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MCP-082-949 -A-47

MISSILE J-20 (XSM-68)

OPERATIONAL SUMMARY REPORT (U

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MISSILE J-20 (XSM-68)
OPERATIONAL SUMMARY REPORT (U)

3 October 1961

CLASSIFICATION CANCELLED, OR CHANGED TO ~~Confidential~~ BY AUTHORITY OF Letter from W. Lamiller ON 10/9/63 DATE

Issued by
Reliability Data Control Office

Approved

G. C. Shires, Manager
Quality Assurance
Titan Project

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FOREWORD

This Operational Summary Report presents the discrepancies or problems encountered on TITAN Missile J-20 (AF Serial No. 60-3631). The reliability of significant problem areas which were encountered on this and previous missiles is also discussed.

The period of time covered by this report is from arrival of the missile at Complex 20 to the moment of launch.

This report was prepared in accordance with the applicable paragraphs of Document WDD-M-S-13 "Data Requirements for Contract AF 04 (645)-56".

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1.0 SUMMARY

Titan Missile J-20 arrived at Complex 20 on 8 September 1961. Prior to erecting the missile, all Marman clamps were replaced in accordance with modification AO 4095. The missile was erected and power was applied on 8 September 1961.

The official Combined Systems Test was accomplished on 26 September 1961 at 0930 hours. Launch was scheduled for 2030 hours 28 September. The count was to be initiated at T-210 minutes. There were no holds programmed.

There was an unscheduled hold of 18 minutes because of a low lox tank pressure signal which caused an automatic hold. The cause of this signal could not be determined.

The missile was successfully launched at 2052 hours 28 September 1961.

2.0 Discrepancies

2.1 Airborne

2.1.1 Airframe and Ordnance

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
1	9/14	Z01224 Z01436	327-8000421 Lox Tank Assembly N/A 327-1000200-9 Complete Missile Assembly S/N 60-3631	The Stage I lox tank was suspected of being contaminated.	The tank interior was blown down from top to bottom with nitrogen. The dome area at the suction lines was washed with trichloroethylene.
2	9/27	Z01499	327-7100404-21 Plate N/A 327-7100404 Decoy Pod	The plate was missing from the decoy pod installation.	The plate was installed.
3	9/28	Z01455	327-8000631 Stage I Fuel Tank N/A 327-1000200-9 Stage I Missile Complete S/N 60-3631	Fuel was dripping from under the missile support strut area. It was suspected that the fuel was leaking from the area around the high-shear rivets at quadrant 3 of the fuel tanks.	This condition was deemed acceptable.

2.1.2 Electrical

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
1	9/14	Z01051	PS724900002D-3 Relay K376-1 S/N 0001022 N/A 327-7080304 Stage II Equipment Installation	The relay had been subjected to excessive current at M-D.	The relay was replaced with S/N 0001257.
2	9/22	Z01052 Z01394	MS91587-4 HPS Shunt N/A 327-7080800 HPS Shunt Installation	A 300 amp shunt had been installed in the HPS system instead of a 500 amp shunt, P/N MS91587-7.	The 300 amp shunt was replaced with a 500 amp shunt.

2.1.3 Flight Controls

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
1	9/13	Z01146	327-7030320-29 Spin Motor Rotation Detector (SMRD) S/N 0000101 N/A 327-7060518 Flight Controls Installation	The reliability of the transistors in the detector was suspected.	The detector was replaced with S/N 0000081.

2.1.4 Fuel and Feed

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
1	9/11	Z01223	327-7050342-19 Lox Suction Line Auxiliary Turbine Pump Assembly N/A 327-7000416 Stage II Lox Tank	The line was missing from the missile when the missile was received at AMR.	The missile line was installed.
2	9/15	Z01429	327-8050810 Lox Fill and Drain System N/A 327-1000200-019 Complete Missile Assembly S/N 60-3631	The Stage I fill and drain system had green discoloration spots and dark drops of liquid within the system. There was a large amount of condensation in the Stage I lox suction lines and in the fill and drain system.	The Stage I lox tank was purged through the fill and drain line for 20 minutes IAW procedure 208. All fill and drain lines were cleaned or replaced. The lines that were cleaned were cleaned from the bottom up with demineralized water and then with chloride.
3	9/15	Z01220	327-7050328-3 ATPA Lox Suction Line Spool N/A 327-7000416 ATPA Lox Suction Line Bellows Assembly	The flare seat on the suction line spool was nicked.	The spool was replaced.

2.1.4 Fuel and Feed

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
4	9/15	Z01401	PD47S0045-59 Lox Fill and Drain Valve N/A 327-8050810 Lox Fill and Drain Assembly	A portion of the O ring was exposed inside the lox passage downstream of the fill and drain valve.	The O ring was replaced.
5	9/19	Z01402	PS4714000016D-59 Stage I Lox Fill and Drain Valve S/N 0000210 N/A 327-8050310 Fill and Drain System Installation	The valve was dirty and the blade scarred. There was also evidence of corrosion on the blade seal.	The valve was replaced with S/N 0000244.

2.1.4 Fuel and Feed

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
6	9/19	Z01408	PD41S0045-001 Lox Fill and Drain Line N/A 327-8050310 Fill and Drain Installation	The line was dirty and corroded.	The line was replaced.
7	9/19	Z01410	PD41S0043-005 Lox Fill and Drain Line N/A 327-8050310 Fill and Drain Installation	The line was dirty and corroded.	The line was replaced.
8	9/21	Z01414	327-0050553-1 Adapter N/A 327-8050310 Fill and Drain Installation	The adapter was corroded.	The adapter was replaced.

2.1.4 Fuel and Feed

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
9	9/25	Z01475	327-8000684 Lox Suction Line Sub-Assembly #2 N/A 327-8000421 Stage I Lox Tank	When the lox low level sensor for feed line number 2 was removed for inspection, it was found that some threads were missing from the boss on the suction line. Existence of this condition was not indicated when the sensor was checked. Also a large amount of oxygen lube 703 sealing compound was removed with the sensor. Some of the compound remained imbedded in the remaining threads of the lox line boss. The flight spools were installed at the time of this discrepancy.	The threads were cleaned, the surface resealed, and the welded boss was retained in service.

2.1.4 Fuel and Feed

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
10	9/25	Z01325	PD83S0020-59 Level Sensor S/N 0000253 N/A 327-8050830 Installation Drawing	When the sensor was removed for inspection, spots were visible on the prism.	The sensor was replaced with S/N 0000417.
11(F)	9/26	Z01449	53619-450A Conoseal N/A 327-8050555-9 Lox Fill and Drain Assembly	The conoseals were leaking in the Stage I lox fill and drain. One leak was at the Stage I heat exchanger and the other was at the transducer in the Stage I accumulator.	The conoseals were replaced and then leak-checked.
12	9/27	Z01500	327-7050342-7 Bellows Assembly N/A 327-7000416 Stage II Lox Tank	The ATPA lox suction bellows had been grooved inside of the tube wall. The damage appeared to have been caused by a tool used to file down the weld penetration. The area was too confined to permit ascertaining the depth.	The bellows assembly was replaced.

2.1.5 Guidance

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
1(F)	9/13	Z01038	GS-65137 Bell Telephone Laboratory Receiver S/N 17X N/A 327-7030293 Bell Telephone Laboratory Guidance S/N 266	The receiver was responding to the wrong codes.	The receiver was replaced with S/N 16X.

2.1.6 Hydraulics

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
1	9/20	Z01389	327-8040130-69 Actuator 2_1 Line B Nut N/A 327-8040003 Hydraulic System Installation	The B nut on the timer was leaking.	The B nut was re-torqued.

2.1.7 Instrumentation

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
1	9/11	Z01047	327-1090099 Instrumentation Wiring	Measurement number 027 did not play through.	The signal wire was wired to Pin H of Plug 818-3 on J box 3A. It should have been wired to Pin J of Plug 818-3. The wire was connected IAW drawing 327-1090099.
2(F)	9/12	Z01050	327-1080135 Wiring Installation N/A 327-7000900 Stage II Complete	Wires ZN96A20 and ZN111A20 to umbilical 1B2E were broken.	The wires were spliced.
3	9/11	Z01071	PS640900028D-41 Module Amplifier N/A PS640900028D-1 Signal Conditioner S/N 27	The amplifier for measurement 136 was missing from slot 3, signal conditioner 6A.	A -41 module was drawn from spares and installed.

2.1.7 Instrumentation

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
4(F)	9/14	Z01070	PD83S0020-59 Low Level Sensor S/N 0000710 N/A 327-8050830 Lox Level Sensor Installation	Relays 3 and 4, measurement number J-508, lox liquid low level sensor, indicated 2.2 volts instead of 3.3 volts.	Broken barrel splices were found on wires K127B2N and K134C20. The wires were re-spliced and gave the correct indication at telemetry package number 2.
5(F)	9/18	Z01068	327-7190224-009 Accelerometer Assembly S/N 1991 N/A 327-7090811 Instrumentation Installation	The ambient reading for measurement number 360, 0-10 G accelerometer, was 4.5 volts instead of 0.5 volts.	The accelerometer was replaced with S/N 1829.

2.1.7 Instrumentation

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
6	9/18	Z01069	327-8090490 Instrumentation Installation N/A 327-1090099 Instrumentation Wiring and Cordage Installation	The wiring for measurement number 530, turbine over-speed number 1 transducer, was open.	The wire bundle to the thermo-switch plug was erroneously identified as TOS number 1. This plug was plugged into the measurement circuitry which caused the open condition. The TOS number 1 tag was then placed on the adjacent measurement wire bundle and the plug from this bundle was connected into the measurement circuitry. The circuit was then satisfactory.
7(F)	9/18	Z01376	74E22-27RH 0-100 PSIA Transducer S/N 26287 N/A 327-8090490 Installation Drawing	Measurement number 986, pressure lube oil discharge on subassembly number 1, indicated 0.629 volts instead of 0.747 volts IAW the calibration curve.	The transducer was replaced with S/N 84.

2.1.7 Instrumentation

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
8(F)	9/18	Z01377	74E22-27GF 0-100 Psia Transducer S/N 29517 N/A 327-7090130 Installation Drawing	Measurement number 988, pressure ATPA fuel suction, indicated 0.662 volts ambient at the telemetry package. It should have indicated 0.884 volts IAW the calibration curve.	The transducer was replaced with S/N 20672.
9(F)	9/20	Z01379	PS961000000D-13 0-50 Psia Transducer S/N 22899 N/A 327-8090546 Installation Drawing	Measurement number 183, fuel pump suction transducer, indicated 0.15 volts instead of 1.5 volts.	The transducer was replaced with S/N 139.
10	9/21	Z01380	PS640900028D-41 DC Amplifier Module S/N 522 N/A PS640900028D-1 Signal Conditioner Box S/N 27	The dc amplifier for measurement number 136 was unstable. The module drifted 0.3 volts high during a 24 hour period. The input to this measurement was from a negative 12.4 millivolts to a negative 5.14 millivolts.	The module was replaced with S/N 345.

2.1.7 Instrumentation

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
11(F)	9/22	Z01337	81A22R-12-105 Strobe Light Wiring N/A 327-7000900 Stage II Complete	The strobe light unit signal did not play through during the CST. A defective pin D was found on a connector in the telemetry circuitry.	The connector was replaced.
12(F)	9/25	Z01238	PS961000015D-3 Transducer S/N 1368 N/A 327-1080136 Instrumentation Wiring	The Stage I helium tank measurement gave a negative indication for the operating position.	The helium transducer was replaced with S/N 8293.
13	9/25	Z01470	PS812000000-1 Patch Board N/A 327-1090099 Instrumentation Wiring	Measurement number 1023 did not play through to the telemetry package.	It was found that the patching went from segment 82 to 449 instead of going to 440. The measurement was repatched and then verified by playing through.

2.1.7 Instrumentation

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
14	9/25	Z01466	MS91587-4 APS and IPS Shunt N/A 327-7000900 Stage II Complete	The cable termination bolts did not have enough thread penetration into the shunt. Plain washers had been installed with the lock washers used as a spacer.	The bolts were replaced with those having a longer shank, and the washers were then installed IAW M-D process manual.
15	9/26	Z01321	ZK1023AA20 and ZK1023BB20 Instrumentation Wiring N/A 327-1090099 Installation Wiring and Cordage	Wires ZK1023BB20 and ZK1023AA20 had been crossed during installation.	The wires were removed and correctly installed IAW drawing 327-1090099.

2.1.7 Instrumentation

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
16(F)	9/27	Z01497	PS6409000280-41 DC Amplifier Module S/N 895 N/A PS640900028D-1 Signal Conditioner S/N 27	The module from signal conditioner 6A, slot 7, indicated minus 1.5 volts constant. A change of input voltage had no effect on the output.	The module was replaced with S/N 454.
17(F)	9/28	Z01355	1371C Temperature Probe N/A 327-1099099 Instrumentation Wiring	The General Electric rate beacon measurement was not playing through and appeared to be open.	The measurement probe was replaced with S/N 28254 to correct the condition.
18(F)	9/28	Z01015	PS230000000D-47 Telemetry Package S/N 4711 N/A 327-7190812 Installation Drawing	Segment 23 on the commutator was leading the information being presented.	The package was replaced with S/N 4713.

2.1.8 Pressurization

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
1(F)	9/26	Z01450	PD48S0038-29 Stage II Fuel Tank Regulator S/N 0000148 N/A 327-7000498 Stage II Fuel Tank	The regulator leaked internally.	The regulator was replaced with S/N 0000109.

2.1.9 Propulsion

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
1 (F)	9/20	Z01412	1-236724-2 Manifold (Fuel Sub-Assembly Number 1) N/A 1-234590-30 Gas Generator Assembly	The manifold was cracked.	The manifold was replaced.
2	9/25	Z01468	1-226200 Lox Discharge Swivel Seal N/A 1-225857 Lox Discharge Line	During a two day period, the swivel seal on sub-assemblies number 1 and number 2 became covered with water to a depth of approximately 1/3 inches.	The discharge lines were removed in the sub-assemblies and inspected. No water was discovered and the lines were then reinstalled.
3	9/26	Z01054 Z01496	1-237820-10 Gas Generator Assembly N/A 1-234001 YLR-91AJ-3 Engine	The gas generator pintle shaft was subjected to deterioration from the degreasing operation on the Stage II engine.	The shaft was checked IAW Aerojet General Corporation (AGC) procedure and found acceptable.

2.1.9 Propulsion

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
4 (F)	9/28	Z01457	1-221655 Adapter YLR-91 AJ-3 Engine Assmebly	The adapter was broken at the swivel seal drain on the fuel discharge line.	The adapter was replaced.

2.2 Ground Support Equipment

2.2.1 Checkers and Consoles

ITEM NO.	DATE	MARS NO.	PART NUMBER & NOMENCLATURE	ORIGIN & DETAILS OF DISCREPANCY	ACTION TAKEN
1 (F)	9/8	Z01079	72-28-2 Relay N/A 327-3785300-9 Panel Assembly S/N 0018	The high resistance contacts were operating intermittently.	The relay was replaced.
2 (F)	9/11	Z01024	327-3959000-29 Chassis Assembly S/N 0029 N/A 327-5350000-79 Rack Assembly S/N 0005	The output of the 3959 chassis in the yaw channel was low, and fluctuated with an input of 200 millivolts.	The chassis was replaced.
3(F)	9/13	Z01178	IN315 Diode N/A 327-4440000 Erector Panel	The CR14 diode was short-circuiting. Stray voltage then caused the failure lights of the complete missile erector (CME) to remain on.	The CR14 diode was replaced.