5	-	SHIM REAR TAB	1				11090			Q
35	2347265	5	-	HINGE TOP	2				10200			Q
36	2347266	5	-	HINGE BOTTOM	2				10200			Q
37	2347266	5	RC1	HINGE BOTTOM						62092	0121	R
38	2347247	3	-	DUST COVER	1				11180			Q
39	2347247	3	A	DUST COVER						F62060	1209	Q
40	2347247-1	4	-	COVER MYLAR	1				11180			Q
41	2347247-2	4	-	STIF PH MYLAR	1				11180			Q
42	2347247-3	4	-	STIF LH MYLAR	1				11180			Q
43	2347270-2	4	-	LANDYARD ASSY	1				11180			Q
44	2347248-2	5	-	GUIDE FWD	1				11030			Q
45	2347248-2	5	RC1	GUIDE FWD						62062	0113	R

ENCLOSURE 3

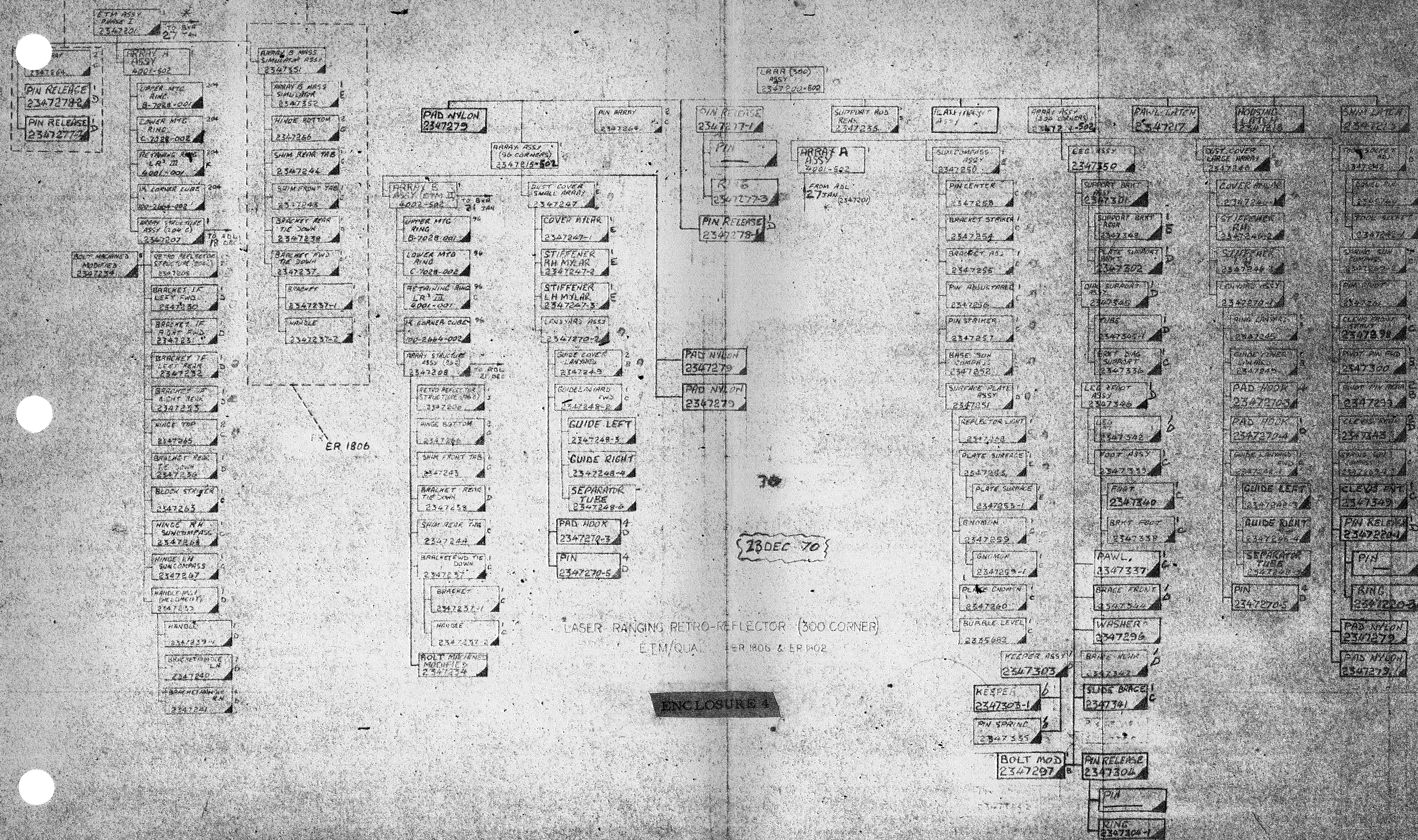
CONFIGURATION STATUS

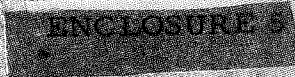
FLIGHT S/N 4

MAY 17 1971

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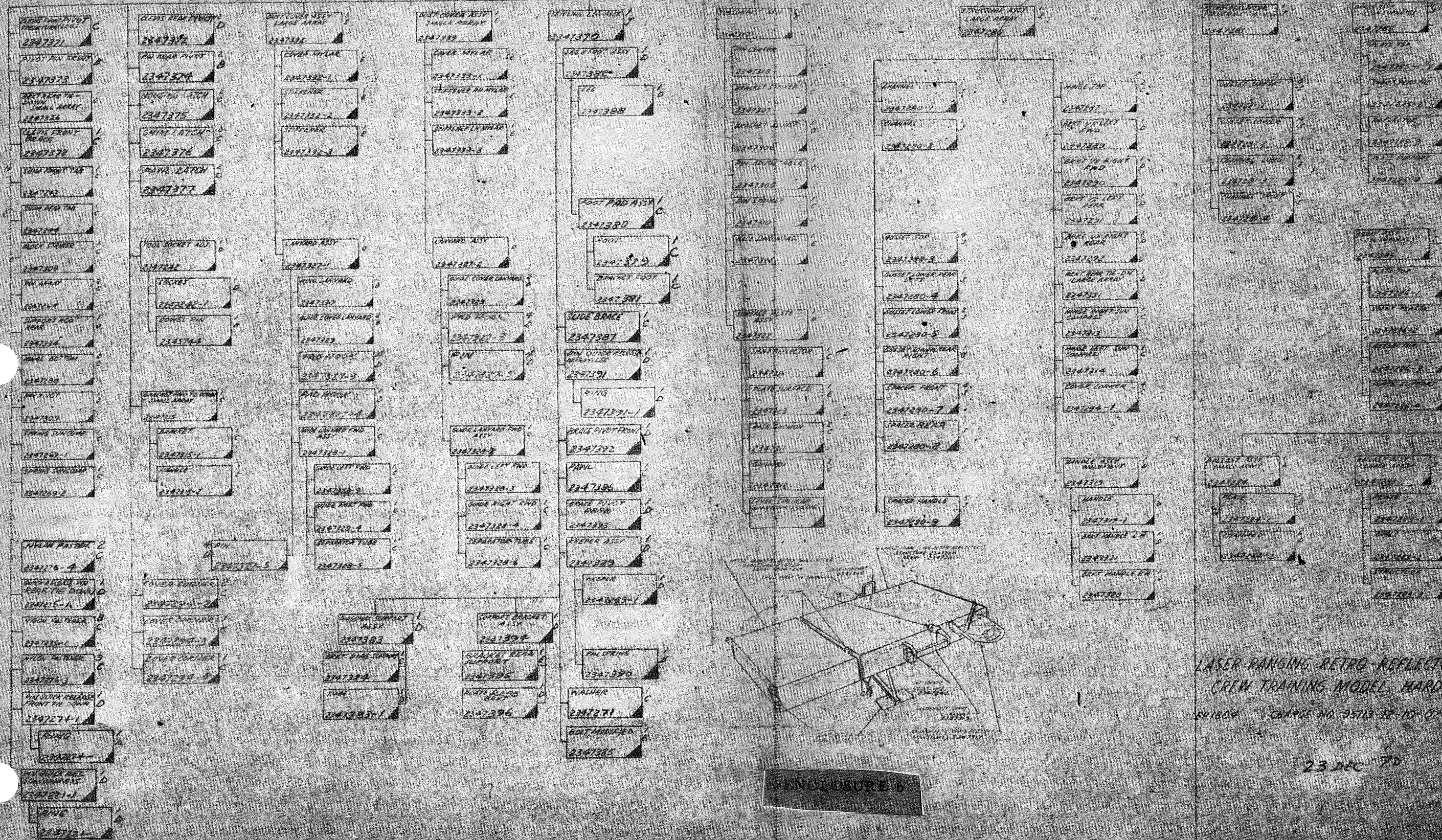
LINE	PART NUMBER	TIER	REV	PART NAME	QTY	UNT		ENG		DATE	CRD	APPVD	STAT
						MES	SCH	EXP	ACT				
1	2347248-3	6	-	GUIDE L FWD	1					01211			Q
2	2347248-4	6	-	GUIDE R FWD	1					01211			Q
3	2347248-6	6	-	SEP TUBE	1					01211			Q
4	2347249	5	-	GUIDE COVER	2					11030			Q
5	2347270-3	5	-	PAD HOOK	4					11180			Q
6	2347270-5	5	-	PIN	4					11180			Q
7	2347217	2	-	PAWL LATCH	2					11240			Q
8	2347218	2	-	HOUSING LATCH	2					11240			Q
9	2347219	2	-	SHIM LATCH	2					11240			Q
10	2347220	2	-	BSHG SUN CMPS	1					02051			Q
11	2347235	2	-	SPRT HUD REAR	1					11050			Q
12	2347264	2	-	PIN ARRAY	2					10200			X
13	2347273	2	-	HUD KIT						N/R			
14	2347272-1	3	-	DECAL	1					03271			X
15	2347272-2	3	-	DECAL	1					03271			X
16	2347272-3	3	-	DECAL	1					03271			X
17	2347272-4	3	-	DECAL	1					03271			X
18	2347277-1	2	-	PIN QIK RLSE	1					12280			Q
19	2347277-1	2	RC1	PIN QIK RLSE							62071	0105	R
20	2347277-1	2	A	PIN QIK RLSE							62085	0114	Q
21	2347277-1	2	B	PIN QIK RLSE							F62118	0324	Q
22	2347278-1	2	-	PIN QIK RLSE	1					12280			Q
23	2347278-1	2	RC1	PIN QIK RLSE							62072	0106	R
24	2347278-1	2	A	PIN QIK RLSE							F62119	0324	Q
25	2347279	2	RC1	PAD NYL FSTNR							60273	0106	R
26	2347279-1	2	-	PAD NYL FSTNR	8					12280			Q
27	2347279-3	2	-	PAD NYL FSTNR	3					12280			Q
28	2347279-4	2	-	PAD NYL FSTNR	2					12280			Q
29	2347363-1	2	-	PLATE IDENT	1					12290			Q





CREW TRAINING
MODEL
HARDWARE
TREE
2347301

2347301
2347302



LASER RANGING RETRO REFLECTOR (300 CORNER)
CREW TRAINING MODEL HARDWARE TREE
SR1804 CHARGE NO. 95113-12-10-02-400 (MCH DESIGN)

23 DEC 70

ENCLOSURE 6

QUALIFICATION STATUS LIST PROGRAM

Qualification Model

Date: 3/18/69

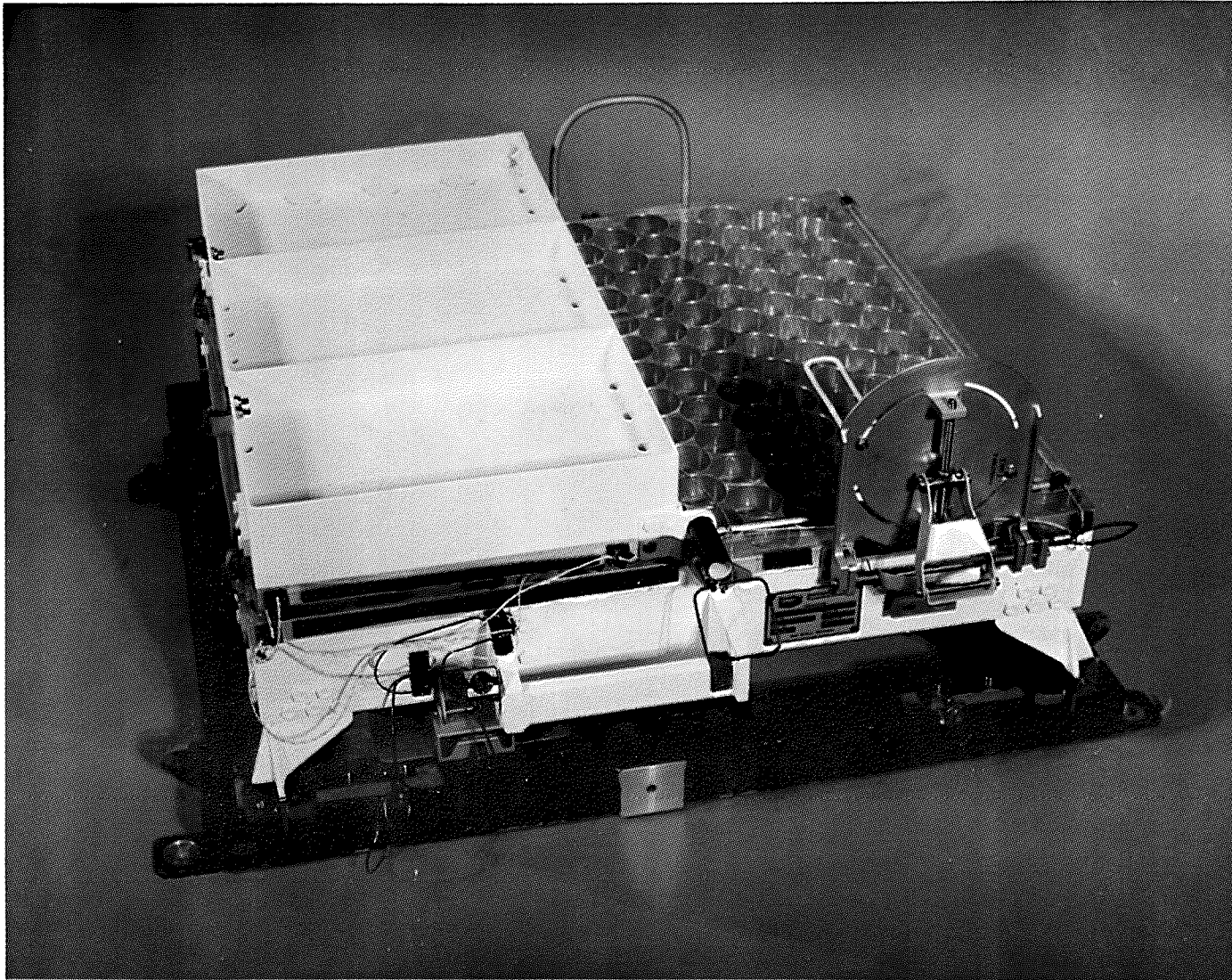
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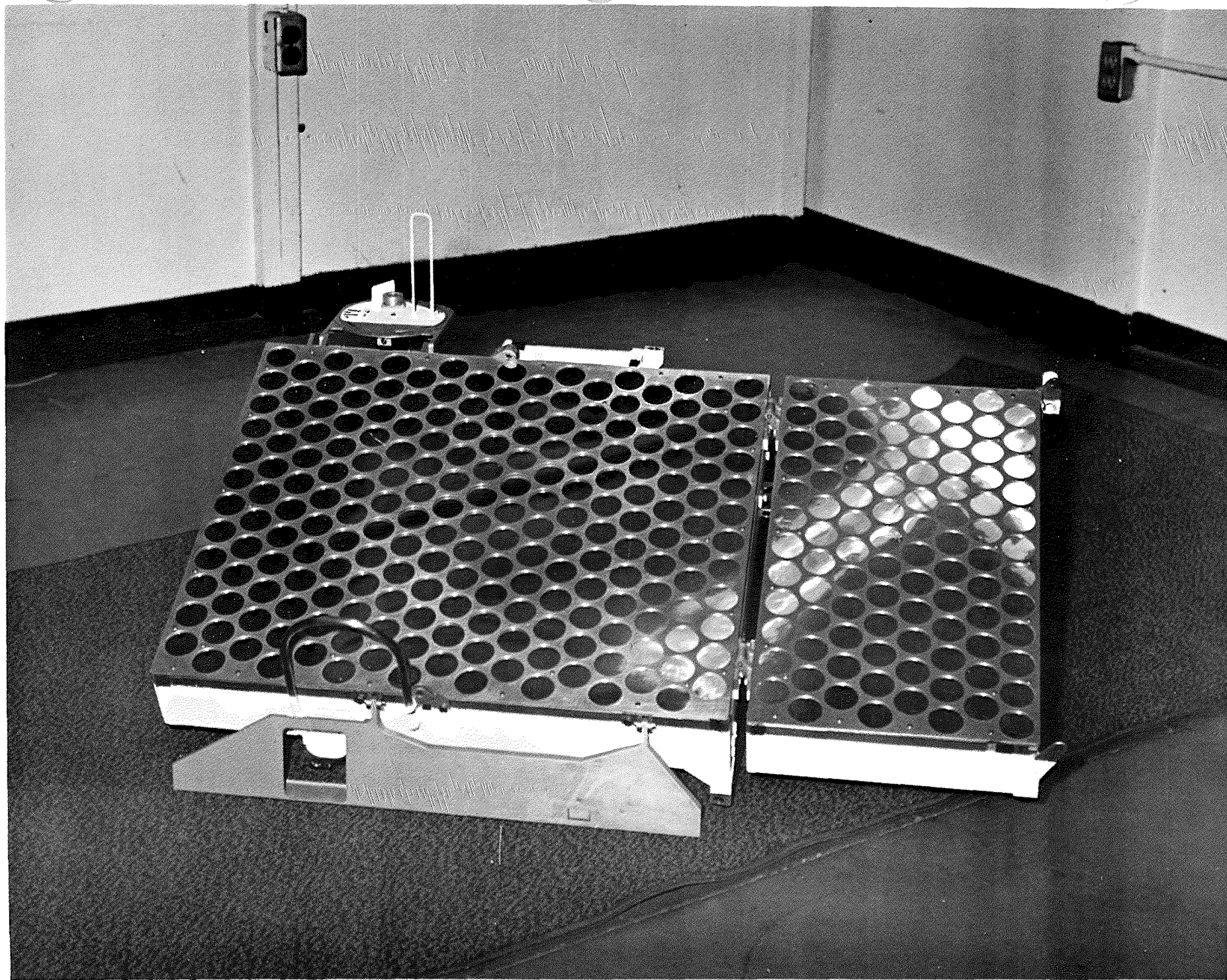
No. Rev. No.

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Item Nomenclature	Environment and/or Parameter	Stress Level		Verification of Stress Level Capability				Remarks
		Requirement	Capability	Agent	Location	Document Reference	Date	
	Temperature °F Prelaunch Flight Lunar Surface	15-100 0-160 -300 to +250	not tested					
	Pressure mm Hg Prelaunch Flight Lunar Surface	ambient 1×10^{-8} 1×10^{-12}	↓					
	Humidity Prelaunch Flight Lunar Surface	15-100 N/A 0						
	Nuclear Radiation Lunar Surface	LED-520-1						
	Acoustics Flight	Exhibit B Par. 3.1.2.4						
	Shock Storage Flight Lunar Surface	LED-520-1						
	Vibration Flight	Sin & random Vibration as per ADL TP4:0511-E1-15 Rev. D	Tested successfully to TP4:0511-E1-15 Rev D 3/18/69	Acton Labs	Burlington Mass.	TP4:0511-E1-15 Rev D submitted with Qual ADP	3/18	(1) Alignment test before & after completed TP5:0511-E1-15
	Acceleration Flight Lunar Surface	14g 1/6g	not tested					(2) Acton Lab input. data available at AD
	Meteoroid Lunar Surface	DS-21	↓					

ENCLOSURE 8





ENCLOSURE 10

FLIGHT MODEL TEST PROCEDURES LIST

<u>TITLE</u>	<u>TP NUMBER</u>	<u>BENDIX RELEASED</u>	<u>NASA/RALPO APPROVED</u>
MASS PROPERTIES	2347877(A)	4-16-71	4-29-71
ACCEPTANCE LEVEL VIBRATION	2347878(A)	4-16-71	4-29-71
POST VIBRATION FLIGHT MODEL VISUAL INSPECTION	2347884(A)	4-16-71	4-29-71
FLIGHT TUMBLE	2347885	3-5-71	4-7-71
DEPLOYMENT, MECHANICAL FUNCTIONAL	2347882(A)	4-16-71	4-29-71