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Wednesday, May 09, 2001

John Greenewald, Jr.  
[REDACTED]

FOIA Office  
341 CS/SCBR  
30 73<sup>rd</sup> Street North  
Malmstrom AFB MT 59402-7513

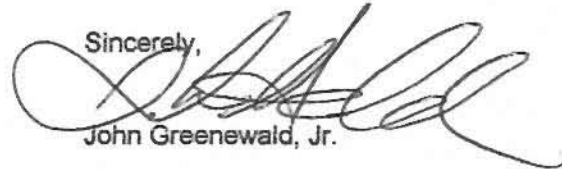
Dear Sir;

This is a non-commercial Freedom of Information Act request 5 U.S.C. § 552. My fee status category is "All Other", and I agree to pay only up to fifteen dollars for the requested material.

- o All documents pertaining to a March 16, 1967 incident, in which there was a malfunction of missile silos at your installation. Please include all documentation of procedures after this incident occurred, the possible cause, procedures on how to handle the situation etc.
- o Please include documents, letters, tapes, audio and video tapes, memos, and all other forms of written and visual media.
- o Also include all documents on one of the personnel there getting injured that same day, or around this date.

Thank you very much for your time, and I look forward to your response.

Sincerely,



John Greenewald, Jr.

Enclosures:  
None



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 341ST SPACE WING (AFSPC)

14 June 2001

341 CS/SCBR (FOIA)  
30 73d Street North  
Malmstrom AFB MT 59402-7513

Mr. John Greenewald, Jr.  
[REDACTED]

Dear Greenewald

On 18 May 2001, we received your Freedom of Information Act (FOIA) request dated 9 May 2001, for records pertaining to a March 16, 1967 incident, in which there was a malfunction of missile silos. Copies of excerpts, as well as supporting documents, of the below listed documents are releasable and are attached:

- a. 341st Strategic Missile Wing History (1 Jan – 31 Mar 1967)
- b. 341st Strategic Missile Wing History (1 Apr – 30 Jun 1967)
- c. 341st Strategic Missile Wing History (1 Jul – 30 Sep 1967)
- d. 341st Strategic Missile Wing History (1 Oct – 31 Dec 1967)
- e. 341st Strategic Missile Wing History (1 Jan – 31 Mar 1968)

We do not have any audio or video tapes, or documents of any personnel injured. If you are pursuing your inquiry further, you may wish to contact the National Archives and Records Administration (NARA) at:

NARA FOIA Officer  
National Archives at College Park  
8601 Adelphi Road, Room 4400  
College Park MD 20740-6001  
Web Site: [www.nara.gov/foia](http://www.nara.gov/foia)

The FOIA provides for the collection of fees based on the costs of processing a FOIA request and your fee category. We have placed you in the "other category"; however, in this case, we have waived collecting fees.

Sincerely

A handwritten signature in black ink that reads "Marty S. Stephens". The signature is written in a cursive, slightly slanted style.

MARTY S. STEPHENS  
Freedom of Information Act Manager

**Attachments**

1. 341SMW History Excerpts, 1 Jan – 31 Mar 67 (25 pgs)
2. 341SMW History Excerpts, 1 Apr – 30 Jun 67 (15 pgs)
3. 341SMW History Excerpts, 1 Jul – 30 Sep 67 (29 pgs)
4. 341SMW History Excerpts, 1 Oct – 31 Dec 67 (8 pgs)
5. 341SMW History Excerpts, 1 Jan – 31 Mar 68 (7 pgs)

THIS EXCERPT IS:



15th AF Strategic Air Command Malmstrom AFB, Montana	341st Strategic Missile Wing 341st COMBAT Support Group HQ SAC DXIH 67-1865	R-WG-341-111
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341st STRATEGIC MISSILE WING  
 AND 341st COMBAT SUPPORT GROUP  
 HQ SAC DXIH 67-1865

(Declassified Title)  
**PRC**  
 1 Jan 1967 to 31 Mar 1967

GROUP 3  
 Declassify on: [unclear]

Assigned to the  
 FIFTEENTH AIR FORCE, STRATEGIC AIR COMMAND  
 Permanently Stationed at  
 MALMSTROM AIR FORCE BASE, GREAT FALLS, MONTANA

**PRC**

DOCUMENT DECLASSIFIED PER  
 HQ AFSPC/DOXN 27 Apr 95 and  
 OO-ALC/LME 27 Jul 95.

~~This document was prepared by A2C David B. Gamble, Wing Historian under the supervision of the Wing Information Officer. It is prepared in compliance with SACR 210-1, 29 June 1964, and is classified SECRET under the provision of AFR 205-1 as amended. The classification is required for the protection of information that reveals the military capability and operational status of the Wing. (U)~~

APPROVED:

*Herman T. DeHaas*  
 HERMAN T. DeHAAS, Capt, USAF  
 Chief, Information Division

*John W. Carroll*  
 JOHN W. CARROLL, Col, USAF  
 Wing Commander

6-400  
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 6-5

COPY (1) OF



23 AUG 1978

Atch 1

SECURITY STATEMENT PAGE

This volume is classified SECRET to conform to the classification of the information in the source documents. It will be handled in accordance with the provisions of AFR 205-1, as amended.

This volume contains information effecting the national defense of the United States within the meaning of the Espionage Laws (Title 18, U.S.C. sections 793 and 794), the transmission or revelation of which in any manner to any unauthorized person is prohibited by law.

This volume has been placed in downgrading Group 3, which is the highest downgrading group assigned to the information in the source documents. The historian's analysis and consolidation of information from many sources, which individually may have lower downgrade provisions, results in a synthesis which may have wider implications than the material on which it is based. Therefore, individual downgrade instructions for each paragraph are not indicated, and all portions of this volume will be handled under the overall downgrading group.

[REDACTED]

Project How Now (Service Star), the testing of Mark 5 re-entry vehicles by higher headquarters for effectiveness. Malmstrom sent the last vehicle in the program for the base during the quarter. This ended the program at Malmstrom. <sup>58</sup> (U)

A walk-thru inspection of the HF Hardened Antennas at Malmstrom was conducted during February by Boeing and SATAF personnel. The antennas were already equipped in the LFs but were not in working order. The walk-thru inspection had an average of 40 discrepancies per site. Boeing Company has not set any official date for an operational antenna to be demonstrated. The estimated date for the operational antennas was set for early July 67. At that time, maintenance will begin on correcting the discrepancies at the sites. <sup>59</sup> (U)

The following is the investigation of Echo Flight incident and the results. (U)

On 16 March 1967 at 0845, all sites in Echo (E) Flight, Malmstrom AFB, shutdown with No-Go indication of Channels 9 and 12 on Voice Reporting Signal Assemble (VRSA). All LF's in E Flight lost strategic alert nearly simultaneously. No other Wing I configuration lost strategic alert at that time. <sup>60</sup> (U)

Guidance & Control channel 50 dump data was collected from E-7 facility and E-8 Facility and all 10 sites were then returned to strategic alert without any LF equipment replacement. All 10

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58. Taken from Messages on file at Job Control, by A2C David B. Gamble, Wing Historian, on 23 Apr 67.
59. Rpt, "Monthly Report HF/SSB Hardened Antenna," by SATAF (DCA), 28 Feb 67, Ex 42. [REDACTED]
60. Msg, (S) DM 02752, SAC to 341 SMW, Subj: Loss of Strategic Alert Echo Flight, Malmstrom AFB, 17 Mar 67, Ex 43.



sites were reported to have been subject to a normal controlled shutdown. <sup>61</sup> (U)

The only unusual LF events noted were the failure of the secondary door actuator motor at LF, E-2 and the intermittent operation of the diesel generator at LF, E-8. <sup>62</sup> (U)

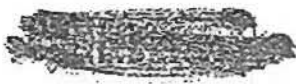
Technical Analysis Division (TAD) personnel inspected LCC, E-1 for loose cable connections and the Electric Surge Arrester (ESA) room for any faults and noted no unusual discrepancies. <sup>63</sup> (U)

LCF, E-1 experienced commercial power problems in the early afternoon of 16 Mar 67 which resulted in a burn out of the 10 Hp Envirmental Control System (ECS) chiller compressor motor. <sup>64</sup> (U)

At approximately 1400 hrs on 16 Mar 67, the 341st SMW was advised that SAC Headquarters had called in OOAMA support for a complete engineering analysis of this problem. <sup>65</sup> (U)

OOAMA decided to send a task group to Malstrom for study of the incident at Echo Flight because the problem pertained peculiarly to Wing I. It was also decided to make the studies and tests there because OOAMA was not equiped with Wing I equipment. The task group included personnel from OOAMA, Boeing Company, Autonetics, and 15th AF ; they were to arrive on 17 or 18

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- 61. Rpt, (S) "Report of Engineering Investigation of Echo Flight Incident, Malmstrom AFB, Mont. - 16 Mar 67," by Engineering Investigation Team, 23 Mar 67, p 1.
  - 62. Ibid.
  - 63. Ibid.
  - 64. Ibid.
  - 65. Ibid.





[REDACTED]

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61. Rpt, (S) "Report of Engineering Investigation of Echo Flight  
Incident, Malmstrom AFB, Mont. - 16 Mar 67," by Engineering  
Investigation Team, 23 Mar 67, p 1.

62. Ibid.

63. Ibid.

64. Ibid.

65. Ibid.

[REDACTED]

[Paperclip]



March 67. <sup>66</sup> ( )

A preliminary analysis was made of the Fault Isolator Test Tape (FITT) from LF, D-7 and E-8. Targeting support was scheduled for a G&C Channel 50 data dump at LF's E-2 and E-9 which, although returned to alert, were still felt to possess useful data. The investigation was held in suspense until the arrival of the OOAMA

team on 18 March 67. <sup>67</sup> ( )

Echo Flight incident was approached in four ways in the investigation: <sup>68</sup> ( )

- a. Review of events on or near 16 March 67 and of flight configuration.
- b. Investigation, and where possible elimination, of circumstances which may have been responsible for the incident.
- c. Investigation of means of causing the results which were noted at the time of shutdown.
- d. Investigation of similar events.

In reviewing the events of the incident, the LCC crew was questioned by Wing Maintenance Evaluation Team (DCMET), OOAMA, and Boeing Company personnel on 16 March 67. <sup>69</sup> ( )

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66. Msg, (C) OONE 01012, OOAMA to SAC, Subj: Wing I, E Flight Incident, 3 Mar 67, Ex 44.

67. Rpt, (S) "Report of Engineering Investigation of Echo Flight Incident, Malmstrom AFB, Mont. - 16 Mar 67," by Engineering Investigation Team, 23 Mar 67, p 1.

68. Ibid., p 3.

69. Ibid., p 6.





In screening the crew it was determined that loss of strategic alert and fault indication occurred in an extremely short period of time. The exact time estimates could not be obtained but the time interval was estimated to be between 10 to 40 seconds. <sup>70</sup> (S)

The standby light was not observed to illuminate for any of the ten launch facilities. None of the command and status line monitor fault lights were illuminated. There was no pattern or sequence noted as to the illumination of fault and loss of strategic alert. No flickering or ripple was noted on any of the other status displays. The emergency lights were on (all other lights off) and these lights did not appear to dim. <sup>71</sup> (S)

The initial time of the incident, decided by the crew, could be no more than two or three minutes earlier than the official log time of 0845 hours (local). <sup>72</sup> (S)

The crew also stated; the LF, E-8 had a channel 26 which indicated it was operating on diesel at the time of fault. The 465L (SAC Communications & Control System) and communications equipment was not processing traffic at the time of the incident. <sup>73</sup> (S)

Neither of the crew members were using any electrical equipment. Such as electric razor...etc. At the time of fault

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70. Rpt, (S) "Report of Engineering Investigation of Echo Flight Incident, Malmstrom AFB, Mont. - 16 Mar 67," by Engineering Investigation Team, 23 Mar 67, p 6.

71. Ibid-

72. Ibid.



73. Ibid., p 7.

36

[REDACTED]

the deputy commander was turned away from the console to brief the commander who had just been awakened from sleep. The commander was the first to see the faults. <sup>74</sup> (U)

Channel 50 data was extracted from sites E-7 and E-8 immediately after the shutdown of the entire flight. Analysis of this data determined that both sites were shutdown as a result of external influence to the G&C, no No-Go's were detected by the G&C. Although E-8 had indications of a previous Monitor check No-Go it was not the cause of shutdown at this time. This was determined by information contained in sector 54 which said that subsequent to the last No-Go the G&C had completed an iteration routine which is performed approximately 2 hours and 30 minutes into a restart. Had a G&C No-Go caused this shutdown, the Discrete Input "A" (DIA) word would have been placed in this sector. <sup>75</sup> (U)

On Sunday, 19 March 67, a team was dispatched to sites E-2 and E-9 to dump channel 50 data. These two sites were in strategic alert at this time but were selected because they had never experienced a restart since the last time that a maintenance tape had been used. Information from the No-Go sectors of channel 50 indicated that these G&C's had never entered a No-Go loop at any time. This hardens the case against a No-Go causing a shutdown of the flight. If a No-Go had shutdown the flight, it would have

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74. Rpt, (S) "Report of Engineering Investigation of Echo Flight Incident, Malmstrom AFB, Mont. - 16 Mar 67," by Engineering Investigation Team, 23 Mar 67, p 7.

75. Ibid., p 8.

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been recorded in channel 50 data. <sup>76</sup> (U)

The only non-detectable fault from the G&C section which could have caused a No-Go would have been loss of confirm codes. This type of fault would not have produced a VRSA channel 9 and 12, but only a channel 9. This information eliminated the No-Go theory as the cause of the incident. <sup>77</sup> (U)

As stated earlier, all 10 launch facilities shutdown with a VRSA channel 9 and 12 (G&C No-Go and Logic Coupler No-Go) recordings. Because of this consistency considerable investigation was expended in the Logic Coupler area. In the channel 50 analysis it was shown that the guidance section did not experience a No-Go and therefore, it was felt that the VRSA channel 9 report was not valid. It is possible, however, for the Logic Coupler to generate both of these No-Go indications. <sup>78</sup> (U)

The logic of the coupler was studied by the investigating team in an effort to identify a method by which both VRSA 9 and 12 could be activated. The opinion of the team was that external generated signals caused the generation of these two channels and shutdown of the launch facilities. The possibility of this is very remote due to the fact that all 10 couplers would have to fail in the flight within a few seconds of each other. <sup>79</sup> (U)

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76. Rpt, (S) "Report of Engineering Investigation of Echo Flight Incident, Malmstrom AFB, Mont. - 16 Mar 67, by Engineering Investigation Team, 23 Mar 67, p 8.

77. Ibid., p 30.

78. Ibid., p 30.

79. Ibid., p 30.

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~~XXXXXXXXXX~~

The only possible means that could be identified by the team involved a situation in which a coupler self test command occurred along with a partial reset within the coupler. This could feasible cause a VRSA 9 and 12 indication. This was also quite remote for all 10 couplers would have to have been partially reset in the same manner. <sup>80</sup> ~~(U)~~ (U)

P32

Further studies of this problem will be accomplished at the contractors facility since a full engineering investigation is not feasible at this level. (U)

In the researching of other possibilities, weather was ruled out as a contributing factor in the incident. <sup>81</sup> (U)

A check with Communication maintenance verified that there was no unusual activity with EWC-1 or EWC-2 at the time of the incident. <sup>82</sup> (U)

Rumors of Unidentified Flying Objects (UFO) around the area of Echo Flight during the time of fault were disproven. A Mobile Strike Team, which had checked all November Flight's LF's on the morning of 16 March 67, were questioned and stated that no unusual activity or sightings were observed. <sup>83</sup> (U)

The 801st Radar Squadron, Malmstrom AFB, gave a negative report on any radar or atmospheric interference problems related to Echo Flight. <sup>84</sup> (U)

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80. Rpt, (S) "Report of Engineering Investigation of Echo Flight Incident, Malmstrom AFB, Mont - 16 Mar 67," by Engineering Investigation Team, 23 Mar 67, p 30.


81. Ibid., p 28.

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82. Ibid., p 25.

83. Ibid., p 27.

84. Ibid., p 26.



Capt. Bradshaw in the command post at the time of Echo Flight incident, verified that there was no activity on the Primary Alerting System (PAS) at Echo Flight.<sup>85</sup> (U)

During the investigation it was discovered that Boeing modification teams were at sites B-1, K-1 and G-1 on 16 March 67; but this could not have affected anything in relationship to E Flight because they arrived at the sites after the incident occurred.<sup>86</sup> (U)

As mentioned before, a power problem affected E-1 at 1453 on 16 March 67 according to LCC log. The Brine Chiller (CH-1) shutdown due to power fluctuation. This was not considered unusual for power failures or fluctuations often cause CH shutdowns. Between 1510 and 1600 hours, E-1 experienced another power fluctuation. The capsule crew heard the Motor Generator brushes chatter. At this time the site manager indicated that one phase had low voltage, but LCF power was not appreciably affected since capsule florescent lights were still on. The diesel generator started but could not be put on the line due to broken lead. Commercial power was restored at 1921 hours on 16 March 67.<sup>87</sup> (U)


In reviewing the maintenance history of the Wing, it was discovered a similar incident occurred at Alpha Flight in

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85. Rpt, (S) "Report of Engineering Investigation of Echo Flight Incident, Malmstrom AFB, Mont - 16 Mar 67," by Engineering Investigation Team, 23 Mar 67, p 26.

86. Ibid., p 23.

87. Ibid., p 12.



P39



P40

December 1966. On 19 December 66, A Flight had some of it's  
 LF's shutdown (A-6, A-7, and A-10). The similarity between the  
 two flights was: The same Capsule crew, adverse weather con-  
 ditions, and commercial power failure after the facilities  
 88  
 shutdown. (U)

Since weather condition and Capsule crew have been eliminated  
 as causes of the incident, investigation of electrical failure  
 was started. (U)

The power outage that affected E-1 at 1453 on 16 March 67,  
 occurred on the 7.2/12.5 kilo volts (KV) transmission line from  
 the Winifred Substation. Fergus Electric Co. (Mr. D. Young,  
 Lewistown) advised Mr. H. Jackson that a transformer shorted one  
 89  
 phase of the three south of Winifred. (U)

Sites Echo 1-6 and E-9, E-10, and E-11 are supplied by 7.2  
 KV line from the Winifred substation. No sites in other flights  
 are supplied power from Winifred. Sites E-7, E-8, D-6, D-7, M-2,  
 M-3, and M-8 are supplied power by 7.2 KV lines from the Hilger  
 90  
 substation. (U) (SEE DIAGRAMS)

The source of power comes from the Rainbow generating plant  
 in Great Falls and is fed through the Rainbow switchboard on  
 100 KV power lines to the Stanford substation. The 100 KV lines  
 continue to Benchland where it feeds two 50 KV lines. One goes

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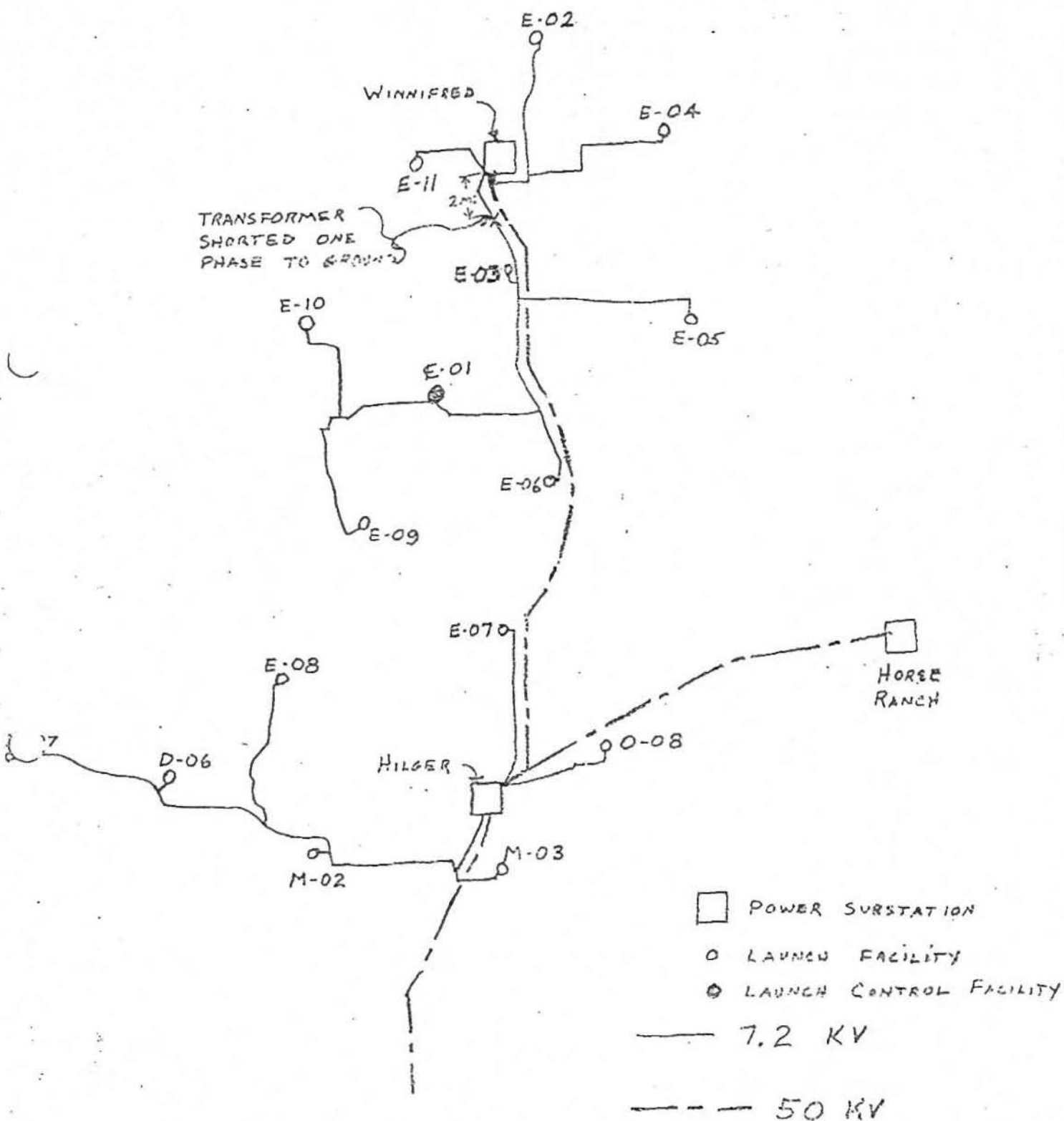
88. Rpt, (S) "Report of Engineering Investigation of Echo Flight  
 Incident, Malmstrom AFB, Mont. - 16 Mar 67," by Engineering  
 Investigation Team, 23 Mar 67, p 9.

89. Ibid., p 12.

90; Ibid., p 14.



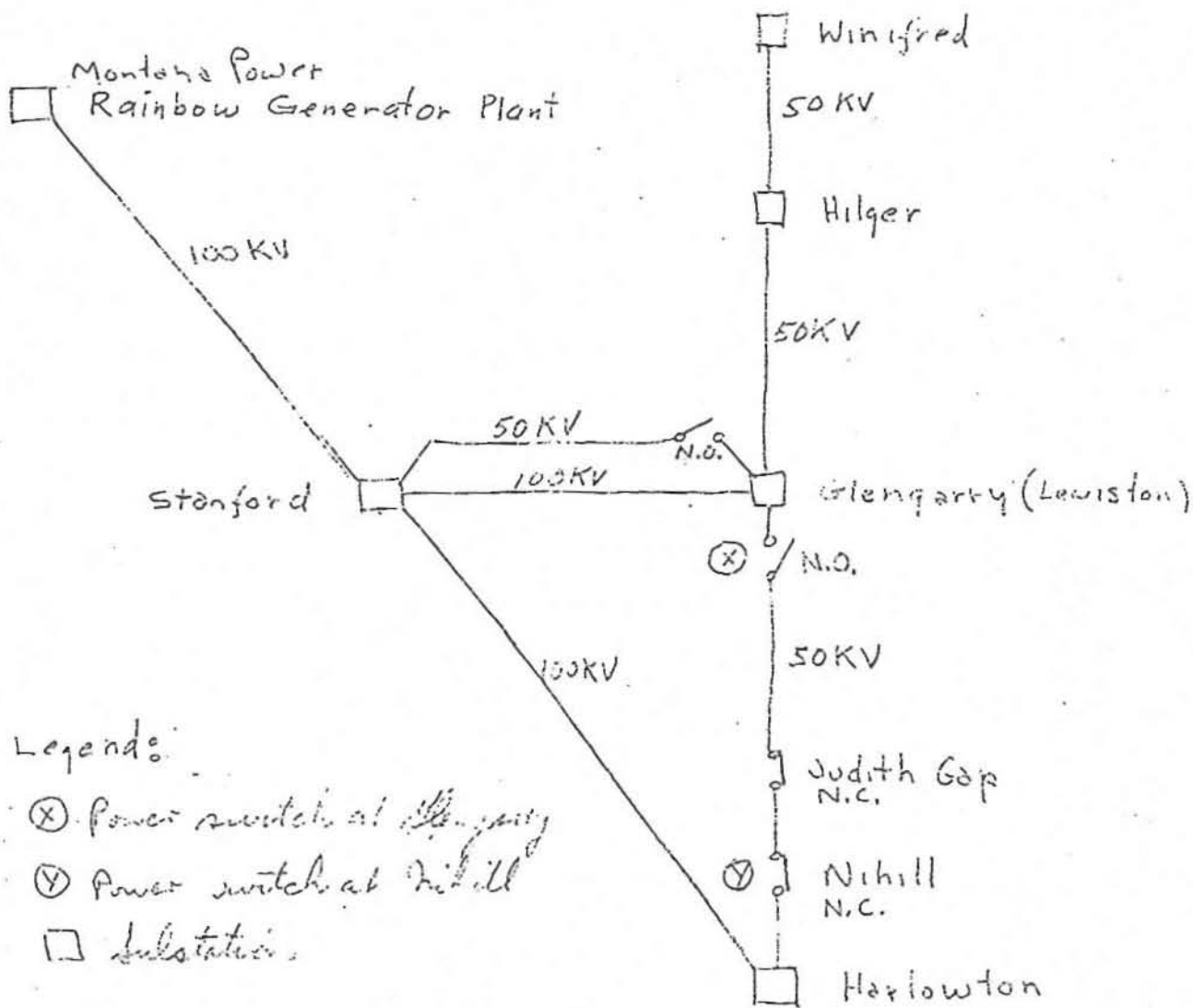




E FLIGHT POWER DISTRIBUTION

FIGURE 1.

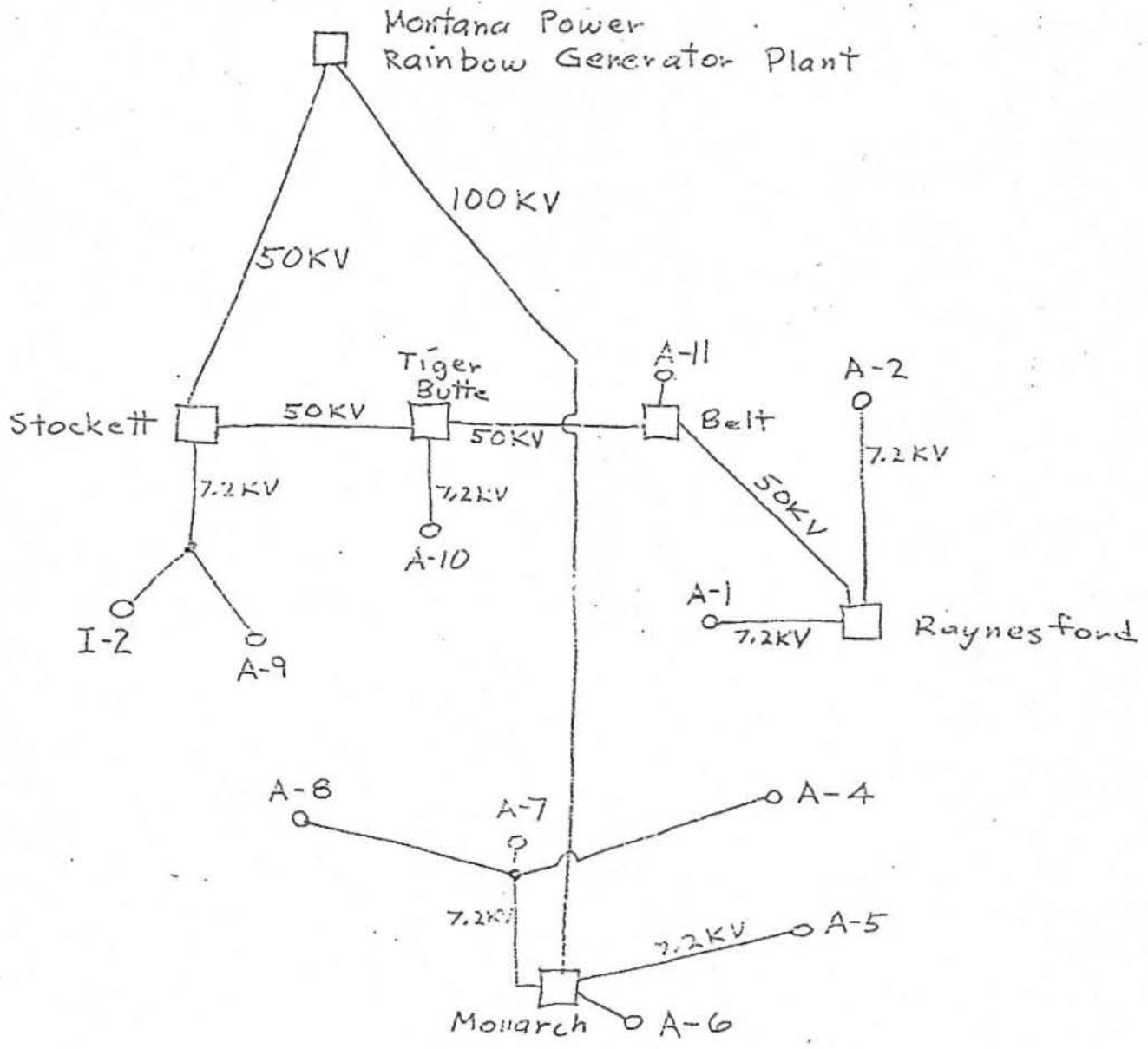
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Channel P. is schematic

FIGURE 2.

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A FLIGHT POWER DISTRIBUTION  
 FIGURE 3.

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to the Glengarry substation at Lewistown and the other to the Harlowton substation. The Glengarry substation feeds the Hilger substation with 50 KV lines and Hilger feeds the Winifred substation with 50 KV lines. The sites are fed by 7.2 KV lines. <sup>91</sup> (U)

A 7.2 KV transformer shorted in the line to site E-3 at 1450, 16 March 67. This transformer is located on a farm two miles south of the Winifred substation. Automatic reclosure switches at Winifred substation opened, and were reclosed manually after transformer replacement later in the day. This caused the Brine Chiller problem at E-1. The transformer was in the West phase. It was not determined which phase this corresponds to at the sites. Sites E-3, E-5, E-6, E-9, and E-10 transferred to Standby Power. Sites E-1 transferred to Direct Current (DC) operation. <sup>92</sup> (U)

On 28 March 67, the 31st SMW in conjunction with the Montana Power Company conducted a switching test on the 50 KV high voltage line between the Harlowton and Glengarry substations. The test was performed at the request of OOAMA/OONE as a part of the initial Echo Flight incident investigation performed at Malmstrom. The intent of the test was to verify correlation, if possible, between high voltage switching and launch facility shutdown or other launch facility faults. <sup>93</sup> (U)

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91. Rpt, (S) "Report Engineering Investigation of Echo Flight Incident, Malmstrom AFB, Mont. - 16 Mar 67," by Engineering Investigation Team, 23 Mar 67, p 14.

92. Ibid., p 15. ~~CONFIDENTIAL~~

93. Msg, (C) DM7 02998, SAC to OOAMA, Subj: Proposed Power Switching Test for Echo Flight, 24 Mar 67, Ex 45.

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After performing the tests, it was decided that commercial power switching operations were not the cause of the E Flight shutdown. This was based on the following reasons. Other flights fed by the Hilger substation were not affected. Similar shutdowns occurred in A Flight LFs which were supplied by power not only from separated substations, but also, from separate feed lines from the generation station. Shutdown in 1965 or 1966 of missiles do not correlate to any power line switching in the Montana Power System. <sup>94</sup> (U)

Since the only common item determined in this investigation was the LCC. The LCC power fault transmitted to the LFs on the hardened cable was considered the only power fault capable of causing the Echo Flight incident. <sup>95</sup> (U)

The investigation teams at Malmstrom, were unable to determine a logical cause for the incident. Further investigation in the area of shutdown results will be conducted in an effort to determine a possible cause of this incident. These studies will be conducted at the contractors facility and will be included in the next history. <sup>96</sup> (U)

On 12 January 1967, at 0905 hours, a potential disaster

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- 94. Rpt, (S) "Report of Engineering Investigation of Echo Flight Incident, Malmstrom AFB, Mont. - 16 Mar 67," by Engineering Investigation Team, 23 Mar 67, p 17.
  - 95. Ibid., p 17.
  - 96. Ibid., p 3.



P43

situation occurred while the 341st MIMS Re-entry Vehicle Branch team was being evaluated by the 3901st SMES in performance of a Dash 1 A maintenance on a W-56-Mod 1 warhead.<sup>97</sup> (U)

During the operation a T-290A (instrument to register gaseous air contamination) gave an alarm. The area was immediately evacuated and those present were sent to the Hospital, Decontamination station, for observation of possible contamination.<sup>98</sup> (U)

A Explosive Ordinance Disposal (EOD) team entered the area wearing protective clothing and equipped with a T-290A, plastic bags, and cotton swabs. The warhead was checked with swipe tests for radiation with all results showing negative.<sup>99</sup> (U)

A check was made on the T-290A which gave the alarm and was determined to be faulty. The area was again checked by the team for radiation with no results. The alert was then ended at 1150 hours on 12 January 67.<sup>100</sup> (U)

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97. Rpt, (U) "Disaster Control Team Action Report," by Team Chief Explosive Ordinance Disposal, 12 Jan 67, Ex 46.

98. Ibid.

99. Ibid.

100. Ibid.

File  
11  
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DCA

28 February 1967

564th SMS (Lt Wilson/3650)

Monthly Report HF/SSB Hardened Antenna  
564th SMS Monthly Narrative Report Input (Hard HF Antenna  
Acceptance Team)

15AF (DM4C)

This monthly report for February is submitted through your headquarters for Hq SAC (DM7B) in accordance with paragraph 41, Chapter 7, SACM 66-8. The following paragraphs where applicable correspond to subparagraphs of paragraph 41, SACM 66-8.

a. Known Problem Areas: All known problem areas have been thoroughly identified as a result of the Walk-Thru Inspections conducted at Wing I facilities during period 1 February 1967 through 24 February 1967. A message report on each walk-thru has been sent to Hq SAC, 15AF and 18 SAD.

b. Formal Demonstration Schedule: No forecast of formal demonstrations can be made until the discrepancies identified during current walk-thru inspections are corrected.

d. Summary of Technical Orders: No change from those previously reported on the status of Technical Orders and SAC CEM's.

f. Significant Matters: HF/Walk-Thru Inspections have been conducted on 564th SMS flights P, Q and R. Tentative walk-thru of flights S and T HF/SSB facilities have been set for period 6 - 10 March 1967. Copies of these inspections will be forwarded in the same manner as Wing I facility inspections.

JOHN W CARROLL, Colonel, USAF  
Commander

Cy to:  
18SAD, WC, COMS, DCO, DCMQ, BCE,  
SAFE, DCGS, SATAF(ESG-29), 10SMS,  
12SMS, 490SMS

HL  
Leid

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FTTC JAW RUCSAAA0489 0831943-0000-RUWMBDA.

ZNY ~~SECRET~~

P 241930Z MAR 67

FM SAC

TO RUWMBBA/COAMA HILL AFB UTAH

INFO RUWBKNA/15AF

RUWMBDA/341SWW MALMSTROM AFB MONT

RUWMBAA/BOEING CO SEATTLE WASH

BT

~~SECRET~~ DM7 02998 MAR 67

1. ACTIONS: COAMA (COONE), INFO: 15AF (DM), 341SWW (C), TBC

APPRO: ATTN: DAN DOWNEY, MINUTEMAN ENGINEERING

SUBJECT: PROPOSED POWER SWITCHING TEST FOR ECHO FLIGHT (U)

REF: CONFIDENTIAL COONE 20321 MARCH AND MALMSTROM CONFIDENTIAL

ZIPPO MSG OCXZ2296 MARCH.

1. FOR ALL. THIS IS AUTHORITY TO CONDUCT THE POWER SWITCHING TEST TO AID IN DETERMINING THE CAUSE OF THE ECHO FLIGHT SHUTDOWN. PROCEDURES OUTLINED IN REFERENCED ZIPPO MESSAGE WILL APPLY. SYSTEM SHOULD BE IN CLOSEST CONFIGURATION POSSIBLE TO CONDITIONS THAT

PAGE 2 RUCSAAA0489 ~~SECRET~~

EXISTED AT TIME OF INCIDENT.

2. FOR ALL. COONE, AS TEAM CHIEF, WILL DETERMINE CONDITIONS, TIME OF TEST AND COMPOSITION OF INVESTIGATION TEAM. INSTRUCTIONS CONTAINED IN COONE 20321 WILL BE RECONFIRMED AS POWER SWITCHING TEST MAY CONFLICT WITH PROCEED MEETING.

3. FOR ALL. SHOULD SHUTDOWN OCCUR, ANALYSIS SHOULD BE CONDUCTED PRIOR TO RETURNING SITES TO ALERT. 51 STRAT WSLANG PROPOSAL OF FOUR SITES RETURNED TO ALERT PER DAY SHOULD BE ADHERED TO IN ORDER TO AVOID PROLONGED OFF ALERT TIME.

4. FOR 15AF AND 341SWW. THIS HEADQUARTERS (DOFI AND DM7B) WILL BE NOTIFIED OF THE TIME OF TEST. IF SHUTDOWNS OCCUR AS A RESULT OF THIS TEST A SCHEDULE OF PROPOSED RETURN TO ALERT IS ALSO REQUIRED.

GP-4.

BT

*CH 2002*  
*24/E-282*  
*DM-1*  
*UCS-1*  
*W-1*

NNNN

~~GROUP 4~~  
~~DOWNGRAD 30 APR 67~~  
~~DECLASSIFIED AFTER 32 YEARS~~

~~CONFIDENTIAL~~



(2) No support teams were utilized.

(3) There are no recommendations for improvement of local or higher headquarters procedures or directives.

*Ross E. Mersman*

ROSS E. MERSMAN, TSgt, USAF  
Team Chief Explosive Ordnance Disposal

~~CONFIDENTIAL~~

PAGE 2 RUWNNBAG954

TO RESOLVE THIS PROBLEM, OR TO DEFINITIZE ADEQUATE ENGINEERING ANALYSIS TASKS WITHOUT ADDITIONAL TESTING. A REVIEW OF AVAILABLE DATA STRONGLY SUGGESTS THIS TO BE A WING X PECULIAR PROBLEM. THE COAMA ETF IS NOT A WING X FACILITY. IT IS, THEREFORE, NECESSARY TO RUN THE PROPOSED TESTS AT MALISTRON, PREFERABLY AT ECHO 5. IT IS CURRENTLY BELIEVED THAT FRUITFUL DATA WILL NOT EXIST UNTIL SUCH TIME AS THE NO-GO MODE CAN BE REPRODUCED AT LEAST AT THE LF LEVEL.

3. THE FOLLOWING PLAN OF ACTION WAS AGREED UPON BY ALL REPRESENTATIVES. DEVELOP A TEST PLAN WHICH, AFTER ISOLATING AN LF FROM THE SYSTEM, ALLOWS FOR THE APPLICATION OF STIMULI WHICH WILL REPRODUCE THE NO-GO AT THE LF LEVEL. AFTER ANALYSIS OF SUCH TEST DATA, PROCEEDING AS REQUIRED TO TEST, OR ANALYZE AT THE LCF LEVEL. THE TASK GROUP WILL CONVENE AT BOEING, SEATTLE ON 4 APRIL TO DEVELOP A TEST PLAN AND PROCEDURES. SUCH PLAN WILL INCLUDE EQUIPMENT REQUIREMENTS, LF ISOLATION PROCEDURES, DEFINE TESTS TO BE PERFORMED, AND BE REVIEWED FOR SAFETY. THE PLAN WILL RECEIVE SAFETY CLEARANCE THROUGH COONE, AND WILL BE COORDINATED WITH SAC AS REQUIRED. COMPLETION DATE FOR THE PLAN IS AIMED AT 5 MAY 1967. THE PLAN WILL BE DEVELOPED AND PROTOTYPED, AT THE NRA FACILITY AT BOEING.

4. ADDITIONAL INVESTIGATIVE ENGINEERING STUDIES ARE IN PROCESS, AND WILL CONTINUE. BOEING IS ATTEMPTING TO OBTAIN AN EXHIBIT 7KVA TRANS-

PAGE 3 RUWNNBAG954

FORMER WHICH WAS REPORTED TO HAVE SHORTED A FEW HOURS AFTER THE INCIDENT. A TROUBLE REPORT ON THE TRANSFORMER WILL BE DEVELOPED BY BOEING ENGINEERING. DEPENDENT UPON THE ANALYSIS OF THIS TRANSFORMER, AND ITS FAILURE MODE, ADDITIONAL TESTS MAY BE REQUESTED SIMILAR TO THE POWER TESTS RUN ON 23 MARCH 1967, AT MALISTRON WITH THE ADDED TRANSFORMER FAILURE MODE SIMULATION. YOU WILL BE FURTHER ADVISED WITH RESPECT TO THIS ACTIVITY.

5. CONCURRENCE IN THE USE OF ECHO 5 FOR TESTING OUTLINED IN PARAGRAPH (3) IS REQUESTED. PLANNING FACTORS AT THIS TIME ARE FOR A PERIOD OF SIX WEEKS BEGINNING 15 MAY 1967. YOU WILL BE ADVISED OF ANY SHIFT IN THESE TARGET DATES. GI-4.

BT Page 2 of 2

~~CONFIDENTIAL~~  
~~RESTRICTED TO TEN YEARS~~

~~CONFIDENTIAL~~

DISASTER CONTROL TEAM ACTION REPORT  
Hahnstrom AFB, Montana

1. Reference: SAC Form 696, para U.
2. Date of Disaster: 12 January 1967
3. Time of Disaster: Approximately 0910 local
4. Location of Disaster: 341st FMS Munitions Storage Area, building 1840, MK-11 Bay.
5. OPR Submitting Report: 341st FMS Explosive Ordnance Disposal Section
6. Report is complete.
7. Report as follows: Explosive Ordnance Disposal Team Chief -  
Ross E. Mersman, TSgt, AF 19433151, WOCIC Explosive Ordnance Disposal Section.

(1) On 12 January 1967 at approximately 0910 local, the 341st WMSRV Evaluation Team consisting of TSgt Roy E. Aldridge, AF 19453530 - Team Chief, SSgt William R. Shoemaker, AF 13533767 - Team Member, and SSgt Frank A. Martin, AF 28718138 - Team Member, was being evaluated by the 3901st while performing Dash 1A maintenance on a W56, Mod 1 Warhead IAW T.O. 11N-561A. During removal of MC1508, the T-290A, serial No. PF-2450-B9, gave an audible alarm, indicating the presence of a hazardous environment.

This maintenance was being performed in the 341st FMS Munitions Storage Area, building 1840, MK-11 Maintenance Bay. The RV maintenance team chief TSgt Aldridge sounded the alarm and the entire area was evacuated. The E.O.D. team consisting of TSgt Mersman, A1C Jackie L. Shreves, AF19681063 and TSgt Robert A. Steele AF11193215 (3901st EOD) re-entered the area with full protective clothing, a second T-290A, serial No. PF-2132-K8, plastic bags and cotton swabs. The W56, Mod 1 Warhead and the MC1508 was monitored with negative results. Swipe tests were taken from the W56, Mod 1 Warhead and MC1508 IAW T.O. 11A17-1-100-29, para 3-1.1, dtd 18 Feb 65, Chg 10 Oct 66. This information was given to the Wing Command Post. At approximately 1105 local TSgt Mersman, A1C Coyle W. Turner, AF19724121 and Capt. Robert J. Huntsman, PV3112241 (3901st EOD - Observer) re-entered the area with both T-290A's and two PAC-15's serial No. 4612 and 5518 and re-monitored the area. The T-290A, serial No. PF-2450-B9 which had been used by the RV maintenance team would not setup IAW T.O. 11N-35-15 and was determined to be inoperative. TSgt Mersman and Capt. Huntsman monitored the MK-11 maintenance bay for alpha contamination with negative results. The second T-290A, serial No PF-2132-K8 was again used, and again a negative indication was received. These actions were reported to the Wing Command Post. All protective clothing was checked for contamination with negative results. The swipe test samples were given to the Bio-environmental Engineer Section to be forwarded to Wright-Patterson AFB for complete evaluation & analysis. Information received from Wright-Patterson indicated that these swipe tests were also negative.

Arch 4<sup>8</sup>

VZCZ ONIA278

FITS JAW RUCSAAA0196 0702315-SSSS--RUWMB0A.

ZNY ~~SSSS~~

P 17225Z MAR 67

FM SAC

TO RUWMMBA/OOAMA HILL AFB UTAH

INFO RUWBKNA/15AF

RUWMB0A/341SMW MALMSTROM AFB MONT

RUWMBAA/AFFRO BOEING CO SEATTLE WASH

RUWJABA/BSO NORTON AFB CALIF

BT

~~SECRET~~ DT 02752 MAR 67.

ACTION: OOAMA (OONCT/OONE-COL DAVENPORT). INFO: 15AF (DM4C), 341SMW (DCM), BOEING AFFRO (D.J. DOWNEY, MINUTEMAN ENGINEERING) BSO (BSS, BSQR)

SUBJECT: LOSS OF STRATEGIC ALERT, ECHO FLIGHT, MALSTROM AFB. (U)

REF: MY SECRET MESSAGE DM73 02751, 17 MAR 67, SAME SUBJECT.

ALL TEN MISSILES IN ECHO FLIGHT AT MALMSTROM LOST STRAT ALERT WITHIN TEN SECONDS OF EACH OTHER. THIS INCIDENT OCCURRED AT 0845L ON 16 MARCH 67. AS OF THIS DATE, ALL MISSILES HAVE BEEN RETURNED TO STRAT

JJ 2342  
17/C-208

DCM-1  
WC-1  
DCO-1  
~~SECRET~~

PAGE 2 RUCSAAA0196 ~~SECRET~~

ALERT WITH NO APPARENT DIFFICULTY. INVESTIGATION AS TO THE CAUSE OF THE INCIDENT IS BEING CONDUCTED BY MALMSTROM TEST. TWO FITTS HAVE BEEN RUN THROUGH TWO MISSILES THIS FAR. NO CONCLUSIONS HAVE BEEN DRAWN. THERE ARE INDICATIONS THAT BOTH COMPUTERS IN BOTH G&C'S WERE UPSET MOMENTARILY. CAUSE OF THE UPSET IS NOT KNOWN AT THIS TIME. ALL OTHER SIGNIFICANT INFORMATION AT THIS TIME IS CONTAINED IN ABOVE REFERENCED MESSAGE.

FOR OOAMA. THE FACT THAT NO APPARENT REASON FOR THE LOSS OF TEN MISSILES CAN BE READILY IDENTIFIED IS CAUSE FOR GRAVE CONCERN TO THIS HEADQUARTERS. WE MUST HAVE AN IN-DEPTH ANALYSIS TO DETERMINE CAUSE AND CORRECTIVE ACTION AND WE MUST KNOW AS QUICKLY AS POSSIBLE WHAT THE IMPACT IS TO THE FLEET, IF ANY. REQUEST YOUR RESPONSE BE IN KEEPING WITH THE URGENCY OF THE PROBLEM. WE IN TURN WILL PROVIDE OUR FULL COOPERATION AND SUPPORT.

FOR OOAMA AND 15AF WE HAVE CONCURRED IN A BOEING REQUEST TO SEND TWO ENGINEERS, MR. R.E. RIGERT AND MR. W. M. DUTTON TO MALMSTROM TO COLLECT FIRST HAND KNOWLEDGE OF THE PROBLEM FOR POSSIBLE ASSISTANCE IN LATER ANALYSIS. REQUEST COOPERATION OF ALL CONCERNED TO PROVIDE THEM ACCESS TO AVAILABLE INFORMATION, I.E., CREW COMMANDERS LOG ENTRIES, MAINTENANCE FORMS, INTERROGATION OF KNOWLEDGEABLE PEOPLE, ETC.

PAGE 3 RUCSAAA0196 ~~SECRET~~

SECURITY CLEARANCES AND DATE AND TIME OF ARRIVAL WILL BE SENT FROM THE AFFRO BY SEPARATE MESSAGE.

FOR 15AF. OOAMA HAS INDICATED BY TELECON THAT THEY ARE SENDING ADDITIONAL ENGINEERING SUPPORT. REQUEST YOUR COOPERATION TO INSURE MAXIMUM RESULTS ARE OBTAINED FROM THIS EFFORT. GP74, BCASMC-67-437

BT

~~SECRET~~

~~SECRET~~  
DOWNGRADED AT 3 YEAR INTERVALS  
DECLASSIFIED AT 10 YEARS

~~CONFIDENTIAL~~

*Handwritten:* 10 / C-344 / 05532

VZCZCNIA764

FTTC JAZ RUWNBAB0034 039 0107-CCCC--RUWNB0A-  
ZNY ~~0000~~

P 30005Z MAR 67

FM OQAMA/KILL AFB UTAH  
TO RUCSAAA/SAC

RUWBKNA/15TH AF MARCON AFB CALIF

RUWNB0A/3415MW MALMSTROM AFB MONT

RUWNBAA/AFPRO THE BOEING CO SEATTLE WASH

RUWJBGA/NORTH AMERICAN AVIATION AUTONETICS DIV ANAHEIM CALIF

INFO RUEDFIA/HDRQS AFLC WRIGHT-PATTERSON AFB OHIO

RUWJABA/BSO NORTON AFB CALIF

BT

*Handwritten:* Dcm-1  
WC-1  
DCO-1

~~CONFIDENTIAL~~ 0000 01012 MAR 67

FOR: SAC/DW7B, DE; 15AF/DWAC, DE; 341 SWM/DCM; BOEING (D.J.

DOWING-MINUTEMAN ENGINEERING); AUTONETICS/MR H.R. HEATH.

INFO: HDRQS AFLC WRIGHT PATERSON AFB MONT (COL MORRISON); BSD/BSS,

BSQR, BSQM

SUBJECT: WING I, E FLIGHT INCIDENT

1. A TASK GROUP MEETING CONVENED AT OQAMA ON 28 MARCH 1967, TO  
REVIEW THE RESULTS OF INVESTIGATION TO DATE. REPRESENTATIVES FROM  
BOEING COMPANY, AUTONETICS, OQAMA, AND 15TH AF WERE REPRESENTED.

2. IT IS THE POSITION OF THE TASK GROUP THAT INSUFFICIENT DATA EXISTS

*Handwritten:* Page 1 of 2

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[REDACTED]

Approved for Release by NSA on 05-08-2014 pursuant to E.O. 13526	Approved for Release by NSA on 05-08-2014 pursuant to E.O. 13526
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341st STRATEGIC MISSILE WING

AND 341st COMBAT SUPPORT GROUP

HQ SAC DXI.. 67-3922

**P.R.C.I.** (Unclassified Title)

Apr Thru 30 Jun 1967

VOL I

Assigned to the [REDACTED]

FIFTEENTH AIR FORCE, STRATEGIC AIR COMMAND

18 AUG 1978

Permanently Stationed at

**P.R.C.I.**

MALMSTROM AIR FORCE BASE, GREAT FALLS, MONTANA

DOCUMENT DECLASSIFIED PER  
HQ AFSPC/DOXN 27 Apr 95 and  
OO-ALC/LNE 27 Jul 95.

~~This document was prepared by A2C David B. Gamble, Wing Historian under the supervision of the Wing Information Officer. It is prepared in compliance with SACR 210-1, 29 June 1964, and is classified SECRET under the provision of AFR 205-1 as amended. The classification is required for the protection of information that reveals the military capability and operational status of the Wing (U)~~

APPROVED:

*David B. Gamble*  
DAVID B. GAMBLE, A2C, USAF  
Historian

*John W. Carroll*  
JOHN W. CARROLL, Col, USAF  
Wing Commander

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SECURITY STATEMENT PAGE

This volume is ~~\_\_\_\_\_~~ to conform to the classification of the information in the source documents. It will be handled in accordance with the provisions of AFR 205-1, as amended.

This volume contains information effecting the national defense of the United States within the meaning of the Espionage Laws (Title 18, U.S.C., sections 793 and 794), the transmission or revelation of which in any manner to any unauthorized person is prohibited by law.

This volume has been placed in downgrading Group 3, which is the highest downgrading group assigned to the information in the source documents. The historian's analysis and consolidation of information from many sources, which individually may have lower downgrade provisions, results in a synthesis which may have wider implications than the material on which it is based. Therefore, individual downgrade instructions for each paragraph are not indicated, and all portions of this volume will be handled under the overall downgrading group.



two different types have been introduced into the Squadron. The only major difference between the vehicles is the weight. This causes a problem in the operational data on the targeting tapes fed into the G&Cs. The present tapes have operational data for a lighter weighing G&C vehicle, therefore, they can not compensate for the additional weight of the heavier G&C vehicle in navigation. This means that the tapes now in use would not be able to correctly guide the missile equipped with a heavy G&C vehicle. Theoretically, a missile equipped with a heavier G&C and with the wrong type of computer tape would fall short of its' target and therefore, be useless. SAC has started a schedule to replace the tapes of the heavy G&Cs with a corrected tape (MOPP-607) which would compensate for the weight difference. The SAC schedule for replacement is as follows: Papa flight, 18 Jul 67, Quebec flight, 21 July 67; Romeo flight, 25 July 67, and Tango flight, 31 July 67.

<sup>41,42</sup>  
67. ~~U~~ (U)

As stated in the last history, studies of the Echo flight incident were to be conducted at the contractors plant. (U)

A task group meeting convened at ODAMA, Hill AFB, Utah on 28 March 67, to review the results of the investigation to date.

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- 41. Interview, A2C David B. Gamble, Wing Historian, with Lt. Thomas R. Filiatreau, Wing Maintenance Technical Analysis Division, 11 Jul 67.
  - 42. Msg, (C) DIRM 07160, SAC to Norton AFB, 6 Jul 67, Ex 44.





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A30

Representatives from the Boeing Company, Autonetics, COAMA, and  
15th AF attended. <sup>43</sup> (U)

The group decided that insufficient data on the incident existed to resolve the problem or for adequate engineering analysis without additional testing. The present data suggested that the problem was a Wing I peculiar problem. Since the COAMA Experimental Test Facility (ETF) was not a Wing I type, it was necessary for the experiments to be conducted at Malmstrom. Further analysis of the problem showed that experiments would be of no real value until a No-Go Mode could be reproduced at least at a LF level. <sup>44</sup> (U)

It was decided by the group to first develop a way to reproduce a No-Go Mode at the LF level then at the Launch Control Facility (LCF) level before a test could be made at Malmstrom. The group was to reconvene at Boeings' Seattle plant on 4 April 67 for development of a way to safely reproduce a No-Go effect. The plan was to be developed at the Network Resolution Area (NRA) at Boeing, with a completion date for the plan set at 5 May 67. <sup>45</sup> (U)

During testing at Boeing, a 30 micro sec Pulse (-10 to 0 volt square wave) was placed on the Self Test Command (STC) line at the C-53P Coupler Logic Drawer interface (STC). Seven out of

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43. Msg, (C) OONE 01012, COAMA to SAC, "Wing I, E Flight Incident," 30 May 67, Ex 45.

44. Ibid.

45. Ibid.

~~REDACTED~~

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P 31

10 separate applications of a single Pulse, would cause the system to shut down with a Channel 9 & 12 No-Go. <sup>46</sup> (U)

Subsequent testing at Autonetics has resulted in the following explanation of what probably happens in the Coupler Logic Drawer. The Pulse inserted is long enough to initiate the Coupler Self test sequence within the C-53P. However, it is not of long enough duration to enable control lines to the computer to place the computer in a Coupler test loop Mode. This causes the Coupler to issue a sequence error due to lack of coincidence between G&C and Coupler Modes. This sequence error, together with the action of two other flip flop outputs (M-17 & M-20), is sufficient to initiate the Coupler and G&C No-Go shut down. <sup>47</sup> (U)

The effort at Boeing NRA was to determine the source and most likely path of noise Pulse to the Logic Coupler. The results to the Electro Magnetic Pulse (EMP) testing at the LF and Wing IV indicated that the Sensitive Information Network (SIN) were susceptible to noise of the type that could have caused the problem. <sup>48</sup> (U)

The SIN lines go only from the LCC to all of the LF's in the flight, which could explain the flight peculiar aspect of the problem. <sup>49</sup> (U)

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46. Msg, (S) OONE 01204, OOAMA to SAC, "Malmstrom E Flight Problem Weekly Status," 17 Apr 67, Ex 46.

47. Ibid.

48. Ibid.

49. Ibid.

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~~SECRET~~

P32

The best possible source of the noise Pulse, so far in the analysis, was the transformer failure which occurred at a stock watering through the Echo flight area. The shorting to ground of the single phase transformer may have unbalanced the three phase "Y" connected system enough to cause ground currents to flow back to the generator. The Hardened Intersite Cable (HIC) shields would provide a path for the ground current thus inducing voltage Pulses on the SIN lines to all LF's. <sup>50</sup> (U)

Testing at NRA has proven that there is significant coupling between the shields of the SIN lines and the Self Test Command (STC) line into the C-53P Logic Coupler. <sup>51</sup> (U)

A conference was held at Boeing on 18 April 67 for the task team to review the preliminary test plan for LF, E-78, at Malmstrom. Also, a test plan was reviewed to accomplish the transformer failure simulation tests at Malmstrom. Boeing had co-ordinated with the power company, and received their approval for the tests. <sup>52</sup> (U)

It was the consensus of the task group that the transformer tests should be run as soon as possible so that the data would be available for the E-78 test plan development. The plan was to instrumentally connect the HIC lines and power line into both one

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50. Msg, (S) OOME 01204, OOAMA to SAC, "Malmstrom E Flight Problem Weekly Status," 17 Apr 67, Ex 46.

51. Ibid.

52. Ibid.

~~SECRET~~

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P 33

E flight LF and LCC. <sup>53</sup> (U)

The power tests were accomplished at Malmstrom AFB during the week of 15 May 67. The tests were in accordance with Test Plan D2-18446-1. No sites were shut down for the test. <sup>54</sup> (U)

Instrumentation on the Sensitive Information Network lines and on the commercial primary power lines showed no significant noise propagation as a result of simulating the transformer failure. <sup>55</sup> (U)

As part of the tests, one of the primary power lines at the LCC was opened and then shorted to neutral. The test plan called for three operations of this sequence; however, the back-up Environmental Control System (ECS) failed to sequence properly and rather than jeopardize the equipment, only one sequence was performed. <sup>56</sup> (U)

During the transformer tests, a one volt peak to peak 60 cycle signal appeared on the SIN receiving line at E-3. Also, a high current spike was seen on the primary power neutral line to launch facility ground point. The 60 cycle signal on the SIN line was insignificant because tests have indicated that frequencies in the area of 100 Kilo Cycle (KC) propagated most readily

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53. Msg, (S) OONE 01204, OQAMA to SAC, "Malmstrom E Flight Problem Weekly Status," 17 Apr 67, Ex 46.

54. Msg, (S) OONE 01787, OQAMA to BSD Norton AFB, "Malmstrom E Flight Problem Interim Report," 2 Jun 67, Ex 47.

55. Ibid.

56. Ibid.

[REDACTED]

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P34

within the LF. Also, known was that the C-53P Logic Coupler will cause Channel 9 & 12 No-GO shut down with Pulse width in the area of 10 to 100 micro sec (a 60 Cycle Per Second signal has a pulse width of approximately 16.7 milli sec). The current spike on the neutral power line did not appear to extend to the Logic Coupler interface therefore, it was not felt to be significant. <sup>57</sup> ~~(U)~~ (U)

Each time a power Pulse was initiated, by shorting the transformer or opening one phase at the LCC, E-1 and E-3 were observed to switch to emergency power momentarily. The capsule area did not report any change in status from the 10 LF's in Echo Flight as a result of power tests. <sup>58</sup> ~~(U)~~ (U)

The tests run at Boeing in the NRA have proved that the C-53P Logic Coupler was the receiver to the noise Pulse irregularly. The normal signal on the STC in the C-53P is (-10 to 0 volt Pulse of duration between two and 200 micro sec) was applied at this point. When the Pulse width was set at 30 micro sec, 12 Channel 9 & 12 No-Go's, one Channel 9 No-Go, and four Coupler Self Tests (CST), were experienced out of 20 separate applications of the Pulse. <sup>59</sup> ~~(U)~~ (U)

In other words, 60 percent of the time the responses were the same as experienced at Echo Flight and 85 percent of the

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57. Msg, (S) OONE 01787, OQAMA to BSD Norton AFB, "Malmstrom E Flight Problem Interim Report," 2 Jun 67, Ex 47.

58. Ibid.

59. Ibid.

~~SECRET~~

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time the response would have placed the system in a non EWO  
status. <sup>60</sup> (U)

P35

A 30 micro sec Pulse is equivalent to a frequency of 3 KC.,  
and previous testing at the LF and NRA have indicated the Pulse  
coupling within the LF is present at frequencies in this general  
area. OONE has conducted tests at the Hill Experimental Launch  
Facility on the Wing II-V Logic Coupler to determine if it could  
be a receiver to this same type Pulse. This testing will in-  
dicate if the Wing II-V, Logic Coupler will respond to a random  
Pulse similar to the response observed on the C-53P Logic Coupler  
during test at the Boeing NRA. <sup>61</sup> (U)

The results of these tests will be included in the next  
history. (U)

Due to the fact that the power tests were essentially  
negative, it appears that the cause of the Echo Flight problem  
was of the EMP or electrostatic nature. <sup>62</sup> (U)

A Channel 9 & 12 No-Go shut down has never been reported  
at Wings II thru V. This fact is probably due to the significant  
difference between the Wing I and the Wing II thru V, Logic  
Couplers as well as differences in the inter site cable and LF

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60. Msg, (S) OONE 01787, OOAMA to BSD Norton AFB, "Malmstrom E  
Flight Problem Interim Report," 2 Jun 67, Ex 47.

61. Ibid.

62. Ibid.

[REDACTED]

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cabling. Therefore, Echo Flight problem still appears to be  
a Wing I peculiar problem. <sup>63</sup> (U)

P 36

OONE recommended Ballistic System Division (BSD) accomplish additional testing of the EMP and electrostatic nature at a Wing I facility at the time of Force Modernization to determine the extent of vulnerability. After the testing has isolated all problems with the Wing I Force Modernization configuration, BSD could evaluate the need for testing of Wing II-V Force Mod silos. <sup>64</sup> (U)

Air Force Systems Command (AFSC) has the primary responsibility for EMP testing, and has an active test program at the present time. Therefore, OAMA recommended that BSD and Air Force Weapons Laboratory (AFWL) accomplish these tests at Malmstrom at the earliest possible date. <sup>65</sup> (U)

The results of these tests will appear in the next history. (U)

In a previous history a problem of Movement Security Alarm System on the Wings' re-entry vehicles G&C Vans was described. The problem was the alarm system under the vans, was inoperative during winter weather conditions, due to the collection of mud, snow, and ice under the van. Because of the great deal of maintenance required to keep the alarm operational; the Wing suggested

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63. Msg, (S) OONE 01787, OAMA to BSD Norton AFB, "Malmstrom E Flight Problem Interim Report," 2 Jun 67, Ex 47.

64. Ibid.

65. Ibid.

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PTT : JAZ RUWMBAG054 280 0107-~~RUWMB0A~~

ZN ~~RUWMB0A~~

P 0005Z MAR 67

FM OAMA HILL AFB UTAH

TO RUCSAAA/SAC

RU 3KMA/15TH AF MARCH AFB CALIF

RUWMB0A/341SMW MALMSTROM AFB MONT

RUWMB0A/AFPRO THE BOEING CO SEATTLE WASH

RUWMB0A/NORTH AMERICAN AVIATION AUTONETICS DIV ANAHEIM CALIF

INFO: RUEDFIA/HQRS AFLC WRIGHT-PATTERSON AFB OHIO

RUWMB0A/BSO NORTON AFB CALIF

BT

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~~SECRET~~ GOME 01012 MAR 67

FOR: SAC/DM7B, DE; 15AF/DM4C, DE; 341 SMW/DM; BOEING (D.J.

DOWING-MINUTEMAN ENGINEERING); AUTONETICS/DR H.R. HEATH.

INFO: HQRS AFLC WRIGHT PATTERSON AFB OHIO (COL MORRISON); BSO/BSS,

BSOR, BSOH

SUBJECT: WING 1, E FLIGHT INCIDENT

1. A TASK GROUP MEETING CONVENED AT OAMA ON 28 MARCH 1967, TO

REVIEW THE RESULTS OF INVESTIGATION TO DATE. REPRESENTATIVES FROM

BOEING COMPANY, AUTONETICS, OAMA, AND 15TH AF WERE REPRESENTED.

2. IT IS THE POSITION OF THE TASK GROUP THAT INSUFFICIENT DATA EXISTS

Page 1 of 2

~~GROUP~~  
~~DOWNGRADED TO SECRET~~  
~~DECLASSIFIED ON 11-14-88~~





PAGE 2 NUMMBA9834

TO RESOLVE THIS PROBLEM, OR TO DEFINITELY ADEQUATE ENGINEERING ANALYSIS TASKS WITHOUT ADDITIONAL TESTING. A REVIEW OF AVAILABLE DATA STRONGLY SUGGESTS THIS TO BE A WING 1 PECULIAR PROBLEM. THE OOAMA ETF IS NOT A WING 1 FACILITY. IT IS, THEREFORE, NECESSARY TO RUN THE PROPOSED TESTS AT MALSTROM, PREFERABLY AT ECHO 8. IT IS CURRENTLY BELIEVED THAT FRUITFUL DATA WILL NOT EXIST UNTIL SUCH TIME AS THE NO-GO MODE CAN BE REPRODUCED AT LEAST AT THE LF LEVEL.

3. THE FOLLOWING PLAN OF ACTION WAS AGREED UPON BY ALL REPRESENTATIVES: DEVELOP A TEST PLAN WHICH, AFTER ISOLATING AN LF FROM THE SYSTEM, ALLOW FOR THE APPLICATION OF STIMULI WHICH WILL REPRODUCE THE NO-GO AT THE LF LEVEL. AFTER ANALYSIS OF SUCH TEST DATA, PROCEEDING AS REQUIRED TO TEST OR ANALYZE AT THE LCF LEVEL. THE TASK GROUP WILL CONVENE AT BOEING, SEATTLE ON 4 APRIL TO DEVELOP A TEST PLAN AND PROCEDURES. SUCH PLAN WILL INCLUDE EQUIPMENT REQUIREMENTS, LF ISOLATION PROCEDURES, DEFINE TESTS TO BE PERFORMED, AND BE REVIEWED FOR SAFETY. THE PLAN WILL RECEIVE SAFETY CLEARANCE THROUGH COME, AND WILL BE COORDINATED WITH SAC AS REQUIRED. COMPLETION DATE FOR THE PLAN IS AIMED AT 5 MAY 1967. THE PLAN WILL BE DEVELOPED AND PROTOTYPED AT THE NRA FACILITY AT BOEING.

4. ADDITIONAL INVESTIGATIVE ENGINEERING STUDIES ARE IN PROCESS, AND WILL CONTINUE. BOEING IS ATTEMPTING TO OBTAIN AN EXHIBIT 7KVA TRANS-

PAGE 3 NUMMBA9834

FORMER WHICH WAS REPORTED TO HAVE SHORTED A FEW HOURS AFTER THE INCIDENT. A TEARDOWN REPORT ON THE TRANSFORMER WILL BE DEVELOPED BY BOEING ENGINEERING. DEPENDENT UPON THE ANALYSIS OF THIS TRANSFORMER AND ITS FAILURE MODE, ADDITIONAL TESTS MAY BE REQUESTED SIMILAR TO THE POWER TESTS RUN ON 28 MARCH 1967, AT MALSTROM WITH THE ADDED TRANSFORMER FAILURE MODE SIMULATION. YOU WILL BE FURTHER ADVISED WITH RESPECT TO THIS ACTIVITY.

5. CONCURRENCE IN THE USE OF ECHO 8 FOR TESTING OUTLINED IN PARAGRAPH (3) IS REQUESTED. PLANNING FACTORS AT THIS TIME ARE FOR A PERIOD OF SIX WEEKS BEGINNING 15 MARY 1967. YOU WILL BE ADVISED OF ANY SHIFT IN THESE TARGET DATES. GP-4.

By page 2 of 2

UNCL

A-8



VZCZCNIA554  
 FTTS JAZ RUWMB0143 1072150 ~~SECRET~~ -RUWMB0A.  
 ZNY SSSSS  
 P 121300Z APR 67  
 FM OORNA HILL AFB UTAH  
 TO RUCSAAA/SAC  
 RUWBKNA/15AF MARCH AFB CALIF  
 RUWMB0A/341STRATMSLVG MALMSTROM AFB MONT  
 RUWMB0A/AFPRO THE BOEING CO SEATTLE WASH  
 RUWJBQA/ANAHEIM CALIF  
 RUWMB0A/SATAF MALMSTROM AFB MONT

*Handwritten:* CB/23052  
 17C-193

*Handwritten:* S/TAF-1  
 WC-7

~~SECRET~~ OONE 01204 APR 67  
 FOR SAC/DM7B 15AF/DM4C BSD/BSS BSGR BSGM 41 SMW/DCM  
 BOEING (D. J. DOWNING MINUTEMAN ENGINEERING AUTONETICS/MR H. R.  
 HEATH AFDC/MCMC (COL MORRISON).  
 INFO HQ AFIC WRIGHT-PATTERSON AFB OHIO BSD NORTON AFB CALIF.  
 SUBJECT: MALMSTROM E FLIGHT PROBLEM WEEKLY STATUS  
 1. DURING TESTING AT BOEING, SEATTLE, A 30 MICRO SECOND PULSE  
 (2-10 TO 0 VOLT SQUARE WAVE) WAS PLACED ON THE SELF TEST COMMAND LINE  
 AT THE C-53P COUPLER LOGIC DRAWER INTERFACE (SELF TEST COMMAND LINE).  
 FOR 7 OUT OF 10 SEPARATE APPLICATIONS OF A SINGLE PULSE, THE SYSTEM

PAGE 2 RUWMB0143 ~~SECRET~~  
 SHUT DOWN WITH CHANNEL 9 & 12. SUBSEQUENT TESTING AT AUTONETICS  
 HAS RESULTED IN THE FOLLOWING EXPLANATION OF WHAT PROBABLY HAPPENS IN  
 THE COUPLER LOGIC DRAWER. THE PULSE INSERTED IS LONG ENOUGH TO  
 INITIATE THE COUPLER SELF TEST SEQUENCE WITHIN THE C53. HOWEVER, IT  
 IS NOT OF LONG ENOUGH DURATION TO ENABLE CONTROL LINES TO THE COMPUTER  
 TO PLACE THE COMPUTER IN A COUPLER TEST LOOP MODE. THIS CAUSES THE  
 COUPLER TO ISSUE A SEQUENCE ERROR DUE TO LACK OF COINCIDENCE BETWEEN  
 G2C AND COUPLER MODES. THIS SEQUENCE ERROR, TOGETHER WITH THE  
 ACTION OF TWO OTHER FLIP FLOP OUTPUTS (M-17 & M-25), IS SUFFICIENT TO  
 INITIATE THE COUPLER AND G2C NO GO SHUT DOWN. THE EFFORT NOW AT  
 BOEING NRA IS TO DETERMINE THE SOURCE AND MOST LIKELY PATCH OF THE  
 NOISE PULSE TO THE LOGIC COUPLER. THE RESULTS OF EMP TESTING AT  
 KEFF AND WING IV INDICATE THAT THE SEN LINES ARE SUSCEPTIBLE TO NOISE  
 OF THE TYPE THAT COULD HAVE CAUSED THE PROBLEM. THE SEN LINES GO  
 ONLY FROM THE LCC TO ALL OF THE LF'S IN THE FLIGHT WHICH WOULD EXPLAIN  
 THE FLIGHT PECULIAR ASPECT OF THE PROBLEM. THE BEST POSSIBLE SOURCE  
 OF THE NOISE PULSE, SO FAR IN OUR ANALYSIS, IS THE TRANSFORMER FAILURE  
 WHICH OCCURRED AT A STORM WATERING THROUGH IN THE E FLIGHT AREA. THE  
 SHORTING TO GROUND OF THE SINGLE PHASE TRANSFORMER MAY HAVE UNBALANCED  
 THE 3 PHASE "Y" CONNECTED SYSTEM ENOUGH TO CAUSE GROUND CURRENTS TO

*Handwritten:* Page 1 of 2



*Handwritten:* GROUP 1 SCASMC-67-580

~~SECRET~~  
 DECLASSIFIED BY *[unclear]* DATE *[unclear]*

FLOW BACK TO THE GENERATOR. THE ORDERED INTERSITE CABLE (HIC) SHIELDS WOULD PROVIDE A PATH FOR THE GROUND CURRENT THUS INDUCING VOLTAGE PULSES ON THE SIN LINES TO ALL LF'S. TESTING AT NRA HAS PROVEN THAT THERE IS SIGNIFICANT COUPLING BETWEEN THE SHIELDS OF THE SIN LINES AND THE STC LINE INTO THE CT55P LOGIC COUPLER.

2. A CONFERENCE IS SCHEDULED AT BOEING ON 13 APRIL FOR THE TASK TEAM TO REVIEW THE PRELIMINARY TEST PLAN FOR LF E78 AT MALMSTROM. ALSO, A TEST PLAN WILL BE REVIEWED TO ACCOMPLISH THE TRANSFORMER FAILURE SIMULATION TESTS AT MALMSTROM. BOEING HAS COORDINATED WITH THE POWER COMPANY, AND HAS THEIR APPROVAL FOR THE TESTS. THE FINAL TRANSFORMER TEST PLAN WILL BE SUBMITTED TO OAMA, AND SUBSEQUENTLY SAC AND SATAF COORDINATION WILL BE ACCOMPLISHED.

IT IS THE CONSENSUS OF THE TASK GROUP THAT THE TRANSFORMER TESTS SHOULD BE RUN AS SOON AS POSSIBLE SO THAT THE DATA ARE AVAILABLE FOR THE E-8 TEST PLAN DEVELOPMENT. THE PLAN IS AT THIS TIME TO INTRUMENT TO HIC LINES AND POWER LINE INTO BOTH ONE E FLIGHT LF AND LCC. GP-4.

BT  
Page 2 of 2

BCASMC-67-580



FIRM NAME AND ADDRESS THE BOEING COMPANY P.O. BOX 3983 SEATTLE, WASH. 98124 (BOE 720)		<b>ENGINEERING CHANGE PROPOSAL FACILITY</b>				DATE 27 December 1966	
1	WCL NO ATTACHMENT AT 2827	WFC CODE	SYSTEM DESIGNATION WS113A	ELCP NO. 528	TYPE F	REV.	CHANGES
2	CONTRACTOR'S RECOMMENDED PRIORITY <input type="checkbox"/> EMERGENCY <input type="checkbox"/> URGENT <input checked="" type="checkbox"/> ROUTINE <input type="checkbox"/> COMPATIBILITY						
3	CONTRACT AND ITEM NOMENCLATURE Launch Facility						
4	NAME OF PART OR LOWEST ASSEMBLY AFFECTED Launch Facility Support Building						
5	TITLE OF CHANGE DC Supply for Isolation Relays - VRSA Channels 26 and 27 (LF)						
6	DESCRIPTION OF CHANGE <p>Provide DC supply for the isolation relays being installed in VRSA channels 26 and 27 per ECP 1141. A typical DC supply circuit for these relays is shown on Attachment A Sketch 1.</p> <p><u>ADDITIONAL DESCRIPTION:</u></p> <p>Instructions for retest of VRSA Channels 26 and 27 and for personnel and weapon system safety will be required.</p>						
7	JUSTIFICATION FOR CHANGE <p>The isolation relays are being installed in VRSA channels 26 and 27 per ECP 1141. The DC power required for these relays is to be supplied from the RPIE power System. This FCIR initiates the required RPIE change.</p>			REQUESTED BY PROCURING ACTIVITY PER REF: _____ FWG Meeting 90 DATE: 29 November 66 ATTACHMENT B PAGE 6			
8	DEVELOPMENTAL REQUIREMENTS N/A			A/E DESIGN REQ'D Yes DATE TBD			
9	ALTERNATIVE SOLUTIONS No alternate solutions are considered feasible						
10	RECOMMENDED PRODUCTION EFFECTIVITY N/A						
11	ESTIMATED COST FOR CHANGE IN PRODUCTION N/A						
12	RECOMMENDATIONS FOR RETROFIT Retrofit required to provide wiring changes for isolation relays to be installed by ECP 1141						
13	RECOMMENDED RETROFITIVE EFFECTIVITY VAFB, LF's 02 - 09; MAFB, EAFB, MTAFB, WAFB, FEWAFB - All Flights HETF, LFSB					MOCKUP AFFECTED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	

[REDACTED]

# 1. Air Force--Anniversary Celebrations.

HISTORY  
of

Director Experience Studies Inst ATTN: Archives Branch XV-2011 AFB, Alabama	RETURN TO:	K-26-341-111 Jul-Sep 1967
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341st STRATEGIC MISSILE WING

AND 341st COMBAT SUPPORT GROUP

HQ SAC DXIH 67E 5/22

(Unclassified Title)

1 Jul thru 30 Sep 1967

**P.R.C.**

DOCUMENT DECLASSIFIED PER  
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**P.R.C.**

APPROVED:

*David B. Gamble*  
DAVID B. GAMBLE, AIC, USAF  
Historian

*John W. Carroll*  
JOHN W. CARROLL, Col, USAF

*William D. Napton*  
WILLIAM D. NAPTON, Sgt, USAF  
Historian

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23 AUG 1970

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Arch 3

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This volume has been placed in downgrading Group 1, because  
it contains Formerly Restricted Data material. The historian's  
analysis and consolidation of information from many sources,  
which individually may have lower downgrade provisions, results  
in a synthesis which may have wider implications than the material  
on which it is based. Therefore, paragraphs have been individually  
classified, but have not been marked with individual downgrade  
instructions, and all portions of this volume will be excluded  
from automatic regrading. (U)

[REDACTED]

but usually if the G&C is off power for any period of time, it will not restart when power is returned by a maintenance team.<sup>133</sup>

The dash 9 and dash 20 missile problem in the 564th SMS had been alleviated this quarter. Since almost all the dash 9 and dash 20 missiles were removed prior to this quarter.<sup>134</sup> (U)

#### MISSILE ACCIDENTS/INCIDENTS

There were no missile accidents or incidents during this quarter, but testing on the Echo Flight Incident was accomplished during this time interval. Testing on Echo Flight, because of it's relationship to this section will be included in this section. (U)

#### MISSILE INCIDENTS-Echo Flight Testing

Testing on the problems associated with Echo Flight are still be conducted by higher headquarters and the contractors. The results of all these tests are not known as yet. Next will be the presentation of test results that are known and their affects. (U)

As stated in the last history, a No-Go Mode effect had to be reproduced in order to study the problem. This was achieved by the use of a 30 micro sec Pulse (-10 to 0 volt square wave) placed on Self Test Command (STC) line at the C-53P Coupler

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133. Interview, ALC David B. Gamble, Wing Historian, with Capt. Daune W. Hollis, DO Code Vault, on 27 Oct 67.

134. History, 341st SMW, Apr - Jun 67, p 28.

[REDACTED]



Logic Drawer interface STC. This caused the system to shut down with a Channel 9 & 12 No-Go. <sup>135</sup> (U)

Boeing studied the source and path of the noise Pulse to the Logic Coupler and suspected that the Sensitive Information Network (SIN) lines would cause the noise Pulse. Further studies at Malmstrom AFB by Boeing proved this analysis wrong. <sup>136</sup> (U)

P63

Tests at Boeing's Network Resolution Area (NRA) have proven that the G-53P Logic Coupler is the receiver of the noise Pulse irregularities. These tests had 60 percent of the time, the responses were the same as experienced at Echo Flight, and 85 percent of the time placing the system in a non EWO status. <sup>137</sup> (U)

OOAMA thought that the cause of the incident was of the Electro Magnetic Pulse (EMP) noise or electrostatic nature. OOAMA, also thought that the problem was a Wing I peculiar problem; because Channel 9 & 12 No-Go shut downs have never been reported at Wing II thru V. This fact was due to the significant difference between the Logic Couplers, inter site cabling, and LF cabling of the Minuteman I and Minuteman II systems. <sup>138</sup> (U)

COME conducted tests at the Hill Experimental Test Facility (HETF) on the Wing II-V Logic Coupler to determine if it could

135. History, 341st SMW, Apr - Jun 67, p 31.  
136. Ibid., p 31 - 34.  
137. Ibid., p 34 - 35.  
138. Ibid., p 35 - 36







be a receiver to this same type of noise Pulse. <sup>139</sup> (U)

Results of these tests were directly determining C-53D Logic Coupler (Minuteman II system) to EMP type noise. The C-53D Logic Coupler was found to be susceptible to input noise injection which resulted in an non EWO system condition. <sup>140</sup> (U)

This test was made in two phases; however the results of Phase II is not yet available to this office. (U)

Phase I consisted of a correlation of noise inputs on the C-53D Coupler interface to system noise response. Preliminary conclusions of Phase I testing indicated that Minuteman II system was vulnerable to noise on the C-53D Logic Coupler input interface lines. Four input lines in the C-53D Logic Coupler were found to be susceptible to input noise injection which results in a non EWO status. <sup>141</sup> (U)

Phase II test objectives were to determine the percentage of coupling from the input of the Electral Surge Arresstor (ESA) panel to the interface of the Logic Coupler. <sup>142</sup> (U)

The probability of a non EWO accurance due to a EMP noise pulse can not be defined until OOAMA's Phase I and II test

139. History, 341st SMW, Apr - Jun 67, p 35 - 36.

140. Msg, (S) OONC 02525, OOAMA to SAC, "Malmstrom Echo Flight Incident," 7 Aug 67, Ex 34.

141. Ibid., Ex 34.

142. Ibid., Ex 34.





programs analysis has been finalized and correlated with SAMSO's EMP tests results in a joint conference. <sup>143</sup> (U)

On 27 - 28 July 1967, OOAMA conducted an engineering inspection at Malmstrom AFB of the interconnecting box, ESA panel, and missile away drawers at LCFs, Alpha 01 and Echo 01. The inspection found approximately 200 were checked. There were no set pattenen of loose connections noted on SIN lines or Command lines. The interconnecting box was inspected for loose connections, arcing, burned areas, and tampering, with none discovered. Missiles away drawers involved in the incident were checked and found operation as designed. Thus no major problems were uncovered. <sup>144</sup> (U)

Pg 65

MISSILE INCIDENTS-Echo Flight Testing (EMP)

The direct relationship of EMP testing and Echo Flight Incident are intermixed, these EMP tests will be included in this section. (U)

SAMSO has been conducting EMP tests at Warren AFB, Wyo., but the results are unknown to this office. The tests made on Delta Flight were completed on all test objectives. SAMSO, with the completion of these tests, began EMP testing at the 564th

143. Msg, (S) OONC 02525, OOAMA to SAC, "Malmstrom Echo Flight Incident," 7 Aug 67, Ex 34.

144. Ibid., Ex 34.





SMS in October. <sup>145</sup> (U)

These EMP tests by SAMSO and Boeing are to discover the weak spots in the different types of Minuteman configurations along the EMP field. When weak or faulty areas are found, ECPs are initiated to correct these discrepancies. <sup>146</sup> (U)

P566

On 28 September 1967, Sierra 39, 564th SMS, was depostured and turned over to Boeing for EMP tests. These tests will be conducted until about mid-January 1968. The primary reason for Boeing's EMP testing is to determine the effectiveness of the lightning protection equipment of the Real Property Installed Equipment (RPIE) at 564th SMS's LFs. Various voltages will be inserted into the site equipment from a test tie-in to simulate the effects of lightning strikes on the outside cable communications, ground electronics system and associated LF equipment. <sup>147</sup> (U)

Later, on 22 October, SAMSO joined Boeing on these EMP tests at Sierra 39. (U)

A primary cause always associated with Echo Flight Incident has been connected with some type of adverse power affect. Tests have been conducted time and time again to determine this, but have always lead to a negative result. Boeing's testing at

145. Msg, (S) OONC 02525, OOAMA to SAC, "Malmstrom Echo Flight Incident," 7 Aug 67, Ex 34.

146. Interview, ALC David B. Gamble, Wing Historian, with Lt. Col. Elliott Coldwater, Deputy Commander for Engineering, SAMSO, Det 29, on 7 Nov 67.

147. Ibid.



[REDACTED]

Sierra 39 is just another test to assure that the Wing VI configuration will not be affected by adverse electrical effects. (U) <sup>148</sup>

A conference was held at Whiteman AFB, Kan., to review test data for a Force Mod EMP modification. The members of the conference agreed that the data indicated the proposed modification would be effective. A decision was made that additional testing would be required by Boeing to verify that specific frequencies were safe in Force Mod systems. These tests were completed in August 1967. <sup>149</sup> (U)

P567

Three major changes have resulted from EMP testing. Boeing has submitted ECPs, numbers 1221, 1141-1 and 1141-2, for the modification of EMP for Force Mod. Another change was a Facility Change Initiation Request (FCIR) Maintenance Change Letter (MCL) number 2827, not yet incorporated into the Force Mod systems. <sup>150</sup> (U)

Presented next will be the changes to the EMP for Force Mod. Because of the complicated engineering terminology, a detailed explanation given by the Boeing Engineers will not be presented of the changes to the EMP. Changes will be presented in brief explanation given by the ECP. (U)

Boeing ECP 1221 will modify the interconnecting box by adding a major sub-assembly containing zener diodes, isolation

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148. Interview, ALC David B. Gamble, Wing Historian, with Lt. Col. Elliott Coldwater, Deputy Commander for Engineering, SAMSO, Det 29, on 7 Nov 67. [REDACTED]
149. Msg, (S) OONC 02525, OOAMA to SAC, "Malmstrom Echo Flight Incident," 7 Aug 67, Ex 34.
150. Interview, ALC David B. Gamble, Wing Historian, with Lt. Col. Elliott Coldwater, Deputy Commander for Engineering, SAMSO, Det 29, on 7 Nov 67.



transformers, and common mode suppression transformers for each Sensitive Command Network (SCN)/ Sensitive Information Network (SIN) circuit pair. <sup>151</sup> (U)

Boeing ECP 1141 dash 1 modifies the cable assembly set (launcher) by revising wiring to provide protection to Voice Reporting Signal Assemble (VRSA) Channels 26 and 27. <sup>152</sup> (U)

PG 67

Boeing ECP 1141 dash 2 made another modification to the interconnecting box, by adding two isolation relays and reroutes wiring to connect relays into VRSA monitoring circuits. <sup>153</sup> (U)

The FCIR, MCL will provide for alteration of sensing at RPIE and of monitor circuits to re-establish correlation of sensing and monitor reporting. <sup>154</sup> (U)

SUPPORT-Security

Last quarter, the Wing's proposal for the removal of the Movement Security Alarm System of Re-entry vehicles G&C vans was agreed with by OOAMA engineers. This proposal was sent to Headquarters, SAC for concurrence. <sup>155</sup> (U)

Headquarters, SAC in a message to OOAMA concurred with the Wing's proposal. It stated that the Movement Security System on



- 151. Engineering Change Proposal, "ECP No. 1221," submitted by Boeing Company, Ex 35.
- 152. Engineering Change Proposal, "ECP No. 1141-1," submitted by Boeing Company, Ex 36.
- 153. Engineering Change Proposal, "ECP No. 1141-2," submitted by Boeing Company, Ex 36.
- 154. Facilities Change Initiation Request, "FCIR, MCL No. 2827," submitted by Boeing Company, Ex 37.
- 155. History, 341st SMW, Apr - Jun 67, p 37.

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ZNY ~~RUWMBA~~

P 071507Z AUG 67

FM OQAMA HELL AFB UTAH

TO RUCSAAA/SAC

INFO RUWBKNA/15AF MARCH AFB CALIF

RUWMBA/34 STRATMSLWG MALMSTROM AFB MONT

RUWMBA/STATAF MALMSTROM AFB MONT

RUWTKIA/AFWL KIRTLAND AFB NMEX

BT

~~SECRET~~ OONC 02525 AUG 67

FOR DM7B. INFO: SANSO (SMQB/SMQW/SMQV/SMQA/SMTGT 1); 15AF (DM7B);

34 ISMW (DCM); SATAF (SAFETY) AND AFWL (WLRPE/CAIT CIKOTOS).

SUBJECT: MALMSTROM ECHO FLIGHT INCIDENT (U). REFERENCE SAC

DM7B 077999, 25 JULY 1967, SAME SUBJECT.

TESTS ARE BEING CONDUCTED AT HELL ENGINEERING TEST FACILITY (HETF)

TO DETERMINE C-53D LOGIC COUPLER VULNERABILITY TO EMP TYPE NOISE.

PHASE I TESTS AT HETF HAVE BEEN COMPLETED. PHASE I TESTING CON-

SISTED OF A CORRELATION OF NOISE INPUTS ON THE C-53D COUPLER

INTERFACE TO SYSTEM NOISE RESPONSE. THE PRELIMINARY CONCLUSIONS

OF PHASE I TESTING INDICATES THAT MINUTEMAN II - V SYSTEM IS

VULNERABLE TO NOISE ON THE C-53D COUPLER INPUT INTERFACE LINES. FOUR

INPUT LINES IN THE C-53D WERE FOUND TO BE SUSCEPTIBLE TO INPUT NOISE

INJECTION WHICH RESULTED IN A NON EWO SYSTEM CONDITION. DETAILED

ANALYSIS HAS NOT BEEN FINALIZED TO DATE. COMPLETION EXPECTED WITHIN

PAGE 2 RUWMBA 0011 ~~SECRET~~

30 DAYS.

PHASE II TESTING AT THE HETF IS PRESENTLY BEING SCHEDULED TO BEGIN WITHIN

10 DAYS. THE PHASE II TESTING OBJECTIVE IS TO DETERMINE THE PERCENTAGE OF

COUPLING FROM THE INPUT OF THE ESA PANEL TO THE INTERFACE OF THE LOGIC

COUPLER.

THE PROBABILITY OF RECURRANCE OF THIS TYPE CANNOT BE DEFINED UNTIL SUCH

TIME AS OQAMA PHASE I AND PHASE I AND PHASE II TEST PROGRAM ANALYSIS HAVE

BEEN FINALIZED AND CORRELATE WITH THE SANSO EMP TEST RESULTS IN A JOINT

CONFERENCE. REFERENCE PARAGRAPH 2. CONFEREES AT THE WHITEMAN CONFERENCE

REVIEWED THE TEST DATA FOR FORCE MOD EMP FIX. THE DATA INDICATED THAT THE

PROPOSED FIX WAS EFFECTIVE. A DECISION WAS MADE THAT ADDITIONAL TESTING

WOULD BE REQUIRED BY BOEING (1 - 1 WEEKS) TO VERIFY THAT SPECIFIC

FREQUENCIES WERE SAFE IN FORCE MOD SYSTEMS. THIS TEST SHOULD BE COMPLETED

BY 11 AUG 67. OQAMA ENGINEERING INSPECTION AT MALMSTROM AFB OF THE

INTERCONNECTING BOX AND ESA PANEL, MISSILE AWAY DRAWERS AT LCFS A701 AND

E-01 ON 27-28 JULY 1967, ARE AS FOLLOWS: (1) INSPECTION INDICATED

APPROXIMATELY 5 PERCENT OF THE ESA TERMINALS CHECKED HAD LOOSE CONNECTIONS

(A QUALITY CONTROL PROBLEM) APPROXIMATELY 200 WERE CHECKED. NO SET PATTERN

OF LOOSE CONNECTIONS NOTED ON SIN LINES OR COMMAND LINES. (2) INSPECTION

OF INTERCONNECTING BOX FOR LOOSE CONNECTIONS, ARCING, BURNED AREAS

PAGE 1 OF 2

SECRET/10-67-1069

Handwritten notes: "63", "1720", "DS-1", "15M-1", "W-1"



PAGE 3 RUWMBBA 0011 ~~SECRET~~

AND TAMPERING. NO ABNORMALITIES WERE NOTED. ( ) MISSILE AWAY DRAWERS INVOLVED IN THE INCIDENT WERE CHECKED AND FOUND OPERATING AS DESIGNED. OQAMA ENGINEERING PERSONNEL ARE PARTICIPATING WITH SAMSO PERSONNEL DURING THE EMP TEST PROGRAM PROVIDING TECHNICAL DIRECTION ON WEAPON SYSTEM TYPE PROBLEMS AS REQUIRED.

EMP TESTS AT WARREN AFB ARE CONTINUING. TESTS AT "D" FLIGHT HAVE BEEN COMPLETED AND THE TEST OBJECTIVES HAVE BEEN MET. ADDITIONAL TESTS ARE TO BE CONDUCTED AT A710 AND ARE SCHEDULED TO BE COMPLETED APPROXIMATELY 15 OCT 1967. SQUADRON 20 TESTS ARE SCHEDULED TO BEGIN APPROXIMATELY 12 OCT 1967 DEPENDING ON END DATE OF M74 TESTING.

THIS HEADQUARTERS WILL CONTINUE TO ADVISE YOU OF OQAMA'S TEST PROGRAM AS TEST RESULTS AND FINDINGS ARE IDENTIFIED. GP74.

BT

~~GROUP~~  
~~REPLACED AT 2 YEAR INTERVALS~~  
~~REPLACED AFTER 12 YEARS~~

FIRM NAME AND ADDRESS <b>THE BOEING COMPANY</b> P.O. BOX 3700 SEATTLE 24, WASHINGTON		<b>ENGINEERING CHANGE PROPOSAL</b>					
1	MODEL OR TYPE DESIGNATION <b>Figure A 137T &amp; 137TM</b>	MSG CODE <b>81205</b>	SYSTEM DESIGNATION <b>WS-133A-M</b>	OFF NO <b>12217</b>	TYPE <b>R</b>	REV <b>3</b>	CORREC.
2	CONTRACTOR'S RECOMMENDED PRIORITY <input type="checkbox"/> EMERGENCY <input type="checkbox"/> URGENT <input checked="" type="checkbox"/> CRITICAL <input type="checkbox"/> COMPARABILITY						
3	CONTRACT NO.	CONTRACT END ITEM NOMENCLATURE <b>Interconnecting Box</b>	CONTRACT SPECIFICATION SPEC NO. <b>See Page 3</b> ENCL NO. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				
4	NAME OF PART OR COMPLETE ASSEMBLY AFFECTED <b>See Line 6</b>	PART NO. FROM WHICH AFFECTED <b>See Page 3</b>	IN PROD. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				
5	TITLE OF CHANGE <b>HIC EM Pulse Suppressor</b>						
6	DESCRIPTION OF CHANGE This ECP will provide for Weapon System implementation of a cost-effective HIC EMP Fix, a study of which was accomplished under CCP B972, the preliminary design of which was developed under CCP B1238, and which will be tested at an operational site under CCP B1185.  This effort will include the following specific objectives:  A. Formalize Form B's, Form C's, and Figure A Technical Requirements based on the preliminary SPA and Design Requirements for HIC EM Pulse Suppressor.						
Continued on Page 10							
7	JUSTIFICATION FOR CHANGE A. Extensive Electro-Magnetic Pulse (EMP) tests have shown that system anomalies occur in the WS-133A-M System as a result of noise generated from electrical discharge type pulses on the Hardened Intersite Cable (HIC). Modification of the Weapon System is required to eliminate these anomalies.  <div style="float: right; border: 1px solid black; padding: 5px;"> <input type="checkbox"/> INITIATED BY PERFORMING ACTIVITY DESK  <input checked="" type="checkbox"/> INITIATED BY CONTRACTOR FOR:  1. LOW PRIORITY WORK OR REVISED SPEC  2. EXISTING CONTRACT WORK  3. NEW WORK UNDER CONTRACT  <b>CONTRACT B1238 entitled "HIC Electro-Magnetic Pulse Fix Design"</b> </div>						
Continued on Page 11							
8	DEVELOPMENTAL REQUIREMENTS <b>See Line 6</b>						
9	ALTERNATIVE SOLUTIONS <b>None</b>						
10	PRODUCTION EFFECTIVITY						
11	ESTIMATED COST FOR CHANGE IN PRODUCTION						
12	RECOMMENDATION FOR RETROFIT <b>To update delivered hardware.</b>  Continued on Page 11						
13	RETROACTIVE EFFECTIVITY						FOR PRODUCTION RECORD <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO



<b>ANALYSIS REVISION NOTICE</b>		CONTRACTOR: The Boeing Company	ARN NO: MA-338
ORIGINATOR: L. Proffitt	SUBMITTAL DATE: October 24, 1967	EFFECTIVITY: IM-VM, I-V	
CONTRACTOR APPROVAL: E. A. Melick	BSD, STL APPROVAL	ECP REF. NO: ECP 1221	
VOLUME TITLE: Operational Ground Equipment Modernized Wing IV DZ-15800-1		SECT:	PAGE: 1, 3
FORM, DWG. TITLE: Interconnecting Boxes, Fig. A 1377M Rev. C dated 8-9-67		NO.:	SHT NO.:
		1377M	1, 3
<b>ACTION AND REASON</b>			
Approval of this ARN will not result in a change to the revision code letter.			
<u>ACTION</u>			
1. Revise the second sentence of paragraph I. F. to read:			
"Requirements shall be met when the input is a 0 to 2200 volt pulse with a rise time of from 1 to 225 microseconds and the volt-time integral is the integral of the pulse shape described in DZ-18148 -4(S) dated 22 August, 1967."			
2. Revise paragraph II. H to read:			
"H.1, To limit voltage pulses at the output of the I-Box to values described in paragraphs I. F. 1 and I. F. 2, a suppression assembly containing an isolation type transformer, zener diodes, and common mode rejection coil will be connected in each Command, HVC, and 494L circuit. For each SIN circuit, a suppression assembly similar to the Command line assembly will be provided that contains an inductor wired between the primary and secondary winding center taps of the isolation transformer for the Missile Away signal path."			
"H.2, Degradation of operational message reliability on lines noted resulting from functioning of the noise suppression assembly will be prevented by selection of components to limit the additional circuit inductance to be compatible with existing communication specifications."			
"H3, Introduction of unacceptable noise and signal degradation on other lines in the I-Box during functioning of the suppression assembly will be prevented by design of the input handle assembly which assures that its shields are tied as closely as practicable to the outer shield of the input cable."			
"H4, Components shall be selected to accept the energy specified in paragraph I. F. 5 without degradation."			
3. Revise Identification Spec. notation, sheet 3, to read:			
"See Identification Spec: S-133-111-1-100 (Wings I-V) S-133-111-1-145 (Wings IM-VM)"			
<u>REASON</u>			
To add revisions reviewed at ECP 1221/1141 In-Process Review dated 10/13/67. (See ARN MA-339 for ECP 1141 revisions).			

## ANALYSIS REVISION NOTICE

CONTRACT NO.

ARN NO:

The Boeing Company

VMA-133

ORIGINATOR:

SUBMITTAL DATE:

EFFECTIVITY:

J. J. Wikert

10/27/57

10-24-57

VAFB LF's 02, 03, 06, 07 &amp; 09

CONTRACTOR APPROVAL:

BSD. STL APPROVAL

ZIP REF. NO:

W. A. Shook

1221

VOLUME TITLE: Operational Ground Equipment:

SECT:

PAGE:

Unmodernized VAFB Supplement D2-12130 Vol. II

FORM DWG. TITLE: Figure A 1377.1 Rev. D 4-7-66  
Interconnecting Boxes (Various)

NO.:

SHT NO.:

1377.1

1 &amp; 2

## ACTION AND REASON

- Approval of this change will result in a change to the Figure A revision code.

ACTION

1. Revise first sentence I. B. to read as follows:

"I. B. A method of connecting signals transmitted between the Launcher Support Building and the launcher equipments via the Cable Assembly Set, Launcher (Figure A 1248.1)"

2. Revise Technical Requirement I. D. to read as follows:

"I. D. A method of mating the site unique signals of the Cable System Pressurized, Hardened, SCN (Figure A 1339 or Figure A 9032M) to the site common signals of the Cable Assembly Set, Launcher (Figure A 1248.1)"

3. Add Technical Requirement I. E. as follows:

"I. E. Means shall be provided which shall meet the requirements listed below. Requirements shall be met when the input is a 0 to 2200 volt pulse with a rise time of from 1 to 225 microseconds and the volt-time integral is the integral of the pulse shape described in D2-18148-4(S) dated 22 August, 1967."

The following HICS lines are referred to:

Command  
SIN  
HVC (where applicable)

Requirements:

1. The Common mode (line to equipment chassis) voltage envelope on any line (listed above) at the output of the Interconnecting Box shall have a peak value of 600 volts if no sharp discharge occurs at the input. If a sharp discharge occurs at the input the voltage output shall not have a sharp discharge which is greater than 80 volts amplitude, nor shall the voltage output exceed the envelope defined by:

$$V(t) = \pm 100 e^{-.7ft} \text{ volts}$$

f = frequency (Hz)

t = time (sec.)

ANALYSIS REVISION NOTICE		CONTRACT NO.	FORM NO.
ORIGINATOR: J. J. Wikert	SUBMITTAL DATE: 10-24-67	The Boeing Company VMA-138	
CONTRACTOR APPROVAL: W. A. Shook	DSO, STL APPROVAL	EFFECTIVITY: VAFB LF's 02, 03, 06, 07&09	ECP REF. NO: 1221
VOLUME TITLE: Operational Ground Equipment Unmodernized VAFB Supplement D2-12130, Vol. II		SECT:	PAGE:
FORM DWG. TITLE: Figure A 1377.1 Rev. D, 4-7-66 Interconnecting Boxes (Various)		NO.:	SHT NO.:
		1377.1	1 & 2
ACTION AND REASON			
3. Add Technical Requirement I. E. as follows: (Cont'd)			
2. The signal mode (line to line) voltage envelope on any line pair (listed above) at the output of the Interconnecting Box shall have a peak value of 600 v maximum, and shall not exceed the limits defined by:			
$V(t) = \pm 600 e^{-.7ft} \text{ volts}$			
3. Degradation of operational message reliability on the lines noted resulting from functioning of the noise suppression means shall not exceed allowable tolerances in existing communication system specifications.			
4. Functioning of the noise suppression means on the lines listed above shall not introduce unacceptable noise nor degrade signals on other lines through the I-Box that do not have noise suppression means.			
5. The means shall be capable of accepting at least .25 watt-second of energy in from 1 to 1000 microseconds without degradation.			
4. Add Recommended Solution II. G, as follows:			
"G. 1, To limit voltage pulses at the output of the I-Box to values described in paragraphs I. E. 1 and I. E. 2, a suppression assembly containing an isolation type transformer, zener diodes and common mode rejection coil will be connected in each command and HVC, circuit. For each SIN circuit, a suppression assembly similar to the command line assembly will be provided that contains an inductor wired between the primary and secondary winding center taps of the isolation transformer for the Missile Away signal path."			
"G. 2, Degradation of operational message reliability on lines noted resulting from functioning of the noise suppression assembly will be prevented by selection of components to limit the additional circuit inductance to be compatible with existing communication specifications."			
"G. 3, Introduction of unacceptable noise and signal degradation on other lines in the I-Box during functioning of the suppression assembly will be prevented by design of the input bundle assembly which assures that its shields are tied as closely as practicable to the outer shield of the input cable."			
"G. 4, Components shall be selected to accept the energy specified in paragraph I.E. 5 without degradation."			
<u>REASON</u>			
To add revisions reviewed at ECP 1221/1141 In-Process Review dated 10/13/67.			

## ANALYSIS REVISION NOTICE

DRAWING NUMBER:

ARN NO.:

The Boeing Company

NMA-137

ORIGINATOR: J. Wilkert 10/22/67	SUBMITTAL DATE: October 24, 1967	EFFECTIVITY: VAFB LF's 04, 05 and 06
CONTRACTOR APPROVAL: W. A. Shook	BSO, STL APPROVAL	ECP REF. NO.:
VOLUME TITLE: Operational Ground Equipment Modernized VAFB Supplement DZ-16119-7	SECT:	PAGE:
FORM. DNG. TITLE: Interconnecting Boxes, Figure A 1377MV, Rev. E dated 8-16-67	NO.:	INT NO.:
	1377MV	1, 2

## ACTION AND REASON

Approval of this ARN will result in a change to the revision code letter.

ACTION

1. Revise the second sentence of paragraph I. F. to read:

"Requirements shall be met when the input is a 0 to 2200 volt pulse with a rise time of from 1 to 225 microseconds and the volt-time integral is the integral of the pulse shape described in DZ-18148-4(S) dated 22 August, 1967."

2. Revise paragraph II. H to read:

"H. 1, To limit voltage pulses at the output of the I-Box to values described in paragraphs I. F. 1 and I. F. 2, a suppression assembly containing an isolation type transformer, zener diodes and common mode rejection coil will be connected in each command, HVC, and 494L circuit. For each SIN circuit, a suppression assembly similar to the command line assembly will be provided that contains an inductor wired between the primary and secondary winding center taps of the isolation transformer for the Missile Away signal path."

"H. 2, Degradation of operational message reliability on lines noted resulting from functioning of the noise suppression assembly will be prevented by selection of components to limit the additional circuit inductance to be compatible with existing communication specifications."

"H3, Introduction of unacceptable noise and signal degradation on other lines in the I-Box during functioning of the suppression assembly will be prevented by design of the input bundle assembly which assures that its shields are tied as closely as practicable to the outer shield of the input cable."

"H4, Components shall be selected to accept the energy specified in paragraph I. F. 5 without degradation."

REASON

To add revisions reviewed at ECP 1221/1141 In-Process Review dated 10/13/67.

Line 6 - DESCRIPTION OF CHANGE: (Continued from Page 1)

- B. Provide detail engineering design, specifications and documentation for modifying Figure A's 1377 and 1377M - Interconnecting (I) Box. This modification will consist of the addition of sub-assemblies within the existing I-Box. One sub-assembly will contain zener diodes, isolation transformers and common mode rejection coils for each SCW/SIN, 494L and Status line CIRCUIT PAIRS mounted on a sheet metal bracket and electrically connected by means of a separate wire bundle. The existing wire bundle in the I-Box will also be modified. When a site has operational Hardened Voice Channel (HVC) circuits connected for use, a second sub-assembly using zener diodes, isolation transformer and common mode rejection coils will be added. R
- Note: This change for Figure A 1377 and 1377M is as follows:
- Figure A 1377 (Wings III, V, VAFB, WETF and CAPB) for inclusion of accommodation of EMP protection for SCW/SIN, Hardened Voice Channel (HVC) and Status lines.
- Figure A 1377M (Wings I, II, IV, VAFB, STP III, NRA and EDL) for SCW/SIN, HVC and 494L.
- C. Provide special tools required for Figure A's 1377 and 1377M kit installation and checkout in the field. R
- D. This ECP will provide a Wing IV Type Figure A 1377M Interconnecting Box for STP III.
- E. Fabricate production prototypes and provide kits and engineering for EDL and NRA/STP III evaluation. Additional Qualification Tests are not recommended.
- F. Identify weight change to the Figure A's 1377 and 1377M Interconnecting Box. R
- G. Revise ACO 6359 and ACO 8302 documentation to allow physical and electrical connection with the revised Figure A's 1377 and 1377M Interconnecting Box. R
- H. This ECP 1221 change shall be incorporated concurrently with ECP 1141. R
- I. Analysis Revision Notices for Figure A's 1377M, 1377.1 and 1377MV are submitted herewith for approval. R

Line 7 - JUSTIFICATION FOR CHANGE: (Continued from Page 1)

- B. If this change is not incorporated, operational status of WS-133A-M is jeopardized under electrical disturbance environments.
- C. Program Priority - Expedited handling to provide earliest possible incorporation at Wing I F/W.
- D. Failure data is not applicable.
- E. End Item Reliability:  
There are no Contractual Requirements for the Figure A's 1377 & 1377M; a reliability estimate will be prepared as part of the In-Process Review. R

Line 12 - RECOMMENDATIONS FOR RETROFIT: (Continued from Page 1)

This ECP does not require Contractor installation of this change. Notwithstanding this fact, it is recommended that Contractor accomplish the installation effort.

Kit validation for the Wing I version and the Wings II through V modernized version to be accomplished at STP III. TOTO Verification and Kit Proofing is not recommended. R R

Line 13 - TOTO REQUIRED: (Continued from Page 1)

Prepare Form 118B and coordinate with affected Air Force Organization. Prepare Record Type Time Compliance Technical Order No. 24X-LGM30-385 for Figure A's 1377 and 1377M under contract AF4(894)-876 in accordance with MIL-T-9835A, dated 31 December 1963. R R

Lines 16, 17, 18, 19, 20:

All items that are not checked (x) are not affected.

Line 17 - TARGETING PARAMETERS: (Continued from Page 2)

Targeting Parameters are not affected.

Line 18 - MAINTENANCE PROCEDURES: (Continued from Page 2)

In accordance with the requirements of ESD 52-62 Maintenance Analysis Form C/C<sub>1</sub>'s will be revised for Figure A's 137TM, 137T.1 and 137TMV. Revision will be for organizational and field level and depot Form C/C<sub>1</sub>'s.

R

'Zero' Indenture Form C's will be revised to support in Process Design Review in lieu of CDR and PDR.

The revised Maintenance Analysis for Figure A 137TM, will be reviewed and Air Force Specialty Codes, Team Codes and Task Proficiency Level Codes will be established or revised as required for the Personnel Data and Personnel Information section's.

Develop maintainability criteria for the revised Figure A's 137TM, 137T.1 and 137TMV.

R  
R

Prepare a maintainability presentation for in Process Design Review.

Line 18 - OVERHAUL/REWORK METHODS: (Continued from Page 2)

Depot tooling is not affected.

Line 18 - NOMENCLATURE: (Continued from Page 2)

Revised Nomenclature will be requested for the Figure A's 137T and 137TM.

R

Line 18 - SPARE PARTS EXHIBIT: (Continued from Page 2)

The priced Spare Parts Exhibit will be affected by this change.

Line 18 - INTERCHANGEABILITY: (Continued from Page 2)

Interchangeability is affected by this change.

Line 19 - TRAINERS: (Continued from Page 2)

For the T-11 Trainer see the attached Training Equipment Supplement.

R  
|  
R

Line 19 - DATA/PUBLICATIONS: (Continued from Page 2)

T.O.'s Affected:

Contract TED:

21M-LGM30A-2-21	LAUNCH FACILITY & LAUNCH CONTROL FACILITY INTRASITE CABLING - WING I	
21M-LGM30A-2-21-1	LAUNCH FACILITY & LAUNCH CONTROL FACILITY INTRASITE CABLING - WAFB	
21M-LGM30B-2-21-2	LAUNCH FACILITY & LAUNCH CONTROL FACILITY INTRASITE CABLING - WING III	
21M-LGM30B-2-21-1	LAUNCH FACILITY & LAUNCH CONTROL FACILITY INTRASITE CABLING - WING II	
21M-LGM30B-2-21-3	LAUNCH FACILITY & LAUNCH CONTROL FACILITY INTRASITE CABLING - WING IV	
21M-LGM30B-2-21-4	LAUNCH FACILITY & LAUNCH CONTROL FACILITY INTRASITE CABLING - WING V	
21M-LGM30A-4-1	LGM30A/B WEAPON SYSTEM ILLUSTRATED PARTS BREAKDOWN	
21M-LGM30A-4-1-1	LGM30A/B/F W.S. - CTL ILLUSTRATED PARTS BREAKDOWN	R

Line 20 - INTERFACE: (Continued from Page 2)

ICWGA 8420 records the interface effect on Boeing and Bendix equipment and interface documents. R  
R

Line 22 - DEVELOPMENT STATUS: (Continued from Page 2)

Conduct of In-Process Review in lieu of PDR, CDR or Data package submittal is recommended. Technical approval at the In-Process Review shall constitute approval for the contractor to proceed with subsequent effort.

First Article Configuration Inspection (FACI) and Team Acceptance Review (TAR) are not recommended.



THE BOEING COMPANY 3800 BOEING AVENUE SEATTLE 20, WASHINGTON	<h1 style="margin:0;">ENGINEERING CHANGE PROPOSAL</h1>	
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MODEL OR TYPE DESIGNATION 1 See Dash No's	WDL LETTER 81205	INDEX IDENTIFICATION 77-175A	FORM NO. 1141	TYPE	REV. R	CORRECT.
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CONTRACTOR'S RESPONSIBILITY	<input type="checkbox"/> EMERGENCY	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> SECURITY	<input type="checkbox"/> COMPATIBILITY
-----------------------------	------------------------------------	---	-----------------------------	-----------------------------------	--

CONTRACT NO.	CONTRACT DESCRIPTION	CONTRACT SPECIFICATION	
	See Dash No's	SPEC. NO. S-153-111-1-100	AFFECTED
		DWG. NO.	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO

NAME OF PART OR SUB-ASSEMBLY AFFECTED See Dash No's	PART NO. OR PART NUMBER See Dash No's	IN PROC. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
--	--	---

5 TITLE OF CHANGE  
Provide Protection for Monitor Lines for VBT Channels 26 and 27.

6 DESCRIPTION OF CHANGE

A. Background:

1. In response to OAMA direction Contractor conducted studies of Launch Facility vulnerability from the Soft Support Building (OSSE Project Control Number 27-10-104, WIP OAMA-1000). These studies led to OAMA direction, via letter OONEC dated 11 February 1966, that an ECF be submitted.
2. Contractor's response, letter 2-1102-26-070, was submitted 10 May 1966.

(Continued on Page 3)

7 DESCRIPTION OF CHANGE To prevent equipment damage and/or failure from overvoltages below 2000 volts. If this change is not incorporated the monitor lines for VBT channels 26 and 27 will not be protected against overvoltages below 2000 volts.	<input checked="" type="checkbox"/> PROPOSED BY CONTRACTOR/AGENCY/OAMA/CONFO by letter dated 11 Feb. 1966 <input type="checkbox"/> PROPOSED BY CUSTOMER/POB 1. COMPLETELY NEW DESIGN 2. BY MODIFICATION OF EXISTING 3. REPAIR
--	--

8 OPERATIONAL REQUIREMENTS  
See Dash No's

9 MATERIALS SPECIFICATIONS  
See Dash No's

10 PRODUCTION NEED DATES  
See Dash No's

11 ESTIMATED COST FOR CHANGE IN FACULTY  
See Page

12 RECOMMENDATIONS FOR REVIEW  
See Dash No's

APPROVALS REQUIRED	11/11/66 (to be reqd.) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
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ANALYSIS REVISION NOTICE		CONTRACTOR: The Boeing Company	ACRNO: VMA-33
ORIGINATOR: C. Wenger	SUBMITTAL DATE: 4-7-66	EFFECTIVITY: VAFB-LF-05 & LF-08	
CONTRACTOR APPROVAL: W. A. Shook	BSD/SIL APPROVAL:	ECP REF NO: 1141	
WORK ITEM TITLE: OGE System Specification S-133-11 Modernized VAFB Supp. D2-16119-1		SECT:	PAGE: 150
FORM / DWG TITLE: Fig. A 1377MV, Rev. B dated 8-3-65 Interconnecting Boxes		NO: 1377MV	SHT NO: 1
ACTION AND REASON			
<p>Approval of this change will result in a change to the Figure A revision code.</p>			
<u>ACTION</u>			
<p>1. Add the following technical requirement to paragraph I. B. "VRSA monitor lines for equipment in the Launcher Support Building require a means to prevent equipment damage to the Programmer Group (Figure A 1201) from overvoltages up to 2000 volts:"</p>			
<p>2. Add the following recommended solution to Part II: "Isolation relays will be provided in the monitor lines for VRSA channels 26 and 27 to prevent equipment damage to the Programmer Group (Figure A 1201) due to overvoltages below 2000 volts."</p>			
<u>REASON</u>			
<p>OOAMA/OONEO letter dated Feb. 11, 1966, directed that an ECP be submitted. The ECP is to prevent Launch Facility vulnerability from the support building. VRSA channels 26 and 27 are used to monitor equipment in the support building and overvoltage protection is not presently provided for overvoltages under 2000 volts.</p>			
Sht. 1 of 1			

Page 6 DEPARTMENT OF THE ARMY (Continued from Page 3)

I. Publication Affected by this Change: (Continued)

T.O. Numbers:

Contract -740:

21M-LGM30B-2-21-3	LF & LCF INTRASITE CABLING (WING VI ONLY)
21M-LGM30B-2-21-4	LF & LCF INTRASITE CABLING (WING V ONLY)
21M-LGM30A-4-1	LGM30A/B WEAPON SYSTEM ILLUSTRATED PARTS BREAKDOWN.

R

Pursuant to Part I, Item 3.3 of Contract AFD4(694)-740, changes and/or revisions to the above Technical Orders to incorporate the effects of this ECP will be accomplished within the scope of basic Contract -740. Issuance of a CCB Directive for this ECP shall constitute authority for incorporation of effects of this change in the affected Technical Manuals.

- J. This change can be implemented with no interface effect on Associate Contractor equipment, drawings or documentation.
- K. Items in lines 16, 17, 18, 19 and 20 which are not checked (x) are not affected.
- L. Neither hardware reliability nor the reliability contractual statement is affected by this change.
- M. Contractor proposes to conduct a kit verification at STP III. This will avoid a delay in the delivery of operational kits expected to result from a kit proofing.

5

FIRMS NAME AND ADDRESS <b>THE BOEING COMPANY</b> P.O. BOX 355 SEATTLE 24, WASHINGTON		<h2 style="margin: 0;">ENGINEERING CHANGE PROPOSAL</h2>													
1	MODEL OR TYPE DESIGNATION <b>Figure A 1248</b>	REQ. NO. <b>81205</b>	SYSTEM DESIGNATION <b>WS-133A</b>	ECP NO. <b>1141-1</b>	TYPE <b>R</b>	CORREC.									
2	CONTRACTOR'S RECOMMENDED PRIORITY: <input type="checkbox"/> EMERGENCY <input checked="" type="checkbox"/> HIGH <input type="checkbox"/> ROUTINE <input type="checkbox"/> COMPATIBILITY														
3	CONTRACT NO.	CONTRACT END ITEM'S DESCRIPTION <b>Cable Assembly Set, Launcher</b>	CONTRACT SPECIFICATION SPEC. NO. ---      AFFECTED DRAWING --- <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO												
4	NAME OF PART, ELEMENT OR MEMBER AFFECTED <b>Cable Assembly Set, Launcher</b>	PART NO. OF END ITEM AFFECTED <b>10</b>	No Change		IN PROD. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO										
5	TITLE OF CHANGE <b>Provide Protection for Monitor Lines for VR&amp;A Channels 26 and 27</b>														
6	DESCRIPTION OF CHANGE <p>A. This change will require the revision of the following schematic drawings to change the nomenclature on cabling affected:</p> <table style="margin-left: 40px;"> <tr> <td>21-52047</td> <td>21-53257</td> <td>21-54327</td> </tr> <tr> <td>21-52987</td> <td>21-53527</td> <td></td> </tr> <tr> <td>21-53487</td> <td>21-54320</td> <td></td> </tr> </table> <p>B. Figure A 1248 hardware will not be affected.</p> <p>C. Interchangeability: The functional interchangeability of the Figure A 1248 cables will not be affected by this change.</p> <p>D. Items in lines 10, 17, 18, 19 and 20 which are not checked (x) are not affected.</p>						21-52047	21-53257	21-54327	21-52987	21-53527		21-53487	21-54320	
21-52047	21-53257	21-54327													
21-52987	21-53527														
21-53487	21-54320														
7	JUSTIFICATION FOR CHANGE <b>See ECP 11412</b>		<input checked="" type="checkbox"/> SHOULD BE PROCESSED ACTIVELY PER THE _____ See ECP 11412 <input type="checkbox"/> INITIATED BY CONTRACTOR FOR 1. COMPLIANCE WITH NEW OR REVISED SPEC. _____ 2. THE FOLLOWING CATEGORIES REPORTING _____ 3. OTHER _____												
8	DEVELOPMENTAL REQUIREMENTS <b>None, the development of Figure A 1248 has been completed.</b>														
9	ALTERNATIVE SOLUTIONS <b>None</b>														
10	PRODUCTION EFFECTIVITY														
11	ESTIMATED COST FOR CHANGE IN THIS AREA <b>See ECP 11412 page</b>														
12	RECOMMENDATIONS FOR REVISION														
13	RETROACTIVE EFFECTIVITY <b>N/A</b>					SCRAM W/TCIO RECD. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO									

FIRM NAME AND ADDRESS <b>THE BOEING COMPANY</b> P.O. BOX 3903 SEATTLE 24, WASHINGTON		<b>ENGINEERING CHANGE PROPOSAL</b>		PART	
---	--	--	--	------	--

1	MODEL OR TYPE DESIGNATION <b>Figure A 1377</b>	WEG. NO. <b>81205</b>	SYSTEM DESIGNATION <b>WS-133A</b>	LOT NO. <b>1141-2</b>	TYPE	REV <b>R</b>	CORRECT
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2	CONTRACTOR'S RESPONSIBILITY <input type="checkbox"/> DESIGN <input checked="" type="checkbox"/> WORK <input type="checkbox"/> EQUIP. <input type="checkbox"/> COMPATIBILITY						
---	---	--	--	--	--	--	--

3	CONTRACT NO.	CONTRACT END ITEM NUMBER/TYPE <b>Interconnecting Box</b>	CONTRACT SPECIFICATION	
			SPEC NO. <b>See page 3</b>	AFFECTED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO

4	NAME OF PART OR ELEMENT ASSEMBLY AFFECTED <b>Interconnecting Box</b>	PART NO. OR IDENTIFICATION <b>See page 3</b>	IN PROD. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
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5	TITLE OF CHANGE <b>Provide Protection for Monitor Lines for VRSA Channels 26 and 27</b>		
---	--	--	--

6	DESCRIPTION OF CHANGE		
	<p>A. This change will add (2) two isolation relays to the Interconnecting Box and reroute the wiring so as to connect these relays into the VRSA monitoring circuits.</p> <p>B. The MCL for the "These Two" power fix will alter the sensing at the RPFE end of the monitor circuits to re-establish the correlation of sensing and monitor reporting as defined under ECP 857 R2.</p> <p>C. Interchangeability: The configuration of the Figure A 1377 Interconnecting Box resulting from this change will not be interchangeable with prior configurations of the item.</p> <p>D. Items in lines 16, 17, 18, 19 and 20 which are not checked (x) are not affected.</p>		

7	DISTRIBUTION OF CHANGE  <b>See ECP 1141 R</b>	<input checked="" type="checkbox"/> PROVIDED BY CONTRACTOR FOR:
		<input type="checkbox"/> INITIATED BY CONTRACTOR FOR: 1. COMPLIANCE WITH NEW OR REVISED SPEC. 2. FOR THE UNSATISFACTORY SUPPLY 3. OTHER

8	DEVELOPMENTAL PROGRAMME <b>None, the development of Figure A 1377 has been completed.</b>
---	--

9	ALTERNATIVE SOLUTIONS <b>None</b>
---	--------------------------------------

10	PRODUCTION EFFECTIVITY
----	------------------------

11	ESTIMATED COST FOR CHANGE IN PRODUCTION <b>See ECP 1141, Page</b>
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12	RECOMMENDATIONS FOR APPROVAL
----	------------------------------

13	REPLACEMENT EFFECTIVITY	REPLACEMENT EFFECTIVITY REQD. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
----	-------------------------	--

FIRM NAME AND ADDRESS <b>THE BOEING COMPANY</b> P.O. Box 3985 SEATTLE, WASH. 98124 (BOE 720)		<b>ENGINEERING CHANGE PROPOSAL FACILITY</b>				DATE 27 December 1966
1	ACL NO ATTACHMENT A1 2827	MFG CODE	SYSTEM DESIGNATION WS113A	ELCP NO. 528	TYPE F	REV. CO-REP.
2	CONTRACTOR'S RECOMMENDED PRIORITY <input type="checkbox"/> EMERGENCY <input type="checkbox"/> URGENT <input checked="" type="checkbox"/> ROUTINE <input type="checkbox"/> COMPATIBILITY					
3	CONTRACT END ITEM NOMENCLATURE Launch Facility					
4	NAME OF PART OR LOWEST ASSEMBLY AFFECTED Launch Facility Support Building					
5	TITLE OF CHANGE DC Supply for Isolation Relays - VRSA Channels 26 and 27 (LF)					
6	DESCRIPTION OF CHANGE Provide DC supply for the isolation relays being installed in VRSA channels 26 and 27 per ECP 1141. A typical DC supply circuit for these relays is shown on Attachment A Sketch 1.  <u>ADDITIONAL DESCRIPTION:</u> Instructions for retest of VRSA Channels 26 and 27 and for personnel and weapon system safety will be required.					
7	JUSTIFICATION FOR CHANGE The isolation relays are being installed in VRSA channels 26 and 27 per ECP 1141. The DC power required for these relays is to be supplied from the RPIE power System. This FCIR initiates the required RPIE change.			REQUESTED BY PROCURING ACTIVITY PER REF: _____ FWG Meeting 90 DATE: 29 November 66 ATTACHMENT B PAGE 6		
8	DEVELOPMENTAL REQUIREMENTS N/A			ARE DESIGN REQ'D _____ Yes _____ DATE TBD _____		
9	ALTERNATIVE SOLUTIONS No alternate solutions are considered feasible					
10	RECOMMENDED PRODUCTION EFFECTIVITY N/A					
11	ESTIMATED COST FOR CHANGE IN PRODUCTION N/A					
12	RECOMMENDATIONS FOR RETROFIT Retrofit required to provide wiring changes for isolation relays to be installed by ECP 1141.					
13	RECOMMENDED RETROFIT EFFECTIVITY VAFB, LF's 02 - 09; MAFB, EAFB, MTAFB, WAFB, FEAFB - All Flights HETF, -LFSB				MOCKUP AFFECTED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	

Item 16 - EFFECT ON OPERATIONAL EMPLOYMENT

Service Life

This change, together with the associated ECP 1141, will improve service life of the VRSA channels 26 and 27 by protecting them from damage by overvoltages below 2000 volts.

Item 19 - EFFECT ON LOGISTIC SUPPORT MATERIALS

Data/Publications

<u>SAC-CEM</u>	<u>VAFB</u> <u>(WG. I,II)</u>	<u>VAFB</u> <u>WG III,V)</u>	<u>MAFB</u>	<u>EAFB</u>	<u>MTAFB</u>	<u>WAFB</u>	<u>FEWAFB</u>
21-SM80A-2-21 Power Generation and Distribution	-1		-2				
21-SM80B-2-21 Power Generation and Distribution		-5		-1	-2	-3	-4

Item 20 - OTHER CONSIDERATIONS

Interface

This is a companion facility change to Boeing ECP 1141. ICWGA 8026 records required action steps.

## MINUTEMAN FACILITY CHANGE INITIATION REQUEST

MCL NO. 2827

DATE \_\_\_\_\_

FECP NO. 528

(FOR BSSO USE ONLY)

ORIGINATOR AND SERIAL NO. ① Boeing 720	DATE PREPARED ② 31 Oct. 1966	NEED DATE ③ 15 Aug. 1967	INTERFACE AFFECTED ④ YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
---	---------------------------------	-----------------------------	---

SUBJECT ⑤

DC Supply for Isolation Relays - VRSA Channels 26 and 27 (LF)

DESCRIPTION OF CHANGE (USE ADDITIONAL SHEETS IF REQUIRED) ⑥  
(ATTACH DWG'S AND SKETCHES)

Provide DC supply for the isolation relays being installed in VRSA channels 26 and 27 per ECP 1141. A typical DC supply circuit for these relays is shown on Sketch 1.

JUSTIFICATION (USE ADDITIONAL SHEETS IF REQUIRED) ⑦

The isolation relays are being installed in VRSA channels 26 and 27 per ECP 1141. The DC power required for these relays is to be supplied from the RPIE power system. This FCIR initiates the required RPIE change.

ESTIMATED COST ⑧

4 MH at \$11	=	\$44
Mat'l	=	1
TOTAL	=	\$45

DOCUMENTS AFFECTED ⑨

RECOMMENDED EFFECTIVITY: ⑩

DRAWINGS \_\_\_\_\_

BASE	CONSTR. PHASE	A B CO PHASE
Wing I		All LFs
Wing II		All LFs
Wing III		All LFs
Wing V		All LFs
VAFB		All W133A LFs
HETF		W133A LF
Wing IV		All LFs

SPECIFICATIONS \_\_\_\_\_

MASTER EQUIPMENT LIST \_\_\_\_\_

MANUALS \_\_\_\_\_

FIG. A AND FORM C Fig. A 1377 and 1329OTHER ICWGA 8026

13-50...  
 Whant  
 W/03  
 W/11/8



1. MCL NO.  2827	MINUTEMAN WEAPON SYSTEM FACILITIES WORKING GROUP ACTION SHEET	2. DAY MONTH YEAR DATE: 29 November 1966 SUPERSEDES ISSUE OF:
------------------------	---	---

3. THE PROPOSED FACILITY CHANGE AS DESIGNATED BY THE MCL NUMBER IN BLOCK 1. ABOVE WAS REVIEWED AT FWG MEETING NO. 90

ACTION TAKEN ON THIS CHANGE WAS:

- 1. APPROVED AS WRITTEN
- 2. APPROVED WITH FOLLOWING CHANGES OR COMMENTS
- 3. RETURNED TO ORIGINATOR:  AS NOT JUSTIFIED:  FOR ADDITIONAL JUSTIFICATION FOR FOLLOWING REASON:

The FWG classified this FCIR for design action. A Routine priority FECF 528 will be submitted to the CCB for final determination. Work with ECP 1141 and if approved accomplish concurrently.

- SKETCHES ATTACHED TO CHANGE ARE ADEQUATE
- SKETCHES WILL BE PROVIDED BY THE A/E ON TBD

4. CLASSIFICATION OF CHANGE:  <input checked="" type="checkbox"/> CLASS I <input type="checkbox"/> CLASS II	6. PRIORITY FOR CHANGE:  <input type="checkbox"/> EMERGENCY <input type="checkbox"/> URGENT <input checked="" type="checkbox"/> ROUTINE	8. FACILITY AREA AFFECTED:  <input checked="" type="checkbox"/> LF <input type="checkbox"/> LCF  <input type="checkbox"/> SMSB <input type="checkbox"/> OTHER
5. INTERFACE AFFECTED:  <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO  ECP ACTION REQUIRED: <input type="checkbox"/> YES <input type="checkbox"/> NO	7. ESTIMATED COST FOR CHANGE: Labor 4 MH at \$11 = \$44 Mat'l                    =    1 <span style="margin-left: 100px;">\$45/Fac</span>	9. FACILITY AFFECTED:  LFSB

EFFECTIVITY FOR CHANGE

BASE	TO BE ACCOMPLISHED BY CONSTRUCTION CONTRACTOR	BASE	TO BE ACCOMPLISHED BY ASSEMBLY AND CHECKOUT CONTRACTOR
VAFB		VAFB	LF's 02-09
WING I MAFB		WING I MAFB	All Flights
WING II EAFB		WING II EAFB	All Flights
WING III MTAFB		WING III MTAFB	All Flights
WING IV WAFB		WING IV WAFB	All Flights
WING V FEWAFB		WING V FEWAFB	All Flights
WING VI GFAFB		WING VI GFAFB	
SQDN 20 MAFB		SQDN 20 MAFB	
ETF HAFB		ETF HAFB	LFSB

T. E. INFORMATION IN THIS REPORT IS:



TABLE OF CONTENTS FOREWORD CHRONOLOGY CHAPTER I CHAPTER II CHAPTER III CHAPTER IV CHAPTER V

K-006-341-41

Director  
Research Studies Inst  
ATTN: Facilities Branch  
Maxwell AFB, Alabama

RETURN TO:

HISTORY

OF

DXIH 68-0356

341ST STRATEGIC MISSILE WING  
AND 341ST COMBAT SUPPORT GROUP

1 October thru 31 December 1967

P.R.C.

(Unclassified Title)

Assigned to the

FIFTEENTH AIR FORCE, STRATEGIC AIR COMMAND

Permanently Stationed at

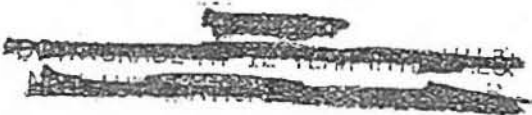
MALMSTROM AIR FORCE BASE, GREAT FALLS, MONTANA

P.R.C.

*William D. Napton*  
WILLIAM D. NAPTON, Sgt, USAF  
Historian

*John W. Carroll Col*  
JOHN W. CARROLL, Col, USAF  
Wing Commander

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Atch 4

DOCUMENT DECLASSIFIED PER  
HQ AFSPC/DOXN 27 Apr 95 and  
OO-ALC/LNE 27 Jul 95.

This volume is classified ~~TOP SECRET~~ to conform to the classification of the information in the source documents. It will be handled in accordance with the provisions of AFR 205-1, as amended.

This volume contains information affecting the national defense of the United States within the meaning of the Espionage Laws (Title 18, U.S.C., sections 793 and 794), the transmission or revelation of which in any manner to an unauthorized person is prohibited by law.

This volume has been placed in downgrading group 3, which is the highest downgrade group assigned to the information in the source documents. The historians analysis and consolidation of information from many sources, which individually may have a lower downgrade provisions, results in a synthesis which may have a wider implication than the material on which it is based. Therefore, individual downgrade instructions for each paragraph are not included, and all portions of this volume will be handled under the overall downgrading group.

PS 57

The remaining bank of batteries were removed from the LCF on 10 October and replaced with new batteries on 14 October. The LCF was examined and found to be in operational status and was brought back to alert status on 15 October. The investigation of the incident could not discover the cause of the incident, but it was believed to be a freak incident.<sup>91</sup> (1)

#### MISSILE INCIDENTS - Echo Flight Testing

In direct relation to the Echo Flight incident as covered in the April - June 1967 History of the 341st SMW was the Electro Magnetic Pulse (EMP) testing conducted throughout the quarter. The EMP tests were conducted by SAMS0, later joined in the testing by the Boeing Company. The EMP tests by SAMS0 and Boeing were to discover the weak spots in the different type of Minuteman configurations within the EMP field. Whenever a weak or faulty area was found, an ECP was to be initiated to correct the discrepancy, or eliminate it.<sup>92</sup> (1)

The EMP tests were conducted at LF Sierra-39 of the 564th SMS. The tests were scheduled to last until mid-January 1968, but could be extended if there were still apparent problem areas to investigate. The primary reason for the Boeing tests were to determine EMP affects on the Real Property Installed Equipment (RPIE) of the Minuteman sites. During the tests, various voltages of electricity were inserted into the equipment on the site to

91. Taken from the files of TAD, 24 Oct 67, by Sgt William D. Napton, Wing Historian.

92. Interview, Sgt William D. Napton, Wing Historian, with Lt. Col E. Coldwater, SATAE Engineer, 6 Feb 68.

simulate a lightning strike, and observe the effect of this situation on the various equipment.<sup>93</sup> (P)

P558

One of the primary theories of the Echo Flight incident was connected with some type of adverse power effect. All test conducted toward this end proved negative results. The EMP tests at Sierra-39 were considered to be the final series of tests in this area.<sup>94</sup> (P)

Personnel of the Air Force Special Weapons Command, Kirkland AFB, New Mexico, joined SAMSO and Boeing personnel in observing the EMP tests from 14 November through 15 December. The Sylvania Electronic Company also sent representatives to the site to discuss the field of lightning effects and EMP. Due to the interest generated by the EMP tests it was estimated they would be carried on into mid-1968.<sup>95</sup> (P)

#### SUPPORT - TRANSPORTATION

Malmstrom had 696 vehicles authorized and 918 vehicles assigned during the quarter. Support of Force Modernization caused the overage in assigned vehicles. The average monthly mileage of the 341st TR4Ns alone was approximately 580,000 miles. Combined with the other units that were involved in vehicle transportation, the

93. Interview, Sgt William D. Napton, Wing Historian, with Lt. Col. E. Coldwater, SATAF Engineer, 6 Feb 68.

94. Ibid.

95. Ibid.

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PT: JAZ RUMMBA0034 882 0187-~~RU~~-RUMBOA.

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FM OQAMA HILL AFB UTAH

TO RUCSANA/SAC

RU BKMA/15TH AF MARCH AFB CALIF

RUMBOA/341SMW MALMSTROM AFB MONT

RUMBA/AFPRO THE BOEING CO SEATTLE WASH

RU ~~SCA~~/NORTH AMERICAN AVIATION AUTONETICS DIV ANAHEIM CALIF

INFO RUCDFIA/HQRS AFLC WRIGHT-PATTERSON AFB OHIO

RU JABA/BSO NORTON AFB CALIF

Dem  
WC  
DCO

~~SECRET~~ GONE 0102 MAR 67

FOR: SAC/DW7B, DE; 15AF/DNAC, DE; 341 SMW/DCM; BOEING (D.J.

DOWING-MINUTEMAN ENGINEERING); AUTONETICS/M. H.R. HEATH.

INFO: HDRQS AFLC WRIGHT PATTERSON AFB MCOM (COL MORRISON); BSD/BSS, BSCR, BSQM

SUBJECT: WING I, E FLIGHT INCIDENT

1. A TASK GROUP MEETING CONVENED AT OQAMA ON 28 MARCH 1967, TO REVIEW THE RESULTS OF INVESTIGATION TO DATE. REPRESENTATIVES FROM BOEING COMPANY, AUTONETICS, OQAMA, AND 15TH AF WERE REPRESENTED.

2. IT IS THE POSITION OF THE TASK GROUP THAT INSUFFICIENT DATA EXISTS

Page 2 of 2

~~DOWNGRADES AND~~  
~~DECLASSIFICATION~~

PAGE 2 RUMMBAA9634

TO RESOLVE THIS PROBLEM, OR TO DEFINITIZE ADEQUATE ENGINEERING ANALYSIS TASKS WITHOUT ADDITIONAL TESTING. A REVIEW OF AVAILABLE DATA STRONGLY SUGGESTS THIS TO BE A WING 1 PECULIAR PROBLEM. THE OOAMA ETF IS NOT A WING 1 FACILITY. IT IS, THEREFORE, NECESSARY TO RUN THE PROPOSED TESTS AT MALSTROM, PREFERABLY AT ECHO 8. IT IS CURRENTLY BELIEVED THAT FRUITFUL DATA WILL NOT EXIST UNTIL SUCH TIME AS THE NO-GO MODE CAN BE REPRODUCED AT LEAST AT THE LF LEVEL.

5. THE FOLLOWING PLAN OF ACTION WAS AGREED UPON BY ALL REPRESENTATIVES. DEVELOP A TEST PLAN WHICH, AFTER ISOLATING AN LF FROM THE SYSTEM, ALLOW FOR THE APPLICATION OF STIMULI WHICH WILL REPRODUCE THE NO-GO AT THE LF LEVEL. AFTER ANALYSIS OF SUCH TEST DATA, PROCEEDING AS REQUIRED TO TEST OR ANALYZE AT THE LCF LEVEL. THE TASK GROUP WILL CONVENE AT BOEING, SEATTLE ON 4 APRIL TO DEVELOP A TEST PLAN AND PROCEDURES. SUCH PLAN WILL INCLUDE EQUIPMENT REQUIREMENTS, LF ISOLATION PROCEDURES, DEFINE TESTS TO BE PERFORMED, AND BE REVIEWED FOR SAFETY. THE PLAN WILL RECEIVE SAFETY CLEARANCE THROUGH CONE, AND WILL BE COORDINATED WITH SAC AS REQUIRED. COMPLETION DATE FOR THE PLAN IS AIMED AT 5 MAY 1967. THE PLAN WILL BE DEVELOPED AND PROTOTYPED, AT THE NRA FACILITY AT BOEING. 4. ADDITIONAL INVESTIGATIVE ENGINEERING STUDIES ARE IN PROCESS, AND WILL CONTINUE. BOEING IS ATTEMPTING TO OBTAIN AN EXHIBIT 7KVA TRANS-

PAGE 3 RUMMBAA9634

FORMER WHICH WAS REPORTED TO HAVE SHORTED A FEW HOURS AFTER THE INCIDENT. A WEAR/DOWN REPORT ON THE TRANSFORMER WILL BE DEVELOPED BY BOEING ENGINEERING, DEPENDENT UPON THE ANALYSIS OF THIS TRANSFORMER, AND ITS FAILURE MODE. ADDITIONAL TESTS MAY BE REQUESTED SIMILAR TO THE POWER TESTS RUN ON 28 MARCH 1967, AT MALSTROM WITH THE ADDED TRANSFORMER FAILURE MODE SIMULATION. YOU WILL BE FURTHER ADVISED WITH RESPECT TO THIS ACTIVITY.

5. CONCURRENCE IN THE USE OF ECHO 8 FOR TESTING OUTLINED IN PARAGRAPH THREE (3) IS REQUESTED. PLANNING FACTORS AT THIS TIME ARE FOR A PERIOD OF SIX WEEKS BEGINNING 15 MARY 1967. YOU WILL BE ADVISED OF ANY SHIFT IN THESE TARGET DATES. GP-4.

BT Page 2 of 2

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ZNY ~~CONFIDENTIAL~~

P 30005Z MAR 67  
FM OQAMA/MILL AFB UTAH  
TO RUCSAAA/SAC

RUWBKNA/15TH AF WARCH AFB CALIF

RUWNBQA/341SMW MALMSTROM AFB MONT

RUWNBAA/APPRO THE BOEING CO SEATTLE WASH

RUWNBQA/NORTH AMERICAN AVIATION AUTONETICS DIV ANAHEIM CALIF

INFO RUEDFIA/HQRS AFLC WRIGHT-PATTERSON AFB OHIO

RUWJABA/BSO NORTON AFB CALIF

BT

Dem-1  
WC-1  
DCO-1

~~CONFIDENTIAL~~ 0000 01012 MAR 67

FOR: SAC/DH7B, DE; 15AF/DNAC, DE; 341 SMW/DCM; BOEING (D.J. DOWING-MINUTEMAN ENGINEERING); AUTONETICS/MR H.R. HEATH.  
INFO: HDRQS AFLC WRIGHT PATTERSON AFB MONT (COL MORRISON); BSO/BSS, BSQR, BSQM

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page 1 of 2

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PAGE 2 RUWMBAG034

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PAGE 3 RUWMBAG034

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5. CONCURRENCE IN THE USE OF ECHO 8 FOR TESTING OUTLINED IN PARA THREE (3) IS REQUESTED. PLANNING FACTORS AT THIS TIME ARE FOR A PERIOD OF SIX WEEKS BEGINNING 15 MARCH 1967. YOU WILL BE ADVISED OF ANY SHIFT IN THESE TARGET DATES. GI-4.

BT Page 2 of 2

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HQ AFSPC/DOXX 27 Apr 95 and  
OO-ALC/LME 27 Jul 95.



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HISTORY  
of

RETURN TO:	R-108-341-111
Director Aerospace Studies Inst ATTN: Archives Branch Maxwell AFB, Alabama	

341st STRATEGIC MISSILE WING  
AND 341st COMBAT SUPPORT GROUP

1 January - 31 March 1968

(Unclassified Title)

P.P.C.  
CXIH-68-7

ASSIGNED TO  
18th Strategic Aerospace Division, 15th Air Force, Strategic Air Command

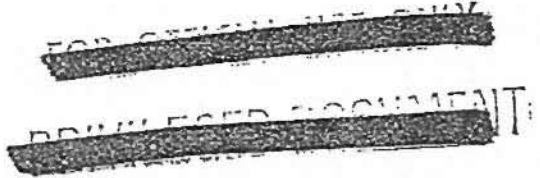
STATIONED AT  
Malmstrom Air Force Base, Great Falls, Montana

P.P.C.

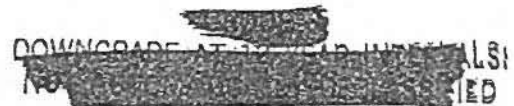


*William D. Napton*  
WILLIAM D. NAPTON  
Sgt, USAF  
Wing Historian

*Carl A. Lilley Col*  
for  
L. J. GRAHAM  
Colonel, USAF  
Wing Commander

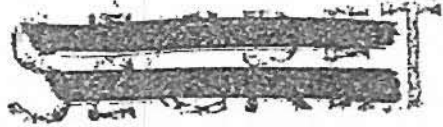


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FOREWORD

CHRONOLOGY

CHAPTER I

CHAPTER II

CHAPTER III

ACH 5

SECURITY STATEMENT

(U) This volume is classified ~~SECRET~~ to conform to the classification of the information in the source documents. It will be handled in accordance with the provisions of AFR 205-1, as amended.

(U) This volume contains information effecting the meaning of the Espionage Laws (Title 18, U.S.C., sections 793 and 794), the transmission or revelation of which in any manner to any unauthorized person is prohibited by law.

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there was a power transfer. Headquarters, 15th AF ordered a test to determine if the channel 20 was being caused by noise or a phase sequence problem. If phase relation was the problem, it could possibly damage both the motor generator and the GAC cooler compressor unit. The test was to cover such items as current draw, voltage drop and the phase relation between the primary power and the 208 volt, 60 hertz (cycles per second) motor generator output at the time of the power transfer.<sup>86</sup>

(U) A meeting on the VISA channel 20 alarm and direct current to alternating current problem was held at SASSO Headquarters, Norton AFB, California, on 27 February. Field tests were required before any corrective action could be planned however. The 341st DCM and the Boeing Company conducted a joint study to determine the frequency of the channel 20 alarms by site, and by date, with all related material. The tests were begun in late February and continued through to the end of the quarter.<sup>87</sup>

#### MODIFICATION - EMP TESTING

(U) In direct relation to an incident covered in the April-June 1967 history of the 341st SSW was the Electro-Magnetic Pulse

86. Msg, dtg 221500Z, 15AF(DM75) to 341SSW(DCM), subj: Channel 20, 22 Jan 68.

87. Msg, dtg 282326Z, SASSO to 341SSW(DCM), subj: VISA channel 20 and DC to AC Power Transfer Problem, 28 Feb 68.

(EMP) testing conducted by SAMSC, the Boeing Company and the 341st SMW at site Sierra-39 of the 564th SMS. The original tests were terminated on 9 January, and the site was returned to the Wing. Due to a G&C change, the site did not resume alert posture until 14 January.<sup>88</sup>

(U) Two Time Compliance Technical Orders (T.C.T.O.) came from the EMP testing. One was for the addition of EMP pulse suppression to LF interconnecting boxes to eliminate the effect of noise generated by electrical discharge type pulses in the Hardened Intersite Cables. The second was the addition of VRSA monitor line protection relays to the interconnecting boxes to prevent equipment damage and/or failure from overvoltages below 2000 volts. The two T.C.T.O.s were to be accomplished concurrently. The second of the T.C.T.O.s was not released until 27 March, and work was not started by the end of the quarter.<sup>89</sup>

(U) A Summer-68 EMP program was scheduled to begin 1 April at site India-6 of the 12th SMS. However, due to contractual problems associated with the test program, the date for the start of the program slipped to 1 June 1968. The program was to last for one year.<sup>90</sup>

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88. Ltr, 341SMW(DCRM) to 15AF(DCR), subj: Unit Progress, 31 Jan 68. Ex 38.

89. Publication, "Minuteman Service News", Issue 36, Jan-Feb 68.

90. Msg, dtg 162323Z, SAC(DPLD) to 341SMW(DCM), subj: Summer EMP Program, 16 Feb 68.

DEPARTMENT OF THE AIR FORCE  
Headquarters 341st Strategic Missile Wing (SAC)  
Malmstrom Air Force Base, Montana, 59402

TO  
FROM: BCRM

31 January 1968

SUBJECT: Unit Progress Report (RCS: SAC-U89)  
SAC Programming Plan 12-66, LGM 30F (Minuteman) Force Modernization  
Program, Malmstrom AFB  
Month Ending 31 January 1968

TO: 15AF (DCR)

1. Commander's Comments: The LGM 30F (Minuteman) Force Modernization Program is on schedule in the 341st Strategic Missile Wing.

2. Status Summaries:

- a. Personnel: All tasks will be accomplished on schedule.
- b. Operations and Training: All tasks will be accomplished on schedule.
- c. Communications: All tasks will be accomplished on schedule.
- d. Maintenance:

(1) Training:

(a) The programmed ATC formal technical retraining of twenty officers and two hundred and seventy-eight technicians in Force Modernization (WS133A-M System) is on schedule. During January, two ATC Travel Team Courses were completed. Forty members completed Course ADF 44370G-4 (Missile Maint. Technician/A-M) and forty officers and key noncommissioned officers completed Course ODF 3124G-2 (WS133A-M Supervisors' and Planners familiarization course). The completions of Travel Team Courses included thirty personnel who were not originally scheduled in the program. During this report period, the inputs into ATC technical courses at Chanute AFB were resumed, after a scheduled "break" for Christmas and New Year holidays. Eight members departed for Course AZR 31670G-3, Msl analyst, (Targeting) A-M; three to Course AZR 31672G, Electronics Technician; four to Course AZR 31670G-4, Msl Analyst (TEAT) A-M and one officer entered training in Course OZR 2825-4, TEAT Officer, A-M. As of 31 Jan 68, 248 members of the 341SMW had completed their technical retraining for maintenance support of the Force Modernized flight.

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(b) The program to provide the initial Force Modernization retrained mobile teams has been completed, as previously reported. As of 31 January 1968, the 341SMW expects to have fifteen electro-mechanical teams, eight missile maintenance teams and eight combat targeting teams Force Modernization retrained. The on-base launch facility trainer has continued to be used effectively for training of missile maintenance teams and combat targeting teams. Site India - 10 was approved as the 341SMW off-base Electro-Mechanical Team trainer during January. It will be utilized to the maximum possible extent to assure an optimum capability in the EMT support area. The on-base LF trainer was converted to the WS133-B configuration on 5 Jan 68, to fulfill the immediate training needs for Wing VI mobile teams.

(c) The T-20 Control Monitor Trainer has been removed from the On-Base LF Trainer for necessary modifications. It is at the Autonetics Company, McAlester, Okla. The training tasks which would normally require the equipment are being accomplished at the Classroom Control Monitor Trainer, T-19, located in the 341MIMS Hangar. No problems are anticipated in fulfilling our training requirements.

(d) The T-15 Control Monitor Trainer, applicable to WS133B (Wing VI) training, is at the Autonetics Company, Anaheim, California, being modified. It is scheduled for return to Malmstrom AFB by 27 Jun 68.

(e) The WS133A (Wing I) off-base launch facility trainer, Alpha - 11, will be continued as a proficiency trainer and team evaluation facility, until Mar 68. After that date, training and evaluations for WS133A mobile maintenance teams will be accomplished in conjunction with EWO dispatches.

(2) Program:

(a) Golf Flight at 341SMW is scheduled to be repostured on 26 Jan 68.

(b) Juliet Flight is scheduled to be deposted on 30 and 31 Jan 68.

(c) The Electro-Magnetic Pulse (EMP) Lightning Test on Site Sierra - 39 was completed and the site returned to SAC on 9 Jan 68. Posturing of the site began on 10 Jan 68; however, due to a Guidance and Control Package problem, posturing was not completed until 14 Jan 68.

(d) The Flight Command, Interrogation and Status Test Demonstration M2-1, Security System, Power System, SIN and VRSA Tests Demonstration M2-2 and Launch and Launch Enable System Test Demonstration M2-3 were scheduled for accomplishment at Site Golf - 1 on 20 and 22 Jan 68.

e. Facilities:

(1) "In-House" work on removal of obstacles for helicopter landing pads has been discontinued because of snow and cold weather. Resumption of this work at C-7 is tentatively scheduled for 7 February 1968. Work also remains to be accomplished at C-3 and N-4. Obstacle removal has been completed at G-9, D-3, N-1, C-1 and N-10.

(2) Drafting of the helicopter landing approach plates for Launch Facilities has been temporarily discontinued at the suggestion of Headquarters 15th Air Force, with 75% completion, until they determine standard criteria for these plates for all missile bases. Currently available approach plates are adequate for interim operational use.

3. Soft Spots: None

4. Problems/Deficiencies Requiring Higher Headquarters Action: None

  
JOHN W CARROLL, Colonel, USAF  
Commander

Copies to: 18AD(DEXO)-3, C-2, DCO-6  
DCM-4, DS-1, MS-1, BC-2,  
BP-2, BCE-2, CSUP-2, BSV-1,  
BO-2, BCR-1, TSC-1, CXI-4,  
DCA-1