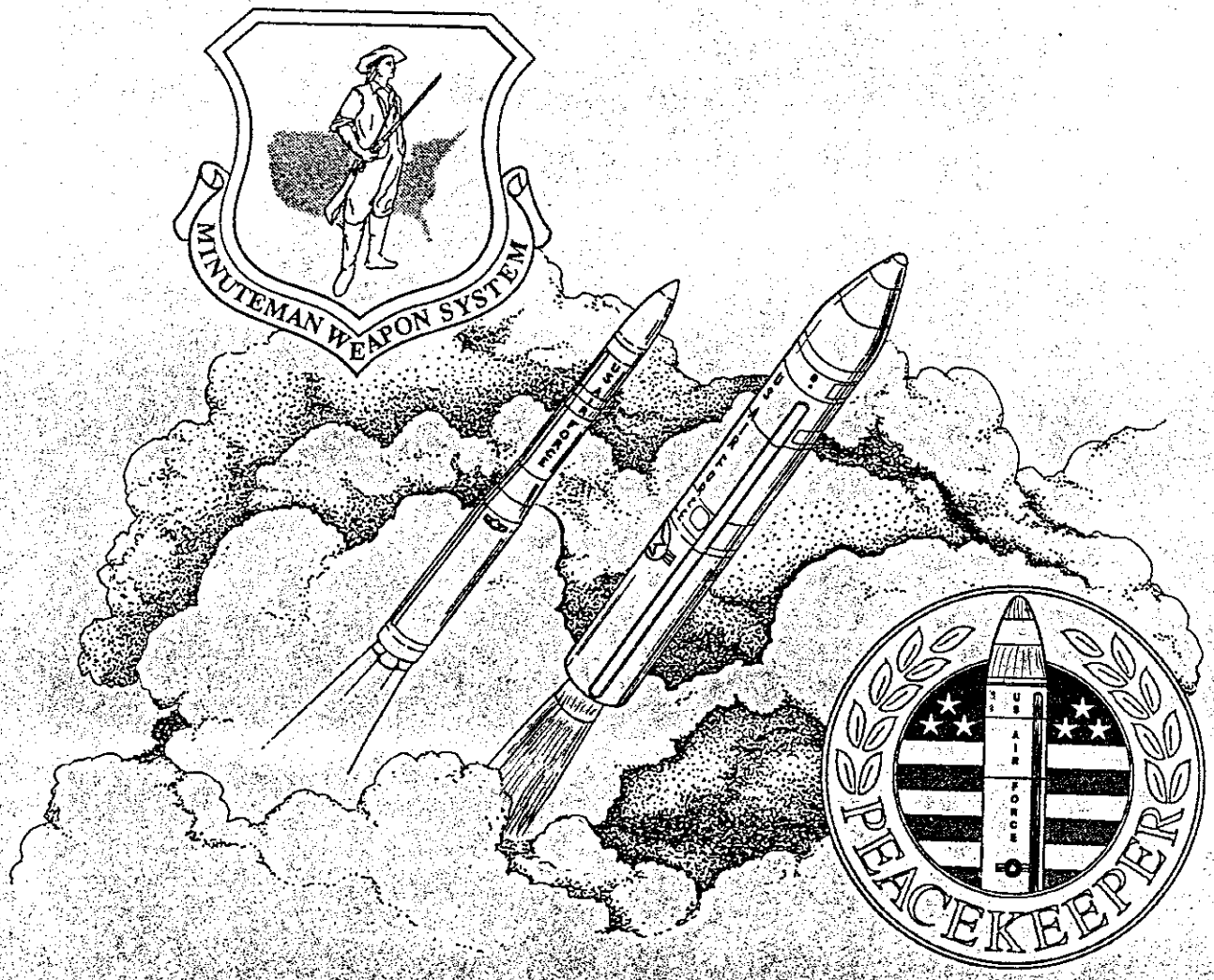
SILO-BASED ICBM
LONG RANGE PLANNING
LOGISTICS PROGRAMS MANAGEMENT PLAN

APRIL 1992



PREPARED BY
SILO-BASED ICBM SYSTEM PROGRAM OFFICE
OGDEN AIR LOGISTICS CENTER
HILL AFB, UT 84056-5990

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FOREWORD

This Logistics Programs Management Plan describes the resource requirements for the Minuteman and Peacekeeper in Minuteman Silos weapon systems. The plan presents the maintenance, supportability, and improvement programs that are in place or planned.

Comments and suggestions regarding this plan are solicited and should be addressed to OO-ALC/LMIL (LMCP), Hill AFB, UT 84056-5990, DSN 458-1274.

DOUGLAS R. HILL, LtCol, USAF
Director of Program Control
Silo-Based ICBM SPO

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1.0 INTRODUCTION

1.1 Intercontinental Ballistic Missile Long Range Planning

Intercontinental Ballistic Missile (ICBM) long range planning is a joint Ballistic Missile Organization (BMO), Strategic Air Command (SAC) and Ogden Air Logistics Center (OO-ALC) process to plan for deployed ICBM weapon systems. The ICBM Long Range Planning (ILRP) program was originally developed for Minuteman (MM) (under the name of MLRP) when the planned life of the system was extended beyond the year 2000. Since the system was built with a service life goal of ten years and was nearly 20 years old when the life was extended another 20, a well-planned, carefully managed program is necessary to insure the weapon system is effectively maintained at specification. Limited budgets and manpower resources have made careful analysis and planning essential for projected redesigns, upgrades, modifications and changes to the weapon system. ILRP has proven that MM is extendable beyond the year 2010 and that life extension is affordable compared to replacement systems.

In the summer of 1992, SAC, Air Force Systems Command (AFSC) and Air Force Logistics Command (AFLC) will be disestablished and their functions will be performed by newly formed commands. While the names and command relationships will change, the acquisition, logistics, and operating agencies will continue to interact as an ICBM community in the performance of long range planning functions. The ILRP charter is currently being rewritten to address these organizational changes.

To begin the planning process, SAC provides a Mission Objectives Report (MOR) which defines the overall mission requirements including threats, ICBM force mix projections, and potential new missions. BMO provides a Systems Options Report (SOR) which outlines options to meet mission and supportability requirements based on current and projected missions. OO-ALC writes the Logistics Programs Management Plan (LPMP), which defines short and long-term logistics requirements to support the currently deployed weapon systems. The three documents are integrated and summarized in the ICBM Weapon Systems Master Plan; formerly the Twenty-Year Technical Plan, last published in November 1987.

The structure of the ILRP LPMP is as follows:

1.0 Introduction

2.0 Minuteman Programs Descriptions and Status
(Appropriation 3020)

3.0 Peacekeeper Programs Descriptions and Status
(Appropriation 3020)

4.0 Sustaining Engineering
(Appropriation 3400/EEIC 583)

5.0 DPEM and Contractor Logistics Support
(Appropriation 3400, EEIC 54X and 578)

Acronyms

Alphabetized Table of Contents

Distribution List

Cost Annex (Limited Distribution)

The requirements in the LPMP are influenced by the force structure mix of ICBM weapon systems in the total strategic offensive force, and the specific numbers of each system that will constitute the deployed force for the planning period. For example, deactivation of a system may free common assets for use as spares or operational test assets and preclude an unnecessary procurement of assets for pipeline spares or testing.

With the retirement of MM II, the ICBM System Program Manager (SPM) conducted reviews of all impacted programs. The goal was to insure that equipment and parts made available by retirement were fully utilized, and that continuing or planned programs to purchase equipment and parts had the quantities adjusted to reflect the lower requirements after retirement. Contracts have been structured with delivery schedules that allow the final number of items purchased to be controlled by exercising production options.

As part of the retirement planning process, "save" lists were developed to set aside items from deactivated facilities to add to the spares levels to maintain remaining equipment. The

existing spares levels and historical condemnation rates were considered before decisions were made to commit resources to removal, processing and storage of additional spares.

The 1992 President's Budget, the Strategic Arms Reduction Treaty (START), and President Bush's address to the nation on 27 September 1991 regarding strategic forces addressed or influenced MM II missile retirement. Retirement of missiles at Wing I (Malmstrom AFB, Montana) and Wing II (Ellsworth AFB, South Dakota) is in progress. Wing IV (Whiteman AFB, Missouri) will begin retiring missiles in FY93.

The Air Force has announced plans to emplace MM III missiles from a "Base X" in the vacated launchers at Malmstrom AFB. Selection and ground system configuration of Base X will affect save lists and equipment modification/upgrade/replacement plans. The decision has been deferred to the next cycle of Base Closure Commission deliberations and is expected by 1994.

1.2 Reliability and Maintainability 2000

The "Reliability and Maintainability Action Plan R&M 2000" reiterates the Air Force policy that Reliability and Maintainability (R&M) will be considered coequal with cost, schedule, and performance during acquisition of major modifications or new systems. The MM and Peacekeeper (PK) weapon systems have embraced the R&M goals and concepts since their inception. Since each missile is located in an unmanned remote silo and must be maintained continuously on alert, the missile and its supporting equipment must remain highly reliable and maintainable. Thus, these became critical factors in the original weapon system design and continue to be so in the current system; not so much to increase the R&M but to maintain the existing high levels of R&M.

The five R&M goals established by Air Force policy are:

Increase Combat Capability
Decrease Vulnerability of Combat Support Structure
Decrease Mobility Requirements per Unit
Decrease Manpower Requirements per Unit Output
Decrease Costs

Due to ICBM-unique requirements, these goals are viewed differently from the more traditional aircraft view. "Increase combat capability" is viewed as maintaining or slightly increasing the high alert rate of ICBMs. "Decrease vulnerability of combat support structure" is interpreted as maintaining or increasing the R&M of missile support equipment. Many projects to increase the survivability of the MM missile and its supporting equipment from attack address both these goals. "Decrease mobility requirements per unit" addresses the maintenance requirements of the system.

Improved R&M means that fewer maintenance personnel and less equipment are needed when a team is dispatched to a silo to perform repairs or general maintenance. With increased reliability, the frequency of maintenance dispatches should decrease. Similarly, "decrease manpower requirements per unit output" means that fewer personnel are required to perform repairs. Also, the requirements for depot level repair should decrease. Finally, "decrease costs" is viewed as the challenge to most effectively use the dollars available. Modifications should decrease the expected life cycle cost of the system.

It is difficult to quantify direct impacts of programs in terms of these five goals. Improvement in missile accuracy can be determined, but must remain classified. Many aspects of increased survivability can also be determined. Modification programs are often justified on the overall life cycle savings for the subsystem, but the effect on system life cycle cost may be slight and difficult to assess. The impact on mobility and manpower is even more difficult to quantify. A program may decrease the number of personnel needed to maintain the subsystem, but the impact on weapon systems manpower requirements may be negligible. Similarly, the program may improve the reliability of a subsystem, which in turn decreases the frequency of maintenance dispatches; but another subsystem may continue to drive maintenance dispatches. It should also be noted that a maintenance team is usually not dispatched for noncritical subsystem repairs, only when a critical repair is needed or several noncritical subsystems need repair. Maintenance teams usually perform several repairs during each dispatch, therefore, it is often difficult to show the direct impacts these programs have in terms of the R&M goals.

Due to the age of the MM system, failure rates are increasing on several items. This means that the Mean Time Between Failure (MTBF) is decreasing. One of the decisions made when the system was procured was to purchase a minimum level of spares up front, based on an expected system life. With life extension and increasing failure rates, some subsystem and piece-part spares levels are critical. Many of the original vendors have gone out of business or have discontinued production of MM parts due to technological obsolescence. New vendors are usually difficult to find.

As a result, several modification and replacement programs are in place to support the weapon system into the next century. Also, the insertion of new technologies into the weapon system has become a common practice. Cutting edge technologies are usually not used due to the uncertainty of the technology's capability to meet the high reliability requirements. However, the use of common, current, and proven technologies allows insertion of improved reliability and provides a base of vendors able to support the force into the next century.

In September 1989, OO-ALC accepted program responsibility for the last of the Peacekeeper in Minuteman Silos (PIMS) ground support equipment (GSE). The restructuring of AFLC and AFSC into the single Air Force Materiel Command (AFMC) and the implementation of Integrated Weapon System Management (IWSM) principles, have gathered system and development support responsibilities for all deployed silo-based ICBMs under a Program Director in the System Program Office at Hill Air Force Base (HAFB). Weapon system support for MM and PK is provided by the System Support Manager at HAFB for day-to-day maintenance of the weapon systems, and by the Development Support Manager at Norton AFB for major modification and new capability development for deployed systems. Logistics support for PIMS is expected to be very similar to the MM support concepts.

1.3 Logistics Programs Management Plan Format and Content Summary

This plan describes programs and projects to maintain the capability of deployed ICBM weapons systems, using funds from Appropriation Categories 3020, Missile Procurement, 3400, Air Force Operations and Maintenance, and 3600, Research and Development. Within Appropriation 3020,

funds are used from Budget Program (BP) 2100, Modifications; BP 2200, Replacement Equipment; and BP 2500, Replenishment Spares. Within Appropriation Category 3400, funds are used from Element Expense Identification Codes (EEICs) 54X, Depot Programmed Equipment Maintenance (DPEM); EEIC 578, Contractor Logistics Support (CLS); and EEIC 583, Sustaining Engineering.

This LPMP describes each permanent modification and equipment replacement costing more than $1 million, and each replenishment action which has not been entered into the Central Secondary Item Stratification (CSIS) automated accounting system or which has been entered into the CSIS and costs more than $1 million. Descriptions of the Sustaining Engineering, DPEM and CLS activities are also provided.

The programs are organized by equipment category; i.e., Aerospace Vehicle Equipment (AVE), Operational Ground Equipment (OGE), and Support Equipment (SE), which includes Maintenance Support Equipment (MSE), Transportation and Handling Equipment (T&HE) and Trainer-Unique Equipment.

Programs entering the budget process are assigned a program number. Information for each program includes a description of the existing equipment and its role in the weapon system, identification of the problem and planned corrective action, resolution schedule, and program management information.

The schedules appear as in the following sample format:

Event	Completion Date
SOW/Data Call	Sep 87
PR Package to PMZ	Jan 88
Contract Award	Oct 88
SDR	Dec 88
PDR	Mar 89
CDR	Jan 90
FCA/PCA	Jul 90

FAD/FOC	Oct 90
Installation	Dec 91

Program management information is comprised of the name and office of the Program Manager, Program Engineer, Program Equipment Specialist, Modification Manager and Item Manager. The following sample format is used:

Program Management	Name	Office	Phone
Program Manager	A. Jones	LMAP	DSN 458-1257
Program Engineer	G. Davis	LMAP	
Program Equipment Specialist	J. Smith	LMAP	
Modification Manager			
Item Manager			

2.0 MINUTEMAN PROGRAMS DESCRIPTIONS AND STATUS (Appropriation 3020)

2.1 Minuteman III Aerospace Vehicle Equipment

2.1.1 Minuteman III Missile Assets

2.1.1.1 Combat Training Launch Instrumentation (87-25-1-0-0018 and 90-25-1-0-0847); Command Receiver (90-25-1-0848); Transmitter UHF (90-25-1-0849); Interval Timer (90-25-1-0846)

This program provides for purchase of instrumentation wafers and components needed for scheduled future operational test (OT) launches since instrumentation group assets are depleted as MM III test launches continue. The basic instrumentation group consists of the Figure A 6370 Mod 7 instrumentation wafer, Figure A 6371 cable set, Figure A 6372 conduit support set, Figure A 6384 inertia switch, and Figure A 6353 interval timer set. The instrumentation group contains the telemetry, C-band transponder, and command destruct subsystems. These transmit data during prelaunch and missile flight for performance and accuracy evaluation; allow transponder inflight tracking for position and velocity; and provide a means of destroying the missile as required by range safety.

Twenty-one wafers are contracted for delivery between June 1991 and April 1992. There is also a buy for seven additional wafers to be delivered between December 1992 and March 1993. These buys will provide wafers through 1999 at the current OT launch rate of four per year.

Schedule:

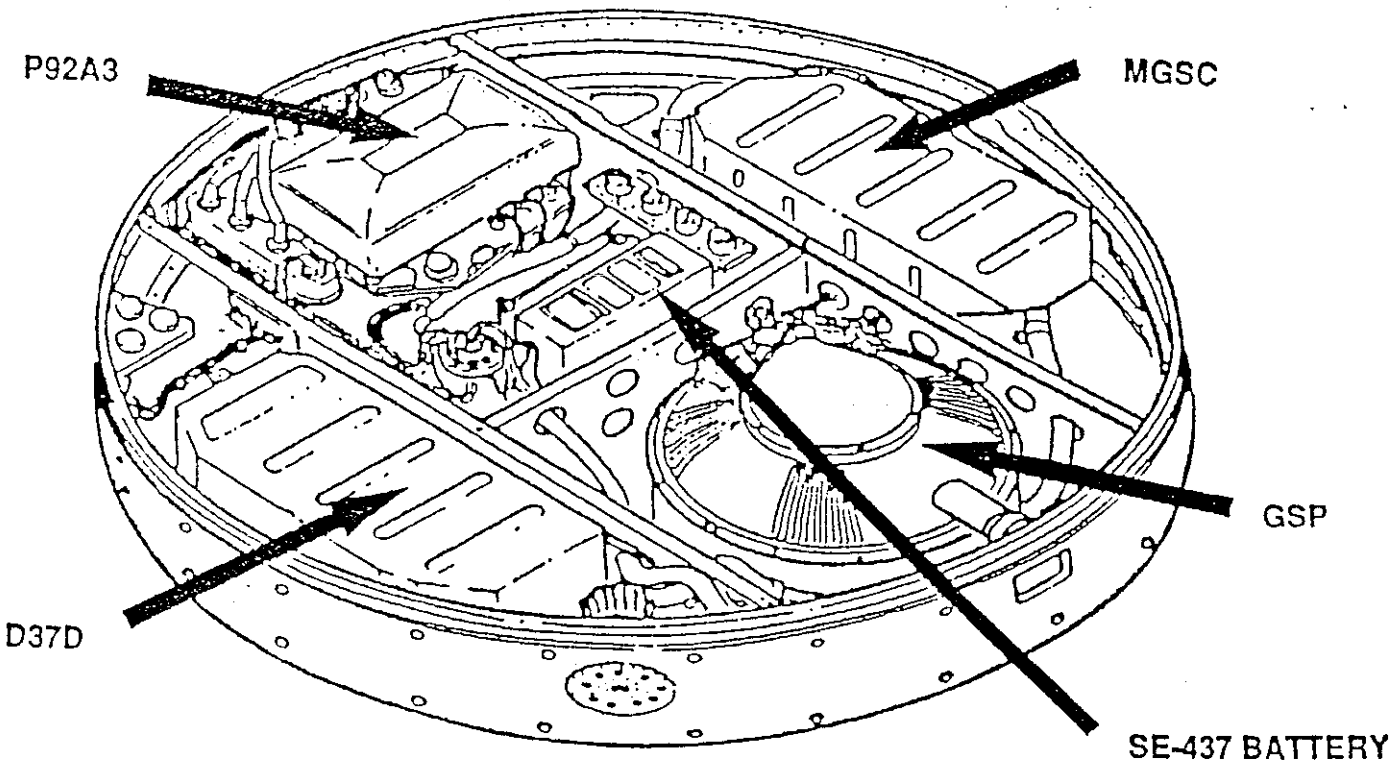
Event	Completion Date		
Contract Award	Sep 87		
CDR	May 88		
FCA/PCA	Mar 91		
Wafer Delivery			
(87-25-1-0-0018)	Jun 91	-	Apr 92
(90-25-1-0-0847)	Dec 92	-	Mar 93
Command Receiver Delivery	Jul 92	-	Jan 93
Transmitter UHF Delivery	May 92	-	Mar 93

Program Management	Name	Office	Phone
Program Engineer	J. Leach	LMAGR	
Program Equipment Specialist	S. Dixon	LMAGR	DSN 458-1356
Item Manager	D. Palmer	LMAPR	

2.1.2 NS20

2.1.2.1 Minuteman III Guidance Replacement Program (13503B) and Planned Life Extension Program

The NS20 MM III Missile Guidance Set (MGS) is comprised of the Gyro Stabilized Platform (GSP), the D37D Digital Computer Unit (DCU), the MGS Control (MGSC), and the P92A3 Amplifier Assembly (Figure 2.1-1). The function of the GSP is to provide acceleration and attitude information to the guidance computer during flight so the missile can deploy the reentry vehicle (RV) at the designated velocity and position. The GSP also provides level detector and alignment information from the gyrocompass assembly (GCA) and accepts control signals so velocity and platform-attitude constants can be obtained and the platform can be properly aligned prior to missile launch. The DCU performs guidance and calibration computations.



MINUTEMAN III NS20A1 MISSILE GUIDANCE SET

Figure 2.1-1

The MGSC contains the electronic circuitry required for operation of the platform. This includes power supplies, the servo amplifier, gyro torquing circuits, and circuitry for interfacing with the DCU. The P92A3 serves as the electronic interface between the computer and the missile downstage, thereby providing missile attitude control to each of the three solid stages and the Propulsion System Rocket Engine (PSRE).

The major features of the weapon system, when it was deployed, were high reliability, minimum maintenance with maximum operational readiness time, and the ability to launch missiles rapidly after the command is given. These features have remained fairly constant for many years, but based on a downward trend in flight reliability realized by the MM II system in 1987, a similar downward trend is projected for the MM III system beginning between 1996 and 2000, which will require action between 1997 and 2001. The NS20 MGS is experiencing comparable parts degradation with wet slug tantalum capacitors, transformers, and semiconductors. At the current failure rates and the lack of qualified vendors, the NS20 is not supportable past 1998, without major procurement action.

A MM III Guidance Replacement Program (GRP) is planned in order to address the electronics degradation. The first phase of the program will replace the MM III NS20 guidance electronics with a design compatible with the current NS20 GSP and with the Advanced Inertial Measurement System (AIMS) currently on contract under a Technology Transition Program (TTP). At the completion of the AIMS TTP, there will be a down select to one AIMS contractor to go into Engineering Manufacturing Development (EMD). An Engineering Change Proposal (ECP) will then be generated to the Guidance Electronics Upgrade (GEU) contract to perform integration and testing of the AIMS into the MM III guidance set.

The GRP/NS20 replacement tasks include design, integration, test, and Low Rate Initial Production (LRIP) of the following hardware and software components: D37D DCU; MGSC; Branched Wiring Harness; P92A3 Amplifier Assembly; GSP electronics; rewrite of guidance operational software and related AVE software; modification or replacement of MGS-related SE hardware and software; modification or replacement of MGS-related trainer hardware and

software; and modification or replacement of MGS-related test facility hardware and software. The GRP/AIMS task includes the design and engineering prototypes of the necessary hardware and software to interface with the AIMS. The operational reliability requirements for this program are a minimum of 15,000 hours MTBF for the MGS and 150,000 hours for the replacement components. The replacement components will be engineered for maintenance at the depot level by one journeyman-level technician. Ninety-five percent of all required replacement and maintenance procedures shall have a combined Mean Time To Repair (MTTR) of 16 hours with a design goal of six hours. First Article Delivery (FAD) for a GRP/NS20 MGS will be FY97 and FAD for GRP/AIMS MGS will be FY00.

Schedule:

Event	Completion Date
SOW/Data Call	Jun 92
CCB	Jun 92
PR Package to PMZ	Oct 92
Contract Award	May 93
SDR	Oct 93
PDR	Apr 94
CDR	Jan 96
FCA/PCA	Jan 97
Kitproof	Mar 97
Installation (By Wing)	TBD

Program Management	Name	Office	Phone
Program Manager	Capt K. Jensen	LMIM	DSN 924-2946
Program Engineer	Capt J. Kosey	LMAGR	DSN 458-1776
Program Equipment Specialist	E. Carlson	LMAGR	DSN 458-1352
Item Manager	J. Allington	LMAGR	DSN 458-6469

2.1.3 Reentry System/Reentry Vehicle

2.1.3.1 Reentry Vehicle Operational Test Assets (89-25-8-4-0205)

OT flights utilize specially-instrumented RVs to provide data on the operation of arming and fuzing (A&F) and detonation systems and on RV flight dynamics. The following configurations are flown:

The MK12 MOD 5R flight test RV consists of three basic sections: a MOD 3 (operational) forward section, a MOD 5R midsection and a MOD 3 or 5 aft section. The midsection is assembled by the Department of Energy (DOE), and is known as the DOE BUSY MARBLE Joint Test Assembly (JTA). The midsection is an instrumentation configuration of the MOD 3 midsection whose shield and structure assembly, with its radar antenna array, was modified to include a C-/C-band antenna array to become a MOD 5F. The midsection is designed for warhead reliability assessment. It contains a 24-gram high explosive charge and another seven grams of explosives in various actuating devices. Like the MOD 5T version, this RV contains a telemetry system that transmits A&F and warhead electrical system functions, but does not transmit indications of RV separation. It contains a transponder for radar tracking and a W3D telemetry cable as part of the aft section, which provides the instrumentation interface to the midsection. The RV mass properties duplicate those of the operational MK12.

The MK12 MOD 5T RV consists of three basic sections: a MOD 3 (operational) forward section, a MOD 5T midsection and a MOD 3 aft section. The midsection, which is externally similar to the MOD 3 midsection, contains a component shelf, a B-band telemetry antenna array and a C-band tracking antenna array. The RV is instrumented with accelerometers, rate gyros, breakwires, and pressure, temperature, and vibration rate transducers which sense aerodynamic and thermodynamic forces resulting from the heating or ablating of the external

structure. The instrumentation system also records and transmits data concerning A&F events. This performance data is converted to a digital message and is transmitted to several receiving stations along the flight path. The midsection is ballasted to match the operational mass properties of the MK12A MOD 3 midsection. A telemetry cable, W3D, between the mid and aft sections allows monitoring of reentry vehicle performance.

The MK12 MOD 5T3 is an upgraded version of the MK12 MOD 5T2 containing additional motion sensors, and magnetometers. It has been ballasted to duplicate the operational weight of the MK12A.

The MK12A MOD 5T RV consists of three basic sections: a MOD 3 (operational) forward section, a MOD 5T midsection and a MOD 3 aft section. The MK12A midsection contains similar components as the MK12 MOD 5T midsection and functions basically the same. The upgraded version of the MK12A MOD 5T contains additional motion sensors and magnetometers.

The MK12A MOD 5F RV consists of three basic sections: a MOD 3 (operational) forward section, a MOD 5F midsection and a MOD 3 aft section. The midsection is equipped with instrumentation similar to that of the MK12A MOD 5T and contains the DOE BUSY MARBLE JTA. Additional quantities of the MK12A MOD 5F midsection will be produced.

The MK12 and MK12A MOD6 flight test RV does not contain telemetry or a transponder. Instead it has a noninstrumented ballast kit which duplicates the mass properties of the operational MK12A. This vehicle provides the same body dynamics, aerodynamics, and radar cross section as an operational vehicle.

The inventory of RV test assets could not support current MM III flight test rates through 2010. Therefore, it was necessary to purchase additional assets to support flight test throughout the extended life of the MM III system.

Procurement actions are underway for the acquisition of additional MK12 and MK12A RV assets in support of the test program (Table 2.2-1). These are being provided by the conversion of existing operational assets as they are decommissioned or drawn down, procurement of new replicate assets when possible, or procurement of functionally replicated items.

Schedule:

Event	Completion Date #1	Completion Date #2	Completion Date #3
SOW/Data Call	Apr 88	Apr 88	Apr 89
PR Package To PMZ	Apr 88	Apr 88	Nov 89 *Apr 89*
Contract Award	Sep 89	Apr 89	Mar 90
PDR	Jun 90	Sep 89	N/A
CDR	Jan 91	Mar 90	N/A
FCA/PCA	Aug 91	Aug 91	N/A
Initial Delivery	Nov 91	Nov 91	Apr 91
Final Delivery	Dec 93	Sep 93	Apr 92

#1 MK12/12A A&F Assembly
#2 MK12/12A Sections
#3 MK12 Mod Conversion

Program Management	Name	Office	Phone
Program Manager	J. Morgan	SA-ALC/SWS	DSN 945-7027
Program Engineer			
MK12	C. Robertson	SA-ALC/SWPE	
MK12A	J. Forester	SA-ALC/SWPE	
Program Equipment Specialist			
MK12	C. Murphy	SA-ALC/SWPB	
MK12A	J. Hendrickson	SA-ALC/SWPB	
Item Manager			
MK12	S. Zuniga	SA-ALC/SWRD	
MK12A	S. Zuniga	SA-ALC/SWRD	

TABLE 2.1-1
REENTRY VEHICLE ASSETS PROCUREMENT

SYSTEM	DESCRIPTION	NO. OF ASSETS
MK 12	Midsection (MOD 5T)	38
MK 12	Midsection (MOD 5R)	27
MK 12	Fwd Section (MOD 6)	31
MK 12	Midsection (MOD 6)	28
MK 12	Aft Section (MOD 6)	29
MK 12A	Midsection (MOD 5T)	49
MK 12A	Midsection (MOD 5F)	28
MK 12A	Fwd Section (MOD 3)*	94
MK 12A	A&F Assembly	19
MK 12A	Aft Section (MOD 3)	83
MK 12A	Fwd Section (MOD 6)	54
MK 12A	Midsection (MOD 6)	48
MK 12A	Aft Section (MOD 6)	54

* Shield/Shell & A&F Assembly

2.1.3.2 Minuteman III MK12/12A Reentry System Test Set Replacement

The existing Reentry System (RS) test set is used by SAC munitions maintenance personnel to troubleshoot the RS. It is also used by OO-ALC and San Antonio Air Logistics Command (SA-ALC) shops for fault isolation and RS component testing following repair. The RS test set has exceeded its design life by a factor of four and must be replaced to support MM III life extension. The existing RS test set was built in the late 1960s and was fielded as part of the original SE when the weapon system was deployed. It is currently in use at five SAC locations and two depots. A replacement RS test set is required due to decreasing MTBF, increasing downtime, and the nonavailability of spare parts to repair the existing test set. Obsolete technology precludes reprocurement of additional test sets or spare parts.

The acquisition and contracting approach proposed for this program calls for design, testing and delivery of a prototype first article and associated drawings. On successful testing of the prototype, an option to build 12 production units would be exercised.

Schedule:

Event	Completion Date
PR Package	Oct 91
ASP	Nov 91
Rel Draft Sol	Feb 92
Rel Solicit	Jun 92
Prop Eval	Jul 92
Request BAFO	Nov 92
Source Sel	Nov 92
Contract Award	Nov 92
Proto Del	Dec 93
Prod Option	CY95
Prod Delivery	CY96

Program Management	Name	Office	Phone
Program Manager	J. Morgan	SA-ALC/SWS	DSN 945-7027

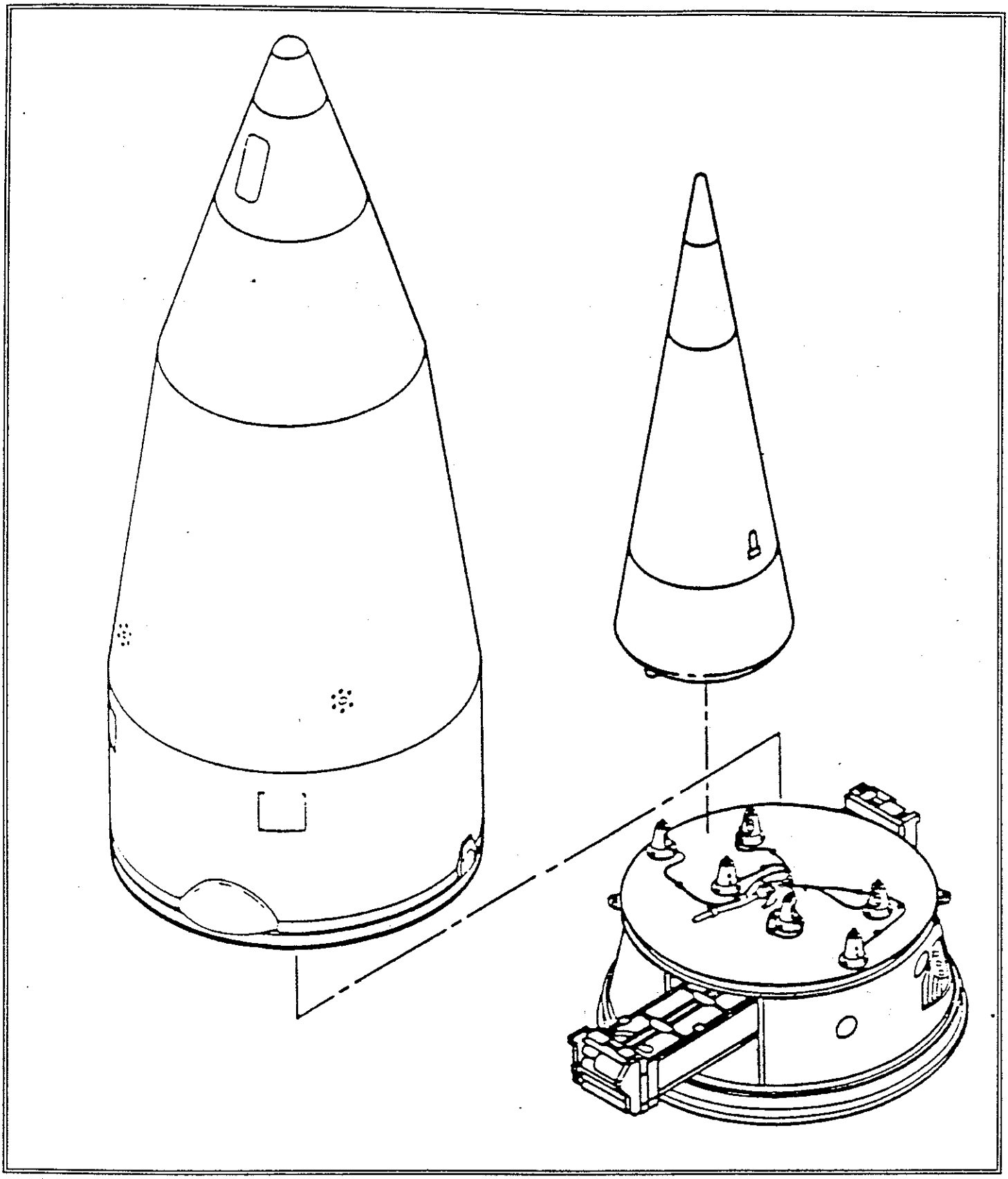
2.1.3.3 Single Reentry Vehicle Modification Program

The Single RV (SRV) program was initiated in 1991 to meet the anticipated START requirements and Air Force plans for a new ICBM force structure. START was signed in the summer of 1991 and ratification by the United States Senate is expected in the summer of 1992. When ratified, START will establish levels for RVs, missiles, and their associated launchers between the United States and the Commonwealth of Independent States (formerly the Soviet Union). To comply with the levels assigned to the Air Force, a modification of the MM III RS to deliver one RV is required.

The MM III missile was intended to have the capability to deliver one, two, or three RVs from the same bulkhead assembly, but the system was only deployed operationally and flight-tested with the capability to deliver only two or three RVs. In addition, START requires that bulkhead mounting provisions be consistent with the number of RVs actually installed and that current bulkhead assemblies be destroyed when they are replaced with a different configuration. The MM III RS is shown in Figure 2.1-2 and the drawing of the bulkhead assembly showing the mounting provisions for one, two, and three RVs is shown in Figure 2.1-3.

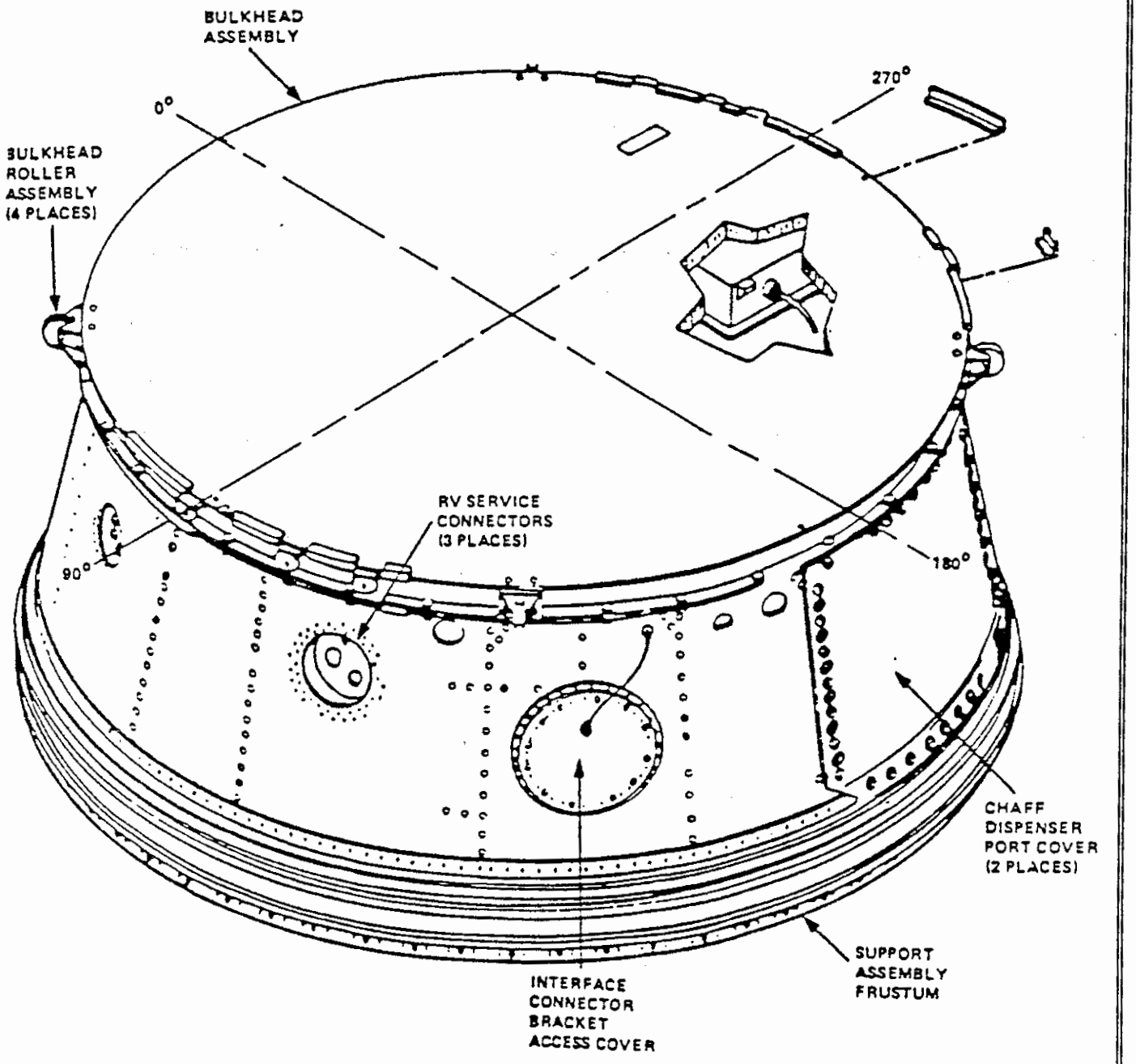
The MM III RS can currently be deployed with MK12 or MK12A RVs and with or without the chaff subsystem. The current MM III targeting software is shown in Figure 2.1-4. This software is currently configured to support only the two or three RV configurations.

The proposed technical solution to address the SRV requirement is to modify the existing bulkhead assembly design, limiting RV mounting capability to both a one-RV-only and a two-RV-only configuration. A two-RV-only bulkhead assembly will be designed and prototyped to preserve future force structure capabilities, but will not go into production. If required, the existing bulkhead assembly will be used for the three-RV configuration. Targeting and flight control software modifications will be developed to support operational and test launch missions.



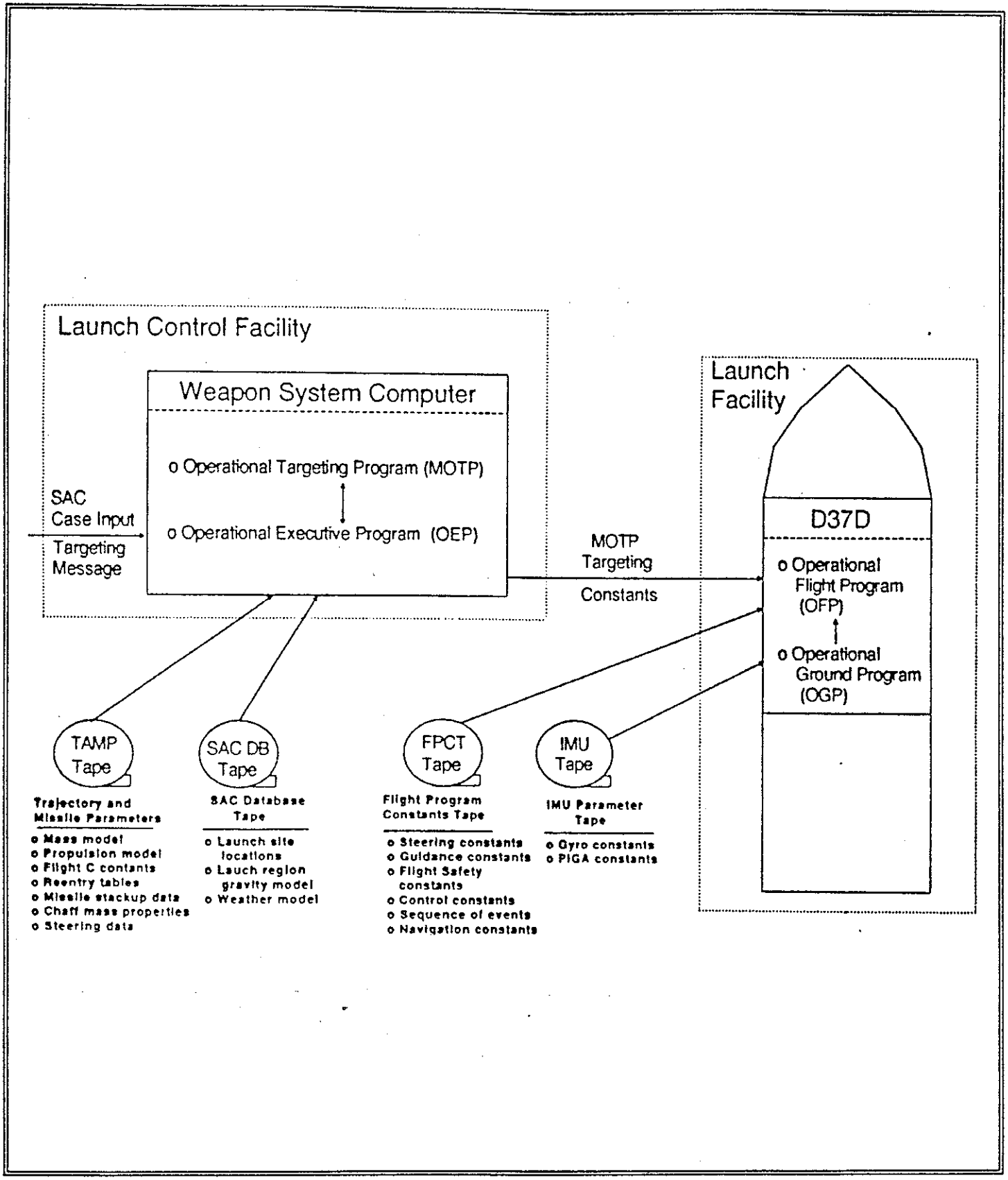
MINUTEMAN MK12A, MOD REENTRY SYSTEM - MAJOR SUBSYSTEMS

Figure 2.1-2



PAYLOAD BULKHEAD SUPPORT (FIGURE A 16909)

Figure 2.1-3



MINUTEMAN III TARGETING OVERVIEW

Figure 2.1-4

To execute these modifications it is necessary to conduct a systems analysis and data definition effort to verify that the current MM III system has the capability to perform a one-RV-only mission and develop the data necessary for the hardware software modifications.

The current program baseline is to procure 622 modification kits of which 500 will be deployed at the rate of 50 per year per wing for a three-year deployment. Software modifications will be integrated with the Rapid Execution and Combat Targeting (REACT) program and a parallel software modification will be performed on the pre-REACT Weapon System Computer (WSC).

The hardware modification program will include the design, prototyping, and production of one-RV-only bulkheads; the design and prototyping of two-RV-only bulkheads; and the procurement of additional jumper plugs to terminate the unused cables for the second or third RV positions. The W5R cable, which is used during flight tests, will be modified and produced. The SE, trainers, and technical manuals will be updated to support the one-RV configuration.

REACT software modifications include the engineering design, development, qualification, and delivery of REACT Operational Targeting Program (OTP), Trajectory and Missile Parameters (TAMP) Tape, SAC Targeting Support Software (STSS), Flight Program Constants Tape (FPCT), and the ICBM Code Processing System (ICPS). WSC software modifications include OTP, TAMP, STSS, and the FPCT. Both the REACT and WSC software must be nuclear-certified.

Schedule:

Event	Completion Date
Contract Award	FY92
FCA/PCA	FY93
Flight Test	FY94
FAD	FY94
FOC	FY97

Program Management	Name	Office	Phone
Program Manager	Capt. L. Mobley	LMAP	DSN 924-2119
Program Equipment Specialist	J. Wilson	LMAP	
Item Manager	D. Palmer	LMAP	

2.1.4 Rocket Motors

The Air Force will be required to replace two of the MM III solid propulsion stages in the operational force prior to the year 2002, based on predicted ageout of the motor case liner material common to Stages II and III. Ageout of Stage I has not been identified at this time. However, it is assumed that because of its extreme age, replacement will be required to support an operational force service life through the year 2020. The oldest Stage I motors are now 24 years old and will be 52 in 2020.

Current production of Stages II and III is scheduled to be completed in FY93; Stage I production ceased in 1978. The Air Force plans to maintain the technical capabilities of the current MM III associate contractors (ASCONs) in order that the planned follow-on production can commence without extensive and costly requalification of the ASCON and component and material vendors or the permanent loss of critical manufacturing capabilities. This will be accomplished by the initiation of low-rate production (one motor/month) for Stages II and III as follow-on to the current production programs. Concurrently, Stage I follow-on production will be qualified and new technologies incorporated as required.

During the Stage I qualification and Stages II and III low-rate production, engineering tasks for technology insertion and maintenance will be performed. The purposes of the tasks are to increase the service life and reliability of the stages, correct known design problems, replace unavailable or environmentally unacceptable materials and to develop environmentally acceptable manufacturing and disposal processes. After the completion of these tasks in FY96, production of all three stages for the operational inventory will begin at a constant moderate rate (four to five motors/month) in FY97. This rate will maintain technical

capabilities and replace the current force before the 17-year Stages II and III service life is exceeded.

2.1.4.1 Minuteman III Stage I Motor Remanufacture Program

The Stage I program consists of two phases; qualification and production.

The original Stage I production program was completed in 1978. The Stage I propellant is no longer in production, therefore, requalification of the contractor processes, components and materials will be required. The qualification program will include efforts to qualify reuse and refurbishment of existing components, incorporate environmentally acceptable materials and processes, and qualify production processes to produce motors that meet Stage I operational requirements.

The newly qualified production program will maintain a qualified production process to produce operational, Production Quality Assurance (PQA), Aging Surveillance (AS), Operational Test and Evaluation (OT&E), Follow-on Operational Test and Evaluation (FOT&E), and spare assets. The production line will operate, starting in FY97, until the force is replaced in FY08.

Schedule:

Event	Completion Date
Remanufacture Program	
Technology Insertion and Qualification	FY92-96
Initial Production	FY97
Final Delivery	FY08

Program Management	Name	Office	Phone
Program Manager	D. Thompson	LMAPM	DSN 924-2336
Program Engineer	C. Topalian	LMAPM	
Program Equipment Specialist	J. Reeder	LMAPM	
Item Manager	J. Johnson	LMAPM	

2.1.4.2 Minuteman III Stage II Remanufacture Program (90-25-4-0-0768)

The Stage II program consists of two phases; technology insertion and production.

The current Stage II production processes produce motors with the same 17-year service life as the original production motors. The incorporation of an extended service life liner into the production line is of primary importance to extend motor service life to the year 2030 without additional remanufacture cycles. Several materials have been identified as unavailable or undesirable for economic or environmental reasons and replacements must be developed and qualified. Requalification of those components not in production or requiring replacement will be included. The continuation of the Stage II production line at a low rate will allow time for development of replacement materials and technologies and the solution of design problems. Motors produced during the technology insertion phase will be used to satisfy qualification requirements for the new materials and processes.

The production program will maintain a qualified production process to produce operational, PQA, AS, OT&E, FOT&E, and spare assets. The production line will operate, starting in FY97, until the force is replaced in the year 2008.

Schedule:

Event	Completion Date
Initial (Current) Remanufacture	
Contract Award	FY89
Initial Production	FY90
Final Delivery	FY93
Second Remanufacture	
Technology Insertion and Qualification	FY92-96
Initial Production	FY97
Final Delivery	FY08

Program Management	Name	Office	Phone
Program Manager	D. Thompson	LMAP	DSN 924-2336
Program Engineer	G. Porter	LMAP	
Program Equipment Specialist	D. Allred	LMAP	
Item Manager	J. Johnson	LMAP	

2.1.4.3 Minuteman III Stage III Remanufacture Program (85-25-3-2-0137 and 88-25-6-2-0215)

The Stage III program consists of two phases; technology insertion and production.

Current Stage III production uses the same design as the original production. This design features the same motor case liner as Stage II, so new production will incorporate the extended service life liner as well as replacement materials for those which are no longer available or are environmentally unacceptable. The composite case material is no longer available for Stage III and a new material must be qualified. Requalification of components not in production or requiring replacement will be included. The continuation of the Stage III production line at a low rate will allow time for development of replacement materials and technologies. Motors produced during the technology insertion phase will be used to satisfy qualification requirements for the new materials and processes.

The production phase will maintain a qualified production process to produce operational, PQA, AS, OT&E, FOT&E, and spare assets. The production line will operate, starting in FY97, until the force is replaced in the year 2008.

Schedule:

Event	Completion Date
Initial (Current) Remanufacture	
Contract Award	FY83
Initial Production	FY87
Final Delivery	FY93

Second Washout Cycle

Technology Insertion and Qualification	FY92-96
Initial Production	FY97
Final Delivery	FY08

Program Management	Name	Office	Phone
Program Manager	D. Thompson	LMAP	DSN 924-2336
Program Engineer	G. Porter	LMAP	
Program Equipment Specialist	D. Allred	LMAP	
Item Manager	J. Johnson	LMAP	

2.1.5 Propulsion System Rocket Engine

The MM III PSRE is a self-contained, prepackaged, liquid bipropellant rocket engine system capable of providing precise vehicle velocity increments as commanded by the MGS. The PSRE is contained in a 19-inch-high wafer located between the MGS and Stage III to provide postboost propulsion capability for downrange and cross-range extension plus attitude hold and release-velocity adjustments.

PSRE assessment has identified the following age-related areas of concern with the following actions planned or underway.

- Axial engine P106A actuator. The problem has been identified as the electrical motor. Delivery of new motors is scheduled for May 1992.
- Arm/disarm mounts. Increase in frequency response noted during 1985 static test vibration testing. New shock mounts are being NSN-requisitioned.
- Gas storage assembly relief valve and regulator. These items have been identified as containing soft goods requiring replacement. The relief valves are planned to be sent to the original equipment manufacturer for refurbishment. Additional procurement may be required for pipeline purposes. The regulator will require procurement action.
- Gas storage assembly pressure switch. Could require replacement. Aging trend indicates switch may give false go signal, but other indicators show that leakage is not a concern.

- P107 cable center mechanism. Silicone O-rings in the center mechanism will require replacement before 2020. Additional damage has accrued during Stage III mating/demating. Procurement action is being initiated.

- Propellant storage assembly status detector. Could require replacement. Aging trend indicates detector may give false go signal, but other indicators show that leakage is not a concern.

If MM III is deployed beyond 2003, 14 years after the start of the present PSRE Programmed Depot Maintenance (PDM), a second PDM may be required. This need will be determined by the results of the present PDM, AS and OT&E flights.

Program Management	Name	Office	Phone
Program Manager	J. Garner	LMAPR	DSN 924-2331
Program Engineer	D. Westien	LMAPR	DSN 924-2330
Program Equipment Specialist	J. Garner	LMAPR	DSN 924-2331
Item Manager	D. Palmer	LMAPR	DSN 458-4280

2.1.6 Aerospace Vehicle Equipment Programs Under $1 Million

A numerical listing of the AVE replacement and replenishment spares programs below the $1 million threshold is provided here for reference.

Housing Assembly (DO41)	89-25-1-0-0777
Interval Timer (DO41)	90-25-1-0-0846
Instrumentation Group (DO41)	90-25-1-0-0847
Command Receiver (DO41)	90-25-1-0-0848
Transmitter UHF (DO41)	90-25-1-0-0849
Cable Assembly (DO41)	90-25-1-0-0858
Gimbal Shell (DO41)	89-25-1-0-0866
Cable Assembly (DO41)	90-25-1-0-0875
Welment (DO41)	90-25-1-0-0877
Cable Assembly (DO41)	90-25-1-0-0880
Cable Assembly W6B (DO41)	90-25-1-0-0881
Cable Assembly W5F (DO41)	90-25-1-0-0882
MM III Stage III Detonators CFM	90-25-1-0-0884
Lead Assembly (DO41)	90-25-1-0-0885
MM III Stage III Fiberglass	87-25-1-0-0142
Gimbal Assembly	90-25-1-0-0998

2.2 Operational Ground Equipment and Real Property Installed Equipment

2.2.1 Launch Facility

2.2.1.1 Modification of the 36-Amp Power Supply to Prevent Electrical Overstress (18510B)

Electrical Overstress (EOS) of the MGS was identified in the December 1987 MM Reliability Report. The report recommended EOS be corrected as a top priority item since it may affect the airborne reliability of the system. EOS occurs when the 36-amp power supply, which provides regulated 28 volts direct current (vdc) ±1 vdc to the MGS while in the silo, fails in a mode that causes high voltage to be applied to the MGS, eventually causing MGS failure. The EOS condition requires the MGS be removed from the missile and be sent to the repair facility for replacement of overstressed components. This repair is depleting nonprocurable spare components.

The proposed corrective action is to modify the 36-amp power supply with fail-safe circuitry (fail at 0 volts) which would protect the MGS, eliminate EOS, and increase flight reliability.

The MTBF of the existing power supply is 320,000 hours. In order not to degrade system reliability because of this modification, a requirement exists for the MTBF to be exceeded by several thousand hours. Flight reliability of the system will increase due to this modification.

Organizational and depot levels of maintenance will be required on the modified 36-amp power supply. Organizational maintenance will consist of removal and replacement of bad drawers. Depot maintenance will test the new drawer on the E-35 test station. An adequate number of parts will be procured to support both maintenance levels.

The contract to modify the existing power supply was awarded in September 1990. All MM III Launch Facilities (LFs) and PK Launch Control Centers (LCCs) will be upgraded with modified drawers. These will be installed by SAC maintenance personnel. Impact to

SAC LF Trainers (LFTs) will be minimal. One operational trainer at Chanute AFB will require two modified drawers. Other LFTs will not be impacted since they consist of a dummy front panel and commercial power supply to simulate the existing drawer.

Schedule:

Event	Completion Date
CCB	Jul 89
SOW/Data Call	Sep 89
PR Package To PMZ	Feb 90
Contract Award	Sep 90
SDR	Jan 91
PDR	Mar 91
CDR	Sep 91
FCA/PCA	Apr 92
Kitproof	Jun 92
Installation:	
Wing I	Aug 92-Jun 94
Wing III	Aug 92-Jun 94
Wing V	Aug 92-Jun 94
Wing VI	Aug 92-Jun 94
Vandenberg	Mar 94-Jul 94

Program Management	Name	Office	Phone
Program Manager	D. Webb	LMEOA	DSN 458-4355
Program Engineer	J. Irvine	LMEO	DSN 458-6331
Program Equipment Specialist	D. Webb	LMEOA	DSN 458-4355
Item Manager	E. Thomas	LMEOB	DSN 924-2231
Modification Manager	C. Williamson	LMEOC	DSN 458-6434

2.2.1.2 Launch Facility Motor Generator Grease Fittings (57056B)

The LF Motor Generators (LFMGs) for Wings I through V were designed and fabricated without the capability for periodic lubrication of the bearings. This has resulted in early bearing failures. Grease fittings, comprised of three grease access and three relief holes in the bearing housings,

will be installed to allow periodic lubrication by field personnel. Four newly designed grease seals and three zerk-type grease fittings will be installed. This modification will be accomplished during LFMG overhaul by Sacramento Air Logistics Command (SM-ALC) and contract overhaul at American Electronics Inc. in Fullerton, California. The modified MGs will be installed in the LGM30 AN/ARW-T2A(T7), AN/GSQ-T41, and T12 (EU) trainers.

Kitproofing was completed at SM-ALC in April 1989. Three units were produced before production quality problems in machining housings were discovered. The problems have been identified and corrective actions documented.

Schedule:

Production resumed in August 1990 and will continue as MGs are returned to the depot for overhaul due to failure or in compliance with time change requirements.

Program Management	Name	Office	Phone
Program Manager	G. Moore	LMMRO	
Modification Manager	L. Loftus	LMMRO	DSN 458-4120

2.2.1.3 Medium Frequency Radio (85-25-3-0-0140) and Medium Frequency Radio Equipment in LGM Trainers (59036B)

The Medium Frequency (MF) Radio (Figure A 14125) is used at Wing VI and Wing I, Squadron 20 LCCs and LFs as an LF and LCC Command and Status (C&S) communication link. The radio consists of a transmitter, receiver, and associated power supply. During peacetime, the radio is a backup to cable links, but in the event of attack it becomes the primary communication link. The radio is designated as launch essential/mission critical.

The radio is original equipment and has been in service since Wing VI became operational in 1967. Replacement parts were increasingly difficult to procure.

The aging radios are being replaced. The new unit is a functional substitute which uses technology supportable well beyond 2000. The MTBF for the old configuration was approximately 13,000 hours. The contract for the replacement radio required 27,200 hours and the current contractor prediction for the replacement design is 100,000 hours. The new radio is a two-drawer configuration instead of the existing six-drawer configuration. It has a built-in test feature that will detect a major fault in a drawer and activate an alarm. This eliminates the need for organizational test equipment and troubleshooting.

The replacement contract was awarded in September 1985 and includes design, development, qualification, and production. The contract was amended in November 1986 to add the "Carrier Detect" capability to the radio. This is a result of the Short Single Vote Launch System requirement imposed by SAC. Installation of the radio at operational sites is part of the Rivet MILE (MM Integrated Life Extension) program. A trainer modification is required and replacement radios for the trainers will be procured under this contract.

A Preliminary Design Review (PDR) was held in February 1986 and the Critical Design Review (CDR) was held and approved in October 1986. Numerous Technical Interchange Meetings (TIMs) were held in 1987 and 1988. FCA was completed in August 1988 and PCA in September 1988. Deployment by Rivet MILE began in July 1991.

Schedule:

Event	Completion Date
Installation Wing I, Squadron 20	Jul 91, Rivet MILE Cycle II
Installation Wing VI	Jun 92, Rivet MILE Cycle II

Trainers Schedule:

Event	Completion Date	Event	Completion Date
Sow/Data Call	Apr 88	Kitproof Installations	
CCB	Jul 89	· Malmstrom	
PR Package to PMZ	Sep 89	EU Trainer	Apr 91
Contract Award	May 90	· Grand Forks	
PDR	Jun 90	LE Trainer	Feb 91

CDR	Sep 90	GV Trainer	Jul 91
FCA/PCA	Mar 91	Chanute	
FAD	Mar 91	LN Trainer	May 91

Program Management	Name	Office	Phone
Program Manager	D. Olsen	LMECA	DSN 924-2853
Program Engineer	S. Cole	LMECA	DSN 924-2846
Program Equipment Specialist	J. Landers	LMECA	DSN 924-2855
Item Manager	C. Robertson	LMECA	DSN 924-2845

2.2.1.4 Minuteman Extended Survivable Power Lithium Battery Service Life Replacement (2989B)

The MM Extended Survivable Power (MESP) lithium battery is a 10,000 ampere-hour, 560-pound nonrechargeable ground power battery. It is currently installed at Wing VI, Squadron 20, and 32 MM LFs at Wing V (321MIS); installation of MESP at the remaining 18 LFs in the squadron are scheduled to be completed by December 1992. MESP is also installed in the PK sites at Wing V. A total of 250 MM LFs and 50 PK LFs will have the MESP capability. This equates to a total of 4,200 batteries: 3,300 batteries installed in the MM LF and 900 batteries installed in PK LFs.

The batteries installed in Wing VI and Wing I, Squadron 20 are approaching their ten-year projected service life. In addition, the PK batteries will be shortly approaching their service life and, if it is decided to maintain this capability in PK, an additional 900 batteries will require replacement.

An SLA is in place to project the actual battery service life in sufficient time to allow procurement action for replacement. At the present time, there have been incidents of batteries that are bulging and requiring replacement. Some of the scrubbers that are affixed to the lithium batteries have failed and are also requiring replacement.

Activity to award a contract for the procurement of lithium batteries and associate scrubbers

needs to be initiated. The procurement should initially allow for a low battery production rate and contain options that allow for an increase in the rate as the SLA program dictates. This will allow the Air Force to complete the time-consuming task of programming funds, and selecting a vendor. It also provides the Air Force with the option of expeditiously increasing the production rate, thereby precluding any gaps in the existing endurable capability due to unforeseen increases in battery failures.

The MESP batteries installed in Wing VI, Wing I, Squadron 20 and PK were fabricated by GTE. The MESP batteries installed at Wing V (321MIS) were fabricated by Altus Corporation. Both of these companies have gone out of the lithium battery business and it will take some time for a company to build a facility, purchase the capital equipment and tool up in order to produce lithium batteries.

Schedule:

Event	Completion Date
Contract Award	TBD

Program Management	Name	Office	Phone
Program Manager	G. Astle	LMMRO	DSN 458-4243
Program Engineer	Capt. J. Brandt	LMMRO	
Program Equipment Specialist	R. Nye	LMMRO	
Item Manager	R. Brown	LMMRO	

2.2.1.5 Launch Facility and Launch Control Facility Ultra High Frequency Antenna Electrical Surge Arrestor Modification (52140B)

An Electrical Surge Arrestor (ESA) provided electromagnetic pulse (EMP) and lightning protection to the original Launch Control Facility (LCF) Ultra High Frequency (UHF) antenna. A filter provided the same protection for the LF. In the early 1970s, the LF antennas were replaced and the original UHF filter was removed. In the early 1980s, the LCF antennas were replaced with Air Force Satellite Communication (AFSATCOM)

equipment, and the ESAs were removed. Since this replacement, Wings I through V LCFs have not had ESA or filter equipment for UHF protection. An ESA for the LF and LCF UHF antenna has been designed, developed, and fabricated. The new ESA meets specification requirements developed for both LFs and LCFs.

Installation is being performed by Rivet MILE and will be completed by October 1993.

Schedule:

Event	Completion Date
Contract Award	Oct 86
CDR	Dec 87
PDR	Jan 87
Kitproof LF	Jul 88
Kitproof LCF	Apr 89
Installation:	
Wing I	Complete
Wing III	Mar 93
Wing V	Sep 93
Wing VI	Mar 92

Program Management	Name	Office	Phone
Program Manager	M. Hansen	LMECA	DSN 924-2854
Program Engineer	S. Cole	LMECA	
Program Equipment Specialist	D. DeFriez	LMECA	

2.2.1.6 Improved Minuteman Physical Security System (10505B)

The restricted area around each LF is monitored by a security system to alert against physical intrusion. The previous security system had excessive nuisance and false alarm rates and low MTBF. Frequent maintenance and security dispatches were required to determine the cause of the alarms and make necessary repairs. Modification of the system was originally scheduled for Wings I and VI, then expanded to include the entire force. Program Management Directive (PMD) 3024(2)/F1050B directed that an improved security system be

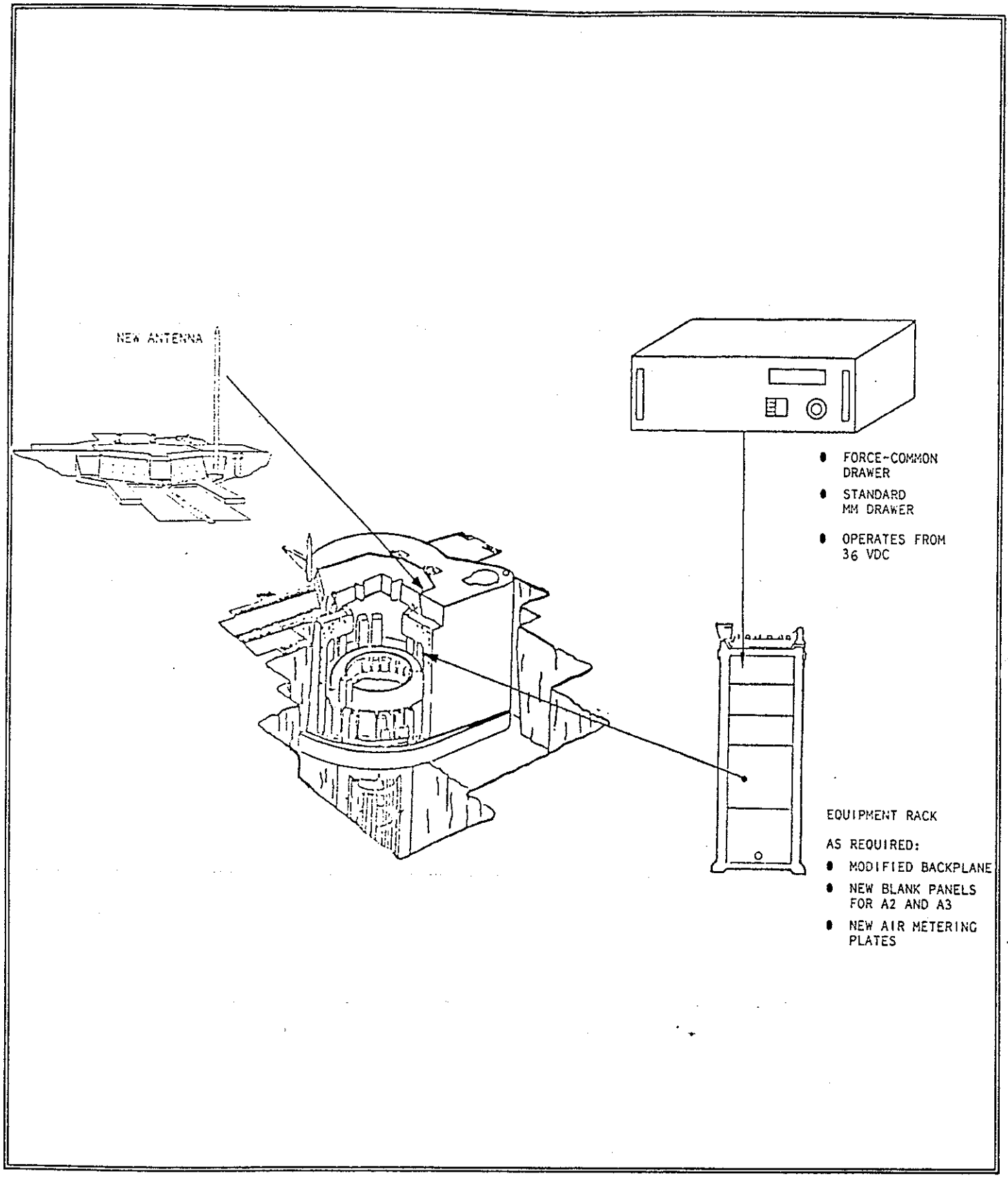
deployed at all six wings, including PK sites.

An improved MM physical security system (IMPSS) (Figure 2.2-1) was designed, developed, and is being deployed as part of the Rivet MILE program. The bistatic radar system and alarm set electronics previously used for outer zone detection will be replaced with a single monostatic radar system. The returning radar images are digitized and processed by a microprocessor-based computer system employing specially developed algorithms. The specified MTBF requirement for IMPSS is 37,000 hours, but the projected MTBF is 43,500 hours.

IMPSS installation began in July 1987 during Rivet MILE Cycle I and will continue through Cycle 2X, with a completion date in late 1992. As of February 1992, IMPSS has been installed at 876 sites. The PK kitproof was accomplished in June 1989.

The system has still not met the specified nuisance alarm rate (NAR) of three alarms/flight/week. The current fleet average is approximately ten alarms/flight/week. After an extensive investigation, a technical team, comprised of OO-ALC, SAC, Boeing, Logicon, and SELECT, concluded that wind-induced antenna vibration was the primary cause of the higher NAR. The original proposal for correction included a redesign of the antenna hardware and some software changes. However, this was rejected because of the unacceptable cost and technical risk involved. In January 1990 an alternate plan was proposed. In it, the vibration is corrected with software that makes the antenna motion transparent to the system. This plan was evaluated and the basic concept agreed to. Fielding of software changes is expected in late 1993.

A manufacturing error was identified with approximately 192 A1 and A3 board assemblies located in the IMPSS backplane. These circuit cards had diodes installed which were improperly sized electrically. There is no degradation to detection performance and the affected units meet hardness requirements. The decision was made to provide 192 replacement A1 boards. The A3 boards will not be replaced, but engineering drawings will be updated to account for the improper diodes. Installation will be accomplished by Rivet MILE during Cycle 2X.



IMPROVED MINUTEMAN PHYSICAL SECURITY SYSTEM

Figure 2.2-1

Trainers are affected by IMPSS. A new Chanute AFB trainer was designed for operational and maintenance training on the new security system. Because of additional SAC training requirements with IMPSS, the major hardware and training functions of the new Chanute AFB trainer were integrated into the LFTs at each SAC wing. These include the AN/GSQ-T9 and AN/GSQ-T41 at Malmstrom AFB; AN/GSQ-T11 at Ellsworth AFB; AN/GSQ-T10 at Minot AFB; AN/GSQ-T12 at Whiteman AFB; AN/GSQ-T13, A/F24A-T2, and A/F24A-T4 at F.E. Warren AFB; and AN/GSQ-T8 at Grand Forks AFB. The WS-133B Ground Electronics System (LN), and WS-133AM Missile Launch Control System (QD) trainers at Chanute AFB were retrofitted with simulated security system panels to maintain weapon system realism in July 1991.

Schedule:

Event	Completion Date
CDR	Dec 85
FCA/PCA	Mar 87
Kitproof	May 87
First Installation	Jun 87
PK Kitproof	Jun 89
Installation Complete	Dec 92
NAR Reduction Event	
Vibration Algorithm and Software Development	Jul 90
Field Test	Aug 90
SMTC Test/Demonstration	Jun 90
EPR	Feb 92
ECP	Sep 92
NSCCA Letter	Mar 93
Nuclear Certification	Aug 93
FCA/PCA	Oct 93
I&CO Complete	Feb 94

Program Management	Name	Office	Phone
Program Manager	J. Hancey	LMEOC	DSN 458-4360
Program Equipment Specialist	R. VanTassell	LMEOA	
Modification Manager	C. Williamson	LMEOC	
Item Manager	I. Shumway	LMEOA	

2.2.1.7 Launch Facility Environmental Control System Emergency Fan Motor (86-25-1-0-0011)

This replacement program will be performed by Rivet MILE at Wings I, III, V & VI. SAC missile maintenance technicians at Wings II, IV and VAFB will replace the next higher emergency fan assembly as the old fan motors fail in accordance with current technical orders.

Rivet MILE installation began in September 1988. During installation an approximately 30 percent failure rate was experienced. A Rivet MILE stop work order was issued in November 1988 and motor teardown and analysis of field failures was performed. The failure investigation revealed that, upon completion of Rivet MILE work at a site, the LF battery charger was charging at a voltage higher than the maximum 36.5 vdc specified in the motor requirements. Two other failure modes included reversal of polarity at the power connection point and reapplication of power to a coasting fan.

Contracts were awarded to incorporate the ECP. The motors that were not delivered to the Air Force were retrofitted in March-August 1991 and delivered to OO-ALC in July-September 1991. The motors that were returned to the manufacturer are currently being retrofitted and delivered to OO-ALC. Rivet MILE resumed installation in August 1991. The next higher assemblies have had new motors installed and are in supply. Installation is expected to be completed in July 1994.

Program Management	Name	Office	Phone
Program Manager	R. Matue	LMMRO	DSN 924-2194
Program Equipment Specialist	R. Matue	LMMRO	
Item Manager	K. Nelson	LMMRO	

2.2.1.8 Real Property/Real Property Installed Equipment Upgrade

The objectives of the ICBM Real Property/Real Property Installed Equipment (RP/RPIE) Upgrade program parallel the Rivet MILE program with the goal of extending the life of the missile facilities and insuring the effectiveness of the missile systems is not adversely affected by RP/RPIE structures and equipment. In the past few years, this program has accomplished topside survey and repair, site preparation, IMPSS installation, standby power enhancements, some LF and LCF tank repairs, and LCC crew module upgrades.

Plans for FY93 through FY99 include:

- Replacement of LF buried diesel fuel tanks with new fiberglass, double-wall tanks with interstitial monitoring for spill and overfill. The LF tanks will be in full EPA compliance by 1998.
- Refurbishment and recoating of the LCF buried diesel fuel tanks and installation of leak monitors for spill and overfill conditions. This program will bring the LCF tanks into full EPA compliance by 1998.
- Topographical repairs to bring all LCFs and LFs to specification.
- Maintenance and repair of dewatering wells and repair/modification of TK112 water tanks at Wing V.
- LF/LCF physical security maintenance; i.e., repairs to fences, gates and guards, to prevent intrusion into the missile facilities.
- Cathodic protection against subterranean corrosion of facilities, piping and conduits.
- VAFB launch tube liner repair and refurbishment.
- Topside corrosion treatment of all facilities.

Future plans emphasize continued physical plant rejuvenation, including power generation and distribution systems replacement, LCF elevator controls, cables, motors repair and replacement,

and water waste and air entrapment systems repair. For listings of RP/RPIE tasks scheduled for completion during Rivet MILE Cycle 2X, see Section 5, Tables 5-2, 5-3, and 5-4.

Schedule:

Project	Wings	Years
LF Tanks	I, III, IV, VI	FY93-97
LCF Tanks	I	FY95
	III	FY93-94
	V, VI	FY93-96
Topographical Repairs	III	FY96
	V	FY93-99
	VI	FY94-97
Dewatering Wells, TK112	V	FY94-97
LF/LCF Security	I, III	FY93-99
	V	FY95-98
	VI	FY95-98
Cathodic Protection	I	FY94-98
	II, V, VI	FY95-96
Topside Corrosion Treatment	I, III, V, VI	FY99

Program Management

3925th ICBM Facility Engineering Squadron, Offutt AFB, NE

2.2.2 Launch Control Facility

2.2.2.1 Dual Modem Upgrade (T3239)

The AFSATCOM dual modem provides connectivity to the Fleet Satellite (FLTSAT) communications system for the AFSATCOM terminals in MM LCCs. There is no capability within the system for connectivity with either the Defense Satellite Communications System (DSCS) III Single Channel Transponder (SCT) satellite or the Military Communication Satellite System (MILSTAR) satellite.

The upgrade consists of modifications to the AFSATCOM terminals for increasing connectivity to the DSCS III/SCT and MILSTAR satellite systems. Phase I replaced the A7 program memory card with a channel 1.5 capability to provide connectivity with the DSCS III/SCT satellite. Phase II will replace the control indicator and decoder card to provide the ability to receive antijamming frequency hopping wave forms (see Section 2.2.2.2) from the MILSTAR UHF downlink.

The contract for the initial development of the upgrade was awarded in July 1984. The contract contained an option for the production of Phase I which the government accepted. The production contract for Phase II was awarded in August 1987. This modification affects the RY, LE, and PG Missile Procedures Trainers (MPTs) located at each SAC wing and VAFB. This includes five LE trainers at Malmstrom, Grand Forks, and VAFB; 14 RY trainers at Malmstrom, Minot, F.E. Warren, and VAFB; and two PG trainers at VAFB and F.E. Warren. These trainers are used to train launch officers in LCC operation procedures including the operation of all communications systems.

Schedule:

Phase I: Deployed in April 90.
Phase II: Delayed until CY 94-95 by ESD.

Event	Completion Date
Development Contract Award	Jul 84
PDR	Dec 84
CDR	May 85
CCB	Aug 85
Production Contract Award	Aug 87
FCA/PCA	Aug 88
Kitproof	Dec 93
Installation (organic)	Oct 95

Trainers Schedule:

Phase I is complete.

Phase II will be developed and installed as part of REACT. (See REACT, Section 2.2.2.5.)

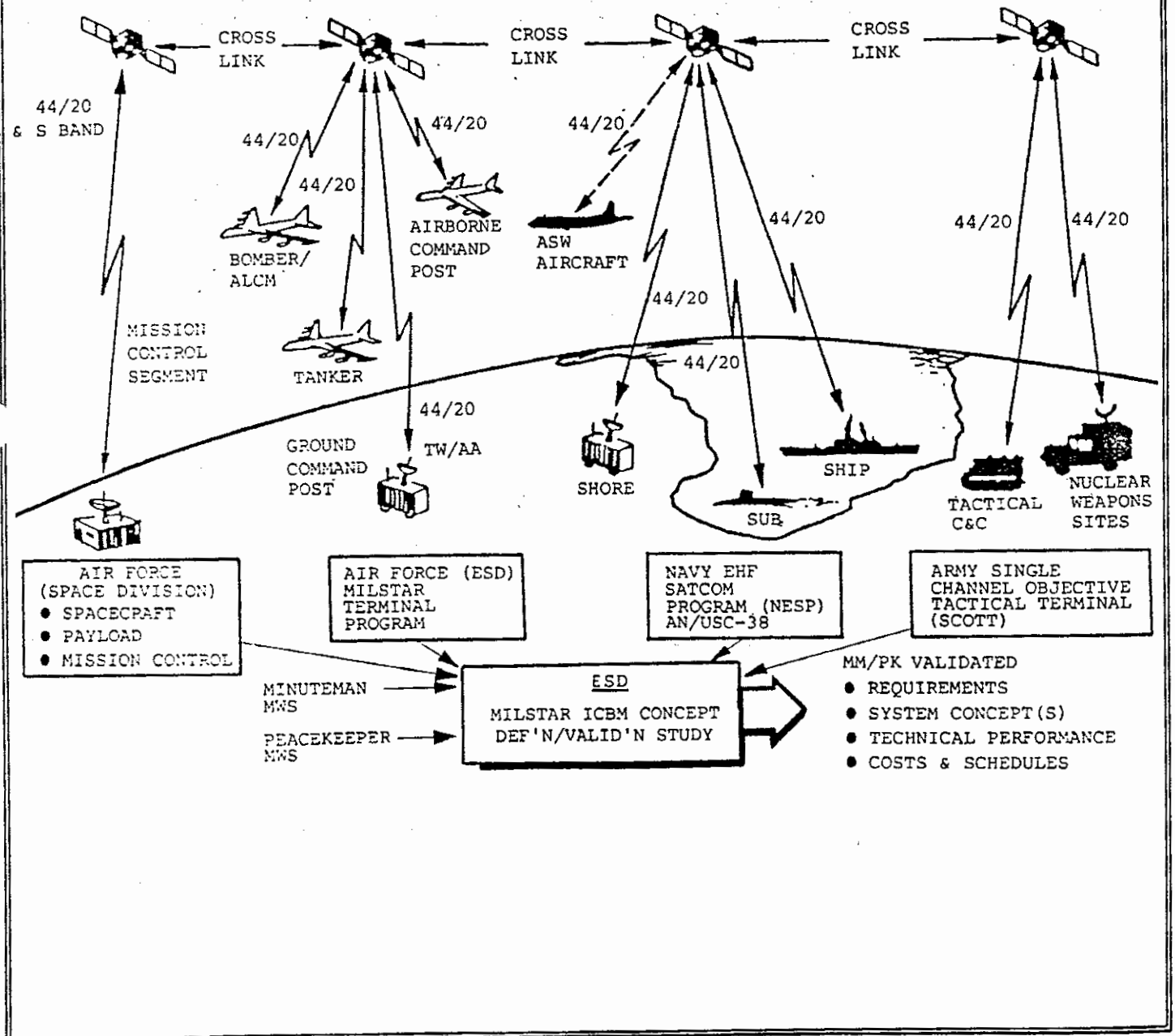
Program Management	Name	Office	Phone
Program Equipment Specialist	T. Clark	LMECA	DSN 924-2844

2.2.2.2 Military Communication Satellite System

MILSTAR is designed to help meet the worldwide communications needs of U.S. military forces. The MILSTAR concept is depicted in Figure 2.2-2. When incorporated, the LCCs will be equipped with Super High Frequency (SHF) receive and Extremely High Frequency (EHF) transmit capability for the receipt of Emergency Action Messages (EAMs) and the transmission of force-status reports.

The MILSTAR Air Force terminal is being developed and acquired by the Electronic Systems Division (HQ AFSC/ESD). Present activity addresses integration of the MILSTAR terminal into the missile weapon system. MILSTAR will be deployed as an integral link in the SAC capability.

ESD is developing the basic capability equipment B kit, comprised of the MILSTAR terminal and supporting equipment. OO-ALC is responsible for developing the integrating A kit hardware for deploying the ESD-provided B kit, and for system deployment.



MILITARY COMMUNICATION SATELLITE SYSTEM

Figure 2.2-2

ESD has awarded three separate demonstration contracts to develop a MILSTAR low cost terminal (LCT). Platforms have been identified as the B-1B, B-2, ICBM weapon systems and the EC-135. Down-select of contractor(s) for Engineering Manufacturing Development AFBs. (EMD) is scheduled for July 1993.

Current direction is provided by PMD R-S2053(35)/33601F and AFLC PAD 82-AQP-013. Updates to both documents are being processed to define and clarify further activity by OO-ALC.

Schedule:

Event	Completion Date
SOW/Data Call	Mar 93
PR Package to PMZ	Aug 93
Contract Award	Jan 94
SDR	Mar 94
PDR	May 94
CDR	Dec 94
FCA/PCA	Mar 95
Kitproof	Dec 96
FAD	Feb 98
Weapon System Installation:	
Wing I Squadron 20	Feb 99
Wing V 400 PK	Nov 99
Wing III	Aug 00
Wing VI	Apr 01
FOC	May 01

Trainer Installation:

Wing I Squadron 20	Nov 98
Wing V 400 PK	Aug 99
Wing III	May 00
Wing VI	Jan 01

Program Management	Name	Office	Phone
Program Manager	C. Gallegos	LMECA	DSN 924-2842
Program Engineer	D. Walker	LMECA	DSN 924-2698
Program Equipment Specialist	T. Clark	LMECA	DSN 924-2844
Modification Manager	M. Hansen	LMECC	DSN 922-2854

2.2.2.3 Dual Frequency Minimum Essential Emergency Communications Network Receiver (3454)

Dual Frequency Minimum Essential Emergency Communications Network (MEECN) Receiver (DFMR) will replace the existing, aged Survivable Low Frequency Communication System (SLFCS) with a broader-frequency spectrum, automated, more jam-resistant combination of Ground Wave Emergency Network (GWEN) and Miniature-Receive Terminal (MRT). DFMR will provide more timely, supportable, maintainable and robust low and very low frequency communications connectivity with the LCCs.

Requirements for the DFMR program are outlined in the draft SAC System Operational Requirements Document XX-89-I/II. PMD 9232(5)/33131F/64312F/11213F, dated 31 July 1991, provided direction from the Air Staff for this program. AFLC PAD 89-XCS-232(03), dated 9 September 1991, assigned OO-ALC implementation responsibility.

MM LCCs will require 61 DFMR sets. This will provide DFMR testing, production and installation in 55 operational MM LCCs, plus six test/engineering facilities. Spares, training, and technical data will be provided, as well as updates to the associated MPTs.

Schedule:

Event	Completion Date
Contract Award	FY93
FAD	FY94
FOC	FY96

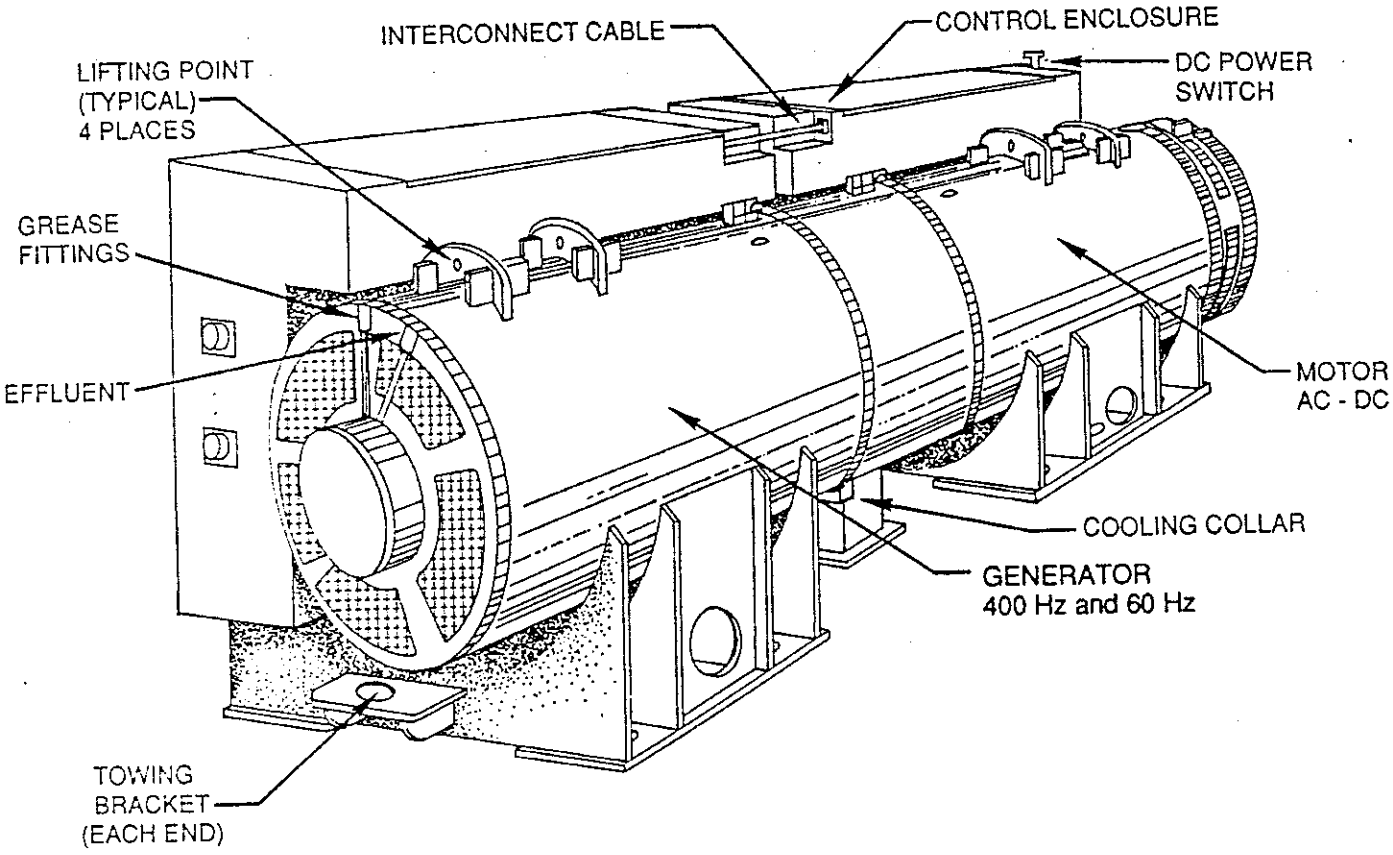
Program Management	Name	Office	Phone
Program Manager	A. Caldwell	LMECA	DSN 924-2852
Program Engineer	D. Walker	LMECA	DSN 924-2698
Program Equipment Specialist	T. Clark	LMECA	DSN 924-2844

2.2.2.4 Launch Control Facility Motor Generator Replacement (86-25-2-0-0138) and Motor Generator Tooling (88-22-1-0-0219)

There were three MG configurations in use. The MGs were installed in the LCC over 20 years ago and became unreliable. The number of failures increased over the years resulting in an MTBF far below the specification. Replacement parts became difficult to obtain.

OO-ALC has acquired a single configuration replacement (Figure 2.2-3) for the two MG configurations currently fielded in Wings I-V. A second configuration has been procured for Wing VI and Wing I, Squadron 20 under the same contract. Commonality has been maximized between these two configurations. A development contract was initiated on 17 June 1987. All production MGs have been delivered and Rivet MILE is installing the new MG in each scheduled LCF. SAC is installing the new MG as a replacement for failed units.

a. Reliability - The Technical Requirements Document (TRD) has specified an MTBF of 150,000 hours, equivalent to about 17 years, with preventive maintenance being performed. The MG will have a shelf life of ten years without reliability degradation.



LAUNCH CONTROL FACILITY MOTOR GENERATOR

Figure 2.2-3

b. Maintainability - New depot and organizational level support equipment was designed, developed and delivered. The MG housing and shaft can be split apart and do not require alignment. Features include new bearings and seals, and a control box with removable panels which are accessible without removing the MG from the floor. There are two configurations with over 80 percent commonality of line replacement unit subassemblies.

The depot level test equipment at SM-ALC used to test overhauled LF and LCF MGs has also been replaced as part of this program.

Schedule:

Production is complete. Installation is scheduled for completion as follows:

Event	Completion Date
Wing I	Sep 93
Wing III	Sep 93
Wing V (319MIS)	Jun 92
Wing V	Sep 93
Wing VI	Sep 93
VAFB	Mar 94

Program Management	Name	Office	Phone
Program Manager	W. Brown	LMMRO	DSN 458-5430
Program Equipment Specialist	B. Manning	LMMRO	
Program Engineer	G. Moore	LMMRO	
Item Manager	K. Nelson	LMMRO	

2.2.2.5 Rapid Execution and Combat Targeting (3413B)

The age and evolution of the weapon system, through modifications incorporating various command, control, and communication (C^3) systems, has degraded LCC operability, decreased

usable workspace, and increased crew workload. REACT, formerly known as LCC Integration and later as ICBM Integrated Electronics Upgrade (I^2EU), is being implemented to relieve these problems, to upgrade the system with increased capabilities, and to improve LCC supportability. It will meet the requirements outlined in the SAC SORD which combined and updated the requirements outlined in SAC Statement of Need (SON) 06-85, Rapid Message Processing (RMP)/Rapid Retargeting, and SAC SON 14-86, ICBM LCC Integration. The program consists of four major efforts which have been combined into a single modification as a result of the July 1986 POM conference conducted at OO-ALC. These are RMP, Rapid Retargeting, LCC Upgrade, and Crew Survivability. Rapid Retargeting and RMP were submitted as separate program decision packages (PDPs) in the FY88-FY92 POM. LCC storage containers (crew survivability) and LCC design were included in the MM Squadrons PDP. This modification will facilitate commonality between MM and PK. AFSC ESD is managing the Higher Authority Communications/Rapid Message Processing Element (HAC/RMPE) as a subset of the overall REACT program. AFSC BMO is managing the Weapon System Control Element (WSCE) portion of REACT.

Rapid Message Processing

Implementation of RMP is needed to increase speed and accuracy in message processing, reduce severe workloads through automation, and eliminate the potential for human error in processing messages through the use of computer-aided error correction. RMP will provide C^3 integration and will allow rapid retargeting to be implemented. Both the HAC/RMPE and WSCE subsystems contribute to the RMP effectivity. The Mission Planning Program and Execution Plan Program Database Generator programs are being modified to aid in the automation process.

Rapid Retargeting

The MM/PK weapon systems currently lack the capability for rapid retargeting while maintaining basic system accuracy. This capability is needed to counter the threat from mobile targets. This program requires modification of the MM/PK OTPs, the Operational Executive Program (OEP) [OEP is replaced by Console Operations Program (COP)] and the Execution Plan Program.

The development contractor will identify, develop, and test the equipment and software necessary to implement the rapid retargeting concept. The contractor will also provide the documentation needed to support the requirements, design and development process.

LCC Upgrade

C^3 modifications, such as SLFCS and AFSATCOM, have added new racks which restrict LCC workspace, increase loads on the environmental control and shock isolator systems, and increase stress levels on LCC personnel. Obsolete console design, minimal work area, minimal storage space, and sleep area all contribute to poor LCC operability. In the current configuration, all available equipment rack space is in use, some support systems are approaching their limits, and there are computer memory growth limitations.

The LCC Upgrade program will provide a single console containing two work stations. Individual crew members will be able to accomplish all required actions from either of two similar work stations except missile launch, which requires both crew members. Existing status monitoring, alarm reset and C^3 functions will be incorporated into the new console. Where possible, electronics racks will be consolidated to increase space and decrease the load on support systems, and improve LCC equipment supportability.

The program will improve supportability by replacing the LCC processor (WSC), keyboard/printer, Memory Control Group, et al. This equipment is difficult or impossible to maintain and will be replaced by supportable REACT equipment.

Crew Survivability (55095B)

The Hardness Surveillance Program (HSP) identified several improperly restrained, contained, or located items that have the potential to adversely affect LCC crew safety and survivability during a seismic event. These include technical order bookcases, radios, heaters, and fire extinguishers. Hardened containers and restraints will be designed, configured, procured, and deployed as part of REACT.

Affected Trainers

SAC MPTs will receive the REACT modification. It will also replace the RY MPT UNIVAC 1624 and the RY and LE Digital Equipment Company (DEC) Model PDP 11/34 computers with a new and supportable computer with sufficient Random Access Memory (RAM) to process the additional messages to be added in future C^3 modifications such as MILSTAR. Also affected are the WS-133B LF/LCF Ground Electronics System Maintenance Trainer (LN) and the WS-133AM Missile Launch Control System Trainer (QD), both located at Chanute AFB.

Below are shown the major milestones for REACT managed by BMO along with the milestones for the HAC/RMPE subset managed by ESD.

Schedule:

Event	Completion Date	Completion Date
	BSD	ESD
Contract Award	Apr 89	Apr 89
SER/SDR	Sep 89	Jul 89
PDR	May 90	Mar 90
CDR	Jan 91	Aug 90
FAD	Sep 93	Sep 93
FOC	May 95	May 95
Trainer Installation		
RY-6 VAFB	Jan 93	
LE-2 VAFB	Mar 93	
RY-4 Wing V	Jun 93	

RY-5 VAFB	Aug 93
RY-3 VAFB	Sept 93
RY-13 Wing V	Oct 93
RY-7 Wing I	Nov 93
LE-3 Wing I	Jan 94
RY-8 VAFB	Feb 94
RY-18 Wing I	Apr 94
LE-4 Wing VI	May 94
LE-1 VAFB	Jun 94
LE-5 Wing VI	Sep 94

Program Management	Name	Office	Phone
Program Monitor (OO-ALC)	R. Warner	LMEOB	DSN 924-2338
Program Manager (BMO)	Col D. Mathias	DSO/MM	DSN 876-5128
Program Manager (ESD)	Lt Col J. Alonys	ESD/ZI	(617)271-8973
Program Engineer	J. Pulver	LMEOC	
Program Equipment Specialist	R. Zamora	LMEOC	
Modification Manager	C. Williamson	LMEOC	

2.2.2.6 Missile Interior Intrusion Detection System Trainer Modification (57011B)

The Missile Interior Intrusion Detection System (MIIDS) is an interior security system that monitors any movement in the LCC elevator shaft and tunnel area, providing an audiovisual alarm warning of potential intrusions of personnel in the LCC. The Nuclear Weapon System Safety Group (NWSSG) directed relocation of the intrusion detection system control and annunciator units from the Flight Security Control (FSC) area to the LCC for increased security. SAC Civil Engineering is relocating the units by Master Change Logs (MCLs) 6452, and 6535-6539 for Wings I-VI, respectively, MCL 6540 for Wing I, Squadron 20, and MCL 8011 for PK squadrons. MIIDS interfaces within the LCC require configuration changes to several items of OGE. Modifications to these will require updates to engineering and technical data managed by OO-ALC. MIIDS is being installed by Rivet MILE into the weapon system from July 1990 to September 1993.

Weapon system data delivery contracts and technical data updates were completed in August 1991.

The MIIDS modification affected all MPTs by installing control monitor panels and Signal Processing Units (SPUs), and providing instructors control of alarm situations. Included with the MIIDS trainer program was an update of the five LE trainers with the new Monitor and Alarm Panel (MAP) and changes to the trainer software to reflect the MF radio operational scenarios. Strategic Missile Test Complex (SMTC) LCFs were updated.

Trainers Schedule:

Event	Completion Date
SOW/Data Call	Aug 88
CCB	Mar 89
PR Package to PMZ	Sep 89
Contract Award	Jun 90
PDR	Sep 90
CDR	Jan 91
FAD	Dec 90
FOC	Sep 93
Trainers	
Kitproof RY7 (Malmstrom)	Apr 91
Kitproof RY5 (VAFB)	May 91
Kitproof RY2 (Whitman)	May 91
Kitproof RY9 (Minot)	Jun 91
Kitproof LE4 (G. Forks)	Jul 91
Kitproof PG2 (F.E. Warren)	Nov 91
FCA/PCA	Nov 91
Installation (RY/LE)	Feb 92
Installation (PG)	Mar 92
FOC	Mar 92

Program Management	Name	Office	Phone
Program Manager	B. Wilson	LMECC	DSN 924-2912
Program Equipment Specialist	G. Maynard	LMECC	
Modification Manager	B. Wilson	LMECC	

2.2.3 Environmental Control Systems

2.2.3.1 Environmental Control System Transfer (57008B)

Wings I through V LCFs are experiencing difficulty adjusting flow sensors and alarms when airflow falls to fifty percent or less of required amount. The air conditioner does not always shut down and switch to emergency ECS as required resulting in overheating and burnout of electronic drawers. The solution is to replace and relocate the airflow sensor. Pneumatic controls will be replaced by electronic controls in the sensor control circuit. The drawings for this modification are completed. The preliminary TCTO was prepared in June 1990. TCTO kit assembly requires seven depot-manufactured items. Some of the components have long lead times.

This modification was initially scheduled to be started in October 1990. However, numerous problems with obtaining parts delayed the manufacturing of kits. All parts will be available by May 1992 and the modification will be presented to the RRB for the second time, in April 1992. The modification was canceled for Wings I, II, and IV and the final decision for installation at Wings III and V is being reviewed by SAC.

Schedule:

Event	Completion Date
Prototype Installation	
Wings III, IV & V Configuration	Feb 88
Wing I & II Configuration	Apr 88
Depot Manufactured Items	Apr 90
Kitproofing	
Wing I or II	Jun 90
Wing III, IV or V	Jun 90
Rivet MILE Installation	Oct 90 (Start)

Program Management	Name	Office	Phone
Program Equipment Specialist	G. Holley	LMMRO	
Modification Manager	L. Loftus	LMMRO	DSN 458-4120

2.2.3.2 Launch Facility and Launch Control Facility Brine Chiller Modification (57010B)

The temperature-regulating valves, installed in the refrigerant section of all brine chillers in the ECS, monitor the delivered brine temperature and regulate the brine cooler evaporator pressure. These valves are no longer procurable and replacement/repair parts are limited.

Replacement valves and interfacing electrical controls have been identified, hardness-qualified, and prototyped. All brine chillers were modified organically (Rivet MILE) to incorporate the replacement valves.

Schedule:

Event	Completion Date
Installation:	
Wing I	Jun 92
Wing II	Mar 91
Wing III	Jun 92
Wing IV	May 91
Wing V	Jun 92

Program Management	Name	Office	Phone
Program Engineer	F. Veibell	LMMRO	
Program Equipment Specialist	R. Matue	LMMRO	
Modification Manager	L. Loftus	LMMRO	DSN 458-4120

2.2.4 Cables

2.2.4.1 Launch Control Facility WS-133AM System Electromagnetic Pulse Hardness Protection (15525B)

Electromagnetic Pulse (EMP) protection is provided for equipment in the WS-133AM LCFs through the use of special hardware and techniques, such as ESAs, electrical grounding, and cable design and routing. The specific justification for this program is classified.

This modification provides the resources to accomplish the design, development, test, and production of kits that will improve the EMP protection for equipment in the WS-133AM LCFs.

Schedule:

Event	Completion Date
SOW Data Call	Aug 87
CCB	May 87
PR Package to PMZ	Dec 87
Contract Award	Aug 88
SDR	Nov 88
PDR	Mar 89
CDR	Jun 89
FCA/PCA	Mar 91
Kitproof	Jun 91
FAD	Sep 91
Installation at Wings (by Rivet MILE)	Sep 92 - Mar 94

Program Management	Name	Office	Phone
Program Manager	C. Gallegos	LMECA	DSN 924-2842
Program Engineer	D. Walker	LMECA	
Program Equipment Specialist	D. DeFriez	LMECA	
Modification Manager	M. Hansen	LMECA	

2.2.4.2 Hardened Intersite Cable System Interconnecting Box (11501B and 53085B)

The Hardened Intersite Cable System Interconnecting Box (HICS I-Box) is a junction point for command control and monitoring lines between MM LCFs and LFs. The internal subsystem which required modification is the suppressor assembly which attenuates electrical surges caused by lightning or EMP to prevent damage to sensitive OGE. This modification was in response to a problem identified by field and laboratory testing conducted by the HSP. ECS number 86-30-99999-11 defined the required modification to the EMP suppression assembly within the HICS I-Box.

The I-Box in the WS-133AM Missile Launch Control System Trainer, AN/GSW-T3(QD), located at Chanute AFB and the PK LF Trainer (LFT), A/F 24A-T2 and Launch Facility Operational Support Equipment Trainer (LFOSET), A/F24A-T4 at F.E. Warren AFB are weapon system I-Boxes. The trainers were modified to maintain weapon system configuration so maintenance training can be accomplished on the modified configuration.

Subsequent to the original PDR in June 1987, testing and analysis revealed that the designed modification, if installed in the system, would not satisfy hardness safety margin requirements. To solve this problem and to incorporate an updated threat requirement, a redesign was directed by OO-ALC. This activity resulted in an approximate ten-month schedule slip. An additional three-month slip resulted from the failure of an electronic part to meet specification requirements and the qualification of a new part. Production was accelerated and delivery was completed ahead of schedule.

Schedule:

Event	Completion Date
Contract Award	Jan 87
SDR	Mar 88
PDR	May 88
CDR	Oct 88
FCA/PCA	Jun 89
Kitproof	Jul 89
Installation	
Wing I	Dec 91 - Sep 93
Wing II	Dec 91 - *
Wing III	Dec 91 - Sep 93
Wing IV	Dec 91 - *
Wing V	Dec 91 - Sep 93

* Discontinued with wing deactivation.

Program Management	Name	Office	Phone
Program Manager	D. Olsen	LMECA	DSN 924-2853
Program Engineer	D. Walker	LMECA	
Program Equipment Specialist	R. McFarland	LMECA	
Modification Manager	M. Hansen	LMECA	

2.2.5 Rivet MILE

2.2.5.1 Rivet MILE Spares (91-25-0-0147)

In support of the Rivet MILE program, spares for installed parts are being procured. These include electrical, electronic, and mechanical parts for alarm sets, monitor cabinets and modules, and multiplying linkages for the launcher closure system. (See Rivet MILE PDM SE (85-22-9-0-0101), Section 2.3.1.6.10.)

Program Management	Name	Office	Phone
Program Manager	K. Morgan	LMMRM	(801) 392-1369
Program Engineer	B. Elwell	LMMRM	
Program Equipment Specialist	R. Rans	LMMRM	

2.2.6 Operational Ground Equipment Programs Under $1 Million

A numerical listing of the OGE replacement and replenishment spares programs below the $1 million threshold is provided here for reference.

Mod of MSG Processing Cont Drawer	50006B
Msg Process Cont Drawer FY90 Install	50006I
Mod of Hands Free Phone	51304B
MG Power Cont Upgrade	59029B
Band Assembly (DO41)	89-25-1-0-0194
Stator Assembly (DO41)	89-25-1-0-0195
Vault door, A Circuit	89-25-1-0-0196
Under Freq Monitor (DO41)	89-25-1-0-0701
Circuit Card Assembly (DO41)	89-25-1-0-0724
Shock Isolator Air Compressor (DO41)	89-25-1-0-0725
Board Assembly Tele Amp (DO41)	88-25-1-0-0754
Actuator Assembly (DO41)	89-25-1-0-0761
Chiller Insulated (DO41)	89-25-1-0-0762
Band Bridge (DO41)	89-25-1-0-0763
Module (Circuit Card) (DO41)	89-25-1-0-0764
Coupling Boss (DO41)	89-25-1-0-0765

Weldment (DO41)	89-25-1-0-0781
Circuit Card (DO41)	89-25-1-0-0782
Motor (DO41)	89-25-1-0-0783
Contractor Assembly (DO41)	89-25-1-0-0785
Cooler and Installation Assembly (DO41)	89-25-1-0-0788
Command Receiver (DO41)	89-25-1-0-0796
Keyboard AY	90-25-1-0-0832
SERRO Value (DO41)	90-25-1-0-0833
Panel Alarm Monitor (DO41)	90-25-1-0-0845
Motor and Brake AY	90-25-1-0-0850
Fan Centrifugal (DO41)	90-25-1-0-0851
Motor Altern Car (DO41)	90-25-1-0-0852
UHF Transmitter (DO41)	89-25-1-0-0863
Module (DO41)	89-25-1-0-0870
MF Radio Handles	89-25-1-0-0872
MF Radio	89-25-1-0-0873
Coupler Radio Freq Divider (DO41)	90-25-1-0-0887
Emergency Fan Motor (ECP)	90-25-1-0-0928
Gas Generator Igniter (DO41)	90-25-1-0-0932
IPD	90-25-1-0-0935
Explosive Bolt	90-25-1-0-0938

2.3 Support Equipment

2.3.1 Maintenance Support Equipment

2.3.1.1 Automatic Test Station (ATS-E35E)

2.3.1.1.1 ATS-E35E Automatic Test Station (84-22-3-0-002), Minuteman Automatic Test Station for Operational Ground Equipment, Follow-up (MATSO-2) (90-22-3-0-0795)

The HP9500 Automatic Test Equipment (ATE) consists of a group of computer-controlled electronic measuring devices, patching assemblies and power supplies. This equipment is used to check out and test electronic OGE. This ATE is located in the Electronics Laboratory (E-Lab) of each wing, at VAFB, Chanute AFB training facility, and the depot repair facility and SMTC at HAFB. Nineteen other items of test equipment are used at these locations to

augment the test capabilities of the HP9500. This equipment is obsolete and becoming very difficult and expensive to maintain.

The ATS-E35E will replace the HP9500 for both intermediate and depot level test requirements and for PK test requirements. Test Program Sets (TPSs), which include the interface test adapter (ITA) and the test program software, has been developed for 100 electronic drawers on the ATS-E35E. The current MTBF of the ATS-E35E is 350 hours; the goal is 500 hours. Some improvement has occurred and will continue to occur as maintenance experience and skills improve, but this will not bring performance up to the 500-hour goal. Some faulty components have been identified and are being replaced with more reliable parts as failures occur.

Eighteen ATS-E35E test stations have been delivered to the government at field and depot locations. All are in production use except one, which was transferred to the BMO in October 1991 for continued use by the contractor in developing TPSs for REACT. Seven additional E35Es were procured by BMO for PK. Two of these are in place at HAFB and the third, which was delivered to HAFB in exchange for one at Hercules transferred to BMO in support of REACT, is presently being installed. The remaining four are at BMO contractor facilities supporting other TPS development.

The contract for development of 100 TPSs was awarded in July 1985. Installation of E35E test stations has been successfully completed at all six wings, VAFB, Chanute AFB, and at the Technical Repair Center (TRC), Software Support Center, and the SMTC at HAFB. The TPSs were developed in two phases. Phase I included 45 TPSs rehosted from the HP9500 to the E35E. Phase II constituted the remaining 55 TPSs, which were completely new automated test programs.

All of the developed TPSs have been deployed. Eight additional were developed and deployed by Ballistic Systems Division (BSD) for PK application. An additional 15 are being developed in-house at OO-ALC under the MATSO-2 program. These will be deployed by March 1993.

Schedule:

Event	Completion Date
Contract Award	Jul 85
SDR	Sep 85
PDR	May 86
CDR	Apr 87
FCA/PCA	Aug 87
FAD	Dec 87

Installation	Phase I	Phase II
Wing I	Dec 87	Jun 90
Wing II	Mar 88	Jul 90
Wing III	Jan 88	Jul 90
Wing IV	Feb 88	Jul 90
Wing V *	Aug 90	Aug 90
Wing VI	N/A	Jun 90

*An ATS-E35E was installed as part of PK deployment.

MATSO-2. Under this program, 15 new, automated TPSs are being developed organically at OO-ALC. A Project Directive (PD) and Work Specification (WS) have been prepared to document the work requirements. The PD, in conjunction with the WS, serves as the contract between LM and TI to provide visibility and control of cost, schedule, and performance. The TPSs will be produced and delivered in groups. Each delivery will be made simultaneously to all required wings and other locations. No installation will be required. Since production and delivery of the TPSs will be incremental by group, and since some of the milestones reflected in the following schedule are defined by group, these milestones will be repetitive. For such events (PDR, CDR, FCA/PCA, and delivery) the following schedule reflects the date of the final occurrence.

Schedule:

Event	Completion Date
PD	Jun 89
PDR	Sep 91
CDR	Feb 92
FCA/PCA	Nov 92
Delivery	Feb 93

Program Management	Name	Office	Phone
Program Manager	D. Abbott	LMECB	DSN 924-2922
Program Engineer	D. Christensen	LMECB	
Program Equipment Specialist	E. Kingford	LMECB	
Item Manager	B. Allison	LMECB	

2.3.1.2 Test Program Set Development for Minuteman Shop Replaceable Units (93-22-2-0-1039)

Currently, 104 MM OGE Shop Replaceable Units (SRUs) (circuit cards and modules) are being verified for serviceability on several antiquated and obsolete testers. These testers assist the depot in fault detection and fault isolation of the OGE SRUs. The testers are quickly becoming unsupportable and unable to perform maintenance testing. In order to continue support for the OGE SRUs, the maintenance testing must be transferred to another system.

The maintenance testing on the obsolete testers for the 104 SRUs requires transfer to the ATS-E35E tester. In order to effect this, a TPS for each SRU requires development on the ATS-E35E. These will consist of the application test software, ITA, personality assembly, and the appropriate documentation. Many SRU TPSs for the ATS-E35E have been developed by OO-ALC/TISM. The R&M of the weapon system will improve because the new TPSs will improve the testing of the OGE SRUs.

Fifty PK SRUs have been identified which could require TPS development. Because of the low PK SRU usage rate and the uncertainty of the PK program, these will not be part of the basic contract. If required, they will be developed via options to the basic contract.

Development is considered to be low technical risk because SRUs with source data that is not readily available will be identified and reverse engineering provided by the contractor. Available data will be provided in a bidders library. Access to existing TPSs will also be provided to mitigate the risks involved.

Schedule:

Event	Completion Date
SOW/Data Call	May 92
PR Package to PMZ	Jun 92
Contract Award	Dec 92
PDR	Feb 93
CDR	May 93
FCA/PCA	Nov 93
FAD	Jan 94

Program Management	Name	Office	Phone
Program Manager	D. Abbott	LMECB	DSN 924-2922
Program Engineer	D. Christensen	LMECB	
Program Equipment Specialist	E. Kingsford	LMECB	
Item Manager	B. Allison	LMECB	

2.3.1.3 Survivability and Vulnerability Test Center

2.3.1.3.1 Triaxial Shock and Vibration System for ICBM Flight Simulation (90-22-1-3-0840)

The Triaxial Shock and Vibration System controls the vibration/shock test system to accomplish mission flight profiles and nuclear hardness qualification of new, replacement, and

modified MM and PK weapon system OGE and flight system equipment at the Survivability and Vulnerability Test Center (SVTC) at Little Mountain. The existing equipment is 25 years old and is difficult to maintain. The single-axis electrodynamic shaker system has limitations which prevent damping and/or amplifying forces in the cross-axes. These limitations prevent realistic, three-dimensional testing. The triaxial system does not have these limitations.

Replacement of this equipment is necessary to meet test schedules, ensure hardness qualification, increase accuracy of the test environment and reduce overtest requirements.

A bearing redesign has necessitated postponement of CDR from January to April 1992.

Schedule:

Event	Completion Date
Contract Award	Dec 90
SDR	Jun 91
PDR	Nov 91
CDR	Apr 92
Installation	Jun 92
Final Acceptance	Mar 93

Program Management	Name	Office	Phone
Program Manager	M. Shafer	LMETL	DSN 458-8248
Program Engineer (Shock & Vibration)	D. Wilson	LMETL	
Program Equipment Specialist	H. Staples	LMETL	

2.3.1.3.2 Single-Axis Electrodynamic Vibration (93-22-3-3-0600)

The electrodynamic shaker system consists of the following equipment:

One Ling 249 electrodynamic shaker rated at 30,000 pounds force.
One Ling 340 electrodynamic shaker rated at 30,000 pounds force.
One Ling 335 electrodynamic shaker rated at 17,000 pounds force.
One Team hydrostatic bearing table, used with the 340 shaker.
One Kimball hydrostatic bearing table, used with the 249 shaker.

This equipment is used to test MM and PK LCF equipment and flight hardware. Ground shock and transportation and handling tests are conducted on LCF equipment. Flight reliability vibration testing (bench tests) are conducted on MM III guidance systems and Nozzle Control Units (NCUs). The equipment is over 20 years old with the exception of the Kimball bearing table which is over ten years old. Repair parts for both the shakers and Ling bearing table are no longer stock items for the respective manufacturers and must be special ordered. A single shaker, even a large one such as the 340 or 249, is not well suited for testing very large test articles. The head expander on the 249 weighs 2,000 pounds and does not provide sufficient area to mount the article, necessitating additional fixturing. The weight of the head expander and fixturing reduces the shaker's ability to accelerate the article to the required test levels. In horizontal axes, large articles extend beyond the sides of the bearing table requiring heavy, expensive fixturing and support structures to achieve acceptable test results. Testing to high fragility levels cannot be done on large heavy articles due to inadequate force, weight of the large slip table and fixturing, and poor transmissibility.

Corrective action is to replace the three existing shakers with four identical shakers rated at 20,000 to 25,000 pounds force each and equip each with identical hydrostatic bearing tables. The shakers must be positioned in such a manner that they may be operated singly, in pairs, or as sets of three or four. A mounting system would be incorporated which would allow them to be moved together for high force applications and farther apart for large articles. A simple mechanical system would be incorporated to link, two, three, or four bearing tables together to form a single larger table. Electrodynamic shakers and hydrostatic bearing tables are highly reliable units that require minimal maintenance when properly set up and operated. Maintainability would be improved due to availability of parts and commonality of units. The controller being provided as part of the triaxial shaker system will have the capability of controlling all of the possible configurations the proposed system would have. The power amplifier and cooling requirements to drive the above systems can be met with existing equipment in the shock and vibration laboratory.

Schedule:

Event	Completion Date
SOW	Oct 93
CCB	1st Quarter 93
PR Package to PMZ	2nd Quarter 93
Contract Award	2nd Quarter 93
SDR	Apr 93
PDR	May 93
CDR	Jun 93
FCA/PCA	Jul 93
Kitproof	N/A
FAD	4th Quarter 93

Program Management	Name	Office	Phone
Program Manager	M. Shafer	LMETL	DSN 458-8248
Program Engineer	D. Wilson	LMETL/BA&E	
Program Equipment Specialist	H. Staples	LMETL	

2.3.1.4 Hardness Surveillance Electromagnetic Pulse Program (87-22-1-3-0112)

The Hardness Surveillance Electromagnetic Pulse Program (HSEP) measures compliance of ground electronics with specifications for hardness to nuclear EMP. It identifies hardness problems and trends in sufficient time to allow repair or replacement before weapon system capabilities degrade. Degradations can be caused by aging and by operational and maintenance activities.

Detailed solutions will be determined by the winning offeror. The former HSP, canceled by pending implementation of the HSEP, cycled through the wings, conducting tests at randomly selected sites. HSEP will not affect reliability or maintainability directly. It will detect problems in reliability in hostile environments, but corrective actions will be taken by other programs.

This competitive contract replaces an earlier sole-source effort which operated from 1978-1990. The program will affect all MM III and PIMS ICBM wings. The acquisition

includes a one-year planning and preparation period between contract award and start of data-gathering activities.

Schedule:

Event	Completion Date
ASP	Jul 91
Final PR	Dec 91
Release RFP	Jan 91
Contract Award	Jun 92
SRR	Jul 92
PDR	Dec 92
CDR	Apr 93
FAD	Jun 93

Program Management	Name	Office	Phone
Program Manager	Capt. M. MacLachlan	LMIM	924-2189
Program Engineer	Capt. M. Rhine	LMEOE	
Production Management Specialist	L. Peterson	LMEOC	
PCO	R. Heinze	LMKE	

2.3.1.5 Hill Air Force Base-Unique Programs

2.3.1.5.1 Guided Missile Component Test Station

The Flight Control/Electrical Depot Support Equipment (Figure As 13420, 13422, 13432, 17897, 18257) is used to perform functional, acceptance, and fault isolation of the P89, P90, P91, and P116 flight control systems. This equipment was originally procured in the mid-1960s and has far exceeded its life expectancy. Age degradation has resulted in decreased MTBF. An increase in retest OK rates has occurred due to aging of components. Parts supportability has become difficult due to lack of availability. The current test stands are requiring additional calibration and maintenance in order to meet tolerance requirements in the electronic voltage ratings. Parts availability is nonexistent due to technology obsolescence.

Figure As 13420, 13422, 13432, 17897, and 18257 will be replaced as a consolidated unit. Two units will be procured and delivered in December 1992.

Schedule:

Event	Completion Date
SOW/Data Call	Dec 88
PR Package to PMZ	May 89
Contract Award	Jan 90
SDR	Jun 90
PDR	Aug 90
CDR	Aug 91
FCA/PCA	Aug 92
FAD/FOC	Dec 92

Program Management	Name	Office	Phone
Program Manager	L. Gale	LMAPR	DSN 924-2130
Program Engineer	J. Bean	LMAPF	
Program Equipment Specialist	R. Dansie	LMAPF	
Item Manager	K. Hatch	LMAPF	

2.3.1.5.2 Servo Actuator/Injector Test Stands

The servo actuator test stand (Figure A 10676) is used to test the Stage I P89 actuators on the F&G missiles, the Stage III P91 actuators on the F missile, and all the actuators on all three stages of the G missiles. The servo injector test stand (Figure A 13450) is used to test the Stage II P90 injectors on the F&G missile. The injector test stand (Figure A 17894) is used to test the Stage III P116A1 injectors on the G missile. The electronic components are unsupportable due to age. This equipment is being evaluated by engineering in terms of refurbishment or replacement to address the supportability issue.

Schedule:

Event	Completion Date
SETR #1	Jan 90
RRG #1	Feb 90
SETR #2	Jul 91
RRG #2	Aug 91
SOW/TRD	Aug 92
Industry Review	Sep 92
SETR/RRG #3	Nov 92
Data Call	Dec 92
ADV RFP	Feb 93
RFP Release	Apr 93
Contract Award	Oct 93
FAD	Oct 95

Program Management	Name	Office	Phone
Program Manager	R. Dansie	LMAPF	DSN 458-1319
Program Engineer	J. Bean	LMAPF	
Program Equipment Specialist	R. Dansie	LMAPF	
Item Manager	K. Hatch	LMAPF	

2.3.1.5.3 Shaker System And Vibration Test Stands

The shaker system is used to perform the vibration requirements on the downstage flight controls after repair is done. Due to the age of this equipment it has become very difficult to buy spare parts. This equipment is being evaluated for refurbishment or replacement.

Schedule:

Event	Completion Date
SETR #1	Nov 91
RRB #1	Dec 91
Phase #1 Engineering	Mar 92
ECS	May 92
SETR #2	May 92
RRB #2	Jun 92

SOW/TRD Prep	Aug 92
Industry Review	Sep 92
SETR #3	Nov 92
RRB #3	Nov 92
Data Call	Jan 93
Advance RFP	Feb 93
RFP Release	May 93
Contract Award	Nov 93
FAD	Nov 95

Program Management	Name	Office	Phone
Program Manager	R. Dansie	LMAPF	DSN 458-1913
Program Engineer	J. Bean	LMAPF	
Program Equipment Specialist	R. Dansie	LMAPF	
Item Manager	K. Hatch	LMAPF	

2.3.1.5.4 Cable Test Sets (90-22-1-0-0773)

Two different 1960s-era testers are presently used for the missile raceway cables. The Cablemaster 400 and maximum resistance test sets are used for continuity, insulation resistance, and dielectric testing to ensure reliable cables are supplied for missile assembly. The DITMCO 200 testers are used in the MAMS to test cables for continuity and regulation resistance during final assembly of missiles. This test is required to ensure no damage has occurred to the missile cables during transportation and handling. Due to age and poor spare parts supportability, the availability and reliability of both testers are below acceptable levels. Support to raceway cable requirements is increasingly difficult due to frequent downtime and long lead repair.

The proposed solution is to combine the requirements of both the Cablemaster and maximum resistance test sets testers into a single state-of-the-art tester and to replace the DITMCO 200. The new test sets will allow faster testing times, greater troubleshooting capability, and hardcopy tracking of cable condition which is unavailable at this time. The test sets will be deployed in each MAMS facility and the cable shop. Different tests are required at each location. Single configuration testers will ease future supportability and increase flexibility in future testing.

Approval was received to add a shielded cable test capability into a new cable test set. Major slippages were experienced in the program while accumulating data for this new acquisition. A new baseline was established after program slippages. The program was canceled in November 1990 and restarted in January 1991. It is currently on schedule.

Schedule:

Event	Completion Date
Contract Award	Jan 92
SDR	Apr 92
PDR	Aug-Sep 92
CDR	Dec 92-Jan 93
FCA/PCA	Sep 93
FAD	Dec 93-Jan 94

Program Management	Name	Office	Phone
Program Manager	R. Williams	LMAPF	DSN 924-2130
Program Engineer	J. Bean	LMAPF	DSN 458-8385
Program Equipment Specialist	R. Williams	LMAPF	DSN 924-2170
Item Manager	K. Hatch	LMAPF	DSN 924-4271

2.3.1.5.5 Computed Tomography, Building 2113 Upgrade (89-22-1-0-0410) and Computed Tomography, New Facility (92-22-1-0-0745)

The nondestructive inspection (NDI) system equipment and inspection techniques currently employed at OO-ALC for solid propellant motors are representative of 1970s technology. Inspection of motors is primarily visual, radiographic, and borescopic. The use of these techniques is unsatisfactory because of poor test result reproducibility and resultant deficiencies in subjective interpretation, partial physical coverage of the object, and poor data storage and retrieval. It has been difficult to use this data in evaluation of failure modes to provide predictions of future reliability. Improved NDI equipment and techniques are needed to detect age-related degradation and to identify motors having an increased probability of

failure. For example, current NDI cannot physically describe the location, size, or depth of defects such as propellant grain cracking. This information is essential in evaluating this type of failure mechanism.

The Computed Tomography (CT) system is an NDI method which performs a radiological examination of solid motors or segments, providing a computer-enhanced color image of the interior of the motor. It is designed to detect flaws such as cracks, debonds, and the presence of foreign objects.

The Productivity, Reliability, and Maintainability program at the Propulsion Directorate of Phillips Laboratory is designed to develop accept/reject criteria for solid rocket motors and examine the effect of defects on ballistic performance. This technology is directly insertable into OO-ALC programs, and reduces costs associated with defect evaluation as well as provide accurate predictions of solid rocket motor reliability. OO-ALC will be working with the Propulsion Directorate on verification of the accept/reject criteria.

Presently CT is being performed at a contractor facility on a worst-case basis, and at costs which far exceed expected depot costs after the CT system is installed. The program is for the development and procurement of a large-scale CT system. This system will have a 16MeV power source and a 94" diameter x 340" long object envelope. This will be adequate for all solid rocket motors. It will include detectors and electronics, computers and software, an optical disk storage system, test specimen table, gantries, bridge crane, hydraulic lift, and the MAMS area facility to house and operate the entire system.

OO-ALC will manage the project using a turnkey approach. The equipment contractor will be responsible for facility construction rather than the Corps of Engineers, per agreement with AFLC and Air Staff.

Schedule:

Event	Completion Date
Contract Award	Sep 92
Facility Completion	Jun 94
Installation & Checkout	Jun 94
FAD	Sep 94

Program Management	Name	Office	Phone
Program Manager	LTC Sprott	LMAPM	DSN 458-4871
Program Engineer	G. Porter	LMAPM	
Program Equipment Specialist	D. Allred	LMAPM	
Item Manager	K. Hatch	LMAPF	

2.3.1.5.6 MAMS 1 (89-22-3-0-0407)

The MAMS 1 test equipment provides end-to-end testing for the LGM30-F/G first, second, and third-stage motor ordnance devices, interstage ordnance devices, raceway cabling, and thrust vector control units.

This equipment was originally procured in the mid-1960s with a life expectancy of ten years, and has far exceeded that goal. However, age degradation has resulted in decreased MTBF of most of the items. Electronics have become obsolete and unreliable and cable sets have deteriorated through long use and repeated handling. Parts supportability has become difficult. Manufacturers cannot supply parts that are obsolete due to state-of-the-art advancements in test set technology.

Thirteen different Figure As will be consolidated into one newly designed test set. Since many of the new components will be off-the-shelf, overall costs will be reduced. This equipment will incorporate modern technology into depot test capability, improve logistics, and provide long-term supportability. The minimum MTBF will be 500 hours.

Schedule:

Event	Completion Date
SOW/Data Call	May 88
PR package to PMZ	Sep 88
Contract Award	Aug 89
SDR	Jan 90
PDR	Jun 90
CDR	Jan 91
FCA/PCA	Aug-Sep 91
FAD	Mar 92
FOC	Dec 92

Program Management	Name	Office	Phone
Program Manager	N. Leavitt	LMAPM	DSN 458-1915
Program Equipment Specialist	N. Leavitt	LMAPM	
Item Manager	K. Hatch	LMAPF	

2.3.1.5.7 Safe and Arming Device Test Set (88-22-1-0-0207)

The Safe and Arming (S&A) test set (Figure A 13 and CI 17793) is used as the test instrument for checkout of first, second, and third-stage rocket motor ordnance devices, interstage ordnance devices, and switches. Seven of the old test sets (Figure A 13) have been provided to government contractors as Government Furnished Equipment (GFE). The five new test sets (CI 17793) are used at HAFB, VAFB, and at a contractor's facility. A review of test set operational use and maintenance history has shown that the S&A test sets are unsupportable due to nonavailability of spare parts. The present Air Force supply levels of spare parts are at a critical level. The only practical means of continued support is through cannibalization of failed units. This means support has a very limited duration, is very costly, and results in a declining number of test sets.

The competitive contract for procurement of twelve test sets was awarded on 30 September 1988.

The final DD Form 250 was signed on 6 September 1991. Three test sets are scheduled for delivery to contractors in April 1992.

Schedule:

Event	Completion Date
SOW	Aug 87
PR Package to PMZ	Dec 87
Contract Award	Sep 88
SDR	Nov 88
PDR	Dec 88
CDR	Oct 89
FCA/PCA	Jul 90
I&CO	Aug 91
Delivery	Apr 92

Program Management	Name	Office	Phone
Program Manager	L. Johnson	LMAPP	DSN 458-1795
Program Engineer	J. Bean	LMAPF	
Program Equipment Specialist	L. Johnson	LMAPP	
Item Manager	K. Hatch	LMAPF	

2.3.1.5.8 Squadron Data Simulator (85-22-4-3-0103 and 88-22-4-3-0812)

The Squadron Data Simulator (SDS) is a depot-level test simulator and test tool. It is used to assist depot maintenance personnel in the isolation and resolution of anomalies in the weapon system. The test set simulates message flow within a squadron. This allows depot personnel the opportunity to test software and hardware modifications and anomalies against a complete operational squadron environment. The test set frees existing LCFs/LFs used at the test facilities for other program testing, allowing optimum use of test resources from a cost and availability of resources perspective. The supportability of this equipment is decreasing, nonsupportable parts and subsystems exist, and the availability is declining. The increasing workload at the test facilities has imposed the need for SDS replacement to avoid the consequences of major program schedule slippage, increased cost, and nonsupportability of the fleet.

The solution is to design an SDS system using state-of-the-art technology with off-the-shelf subsystems that are compatible with the existing weapon configuration.

Schedule:

Event	A/M System	PKTF System
Project Execution	Jan 88	Jan 88
Software Specification Review	Apr 88	Jun 90
PDR	Feb 89	May 91
CDR	Oct 89	Apr 92
Test Readiness Review	Oct 90	Dec 93
FCA/PCA	Aug 92	Oct 93

Program Management	Name	Office	Phone
Program Manager	G. Chinault	LMETB	DSN 458-1398
Program Engineer	G. Chinault	LMETB	DSN 458-1398

2.3.1.5.9 Guidance and Control Lab Test Stand Replacement Program (88-22-2-3-0200)

The G&C lab test stand provides the operational environment of an LF that is instrumented to support testing of an MGS. The current test stand known as the Communications and Processing System (CAPS) was designed in 1965 to support MGS testing for 15 years, but has far exceeded that goal.

Age-related problems have made it difficult to complete a lengthy test without a CAPS failure. Finding replacement parts or modifying the software for CAPS has become extremely difficult or impossible. Without CAPS it is not possible to continue MGS troubleshooting or support an MGS modification program.

G&C Sites 1 and 3 will be replaced with systems utilizing current technology. The proposed G&C lab test stand will be composed of several interface processors connected via Ethernet to user work stations. The interface processors will collect and filter data from the MGS. One work station is used to analyze data from previous tests or develop new tests. Reliability

will be increased from 60 to 2,000 hours MTBF and maintainability will be increased to support one hour Mean Time To Repair (MTTR). The software will be written in Ada to maximize software R&M.

Schedule:

Event	Completion Date
PR Package to LMK	Jun 91
Contract Award	Aug 91
PDR	Jun 92
CDR	Jan 93
FCA/PCA	Jul 94

Program Management	Name	Office	Phone
Program Manager	Capt. Cole	LMETG	DSN 458-7121
Equipment Specialist	H. Staples	LMETO	
Program Engineer	Capt. Cole	LMETG	
Item Manager	J. Marquardt	LMECB	

2.3.1.6 Wings and Vandenberg Air Force Base Maintenance Support Equipment

2.3.1.6.1 Missile Launch Electrical Functions Simulator Set (89-22-1-0-0309)

The Launch Capability Test/System Function Test (LCT/SFT) equipment is Vandenberg-unique equipment and is not used in the field. The Missile Launch Electrical Functions (MLEF) Simulator Set (Figure A 4490) is used to perform a prelaunch checkout of the LF ground electronics systems through terminal countdown. In the WS-133AM (Wings I-V) configuration, the test is known as the LCT. In the WS-133B (Wing I, Squadron 20 and Wing VI) configuration, the test is known as the SFT.

The LCT/SFT equipment was originally procured in 1965 with an expected life of ten years. Delays in facility inspections, missile emplacements, and transition to task force control have a serious negative impact on the OT launch program. Erratic test results caused by

malfunctions have slipped schedules and extended manpower demands for VAFB maintenance personnel. Supportability has become difficult and expensive because stock spare parts are no longer available. LCT/SFT equipment functions have been replaced by advancements in technology not compatible with the existing design.

The simulator set cables are exhibiting repetitive malfunctions and failures in the connectors and casings. The cables are expensive to replace. The strip chart recorder is obsolete and replacement parts are difficult to obtain. Transport of the equipment to the LF sites and into the personnel access hatch causes "unseating" of the IC cards. This results in self-test failures, failures to load the operational software, and a high failure rate with the SFT equipment software.

The LCT/SFT equipment will be replaced by the Guided Missile Launcher Electrical Circuit (CI 09519) test set with three simulator sets and associated cabling, using current technology, equipment, and components.

Schedule:

Event	Completion Date
Comments from Industry	Sep 88
PR Package to PMZ	Oct 89
Contract Award	Aug 90
SDR	Nov 90
PDR	Apr 91
CDR	Oct 91
FCA/PCA	Sep 92
FOC	Apr 93

Program Management	Name	Office	Phone
Program Manager	L. Mills	LMEOC	DSN 458-6433
Program Engineer	A. Hartoonian	LMEOC	
Program Equipment Specialist	L. Mills	LMEOC	
Item Manager	P. Crosbie	LMEOC	

2.3.1.6.2 Test Launch Support System - VAFB (86-22-3-0-0001)

The Launch Support System (LSS) is a multifaceted network of support equipment used with MM OT launch activities unique to VAFB. Included in these VAFB LSS activities are those which are associated with range safety; command destruct, monitor and control functions; beacon tracking system; telemetry prior to launch, transmitting prelaunch telemetry data to the Data Acquisition Center (Building 7000, VAFB) via a microwave network; and the countdown network which is used to coordinate launch functions. The LSS is comprised of various types of antennas, relay huts, control and monitoring consoles, Launch Support Center (LSC) associated electronics equipment, and cabling. The present equipment is approximately 20 years old and cannot be maintained because replacement parts are no longer available. Redesign is required to maintain the operational capabilities with the application of current technology.

A contract has been awarded for the design and/or fabrication of the equipment necessary to support missile launches at VAFB. The preferred design solution is the use of standard off-the-shelf parts, integrated into the unique MM test capability, which will be supportable for 15 years. Currently, LFs 04, 07, 09, and 10 are planned for this upgrade. LFs 03 and 06 will be upgraded for the RS Launch Program (RSLP).

The existing LSS upgrade program has been modified to include relocation of the LSC from Building 1959 to Building 1871, the former Titan guidance facility, at VAFB. This is a first step in SAC's plan to create an Integrated LSC (ILSC). This relocation moves the MM and PK LSCs out of the flight hazard/caution area and provides the basis for a logistically supportable system which will provide affordable life cycle costs to SAC and OO-ALC. Use of Building 1871 negates a military construction program (MCP) project to build an ILSC. Additionally, a second MCP project which may not be needed is a 392 Communications Group facility to house communications maintenance personnel.

The ILSC will be a common facility adaptable to any missile system which is launched by SAC for FOT&E purposes. The ILSC will also be capable of supporting colocated LSCs

used by BMO for development test and evaluation launches of any new ICBM systems. The BMO RSLP LSC could also use the ILSC for its launches.

The facility is of sufficient size to colocate existing MM LSCs and a common communications switch of sufficient size to accommodate the total development test and evaluation and FOT&E requirements for all ICBM systems launched from VAFB. As each BMO ICBM development program is turned over to SAC, the SAC FOT&E ILSC would expand slightly to accommodate any unique consoles needed to support new weapon system specific requirements.

The MM LSS upgrade contract currently involves installation of a Supervisory Control and Data Acquisition (SCADA) system into the MM LSC. SCADA will be the baseline system for SAC monitoring and controlling of the VAFB-unique instrumentation and launcher environmental protective system components in an ILSC now planned for Building 1871. SCADA is an Air Force-maintainable and logistically supportable system that will significantly reduce contract maintenance costs. SAC and OO-ALC/LMIL/LMAG have secured funding to integrate PK LSS equipment into the SCADA baseline after PMRT.

Schedule:

Event	Completion Date
SOW	Jun 86
Contract Award	Sep 86
PDR #1	Jun 88
PDR #2	Aug 88
CDR	Mar 89
Contract Modification	Mar 90
ILSC Kickoff Mtg	Apr 90
FCA/PCA	Nov 91
I&CO (MM)	Mar 92

Program Management	Name	Office	Phone
Program Manager	J. Barlow	LMAGR	DSN 924-2107
Program Engineer	J. Leach	LMAGR	
Program Equipment Specialist	S. Dixon	LMAGR	
Item Manager	S. Williams	LMAGR	

2.3.1.6.3 Code Change Verifier (89-22-2-0-0306)

The Code Change Verifier (CCV) set consists of a CCV assembly, a CCV test set, and cables W1, W2, and W3 which are stored in the CCV test set. The CCV is a secure coding unit used at the LF to penetrate, change, and verify the enable code in the missile command signal decoder on the Stage I of the MM missile and in the D-Box in the PK LF.

The CCV is the means for positive verification of proper enable code loading in the missile. Posturing and deposturing for Rivet MILE has caused a dramatic increase in CCV usage. During the last fleet-wide code change, SAC had to resort to extraordinary lateral support measures in order to keep enough functioning CCVs at each wing during their respective squadron code changes. This situation will continue until additional CCVs are available.

The CCV was designed in the late 1950s and produced in the early 1960s. Parts are becoming increasingly difficult to procure. The CCV MTBF is decreasing. Code change anomalies have caused SAC to initiate a SON to list additional requirements needed for verification and reliability purposes. OO-ALC and SAC have agreed that a new design for replacement CCVs is the best option.

Existing trainer CCVs must be replaced to mirror the new configuration. These CCV simulators will affect the GY/QY trainers at Wings II-VI and the EU trainer at Wing I. ATC has also requested CCV simulators in place of two weapon system units. Simulator procurement is for two preproduction units plus eight production units.

Schedule:

Event	Completion Date
SOW/Data Call	Sep 88
P/R Release Date	Feb 89
Contract Award	Sep 89
SDR	Dec 89
PDR	Apr 90
CDR	Nov 90
FCA/PCA	Nov 91
FAD	Mar 92
Delivery	Mar-Jul 92

Trainers Schedule:

The CCV simulators will be acquired under the same contract as the weapon system with deliveries concurrent with the first production units.

Program Management	Name	Office	Phone
Program Manager	R. Kilburn	LMEOA	DSN 458-1927
Program Engineer	M. Nay	LMEOA	
Program Equipment Specialist	R. Kilburn	LMEOA	
Item Manager	P. Crosbie	LMEOA	

2.3.1.6.4 Wing Code Processing System Modification (59032B)

The Wing Code Processing System (WCPS) is equipment configured to accomplish coding procedures on a number of items used on MM and PK missiles. Among these are the command signal decoder, launch control panel, launch enable panel, code change verifier, and cartridge tape unit.

A modification is needed to accommodate the new capabilities of the replacement code change verifier, such as a printout of the procedures accomplished during code change. The modifications are minor in nature.

Schedule:

Event	Completion Date	Event	Completion Date
WCPS		Software	
PDR	Jul 89	PDR	Aug 89
CDR	Dec 89	CDR	
Kit Assembly	Apr 91	*CCOS	Jan-Feb 90
Kit Testing	Aug 91	*WPAP and WMAP	Jun 90
Installation	Mar 92 to Jun 92	TRR	Aug-Oct 90
		PCA	Dec 91
		Installation	Mar 92

Software programs are used on the WCPS to insert targeting codes, launch codes, and application programs into the MM (WMAP) and PK (WPAP) weapon systems.

Program Management	Name	Office	Phone
Program Manager	Lt E. Skobow	BMO/MESL	DSN 876-9235
Program Equipment Specialist	R. Kilburn	LMEOC	

2.3.1.6.5 Mechanical Code System Modification Replacement Program (T5023)

The WCPS is used to process classified codes. The Mechanical Code Unit (MCU) encoder drawer is part of the WCPS and is used to mechanically code the MCUs. These units are inserted into the Launch Enable Panel (LEP) and Launch Control Panel (LCP), which are installed into the WCPS. The code is then verified. The MCU encoder drawer, the LCP and the LEP are GFE to the WCPS program and no certification/decertification procedures exist. To repair these items the drawer/panels are shipped to depot for repair. This is in violation of DNS interpretation of the approved NWSSG certification study which states that the WCPS is a critical component and as such no subcomponents can be removed for repair and then returned to the WCPS for use without decertification and subsequent recertification.

All WCPS components were to be provisioned for 20-year spares. This was not done for the GFE. This problem with the present procedures was brought to light in DNS message 1011700Z October 1990. As a result, a team was set up to recertify the MCU encoder

drawers. The LEP and the LCP and other GFE were addressed in another DNS Message 3118307 October 1990, that stated the same concern existed for the MCU encoder drawer, LCP, and LEP.

Corrective actions are in place to develop a new programmable code device and Coder Verifier Panels (CVP) to replace the MCU and the MCU encoder drawer; develop a replacement LCP and LEP for the LCF; and eliminate the requirement to transport the LCP and LEP between the WCPS and LCF.

The reliability of the new components will exceed the old MTBF by 3,000 hours. Improved maintainability will reduce the time required to perform organizational and depot level maintenance.

All MM and PK LCFs will be upgraded with the new LEP and LCP hardware after REACT. The REACT console will require modification to add an additional power input to each panel location. The CVP will be installed in the location where the launch enable code group presently exists. The rear panel connector will be modified to add the necessary inputs, outputs, and power. The above modifications will allow interchangeability with the old equipment. This program also impacts the post-REACT RY, LE and PG MPTs and the post-REACT LN and QD missile maintenance trainers.

Schedule:

Event	Completion Date
CCB	Apr 92
SOW/Data Call	Apr 92
PR Package to PMZ	May 92
Contract Award (CW)	Nov 92
SDR	May 93
PDR	Oct 93
CDR	Jun 93
FCA/PCA	Feb 95
Kitproof	Aug 95
FAD	Sep 95

Program Management	Name	Office	Phone
Program Manager	R. Kilburn	LMEOC	DSN458-1927
Program Equipment Specialist	B. Kilburn	LMEOC	
	J. LaFrance	LMEOC	
Item Manager	P. Crosbie	LMEOC	
	I. Shumway	LMEOC	

2.3.1.6.6 Elevator Work Cage (94-22-2-0778)

The work cage is a personnel safety device used to raise and lower personnel in the launch tube to perform maintenance on the MM missile and launch tube. The current work cages were designed in 1962 and had a design life of ten years. Most of the parts are difficult to obtain and the repair costs are increasing each year. Replacement of the work cages is necessary to ensure work can be accomplished in a safe and timely manner and to ease supportability concerns.

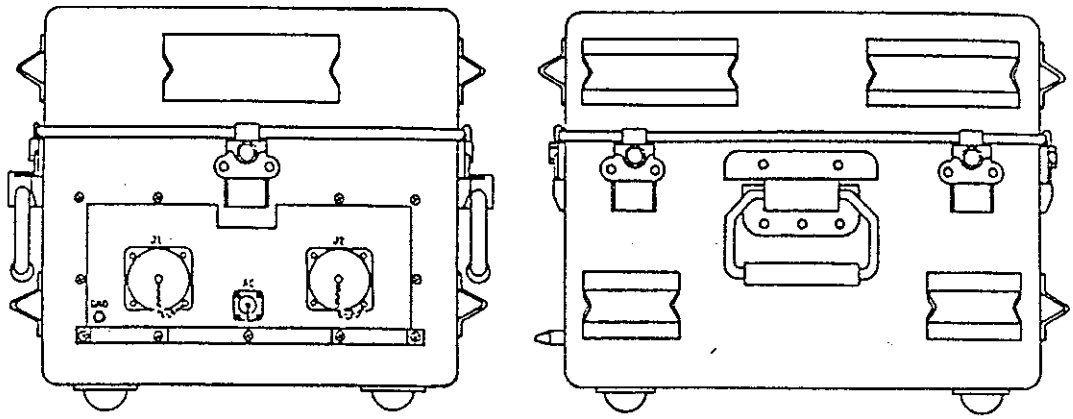
Schedule:

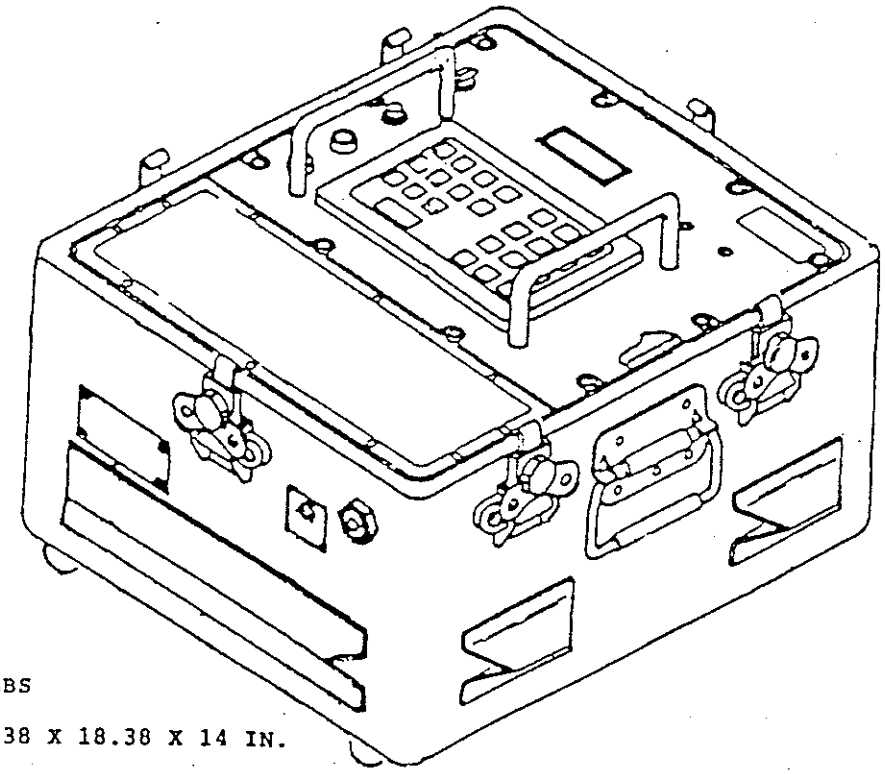
Event	Completion Date
Redesign (DEP) Contract Award	Dec 91
PDR	Mar 92

Program Management	Name	Office	Phone
Program Manager	W. Brown	LMMRO	DSN 458-5430
Program Engineer	F. Veibeli	LMMRO	
Program Equipment Specialist	R. Nye	LMMRO	
Item Manager	R. Brown	LMMRO	

2.3.1.6.7 Explosive Set Circuitry Test Set (89-22-2-0-0311 and 51302B)

The Explosive Set Circuitry Test Set (ESCTS) (Figure 2.3-1), Figure A 3007 (CI 9502), is a nuclear-certified, precision measuring instrument used to measure the absolute resistance of electro-explosive ordnance devices and any stray energy present in the firing circuits





CI: 9502

P/N 1D9200G3

WEIGHT: 56.43 LBS

DIMENSIONS: 16.38 X 18.38 X 14 IN.

EXPLOSIVE SET CIRCUITRY TEST SET

Figure 2.3-1

connected to the explosive devices. It is used at all wings, VAFB, and HAFB, but is not installed equipment. It has been in the Air Force inventory for 25 years, but now can no longer be obtained because manufacturers can no longer obtain parts quotes from vendors.

The test set will be replaced with the CI 9502 ESCTS and the CI 9508 cable breakout adapter set.

a. The new ESCTS requires a minimum MTBF of 8,000 hours. It will also have a minimum service life of 20 years with no performance degradation.

b. Improved maintenance provisions give the new test set the ability to perform go/no-go self tests, built-in tests to isolate to a single faulty printed wire board, use of components that require little or no preventive maintenance, and the capability to remove and replace components by one person. These improved design features and new capabilities will improve the potential of intermediate level repair.

The initial ESCTS contract requirements were fulfilled and 35 test sets were delivered to the wing. A second contract was initially let for 110 sets, but was later changed to 70 sets due to MM II deactivation. This contract was terminated by default in December 1991.

Since deployment of the sets to the wings, daily use has demonstrated structural inadequacies in the test set case, creating problems with the ESCTS electronics. The case needs to be strengthened to survive the rigors of daily use. Firmware improvements are required to resolve nuclear safety concerns and to improve maintainability by automating operational procedures for "manual only" applications, optimizing time efficiency of firmware during cable identification and self test, and preventing multiple keypad entries following a single key depression.

A program is now being developed to modify the new CI 9502 test set, modify 35 existing test sets, and manufacture 70 new test sets.

Schedule:

Event	Completion Date
Contract Award	Jul 92
First Article	Jul 94
Installation (By Wing)	Jan-May 95

Program Management	Name	Office	Phone
Program Manager	N. Leavitt	LMAPM	DSN 458-1915
Program Engineer			
Equipment Specialist	N. Leavitt	LMAPM	DSN 458-1915
Item Manager	K. Hatch	LMAPF	DSN 458-4271

2.3.1.6.8 Hydraulic Pusher Set Replacement Program (90-22-2-0-0766)

The hydraulic pusher set consists of an electrically powered hydraulic pump, hydraulic pusher, and a yoke and pin assembly. It is used to open and close the launcher closure door of the missile silo for AVE maintenance purposes. This unit was an off-the-shelf item that now has marginal capability. It was not replaced to accommodate the weight that was added to the launcher closure. More than one unit is sometimes required to open and close the launcher closure.

The proposed solution is to design a state-of-the-art unit that will provide higher reliability and reduce maintenance, will meet load requirements, and will be more convenient to operate.

During PDR it was discovered that the 8.5 inch stroke length of the hydraulic pusher would not allow the launcher closure door to fully open. The technical requirements document was modified changing the stroke length to 4.25 inches. This design change resulted in a four-month slippage in the schedule.

Schedule:

Event	Completion Date
SOW/Data Call	Jul 90
PR Package to PMZ	Sep 90
Contract Award	Jul 91
SDR	Oct 91
PDR	Dec 91
CDR	Jul 92
FCA/PCA	Dec 92
Installation	Feb 93
FOC	Dec 93

Program Management	Name	Office	Phone
Program Manger	B. Turner	LMMRO	DSN 924-2196
Program Engineer	J. Gutierrez	LMMRO	
Program Equipment Specialist	B. Turner	LMMRO	
Item Manager	R. Brown	LMMRO	

2.3.1.6.9 Control Monitor Replacement Program (90-22-2-0-0827)

The control monitor is a portable electronic unit of maintenance GSE that provides maintenance personnel at the LF with the ability to communicate with the Missile Guidance Computer (MGC). In conjunction with the Cartridge Tape Unit (CTU), it provides the ability to load programs into the MGC portion of the MGS and monitor its responses. It can acquire and relinquish local control of the LF, and interrogate the MGC and display essential fault isolation information, and control, monitor, and display the LF status and MGC mode of operation. Due to age and the lack of parts supportability, the reliability of the unit has become critical. A recent SAC/LGB study for Wings I-VI states frequent loss of alert time and maintenance delays were attributed to inoperative units. The units are currently exhibiting an unacceptable MTBF of 52 hours. The specified requirement was 500 hours. In addition, there was a 35 percent out-of-commission rate for the units during the study period.

The recommended solution is to provide the wings with new control monitors and control monitor trainers to replace the existing units. The new units will provide the necessary components for both the weapon system and trainers.

a. Reliability: A reliability study was conducted on the existing control monitors and it was determined that the units did not meet the specified requirement of 500 hours. The projected MTBF for the replacement units is for at least 5,000 hours. Long-term parts supportability, a single configuration with flush mount indicators, and reduction in weight will also enhance the R&M of the new unit. There will also be an operator self-assurance test feature that will enable the operator to receive a go/no-go indication prior to dispatch. There will be a built-in test to isolate failures down to a single SRU.

b. Maintainability: Organizational and depot maintenance will be required to maintain the new units. The built-in-test capability will enable organizational level repair through change-out of failed SRUs. The failed SRUs will then be forwarded to depot for repair utilizing the ATS-E35E test station.

The contract was awarded on 28 November 1990. It is on schedule to procure 89 weapon system and 18 trainer units for MM II and III requirements. The units will be identical in size and appearance and the trainer units will simulate the weapon system units for optimum training advantage.

Schedule:

Event	Completion Date
Contract Award	Nov 90
CDR	Nov 91
FCA/PCA	Jun 92
Kitproof	Jul 92
Installation (Deployment)	Nov 92-Sep 93

Program Management	Name	Office	Phone
Program Manager	J. Gutierrez	LMEOA	DSN 924-2199
Program Equipment Specialist	J. Gutierrez	LMEOA	
Item Manager	P. Crosbie	LMEOC	
Contracting	S. Simmons	LMKE	

2.3.1.6.10 Rivet MILE PDM Support Equipment (85-22-9-0-0101)

Various pieces of support equipment are required to facilitate the repair/modifications to be accomplished as part of Rivet MILE tasks. Standard Air Force equipment does not exist to accomplish some tasks, and other scheduled tasks exceed organizational and intermediate level maintenance capabilities and become depot level tasks.

FY90 dollars were programmed for a portable security system for LF and LCF security monitoring in accordance with AFR 122-17. Due to default on the part of the original supplier, the control unit is not procurable. Rivet MILE is working with the Army to certify a new source of control units to meet DNS-imposed requirements. Until certification is completed and units are available, DNS has authorized use of the interim security system presently in the inventory.

Program Management	Name	Office	Phone
Program Manager	K. Morgan	LMMRM	801-392-1369
Program Engineer	B. Elwell	LMMRM	
Program Equipment Specialist	R. Rans	LMMRM	

2.3.1.7 Aerospace Guidance and Metrology Center

2.3.1.7.1 IBM 1800 Emulator (85-25-3-0-0133, 87-25-4-0-0134 and 88-25-1-0-0223)

The IBM 1800 series computer is used to test and calibrate MM II and III MGSs during reliability tests. Eight of these are at the Aerospace Guidance and Metrology Center (AGMC), two at Rockwell's Anaheim facility, and one at the SVTC in Utah. As of September 1985, IBM cancelled its agreement to maintain this equipment due to its age, the difficulty in acquiring spare parts, and the loss of 1800-series expertise.

A new computer system that emulates the IBM 1800 central processor and its replacement peripherals is being purchased. A lifetime buy of 32 systems will be made and installed to keep the existing test capabilities and schedules. The reliability of the emulator is expected to be 10,000 hours MTBF. The maintenance concept is a remove and replace of systems.

The contractor is three years late delivering the first emulator. During integration testing, over 280 problems were discovered. Also, the contractor did not follow contractual requirements to use MIL-Q-9858. A production go-ahead decision will be made when the quality issue is resolved.

Schedule:

Event	Completion Date
Package to PMZ	Mar 86
Contract Award	Sep 86
PDR	Apr 87
CDR	Dec 87
FCA/PCA	Jan 92
Prototype Acceptance	Apr 92
Production Go-Ahead	May 92
First Production Unit	Oct 93
Final Delivery	Aug 94

Program Management	Name	Office	Phone
Program Manager	Capt J. Meyers	LMAGR	DSN 458-1354
Program Engineer	M. Goeckeritz	LMAGR	
Program Equipment Specialist	J. Polteno	LMAGR	
Item Manager	M. Pittman	LMAGR	

2.3.1.7.2 Minuteman Guidance System Test Console Modification (90-22-2-0-0734)

The purpose of this program is to provide logistics supportability for the guidance system test consoles. The MM II and III G&C systems are tested, verified, and calibrated using the IBM 1800 test complexes at AGMC. The test complexes utilize late-1960s technology for the computer and interface consoles. The consoles provide control signals and measure responses between the IBM 1800 computer and the units-under-test. Numerous console components are experiencing maintenance and supply problems and reliability concerns.

Eight separate test complexes are located at Newark Air Force Base, Ohio; two complexes are at Rockwell, Anaheim; and one is at SVTC in Utah. Due to age and lack of parts supportability, much of this equipment is in critical condition. The interface consoles to be modified are the GSP, Pendulous Integrating Gyro Accelerometer (PIGA), MGS, GCA, guidance set platform/ vibration, central power console, and card tester.

Supportability of consoles is best addressed by replacing discrete problem components with off-the-shelf components. Several console components will require a new build effort to meet form, fit and function. Modification of the consoles is necessary to accommodate the newer components.

Schedule:

Event	Completion Date
SOW	Jun 91
PR Package to LMKE	May 92
Contract Award	Mar 93

Program Management	Name	Office	Phone
Program Director	Capt J. Meyers	LMAG	DSN 458-1354
Program Engineer	M. Goeckeritz	LMAG	
Program Equipment Specialist	K. Forman	LMAG	
Item Manager	S. Williams	LMAG	

2.3.1.7.3 Gyrocompass Assembly Test Station (92-22-2-0-0825)

The GCA is a major component of the MM II and III guidance systems. The GCA functional acceptance test, Optical Electrical Resolver (OER) test station, and the GI-T1-B test stations are used to test the GCA during build. These stations are old and unreliable and in many cases violate the cone of the test tolerance. Test tolerances at lower levels are not tighter than those at higher levels. Because of these problems, AGMC is experiencing a 35 percent Inertial Measurement Unit (IMU) recycle rate.

This program has three phases. Phase I will develop the test requirements for the GCA. Phase II will develop, build, and test a single prototype test station to replace the functional acceptance test, OER test station, and the GI-T1-B test station. Phase III will be an open competition to procure additional GCA test stations to support production at AGMC.

Phase I is now in fact-finding. The station will be installed at AGMC.

Schedule:

Event	Completion Date
PR Package to LMKE	Feb 92
Contract Award Phase I	Apr 92
Contract Award Phase II	Oct 92
FAD (Deliver Prototype)	Jan 94
Contract Award Phase III	May 94
PDR	Jan 93
CDR	Jul 93
FOC	Jan 95

Program Management	Name	Office	Phone
Program Manager	Capt J. Meyers	LMAG	DSN 458-1354
Program Engineer	R. Whetman	LMAG	
Program Equipment Specialist	J. Polteno	LMAG	
Item Manager	S. Williams	LMAG	

2.3.1.7.4 D37 Computer Memory Overwrite Adapter (91-22-1-0-0903)

The D37 computer contains Top Secret course and target information. It is a major subsystem of the MM II and III MGSs. The overwrite of D37 computer memory is necessary so that the classified information can be purged and the computer downgraded to Secret at the depot. This facilitates what AGMC now does with original, nonsupportable Factory Test Equipment (FTE). The original FTE, which not only performed computer memory overwrite but computer fault diagnostics, was replaced by a new Computer Test Station (CTS) in 1986 using a state-of-art microprocessor controlled system. However, the FTE has been retained to perform overwrite because the CTS contains microprocessors that can be tampered with. For this reason, the National Security Agency (NSA) will not certify the CTS for accomplishing D37 computer memory overwrite.

The acquisition is for the design, development, fabrication, assembly, demonstration, test and delivery of D37 O/A equipment, associated cabling, and engineering/technical data to replace the existing FTE overwrite capability. Two D37 O/As will be provided as part of the "loose equipment" assigned to the parent CTS. Besides the two overwrite adapters and related cables, no other additional hardware or software needs to be procured. The proposed D37 memory overwrite capability is compatible with the existing CTS and the CTU. The CTUs have been procured under a separate contract and are currently used in the field to perform overwrites of the D37 computer's memory prior to its shipment to AGMC. If this field overwrite procedure is acceptable to NSA, no other overwrite is required. However, if the field overwrite procedure is not acceptable, a subsequent overwrite at the depot is necessary

to downgrade computer memory contents from Top Secret to Secret. The D37 computer memory overwrite adapter will resolve NSAs concerns about the CTS.

The loss of the FTE overwrite capability would increase the attendant labor costs per year by $551,187. Based on this, it is estimated that the cost of the D37 O/A could be amortized in less than three years.

Schedule:

Event	Completion Date
SOW/Data Call	May 91
Contract Award	Jan 92
PDR	Aug 92
CDR	Dec 92
FCA/PCA	Apr 93
Delivery	Sep 93

Program Management	Name	Office	Phone
Program Manager	Capt J. Meyers	LMAG	DSN 458-1354
Program Engineer	R. Whetman	LMAG	
Equipment Specialist	J. Polteno	LMAG	
Item Manager	S. Williams	LMAG	

2.3.1.7.5 Pacer Cord, Project Code 471 (90-25-1-0-0899)

This is a cable replacement program in direct support of the IBM 1800 test complex at AGMC. The cables were identified to OO-ALC as needing replacement due to heavy usage which has caused a severe wear, especially on connectors.

This program will replace worn cables with new cables locally manufactured at HAFB cable shop, Building 1208. The acceptance listing will be conducted by AGMC. Upon acceptance, the cable shop will produce the remaining balance of cables.

Current operations are hindered by the unreliable cables. When the tester returns unacceptable or with erratic results, the cables may be at fault rather than the item undergoing testing. Replacement of suspected faulty cables will significantly reduce the number of retests.

Schedule: Production of 33 different cables started in February 1992 and will be completed in November 1993.

Program Management	Name	Office	Phone
Program/Production Manager	S. Thurston	LMAG	DSN 458-0671
Program Engineer	R. Ramey	LMAG	
Program Equipment Specialist	J. Polteno	LMAG	
Item Manager	C. Christensen	LMAG	

2.3.1.8 Maintenance Support Equipment Programs Under $1 Million

A numerical listing of the MSE programs below the $1 million threshold is provided here for reference.

Mod of ITA Cooling Air Duct	51313B
Rivet MILE IMPSS Support Equipment	86-22-1-0-0022
Adapter Kit Test Set	85-22-5-0-0106
Support Hoist Umbilical	85-22-3-3-0107
Retainer Shroud Set	86-22-1-0-0114
Leak Detector and Purging Equipment	87-22-1-0-0115
Mobile Equipment Van (SELECT Equipment)	87-22-1-0-0117
Mobile Instrumentation Van (SELM Equipment)	86-22-2-0-0119
Portable Winch	87-22-1-0-0125
Brine Balancing Kit	87-22-1-0-0129
Launch Tube Barrier (DO39)	85-22-8-0-0158
Infrared Microscope	86-22-1-0-0160
Temp Cont Test Set (DO39)	88-22-1-0-0161
Optical Microscope	86-22-1-0-0162
RS Fuzing Simulator (DO39)	89-22-1-0-0186
Sling Beam Type	88-22-1-0-0189
Spot Welder	87-22-1-0-0190
Conformal Coating (Test)	88-22-1-0-0208

Fixture, Case and LE (DO39)	87-22-1-0-0213
Battery Charger (DO39)	86-22-4-0-0214
Recorder (DO39)	88-22-1-0-0703
Maintenance Platform (DO39)	87-22-2-0-0704
Cable Set, Battery Charger (DO39)	88-22-1-0-0705
Sling Set (DO39)	88-22-1-0-0706
Barrier PAH (DO39)	88-22-1-0-0707
Elevator Work Cage Assembly (DO39)	88-22-1-0-0708
Beam Type Sling (DO39)	89-22-1-0-0709
LCC Floor Pedestal	87-22-1-0-0711
Case, Carry Signal Panel (TA)	87-22-1-0-0712
P106A Test Stand Replacement	90-22-1-0-0716
Handling Devices	88-22-1-0-0721
Brine Chiller Test Stand	89-22-1-0-0722
Cable Puller HICS (DO39)	88-22-1-0-0726
Air Gaging Device	87-22-1-0-0727
Dolly Truck	88-22-1-0-0728
MM Guidance System Test Consoles	90-22-2-0-0734
Dolly Hydraulic Pusher Set (DO39)	89-22-1-0-0736
Magnetic Part Kit (Rivet MILE)	88-22-1-0-0746
Cartridge Tape Unit (DO39)	89-22-1-0-0748
D39C Test Console (Test)	88-22-1-0-0750
Case Leak Test Fixture	87-22-1-0-0752
Case Encoder	87-22-1-0-0753
Transverse Plate (DO39)	87-22-2-0-0757
Jack, Lock Mechanism (DO39)	89-22-1-0-0759
Aging and Surveillance Test Equipment Replacement	92-22-1-0-0780
Remote Wing Network Rivet MILE	88-22-1-0-0801
SMTC ALCC Annotation System	90-22-1-3-0805
SMTC Pulse Code Modulation Formatter	97-22-1-3-0809
SMTC MM Data Acquisition and Reduction System	97-22-1-3-0810
SMTC Squadron Data Simulator	88-22-4-3-0812
TEM Cell and Radio Frequency Gen System (SVTC)	92-22-1-3-0816
12-Inch Hyge Sled Test Machine (SVTC)	95-22-1-3-0819
Missile Readiness Integrated Support Facility	88-22-1-0-0823
Hoist Assembly, Umbilical Cable (DO39)	90-22-1-0-0835
Torque Mechanism for Umbilical Cable	88-22-1-0-0836
SMTC Instrumentation System	88-22-9-3-0838
Adapter Kit, Beam Sling (DO39)	90-22-1-0-0839
Sling, Container	90-22-1-0-0860
Fieldmeter, ES (DO39)	88-22-1-0-0861
Fall/Rescue Protection, Rivet MILE	90-22-1-0-0890
Hoisting Unit (DO39)	90-22-1-0-0893
Power Oscillator Rivet MILE	90-22-1-0-0900
Impedance/Copedance Meter Rivet MILE	90-22-1-0-0901
DBM Meter Rivet MILE	90-22-1-0-0902

Temp Control Units for PRESS (DMSE)	90-22-1-0-0909
P92 Amplifier for PRESS (DMSE)	89-22-2-0-0913
Shock/Vib Lab Instrumentation (SVTC)	92-22-1-3-0914
BLG and HMGE High Pressure Air Distrib Sys (SVTC)	90-22-1-3-0915
Shock and Vib Data Acq. and Reduct Sys (SVTC)	94-22-1-3-0917
Multiple Leg Sling (DO39)	89-22-6-0-0919
Pumping System Rivet MILE	89-22-2-0-0944
Heat Exchanger Controller for MM Guidance (SVTC)	92-22-1-3-0946
Pwr Supply, FCBT Elect. and Hydraulic Sys (SVTC)	92-22-1-3-0948
Elec Comp Tester Analog Dev (SVTC)	92-22-1-3-0949
Laser Trigger Generator (SVTC)	93-22-1-3-0950
EMP User Interface Data Reduction Sys (SVTC)	93-22-1-3-0951
Wide Band Pulse CW Amplifier (SVTC)	92-22-1-3-0952
Data Acquisition Sys Controller (SVTC)	95-22-1-3-0954
Modular Pulse Generator (SVTC)	95-22-1-3-0955
High Energy Pulse Generator (SVTC)	96-22-1-3-0956
LINAC Data Controller (SVTC)	96-22-1-3-0957
Work Platform Set (DO39)	90-22-1-0-0961
G&C Cooler Refrigerant Recovery Sys	94-22-1-0-0971
Sealant Mixer (DMSE)	90-22-1-0-0994
Component Test System (SVTC)	90-22-1-3-0995
SMTC Repetitive Countdown Monitor CU	92-22-3-3-1014
SMTC MM D37 Monitor Unit	90-22-1-3-1034
Shock and Vib T/S	87-25-1-9-0146
OS V&V Test Bed	87-25-1-3-0176
IBM Emulator Card Reader	88-25-1-0-0223
Engaging Tool Assembly (VAFB)	89-25-1-0-0719
Multiplying Linkage (DO41)	89-25-1-0-0760
Cable Assembly (DO41)	89-25-1-0-0794
Actuator Hand (DO41)	90-25-1-0-0855
KVA Pwr Amplifier/MGSC Vib Cont	89-25-1-0-0864
Tape Drive (DO41)	89-25-1-0-0865
Support Structure (DO41)	89-25-1-0-0867
Pendant Assembly (DO41)	89-25-1-0-0868
Threaded Guide Tube (DO41)	89-25-1-0-0869
Cylinder (DO41)	89-25-1-0-0871
Transducer (DO41)	90-25-1-0-0876
Cylinder Assembly (DO41)	90-25-1-0-0878
Motor Traverse	90-25-1-0-0933
PIGA Float Test Station Component Replace (RSA)	91-25-1-0-0996
Cover, Environ Launching (DO39)	90-22-1-0-0911
Enhanced Module Diagnostic Test Set	94-22-1-0-1010
Command Signal Decoder ATE	90-22-1-0-1011
Hand Crank Assembly (DO39)	92-22-1-0-1017
Pneumatic Test Set (DO39)	92-22-1-0-1018
Telephone Test Set (DO39)	92-22-1-0-1019

Tool Kit, Comd (DO39)	92-22-1-0-1020
Tool Kit, Extrac (DO39)	92-22-1-0-1021
Battery Load Bank	90-22-1-0-1035
Liquid Cooler Test Set	86-22-1-0-0007
Pump Motor Assembly (DO41)	91-25-1-0-0975
Cylinder Assembly (RSD)	91-25-1-0-0980
Emergency Fan Motor (Option II)	90-25-1-0-0989
Insulated Chiller (DO41) (RSD)	91-25-1-0-0997

2.3.2 Transportation and Handling Equipment

2.3.2.1 Ballistic Missile Transporter Winch System (58035B)

The winches on the Ballistic Missile Transporter (BMT) are used to upload or download the shipping and storage container ballistic missile on a C-141 aircraft.

The BMT is over 20 years old and parts to repair the winches are no longer available. The present winch system will be replaced with a new updated system.

Schedule:

Event	Completion Date
CCB	Feb 91
SOW	Dec 90
Data Call	Mar 91
PR to PMZ	Apr 91
Contract Award	Mar 92
Prototype Installation/Test Complete	Feb 93
Production Kits	Aug 94
Installation (Depot)	Aug 94-Aug 95

Program Management	Name	Office	Phone
Program Manager	R. Sweeten	LMMRT	DSN 458-1984
Program Engineer	R. Johnson	LMMRT	
Program Equipment Specialist	R. Sweeten	LMMRT	
Item Manager	J. Hanni	LMMRT	

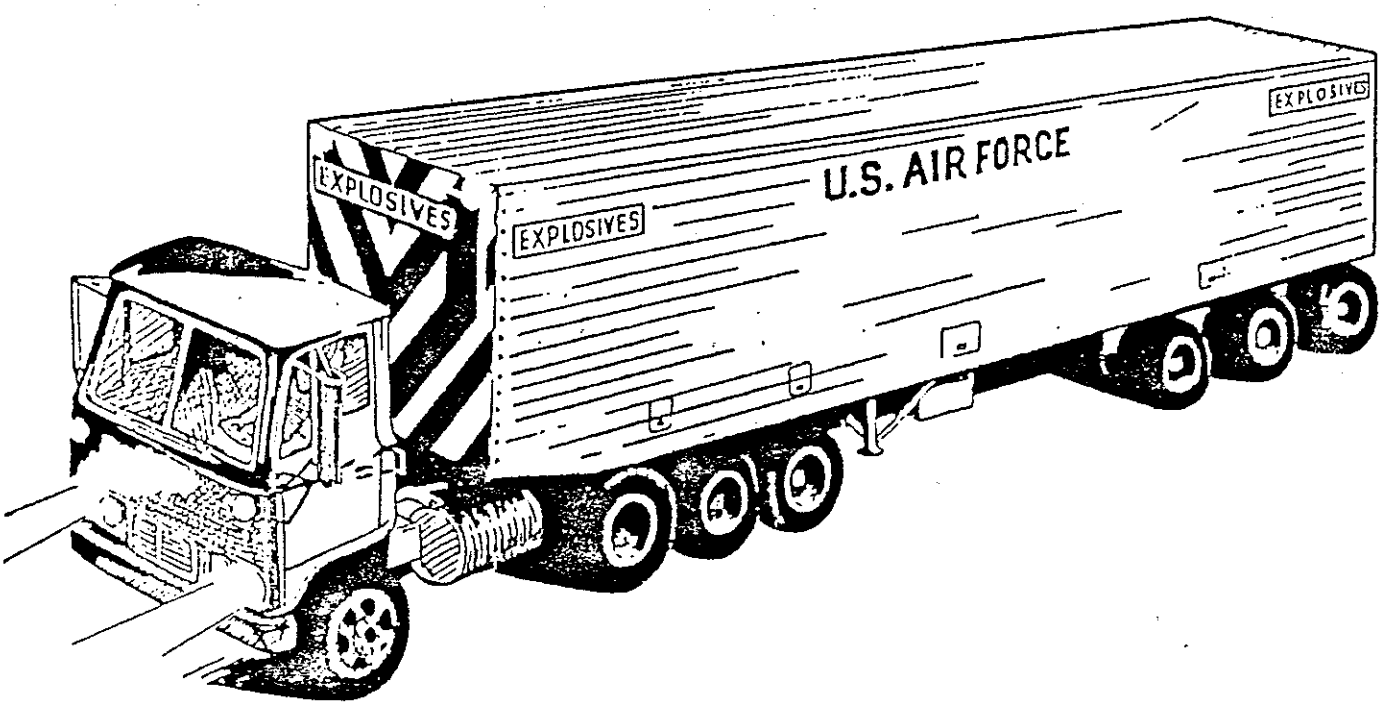
2.3.2.2 Missile Transporter Replacement (90-22-3-0-0400)

The 1960s vintage Missile Transporter (MT) (Figure 2.3-2) is a tractor-trailer combination used to transport assembled MM boosters between wings, VAFB, and OO-ALC, the overhaul repair facility. The trailer can also be mounted on special railcars, fulfilling two of the three transportation modes required for MM boosters.

The current configuration of the tractor is one steering axle, three drive axles with single-wide-base wheels, an extended frame, and a specially positioned fifth wheel which allows a turning radius of approximately 50 feet. The tractor experiences problems similar to any 20 plus-years-old vehicle, ranging from engine and transmission problems to door handle replacement problems.

The trailer is a box with subsystems mounted on it, including the ECS, auxiliary power system, landing gear, winch, and hydraulic system. Replacement parts for these subsystems are a problem, especially the ECS. Structural modifications to the trailers during programmed depot maintenance over the last several years resulted in an increased axle load weight of approximately 1,000 pounds. Because of this additional weight, the tractor-trailer combination is in violation of the federal and state Department of Transportation codes. California and Missouri will not allow the loaded MT to travel on their highways, and other states are contemplating this same action.

The existing MTs will be replaced with ten new tractors and 20 new trailers of a new design. The TRD requires that the new vehicle be permitted within all states affected, and that commercial components be used wherever possible. The operating life is either 15 years or 500,000 road miles with organizational, intermediate, and depot maintenance. It will have a Mean Distance Between Failure (MDBF) of at least 100,000 miles, and will undergo component reliability testing on the winch, ECS, engine generator set, and hydraulic power unit.



MINUTEMAN MISSILE TRANSPORTER
Figure 2.3-2

Schedule:

Event	Completion Date
SOW/Data Call	Feb 89
PR Package to PMZ	Dec 89
Contract Award	Jun 90
SDR	Oct 90
PDR	Dec 90
CDR	May 91
FCA/PCA	Oct 92
Delivery	Nov 92 - Jul 93

Program Management	Name	Office	Phone
Program Manager	W. Steiger	LMMRT	DSN 458-1110, X 5-3140
Program Engineer	R. Johnson	LMMRT	
Program Equipment Specialist	J. West	LMMRT	
Item Manager	J. Hanni	LMMRT	

2.3.2.3 Payload Transporter Type III (89-22-3-0-0300 and 88-22-2-0-0-0874) and Payload Transporter Type III Trainer (57098B)

The RV/G&C van is used to transport and remove/replace the RV and the MGS for the MM II weapon system. The Payload Transporter (PT) is used to perform the same functions for the MM III weapon system. Existing vans are becoming increasingly difficult to support, parts are difficult to procure, and out-of-commission time is rising. Study of the RV/G&C van indicated replacement action should be taken to ensure mission supportability beyond the year 2000. Greater life cycle cost savings can be achieved through the acquisition of a common van, i.e. PT Type III.

A single configuration van will satisfy the mission requirements of both the existing RV/G&C van and the PT van. Armor protection will be provided in the new design of the PT III which will comply with DODM 5210.41, protecting the RV/RS from small arms fire. A total of 40 vans and one trainer will be procured.

a. Reliability - The PT III will have a minimum operating life of 15 years or 260,000 road miles and a MDBF of at least 65,000 miles with periodic inspection no sooner than 10,000 miles or six months.

b. Maintainability improvements will include an improved design of the environmental flaps and new hoist design and use of commercially available parts. Human engineering criteria are being enforced to allow more work space and a safer work environment for maintenance personnel.

This program includes the purchase of 19 new tractors. These tractors when combined with the existing PT tractors will support the 40 new vans.

Schedule:

Event	Completion Date
SOW/Data Call	Jul 88
PR Package to PMZ	Mar 89
Contract Award	Sep 89
SDR	Dec 89
PDR	May 90
CDR	Jan 91
FCA/PCA	Jun 92
Trainer Kitproof (Facility Mod.)	Jun 92
Trainer Kitproof (PT III)	Sept 92
FAD	Nov 92
FOC	May 93

The PT III trainer program is a weapon system compatibility modification to the AN/GSQ-T41 (EU) trainer at Wing I. This trainer presently uses a modified RV/G&C van to train missile maintenance teams in mate/demate operations of RVs and MGS emplacement/ removal. The need for realistic training requires that the existing RV/G&C van be removed and the trainer modified to accept the new PT III.

OO-ALC will modify the EU trainer to accept the new PT III van. This modification is incorporated with the weapon system contract to ensure the trainer is delivered and ready for training prior to weapon system FAD.

Trainer Schedule:

Event	Completion Date
Contract Award	Jan 90
PDR	Aug 90
CDR	Jan 91
FCA/PCA	May 92
FAD	Jul 92

Program Management	Name	Office	Phone
Program Manger	L. Anderson	LMMRT	DSN 924-2240
Program Engineer	K. Gomm	LMMRT	
Program Equipment Specialist	N. Silvester	LMMRT	
Item Manager	J. Hanni	LMMRT	

2.3.2.4 Rocket Motor Transporter (89-22-3-0-0202)

The sixteen 1960s-vintage rocket motor transporter is a semitrailer used to transport MM booster stages. The specialized trailer has a removable bonnet that converts it to a flatbed-type trailer. In this configuration, the trailers can be used at the X-ray facilities at the MAMS and at the Oasis storage facilities. The replacement of these vehicles is necessary due to excessive corrosion and weight problems. When the transporter is loaded with the Stage I motor, it does not meet the federal highway requirements and cannot be permitted for travel.

The transporters will be replaced with a redesigned vehicle that will meet the federal highway requirements. The TRD requires that the vehicle have a minimum operating life of 400,000 road miles or 15 years, and a MDBF of 100,000 miles with organizational, intermediate, and depot level maintenance.

Schedule:

Event	Completion Date
SOW/Data Call	Mar 88
PR Package to PMZ	Mar 89
Contract Award	Sep 89
SDR	Dec 89
PDR	Apr 90
CDR	Oct 90
FCA/PCA	Feb 92
Initial Delivery	Mar 92
Final Delivery	Sep 92

Program Management	Name	Office	Phone
Program Manager	W. Steiger	LMMRT	DSN 458-1110, X 5-3141
Program Engineer	R. Johnson	LMMRT	
Program Equipment Specialist	J. Lewis	LMMRT	
Item Manager	J. Hanni	LMMRT	

2.3.2.5 Transporter Erector Actuator Redesign (F51312B)

The Transporter Erector (TE) is used to transport, emplace, and remove assembled MM boosters. During an emplacement at a training site, an incident occurred which caused the third stage of the hydraulic actuator assembly to fail. To prevent future failures of this type, the actuator assembly is being redesigned to increase the strength of the third stage actuator.

The modification will be contracted under a sole source justification to the original vendor. The contractor will redesign the third stage actuator tube increasing the outside diameter and wall thickness. The first two actuators designed and modified will be used in qualification testing and kitproof. Upon completion of qualification testing, the contractor will modify 70 actuators and deliver them to the bases for installation.

Upon receipt of a modified set of actuators, the base will immediately remove the old actuators and ship them direct to the contractor for the next cycle of modification. The pipeline will be maintained until all TEs have been modified with the redesigned actuators.

Schedule:

Event	Completion Date
SOW/Data Call	Dec 91
PR Package to PMZ	Dec 91
RFP Released	Feb 92
Proposal Receipt	Mar 92
Contract Award	Jun 92
PDR/CDR	Feb 93
Qual Test	Mar 93
Kitproof	Apr 93
FAD	Jun 93
Final Delivery	Jan 94

Program Management	Name	Office	Phone
Program Manager	W. Steiger	LMMRT	DSN 458-3140
Program Engineer	R. Johnson	LMMRT	
Program Equipment Specialist	R. Bailey	LMMRT	
Modification Manager	L. Loftus	LMMRO	

2.3.2.6 Transportation and Handling Equipment Programs Under $1 Million

A numerical listing of the T&HE programs below the $1 million threshold is provided here for reference.

Mobile Instrumentation Tractor	87-22-1-0-0118
Container ship and Store	85-22-2-0-0157
APU	90-25-1-0-0922
Guide Handling Unit (DO39)	92-22-1-0-1016

2.3.3 Trainer-Unique Equipment

2.3.3.1 Remote Start Unit (57100B)

The Remote Start Unit (RSU) program is a trainer modification driven by a weapon system MCL to modify the power/ECS trainers at Wings I, III, V, VI and at the Chanute Technical Training Center. The weapon system modification provides the missile combat crew with the capability to remotely start the diesel electric unit in the LF support building when situations warrant. SAC maintenance personnel require hands-on training in troubleshooting and replacing the RSU. Accordingly, SAC on-base trainers and ATC trainers must be modified to maintain full weapon system simulation and capability to provide adequate training.

OO-ALC is modifying the power/ECS trainers by contract to incorporate the RSU, so maintenance personnel can be fully trained on this equipment. Contracting problems caused an 11-month slip after the PDR. The contract was amended and approved by the RRB. CDR is scheduled for completion in August 1992.

Schedule:

Event	Completion Date
SOW/Data Call	Jul 89
PR Package to PMZ	Jun 90
Contract Award	Aug 90
CDR	Aug 92
Kitproof Wing I-VI	Nov/Dec 92
Installation CTTC	Nov 92
Completion	Feb 93

Program Management	Name	Office	Phone
Program Manager	B. Wilson	LMECC	DSN 458-2912
Program Equipment Specialist	G. Maynard	LMECC	
Modification Manager	B. Wilson	LMECC	

2.3.3.2 Sump Pump (55109B)

LF power and ECS trainers are located at each wing and Chanute AFB. The trainers are used to train Air Force personnel in a wide variety of LF maintenance tasks. However, none of these trainers are designed to train personnel in troubleshooting, adjustment, and removal/replacement procedures for the LF sump pump assemblies. Teams are dispatched from the wing strategic missile support base to operational LFs to train maintenance personnel in these operations.

Operational sump pumps with power, controls, and a recirculating fluid system will be incorporated into LF power and ECS trainers.

All wings are complete and Chanute AFB will be completed by June 1992.

Schedule:

Event	Completion Date
CCB	Apr 87
PR Package to PMZ	Oct 87
Contract Award	Sep 89
PDR	Jan 90
CDR	Jun 90
Kitproof (Wing VI)	Apr 91
Kitproof (Wing I)	Oct 91
Kitproof (Wing III)	Oct 91
Kitproof (Wing V)	Jan 92
Installation	
Chanute AFB	Jun 92

Program Management	Name	Office	Phone
Program Manager	B. Wilson	LMECC	DSN 924-2912
Program Equipment Specialist	G. Maynard	LMECC	
Modification Manager	B. Wilson	LMECC	

2.3.3.3 Operational Ground Equipment Power System Upgrade (55108B)

The trainers have only mock-up emergency power equipment at the present time. Simulated MGs, battery chargers, and batteries are used in Wings III and V LFTs to train personnel in equipment maintenance. Training in OGE power system maintenance, therefore, requires the dispatch of teams to operational sites.

Operational MGs, battery chargers, and batteries will be incorporated in LFTs to provide on-base training with this equipment.

The power fault-to-ground capability failed during the final kitproof. SAC approved the deletion of the capability and the contract is being modified to allow this. The contractor is currently installing the production unit at Wing V.

Schedule:

Event	Completion Date
CCB	Mar 87
Contract Award	Sep 89
PDR	Jan 90
CDR	Sep 90
Kitproof	Jan 92
Completion	Dec 92
Installation	
Wing III	Jan 92
Wing V	May 92

Program Management	Name	Office	Phone
Program Manager	B. Wilson	LMECC	DSN 924-2912
Program Equipment Specialist	G. Maynard	LMECC	
Modification Manager	B. Wilson	LMECC	

2.3.3.4 Missile Launch Communication System Trainer Modification

The missile launch communication systems trainer is used to train communication system maintenance teams in troubleshooting, repairing and adjustments to the weapon system. The current trainer is not compatible with the weapon system equipment, various components are not supportable, and configuration and technical data are out of date with the actual fielded weapon system equipment.

The proposed solution is to modify the trainer to be compatible with the weapon system, to enhance logistics supportability, and to document exact configuration. The modification will include upgrading the Telephone Repeater Sets (AN/GTC-90) and Communications Terminal Equipment (AN/GTC-10) and associated equipment, replacing unsupportable components, and documenting OO-ALC and ATC modifications.

The upgrade deletes unnecessary simulation and replaces unsupportable components. These actions will increase R&M.

Since there is only one kit involved, the modified equipment will remain installed after the kitproof.

Schedule:

Event	Completion Date
SOW/Data Call	Feb 94
CCB	Oct 93
PR Package to LMK	Apr 94
Contract Award	Oct 94
SDR	Jan 95
PDR	Apr 95
CDR	Jul 95
PCA/FCA	Dec 95
Kitproof	Dec 95

FAD	Dec 95
Installation-ATC	
Sheppard AFB	Dec 95

Program Management	Name	Office	Phone
Program Engineer	V. Huffaker	LMECC	DSN 924-2911
Program Manager	B. Wilson	LMECC	DSN 924-2912
Program Equipment Specialist	B. Garr	LMECC	DSN 924-2914
Item Manager	J. Marquardt	LMECC	

2.3.3.5 Airborne Procedures Trainer Computer Replacement

The Airborne Procedures Trainer (APT) simulates the operational Airborne Launch Control Center (ALCC) and provides qualification follow-on training and proficiency evaluation of the MCC-A. Training and evaluation include preflight, inflight and postflight operations and communication for common command post and ALCC/relay aircraft configurations. Computer components include a VAX 11/750 main computer, Intel 80186 CPUs located in a three-subsystem buffer, and the Ethernet LAN which connects the three subsystem CPUs to the main computer.

Most of the APT equipment is controlled by the three computer systems and the VAX main computer. The computers are becoming unsupportable due to obsolescence.

The program will replace the computers with supportable state-of-the-art equipment.

Schedule:

Event	Completion Date
SOW/Data Call	Aug 95
CCB	Sep 95
PR Package to LMK	Jan 96
Contract Award	Aug 96
SDR	Dec 96
PDR	May 97

CDR	Sep 97
PCA/FCA	Mar 98
Kitproof	Apr 98
FAD	Jul 98
Installation	
Offutt AFB	Jul 98

Program Management	Name	Office	Phone
Program Engineer	M. Gonnella	LMECC	
Program Equipment Specialist	B. Garr	LMECC	DSN 924-2914
Item Manager	J. Marquardt	LMECC	

2.3.3.6 Control Monitor Procedures Trainer Computer Replacement Program

The Control Monitor Procedures Trainers (CMPTs) are designed to train Air Force personnel in weapon system start-up, shutdown, and computer loading operations and maintenance procedures. The CMPT software simulates the interactive support functions associated with MM III A-M and B systems expanded execution plans for an operational weapon system. The CMPTs use a Data General 10SP computer. The computers are becoming unsupportable due to obsolescence. The R-DOS operating system was dropped from the computer market over five years ago and is unsupportable. The computer is limited in memory, making software updates difficult.

The computers will be replaced with supportable state-of-the-art equipment and software.

Schedule:

Event	Completion Date
SOW/Data Call	Oct 92
CCB	Nov 92
PR Package to LMK	May 93
Contract Award	Oct 93
SDR	Feb 94
PDR	Jul 94

CDR	Nov 94
PCA/FCA	May 95
Kitproof	Jun 95
FAD	Sep 95
Installation	
Wing I	
Wing III	
Wing V	
Wing VI	
ATC	

Program Management	Name	Office	Phone
Equipment Specialist	G. Maynard	LMECC	DSN 775-2917
Engineer	V. Huffaker	LMECC	
Item Manager	J. Marquardt	LMECC	

2.3.3.7 Peacekeeper in Minuteman Silos Launch Facility Trainer and Launch Facility Operational Support Equipment Trainer Computer Replacement

The computer systems for the PIMS LFT and Launch Facility Operational Support Equipment (LFOSET) utilize similar commercial components. The LFT and LFOSET computer programs control simulated Operational Support Equipment (OSE) and MSE responses during student training in LF organizational maintenance procedures. Computer components include a VAX 11/750 main computer, an Intel 80186 CPU in the buffer, and the Ethernet LAN which connects the buffer with the main computer. The computers are becoming unsupportable due to obsolescence.

Computers will be replaced with supportable state-of-the-art equipment.

Schedule:

Event	Completion Date
SOW/Data Call	Aug 94
CCB	Sep 94

PR Package To LMK	Jan 95
Contract Award	Aug 95
SDR	Dec 95
PDR	May 96
CDR	Sep 96
PCA/FCA	Mar 97
Kitproof	Apr 97
FAD	Jul 97
Installation	
Wing V	Jul 97

Program Management	Name	Office	Phone
Program Engineer	M. Gonnella	LMECC	
Program Equipment Specialist	B. Garr	LMECC	DSN 924-2914
Item Manager	J. Marquardt	LMECC	

2.3.3.8 Trainer-Unique Equipment Programs Under $1 Million

A numerical listing of the trainer-unique equipment programs below the $1 million threshold is provided here for reference.

Trainer Mods for START	12345D
Mod to RY MPT Air Conditioners	1234A
Mod to CMPTS to Incorp. Supp. Computer Equip.	5011B
Mod to NSB-38 on MPTs	5012B
Mod of Pwr/ECS Trainers	51307B
Mod of LGM30 Trainers to Incorp. MM III Conv.	51310B
Air Conditioner Replacement Mod	53018B
Master Change Log	55042B
Mobile Instrumentation Tractor (SELM Equip.)	87-22-1-0-0118
MM CLS Trng Support Equipment	93-22-2-0-1037
Missile Procedures Trainer KG-38 Simulator Modification	

3.0 PEACEKEEPER PROGRAMS DESCRIPTIONS AND STATUS (Appropriation 3020)

3.1 Peacekeeper Aerospace Vehicle Equipment

PK AVE is comprised of three solid stage motors and the RS. Production of PK AVE will end in the FY92/93 timeframe. Postproduction support activities include AS, depot maintenance support, field problem support, and operational flight test program support. These will be the responsibility of the Sustaining Systems Management Office (SSM) at HAFB.

To maintain the PK AVE subsystem through its deployed life, an assessment program is required to provide the reliability data. The program is comprised of operational flight testing, data analysis and reporting; AS testing, data analysis and reporting; and PK Assessment Report preparation, which includes SLA.

Depot maintenance is required to repair and overhaul the elements of the AVE. This capability is needed to maintain alert status and to repair any anomalies or discrepancies with the AVE. Depot capability for the solid stages and the PBV are maintained at HAFB and the RS depot capability is maintained at Kelley Air Force Base, Texas.

Contracting for production support tasks is provided by SSM funds with the contract managed by the SSM Procuring Contracting Office (PCO). All engineering direction will be provided by the SSM AVE Engineering Office (LMAP).

Schedule:

Event	Completion Date
Contract Award	Oct 93
Stage I Sustaining Engr.	Apr 93
Stage II Sustaining Engr.	Apr 93

PBV Sustaining Engr.	Jan 93	
RS	Jan 93	
Ordnance Sustaining Engr.	Oct 93	

Program Management	Name	Office	Phone
Solid Propulsion/Ordnance			
Program Engineer	J. Cox/C. Pyles	LMAPP	DSN 924-2131
Program Manager	D. Hendry	LMAPP	
Program Equipment Specialist	H. Ray/C. Ringle/ L. Johnson	LMAPP	

3.2 Peacekeeper Specific Force Integrating Receiver (90-25-1-5-0843)

The Specific Force Integrating Receiver (SFIR) is one of the instruments within the IMU of the Missile G&C Set (MGCS) which measures velocity along three orthogonal axes. The SFIR incorporates a pendulous integrating gyro having a specific mass unbalance along the spin axis, and provides correction rates to the Missile Electronics Computer Assembly (MECA) which provides outputs to the different direction control units resulting in control of the missile flight.

To maintain the required MGCS spares level for Single Integrated Operational Plan planning, additional spare SFIRs are required to be procured.

Procurement is made using AFLC funds on a BMO contract, managed by the BMO PCO.

Schedule:

Event	Completion Date
Contract Award for 40 each	Aug 90
Delivery	Jan 91 thru Apr 92

Program Management	Name	Office	Phone
Program Manager	L. Hodges	LMAG	DSN 458-5462
Program Engineer	D. Butcher	LMAG	
Program Equipment Specialist	F. Brooks	LMAG	
Item Manager	T. Miller	LMAG	

3.3 Peacekeeper Reentry System Engineering Data

To maintain the PK RS, a complete set of baseline engineering data is required.

Tasks to be completed are: submit missing drawings referenced on control drawings, submit data referred to as "catalog" items in the master engineering data list, create list of drawings needing ESD markings so OO-ALC can correct them, update the NH&S Design Analysis Report, create specifications for the CIs that do not yet have them, submit missing data needed for the support equipment requirements documents, and determine whether or not to delete/resubmit final data for those "preliminary data" packages previously received.

Schedule:

Event	Completion Date

A schedule is being developed and will be provided at a later date.

Program Management	Name	Office	Phone
Program Manager	D. Westien	LMAPR	DSN 924-2330
Program Engineer	D. Westien	LMAPR	DSN 924-2330
Program Equipment Specialist	L. Christensen	LMAPR	DSN 924-2335

3.4 Peacekeeper Third Generation Gyro (90-25-1-5-0844)

The Third Generation Gyro (TGG) is one of the instruments within the IMU of the MGCS and measures/monitors rotational disturbances of the floated sphere from the prescribed

inertial orientation. A pair of hydraulic bidirectional jet valves on opposite sides of the floated sphere are slaved to the output of each gyro to achieve corrective rotation of the sphere about the same axes monitored by their related gyro. The messages are sent through a communications system back and forth to the MECA which provides G&C commands to the other control units to ensure accurate missile flight.

To maintain SAC-required spares levels for the MGCS, additional TGGs are to be procured. Procurement is made using AFLC funds on a BMO contract, managed by a BMO contracting officer.

Schedule:

Event	Completion Date
Contract Award for 33 each	Sep 91
Delivery	Nov 91 - Oct 92

Program Management	Name	Office	Phone
Program Manager	L. Hodges	LMAGR	DSN 458-5462
Program Engineer	R. Young	LMAGR	
Program Equipment Specialist	F. Brooks	LMAGR	
Item Manager	T. Miller	LMAGR	

3.5 Peacekeeper Solid Propulsion Dissection

The PK solid propulsion dissection program is the management responsibility of SSM at HAFB. The program encompasses the dissection of Stages I and II rocket motors for AS testing. The program will modify facilities, purchase equipment and tooling for handling and dissection of the motors, and develop technical orders for the procedures.

Procurement of hardware and contracting for data and engineering support is the responsibility of SSM, utilizing funding provided by the SSM organization.

Schedule:

Event	Completion Date
Contract Award	May 92
Logistics Support Analysis/TO Preparation	
Purchase of Additional Equipment	Mar 93
Subsystem Safety Analysis	Feb 93
TO Completion	Mar 93
Operational Safety & Hazard Analysis	Apr 93
Dissection of Proof of Concept Motor	Apr 93 - Sep 93

Program Management	Name	Office	Phone
Program Engineer	J. Cox	LMAPP	DSN 924-2131
Program Manager	D. Hendry	LMAPP	
Program Equipment Specialist	H. Ray	LMAPP	

3.6 Peacekeeper Launch Support System Modification

SAC has directed that all VAFB flight test systems and the PK LSS will be compatible with the SAC ILSC requirement. LFs 02, 05, 08, the LF LSS equipment, and the PK LSC must be modified with the SCADA baseline system. New SCADA equipment will be procured for the PIMS launch sites and existing MM coaxial cable used for closed loop telemetry. Most MM LSS equipment is directly applicable to PK without modification or with only slight modification. All test flight interfaces will remain and trainers are not impacted. The PK LSC will be relocated to the ILSC.

Several pieces of PK LSS equipment have high yearly maintenance costs. This equipment will be replaced to reduce the cost by $3.2 million. The equipment includes the ground control and power unit, monitor and control console, LPS, fiber optics transmission system, and LSC. This equipment is failing at the rate of one per test flight. The average failure repair costs $40 thousand. The new equipment will have an MTBF of 5,000 hours with an average repair cost of $1 thousand.

The following launch support subsystems are involved in the modification:

PK LSC
Monitor and Control
Safety Consoles
Launch Environmental Protection System
Command Destruct
Telemetry
Beacon Tracking (C-Band)
Voice Communications
Mock-ups

The new equipment has an MTBF of 5,000 hours.

Schedule:

Event	Completion Date
SOW/Data Call	Nov 91
CCB (for BP2100)	Sep 91
PR Package to PMZ	Dec 91
Contract Award	Dec 92
SDR	May 93
PDR	Nov 93

Program Management	Name	Office	Phone
Program Manager	J. Barlow	LMAGR	DSN 924-2107
Equipment Specialist	W. Dillon	LMAGR	
Program Engineer	J. Leach	LMAGR	

3.7 Launch Control Program

The basing portion of PK software has been transferred to OO-ALC for long-term support. There are no requirements identified, or plans being pursued to update the Launch Control Program (LCP) because BMO made several block updates prior to the transfer and the final LCP is now being deployed in the field. The LCP operates in the Launch Control System Controller (LCSC) which functions as the ground processor in the LF. The LCP provides the

C^3 interface link between the LCCs and the Operational Ground Program (OGP) which operates the computer on board the missile. The LCP also controls missile targeting constant verification and transfer to the OGP, controls terminal countdown operations, and gathers/reports status of the OGE.

Schedule:

Event	Completion Date
Competitive Procurement Action	Oct 96

Program Management	Name	Office	Phone
Program Manager	D. Ericksen	LMEO	DSN 458-1760

3.8 ICBM Code Processing System

The ICBM Code Processing System (ICPS), composed of the WCPS and the SAC Code Processing System (SCPS), is being considered for management transfer to OO-ALC within the next three years. The WCPS and SCPS software runs on HP 2117F computers and share a program called Common Certification Operating System.

The WCPS prepares load cartridges for loading computer programs and data into the LF and LCF operational processors. It also provides secure codes for coding devices used in the weapon systems. MM-unique load cartridges are generated with a program called WMAP. PK-unique load cartridges use WPAP. The SCPS prepares the SAC master tapes and load cartridges for distribution to the WCPS and ALCC. It utilizes the SCPS Application Program, contractor master data and NSA codes data to prepare the data tapes and generate required codes.

OO-ALC is initiating plans to obtain the necessary hardware, facilities and software to totally manage the ICPS. The feasibility of moving a WCPS from one of the deactivated wings is being studied.

Schedule:

Event	Completion Date
Trade Study to move ICPS to Ogden	May 92

Program Management	Name	Office	Phone
Program Manager	D. Ericksen	LMEO	DSN 458-1760

3.9 Strategic Missile Test Complex Peacekeeper Data Acquisition (97-22-1-0-0904)

The SMTC Data Acquisition System (DAS) consists of analog and Digital DAS (DDAS) equipment and Upgraded DAS (UDAS) which are sets of computers and recording devices.

The SMTC data acquisition systems, UDAS/DDAS, are part of the PK Test Facility (PKTF). The data acquisition systems are required to record, process, and display data collected from test points in the PKTF instrumentation equipment. The DDAS acquires, records, processes, displays, and prints defined PK system digital data. The UDAS performs the same functions as the DDAS except the data is acquired from the MGCS/MECA. Many data acquisition systems replacement parts will no longer be manufactured or stocked in FY95 and the system will become nonsupportable. State-of-the-art equipment must be procured to assure adequate testing can be accomplished and to insure the missile system is functioning at mission readiness levels.

Schedule:

Event	Completion Date
Procurement Action	Oct 94

Program Management	Name	Office	Phone
Program Manager	B. John	LMETP	DSN 458-5678
Program Engineer	B. John	LMETP	

3.10 Common Airborne Procedures Trainer Equipment

The common APT was PMRTd with nine problems. Eight of these are weapon system/ trainer configuration incompatibility discrepancies, and one is an air conditioner malfunction problem. The solution is to bring the APT up to the current configuration of the weapon system. In most cases this will require minor hardware and software changes.

Schedule:

Event	Completion Date
SOW/Data Call	Sep 92
CCB	Aug 92
PR Package to PMZ	Mar 93
Contract Award	Aug 93

Program Management	Name	Office	Phone
Program Manager	B. Garr	LMECC	DSN 924-2914
Program Engineer	M. Gonnella	LMECC	
Program Equipment Specialist	B. Garr	LMECC	
Item Manager	J. Marquardt	LMECC	

3.11 Peacekeeper Tractor, Transporter Truck Type II Replacement

The Type II tractor is used to tow the PK missile stage semitrailer. The existing tractors were designed for low speed, relatively short distance use on secondary roads. However, the depot is required to use these tractors to transport the PK missile stages at higher speeds on interstate highways. The long distances these tractors are driven at highway speeds reduces their reliability. The excessive number of breakdowns has caused the parts supply to dwindle and the out-of-commission rate to rise. The current tractor has an MDBF of approximately 4,000 miles.

This program will purchase seven new tractors for depot use only. The MDBF will be 50,000 miles and the service life will be 250,000 road miles without depot maintenance or 500,000 road miles with depot maintenance. The tractors will be comprised of mostly commercial off-the-shelf parts and will be procured competitively.

Schedule:

Event	Completion Date
SOW/Data Call	May 92
PR Package to PMZ	Jun 92
RFP Release	Jul 92
Contract Award	Nov 92
Delivery	May 93

Program Management	Name	Office	Phone
Program Manager	L. Anderson	LMMRT	DSN 924-2240
Program Engineer	1Lt T. Zadzora	LMMRT	
Program Equipment Specialist	B. Taylor	LMMRT	
Item Manager	J. Hanni	LMMRT	

4.0 SUSTAINING ENGINEERING (Appropriation 3400/EEIC 583)

The MM weapon system exceeded its initial ten-year design life goal many years ago. Some missile components and much of the system support equipment have been in continuous use for more than 20 years. This has resulted in a need for significant modification and redesign activity as equipment becomes nonsupportable due to a lack of replacement parts or vendor sources. Based on this history, the same expectations are projected for succeeding ICBM programs and planning is geared to accommodate the situation.

The ICBM spares concept is austere compared to other types of weapon systems. Sufficient subsystems were purchased to equip the support facilities and provide a limited number of spares based on failure rate estimates and minimum support requirements. Also, the system was designed for a relatively high level of work at the depot and a correspondingly lower effort by base organizational and intermediate level maintenance. This spares support concept requires continuing in-depth assessment programs to avoid parts nonavailability and resultant missile downtime.

In order to deploy and maintain viable ICBM weapon systems with a high rate of availability, reliability, and accuracy, OO-ALC must design, develop, and deploy replacement hardware and software that adhere to the operational specifications of the system. The ability of the system to survive a hostile nuclear environment must be maintained, and R&M enhancements must be included in planning for modifications, acquisition of spares, and depot repair in keeping with the Air Force R&M 2000 plan. Through sustaining engineering assessment, problems are identified and corrective actions begin before missile reliability, accuracy, availability, and survivability degrade to unacceptable levels. Readiness assessment identifies adverse trends, determines mission impact, and recommends corrective action.

As new requirements evolve, additional demands for modification and redesign occur. Each modification or new equipment item must be analyzed to ensure that system integrity and nuclear safety/surety are not degraded. System engineering is required to develop and review

engineering data for reprocurement, repair, maintenance, and modification. Part of system engineering support is provided under the System Engineering and Technical Assistance (SE/TA) concept. In this capacity, TRW assists and makes technical recommendations to the ICBM SPM, but the final decision and technical direction remains with the Air Force.

Key aspects driving ICBM support requirements are related to an early Air Force decision and the inherent nature of nuclear ballistic missile systems. In 1954, the Air Force Scientific Advisory Committee was formed and tasked to develop a management engineering philosophy for the ICBM development effort. A conscious decision was made by the Air Force to retain contractor support rather than organic personnel in development and technical support for ICBM systems.

The concepts initially set up to incorporate contractor personnel for scientific and engineering technical support, referred to as SE/TA and ASCONs, retain essential capabilities in supporting the ICBM systems. Individual system components and subsystems require engineering expertise and historical data files to assess continued performance and predict possible age-related failure modes. A group of associate contractors, known as the ASCONs, that designed and developed the initial ICBM systems worked under contracts over the years to resolve problems and provide engineering support. The ASCONs form an important part of the ICBM problem-solving community. Several contractors have been added to the ASCON list in recent years through competition.

Prior to being placed on contract, each requirement is reviewed to determine if all or part of it can be accomplished competitively. These concepts have been in continuous use for MM and PK since their inception.

The purpose of ICBM long range planning is to establish program requirements and costs for extended life of the weapon systems. Fundamental to the longevity findings on MM are the continuation of the engineering programs defined in this section. They formulate the core work which makes life extension possible.

Direction for managing Air Force systems is accomplished through the use of PMDs that originate at Headquarters, U.S. Air Force. The PMDs establish activities that are to be performed or supported, and which major modifications are to be accomplished. The funds expended for technical support as described in this section are largely a result of PMD taskings.

The following paragraphs describe the major programs being conducted under sustaining engineering funding. Additional detail is documented in the OO-ALC Plan for Sustaining Engineering OO-LMI-93/94-M133 for MM, and OO-LMI-93/94-M118 for PK.

4.1 Management/System Engineering

The Silo-Based ICBM Program Director is responsible for system effectiveness, system safety, and the management of configuration and system interface control documentation. Problems must be identified and their resolution controlled. Each modification or equipment replacement must be analyzed to be sure that system integrity and nuclear safety/surety are not degraded or compromised.

4.2 Mechanical

Contractual engineering support is required to allow continued operation and ensure performance within system specifications by ICBM mechanical GSE, including such items as the shock isolators and shock-isolated floor, the ECS, the MG, batteries, electromechanical equipment, the PK canister, and SAC-owned RPIE with hardness requirements. The required support includes evaluation of engineering data, hardness data, SAC-submitted MCLs, field problems, and new procurement data packages/first articles. Also included is support for Rivet MILE, in developing procedures, parts lists, support equipment lists, and ensuring that the engineering documents are updated through engineering change orders. Rivet MILE is accomplishing refurbishment of the LFs and LCFs using a detached depot team. By integrating PDM tasks with facility/weapon system modifications, cost and off-alert time have been minimized. The PK weapon system is housed in MM silos and utilizes much of the

same ground equipment. Rivet MILE also applies to PK because of the 50 PK missiles in MM silos.

4.3 Electrical

Contractual engineering support is required to resolve day-to-day problems pertaining to ICBM ground equipment electronics, including OGE. Engineering efforts are directly related to problems at the SAC missile wings, depot problems, flight test facility problems, and reprocurement problems. An indication of the amount of workload is that during a typical year the Electronics Division processes over 250 formal MM weapon system electronic projects to include 100 material improvement projects. Innumerable problems are also processed without establishing formal projects in response to SAC and in response to logistics support requests. The Electronics Division workload covers operational and MSE, electronic DMSE, and the C^3 area discussed in Section 4.4.

Sustaining engineering contracts allow OO-ALC to resolve problems by tasking weapon system ASCONs. This results in timely technical analysis and problem resolution. The hardware contractors conduct testing, analysis, or other engineering services required to identify and select proper equipment for component/material/process modification, interchangeability, replacement, or substitutability. This may include prototype design and demonstration. They will analyze, on an individual work assignment basis, material component subassemblies or full assemblies to determine aging and wear-out characteristics. They perform engineering required to resolve reported maintenance or repair problems, evaluate repair methods, and establish repair or maintenance procedures for failed or damaged components at operational bases, TRCs, or depot. They provide integration services to assess and control the interaction of configuration changes within the weapon system and identify required engineering data changes for OO-ALC approval required to implement changes. They perform engineering required for material or equipment in the field, depot, TRC, and contract repair facilities. They provide engineering and maintenance required for hardness and survivability sustainment. They prepare engineering documentation to support preparation of draft engineering changes into contractor engineering drawings and specifications.

4.4 Command, Control, and Communication

Contracted engineering support is required to resolve problems that occur during day-to-day operations pertaining to C^3 equipment. This support is similar to that discussed for the electrical support equipment in Section 4.3. The description of the type of services applies to this area also.

4.5 Guidance

Contractual engineering support is required for ICBM guidance systems. The status of the guidance system is very different for MM and PK. Versions of the current MM MGS have been in the operational inventory for 25 years. The system has been maintained well beyond its original lifetime requirement. Identified logistics problems, system age, and service life extension create a need for major initiatives to maintain a viable alert force. Current plans are to upgrade the existing MM III NS20 MGS electronics package, replace the flight computer, and to integrate AIMS technology. Force structure/mix options as a result of START are being evaluated and operational software programs will be affected. To insure all guidance issues are addressed and satisfied, software and technical engineering support is required.

Since deployment of PK, significant growing pains have been experienced in the system, resulting in numerous hardware and software modifications. Two of the major changes are a block upgrade to the IMU and software changes to the OGP. To guarantee all guidance issues are addressed, engineering support is needed to ensure the combined actions of ASCONs and OO-ALC are integrated and the issues resolved.

4.6 Test Facilities

Contract engineering support is needed for the SMTC, which provides OO-ALC with the capability for nonflight testing of all configurations of the PK and MM weapon systems. Testing is conducted at the system, subsystem, and piece-part level for hardware and software.

The SMTC provides field anomaly resolution, hardness anomaly resolution, and acceptance testing of modification programs.

Engineering support required to do the testing includes test planning and site preparation, test readiness reviews, test evaluation boards, test conduct and test result reporting. The support is also required to maintain weapon system test-unique hardware and software in the SMTC test facilities and to support troubleshooting, repair, and testing.

4.7 Transportation and Handling

Contractual engineering support is required for the PK T&HE, which is unique, complex, and technically challenging. Although relatively new, several modifications are required to improve the system. The support is for Type I and II transporters. Type I is used at VAFB only, for moving the stage containers from rail cars to Type II transporters and vice versa. Type II is used for the transportation of all PK stages, RSs, and launch eject gas generators. It is used at the SMBs, OO-ALC depot, and test facilities at VAFB.

4.8 Propulsion

Contractual support is required for ICBM propulsion stages, ordnance, and RSs. The systems requiring support vary widely from those that are new and are just being fielded to those that have been serviced for many years beyond their original design life. The effort includes support for operational flight tests, AS tests, service life determination and maintenance repair/replacement actions. Numerous flights, static firings, and nondestructive laboratory tests are conducted to identify aging trends and predict systems hardware lives. The contractor conducts or assists with the tests, analyzes the resultant data, and provides prediction of service life for motor subsystems, components, and materials. Anomalies identified during the tests are corrected to extend motor life via improved maintenance or item replacement prior to impacting operational reliability.

Data systems to support AS and assessment tasks will be maintained by the contractors to assure accurate and timely analysis. As propulsion systems are recycled to the depot and tested, maintenance problems and discrepancies are identified. The contractors evaluate hardware maintenance problems and deficiencies and qualify and develop repair procedures or replacement components and materials to resolve identified problems. Due to system age, numerous maintenance materials are no longer available or are prohibited due to environmental constraints. Replacement materials need to be selected and qualified for use in the current and future remanufactured propulsion motor systems.

4.9 Trainers

Contractual engineering support is required for ICBM trainers. Many of these are digital computer-controlled systems requiring periodic updates due to weapon system configuration changes or parts obsolescence. Studies and engineering services are provided in support of modifications or as problems are encountered with the field training equipment.

5.0 DEPOT PROGRAMMED EQUIPMENT MAINTENANCE AND CONTRACTOR LOGISTICS SUPPORT (Appropriation 3400, EEIC 54X and 578)

The repair and modification activities funded under Appropriation 3400, EEIC 54X, include:

5.1	Depot Programmed Equipment Maintenance
5.1.1	Depot System Maintenance Support (EEIC 542)
5.1.2	Repairable Stock Division
5.1.3	Rapid Execution and Combat Targeting Software Block Update (3413 PK)
5.1.4	Software Support (EEIC 540)
5.1.5	Other Major End Item Maintenance (EEIC 544X)
5.1.6	Area Base Support (EEIC 546)
5.1.7	Exchangeables Program (EEIC 545)

Any questions regarding DPEM should be directed to LMSM/DSN 458-6212.

Contractor Logistics Support (CLS) is a preplanned method used to provide all or part of the logistics support to a system, subsystem, modification, or equipment throughout its entire life cycle. CLS funding covers depot maintenance and, as negotiated with the operating command, necessary organizational and intermediate level maintenance, software support, and other operation and maintenance tasks. Systems or equipment are generally selected for CLS if they are not essential to wartime requirements or if development of organic capability is not cost-effective. The activity funded under Appropriation 3400, EEIC 578 is:

5.2	Contractor Logistics Support (EEIC 578)
5.2.1	Contractor Logistics Support for Missile Trainers
5.2.2	Peacekeeper Instrumentation and Flight Safety System

Any questions regarding CLS should be directed to LMSM/DSN 458-6213.

5.1 Depot Programmed Equipment Maintenance

5.1.1 Depot System Maintenance Support (EEIC 542)

Depot maintenance tasks are accomplished using organic resources where possible, and by contract when organic resources are overextended or do not have needed capabilities. Maintenance tasks which fall under each of these categories are discussed below.

5.1.1.1 Organic Maintenance

Organic resources are applied to support special SAC maintenance, recycle missiles, provide depot maintenance, and to transport, overhaul, and store MM and PK missiles and stages. Details for each of these tasks are provided below.

5.1.1.1.1 Special Maintenance Support

The concept of Rivet MILE grew out of a need to manage the maintenance of an already mature weapon system well beyond the year 2000. During the initial twenty years of MM deployed life, major force modification programs were implemented, including facility reconditioning. Since 1980, however, no major modifications have been programmed and weapon system maintenance has been minimal. Identified hardness problems, age degradation, and the service life extension have created a need for on-site PDM. Other modifications, based on either MCLs or TCTOs are also required. Rivet MILE, being conducted by AFLC, will integrate these MCLs and TCTOs concurrent with depot maintenance. The program is now being performed in two 3-year cycles with an extension of the second cycle. The first cycle began in April 1985. Candidate tasks to be implemented are identified by OO-ALC, SAC, TRW and ASCONs. The approved tasks are included in the Rivet MILE Program Management Plan. The program applies to PK because of the 50 PK missiles in MM silos.

During each Rivet MILE cycle, LFs and LCFs are taken off alert and turned over to depot maintenance teams. The teams implement repair and refurbishment tasks to correct material and equipment deficiencies. Selected modifications are implemented while the facilities are off alert for PDM. A list of modification/replacement tasks (OGE) scheduled for implementation in Rivet MILE are shown in Table 5-1. This planned and integrated approach to maintenance management will maintain the performance of the weapon system at a high on-alert rate while remaining within budget constraints. In Cycle 1, only limited tasks were performed by contractors for PK LF support buildings.

During Cycle 2, which began in September 1988, groups consisting of three or four LFs and one LCF were successively taken off alert at each wing.

In January 1990, Cycle 2 was extended to 1993 to accomplish all modifications, MCLs, and depot maintenance. This effort combined Cycle 2 and 3 tasks into what is known as Cycle 2 Extension (2X). The combining of depot maintenance, MCLs and TCTOs into Cycle 2X reduced overall accomplishment time of the two cycles by 15-17 months. Cycle 2X started on 29 June 1990. Candidate tasks were identified and prioritized, engineering data developed and validated, and funding was budgeted for procurement of replacement equipment and replenishment spares. The MCL tasks (RP/RPIE), LF and LCF PDM tasks (OGE and RP/RPIE), and miscellaneous PDM and MCL tasks (OGE and RP/RPIE) being accomplished during Cycle 2X are presented in Tables 5-1, 5-2, 5-3, and 5-4, respectively.

Cycle 2X is scheduled for completion no later than 30 September 1993. Due to the success of Rivet MILE and to respond to the need to continue the service life of the MM beyond 2010, planning began in 1990 for the follow-on Rivet MILE program. This program is named Rivet MILE 2010, is scheduled to begin in FY94, and will be conducted in two-year cycles. Rivet MILE 2010 is structured as a lower cost alternative to previous cycles and will continue the depot presence at ICBM wings. Greatly reduced in size and scope, the depot work force will perform only PDM and modification of OGE. SAC will provide a RP/RPIE work force at each wing dedicated to Rivet MILE 2010 task maintenance. LFs and LCFs will remain SAC-owned during Rivet MILE 2010 maintenance and configured as Category A

versus Category B whenever possible (e.g., reentry vehicle installed). Cost efficiencies will be achieved by colocating ICBM PD personnel with SAC maintenance personnel and consolidating management support functions under SAC on-base agencies such as supply, scheduling, vehicle maintenance, etc.

5.1.1.1.2 Missile Recycle

Organic labor is provided for depot level maintenance of missiles during refurbishment at OO-ALC. The effort includes disassembly, maintenance, x-ray, modification, inspection, reassembly, and functional tests as necessary to ensure that missiles and components are serviceable and of current configuration.

TABLE 5-1

RIVET MILE CYCLE 2 EXTENSION

MODIFICATION/REPLACEMENT TASKS (OGE)

WSE NUMBER	START DATE	TITLE	WING APPLICABILITY
511-001	Sep 88	LF MF Radio (Repl)	67
511-020	Aug 87	IMPSS	1356789
511-020A	Oct 88	Amend IMPSS	135679
511-021	Jan 85	G&C Ampl & Control Valve}	59
511-025	Oct 89	HIC I-Box	13589
511-059	Jul 90	MESP Battery	5 (321MIS)
511-074	Nov 85	Secondary Door Wiring}	5
511-205	Oct 88	L/T Heater Duct	67
511-213	Oct 88	EPL MESP Label	6
521-280	Mar 89	Brine Chiller Valve (LF)	1356789
511-294	Apr 89	Emergency Fan Motor (Repl)	1356789
511-297	Sep 88	UHF Antenna ESA	135679
917-001	Jun 88	MM II NCU Battery (Repl)	1
927-001	Jun 88	MM III NCU Battery (Repl)	35679
711-002	Sep 88	LCF MF Radio (Repl)	67
711-046	Oct 89	Motor Generator (Repl)	1356789
711-053	May 89	EMP Protection - B System	67
711-065	Feb 91	EMP Protection - A System	13589
711-095	Mar 87	Port IPD - Nutplate	356789
711-096	Jun 88	Port IPD - Electrical	67
711-250	Jun 88	Power Supply Drawer	67
711-275	Sep 88	UHF Antenna ESA	1359
721-294	Mar 89	Brine Chiller Valve (LCF)	1356789
711-297	Mar 90	ECS OPS Transfer Switch	13589
711-298	Sep 88	Alarm Monitor TBox	67

NOTES:

1 Wing I = 10,12,490 MIS; Wing III = 740, 41, 42 MIS Minot ND;
Wing VI 446, 47, 48 MIS Grand Forks, ND;
Wing VII = 564 MIS; Malmstrom, MT; Wing V = 320,321 MIS;
Wing VIII = 400 MIS; Wing IX = 319 MIS; FE Warren, WY

2 Not installed in the LCC Command Posts

3 Modifications/Replacements started in Cycle 1 which are carried over into Cycle 2X

TABLE 5-2

RIVET MILE CYCLE 2 EXTENSION

MCL TASKS (RP/RPIE)

WSE NUMBER	START DATE	TITLE	WING APPLICABILITY
512-026	6416	Modify Rattlespace Drain Line	167
512-038	6201C	Replace Conduit - Sump Pump 601 J Box	7
512-212	6441	Repair ECS Drain Line	1359
512-213	6650	Install ESA Vault Drain Holes	135679
512-214	6610	Mod LF Expansion Joint	67
512-215	6406	Move TS-1 J Box	3
512-235	6458	Install RFI Filters	13
512-235	6504	Install RFI Filters	5
512-255	6616	Inspect/Repair Pylons	135679
522-019	6391	Electrical Service Disconnect	9
522-020	6405	Disconnect Liquidometer	9
522-203	6590	Abandon LEB Delay Line	67
522-243	6424	Install Safety Lanyards	67
712-005	6341	Install Safety Ladders	1356789
712-206	6425	Modify TK-401 Water Tanks	7
712-207	6651	RPIE Switch for MG Set	1356789
712-219	6460	Install RFI Filters	13
712-221	6452	MM Interior Intrusion Detection Sys	1
712-221	6536	MM Interior Intrusion Detection Sys	3
712-221	6538	MM Interior Intrusion Detection Sys	59
712-221	6539	MM Interior Intrusion Detection Sys	6
712-221	6540	MM Interior Intrusion Detection Sys	7
712-221	8011	MM Interior Intrusion Detection Sys	8
712-271	6373C	Install Brine Line Bypass	67
712-272	6445	LCC Floor Plate Modification	67

NOTE:

Wing I = 10,12,490 MIS; Wing III = 740, 41, 42 MIS, Minot ND;
Wing VI 446, 47, 48 MIS, Grand Forks, ND;
Wing VII = 564 MIS, Malmstrom, MT;
Wing VI = 320,321 MIS; Wing VIII = 400 MIS; Wing IX = 319 MIS, FE Warren, WY

TABLE 5-3

RIVET MILE CYCLE 2 EXTENSION

LAUNCH FACILITY PDM TASKS (OGE & RP/RPIE)

WSE NUMBER	TITLE	WING APPLICABILITY
500-001A	Inspect-Repair HCI Components (OGE & RP/RPIE)	135679
500-001F	Deposture/Reposture Sites (OGE & RP/RPIE)	135679
500-001G	Site Preparation/Operations/Restoration (OGE & RP/RPIE)	1356789
500-001J	Site Acceptance-Technical Acceptance Teams (OGE)	135679
500-201B	Inspect-Repair Environmental/Control/System(OGE)	135679
500-201F	Deposture/Reposture Sites (OGE & RP/RPIE)	8
500-201L	Remove LF 36" Blast Valve (OGE & RP/RPIE)	67
511-011	Repair Personnel Access System Components (OGE)	135679
511-019	Repair Closure Actuator Components (OGE)	135679
511-279	Correct Water Leaks at UHF/EMP Antenna (OGE)	135679
511-282	Personnel Access Hatch Hand Actuator (OGE)	1356789
511-285	Inspect/Repair/Replace Audio ESAs	67
511-286	Refurbish Racks & Drawers (OGE)	135679
511-292	Repair Pipe Pusher Rail (OGE)	1356789
512-002	Repair LF Water Leaks (RP/RPIE)	1356789
512-004	Repair Sump Pump Controls (RP/RPIE)	135679
512-005	Repair Launcher Components (RP/RPIE)	13567
512-201	Remove/Install Transporter-Erector Pylons (RP/RPIE)	135679
512-236	Repair C-Rail Workcage Motor Door (RP/RPIE)	135679
513-002	Repair Leaking Splice Cases (OGE)	7
513-204	Repair HICS Penetration at ESA Room (OGE)	135679
521-220	Repair LEB Blast Doors (OGE)	67
522-002	Correct LFSB/LEB Water Leaks (RP/RPIE)	7
522-003	Repair Air Entrainment Syst (RP/RPIE)	67
522-225	Repair DEU and ASU Electrical Panels (RP/RPIE)	13569

NOTE:

Wing I = 10,12,490 MIS; Wing III = 740, 41, 42 MIS, Minot ND;
Wing VI 446, 47, 48 MIS, Grand Forks, ND;
Wing VII = 564 MIS, Malmstrom, MT;
Wing V = 320,321 MIS; Wing VIII = 400 MIS; Wing IX = 319 MIS, FE Warren. WY

TABLE 5-3 (cont)

RIVET MILE CYCLE 2 EXTENSION

LAUNCH CONTROL FACILITY PDM TASKS (OGE & RP/RPIE)

WSE NUMBER	TITLE	WING APPLICABILITY
700-001A	Inspect-Repair HCI Components (OGE & RP/RPIE)	1356789
700-001F	Deposture - Reposture Sites (OGE & RP/RPIE)	1356789
700-001G	Site Preparation/Operation/Restoration (OGE & RP/RPIE)	1356789
700-001J	Site Acceptance - Technical Acceptance Teams (OGE)	1356789
700-201B	Refurbish Environmental Control System (OGE)	1356789
711-211	Repair 24" Blast Valve (OGE)	234589
711-215	Repair Associated Motor Generator Components	1356789
711-264	Repair Liquid Shock Isolation (OGE)	67
711-267	Repair Rack & Drawers (OGE)	1356789
711-268	Repair Air Shock Isolators (OGE)	1234589
711-272	Repair VCNS Power Supply (OGE)	67
712-002	Repair LCC Water Leaks (RP/RPIE)	1356789
713-002	Repair Leaks - Termination Splice Cases (OGE)	67
713-220	Repair HICS Penetration at ESA Room (OGE)	1356789
721-003	Repair Shock Isolator Components (OGE)	67
722-217	Repair DEU/ASU Panels (RP/RPIE)	135789

NOTE:

Wing I = 10,12,490 MIS; Wing III = 740, 41, 42 MIS, Minot, ND;
Wing VI 446, 47, 48 MIS, Grand Forks, ND;
Wing VII = 564 MIS, Malmstrom, MT;
Wing V = 320,321 MIS; Wing VIII = 400 MIS; Wing IX = 319 MIS, FE Warren, WY

TABLE 5-4

RIVET MILE CYCLE 2 EXTENSION

MISCELLANEOUS PDM & MCL TASKS (OGE & RP/RPIE)

TRAINER PDM & MCL (ALL TASKS OGE)

WSE NUMBER	TITLE	WING APPLICABILITY
500-001A	Inspect-Repair HCI Components	13567
500-001B	Environmental Control System Start Up	1
500-001F	Deposture-Reposture Sites	13567
500-001G	Site Preparation/Operation/Restoration	13567
500-001J	Site Acceptance & Technical Teams	13567
500-201H	Site Pre-Inspection	13567
511-011	Repair Personnel Access Hatch Components	3567
511-282	Personnel Access Hatch Hand Actuation	3567
511-286	Refurbish Racks & Drawers	13567
511-292	Repair Pipe Pusher Rail	3567
512-002	Repair TLF Water Leaks	3567
512-004	Test-Remove/Replace SP102	3567
512-038	SP-601 J Box Replacement (MCL 6201)	7
512-201	Remove/Install Transporter Erector Pylons	13567
512-236	Repair C-Rail Workcage Motor Door	13567
512-248	Treat TLF Corrosion Below Grade	3567
711-048	LCC Blast Doors	1356789
712-208	Fill Tunnel Junction Expansion Joint	356789
721-014	LCEB Blast Doors	356789
9.1-201	Restore MSL Acc Nutplates/Fasteners	1
9.2-201	Restore MSL Acc Nutplates/Fasteners	35679

NOTE:

Wing I = 10,12,490 MIS; Wing III = 740, 41, 42 MIS, Minot, ND;
Wing VI 446, 47, 48 MIS, Grand Forks, ND;
Wing VII = 564 MIS, Malmstrom, MT;
Wing V = 320,321 MIS; Wing VIII = 400 MIS; Wing IX = 319 MIS, FE Warren, WY

TABLE 5-4 (cont)
RIVET MILE CYCLE 2 EXTENSION
MISCELLANEOUS PDM & MCL TASKS (OGE & RP/RPIE)

PROOF LOAD TEST FACILITY (RP/RPIE)

8-201	Repair Hydraulic System (RP/RPIE)	1356

MISSILE PDM (OGE)

91-201	Repair Nutplates & Fasteners - MMII (OGE)	1
92-201	Repair Nutplates & Fasteners - MMIII (OGE)	35679

NOTE:

Wing I = 10, 12, 490 MIS; Wing III = 740, 41, 42 MIS, Minot, ND;
Wing VI = 446, 47, 48 MIS, Grand Forks, ND;
Wing VII = 564 MIS, Malmstrom, MT;
Wing V = 320, 321 MIS; Wing VIII = 400 MIS; Wing IX = 319 MIS, FE Warren, WY

5.1.1.1.3 Depot Team Maintenance

Depot teams provide maintenance support in the field for some elements of the weapon system. Work includes major unprogrammed depot maintenance in response to requests from SAC wings in accordance with TO 00-25-107. For example, support is provided for the missile suspension system, blast door alignment, and bearing surface corrosion of the launcher closure door.

5.1.1.1.4 Missile/Motor Handling and Storage

Organic labor is used for the transportation, receipt, storage, internal movement, assembly, functional test, and shipment of the MM missiles and PK stages undergoing OO-ALC maintenance or being taken from storage and placed in service.

5.1.1.2 Contract Maintenance

Contract services are required for certain special tasks. These include remanufacture of the Stage II motors, the HSP, identification and correction of certain anomalies in field equipment, Rivet MILE, and PK launch refurbishment and FOT&E launch support.

5.1.1.2.1 Minuteman III Stage II Motor Remanufacture

This category provides the labor, material, and engineering services needed to wash out and remanufacture Stage II motors prior to ageout. This program is in progress and will result in a complete recycle of Stage II motors.

5.1.1.2.2 Hardness Surveillance Electromagnetic Pulse Program (87-22-1-3-0112)

The HSEP measures compliance of ground electronics with specifications for hardness to nuclear EMP. It identifies hardness problems and trends in sufficient time to allow repair or

replacement before weapon system capabilities degrade. Degradations can be caused by aging and by operational and maintenance activities.

5.1.1.2.3 Correction of Anomalies in Deployed Equipment

The SELECT effort funds isolation and correction of anomalous conditions in deployed equipment beyond the capability of the user's organizational or intermediate level maintenance organization. This may be due to a requirement for a high level of weapons system knowledge or for special test equipment.

5.1.1.2.4 Propulsion System Rocket Engine Recycle

This category provides for a program to recycle all PSRE systems to the depot to test and repair as necessary. Procedures have been developed and training conducted to overhaul axial engine actuators exhibiting discrepant response times. Five added tests will be conducted for system areas that have shown some aging trends or previous malfunctions. Twenty tests overall will assure like-new reliability of PSRE systems. A monthly program will send two PSREs per wing plus two depot spares through the depot testing and repair. Total force recycle should be completed by 1995.

5.1.2 Repairable Stock Division

This funding category provides for the labor, material, and overhead associated with exchangeables repair/modification. The funding covers organic, interservice, and contract efforts. Beginning in FY91 exchangeables were moved to the stock fund Repairable Stock Division (RSD).

5.1.2.1 Organic

The major effort in this category involves organic and contract support for the repair of guidance sets and AVE and OGE components. AGMC is the TRC for guidance sets. OO-ALC is the TRC for AVE and OGE component repair.

This effort is spread over different projects, some of which are conducted by OO-ALC, while others are conducted by SA-ALC, SM-ALC, and AGMC. The projects range in scope from individual components (capacitors, switches, etc.) to major assemblies (handling and servicing equipment, guidance systems, motors, etc.).

5.1.2.2 Defense Maintenance Interservice Support Agreement

This workload was transferred from SA-ALC to the Tooele Army Depot. The specific tasks are in the maintenance of ECSs (refrigerant compressors, air handlers, fans, chillers, etc.).

5.1.2.3 Contract

The efforts in this category involve operational reliability support, SLA, hardness testing of components, technical support, and the ALCC. All exchangeables that cannot be repaired by organic maintenance are repaired on contract. For example, MM PIGA and PIGA floats, memory units, and guidance system rotors, and PK SFIR, SFIR floats, and PGG floats. In 1991, the repair of exchangeables were moved to the RSD stock fund. An exception to this were the repair of items exempt from RSD.

5.1.3 Rapid Execution and Combat Targeting Software Block Update (3413 PK)

REACT will replace the OEP with the COP. The COP will perform the basic command, control and communications functions, targeting and launch sequences, monitoring of squadron message processing for up to 50 LFs while providing interfaces with the combat

crew. The COP will operate in the WSP, which is a VAX 810 computer, and will provide new human-machine interface functions. REACT FAD is scheduled for September 1993. While the field COP will meet current system requirements, it is anticipated that some additional requirements may be identified. In addition to new requirements, incorporating some of the significant anomaly solutions that were deferred due to tight fielding constraints, and resolving minor field problems discovered by the using command after deployment, will warrant a major update.

Schedule:

Event	Completion Date
Contract Award	Oct 94
SSR	Jul 95
PDR	Nov 95
CDR	Jul 96
TRR	Jan 97
FCA	Jun 97
Delivery	Oct 97

Program Management	Name	Office	Phone
Program Manager	D. Ericksen	LMEO	(801) 776-3390

5.1.4 Software Support (EEIC 540)

This category funds the following areas of software development and maintenance:

Software support for MGSs.
Software support for MM at OO-ALC.
Temporary duty travel for software support.
Software support for the ATS-E35E ATE.
Software support for PK.
ATE software support for PK OGE.
Software support for PK AVE (guidance system) at AGMC.
Software support for missile integrated support of testers utilized for development, integration, certification, and testing of operational software.

5.1.5 Other Major End Item Maintenance (EEIC 544)

The requirements in this category are projected based on known and anticipated item repair rates.

5.1.5.1 Organic Repair

This category provides for repair of assorted transportation equipment including the TE, TE tractor, BMT, MM III PT, and MM II RV/G&C transporter, SSCBM, RMT, PK Type I and II transporters, Oshkosh tractor, gantry crane, emplacer, Talbert trailer, AES trailer, and emergency response van. These repairs are needed to sustain equipment reliability and meet nuclear safety requirements.

5.1.5.2 Contract Repair

This category provides for fault isolation and repair of the Expanded Missile Data Analysis System, and for miscellaneous transportation and handling components.

5.1.6 Area Base Support (EEIC 546)

This category includes base/tenant support, manufacture for the Air Force stock fund, and manufacture of centrally procured items.

5.1.7 Exchangeables Program (EEIC 545)

This funding category provides for labor, material, and overhead associated with equipment repair and services (DO39 items).

5.2 Contractor Logistics Support (EEIC 578)

5.2.1 Contractor Logistics Support for Missile Trainers

PMD No. 5220(2)/64227F identifies CLS implementation requirements due to phase-out of the aircrew/missile training device career field (AFSC 341XX). The Air Force has selected 29 ICBM trainers that were supported by this career field and placed them under CLS. In addition, new ICBM trainers that utilize computer-based instruction were included in this contract. Currently, 48 of the approximately 140 ICBM trainers utilize CLS; the remaining trainers are organically supported. The trainers supported by CLS* are:

Nomenclature	Type Designation	Qty
Missile Procedures Trainers	RY, LE, PG	25
Airborne Procedures Trainers	LY, PH	2
Control Monitor Procedures Trainer		16
Launch Facility Trainer**	PE	1
Equipment Trainer**	PF	1
		45

* Weapon system equipment is supported by the Air Force except for organizational level removal and replacement.

** LFT and LFOSET require some organic organizational level maintenance.

5.2.2 Peacekeeper Instrumentation and Flight Safety System

The IFSS is currently funded with RSD funds. Prior to FY91, this project was worked using CLS funding. An item management review team recommended funding be returned to CLS funding. IFSS covers: Depot level repair, overhaul, modification, and testing of all IFSS hardware at contractor and vendor facilities, including both scheduled and unscheduled maintenance as well as metrology requirement; installation and checkout of the IFSS AVE and flight termination ordnance system components; IFSS truss assembly build-up and

functional check at the functional test facility; support of missile assembly and launch operations; and IFSS support equipment maintenance and custodial management support.

The current PMD decreases planned FOT&E flights from 108 to approximately 50, and the IFSS production contract was terminated on 8 March 1991. As a result, the number of IFSS flight assets exceeds the number of test flights. OO-ALC will continue using CLS support for repair of support equipment and for AVE failure analysis.

6.0 ACRONYMS

AFLC	Air Force Logistics Command
AFMC	Air Force Materiel Command
AFSATCOM	Air Force Satellite Communication
AFSC	Air Force Systems Command
AGMC	Aerospace Guidance and Metrology Center
AIMS	Advanced Inertial Measurement System
ALCC	Airborne Launch Control Center
APT	Airborne Procedures Trainer
AS	Aging and Surveillance
ASCON	Associate Contractor
ASP	Acquisition Strategy Panel
ATE	Automatic Test Equipment
AVE	Aerospace Vehicle Equipment
A&F	Arming and Fuzing
BMO	Ballistic Missile Organization
BMT	Ballistic Missile Transporter
BP	Budget Program
BSD	Ballistic Systems Division
C&S	Command and Status
C^3	Command, Control, and Communications
CA	Contract Award
CAPS	Communications and Processing System
CCB	Configuration Control Board
CCV	Code Change Verifier
CDR	Critical Design Review
CLS	Contractor Logistics Support
CMPT	Control Monitor Procedures Trainer
COP	Console Operations Program
CSIS	Central Secondary Item Stratification
CTS	Computer Test Station
CTU	Cartridge Tape Unit
CVP	Coder Verifier Panel
DAS	Data Acquisition System
DCU	Digital Computer Unit
DDAS	Digital Data Acquisition System
DEC	Digital Equipment Company
DFMR	Dual Frequency Minimum Essential Emergency Communications Network Receiver
DNS	Directorate of Nuclear Surety
DOE	Department of Energy

DPEM	Depot Programmed Equipment Maintenance
DSCS	Defense Satellite Communications System
EAM	Emergency Action Message
ECP	Engineering Change Proposal
ECS	Environmental Control System
EEIC	Element Expense Identification Code
EHF	Extremely High Frequency
EMD	Engineering Manufacturing Development
EMP	Electromagnetic Pulse
EOS	Electrical Overstress
EPA	Environmental Protection Agency
ESA	Electrical Surge Arrestor
ESCTS	Explosive Set Circuitry Test Set
ESD	Electronic Systems Division
ESSG	Environmental Sensors Signal Generator
FAD	First Article Delivery
FCA	Functional Configuration Audit
FLTSAT	Fleet Satellite
FOC	Final Operational Capability
FOT&E	Follow-on Operational Test and Evaluation
FPCT	Flight Program Constants Tape
FSC	Flight Security Control
FTE	Factory Test Equipment
G&C	Guidance and Control
GCA	Gyrocompass Assembly
GEU	Guidance Electronics Upgrade
GFE	Government Furnished Equipment
GFP	Government Furnished Property
GRP	Guidance Replacement Program
GSE	Ground Support Equipment
GSP	Gyro Stabilized Platform
GWEN	Ground Wave Emergency Network
HAC/RMPE	Higher Authority Communications/Rapid Message Processing Element
HQ SAC	Headquarters Strategic Air Command
HSEP	Hardness Surveillance EMP Program
HSP	Hardness Surveillance Program
I^2EU	ICBM Integrated Electronics Upgrade
ICBM	Intercontinental Ballistic Missile
ICPS	ICBM Code Processing System
IFSS	Instrumentation and Flight Safety System
ILRP	ICBM Long Range Planning

ILSC	Integrated Launch Support Center
IMPSS	Improved Minuteman Physical Security System
IMU	Inertial Measurement Unit
IPR	In-Process Review
ISST	ICBM Super High Frequency Satellite Terminal
IWSM	Integrated Weapon System Management
JTA	Joint Test Assembly
LCC	Launch Control Center
LCF MG	Launch Control Facility Motor Generator
LCP	Launch Control Panel
LCT	Launch Capability Test
LEP	Launch Enable Program
LF	Launch Facility
LFMG	Launch Facility Motor Generator
LFOSET	Launch Facility Operational Support Equipment Trainer
LFT	Launch Facility Trainer
LPMP	Logistics Programs Management Plan
LRIP	Low Rate Initial Production
LSC	Launch Support Center
LSS	Launch Support System
LVFE	Low Volume Force Element
MAP	Monitor and Alarm Panel
MCL	Master Change Log
MCP	Military Construction Program
MCU	Mechanical Code Unit
MDBF	Mean Distance Between Failure
MECA	Missile Electronic Computer Assembly
MEECN	Minimum Essential Emergency Communications Network
MESP	Minuteman Extended Survivable Power
MF	Medium Frequency
MGC	Missile Guidance Computer
MGCS	Missile Guidance & Control Set
MGS	Missile Guidance Set
MGSC	Missile Guidance Set Control
MIIDS	Missile Interior Intrusion Detection System
MILE	MM Integrated Life Extension
MILSTAR	Military Communication Satellite System
MM	Minuteman
MOR	Mission Objectives Report
MPT	Missile Procedures Trainer
MRT	Mini-Receive Terminal
MSE	Maintenance Support Equipment
MT	Missile Transporter

MTBF	Mean Time Between Failure
MTTR	Mean Time To Repair
NAR	Nuisance Alarm Rate
NDI	Nondestructive Inspection
NSA	National Security Agency
NSCCA	Nuclear Surety Cross-Check Analysis
NWSSG	Nuclear Weapons System Safety Group
OEP	Operational Executive Program
OER	Optical Electrical Resolver
OGE	Operational Ground Equipment
OGP	Operational Ground Program
OO-ALC	Ogden Air Logistics Command
OSE	Operational Support Equipment
OT	Operational Test
OTP	Operational Targeting Program
PATE	Performance Analysis and Technical Evaluation
PBV	Post Boost Vehicle
PCA	Physical Configuration Audit
PCO	Procuring Contracting Office
PD	Project Directive
PDM	Program Decision Memorandum or Program Depot Maintenance
PDP	Program Decision Package
PDR	Preliminary Design Review
PIGA	Pendulous Integrating Gyroscopic Accelerometer
PIMS	Peacekeeper in Minuteman Silos
PK	Peacekeeper
PKTF	Peacekeeper Test Facility
PMD	Program Management Directive
PMRT	Program Management Responsibility Transfer
POM	Program Objective Memorandum
PQA	Production Quality Assurance
PR	Purchase Request
PSRE	Propulsion System Rocket Engine
QOT&E	Qualification Operational Test and Evaluation
R&M	Reliability and Maintainability
RAM	Random Access Memory
REACT	Rapid Execution and Combat Targeting
RFP	Request for Proposal
RMP	Rapid Message Processing
RP/RPIE	Real Property/Real Property Installed Equipment
RRB	Requirements Review Board

RS	Reentry System
RSD	Repairable Support Division
RSLP	Reentry System Launch Program
RSU	Remote Start Unit
RV	Reentry Vehicle
SAC	Strategic Air Command
SCADA	Supervisory Control and Data Acquisition
SCPS	SAC Code Processing System
SCT	Single Channel Transponder
SDR	System Design Review
SDS	Squadron Data Simulator
SE/TA	Systems Engineering and Technical Assistance
SELECT	System Engineering Level Evaluation and Correction Team
SFIR	Specific Force Integrating Receiver
SFT	System Function Test
SHF	Super High Frequency
SLA	Service Life Analysis
SLFCS	Survivable Low Frequency Communication System
SMTC	Strategic Missile Test Complex
SOR	Systems Options Report
SORD	System Operational Requirements Document
SOW	Statement of Work
SPM	System Program Manager
SPU	Signal Processing Unit
SRU	Shop Replaceable Unit
SRV	Single Reentry Vehicle
SSM	Systems Management Office
START	Strategic Arms Reduction Treaty
SVTC	Survivability and Vulnerability Test Center
T&HE	Transportation and Handling Equipment
TAMP	Trajectory and Missile Parameters
TCTO	Time Compliance Technical Order
TGG	Third Generation Gyro
TIM	Technical Interchange Meeting
TPS	Test Program Set
TRC	Technology Repair Center
TRD	Technical Requirements Document
TREE	Transient Radiation Effects on Electronics
TTP	Technology Transition Program
UDAS	Upgraded Data Acquisition System
VDC	Volts Direct Current

WCPS	Wing Code Processing System
WS	Work Specification
WSC	Weapon System Computer
WSCE	Weapon System Control Element

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