16 May 66
1 June 66
4 August 66
7 Sept 66
23 Sept 66
13 Jan 67
10 May 67

The pages contained herein represent Revision F to this ATM. This revision represents an update of the Prediction portion of the Reliability Mathematical Model, Prediction and Assessment Report.

The pages contained herein, along with the unrevised pages contained in ATM-274, Rev. E dated 13 Jan 1967 constitute a complete issue of the Reliability Mathematical Model, Prediction and Assessment Report.

In accordance with the Reliability MCP this Mathematical Model and Prediction will be revised periodically throughout the program.

As the in-depth reliability mathematical models, predictions and assessments are accomplished and modified they will be incorporated into this report. This will permit programwide knowledge of subsystem and system numerical reliability status.

The detail prediction worksheets for each subsystem are on file in the ALSEP reliability office design and test history workbooks.

This publication represents the Interim Prediction and the Interim #2 Mathematical Model.

Prepared by ALSEP Reliability Group

Approved by S. J. Ellison

S. J. Ellison, Manager
ALSEP Reliability Department

LIST OF EFFECTIVE PAGES

Remove the following pages from ATM 274, Revision E dated 13 January, 1967

Title	Appendix A		Appendix B		
1	A37	A54	B4	B41	B56
1d	A38	A55	B5	B42	B57
11	A39	A56	B5a	B46	B58
12	A40	A57	B6	B47	B59
21	A41	A58	B7	B48	
22	A42	A59	B7a	B49	
25	A44	A60	B8	B50	
25a	A45	A60a	B36a	B51	
28	A48		B37	B52	
30	A50		B38	B53	
33	A51		B39	B53a	
35	A52		B39a	B54	
36	A53		B40	B55	
			B38a		

Add the following pages: Revision F

Title	Appendix A		Appendix B		
1	A37	A56	B4	B42a	B56
1d	A38	A57	B5	B46	B57
11	A39	A58	B5a	B47	B58
12	A40	A59	B6	B48	B59
21	A48	A60	B7	B49	B59a
22	A48a	A60a	B7a	B50	
25	A48b	A59a	B8	B51	
25a	A50		B37	B52	
28	A51		B38	B52a	
30	A52		B39	B53	
33	A53		B40	B53a	
35	A54		B41	B54	
36	A55		B42	B55	

4.5.6.3 Full Failure

Any information output less than that listed in 4.5.6.1

4.5.7 Heat Flow Experiment

The objectives are to measure the temperature gradients and thermal conductivity characteristics of the lunar subsurface.

4.5.8 Suprathermal Ion Detector Experiment

The objectives are (1) to measure the flux, energy and velocity of the positive ions in the lunar ionosphere and (2) to measure the characteristics of the raw and thermalized solar wind at the lunar surface.

4.5.8.1 Full Success

Two energy levels and one velocity level and a pressure measurement.

4.5.8.2 Degraded Mode

Any one or more of the following will result in partial success:

a) two or more energy levels
b) one energy level
c) any velocity level
d) pressure data only

4.5.8.3 Full Failure

No data from this experiment.

4.5.9 Active Seismic Experiment

The objective of the experiment is to determine the structure, thickness, physical properties, and elastic constants of the surface and shallow depth materials on the moon.

4.5.9.1 Full Success

Four mortars fired and exploded plus twenty thumper squibs fired plus range and zero time data, plus three geophones.

4.5.9.2 Degraded Mode

All combinations of 0, 1, 2, 3 geophones plus 0, 1, 2, 3, 4 mortars or 9 through 20 thumper squibs.

4.5.9.3 Full Failure

No geophones and no mortars and no thumper squibs.

4.5.10 Charged Particle Experiment

4.5.10.1 Full Success

Electron and proton data in nine out of ten channels, plus all six voltages for a total of 61 days. This could be revised to cover the 61 days as follows: All Charged Particle data in an undetermined number of channels greater than 8 but less than 12 and all six voltages.

4.5.10.2 Degraded Modes

Same as above for:

a) 3-10 days
b) 11-30 days
c) 31-60 days

4.5.10.3 Full Failure

Data in less than 9 channels or less than 6 voltages or operation for less than 3 days. This could be revised as follows: Data in less than specified number of channels or less than 6 voltages or operation of the experiment for less than 3 days.

5.0 Mission Profile

The mission phases used in this model include factory acceptance test through one year of lunar operation.
Figure 5.0 presents the mission phase/time profile.

ALSEP
RELIABILITY STATUS RECORD

DATE: 10 May 67

EQUIPMENT	MNEMONIC CODE	GOAL ALLOCATION	CURRENT PREDICTION		PREVIOUS PREDICTION		CURRENT DEVIATION
			A PRIORI	DATE	A PRIORI	DATE	
Electrical Power (A & B)	PW00	.9900	.981938	20 Mar67	.98194	20 Mar 67	-.008116
Data (A)	DA00K	.9642	.87064	13 Jan 67	.87064	13 Jan 67	-.09356
Data (B)	DA00L	.9642	.86388	13 Jan 67	.86388	13 Jan 67	-.10032
Structural/Thermal (A&B)	ST00	.9997	.99256	13 Jan 67	.99256	13 Jan 67	-.00714
Passive Seismic (A&B)	PS00	.9900	.901297	10 May 67	.93000	2 Feb 67	-.098703
Magnetometer (A)	MA00	.9900	.85904	4 Aug 66	.85904	4 Aug 67	-.13096
Solar Wind (A)	SW00	.9900	.85427	4 Aug 66	.85427	4 Aug 67	-.13573
Heat Flow (B)	HF00	.9900	.899297	1 May 67	.87747	20 Mar 67	-.090703
Suprathermal Ion Detector (A&B)	TI00	.9900	.8991	31 May 66	.8991	31 May 66	-.0909
Active Seismic (B)	AS00	.9900	.996997	20 Mar 67	.99700	20 Mar 66	+.006997
Charged Particle (B)	CP00	.9900	.77395	13 Jan 67	.77395	13 Jan 67	-.21605
System Array A	SA99	.9000	.5046	10 May 67	.5206	14 Apr 67	-.3954
System Array B	SB99	.9000	.4734	10 May 67	.4767	14 Apr 67	-.4266

NOTE: ALL VALUES IN UNITS OF 0.01%

970-8

Reliability Status Record Table 8.1

ALSEP
RELIABILITY STATUS RECORD

DATE: 20 Mar 67

EQUIPMENT	MNEMONIC CODE	GOAL ALLOCATION	CURRENT PREDICTION		PREVIOUS PREDICTION		CURRENT DEVIATION
			A PRIORI	DATE	A PRIORI	DATE	
Flight Handling Tool	PW01	.999950	.999996	20 Mar 67	.999990	13 Jan 67	+.000046
Generator Assembly	PW02	.994230	.994756	20 Mar 67	.994750	13 Jan 67	+.000526
Fuel Cap & Cask Ass'y	PW03	.999400	.999496	20 Mar 67	.999490	13 Jan 67	+.000096
Power Conditioning Unit	PW04	.996500	.987733	20 Mar 67	.973160	13 Jan 67	-.008767
PCU/PDU Cable	PW05	.999900	.999900	20 Mar 67	.999900	13 Jan 67	±0.0
Totals	PW00	.990054	.981938	20 Mar 67	.967450	13 Jan 67	-.008116

[redacted]

Electrical Power Subsystem Table 8.2.1-1

970-8

ALSEP
RELIABILITY STATUS RECORD

DATE: May, 1967

EQUIPMENT	MNEMONIC CODE	GOAL ALLOCATION	CURRENT PREDICTION		PREVIOUS PREDICTION		CURRENT DEVIATION
			A PRIORI	DATE	A PRIORI	DATE	
Passive Seismic	PS00	.9900	0.901297	10 May 67	0.93000	2 Feb 67	-.098703
Central Station Electronics	PS01-(0000)	.9934	0.934023	10 May 67			
Elec. Assembly	PS01-(1000)		0.999850	10 May 67			
Calibration Attenuator	PS01-(2000)		0.997748	10 May 67			
Short Period Elec.	PS01-(3000)		0.993580	10 May 67			
Power Converter "A"	PS01-(4000)		0.997693	10 May 67			
Power Converter "B"	PS01-(5000)		0.995266	10 May 67			
Long Period Elec. "X" Axis	PS01-(6000)		0.995449	10 May 67			
Long Period Elec. "Y" Axis	PS01-(7000)		0.995478	10 May 67			
Long Period Elec. "Z" Axis	PS01-(8000)		0.995478	10 May 67			
Level Sw. & Trig. Gen. X	PS01-(9000)		0.999992	10 May 67			
Level Sw. & Trig. Gen. Y	PS01-(9100)		0.999992	10 May 67			
Level Sw. & Trig. Gen. Z	PS01-(9200)		0.999992	10 May 67			
Digital Elec Module #1	PS01-(9300)		0.996269	10 May 67			
Digital Elec Module #2	PS01-(9400)		0.995711	10 May 67			
Ditigal Elec.Module #3	PS01-(9500)		0.996373	10 May 67			
A/D Converter	PS01-(9600)		0.974601	10 May 67			
Sensor Electronics	PS02-(0000)	.9971	.970194	10 May 67			
Sensor Elec X, Y, Z Axis	PS02-(1000)		.977821	10 May 67			
Sensor Elec "W" Board	PS02-(2000)		0.993563	10 May 67			
Long Period Preamplifier	PS02-(3000)		0.999683	10 May 67			
Short Period Calib. Assy.	PS02-(4000)		0.999961	10 May 67			
Long Period Calib. X, Y & Z Axis	PS02-(5000)		0.999615	10 May 67			
Long Period Preamplifier	PS02-(6000)		0.999683	10 May 67			

NOTE: ALL VALUES IN UNITS OF 0.01 %

970-8

ALSEP
RELIABILITY STATUS RECORD

DATE: May 1967

EQUIPMENT	MNEMONIC CODE	GOAL ALLOCATION	CURRENT PREDICTION		PREVIOUS PREDICTION		CURRENT DEVIATION
			A PRIORI	DATE	A PRIORI	DATE	
Long Period Preamplifier	PS02-(7000)	.9995	0.999683	10 May 67			
Uncage Circuit	PS02-(8000)		0.999994	10 May 67			
				10 May 67			
Electro-Mechanical	PS03-(0000)		.994609	10 May 67			
Long Period Hor, Boom							
Assy. (2)	PS03-(1000)		0.999860	10 May 67			
Spring Caging Assy.	PS03-(2000)		0.999960	10 May 67			
Mass Caging Bellows							
Assy. (3)	PS03-(3000)		0.999765	10 May 67			
Gimballed Platform Assy.	PS03-(4000)		0.998101	10 May 67			
Upper Platform Assy.	PS03-(5000)		0.997853	10 May 67			
Boom Assembly	PS03-(6000)		0.999930	10 May 67			
Base Enclosure Assy.	PS03-(7000)		0.999465	10 May 67			
Uncaging Mech. Assy.	PS03-(8000)		0.999994	10 May 67			
Leveling Drive Assy.	PS03-(9000)		0.999752	10 May 67			
Leveling Stool	PS03-(9100)		0.999998	10 May 67			
Thermal Control Assy.	PS03-(9200)		0.999998	10 May 67			
Sensor Assy.	PS03-(9300)		0.999946	10 May 67			
Bubble Level	PS03-(9400)		0.999998	10 May 67			
Mercury Switch Assy.	PS03-(9500)		0.999996	10 May 67			
Short Period Vertical							
Assy.	PS03-(9600)		0.999967	10 May 67			

NOTE: ALL VALUES IN UNITS OF 0.01 %

970-8

Passive Seismic Experiment Table 8.2.1-4 (Con't)

ALSEP
RELIABILITY STATUS RECORD

DATE: 10May 67

EQUIPMENT	MNEMONIC CODE	GOAL ALLOCATION	CURRENT PREDICTION		PREVIOUS PREDICTION		CURRENT DEVIATION
			A PRIORI	DATE	A PRIORI	DATE	
Heat Flow Experiment	HF00	.9900	0.899297	1 May 67			-.090703
Heat Flow Electronics	HF01	.9910	0.902491	1 May 67			-.088509
Probes	H02/03	.9991	0.946382	1 May 67			-.042718
Reference Junction	HF04	.9999	0.999334	1 May 67			-.000566

NOTE: ALL VALUES IN UNITS OF 0.01%

970-8

Heat Flow Experiment Table 8.2.1-7

ALSEP
RELIABILITY STATUS RECORD

DATE: 20 Mar 67

EQUIPMENT	MNEMONIC CODE	GOAL ALLOCATION	CURRENT PREDICTION		PREVIOUS PREDICTION		CURRENT DEVIATION
			A PRIORI	DATE	A PRIORI	DATE	
Thumper	AS01	.9999	.999996	20 Mar 67	.99996	13 Jan 67	+.000096
Geophones	AS02	.9994	.999889	20 Mar 67	.99976	13 Jan 67	+.000489
Mortar Package	AS03	.9975	.997686	20 Mar 67	.99946	13 Jan 67	+.000186
Central Station Elect.	AS04	.9932	.999426	20 Mar 67	.99772	13 Jan 67	+.006226
Total	AS00	.9900	.996997	20 Mar 67	.9969	13 Jan 67	+.006997

* Based on stress analysis

8.2.2.2 Electrical Power Subsystem

An improvement in the overall reliability was achieved by a redesign which eliminated relay K1 and its associated components. This increase was achieved although a number of capacitors were added to eliminate single point failures.

8.2.2.3 Data Subsystem

This reliability prediction is for the baseline design configuration as defined by the delta PDR. The estimated reliability of the data subsystem was calculated to be .87065 for array A and .863883 for Array B. This prediction though still below the reliability goal shows a marked improvement over the previous reliability prediction estimates (.8229 & .8188).

The most significant improvements were realized in the areas of the command decoder and data processor. There was a reduction in the reliability prediction for the Power Distribution Unit.

The primary reason for the different prediction is attributed to two factors: standardization of failure rates for performing the prediction, and design modifications that were incorporated as a result of the failure mode and effects analysis.

8.2.2.4 Structural/Thermal Subsystem

An increase in Reliability in the Structural/Thermal Subsystem was caused by the following changes and considerations:

(a) Compartment 1 structure has incorporated the single-forged unit in place of the sheet metal build-up used in the previous prediction.
(b) Use of more realistic failure rates for structural members where safety margins will permit.
(c) More complete Reliability analysis of all structural and thermal members.

8.2.2.5 Passive Seismic Experiment

The current reliability prediction is based on a full success criteria as defined in para. 4.5.4.1 of this report. Although this estimate represents a decrease in probability of full success from previous estimates, this estimate is based on essentially the final design and on actual component stresses with the required adjustments reflecting application factors.

8.2.2.6 Magnetometer Experiment

The prediction data contained in the GFE Contractor preliminary report, dated August, 1966, has been evaluated for mission success probability and the results are included in this report.

8.2.2.7 Solar Wind Experiment

The prediction data contained in this report were calculated from the failure rates presented in the GFE contractor preliminary prediction, dated August, 1966. These failure rates, when combined in the proper mathematical expression to represent functional operation experiment, indicate the contractor has presented data which predicts 86 per cent of the goal.

8.2.2.8 Heat Flow Experiment

This prediction reflects the status of the Heat Flow Experiment at the time of the Critical Design Review. The predictions of the electronics, probes and reference junctions are firmly based on the current design and any change resulting from the CDR will be reflected in the next update. The model considers the two probes in a parallel configuration and shows that the desired goals have not been achieved.

8.2.2.9 Suprathermal Ion Detector

A first application of the Reliability Prediction Model has been received from the GFE subcontractor. This prediction model represents the first update of the initial apportionment. The reliability design goals have been established for the breakdown indicated on the ALSEP reliability status record. Bendix has not received any prediction data and cannot at this time include a current prediction, however, the goal allocations presented do represent the GFE subcontractors design goals as submitted.

8.2.2.10 Active Seismic Experiment

The prediction provided in this report illustrates achievement of the goal which was initially assigned for one hour of lunar operation after one year of lunar storage. A reorganization of the analysis has been performed to group the circuits by function and environmental conditions. A stress analysis has been performed for the majority of the parts in their application and the prediction was adjusted to account for the application data.

8.2.2.11 Charged Particle Experiment

An updated Reliability Prediction has been received from the subcontractor and incorporated in this report. This prediction shows a significant increase of approximately 31% due to incorporation of design changes.

8.3 Conclusions and Recommendations Discussion

This Mathematical Model Block Diagram and Prediction represents the second update of the interim ALSEP Program Phase II Prediction. This prediction is a further refinement of previous predictions for several reasons:

(1) The design is further defined and substantially firmed
(2) ATM-501A "Failure Modes, Effects and Criticality Analysis", dated 1 January, 1967 made possible the use of failure modes, effects and probability of occurrence to the piece part level.

5 | 4 | 3 | 2 | 1

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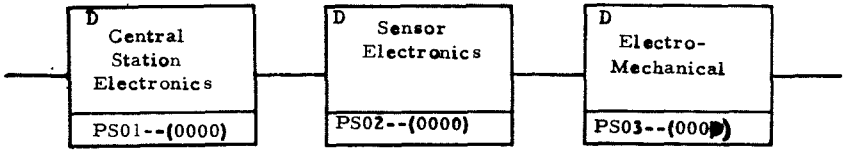
APPD	PREDICTION	ZONE	LTR	DESCRIPTION	DATE	



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LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.

DRAWING AND PART APPLICATION

DRAWING CLASS A ☐ B ☐ C ☐ | FINISH

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMAL .X ± .XX ± .XXX ± ANGLES ±
CHAMFER ± 5°
FINISH MICROINCHES RHR
MATERIAL:

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DRAWN		
CHECKED		
STRESS/WT		
DSGN SUPV		
PROJ ENGR		
QUAL CONT		
SYS SPT		
DSGN APPL		
MFG		
CUSTOMER		

THE Bendix CORPORATION
Systems Division
Ann Arbor, Michigan

TITLE PASSIVE SEISMOMETER
RELIABILITY BLOCK DIAGRAM

SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	PS00

SCALE LEVEL 4 | WEIGHT | SHEET A37 OF A61

FORM NO. BS-342A

K&E 10 5135 10-66

RELIABILITY	
APPD	PREDICTION

REVISIONS				
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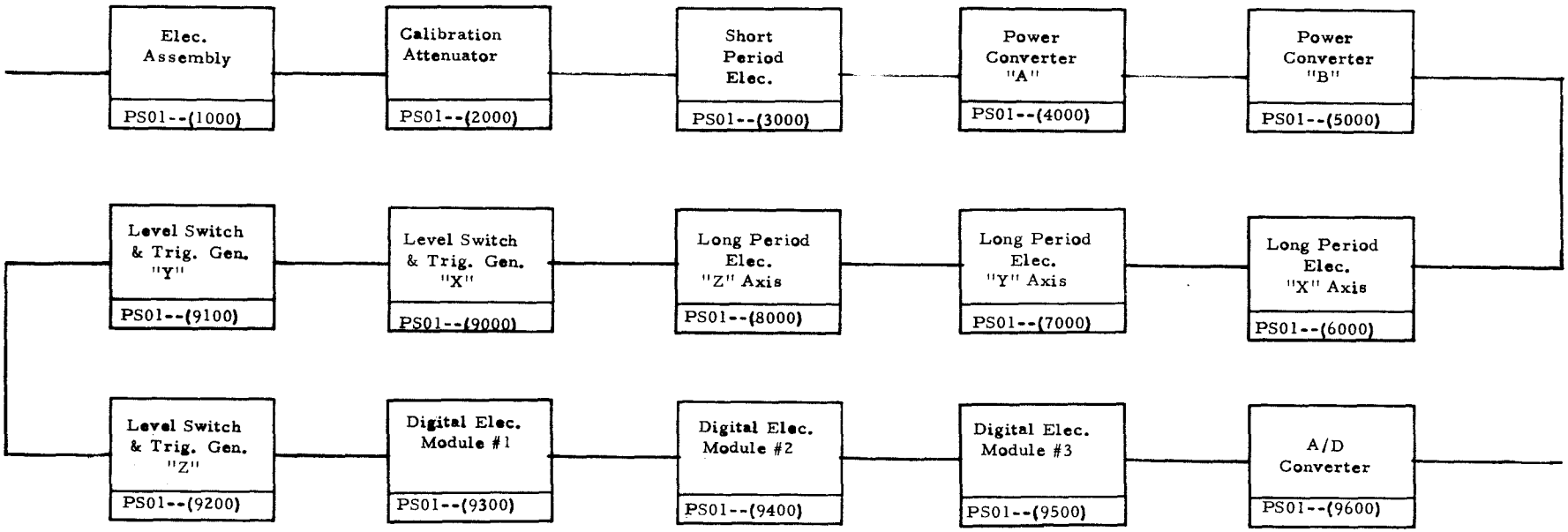

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LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.

DRAWING AND PART APPLICATION

DRAWING CLASS A ☐ B ☐ C ☐

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DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMAL ANGLES
.X ± ±
.XX ±
.XXX ± CHAMFER ± 5°

FINISH MICROINCHES RHR

MATERIAL:

CONTR NO.	
DRAWN	
CHECKED	
STRESS/WT	
DSGN SUPV	
PROJ ENGR	
QUAL CONT	
SYS SPT	
DSGN APPL	
MFG	
CUSTOMER	

THE Bendix CORPORATION
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Ann Arbor, Michigan

TITLE CENTRAL STATION ELECTRONICS
RELIABILITY BLOCK DIAGRAM
PASSIVE SEISMOMETER

SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	PS 01

SCALE LEVEL 5 | WEIGHT | SHEET A38 OF A61

FORM NO. BS-342A

K&E 10 5155 10-66•

RELIABILITY		REVISIONS				CONFIG MGT
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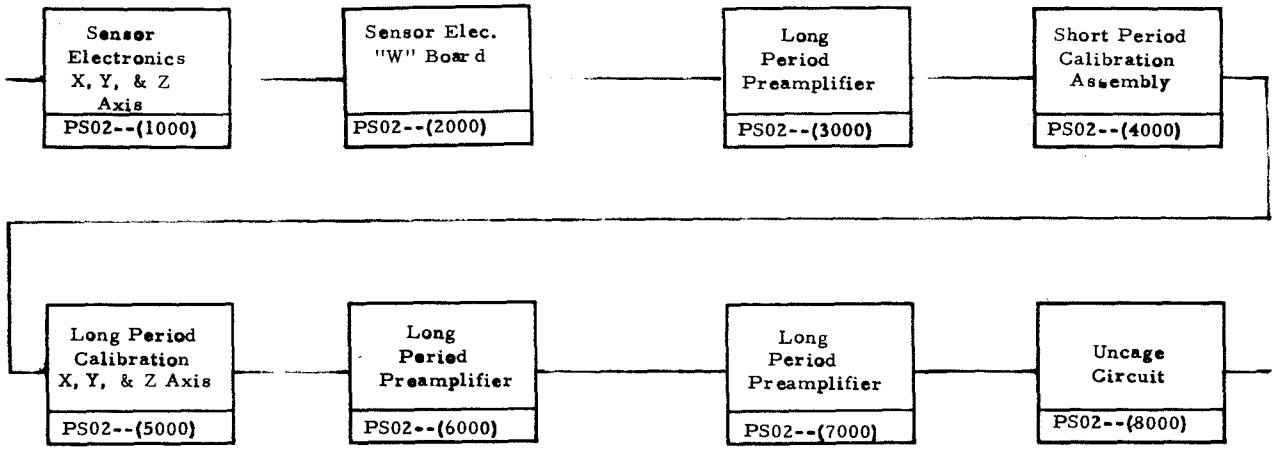

QTY REQD	DESCRIPTION	CODE IDENT	PART OR SPECIFICATION NO.	ITEM

LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.

DRAWING AND PART APPLICATION

DRAWING CLASS A ☐ B ☐ C ☐ | FINISH

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMAL .X ± .XX ± .XXX ± ANGLES ± CHAMFER ± 5°
FINISH MICROINCHES RHR
MATERIAL:

CONTR NO.		
DRAWN		
CHECKED		
STRESS/WT		
DSGN SUPV		
PROJ ENGR		
QUAL CONT		
SYS SPT		
DSGN APPL		
MFG		
CUSTOMER		

THE Bendix CORPORATION Systems Division Ann Arbor, Michigan

TITLE SENSOR ELECTRONICS
RELIABILITY BLOCK DIAGRAM
PASSIVE SEISMOMETER

SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	PS02

SCALE LEVEL 5 | WEIGHT | SHEET A39 OF AL1

FORM NO. BS-342A

K&E 10 5155 10-66•

5 | 4 | 3 | 2 | 1

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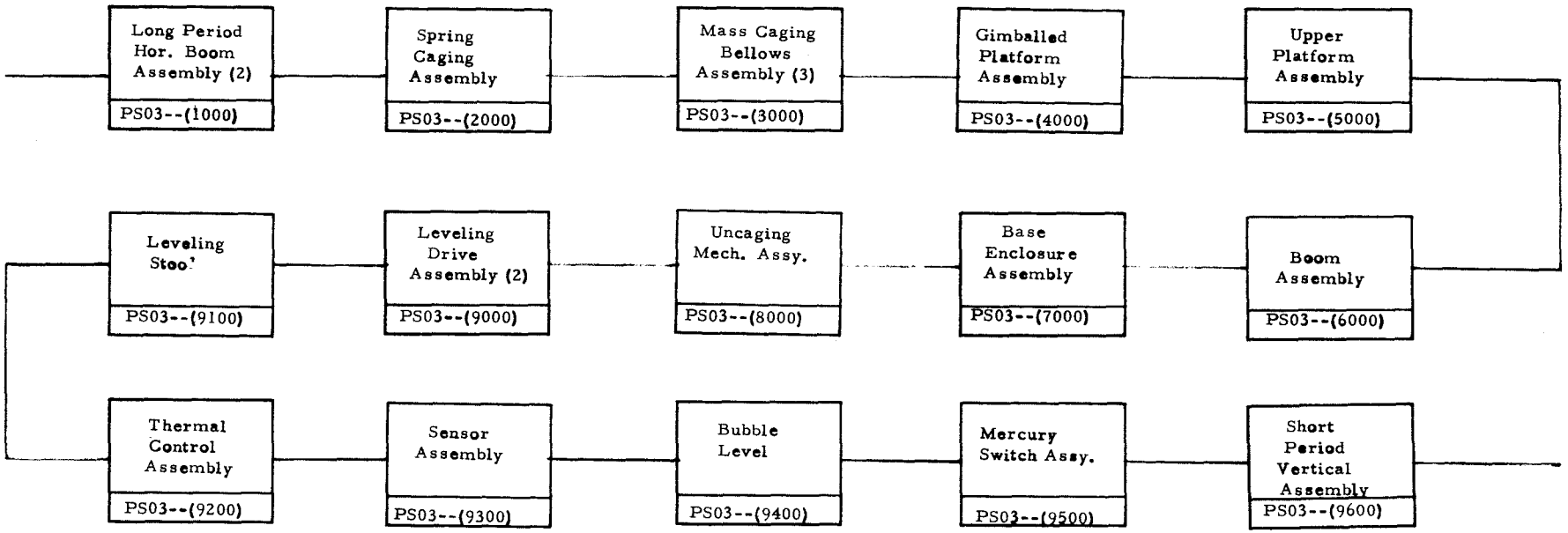

QTY REQD	DESCRIPTION	CODE IDENT	PART OR SPECIFICATION NO.	ITEM

LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.

DRAWING AND PART APPLICATION

DRAWING CLASS A ☐ B ☐ C ☐ | FINISH

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMAL .X ± .XX ± .XXX ± ANGLES ± CHAMFER ± 5°
FINISH MICROINCHES RHR
MATERIAL:

CONTR NO.	
DRAWN	
CHECKED	
STRESS/WT	
DSGN SUPV	
PROJ ENGR	
QUAL CONT	
SYS SPT	
DSGN APPL	
MFG	
CUSTOMER	

THE Bendix CORPORATION — Systems Division, Ann Arbor, Michigan

TITLE ELECTRO-MECHANICAL RELIABILITY BLOCK DIAGRAM PASSIVE SEISMOMETER

SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	PS03

SCALE LEVEL 5 | WEIGHT | SHEET A40 OF A41

FORM NO. BS-342A

K&E 10 5155 10-66•

RELIABILITY	
APPD	PREDICTION

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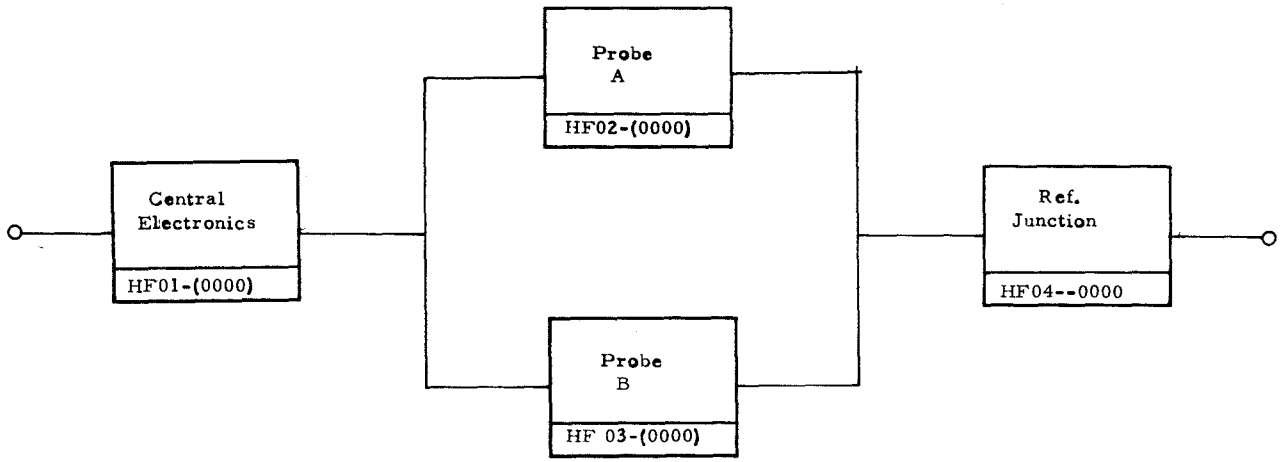
	C	REALIGNED TO CONFORM TO MATH MOD	4-28-67	NA



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LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.
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DRAWING AND PART APPLICATION

DRAWING CLASS A ☐ B ☐ C ☐ | FINISH

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMAL .X ± .XX ± .XXX ± ANGLES ± CHAMFER ± 5°
FINISH MICROINCHES RHR
MATERIAL:

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CHECKED		
STRESS/WT		
DSGN SUPV		
PROJ ENGR		
QUAL CONT		
SYS SPT	HW BEATTY	5/11/66
DSGN APPL		
MFG		
CUSTOMER		

THE Bendix CORPORATION
Systems Division
Ann Arbor, Michigan

TITLE HEAT FLOW EXPERIMENT
RELIABILITY BLOCK DIAGRAM

SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	HF00

SCALE LEVEL 4 | WEIGHT | SHEET A48 OF A61

FORM NO. BS-342A

K&E 10 5135 10-66•

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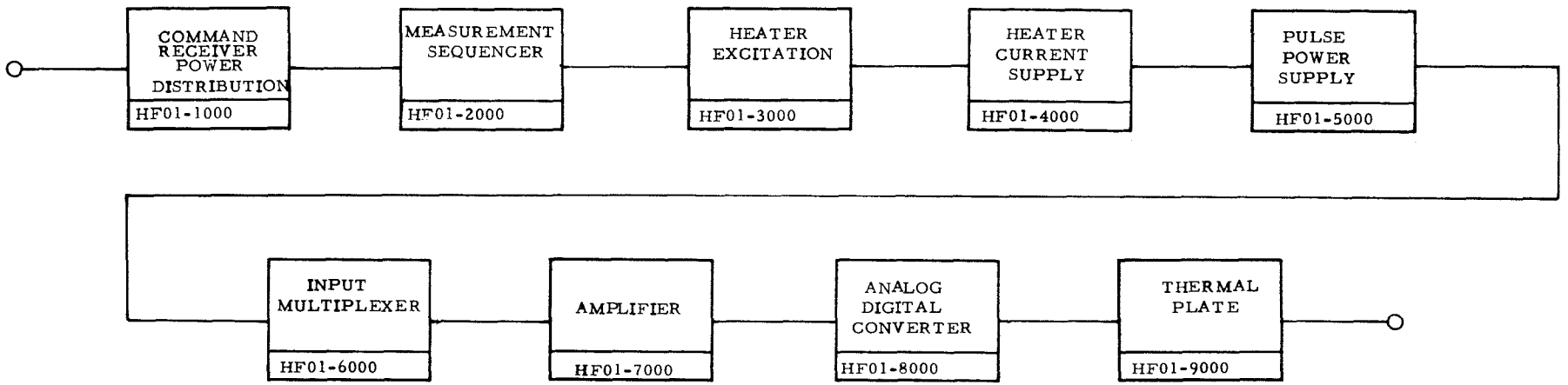

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LIST OF MATERIALS

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PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.

DRAWING AND PART APPLICATION

DRAWING CLASS A ☐ B ☐ C ☐ | FINISH

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMAL ANGLES
.X ± ±
.XX ±
.XXX ± CHAMFER ± 5°

FINISH MICROINCHES RHR

MATERIAL:

CONTR NO.	
DRAWN	
CHECKED	
STRESS/WT	
DSGN SUPV	
PROJ ENGR	
QUAL CONT	
SYS SPT	
DSGN APPL	
MFG	
CUSTOMER	

THE Bendix CORPORATION
Systems Division
Ann Arbor, Michigan

TITLE HEAT FLOW EXPERIMENT
RELIABILITY BLOCK DIAGRAM
CENTRAL ELECTRONICS

SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	HF01

SCALE LEVEL 5 | WEIGHT | SHEET A48a OF A61

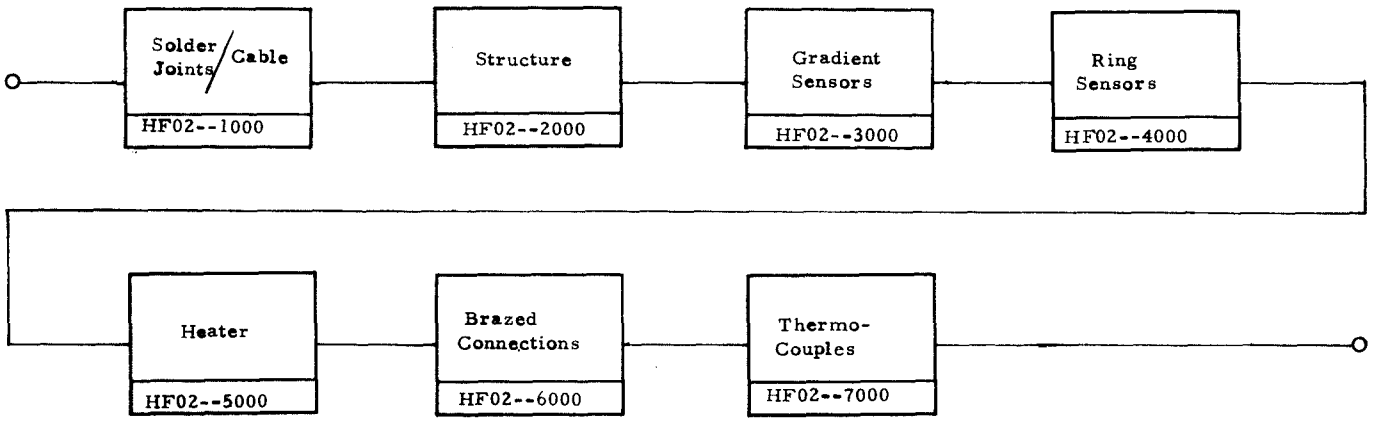
FORM NO. BS-342A

K&E 10 5155 10-66

5	4	3	2	1

RELIABILITY		REVISIONS				CONFIG MGT
APPD	PREDICTION	ZONE	LTR	DESCRIPTION	DATE	APPV'D

NOTE: THIS BLOCK DIAGRAM IS TYPICAL OF BOTH PROBES.



QTY REQD	DESCRIPTION	CODE IDENT	PART OR SPECIFICATION NO.	ITEM

LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.
	HF00		

DRAWING AND PART APPLICATION

DRAWING CLASS A ☐ B ☐ C ☐

FINISH

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMAL ANGLES
.X ± ±
.XX ±
.XXX ± CHAMFER ± 5°

FINISH MICROINCHES RHR

MATERIAL:

CONTR NO.	
DRAWN	
CHECKED	
STRESS/WT	
DSGN SUPV	
PROJ ENGR	
QUAL CONT	
SYS SPT	
DSGN APPL	
MFG	
CUSTOMER	

THE Bendix CORPORATION
Systems Division
Ann Arbor, Michigan

TITLE HEAT FLOW EXPERIMENT
RELIABILITY BLOCK DIAGRAM
PROBES

SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	HF02

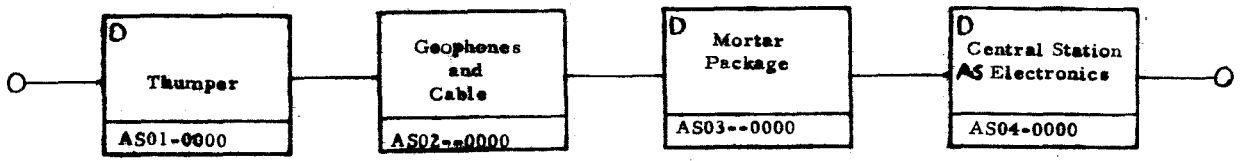
SCALE LEVEL 5 | WEIGHT | SHEET A486 OF A61

FORM NO. BS-342A

K&E 10 5155 10-66•

ATM-274 F

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPV'D
C-2	A	ADDED AS to AS04 ID	3/29/67	HR



QTY REQD	DESCRIPTION	CODE IDENT	PART OR SPECIFICATION NO.	ITEM

LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.

DRAWING AND PART APPLICATION

MATERIAL | FINISH

UNLESS OTHERWISE SPECIFIED

TOLERANCES

DECIMAL: x ± ; .xx ± ; .xxx ±

ANGLES: ± EXCEPT SPECIFIED CHAMFER ±5°

SURFACE FINISH MICROINCHES RHR

DIMENSIONS ARE IN INCHES

RADII, FILLETS, AND BREAK EDGES .005-.020

CONTRACT NUMBER

DRAWN	N. PETTUS	1/10/67
CHECKED		
STRESS		
MECH ENGR		
SYS ENGR		
QUAL CONT		
CYS SPT		

APPROVED-DESIGN

APPROVED-CUSTOMER

THE Bendix CORPORATION
BENDIX SYSTEMS DIVISION · ANN ARBOR, MICHIGAN

TITLE ACTIVE SEISMIC EXPERIMENT
RELIABILITY BLOCK DIAGRAM

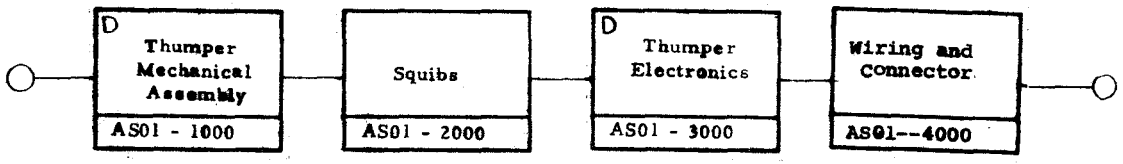
SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	AS00

SCALE | WEIGHT | SHEET A50 of A61

FORM NO. BS-342

ATM-274F

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPV'D
FD	B	REDRAWN	28SEPT 1966	N. PETTUS
1C	F	ADDED AS01-4000	3/29/67	LAux



QTY REQD	DESCRIPTION	CODE IDENT	PART OR SPECIFICATION NO.	ITEM

LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.

DRAWING AND PART APPLICATION

MATERIAL	FINISH

UNLESS OTHERWISE SPECIFIED

TOLERANCES

DECIMAL	ANGLES
x ±	±
.xx ±	EXCEPT SPECIFIED
.xxx ±	CHAMFER ±5°

SURFACE FINISH MICROINCHES RHR

DIMENSIONS ARE IN INCHES

RADII, FILLETS, AND BREAK EDGES .005-.020

CONTRACT NUMBER

DRAWN	N. PETTUS	28 SEPT 1966
CHECKED		
STRESS		
MECH ENGR		
SYS ENGR		
QUAL CONT		
SYS SPT		

APPROVED-DESIGN

APPROVED-CUSTOMER

THE Bendix CORPORATION
BENDIX SYSTEMS DIVISION · ANN ARBOR, MICHIGAN

TITLE THUMPER
RELIABILITY BLOCK DIAGRAM
ACTIVE SEISMIC

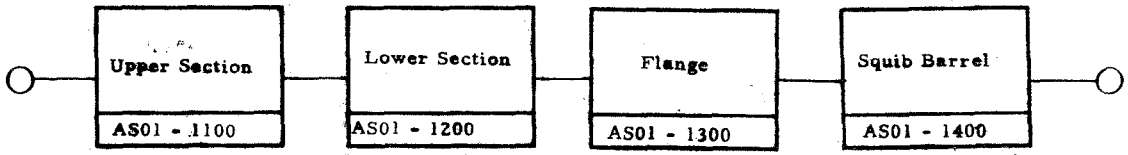
SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	AS01

SCALE LEVEL 5 | WEIGHT | SHEET A5/ OF A61

FORM NO. BS-342

ATM-Z74F

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPV'D
FD	A	REDRAW	SEPT 28 1966	N. PETTUS



QTY REQD	DESCRIPTION	CODE IDENT	PART OR SPECIFICATION NO.	ITEM

LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.	

DRAWING AND PART APPLICATION

MATERIAL | FINISH

UNLESS OTHERWISE SPECIFIED

TOLERANCES

DECIMAL: x ± | .xx ± | .xxx ±

ANGLES: ± EXCEPT SPECIFIED CHAMFER ±5°

SURFACE FINISH MICROINCHES RMR

DIMENSIONS ARE IN INCHES

RADII, FILLETS, AND BREAK EDGES .005-.020

CONTRACT NUMBER

DRAWN	N. PETTUS	SEP 28 1966
CHECKED		
STRESS		
MECH ENGR		
SYS ENGR		
QUAL CONT		
SYS SPT		

APPROVED-DESIGN

APPROVED-CUSTOMER

THE Bendix CORPORATION
BENDIX SYSTEMS DIVISION · ANN ARBOR, MICHIGAN

TITLE THUMPER MECHANICAL ASS'Y
RELIABILITY BLOCK DIAGRAM
ACTIVE SEISMIC

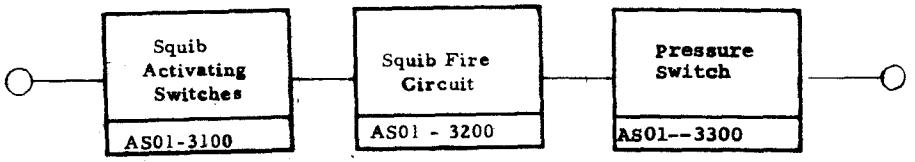
SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	AS01-1000

SCALE | WEIGHT | SHEET A52 OF A61

FORM NO. BS-342

ATM-Z74F

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPV'D
FD	A	REDRAW	SEPT 28 1966	N. PETTUS
2C	F	ADDED AS01-3300	3/29/67	F CAUX



QTY REQD	DESCRIPTION	CODE IDENT	PART OR SPECIFICATION NO.	ITEM

LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.

DRAWING AND PART APPLICATION

MATERIAL | FINISH

UNLESS OTHERWISE SPECIFIED

TOLERANCES

DECIMAL: x ± ; .xx ± ; .xxx ±

ANGLES: ± EXCEPT SPECIFIED

CHAMFER ±5°

SURFACE FINISH MICROINCHES RMR

DIMENSIONS ARE IN INCHES

RADII, FILLETS, AND BREAK EDGES .005-.020

CONTRACT NUMBER

DRAWN	N. PETTUS	28 SEPT 1966
CHECKED		
STRESS		
MECH ENGR		
SYS ENGR		
QUAL CONT		
SYS SPT		

APPROVED-DESIGN

APPROVED-CUSTOMER

THE Bendix CORPORATION
BENDIX SYSTEMS DIVISION · ANN ARBOR, MICHIGAN

TITLE THUMPER ELECTRONICS RELIABILITY BLOCK DIAGRAM ACTIVE SEISMIC

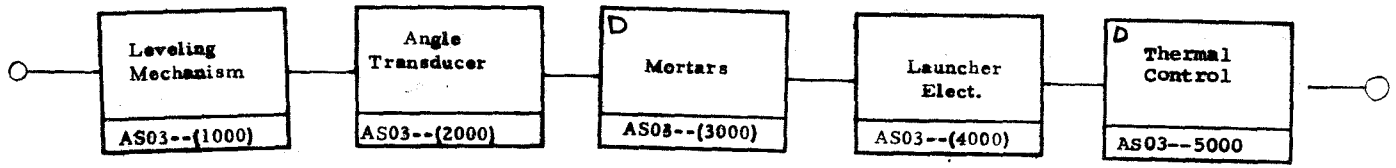
SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	ASC1-3000

SCALE | WEIGHT | SHEET A53 or A61

FORM NO. BS-342

ATM-274E

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPV'D
C	F	OMIT TRANS + MPE ADD THERMAL	3/29/67	F LAux



QTY REQD	DESCRIPTION	CODE IDENT	PART OR SPECIFICATION NO.	ITEM

LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.

DRAWING AND PART APPLICATION

MATERIAL | FINISH

UNLESS OTHERWISE SPECIFIED

TOLERANCES

DECIMAL	ANGLES
X ±	±
.XX ±	EXCEPT SPECIFIED
.XXX ±	CHAMFER ±5°

SURFACE FINISH MICROINCHES RHR

DIMENSIONS ARE IN INCHES

RADII, FILLETS, AND BREAK EDGES .005-.020

CONTRACT NUMBER

DRAWN	J. PETTUS	1/18/67
CHECKED		
STRESS		
MECH ENGR		
SYS ENGR		
QUAL CONT		
SYS SPT		

APPROVED-DESIGN

APPROVED-CUSTOMER

THE Bendix CORPORATION
BENDIX SYSTEMS DIVISION · ANN ARBOR, MICHIGAN

TITLE MORTAR PACKAGE RELIABILITY BLOCK DIAGRAM ACTIVE SEISMIC

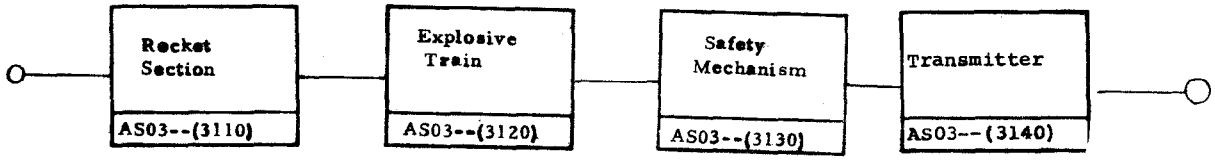
SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	AS03

SCALE | WEIGHT | SHEET A54 of A61

FORM NO. BS-342

ATM-274F

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPV'D
C	F	ADDED AS03-(3140)	3/30/67	[illegible]



QTY REQD	DESCRIPTION	CODE IDENT	PART OR SPECIFICATION NO.	ITEM

LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.	

DRAWING AND PART APPLICATION

MATERIAL | FINISH

UNLESS OTHERWISE SPECIFIED

TOLERANCES

DECIMAL: x ± ; .xx ± ; .xxx ±

ANGLES: ± EXCEPT SPECIFIED CHAMFER ±5°

SURFACE FINISH MICRODINCHES RHR

DIMENSIONS ARE IN INCHES

RADII, FILLETS, AND BREAK EDGES .005-.020

CONTRACT NUMBER

DRAWN	U. PETTUS	1/18/67
CHECKED		
STRESS		
MECH ENGR		
SYS ENGR		
QUAL CONT		
SYS SPT		

APPROVED-DESIGN

APPROVED-CUSTOMER

THE Bendix CORPORATION
BENDIX SYSTEMS DIVISION · ANN ARBOR, MICHIGAN

TITLE MORTARS
RELIABILITY BLOCK DIAGRAM
ACTIVE SEISMIC

SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	AS03-3000

SCALE | WEIGHT | SHEET A55 of A61

FORM NO. BS-342

ATM-274F

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPY'D
ALL	A	CHANGED RELIAB ID	3/29/67	[illegible]

QTY REQD	DESCRIPTION	CODE IDENT	PART OR SPECIFICATION NO.	ITEM

LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.

DRAWING AND PART APPLICATION

MATERIAL | FINISH

UNLESS OTHERWISE SPECIFIED

TOLERANCES

DECIMAL	ANGLES
x ±	±
.xx ±	EXCEPT SPECIFIED
.xxx ±	CHAMFER ±5°

SURFACE FINISH MICROINCHES RHR

DIMENSIONS ARE IN INCHES

RADII, FILLETS, AND BREAK EDGES .005-.020

CONTRACT NUMBER

DRAWN	N. PETTUS	1/16/67
CHECKED		
STRESS		
MECH ENGR		
SYS ENGR		
QUAL CONT		
SYS SPT		

APPROVED-DESIGN

APPROVED-CUSTOMER

THE Bendix CORPORATION
BENDIX SYSTEMS DIVISION · ANN ARBOR, MICHIGAN

TITLE THERMAL CONTROL
RELIABILITY BLOCK DIAGRAM
ACTIVE SEISMIC

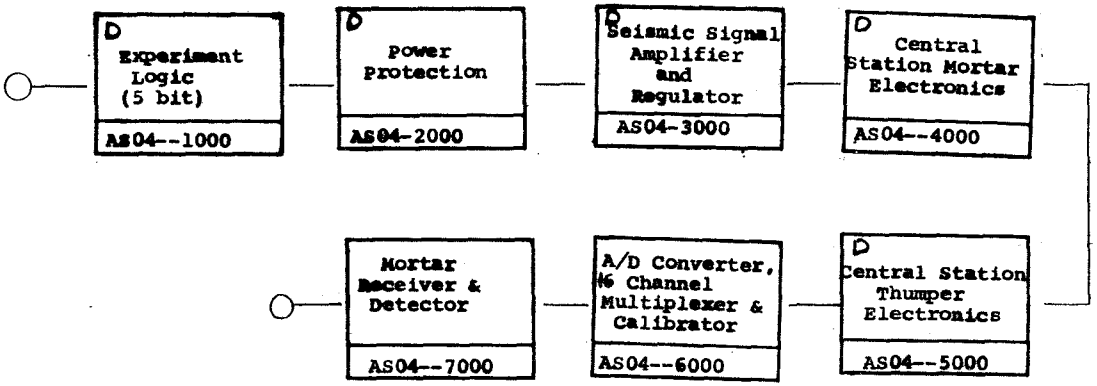
SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	AS03 5000

SCALE | WEIGHT | SHEET A5 of A61

FORM NO. BS-342

ATM-274F

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPV'D
ALL	A	ELIMINATE THERMAL CONTROL	3/29/66	
		CHANGE EXP. LOGIC + REARRANGE		



QTY REQD	DESCRIPTION	CODE IDENT	PART OR SPECIFICATION NO.	ITEM

LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.

DRAWING AND PART APPLICATION

MATERIAL | FINISH

UNLESS OTHERWISE SPECIFIED

TOLERANCES

DECIMAL: x ± ; .xx ± ; .xxx ±

ANGLES: ± EXCEPT SPECIFIED CHAMFER ±5°

SURFACE FINISH MICROINCHES RHR

DIMENSIONS ARE IN INCHES

RADII, FILLETS, AND BREAK EDGES .005-.020

CONTRACT NUMBER

DRAWN	N. PETTUS	SEPT 29 1966
CHECKED		
STRESS		
MECH ENGR		
SYS ENGR		
QUAL CONT		
SYS SPT		

APPROVED-DESIGN

APPROVED-CUSTOMER

THE Bendix CORPORATION
BENDIX SYSTEMS DIVISION · ANN ARBOR, MICHIGAN

TITLE: CENTRAL STATION ELECTRONICS RELIABILITY BLOCK DIAGRAM ACTIVE SEISMIC

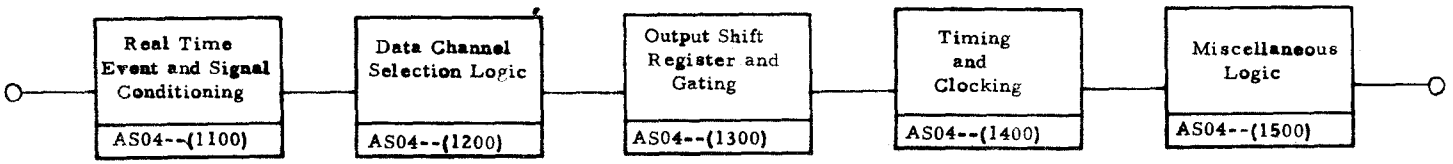
SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	AS04

SCALE | WEIGHT | SHEET A5 of A61

FORM NO. BS-342

ATM-274 F

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPV'D



QTY REQD	DESCRIPTION	CODE IDENT	PART OR SPECIFICATION NO.	ITEM

LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.

DRAWING AND PART APPLICATION

MATERIAL | FINISH

UNLESS OTHERWISE SPECIFIED

TOLERANCES

DECIMAL: x ± | .xx ± | .xxx ±

ANGLES: ± EXCEPT SPECIFIED

CHAMFER ±5°

SURFACE FINISH MICROINCHES RHR

DIMENSIONS ARE IN INCHES

RADII, FILLETS, AND BREAK EDGES .005-.020

CONTRACT NUMBER

DRAWN	N. PETTUS	JAN 13 1967
CHECKED		
STRESS		
MECH ENGR		
SYS ENGR		
QUAL CONT		
SYS SPT		

APPROVED-DESIGN

APPROVED-CUSTOMER

THE Bendix CORPORATION
BENDIX SYSTEMS DIVISION · ANN ARBOR, MICHIGAN

TITLE EXPERIMENT LOGIC
RELIABILITY BLOCK DIAGRAM
ACTIVE SEISMIC

SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	AS04-1000

SCALE | WEIGHT | SHEET 458 of A11

FORM NO. BS-342

ATM-274 F

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPV'D
C ALL	A	CHANGED RELIAB. I D	3/29/67	[illegible]

QTY REQD	DESCRIPTION	CODE IDENT	PART OR SPECIFICATION NO.	ITEM

LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.

DRAWING AND PART APPLICATION

MATERIAL | FINISH

UNLESS OTHERWISE SPECIFIED

TOLERANCES

DECIMAL: X ± | .XX ± | .XXX ±

ANGLES: ± EXCEPT SPECIFIED CHAMFER ±5°

SURFACE FINISH MICROINCHES RHR

DIMENSIONS ARE IN INCHES

RADII, FILLETS, AND BREAK EDGES .005-.020

CONTRACT NUMBER

DRAWN	N. Petrus	1/18/67
CHECKED		
STRESS		
MECH ENGR		
SYS ENGR		
QUAL CONT		
SYS SPT		

APPROVED-DESIGN

APPROVED-CUSTOMER

THE Bendix CORPORATION
BENDIX SYSTEMS DIVISION · ANN ARBOR, MICHIGAN

TITLE POWER PROTECTION UNIT
RELIABILITY BLOCK DIAGRAM
ACTIVE SEISMIC

SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	AS04-2000

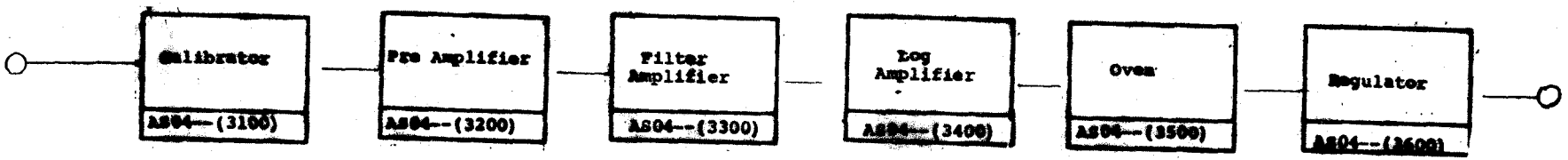
SCALE | WEIGHT | SHEET A5 of A6

FORM NO. BS-342

5 | 4 | 3 | 2 | 1

ATM-274F

RELIABILITY		REVISIONS				CONFIG MGT-
APPD	PREDICTION	ZONE	LTR	DESCRIPTION	DATE	APPV'D



QTY REQD	DESCRIPTION	CODE IDENT	PART OR SPECIFICATION NO.	ITEM

LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.

DRAWING AND PART APPLICATION

DRAWING CLASS A ☐ B ☐ C ☐ | FINISH

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMAL .X ± .XX ± .XXX ± ANGLES ±
CHAMFER ± 5°
FINISH MICROINCHES RHR
MATERIAL:

CONTR NO.		
DRAWN	F LAUX	3/31/67
CHECKED		
STRESS/WT		
DSGN SUPV		
PROJ ENGR		
QUAL CONT		
SYS SPT		
DSGN APPL		
MFG		
CUSTOMER		

THE Bendix CORPORATION
Systems Division
Ann Arbor, Michigan

TITLE SEISMIC SIGNAL AMPLIFIER AND REGULATOR ACTIVE SEISMIC

SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	AS04--3000

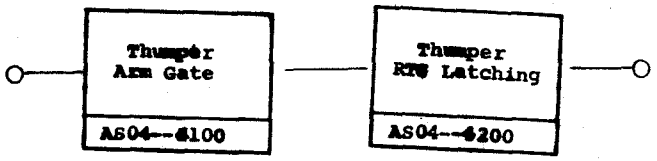
SCALE | WEIGHT | SHEET A59a of A61

FORM NO. BS-342A

K&E 10 5185 10-66*

ATM-Z74F-1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPV'D
C1D	A	CHANGED RELIAB ID #	3/29/67	JL



QTY REQD	DESCRIPTION	CODE IDENT	PART OR SPECIFICATION NO.	ITEM

LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.

DRAWING AND PART APPLICATION

MATERIAL	FINISH

UNLESS OTHERWISE SPECIFIED

TOLERANCES

DECIMAL	ANGLES
x ±	±
.xx ±	EXCEPT SPECIFIED
.xxx ±	CHAMFER ±5°

SURFACE FINISH MICROINCHES RHR

DIMENSIONS ARE IN INCHES

RADII, FILLETS, AND BREAK EDGES .005-.020

CONTRACT NUMBER

DRAWN	N. PETTUS	1-18-67
CHECKED		
STRESS		
MECH ENGR		
SYS ENGR		
QUAL CONT		
SYS SPT		

APPROVED-DESIGN

APPROVED-CUSTOMER

THE Bendix CORPORATION
BENDIX SYSTEMS DIVISION · ANN ARBOR, MICHIGAN

TITLE CENTRAL STATION THUMPER ELEC. RELIABILITY BLOCK DIAGRAM ACTIVE SEISMIC

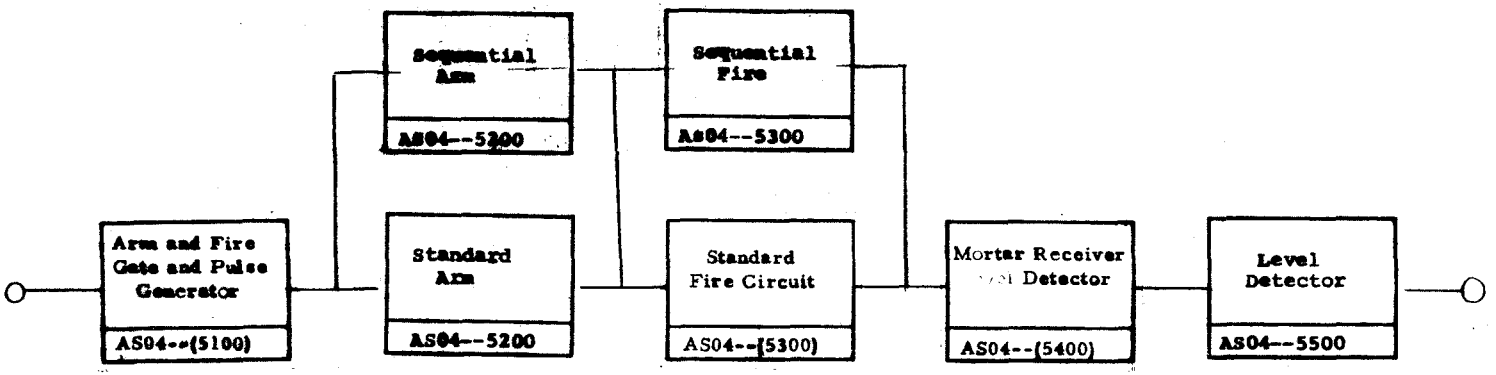
SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	AS04-4000

SCALE | WEIGHT | SHEET A60 of A61

FORM NO. BS-342

ATM-274 F

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPV'D
B3-4	A	ADDED ALTERNATE MODE 5500	3/29/61	JH



QTY REQD	DESCRIPTION	CODE IDENT	PART OR SPECIFICATION NO.	ITEM

LIST OF MATERIALS

PART NO.	NEXT ASSY	END ITEM NO.	SERIAL NO.

DRAWING AND PART APPLICATION

MATERIAL | FINISH

UNLESS OTHERWISE SPECIFIED

TOLERANCES

DECIMAL: x ± ; .xx ± ; .xxx ±

ANGLES: ± EXCEPT SPECIFIED CHAMFER ±5°

SURFACE FINISH MICROINCHES RHR

DIMENSIONS ARE IN INCHES

RADII, FILLETS, AND BREAK EDGES .005-.020

CONTRACT NUMBER

DRAWN	N. PETTUS	11/8/67
CHECKED		
STRESS		
MECH ENGR		
SYS ENGR		
QUAL CONT		
SYS SPT		

APPROVED-DESIGN

APPROVED-CUSTOMER

THE Bendix CORPORATION
BENDIX SYSTEMS DIVISION · ANN ARBOR, MICHIGAN

TITLE CENTRAL STATION MORTAR ELEC. RELIABILITY BLOCK DIAGRAM ACTIVE SEISMIC

SIZE	CODE IDENT NO.	DRAWING NUMBER
B	07038	AS04-5000

SCALE | WEIGHT | SHEET A60a of A61

FORM NO. BS-342

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
ELECTRICAL POWER SUBSYSTEM PW00	ATM-274	F

RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: 10^5 λ	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: HRS t	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
PW01(0000)	NO DETAIL	RPW01 (0000) = .999996			GB	G.F.E. COMPONENT	FLIGHT HANDLING TOOL	
PW02(0000)	NO DETAIL	RPW02 (0000) = .999956		8760	T	G.F.E. COMPONENT	GENERATOR ASSEMBLY	
PW03(0000)	NO DETAIL	RPW03 (0000) = .999996			GE B	G.F.E. COMPONENT	FUEL CAPSULE AND CASK ASSEMBLY	
PW04(0000)	DETAIL	$\prod_{i=1}^{i=3}$ RPW04(i000) = .987733		8760	T	BENDIX AEROSPACE	POWER CONDITIONING UNIT	
PW05(0000)	NO DETAIL	RPW05 = .999900		8760	BA	G.F.E COMPONENT	PCU/PDU CABLE	

970-9

SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
POWER CONDITIONING UNIT PW04-1000	ATM-274	F
	PAGE B5 OF B61 PAGES	

RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5\lambda$	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: HRS t	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
PW04 (1000)	DETAIL	$\prod_{i=1}^{i=2} RPW04(1i00) = .988920$		8760	P		SENSORS AND AUTO-COMMAND SWITCHOVER	
PW04 (2000)	DETAIL	$\prod_{i=1}^{i=2} RPW04(2i00)$	.00165	8760	P		REGULATOR + INVERTER	
	(a)	(a) = .992123			FB			
	(b)	(b) = .999855						
PW04 (3000)	DETAIL	$\prod_{i=1}^{i=2} RPW04(3i00)$	.012	8760	P		TRANSFORMER RECTIFIER FILTER	
	(a)	(a) = .996889			FB			
	(b)	(b) = .998945						

970-9

SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
SENSORS AUTOMATIC AND COMMAND SWITCHOVER PW04 (1100)	ATM-274	F
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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: 10^5 λ	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: HRS t	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
PW04(1100)	DETAIL	$\prod_{i=1}^{i=3}$ RPW04(1100) = .992032	.091	.0198	PA		SENSORS TOTAL	
PW04(1110)	NO DETAIL	RPW04 (1110) = .998339	.0198	.0368	PA		THERMAL SENSORS	
PW04(1120)	NO DETAIL	RPW04 (1120) = .996777	.0368	.0354	PA		CURRENT SENSORS	
PW04(1130)	NO DETAIL	RPW04 (1130) = .996894	.0354	.0358	PA		VOLTAGE SENSORS	
PW04(1200)	NO DETAIL	RPW04 (1200) = .996866	.0358	8760.	PA		AUTOMATIC AND COMMAND SWITCHOVER	

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SHEET ____ OF ____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
REGULATOR A-B INVERTER A-B PW04 (2100)	ATA1-274	F
	PAGE 6 OF Rev1 PAGES	

RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS		PARAMETRIC VALUES FROM PAST DATA & PREDICTION						MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE	RELIABILITY PREDICTION WORKSHEET REFERENCE
	CODE IDENT.	RELIABILITY FUNCTION R =	10^5 λ	HRS t	F						INCLUDE REFERENCE DESIGNATION	DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
PW04 (2100)	NO DETAIL (a)	RPW04 (2100) (a) = .995640	.04917 .000228 .0403 .00142	8760					A	NORMALLY ACTIVE	REGULATOR "A"	
PW04 (2200)	NO DETAIL (b)	RPW04 (2200) (b) = .999980		8760	.52				PA	NORMALLY INACTIVE	REGULATOR "B"	
PW04 (2300)	NO DETAIL (a)	RPW04 (2300) (a) = .996468		8760					A	NORMALLY ACTIVE	INVERTER "A"	
PW04 (2400)	NO DETAIL (b)	RPW04 (2400) (b) = .999875							PA	NORMALLY INACTIVE	INVERTER "B"	

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
TRANSFORMER - RECTIFIER A-B FILTER PW04(3100)	ATM-214	E

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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5 \lambda$	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: HRS t	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
PW04(3100)	DETAIL (a)	$\prod_{i=1}^{i=2}$ RPW04(3100) $i=1$ (a) = .999937	.02335	8760	PA	NORMALLY ACTIVE	TRANSFORMER - RECTIFIER "A"	
PW04(3200)	NO DETAIL (b)	RPW04(3200) (b) = .999995	.000057	8760	P	NORMALLY INACTIVE	TRANSFORMER - RECTIFIER "B"	
PW04(3300	DETAIL	$\prod_{i=1}^{i=6}$ RPW04(3300) $i=1$ = .998950	.01198	8760	PA		FILTER	

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
TRANSFORMER "A" RECTIFIER "A" PW04 (3110)	ATM-374	F
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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: 10^5 λ	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: HRS t	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
PW04 (3110)	NO DETAIL	RPW04 (3110) = .999825	.001994 .021552	8760	P.A.		TRANSFORMER "A"	
PW04 (3120)	NO DETAIL	RPW04 (3120) = .998112		8760	P.A		RECTIFIER "A"	

NOTE:- TRANSFORMER "A" IS IDENTICAL TO TRANSFORMER "B"

RECTIFIER "A" IS INDENTICAL TO RECTIFIER "B",

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
FILTER PW04 (3310)	ATA-27Y	F

RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5 \lambda$	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: HRS t	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
PW04 (3310)	NO DETAIL	RPW04 (3310) = .999825	.001997 .001997 .001997 .001997 .001997 .001997 .001997	8760	P.A.		+5VDC FILTER	
PW04 (3320)	NO DETAIL	RPW04 (3320) = .999825		8760	P.A.		-6VDC FILTER	
PW04 (3330)	NO DETAIL	RPW04 (3330) = .999825		8760	P.A.		-12VDC FILTER	
PW04 (3340)	NO DETAIL	RPW04 (3340) = .999825		8760	P.A.		+12VDC FILTER	
PW04 (3350)	NO DETAIL	RPW04 (3350) = .999825		8760	P.A.		+15VDC FILTER	
PW04 (3360)	NO DETAIL	RPW04 (3360) = .999825		8760	P.A.		+29VDC FILTER	

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
PASSIVE SEISMIC	ATM-374	F
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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: 10^5 λ	HRS t	F				MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
PS00-(0000)	DETAIL	$\prod_{i=1}^{3} (e^{-\lambda t} \cdot e^{-F\lambda})_i$ 0.901297							EB A P			
PS01-(0000)	DETAIL	$\prod_{i=1}^{15} (e^{-\lambda t} \cdot e^{-F\lambda})_i$ 0.934023							EB A P			
PS02-(0000)	DETAIL	$\prod_{i=1}^{8} (e^{-\lambda t} \cdot e^{-F\lambda})_i$ 0.970194							EB A P			
PS03-(0000)	DETAIL	$\prod_{i=1}^{15} (e^{-\lambda t} \cdot e^{-F\lambda})_i$ 0.994609							EB A P			

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
PASSIVE SEISMIC	ATM-274	F

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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: 10^5 λ	HRS t	F	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
PS01-(0000)	DETAIL	$\prod_{i=1}^{15} (e^{-\lambda t} \cdot e^{-F\lambda})_i$ = 0.934023				EB AP			
PS01-(1000)	NO DETAIL	0.999850							
PS01-(2000)	NO DETAIL	0.997748							
PS01-(3000)	NO DETAIL	0.993580							
PS01-(4000)	NO DETAIL	0.997693							
PS01-(5000)	NO DETAIL	0.995266							
PS01-(6000)	NO DETAIL	0.995449							
PS01-(7000)	NO DETAIL	0.995478							
PS01-(8000)	NO DETAIL	0.995478							
PS01-(9000)	NO DETAIL	0.999992							
PS01-(9100)	NO DETAIL	0.999992							
PS01-(9200)	NO DETAIL	0.999992							
PS01-(9300)	NO DETAIL	0.996269							
PS01-(9400)	NO DETAIL	0.995711							
PS01-(9500)	NO DETAIL	0.996373							
PS01-(9600)	NO DETAIL	0.997601							

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
PASSIVE SEISMIC	ATM-274	F
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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5/\lambda$	HRS / t	F				MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
PS02-(0000)	DETAIL	$\prod_{i=1}^{8} (e^{\lambda t}, e^{Ft})_i$ 0.970194							EB A P			
PS02-(1000)	NO DETAIL	0.977821										
PS02-(2000)	NO DETAIL	0.993563										
PS02-(3000)	NO DETAIL	0.999683										
PS02-(4000)	NO DETAIL	0.999961										
PS02-(5000)	NO DETAIL	0.999615										
PS02-(6000)	NO DETAIL	0.999683										
PS02-(7000)	NO DETAIL	0.999683										
PS02-(8000)	NO DETAIL	0.999994										

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
PASSIVE SEISMIC	ATM-274	F
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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: 10^5 / λ	HRS / t	F	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
PS03-(0000)	DETAIL	$\prod_{i=1}^{15} (e^{-\lambda t} \cdot e^{-F\lambda})_i$ 0.994609				EB A P			
PS03-(1000)	NO DETAIL	0.999860							
PS03-(2000)	NO DETAIL	0.999960							
PS03-(3000)	NO DETAIL	0.999765							
PS03-(4000)	NO DETAIL	0.998101							
PS03-(5000)	NO DETAIL	0.997653							
PS03-(6000)	NO DETAIL	0.999930							
PS03-(7000)	NO DETAIL	0.999465							
PS03-(8000)	NO DETAIL	0.999994							
PS03-(9000)	NO DETAIL	0.999752							
PS03-(9100)	NO DETAIL	0.999998							
PS03-(9200)	NO DETAIL	0.999998							
PS03-(9300)	NO DETAIL	0.999946							
PS03-(9400)	NO DETAIL	0.999998							
PS03-(9500)	NO DETAIL	0.999996							
PS03-(9600)	NO DETAIL	0.999967				↓			

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
HEAT FLOW EXPERIMENT HF 00	ATM 274	E
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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS		PARAMETRIC VALUES FROM PAST DATA & PREDICTION						MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE	RELIABILITY PREDICTION WORKSHEET REFERENCE
	CODE IDENT.	RELIABILITY FUNCTION R =	10^5 λ	HRS t	F						INCLUDE REFERENCE DESIGNATION	DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
HF01--(0000)	DETAIL	$TTRHF01--(\lambda 000)$ $Q = 0.902491$	1.1_{934}	8_{760}	.52				P		CENTRAL ELECTRONICS	GULTON IND. PREDICTION
HF02--(0000)	DETAIL	$RHF02--(0000)$ $b = 0.946382$	$.61_{25}$	8_{760}	.52				P	PROBE "A" AND PROBE "B" IN PARALLEL CONFIGURATION	PROBE "A"	A.D. LITTLE PREDICTION
HF03--(0000)	DETAIL	$RHF03--(0000)$ $c = 0.946382$	$.61_{25}$	8_{760}	.52				P		PROBE "B"	A. D. LITTLE PREDICTION
HF04--(0000)	DETAIL	$RHF04--(0000)$ $d = 0.999334$	$.0_{190}$	8_{760}	.52				P		REF. JUNCTION	A.D. LITTLE PREDICTION
HF00--(0000)	TOTAL	$RHF00--(0000)$ $R_T = 0.899297$								$R_T = ad(b+c-bc)$	HEAT FLOW EXPERIMENT	

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
HEAT FLOW ELECTRONICS HF 01	ATM 274	F
	PAGE B42 OF B61 PAGES	

$R_{HFE} = 1 - \lambda t + \frac{\lambda t^2}{2}$

RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5 \lambda$	HRS t	F	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE (INCLUDE REFERENCE DESIGNATION)	RELIABILITY PREDICTION WORKSHEET REFERENCE (DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT)
HF01--(0000)	DETAIL	0.902491	1.1734	87.60	.52	P			GULTON IND. PREDICTION
HF01--(1000)	DETAIL	0.98458	.1774					COMMAND RECEIVER & POWER DISTRIBUTION	
HF01--(2000)	DETAIL	0.996688	.0378					MEASUREMENT SEQUENCER	
HF01--(3000)	DETAIL	0.990679	.1064					HEATER EXCITATION	
HF01--(4000)	DETAIL	0.997433	.0293					HEATER CURRENT SUPPLY	
HF01--(5000)	DETAIL	0.994437	.0635					PULSE POWER SUPPLY	
HF01--(6000)	DETAIL	0.961281	.4509					MULTIPLEXER	
HF01--(7000)	DETAIL	0.995436	.0521					AMPLIFIER	
HF01--(8000)	DETAIL	0.977998	.2540					A-D CONVERTER	
HF01--(9000)	DETAIL	0.999825	.0020					THERMAL PLATE	

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
HEAT FLOW PROBES HF02, HF03	ATM 274	F
	PAGE B42a	OF B61 PAGES

RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^6/\lambda$	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: HRS / t	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE (INCLUDE REFERENCE DESIGNATION)	RELIABILITY PREDICTION WORKSHEET REFERENCE (DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT)
		$R_{HFP} = e^{-n_i \lambda_i t}$						
HF02--(0000)	DETAIL	0.946382	.61 25	8760	P			A.D. LITTLE PREDICTION
HF02--(1000)	DETAIL	0.999920	.0031	8760	P		SOLDER JOINTS AND CABLE	
HF02--(2000)	DETAIL	0.999800	—	8760	P		STRUCTURE	
HF02--(3000)	DETAIL	0.973958	3.000	8760	P		GRADIENT SENSORS	
HF02--(4000)	DETAIL	0.973958	3.000	8760	P		RING SENSORS	
HF02--(5000)	DETAIL	0.998580	.1620	8760	P		HEATER	
HF02--(6000)	DETAIL	0.999948	.00005	8760	P		BRAZED CONNECTIONS	
HF02--(7000)	DETAIL	0.999469	.0150	8760	P		THERMO COUPLES	
HF02 = HF03		$R_T = 0.946382$			P	EITHER PROBE		

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
ACTIVE SEISMIC EXPERIMENT	ATM-274	F
	PAGE 846 OF 861 PAGES	

RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: 10^5 λ	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: HRS t	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE - TEST REPORT NO. & DATE FOR ASSESSMENT
AS01-(0000)	DETAIL	$\prod_{L=1}^{L=3} R_{AS01-(L000)}$	See Note Below		A	$e^{-\lambda t}$ =	THUMPER	
					PB	$e^{-\lambda F}$ =		
					P	$R_{A_0} \cdot R_{A_1} \cdot R_{PB} = 0.999996$		
AS02-(0000)	NO DETAIL	$R_{AS02-(0000)}$	501.0	13.8747	A_0	$e^{-\lambda t} = 0.99998635$	GEOPHONES AND CABLE	
					A_1	$e^{-\lambda tk} = 0.99990818$		
					PB	$e^{-\lambda F} = 0.99999454$		
					P	$R_{A_0} \cdot R_{A_1} \cdot R_{PB} = 0.999889$		
AS03-(0000)	DETAIL	$\prod_{L=1}^{L=} R_{AS03-(L000)}$	See Note Below		A_0	$e^{-\lambda t}$ =	MORTAR PACKAGE	
					A_1	$e^{-\lambda tk}$ =		
					PB	$e^{-\lambda F}$ =		
					P	$R_{A_0} \cdot R_{A_1} \cdot R_{PB} = 0.997686$		
AS04-(0000)	DETAIL	$\prod_{L=1}^{L=} R_{AS04-(L000)}$	See Note Below		A_0	$e^{-\lambda t}$	CENTRAL STATION AS ELECTRONICS	
					A_1	$e^{-\lambda tk}$		
					PB	$e^{-\lambda F}$		
					P	$R_{A_0} \cdot R_{A_1} \cdot R_{PB} = 0.999426$		

Note: The probabilities for certain devices have been calculated using both Electronic and Electromechanical "F" factors and therefore the reader is referred to the detailed Math Model sheets for these calculations

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RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
THUMPER	ATM 274	F
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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5\lambda$	HRS t	F	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
AS01-1000	DETAIL	$\prod_{i=1}^{\lambda=} R_{AS01-(1,i,00)}$	0.0064	0.5	520	A	$e^{-\lambda t} = 0.999999968$	THUMPER MECHANICAL ASSEMBLY	
						PB	$e^{-\lambda F} = 0.999996668$		
						P	$R_A \cdot R_{PB} = 0.99999664$		
AS01-2000	NO DETAIL	$R_{AS01-2000}$	1.00	1.0 CYCLE EA	.52	A	$e^{-\lambda t} = 0.9999999$	SQUIBS	13 OF 21 REQUIRED FOR FULL SUCCESS.
						PB	$e^{-\lambda F} = 0.9999999$		
			SEE NOTE			P	$R_A \cdot R_{PB} = 0.99999.9$		
AS01-3000	DETAIL	$\prod_{i=1}^{\lambda=} R_{AS01-(3,i,00)}$	0.00591			A	Note: Both Electromechanical and Electronic Components are used – See detail sheet for Reliability Calculations	THUMPER ELECTRONICS	
						PB			
						P	$R_A \cdot R_{PB} = 0.99999995$		
AS01-4000	NO DETAIL	$\prod_{i=1}^{\lambda=} R_{AS01-(4,i,00)}$	0.052	0.5	5.2	P	$R_A \cdot R_{PB} = 0.999999947$	WIRING AND CONNECTOR	

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
THUMPER MECHANICAL ASSY.	ATM-274	F
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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5 \lambda$	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: HRS t	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
AS01-1100	NO DETAIL	RAS01-1100	0.0016	1.0	A	$e^{-\lambda t} = 0.999999984$	UPPER SECTION	
				52.0	PB	$e^{-\lambda F} = 0.999999168$		
					P	$R_A \cdot R_{PB} = 0.999999152$		
AS01-1200	NO DETAIL	RAS01-1200	0.0016	1.0	A	$e^{-\lambda t} = 0.999999984$	LOWER SECTION	
				52.0	PB	$e^{-\lambda F} = 0.999999168$		
					P	$R_A \cdot R_{PB} = 0.999999152$		
AS01-1300	NO DETAIL	RAS01-1300	0.0016	1.0	A	$e^{-\lambda t} = 0.999999984$	FLANGE	
				52.0	PB	$e^{-\lambda F} = 0.999999168$		
					P	$R_A \cdot R_{PB} = 0.999999152$		
AS01-1400	NO DETAIL	RAS01-1400	0.0016	1.0	A	$e^{-\lambda t} = 0.999999984$	SQUIB BARREL	
				52.0	PB	$e^{-\lambda F} = 0.999999168$		
					P	$R_A \cdot R_{PB} = 0.999999152$		
						TOTAL $R = 0.999996640$		

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
THUMPER · ELECTRONICS	ATM-274	F
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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5\lambda$	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: HRS t	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: E	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
ASO1-3100	NO DETAIL	RASO1-3100	0.0013944	0.5	5.2	A	$e^{-\lambda t} = 0.99999999$	SQUIB ACTUATING SWITCHES	
						PB	$e^{-\lambda F} = 0.99999999$		
						P	$R_A \cdot R_{PB} = 0.99999998$		
ASO1-3200	NO DETAIL	RASO1-3200	0.0004427	0.5	0.52	A	$e^{-\lambda t} = 0.99999998$	SQUIB FIRE CIRCUIT	
						PB	$e^{-\lambda F} = 0.99999998$		
						P	$R_A \cdot R_{PB} = 0.99999997$		
ASO1-3300	NO DETAIL	RASO1-3300	0.001	0.5	0.52	A	$e^{-\lambda t} = 0.99999999$	PRESSURE SWITCH	
						PB	$e^{-\lambda F} = 0.99999999$		
						P	$R_A \cdot R_{PB} = 0.99999998$		
							TOTAL R = 0.99999995		

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
MORTAR PACKAGE	ATM-274	F

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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5\lambda$	HRS t	F	K	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
AS03-1000	No Detail	RAS03-1000	0.0462	0.5 8760	52.0	.001	A_o	$e^{-\lambda t} = 0.99999976$	Leveling Mechanism	
							A_1	$e^{-\lambda tk} = 0.99999960$		
							PB	$e^{-\lambda F} = 0.99999854$		
							P	$R_{A_o} \cdot R_{A_1} \cdot R_{PB} = 0.99999893$		
AS03-2000	No Detail	RAS03-2000	0.0144	13 8741	52.0	0.01	A_o	$e^{-\lambda t} = 0.99999251$	Angle Transducer	
							A_1	$e^{-\lambda tk} = 0.99998741$		
							PB	$e^{-\lambda F} = 0.99999813$		
							P	$R_{A_o} \cdot R_{A_1} \cdot R_{PB} = 0.99997805$		
AS03-3000	Detail	$\prod_{L=1}^{L=3} R_{AS03-(3,00)}$	1.808	1 cycle 8760	5.2	.001	A_o	$e^{-\lambda t} = 0.99999100$	Mortars	
							A_1	$e^{-\lambda tk} = 0.99984160$		
							PB	$e^{-\lambda F} = (0.99999548)^4$		
							P	$R_{A_o} \cdot R_{A_1} \cdot R_{PB} = 0.99981452$		

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
MORTAR PACKAGE	ATM 274	F
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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5 \lambda$	HRS t	F	K			MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
AS03-4000	NO DETAIL	RAS03 - 4i00	.11013	0.5 8760	0.25	0.001			A_0	$e^{-\lambda t} = .99999943$		
									A_1	$e^{-\lambda t_M} = .99999035$	Launcher Elect.	
									P_B	$e^{-\lambda F} = .99999949$		
									P	$R_{A0} \cdot R_{A1} \cdot R_{PB} = .99998927$		
AS03-5000	DETAIL	RAS03- 5i00	0.04777	4360 - 4360	0.52	.001			A_0	$e^{-\lambda t} = .99790867$	Thermal control	
									A_1	$e^{-\lambda t_M} = .99999791$		
									P_B	$e^{-\lambda F} = .99999975$		
									P	$R_{A0} \cdot R_{A1} R_{PB} = .99790767$		

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
Mortars	ATM-274	F
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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5\lambda$	HRS t					MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
AS03-3100	No Detail	RAS03-3100	0.078	1.0 8760	525	.01			A_0	$e^{-\lambda t} = 0.99999922$	Rocket Section	
									A_1	$e^{-\lambda tk} = 0.99993168$		
									P_B	$e^{-\lambda F} = 0.99995944$		
									P	$R_{A_0} \cdot R_{A_1} \cdot R_{P_B} = 0.99989034$		
AS03-3120	No Detail	RAS03-3200	0.042	1.0 8760	525	0.01			A_0	$e^{-\lambda t} = 0.99999958$	Explosive Train	
									A_1	$e^{-\lambda tk} = 0.99996321$		
									P_B	$e^{-\lambda F} = 0.99997816$		
									P	$R_{A_0} \cdot R_{A_1} \cdot R_{P_B} = 0.99994096$		
AS03-3130	No Detail	RAS03-3300	0.202	1.0 8760	5.2	001			A_0	$e^{-\lambda t} = 0.99999798$	Safety Mechanism	
									A_1	$e^{-\lambda tk} = 0.99982305$		
									P_B	$e^{-\lambda F} = 0.9999895$		
									P	$R_{A_0} \cdot R_{A_1} \cdot R_{P_B} = 0.99981055$		
AS03-3140	No DETAIL	RAS03-3400	0.7720, 0.4370, 0.1517	1.0 8760	0.52	0.001			A_0	$e^{-\lambda t} = 0.99999228$		
									A_1	$e^{-\lambda tk} = 0.99996172$	TRANSMITTER	
									P_B	$e^{-\lambda F} = 0.99999930$		
									P	$R_{A_0} \cdot R_{A_1} \cdot R_{P_B} = 0.99996085$		

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME: THERMAL CONTROL | NO. ATM-274 | REV. NO. F | PAGE B 520 OF B61 PAGES

RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: 10^5 HRS λ	t	E	L	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
AS03-5100	NO DETAIL	RAS04-2100 $\prod_{i=1}^{3}(e^{-t\lambda}e^{-tK\lambda}\cdot e^{-tK\lambda})_i$	600.	8760	0.52		A	$e^{-\lambda t}$ = 0.99921160	TEMPERATURE SENSORS	
							PB	$e^{-\lambda F}$ = 0.999999955		
							P	$R_A \cdot R_{PB}$ = 0.99921156		
AS03-5200	NO DETAIL	RAS04-2200 $\prod_{i=1}^{2}(e^{-t\lambda}e^{-tK\lambda}\cdot e^{-tK\lambda})_i$	60000	8760	0.52		A	$e^{-\lambda t}$ = 0.9991451	HEATER AND CONTROL	
							PB	$e^{-\lambda F}$ = 0.9999999950		
							P	$R_A \cdot R_{PB}$ = 0.9991450		
AS03-5300	NO DETAIL	RAS04-2300 $\prod(e^{-t\lambda}e^{-tK\lambda}\cdot e^{-tK\lambda})$	0.003	8760	.52		A	$e^{-\lambda t}$ = 0.9997372	ISOLATION CIRCUIT	
							PB	$e^{-\lambda F}$ = 0.99999985		
							P	$R_A \cdot R_{PB}$ = 0.99973705		

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
CENTRAL STATION ELECTRONICS	ATM-27Y	F
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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5 \lambda$	HRS t	F	K			MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
AS04-1000	DETAIL	$\prod_{i=1}^{5}$ RAS04-(1:00)	0.3458	13,8747	0.52	0.001			A_0	$e^{-\lambda t} = .99997072$	EXPERIMENT LOGIC 5 BIT	
									A_1	$e^{-\lambda t K} = .99995505$		
									P_B	$e^{-\lambda F} = .99999821$		
									P	$R_{A0} \cdot R_{A1} \cdot R_{PB} = .99992398$		
AS04-2000	DETAIL	$\prod_{i=1}^{3}$ RAS04-(3:00)		13,8747					A_0	$e^{-\lambda t}$		
									A_1	} COMPUTED ON DETAIL SHEETS SINCE A COMBINATION OF ELECTRONIC AND ELECTOMECHANICAL COMPONENTS ARE USED	POWER PROTECTION UNIT	
									P_B			
AS04-3000	DETAIL	$\prod_{i=1}^{4}$ RAS04-(4:00)		13,8747	0.52	0.001			A_0	$e^{-\lambda t}$		
									A_1	$e^{-\lambda t K}$		
									P_B	$e^{-\lambda F}$	SEISMIC SIGNAL AMPLIFIER AND REGULATOR	
									P	$R_{A0} \cdot R_{A1} \cdot R_{PB} = .99999095$		

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
CENTRAL STATION ELECTRONICS	ATM-274	F
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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: 10^5 λ	HRS t					MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
AS04-4000	DETAIL	$\prod_{L=1}^{L=} R_{AS04-(5100)}$	0.07832	0.5 8760	0.52	0.001			A_0	$e^{-\lambda t} = 0.99999960$	CENTRAL STATION MORTAR ELECTRONICS	
									A_1	$e^{-\lambda tk} = 0.99999832$		
									PB	$e^{-\lambda F} = 0.99999971$		
									P	$R_{A_0} \cdot R_{A_1} \cdot R_{PB} = 0.99998957$		
AS04-5000	DETAIL	$\prod_{L=1}^{L=} R_{AS04-(6100)}$	0.01379	0.5 8760	0.52	0.001			A_0	$e^{-\lambda t} = 0.99999993$	CENTRAL STATION THUMPER ELECTRONICS	
									A_1	$e^{-\lambda tk} = 0.99999879$		
									PB	$e^{-\lambda F} = 0.99999410$		
									P	$R_{A_0} \cdot R_{A_1} \cdot R_{PB} = 0.99999813$		
AS04-6000	NO DETAIL	RAS04-7000	0.008 0.23110	13 9747	0.52	0.001			A_0	$e^{-\lambda t} = 0.99999880$	A/D CONVERTER AND 16 CHANNEL MULTIPLEXER AND CALIBRATOR	
									A_1	$e^{-\lambda tk} = 0.99997972$		
									PB	$e^{-\lambda F} = 0.99996991$		
									P	$R_{A_0} \cdot R_{A_1} \cdot R_{PB} = 0.99994843$		
AS04-7000	NO DETAIL	$\prod_{L=1}^{L=} R_{AS04-(8100)}$	0.12465	.13 9760	0.52	0.001			A_0	$e^{-\lambda t} = 0.99999935$	MORTAR RECEIVER AND DETECTOR	
									A_1	$e^{-\lambda tk} = 0.99998906$		
									PB	$e^{-\lambda F} = 0.99999984$		
									P	$R_{A_0} \cdot R_{A_1} \cdot R_{PB} = 0.99998240$		

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RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME Experiment Logic | NO. ATM-294 | REV. NO. F | PAGE B54 OF B61 PAGES

RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5\lambda$	HRS t					MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
AS04-1100	No Detail	RAS04-(1100)	0.296	1.0 8760	0.52	0.001			A_o	$e^{-\lambda t} = 0.99999704$	Real Time Event and Signal Conditioning	
									A_1	$e^{-\lambda tk} = 0.99997408$		
									PB	$e^{-\lambda F} = 0.99999846$		
									P	$R_{A_o} \cdot R_{A_1} \cdot R_{PB} = 0.99996958$		
AS04-1200	No Detail	RAS04-(1200)	0.1158	1.0 8760	0.52	0.001			A_o	$e^{-\lambda t} = 0.99999884$	Data Channel Selection Logic	
									A_1	$e^{-\lambda tk} = 0.99998985$		
									PB	$e^{-\lambda F} = 0.99999939$		
									P	$R_{A_o} \cdot R_{A_1} \cdot R_{PB} = 0.99998808$		
AS04-1300	No Detail	RAS04-(1300)	0.2121	1.0 8760	0.52	0.001			A_o	$e^{-\lambda t} = 0.99999788$	Output Shift Register and Gating	
									A_1	$e^{-\lambda tk} = 0.99998142$		
									PB	$e^{-\lambda F} = 0.99999889$		
									P	$R_{A_o} \cdot R_{A_1} \cdot R_{PB} = 0.99997819$		
AS04-1400	No Detail	RAS04-(1400)	0.297	1.0 8760	0.52	0.001			A_o	$e^{-\lambda t} = 0.99999703$	Timing and Clocking	
									A_1	$e^{-\lambda tk} = 0.99997398$		
									PB	$e^{-\lambda F} = 0.99999845$		
									P	$R_{A_o} \cdot R_{A_1} \cdot R_{PB} = 0.99996946$		

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
Experiment Logic	ATM-274	F
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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5\lambda$	HRS t	F	k	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
AS04-1500	No Detail	RAS04 – (1500)	0.1776	1.0 8760	0.52	0001	A_0	$e^{-\lambda t} = 0.99999822$	Miscellaneous Logic	
							A_1	$e^{-\lambda t k} = 0.99998444$		
							PB	$e^{-\lambda F} = 0.99999907$		
							P	$R_{A_0} \cdot R_{A_1} \cdot R_{PB} = 0.99998174$		

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
POWER PROTECTION UNIT	ATM-274	F
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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: 10^5 λ	HRS t	F	K	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
AS04-2100	NO DETAIL	RAS04-3100	0.016	1.0 8760	.52	1.01	A_o	$e^{-\lambda t} = 0.99999984$	CIRCUIT BREAKERS	
							A_1	$e^{-\lambda tk} = 0.99998599$		
							PB	$e^{-\lambda F} = 0.99999917$		
							P	$R_{A_o} \cdot R_{A_1} \cdot R_{PB} = 0.999985$		
AS04-2200	NO DETAIL	RAS04-3200	0.150	1.0 8760	.52	1.01	A_o	$e^{-\lambda t} = 0.9999985$	RELAYS	
							A_1	$e^{-\lambda tk} = 0.9998686$		
							PB	$e^{-\lambda F} = 0.99999922$		
							P	$R_{A_o} \cdot R_{A_1} \cdot R_{PB} = 0.9998593$		
AS04-2300	NO DETAIL	RAS04-3300	0.150	1.0 8760	.52	1.001	A_o	$e^{-\lambda t} = 0.9999985$	ELECTRONICS	
							A_1	$e^{-\lambda tk} = 0.99998686$		
							PB	$e^{-\lambda F} = 0.99999922$		
							P	$R_{A_o} \cdot R_{A_1} \cdot R_{PB} = 0.99998458$		

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
SEISMIC SIGNAL	ATM-274	F

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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: 10^5 λ	HRS t	K	F			MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
AS04-3100	NO DETAIL	$\prod_{A=1} R_{AS04-(31A0)}$	.0089	13-8747	.001	.52			A_0	$e^{-\lambda t}$	Calibrator	
									A_1	$e^{-\lambda t K}$		
									P_B	$e^{-\lambda F}$		
									P	$R_{A0} \cdot R_{A1} \cdot R_{PB} = .99999803$		
AS04-3200	NO DETAIL	$\prod_{A=1} R_{AS04-(32A0)}$	.0319	13-8747	.001	.52			A_0	$e^{-\lambda t}$	Pre-Amplifier	
									A_1	$e^{-\lambda t K}$		
									P_B	$e^{-\lambda F}$		
									P	$R_{A0} \cdot R_{A1} \cdot R_{PB} = 99999290$		
AS04-3300	NO DETAIL	$\prod_{A=1} R_{AS04-(33A0)}$	.0122	13-8747	.001	.52			A_0	$e^{-\lambda t}$	Filter Amplifier	
									A_1	$e^{-\lambda t K}$		
									P_B	$e^{-\lambda F}$		
									P	$R_{A0} \cdot R_{A1} \cdot R_{PB} = .99999730$		
AS04-3400	NO DETAIL	$\prod_{A=1} R_{AS04-(34A0)}$	.045	13-8747	.001	.52			A_0	$e^{-\lambda t}$	Log Amplifier	
									A_1	$e^{-\lambda t K}$		
									P_B	$e^{-\lambda F}$		
									P	$R_{A0} \cdot R_{A1} \cdot R_{PB} = .99999013$		
AS04-3500	NO DETAIL	$\prod_{A=1} R_{AS04-(35A0)}$	.0001	13-8747	.001	.52			A_0	$e^{-\lambda t}$	Oven	
									A_1	$e^{-\lambda t K}$		
									P_B	$e^{-\lambda F}$		
									P	$R_{A0} \cdot R_{A1} \cdot R_{PB} = .99999998$		
AS04-3600	NO DETAIL	$\prod_{A=1} R_{AS04-(36A0)}$	.070	13-8747	.001	.52			A_0	$e^{-\lambda t}$	Regulator	
									A_1	$e^{-\lambda t K}$		
									P_B	$e^{-\lambda F}$		
									P	$R_{A0} \cdot R_{A1} \cdot R_{PB} = .99998436$		

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME: CENTRAL STATION THUMPER ELECTRONICS | NO. ATM-270 | REV. NO. F | PAGE B58 OF B61 PAGES

RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5/\lambda$	HRS / t				MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
AS04-6100	NO DETAIL	$\prod_{i=1}^{i=} R_{AS04-6100}$	.00511	0.1	8760	250	0.001	A_o	$e^{-\lambda t} = 0.99999995$	THUMPER ARM GATE	
								A_1	$e^{-\lambda t_k} = 0.99999950$		
								PB	$e^{-\lambda F} = 0.99999998$		
								P	$R_{A_o} \cdot R_{A1} \cdot R_{PB} = 0.99999943$		
AS04-6200	NO DETAIL	$\prod_{i=1}^{i=} R_{AS04-6200}$	.0172	0.1	8760	250	0.001	A_o	$e^{-\lambda t} = 0.99999983$	THUMPER RTE LATCHING CIRCUIT	
								A_1	$e^{-\lambda t_k} = 0.99999851$		
								PB	$e^{-\lambda F} = 0.99999992$		
								P	$R_{A_o} \cdot R_{A1} \cdot R_{PB} = 0.99999826$		

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SHEET _____ OF _____

RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
CENTRAL STATION MORTAR ELECTRONICS	ATM-274	F
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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5\lambda$	HRS t	F	K	MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
AS04-5100	NO DETAIL	$\prod_{L=1}^{4=} RAS04-(5100)$	.055665	1.0 8760	0.52	0.001	A_0	$e^{-\lambda t}=0.99999945$	ARM AND FIRE GATES AND PULSE GENERATOR	
							A_1	$e^{-\lambda tk}=0.99999513$		
							PB	$e^{-\lambda F}=0.99999973$		
							P	$R_{A_0} \cdot R_{A_1} \cdot R_{PB} = 0.99999431$		
AS04-5200	NO DETAIL	$\prod_{L=1}^{4=} RAS04-(5200)$	.011884	1.0 8760	0.52	0.001	A_0	$e^{-\lambda t}=0.99999989$	ARM CIRCUITS	
							A_1	$e^{-\lambda tk}=0.99999897$		
							PB	$e^{-\lambda F}=0.99999995$		
							P	$R_{A_0} \cdot R_{A_1} \cdot R_{PB} = 0.99999881$		
AS04-5300	NO DETAIL	$\prod_{L=1}^{4=} RAS04-(5300)$	.011884	1.0 8760	0.52	0.001	A_0	$e^{-\lambda t}=0.99999989$	FIRE CIRCUITS	
							A_1	$e^{-\lambda tk}=0.99999897$		
							PB	$e^{-\lambda F}=0.99999995$		
							P	$R_{A_0} \cdot R_{A_1} \cdot R_{PB} = 0.99999881$		
AS04-5400	NO DETAIL	$\prod_{L=1}^{4=} RAS04-(5400)$	.014434	1.0 8760	0.52	0.001	A_0	$e^{-\lambda t}=0.99999986$	MORTAR RECEIVER DETECTOR	
							A_1	$e^{-\lambda tk}=0.99999875$		
							PB	$e^{-\lambda F}=0.99999993$		
							P	$R_{A_0} \cdot R_{A_1} \cdot R_{PB} = 0.99999854$		

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RELIABILITY MATHEMATICAL MODEL CHART

(FOR USE IN RELIABILITY PREDICTION AND ASSESSMENT)

NAME	NO.	REV. NO.
CENTRAL STATION MORTAR ELECTRONICS	ATM-774	F

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RELIABILITY MATHEMATICAL BLOCK DIAGRAM IDENTIFICATION CODE	CONSTITUENT COMPONENTS AND PARTS: CODE IDENT.	CONSTITUENT COMPONENTS AND PARTS: RELIABILITY FUNCTION R =	PARAMETRIC VALUES FROM PAST DATA & PREDICTION: $10^5\lambda$	HRS: t	K	F			MISSION PHASE CODE IDENT.	CONSTRAINTS, CONDITIONS, AND REMARKS	NOMENCLATURE: INCLUDE REFERENCE DESIGNATION	RELIABILITY PREDICTION WORKSHEET REFERENCE: DATA SOURCE – TEST REPORT NO. & DATE FOR ASSESSMENT
AS04-5500	NO DETAIL	$R = \prod_{i=1}^{n} R_{AS04-(5510)}$	0.001	0.5 - 8760	0.001	0.52			A_0	$e^{-\lambda t}$	Level Detector	
									A_1	$e^{-\lambda t K}$		
									P_{IB}	$e^{-\lambda F}$		
									P	$R_{A_0} \cdot R_{A_1} \cdot R_{P_{IB}} = .99999991$		

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