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STRATEGIC SYSTEMS TEST SUPPORT STUDY (SSTSS)

Final Report
Volume I
Executive Summary (U)

November 1981

Prepared by SRI International,
Menlo Park, California 94025

for

The SSTSS Ad Hoc Executive Committee
Dr. James A. Means, SAMTO/CA, Chairman
Dr. Charles D. Smith, BMDSCOM-RD, Co-Chairman
Mr. Vincent J. Prestipino, NAVAIRSYSCOM, Co-Chairman

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

(U) The Strategic Systems Test Support Study (SSTSS) (November 1979-September 1981) was performed by a tri-service ad hoc committee to deal with questions facing DoD concerning the future of terminal area test support resources. The study analyzed future requirements of strategic weapon testing and examined existing terminal area support resources. These resources included Kwajalein Missile Range (KMR) and mobile instrumentation aircraft and ships. Deficiencies and shortfalls were identified, and various alternatives were studied to arrive at (1) a contingency island location if political stresses force evacuation of KMR, (2) an

19. KEY WORDS (Continued)

Ballistic Missile Terminal Area Support
Universal Range Instrumentation Aircraft

20 ABSTRACT (Continued)

economically and operationally improved support aircraft resource posture, (3) a plan for reduced terminal area support ships, and (4) supplemental land-based instrumentation concepts to reduce the cost of broad ocean area test support provided by CONUS-based instrumentation aircraft. An implementation plan and budgetary requirements were also developed.

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(U) The Strategic Systems Test Support Study (SSTSS) (November 1979-September 1981) was performed by a tri-service ad hoc committee to deal with questions facing DoD concerning the future of terminal area test support resources. The study analyzed future requirements of strategic weapon testing and examined existing terminal area support resources. These resources included Kwajalein Missile Range (KMR) and mobile instrumentation aircraft and ships. Deficiencies and shortfalls were identified, and various alternatives were studied to arrive at (1) a contingency island location if political stresses force evacuation of KMR, (2) an economically and operationally improved support aircraft resource posture, (3) a plan for reduced terminal area support ships, and (4) supplemental land-based instrumentation concepts to reduce the cost of broad ocean area test support provided by CONUS-based instrumentation aircraft. An implementation plan and budgetary requirements were also developed.

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GLOSSARY (U)

ABRES	Advanced Ballistic Reentry System
AFSC/ESD	Air Force Systems Command/Electronic Systems Division
AFSC/TE	Air Force Systems Command/Test and Evaluation
APATS	ARIA Phased Array Telemetry System
ARIA	Advanced Range Instrumentation Aircraft
ARIS	Advanced Range Instrumentation Ships
BMD	Ballistic Missile Defense
BMDSCOM	Ballistic Missile Defense System Command
BOA	Broad Ocean Area
DASO	Demonstration and Shakedown Operations
DCR	Direct Cost Reimbursement
DDT&E/DTF&R	Deputy Director Test and Evaluation/Deputy for Test Facilities and Resources
DoD	Department of Defense
DOT	Deep Ocean Transponder
DRSS	Down Range Support Ship
EATS	Extended Area Test System
ENNK	Endoatmospheric Nonnuclear Kill
ESMC	Eastern Space and Missile Center
FBM	Fleet Ballistic Missile
FOC	Full Operational Capability

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OT	Operational Testing
OUSDRE/DDTE	Office of the Under Secretary of Defense Research and Engineering/Deputy Director Test and Evaluation
PME	Prime Mission Electronics
PMR	Pacific Missile Range
PMTC	Pacific Missile Test Center
SALT II	Strategic Arms Limitation Treaty II
SAMTO	Space and Missile Test Organization
SATRACK	Satellite Tracking (GPS part of TRIDENT range safety system)
SDR	Splash Detection Radar
SLBM	Submarine-Launched Ballistic Missile
SLEP	Service Life Extension Program
SLTA	Supplemental Land-Terminal Area
SMILS	Sonobuoy Missile Impact Location System
SSTS	Strategic Systems Test Support
SSTSS	Strategic Systems Test Support Study
TASA	Terminal Area Support Aircraft (C-7A aircraft)
TASS	Terminal Area Support Ship
TOO	Target of Opportunity
TOS	Time-on-Station
TSSC	Tri-Service Steering Committee
TTS	Transportable Telemetry System

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FOREWORD (U)

(U) A DoD study of the magnitude of the Strategic Systems Test Support Study (SSTSS), encompassing as it does all three military services, all strategic system programs, and all strategic test support ranges, resources, and events projected over a 20-yr period, is bound to be difficult. Add to this the complexity of a tri-service ad hoc committee with no funds, save the support from a contractor, and the task set for the committee looks even more difficult. The chances of reaching agreement between the services, staffing the tasks through the individual services, and obtaining the support of a Major Range and Test Facility Committee (MRTFC) appear to be insurmountable. Yet the study has been extremely rewarding for all involved, and it has accomplished a great deal.

(U) The major ingredient that has made this possible is the people involved. Thanks are especially due to now-retired Col. Edward P. Miller of the Eastern Space and Missile Center (ESMC), who served as Chairman during Phase I. Colonel Miller successfully initiated the effort, got the program requirements identified, and surveyed and documented all support capabilities. He had the good fortune to have the support of Mr. Vincent J. Prestipino of NAVAIRSYSCOM as his Navy colleague, and Dr. Charles D. Smith of BMDSCOM, as his Army colleague. They were then able to draw on the resources of the services to support the study. A support service contract was awarded to SRI International (SRI), and Mr. Earl G. Blackwell of SRI did an outstanding job of assembling and directing the technical and analytical talent required to support the study. The professional cost analyses performed by Mr. Eugene A. Erb of SRI were especially helpful in the evaluation and decision-making process applied to the highly competitive concepts for test support resource advanced by the individual services.

Maj. Gen. Grayson Tate of BMDSCON, Adm. Fred Baughman of PMTC, Maj. Gen. James Marshall and Brig. Gen. Ted Twinting of SAMTO this study would not have been possible. Each of these responsive leaders provided major support and each was directly involved in the study. In addition, each of the commanders most affected by the results of the study accepted the validity of the study, permitted it to impact their domain, and treated it in a very objective and realistic manner.

(U) Finally, one additional aspect of this study that has made it so rewarding was that it has been real, not abstract. The results of the study were desperately needed, and rather than waiting for a final blessing before trying to initiate the much needed near-term activities the SSTSS group took the initiative to actually cause these events to happen. As a result, many of the results of this study are being implemented as the study is being completed, and plans for evolving the interim capabilities into final long-term solutions are being prepared.

(U) There is a pressing need for a permanent Tri-Service Steering Committee (TSSC), modeled after the SSTSS, that could provide continuing support to DDT&E in test resource planning. The TSSC could meet periodically to assess needed or desired changes in planning and to extend plans, slowly but surely, farther into the horizon of time. Many additional areas than those treated in the SSTSS need desperately to be studied to meet the problems and opportunities of the future. One example is the shared use of emerging space and satellite systems by near-contiguous ranges and test resources. These systems could satisfy the requirements of extended range weapons testing and overcome area limitations, encroachment, and instrumentation constraints of existing ranges. The success of the Space Shuttle and other advances in microcircuit technology should open this area to extensive exploitation by the ranges. The use of satellites for position location (e.g., GPS) and communications is already being used in somewhat rudimentary fashion, with the promise of wider application in the future. A great deal remains to be done in the area of test resource planning to meet projected needs effectively, and a TSSC could help considerably.

Dr. James A. Means
SSTSS Chairman
Technical Director, SAMTO/CA
Vandenberg AFB, CA

(U) A significant contributor to the study was Lt. Richard S. Hassan of SAMTO, who chaired the URIA Study Group, and who also worked on the Joint MX-TRIDENT BOA consolidation effort and the Deep Ocean Transponder (DOT) alternate ship support concepts. Also participating were Mr. Bernard M. Davis and Mr. Donald H. Strietzel of BMDSCOM. Barney Davis presented numerous alternatives for land-based terminal area support and Don Strietzel headed the BOAST and C-7A TASA efforts. Mr. Robert Nifong and Cdr. Richard A. McConnel of PMTC worked all aspects of P-3 Interim SMILS and EATS support projects. Mr. Charles P. Coombs and Lt. Col. David D. Hopkins of the 4950th Test Wing worked all ARIA support options. Mr. Kingston George, of the Western Space and Missile Center (WSMC) contributed heavily in the GPS-SMILS and supplemental Land Terminal Area concepts. Lt. Col. Michael R. Boldrick, USAF, of AFTEC, Mr. Robert T. Herzog of TRW, Maj. Larry Sandlin of BMD/MNNXG, and Maj. Richard Shankel of SAC-XP provided the bulk of MX support and Capt. William Bancroft and Mr. M. E. Rasmussen of SSPO provided the TRIDENT support. Lt. Col. Thomas B. Kempster of HQ USAF and Maj. John W. Kollety of HQ AFSC were extremely helpful in completing this study.

(U) A great many others also provided support, such as Mr. Dave Cherry of WSMC and Mr. Charles D. Miller of ESMC. Dave Cherry worked with MINUTEMAN and MX range support areas, and Charlie Miller was responsible for ARIS support considerations. Charlie will probably feel the greatest impacts from this study as the ARIS ships are phased out. Also noteworthy was the work of Maj. Richard B. Boller of WSMC who labored long and hard over the supplemental land terminal area concepts.

(U) Without good guidance, the study had little chance to succeed. Mr. Bill Richardson (DDT&E/DTF&R) served as DoD Manager on the project. He was bold enough to challenge many existing concepts and to pursue cost-effective alternative solutions when most managers would have given up. His staunch support contributed greatly to the success of the study. Also, Adm. Isham Linder, Ret., (DDT&E), serving as Chairman for the MRTFC, and the members of the MRTFC, in their respective reviews and subsequent excellent guidance, contributed significantly to the success of this endeavor. Additionally, without the active support of

URIA	Universal Range Instrumentation Aircraft
VAFB	Vandenberg Air Force Base
WSMC	Western Space and Missile Center

GOM	Government of The Marshallese
GPS	Global Positioning System
HOE	Homing Overlay Experiment
IAP	Improved Accuracy Program
ICBM	Intercontinental Ballistic Missile
I&M	Improvement and Modernization
IOC	Initial Operational Capability
IRS	Interim Recovery System
IRV	Instrumented Reentry Vehicle
ITA	Instrumented Terminal Area
K-BOAT	Kwajalein Broad Ocean Area Tug
KMR	Kwajalein Missile Range
KMRD	Kwajalein Missile Range Directorate
KMRN	Kwajalein Missile Range North
KREMS	Kiernan Reentry Measurements System
LBRV	Large Ballistic Reentry Vehicle
LBTS	Land-Based Telemetry System
LCC	Launch Control Center
LF	Launch Facility
LOAD	Low Altitude Defense
MDPS/MSS	Missile Data Processing System/Missile Safety System
MIS	Missile Impact Location System
MRTFC	Major Range and Test Facility Council

I INTRODUCTION AND STUDY APPROACH (U)

A. Introduction (U)

(U) Major concerns and decisions were facing DoD in late 1979 regarding the resources for strategic system test support that would be needed by the United States through the turn of the century. The Advanced Range Instrumentation Ships (ARIS), which were converted World War II troop ships, were due to undergo upgrading under expensive service life extension programs (SLEPs), and even more of these ships were being planned for rehabilitation and recommissioning.* The Advanced Range Instrumentation Aircraft (ARIA) were also aging and operationally deficient and needed extensive modifications or replacement.

(U) In the wake of these problems, two major ballistic missile programs (MX and TRIDENT), were reaching the stage at which extensive testing was to begin in the Pacific in early 1980s. These ICBM tests will need to be conducted at distances beyond KMR. In view of the additional demands these two programs could place on the existing and aging terminal area support resources, the possibility that opportunities existed for joint planning by the Air Force and Navy to consolidate

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*(U) The USNS Wheeling replacement.

(U)

support needs and minimize redundant requirements became a foremost concern.

B. Study Structure and Approach (U)

(U) In response to a tasking letter from OUSDRE in November 1979, a tri-service ad hoc committee was formed to address these multiple concerns of DoD in a Strategic Systems Test Support Study (SSTSS). The committee was initially chaired by Col. Edward P. Miller, USAF, ESMC, with Dr. Charles D. Smith, BMDSCOM-RS, and Mr. Vincent J. Prestipino, NAVAIRSYSCOM, as co-chairmen. In June 1980, Dr. James A. Means, SAMTO/CA, accepted the chairmanship from Col. Miller, who retired. Representatives of more than sixteen agencies within the three services contributed to the study.* In the civil sector, SRI International was contracted to provide support through the consolidation of requirements, the performance of technical and economic trade-offs, and the preparation of the SSTSS final reports.

1. Charter Tasking (U)

(U) The initial SSTSS objectives were to provide recommendations and planning information regarding the specific questions in the original OUSDRE/DDTE tasking letter. These initial task areas concerned:

- (U) An alternative location for test support heretofore available at KMR.
- (U) Aging mobile aircraft and ship resources.
- (U) New technology applications.
- (U) Cross-service program coordination.
- (U) Implementation planning.

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*(U) These agencies and their representatives are noted in Volume II, Section I.

(U) Approximately midway through the study, several other issues arose that resulted in additional tasks to be assigned to the ad hoc study group. These additional tasks extended the period of study from approximately 12 to 18 months. The additional task topics were:

- (U) The technical and economic feasibility of a Universal Range Instrumentation Aircraft (URIA).
- (U) A comparative analysis of the EATS and APATS telemetry systems for SSTSS.
- (U) Potential for repopulation of Bigej Island (Kwajalein Atoll).
- (U) Pacific utilization: ICBM/SLBM testing and support aircraft staging.
- (U) Advisability of replacing ARIA EC-135N aircraft with 707-320C aircraft.

2. Study Approach (U)

(U) The approach employed consisted of:

- (U) Identification and consolidation of range user program requirements.
- (U) Examination of existing resources for capabilities and limitations.
- (U) Identification and evaluation of alternatives for solutions that were preferred from both technical and economic standpoints.
- (U) Development of an implementation plan including schedules and milestones.

(U) Certain basic assumptions were necessary to support the definition and selection of preferred alternatives:

- (U) An alternative must satisfy user requirements at least as well as the baseline resource.
- (U) The cost to the nation is a primary consideration.
- (U) Least-technical-risk solutions are preferred.
- (U) Direct-cost-reimbursable policy will continue throughout the period studied (i.e., 1981-1999).

C. Study Documentation (U)

(U) Several SSTSS reports were generated to completely document the issues and findings. The principal report, "Strategic Systems Test Support Study (U)," consists of three volumes:

- Volume I: Executive Summary (U)
- Volume II: Supporting Analyses (U)
- Volume III: Appendices--Detailed Air Force, Army, and Navy Requirements (U)

Section VII of this report summarizes the recommendations and presents the implementation plan resulting from this study.

(U) Three additional reports were prepared on task areas too specialized for the main report:

- (U) "A Universal Range Instrumentation Aircraft (URIA) Study" prepared by SRI International, Menlo Park, CA (October 1981).
- (U) "EATS and APATS Telemetry Antenna Performance Comparison In a Ballistic Missile Terminal Area Support Role" prepared by SRI International, Menlo Park, CA (June 1981).
- (U) "The Impact of The Repopulation of Bigej Island (U)" prepared by Western Space and Missile Center Safety Directorate, Vandenberg AFB, CA, and Kwajalein Missile Range Directorate Safety Office, Huntsville, AL (3 April 1981).

The results contained in adjunct reports are incorporated into the SSTSS report and are summarized in Volume II.

(U) In addition to these formal reports, numerous informal task reports, briefings, and working papers were accumulated throughout the study. These materials, which are listed in the Bibliography of Volume II, will be placed in archives at WSMC, Vandenberg Air Force Base, California, for future reference.

II REQUIREMENTS OVERVIEW (U)

A. User Programs Requiring Terminal Area Support (U)

(U) One of the first items addressed by the SSTSS was the definition of strategic system programs, their support requirements, and their testing schedules. This task was not resolved immediately because some programs were just evolving and had neither firm support requirements nor schedules yet defined. Also, as the study progressed, previously established user program requirements were found to be subject to change. Thus, after six months of requirements updating, it became obvious that a "freeze" was necessary. As a result, some minor discrepancies may be found between requirements determined by the SSTSS and "current" program requirements. Also, if an existing program test schedule (which rarely exceeded five years), were not defined far enough into the future, the SSTSS group resorted to their best-guess extrapolations to provide a reasonable basis for analysis to cover the period to be studied: 1981-2000.

(U) The principal programs identified as requiring strategic systems test support are listed in Table 1 along with their respective test event schedules. Schedules provided by the respective program offices are shown by solid lines; SSTSS projections are shown by dashed lines. The category of "Other Programs" refers to programs that were not concerned with strategic weapons but that would impact the workload of mobile resources that support strategic weapon testing.

B. Test Support Locations and Functional Requirements (U)

1. Baseline Terminal Areas (U)

(U) The Navy is the principal user of the Atlantic test range. Figure 1 indicates the locations of the major launch and impact terminal areas in the Atlantic. Broad ocean launch points are provided with

[redacted]

(U)

Deep Ocean Transponders (DOTs), which are acoustic devices installed by ships to provide a precise geodetic position reference for the TRIDENT submarine.

(U) The terminal Broad Ocean Areas (BOAs) are also equipped with DOTs, which serve as a geodetic reference for air-deployed sonobuoys that are used to provide acoustic impact scoring for reentry bodies. All Atlantic BOAs have DOTs installed, except for C18 located off the south tip of Africa; C18 will be operational in FY82.

(U) Ascension Island is the only instrumented (land-based) terminal area (ITA) in the Atlantic. Limited instrumentation exists at Antigua, which is principally used for A3TK support. Ascension is located in the

(U)

South Atlantic, about 4500 nmi from Cape Canaveral and is operated by the Air Force Eastern Space and Missile Center (ESMC), Patrick Air Force Base, Florida.

(U) The principal ITA in the Pacific is Kwajalein Missile Range (KMR), located about 4200 nmi from Vandenberg AFB (VAFB), California, and operated by the Army Ballistic Missile Defense System Command Kwajalein Missile Range Directorate, (BMDSCOM-R), Huntsville, Alabama. No BOAs are used in the Pacific at present; however, when testing on two major programs, MX and TRIDENT, begin in the Pacific (planned for FY83), they will require BOAs to be established. Some use of KMR assets is planned by MX, but TRIDENT plans only BOA impacts.

(U) The MX program will launch from VAFB into three Pacific BOAs, referred to as BOA-1, -2, and -3. TRIDENT was planned to be launched from the California coastal waters into three different BOAs, located near Wake, Chatham, and Oeno Islands.

(U) The need for separate BOAs for these two programs was investigated by the SSTSS. MX BOA planning had not completely solidified in that the preliminary BOA locations were chosen to permit weapon system targeting under equivalent west-firing ranges and reentry conditions for representative strategic targets. The TRIDENT program had somewhat shorter range requirements, but it also required testing at different launch azimuths.

(U) After the SSTSS Working Group discussed this with BMO, AFTEC, SAC, and SSPO, a joint Air Force/Navy working group was formed to investigate the possibility of satisfying both program needs by consolidating some Pacific BOAs. The primary trajectory missions of both MX and TRIDENT are illustrated by the solid lines in Figure 2. Alternative trajectories considered are shown by the dotted lines (Air Force use of some Navy BOAs and Navy use of some Air Force BOAs).

(U) ~~(S)~~ Because these BOAs had been originally selected with care to avoid overflights and potential terminal area hazards to populated

(U)

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Table 2

(U) SUMMARY OF INSTRUMENTATION FUNCTIONAL REQUIREMENTS FOR AIR FORCE PROGRAM TEST SUPPORT

Program	Midcourse						Terminal Area														
							ITA								BOA						
	Metric	Tele-metry	Radar Sig-nature	Optics	Meteo-rology	Data Relay	Metric	Tele-metry	Scoring	Radar Sig-nature	Optics	Recovery	Meteo-rology	Data Relay	Metric	Tele-metry	Scoring	Radar Sig-nature	Optics	Meteo-rology	Data Relay
MX Flight Tests (DT&E)	--	--	--	--	--	--	(1)	X	X	--	(2)	--	X	--	--	X	X	--	(2)	(3)	--
MX Post-IOC (OT&E)	--	--	--	--	--	--	(1)	X	X	--	(2)	--	X	--	--	X	X	--	(2)	(3)	--
MINUTEMAN II MK-11C OT&E	(1)	--	--	--	--	--	X	--	X	X	X	X	X	--	--	--	--	--	--	--	--
MINUTEMAN III OT&E	--	--	--	-	--	--	X	X	X	(4)	(2)	--	X	--	--	--	--	--	--	--	--
ABRES R&D	--	--	--	--	--	--	X	X	--	(5)	(5)	(6)	X	--	--	--	--	--	--	--	--

NOTES:

-- Not required

X Required

(1) Required only if readily available, for example at KMR

(2) Streak photography

(3) Desired for accuracy assessment

(4) Required for PENAID launches only

(5) Complex signatures

(6) Generally not required, except IRS, LBRV

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Table 3

(U) SUMMARY OF INSTRUMENTATION FUNCTIONAL REQUIREMENTS FOR ARMY BMD PROGRAMS

Program	Midcourse (TOO)						ITA (Interceptor)								ITA (TOO)							
	Metric	Telemetry	Radar Signature	Optics	Meteorology	Data Relay	Metric	Telemetry	Scoring	Radar Signature	Optics	Recovery	Meteorology	Data Relay	Metric	Telemetry	Scoring	Radar Signature	Optics	Recovery	Meteorology	Data Relay
Designated Optical Tracker	(1)	X			--	X	X	X	--	--	--	(2)	X	X	X	--	--	X	X	--	X	X
Ground-Based Optics	(1)	--			--	X	--	--	--	--	--	--	X	X	(1)	--	--	--	(3)	--	X	X
Shuttle Experiments		X	-	--	--	--	--	-	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Low-Altitude Discrimination	-	--	--	--	--	--	--	--	--	--	--	--	--	--	X	X	--	(3)	(3)	--	X	X
ALCOR MMW Augmentation	--	--	--	--	--	--	--	--	--	--	--	--	--	--	X	--	--	(3)	(3)	--	X	--
Multistatic Discrimination	--	--	--	--	--	--	--	--	--	--	--	--	--	--	X	--	--	(3)	(3)	--	X	X
Optical Aircraft Measurements	(1)	--	--	--	--	--	(1)	--	--	--	--	--	--	--	X	--	--	X	X	--	--	--
Homing Overlay Experiment	(1)	X	--	--	--	X	X	X	(4)	--	--	X	X	X	X	X	(4)	(3)	(3)	--	X	X
Optics Adjunct	--	--	--	--	--	--	X	X	--	--	--	--	X	X	--	--	--	--	--	--	X	X
Signature Measurement Radar	--		-	--	-	--	--	--	--		--	--	X	--	(1)	--	--	(1)	(1)	--	X	--
Low-Altitude Defense (LoAD)	(1)	X		--	--	X	(1)	X	(4)	--	(5)	--	X	X	(1)	X	(4)	--	(5)	--	X	X
ENNK	-	-	--		--	--	X	X	(4)	--	(5)	X	X	--	X	X	(4)	--	(5)	X	X	--
Rapid Deployment Programs	--	--	--	--	--	--	X	--	(4)	--	(5)	X	--	X	X	--	(4)	--	(5)	--	--	X
PERSHING (considered as TOO)	(6)	(6)	-	--	X	--	--	-	--	--	--	--	--	--	(6)	(6)	--	--	--	--	--	--

NOTES: -- Not required
X Required
(1) Pointing data, handover
(2) Sensor recovery required
(3) Signature data for correlation
(4) Kill assessment, miss distance
(5) Documentary optics
(6) PERSHING metric and telemetry can be performed by land-based assets near Atlantic

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Table 4

(U) SUMMARY OF INSTRUMENTATION FUNCTIONAL REQUIREMENTS FOR NAVY FBM PROGRAMS

Program	Midcourse			ITA						BOA					
	Metric	Sig-nature	Tele-metry	Metric	Tele-metry	Sig-nature	Scoring	Optics	Meteoro-logical	Metric	Tele-metry	Sig-nature	Scoring	Optics	Meteoro-logical
Atlantic															
POSEIDON (C-3) DASO	--	--	X	--	X	--	X	--	X	--	X	--	X	--	(4)
POSEIDON (C-3) OT	--	--	X	(3)	X	--	X	(3)	X	--	X	--	X	--	(4)
TRIDENT (C-4) DASO	(2)	--	X	(1)	X	--	X	(1)	X	--	X	--	X	--	(4)
TRIDENT (C-4) OT	(2)	--	X	(1)	X	--	X	(1)	X	--	X	--	X	--	(4)
Advanced TRIDENT (D-5) PEM/DASO/DEV	(2)	--	X	X	X	--	X	X	X	(2)	X	--	X	--	(4)
CHEVALINE A3TK	--	X	X	X	X	X	X	X	X	--	X	X	X	--	(4)
MK-500 EVADE	--	--	X	X	X	X	--	X	X	--	--	--	--	--	(4)
Pacific															
TRIDENT (C-4) OT	(2)	--	X								X		X		(4)
Advanced TRIDENT (D-5) OT	(2)	-	X	(Not defined)						[Not defined (5)]					

NOTES

(1) TAP launches (Ascension Island)
(2) Metric data via SATRACK
(3) Ascension Island
(4) Data used when available (i.e., from TASS, P-3 standard avionics, air deployed Omegasonde Under Investigation)
(5) Assumed for SSTSS purposes to be similar to C-4 requirements.

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(U) The Army ballistic missile defense (BMD) programs require mainly an ITA with a large number of instrumentation resources, plus adequate island geometry to provide baselegs for multilateration measurements and BMD interceptor testing. Some midcourse support is required for BMD targets of opportunity (TOOs), such as MINUTEMAN and ABRES reentry vehicles.

(U) Navy requirements (Table 4) are shown for Atlantic and Pacific in addition to midcourse, ITA, and BOA. A word of explanation is necessary concerning Navy midcourse requirements. For POSEIDON (C-3) and TRIDENT (C-4, D-5) programs, midcourse telemetry is provided by the Down Range Support Ship (DRSS) rather than a land-based facility. The DRSS is also able to provide metric data (if needed) via the Navy's SATRACK instrumentation on the missile.

(U) Notice that ITA support for Navy programs is only indicated for the Atlantic, i.e., Ascension Island); no use is currently planned for the Pacific ITA (KMR). Note also that D-5 BOA support requirements were projected by the SSTSS because they are not yet defined. No D-5 support was projected for the Pacific ITA (KMR). The Navy's Fleet Ballistic Missile (FBM) programs are the other principal users of mobile instrumentation support resources for their BOA needs.

3. Driving Requirements Summary (U)

(U) Two primary directives of the SSTSS were the identification of an alternative location for KMR and opportunities to improve the nation's mobile instrumentation resources. An analysis was made of the user program SSTS needs to identify driving requirements that would permit a realistic definition of selection criteria for ITA locations and to provide a rational basis for screening the alternatives. Driving requirements for each service's programs were determined for impacts on (1) alternative ITAs, and (2) mobile instrumentation resources.

a. Driving Requirements for Instrumented Terminal Areas (U)

(U) Driving requirements that constrained the choices of KMR alternatives fall into three main categories: (1) the distances required from launch heads, (2) the size/geometry and physical aspects of the island complex necessary to provide instrumentation base-legs and preserve safety for BMD programs, and (3) the complexity of instrumentation required.

(U) Table 5 summarizes the consolidated driving ITA requirements of the tri-service strategic weapon programs.

(U) The foremost driving requirement for the alternate ITA location is seen to be in providing a location at a distance from launch facilities within the bounds of realistic ICBM trajectory ranges. The location of KMR relative to the California coast currently satisfies almost all program needs. Relocation of launch facilities was considered but the idea was rejected by the Air Force due to cost and launch constraints (Volume II, Section IVB).

(U) The terminal area instrumentation requirements are driven principally by the needs of Air Force MMII, MMIII, and ABRES programs, and Army BMD programs. These programs will continue to require complex instrumentation facilities at any ITA. The MX and TRIDENT programs are occasional users of an ITA, but have not projected any specific future ITA requirements. However, the SSTSS working group feels that some contingency allowances should be considered for programs claiming no current need for ITA capabilities. This contingency is reflected in the SSTSS recommendations for a split-range to be discussed later.

- (U) A large complex geometry to provide:

  Long instrumentation sensor base-leg for metric tracking accuracy.

  Remote siting opportunities for BMD interceptor launches.

  Remote instrumentation sites to preserve safety when close-in targeting is necessary for acquiring low aspect angle data.

- (U) Shallow-water recovery areas remote from uncontrolled population centers.
- (U) Remote unpopulated land areas for RV fuzing tests that require land impacts.

b. Driving Requirements for Broad Ocean Areas (U)

(U) These requirements will affect the mobile instrumentation resources (and any alternatives) that are needed to support ICBM/SLBM BOA testing. The functions needed for BOA support (Tables 2 and 3) are telemetry, scoring, and streak photography required by Air Force MX and Navy FBM programs. The MX and TRIDENT telemetry, scoring, and streak optics (Table 5) required for the ITA also will be needed in the BOA. Briefly, these mobile support requirements are:

- (U) Telemetry on up to 4 instrumented RVs

  Bandwidths of 1.5 MHz

  Two telemetry links on each TRIDENT RV
- (U) Scoring impacts on up to 10 to 14 RVs
- (U) Streak optics for MX RVs.

(U) From a workload standpoint, the nation's instrumentation aircraft resources will be used far more extensively for BOA support than will ships. Also, the beginning of the MX and TRIDENT testing in the Pacific will necessitate the addition of scoring aircraft resources on the West Coast. Currently, the Navy VX-1 squadron provides only one P-3C SMILS (plus a backup) for scoring FBM tests in the Atlantic.

III EXISTING RESOURCES (U)

A. Scope of Resources Considered (U)

(U) The existing resources considered by the SSTSS were primarily the terminal support assets that would be required by future strategic weapon testing. These resources consist of two major ITAs (Ascension Island and KMR) and aircraft and ship mobile instrumentation assets. Launch assets were not of concern in this study.

B. Ascension Island (U)

(U) Ascension Island is a British colony located in the south Atlantic Ocean approximately 4,500 nmi southeast of Cape Canaveral. Existing U.S.-operated strategic system testing instrumentation assets and their locations on the island are shown in Figure 4.

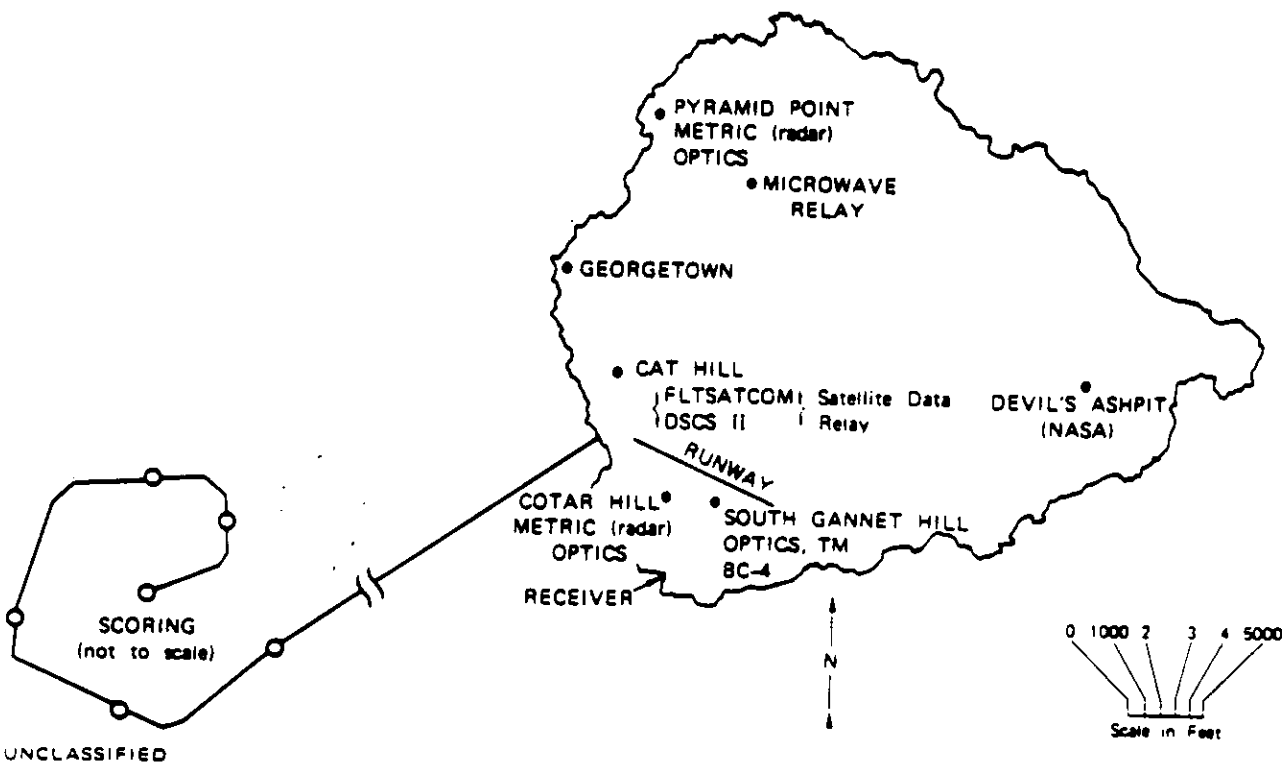

FIGURE 4 (U) ASCENSION ISLAND BASELINE (Atlantic) ITA

C. Kwajalein Missile Range (U)

(U) KMR is located on a number of the islands forming the Kwajalein Atoll in the Marshall Islands, a U.S. Trust Territory, approximately 4200 nmi west of VAFB.

(U) KMR is a sophisticated and complex terminal test area. It provides not only range instrumentation for collection of telemetry, radar metric data, meteorology, photography, and optics but offers a broad spectrum, wide-band signature measurements capability (e.g., Kiernan Reentry Measurements Systems [KREMS]). Thus equipped, KMR is particularly suited as terminal test area for both ICBM and SLBM as well as for BMD developmental testing, in which the maximum information can be obtained per mission and diagnostics of minor and major system anomalies minimize program disruption.

(U) Existing and proposed major instrumentation assets of KMR are shown in Figure 5 (Ascension Island is inset for size comparison). In addition to the major instrumentation assets, KMR has extensive meteorological measurement capabilities, RV and interceptor recovery, launch, and ordnance support facilities, inter-atoll and inter-range communications, frequency and time control, analysis and calibration facilities, and a range operations control center.

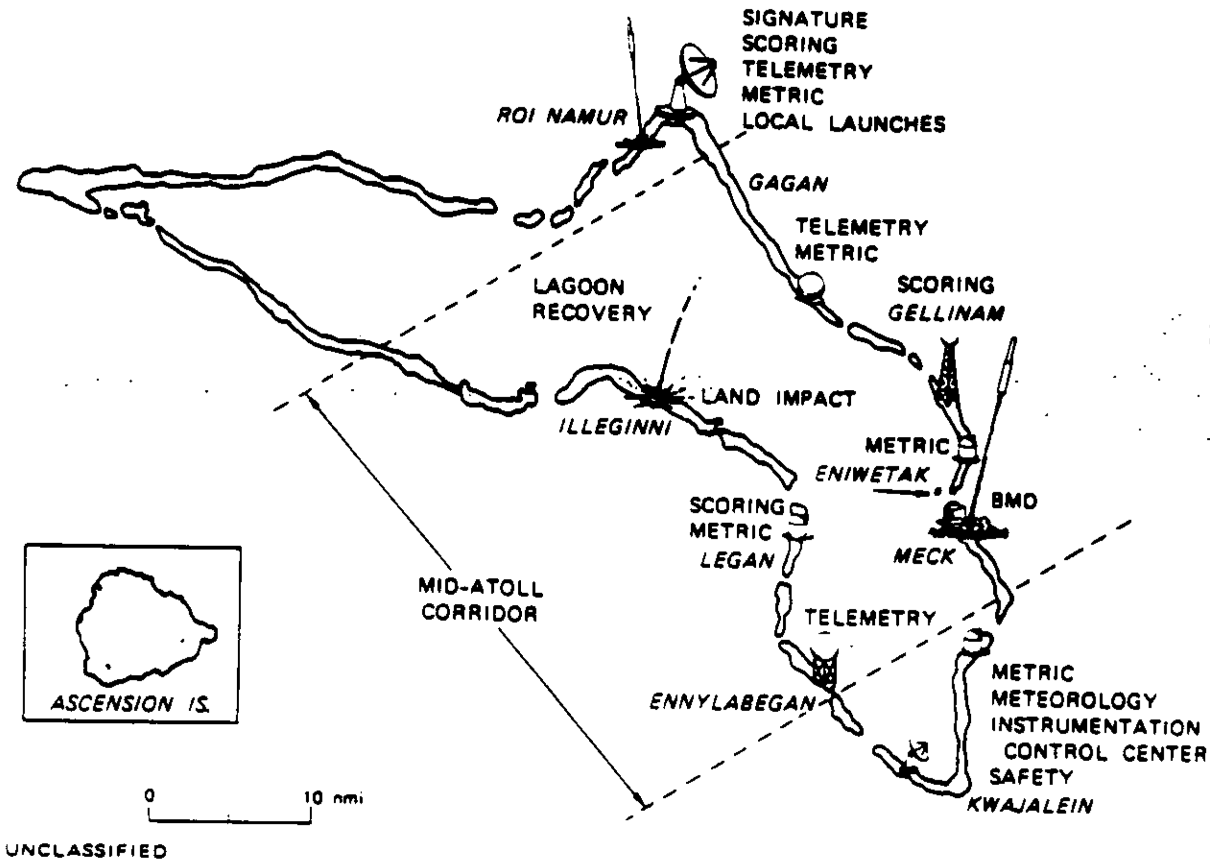

FIGURE 5 (U) KWAJALEIN MISSILE RANGE BASELINE (Pacific) ITA

(U) Sufficient instrumentation is available at KMR to support most of the strategic system testing scheduled to be targeted for the KMR mid-atoll corridor and to support the Army BMD programs scheduled for development at KMR. If MX were to target into the KMR lagoon, additional instrumentation capability would be imposed on WSMC until VAFB

(S/U)

had developed sufficient instantaneous impact prediction capability to satisfy range safety requirements to provide positive protection while allowing this "hotter" missile to impact in or near the KMR lagoon.

D. Existing Mobile Instrumentation Resources (U)

(U) Three types of mobile instrumentation assets are currently used for strategic system test support: (1) eight ARIA, (2) two P-3C aircraft, and (3) two ARIS (USNS Vandenberg and USNS Arnold). These mobile assets permit test operations, such as ballistic missile terminal area impacts to be supported in the broad ocean areas (BOAs) over most of the world. Figure 6 depicts the generic BOA support functions that these mobile resources provide.

(U) The ARIA, equipped with a large nose-mounted dish antenna, is capable of providing single object telemetry collection/recording and data relay for testing operations remote from land-based instrumentation resources.

(U) A common accompanyment to the ARIA during ICBM/FBM support is the P-3C aircraft, which is equipped to perform RV impact scoring using the sonobuoy missile impact location system (SMILS). This system, which permits scoring RV impacts, is based on the use of specially modified sonobuoys to relay the acoustic splash to the station-keeping P-3C. A receiving system on the P-3C aircraft records the acoustic data for subsequent scoring analysis. Two P-3C aircraft (one primary and one backup) are thus available to provide FBM terminal area support in the Atlantic from the VX-1 Squadron at Patuxent River.

(U) The geodetic reference for the sonobuoy scoring pattern is provided acoustically by an array of DOTs, which are installed and surveyed by a ship prior to test operations.

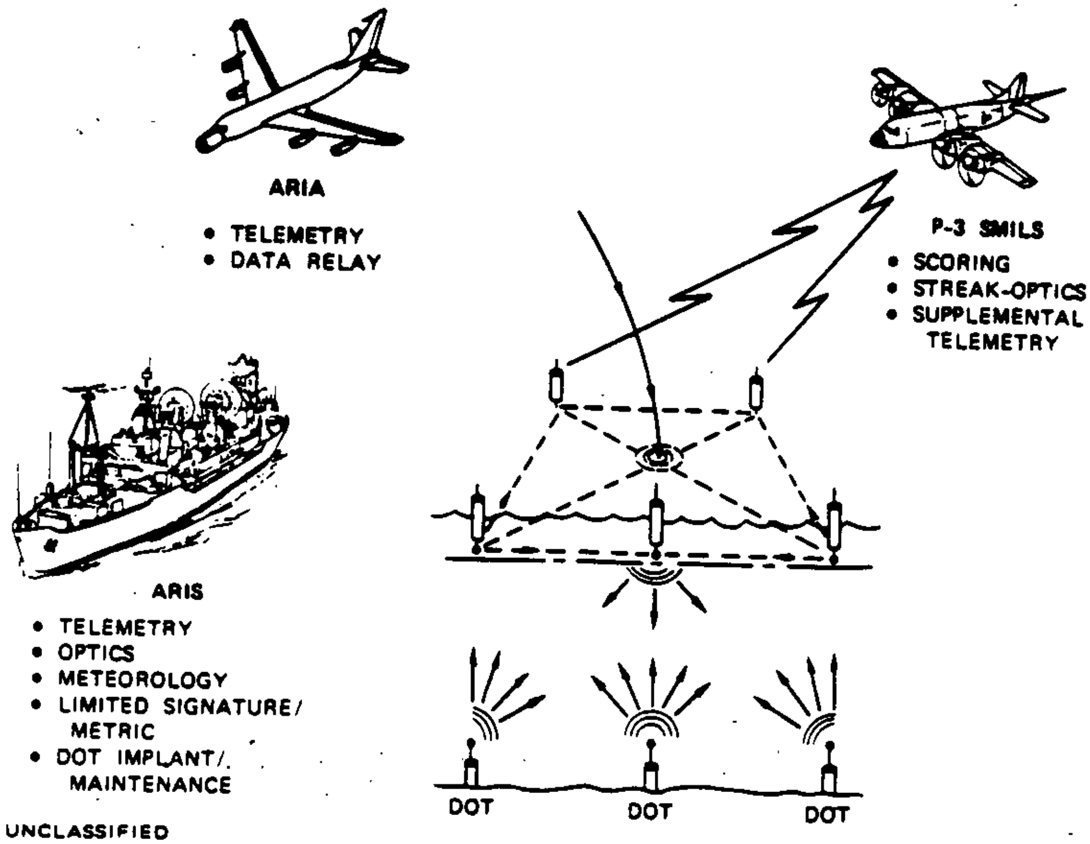

FIGURE 6 (U) BASELINE MOBILE RESOURCES USED FOR TERMINAL AREA SUPPORT

(U) The USNS Vandenberg and the USNS Arnold, available for terminal area support, are heavily instrumented with telemetry, optics, meteorology, and radars that provide limited signature and metric tracking capability. Another function the ARIS performs is the installation and periodic maintenance of the scoring DOT arrays.

(U) One other instrumentation ship is the USNS Wheeling. This resource was "down-hard" in a dockside reserve status at the outset of the SSTSS and was budgeted to be replaced by a later model ship with a C-4 type hull.

(U) These resources were examined for their capabilities, limitations, and future workload projections. Then various alternatives were considered for optimizing these mobile assets into more operationally and economically efficient configurations.

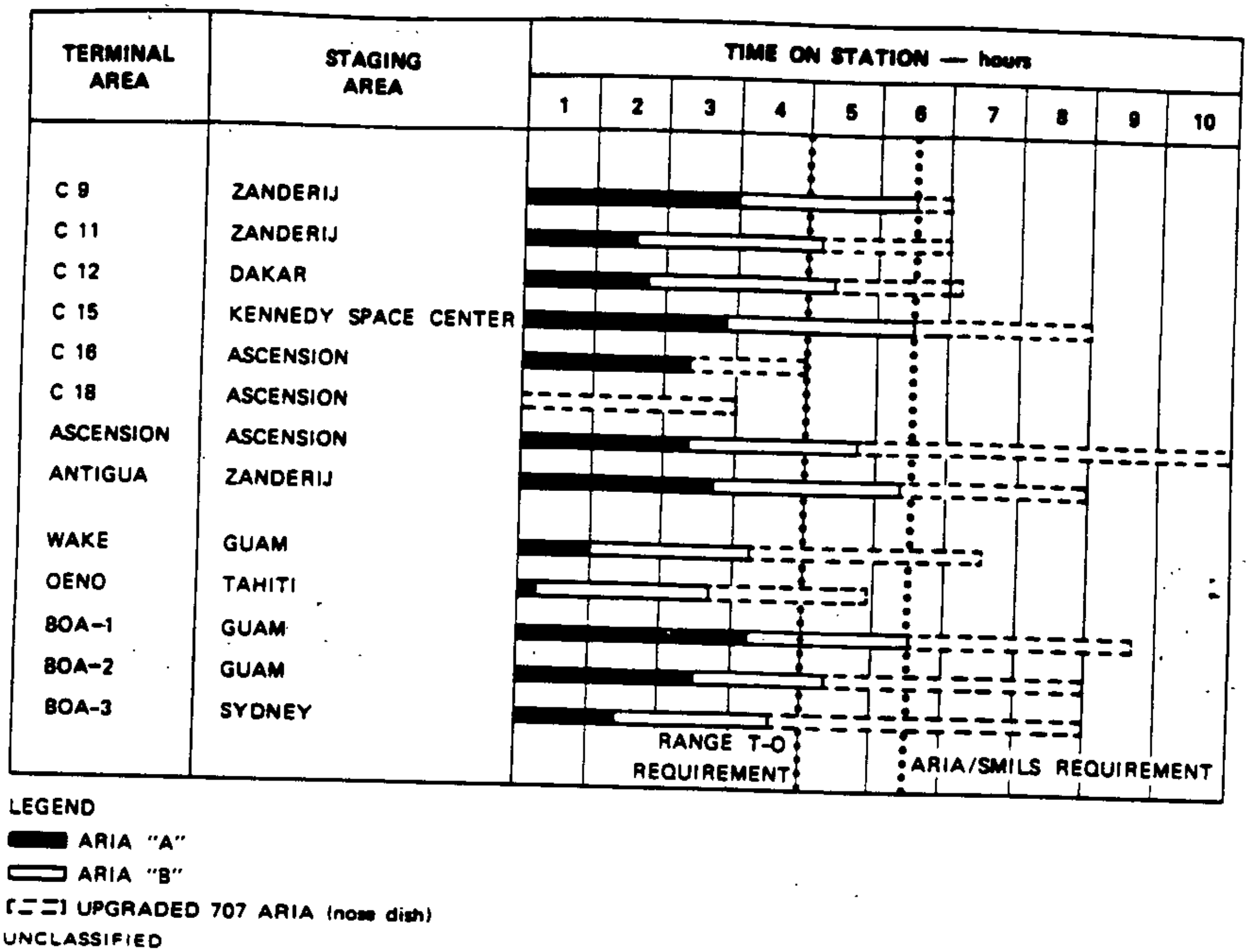

FIGURE 7 (U) TIME-ON-STATION COMPARISON OF EXISTING AND UPGRADED ARIAs

IV ALTERNATIVE LOCATIONS FOR KWAJALEIN MISSILE RANGE (U)

(U) Because of the potential cost impact and political uncertainty that emerged in recent negotiations with the Marshallese for continued use of KMR, the SSTSS committee was directed by the original tasking letter to investigate alternative instrumented terminal areas to support strategic system testing. This section discusses the alternatives considered, and the implementation of the recommended alternative, which should be considered only on a contingency basis.

V MOBILE INSTRUMENTATION RESOURCE ALTERNATIVES (U)

(U) Alternatives for existing mobile resources were considered in three categories:

- (U) Instrumentation aircraft
- (U) Instrumentation ships
- (U) Supplemental land-based concepts.

(U) The aircraft studies considered consolidating functions historically performed by separate aircraft into a single aircraft configuration. Investigations into the ship workloads were conducted to identify future ship needs and opportunities for cost reductions. Supplemental land-based concepts were examined to reduce the cost to the nation for mobile resources in BOA test operations.

A. Alternatives for Mobile Instrumentation Aircraft (U)

(U) Currently, the nation has a fleet of eight* EC-135N ARIA at the 4950th Test Wing at Wright-Patterson Air Force Base, Ohio, to provide telemetry collection and relay from remote test areas of the world. Two P-3C SMILS aircraft will be used in the Atlantic to support RV impact scoring for Navy FBM testing, and two additional P-3 SMILS aircraft will be provided to support the MX and TRIDENT testing in the Pacific on an interim basis. PMTC, at Pt. Mugu, California, is equipping four P-3A aircraft for telemetry collection, tracking, and target control as part of the EATS. These resources total 17 aircraft.

(U) BOA support for ICBM/SLBM tests involving three to four multiple instrumented RVs (IRVs) currently can require equally as many ARIA for telemetry collection, because the existing nose dish antenna

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*(U) One ARIA was lost in an accident on 6 May 1981.

(U)

on the ARIA accommodates only single objects at one time.* Both the ARIA and a SMILS aircraft are needed for support of such tests. AFSC/ESD is planning the development of a multi-beam phased array telemetry antenna (APATS) for the ARIA to reduce the number of simultaneous support aircraft needed on multiple IRV tests. The EATS aircraft also incorporates a multi-beam phased array telemetry system which, although developed for supporting Naval weapon T&E and fleet exercises, could be modified to handle multiple IRV missions.

(U) Under guidance by OUSDRE/DDTE, the SSTSS Executive Committee designated a special task study group (October 1980) to examine the potential and options for a Universal Range Instrumentation Aircraft (URIA). SRI International was given (February 1981) a separate three-month task to conduct this study under the direction and guidance of the URIA study group. The study group members consisted of representatives from PMTC, the 4950th Test Wing, BMDSCOM-R, Headquarters USAF, and Headquarters AFSC. The group was chaired by Lt. R. S. Hassan, SAMTO/DOS.

(U) The results of the URIA study are documented in a separate SRI report and were summarized for integration into the overall SSTSS.

(U) The URIA study objectives were to:

- (U) Examine technically and operationally viable opportunities for satisfying users with mobile support needs by consolidating aircraft functions to configure a more efficient and cost-effective national resource.
- (U) Recommend and substantiate a preferred fleet configuration through cost benefit analyses.
- (U) Define the budget profile required to achieve the recommended approach.

*(U) In some instances MX RV deployment can be spaced to permit an ARIA sufficient time to complete telemetry collection on one RV before the second RV appears.

1. <u>Option Definitions</u> (U)

(U) Seven aircraft fleet options were identified for the URIA study.* These options represented a rational set of asset transition alternatives from current resources and also took advantage of existing or planned aircraft instrumentation system programs, such as EATS and APATS. The options ranged from simple functional consolidations to a fully universal range instrumentation aircraft concept. All options were technically defined, and the fleets were appropriately sized (see Section V, Volume II) so that each would be capable of supporting future user requirements and workloads. Table 7 lists the options, indicates the number of differently configured aircraft in each fleet, and designates the user missions each option would support.

(U) The fleet sizes established were a function of:

- (U) The maximum number of simultaneous aircraft of a given capability required per single mission.
- (U) Spare aircraft (if any) to ensure at least an 0.85 probability that the required number of aircraft would support a mission.
- (U) Additional aircraft reserves for aircraft and PME maintenance (for heavily worked fleets).
- (U) Additional aircraft needed to accommodate workload peaking from simultaneous missions.

2. <u>Alternative Aircraft Candidates</u> (U)

(U) A large variety of aircraft were investigated to determine the best operational and economical aircraft upgrade for the ARIA or integrated instrumentation aircraft mission. These alternatives included large, medium, and small aircraft. Instrumentation payloads were defined for each aircraft configuration used in the various fleet options. These payload weights (and volumes) were used to compare the candidate aircraft

*(U) One additional fleet option (option VIII) was analyzed by the SSTSS in response to a request by OUSDRE/DDTE. The results are documented under separate cover.

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Table 7

(U) URIA STUDY OPTIONS, FLEET SIZES, AND SUPPORT ROLES

Option	Aircraft Instrumentation						Total No. of Aircraft
	707 ARIA		P-3 SMILS		P-3 EATS		
	No. of Aircraft	Missions Supported	No. of Aircraft	Missions Supported	No. of Aircraft	Missions Supported	
I BASELINE	8	ICBM BOA* NASA/DoD satellite Cruise missile	5	ICBM Scoring*	4	Fleet exercises Tactical missile T&E	17
II ARIA/APATS	6	ICBM BOA* NASA/DoD satellite Cruise missile	5	ICBM Scoring*	4	Fleet exercises Tactical missile T&E	15
III EATS(U)/SMILS	4	NASA/DoD satellite Cruise missile		--	7	Fleet exercises Tactical missile T&E ICBM BOA*	11
IV ARIA/APATS/SMILS	6	ICBM BOA* NASA/DoD satellite Cruise missile		--	4	Fleet exercises Tactical missile T&E	10
V ARIA/SMILS	8	ICBM BOA* NASA/DoD satellite Cruise missile		--	4	Fleet exercises Tactical missile T&E	12
VI URIA	9	ICBM BOA* NASA/DoD satellite Cruise missile Fleet exercises Tactical missile T&E		--		--	9
VII EATS(U)/SMILS & ARIA/SMILS	6	Single IRV BOA missions* NASA/DoD space & satellite Cruise missile		--	4	Multi-IRV BOA missions* Fleet exercises Tactical missile T&E	10

*Atlantic and Pacific oceans

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performance for the required time-on-station (TOS) at a stressing BOA support location.

(U) Small aircraft were liminated due to limited volume and aircraft performance. Medium and large aircraft were investigated more thoroughly. Figure 11 plots the relative cost-effectiveness of these aircraft in providing the required TOS at Oeno.

FIGURE 11 (U) COST EFFECTIVENESS OF AIRCRAFT ALTERNATIVES vs TIME-ON-STATION AT OENO

(U) The 707-320C was identified as the preferred ARIA upgrade (over the alternatives of re-engining or using other aircraft) because it provides an acceptable TOS at stressing BOA locations, it is in the Air Force inventory (AWACS), and has the lowest acquisition and competitive O&S costs.

Table 8

(U) URIA OPTION COMPARISONS AND RANKING

Parameter	Option III EATS(U)/SMILS	Option IV 707 ARIA/APATS/SMILS	Option VII EATS(U)/SMILS & 707 ARIA/SMILS
Fleet size (aircraft)	11	10	10
Technical and operational factors			
TM capability	EATS(U) phased array	APATS	EATS(U) phased array, plus ARIA dish
Growth	None: P-3 volume and weight at limit	Good: Additional 707 volume and weight available	Good with 707; none with P-3
Organization	Transfer all ICBM/SLBM workload to new organization	Retains ICBM/SLBM at experienced organization	Uses both 4950th TW and PMTC
Technical risk	Moderate: New phased array	Moderate: New phased array	Moderate: New phased array
Operational risk	Moderate: New organization	Low: Old organization	Low: Old organization
Ranking			

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(U) In consideration of the above conclusions, all ARIA or ARIA variants used in the various URIA/ARIA study options employed a 707-320C aircraft. Also, for all study options involving P-3A aircraft (Options I and II PMTC SMILS and all standard EATS aircraft) it is assumed that the T56-A-10W engines will be modified to -14 engines after 1985 to ensure continued maintainability due to probable discontinuance of the -10 engine in the Navy's P-3 inventory. Finally, the P-3A aircraft will require upgrading to a P-3B equivalent to perform the EATS(U) SMILS ballistic missile support in Options III and VII.

(U) Details of these aircraft performance analyses can be found summarized in Section V, Volume II, and are expanded in the separate URIA report.

(U) Next, alternative ARIS ship concepts were considered to perform the DOT installation and maintenance. It was determined that either a NAVOCEANO or commercial vessel, suitably equipped with accurate navigation and DOT acoustic surveying equipment, could perform the functions for substantially less cost than could the ARIS (about . To provide a firm commitment for Pacific DOT emplacement to meet near-term MX and TRIDENT needs, PMTC arranged with NAVOCEANO for the USNS Silas Bent to perform the initial TRIDENT Pacific DOT implants. NAVOCEANO, however, declined to assume responsibility for subsequent routine DOT maintenance. Investigations by the SSTSS identified potential commercial vessels that could perform the required maintenance if they were equipped with precise navigation and the acoustic survey devices that were to be developed for the NAVOCEANO ship Silas Bent.

(U) One further cost-saving concept was studied: The use of an existing oceangoing tug to install and maintain the DOT array at KMRN. This Kwajalein Broad Ocean Area Tug (K-BOAT) is described more fully in a later section.

(U) The plan and schedule developed for DOT installation using the NAVOCEANO/commercial ships is summarized in Table 9.

(U) According to the plan, once the Silas Bent has finished installing the Pacific TRIDENT DOTs, the DOT acoustic installation equipment will be transferred to a contract vessel during June 1982 through 1983 for installation of the MX DOTs at BOAs 1, then 3, and 2. This task will be the responsibility of PMTC.

(U) Again, according to the plan, the K-BOAT installs the MX DOTs at KMRN under the joint responsibility of the Kwajalein Missile Range Directorate (KMRD) and Western Space and Missile Center (WSMC) in August 1982.

(U) Figure 13 shows the redistribution of ship workloads with the NAVOCEANO/contract ship (and K-BOAT) performing all DOT installation and

Table 9

(U) DOT INSTALLATION PLAN

Resource	Location	Initial Operating Capability	Responsibility
NAVOCEANO (Silas Bent)	LP-11 LP-12	Nov-Dec 1981	PMTC/NAVOCEANO
	Oeno Wake	Mar-Jun 1982	
K-boat	KMRN	Aug 1982	KMRD/WSMC
Equipment transition		Jun 1982-Jan 1983	PMTC/NAVOCEANO
Commercial ship	BOA-1 BOA-2 BOA-3	Jan-Jun 1983	PMTC
	BOA maintenance SLTA implants Atlantic BOAs	Post-Jun 1983	PMTC: Pacific ESMC: Atlantic

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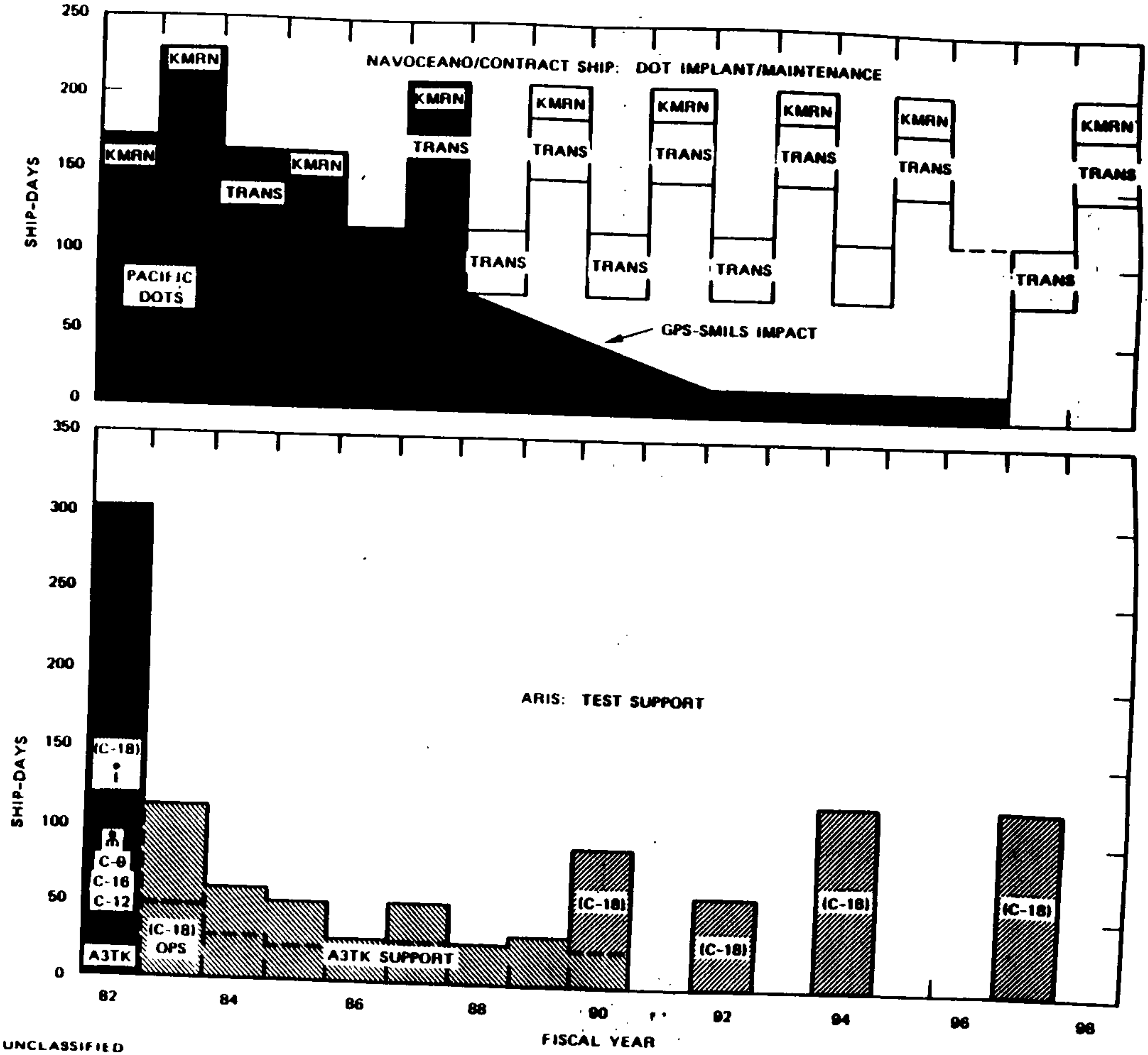

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FIGURE 13 (U) REDISTRIBUTION OF SHIP WORKLOADS

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(U)

maintenance, while the ARIS performs the test support for which it is uniquely equipped.

(U) In FY88, there will be a potential reduction in the contract DOT vessel workload because of the Global Positioning System (GPS)-SMILS system being developed by WSMC. This scoring system uses small GPS translators on two or three of the sonobuoys deployed by the mission support aircraft. The GPS sonobuoys then provide their own geodetic reference for scoring and thereby eliminate the need for DOTs in the terminal areas. The shaded portion of the DOT workload shown in Figure 13 reflects this potential reduction for even greater savings to the nation. A residual DOT maintenance service will still be required for the launch point DOTs used to locate the TRIDENT submarine.[29]

- (U) Impact scoring on all RVs.

(U) Several reasons prompted investigation of mobile instrumentation support at KMRN:

- (U) The cost of ship-installed and -maintained DOTs for RV scoring is very high.
- (U) Opportunities were being investigated by KMRD for reducing the aircraft workload by supplemental land-based instrumentation concepts on the small islands around the Kwajalein Atoll.
- (U) The advantages of supporting a nearby BOA from KMR rather than CONUS seem economically and operationally attractive.

(U) The recommended alternative for MX support at KMRN consists of two primary elements:

- (U) A C-7A Terminal Area Support Aircraft (TASA) equipped with:
  - (U) Supplemental (terminal) telemetry system
  - (U) SMILS scoring capability
  - (U) Streak-optics camera system.
- (U) A K-BOAT for:
  - (U) Initial DOT installation
  - (U) Continued DOT maintenance.

(U) Of the various SLTA instrumentation alternatives examined, the concepts that most consistently appealed to the ad hoc group were the use of a LBTS, plus either a Missile Impact Location System (MILS) or SMILS scoring system. Supplemental telemetry and surveillance would be provided with a low-cost aircraft platform.

(U) The MRTFC, in response to a SSTSS recommendation to proceed with the SLTA design, designated WSMC as the lead range for design and implementation.

relay for the 60-nmi target.

- (U) Impact scoring with the MILS array.

(U) Concerns over this approach by the SSTSS Executive Committee were: the degree of confidence that could be placed on the planned WSMC updated range safety abort system (MDPS/MSS) to achieve the close-in targeting required by the 30-nmi target point, and the high initial development costs.

VI MISCELLANEOUS TOPICS (U)

A. EATS/APATS Telemetry Antenna Comparisons (U)

(U) During the SSTSS, a question arose concerning the ability of the EATS phased array telemetry antenna to collect ballistic missile telemetry from RVs. Various degrees of modification had been proposed by PMTC to accommodate the requirements of RV telemetry support in the BOA. Of additional interest was the performance comparison between an upgraded EATS antenna (EATS[U]), and the proposed ARIA phased array telemetry system (the APATS). In a special tasking of OUSDRE/DDTE, the SSTSS Executive Committee was asked to have this EATS/APATS analysis performed.

(U) SRI International (the SSTSS support contractor) was assigned the analysis. The detailed results are documented in a separate report;* they are summarized below:

Ex 5

Ex 3

(U) Figure 22 depicts an elevation azimuth plot (as viewed from the antenna) comparing the EATS(U) and APATS telemetry signal blackout duration for representative reentry trajectories of the MK-4 and MK-12A RVs. Blackout is not critical to the Navy MK-4 RV due to a second

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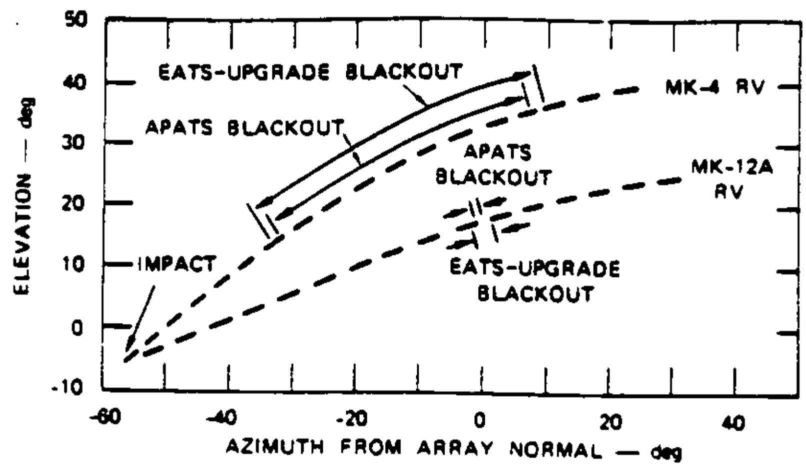
* (U) J. F. Cline and E. G. Blackwell, "EATS/APATS Telemetry Antenna Performance Comparisons in a Ballistic Missile Terminal Area Support Role," SRI Project 1715, Final Task Report 1715-81-FR-88 (June 1981).

(U)

telemetry channel that retransmits several seconds of recorded data after the reentry plasma conditions have subsided but prior to RV impact.



- BASIC EATS IS NOT ADEQUATE
- POLARIZATION DIVERSITY ADDED TO EATS NOT ADEQUATE
- UPGRADED EATS AND APATS NEARLY EQUIVALENT

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FIGURE 22 (U) EATS/APATS ANTENNA PERFORMANCE COMPARISONS

B. Bigej Repopulation (U)

(U) KMR instrumentation and BMD launch facilities are located on several of the islands of Kwajalein Atoll. There is a Mid-Atoll Corridor set aside (with controlled personnel access) in which the potentially more hazardous ICBM targeting and BMD interceptor test operations can be conducted in relative safety. This corridor was established in a 1964 agreement between the U.S. Army and the Government of the Trust Territory of the Pacific Islands.

(U) As part of the 1980-1981 Interim Use Agreement between the United States and the Marshallese, a review of the current Mid-Atoll Corridor boundary was to be made to determine the possibility of moving the boundary just north Bigej to permit safe habitation of that island.

C. Pacific Utilization (U)

(U) One of the additional tasks assigned to the SSTSS Executive Committee was to coordinate with the State Department the initial plans for using the Pacific as a ballistic missile test arena. This activity stemmed from the continuing need and concern of the State Department in staying abreast of possible plans for using foreign facilities or territorial waters.

(U) Of specific interest to the State Department was the potential need for Pacific staging bases for the C-7A TASA aircraft and planned MX target areas.

(U) Briefings were prepared on these specific topics and presented on two occasions (February and March 1981) to DoD/ISA and the State Department. Additionally, PACAF and CINCPAC were briefed on April 1981.

(S) ~~(U)~~ As a result of this activity, the State Department gleaned a better understanding of the utilization of the Pacific by the strategic ballistic missile testing programs, whereupon a site survey of NML was permitted in May 1981. Coordination between test planning agencies and the State Department is continuing.

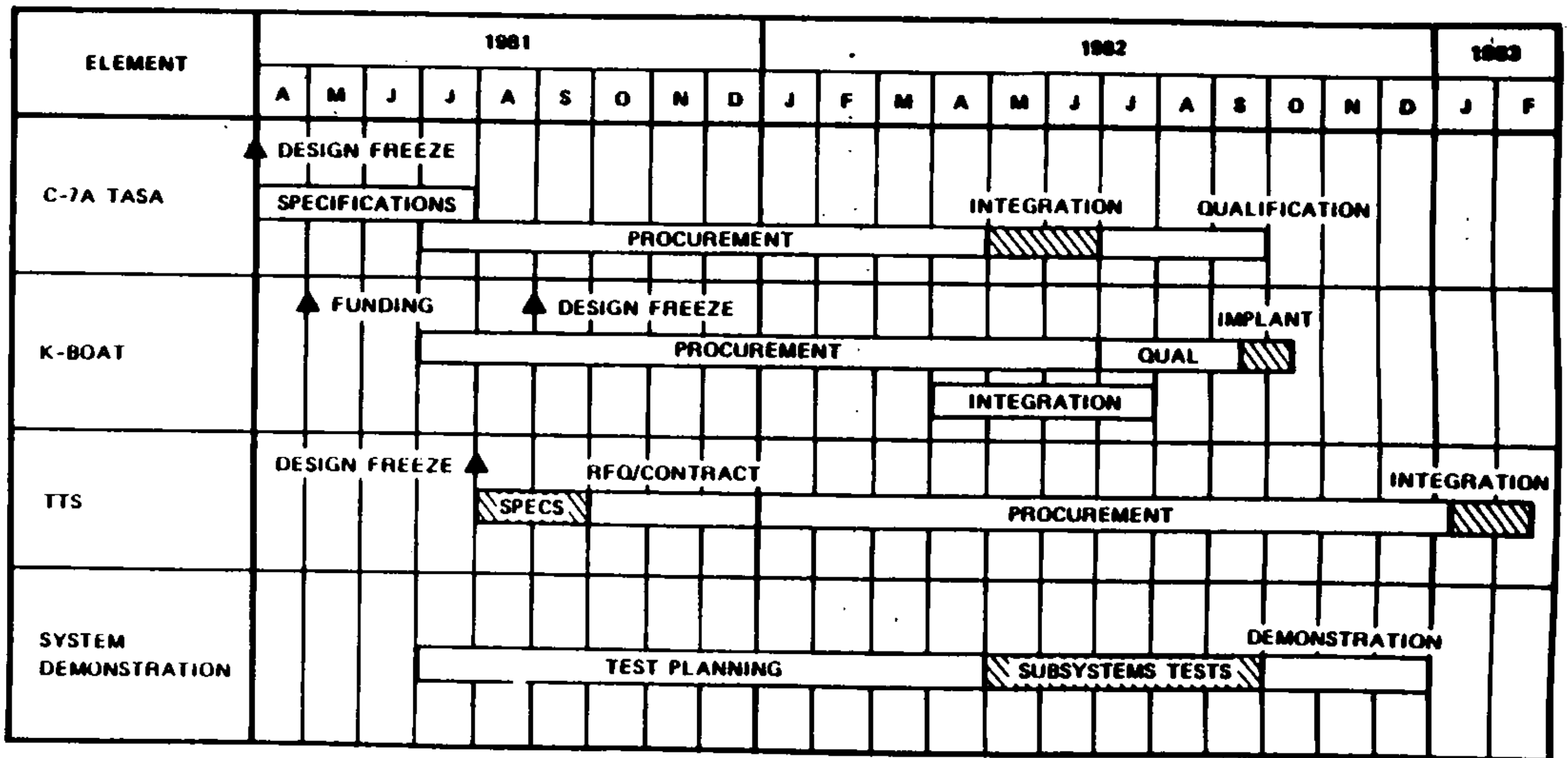

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FIGURE 25 (U) INTEGRATED DEVELOPMENT SCHEDULE FOR KMRN