STRATEGIC AIR COMMAND

AGM-69 JOINT TEST UNIT

FINAL REPORT

This material is on loan from the USAF CTEC Data Bank, Hq AFTEC/LOA. Please return on or before

15 NOVEMBER 1975

HEADQUARTERS
STRATEGIC AIR COMMAND

Offutt Air Force Base, Nebraska

OPR: DOO

atch 5 2

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS STRATEGIC AIR COMMAND
OFFUTT AIR FORCE BASE, NEBRASKA, 68113

REPLY TO ATTN OF: DOO

15 NOV 1975

SUBJECT: AGM-69A Joint Test Unit Final Report

TO: See Distribution

1. This is the Strategic Air Command report on early testing of the U.S. Air Force/Energy Research and Development Administration (USAF/ERDA) Joint Test Unit (JTU) for the AGM-69A Short Range Attack Missile (SRAM). The report combines the results of two test programs which were conducted using the JTU. The first was a concurrent Development Test and Evaluation/Initial Operational Test and Evaluation (DT&E/IOT&E) conducted during the period of Jun-Dec 74 under the exercise term BULLET BLAST. The second was an Operational Test and Evaluation conducted during the period of Mar-May 75 under the exercise term BULLET BLITZ II. The results of these two programs were combined so as to provide a larger sample size for assessment.

2. The OPR for this report is HQ SAC/DOO. Questions or comments concerning this report should be addressed to HQ SAC/DOOV or teleconed to this office at Autovon 271-5307.

REVIEWED:

Charles R. Mason

CHARLES R. MASON, Lt Col, USAF
Ch, Aircraft Test Div
Dir of Operations, DCS, Operations

APPROVED:

EDWIN THOMPSON, Colonel, USAF
Director of Operations
Deputy Chief of Staff, Operations

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

20060223340

(This page intentionally left blank)

DISTRIBUTION

HQ USAF/XOOF-1, XOOS-1 Washington DC 20330	2
Kirtland AFB NM 87115	
AFTEC/TES	3
SACLO	1
AFSC/DOV Andrews AFB DC 20331	1
Wright-Patterson AFB OH 45433	
AFLC/MMA	1
ASD/YS69	1
HQ SAC/DOO-4, XPH-1, LGW-1 Offutt AFB NE 68113	6
Oklahoma City ALC/MMA Tinker AFB OK 73145	1
San Antonio ALC/SWOS-1, SWPR-1 Kelly AFB TX 78241	2
Barksdale AFB LA 71110	
4201TESTS/CC	1
2MMS/NTI	1
Sandia Labs P O Box 5800 Div 9521 Albuquerque NM 87115	1
Defense Documentation Center Bldg 5, Cameron Station 5010 Duke St Alexandria VA 22314	12

ABSTRACT

1. The Strategic Air Command (SAC) has assessed the operational utility and suitability, training requirements, and logistic supportability of the Joint Test Unit (JTU) for the AGM-69 Short Range Attack Missile (SRAM). This assessment was made during a concurrent Development Test and Evaluation/Initial Operational Test and Evaluation (DT&E/IOT&E) conducted from June through December 1974, and a subsequent Operational Test and Evaluation (OT&E) conducted from March through May 1975. Two live launches were conducted for the DT&E/IOT&E and six live launches were conducted for the OT&E.

2. The results of these programs indicate that the JTU payload will reliably and effectively meet SAC test requirements. However, the inherent absence of a flight termination (command destruct) system precluded testing of the JTU configured system on certain land ranges and, therefore, the SRAM's total capability envelope was not exercised during these launches.

RELATED DOCUMENTS

1. B-52 SRAM Joint Test Unit (JTU) Development Flight Test Report (U), ASD/YS69D, dated 30 Jan 75 (SECRET).

2. FB-111 SRAM Joint Test Unit (JTU) Development Flight Test Report (U), ASD/YS69D, dated 30 May 75 (SECRET).

3. SRAM JTU (W69-0/JTA) Development Flight Tests at Air Force Eastern Test Range (U), Sandia Laboratories, dated 31 Jul 75 (SECRET FRD).

4. SRAM JTU (W69-0/JTA) Development Flight Tests at Tonopah Test Range (U), Sandia Laboratories, dated Aug 75 (SECRET FRD).

5. SAC OPORD 79-75, BULLET BLAST (U), dated 15 Jun 74 (SECRET).

6. SAC OPORD 77-75, BULLET BLITZ II (U), dated 1 Feb 75 (SECRET).

7. BULLET BLITZ II SRAM OT&E Final Report (U), dated 1 Dec 75 (SECRET).

8. Program Management Directive, R-P3005(1)/64602F, dated 11 Aug 72 (UNCLASSIFIED).

9. Program Management Directive, R-P2110(4)/64602F, dated 3 Jul 74 (CONFIDENTIAL).

TABLE OF CONTENTS

BACKGROUND

1. Memorandum of Understanding No. AT(29-2)-2056 between the United States Air Force (USAF) and the Energy Research and Development Administration (ERDA), formerly Atomic Energy Commission (AEC), provides for joint testing of Air Force weapons systems containing nuclear warheads. To comply with the terms of the AF/ERDA agreement, a Joint Test Unit (JTU) was developed to verify complete weapon system function of the AGM-69A Short Range Attack Missile (SRAM). The JTU consists of:

a. A Joint Test Assembly (JTA) containing a W69-0 warhead (less nuclear assembly), tracking and telemetry systems, certain war reserve electrical components, and an Air Force supplied Digital Data Register (DDR).

b. A payload shell to house the JTA.

c. A dual-band antenna mounted on the payload nose for tracking and telemetry systems.

2. A joint Development Test and Evaluation/Initial Operational Test and Evaluation (BULLET BLAST) was conducted by AFSC/ASD, ERDA/Sandia Laboratories, The Boeing Co., and HQ SAC. This program was conducted during the period of Jun-Dec 74 and consisted of technical data verification, four captive sorties, and one live launch from each type of carrier aircraft (B-52 and FB-111). The payloads used during this program were pre-production flight test units.

3. Upon completion of the DT&E/IOT&E program, SAC and ERDA/Sandia Laboratories conducted a six missile launch program (BULLET BLITZ II) as part of the AF/ERDA Joint Drop Test and Missile Firing Program. This program used production JTAs and resulted in the launch of three missiles from each type of carrier (B-52 and FB-111).

4. This report covers HQ SAC's assessment of the SRAM JTU (W69-0/JTU) payload. In assessing the W69-0/JTU, the following areas were examined:

a. The adequacy of technical data and test equipment used in maintenance, checkout, and operation of the JTU payload.

b. The adequacy of aircrew and maintenance training as it applies to JTU unique operations.

c. The capability of the JTU payload to support test requirements while using current employment concepts, tactics, and techniques.

SCHEDULE OF ACTIVITIES

DATE	ACTIVITY
4-5 Jun 74	Technical Order Validation
23 Jul 74	B-52 Captive Flight Test #1
6 Aug 74	B-52 Captive Flight Test #2
20 Aug 74	B-52 Live Launch
2 Nov 74	Technical Order Validation
5 Nov 74	FB-111 Captive Flight Test #1
19 Nov 74	FB-111 Captive Flight Test #2
6 Dec 74	FB-111 Live Launch
25 Mar 75	B-52 Live Launch
21 Apr 75	FB-111 Live Launch
12 May 75	B-52 Live Launch (2)
23 May 75	FB-111 Live Launch (2)

EVALUATION OF TECHNICAL DATA AND EQUIPMENT

1. Maintenance Technical Data. Validation of maintenance technical data was accomplished at Grand Forks AFB (B-52) and Plattsburgh AFB (FB-111) prior to the first captive mission at each base. No deficiencies were noted during the validations. The Non-Tactical Instrumentation (NTI) team (responsible for JTU installation) has continued to submit recommended improvement/procedural changes as necessary. The recommended procedural changes generally concern the streamlining of the required NTI team tasks in an attempt to produce work/time savings.

2. Aircrew Technical Data.

a. B-52 aircrews used formal technical orders for all JTU flight tests. No discrepancies were noted.

b. FB-111 aircrews used Boeing Co. source data for all DT&E/IOT&E missions since the formal technical orders incorporating JTU checklist procedures had not been distributed. Formal technical orders were subsequently used for all OT&E missions.

c. One revision was made to aircrew technical data as a result of an anomaly observed on the first FB-111 captive mission. Immediately after conducting a simulated launch in the Manual mode, the crew observed a Missile No-Go indication (not normal for a routine simulated launch). Postflight investigation revealed that the Missile No-Go condition was not valid, but was caused by a software peculiarity of the JTU configuration. An interim Operational Supplement was issued to advise crews of this peculiarity and detailed the procedures to determine the validity of the No-Go indication. This peculiarity will be eliminated in a revised operational software tape which is scheduled for release in the near future.

3. Maintenance Equipment.

a. The JTU payload is compatible with the current configuration of the SRAM missile and its associated maintenance equipment.

b. Only one piece of unique equipment is required for the JTU configuration. This equipment, which consists of an Impact Fuze Removal tool, is used to remove the impact fuze from the payload shell. This item was used for both test programs during the premission JTU preparation. No deficiencies were

noted. Per agreement with the Director of Special Weapons, Kelly AFB TX, future JTU payload shells will be pre-equipped with the dual-band antenna and will not require the Impact Fuze Removal tool.

4. Aircrew Equipment. Peculiar aircrew equipment is not required for JTU launch missions. The equipment installed to support the SRAM in the Operational Test Launch (OTL) configuration also satisfactorily supports the JTU configured missile. Only one aircrew input to the Carrier Aircraft Equipment (CAE) is required in order to identify the presence of a JTU configuration to the computer software.

5. Other Equipment.

a. SRAM inflight performance with the JTU payload installed was normal from launch to fuzing; however, immediately following the issuance of the airburst fuzing discrete it was apparent that the missile computer memory was perturbed. This perturbation was first observed on the 6 Dec 74 mission at the Tonopah Test Range (TTR) when the missile went unstable after the fuzing event. Subsequent post fuzing anomalies were observed at the Air Force Eastern Test Range (AFETR) on five of the six BULLET BLITZ II missions. The severity of these anomalies ranged from an insignificant temporary loss of computer synchronization to complete loss of missile stability.

b. Following the first occurrence on 6 Dec 74 a technical review was held between HQ SAC, AFSC/ASD, Sandia Laboratories, and The Boeing Co. It was mutually agreed that the most probable cause of the anomaly was electromagnetic interference caused by the JTU payload at fuzing. It was further agreed that the anomaly occurred after airburst fuzing, and therefore, did not affect the overall mission profile. Further, it was agreed that if the fuzing discrete had not been issued, the anomaly would not have occurred and the missile would have performed its normal pull-down maneuver. From a test point of view, this anomaly has some effect on mission planning and trajectory positioning on the test range. With a severe tumble after fuzing, it is possible that the missile will impact at some point other than predicted. Also, during AFETR tests, if the missile should enter a "flat spin" after fuzing, it is remotely possible that it could impact the water at a low vertical velocity, remain intact, and float. A study is currently underway to further evaluate this possibility.

EVALUATION OF TRAINING

1. Maintenance Training.

a. The JTA closely resembles the W69-0 war reserve component in size and shape. The Munitions Maintenance Squadron (MMS) teams use normal technical data to place the JTA within the SRAM payload shell. No unique training is required for the unit MMS to accomplish this task.

b. The 2MMS/NTI team, Barksdale AFB LA, is a unique organization whose job is to maintain, configure, and checkout the instrumentation used to support SAC testing of airborne missile systems. Members of this NTI team received on-the-job training for the unique tasks required to configure and checkout the JTU system at Grand Forks AFB and Plattsburgh AFB during the BULLET BLAST test program. This training was provided by personnel of the Boeing Co. and Sandia Laboratories. No deficiencies were noted in the training program. Training of new NTI personnel will continue to take place at the designated launch base during future live launch programs.

2. Aircrew Training.

a. Aircrews do not receive recurring training in the operations required for OT&E launch missions. They are given a specialized briefing prior to flight on those operations which are unique to OT&E live launch missions. In addition, a trainer/simulator mission is recommended to assist the aircrew in integrating the specialized checklists and communication procedures required for OT&E missions. Experience has shown that these procedures are adequate to assure satisfactory mission completion.

b. A crew procedural error was made during an FB-111 scheduled launch mission on 21 May 75 and the aircrew was unable to accomplish a simulated launch. Post flight investigation revealed the most probable cause was the aircrew's failure to enter System Instruction Code (SIC) 22 into the SRAM master computer (insertion of SIC 22 identifies the presence of a JTU missile to the master computer). The aircrew could not recall entering the briefed SIC inflight as they were preoccupied with avionics problems during that period of the mission. To reduce the possibility of a recurrence of this problem, future aircrew briefings will emphasize the importance of properly entering the appropriate SIC. This additional emphasis is expected to prevent a recurrence of this problem.

CAPABILITY TO SUPPORT TEST REQUIREMENTS

1. The JTU payload provides satisfactory telemetry and radar beacon signals, throughout presently defined missile profiles and aircraft delivery regimes, to adequately document test missions. A limitation on the missile profiles available for evaluation is imposed due to the lack of a flight termination (command destruct) system on the JTU configuration.

2. Absence of a flight termination system significantly limits the number of missile profiles that can be tested. This limitation has precluded some JTU testing at any range (see paragraph 3 below) other than the Air Force Eastern Test Range (AFETR). Further profile restrictions are imposed at the AFETR because of:

a. Water depth requirements to guard against possible recovery of classified components.

b. Limited radar and telemetry support (one station each) precluding launches from minimum altitudes and the planning of fuzing events at operationally representative altitudes.

3. Originally, it was planned to evaluate the SRAM JTU in the low level mode at the Tonopah Test Range (TTR) Nevada; however, after the BULLET BLAST launch on 6 Dec 74, Sandia Laboratories (operators of the TTR) refused to accept further testing of the SRAM JTU without a flight termination system. Although the TTR is limited in area and approach paths to acceptable launch points, a low level profile of the SRAM/JTU could be successfully evaluated at the TTR.

4. Sandia Laboratories has recently (Aug 75) requested the resumption of SRAM JTU testing at the TTR on a one year trial basis. SAC has already planned FY76 SRAM JTU launches at the AFETR and has committed the appropriate support resources. SAC is currently investigating possible profiles to fly at the TTR during the FY77 OT&E program. With the resumption of testing at the TTR, the SRAM JTU can probably be tested in both the high and low altitude trajectory regimes.

CONCLUSIONS AND RECOMMENDATIONS

1. Conclusions.

a. SAC concurs with the conclusions of the AFSC report (see RELATED DOCUMENTS).

b. The technical data, test equipment, and training are adequate to provide for reliable and efficient operation of the JTU.

c. The JTU payload is capable of supporting SAC test requirements; however, the necessity for a flight termination system on any test vehicle is obvious. Fiscal realities mitigate against designing and installing such a system on the SRAM JTU at this time.

2. Recommendation. On future programs involving similar test vehicles and payloads, personnel in the test and evaluation communities should make every effort to ensure that a flight termination system is incorporated in the basic design. With a flight termination system compatible with all candidate test ranges, it would then be possible to evaluate future systems throughout their complete operational regimes.

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: N/A	2. GOVT ACCESSION NO.
3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle): AGM-69A Joint Test Unit Final Report	5. TYPE OF REPORT & PERIOD COVERED: Final, Jun 74 - May 75
6. PERFORMING ORG. REPORT NUMBER: N/A	
7. AUTHOR(s)	8. CONTRACT OR GRANT NUMBER(s): N/A
9. PERFORMING ORGANIZATION NAME AND ADDRESS: HQ SAC/DOOV, Offutt AFB NE 68113	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: Program Element 11118
11. CONTROLLING OFFICE NAME AND ADDRESS	12. REPORT DATE: 15 Nov 75
	13. NUMBER OF PAGES
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office): Directorate of Operations, Deputy Chief of Staff, Operations, HQ SAC, Offutt AFB NE 68113	15. SECURITY CLASS. (of this report): UNCLASSIFIED
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

None

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

None

18. SUPPLEMENTARY NOTES

N/A

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Joint Test Unit (JTU)
Short Range Attack Missile (SRAM)
AGM-69A

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report contains the Strategic Air Command's assessment of the operational utility and suitability, training requirements, and logistic supportability of the Joint Test Unit for the AGM-69A Short Range Attack Missile (SRAM).

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED